

## Standard Features of the Tornado

- ★ Lifetime Warranty — No hidden charges, just first rate service if it's ever needed.
- ★ A Pair of 2-Button/3-Channel Remotes — Fingertip control from up to 100' away.
- ★ Remote Control Code Learning — One touch interfaces the Tornado with up to four Avital remote controls, regardless of their individual codes.
- ★ Remote Control Code Deletion — Remove the code of a lost or stolen remote so that it's no longer a threat.
- ★ Electronic Scan Prevention (ESP) — Blocks digital code scanners used by thieves.
- ★ Remote Controlled Chirp Muting — Lets the owner mute the chirps via the remote.
- ★ Three Car Control— The user may command Avital systems on three of his vehicles with the same remote control.
- ★ Remote Door Lock/Unlock Outputs — Some cars require optional relays.
- ★ Programmable Door Trigger Polarity — No converters, no separate inputs, just connect to the door trigger line and, if positive polarity, a few flicks of a switch is all it takes.
- ★ Channel 2 Output — For a remote controlled trunk release or other remote accessory.
- ★ Parking Light Flasher Output — Visually confirms system status and draws visual attention to the vehicle when the alarm sounds (most vehicles require an optional relay).
- ★ Advanced CMOS Microprocessor — Large scale integration (LSI) for precise operation.
- ★ Automatic Self-Diagnostics — Checks all points each time the Tornado is armed.
- ★ Malfunction Alert — Warns you if there is a problem with an open or active line, and identifies whether the malfunction is a trigger or sensor input.
- ★ Automatic Malfunction Override — Overrides any malfunctioning trigger or sensor, then monitors all other points to provide the utmost possible protection.
- ★ Previous Intrusion Alert — Warns the owner if the system sounded while he was away.
- ★ User-Selectable Passive Arming — Arms itself if the owner forgets.
- ★ User-Selectable Passive Door Locking — Lets the owner select whether the doors automatically lock when the system passively arms.
- ★ High-Powered Electronic Siren — Loud, attention-getting wail.
- ★ Remote Panic — For personal safety, the siren and parking light flasher can be activated from a distance.
- ★ Vibration & Impact Sensor — For reliable, full-perimeter detection of theft attempts.
- ★ Starter Disable Output— Just add a relay to immobilize the vehicle while the Tornado is armed.
- ★ High-Luminescence LED Status Indicator — Indicates status and deters thieves.
- ★ Hood/Trunk Trigger Input — For full perimeter protection.
- ★ User-Friendly Programming — All it takes is a few flicks of a switch.
- ★ Secured Valet Mode — Permits valet parking, vehicle servicing and car washing.

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# TORNADO

Remote Controlled  
Vehicle Security System

## Installation Manual



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## Required Installation Tools

Voltmeter	Electric drill and bits	Convoluted tubing*
Wire crimpers	Phillips screwdriver	Solder gun*
Wire strippers	Crescent wrench	Shrink tube or electrical tape

\*Optional

## Important Information

- DO NOT disconnect battery cables! Make connections by removing lug nut from cable clamp without detaching clamp.
- Turn off interior lights or remove dome light fuse before starting installation.
- Test all vehicle circuits with a voltmeter. **DO NOT** use a test light.
- Make all connections with the supplied butt connectors. **DO NOT** twist wires together. **DO NOT** use wire nuts or "scotch lok" connectors.
- Route both RED and BLACK wires from control unit directly to battery.
- Keep extensions as short as possible. Use same gauge wire for short extensions. Use larger gauge wire for long extensions.
- BEFORE INSTALLING**, discuss placement of the LED indicator and valet switch with vehicle owner.
- Do not mount components or route wires near hot or moving vehicle parts.
- DO NOT** mount the sensor in the engine compartment.
- For proper installation and testing, follow the Installation Sequence on page 4

## Installation Sequence

### 1. Passenger Compartment

- Select a suitable location to mount the control unit.
- Wire the ignition input and optional starter disable relay.
- Mount and wire the LED indicator.
- Mount and wire the valet switch.
- Mount and wire the Vibration & Impact Sensor.
- Wire the door trigger.
- Wire the door locks.
- Wire the parking lights.
- Wire the trunk trigger and optional trunk release.

### 2. Engine Compartment

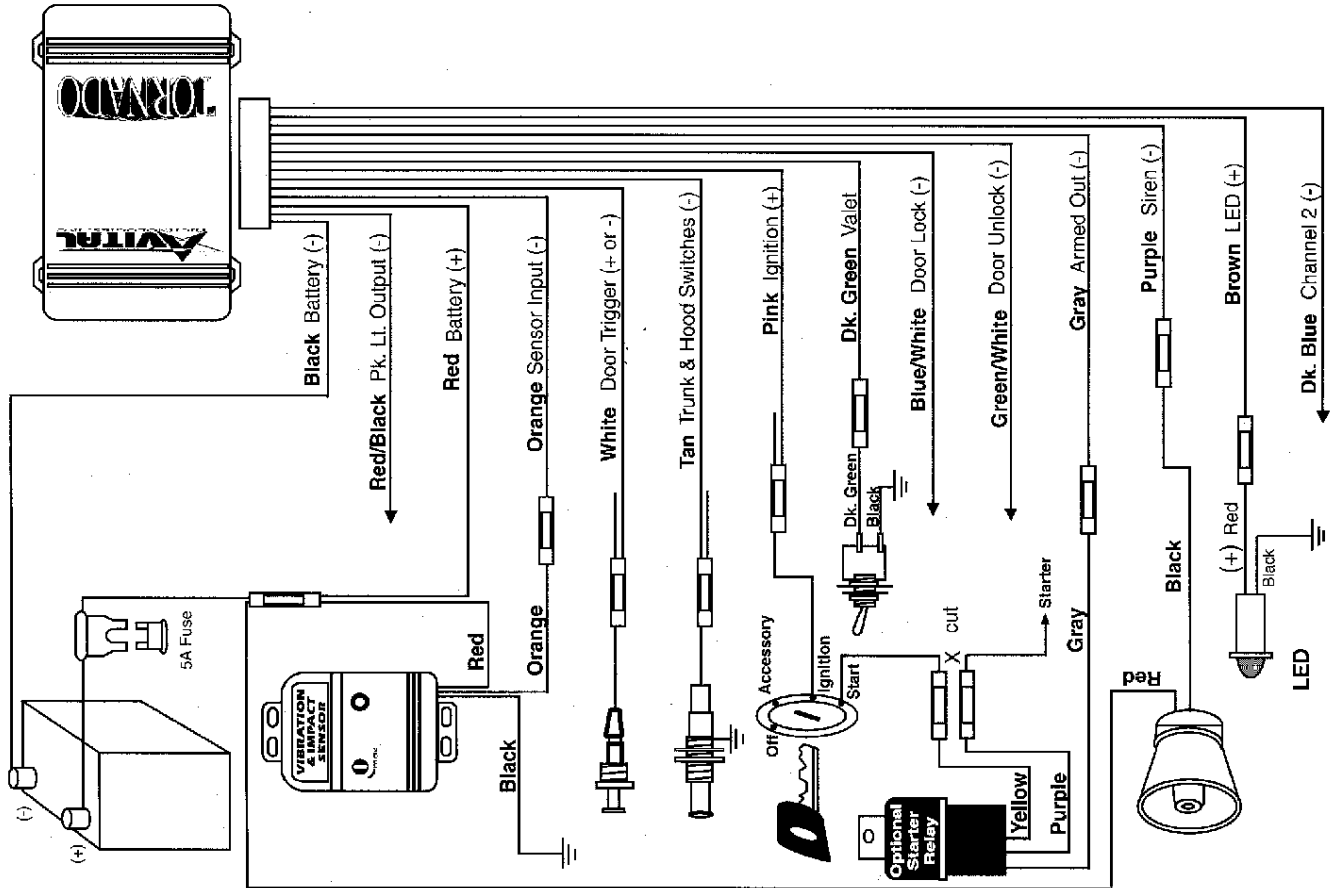
- Select locations to mount the siren and engine compartment accessories.
- Route and connect wires to each component using supplied connectors or solder and shrink tube.
- Make final wiring connections at battery.

### 3. Adjust sensor sensitivity (page 8).

### 4. Test, then secure the control unit and wiring.

# 14-Pin Connector

Pin	Wire Color	Connect To	Page
1	BLACK	Battery negative	8
2	RED/BLACK	Parking light negative (or a relay for positive switching)	7
3	RED	Battery positive	8
4	ORANGE	ORANGE sensor wire	7
5	WHITE	Door trigger line (+ or -)	7
6	TAN	Hood pin and trunk pin (-)	8
7	PINK	Ignition line	7
8	DARK GREEN	DARK GREEN valet/program switch wire	7
9	BLUE/WHITE	Door lock output (-)	5-6
10	GREEN/WHITE	Door unlock output (-)	5-6
11	GRAY	GRAY wire of optional starter disable relay	7
12	PURPLE	BLACK siren wire	8
13	BROWN	RED LED wire	7
14	DARK BLUE	Optional trunk release or other channel 2 accessory	8



## PASSENGER COMPARTMENT COMPONENTS

### Control Unit

- Identify where in the passenger compartment the control unit will be installed. DO NOT install the control unit in the engine compartment. For maximum remote control range, mount the control unit high under dash and as far away as possible from metal.
- Route wires from this point, leaving slack for ease of service.

### Antenna

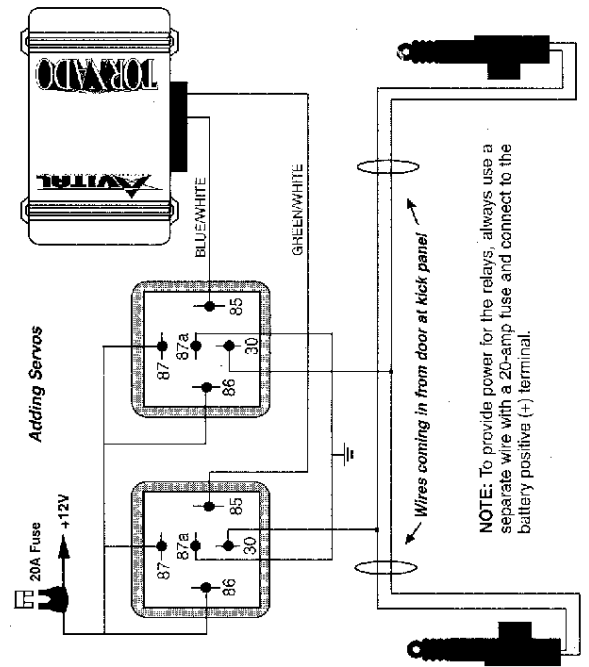
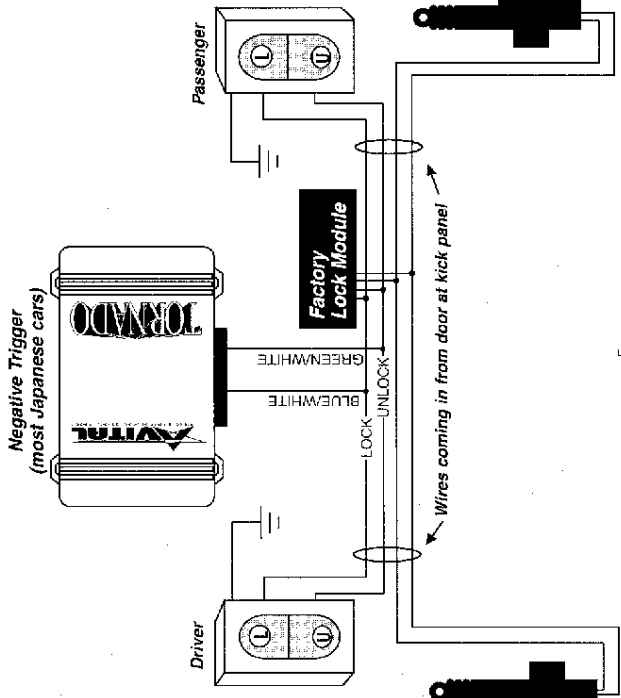
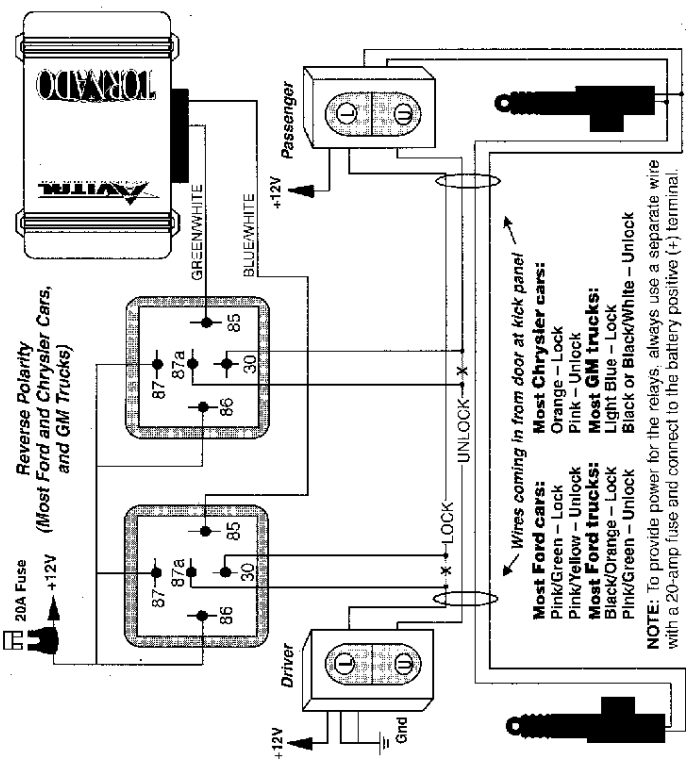
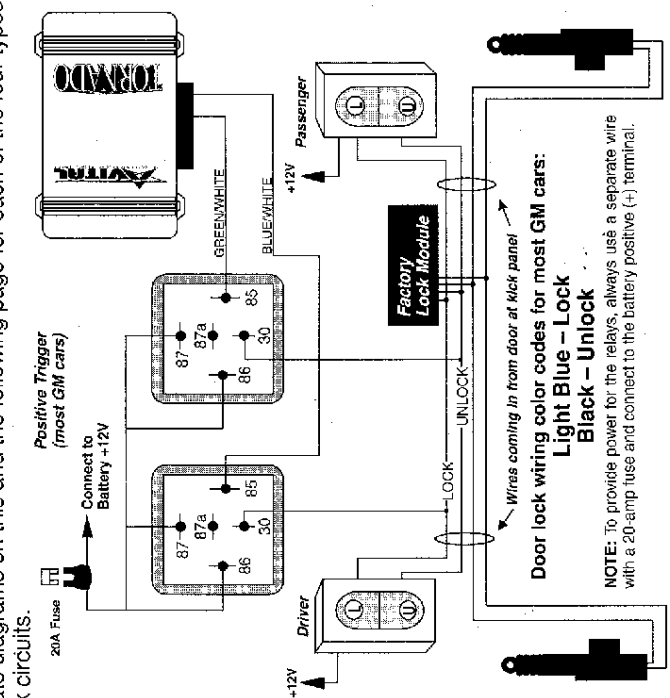
- Do not shorten or lengthen the antenna wire.
- Position the antenna pointing away from the control unit. Be sure not to position the antenna parallel to any wiring harness.
- Keep the antenna wire as far as possible from metal, as metal will interfere with the remote control operating range.

### Wireloom

- The system is designed to be wired FROM control unit TO each component. Route power and ground connections directly to the battery.
- Separate RED, BLACK, TAN and PURPLE wires.
  - Sleeve these wires with vinyl tubing and pass them through an existing grommet into engine compartment. If you drill a new opening, add a rubber grommet to protect against shorts and fire hazards.

**Wiring Diagrams for Remote Door Locking/Unlocking** — Use one of the appropriate diagrams on this and the following page for each of the four types of door-lock circuits.

**Wiring Diagrams for Remote Door Locking/Unlocking (cont.)**



**Ignition Input Wire** — The PINK wire from the control unit connects to the vehicle's ignition circuit, which supplies operating information to the system.

1. Use a voltmeter to locate the one wire that carries +12V when the key is on and cranking, and 0 voltage when the key is off.
2. Connect the PINK wire to this wire as noted in the diagram on page 3.

**Optional Starter Disable Relay** — Make sure the YELLOW and PURPLE wires on the optional relay are solidly connected since the starter circuit may have very high current. We recommend you solder and shrink tube these connections.

1. Locate the ignition switch wireloom under the dash.
2. Use a voltmeter to find the ONE wire in the ignition switch wireloom that carries +12V during the cranking cycle only. This is the starter solenoid wire.
3. Cut the starter solenoid wire. Test by trying to crank the starter with the ignition key. If it will not crank, you have the correct wire.
4. Connect the YELLOW wire to the key side.
5. Connect the PURPLE wire to the starter side.
6. Connect the GRAY wire to the GRAY armed output wire.

**LED Status Indicator** — Discuss the mounting location with the owner. The LED should be visible from both the passenger and driver windows.

1. Drill a 1/4" hole.
2. Route the LED wires from the LED through the hole and press into place.
3. Connect the RED LED wire to BROWN wire from control unit.
4. Connect the BLACK LED wire to BLACK wire from control unit.

**Valet/Program Switch** — Discuss placement with the owner. Avoid placing the switch where it may be accidentally toggled or damaged.

1. Drill a 1/4" hole and mount the switch.
2. Connect the DARK GREEN switch wire to the DARK GREEN wire.
3. Connect the BLACK switch wire to the BLACK control unit wire.

**Vibration & Impact Sensor** — The sensor must be firmly mounted on a solid surface inside the vehicle. We recommend tie-wrapping it to the steering column, or mounting it on the interior firewall or kick panel. DO NOT mount the sensor anywhere it would be exposed to water or extreme heat.

1. Firmly mount the sensor on a solid surface with the adjustment screw accessible.
2. Connect the ORANGE sensor wire to the ORANGE control unit wire.
3. Connect the RED sensor wire to the RED control unit wire.
4. Connect the BLACK sensor wire to the BLACK control unit wire.

**Door Trigger** — With Tornado's programmable door trigger, you simply connect to the door trigger line. After powering up, you can program polarity.

1. Connect the WHITE wire to the door trigger line.

### Parking Light Output

1. Use a voltmeter to determine the polarity of the parking lights.
2. **For positive parking lights (requires an optional relay):** connect the RED/BLACK wire to terminal 85, connect terminals 86 and 87 to 20-amp-fused +12V, then connect terminal 30 to the positive parking light wire.
3. **For negative parking lights:** connect the RED/BLACK wire to the negative parking light wire.

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### Trunk Trigger

1. Locate the trunk switch. As an alternative, you may wire the trunk trigger into the trunk light. **NOTE:** If the trunk doesn't have a switch, install a switch.
2. Connect the TAN wire to the trunk switch.

**Channel 2 Output** — The DARK BLUE wire provides a 0.5 seconds ground signal for a remote trunk release or other options.

**Trunk Release** — Installation requires an optional relay. **NOTE:** Always use a separate fused +12V wire to power accessories — NOT the control unit power wire.

1. Using a voltmeter, locate the one wire that goes to +12V when the trunk release button is pressed. Add a wire to this line and connect to terminal 30 of the relay.
2. Connect the DARK BLUE wire to terminal 85 of the relay.
3. Connect terminals 86 and 87 to the battery positive terminal through a fuse.

**Channel 3** — Channel 3, which is transmitted by simultaneously pressing both remote control buttons 1 and 2, is reserved to silently arm or disarm the alarm.

## ENGINE COMPARTMENT COMPONENTS

**Siren** — Mount in the engine compartment away from moving or heat producing components and, if possible, opposite the exhaust system. It must not be accessible or visible from outside the vehicle. Point the siren down to avoid collecting water.

1. Use all three sheet metal screws included in the kit to mount the siren.
2. Connect the BLACK siren wire to the PURPLE control unit wire.
3. Connect the RED siren wire to the RED control unit wire.

### Hood Trigger

1. Locate the hood switch. If hood does not have a pin switch, install a switch.
2. Connect the TAN control unit wire to the hood pin switch.

**Final Wiring Connections** — DO NOT plug in the system fuse until step 9 below.

1. Remove the bolts from the battery terminal clamps without removing the clamps.
2. Slip a ring connector onto each bolt (use an additional ring connector on the positive bolt for each option that requires separately fused power). Retighten.
3. Connect the BLACK control unit wire to the negative post ring terminal.
4. Connect the empty fuseholder(s) to the positive post ring connector(s).
5. Connect the RED control unit wire to the supplied fuseholder.
6. Plug in the control unit connector.
7. Reinstall the interior light fuse(s).
8. Install alarm fuse(s). The siren will sound. Disarm with remote control button 1.

**Program Door Trigger Polarity** — For Ford and any other positive door trigger vehicle, refer to the User-Programmable Features section on the following page.

### Sensor Adjustment

1. Arm the system with button 1/channel 1. Wait at least 5 seconds.
2. Firmly thump your fist on the driver's side window (do not strike windshield or pillar, damage may occur). The alarm should trip.
3. To increase sensitivity, turn the adjustment screw **clockwise** in small increments. To reduce sensitivity, turn the screw **counter-clockwise**.
4. Test again by repeating steps 1 and 2 until the desired sensitivity is obtained.

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## User-Programmable Features

The owner may set the system features to his or her preferences, except, of course, door trigger polarity. If the customer would like you to change some of the settings, use the procedure and chart below.

1. Select the feature you wish to program from the table below and note the number of chirps associated with that feature.
2. Insert the ignition key and turn it to the "ON" position.
3. Immediately flick the valet switch back and forth, counting the number of chirps you hear. Stop when you reach the number of chirps associated with the feature you wish to program.
4. If noted, do the "secondary action."
5. After a 3-second pause, you will hear the number of chirps noted to confirm that you have changed the setting of the feature. Turn the ignition off.
6. Repeat steps 1-5 for any other features you wish to program.

**Programming Table for User-Programmable Features**

Feature	Factory setting	# of flicks & chirps	Secondary action	Completion confirmation	Result
Passive Arming	ON	4	—	1 chirp 3 seconds after last step	Change state from ON to OFF or vice-versa
Passive Self-Locking	OFF	5	—	1 chirp 3 seconds after last step	Change state from ON to OFF or vice-versa
Add a New Remote to Channel 1 (arm/disarm)	—	13	Press remote control button 1	1 chirp	Button 1/channel 1 code of new remote control has been memorized
Add a New Remote to Channel 2 (optional remote accessory)	—	14	Press remote control button 2	2 chirps	Button 2/channel 2 code of new remote control has been memorized
Add a New Remote to Channel 3 (silent arm/disarm)	—	15	Simultaneously press remote control buttons 1+2	3 chirps	Button 1+2/channel 3 code of new remote control has been memorized
Change Door Trigger Polarity	NEG.	18	—	1 chirp 3 seconds after last step	Change state from NEG to POS or vice-versa

**User-Programmable Remote Controls:** The two remotes included are pre-programmed. The system will respond to four remote controls regardless of each remote control's individual digital coding. To add a new remote control to the system, use the procedure noted on page 9.

**Final Check** — Test all of the system's functions. Individually power up and test each optional accessory. Then secure the control unit and wireloom.

## Trouble-Shooting Guide

PROBLEM	POSSIBLE CAUSES
Alarm will not respond to transmitter. System will not arm or disarm but will panic.	<ol style="list-style-type: none"> <li>1. The system is in valet mode.</li> <li>2. Red and/or black wire(s) not connected directly to car battery.</li> <li>1. Ignition is on.</li> <li>2. Pink wire has +12V when the ignition key is off.</li> </ol>
Alarm chirps four times upon arming.	<ol style="list-style-type: none"> <li>1. Hood or trunk switch opened or grounded.</li> <li>2. Tan wire shorted to ground running to the rear of the car.</li> </ol>
Alarm chirps twice, then four times five seconds after arming. System has poor remote control range.	<ol style="list-style-type: none"> <li>1. Vibration &amp; Impact Sensor set too sensitive or there is a ground short in the orange line.</li> <li>1. Transmitter or car battery is low.</li> <li>2. Red and/or black wire(s) are not connected directly to battery.</li> <li>3. Re-position antenna.</li> </ol>
Parking lights do not flash.	<ol style="list-style-type: none"> <li>1. Check parking light polarity.</li> <li>2. Check relay terminal wiring.</li> </ol>
Alarm does not sound when door is opened but sounds when door is closed. Alarm sounds when driver's door is opened but not other doors.	<ol style="list-style-type: none"> <li>1. Re-program door trigger polarity.</li> <li>2. The white door trigger wire is not detecting the door opening and the sensor is triggering when the door is closed.</li> <li>1. The white door trigger wire is connected to the key's buzzer circuit instead of the door's interior light circuit.</li> </ol>
Door lock fuse blows when system is armed. Alarm will not passively arm.	<ol style="list-style-type: none"> <li>1. Door locks miswired.</li> <li>2. Lock system is reversing polarity and positive wiring was used.</li> <li>1. The door and/or hood/trunk trigger is grounded or open.</li> <li>2. Passive arming was user-programmed off.</li> </ol>
Alarm will not go into program mode.	<ol style="list-style-type: none"> <li>1. Pink wire is not connected to ignition line.</li> <li>2. Too much of a delay between steps 2 and 3.</li> <li>3. Valet switch green and/or black wires are not connected.</li> <li>4. The system will not go into program mode directly from valet.</li> </ol>
Car battery is being drained.	<ol style="list-style-type: none"> <li>1. The car was not driven for 3 weeks or more.</li> <li>2. System is miswired so that a relay is staying energized. Measure current draw with an ammeter across the fuseholder terminals. Current draw for the system should be about 20mA.</li> </ol>