

2006 Chevrolet Impala LS

2006 ACCESSORIES & EQUIPMENT Entertainment - Impala

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Entertainment - Impala

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Antenna Amplifier Fastener	3 N.m	27 lb in
Audio Amplifier Fasteners	2.5 N.m	22 lb in
Digital Radio Receiver Mounting Bracket to Body Fasteners	5 N.m	44 lb in
Digital Radio Receiver to Mounting Bracket Fasteners	3.5 N.m	31 lb in
Radio Fasteners	2 N.m	18 lb in
Speaker Grille Fasteners	2 N.m	18 lb in

SCHEMATIC AND ROUTING DIAGRAMS

ENTERTAINMENT SCHEMATIC ICONS

Entertainment Schematic Icons

Icon	Icon Definition
	IMPORTANT: Twisted-pair wires provide an effective "shield" that helps protect sensitive electronic components from electrical interference. In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted-pair wires shown : • The wires must be twisted a minimum of 9 turns per 31 cm (12 in) as measured anywhere along the length of the wires. • The outside diameter of the twisted wires must not exceed 6.0 mm (0.2 in).

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RADIO/AUDIO SYSTEM SCHEMATICS

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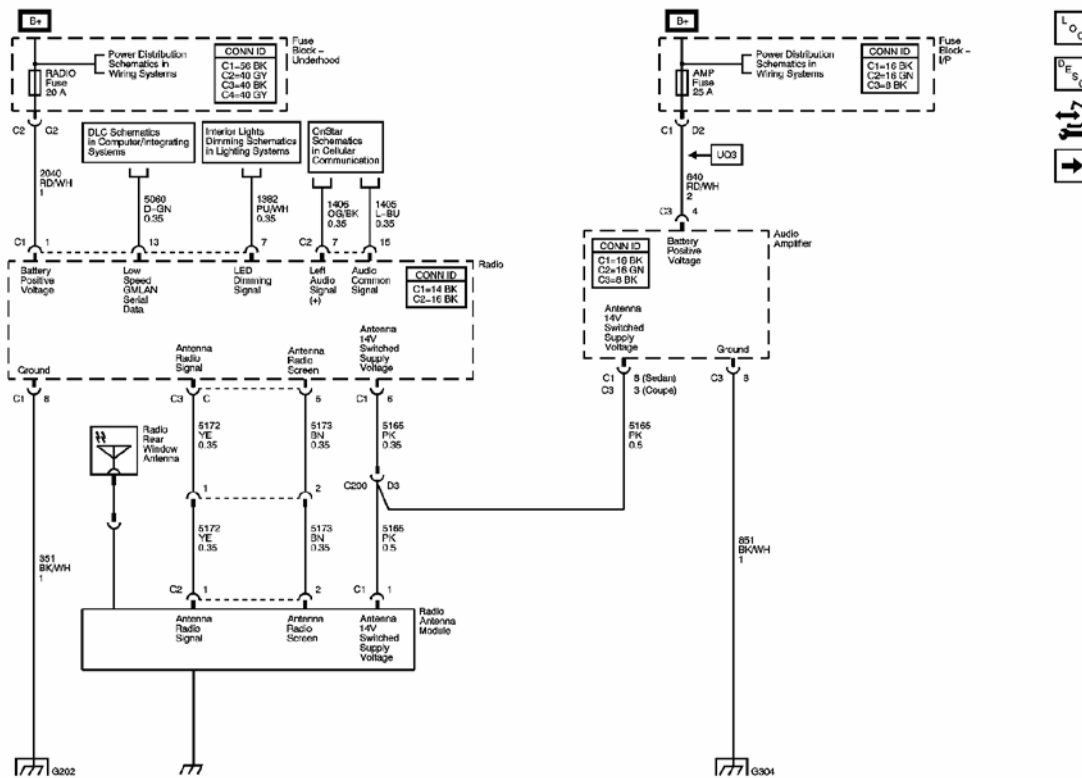


Fig. 1: Power, Ground, and References - Wiring Diagram
 Courtesy of GENERAL MOTORS CORP.

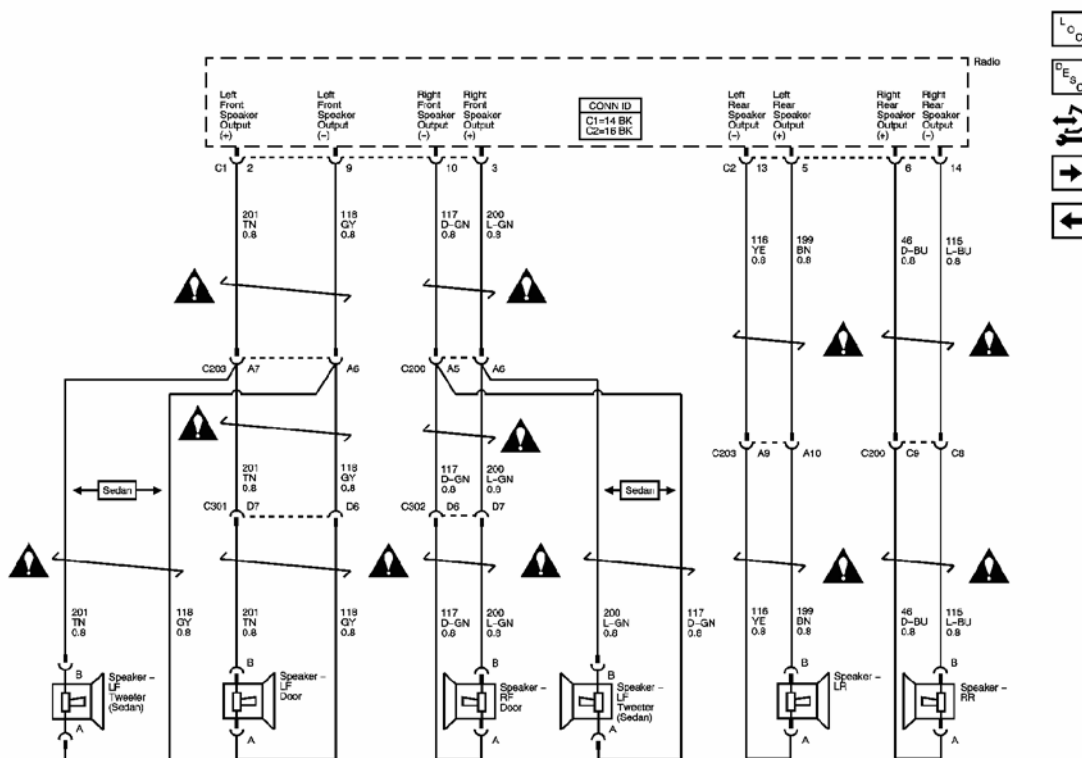


Fig. 2: Radio to Speakers - UW6 - Wiring Diagram
Courtesy of GENERAL MOTORS CORP.

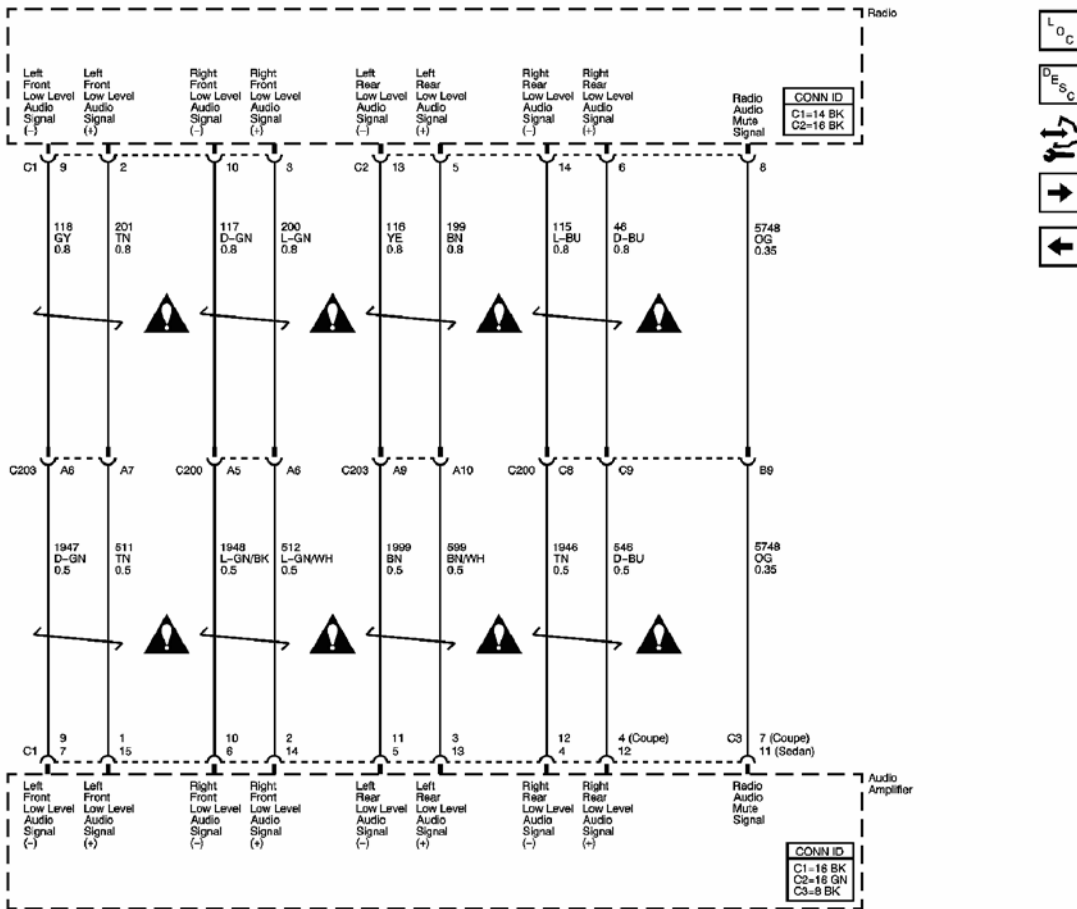


Fig. 3: Audio Signal Communication - UQ3 - Wiring Diagram
Courtesy of GENERAL MOTORS CORP.

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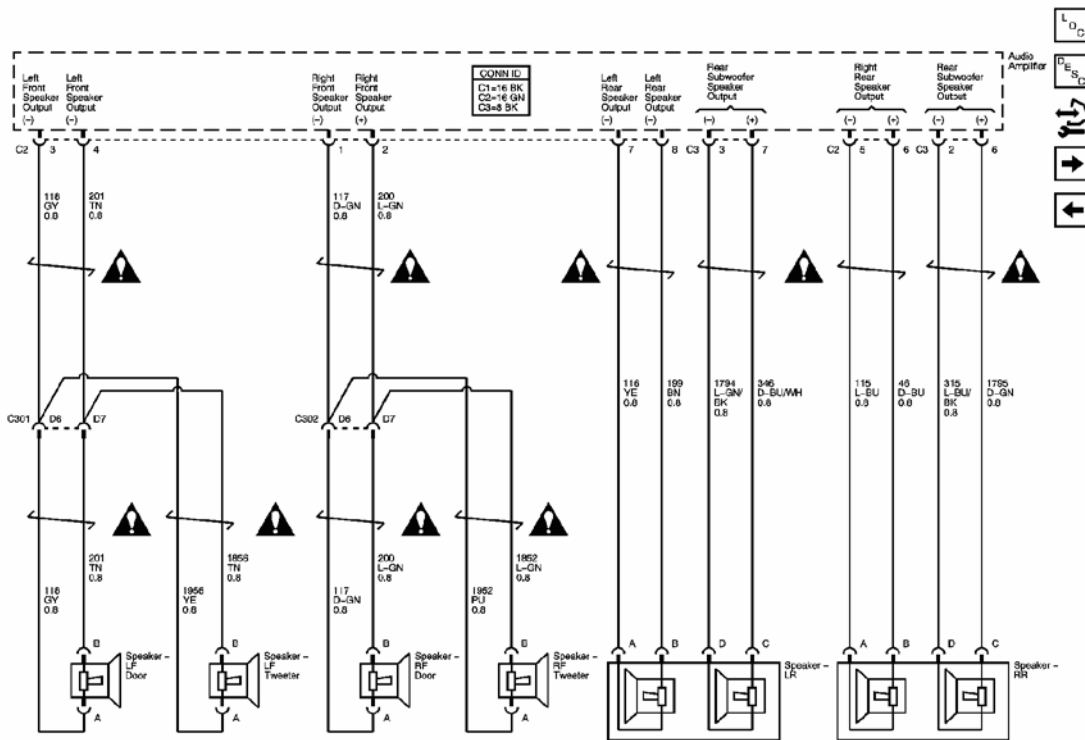


Fig. 4: Audio Amplifier to Speakers - UQ3, Sedan - Wiring Diagram
Courtesy of GENERAL MOTORS CORP.

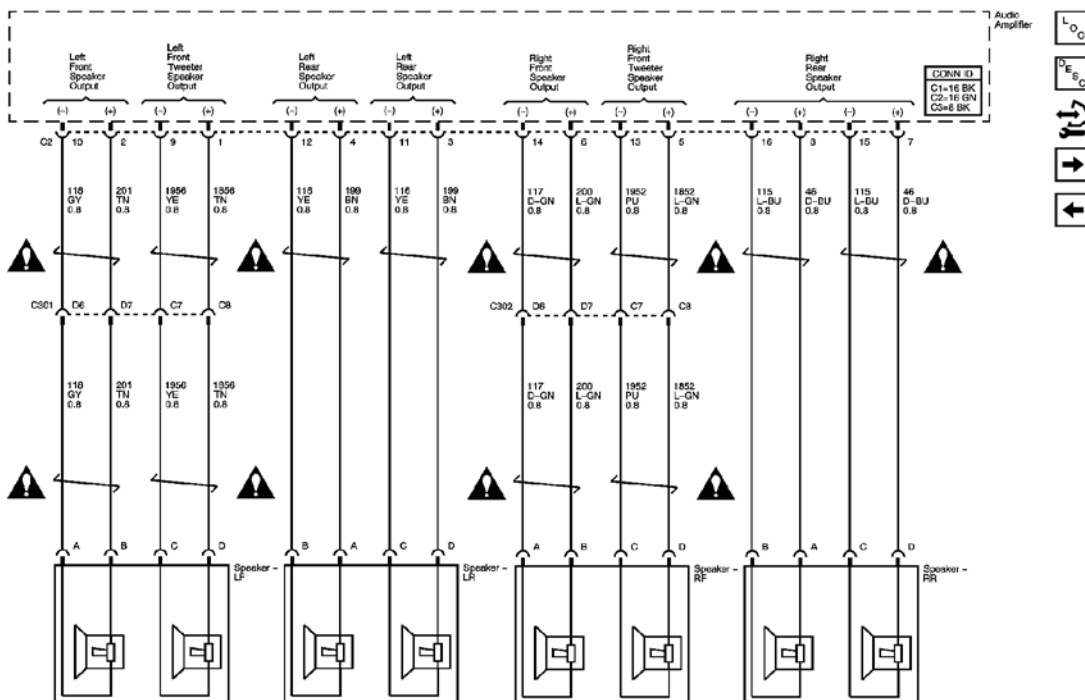


Fig. 5: Amplifier to Speakers - UQ3, Coupe - Wiring Diagram
Courtesy of GENERAL MOTORS CORP.

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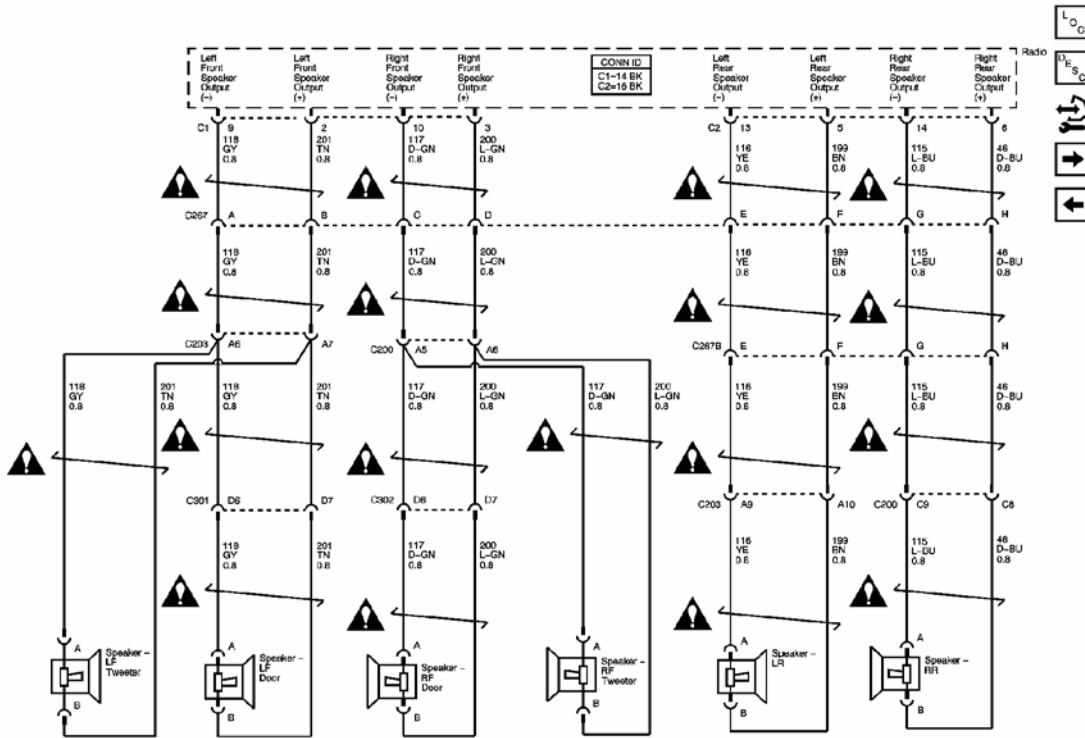


Fig. 6: Radio to Speakers - 9C1, 9C3, w/o WX7 - Wiring Diagram
 Courtesy of GENERAL MOTORS CORP.

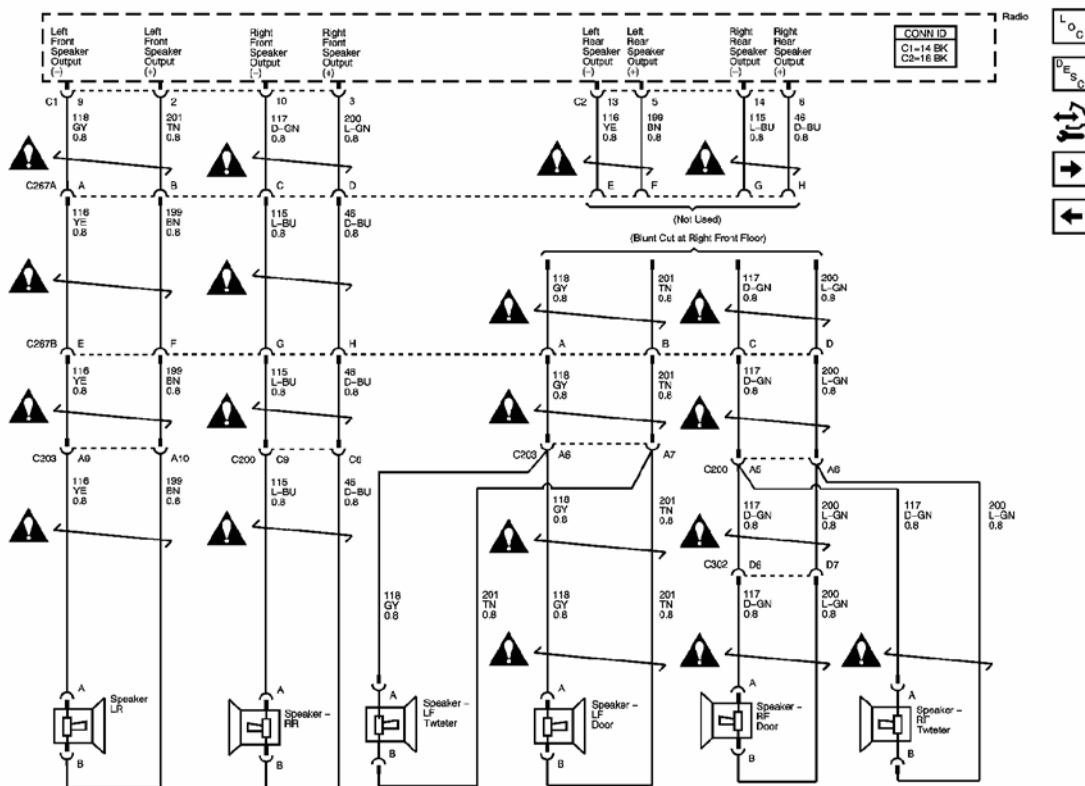


Fig. 7: Radio to Speakers - 9C1, 9C3, and WX7 - Wiring Diagram
 Courtesy of GENERAL MOTORS CORP.

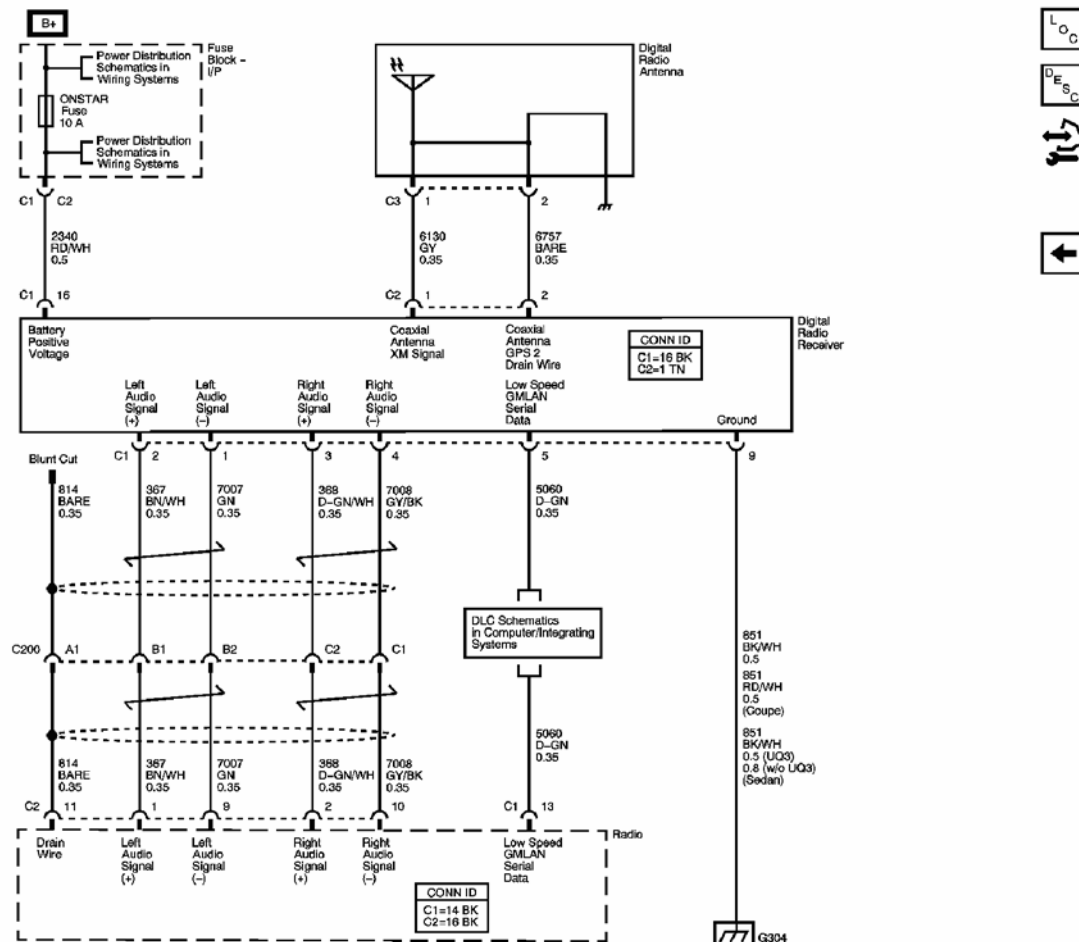


Fig. 8: Satellite Radio - U2K - Wiring Diagram
 Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

ENTERTAINMENT COMPONENT VIEWS

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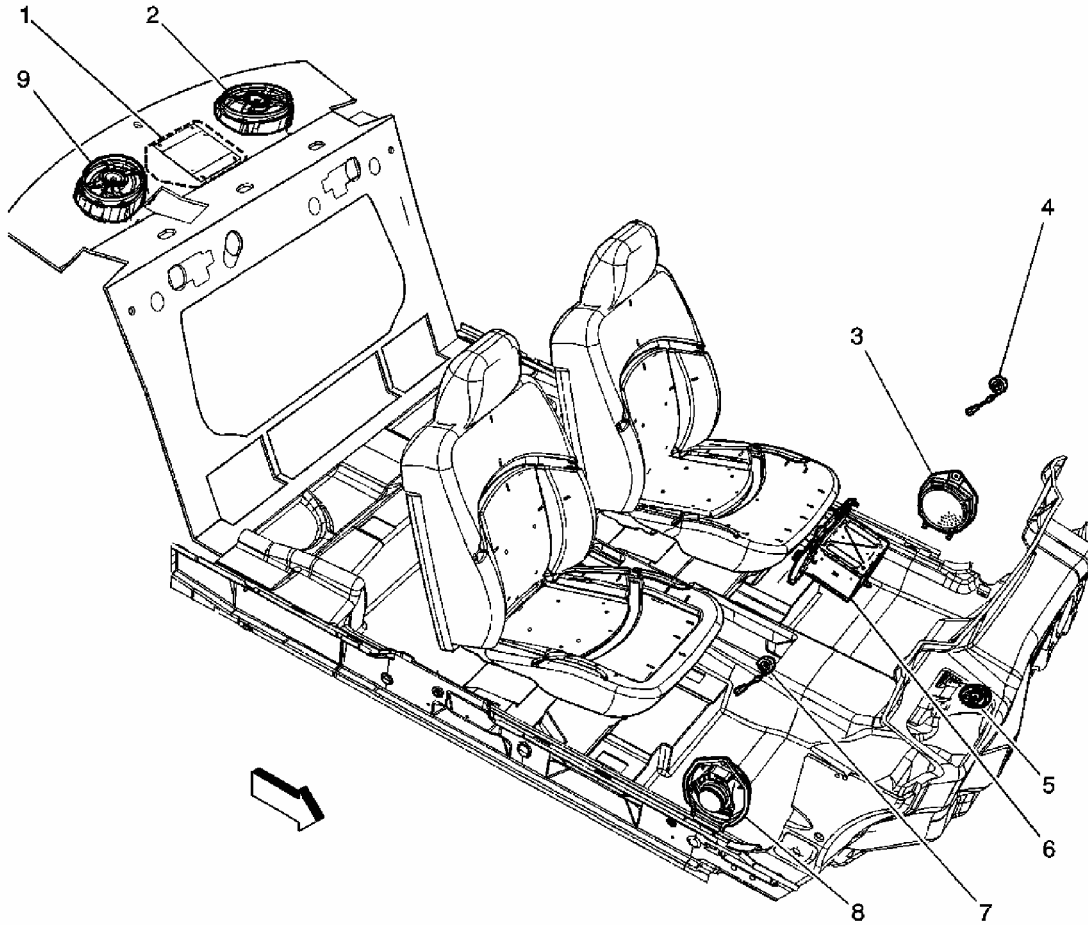


Fig. 9: Radio and Speaker Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 9

Callout	Component Name
1	Radio Amplifier (U88)
2	Speaker - LR
3	Speaker - LF Door
4	Speaker - LF Tweeter
5	Speaker - Center (U88)
6	Radio
7	Speaker - RF Tweeter
8	Speaker - RF Door
9	Speaker - RR

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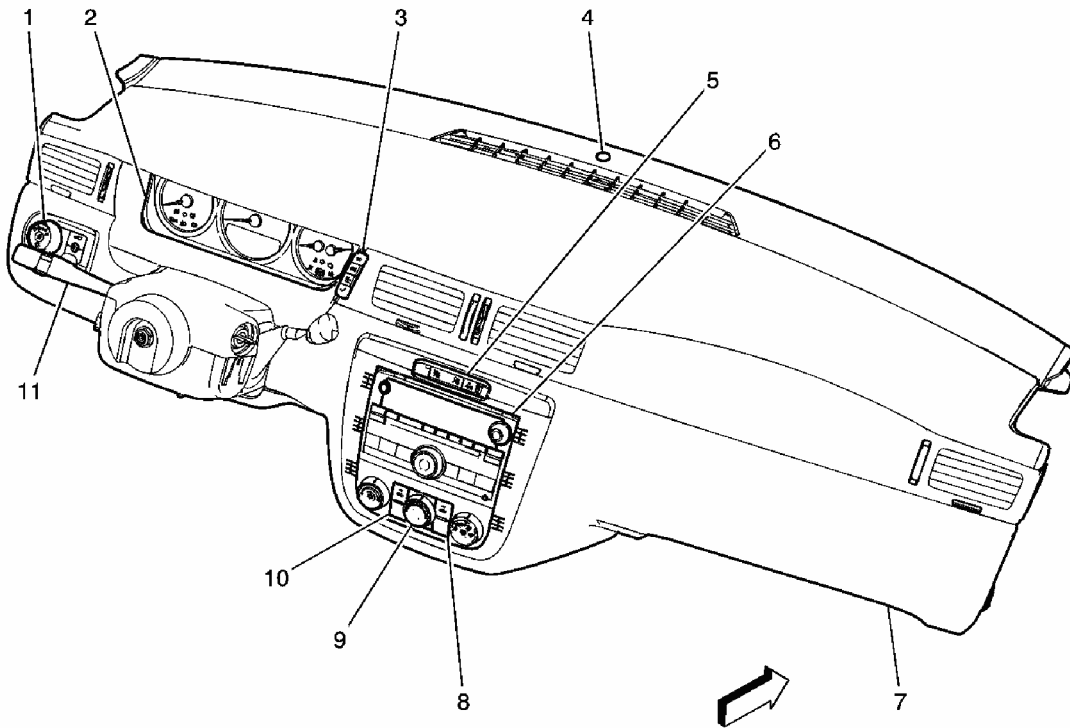


Fig. 10: I/P Components

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 10

Callout	Component Name
1	Headlamp Switch
2	Instrument Panel Cluster (IPC)
3	Driver Information Center (DIC) Switch
4	Ambient Light Sensor
5	Inflatable Restraint Passenger Air Bag On/Off Indicator (Sedan w/o 9C1, 9C3)
6	Radio
7	I/P Trim Panel
8	Heated Seat Switch-Passenger (KA7)
9	HVAC Control Module
10	Heated Seat Switch-Driver (KA7)
11	Turn Signal / Multifunction Switch

ENTERTAINMENT CONNECTOR END VIEWS

Audio Amplifier C1 (U87)

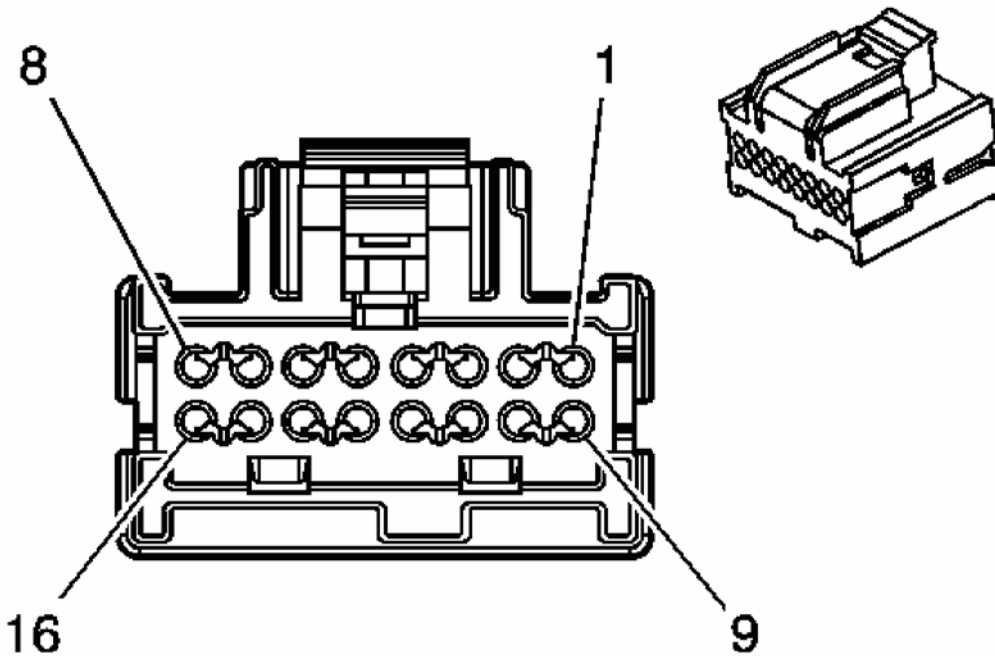


Fig. 11: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15394150
- Service: See Catalog
- Description: 16-Way F Micro 64 Modular (BK)

Terminal Part Information

- Pins: 1, 2, 9, 10, 3, 4, 11, 12
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: Pins 1, 2, 9, 10 - See Terminal Repair Kit
- Core/Insulation Crimp: Pins 3, 4, 11, 12 - M/M
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Audio Amplifier C1 (U87)

Pin	Wire Color	Circuit No.	Function
1	TN	201	Left Front Speaker Output (+)

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2	L-GN	200	Right Front Speaker Output (+)
3	BN/WH	599	Left Rear Low Level Audio Signal (+)
4	D-BU	546	Right Rear Low Level Audio Signal (+)
5-8	-	-	Not Used
9	GY	118	Left Front Speaker Output (-)
10	D-GN	117	Right Front Speaker Output (-)
11	BN	1999	Left Rear Low Level Audio Signal (-)
12	TN	1946	Right Rear Low Level Audio Signal (-)
13-16	-	-	Not Used

Audio Amplifier C1 (UQ3)

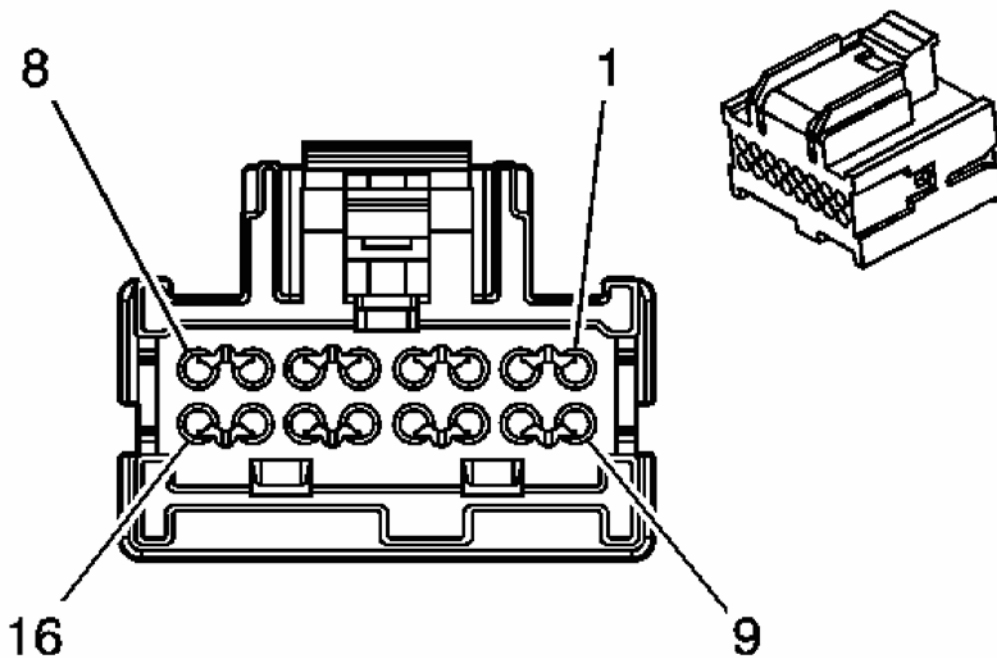


Fig. 12: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

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- OEM: 15394150
- Service: See Catalog
- Description: 16-Way F Micro 64 Modular (BK)

Terminal Part Information

- Pins: 4, 5, 6, 7, 8, 11, 12, 13, 14, 15
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: M/M
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Audio Amplifier C1 (UQ3)

Pin	Wire Color	Circuit No.	Function
1-3	-	-	Not Used
4	TN	1946	Right Rear Low Level Audio Signal (-)
5	BN	1999	Left Rear Low Level Audio Signal (-)
6	L-GN/BK	1948	Right Front Low Level Audio Signal (-)
7	D-GN	1947	Left Front Low Level Audio Signal (-)
8	PK	5165	TBD
9--10	-	-	Not Used
11	OG	5748	TBD
12	D-BU	546	Right Rear Low Level Audio Signal (+)
13	BN/WH	599	Left Rear Low Level Audio Signal (+)
14	L-GN	512	Right Front Low Level Audio Signal (+)
15	TN	511	Left Front Low Level Audio Signal (+)
16	-	-	Not Used

Audio Amplifier C2 (U87)

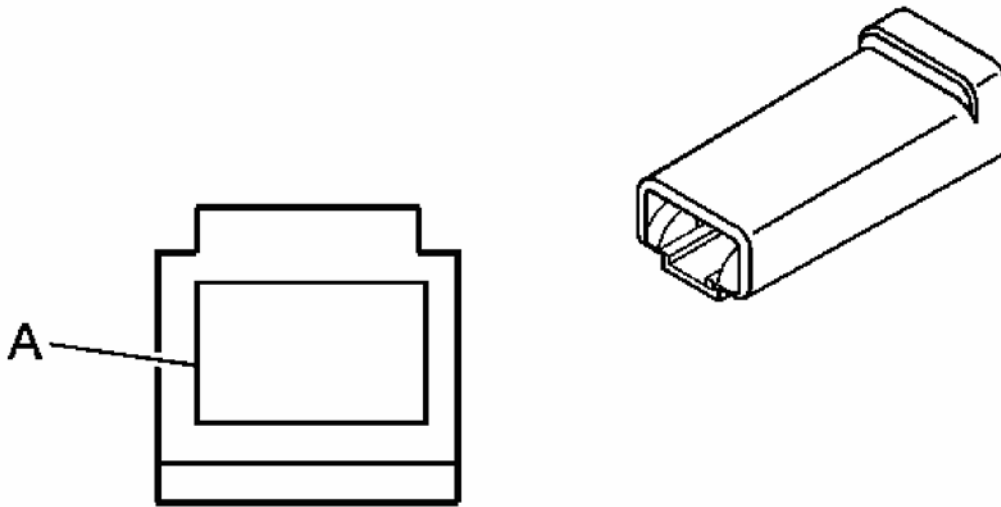


Fig. 13: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 10734461
- Service: See Catalog
- Description: 16-Way F 1.5 (GN)

Terminal Part Information

- Terminal/Tray: 33012-0002/26
- Core/Insulation Crimp: 2/C
- Release Tool/Test Probe: 12094429/J-35616-66 (YE)

Audio Amplifier C2 (U87)

Pin	Wire Color	Circuit No.	Function
1	TN	1856	Left Front Tweeter Speaker Output (+)
2	TN	201	Left Front Speaker Output (+)
3	BN	199	Left Rear Speaker Output (+)
4	BN	199	Left Rear Speaker Output (+)
5	L-GN	1852	Right Front Tweeter Speaker Output

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			(+)
6	L-GN	200	Right Front Speaker Output (+)
7	D-BU	46	Right Rear Speaker Output (+)
8	D-BU	46	Right Rear Speaker Output (+)
9	YE	1956	Left Front Tweeter Speaker Output (-)
10	GY	118	Left Front Speaker Output (-)
11	YE	116	Left Rear Speaker Output (-)
12	YE	116	Left Rear Speaker Output (-)
13	PU	1952	Right Front Tweeter Speaker Output (-)
14	D-GN	117	Right Front Speaker Output (-)
15	L-BU	115	Right Rear Speaker Output (-)
16	L-BU	115	Right Rear Speaker Output (-)

Audio Amplifier C2 (UQ3)

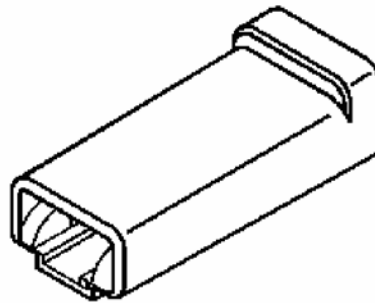
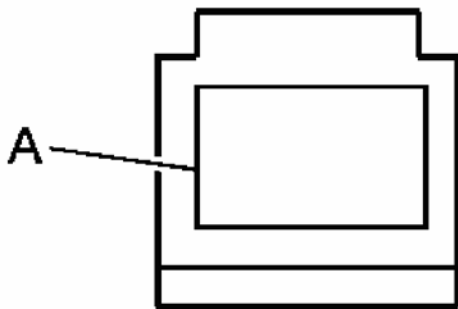


Fig. 14: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 10734461

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- Service: See Catalog
- Description: 16-Way F 1.5 (GN)

Terminal Part Information

- Pins: 1, 2, 3, 4, 5, 6, 7, 8
- Terminal/Tray: 33012-0002/26
- Core/Insulation Crimp: 2/C
- Release Tool/Test Probe: 12094429/J-35616-66 (YE)

Audio Amplifier C2 (UQ3)

Pin	Wire Color	Circuit No.	Function
1	D-GN	117	Right Front Speaker Output (-)
2	L-GN	200	Right Front Speaker Output (+)
3	GY	118	Left Front Speaker Output (-)
4	TN	201	Left Front Speaker Output (+)
5	L-BU	115	Right Rear Speaker Output (-)
6	D-BU	46	Right Rear Speaker Output (+)
7	YE	116	Left Rear Speaker Output (-)
8	BN	199	Left Rear Speaker Output (+)
9-16	-	-	Not Used

Audio Amplifier C3 (U87)

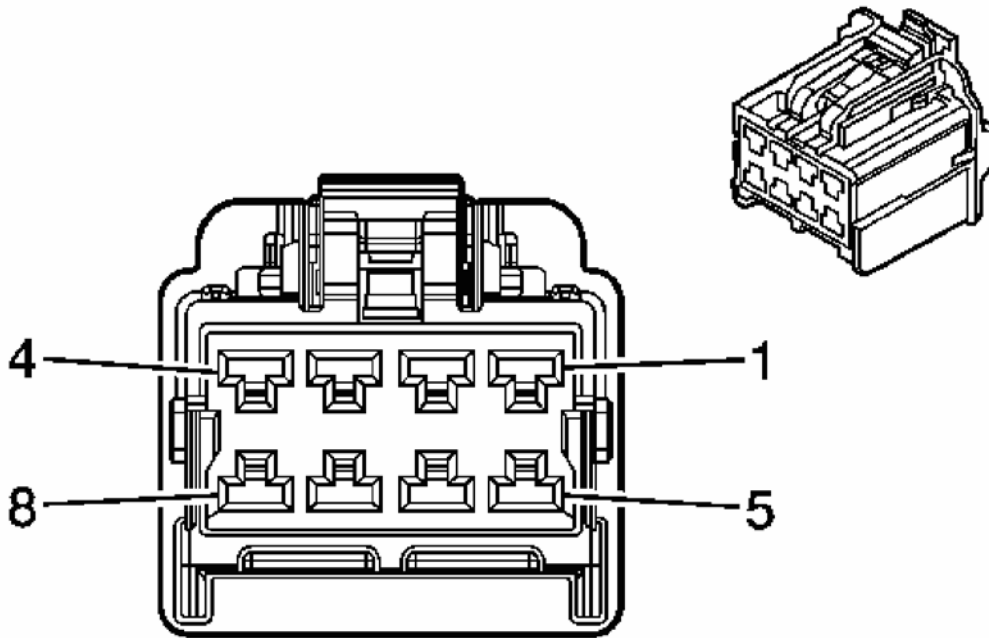


Fig. 15: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15465056
- Service: See Catalog
- Description: 8-Way F GT 280 (BK)

Terminal Part Information

- Pins: 4
- Terminal/Tray: 15304713/19
- Core/Insulation Crimp: 4/4
- Release Tool/Test Probe: 15315247/J-35616-4A (PU)
- Pins: 3, 7, 8
- Terminal/Tray: 15304711/8
- Core/Insulation Crimp: Pins 3, 7 - See Terminal Repair Kit
- Core/Insulation Crimp: Pins 8 - 2/A

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- Release Tool/Test Probe: 15315247/J-35616-4A (PU)

Audio Amplifier C3 (U87)

Pin	Wire Color	Circuit No.	Function
1-2	-	-	Not Used
3	PK	5165	TBD
4	RD/WH	640	Battery Positive Voltage
5-6	-	-	Not Used
7	OG	5748	TBD
8	BK/WH	351	Ground

Audio Amplifier C3 (UQ3)

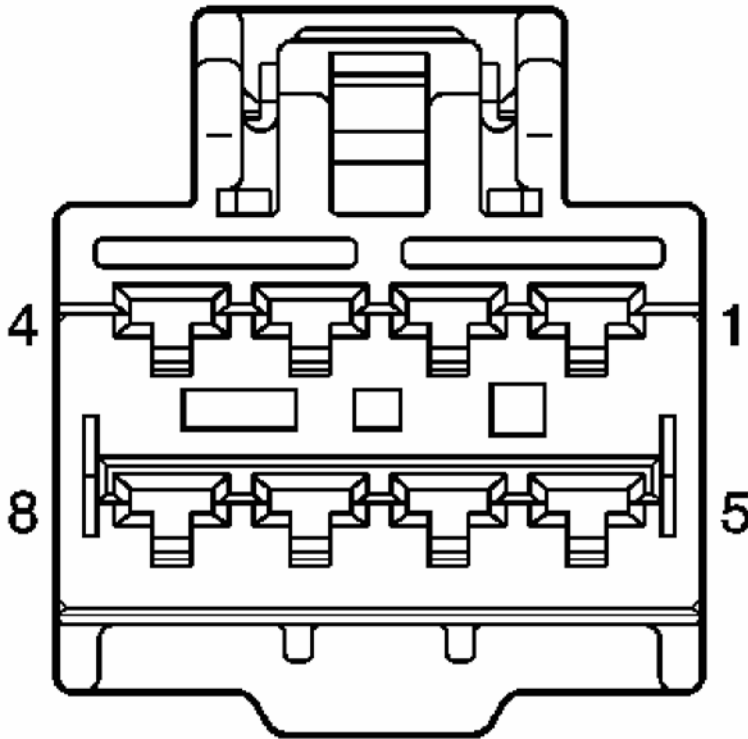


Fig. 16: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

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- OEM: 15491286
- Service: See Catalog
- Description: 8-Way F Receptacle 2.8 (BK)

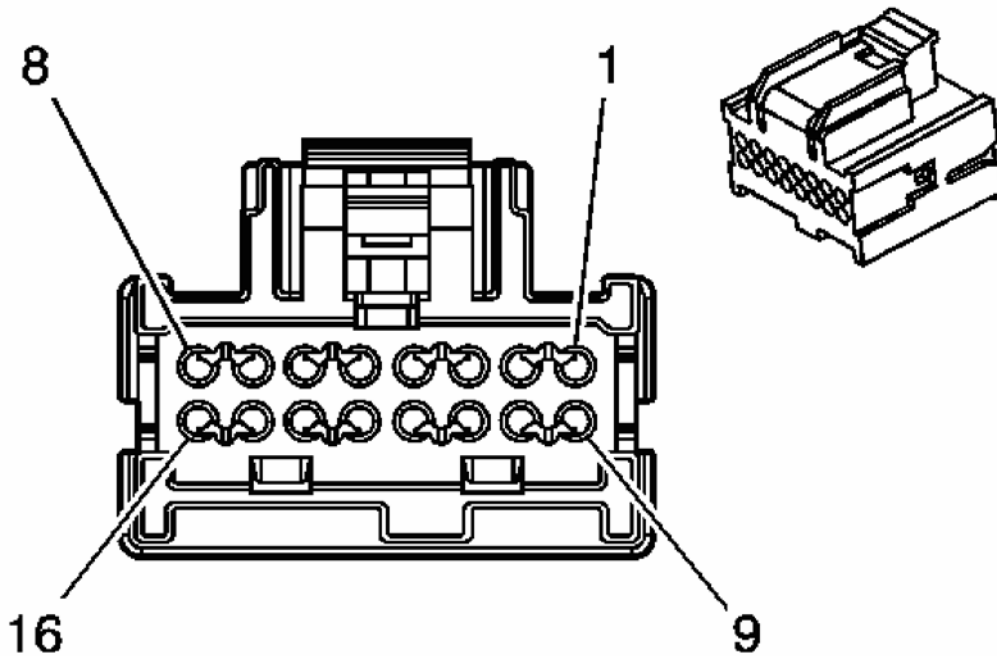
Terminal Part Information

- Pins: 2, 3, 6, 7
- Terminal/Tray: 8100-4444/22
- Core/Insulation Crimp: 2/A
- Release Tool/Test Probe: 15315247/J-35616-4A (PU)
- Pins: 4, 8
- Terminal/Tray: 8100-4445/22
- Core/Insulation Crimp: 4/4
- Release Tool/Test Probe: 15315247/J-35616-4A (PU)

Audio Amplifier C3 (UQ3)

Pin	Wire Color	Circuit No.	Function
1	-	-	Not Used
2	L-BU/BK	315	Right Subwoofer Speaker Output (-)
3	L-GN/BK	1794	[Left or Rear] Subwoofer Speaker Output (-)
4	RD/WH	640	Battery Positive Voltage
5	-	-	Not Used
6	D-GN	1795	Right Subwoofer Speaker Output (+)
7	D-BU/WH	346	Left or Rear Subwoofer Speaker Output (+)
8	BK/WH	851	Ground

Digital Radio Receiver C1 (U2K)

**Fig. 17: Connector End View**

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views**Connector Part Information**

- OEM: 15394150
- Service: See Catalog
- Description: 16-Way F Micro 64 Modular (BK)

Terminal Part Information

- Pins: 1, 2, 3, 4, 5, 9, 16, 9
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: M/M
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Digital Radio Receiver C1 (U2K)

Pin	Wire Color	Circuit No.	Function
1	D-GN	7007	TBD
2	BN/WH	367	Remote Radio Left Audio Signal

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3	D-GN/WH	368	Remote Radio Right Audio Signal
4	GY/BK	7008	TBD
5	D-GN	5060	Low Speed GMLAN Serial Data
6-8	-	-	Not Used
9	BK/WH	851	Ground
10-15	-	-	Not Used
16	RD/WH	2340	Battery Positive Voltage
9	BK/WH	351	Ground

Radio Antenna Module

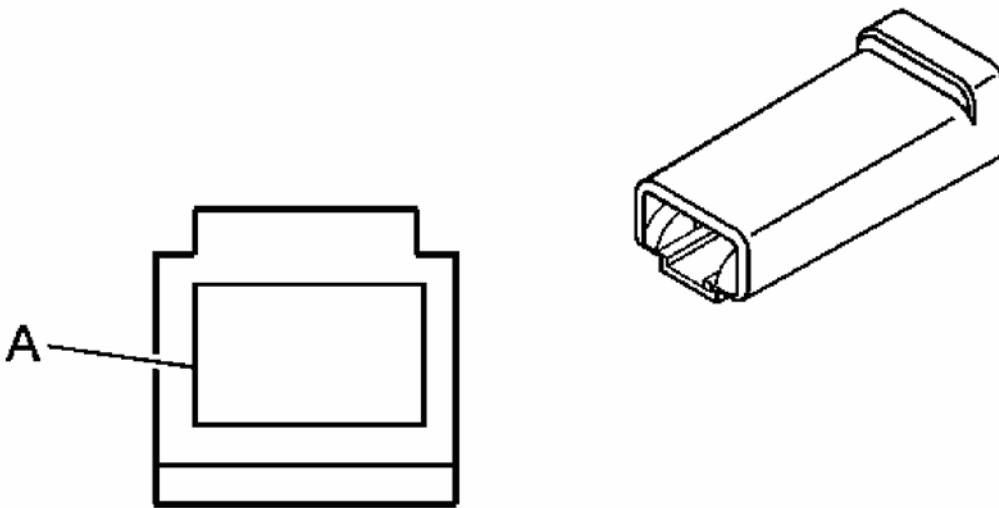


Fig. 18: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15418109
- Service: Not Serviced
- Description: 1-Way F

Terminal Part Information

- Pins: 1
- Terminal/Tray: See Terminal Repair Kit

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- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit
- Pins: A, B
- Terminal/Tray: Not Serviced in Kit
- Core/Insulation Crimp: Not Serviced in Kit
- Release Tool/Test Probe: Not Serviced in Kit

Radio Antenna Module

Pin	Wire Color	Circuit No.	Function
1	PK	5165	TBD
A	PK	5165	TBD
B	BK/WH	1351	Ground

Radio C1

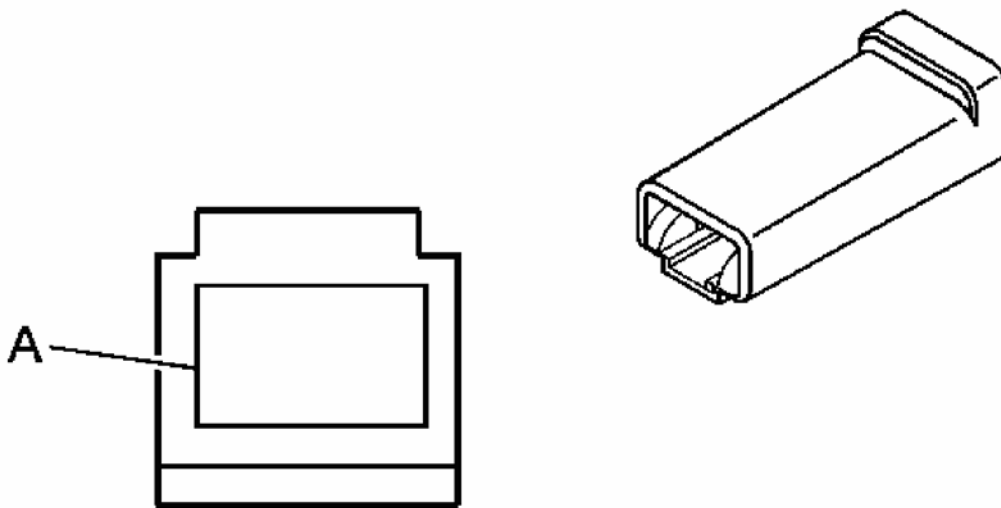


Fig. 19: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15488568
- Service: See Catalog

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- Description: 14-Way F GT 150 Micro 64 Modular

Terminal Part Information

- Pins: 1, 2, 3, 8, 9, 10, 6, 7, 13
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: Pins 1, 2, 3, 8, 9, 10 - See Terminal Repair Kit
- Core/Insulation Crimp: Pins 6, 7, 13 - M/M
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Radio C1

Pin	Wire Color	Circuit No.	Function
1	RD/WH	2040	Battery Positive Voltage
2	TN	201	Left Front Speaker Output (+)
3	L-GN	200	Right Front Speaker Output (+)
4-5	-	-	Not Used
6	PK	5165	TBD
7	PU/WH	1382	LED Dimming Signal/LED Dimming Supply
8	BK/WH	351	Ground
9	GY	118	Left Front Speaker Output (-)
10	D-GN	117	Right Front Speaker Output (-)
11-12	-	-	Not Used
13	D-GN	5060	Low Speed GMLAN Serial Data
14	-	-	Not Used

Radio C1 (9C1/9C3)

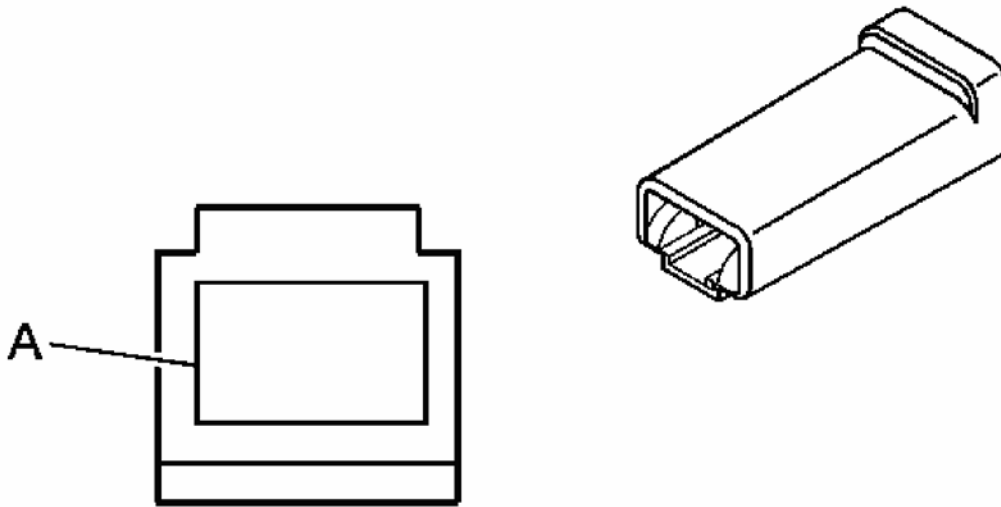


Fig. 20: Connector End View
 Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15488568
- Service: See Catalog
- Description: 14-Way F GT 150 Micro 64 Modular

Terminal Part Information

- Pins: 1, 2, 3, 8, 9, 10, 6, 7, 13
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: Pins 1, 2, 3, 8, 9, 10 - See Terminal Repair Kit
- Core/Insulation Crimp: Pins 6, 7, 13 - M/M
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Radio C1 (9C1/9C3)

Pin	Wire Color	Circuit No.	Function
1	RD/WH	2040	Battery Positive Voltage
2	TN	201	Left Front Speaker Output (+)
3	L-GN	200	Right Front Speaker Output (+)
4-5	-	-	Not Used

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6	PK	5165	TBD
7	PU/WH	1382	LED Dimming Signal/LED Dimming Supply
8	BK/WH	351	Ground
9	GY	118	Left Front Speaker Output (-)
10	D-GN	117	Right Front Speaker Output (-)
11-12	-	-	Not Used
13	D-GN	5060	Low Speed GMLAN Serial Data
14	-	-	Not Used

Radio C2

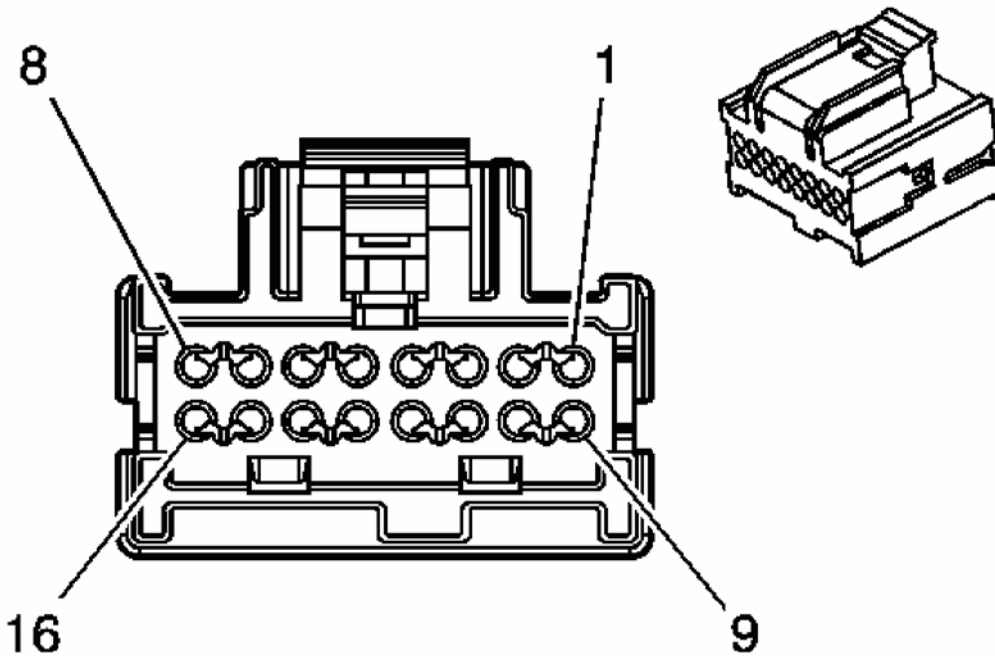


Fig. 21: Connector End View
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Entertainment Connector End Views

Connector Part Information

- OEM: 15416970
- Service: See Catalog

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- Description: 16-Way F Micro 64 Modular (BK)

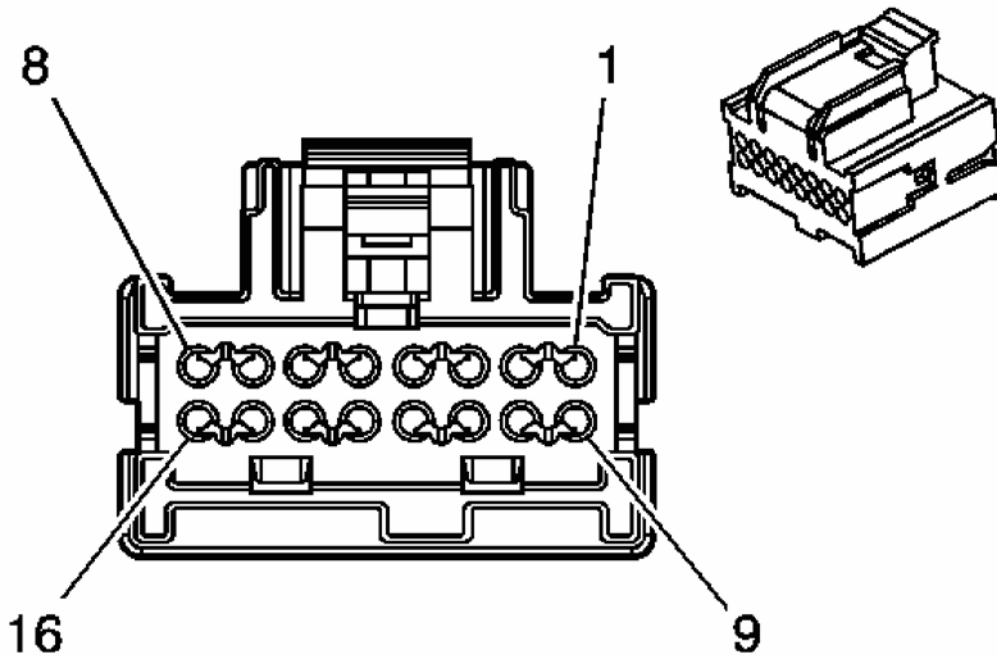
Terminal Part Information

- Pins: 1, 2, 7, 8, 9, 10, 11, 15, 5, 6, 13, 14
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: Pins 1, 2, 7, 8, 9, 10, 11, 15 - M/M
- Core/Insulation Crimp: Pins 5, 6, 13, 14 - See Terminal Repair Kit
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Radio C2

Pin	Wire Color	Circuit No.	Function
1	BN/WH	367	Remote Radio Left Audio Signal
2	D-GN/WH	368	Remote Radio Right Audio Signal
3-4	-	-	Not Used
5	BN	199	Left Rear Speaker Output (+)
6	D-BU	46	Right Rear Speaker Output (+)
7	OG/BK	1406	Remote Playback Device Left Audio Signal
8	OG	5748	TBD
9	L-GN	7007	TBD
10	GY/BK	7008	TBD
11	-	814	Drain Wire
12	-	-	Not Used
13	YE	116	Left Rear Speaker Output (-)
14	L-BU	115	Right Rear Speaker Output (-)
15	L-BU	1405	Remote Playback Device Audio Common Signal
16	-	-	Not Used

Radio C2 (9C1/9C3)

**Fig. 22: Connector End View**

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views**Connector Part Information**

- OEM: 15416970
- Service: See Catalog
- Description: 16-Way F Micro 64 Modular (BK)

Terminal Part Information

- Pins: 5, 6, 13, 14
- Terminal/Tray: 15359541/4
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: 15381651-2/J-35616-64A (L-BU)

Radio C2 (9C1/9C3)

Pin	Wire Color	Circuit No.	Function
1-4	-	-	Not Used
5	BN	199	Left Rear Speaker Output (+)

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6	D-BU	46	Right Rear Speaker Output (+)
7-12	-	-	Not Used
13	YE	116	Left Rear Speaker Output (-)
14	L-BU	115	Right Rear Speaker Output (-)
15-16	-	-	Not Used

Speaker - LF Door

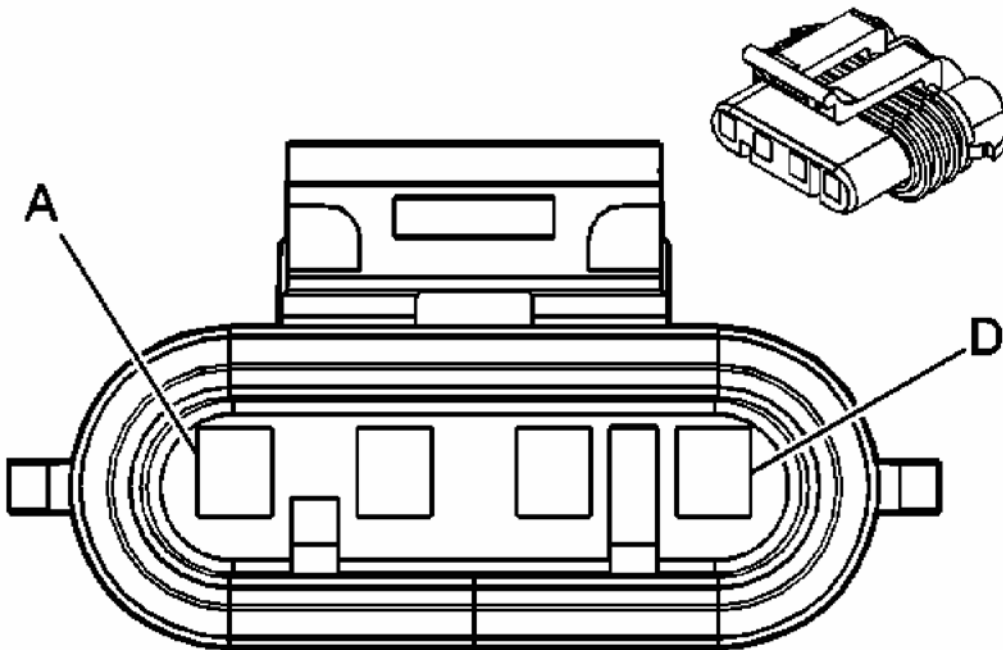


Fig. 23: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12186568
- Service: See Catalog
- Description: 4-Way F Metri-Pack 150 Sealed (BK)

Terminal Part Information

- Terminal/Tray: 12048074/2
- Core/Insulation Crimp: E/1

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- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LF Door

Pin	Wire Color	Circuit No.	Function
A	GY	118	Left Front Speaker Output (-)
B	TN	201	Left Front Speaker Output (+)
C	YE	1956	Left Front Tweeter Speaker Output (-)
D	TN	1856	Left Front Tweeter Speaker Output (+)

Speaker - LF Door (UW6)

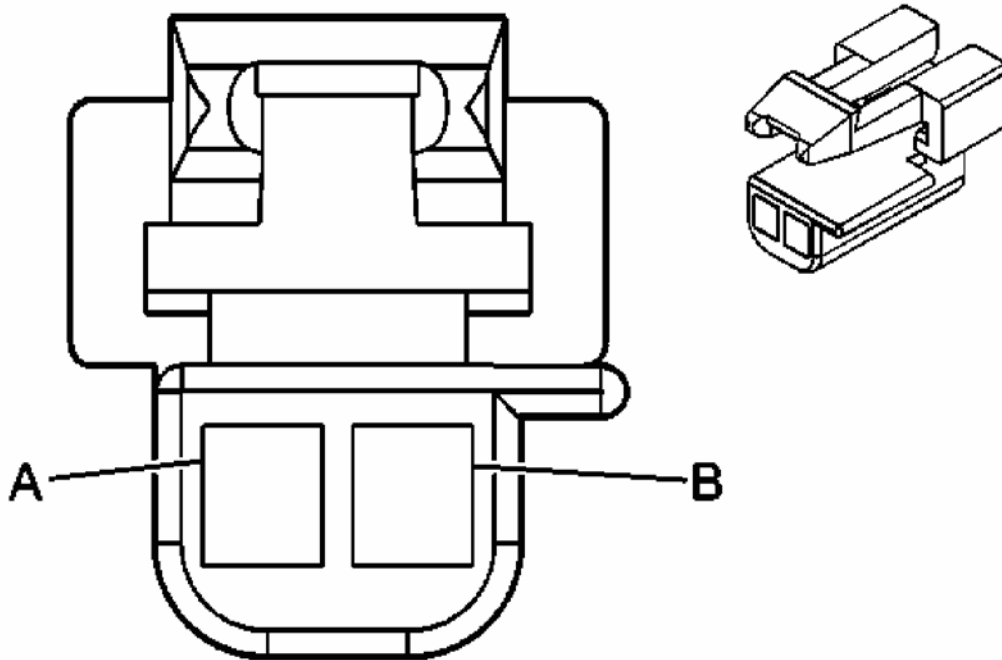


Fig. 24: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064867
- Service: 88987981

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- Description: 2-Way F Metri-Pack 150 (NA)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LF Door (UW6)

Pin	Wire Color	Circuit No.	Function
A	GY	118	Left Front Speaker Output (-)
B	TN	201	Left Front Speaker Output (+)

Speaker - LF Tweeter

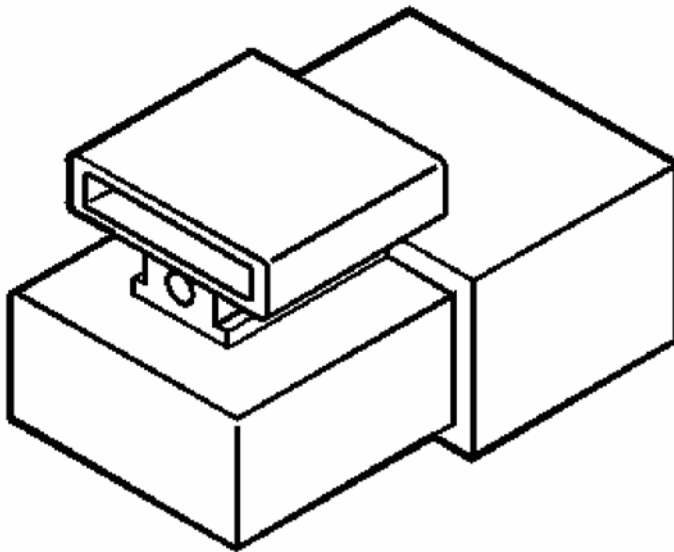


Fig. 25: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15393225
- Service: 12117275

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- Description: 2-Way M Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047581/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-3 (GY)

Speaker - LF Tweeter

Pin	Wire Color	Circuit No.	Function
A	YE	1956	Left Front Tweeter Speaker Output (-)
B	TN	1856	Left Front Tweeter Speaker Output (+)
A	GY	118	Left Front Speaker Output (-)
B	TN	201	Left Front Speaker Output (+)

Speaker - LR (U87)

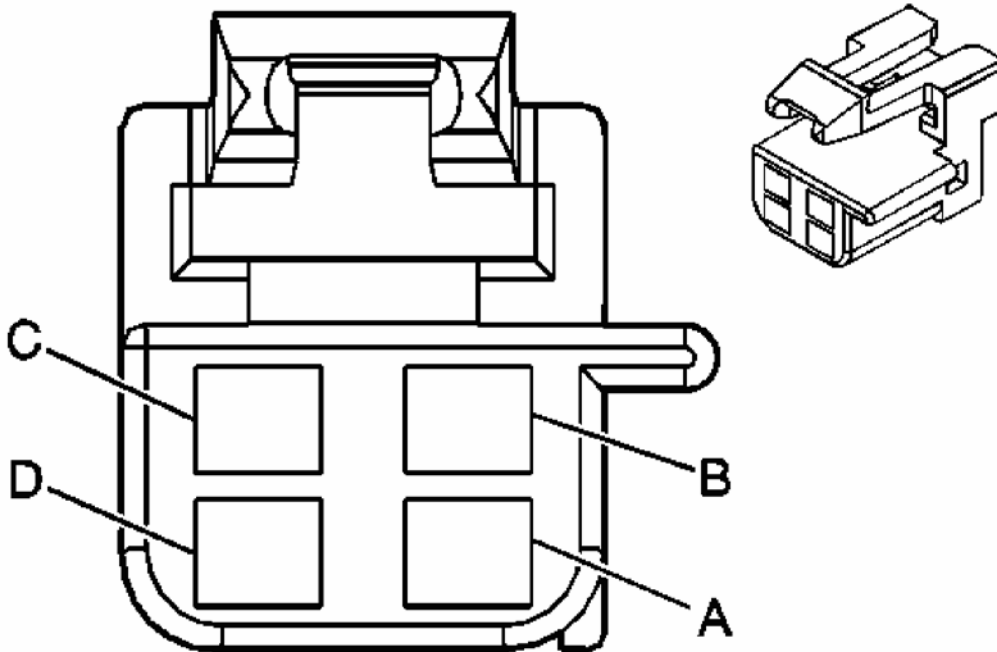


Fig. 26: Connector End View
Courtesy of GENERAL MOTORS CORP.

2006 Chevrolet Impala LS

2006 ACCESSORIES & EQUIPMENT Entertainment - Impala

Entertainment Connector End Views

Connector Part Information

- OEM: 12064760
- Service: 12085208
- Description: 4-Way F Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR (U87)

Pin	Wire Color	Circuit No.	Function
A	YE	116	Left Rear Speaker Output (-)
B	BN	199	Left Rear Speaker Output (+)
C	YE	116	Left Rear Speaker Output (-)
D	BN	199	Left Rear Speaker Output (+)

Speaker - LR (UQ3)

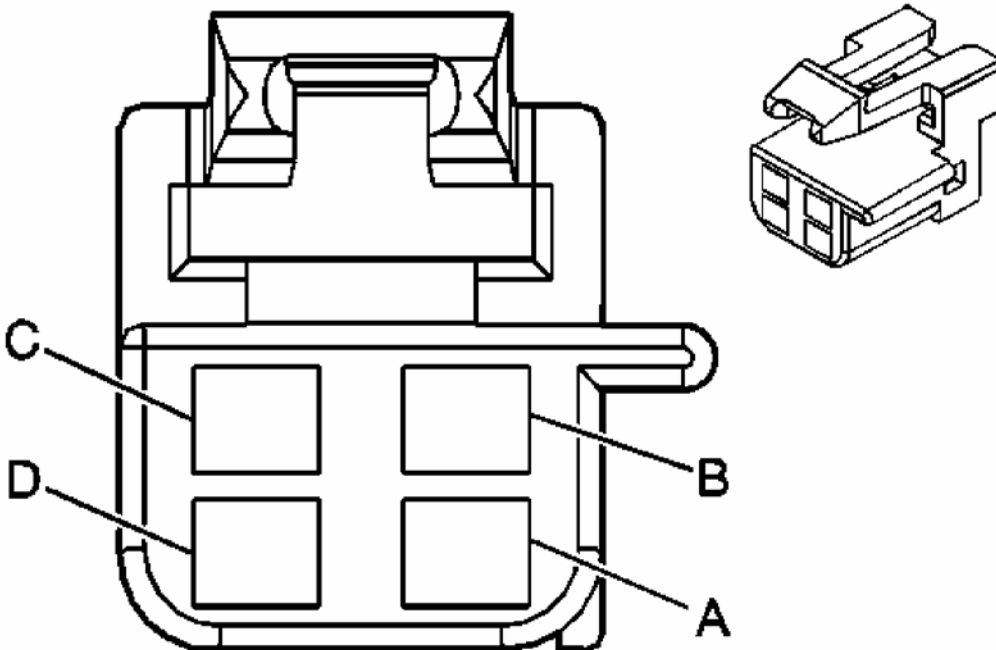


Fig. 27: Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064760
- Service: 12085208
- Description: 4-Way F Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR (UQ3)

Pin	Wire Color	Circuit No.	Function
A	YE	116	Left Rear Speaker Output (-)
B	BN	199	Left Rear Speaker Output (+)
C	D-BU/WH	346	Left or Rear Subwoofer Speaker Output (+)
D	L-GN/BK	1794	[Left or Rear] Subwoofer Speaker Output (-)

Speaker - LR (UW6)

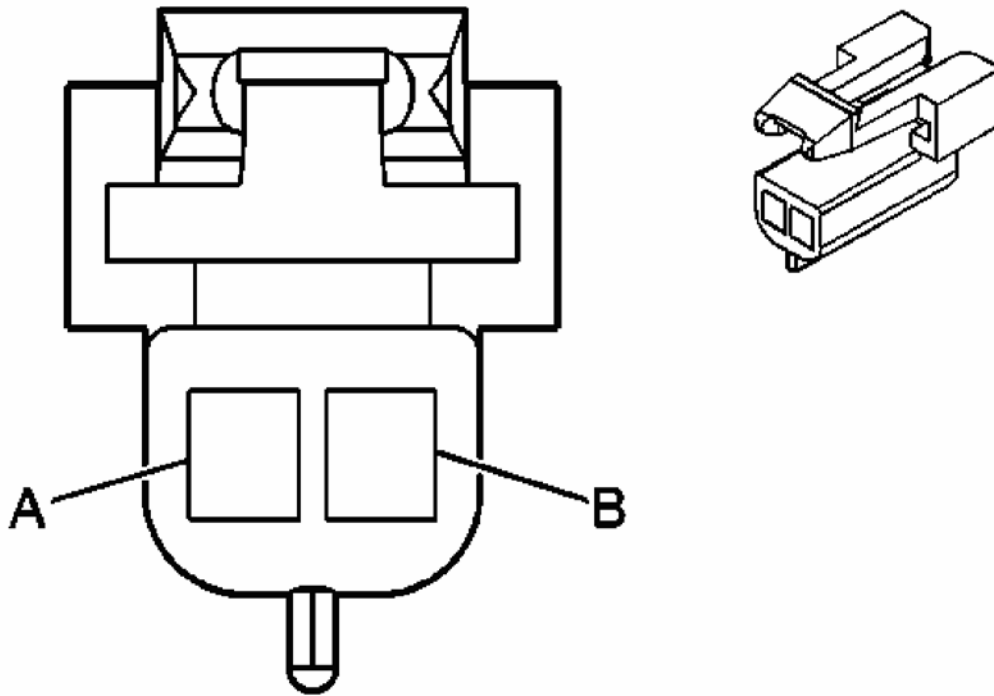


Fig. 28: Connector End Views
 Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12052832
- Service: 12101825
- Description: 2-Way F Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR (UW6)

Pin	Wire Color	Circuit No.	Function
A	YE	116	Left Rear Speaker Output (-)
B	BN	199	Left Rear Speaker Output (+)

Speaker - RF Door

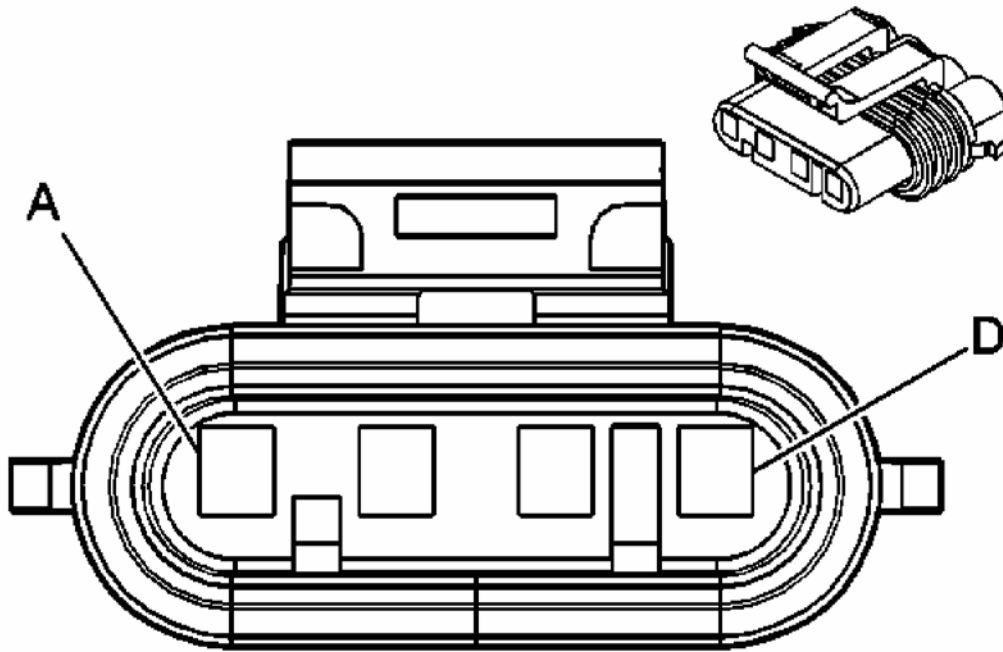


Fig. 29: Connector End View
 Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12186568
- Service: See Catalog
- Description: 4-Way F Metri-Pack 150 Sealed (BK)

Terminal Part Information

- Terminal/Tray: 12048074/2
- Core/Insulation Crimp: E/1
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RF Door

Pin	Wire Color	Circuit No.	Function
A	D-GN	117	Right Front Speaker Output (-)
B	L-GN	200	Right Front Speaker Output (+)

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C	PU	1952	Right Front Tweeter Speaker Output (-)
D	L-GN	1852	Right Front Tweeter Speaker Output (+)

Speaker - RF Door (UW6)

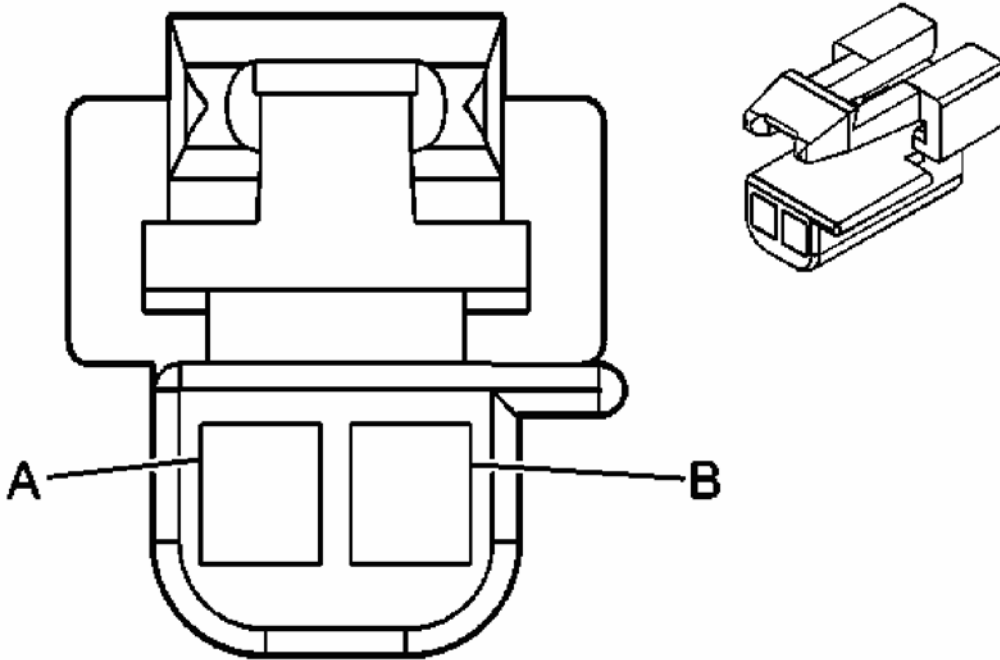


Fig. 30: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064867
- Service: 88987981
- Description: 2-Way F Metri-Pack 150 (NA)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

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Speaker - RF Door (UW6)

Pin	Wire Color	Circuit No.	Function
A	D-GN	117	Right Front Speaker Output (-)
B	L-GN	200	Right Front Speaker Output (+)

Speaker - RF Tweeter

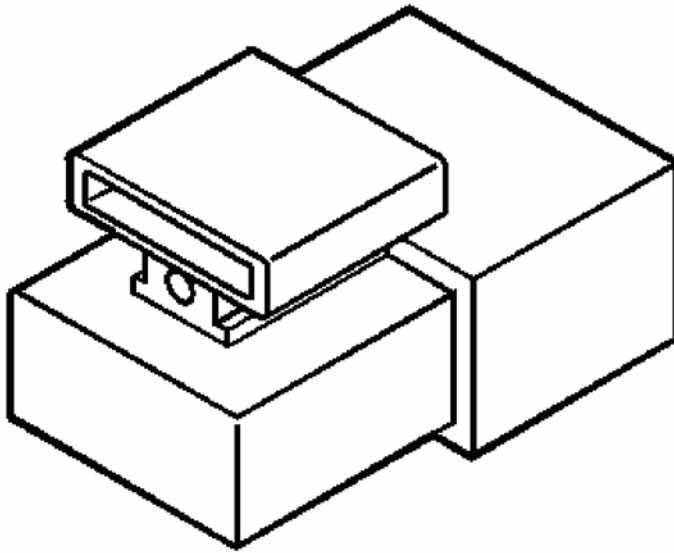


Fig. 31: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 15393225
- Service: 12117275
- Description: 2-Way M Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047581/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-3 (GY)

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Speaker - RF Tweeter

Pin	Wire Color	Circuit No.	Function
A	PU	1952	Right Front Tweeter Speaker Output (-)
B	L-GN	1852	Right Front Tweeter Speaker Output (+)
A	D-GN	117	Right Front Speaker Output (-)
B	L-GN	200	Right Front Speaker Output (+)

Speaker - RR (U87)

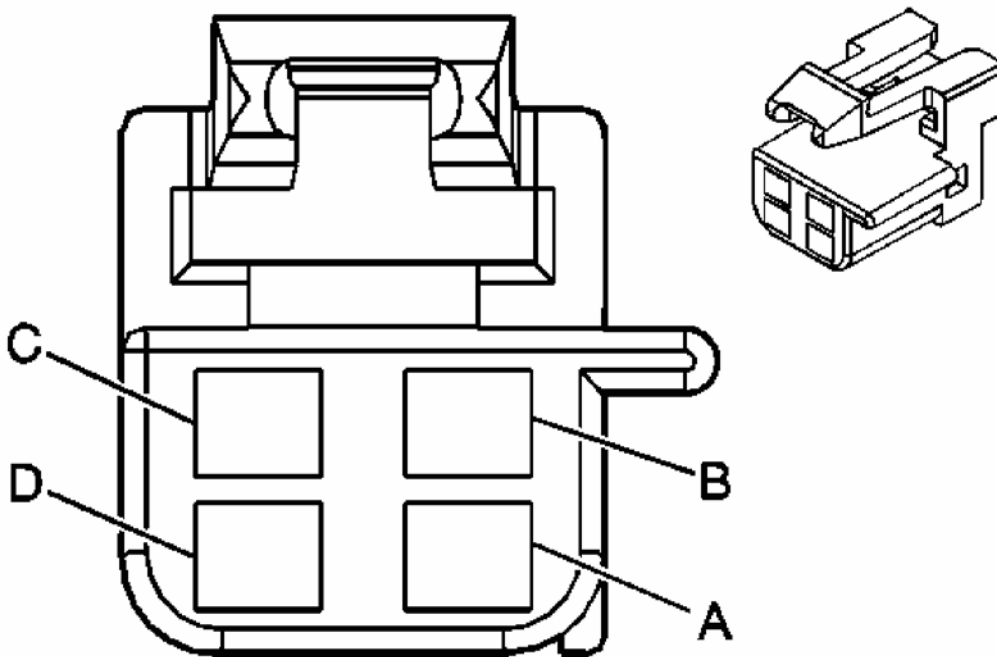


Fig. 32: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064760
- Service: 12085208
- Description: 4-Way F Metri-Pack 150 (BK)

Terminal Part Information

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- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RR (U87)

Pin	Wire Color	Circuit No.	Function
A	L-BU	115	Right Rear Speaker Output (-)
B	D-BU	46	Right Rear Speaker Output (+)
C	L-BU	115	Right Rear Speaker Output (-)
D	D-BU	46	Right Rear Speaker Output (+)

Speaker - RR (UQ3)

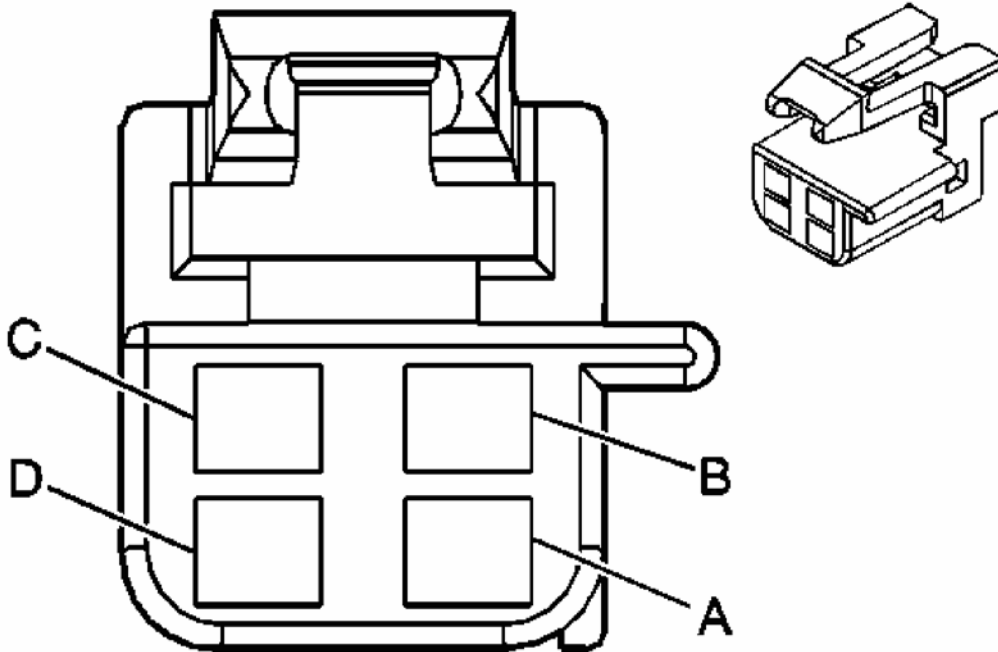


Fig. 33: Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064760

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- Service: 12085208
- Description: 4-Way F Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RR (UQ3)

Pin	Wire Color	Circuit No.	Function
A	L-BU	115	Right Rear Speaker Output (-)
B	D-BU	46	Right Rear Speaker Output (+)
C	D-GN	1795	Right Subwoofer Speaker Output (+)
D	L-BU/BK	315	Right Subwoofer Speaker Output (-)

Speaker - RR (UW6)

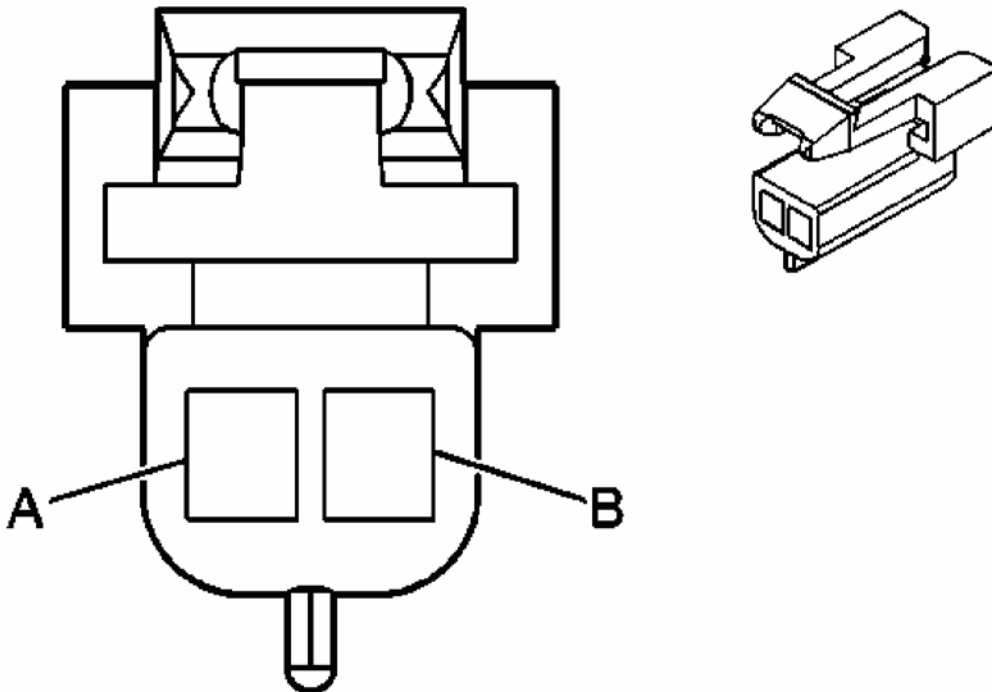


Fig. 34: Connector End Views
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views**Connector Part Information**

- OEM: 12052832
- Service: 12101825
- Description: 2-Way F Metri-Pack 150 (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RR (UW6)

Pin	Wire Color	Circuit No.	Function
A	L-BU	115	Right Rear Speaker Output (-)
B	D-BU	46	Right Rear Speaker Output (+)

DIAGNOSTIC INFORMATION AND PROCEDURES**DIAGNOSTIC CODE INDEX****DIAGNOSTIC CODE INDEX**

DTC	Description
DTC B1001	B1001 Option Configuration Error
DTC B1025, B1035, B1045, or B1055	MULTIPLE VALUES see link in column to the left
DTC B1259	Antenna Ground Circuit
DTC B1780	Theftlock Enabled

DIAGNOSTIC STARTING POINT - ENTERTAINMENT

Begin the system diagnosis with **Diagnostic System Check - Vehicle** in Vehicle DTC Information. The System Check will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored diagnostic trouble codes (DTCs) and their status

The use of the System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL OUTPUT CONTROLS

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Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selections	Description
Left Front Speaker	Front Speakers	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.
Left Rear Speaker	Rear Speakers	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.
Right Front Speaker	Front Speakers	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.
Right Rear Speaker	Rear Speakers	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.

SCAN TOOL DATA LIST**Radio**

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Radio ON			
Antenna Module	Data	Enabled/Disabled	Enabled
Auxiliary Video Input	Data	Present/Not Present	Not Present
Battery Voltage Signal	Data	Volts	11.8 Volts
CD H/W Level	CD/DVD/MAP Information	Numeric	Varies
CD S/W Level	CD/DVD/MAP Information	Numeric	Varies
DVD H/W Part Number	CD/DVD/MAP Information	Numeric	Varies
DVD S/W Part Number	CD/DVD/MAP Information	Numeric	Varies
Navigation Software Version	CD/DVD/MAP Information	Numeric	Varies
Navigation Hardware Level	CD/DVD/MAP Information	Numeric	Varies
Component Serial No. 13 -	Module		

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16	Information	Numeric	Varies
End Model Part Number	Module Information	Numeric	Varies
Base Model Part Number	Module Information	Numeric	Varies
DRR	Data	Present/Not Present	Present
Ign. Cycles Since Last DTC	Data	Numeric	Varies
Software Part Number	Module Information	Numeric	Varies
Year Module Built	Module Information	Numeric	Varies
Julian Date of Build	Module Information	Numeric	Varies
Phone Signal	Data	Present/Not Present	Present
Power Mode	Data	Off/Accessory/Run/Crank Request	Varies
Power Mode Config.	Data	Normal Mode/Bench Mode	Normal Mode
Signal Strength	Data	dBuV	19 dBuV
Video Display	Data	Present/Not Present	Not Present
Theft Armed	Data	Learned VIN/No VIN	Learned VIN
Theft Lock Status	Data	Active/Inactive	Inactive

Digital Radio Receiver

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Radio ON			
Battery Voltage	Data	Volts	12.2 Volts
Digital Radio Antenna	Data	mV	1400 mV
Ignition Counter	Data	Numeric	98
Julian Date of Build	Module Information	Numeric	043
Power Mode	Data	Run/Crank/ Accessory/ RAP/Off Awake	Run
Year Module Built	Module Information	Numeric	varies

SCAN TOOL DATA DEFINITIONS

Base Model Part Number

Information used during SPS programming to identify a unique combination of ECU hardware and all non-reprogrammable software (e.g. Boot software).

Battery Voltage Signal

The scan tool displays 0-25.5 volts. The displayed value is calculated from a circuit connected to source voltage.

CD H/W Level

The scan tool displays a numeric value that represents the hardware level the internal CD Changer contains.

CD S/W Level

The scan tool displays a numeric value that represents the software level the internal CD Changer contains.

Component Serial No. 13-16

The scan tool displays a numeric value that represents the modules serial number.

Digital Radio Antenna

The scan tool displays millivolts. This parameter indicates the amount of current being used by the digital radio antenna by measuring the voltage drop across an internal resistor. Typical value is 1,200-1,800 mV.

DRR

The scan tool displays Present/Not Present. The scan tool displays Present when the digital radio receiver (DRR) is connected to the radio.

End Model Part Number

Part number used in service to uniquely identify the combination of hardware/software/calibrations programmed into the ECU at the time the part is ordered.

Julian Date of Build

The scan tool displays 0-999. This represents the day of year the module was manufactured.

Phone Signal

The scan tool displays Present/Not Present. The scan tool displays Present when a phone is connected.

Power Mode

The scan tool displays what power mode the module is in.

Power Mode Config

The diagnostic state the radio is in.

Radio Signal Strength

The scan tool displays 0-300. The signal from the antenna is measured in dBuV.

Theft Armed

The scan tool displays Learned VIN/No VIN. The scan tool displays Learned VIN indicating the radio received a valid VIN.

Theft Lock Status

The scan tool displays Active/Inactive. The scan tool displays Inactive, indicating the radio received the correct VIN and the Theft Lock Mode is not enabled.

DTC B1001**Circuit Description**

The radio receives GMLAN messages, containing VIN digits 3 and 4, when the ignition cycles from OFF to ON and the radio is active. The specific VIN data is sent from another module on the GMLAN serial data circuit. The VIN data needs to match the calibration platform ID stored in the radio memory in order for the radio to operate normally.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1001

Option Configuration Error

This vehicle has DTCs which include DTC Symptoms. For more information on DTC Symptoms, refer to **DTC Symptom Description**.

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DTC B1001

DTC Symptom	DTC Symptom Descriptor
00	No Additional Information

Conditions for Running the DTC

The following conditions must be present in order for the radio to enable the diagnostics:

- The radio transitions from OFF to ON. This may be in response to the radio power switch or an ignition key cycle.
- The system voltage is at least 9 volts and no more than 16 volts.

Conditions for Setting the DTC

The radio detects the calibration platform ID does not match the VIN data sent to the radio with GMLAN messages.

Action Taken When the DTC Sets

The radio does not function properly. The radio displays "CALIBRATE".

Conditions for Clearing the DTC

- The conditions for setting the DTC are no longer present.
- A history DTC clears after 100 malfunction-free ignition cycles.
- The radio receives the clear code command from the scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

- 2: Clear all DTCs and cycle the ignition to verify that the DTC did not falsely set.
- 3: Clear all DTCs after the repair procedure is complete.

DTC B1001

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, perform the VIN		

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2	relearn procedure. On the scan tool, go to Module Replacement/Setup and select Radio.		
	4. Turn OFF the ignition. 5. Turn ON the ignition, with the engine OFF.		
	Does the DTC reset?	Go to Step 3	System OK
3	1. Replace the radio. Refer to Radio Replacement for service procedure. 2. Perform the VIN Relearn procedure with a scan tool. On the scan tool, go to Module Replacement/Setup and select Radio.		
	Did you complete the replacement?	Go to Step 4	-
4	Operate the system in order to verify the repair.		
	Did you correct the condition?	System OK	Go to Step 2

DTC B1025, B1035, B1045, OR B1055

Circuit Description

When the radio is powered up, the radio supplies low level audio signals to the speakers. If the vehicle is equipped with an audio amplifier, the amplifier will boost the signal sent to the speakers.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1025

Audio Output Circuit

Conditions for Running the DTC

The test is performed when the radio switches from OFF to ON. The radio will continue to test for the fault once every 0.5 seconds.

Conditions for Setting the DTC

The radio sets a current status for this DTC when a short to ground or voltage is detected on any of the speaker channels for 1.5 seconds.

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Action Taken When the DTC Sets

No sound is present from one or more of the speakers.

Conditions for Clearing the DTC

The fault condition is not present for 5 seconds.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: This step verifies that the DTC is still present.

3: This step isolates the fault condition.

DTC B1025

Step	Action	Yes	No
Schematic Reference: Radio/Audio System Schematics			
Connector End View Reference: Entertainment Connector End Views			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, monitor the DTC Information for DTC B1025. Does the scan tool indicate that DTC B1025 is current?	Go to Step 3	Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems
3	Test the speaker outputs from the radio for a short to ground or voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 6	Go to Step 4
4	Inspect for poor connections at the harness connector of the radio. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 6	Go to Step 5

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5	Replace the Radio. Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to Step 6	-
6	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

DTC B1259

Circuit Description

The digital radio antenna is connected to the digital radio receiver by 2 coax cables. One coax carries the satellite signal, the other coax carries the terrestrial signal. The antenna cable for the satellite antenna also provides a path for DC current for powering the antenna.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1259

Antenna Ground Circuit

Conditions for Running the DTC

This test is run every 300 milliseconds.

Conditions for Setting the DTC

The digital radio receiver detects an antenna fault.

Action Taken When the DTC Sets

The radio displays "No XM Signal."

Conditions for Clearing the DTC

- The condition must be corrected.
- The DTC clears after 100 malfunction free ignition cycles.

Test Description

The number below refers to the step number on the diagnostic table.

2: Early design modules support the mV reading while later design modules support the

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mA reading.

3: Due to current limiting capabilities in the module, an antenna cable shorted to ground could still show 1200-1800 mV.

DTC B1259

Step	Action	Values	Yes	No
Schematic Reference: Radio/Audio System Schematics Connector End Views Reference: Entertainment Connector End Views				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to Diagnostic System Check - Vehicle
2	With a scan tool, observe the digital radio antenna in the digital radio receiver data list. Does the scan tool indicate that the digital radio antenna is within the specified range?	1200-1800 mV or 42-118 mA	Go to Step 3	Go to Step 4
3	Test the antenna cables for a short to ground. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	-	Go to Step 10	Go to Step 8
4	1. Disconnect the antenna cables from the digital radio receiver. 2. Measure the voltage from the center conductor of the inboard antenna connector on the digital radio receiver to one of the case screws. Does the voltage measure within the specified range?	4.5-5.5 V	Go to Step 5	Go to Step 6
5	Test the antenna cables for an open or a high resistance. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	-	Go to Step 10	Go to Step 8
6	Inspect for poor connections at the digital radio receiver. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	-	Go to Step 10	Go to Step 7

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7	Replace the digital radio receiver. Refer to Control Module References for replacement, setup, and programming. Did you complete the replacement?	-	Go to Step 10	-
8	Inspect for poor connections at the digital radio antenna. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	-	Go to Step 10	Go to Step 9
9	Replace the digital radio antenna. Refer to Antenna Replacement - Cellular Communications/Digital Radio . Did you complete the replacement?	-	Go to Step 10	-
10	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	-	Go to Step 2	System OK

DTC B1780

Circuit Description

Each time the ignition cycles from OFF to ON, the radio receives VIN data over the class 2 communication circuit. If the VIN data in the radio memory matches the VIN data the radio receives over the class 2 communication circuit, the radio will operate normally.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1780

Theftlock Enabled

Conditions for Running the DTC

- The DTC is run when the radio is turned from OFF to ON.
- Battery voltage is between 9-16 volts.

Conditions for Setting the DTC

Installing a radio from another vehicle or installing a new body control module (BCM) and

not entering the correct VIN information with the scan tool.

Action Taken When the DTC Sets

The radio does not function. The radio displays "LOC" or "LOCKED".

Conditions for Clearing the DTC

- When installing a radio from another vehicle of the same platform, clear the VIN data using the scan tool.
- Installing a new BCM setup properly with the correct VIN for that vehicle.

The DTC status will turn to history when the above criteria is met. The scan tool can now clear the history DTC, or the DTC will clear automatically after 100 consecutive fault free ignition cycles.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: After clearing the DTCs and theft information, the radio relearns the VIN upon cycling the ignition switch.

3: After completing the repair procedure, clear all DTCs.

DTC B1780

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	1. Install a scan tool. 2. Use the scan tool to clear the DTCs. 3. Perform radio setup procedure. Refer to Radio Setup . Does the DTC Reset?	Go to Step 3	System OK
3	Replace the Radio. Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	System OK	-

SYMPTOMS - ENTERTAINMENT

- IMPORTANT:**
1. Perform the Diagnostic System Check - Vehicle before using the Symptom Tables in order to verify that all of the following conditions are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
 2. Review the system operation in order to familiarize yourself with the system functions. Refer to Radio/Audio System Description and Operation.

Visual/Physical Inspection

- Inspect for aftermarket devices which may affect the operation of the Radio/Audio System. Refer to Checking Aftermarket Accessories .
- Inspect for easily accessible or visible system components for obvious damage or conditions which may cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to Testing for Intermittent Conditions and Poor Connections .

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Audio System Troubleshooting Hints
- Radio Poor Reception
- Digital Radio Poor or No Reception
- Audio Distortion - One or More Speakers
- Speakers Inoperative - One or More

AUDIO SYSTEM TROUBLESHOOTING HINTS**Tools Required**

J 39916-A CD and Cassette Diagnostic Audio Kit

Many conditions that affect radio operation may be corrected without removing the radio from the car. Verify the condition, and follow the diagnostic procedures in order to isolate and correct the condition. In order to properly diagnose any audio system problems, ensure

that you have a fully charged battery.

Preliminary Inspections

IMPORTANT: When testing the audio system for poor reception or noise, the vehicle should be outside away from metal buildings and utility lines, with the hood and rear compartment closed.

- Inspect for any aftermarket equipment that may have been installed on the vehicle. If aftermarket equipment is found, disconnect the equipment and verify that the audio noise is still present.

Verify that the antenna connector and the antenna coaxial cable are clean and tight.

- For reception concerns, first determine if the customer is within the listening area of the stations they are attempting to receive.
- Stations at the lower end of the FM band are more susceptible to audio noises than stations at the higher end.
- If the noise is only from one speaker, inspect for the following items before speaker replacement:
 - Isolate the noise using the **J 39916-A**.
 - Inspect the speaker connections in order to ensure they are clean and tight. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.
 - Inspect for a loose or incorrectly installed speaker or surrounding trim. Loose trim may cause a buzz or flutter which sounds like a malfunctioning speaker.
- Ignition noise on the FM band may be an indication of an ignition system problem.
- Verify that all vehicle grounds are clean, tight, and free of corrosion.
- Inspect the rear defogger grid lines for large breaks or dark spots.
- Inspect the connections at the radio antenna module, if equipped, in order to ensure that they are clean and tight.
- Compare the customers vehicle to another of similar model and audio system in order to determine if the condition is abnormal.

Identifying Concerns

1. In order to isolate the source of the noise/poor reception, identify the ignition switch position that the concern is most noticeable:
 1. Turn the ignition switch to the ACCESSORY position.
 2. Turn ON the radio.
 3. Seek up 88 to 108 FM then 550 to 1600 AM.
 4. Record the number of valid radio stations where the tuner stops.

5. Repeat these steps with the ignition ON, and the engine OFF, then repeat the steps again with the engine running.
2. Return the ignition switch to the position that the concern was most noticeable.
3. Remove the fuses or circuit breakers, one at a time, until the noise has been eliminated.
4. Identify what systems or components are powered by the fuse.
5. Reinstall all fuses and circuit breakers.
6. Disconnect the components powered by the fuse, one at a time, until the concern has been eliminated.

Corrective Action

- Inspect the ground integrity of the component or system causing the noise.
- Malfunctioning and marginal components such as relays and solenoids may cause noise and/or poor reception.
- Always use a braided ground strap when applying additional grounds and keep the ground strap as short as possible.
- If the noise source is found to be coming from the vehicle harness:
 - Route the antenna cable separately from the wire harness that is emitting the noise.
 - Use aluminum or nickel tape in order to shield the antenna cable. Try variations of the following repairs:
 - Try adding only aluminum or nickel tape before adding a ground strap to the tape.
 - Wrap a ground strap 360 degrees around the tape, securing the other end of the strap to chassis ground.

IMPORTANT: When installing suppression devices, signal wires such as sensor and communication circuits should not be suppressed. Battery and ignition voltage circuits are the best choices for suppressing.

- Capacitors work best on switch pops and low frequency noise.
- Filters work best on high frequency whines and static.
- After adding any suppression device, inspect all of the vehicle systems, including those not related to the audio system, for proper operation and function.
- Whenever possible, make a test harness that includes filters or capacitors. Always inspect the effectiveness and operation before permanent installation.
- If an audible pop is caused due to operating a switch, perform the following repairs as necessary:
 - Add a capacitor across the contacts of the switch.

- Add a capacitor from the battery positive voltage (B+) side of the switch to chassis ground.
- Add a capacitor from the ground side of the switch to chassis ground.
- Use the following available noise suppression devices:
 - 220 micro farad (50V) capacitor GM P/N 1227895

This works well for ignition system related noise.

- 0.47 micro farad capacitor GM P/N 1227894

This works well for switches and relays.

- Feed through capacitor GM P/N 477371

This works well for high current situations.

- Filter package GM P/N 1224205

This works well for low current situations.

- Fuel pump suppressor GM P/N 25027405
- 21 inch braided ground strap GM P/N 8910791
- 19 inch braided ground strap GM P/N 6286800
- 10.5 inch braided ground strap GM P/N 6287160
- 8.5 inch braided ground strap GM P/N 12091511

Generator Whine Concerns

1. Inspect the ground terminal and cable for high resistance.
2. Inspect the generator and brackets for loose or coated mounting bolts.
3. Verify that the ground straps between the engine and the frame are clean and tight.
4. If the noise is still present, inspect the charging system for proper operation. Refer to **Diagnostic Starting Point - Engine Electrical** in Engine Electrical.
5. Install a filter GM P/N 1224205 in the battery voltage feed circuit to the radio.
6. If the noise is not eliminated, install the filter in each following variation:
 - Install the filter with the single wire side toward the radio and the ground wire attached to chassis ground.
 - Remove the ground to the filter.
 - Reverse the filter so that the 2-wire side is toward the radio with the ground wire attached to chassis ground.
 - Remove the ground from the filter.

7. If the filter GM P/N 1224205 causes a delay when turning the radio ON or OFF, or other problems, remove the filter and Install a 0.47 micro farad capacitor to chassis ground.
8. Before reassembling the vehicle, remove any unneeded filters.
9. Test the functionality of all the vehicle systems, including those not related to the audio system, for proper operation and function.

RADIO POOR RECEPTION

Schematic Reference: Radio/Audio System Schematics

Antenna System Test

The length of the antenna coax cable lead-in and antenna body determines the total system ground measurement.

IMPORTANT: Always zero out the DMM before taking a resistance measurement in order to ensure an accurate reading.

1. Disconnect the antenna lead-in connector from the radio receiver.
2. Measure the resistance from the negative battery post to the coax outer conductor connector.
3. The resistance measured should be as follows:
 - Cable less than 5 ft-No more than 0.035 ohms
 - Cable 5-13 ft-No more than 0.060 ohms
 - Cable 13-20 ft-No more than 0.085 ohms
4. Test the following when the resistance is greater than specified:
 - Base of the antenna for a poor connection to body ground.
 - The coaxial cable interconnects for a poor connection or corrosion.
 - Test for an open or high resistance from the battery negative cable to the body. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems.
 - Do not use black (phosphate-coated) hardware for antenna mounting purposes. This type of fastener is unreliable in making good connections.
5. After finding and correcting the condition, operate the system in order to verify the repair.

Perform the Antenna Checking Procedures after confirming the integrity of the antenna ground.

Antenna Checking Procedures

Perform the following tests for the type of antenna on the vehicle.

Using a Test Antenna

Use a test mast antenna to check for poor vehicle antenna operation. Unplug antenna lead-in connector from radio receiver and plug the test antenna into radio. Make sure the test antenna base is grounded to the vehicle chassis and keep hands off the mast. Check radio reception in an area away from electrical interferences. Tune to several weak and strong AM and FM stations. If the radio reception improved, the problem exists with the vehicle antenna and/or lead-in cable. If the reception is still poor, refer to **Audio System Troubleshooting Hints**.

Antenna Coaxial Cable Testing

Disconnect the antenna coax cable connector from the radio receiver and perform the following measurements.

IMPORTANT: Always zero out the DMM before taking a resistance measurement in order to ensure an accurate reading.

1. Measure the resistance from the coax cable center conductor to center conductor or antenna mast.
2. Total resistance from end to end of center conductor:
 - RG-58/RG-59 type cable-Less than 0.20 ohms
 - RG-62/RG-62M type cable-Less than 3.5 ohms
3. When checking the resistance, cautiously wiggle the lead-in tip and cable. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.
4. Measure the resistance from the cable center conductor to metal case. Reading should be infinite.
5. Replace the antenna and/or lead-in cable when the above readings are not obtained.

Radio Antenna Module System

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause followed by the appropriate test for that condition. If the test leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to **Testing for Intermittent Conditions and Poor Connections and **Connector Repairs** in Wiring Systems.**

This antenna system consists of an antenna module and a grid separate from the heated grid element.

Perform the Antenna System Test and test the antenna coax cable prior to performing the following tests:

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- The radio antenna module is not grounded properly. The module grounding screws should be clean and tight. Measure the resistance from the antenna module base plate to a good ground. Resistance should be 0.020 ohms or less. Find and correct the condition if the resistance is out of specification.
- The antenna module supply voltage circuit to the radio antenna module is open or shorted to ground. Test the antenna module supply voltage circuit for an open or short to ground. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems.
- No antenna module supply voltage output from the radio. Disconnect the radio antenna module connector. Turn ON the radio and measure the voltage from the antenna module supply voltage circuit of the radio to a good ground. Voltage measured should be near 12 volts. If no voltage is measured, replace the radio. Refer to **Radio Replacement** for service procedure. Perform the VIN Relearn procedure after replacing the radio. On the scan tool, go to Module Replacement/Setup in Vehicle Control Systems and select Radio.
- Defective radio antenna module. Replace the radio antenna module.
- After finding and correcting the condition, operate the system in order to verify the repair.

DIGITAL RADIO POOR OR NO RECEPTION

Digital Radio Poor or No Reception

Step	Action	Values	Yes	No
Schematic Reference: Radio/Audio System Schematics				
Connector End View Reference: Entertainment Connector End Views				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	1. Make sure the vehicle is outside in an area with an unobstructed view of the southern sky. 2. Turn ON the ignition, with the engine OFF. 3. Turn ON the radio. 4. Tune the radio to satellite channel 1. Is the reception clear?	-	Go to Step 3	Go to Step 5

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3	Tune the radio to several other satellite channels. Is the reception clear?	-	Go to Audio System Troubleshooting Hints	Go to Step 4
4	Contact XM at 1-800-556-3600 to verify customer account status or possible network problems. Did you find and correct the condition?	-	Go to Step 14	Go to Step 10
5	Contact XM at 1-800-556-3600 to verify possible network problems. Did you find and correct the condition?	-	Go to Step 14	Go to Step 6
6	With a scan tool, observe the digital radio antenna in the digital radio receiver data list. Does the scan tool indicate that the digital radio antenna is within the specified range?	1200-1800 mV or 42-118 mA	Go to Step 10	Go to Step 7
7	1. Disconnect the antenna cables from the digital radio receiver. 2. Measure the voltage from the center conductor of the inboard antenna connector on the digital radio receiver to one of the case screws. Does the voltage measure within the specified range?	4.5-5.5 V	Go to Step 8	Go to Step 10
8	Test the antenna cables for an open, short, or high resistance. Refer to Testing for Intermittent Conditions and Poor Connections in Wiring Systems. Did you find the condition?	-	Go to Step 9	Go to Step 11
9	Replace the antenna cable. Refer to Coaxial Cable Replacement - Digital Radio . Did you complete the replacement?	-	Go to Step 14	-
	Inspect for poor connections at the digital radio receiver. Refer to Testing for Intermittent			

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10	Conditions and Poor Connections in Wiring Systems. Did you find and correct the condition?	-	Go to Step 14	Go to Step 12
11	Inspect for poor connections at the digital radio antenna. Refer to Testing for Intermittent Conditions and Poor Connections in Wiring Systems. Did you find and correct the condition?	-	Go to Step 14	Go to Step 13
12	Replace the digital radio receiver. Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	-	Go to Step 14	-
13	Replace the digital radio antenna. Refer to Antenna Replacement - Digital Radio . Did you complete the replacement?	-	Go to Step 14	-
14	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2

AUDIO DISTORTION - ONE OR MORE SPEAKERS

Audio Distortion - One or More Speakers

Step	Action	Yes	No
Schematic Reference : Radio/Audio System Schematics			
Connector End View Reference: Entertainment Connector End Views			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to Diagnostic System Check - Vehicle
2	Play the radio or CD player. Can audio distortion be heard from any speakers?	Go to Step 3	Go to Audio System Troubleshooting Hints
3	Can audio distortion be heard from all speakers?	Go to Step 4	Go to Step 6
4	Is the vehicle equipped with an audio		

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	amplifier?	Go to Step 5	Go to Step 8
5	Test the appropriate speaker outputs from the radio to the audio amplifier for an open or high resistance. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	Go to Step 12	Go to Step 6
6	Test the battery positive voltage circuit to the audio amplifier for an open or high resistance. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	Go to Step 12	Go to Step 7
7	Test the audio amplifier ground circuit for an open or high resistance. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	Go to Step 12	Go to Step 8
8	Test the appropriate speaker outputs from the radio for a short to ground or a short to voltage. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	Go to Step 12	Go to Step 9
9	Inspect for poor connections at the harness connector of the speaker. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	Go to Step 12	Go to Step 10
10	Replace the speaker. Refer to Speaker Replacement - Rear (UW6) or Speaker Replacement - Rear (UQ3) or Speaker Replacement - Front Door . Did you find and correct the condition?	Go to Step 12	Go to Step 11
11	Replace the radio. Refer to Control Module References for replacement, setup, and programming. Did you find and correct the condition?	Go to Step 12	-
12	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

REDUCED VOLUME - ONE OR MORE SPEAKERS**Schematic Reference:** Radio/Audio System Schematics**Connector End View Reference:** Entertainment Connector End Views

Speakers - Reduced Volume

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs .

With RPO UW6

1. Speaker output circuit high resistance-Test the appropriate speaker output circuits for high resistance. Refer to Circuit Testing and Wiring Repairs .
2. Defective speaker-Replace the appropriate speaker. Refer to Speaker Replacement Reference.

With RPO UQ3

1. Speaker output circuit high resistance-Test the appropriate speaker output circuits from the audio amplifier for high resistance. Refer to Circuit Testing and Wiring Repairs .
2. Defective speaker-Replace the appropriate speaker. Refer to Speaker Replacement Reference.

IMPORTANT: The following procedure assumes all speakers are operative for all modes of operation except digital radio.

With RPO U2K or U2L

1. Audio common circuit open-Test the audio common circuit for an open. Refer to Circuit Testing and Wiring Repairs .
2. Audio left or right circuit open-Audio common circuit open. Test the audio common circuit for an open. Refer to Circuit Testing and Wiring Repairs .

SPEAKERS INOPERATIVE - ONE OR MORE

Schematic Reference: Radio/Audio System Schematics

Connector End View Reference: Entertainment Connector End Views

One Speaker Inoperative

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause. If the list leads to the replacement of a component, always inspect for a poor

connection before proceeding with replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs .

With RPO UW6

1. Speaker output open-Test the appropriate speaker output circuits for an open. Refer to Circuit Testing and Wiring Repairs .
2. No audio output from the radio-Test for any AC voltage between the appropriate speaker output circuits at the speaker harness connector, disconnected with the radio volume adjusted to 50 percent. If AC voltage is present, replace the speaker. Refer to Speaker Replacement Reference. If no AC voltage is present, replace the radio. Refer to Control Module References for replacement, setup, and programming.

With RPO UQ3

1. Speaker output circuit from amplifier open-Test the appropriate speaker output circuits for an open. Refer to Circuit Testing and Wiring Repairs .
2. No audio output from the amplifier-Test for any AC voltage between the appropriate speaker output circuits at the speaker harness connector, disconnected with the radio volume adjusted to 50 percent. If AC voltage is present, replace the speaker. Refer to Speaker Replacement Reference. If no AC voltage is present, replace the amplifier. Refer to Control Module References for replacement, setup, and programming.

Speakers - One Channel Inoperative

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs .

With RPO UQ3

1. Speaker output circuit from amplifier shorted-Test the appropriate speaker output circuits for a short. Refer to Circuit Testing and Wiring Repairs .
2. No audio output from the amplifier-Test for any AC voltage between the appropriate speaker output circuits at the speaker harness connector, disconnected with the radio volume adjusted to 50 percent. If AC voltage is present, replace the speaker. Refer to Speaker Replacement Reference. If no AC voltage is present, replace the amplifier. Refer to Control Module References for replacement, setup, and programming.

IMPORTANT: The following procedure assumes all speakers are operative for all modes of operation except digital radio.

With RPO U2K or U2L

1. Remote radio audio signal circuit open-Test the appropriate remote radio audio signal circuit for an open. Refer to **Circuit Testing** and **Wiring Repairs** .
2. No audio output from the digital radio receiver-Replace the digital radio receiver. Refer to **Control Module References** for replacement, setup, and programming.
3. No digital radio audio output from the radio-Replace the radio. Refer to **Control Module References** for replacement, setup, and programming.

SPEAKERS INOPERATIVE - ALL

Schematic Reference: **Radio/Audio System Schematics**

Connector End View Reference: **Entertainment Connector End Views**

All Speakers Inoperative

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause followed by the appropriate test for that condition. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** .

With RPO UW6

1. Speaker output shorted-Test all speaker outputs for a short. Refer to **Circuit Testing** and **Wiring Repairs** .
2. Defective radio-Replace the radio. Refer to **Control Module References** for replacement, setup, and programming.

With RPO UQ3

1. Battery positive voltage circuit to the amplifier open-Test the battery positive voltage circuit to the amplifier for an open. Refer to **Circuit Testing** and **Wiring Repairs** .
2. Ground circuit to the amplifier open-Test the ground circuit to the amplifier for an open. Refer to **Circuit Testing** and **Wiring Repairs** .
3. Antenna enable signal circuit to the amplifier open or shorted to ground-Test the antenna enable signal circuit for an open or short to ground. Refer to **Circuit Testing** and **Wiring Repairs** .

4. No audio output from the amplifier-Replace the amplifier. Refer to Control Module References for replacement, setup, and programming.

IMPORTANT: The following procedure assumes all speakers are operative for all modes of operation except digital radio.

With RPO U2K or U2L

1. Remote radio audio signal circuit shorted-Test the remote radio audio signal circuits for a short. Refer to Circuit Testing and Wiring Repairs.
2. No audio output from the digital radio receiver-Refer to Control Module References for replacement, setup, and programming.
3. No digital radio audio output from the radio-Replace the radio. Refer to Control Module References for replacement, setup, and programming.

RADIO SETUP

Radio setup completed using Service Programming System (SPS).

DIGITAL RADIO RECEIVER SETUP

IMPORTANT: The digital radio receiver setup option does not contain a submenu. Digital radio receiver setup will configure the following systems:

- DTCs
- GMLAN and class 2 radio messages

To setup the digital radio receiver, complete the setup procedure under the Special Functions menu of the scan tool, then cycle ignition.

XM Activation

IMPORTANT: After replacement of an XM receiver, call XM radio to deactivate the receiver that has been removed from the vehicle and activate the new XM radio receiver. The vehicle must be parked in view of a satellite within 24 hours after an activation call.

1. Turn the radio ON, tune to the XM channel 0, and record the radio ID. The radio ID will be needed for activation of the new receiver.
2. Call XM radio at 1-800-556-3600 to deactivate the faulty receiver and activate the new receiver.
3. Park the vehicle outside in an area with an unobstructed view of the southern sky.

4. Leave the vehicle outside with the ignition switch in the ACC position and the radio on for 30 minutes to activate XM service.
5. Once activated, the radio will receive the remaining XM channels.

SPEAKER REPLACEMENT REFERENCE

Speaker Replacement Reference

Component	Repair Instruction
Front Door Speaker	Refer to Speaker Replacement - Front Door
Rear Speaker	Refer to Speaker Replacement - Rear (UW6) or Speaker Replacement - Rear (UQ3)

REPAIR INSTRUCTIONS

RADIO REPLACEMENT

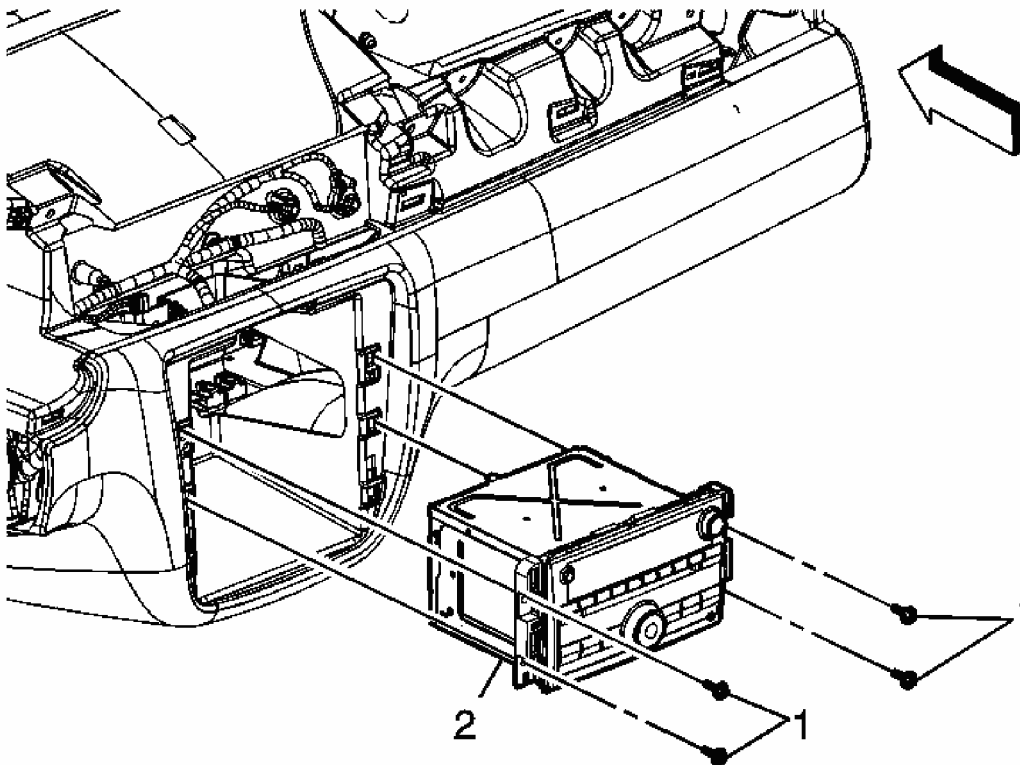


Fig. 35: Replacing Radio

Courtesy of GENERAL MOTORS CORP.

Radio Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the Instrument panel accessory trim plate. Refer to <u>Trim Plate Replacement - Instrument Panel (I/P) Accessory (Impala)</u> or <u>Trim Plate Replacement - Instrument Panel (I/P) Accessory (Monte Carlo)</u> . 2. Program the radio after replacement. Refer to <u>Control Module References</u> .	
1	Bolt/Screw, Radio (Qty: 4) Tighten: 2 N.m (18 lb in)
2	Radio, AM/FM Stereo

DIGITAL RADIO RECEIVER REPLACEMENT

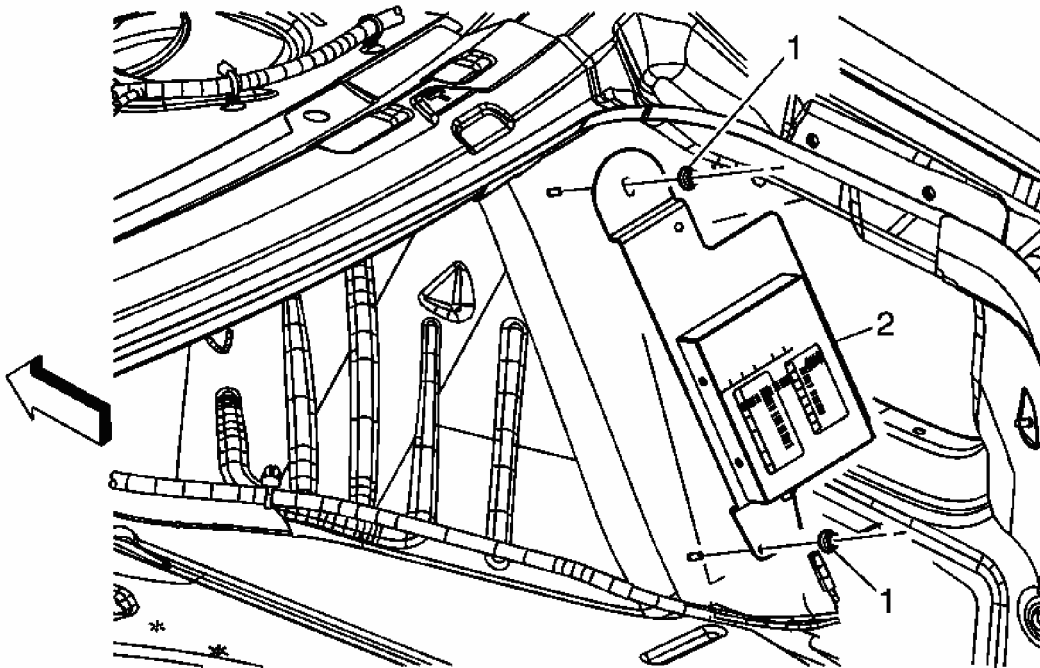


Fig. 36: Replacing Digital Radio Receiver
Courtesy of GENERAL MOTORS CORP.

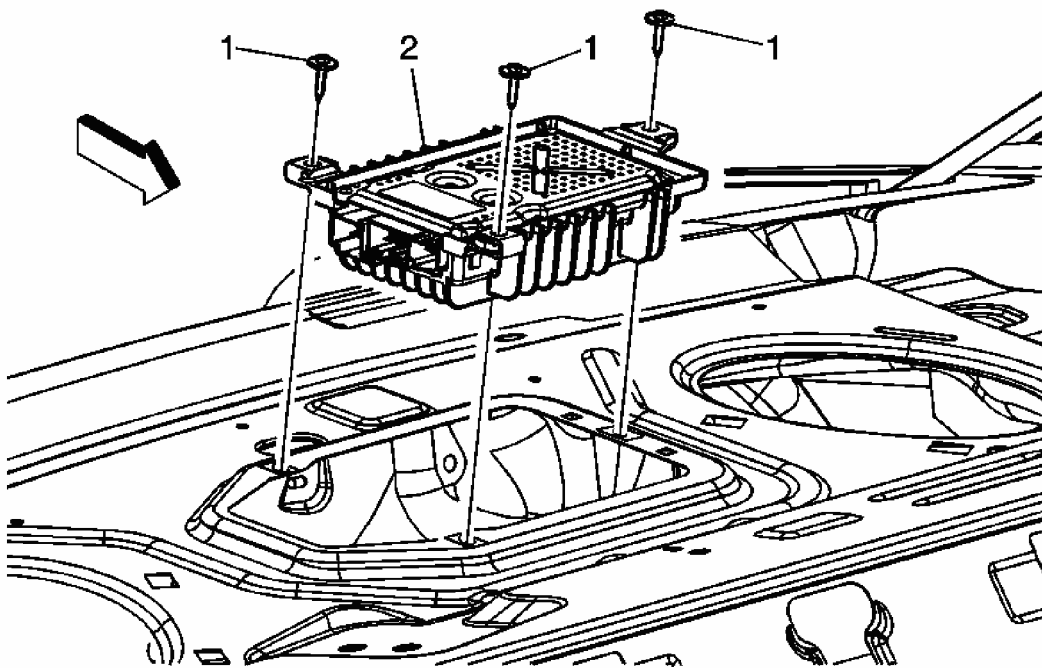
Receiver Replacement - Digital Radio

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Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>. IMPORTANT: Do not swap digital radio receivers between vehicles. Swapping digital receivers between vehicles will activate the digital radio Theftlock. "XM Theftlock" will be displayed. Preliminary Procedure 1. Remove the right rear compartment trim. Refer to <u>Compartment Side Trim Replacement - RH Rear</u> . 2. After replacement, perform the digital radio setup procedure. Refer to <u>Digital Radio Receiver Setup</u>. 3. Program the digital radio receiver after replacement. Refer to <u>Control Module References</u> .	
1	Nuts, Digital Radio Receiver Bracket (Qty: 2) Tip: Disconnect the antenna and electrical connectors from the module. Tighten: 3.5 N.m (31 lb in)
2	Receiver Assembly, Digital Radio

AMPLIFIER REPLACEMENT

**Fig. 37: Replacing Amplifier**

Courtesy of GENERAL MOTORS CORP.

Amplifier Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the rear window shelf trim panel. Refer to <u>Trim Panel Replacement - Rear Window Shelf</u> .	
1	Bolt, Low Frequency Audio Amplifier (Qty: 3) Tighten: 2.5 N.m (22 lb in)
2	Amplifier Assembly, Low Frequency Audio

COMPACT DISC CARE AND CLEANING

Care of CDs

Handle CDs carefully. Store them in their original cases or other protective cases and away from direct sunlight and dust. The CD player scans the bottom surface of the disc. If the surface of a CD is damaged, such as cracked, broken, scratched, or wrinkled labeling, the

CD will not play properly or not at all. If the surface of a CD is soiled, take a soft, lint free cloth or dampen a clean, soft cloth in a mild, neutral detergent solution mixed with water, and clean it. Make sure the wiping process starts from the center to the edge. Do not touch the bottom side of a CD while handling it. This could damage the surface. Pick up CDs by grasping the outer edges or the edge of the hole and the outer edge.

Care of the CD Player

The use of CD lens cleaners for CD players is not advised, due to the risk of contaminating the internal lens of the CD optics with lubricants.

Stuck CDs

Interrupting the battery power by pulling the fuse will sometimes release a stuck CD. If a CD is stuck, and removed, inspect it for warps, cracks, etc. If the CD is damaged, do not replace the radio.

Labeling CDs

Paper labels can eventually warp and wrinkle, and this will cause the disc to jam inside the CD player. Try labeling the top of the discs with a soft magic marker instead.

ANTENNA MODULE REPLACEMENT

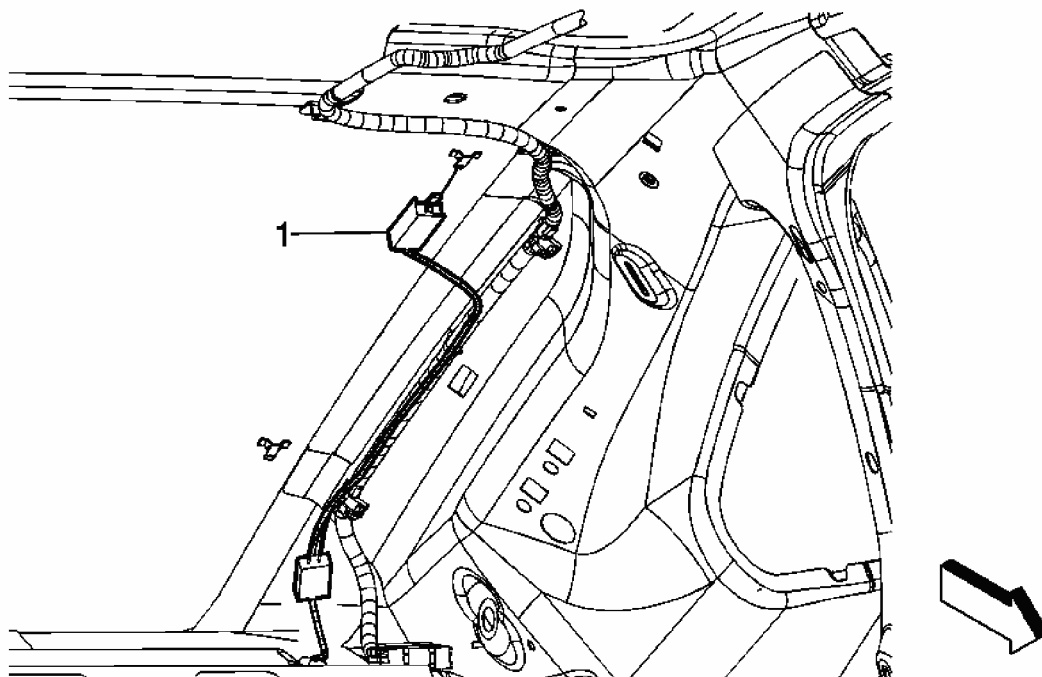


Fig. 38: Replacing Antenna Module

Courtesy of GENERAL MOTORS CORP.

Antenna Module Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the rear quarter upper trim panel. Refer to <u>Trim Panel Replacement - Rear Quarter Upper (Impala)</u> or <u>Trim Panel Replacement - Rear Quarter Upper (Monte Carlo)</u>. 2. Remove the rear window shelf trim panel. Refer to <u>Trim Panel Replacement - Rear Window Shelf</u>.	
1	Module Assembly, Radio Antenna

DIGITAL RADIO ANTENNA REPLACEMENT

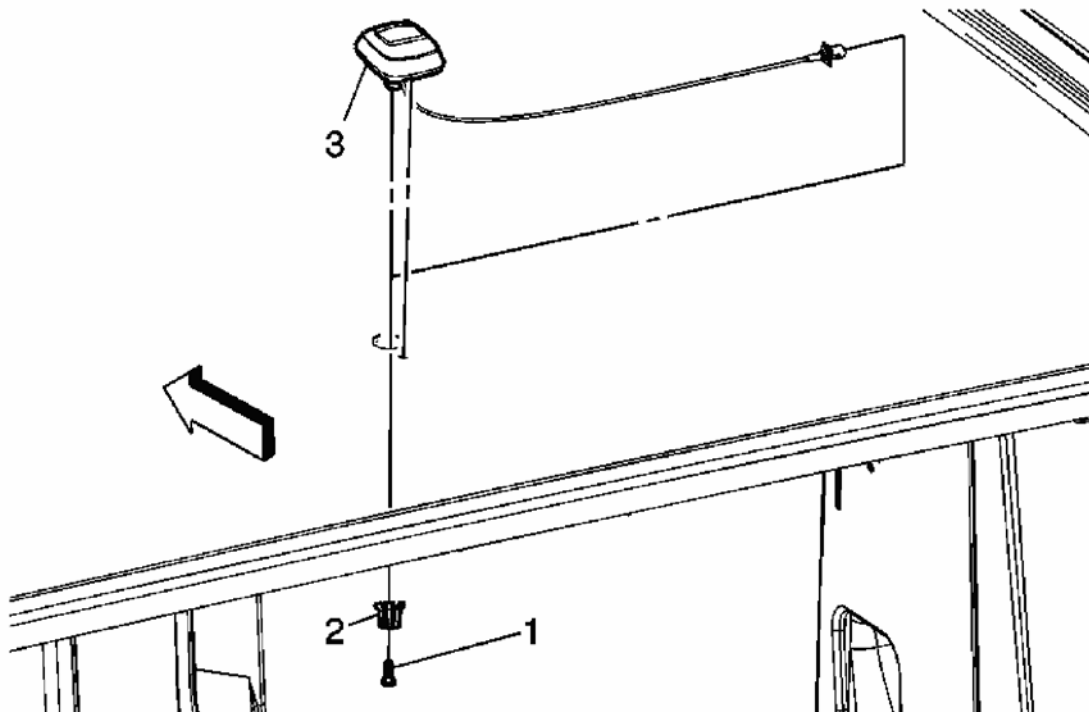


Fig. 39: Replacing Digital Radio Antenna
Courtesy of GENERAL MOTORS CORP.

Antenna Replacement - Digital Radio

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	

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Fastener Tightening Specifications: Refer to **Fastener Tightening Specifications** .**Preliminary Procedure:** Lower the rear of the headliner. Refer to **Headliner Replacement (Impala)** or **Headliner Replacement (Monte Carlo)** .

1	Bolt, Digital Radio Antenna Assembly Tip: Disconnect the electrical connections. Tighten: 9 N.m (80 lb in)
2	Expansion Sleeve, Digital Radio Antenna
3	Antenna Assembly, Digital Radio

ANTENNA EXTENSION CABLE REPLACEMENT

Removal Procedure

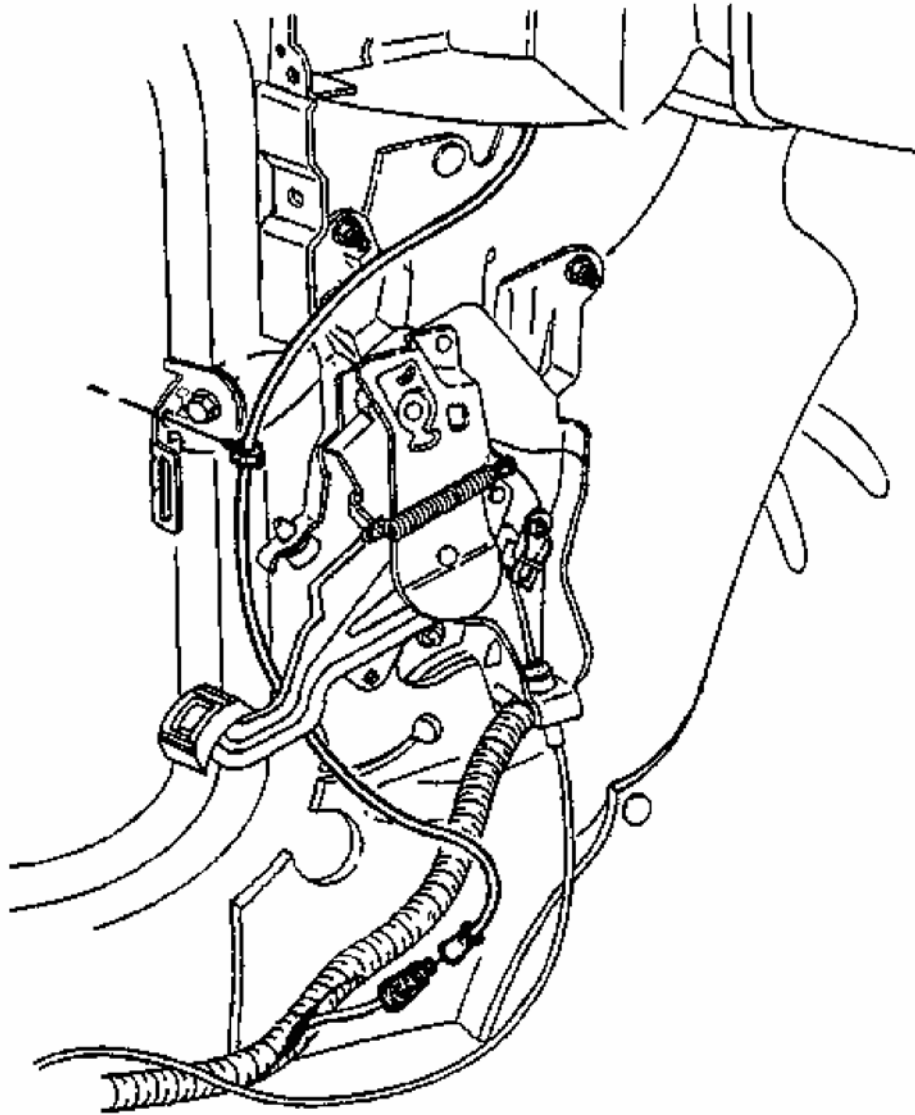


Fig. 40: Antenna Extension Cable
Courtesy of GENERAL MOTORS CORP.

1. Remove the left carpet retainer. Refer to **Carpet Retainer Replacement - Front (Impala)** or **Carpet Retainer Replacement - Front (Monte Carlo)** in Interior Trim.
2. Adjust the carpet for access.
3. Disconnect the antenna extension cable from the antenna cable.
4. Remove the left instrument panel insulator. Refer to **Closeout/Insulator Panel Replacement - Left** in Instrument Panel, Gages and Console.

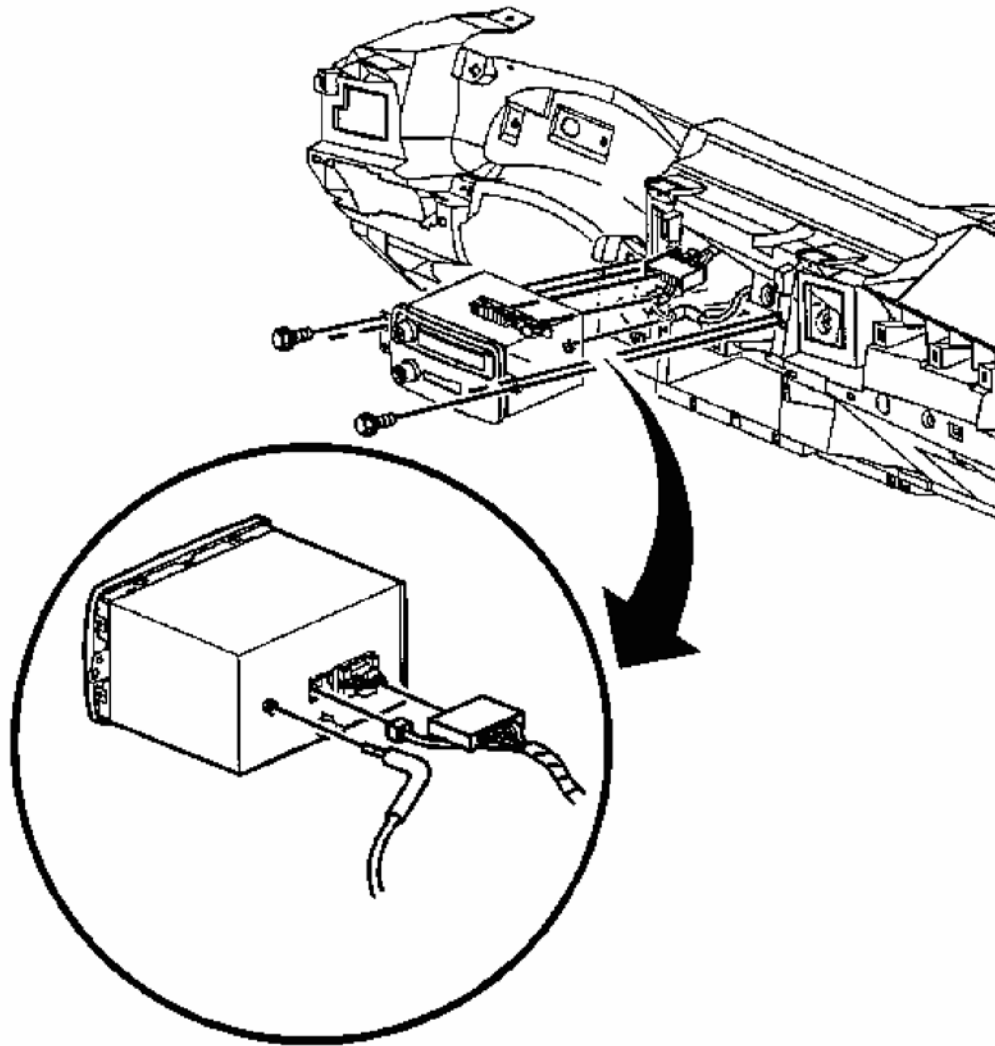


Fig. 41: Instrument Panel Wiring Harness Connector & Antenna Cable
Courtesy of GENERAL MOTORS CORP.

5. Adjust the radio for access. Disconnect the antenna extension cable from the radio. Refer to **Radio Replacement**.
6. Cut off the visible ends of the antenna extension cable.

Installation Procedure

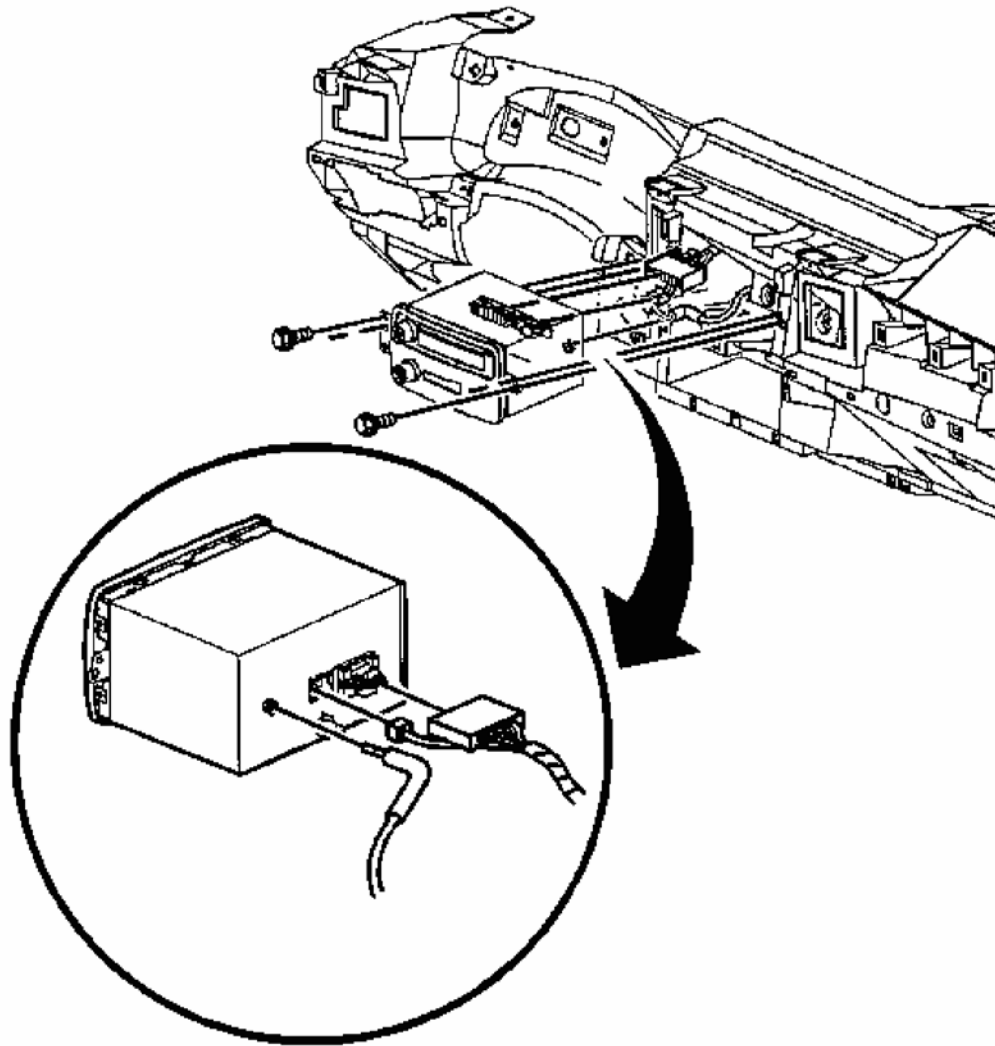


Fig. 42: Instrument Panel Wiring Harness Connector & Antenna Cable
Courtesy of GENERAL MOTORS CORP.

1. Route the antenna extension cable. Secure the cable.
2. Connect the antenna extension cable to the radio. Install the radio. Refer to **Radio Replacement**.

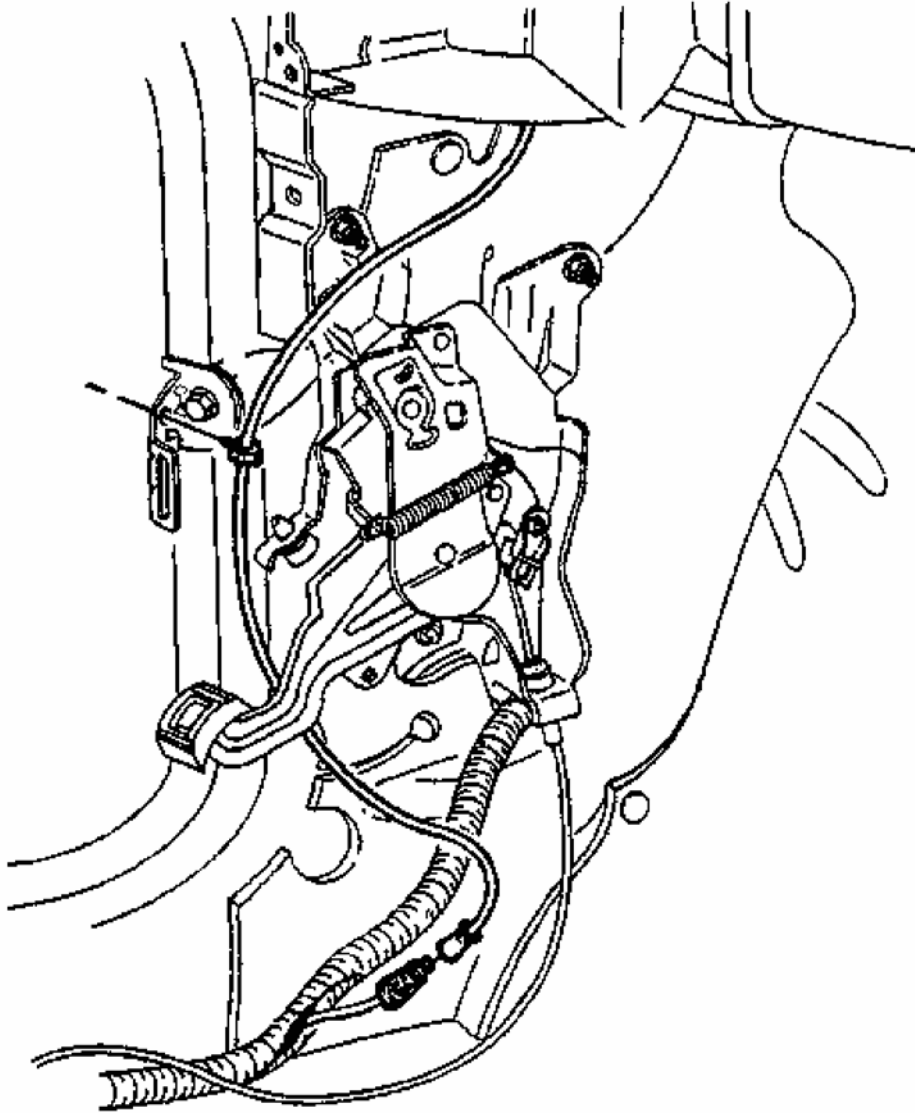


Fig. 43: Antenna Extension Cable
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The antenna cable uses a sliding snap-lock. Holding the sliding lock feature will prevent installation.

3. Connect the antenna extension cable from the radio to the antenna cable near the kick panel:
 1. Position the antenna extension cable behind the sliding lock feature.

2. Install the antenna extension cable to the sliding lock feature.
4. Install the left instrument panel insulator. Refer to **Closeout/Insulator Panel Replacement - Left** in Instrument Panel, Gages and Console.
5. Install the carpet.
6. Install the left carpet retainer. Refer to **Carpet Retainer Replacement - Front (Impala)** or **Carpet Retainer Replacement - Front (Monte Carlo)** in Interior Trim.

ANTENNA CABLE REPLACEMENT

Removal Procedure

1. Remove the rear upper quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper (Impala)** or **Trim Panel Replacement - Rear Quarter Upper (Monte Carlo)** in Interior Trim.
2. Disconnect the antenna cable from the radio antenna module.

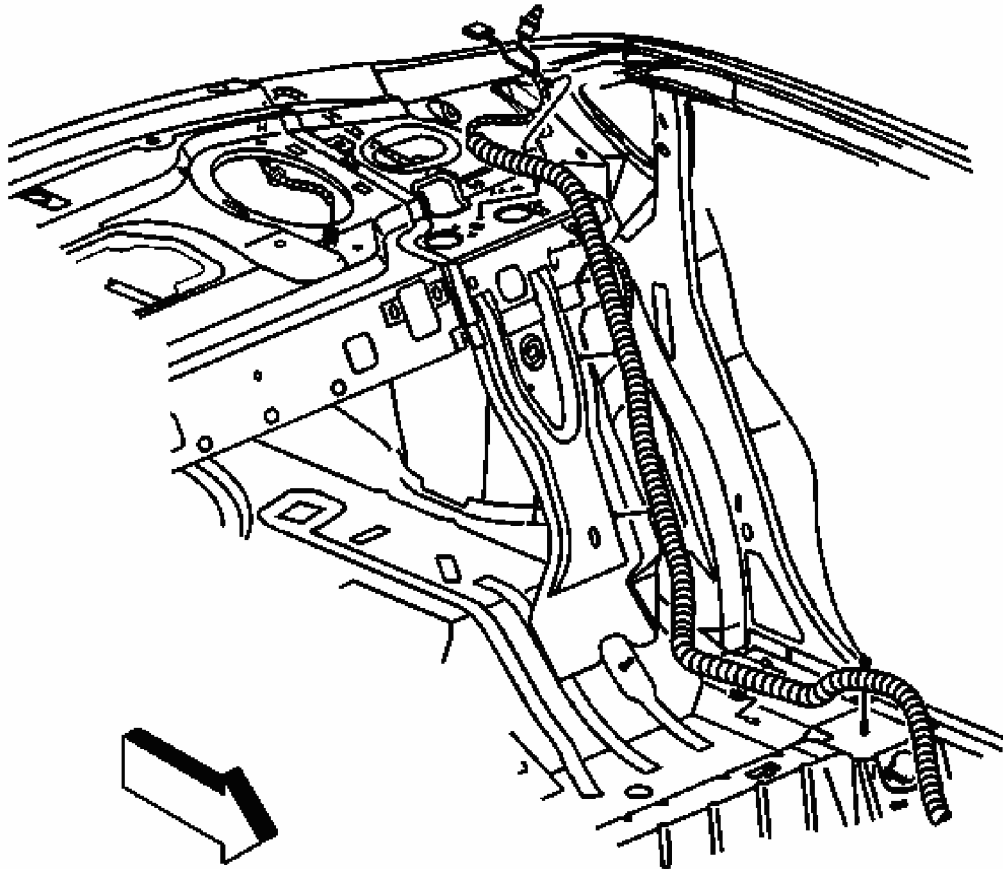


Fig. 44: Antenna Cable

Courtesy of GENERAL MOTORS CORP.

3. Remove the rear seat cushion. Refer to Seat Cushion Replacement - Rear (Impala) or Seat Cushion Replacement - Rear (Monte Carlo) in Seats.
4. Remove the rear seat back. Refer to Seat Back Replacement - Rear (Impala) or Seat Back Replacement - Rear (Monte Carlo) in Seats.

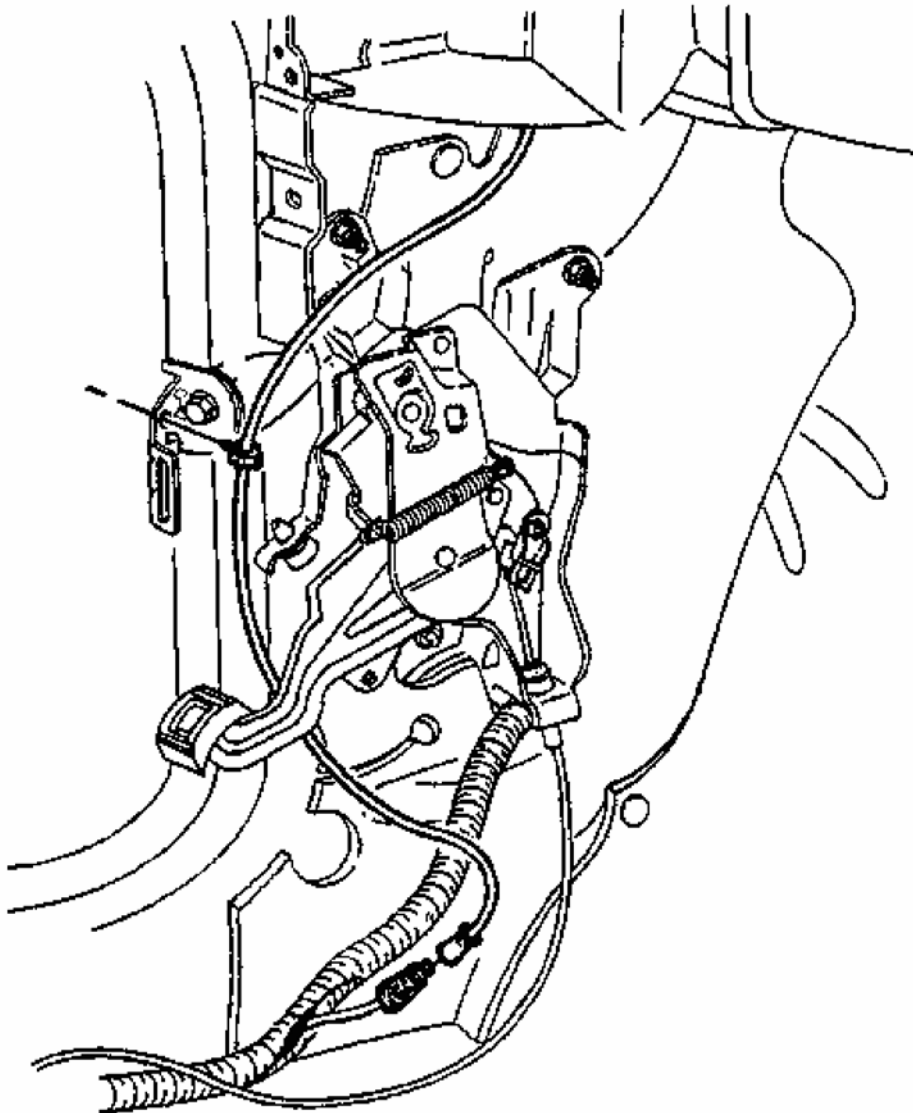


Fig. 45: Antenna Extension Cable

Courtesy of GENERAL MOTORS CORP.

5. Remove the left carpet retainers. Refer to **Carpet Retainer Replacement - Front (Impala)** or **Carpet Retainer Replacement - Front (Monte Carlo)** in Interior Trim.
6. Remove the lower center pillar trim panel. Refer to **Trim Panel Replacement - Lower Center Pillar** in Interior Trim.
7. Adjust the carpet for access to the antenna cable as required.
8. Disconnect the antenna cable from the antenna extension cable.
9. Cut off the visible end of the antenna cable from the wiring harness in the following locations:
 - The kick panel area
 - The rear shelf area

Installation Procedure

1. Install the antenna cable to the vehicle. Use electrical tape in order to secure the antenna extension cable to the top of the wiring harness. Secure the cable to the harness at least every 150 mm (6 in).

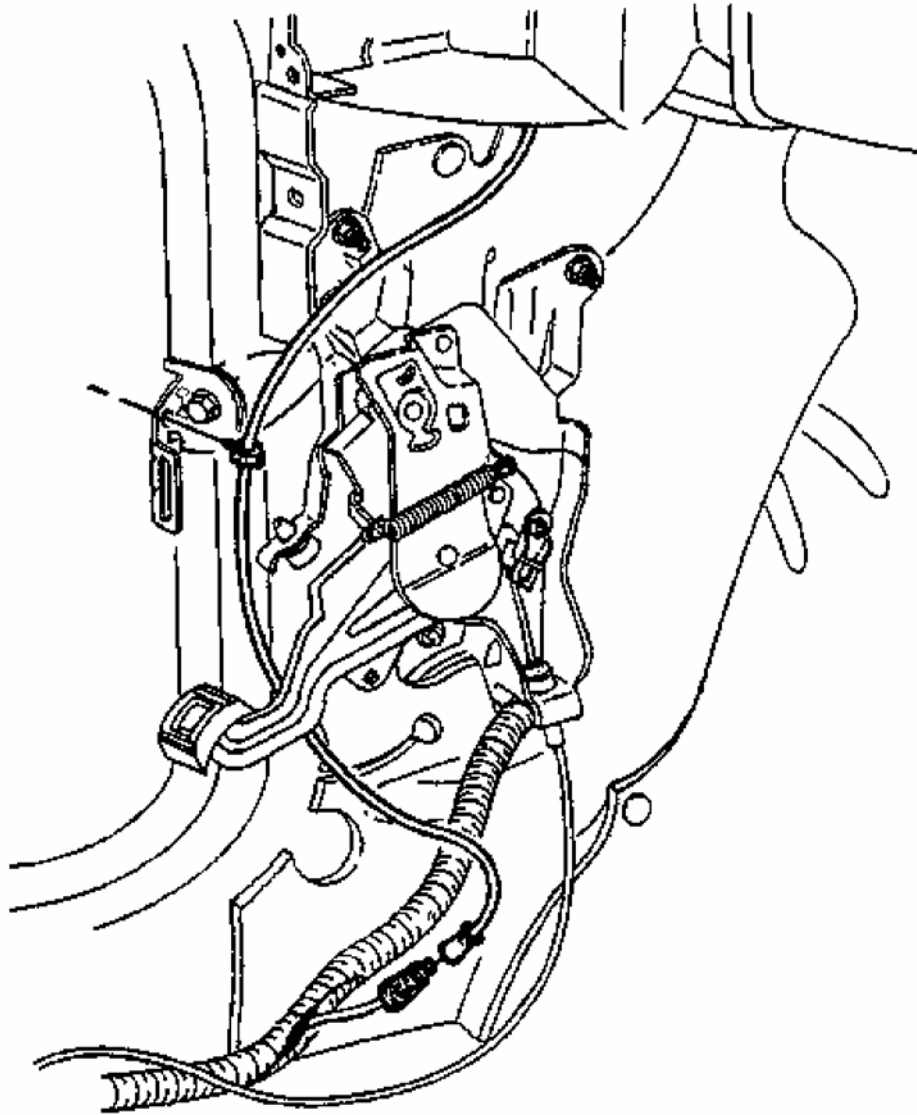


Fig. 46: Antenna Extension Cable
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The antenna cable uses a sliding snap-lock. Holding the sliding lock feature will prevent installation.

2. Connect the antenna extension cable from the radio to the antenna cable near the kick panel:
 1. Position the antenna extension cable behind the sliding lock feature.

2. Install the antenna extension cable to the sliding lock feature.
3. Install the carpet.
4. Install the lower center pillar trim panel. Refer to **Trim Panel Replacement - Lower Center Pillar** in Interior Trim.
5. Install the left carpet retainers. Refer to **Carpet Retainer Replacement - Front (Impala)** or **Carpet Retainer Replacement - Front (Monte Carlo)** in Interior Trim.

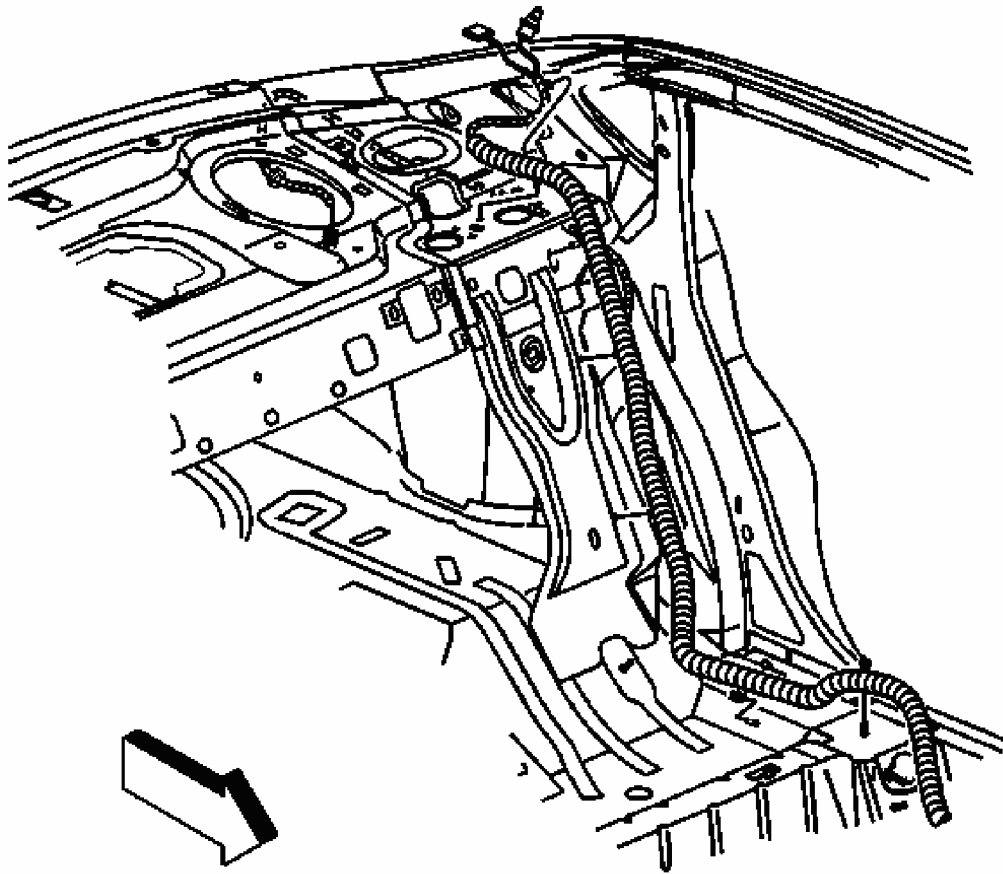


Fig. 47: Antenna Cable

Courtesy of GENERAL MOTORS CORP.

6. Install the rear seat back. Refer to **Seat Back Replacement - Rear (Impala)** or **Seat Back Replacement - Rear (Monte Carlo)** in Seats.
7. Install the rear seat cushion. Refer to **Seat Cushion Replacement - Rear (Impala)** or **Seat Cushion Replacement - Rear (Monte Carlo)** in Seats.

IMPORTANT: The antenna cable uses a sliding snap-lock. Holding the sliding lock feature will prevent installation.

8. Connect the antenna cable to the radio antenna module:
 1. Position the antenna cable behind the sliding lock feature.
 2. Install the antenna cable to the sliding lock feature.
9. Install the rear upper quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper (Impala)** or **Trim Panel Replacement - Rear Quarter Upper (Monte Carlo)** in Interior Trim.

COAXIAL CABLE REPLACEMENT - DIGITAL RADIO

Removal Procedure

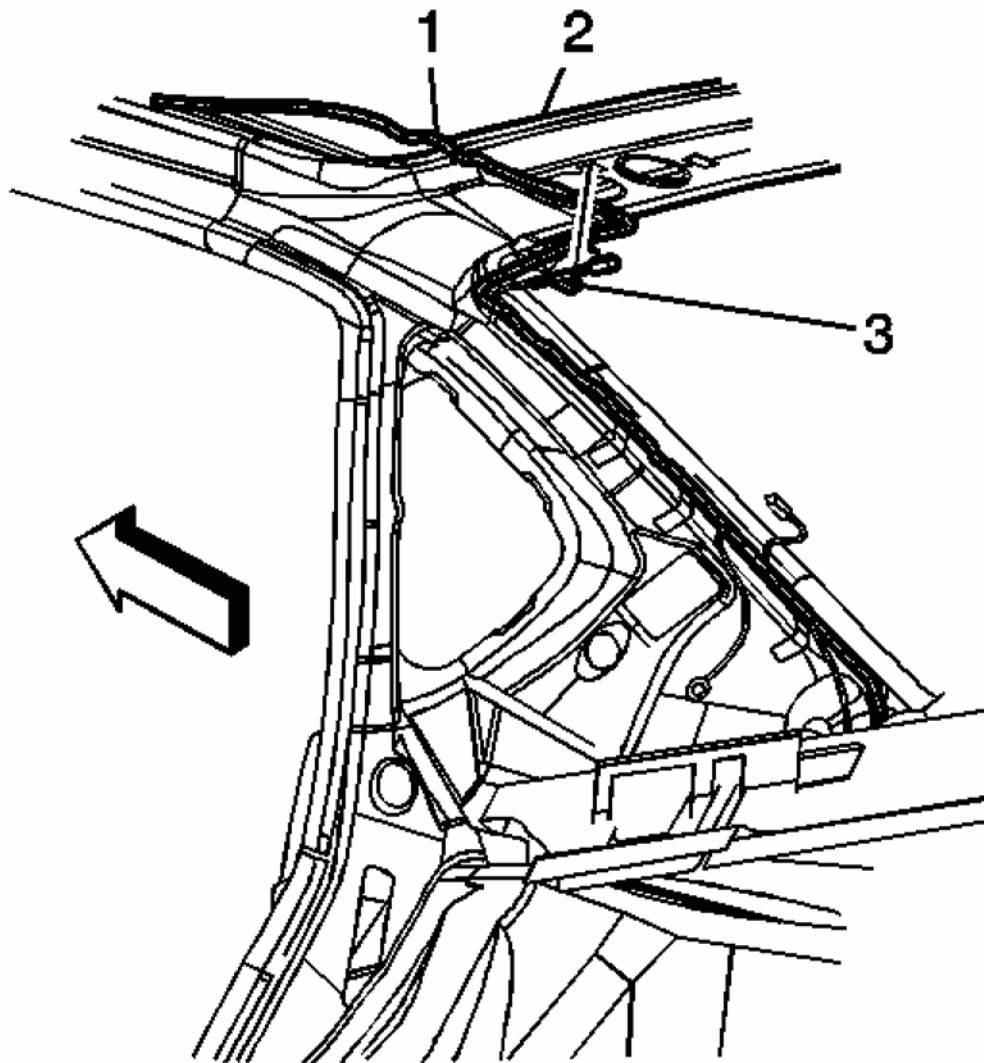


Fig. 48: Removing Antenna Cable
Courtesy of GENERAL MOTORS CORP.

1. Remove the right rear upper quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper (Impala)** or **Trim Panel Replacement - Rear Quarter Upper (Monte Carlo)** in Interior Trim.
2. Lower the rear of the headliner for access to the antenna/cable attachment. Refer to **Headliner Replacement (Impala)** or **Headliner Replacement (Monte Carlo)** in Interior Trim.
3. Adjust the antenna cable mastic patch/tape at the roof.
4. Disconnect the antenna cable from the antenna base cable connector.

5. Remove the antenna cable retainer (3) from the rear header (2).

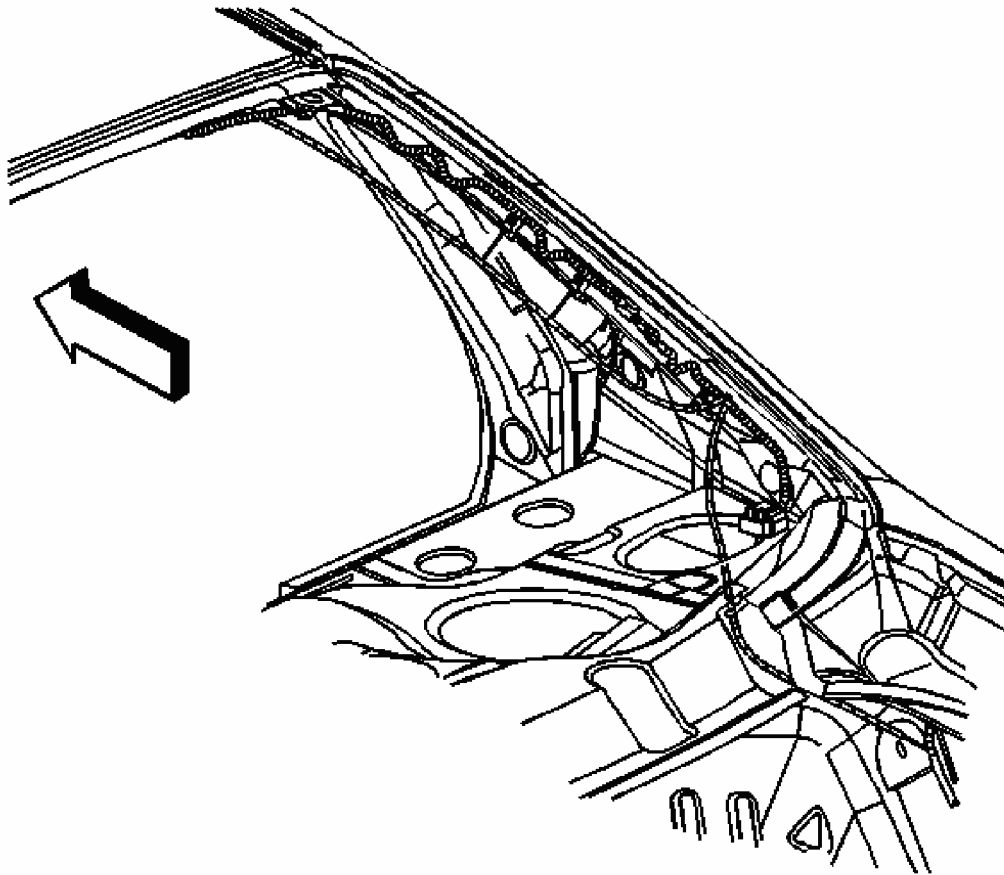


Fig. 49: Routing Antenna Cable
Courtesy of GENERAL MOTORS CORP.

6. Remove the antenna cable from the dome lamp harness clips.
7. Remove the antenna cable from between the dome lamp harness and the upper quarter panel.
8. Attach a piece of wire or string to the end of the antenna cable.
9. Route the antenna cable through the rear shelf and along the rear wheel house.
10. Adjust the right rear compartment trim panel.
11. Disconnect the antenna cable from the digital radio receiver.
12. Remove the antenna cable retainers from the receiver bracket.
13. Remove the wire or string from the antenna cable.
14. Remove the antenna cable.

Installation Procedure

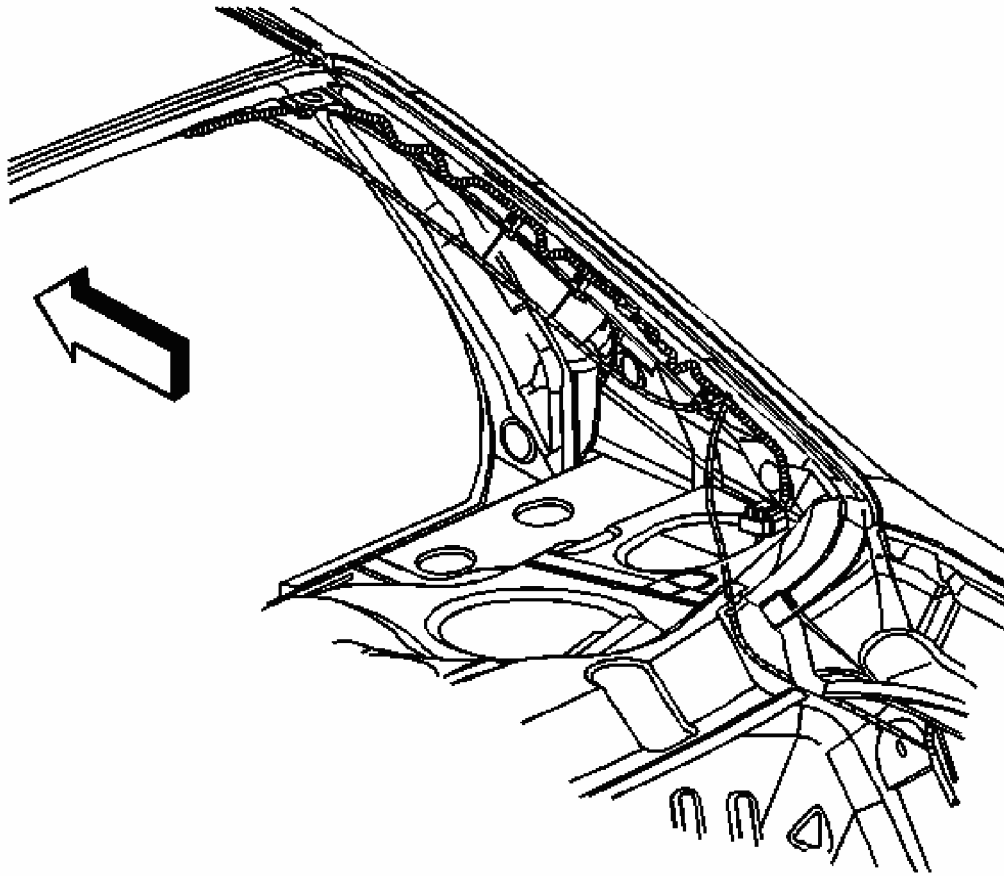


Fig. 50: Routing Antenna Cable
Courtesy of GENERAL MOTORS CORP.

1. Install the antenna cable retainers to the receiver bracket.
2. Connect the antenna cable to the digital radio receiver.
3. Attach the wire or string used in the removal procedure to the cable being installed.
4. Carefully pull the antenna cable through the rear shelf into the passenger compartment.
5. Install the right rear compartment trim panel.
6. Remove the wire or string from the antenna cable.
7. Route the antenna cable between the dome lamp harness and the upper quarter panel.
8. Install the antenna cable to the dome lamp harness clips.

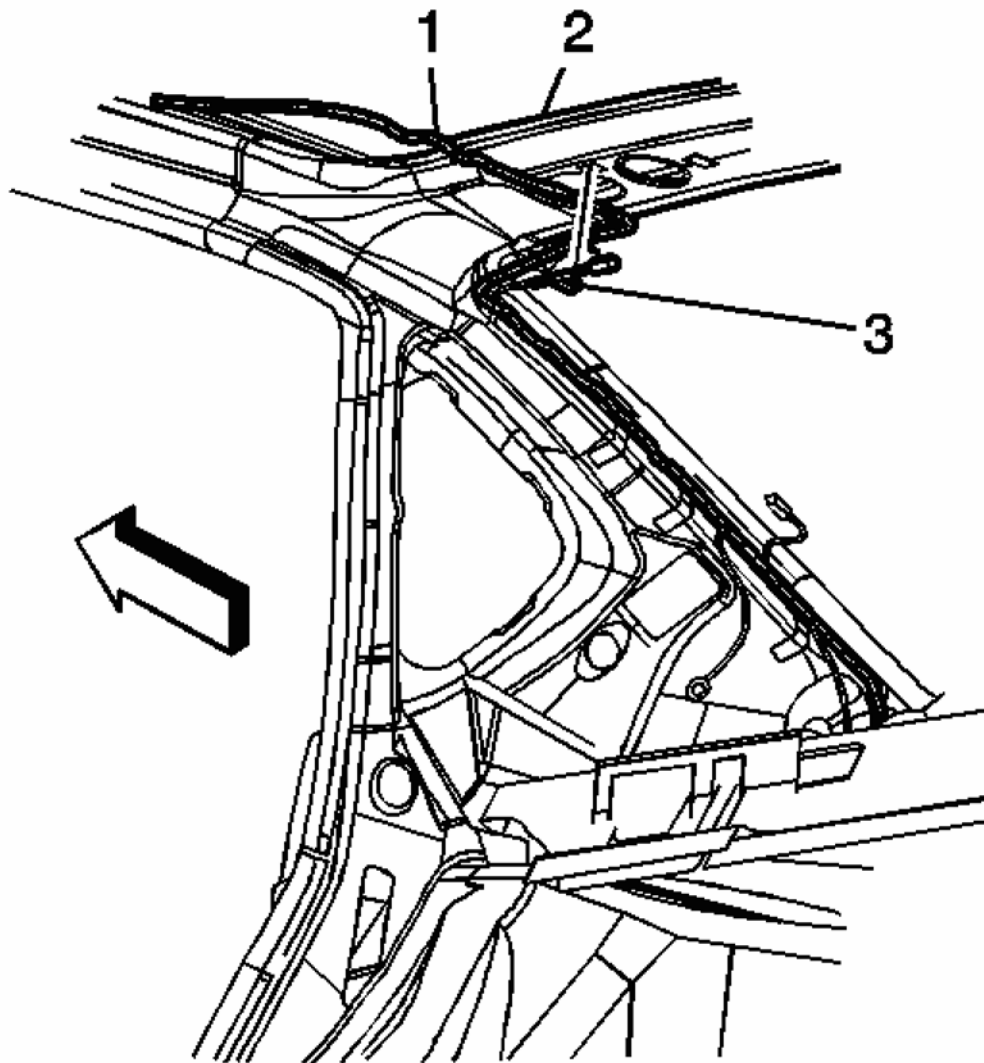


Fig. 51: Removing Antenna Cable
Courtesy of GENERAL MOTORS CORP.

9. Install the antenna cable retainer (3) to the rear header (2).
10. Connect the antenna cable to the antenna base cable connector.
11. Install the antenna cable mastic patch/tape at the roof.
12. Install the rear of the headliner. Refer to **Headliner Replacement (Impala)** or **Headliner Replacement (Monte Carlo)** in Interior Trim.
13. Install the right rear upper quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper (Impala)** or **Trim Panel Replacement - Rear Quarter Upper**

(**Monte Carlo**) in Interior Trim.

FRONT DOOR SPEAKER REPLACEMENT

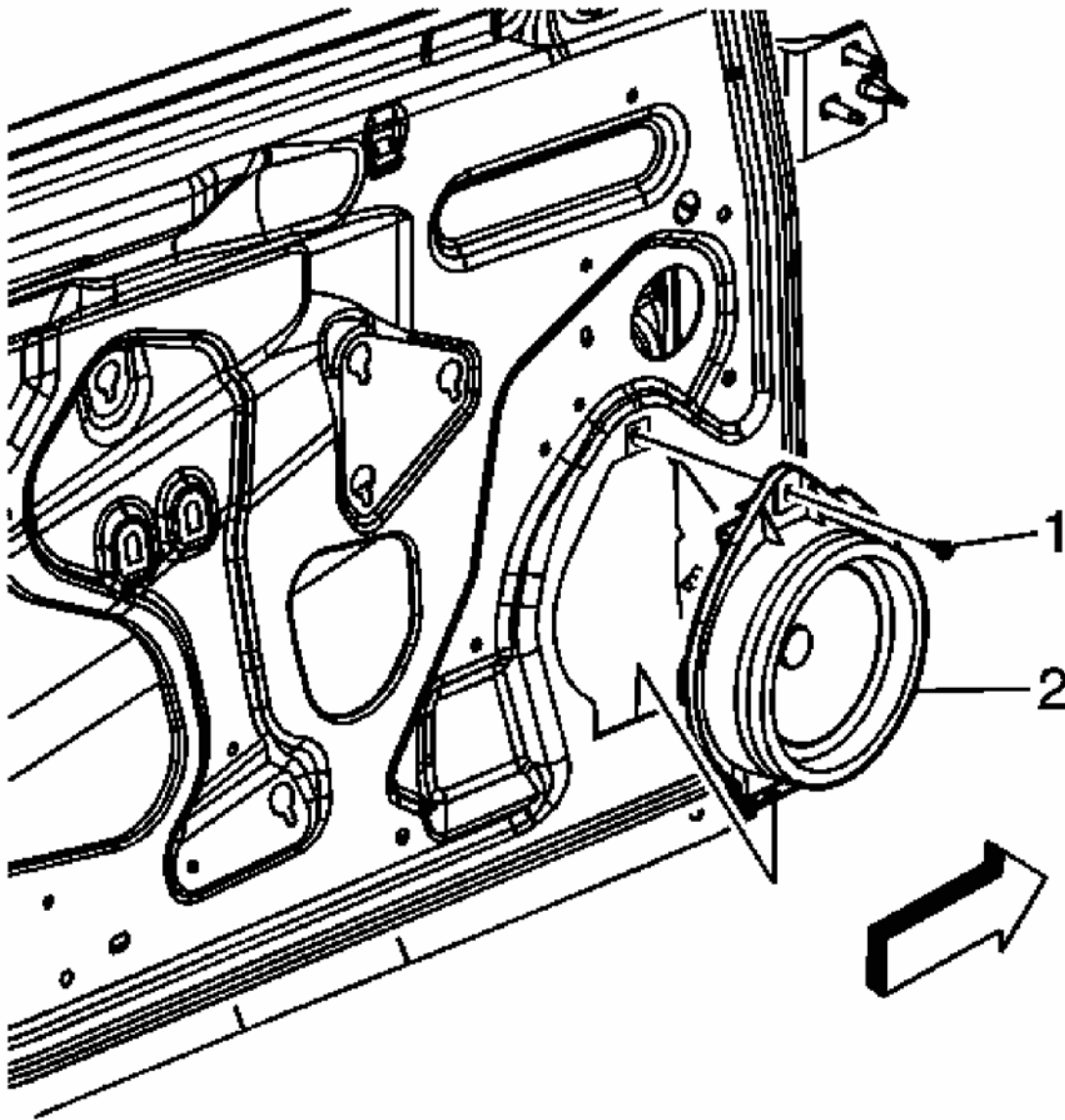


Fig. 52: Replacing Front Door Speaker
Courtesy of GENERAL MOTORS CORP.

Speaker Replacement - Front Door

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the front door trim panel. Refer to	

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Trim Panel Replacement - Side Front Door (Impala) .

1	Bolt/Screw, Radio Front Side Door Speaker Housing Tighten: 2 N.m (18 lb in)
2	Speaker Assembly, Radio Front Side Door

FRONT UPPER SPEAKER REPLACEMENT

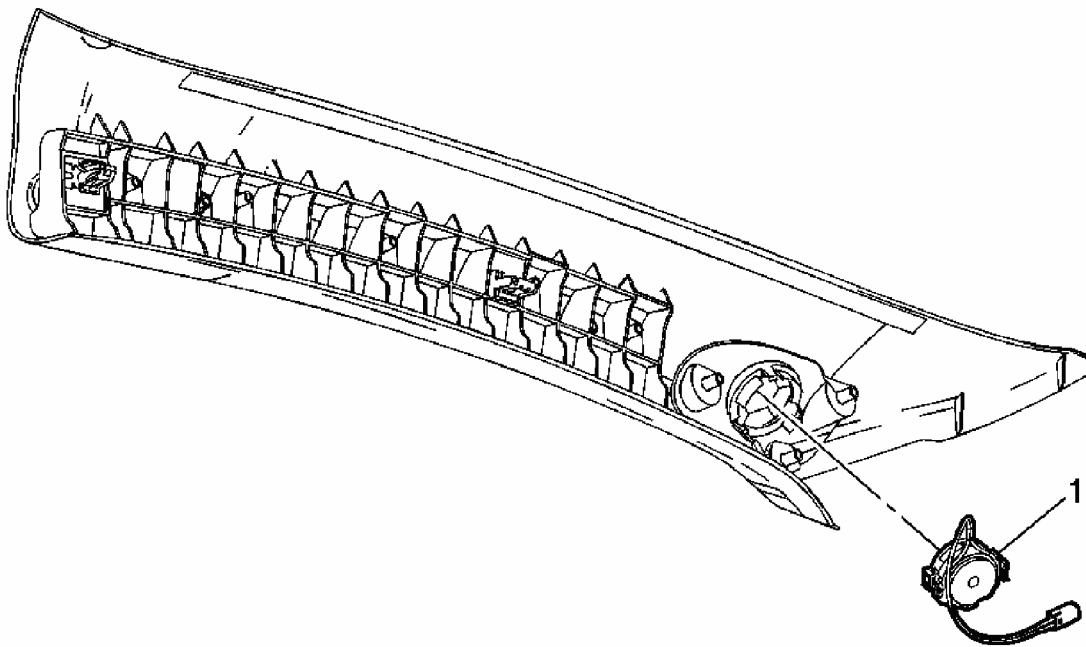


Fig. 53: Replacing Front Upper Speaker
Courtesy of GENERAL MOTORS CORP.

Speaker Replacement - Front Upper

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the windshield pillar garnish molding. Refer to <u>Garnish Molding Replacement - Windshield Pillar (Impala)</u> or <u>Garnish Molding Replacement - Windshield Pillar (Monte Carlo)</u> .	
1	Speaker Assembly, Radio Windshield Side Garnish Molding Tip: Release the tabs on the windshield pillar speaker carrier to remove the speaker from the molding.

REAR (UW6) SPEAKER REPLACEMENT

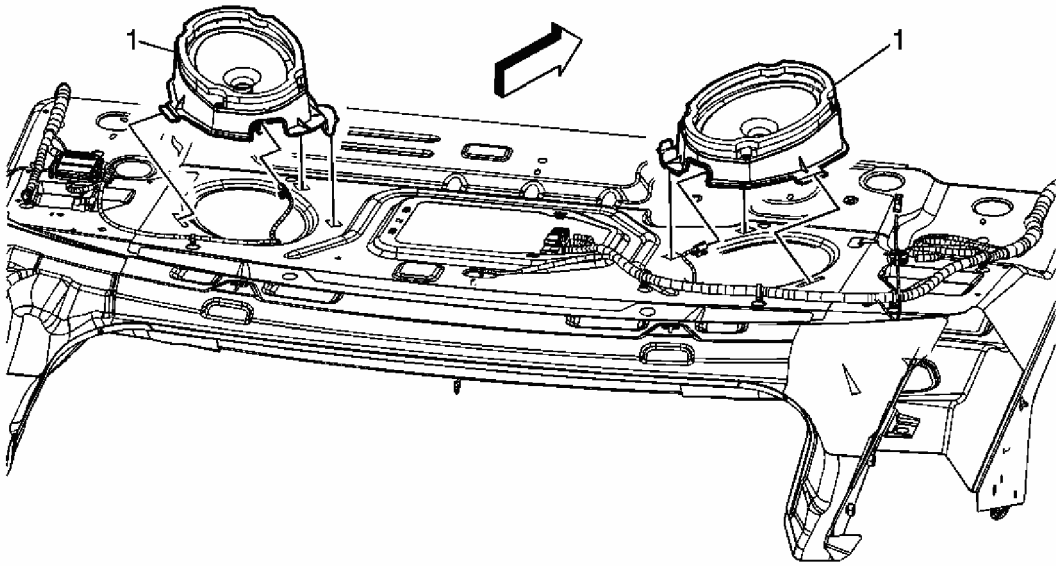


Fig. 54: Replacing Rear (UW6) Speaker
 Courtesy of GENERAL MOTORS CORP.

Speaker Replacement - Rear (UW6)

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the rear window shelf trim panel. Refer to <u>Trim Panel Replacement - Rear Window Shelf</u> .	
1	Speaker Assembly, Radio Rear (Qty: 2) Tip: • Push in on the tabs on the speaker in order to release. • Disconnect the electrical connector.

REAR (UQ3) SPEAKER REPLACEMENT

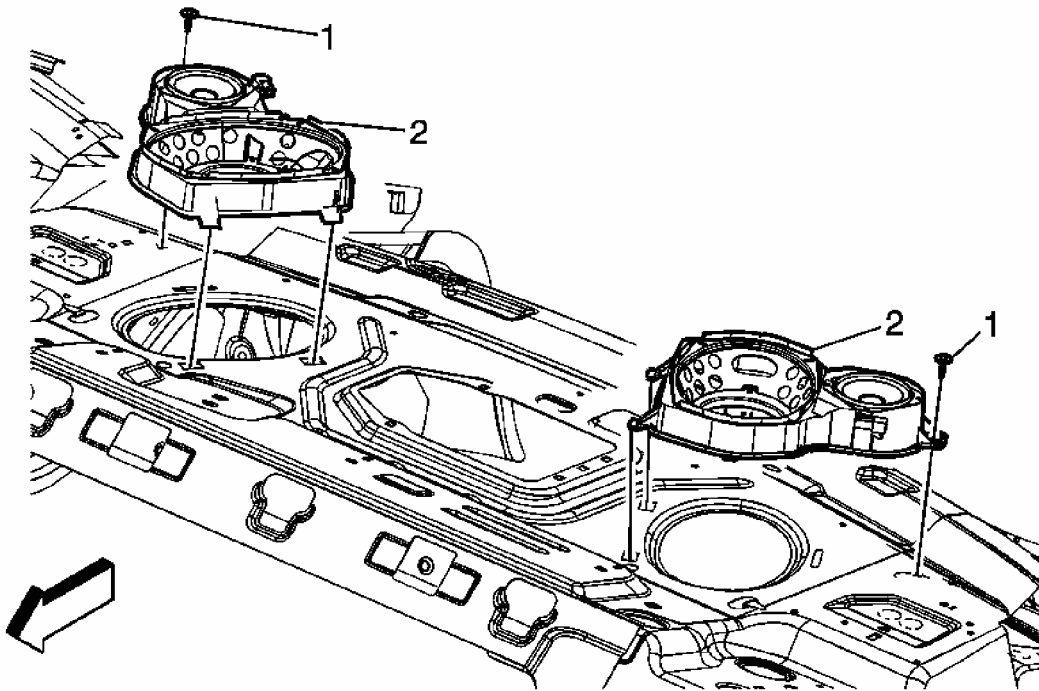


Fig. 55: Replacing Rear (UQ3) Speaker
 Courtesy of GENERAL MOTORS CORP.

Speaker Replacement - Rear (UQ3)

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the rear window shelf trim panel. Refer to <u>Trim Panel Replacement - Rear Window Shelf</u> .	
1	Bolt/Screw, Radio Rear Speaker Tip: Disconnect the electrical connector. Tighten: 2.5 N.m (22 lb in)
2	Speaker Assembly, Radio Rear

REAR SPEAKER GRILLE REPLACEMENT

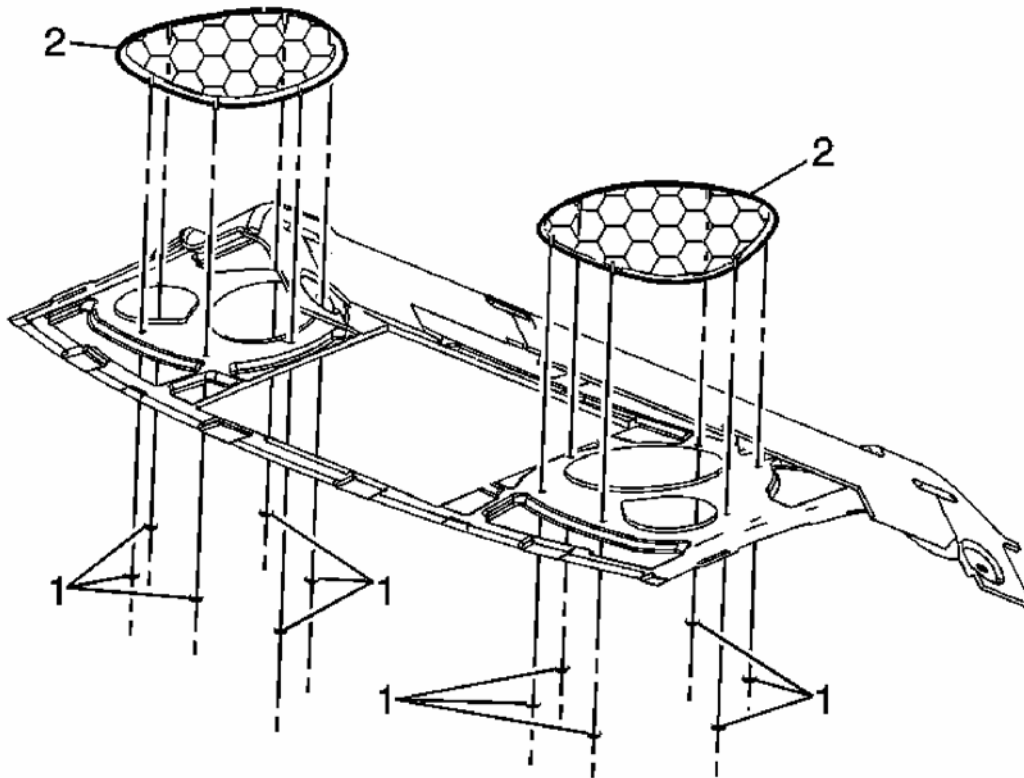


Fig. 56: Replacing Rear Speaker Grille
 Courtesy of GENERAL MOTORS CORP.

Speaker Grille Replacement - Rear

Callout	Component Name
NOTE: Refer to Fastener Notice .	
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications . Preliminary Procedure: Remove the rear window shelf trim panel. Refer to Trim Panel Replacement - Rear Window Shelf .	
1	Nut, Radio Rear Speaker Grille Tighten: 2 N.m (18 lb in)
2	Grille, Radio Rear Speaker

DESCRIPTION AND OPERATION

RADIO/AUDIO SYSTEM DESCRIPTION AND OPERATION

Contents

- RPO options
- Circuit description
- Component description
- Theft deterrent feature

RPO Options

The entertainment system on this vehicle is configured with either a base or uplevel audio system. Both the base and uplevel audio systems contain a radio, antenna, and speakers. The following shows the Entertainment RPOs that are available for this vehicle:

- (U1C) AM/FM Stereo CD
- (US8) AM/FM Stereo, CD, MP3, RDS, EQ
- (US9) AM/FM Stereo, 6-Disc CD, MP3, RDS, EQ
- (UW5) Base Six Speaker
- (UQ3) Uplevel Six Speaker
- (U2K) Digital Radio

Circuit Operation**Radio Power**

The main radio power is supplied by a 15A RADIO fuse located in the body control module (BCM). The radio does not require a discrete ignition feed circuit for power moding. The power moding is accomplished using a structure of Virtual Networks (VN). The Power Mode Master (PMM) transmits the GMLAN power mode signals.

The radio supports the following signals:

- System Power Mode
- Infotainment Operation Allowed

The radio also supports the following GMLAN Vehicle Power Modes:

- OFF
- ACCESSORY
- RUN
- CRANK REQUEST

Radio Ground

A wire in the main radio connector that is connected to battery negative at all times provides

the main radio ground. Resistance between the ground pin and the vehicle battery negative terminal must not exceed 0.05 ohm.

Radio Speaker Outputs

At low volume, the plus (+) and minus (-) speaker outputs circuits measure approximately 7-8 volts. If a plus or minus circuit for any speaker output is shorted to ground or voltage, the radio disables the circuit for component protection and sets a diagnostic trouble code (DTC). The radio sets the speaker circuit DTC on non - amplified systems only. As the radio volume increases the voltage on the plus and minus circuits change to create a voltage difference between each other. The difference in voltage is what drives the voice coil of the speaker producing sound.

Radio Head Unit Dimming

GMLAN signal data received by the radio determines the radio dimming and backlighting levels. The radio sets the backlight and VF display dimming to the value indicated by the interior dimming level and interior dimming display level signals in the GMLAN dimming information frame. The radio provides faceplate and control/graphics backlighting in the OFF (RAP inactive) when the exterior lighting virtual network (VN) is activated. The radio display is consistent then with the surrounding devices that use analog PWM dimming to backlight their control/graphics when the power mode is OFF and the park lights are ON.

Amplifier Interface

The main amplifier power is provided by a 20A RADIO AMP fuse located in the body control module (BCM). A discrete switched 12 volt output is used to control the power - state of the amplifier. To respond quickly to audio input and control signals, the amplifier is ON in all vehicle power modes except OFF and CRANK Request. However, when the amplifier is asleep it still must allow chime functionality. The internal amplifier bridges are fully powered and unmuted when the amplifier receives the switched 12-volt input.

The radio provides a remote amp mute output circuit to control overall muting of remote non-GMLAN amplifiers with rear seat audio (RSA) applications. The amplifier receives PWM signals on the circuit at varying duty cycle percentages for controlling the muted and unmuted functions of the amplifier. The RSA Enable circuit in the radio enables the rear seat channel muting of the amplifier. A Diag Sense circuit internal to the radio monitors the remote amp mute circuit for faults and sets the appropriate DTC when detected.

The function table below shows the four possible amplifier mute functions.

Radio/Audio System Description and Operation

% Duty Cycle Out	Function
0 % (Vlow Vdc)	FOUR_CHANNEL_UNMUTE
50 %	REAR_MUTE (input must be 2-channel)

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75 %	SIX_CHANNEL_UNMUTE
100% (Vhigh Vdc	ALL_MUTE

Amplifier Radio Speaker Inputs

The low-level audio signals (LF, RF, LR, and RR) from the radio are the inputs to the amplifier. The amplifier boosts these inputs and outputs them to the vehicle speakers. If one speaker plus or minus low level audio signal circuit is open between the radio and the amplifier, the input to the amplifier is approximately half. The speakers for that channel then operate at approximately half the normal volume or in some cases no volume.

The low level audio signals from the radio to the amplifier typically measure in the 4-5 V range.

Amplifier Speaker Outputs

At a low volume, the plus (+) and minus (-) speaker outputs circuits measure approximately 2-7 V AC or 7-8 V DC at the speaker connector when testing a normal working system. If a plus or minus for any speaker output is shorted to ground or voltage, the amplifier circuitry will turn OFF the front outputs or rear outputs for component protection.

Repeat speaker failure can be caused by a damaged amplifier. Test for a damaged quad bridge output in the amplifier if the wiring between the amplifier and speaker test negative for a short to voltage. Prolonged exposure to DC voltage can cause a speaker coil to short. An early indication of a shorted speaker coil is distortion/noise and eventual failure.

Remote Radio Audio Signal Inputs (UE1 only)

Audio output from the OnStar(R) communications module connects to the remote audio signal inputs of the radio. When the cellular telephone mute signal goes to 0 volts, the radio over-rides any other audio signal and uses these inputs as the source for the output to the speakers.

Cellular Telephone Mute (UE1 only)

The OnStar(R) communications module uses the cellular telephone mute signal circuit to over-ride the radio for OnStar(R) communication. When cellular telephone mute is not active, this circuit is held at 1-volt by the radio. When the cellular telephone mute signal is pulled to ground, the radio over-rides any other audio signal and uses the remote audio signals as the source for output to the speakers. If the radio was OFF when this circuit is pulled low, the radio will turn ON. Additionally, the radio fades the speakers to full front, adjusts the volume to an initial audible level, and sets an Auto Tone designed for optimal use with OnStar(R). When the mute signal is no longer pulled to ground, the radio returns to the mode it was in previously.

Component Description

Antenna System

The antenna system receives broadcast AM or FM stereo signals from free space and sends the signals to the radio receiver for processing via a coaxial antenna cable. Good antenna grounding is important for good radio reception.

Radio

The operator interfaces with the radio system through the radio display and controls. Through these controls the operator is able to control system power, volume, fade, balance, bass, and treble equalizations. Control on the integrated CD, MP3, or XM Satellite Radio system is also available when equipped with these options. A VFD (vacuum florescent display) provides system feedback to the operator.

The radio processes the AM and FM signals from the antenna system or the information from the CD media, amplifies that information and sends the output to the speaker system.

The radio is located in the instrument panel center stack area and is fastened to the instrument panel by fasteners. A rear bullet type guide pin is provided to aid in aligning the radio. An electrical connection to the radio is a 30-way connector that is part of the I/P harness, antenna lead connector, and an additional 16-way harness connector is present on OnStar(R) equipped vehicles. Additional service length is provided in the radio harnesses to allow connection prior to radio installation.

Radio amplifier outputs to the speakers are protected from damage should speaker leads become shorted to ground or shorted to vehicle power. The radio will sense these conditions and shut down the amplifier outputs in a non-destructive manner. After the short condition is removed, the radio will return to normal operation.

Speakers

The speaker system consists of six speakers, two 6 inch speakers mounted in the doors. Two 3.5 inch speakers mounted in the back panels. Two one-inch tweeter speakers mounted in the A-pillars. The amplified speaker system adds a subwoofer and amplifier.

Subwoofer

The premium audio system includes a subwoofer that is mounted in the rear of the vehicle. The subwoofer is a single speaker designed for low frequency response. The subwoofer speaker is a dual coil design. The amplifier, which is included with the premium audio package amplifies the low frequency and outputs it to the subwoofer.

Auxiliary Jack Socket

The AM/FM Stereo CD radio shall provide a 3.5 mm Auxiliary stereo jack that will allow playback of audio signals from remote devices (e.g., portable tape player, IPOD, MP3 playback device, etc.).

OnStar(R)

OnStar(R) equipped (RPO UE1) vehicles use the radio amplifier and speaker system for voice communication from the OnStar(R) operator to the vehicle. Voice communication from the vehicle to the OnStar(R) operator is through the OnStar(R) microphone and module, which is not a part of the radio system.

When OnStar(R) begins operation, the radio volume is set to a preset level, auto tone preset for OnStar(R) becomes active and the fade control is adjusted to the full front speakers. The radio volume control can then be used to adjust the volume to a desired level.

The radio system and OnStar(R) system are connected through the 16-way connector at the back of the radio. Left and right channel OnStar(R) audio, mute control of radio functions by OnStar(R) and the audio signal ground are the circuits provided in the 16-way connector. Disconnecting the 16-way connector from the radio will isolate the radio system from the OnStar(R) system.

Voice communication from the vehicle to the OnStar(R) operator could be possible under this condition. However, the vehicle occupant will not be able to hear the OnStar(R) operator.

For more information regarding radio operation problems, refer to **Symptoms - Entertainment** and **Diagnostic System Check - Vehicle** .

Theft Deterrent

The radio theft deterrent system is intended to disable radio functionality if incorrect vehicle information is received by the radio. The radio disables functionality if the VIN information received by the radio does not match the VIN information that has been learned by the radio. A VIN sequence is the last 6 digits of the VIN. The radio receives this information in a GMLAN frame form.

The radio shall provide the following theft operating modes as part of the radio theft deterrent system:

- No VIN Mode - A radio that has not received or learned a VIN. In this mode the radio has limited functionality.
- Normal Mode - A radio has received a VIN sequence. The radio only learns the VIN sequence if the VIN sequence contained all 6 digits. In this mode the radio has full functionality.
- Theft Detected Mode - A radio that had previously learned a VIN sequence and subsequently received a VIN sequence not matching the learned sequence. In this mode the radio has limited functionality.

AM/FM Reception

Radio Signal

The radio signal is sent from a broadcast station and is then received by an antenna. The strength of the signal received depends on the following:

- The power output, or wattage, of the broadcasting station
- The location of the vehicle, or receiver, relative to the broadcast tower.
- Obstacles between the tower and the receiver
- Atmospheric conditions
- Which band, AM or FM, the station is broadcasting
- Type of antenna and the ground plane

AM Reception

The AM band has a lower frequency range than the FM band. These longer wavelengths:

- Bend around obstacles
- Follow the curvature of the earth
- May reflect, or skip, off of the ionosphere

The AM frequencies have longer range due to the ground wave. The ground wave follows the curvature of the earth and is affected by its conductivity. Greater conductivity equates to less signal loss, thus transmission over water is better than over land. The AM band has a range of 80-320 km (50-200 mi).

FM Reception

The shorter wavelengths of the higher frequency FM band:

- Reflect off obstacles
- Are absorbed by the ground
- Penetrate the ionosphere

Broadcasts in the FM band are limited to "line of sight" reception which is typically 40 km (25 mi). Even when out of a direct line of sight, the signal may be reflected into areas that would be in a "shadow" otherwise. Factors which affect the line of sight include:

- Height of the broadcast antenna
- Height of the receiving antenna
- Terrain and buildings in the broadcast path

XM Reception

XM satellite radio provides digital radio reception. The XM signal is broadcast from two

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satellites and, where necessary, terrestrial repeaters. The high power satellites allow the antenna to receive the XM signal even when foliage and other partial obstructions block the antennas view of the satellite. Terrestrial repeaters are used in dense urban areas. These repeaters will receive the satellite signal and re-broadcast them at much higher power levels in order to ensure reception in areas with densely packed tall buildings.

XM Satellite Radio

XM is a national satellite radio service that offers up to 100 coast to coast channels including music, news, sports, talk and children's programming. XM provides digital quality audio and text information, including song title and artist name. A service fee is required in order to receive the XM service. For more information, contact XM at www.xmradio.com or call 1-800-852-9696.

Digital Radio Receiver

The radio controls communicate with the digital radio receiver via the class 2 communication circuit. The digital radio receiver sends remote radio audio signals to the radio.