

**MODEL:** Karma Revero**DATE:** May 2018**TITLE:** Key Fob Function**Revised - February 2019****PRIORITY:** On Complaint**APPLICABILITY:** All Karma Revero**MARKET REGION:** North America**PURPOSE:** Functional description of the Key Fob to verify proper operation

This key fob function document will aid the technician to verify key fob operation. Keep in mind that each Revero is supplied with two key fobs and separate mechanical key blades.

The vehicle security system, door locks, and ignition are controlled by the key fob (Fig. 1). The doors and trunk can be locked or unlocked using the key fob. Additionally, the key fob is part of the immobilizer system and the user can configure the vehicle's lights and horn to provide feedback on locking, unlocking, security system status and side view mirror folding/unfolding. Detailed system operation is described below.

When presented with any key fob concerns, refer to the Table of Contents (TOC) below to address any possible concerns and restore any lost system functionality:

- I. Using the Key Fob - How to: (Page 2)
- II. Verifying Key Fob Functions
- III. Key Fob Antennas
- IV. In-Car Settings
- V. Key Fob Battery
- VI. Key Fob Battery Shimming Procedure



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## I. USING THE KEY FOB - How to:

The buttons on the key fob (Fig. 2) operate as follows:

### **Button 1:** Key Fob Lock: Remote Keyless Entry (“RKE”)

- Press once (1x) to lock the vehicle and activate the vehicle’s security system (anti-theft alarm is armed)
- The vehicle’s lights will briefly flash to confirm system is active.
- Audible and Visual feedback is dependent on the selection made by the user in the Settings Menu on the Touch Panel Interface (TPI)

### **Passive Lock:**

When exiting the vehicle, press the switch on the exterior door handle and close the door. All doors should lock and the parking lights should flash once, indicating the security system is active

**NOTE: All other doors must be closed when passive locking the vehicle, Passive Lock can only be enabled using the front doors and a Key Fob must be within 1.5 meters of the outside rearview mirror.**

### **Remote Cabin Pre-Conditioning (CPC):**

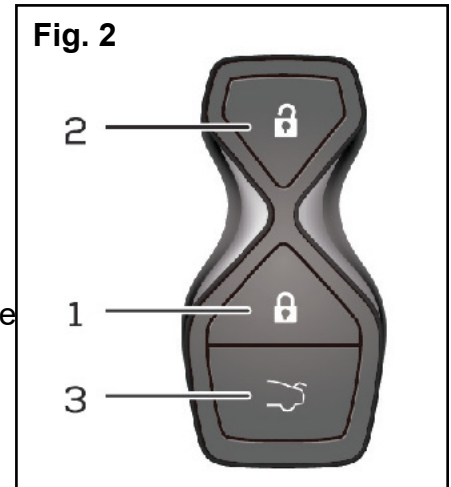
The following pages have a description on CPC system set up.

- First, make sure to enable these settings in the Touch Panel Interface (TPI).
- Press lock once (1x), then press and hold the lock button for two (2) seconds to activate the remote preconditioning feature. **NOTE: The lights will flash twice; one short and one long, to signal successful activation. The power button will alternate green and amber when CPC is active.**

### **Button 2:** Key Fob Unlock: Remote Keyless Entry (“RKE”)

- Press unlock button once (1x) to unlock the driver’s door.
- Press the button a second time to unlock all doors
- The parking lights should flash and the mirrors may unfold, if configured, to confirm door unlocking.

**NOTE: This functionality is dependent on enabling applicable user functionality in the Settings menu of the Touch Panel Interface (TPI).**



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**Passive Unlock:**

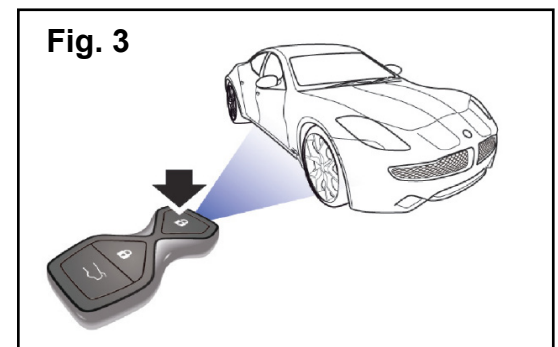
- When a programmed key fob is in your possession, and within the specified range (1.5m), activate an exterior front door handle (Fig. 3).
- Dependent on current vehicle settings, either a single door, the entire side of the vehicle, or all doors will unlock. **NOTE: If a key is sensed inside the vehicle, the system will not be able to authorize passive unlock request, until the key fob is removed and no longer sensed inside the passenger compartment.**
- The parking lights may flash to indicate system status. **NOTE: This functionality is dependent on enabling applicable user functionality in the Settings menu of the Touch Panel Interface (TPI).**

**Button 3:** Trunk Release:

- Press and hold the trunk release button for three (3) seconds to release the trunk

With a new full capacity, and properly inserted, battery you can expect the following system functionality:

- Remote Keyless Entry, trunk opening, and CPC actions are available within **10 meters (minimum)**
- Passive Entry is available to activate at a distance of **1 or 2 meters (3-6ft)** from the front doors of the vehicle
- Vehicle Start will operate with the key fob inside passenger compartment.



**NOTE: It is not necessary to point the key fob at the vehicle, but the key fob should be within the specified operating range. The operating range will vary according to the condition of the key fob battery, and other physical factors. If the vehicle cannot be locked, or unlocked, using the buttons on the key fob, battery replacement may be required.**



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## II. Verifying Key Fob Functions

**Exercise** - Typical Use Case Scenarios:

**NOTE: Test at the specified distances, from every side of the vehicle, for remote entry and trunk opening.**

1. Starting with the vehicle in "OFF\_AWAKE", all doors closed, and the key fob outside, 45 seconds before this state expires. Lock the vehicle as soon as you exit.
2. Press Button 1 (lock button), then, verify vehicle lock status.
3. Allow vehicle to sleep (power vehicle OFF and wait for seven (7) minutes).
4. Passively unlock the vehicle, with assistance place the key 10 meters away and attempt to passively open the locked vehicle. For every attempt, bring the fob closer by one (1) meter until the specified distance of 1 - 2 meters is reached.
5. Open driver's door and enter the vehicle
6. Place key upright in front cup holder
7. Close all doors
8. Turn vehicle on (Karma start button turns green)
9. Open and Close door
10. Turn vehicle off
11. Exit vehicle with key
12. Passive Lock vehicle
  - a. Key outside of vehicle (within 1.5m of outside rear view mirror), all doors closed except for the one where passive locking will be requested (must be a front door)
  - b. While the door is open, press the exterior door button at the handle once
  - c. Close door
  - d. Move key fob 15 meters or more from the vehicle, confirm the vehicle is locked
13. Allow vehicle to sleep (power vehicle OFF and wait for seven (7) minutes)
14. RKE unlock vehicle
15. Open driver's door
16. Place key upright in front cup holder
17. Turn vehicle on (Karma start button turns green)
18. Close all doors
19. Turn the vehicle OFF
20. Exit vehicle with key
21. Press Button 1 (lock button), then, verify the vehicle lock status.
22. Allow vehicle to sleep (power vehicle OFF and wait for seven (7) minutes)

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Verify the Key Fob Signal by checking the Received Signal Strength Indicator (RSSI):

An RSSI value provides a means of identifying the signal strength received by the vehicle. It allows the person performing the troubleshooting exercise to assess the noise floor and compare it to the received signal. Comparatively, a Vehicle Control Module (VCM), without an RKE antenna connected, will show a lower RSSI value, as compared to when an RKE antenna is connected. **NOTE: The RSSI also allows for monitoring of when an RKE signal has been received.**

### Connect KarmaSync:

Key Fob activation (and key fob ID, 1, 2, or 3.) is available to view in **Live Data**.

- Go to **Live Data** (Module Diagnosis -> Body -> Vehicle Control Module Security -> Measurement Values) to visualize as the key fob signal is sent, as measured in mV.
- Observe UHF RSSI Value (The UHF RSSI Value should increase each time the key button is pressed)
- Test at multiple locations outside, and inside, of the vehicle and record the results below.

Location	Left Side	Right Side	Rear	Interior
Value (mV)				

The value will be influenced by exterior factors, such as metal structures and objects near the vehicle. This step can confirm that a key fob is working properly. While there is no 'pass/fail' value, if there is significant change in the value, then, the system is working correctly at this time (see Fig. 4 for value

**Fig. 4**



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If the key fobs do not operate correctly, begin with battery replacement. If the key fob continues to malfunction, shim the battery as specified in section **VI**, Key Fob Battery Shimming Procedure.

If this key fob still does not function correctly, test the antenna connections (see below)

Replace as needed (normal warranty rates apply) for the affected parts for replacement and diagnosis.

### **III. Key Fob Antennas:**

Antennas which detect the presence of the key fob are located in the following locations (Fig. 5):

1. Behind the dashboard
2. Beneath the center console
3. Underneath the rear parcel shelf
4. In both external mirrors

**Fig. 5**



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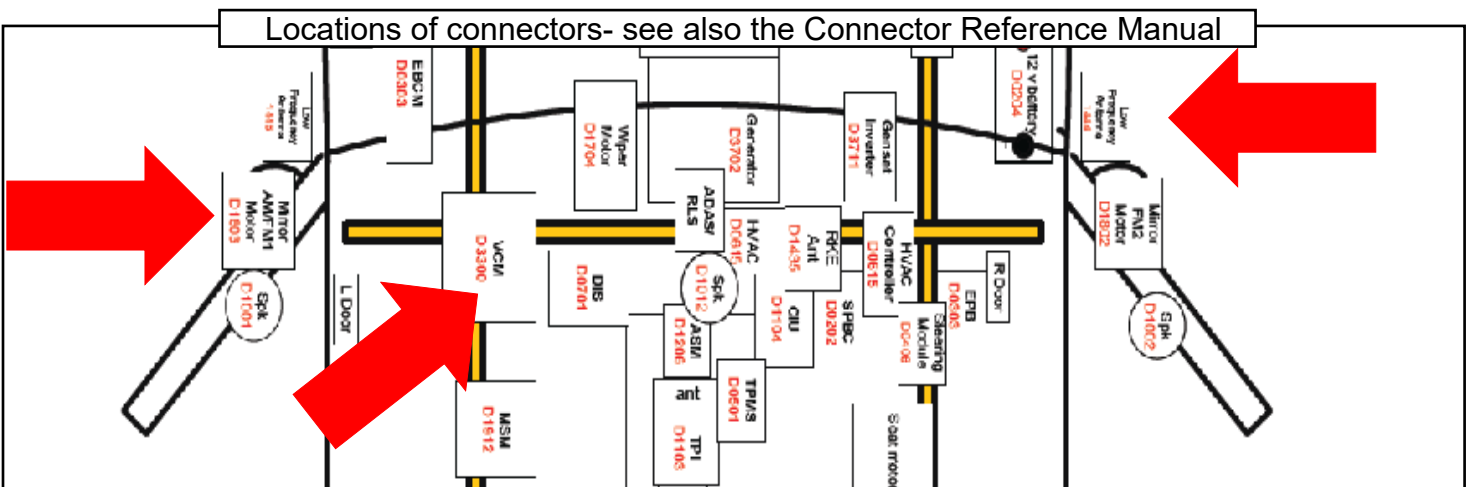
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**Note:** Interference from other radio equipment operating on a similar frequency may also affect the operation of the key fob. Metal objects, mobile phones, or devices, held against or in close proximity to the fob, may affect signal reception. If this happens, operate the key fob as close to a vehicle antenna as possible. If you are still unable to unlock the vehicle with the key fob, use the manual door lock located on the passenger side front door.

If a problem persists inspection of the antennas may be required. Measure Low Frequency (“LF”) Antenna resistance value at module connector. The target resistance value is 1.5 ohms +/- 0.6 ohms.

ECU	LF Antenna Location	Connector and Pins
VCM	Left OSRVM	D3300-7, Pin(s) 16 & 17
VCM	Center Console	D3300-7, Pin(s) 8 & 20
VCM	Right OSRVM	D3300-7, Pin(s) 18 & 19
DML (Door Module Left)	Trunk Shelf	D1436-2, Pin(s) 14 & 28
DMR (Door Module Right)	Instrument Panel	D1437-2, Pin(s) 14 & 28

Remember that the RKE operations: Lock & Unlock from Front, Rear, Left and Right of the vehicle operate at a minimum distance of **10 meters**.



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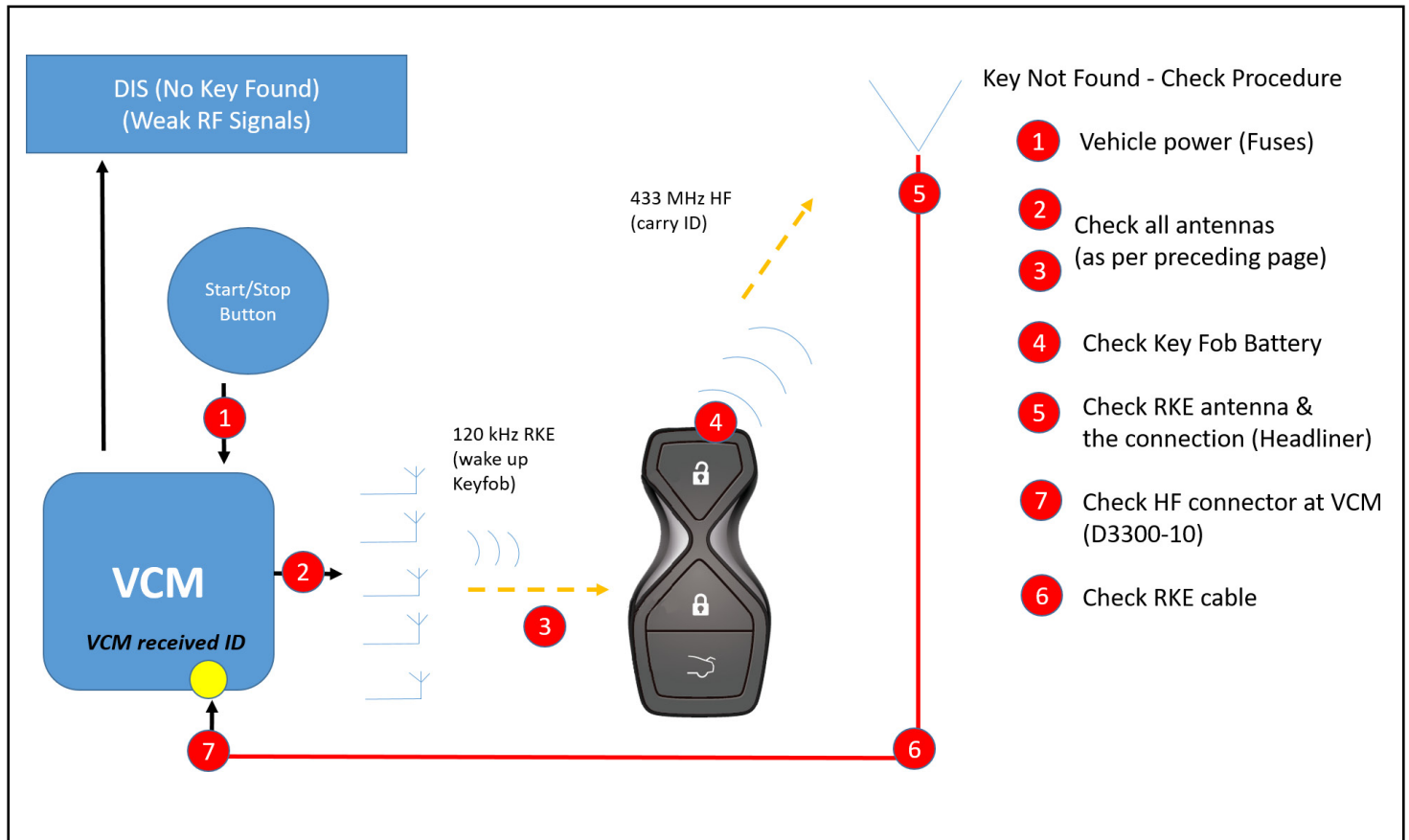
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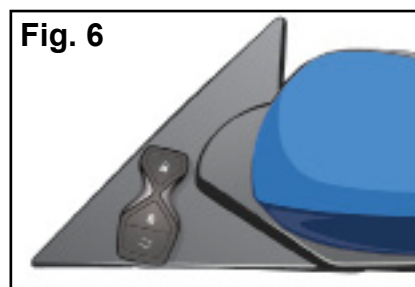
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Use the diagram below as a diagnostic aid.



When the key fob is not detected, place the key fob on the external part of the side view mirror base, as shown in Figure 6. This will create a shorter communication path for the fob to transmit a signal and allow the security system to recognize the wake fob to ensure proper system operation.



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### IV. IN CAR SETTINGS:

There are nine different options offered through the Touch Panel Interface (TPI) (Fig 7a).

To access these settings press:

**My Karma > Settings > Doors & Mirrors**

**NOTE: The following key fob action descriptions assume that all of these settings have been enabled.**

The key fob can also be used to activate the Cabin Pre-Condition (“CPC”) feature (Fig. 7b). This feature enables the fob to remotely turn on the climate control system and adjust the temperature inside the vehicle to the pre-configured setting.

To configure CPC press:

**My Karma > Settings > Seats & Keys > Under Seats & Keys, scroll to CPC Target Temperature and/or CPC Confirmation.**

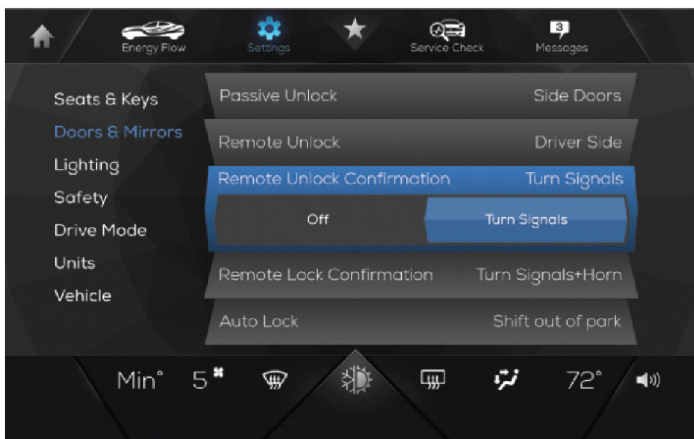


Fig. 7a

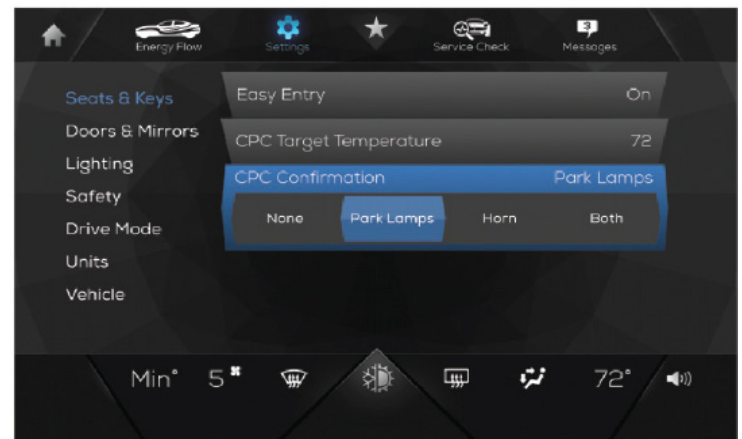


Fig. 7b

**NOTE: Passive entry to the vehicle is allowed when you activate the exterior door handle switch and you have a registered key close to the vehicle. The doors can be programmed to use the Passive Lock feature.**

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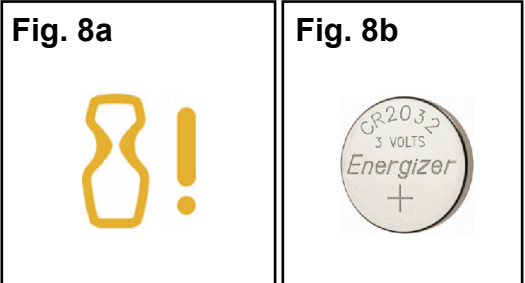
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### V. KEY FOB BATTERY

Replacing the Key Fob Battery:

If the vehicle detects that the key fob battery is low, the following message, and icon, will be displayed in the Touch Panel Interface (TPI): “Key Fob Battery Low” (Fig. 8a).



#### NOTE:

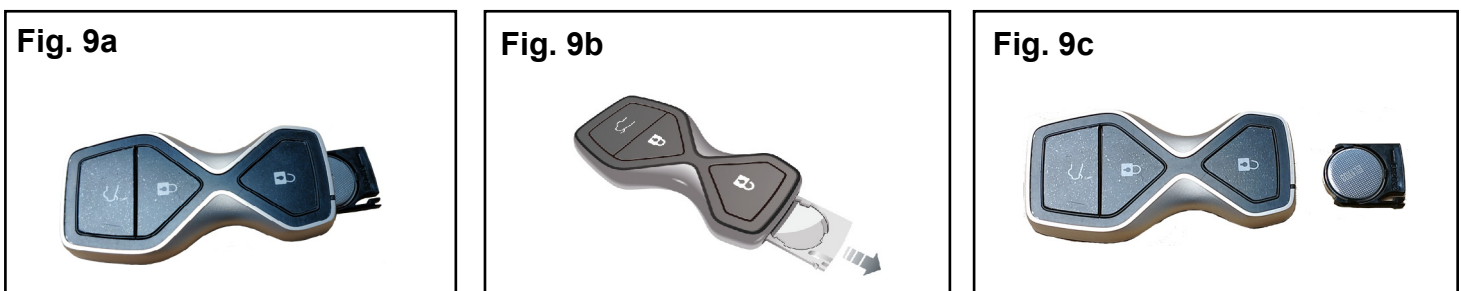
- **Key Fob battery voltage above 3V, is best**
- **Battery thickness should be 3.12mm. Make sure the battery is the correct size to allow for proper contact with the terminals. ‘Energizer’ brand batteries are the most consistent.**
- **Take proper care to not short-circuit the battery if using metal calipers to gauge proper battery thickness. A set of plastic calipers should be used when performing measurements.**

If the key fob battery is low at the time of service, replace as part of the normal service procedure. Replace the battery every time the vehicle comes in for service, under normal warranty, as a way to prevent a low battery concern. When out of warranty, replace key fob battery as ‘low’ or when requested. Additionally, shim the new batteries, as necessary, during service procedure verification (Refer to the battery shimming procedure on Page 11).

To change the key fob battery (Figs. 9a, 9b, 9c)

1. Place the key fob button side up on a soft surface so as not to mar or scratch any surface
2. Carefully release the battery tray lock. Slide the battery tray out to access the battery
3. Remove the battery and replace with a new battery Ensure proper polarity of coin cell battery when installing. Positive Terminal must face down.

**Note: Ensure battery tray is fully inserted when reinstalling the battery tray in the key fob (there is an audible “click” when fully inserted). The required batteries are 3V, Type CR2032 (Fig. 8b) and are available from Karma as P/N C161194800100.**



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### VI. KEY FOB BATTERY SHIMMING PROCEDURE

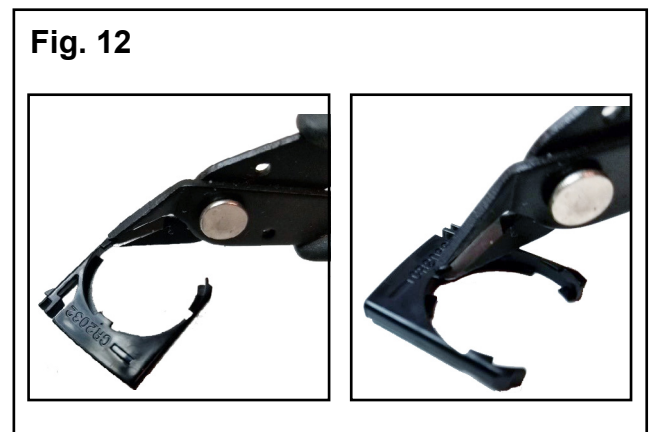
On some key fobs, it may be necessary to shim the battery to ensure best fit and proper contact of the battery with the terminals. If after installing a new key fob battery, any fobs which are still exhibiting intermittent operation, or displaying similar concerns, may be restored to proper functionality by performing a simple shimming procedure to the battery, as shown below.

1. Remove the battery tray from the key fob, as described on Page 10.

2. Remove the battery from the tray and locate the side with "CR2032" and a Negative (-) symbol marked on it, as shown in Figure 10.

3. Locate three (3) small tabs on the battery tray, as shown in Figure 10.

4. To ensure proper battery fit in the tray after applying the shims, use a set of flush-cut pliers (Fig. 11) to remove three (3) tabs off the battery tray, as shown in Figure 12.



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5. Use two (2) round stickers as shims, such as Avery color coding labels (5472) in 3/4" size (Fig. 13).

**NOTE:** The shim(s) should add a maximum of 0.25mm to the height of the battery. Overall height should **NOT** exceed 0.30mm.

6. Place one (1) or two (2) shims over the Positive (+) terminal (flat side) of the battery, as shown in (Fig. 14), as required.

7. Reinstall the battery onto the tray (Fig. 15), replace the tray in the key fob, and test the key fob, again, to verify proper function.

**Fig. 13**



**Fig. 14**



**Fig. 15**



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If a Key fob is exhibiting faulty operation, create a TSS case and provide the key fob serial number.

**NOTE: The serial number is located directly below the CE mark on the back of the key fob and begins with a “W” or an “X” (Fig. 16). For Example: The fob in Figure 13 has the following serial number: “WL0333”.**

Replace and reprogram using normal warranty labor operation (90-40-12-00), as required.

Fig. 16

