

2004 ACCESSORIES & EQUIPMENT

Rear Parking Assist - SRX

SCHEMATIC AND ROUTING DIAGRAMS

REAR PARKING ASSIST SCHEMATICS

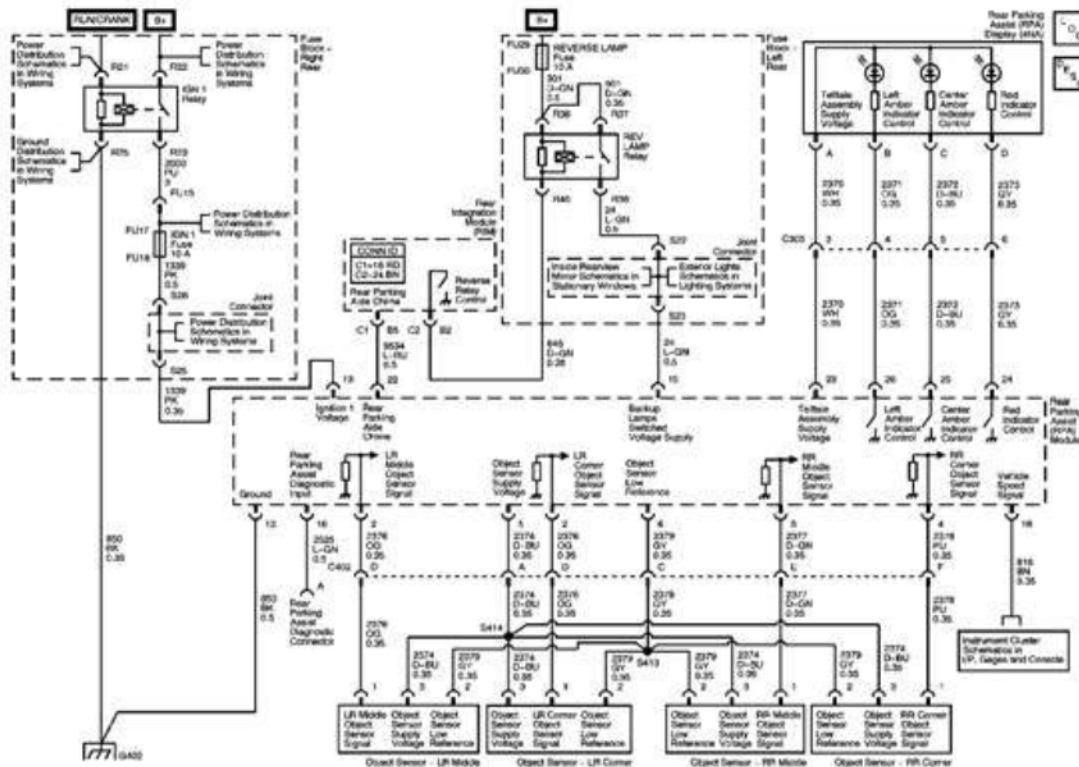


Fig. 1: Rear Parking Assist Schematic
 Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

REAR PARKING ASSIST COMPONENT VIEWS

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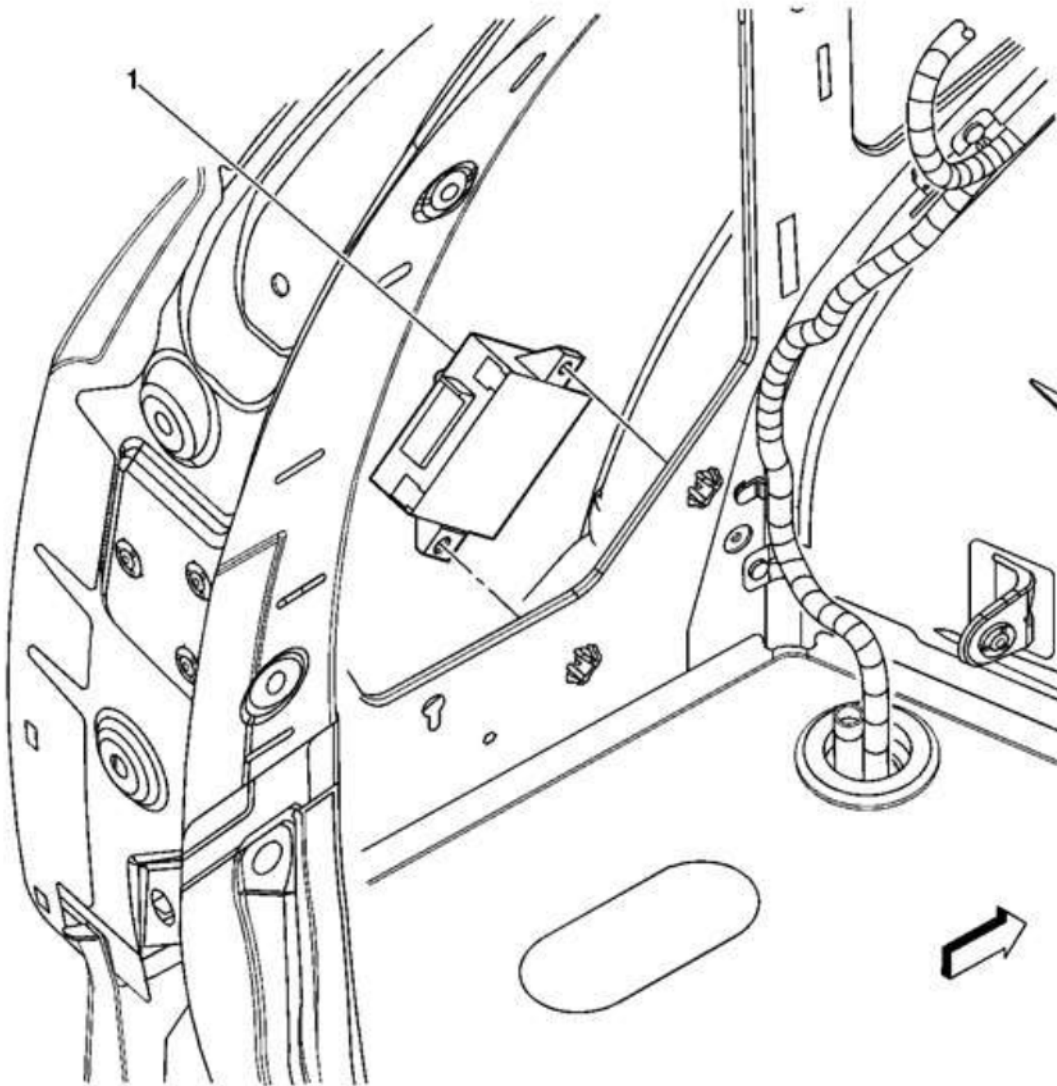


Fig. 2: LR Of Cargo Area Component View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 2

Callout	Component Name
1	Rear Parking Assist (RPA) Module

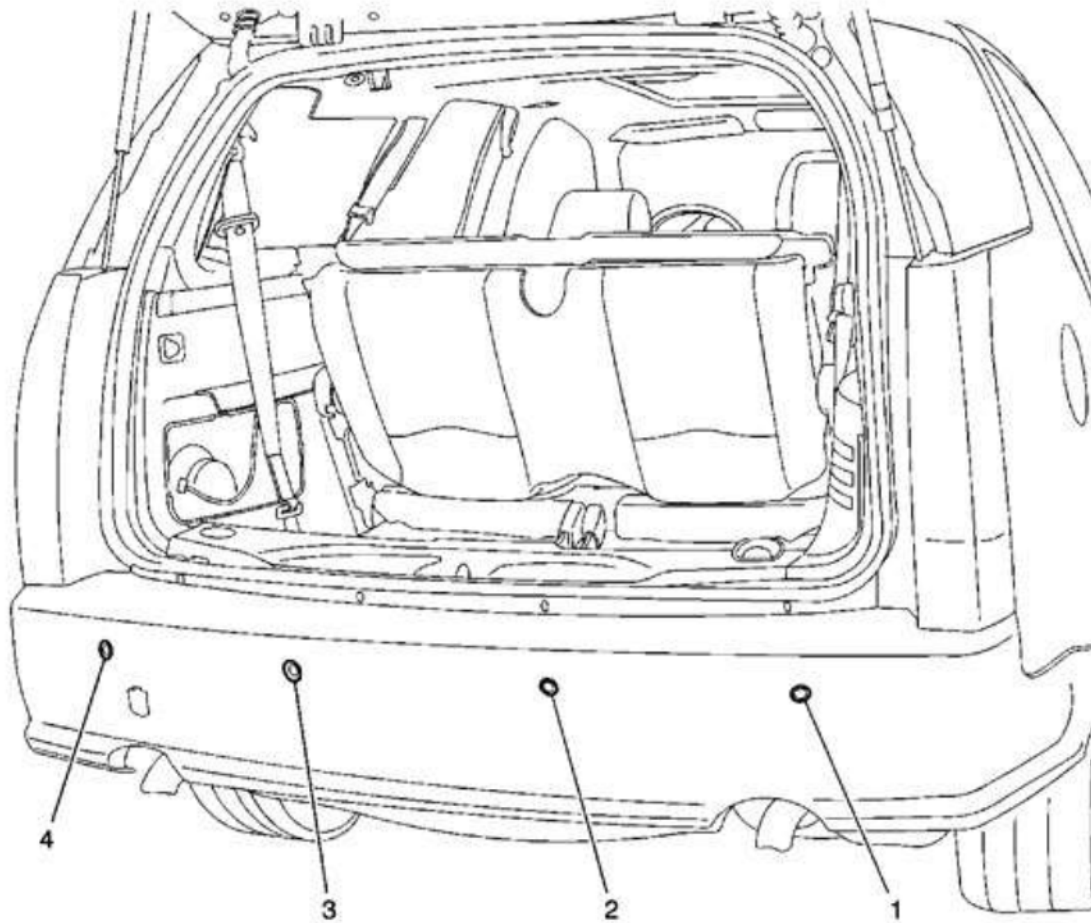


Fig. 3: Rear Bumper Component View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
1	Rear Parking Assist (RPA) Object Sensor - Right Rear Corner
2	RPA Object Sensor - Right Rear Middle
3	RPA Object Sensor - Left Rear Middle
4	RPA Object Sensor - Left Rear Corner

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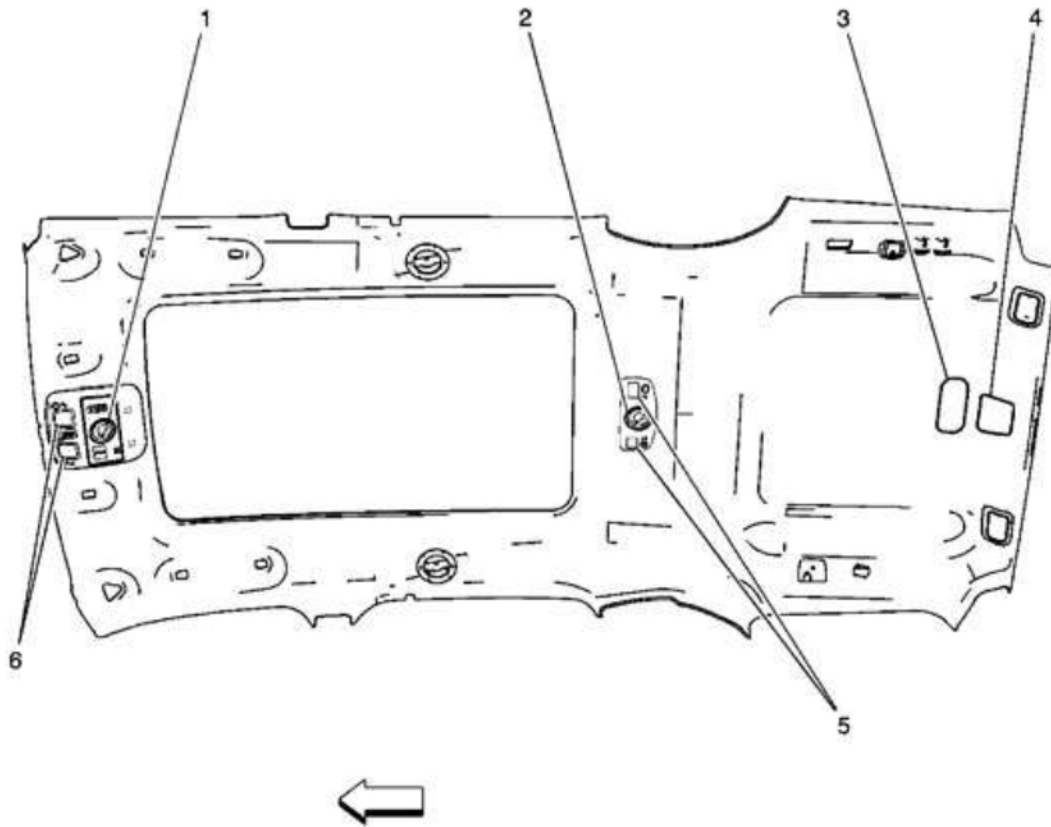


Fig. 4: Headliner Component View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Blower Motor Switch - Auxiliary (C57)
2	Blower Motor Switch - Rear Auxiliary (C57)
3	Courtesy/Reading Lamp - Rear
4	Rear Parking Assist (RPA) Display
5	Courtesy/Reading Lamp - Center
6	Courtesy/Reading Lamp - Front

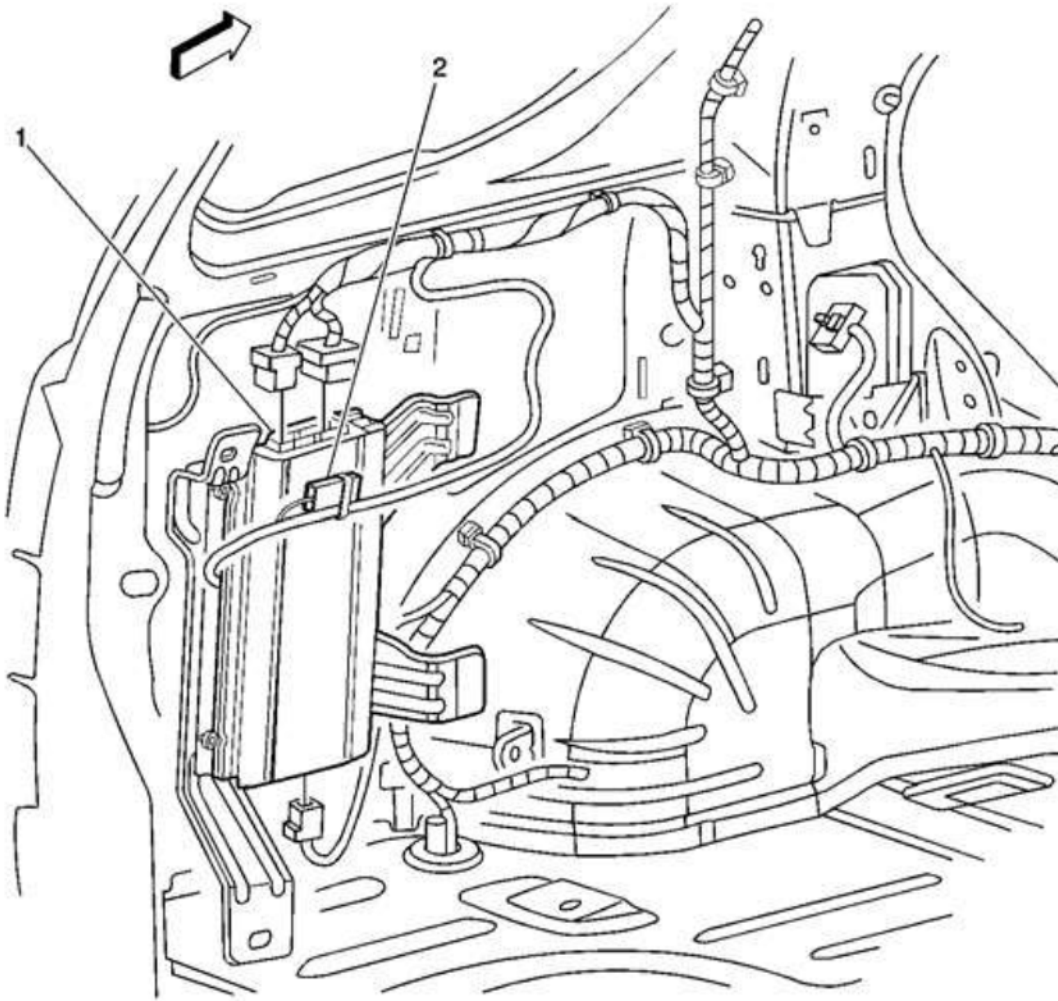


Fig. 5: Left Rear Of Vehicle Behind Trim Panel Component View
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
1	Audio Amplifier
2	Rear Parking Assist (RPA) Diagnostic Connector

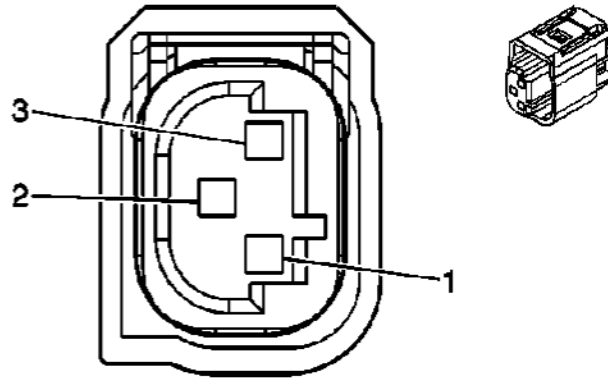
REAR PARKING ASSIST CONNECTOR END VIEWS

Object Sensor Terminal Identification - LR Corner

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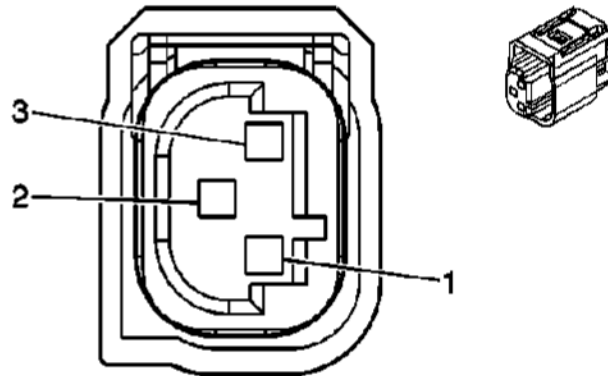


Connector Part Information

- 15324398
- 3-Way F MQS Sealed (BK)

Pin	Wire Color	Circuit No.	Function
1	YE	2375	LR Corner Object Sensor Signal
2	GY	2379	Object Sensor Low Reference
3	D-BU	2374	Object Sensor Supply Voltage

Object Sensor Terminal Identification - RR Corner



Connector Part Information

- 15324398
- 3-Way F MQS Sealed (BK)

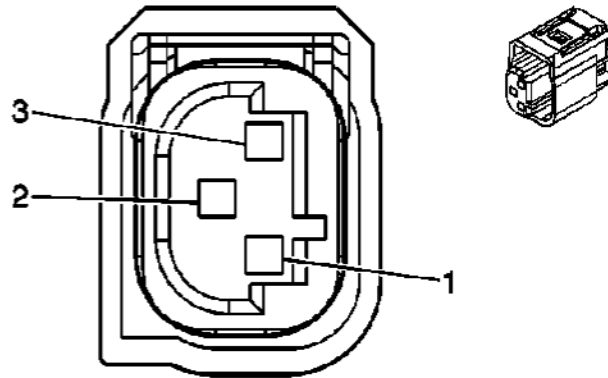
Pin	Wire Color	Circuit No.	Function
1	PU	2378	RR Corner Object Sensor Signal

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2	GY	2379	Object Sensor Low Reference
3	D-BU	2374	Object Sensor Supply Voltage

Object Sensor Terminal Identification - LR Middle

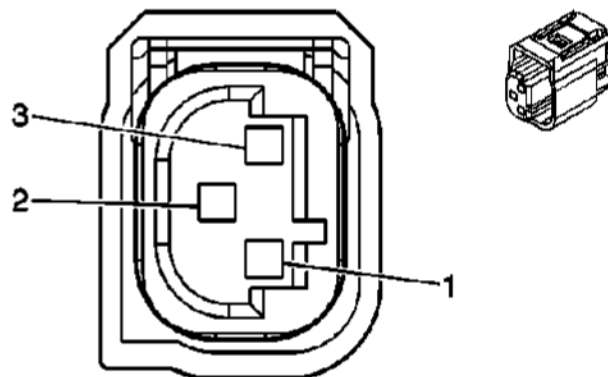


Connector Part Information

- 15324398
- 3-Way F MQS Sealed (BK)

Pin	Wire Color	Circuit No.	Function
1	OG	2376	LR Middle Object Sensor Signal
2	GY	2379	Object Sensor Low Reference
3	D-BU	2374	Object Sensor Supply Voltage

Object Sensor Terminal Identification - RR Middle



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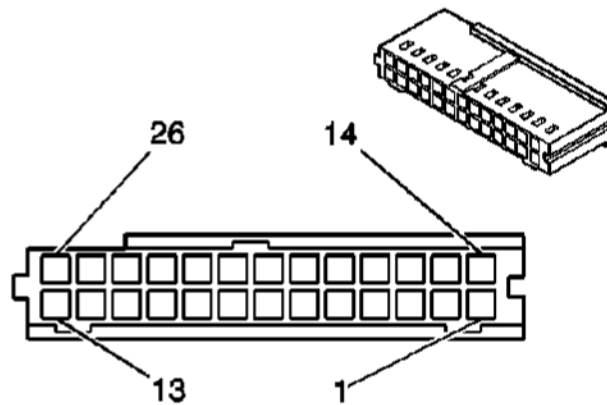
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Connector Part Information

- 15324398
- 3-Way F MQS Sealed (BK)

Pin	Wire Color	Circuit No.	Function
1	D-GN	2377	RR Middle Object Sensor Signal
2	GY	2379	Object Sensor Low Reference
3	D-BU	2374	Object Sensor Supply Voltage

Rear Object Sensor Control Module Terminal Identification



Connector Part Information

- 927690-1
- 26-Way F Amp (BK)

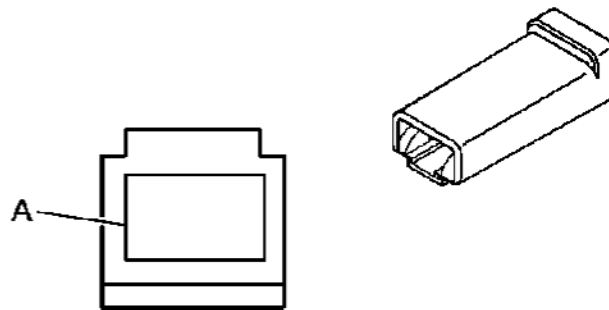
Pin	Wire Color	Circuit No.	Function
1	YE	2375	LR Corner Object Sensor Signal
2	OG	2376	LR Middle Object Sensor Signal
3	D-GN	2377	RR Middle Object Sensor Signal
4	PU	2378	RR Corner Object Sensor Signal
5	D-BU	2374	Object Sensor Supply Voltage
6	GY	2379	Object Sensor Low Reference
7-11	-	-	Not Used
12	BK	850	Ground
13	PK	1339	Ignition 1 Voltage
14	-	-	Not Used
15	L-GN	24	Backup Lamp Supply Voltage
16	L-GN	2525	Rear Parking Assist Diagnostic Input

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17	-	-	Not Used
18	BN	818	Vehicle Speed Signal
19-21	-	-	Not Used
22	L-BU	9534	Rear Parking Aide Chime
23	WH	2370	Telltale Assembly Supply Voltage
24	GY	2373	Red Indicator Control
25	D-BU	2372	Center Amber Indicator Control
26	OG	2371	Left Amber Indicator Control

Rear Parking Assist (RPA) Diagnostic Connector Terminal Identification

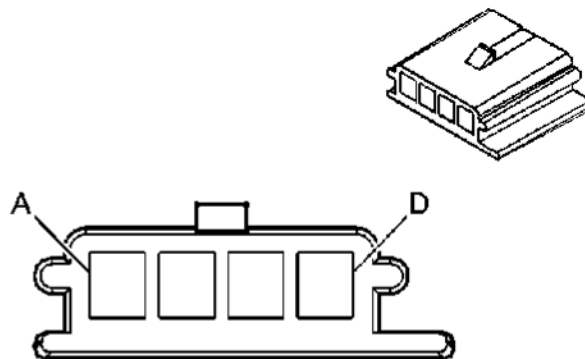


Connector Part Information

- 08905615
- 1-Way F 56 Series (L-GY)

Pin	Wire Color	Circuit No.	Function
A	L-GN	2525	Rear Parking Assist Diagnostic Input

Rear Parking Assist (RPA) Display Terminal Identification



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Connector Part Information		• 12045813 • 4-Way F Metri-Pack 150 Series (NA)	
Pin	Wire Color	Circuit No.	Function
A	WH	2370	Telltale Assembly Supply Voltage
B	OG	2371	Left Amber Indicator Control
C	D-BU	2372	Center Amber Indicator Control
D	GY	2373	Red Indicator Control

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - ULTRASONIC REAR PARKING ASSIST

Begin the system diagnosis by reviewing the system Description and Operation. Reviewing the Description and Operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the Description and Operation information will also help you determine if the condition described by the customer is normal operation. Refer to **Symptoms - Ultrasonic Rear Parking Assist** in order to identify the correct procedure for diagnosing the system and where the procedure is located.

DIAGNOSTIC TROUBLE CODE (DTC) DISPLAYING

This vehicle is equipped with an on-board diagnostic display feature capable of displaying diagnostic trouble codes using the 3 indicators on the rear parking assist display. After the bulb check has been completed, the red outside indicator flashes to indicate a malfunction with the system. The module disables operation of the URPA system under this condition.

In order to enter the diagnostic mode, complete the following actions:

1. With the ignition turned OFF, short the rear parking assist diagnostic connector to ground while the vehicle is in PARK. Refer to **Rear Parking Assist Component Views** for the location of the rear parking assist diagnostic connector.
2. Turn the ignition ON.
3. Place foot on the brake.
4. Shift the vehicle into REVERSE within 5 seconds.

If the vehicle is not shifted into reverse within 5 seconds after turning the ignition ON, the diagnostic mode will still be initiated. However, a reverse input wiring fault will be registered as sequence #7 as shown in the Diagnostic Indicator table below. Refer to **Diagnostic Trouble Code (DTC) Clearing** for specific steps on how to clear diagnostic

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trouble codes. After the reverse input wiring code is cleared, repeat the diagnostic trouble code displaying steps in order to enter the diagnostic mode.

When the diagnostic mode is first entered, the rear parking assist display displays the amber outside indicator and the red outside indicator. Then the indicators on the rear parking assist display will display one or more of the sequences in the table below to indicate where the fault exists within the rear parking assist system. Refer to **Diagnostic Trouble Code (DTC) Clearing** for the specific steps on how to clear diagnostic trouble codes.

Diagnostic Indicators

#	State/Fault Location	Amber Outside	Amber Middle	Red Outside	Flashing
1	Start of Diagnostics	X	-	X	-
2	RR Corner Object Sensor and Wiring	X	-	-	-
3	RR Middle Object Sensor and Wiring	X	X	-	-
4	LR Middle Object Sensor and Wiring	-	X	X	-
5	LR Corner Object Sensor and Wiring	-	-	X	-
6	Chime Warning Wiring	-	X	-	-
7	Reverse Input Wiring	-	X	-	X
8	Sensor Supply Voltage Circuit and Sensor Low Reference Circuit IMPORTANT: This diagnostic pattern sets for an open sensor supply voltage circuit and sensor low reference circuit.	X	X	X	X Flashes in the following sequence: 1. Amber Outside 2. Amber Outside and Amber Middle 3. Amber Middle and Red Outside 4. Red Outside

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	Sensor Supply Voltage Circuit				
9	IMPORTANT: This diagnostic pattern sets for a short to ground in the sensor supply voltage circuit.	X	X	X	-

DIAGNOSTIC TROUBLE CODE (DTC) CLEARING

The rear parking assist diagnostic sequences may be cleared in one of the following ways:

Vehicle Moving

IMPORTANT: The sequences will not clear if the rear parking assist diagnostic connector is grounded.

1. Drive the vehicle forward at least 24 km/h (15 mph).
2. Stop the vehicle.
3. Turn the ignition OFF.

Vehicle Stopped

IMPORTANT: The sequences will not clear if the rear parking assist diagnostic connector is grounded.

1. Turn the ignition ON.
2. Place foot on the brake.
3. Shift the vehicle into REVERSE within five seconds.
4. Turn the ignition OFF.

SYMPTOMS - ULTRASONIC REAR PARKING ASSIST

IMPORTANT: Review the system operation in order to familiarize yourself with the system functions. Refer to Object Detection Description and Operation.

Visual/Physical Inspection

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- Inspect for aftermarket devices which could affect the operation of the system. Refer to **Checking Aftermarket Accessories** in Wiring Systems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Make sure the rear parking assist sensors located on the vehicle rear bumper are clear. Remove any snow, mud or ice that is blocking the sensors.

Intermittent

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

Symptom List

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

- **Rear Parking Assist Malfunction**
- **Rear Parking Assist Inoperative - Red Indicator Flashes**

REAR PARKING ASSIST MALFUNCTION

Diagnostic Aids

Before performing this procedure, ensure that the vehicle park brake is SET.

Rear Parking Assist Malfunction

Step	Action	Value(s)	Yes	No
Schematic Reference: <u>Rear Parking Assist Schematics</u> Connector End View Reference: <u>Rear Parking Assist Connector End Views</u> or <u>Body Control System Connector End Views</u>				
1	Did you review the operation and perform the necessary inspections?	-	Go to Step 2	Go to <u>Symptoms - Ultrasonic Rear Parking Assist</u>
	1. Turn the ignition ON. 2. Place foot on the BRAKE.		Go to <u>Testing for Intermittent</u>	

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2	3. Shift vehicle into REVERSE. Do all three display indicators illuminate for 2 seconds and then turn off?	-	<u>Conditions and Poor Connections</u> in Wiring Systems	Go to Step 3
3	Does the red indicator flash?	-	Go to <u>Rear Parking Assist Inoperative - Red Indicator Flashes</u>	Go to Step 4
4	Do all of the indicators but one indicator illuminate?	-	Go to Step 6	Go to Step 5
5	Does any indicator remain on?	-	Go to Step 7	Go to Step 10
6	Connect a test lamp between the control circuit of the inoperative indicator at the module connector and a good ground. Does the test lamp illuminate?	-	Go to Step 16	Go to Step 8
7	1. Turn the ignition OFF. 2. Disconnect the rear parking assist display. 3. Turn the ignition ON. 4. Connect a test lamp between the rear parking assist display supply voltage circuit and the malfunctioning indicator control circuit. Does the indicator illuminate?	-	Go to Step 9	Go to Step 15
8	Test the control circuit of the inoperative indicator for an open, for a short to battery voltage and a high resistance. Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 15
	Test the control circuit of the indicator for a short to ground. Refer to <u>Circuit</u>			

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9	Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 16
10	Test the rear object sensor control module ground circuit for an open. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 11
11	Test the rear object sensor control module ignition 1 voltage circuit for an open and for a short to ground. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 12
12	Test the backup lamp supply voltage circuit for an open or for a short to ground. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 13
13	1. Turn the ignition OFF. 2. Disconnect the rear parking assist display. 3. Turn the ignition ON. 4. Connect a test lamp between the rear parking assist display supply voltage circuit and a good ground. Does the test lamp illuminate?	-	Go to Step 15	Go to Step 14
14	Test the rear parking assist display supply voltage circuit for an open and for a short to ground. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 16
15	Inspect for poor connections at the harness connector of the rear parking assist display. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs	-		

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	in Wiring Systems. Did you find and correct the condition?		Go to Step 19	Go to Step 17
16	Inspect for poor connections at the harness connector of the rear object sensor control module. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and to <u>Connector Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 19	Go to Step 18
17	Replace the rear parking assist display. Refer to <u>Information Center Telltale Assembly Replacement</u> . Did you complete the replacement?	-	Go to Step 19	-
18	Replace the rear object sensor control module. Refer to <u>Object Alarm Module Replacement</u> . Did you complete the replacement?	-	Go to Step 19	-
19	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2

REAR PARKING ASSIST INOPERATIVE - RED INDICATOR FLASHES

Rear Parking Assist Inoperative - Red Indicator Flashes

Step	Action	Value(s)	Yes	No
Schematic Reference: <u>Rear Parking Assist Schematics</u> Connector End View Reference: <u>Rear Parking Assist Connector End Views</u> or <u>Body Control System Connector End Views</u>				
IMPORTANT: Before performing this procedure, ensure that the vehicle park brake is SET.				
1	Did you review the operation and perform the necessary inspections?	-	Go to Step 2	Go to <u>Symptoms - Ultrasonic Rear Parking Assist</u>
	1. Turn the ignition ON.			Go to <u>Testing for</u>

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2	2. Place foot on the BRAKE. 3. Shift the vehicle into REVERSE. Does the red indicator continue to flash after the bulb check?	-	Go to Step 3	<u>Intermittent Conditions and Poor Connections in Wiring Systems</u>
3	1. Turn the ignition OFF. 2. Remove all objects at least 2 meters from the rear bumper. 3. Enter the diagnostic mode. Refer to <u>Diagnostic Trouble Code (DTC) Displaying</u> for more information. Does diagnostic indicator pattern #1 (<u>Diagnostic Trouble Code (DTC) Displaying</u>) appear as shown in the diagnostic indicator table when you enter diagnostics?	-	Go to Step 4	Go to Step 14
4	Does diagnostic indicator pattern #2, 3, 4, or 5 (<u>Diagnostic Trouble Code (DTC) Displaying</u>) appear as shown in the diagnostic indicator table?	-	Go to Step 9	Go to Step 5
5	Does diagnostic indicator pattern #6 (<u>Diagnostic Trouble Code (DTC) Displaying</u>) appear as shown in the diagnostic indicator table?	-	Go to Step 10	Go to Step 6
6	Does diagnostic indicator pattern #7 (<u>Diagnostic Trouble Code (DTC) Displaying</u>) appear as shown in the diagnostic indicator table?	-	Go to <u>Diagnostic Trouble Code (DTC) Displaying</u> and to <u>Diagnostic Trouble Code (DTC) Clearing</u>	Go to Step 7
7	Does diagnostic indicator pattern #8 (<u>Diagnostic Trouble Code (DTC)</u>)	-		

	<u>Displaying</u>) appear as shown in the diagnostic indicator table?		Go to Step 8	Go to Step 17
8	• Turn the ignition OFF. • Disconnect only ONE rear object sensor. • Perform the following actions after a rear object sensor is disconnected: • Enter the diagnostic mode to determine if the diagnostic indicator pattern # 8 will still be displayed. When the sensor causing the short to ground is disconnected, the diagnostic indicator pattern # 8 will not be displayed. The diagnostic indicator pattern displayed will be any one of the diagnostic indicator patterns # 2, # 3, # 4 and # 5. Refer to <u>Diagnostic Trouble Code (DTC) Displaying</u> for more information on how to enter the diagnostic mode. • Reconnect the rear object sensor when it is determined the sensor is not source of the short to ground. • Clear the diagnostic trouble code (DTC). Refer to <u>Diagnostic Trouble Code (DTC) Clearing</u>. • Repeat the above process for all rear object sensors to determine if the sensors are the source of the short to ground. Does diagnostic indicator pattern #8 (<u>Diagnostic Trouble Code (DTC)</u>)	-		

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	Displaying) still appear as shown in the diagnostic indicator table?		Go to Step 15	Go to Step 16
9	1. Turn the ignition OFF. 2. Connect the DMM between the signal circuit of the inoperative rear object sensor and the low reference circuit of the rear object sensor at the rear object sensor control module with the harness connected to the module. 3. Turn the ignition ON. 4. Place foot on BRAKE. 5. Shift the vehicle into REVERSE. 6. Measure the voltage between the signal circuit of the inoperative rear object sensor and the low reference circuit of the rear object sensor. Does the voltage measure greater than the specified value?	7 V		
			Go to Step 17	Go to Step 11
10	1. Turn the ignition OFF. 2. Disconnect the rear object sensor control module connector. 3. Measure the voltage between the rear parking assist chime signal circuit and a good ground. Does the voltage measure greater than the specified value?	9.5 V		
			Go to Step 17	Go to Step 13
11	Test the signal circuit of the inoperative rear object sensor for an open, for a short to ground and for a short to B+. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-		
			Go to Step 22	Go to Step 12
	Test the supply voltage circuit and the low reference circuit of the inoperative rear			

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12	object sensor for an open between S408 or S407 and the rear object sensor. Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 22	Go to Step 16
13	Test the rear parking assist chime signal circuit for an open and for a short to ground. Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 22	Go to Step 18
14	Test the rear parking assist diagnostic circuit for an open and for a high resistance. Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 22	Go to Step 17
15	Test the supply voltage circuit and the low reference circuit of the rear object sensors for an open, for a short to ground and for a high resistance. Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 22	Go to Step 17
16	Inspect for poor connections at the harness connector of the rear object sensor. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and to <u>Connector Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 22	Go to Step 19
17	Inspect for poor connections at the harness connector of the rear object sensor control module. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and to <u>Connector Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 22	Go to Step 20
18	Inspect for poor connections at the harness connector of the rear integration module (RIM). Refer to <u>Testing for Intermittent</u>	-		

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	<u>Conditions and Poor Connections</u> and to <u>Connector Repairs</u> in Wiring Systems. Did you find and correct the condition?		Go to Step 22	Go to Step 21
19	Replace the inoperative rear object sensor. Refer to <u>Rear Object Sensor Replacement</u> . Did you find and correct the condition?	-	Go to Step 22	-
20	Replace the rear object sensor control module. Refer to <u>Object Alarm Module Replacement</u> . Did you complete the replacement?	-	Go to Step 22	-
21	Replace the rear integration module (RIM). Refer to <u>Rear Integration Module Replacement</u> in Body Control System. Did you complete the replacement?	-	Go to Step 22	-
22	1. Clear all codes. Refer to <u>Diagnostic Trouble Code (DTC) Clearing</u> . 2. Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2

REPAIR INSTRUCTIONS

INFORMATION CENTER TELLTALE ASSEMBLY REPLACEMENT

Removal Procedure

1. Pull downward on the front of the RPA bezel in order to release the retaining clips (3).
2. Disconnect the electrical connector (2).
3. Remove the RPA tell tale indicator from the bezel.

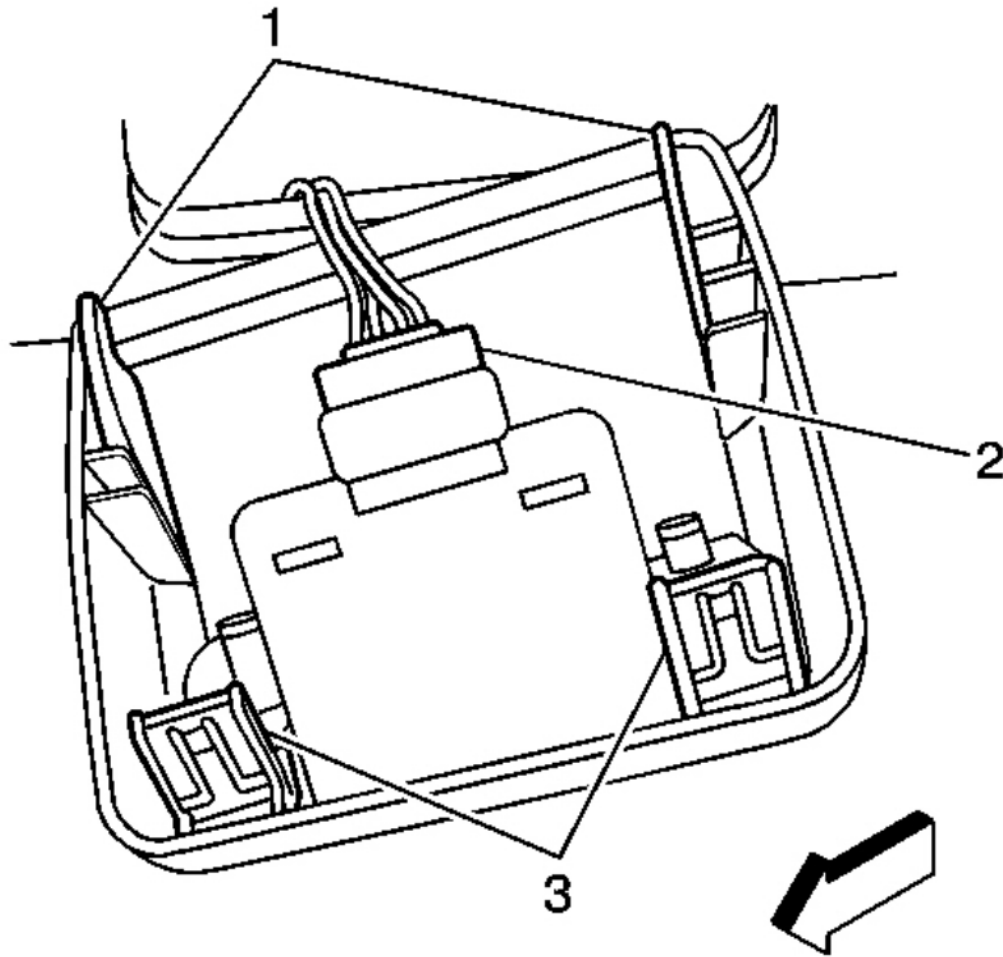


Fig. 6: View Of Information Center Telltale Assembly
Courtesy of GENERAL MOTORS CORP.

Installation Procedure

1. Install the RPA tell tale indicator into the bezel.
2. Connect the electrical connector (2).
3. Locate the rear bezel hook retainers (1) into the headliner assembly.
4. Push upward on the front of the RPA bezel in order to secure the retaining clips (3).

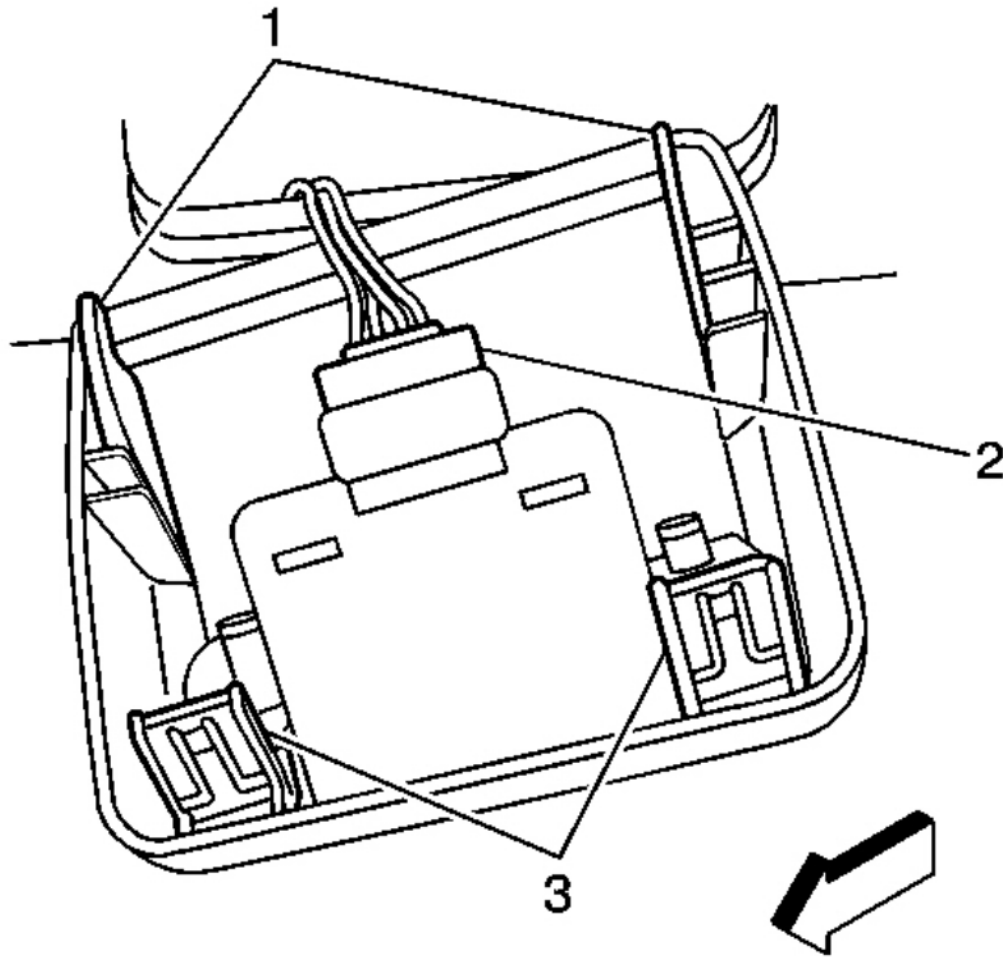


Fig. 7: View Of Information Center Telltale Assembly
Courtesy of GENERAL MOTORS CORP.

REAR OBJECT SENSOR REPLACEMENT

Removal Procedure

1. Remove rear bumper fascia. Refer to **Fascia Replacement - Rear Bumper** in Bumpers.

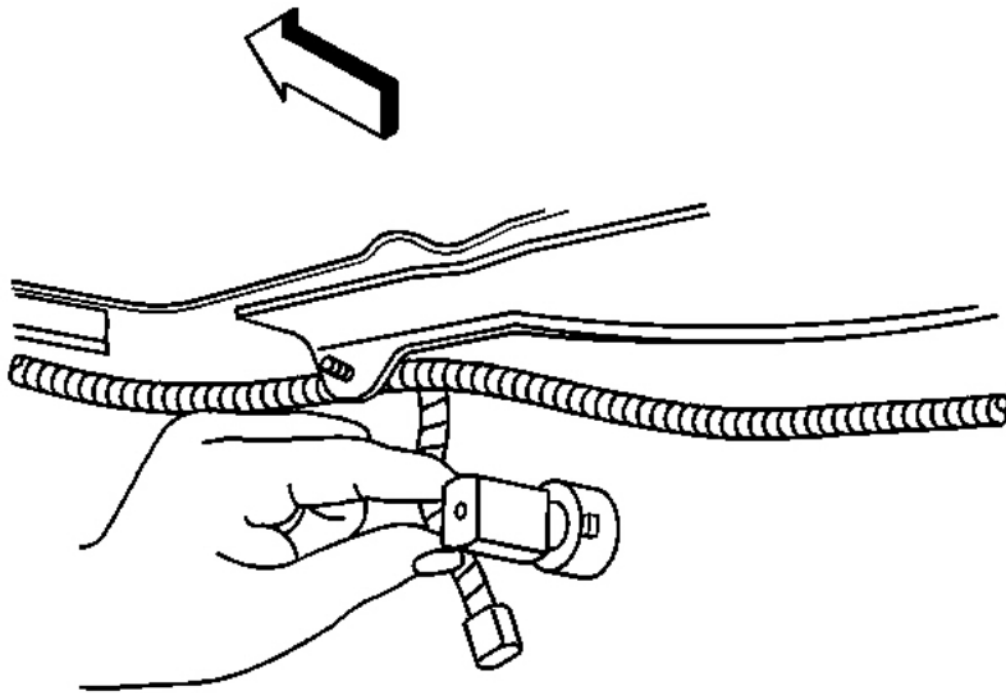


Fig. 8: View Of Rear Object Sensor Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

2. Lift the locking tabs on the housing (4) and remove the rear object sensor (1).

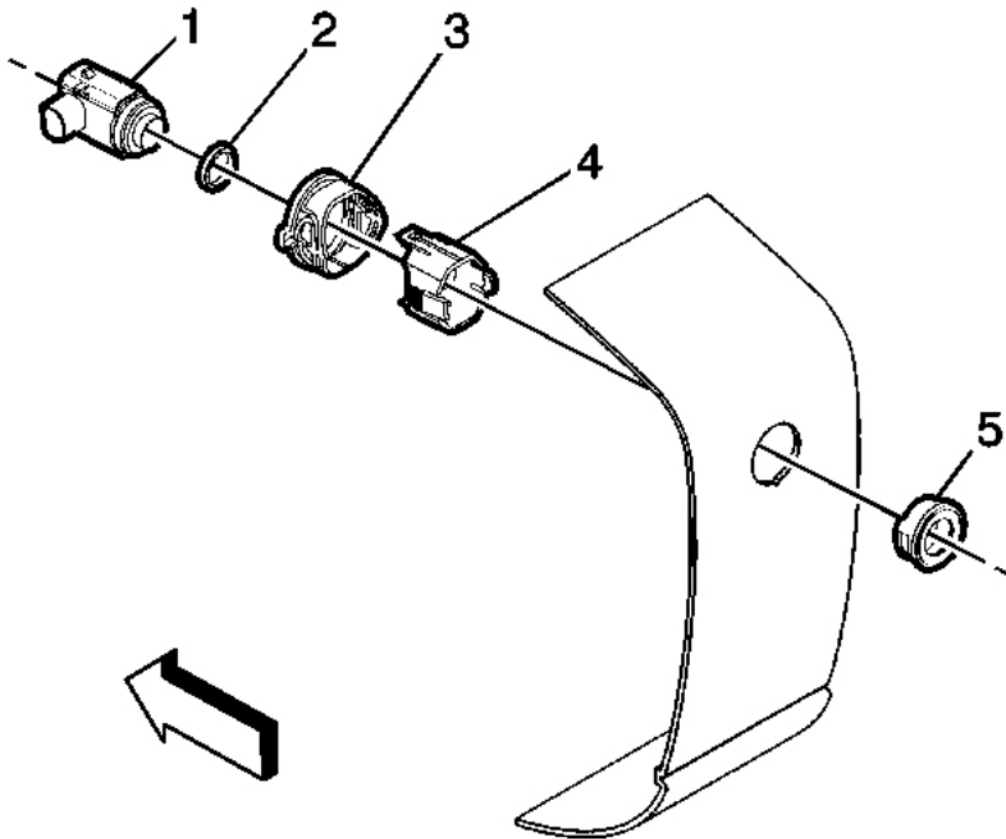


Fig. 9: View Of Rear Object Sensor Assembly
Courtesy of GENERAL MOTORS CORP.

3. Squeeze the spring (1) and remove it from the housing (2).

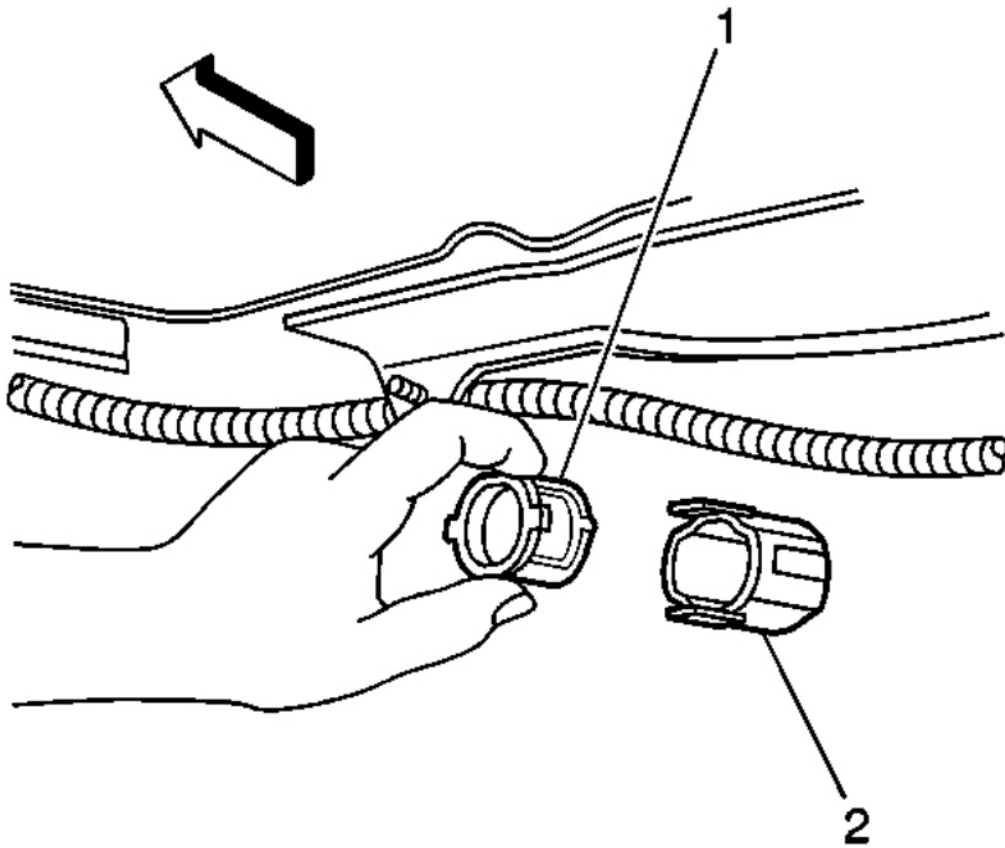


Fig. 10: View Of Spring & Housing
Courtesy of GENERAL MOTORS CORP.

4. Release the tabs on the housing and remove.

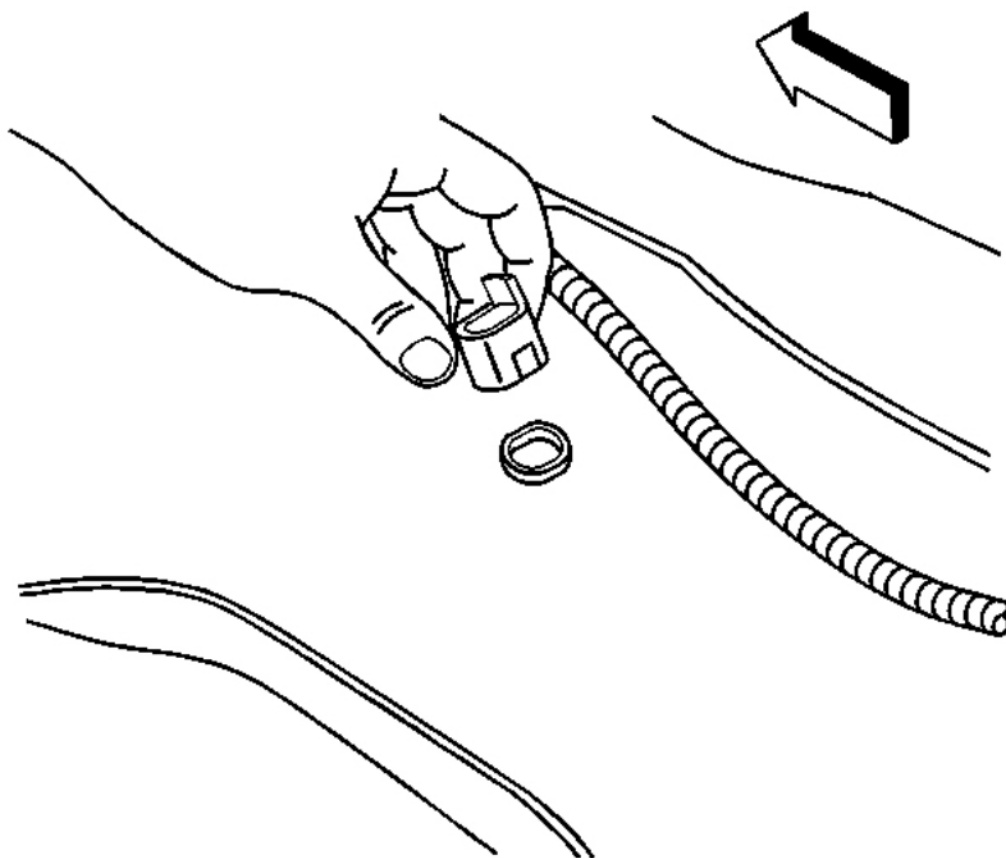


Fig. 11: View Of Rear Object Sensor Housing
Courtesy of GENERAL MOTORS CORP.

5. Remove the rear object sensor bezel from the rear fascia.

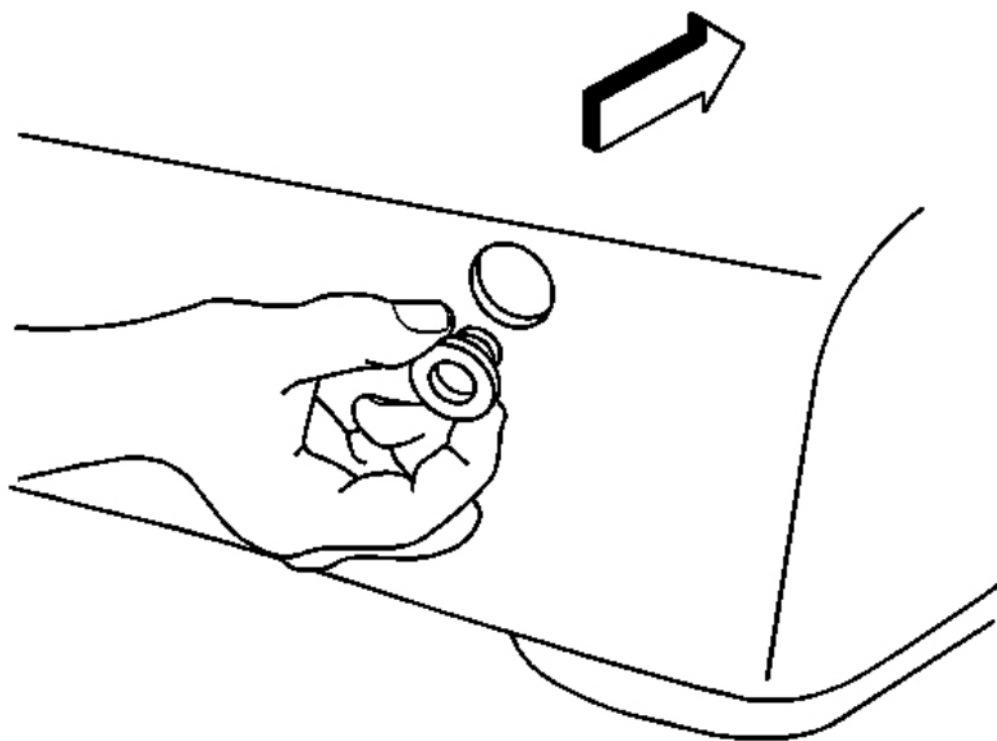


Fig. 12: Painting Rear Object Sensor Bezel
Courtesy of GENERAL MOTORS CORP.

Installation Procedure

IMPORTANT: Do not refinish previously painted sensors.

1. Paint the new rear object sensor. Refer to **Basecoat/Clearcoat Paint Systems** in Paint/Coatings.
2. Inspect the paint thickness to ensure it does not exceed 6 mm using a paint thickness gauge suitable for non-ferrous metals. Refer to **Paint Gages** in Paint/Coatings.
3. Align the keyhole (2) with the key (1) and press the rear object sensor bezel flush to the fascia.

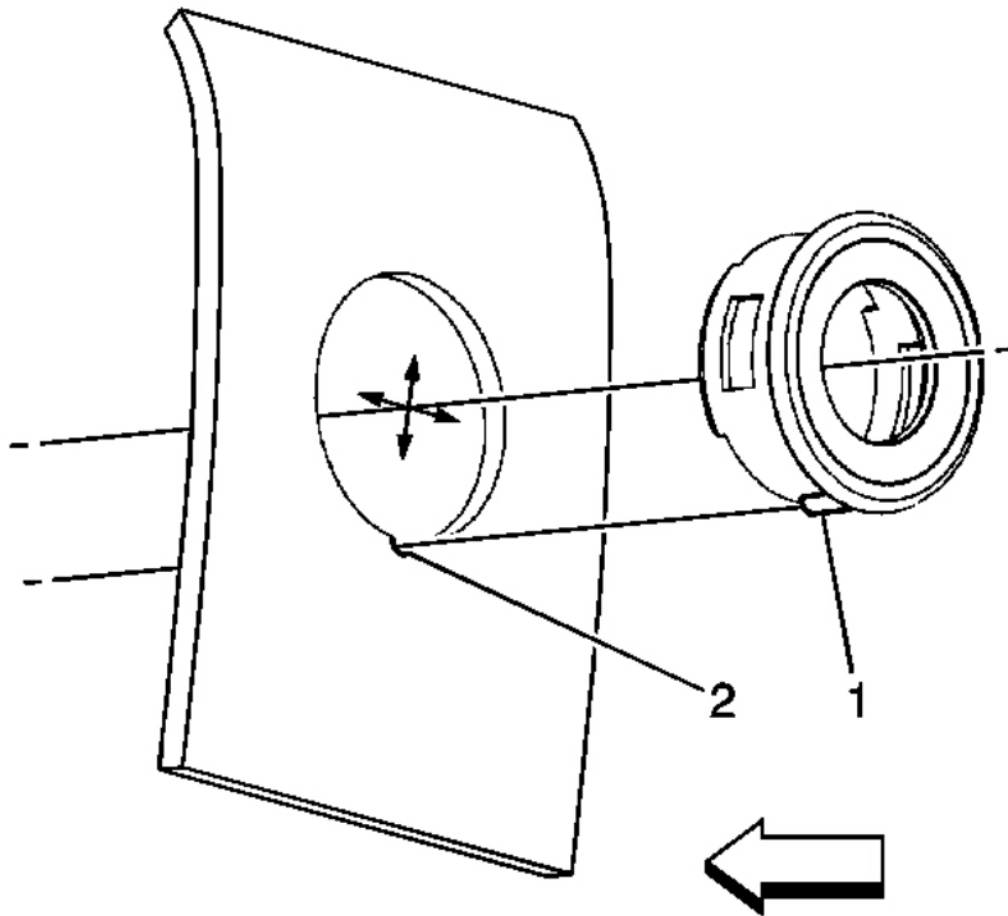


Fig. 13: Installing Rear Object Sensor Bezel
Courtesy of GENERAL MOTORS CORP.

4. Install the housing to the cutouts on the bezel through the back side of the fascia.

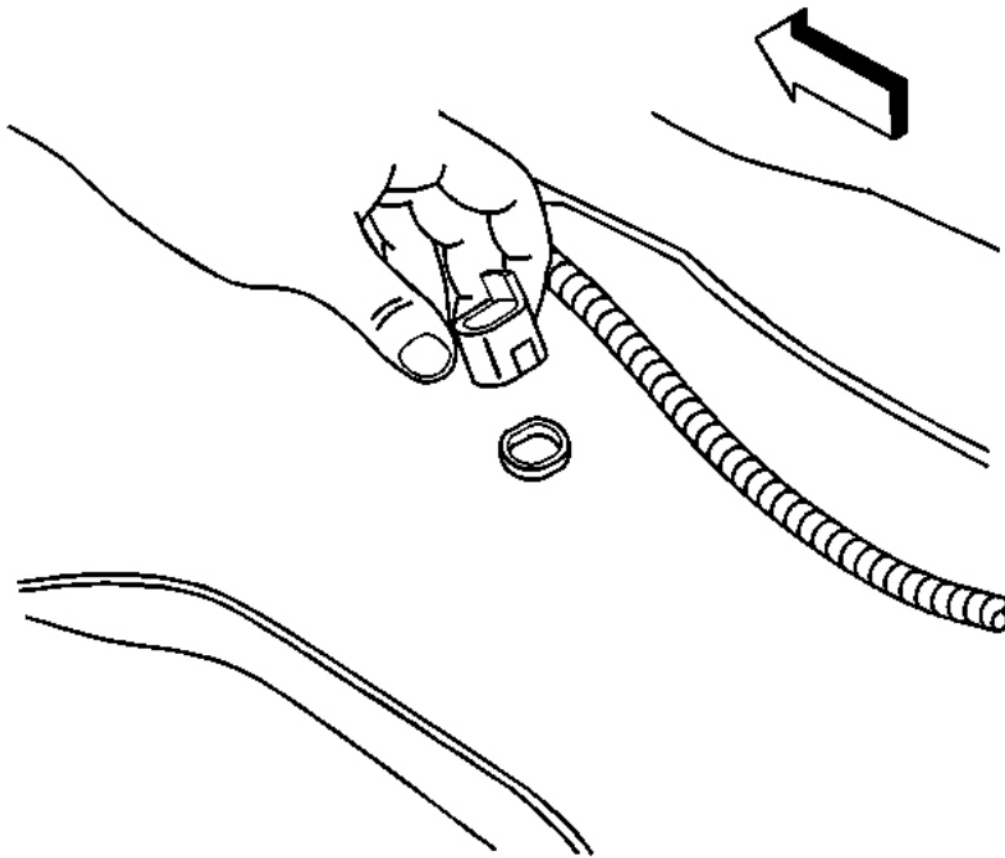


Fig. 14: View Of Rear Object Sensor Housing
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The spring keys must be on the top and bottom of the housing.

5. Install the spring (1) to the housing (2).

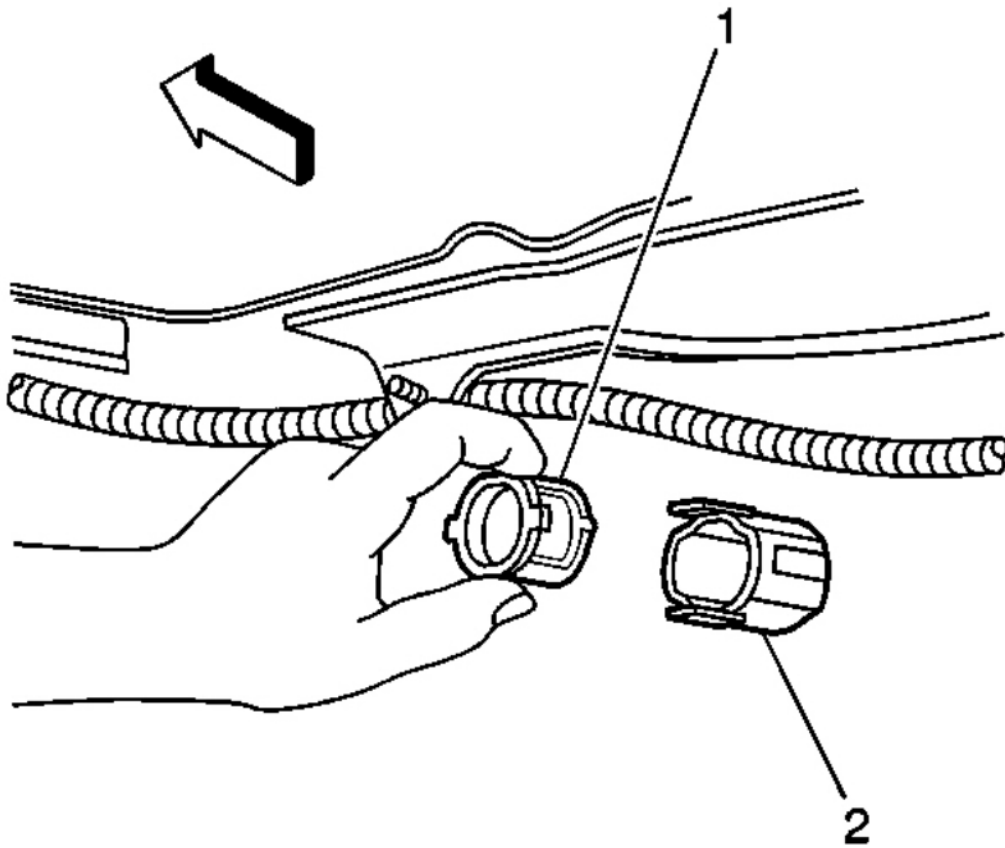


Fig. 15: View Of Spring & Housing
Courtesy of GENERAL MOTORS CORP.

6. Install the decoupling ring (2) to the sensor (1).
7. Insert the sensor into the housing (4) with the connector pointing toward the passenger side of the fascia. Press the sensor tabs into the cutouts on the housing (4).

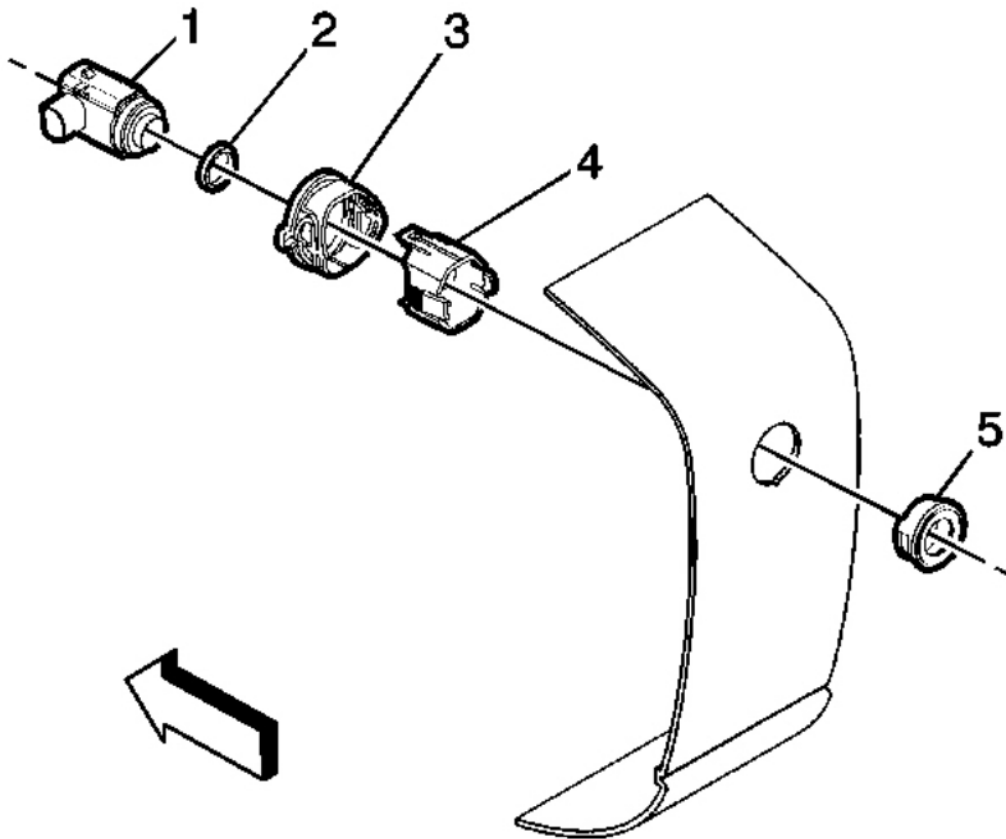


Fig. 16: View Of Rear Object Sensor Assembly
Courtesy of GENERAL MOTORS CORP.

8. Connect the electrical connector.

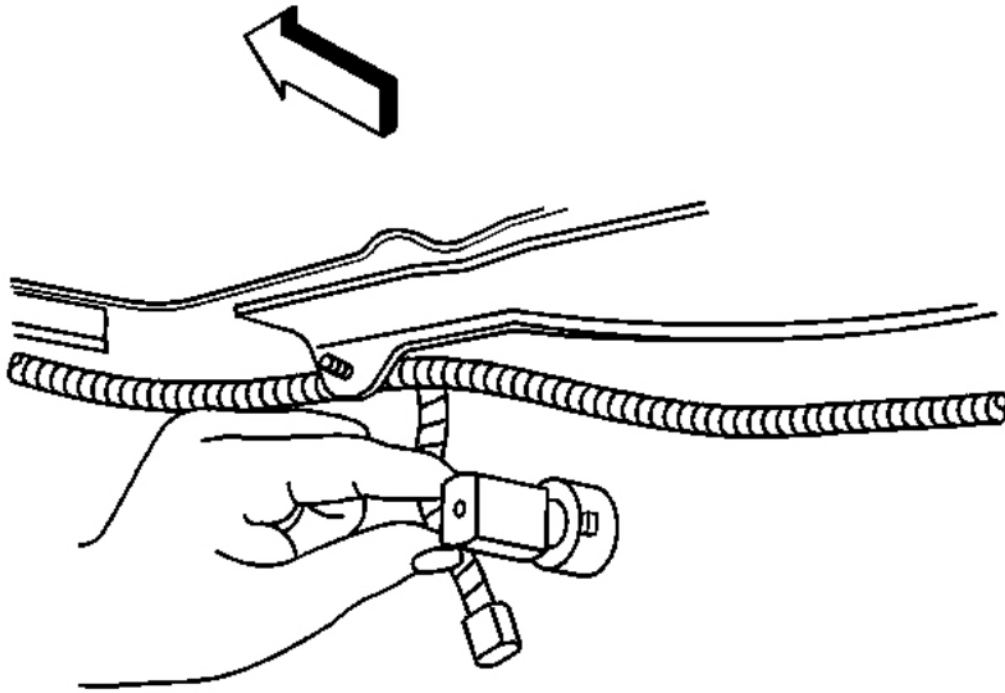


Fig. 17: View Of Rear Object Sensor Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

9. Install the rear bumper fascia. Refer to **Fascia Replacement - Rear Bumper** in Bumpers.

OBJECT ALARM MODULE REPLACEMENT

Removal Procedure

1. Remove the left rear body side trim. Refer to **Trim Panel Replacement - Body Side Rear** in Interior Trim.
2. Disconnect the RPA module electrical connector (1).

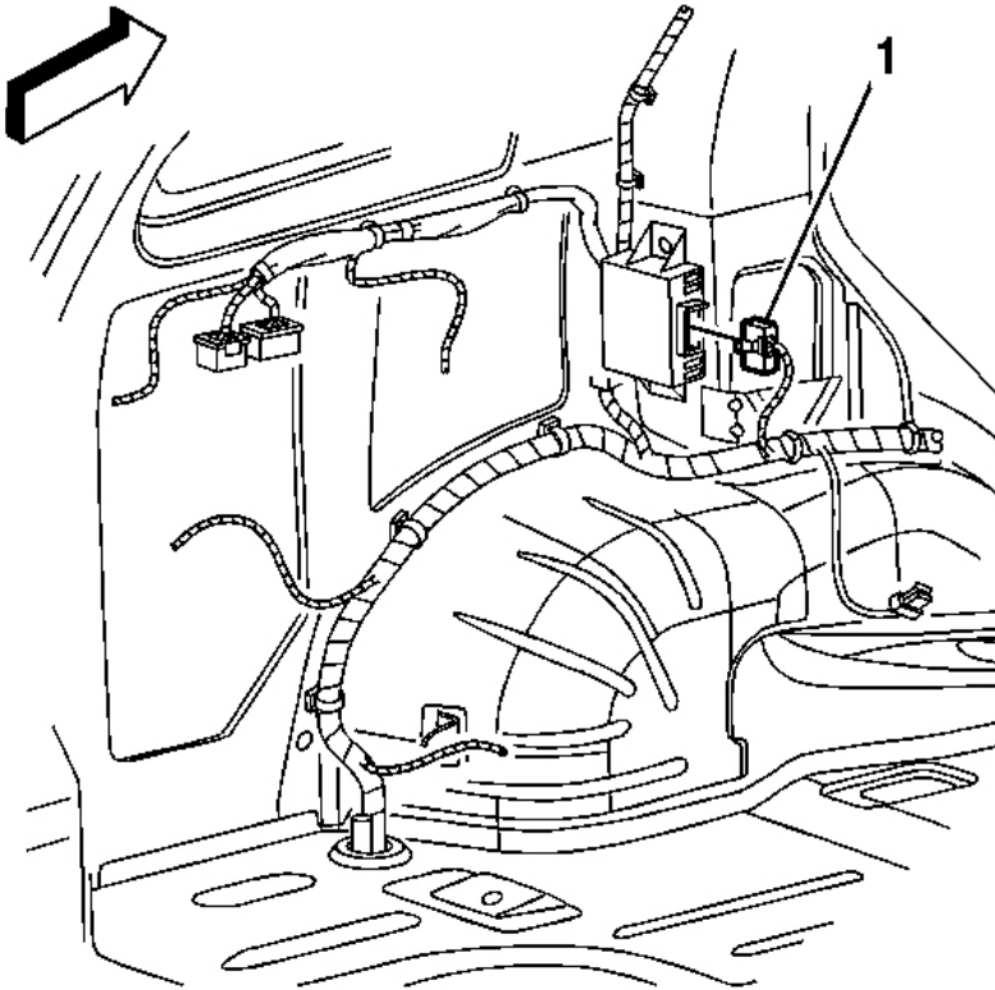


Fig. 18: View Of RPA Module Electrical Connector
Courtesy of GENERAL MOTORS CORP.

3. Remove the RPA module.

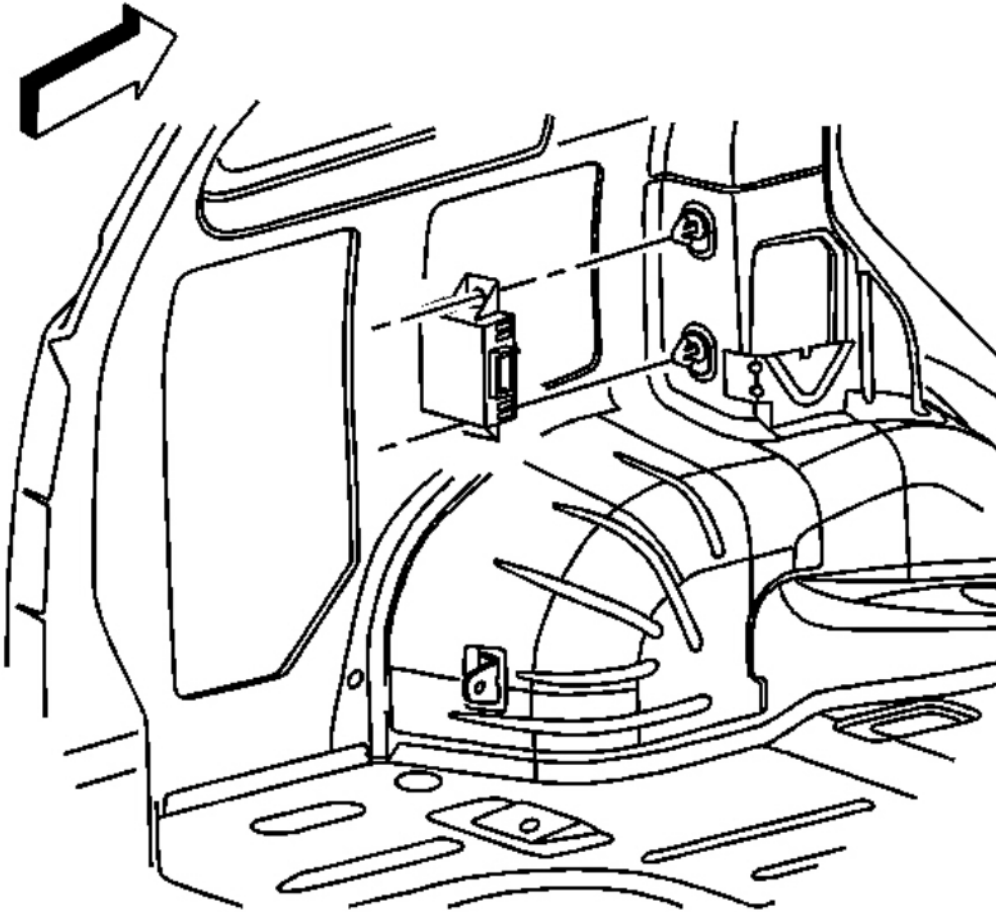


Fig. 19: View Of RPA Module
Courtesy of GENERAL MOTORS CORP.

Installation Procedure

1. Install the RPA module to the retainers.

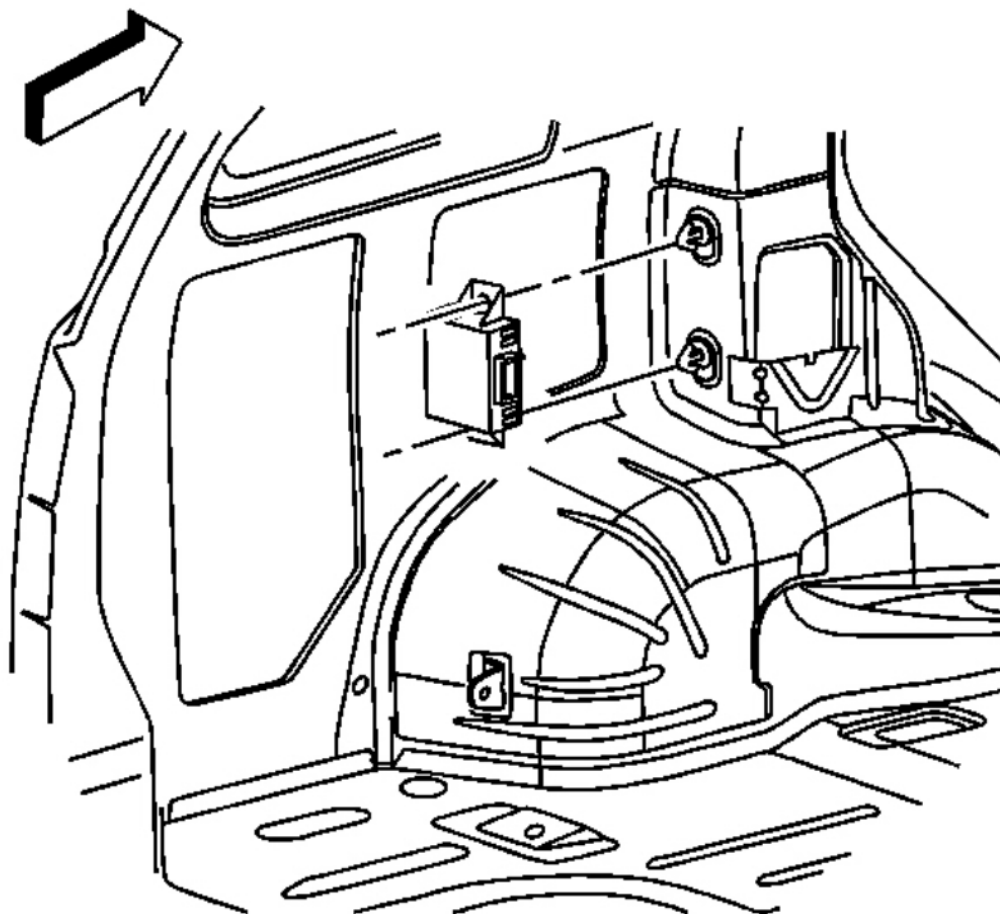


Fig. 20: View Of RPA Module
Courtesy of GENERAL MOTORS CORP.

2. Connect the electrical connector (1).

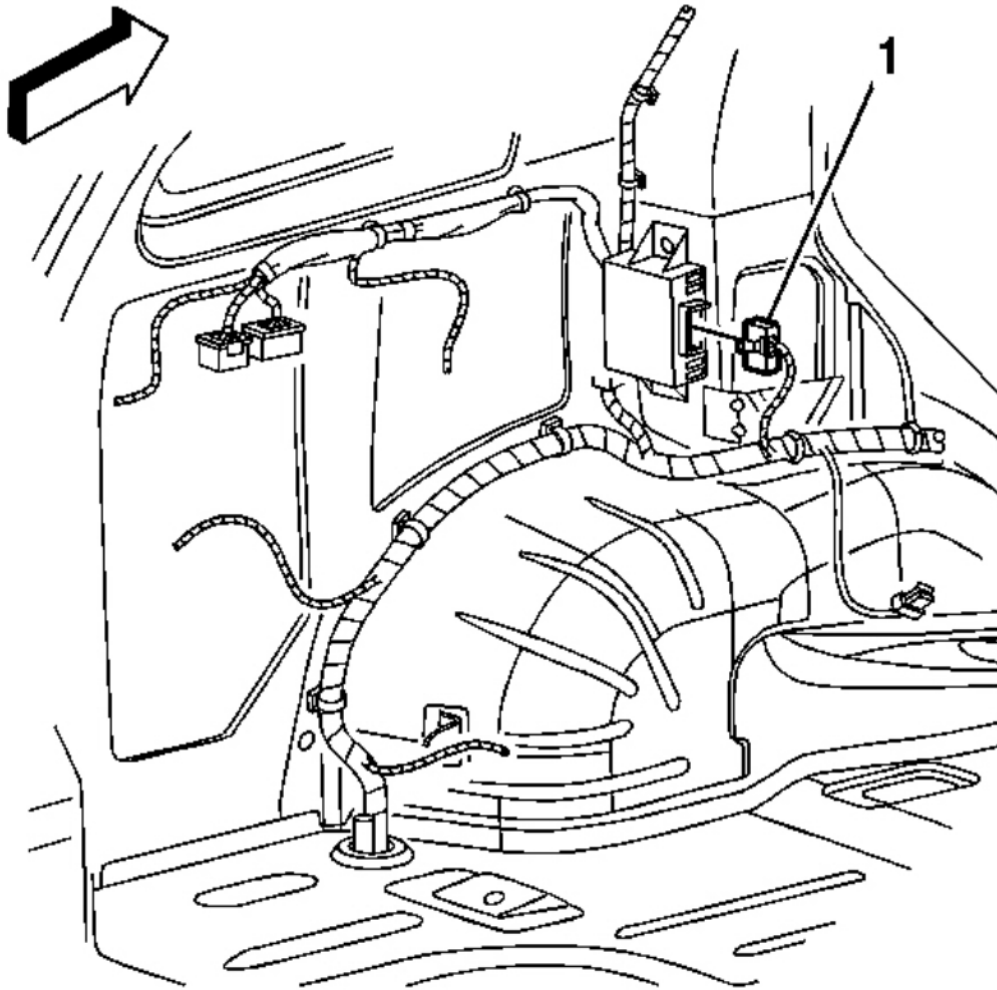


Fig. 21: View Of RPA Module Electrical Connector
Courtesy of GENERAL MOTORS CORP.

3. Install the rear body side trim. Refer to **Trim Panel Replacement - Body Side Rear** in Interior Trim.

DESCRIPTION AND OPERATION

OBJECT DETECTION DESCRIPTION AND OPERATION

The ultrasonic rear parking assist (URPA) can help a driver determine how close an object is to

the rear bumper within a defined rearward field of view.

The rear parking assist display is located inside the vehicle by the rear window. Refer to **Rear Parking Assist Component Views** for the location of the display. The display has 3 indicators that can be seen through the rearview mirror or by turning around when seated in the driver seat.

When the ignition is ON and the vehicle is placed into reverse, the URPA performs a bulb check. During the bulb check, the 3 indicators on the display illuminate for approximately 2 seconds to indicate that the system is working. The URPA performs a bulb check and operates when the following conditions are present:

- The ignition is ON
- The vehicle is placed in REVERSE (R)
- The vehicle speed is less than 5 km/h (3 mph)

At speeds greater than 5 km/h (3 mph), the URPA is disable. The red indicator flashes to warn the driver that the URPA is disabled.

The URPA senses how close the vehicle is to an object. The distance is determined by the four ultrasonic sensors located on the rear bumper. When the system detects an object, one of the following will occur:

- If the object is less than 0.3 m (11 in) away from the rear of the vehicle, the amber outside, amber middle, and the red outside indicators flash and the chime sounds continuously.
- If the object is less than 0.3 m to 0.5 m (11 to 20 in) away from the rear of the vehicle, the amber outside, amber middle, and the red outside indicators are on and the chime sounds continuously.
- If the object is 0.5 to 1.0 m (20 to 40 in) away from the rear of the vehicle, the amber outside, and the amber middle indicators are on.
- If the object is 1.0 to 1.5 m (40 in to 5 ft) away from the rear of the vehicle, the amber outside indicator is on and the chime sounds one time on the first detection of an object.

URPA can detect objects 7.6 cm (3 in) wide and at least 25.4 cm (10 inches) tall. It cannot detect objects above the level of the roof.

If the red indicator flashes continuously the on-board diagnostic needs to be entered to determine if a malfunction is present. Refer to **Diagnostic Trouble Code (DTC) Displaying**.