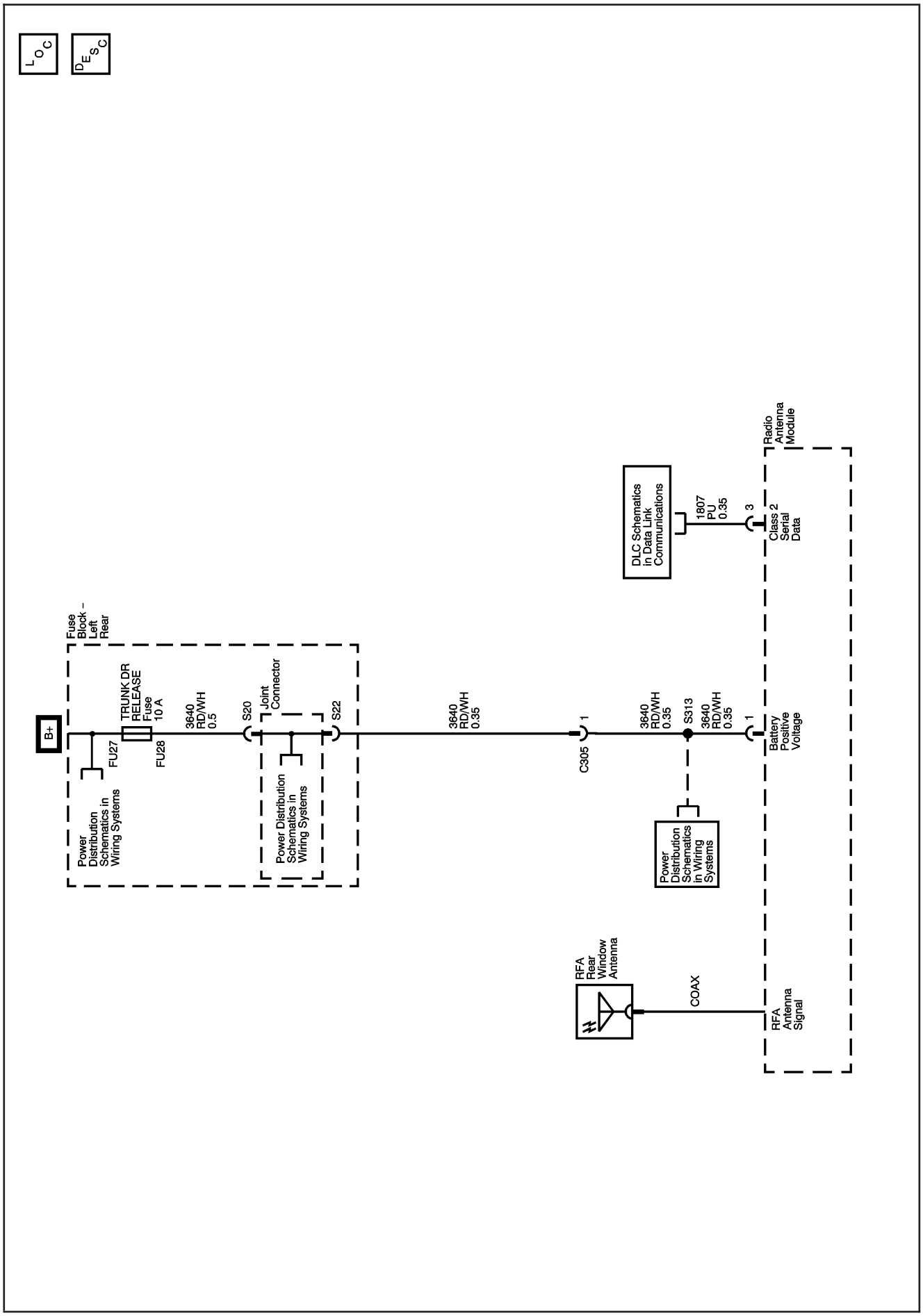
Keyless Entry

Schematic and Routing Diagrams

SIE-ID = 1227613 Owner = jsumme01 LMD = 21-jan-2003 LMB = jschro01

Keyless Entry Schematics



Diagnostic Information and Procedures

Diagnostic Starting Point - Keyless Entry

SIE-ID = 641263 Owner = tlerch01 LMD = 09-mar-2000 LMB = kkulic01

SIO-ID = 689022 LMD = 23-aug-2000

Begin the system diagnosis with *Diagnostic System Check - Remote Keyless Entry on page 11-4*.
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.

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.
3. The symptoms list in Symptoms will determine the correct diagnostic procedure to use.
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.

Diagnostic System Check - Remote Keyless Entry

SIE-ID = 641264 Owner = tlerch01 LMD = 16-may-2002 LMB = ckwiat01

Diagnostic System Check - Remote Keyless Entry

Step	Action	Yes	No
Schematic Reference: *Keyless Entry Schematics on page 11-2*			
1	Install a scan tool. Does the scan tool power up?	Go to *Step 2*	Go to *Scan Tool Does Not Power Up on page 8-27* in Data Link Communications
2	1. Turn ON the ignition, with the engine OFF. 2. Attempt to establish communication with the following modules: • Driver’s Door Module (DDM) • Passenger • Left Rear Door Module (LRDM) • Right Rear Door Module (RRDM) • The Dash Integration Module (DIM) • The Instrument Panel Cluster (IPC) • The Rear Integration Module (RIM) • The Radio Antenna module Does the scan tool communicate with all of the listed modules?	Go to *Step 3*	Go to *Scan Tool Does Not Communicate with Class 2 Device on page 8-28* in Data Link Communications
3	Select the display DTC function on the scan tool for the following modules: • Driver’s Door Module (DDM) • Passenger • Left Rear Door Module (LRDM) • Right Rear Door Module (RRDM) • The Dash Integration Module (DIM) • The Instrument Panel Cluster (IPC) • The Rear Integration Module (RIM) • The Radio Antenna module Does the scan tool display any DTCs?	Go to *Step 4*	Go to *Symptoms - Keyless Entry on page 11-6*

Diagnostic System Check - Remote Keyless Entry (cont'd)

Step	Action	Yes	No
4	Does the scan tool display any DTCs which begin with a "U"?	Go to *Scan Tool Does Not Communicate with Class 2 Device on page 8-28* in Data Link Communications	Go to *Step 5*
5	Does the scan tool display DTC B1000, B1001, B1004, B1007, B1009, B1013, or B1014?	Go to *Diagnostic Trouble Code (DTC) List on page 8-15* in Body Control System	Go to *Step 6*
6	Does the scan tool display DTC B1327 or B1328?	Go to *Diagnostic Trouble Code (DTC) List on page 6-13* in Engine Electrical	Go to *Symptoms - Keyless Entry on page 11-6*

SIE-ID = 839791 Owner = tlerch01 LMD = 10-jul-2002 LMB = csharp01

Scan Tool Output Controls

Scan Tool Output Control	Menu Selection	Description
One Key Fob	Program Key Fobs	The Remote Keyless Entry system (Transmitter, Radio Antenna Module, Rear Integration Module) programs one transmitter.
Two Key Fobs	Program Key Fobs	The Remote Keyless Entry system (Transmitter, Radio Antenna Module, Rear Integration Module) programs two transmitters.
Three Key Fobs	Program Key Fobs	The Remote Keyless Entry system (Transmitter, Radio Antenna Module, Rear Integration Module) programs three transmitters.
Four Key Fobs	Program Key Fobs	The Remote Keyless Entry system (Transmitter, Radio Antenna Module, Rear Integration Module) programs four transmitters.

Scan Tool Data List

SIE-ID = 894429 Owner = tlerch01 LMD = 19-jun-2002 LMB = mschul01

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 on page 11-4*. 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

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition On, Engine Off			
8-Digit GM Part Number	Module Information	8 digit number	25665573
# of Fob's Programmed	Key Fob Information	number	4
Calibration ID	Module Information	4 digit number	5573

Scan Tool Data List (cont'd)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition On, Engine Off			
Invalid Transmitter	Key Fob Information	number	0
Key Pressed on Fob	Key Fob Information	Lock, Unlock,Panic, Fuel, Rear Compartment	Unlock
Last Fob Used	Key Fob Information	number	1
PROM ID	Module Information	4 digit number	8073

Scan Tool Data Definitions

SIE-ID = 894430 Owner = tlerch01 LMD = 19-jun-2002 LMB = mschul01

8–Digit GM Part Number: The scan tool displays an 8 digit number which indicates the GM part number of the module.

# of Fobs Programmed: The scan tool displays 1 Fob — 4 Fobs to indicate the number of keyless entry transmitters that are programmed for the system.

Calibration ID: The scan tool displays a 4 digit number which indicates the calibration ID number of the module.

Invalid Transmitter: The scan tool displays More Than 10 or Less Than 10 which indicates how many times an invalid transmitter has been used in the vicinity of the vehicle.

Key Pressed on Fob: The scan tool displays Dr. Door Unlock, Door Lock, All Door Unlock, Trunk, or Fuel Door/Alarm which indicates which keyless entry transmitter button was last pressed.

Last Fob Used: The scan tool displays Fob#1–Fob#4 which indicates the number of the last keyless entry transmitter used.

PROM ID: The scan tool displays a 4 digit number which indicates the ID number of the PROM associated with the module.

Symptoms - Keyless Entry

SIE-ID = 681226 Owner = tlerch01 LMD = 20-nov-2000 LMB = kkulic01

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

1. Perform *Diagnostic System Check - Remote Keyless Entry on page 11-4* 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 Keyless Entry System. Refer to *Checking Aftermarket Accessories on page 8-10* in Wiring Systems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to *Testing for Intermittent and Poor Connections on page 8-14* in Wiring Systems.

Symptom List

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

- *Panic Mode Inoperative on page 11-6*
- *Keyless Entry System Inoperative on page 11-7*

SIE-ID = 681228 Owner = tlerch01 LMD = 02-nov-2000 LMB = kkulic01

Panic Mode Inoperative

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check?	Go to *Step 2*	Go to *Diagnostic System Check - Remote Keyless Entry on page 11-4*
2	With the keyless entry transmitter, attempt to operate the panic function. Do both the horns and the park lamps pulse on and off?	Go to *Testing for Intermittent and Poor Connections on page 8-14* in Wiring Systems	Go to *Step 3*
3	Do any of the panic functions operate?	Go to *Step 4*	Go to *Keyless Entry System Inoperative on page 11-7*

Panic Mode Inoperative (cont'd)

Step	Action	Yes	No
4	Do the horns pulse on and off?	Go to *Diagnostic System Check - Lighting Systems on page 8-52* in Lighting Systems	Go to *Diagnostic System Check - Horns on page 8-7* in Horns

SIE-ID = 826495 Owner = tlerch01 LMD = 27-feb-2003 LMB = tlerch01

Keyless Entry System Inoperative

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check?	Go to *Step 2*	Go to *Diagnostic System Check - Remote Keyless Entry on page 11-4*
2	Press each button of the transmitter one at a time. Does the system operate normally?	Go to *Testing for Intermittent and Poor Connections on page 8-14* in Wiring Systems	Go to *Step 3*
3	Lock and unlock the door locks using the controls inside the vehicle. Do the locks operate properly?	Go to *Step 4*	Go to *Diagnostic System Check - Door Systems on page 8-40* in Doors
4	Operate the rear compartment release from the controls inside the vehicle. Does the rear compartment release operate properly?	Go to *Step 5*	Go to *Symptoms - Body Rear End on page 8-9* 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 *Transmitter Battery Replacement on page 11-9*. 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 10*	—
10	**Important:** All transmitters which are to be recognized by the Keyless Entry system 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. Perform the programming procedure. Refer to *Transmitter Programming on page 11-11*. Did the locks cycle to lock then unlock?	Go to *Step 12*	Go to *Step 11*

Keyless Entry System Inoperative (cont'd)

Step	Action	Yes	No
11	**Important:** When replacing the Radio Antenna Module, perform the transmitter programming procedure. Replace the Radio Antenna Module. Refer to *Antenna Module Replacement on page 11-59*. Did you complete the replacement?	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*

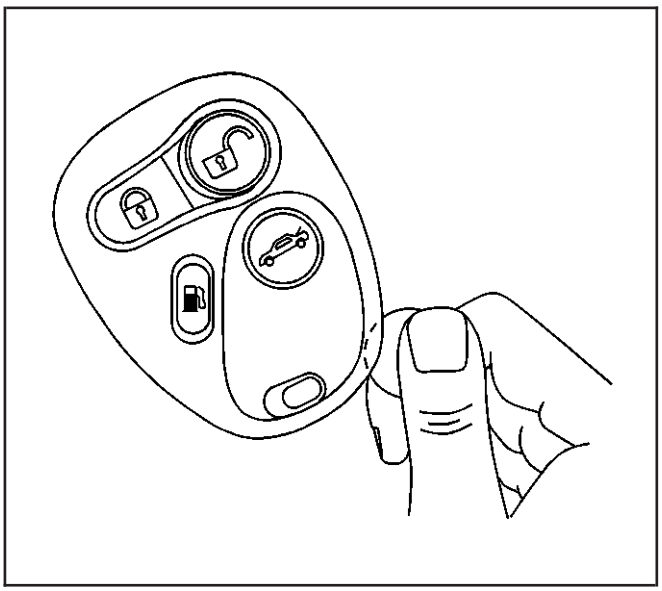
Repair Instructions

Transmitter Battery Replacement

SIE-ID = 595390 Owner = arusse01 LMD = 07-feb-2000 LMB = hinks

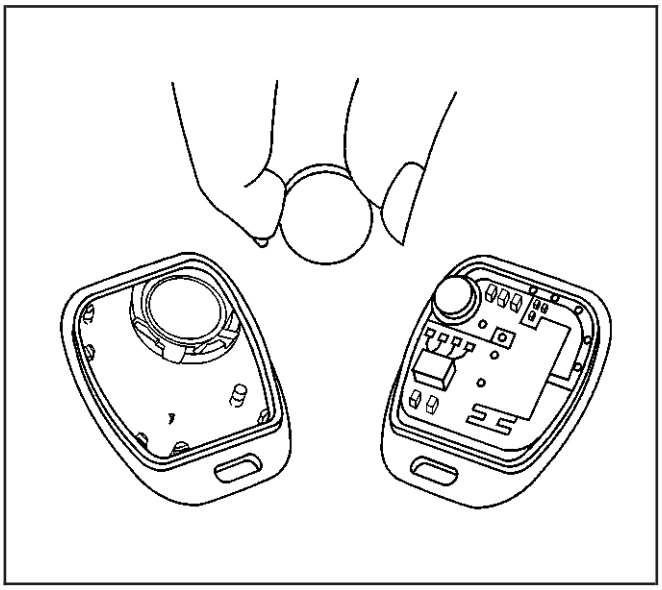
Removal Procedure

1. Insert a coin into the slot on the battery access cover on the back of the transmitter.

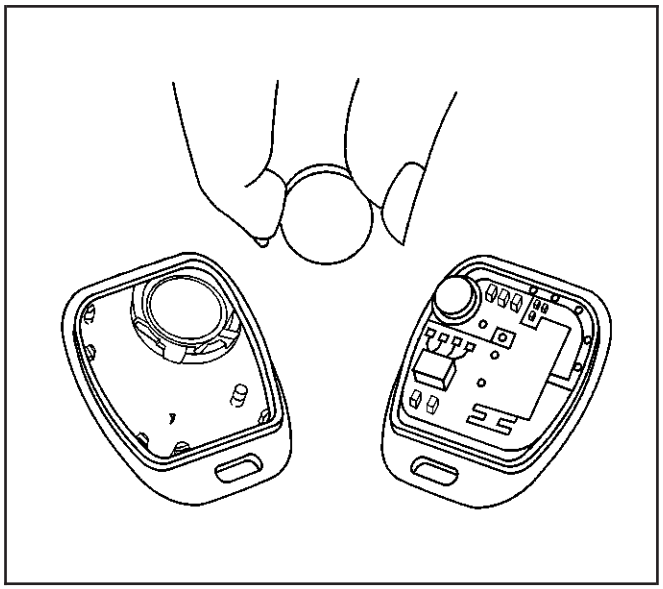


439246

2. Turn the coin counterclockwise to remove the transmitter rear cover.
3. Remove the battery.



439247



439247

Installation Procedure

Important: Use the proper battery size or damage to the transmitter may result.

1. Install a GM P/N 90541381 battery type or equivalent.
2. Install the transmitter rear cover.
3. Test the transmitter operation.

Transmitter Programming

SIE-ID = 838366 Owner = tlerch01 LMD = 27-feb-2003 LMB = tlerch01

Transmitter Programming

Important: All transmitters which are to be recognized by the Radio Antenna Module (RAM) 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. Up to 4 transmitters can be programmed. Do not operate or program the transmitters in the vicinity of other vehicles that are in keyless entry program mode. This prevents the programming of the transmitters to the incorrect vehicle. The order in which the transmitters are programmed is important. The first transmitter programmed will become Driver #1, and the second transmitter programmed will become Driver #2. The number on the back of the transmitter is for reference only. Additional unnumbered transmitters are also available. Use care to program the transmitters correctly.

To program transmitters:

1. Install a scan tool.
2. Turn ON the ignition, with the engine OFF.
3. Use the scan tool menu Body, RFA, Special Functions, Program Key Fobs in order to access transmitter programming.
4. Follow the directions on the scan tool in order to program the transmitters.
5. Operate the transmitter functions of each transmitter in order to verify correct system operation.

Description and Operation

Keyless Entry System Description and Operation

SIE-ID = 681976 Owner = tlerch01 LMD = 05-may-2003 LMB = csharp01

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 radio antenna module

When you press a button on a transmitter, the transmitter sends a signal to the radio antenna module. The module interprets the signal and activates the requested function via a class 2 message over the serial data line.

Unlock Driver Door Only

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

- Unlock the driver door only.
- Illuminate the interior lamps for approximately 40 seconds or until the ignition is turned ON.
- Flash the exterior lights (if selected ON in personalization).
- Disarm the content theft deterrent (CTD) system (if equipped).
- Deactivate the CTD system when in the Alarm Mode (if equipped).
- Recall the memory seat and memory mirror positions 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 for approximately 40 seconds or until the ignition is turned ON.
- Flash the exterior lights (if selected ON in personalization).
- Chirp the horn (if selected ON in personalization).
- Recall the memory seat and memory mirror positions for that driver.

Lock All Doors

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

- Lock all of the doors.
- Momentarily illuminate the interior lamps.
- Flash the exterior lights (if selected ON in personalization).
- Chirp the horn (if selected ON in personalization).
- Arm the content theft deterrent (CTD) system.

Panic Alarm

Important: On export vehicles, the alarm function may not automatically reset after 30 seconds. The operator must cancel the alarm using one of the methods listed below.

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

- Illuminates the interior lamps.
- Pulses the horn.
- Flashes the head lamps.

All of the above will continue for 30 seconds or until any of the following conditions occur:

- 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 horn chirp may be personalized for two separate drivers as part of remote activation verification. For mode descriptions and programming instructions, refer to *Driver Personalization on page 11-1* in Personalization.

SIO-ID = 689049 LMD = 02-mar-2000

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 remote control door lock receiver (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 transmitter is out of synchronization. This occurs after 256 presses of any transmitter button when it is out of range of the vehicle.

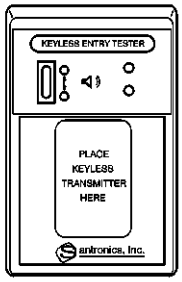
SIO-ID = 689051 LMD = 02-mar-2000

Automatic Synchronization

The keyless entry transmitters do not require a manual synchronization procedure. If needed, the transmitters automatically resynchronize when any button on the transmitter is pressed within range of the vehicle. The transmitter will operate normally after the automatic synchronization.

Special Tools and Equipment

SIE-ID = 619049 Owner = tlerch01 LMD = 01-mar-2001 LMB = scaugh01

Illustration	Tool Number/ Description
 441447	J 43241 Keyless Entry Tester