

Keyless Entry

Specifications

GM SPO Group Numbers

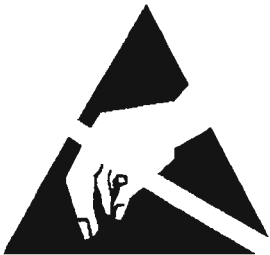
Application	GM SPO Group Number
Remote Control Door Lock Receiver	16.263
Remote Control Door Lock Transmitter	16.263

Schematic and Routing Diagrams

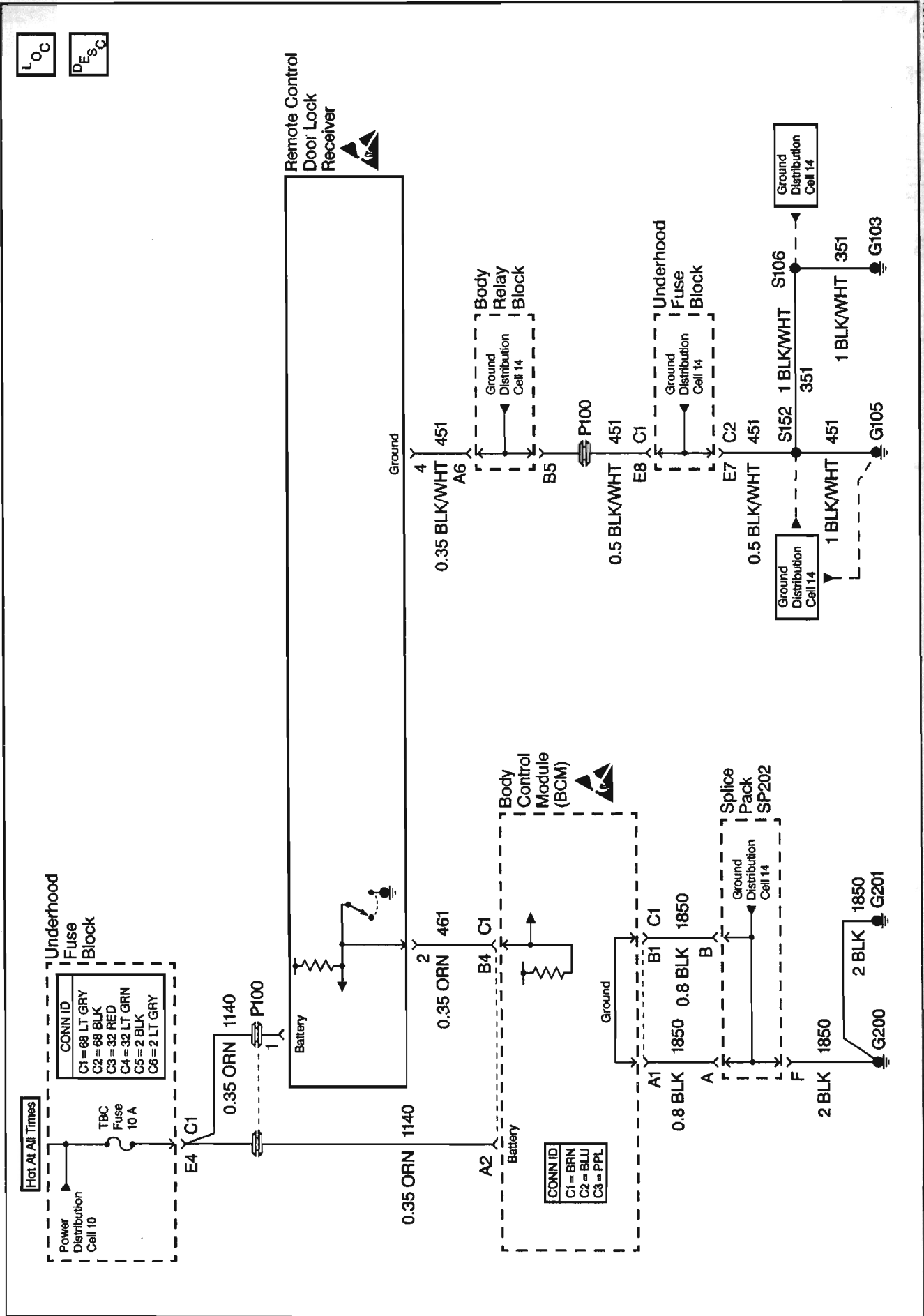
Keyless Entry Schematic References

Reference on Schematic	Section Number - Subsection Name
Ground Distribution Cell 14	8 - Wiring Systems
Power Distribution Cell 10	8 - Wiring Systems

Keyless Entry Schematic Icons

Icon	Icon Definition
 <p style="text-align: right; font-size: small;">19384</p>	<p>Refer to <i>ESD Notice</i> in Cautions and Notices.</p>

Keyless Entry Schematics (Cell 132)



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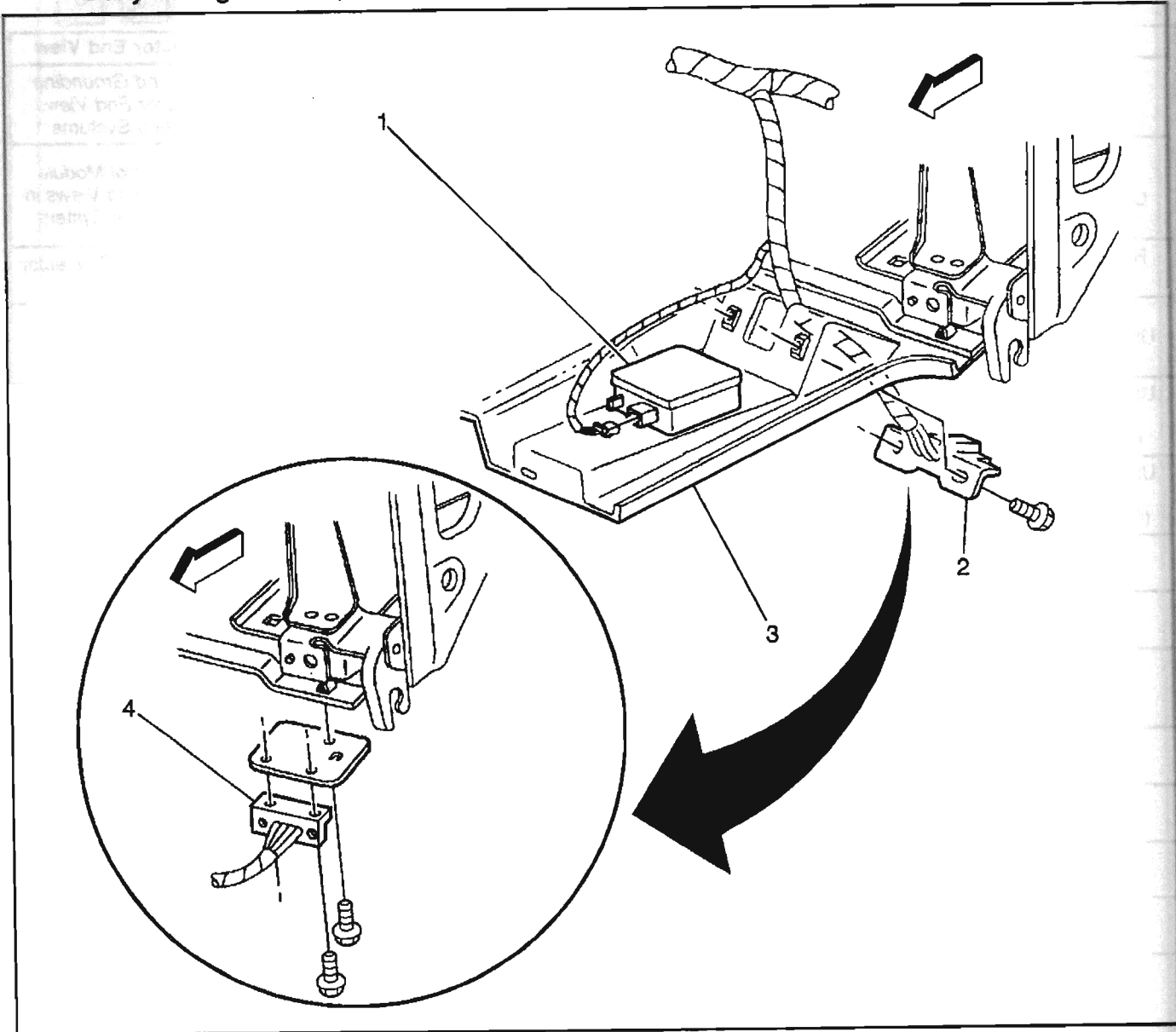
Component Locator

Keyless Entry Components

Name	Location	Locator View	Connector End View
Body Relay Block	LH of the dash, right of the IP Fuse Block	<i>Power and Grounding Component Views in Wiring Systems</i>	<i>Power and Grounding Connector End Views in Wiring Systems</i>
Body Control Module (BCM) Connector C1, Brown (24 Cavities)	Lower rear of the IP, on the heater	<i>Body Control Module Component Views in Body Control System</i>	<i>Body Control Module Connector End Views in Body Control System</i>
Remote Control Door Lock Receiver	On the LH IP sound insulator	<i>Keyless Entry Component Views</i>	<i>Keyless Entry Connector End Views</i>
Underhood Fuse Block	On the top of the left inner wheelwell	<i>Power and Grounding Component Views in Wiring Systems</i>	—
Underhood Fuse Block Connector C1 (68 Cavities) (Body)	Below the Underhood Fuse Block	<i>Power and Grounding Component Views in Wiring Systems</i>	<i>Power and Grounding Connector End Views in Wiring Systems</i>
Underhood Fuse Block Connector C2 (68 Cavities) (Engine)	Below the Underhood Fuse Block	<i>Power and Grounding Component Views in Wiring Systems</i>	<i>Power and Grounding Connector End Views in Wiring Systems</i>
G103 (2.2L Engine)	(CKT 351) Engine harness, RH Front of the engine block, under the generator	<i>Harness Routing Views in Wiring Systems</i>	—
G103 (4.3L Engine)	(CKT 351) Engine harness, RH Rear of the cylinder head	<i>Harness Routing Views in Wiring Systems</i>	—
G105 (2.2L Engine)	(CKT 450, CKT 451) Engine harness, to the RH rear of the engine block, near the Ignition Control Module	<i>Harness Routing Views in Wiring Systems</i>	—
G105 (4.3L Engine)	(CKT 450, CKT 451) Engine harness, LH Rear of the cylinder head	<i>Harness Routing Views in Wiring Systems</i>	—
G200	(CKT 1850) Body harness, to the LF of the IP, above P100	<i>Harness Routing Views in Wiring Systems</i>	—
G201	(CKT 1850) Body harness, to the LF of the IP, above P100	<i>Harness Routing Views in Wiring Systems</i>	—
P100	IP bulkhead pass-through, LH rear of the engine compartment, on the cowl	<i>Harness Routing Views in Wiring Systems</i>	—
S106 (2.2L Engine)	(CKT 351) Engine harness, between the breakouts to the PCM and to the fuel injector connector, 25 cm (9.8 in) from the breakouts to the PCM	<i>Harness Routing Views in Wiring Systems</i>	—
S106 (4.3L Engine)	(CKT 351) Engine harness, between the breakouts to the rear heated oxygen sensors connector and the body harness connector, 7 cm (2.8 in) from the breakout to the heated oxygen sensor connector	<i>Harness Routing Views in Wiring Systems</i>	—
S152 (2.2L Engine)	(CKT 351, CKT 413, CKT 451) Engine harness, between the breakouts for the fuel injector connector and the Ignition Control Module, 7 cm (2.8 in) from G105	<i>Harness Routing Views in Wiring Systems</i>	—
S152 (4.3L Engine)	(CKT 351, CKT 413, CKT 451) Engine harness, between the breakouts for the LH rear and RH rear engine block grounds, 15 cm (5.9 in) from the breakout to the LH rear engine grounds	<i>Harness Routing Views in Wiring Systems</i>	—
Splice Pack SP202	(CKT 379, CKT 1850) Strapped to the body harness, at the LH center of the IP	<i>Harness Routing Views in Wiring Systems</i>	—

Keyless Entry Component Views

Body Wiring Harness, LH Instrument Panel and Remote Control Door Lock Receiver



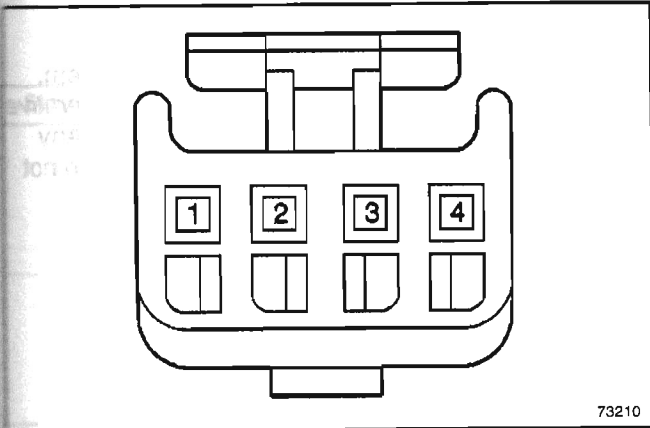
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Legend

- | | |
|-------------------------------------------------------|-----------------------------------------------|
| (1) Remote Control Door Lock Receiver | (3) Instrument Panel (IP) Sound Insulator, LH |
| (2) Data Link Connector (DLC)
(Except Base Pickup) | (4) Data Link Connector (DLC) (Base Pickup) |

Keyless Entry Connector End Views

Remote Control Door Lock Receiver



Connector Part Information		<ul style="list-style-type: none"> • 12059162 • 4-Way F Micro-Pack 100 Series (BLU) 	
Pin	Wire Color	Circuit No.	Function
1	ORN	1140	Fuse Output - Battery
2	ORN	461	Serial Data Signal - GMCM - 160 Baud
3	—	—	Not Used
4	BLK/WHT	451	Ground

Diagnostic Information and Procedures

A Diagnostic System Check - Remote Keyless Entry

Test Description

The number(s) below refer to the step number(s) 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.
4. 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.

5. At this point you have determined all DTCs applicable to the Remote Keyless Entry System. Refer to *Remote Keyless Entry System Inoperative* for further Remote Keyless Entry diagnosis. Any other body control module DTCs displayed do not apply to Remote Keyless Entry and should be diagnosed in their applicable section.

A 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 <i>Scan Tool Inoperative in Data Link Communications</i>
2	1. Turn ON the ignition, with the engine OFF. 2. Attempt to establish communication with the Body Control Module. Does the scan tool communicate with the Body Control Module?	Go to Step 3	Go to <i>A Diagnostic System Check - Body Control System</i> in Body Control System
3	Select the Body Control Module display DTCs function on the scan tool. Does the scan tool display any DTCs?	Go to Step 4	Go to <i>Remote Keyless Entry System Inoperative</i>
4	Does the scan tool display any DTCs which begin with a U?	Go to <i>A Diagnostic System Check - Data Link Communications</i> in Data Link Communications	Go to Step 5
5	Does the scan tool display DTC B3102?	Go to <i>DTC B3102 Keyless Entry (RFA) Data Link Circuit Lo</i> in Body Control System	Go to <i>Remote Keyless Entry System Inoperative</i>

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Remote Keyless Entry System Inoperative

16. This step verifies that the keyless entry serial data circuit is at B+ supplied by the BCM.

17. This step tests for a short to voltage which would not be detected with a DMM in step 16.

Remote Keyless Entry System Inoperative

Step	Action	Value	Yes	No
1	Did you perform the Remote Keyless Entry Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic System Check - Remote Keyless Entry
2	Press each button of the transmitter one at a time. Does the system operate normally?	—	Go to Intermittents and Poor Connections Diagnosis in Wiring Systems	Go to Step 3
3	Lock and unlock the door locks using the lock switches inside the vehicle. Do the locks operate properly?	—	Go to Step 4	Go to Power Door Locks System Check in Doors
4	Operate the rear hatch release from the controls inside the vehicle (if equipped). Does the hatch release operate properly?	—	Go to Step 5	Go to Lift Window Release System Check in Body Rear End
5	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. 1. Turn on the J 43241 Keyless Entry Tester. 2. Place the transmitter on the J 43241 test pad. 3. Press each button of the transmitter one at a time. Does a tone sound and the green light illuminate on the J 43241 after each button is pressed?	—	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 <i>Transmitter Battery Replacement</i> . Did you complete the replacement?	—	Go to Step 8	—
8	1. Turn on the J 43241 Keyless Entry Tester. 2. Place the transmitter on the J 43241 test pad. 3. Press each button of the transmitter one at a time. Does a tone sound and the green light illuminate on the J 43241 after each button is pressed?	—	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 <i>Transmitter Synchronization</i> . Do the locks cycle to lock then unlock?	—	Go to Step 12	Go to Step 13
12	Operate the transmitter within range of the vehicle. Do all of the Remote Keyless Entry functions operate normally?	—	Go to Step 26	Go to Step 13

Remote Keyless Entry System Inoperative (cont'd)

Step	Action	Value	Yes	No
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 <i>Transmitter Programming</i>.</p> <p>Do the locks cycle to lock then unlock?</p>	—	Go to Step 26	Go to Step 14
14	<ol style="list-style-type: none"> 1. Turn OFF the Ignition. 2. Disconnect the Remote Control Door Lock Receiver. 3. Probe the battery positive voltage circuit of the Remote Control Door Lock Receiver with a test lamp that is connected to a good ground. <p>Does the test lamp illuminate?</p>	—	Go to Step 15	Go to Step 24
15	<p>Connect a test lamp between the ground circuit of the Remote Control Door Lock Receiver and the battery positive voltage circuit of the Remote Control Door Lock Receiver.</p> <p>Does the test lamp illuminate?</p>	—	Go to Step 16	Go to Step 25
16	<ol style="list-style-type: none"> 1. Disconnect the test lamp. 2. Turn ON the ignition, with the engine OFF. 3. Measure the voltage between the keyless entry serial data circuit and the ground circuit of the Remote Control Door Lock Receiver. <p>Does the voltage measure within the specified range?</p>	B+	Go to Step 17	Go to Step 19
17	<ol style="list-style-type: none"> 1. Turn ON the ignition, with the engine OFF. 2. Probe the keyless entry serial data circuit of the Remote Control Door Lock Receiver with a test lamp that is connected to a good ground. <p>Does the Test lamp illuminate?</p>	—	Go to Step 18	Go to Step 20
18	<p>Test the keyless entry serial data circuit for a short to voltage. Refer to <i>Testing for a Short to Voltage and Wiring Repairs</i> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 26	Go to Step 21
19	<p>Test the keyless entry serial data circuit for an open, high resistance, or short to ground. Refer to the following procedures in Wiring Systems:</p> <ul style="list-style-type: none"> • <i>Testing for Continuity</i> • <i>Testing for Short to Ground</i> • <i>Wiring Repairs</i> <p>Did you find and correct the condition?</p>	—	Go to Step 26	Go to Step 21
20	<p>Inspect for poor connections at the harness connector of the Remote Control Door Lock Receiver. Refer to <i>Testing for Intermittent and Poor Connections and Connector Repairs</i> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 26	Go to Step 22
21	<p>Inspect for poor connections at the harness connector of the Body Control Module. Refer to <i>Testing for Intermittent and Poor Connections and Connector Repairs</i> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 26	Go to Step 23

Remote Keyless Entry System Inoperative (cont'd)

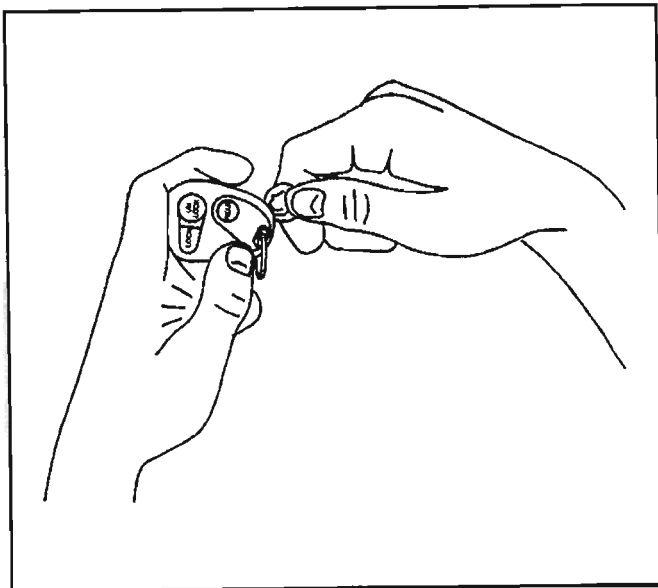
Step	Action	Value	Yes	No
22	<p>Important: All transmitters which are to be recognized by the Remote Control Door Lock Receiver must be programmed in a single programming sequence. If the system is placed in program mode it will erase all previously programmed transmitters upon the receipt of the programming signal from the first transmitter. Refer to <i>Transmitter Programming</i>.</p> <p>Replace the Remote Control Door Lock Receiver. Refer to <i>Receiver Replacement</i>.</p> <p>Did you complete the replacement?</p>	—	Go to Step 26	—
23	<p>Important: Replacement of the Body Control Module will require a setup procedure to be performed. Refer to <i>BCM Programming/RPO Configuration</i> in Body Control System.</p> <p>Replace the Body Control Module. Refer to <i>Body Control Module Replacement</i> in Body Control System.</p> <p>Did you complete the replacement?</p>	—	Go to Step 26	—
24	<p>Repair the open, high resistance, or short to ground in the battery positive voltage circuit of the Remote Control Door Lock Receiver. Refer to the following procedures in Wiring Systems:</p> <ul style="list-style-type: none"> • <i>Testing for Continuity</i> • <i>Testing for Short to Ground</i> • <i>Wiring Repairs</i> <p>Did you complete the repair?</p>	—	Go to Step 26	—
25	<p>Repair the open or high resistance in the ground circuit of the Remote Control Door Lock Receiver. Refer to <i>Testing for Continuity</i> and <i>Wiring Repairs</i> in Wiring Systems.</p> <p>Did you complete the repair?</p>	—	Go to Step 26	—
26	<p>Operate the system in order to verify the repair.</p> <p>Did you correct the condition?</p>	—	System OK	Go to Step 3

Repair Instructions

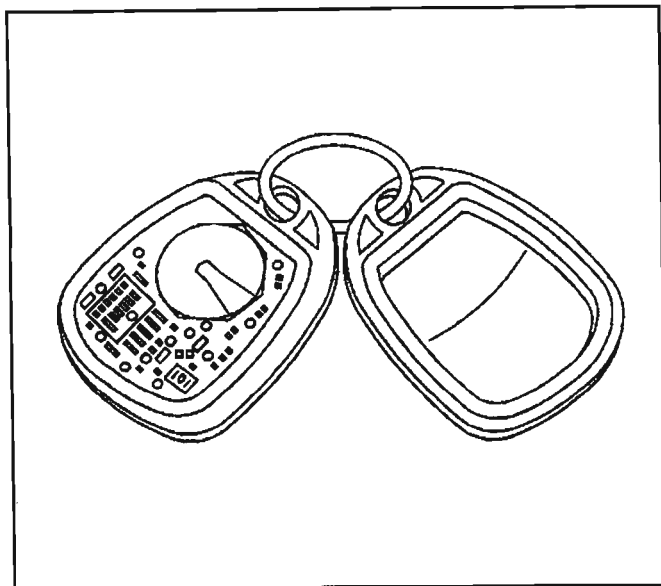
Transmitter Battery Replacement

Removal Procedure

1. Insert a small coin between the two halves of the transmitter case at the slot provided near the key ring hole.
2. Twist the coin in order to open the case.
3. Open the transmitter case.



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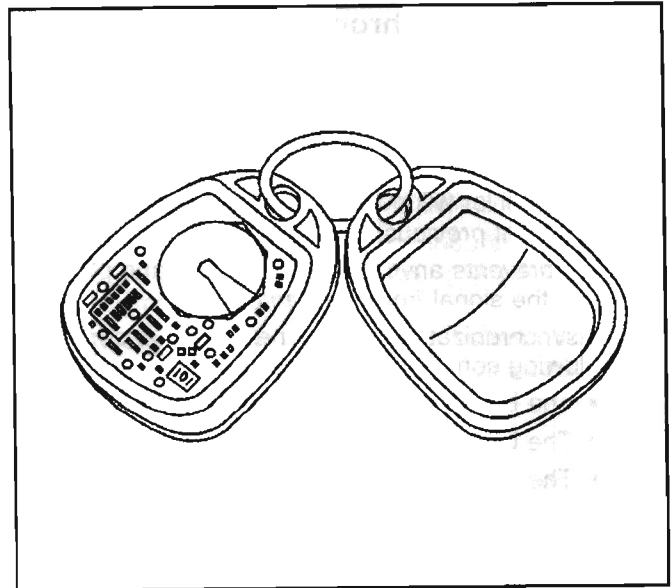
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Notice: Refer to *ESD Notice* in Cautions and Notices.

4. Remove the battery.

Installation Procedure

1. Install the battery with the positive (+) side up. Use one 3 V CR2032 battery (or the equivalent).
2. Ensure that the seal is in position. Align the two halves of the case and snap the two halves together.
3. Resynchronize the transmitter.

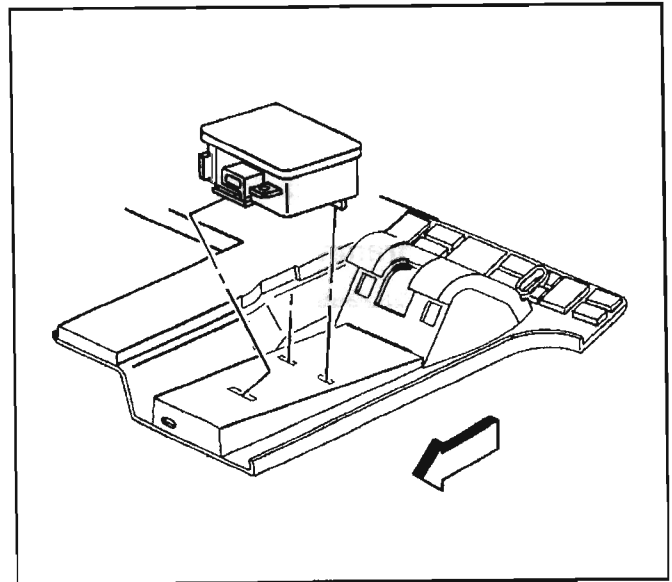


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Receiver Replacement

Removal Procedure

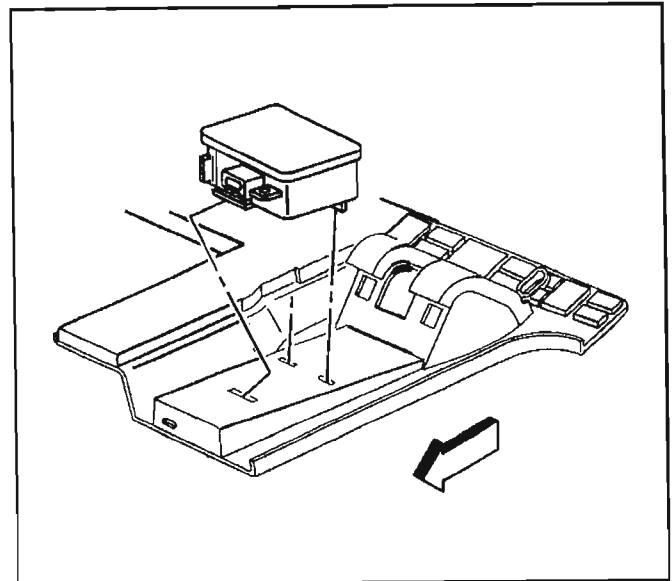
1. Remove the left-side instrument panel sound insulator. Refer to *Closeout/Insulator Panel Replacement - Left* in Instrument Panel, Gauges and Console.
2. Disconnect the electrical connector.
3. Remove the remote control door lock receiver from the instrument panel sound insulator by unsnapping the receiver.



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Installation Procedure

1. Install the remote control door lock receiver to the instrument panel sound insulator by snapping the receiver into place.
2. Connect the electrical connector.
3. Install the left-side instrument panel sound insulator. Refer to *Closeout/Insulator Panel Replacement - Left* in Instrument Panel, Gauges and Console.
4. Reprogram the transmitters. Refer to *Transmitter Programming*.
5. Test the operation of the system.



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Transmitter Synchronization

1. Resynchronization may be necessary due to the security method used by the RKE system.
The transmitter does not send the same signal twice to the receiver.
2. The receiver will not respond to a signal that has been sent previously.
This prevents anyone from recording and playing back the signal from the transmitter.
3. Resynchronization may be necessary under the following conditions:
 - The battery in the transmitter is replaced.
 - The battery in the transmitter is weak.
 - The battery in the vehicle has been in a low or no charge condition for an extended period of time.
4. In order to resynchronize the transmitter with the receiver, perform the following steps:
 - 4.1. Stand within 1.5 meters (5 ft) from the vehicle.
 - 4.2. Simultaneously press and hold the LOCK and UNLOCK buttons on the transmitter for 7 seconds.
The door locks should cycle in order to confirm resynchronization.

Transmitter Programming

Important: Different keyless entry systems are used on General Motors vehicles. The parts are not interchangeable even though the parts may appear to be similar. Observe the back of the transmitter in order to properly identify the system. On 1999 S/T pickups and utilities, use a transmitter identified with GM/UTA preceding the part number.

1. With the driver door closed, hold down the power unlock button on the door panel.
2. Turn the ignition switch to the ON position.
3. Turn the ignition switch to the OFF position.
4. Turn the ignition switch to the ON position.
5. Turn the ignition switch to the OFF position.
6. Release the power unlock button on the door panel.

The remote control door lock receiver will respond in the following manner in order to indicate that the receiver is in the programming mode:

- 6.1. Locking the doors
- 6.2. Unlocking the doors

Important: All extra transmitters must be programmed at this time. When a new transmitter is programmed, it will deactivate the old transmitters.

7. Hold down the lock and unlock buttons on the transmitter until the remote control door lock receiver will respond in the following manner:
 - 7.1. Locking the doors.
 - 7.2. Unlocking the doors.
8. Repeat step 7 for each additional transmitter.
9. Turn the ignition switch to the ON position in order to exit the transmitter programming mode.
10. In order to reprogram the remote control door lock transmitter with a scan tool, refer to Scan Tool instructions.

Memory Seat Recall Programming

1. Adjust the driver seat to the desired position.
2. Press the switch labeled SET. A chime confirmation will be heard.
3. Press the desired position switch labeled 1 or 2. Within 5 seconds from pressing the SET switch, a chime confirmation will be heard.
4. Press the UNLOCK button on the desired transmitter (key fob) within 5 seconds from pressing the SET switch. A chime confirmation will be heard.
 - The transmitter (key fob) is now programmed with the desired position switch. Pressing the transmitter UNLOCK button will cause a recall request to be initiated and the seat will adjust to position 1 or 2.
 - The stored memory positions may be changed without having to reprogram the transmitter.
 - The transmitter feature is available in all ignition positions.

Memory Seat Recall Unprogramming

1. Press the switch labeled SET. A chime confirmation will be heard.
2. Press the UNLOCK button on the transmitter (key fob) within 5 seconds from pressing the SET switch.
3. Do not press any memory switch or power adjustment for 5 seconds. Pressing a switch will cancel the unprogramming event and the transmitter will remain programmed.
 - The transmitter (key fob) is now unprogrammed and pressing the UNLOCK button will not effect memory seat operation.
 - No chime confirmation will be heard when the UNLOCK button is pressed if the transmitter is unprogrammed.

Description and Operation

Remote Keyless Entry System Description

Important: Different keyless entry systems are used on General Motors vehicles. The parts are not interchangeable even though the parts may appear to be similar. Observe the back of the transmitter in order to properly identify the system. On 1999 S/T pickups and utilities, use a transmitter identified with GM/UTA preceding the part number.

- A remote control allows the remote keyless entry (RKE) system to lock and unlock the vehicle. RKE can lock and unlock the rear window on utility models.

- The remote control door lock receiver is located on the left-side instrument panel sound insulator.
- Each vehicle comes with a pair of remote control door lock transmitters.

Features of the remote control door lock transmitter include the following items:

- The remote control door lock transmitters are hand-held.
- The remote control door lock transmitters are attached to a key ring.

- The remote control transmitter for pickups models has 3 buttons.

These 3 buttons control the operation of the system.

- The remote control transmitter for utility models has 4 buttons.

Whenever a button on the transmitter is pressed, the transmitter sends a coded ultra-high frequency (UHF) radio signal to the receiver.

- In order for the receiver to detect any coded signal, the transmitter must be within approximately 10 meters (33 ft) of the vehicle.
- The RKE system has no effect on the normal operation of the power door locks.
- The RKE system has no effect on the rear window power release.
- Each remote keyless entry transmitter is coded in order to prevent another transmitter from unlocking the vehicle.
- If the remote control transmitter is lost or stolen, a replacement may be purchased through the dealer. Each vehicle may have up to 4 transmitters matched to the vehicle.

Remote Keyless Entry System Operation

Unlocking the Doors

1. Press the UNLOCK button on the transmitter once in order to unlock the driver's side door.
2. Press the UNLOCK button on the transmitter a second time, within 3 seconds, in order to unlock the remaining doors.

This second press of the unlock button also unlocks the liftgate on utility vehicles equipped with this feature.

Locking the Doors

1. Press the LOCK button on the transmitter in order to lock all of the vehicle doors at once.

This press of the lock button also locks the liftgate on utility vehicles.

2. Press the LOCK button a second time, within 3 seconds, and the horn will chirp.

Rear Window Release (Utility Models Only)

1. Press the REAR 2X button twice, within 3 seconds, in order to unlatch the rear window.
2. On vehicles equipped with a manual transmission, the parking brake must be set in order for the rear window release feature to operate.

Remote Panic Alarm

1. Press the button with the horn symbol, located on the key transmitter, in order to set the remote panic alarm.

The following steps will occur in order to indicate that the remote panic alarm is ON:

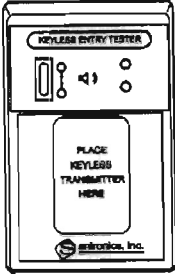
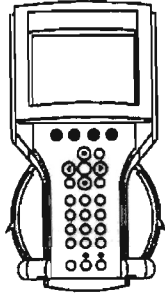
- 1.1. The horn will sound for up to 30 seconds.
- 1.2. The park lamps will flash for up to 30 seconds.
- 1.3. The taillamps will flash for up to 30 seconds.

2. In order to turn the remote panic alarm OFF, perform any one of the following:
 - 2.1. Press the horn button on the transmitter.
 - 2.2. Wait 30 seconds.
 - 2.3. Start the vehicle.

Remote Keyless Entry System Circuit Description

The Power Door Locks/Remote Keyless Entry control system provides several functions. The driver operates the vehicle door locks and rear window release from outside the vehicle using a hand-held radio transmitter. The transmitter sends coded signals to the remote control door lock receiver. The remote control door lock receiver detects and decodes the signal from the transmitter. The remote control door lock receiver issues signals to the body control module (BCM) through a serial data link. The BCM actuates relays to lock and unlock the doors and liftgate. The BCM can also release the liftglass. The power door lock switches provide manual control of the door locks. Refer to Release Systems or information on the operation of the rear window release system.

Special Tools and Equipment

Illustration	Tool Number/ Description
 <p style="text-align: right;">441447</p>	<p style="text-align: center;">J 43421 Keyless Entry Tester</p>
 <p style="text-align: right;">59260</p>	<p style="text-align: center;">Scan Tool</p>