

Keyless Entry - Corvette

SCHEMATIC AND ROUTING DIAGRAMS

KEYLESS ENTRY SCHEMATICS

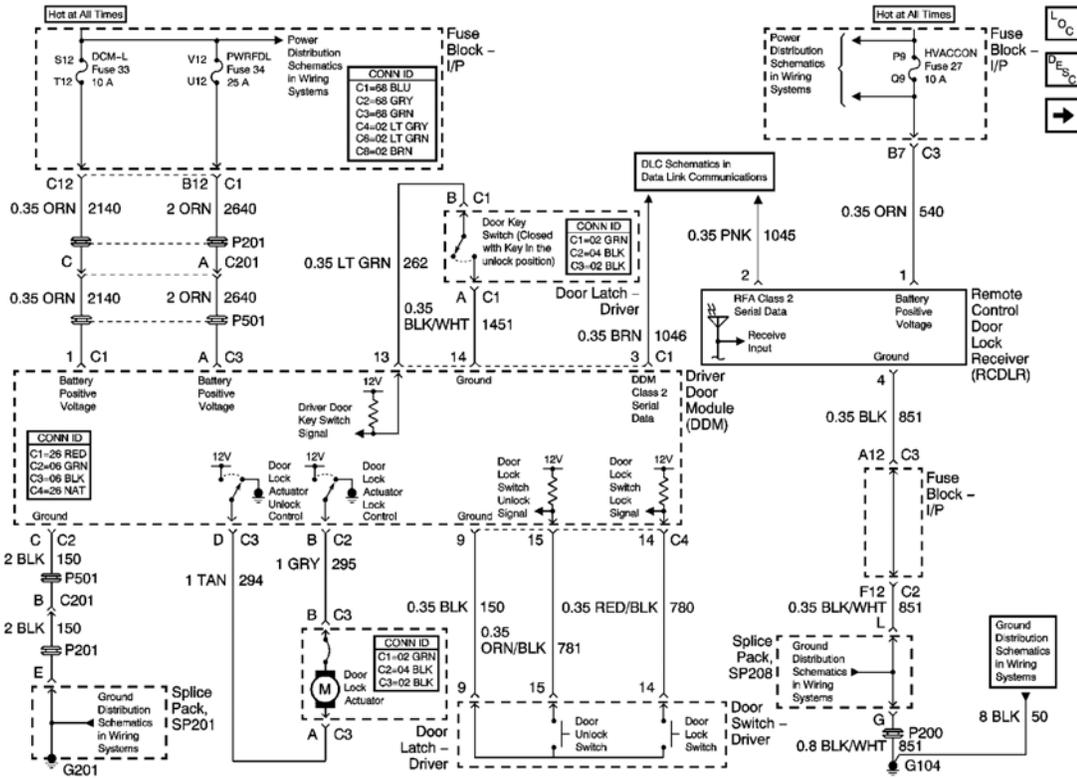


Fig. 1: Driver Door Schematic
 Courtesy of GENERAL MOTORS CORP.

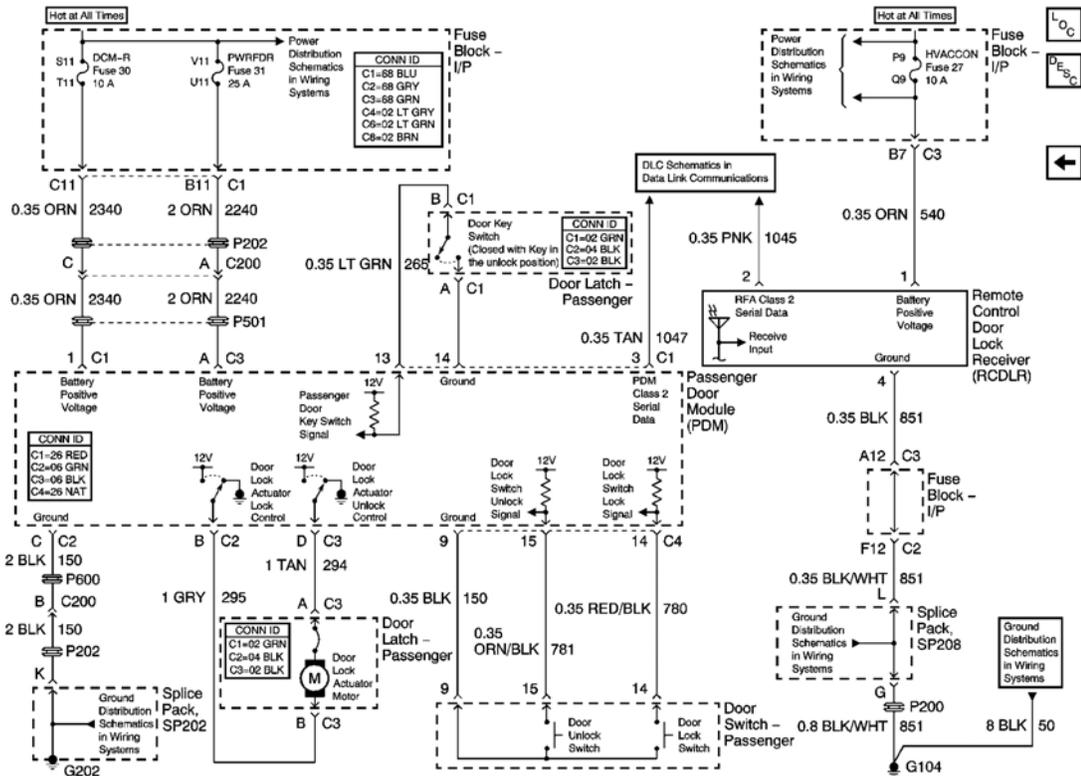


Fig. 2: Passenger Door Schematic
 Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

KEYLESS ENTRY COMPONENT VIEWS

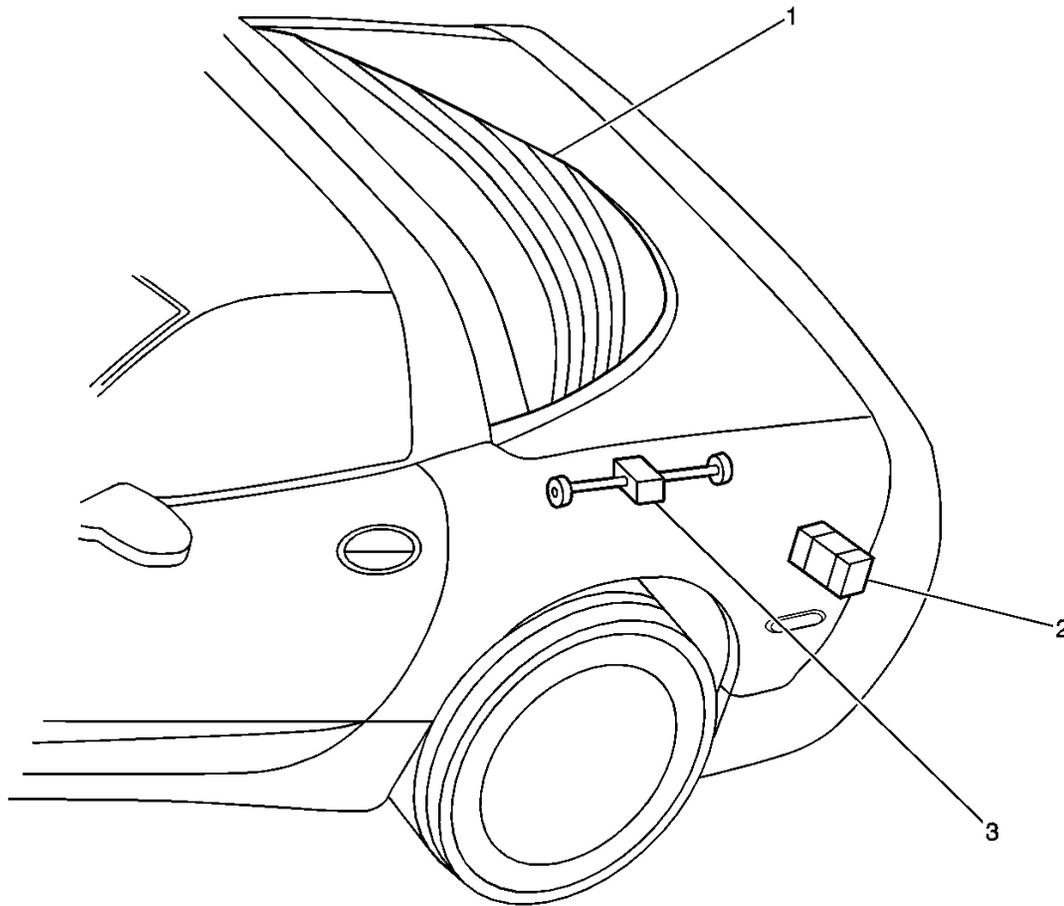


Fig. 3: Rear Of Vehicle Component Views - Left
 Courtesy of GENERAL MOTORS CORP.

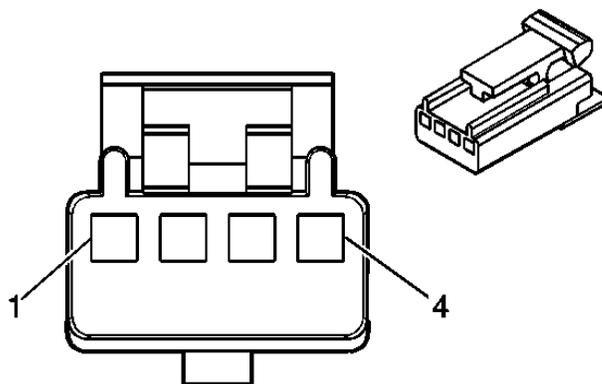
Callouts For Fig. 3

Callout	Component Name
1	Defogger Grid
2	Electronic Suspension Control (ESC) Module
3	Remote Control Door Lock Receiver (RCDLR)

KEYLESS ENTRY CONNECTOR END VIEWS

Remote Control Door Lock Receiver (RCDLR) Terminal Identification

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Connector Part Information		<ul style="list-style-type: none"> • 12059162 • 4 Way F Micro-Pack 100 Series (BLK) 	
Pin	Wire Color	Circuit No.	Function
1	ORN	540	Battery Positive Voltage
2	PNK	1045	RFA Class 2 Serial Data
3	-	-	Not Used
4	BLK	851	Ground

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - KEYLESS ENTRY

Begin the system diagnosis with **Diagnostic System Check - Remote Keyless Entry** . The Diagnostic System Check will provide the following information:

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

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

DIAGNOSTIC SYSTEM CHECK - REMOTE KEYLESS ENTRY

Test Description

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

2: Lack of communication may be due to a partial malfunction of the class 2 serial data circuit or due to a

total malfunction of the class 2 serial data circuit. The specified procedure will determine the particular condition.

5: The presence of DTCs which begin with "U" indicate some other module is not communicating. The specified procedure will compile all the available information before tests are performed.

Diagnostic System Check - Remote Keyless Entry

Step	Action	Yes	No
1	Install a scan tool. Does the scan tool power up?	Go to Step 2	Go to Scan Tool Does Not Power Up in Data Link Communications
2	1. Turn ON the ignition, with the engine OFF. 2. Attempt to establish communication with the body control module (BCM). Does the scan tool communicate with the BCM?	Go to Step 3	Go to Scan Tool Does Not Communicate with Class 2 Device in Data Link Communications
3	IMPORTANT: The engine may start during the following step. Turn OFF the engine as soon as you have observed the Crank power mode. 1. Access the Class 2 Power Mode in the Diagnostic Circuit Check on the scan tool. 2. Rotate the ignition switch through all positions while observing the ignition switch power mode parameter. Does the ignition switch parameter reading match the ignition switch position for all switch positions?	Go to Step 4	Go to Power Mode Mismatch in Body Control System
4	Select the BCM display DTCs function on the scan tool. Does the scan tool display any DTCs?	Go to Step 5	Go to Symptoms - Keyless Entry
5	Does the scan tool display any DTCs which begin with a "U"?	Go to Scan Tool Does Not Communicate with Class 2 Device in Data Link Communications	Go to Step 6
6	Does the scan tool display DTC B1000 or B1004?	Go to Diagnostic Trouble Code (DTC) List in Body Control System	Go to Step 7

7	Does the scan tool display DTC B1339 or B1349?	Go to <u>Diagnostic Trouble Code (DTC) List</u> in Body Control System	Go to Step 8
8	Does the scan tool display DTC B1482, B1483, B1507 or B1508?	Go to <u>Diagnostic Trouble Code (DTC) List</u> in Engine Electrical	Go to <u>Diagnostic Trouble Code (DTC) List</u>

SCAN TOOL OUTPUT CONTROLS

Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selection(s)	Description
Program Key Fobs	1 Key Fobs	The BCM requests the Remote Control Door Lock Receiver to enter the Program Key Fobs mode. Refer to <u>Transmitter Programming</u> for additional information.
Program Key Fobs	2 Key Fobs	The BCM requests the Remote Control Door Lock Receiver to enter the Program Key Fobs mode. Refer to <u>Transmitter Programming</u> for additional information.
Program Key Fobs	3 Key Fobs	The BCM requests the Remote Control Door Lock Receiver to enter the Program Key Fobs mode. Refer to <u>Transmitter Programming</u> for additional information.
Program Key Fobs	4 Key Fobs	The BCM requests the Remote Control Door Lock Receiver to enter the Program Key Fobs mode. Refer to <u>Transmitter Programming</u> for additional information.

SCAN TOOL DATA LIST

The Keyless Entry Scan Tool Data List contains all of the keyless entry related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order. The column, "Data List," indicates the location of the parameter within the scan tool menu selections. Use the Keyless Entry Scan Tool Data List as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all of the diagnostic procedures with **Diagnostic System Check - Remote Keyless Entry** .

Use the Scan Tool Data List only after the following is determined:

- There is no published DTC procedure nor published symptom procedure for the customer concern.
- The DTC or symptom diagnostic procedure indicated by the diagnostic system check does not resolve the customer concern.

The Typical Data Values are obtained from a properly operating vehicle under the conditions specified in the first row of the Scan Tool Data List table. Comparison of the parameter values from the suspect vehicle with the Typical Data Values may reveal the source of the customer concern.

Scan Tool Data List

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Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition ON/Engine OFF			
RFA Serial Data Link	Outputs	Active/Inactive	Inactive

SCAN TOOL DATA DEFINITIONS

RFA Serial Data Link

The scan tool displays Active/Inactive. The state of the keyless entry serial data circuit as commanded by the body control module (BCM).

DIAGNOSTIC TROUBLE CODE (DTC) LIST

Diagnostic Trouble Code (DTC) List

DTC	Diagnostic Procedure	Module(s)
B3109	<u>DTC B3109</u>	RFA

DTC B3109

Circuit Description

The LOW battery detection is handled inside the transmitter. The transmitter sends a battery condition signal to the remote control door lock receiver (RCDLR) when the transmitter buttons are pressed.

Conditions for Setting the DTC

This code shall be set after 3 consecutive low battery signals from the same programmed transmitter.

Conditions for Clearing the DTC

This code is cleared as current when a normal transmitter voltage signal is received from any programmed transmitter.

Test Description

The number(s) below refer to the step number(s) on the diagnostic table.

3: This step identifies the key fob # (transmitter) with a low battery signal.

4: This step verifies that the battery replacement corrected the fault.

DTC B3109

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check?	Go to Step 2	Go to <u>Diagnostic System Check - Remote Keyless Entry</u>

2	<ol style="list-style-type: none"> 1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Select the display DTC function on the scan tool in the remote function actuation menu. <p>Does the scan tool indicate that DTC B3109 is current?</p>	Go to Step 3	Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems
3	<ol style="list-style-type: none"> 1. With the scan tool, observe the Key Fob Low Voltage parameters for each transmitter in the Key FOB Information data list to identify the programmed transmitter(s) that set the DTC. 2. Replace the battery(s) on the indicated transmitter(s). Refer to Transmitter Battery Replacement . <p>Did you complete the battery(s) replacement?</p>	Go to Step 4	-
4	<ol style="list-style-type: none"> 1. Use the scan tool in order to clear the DTCs. 2. Operate for 3 consecutive times the transmitter(s) that had the battery replaced. <p>Does the DTC reset?</p>	Go to Step 5	System OK
5	<p>Inspect for poor connections at the battery connections of the transmitter(s) that set the DTC.</p> <p>Did you find and correct the condition?</p>	System OK	Go to Step 6
6	<ol style="list-style-type: none"> 1. Replace the transmitter(s). 2. Ensure that the replacement transmitter(s) is the correct model for the vehicle. 3. All transmitters must be programmed at the same time. Refer to Transmitter Programming . <p>Did you complete the replacement?</p>	Go to Step 7	-
7	<ol style="list-style-type: none"> 1. Use the scan tool in order to clear the DTCs. 2. Operate the replaced transmitter(s) 3 consecutive times. <p>Does the DTC reset?</p>	Go to Step 8	System OK
8	<p>IMPORTANT: When replacing the remote control door lock receiver (RCDLR), perform the transmitter programming procedure.</p> <p>Replace the RCDLR. Refer to Remote Control Door Lock Receiver Replacement .Did you complete the replacement?</p>	System OK	-

SYMPTOMS - KEYLESS ENTRY

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform **Diagnostic System Check - Remote Keyless Entry** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control module(s) can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Keyless Entry System Description and Operation** .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Remote Keyless Entry 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.
- Inspect that the transmitter is the correct model for the vehicle. An incorrect model will not operate the keyless entry system.

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:

- **Panic Mode Inoperative**
- **Keyless Entry System Inoperative**

PANIC MODE INOPERATIVE

Panic Mode Inoperative

Step	Action	Yes	No
<u>Schematic Reference:Keyless Entry Schematics</u>			
1	Did you perform the Diagnostic System Check?	Go to Step 2	Go to <u>Diagnostic System Check - Remote Keyless Entry</u>
	1. Change the keyless entry alarm personalization settings to ALARM HORN and LIGHTS ON before preceding with this		

2	<p>step. Refer to Vehicle Personalization in Personalization.</p> <p>2. With the keyless entry transmitter, attempt to operate the panic function.</p> <p>Do the horns and the headlamps pulse on and off?</p>	<p>Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems</p>	<p>Go to Step 3</p>
3	<p>Do any of the panic functions operate?</p>	<p>Go to Step 4</p>	<p>Go to Keyless Entry System Inoperative</p>
4	<p>Do the horns pulse on and off?</p>	<p>Go to Diagnostic System Check - Lighting Systems in Lighting Systems</p>	<p>Go to Diagnostic System Check - Horns in Horns</p>

KEYLESS ENTRY SYSTEM INOPERATIVE

Keyless Entry System Inoperative

Step	Action	Yes	No
Schematic Reference: Keyless Entry Schematics			
1	<p>Did you perform the Diagnostic System Check?</p>	<p>Go to Step 2</p>	<p>Go to Diagnostic System Check - Remote Keyless Entry</p>
2	<p>Press each button of the transmitter one at a time. Does the system operate normally?</p>	<p>Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems</p>	<p>Go to Step 3</p>
3	<p>Lock and unlock the door locks using the controls inside the vehicle. Do the locks operate properly?</p>	<p>Go to Step 4</p>	<p>Go to Diagnostic System Check - Door Systems in Doors</p>
4	<p>Operate the rear compartment release from the controls inside the vehicle. Does the rear compartment release operate properly?</p>	<p>Go to Step 5</p>	<p>Go to Diagnostic System Check - Body Rear End in Body Rear End</p>
5	<p>IMPORTANT: Inspect that the keyless entry transmitter is the correct model for the vehicle remote system. A wrong model transmitter may pass this test, but will not activate the vehicle remote system.</p> <p>1. Turn on the J 43241 Keyless Entry Tester. See Special Tools and Equipment .</p> <p>2. Place the transmitter on the J 43241 test pad. See</p>		

	<p align="center"><u>Special Tools and Equipment</u> .</p> <p>3. Press each button of the transmitter one at a time.</p> <p>Does a tone sound and the green light illuminate on the J 43241 after each button is pressed? See <u>Special Tools and Equipment</u> .</p>	Go to Step 10	Go to Step 6
6	Do any of the buttons on the transmitter sound the tone and illuminate the green light when pressed?	Go to Step 9	Go to Step 7
7	Replace the transmitter battery. Refer to <u>Transmitter Battery Replacement</u> . Did you complete the replacement?	Go to Step 8	-
8	<p>1. Turn on the J 43241 Keyless Entry Tester. See <u>Special Tools and Equipment</u> .</p> <p>2. Place the transmitter on the J 43241 test pad. See <u>Special Tools and Equipment</u> .</p> <p>3. Press each button of the transmitter one at a time.</p> <p>Does a tone sound and the green light illuminate on the J 43241 after each button is pressed? See <u>Special Tools and Equipment</u> .</p>	Go to Step 10	Go to Step 9
9	Replace the transmitter. Did you complete the replacement?	Go to Step 13	-
10	Press the PANIC button on the transmitter. Does the PANIC function operate normally?	Go to Step 11	Go to Step 13
11	Perform the synchronization procedure. Refer to <u>Transmitter Resynchronization</u> . Did the horn chirp?	Go to Step 12	Go to Step 13
12	Operate the transmitter within range of the vehicle. Do all of the keyless entry functions operate normally?	Go to Step 15	Go to Step 13
13	<p>IMPORTANT: All transmitters which are to be recognized by the remote control door lock receiver must be programmed in a single programming sequence. If the system is placed in program mode it will erase all previously programmed transmitters upon the receipt of the programming signal from the first transmitter.</p> <p>Perform the programming procedure. Refer to <u>Transmitter Programming</u> .Did the programming complete successfully?</p>	Go to Step 15	Go to Step 14
14	<p>IMPORTANT: When replacing the remote control door lock receiver, perform the transmitter programming procedure.</p>		-

	Replace the remote control door lock receiver. Refer to <u>Remote Control Door Lock Receiver Replacement</u> .Did you complete the replacement?	Go to Step 15	
15	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

REPAIR INSTRUCTIONS

REMOTE CONTROL DOOR LOCK RECEIVER REPLACEMENT

Removal Procedure

IMPORTANT: The Remote Function Actuation (RFA) system uses the same receiver as the Tire Pressure Monitor (TPM) system. The service replacement receiver must be programmed to accept both the keyless entry transmitters and the TP sensors. Refer to Transmitter Programming and Tire Pressure Sensor Learn in Tire Pressure Monitoring.

1. Turn the ignition to OFF.
2. Remove the left rear compartment insulator (1).

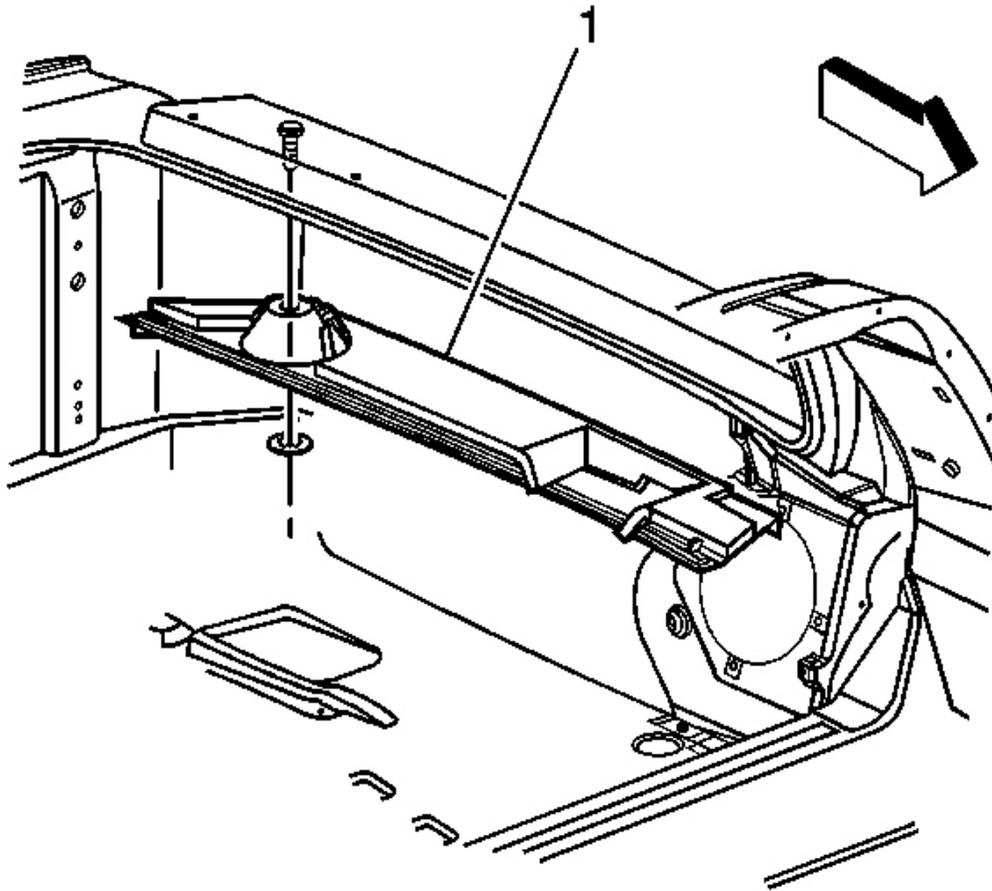


Fig. 4: Left Rear Compartment Insulator
Courtesy of GENERAL MOTORS CORP.

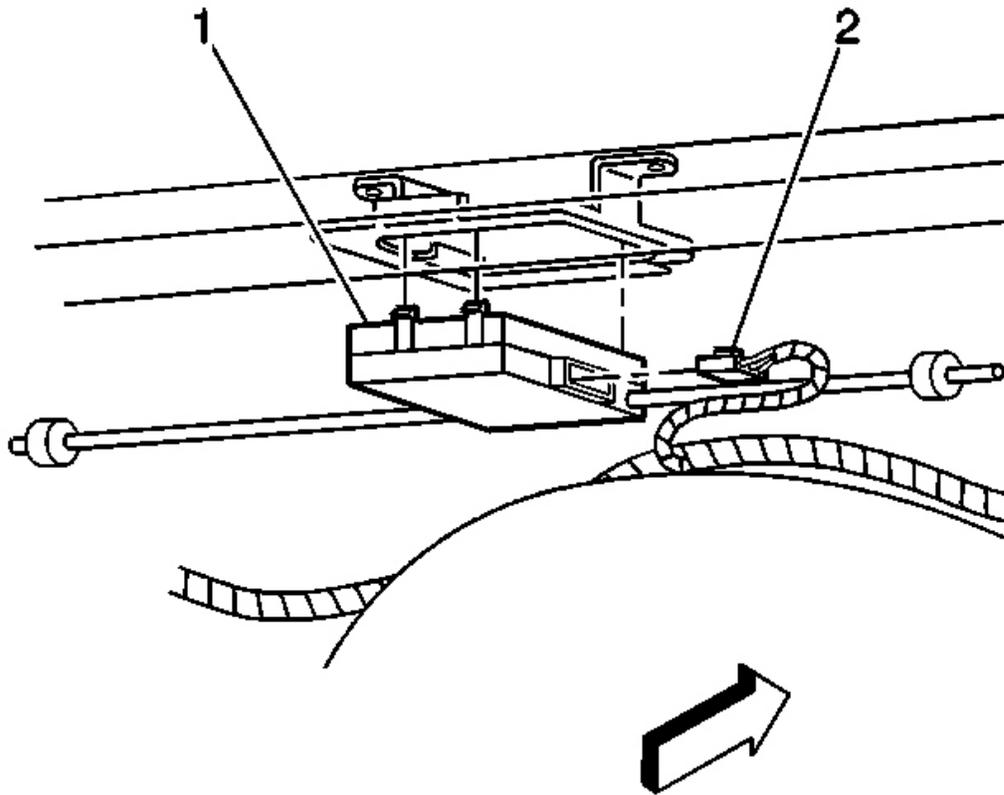


Fig. 5: Remote Control Door Lock Receiver And Connector
Courtesy of GENERAL MOTORS CORP.

3. Gently pull on the retainer at the back side of the receiver (1).
4. Pull out the receiver (1) only enough to expose the connector (2).
5. Disconnect the receiver connector (2).

Installation Procedure

1. Connect the receiver connector (2).
2. Line up the receiver (1) with the slots on the retainer.

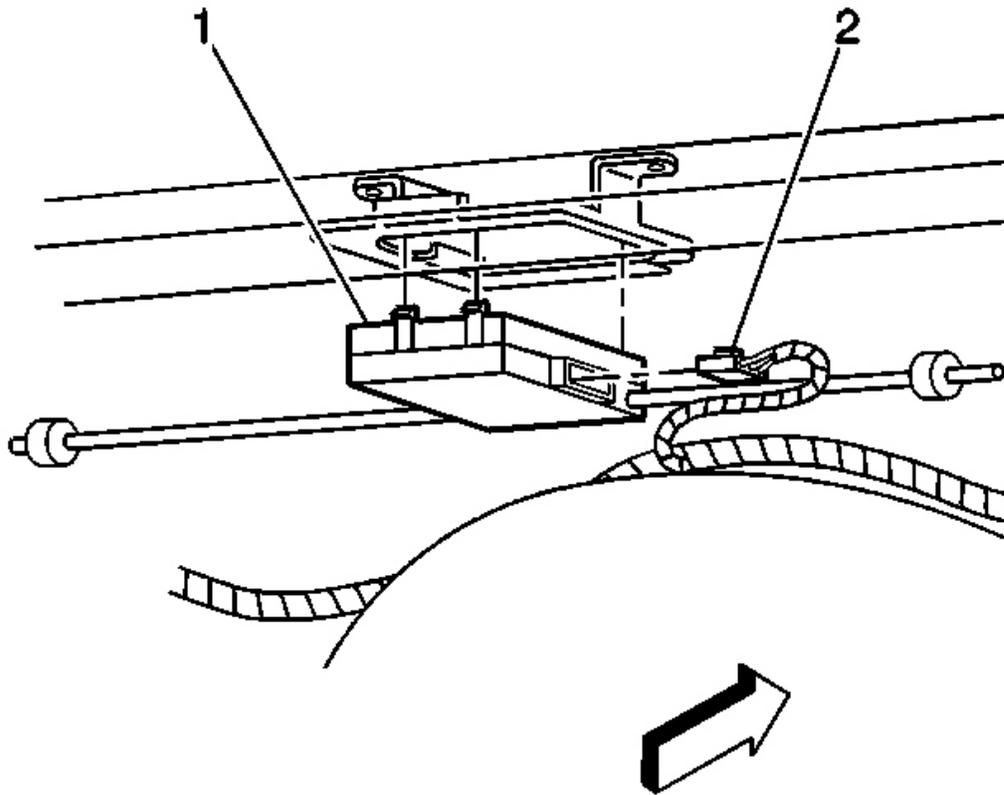


Fig. 6: Remote Control Door Lock Receiver And Connector
Courtesy of GENERAL MOTORS CORP.

3. Snap the receiver (1) into place on the retainer.

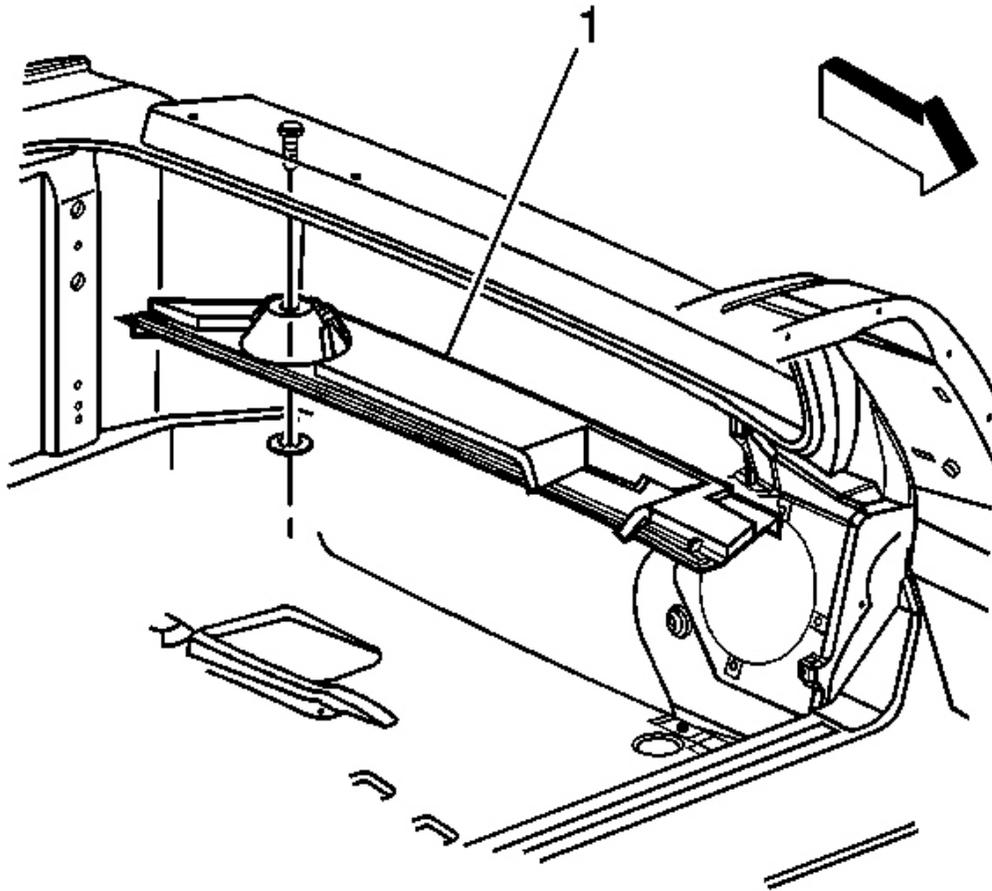


Fig. 7: Left Rear Compartment Insulator
Courtesy of GENERAL MOTORS CORP.

4. Install the left rear compartment insulator (1).
5. Program the keyless entry transmitters. Refer to **Transmitter Programming** .
6. Program the TPM sensors. Refer to **Tire Pressure Sensor Learn** in Tire Pressure Monitoring.

TRANSMITTER BATTERY REPLACEMENT

Removal Procedure

1. Insert a small coin between the 2 halves of the transmitter case in the slot located near the key ring.
2. Twist the coin in order to open the case.

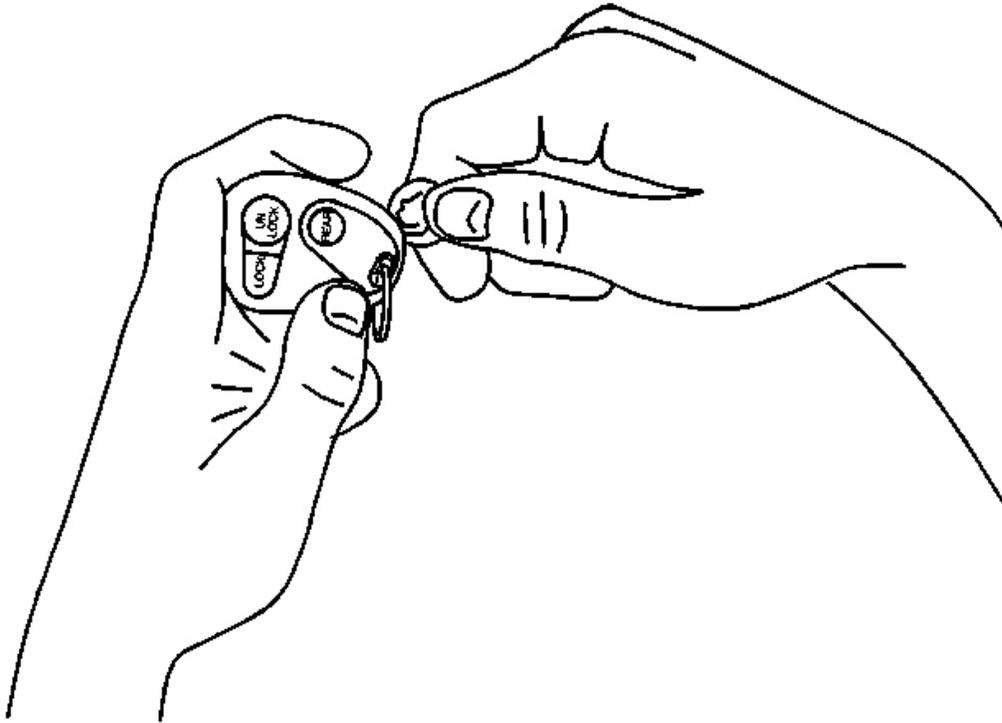


Fig. 8: Opening Transmitter Case
Courtesy of GENERAL MOTORS CORP.

3. Remove the cover while being careful not to damage the seal.
4. Remove the battery from the transmitter.

Installation Procedure

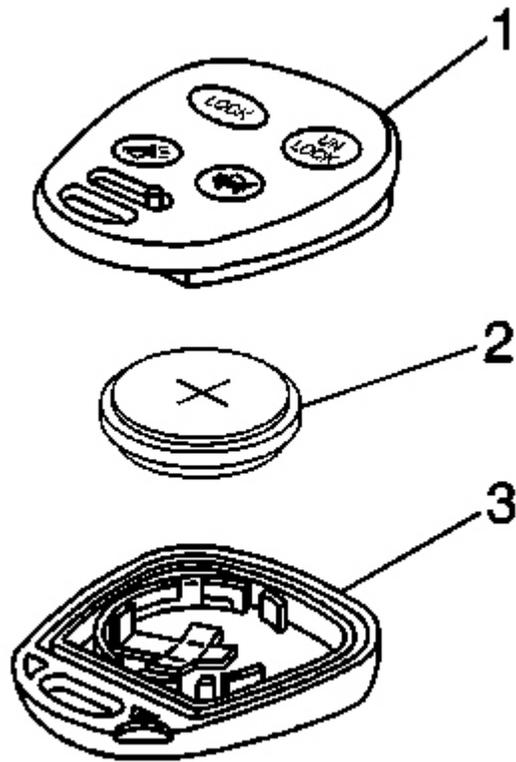


Fig. 9: Transmitter Halves And Battery
Courtesy of GENERAL MOTORS CORP.

1. Install the new battery (CR 2450 or equivalent) (2) with the positive (+) side facing up.
2. Inspect that the seal is properly positioned.
3. Snap the 2 halves together (1, 3).
4. Synchronize the transmitter to the receiver. Refer to **Transmitter Resynchronization** .

TRANSMITTER PROGRAMMING

Each transmitter has a unique Vehicle Access Code (VAC) that changes every 5 seconds. If a transmitter or receiver is replaced, each transmitter must be programmed to the vehicle's receiver. Entering a specific button sequence on the DIC, up to 3 transmitters can be programmed into the receiver. After programming the transmitters to the vehicle, the receiver will update this code every 5 seconds in order to match the code programmed in the transmitter.

The transmitter may not communicate or become out of synchronization with the receiver if any of the

following situations occurs:

- The transmitter battery is disconnected.
- The vehicle battery is disconnected.
- The transmitter and the vehicle are separated for 2 weeks or more.
- The receiver is disconnected.

Perform the synchronizing procedure if the transmitter does not communicate or becomes out of synchronization with the receiver. If the transmitter and/or receiver are replaced, perform the following programming procedure:

Programming Transmitters

1. Turn the ignition to ON.
2. Turn the radio to OFF.
3. Press the RESET button on the driver information center (DIC) in order to clear any IPC warning messages.
4. Press and release the OPTIONS button on the DIC to scroll through the display options until the IPC display is blank.
5. Press and hold the RESET button for 3 seconds.
6. Press the OPTIONS button until FOB TRAINING message is displayed.

IMPORTANT: If the FOB TRAINING message cannot be display, check if the BCM is configured with the correct RPO codes.

7. Press the RESET button in order to begin the programming sequence. The message HOLD LK + UNLK 1ST FOB will be displayed.
8. Simultaneously press and hold the LOCK and UNLOCK buttons on the first transmitter for 15 seconds. The IPC will indicate when that transmitter is programmed and when to proceed to the next. Repeat this procedure for each additional transmitter or press the OPTIONS button to exit.

Programming Cancellation

The receiver will cancel the programming sequence if any of the following conditions occur:

- The program mode is exited through the DIC.
- The ignition is turned to OFF.
- The three transmitters have been programmed.
- The RFA system has been in the program mode for longer than 2 minutes and no transmitters have been learned.

If the program mode is cancelled with less than 3 codes stored, the receiver will only accept the codes just stored. If the program mode is cancelled before any code is stored, the codes still remain valid.

The receiver retains all current access codes in memory if either of the following conditions occur:

- A programming sequence is interrupted.
- The battery is disconnected.

Synchronizing Transmitters

Perform the following procedure if a transmitter cannot communicate or becomes out of synchronization with the receiver:

1. Move a programmed transmitter within range.
2. Press the LOCK and UNLOCK buttons on the transmitter simultaneously for 7 seconds.
3. The horn will chirp once when the transmitter is synchronized. Repeat this procedure for each additional transmitter if needed.

DESCRIPTION AND OPERATION

KEYLESS ENTRY SYSTEM DESCRIPTION AND OPERATION

The keyless entry system is a supplementary vehicle entry device. Radio frequencies or discharged batteries may disable the system.

Keyless entry allows you to operate the following components:

- The door locks
- The rear compartment lid release
- The illuminated entry lamps
- The panic alarm (instant alarm)

The keyless entry system has the following main components:

- The transmitters
- The remote control door lock receiver (RCDLR)

When you press a button on a transmitter, the transmitter sends a signal to the remote control door lock receiver. The RCDLR interprets the signal and activates the requested function via a class 2 message over the serial data line.

Unlock Driver's Door Only

Momentarily press the UNLOCK button in order to perform the following functions:

- Unlock the driver door only.
- Illuminate the interior lamps when the ambient light is low for approximately 30 seconds or until a door

is opened.

- Illuminate the exterior lights for approximately 30 seconds or until a door is opened (if selected ON in personalization).
- Disarm the content theft deterrent (CTD) system (if equipped).
- Recall the memory seat, the memory mirror, and the telescopic steering column (if equipped) positions for that driver.
- Recall the temperature, the fan speed, and the mode settings for the comfort control for that driver.
- Recall the radio presets, tone volume, playback mode (AM/FM, tape or CD), last displayed station, compact disc position, and tape direction for that driver.

Unlock All Doors (Second Operation)

Momentarily press the UNLOCK button a second time (within 2 seconds of the first press) in order to perform the following functions:

- Unlock the remaining doors.
- Illuminate the interior lamps when the ambient light is low for approximately 30 seconds or until a door is opened.
- Illuminate the exterior lights for approximately 30 seconds or until a door is opened (if selected ON in personalization).
- Disarm the content theft deterrent (CTD) system (if equipped).

Lock All Doors

Press the LOCK button in order to perform the following functions:

- Lock all of the doors.
- Immediately turn off the interior lamps.
- Flash the park lamps (if selected ON in personalization).
- Chirp the horn (if selected ON in personalization).
- Arm the content theft deterrent (CTD) system.

Rear Compartment Lid Release

If the vehicle transaxle is in PARK or NEUTRAL and the ignition is in the OFF position, a single press of the rear compartment release button will open the rear compartment lid. The interior lamps will not illuminate.

Alarm

A single press of the panic button performs the following functions:

- Illuminates the interior lamps.
- Flashes the headlamps (if turned ON in personalization).

- Pulses the horn for 30 seconds or until one of the following conditions is met:
 - The panic button is pressed again.
 - The ignition switch is turned to the RUN position with a valid key.
 - The vehicle is unlocked with the key.

Keyless Entry Personalization

The exterior lamps and the horn chirp may be personalized as part of the remote activation verification feature. The headlamps may be personalized as part of the keyless entry alarm feature. For mode descriptions and programming instructions, refer to **Driver Personalization** in Personalization.

Rolling Code

The keyless entry system uses rolling code technology. Rolling code technology prevents anyone from recording the message sent from the transmitter and using the message in order to gain entry to the vehicle. The term "rolling code" refers to the way that the keyless entry system sends and receives the signals. The transmitter sends the signal in a different order each time. The transmitter and the RCDLR are synchronized to the appropriate order. If a programmed transmitter sends a signal that is not in the order that the RCDLR expects, then the keyless entry system will not function.

Transmitter Resynchronization

If the functions on the remote keyless entry transmitter do not work, or, if only the remote alarm works, after the battery is replaced, then the transmitter needs to be resynchronized to the receiver. Do this by pressing and holding the LOCK and UNLOCK buttons on the transmitter at the same time for about eight seconds.

To verify that the transmitter has been resynchronized, the horn will sound and the exterior lamps will flash once.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	<p>J 43241 Keyless Entry Tester</p>

