CLIFFORD

World-Class Auto Security™

VirtualKey™

AutoImmobilizer™

Installation Manual

Standard Features

☑ ***Lifetime Warranty*** — For as long as your customer owns the vehicle, Clifford Electronics will repair or replace the control unit free of charge.

☑ ***A Pair of VirtualKeys™*** — These ingenious proximity keys attach to your customer's car keys and communicate through the airwaves with the engine immobilization system even before the key is into the ignition switch. These keys are truly virtual since they are completely "user-transparent." There is nothing the driver needs to do in order to arm or disarm the VirtualKey AutoImmobilizer.

- ***280 Trillion Digital Codes*** — Each VirtualKey utilizes a truly unique digital code selected from a code universe of ***more than 280 trillion digital codes***. Even if a thief had the ability to rapidly create codes, it would take ***millions of years*** of constant work! And no two keyfobs will ever have the same code.
- ***User-Transparent Arming and Disarming*** — There are no remotes, no personal codes to remember, no receptors to touch, no hassle whatsoever. The driver of the vehicle does absolutely nothing in order to arm or disarm the system.
- ***Incredibly Rugged*** — No battery to run down nor mechanical parts to wear out. The VirtualKeys are weather-proof, water-proof and virtually indestructible.

☑ ***MultiPoint™ Immobilization with On-Board Relays*** — Three on-board relays interrupt the ignition, starter and the electric fuel pump or other device.

☑ ***Attempted Theft Alert*** — For maximum theft alert, the system will sound an alarm by triggering the car horn or optional siren if, within 15 seconds after the door is opened, the ignition key that has the VirtualKey attached has not been inserted into the ignition switch. The horn/siren will sound for up to five siren duration cycles of 30 seconds each.

☑ ***MultiKey™ Recognition*** — The VirtualKey AutoImmobilizer accepts up to 30 VirtualKeys, perfect for fleet and other commercial vehicles.

☑ ***AutoArming*** — The system passively arms itself sixty seconds after the key is removed from the ignition.

Standard Features *(cont.)*

☑ ***Car Dealer Friendly*** — Easy to manage on the car lot, since there is no need for separate VirtualKeys for each system. Until the car is sold, the system will accept *any* VirtualKey. Once a key is coded into the system, only it (or other keys programmed by the owner) will disarm the VirtualKey AutoImmobilizer.

☑ ***MultiCar Protection*** — If the customer has more than one car, you can use any of the VirtualKeys to control any or all of the other vehicles for increased sales opportunities, even if each vehicle has an entirely different ignition key.

☑ ***Instant Code Learning*** — The customer can add new VirtualKeys in seconds, yet it's totally secure.

☑ ***Instant Code Deletion*** — If one of the VirtualKeys is ever lost or stolen, a simple procedure will clear all VirtualKey codes from memory so that the remaining VirtualKeys may be reprogrammed.

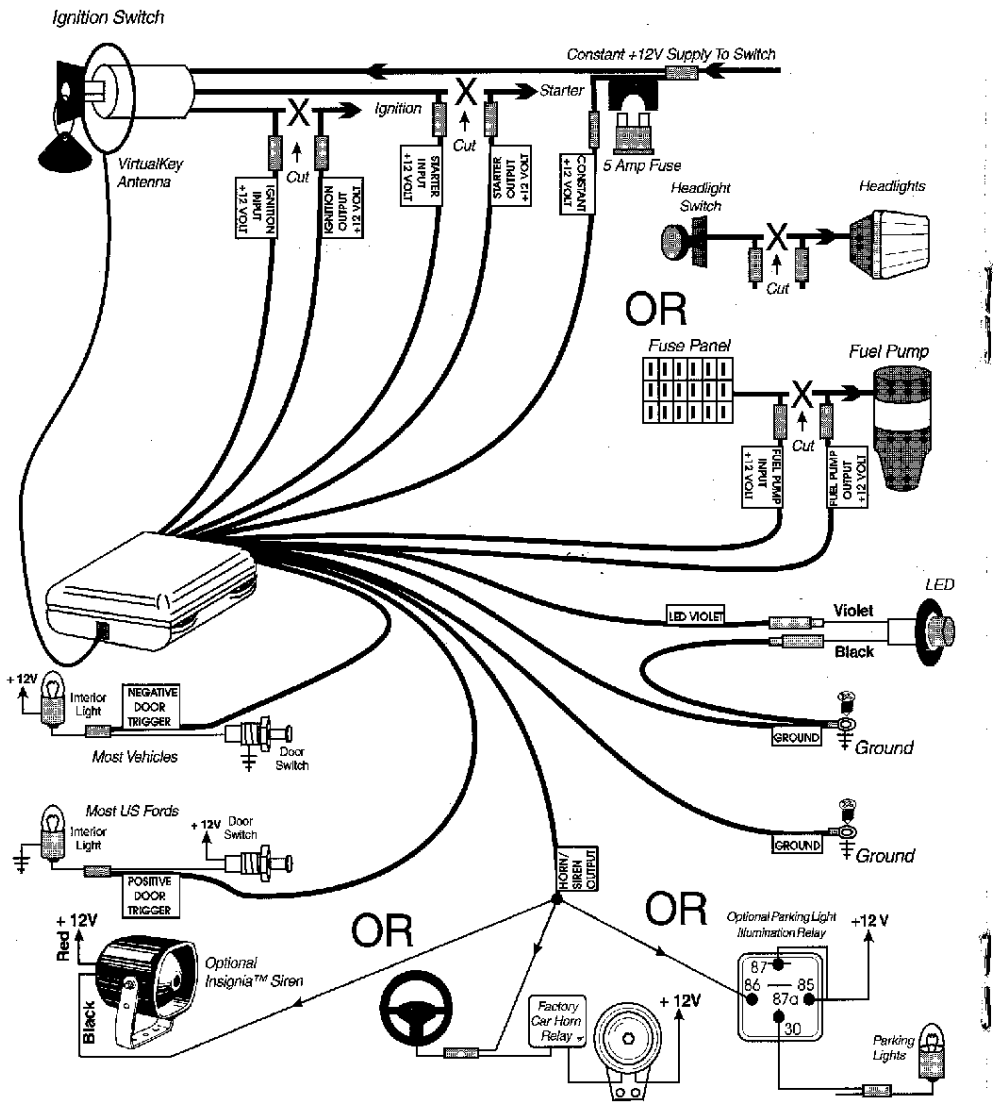
☑ ***Dual Grounds*** — To thwart tampering and assure unfailing operation.

☑ ***Non-Volatile Memory*** — Remembers all codes even if power is disconnected.

☑ ***Fault-Proof Driving Safety*** — Clifford's unique electronic circuitry assures that the VirtualKey AutoImmobilizer cannot inadvertently shut down the car's engine while the owner is driving.

☑ ***Sabotage-Proof Electronics*** — The three normally open relays assure that the vehicle remains immobilized even if a thief were to cut any of the wires or remove the control unit.

☑ ***High-Luminescence LED Status Indicator*** — Indicates system status and provides visual deterrence.



IMPORTANT: Remove tags after making connections.

Control Unit

Mount under the dash or under one of the seats. Secure with wire-ties.

Door Trigger

Door triggers on most cars are negative (except most Rolls-Royce and Ford cars). To determine door trigger polarity, use the following procedure:

1. Remove but do not disconnect the vehicle door switch.
2. Temporarily attach a wire to ground from the exposed metal housing of the switch (where the switch is installed in the door is usually the switch ground).
3. Connect a voltmeter lead to ground.
4. Find the one wire that shows +12 volts when the switch is pressed in and 0 volt when released. This is a **negative trigger** door wire. Connect the wire with the NEGATIVE (–) DOOR TRIGGER wire, then ***remove both the DOOR TRIGGER wire tags*** and insulate (tape) the unused door trigger input wire.
5. If you don't get the indications noted in step 4, connect the voltmeter lead to ground and find the one wire that shows 0 volt when the switch is pressed in and +12V when released. This is a positive trigger door wire. Connect the wire with the POSITIVE (+) DOOR TRIGGER wire, then ***remove both the DOOR TRIGGER wire tags*** and insulate (tape) the unused door trigger input wire.

LED

Select a suitable location on the dash or console clearly visible from outside the car.

1. Make sure there is adequate clearance for the LED, then drill a 5/16" hole.
2. Connect the BLACK wire to one of the system's ground wires.
3. Connect the VIOLET wire to the wire tagged LED VIOLET, then **remove the tag.**
4. Press the LED into place.

IMPORTANT: The following connections are vital to the operation of the vehicle. After crimping, pull the wires to make sure that they are solidly crimped. Or solder and shrink-tube each connection.

Ignition

1. Use a voltmeter to locate the **one** wire that carries +12V throughout **BOTH the cranking AND engine running cycles**, and 0 volt when the ignition is off.
2. Cut the wire, then try starting the engine. It should crank but not start.
3. Connect the ignition input and output wires as shown, then ***remove the wire tags.***

Starter

1. Use a voltmeter to locate the **one** wire that carries +12V during the **cranking cycle ONLY**. This is the starter wire.
2. Cut the wire, then try starting the engine. It should not crank.
3. Connect the starter input and output wires as shown, then ***remove the wire tags.***

Fuel Pump or Other Electric Device

1. Use a voltmeter to locate the +12V fuel pump supply wire.
2. Cut the wire and connect the fuel pump input and output wires as shown, then ***remove the wire tags.***

Car Horn/Parking Lights/Optional Siren

The on-board negative-switching relay will pulse the horn and/or parking lights (use two 6-amp diodes with bands pointing toward the control unit if connecting to two devices).

1. Connect the ***horn/siren output*** wire to the negative-switching device as shown in the illustration, then **remove the wire tag**. If the device is positive-switching, invert polarity with a relay.
3. **If connecting to an optional siren, you will need to change the pulsed output to constant. See page 7.**

Power and Ground

1. Connect the constant +12 volt wire to the fuse and fuseholder. Connect the other side of the fuseholder to the ignition switch's constant +12 volt supply line, then ***remove the wire tag.***
2. Connect the one of the two ground wires to a solid ground (resistance less than 0.1 ohm), then ***remove the wire tag.***
3. Connect the other ground wire to a *different* solid ground (resistance less than 0.1 ohm), then ***remove the wire tag.***

Transponder Antenna

The shielded cable that terminates in a two-pin connector is the transponder antenna. The loop must be mounted as close as possible to the keyhole of the ignition switch and must be perpendicular (right angle) to the floor of the vehicle. In other words, the antenna must be vertical, while the VirtualKey hangs horizontally. If they are not perpendicular to each other, they system may not be able to read the VirtualKey.

1. Remove the lower half of the steering column shroud.

2. Lift the top half of the shroud and position the loop over the ignition switch.
3. Use the supplied double-sided tape to temporarily adhere the antenna loop inside the top half of the shroud around the ignition switch.
4. Range testing mode: To check transponder range with the transponder antenna positioned, perform the following steps:
   a. While the system is disarmed, remove and then re-install the fuse.
   b. Within 30 seconds of reinserting the fuse, enter the vehicle, close all the doors and **keep them closed**, then turn the ignition to "ON" then "OFF" four times, then turn the ignition to "ON" and leave it on (you will notice that the LED blinks once each time).
   c. Wait until you see another LED blink (this will occur 30 seconds after you reinserted the fuse). This indicates that the system is now in range testing mode.
   d. Position one of the pre-programmed VirtualKeys near where it will hang from the ignition key while the key is in the ignition switch. When the VirtualKey is in range, the system LED will illuminate. If you find that the range is not adequate, reposition the antenna loop and retest.
   e. When the antenna loop has been properly positioned for maximum range, turn off the ignition to exit range test mode.
5. Permanently adhere the loop in position, then reassemble the steering column shroud.

MANDATORY: Program the VirtualKeys

The system will accept as many as 30 different VirtualKeys. To minimize dealer hassle and inventory costs, as shipped from the factory, the system will accept ***ALL VirtualKeys*** regardless of their codes until you program the first VirtualKey. Once a VirtualKey has been programmed, the system will respond only to programmed VirtualKeys. ***Before you deliver the car to the owner, you MUST program the VirtualKeys. To program VirtualKeys:***

1. Open a door and **leave it open** (make sure the courtesy light is on).
2. If you've attached a VirtualKey to the ignition key, remove it.
3. Turn the ignition switch to the "ON" position.
4. Immediately bring the VirtualKey within an inch of the ignition switch to disarm (LED will turn off), then move it away. Repeat this for a total of 5 times. When you bring the VirtualKey into range the 5th time, the LED will light and stay lit to indicate that the system is in program mode.
5. Within 60 seconds, bring **each additional** VirtualKey to within an inch of the ignition switch. When you do so, you will note that the LED will blink off once to indicate that that VirtualKey has been registered and the system will now accept it. Repeat this step for any other VirtualKeys you wish to add.
6. Turn the ignition off to end programming mode.

Properly Attach the VirtualKey to the Ignition Key

You must attach the VirtualKey directly to the vehicle's ignition key as shown in the illustration. **DO NOT ATTACH THE VirtualKey TO A KEYCHAIN.** Doing so may put too much distance between the VirtualKey and the transceiving antenna, thus preventing normal disarming.

Programming for Horn/Siren Pulsed or Constant Output

If installing an optional siren, you need to toggle the horn/siren output from its factory preset pulsed output to constant or vice-versa. To toggle the output type:

1. While the system is disarmed, disconnect then reconnect power.
2. Within 30 seconds of reinserting the fuse, enter the vehicle, close all the doors and **keep them closed**, then turn the ignition to "ON" then "OFF" 11 times. You will see an LED confirmation blink each time except the 11th time. The setting has now been toggled.

How to Delete the Code(s) of Lost or Stolen VirtualKeys(s)

You can erase the codes of lost or stolen VirtualKeys so that they can never again be used disarm the VirtualKey AutoImmobilizer. ***When done, you MUST use the procedure on page 6 to add all remaining VirtualKeys to the system, otherwise the system will respond to ANY unprogrammed VirtualKey.***

1. Open a door and leave it open (make sure the courtesy light is on).
2. If a VirtualKey is attached to the ignition key, remove it.
3. Turn the ignition switch to the "ON" position.
4. Immediately bring one of the VirtualKeys within an inch of the ignition switch to disarm (LED will turn off), then move it away. Repeat this for a total of 5 times. On the 5th time, ***hold*** the VirtualKey within an inch of the ignition switch for 30 seconds. When you do so, the LED will light to indicate that the system is in program mode. After 30 seconds of holding it in place, the LED will turn off to indicate that all codes have been erased from the system's memory.
5. Turn the ignition off to end programming mode.
6. **MANDATORY: Perform the procedure above to add all remaining VirtualKeys to the system, otherwise it will disarm when ANY VirtualKey is used.**

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