Crime Guard
Keyless Entry and Security.

INSTALLATION MANUAL

for models

328i³ / 533i³ / 745i³

Installation Considerations

Main Power Connections - 5-Pin Connector

Secondary Connections - 8-Pin Connector

Power Doorlock Interfaces

This Installation Manual explains the installation and connection of these system's wiring connections utilizing the included Universal Harness. Certain Omega Quick Interconnect Harnesses, which plug directly into the vehicle's existing wiring harnesses, are available. Specific instructions are included with each Quick Interconnect Harness.

These instructions are for three Crime Guard models; the beginning of each section specifies "all models" or notes the exact model or models.

Instructions for programming transmitters and features may be found in the Operation Manual.

Installation Considerations

Important: The single most important factor regarding the proper operation and effectiveness of a vehicle security system is its installation. This system can be successfully installed with basic hand tools, by carefully following these instructions. One area to take special care in is wiring connections; soldering is most desirable, with crimp-type terminals following. "Quick-tap" or "t-tap" connections are acceptable, providing that extreme care is taken to ensure that they are done correctly. The "strip and twist" method of joining wires is the least desirable; although a satisfactory connection can be made if done properly, this is considered as the least reliable method of joining wires. When using any method, it is most important that the spliced wires be adequately insulated; not only to prevent short-circuits, but to also protect the wires' splice from exposure to the weakening environmental effects of moisture in the atmosphere.

Before Starting The Installation: This entire booklet should be read before starting the installation. An understanding of which control module wires are to be used and their functions is essential. Installations will vary from car to car , as some control module wire connections are required, while others are optional. Before starting the installation, it should be determined which control module wires will be used. Most installers will list these wires, then "map out" the installation by locating and noting the target wires in the vehicle. This will also determine the best location for the system's control module, which is mounted upon completion of the installation and testing of the system.

Most of the main wiring harness connections will be made at the ignition switch harness, which is typically located around the steering column area. **Caution! Avoid the Airbag circuit!** Especially avoid any harness or wires encased in Yellow or Red tubing or sleeves. Do not use a standard test light, as it can deploy an airbag or damage on-board computers and sensors if the wrong circuits are probed. Instead, use a Digital Multimeter (DMM). Proper wiring connections are a must!

Mounting The Control Module: The Control Module contains the necessary electronics required for the system's operation. Always mount this module in the vehicle's interior compartment, in a secure location that is not easily accessible. Ensure that moisture, vibration and temperature extremes are minimized. Acceptable locations include mounting behind the dash, behind the glovebox or other interior panels.

Mounting The Electronic Siren: Find a location in the engine compartment away from the extreme heat of the engine and manifold. Remember the "map out" approach to installation; the hood pin switch wire and any other wires to be ran to the engine compartment should be considered. Route these wires very carefully to prevent their being damaged or shorted by being pinched, or by hot or moving parts of the vehicle. In many cases the vehicle may have an unused rubber grommet on the firewall; these are excellent methods for routing wires to the engine compartment. Cut a small slice in the rubber, pass the wires through the grommet (needle-nose pliers are good for this) and be sure to reinstall the grommet in firewall sheet metal. If the vehicle is equipped with a speedometer cable, its grommet typically offers a path through the firewall. Always protect the wires which are routed to the engine compartment; for example, if the siren Positive wire

is shorted to Ground, the control module can suffer serious damage.

A suitable siren mounting location will offer a firm mounting surface, will also allow sound dispersion out of the engine compartment, and not be accessible to a thief. The siren must be pointed downward to avoid moisture collecting inside it and to enhance sound dispersal. Use three of the included screws to securely mount the siren.

LED Status Light/Valet Switch/Data Port: This assembly contains the LED Status Light, Valet Switch, and a Data Port which is for use with the FPM-1 Features Programming Module (which is used by professional installers). Mount the assembly in a location where it can easily be seen by the driver, and preferably where it can be seen from outside, as the LED Status Light provides a level of visual deterrence. If desired, Crime Guard's SecureCode override may be custom-programmed for maximum security (see the Operation Manual). Two mounting methods are provided: double-sided adhesive tape, and two screws. If using the adhesive tape, properly prepare the mounting surfaces to ensure good adhesion. If using the screws for a more permanent mounting, carefully separate the housing halves, install the screws (avoid overtightening), then snap the assembly halves back together. Carefully route the wiring harness to the control module (both ends are the same) to avoid any chances of it being chafed or pinched.

Optional Customized LED & Valet Switch Mounting: An alternative to the LED/Valet Switch/Data Port assembly is a separate LED and valet switch. Mount the LED Status Light in the vehicle interior where it can be easily seen by the operator, and preferably where it can be seen from the exterior of the vehicle. Drill a 9/32" hole in a suitable interior panel, route the wiring harness through the hole to the control module, and snap the LED in place. Plug the LED's small 2-pin plug into the Red matching port on the control module. Mount the valet switch, using its adhesive pad, in a hidden location which is accessible to the operator; carefully route the wires to the control module, and plug the valet switch's Blue 2-pin plug into the control module's Blue 2-pin port. If the separate LED Status Light and valet are used, the optional FPM-1 Features Programming Module can still be plugged into the remaining 3-pin port on the control module.

Auxiliary Sensor Port: This allows the easy plug-in addition of an auxiliary sensor. The auxiliary sensor port is dual-zoned: the first zone will respond by chirping the siren only; and the second zone will respond by

fully triggering the system. These ports supply constant 12 volt power, grounded output when the system is armed, a negative instant trigger, and a negative prewarn trigger. The Crime Guard 745i^3 features dual sensor ports, both having identical operation, easily facilitating multiple sensors.

The Crime Guard 533i^3 and 745i^3 include sensor units, which are packaged with their own instruction sheet.

Main Power Connections - 5-Pin Connector

Make all of the wiring connections, then plug both of the harnesses into the control module.

Black Wire - (Ground): All Models

The Black wire provides Negative ground for the system; proper connection of this wire is important.

CONNECTION: Using the correctly sized crimp-on ring terminal, connect the Black wire to the metal frame of the vehicle, preferably using an existing machine-threaded fastener. Make sure that the ring terminal attached to the Black wire has contact with bright, clean metal. If necessary, scrape any paint, rust or grease away from the connection point until the metal is bright and clean. If the control module has an insufficient ground connection, the security system can find partial ground through the wires that are connected to other circuits, and function, but not correctly. As the alarm can partially operate, a bad ground wire connection would not likely be suspected.

Antenna Wire - All Models

The Black (or Black/Red) wire attached to the control module is the coaxial antenna cable. Do not connect this wire to anything or the transmitter's range will be reduced or eliminated. Stretch the Black antenna wire out and as high as possible for the best operating range. If desired, this wire can be extended to possibly increase the unit's operating range. The same size wire should be used (22 ga.), and as a general rule the added length should not exceed twice the standard length.

Red Wire - (Constant Power Input): All Models

The Red wire's function is to supply Constant Positive 12 Volts for security system's operation. When 12 Volts is first applied to the Red wire, the system will revert to the state in which it was in when power was taken away. If the vehicle to be serviced, especially if it involves the battery, the system should be placed in Valet Mode. This will prevent the system from being activated if the battery is disconnected and reconnected. The Red wire also supplies 12 Volt Positive to the module's internal relay for flashing the parking lights.

CONNECTION: Connect the Red wire to a Constant Positive 12 Volt source. This source should have Positive 12 Volts with at least a 15 Amp capacity at all times and in all ignition key positions. Connection locations can be at the supply wire at the ignition switch, the supply wire *behind* the fuse block or the fuse/junction block. *Never* just insert the Red wire or any other security system wire behind a fuse. Also, please note that connecting directly to the battery's Positive terminal will expose this connection to failure due to a corrosive environment unless the connection has a protective coating.

Yellow Wire - (Ignition Input): All Models

The Yellow wire is an ignition "on" input to the security system. This connection is critical to the proper operation of many of the security system's features.

CONNECTION: This wire supplies Positive 12 Volts to the control module whenever the ignition switch is "on". This connection should be made at the ignition switch harness, to the primary ignition circuit. Primary ignition has 0 Volts when the ignition key is in the "Lock", "Off" and "Accessory" positions; and Positive 12 Volts in the "Run" and "Start" positions. Locate the correct wire at the ignition switch harness and securely splice the Yellow wire to it.

Orange Wire - (Output While Armed): All Models
Starter Interrupt Optional On 328i³, Starter Interrupt Standard On 533i³ & 745i³

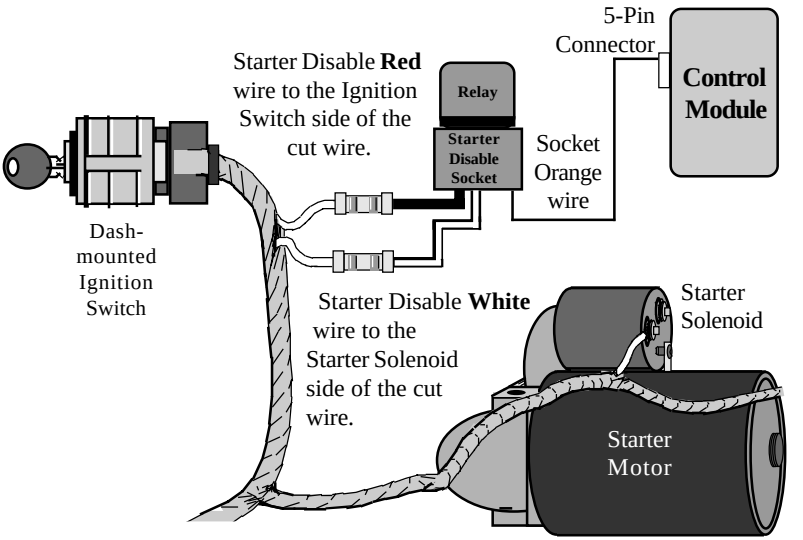
The Orange wire is a Negative starter interrupt output, which is active whenever the security system is in an armed state.

CONNECTION: To interrupt the vehicle's starter circuit, the starter wire must be located, identified and cut. Cutting the vehicle's starter wire will result

in two sides- the "ignition switch" side and the "starter solenoid" side. It is recommended that this connection be made as close to the ignition switch as possible. Use a voltmeter, not a test light, to find the correct wire, which is the wire from the ignition switch to the starter solenoid.

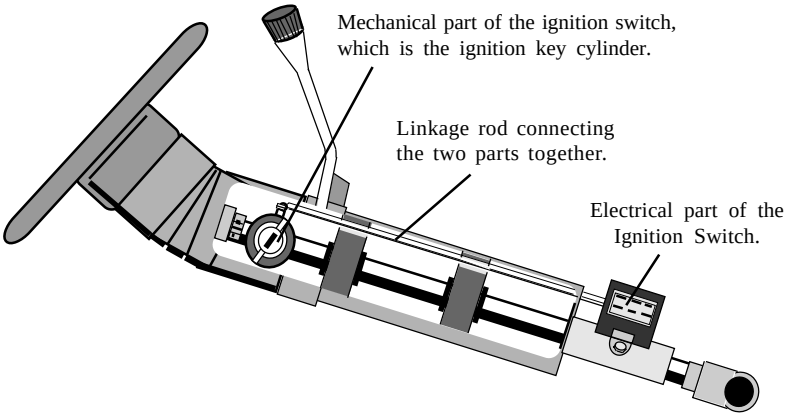
CAUTION! Avoid the airbag circuit! Improper use of a test light can cause deployment of the airbag, which may result in bodily injury! Test lights can also damage on-board computers and associated sensors.

Typical Dash-Mounted Ignition Switch Showing Starter Disable Connections



The starter wire will read Positive 12 Volts only when ignition key is in "start" position (cranking the engine). Cut this wire at a suitable location. Confirm that this is the correct wire by turning the ignition switch to the "start" position. The starter should not engage Connect the starter disable socket's Red wire to the ignition switch side. Connect the starter disable socket's White wire to the starter solenoid side. Be sure that good, solid electrical connections are made as this generally is a high amperage circuit.

Cutaway View Of A Typical Steering Column-Mounted Ignition Switch



Gray Wire - (Auxiliary Output #2): All Models

The Gray wire is an optional output; typically the primary use is for trunk release. Unless the vehicle's existing trunk release switch draws no more than 250mA, an optional relay must be used.

CONNECTION: Connect the Gray wire to relay pin (85), and connect Constant Positive 12 Volts to relay pin (86). Connect pin 30 to power, or ground, as needed. Pin #87 is then connected to the vehicle's trunk wire. Please refer to the relay wiring instructions on the back cover.

Secondary Connections - 8-Pin Connector

Brown Wire - (Positive Siren Output): All Models

The Brown wire is a 1 Amp Positive output designed to operate the electronic siren for audible confirmations, and also to sound if the alarm is triggered. An alternative to the siren is to program the alarm to pulse this output to sound the vehicle's horn by adding an optional relay. This would require changing Programmable Feature #22 from the preset "steady" output to a "pulsed" output.

SIREN CONNECTION: The Brown wire may be connected directly to

the siren's Red wire, and the siren's Black wire is connected to (-) Ground.

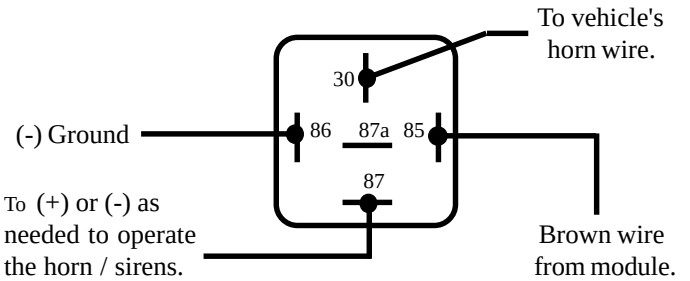
SIREN MOUNTING: Find a location in the engine compartment away from the extreme heat of the engine and manifold. A suitable location will offer a firm mounting surface, will also allow sound dispersion out of the engine compartment, and not be accessible to a thief. The siren must be pointed downward to avoid moisture getting inside it and to enhance sound dispersal. See pages 4-5 for more siren mounting information.

BLACK WIRE LOOP ON SIREN: Cut the short Black wire loop on the siren for louder confirmation chirps.

HORN CONNECTION: The Brown wire may be used to sound the vehicle's existing horn, but a relay must be used to switch the polarity to Negative. The horn switch wire is typically found at the steering column. Use a digital multimeter (DMM) to identify the horn wire. **CAUTION! <u>Avoid the Airbag circuit</u>!** The correct wire will show Positive 12 Volts normally, and no voltage when the horn is honked. Direct connection of the Brown wire to the horn itself is not recommended because the average horn requires more than the 1 amp output that the Brown wire supplies. One alternative is to disconnect the horns, then operate the horn switch. A clicking sound from the vehicle will confirm the presence of a horn relay. Another alternative is to check a wiring schematic of the vehicle in question.

Configuring An Optional Relay: The Brown Siren / Horn output wire has a 1 Amp capacity, which, if exceeded, can damage the security system control module. In certain situations, among them multiple optional sirens or utilizing the vehicle's horn, an optional SPDT relay is required. Connect the Brown wire to pin 86, ground pin 85, connect pin 87 to Negative or Positive 12 Volts as needed, and connect pin 30 to the sound generating device's wire.

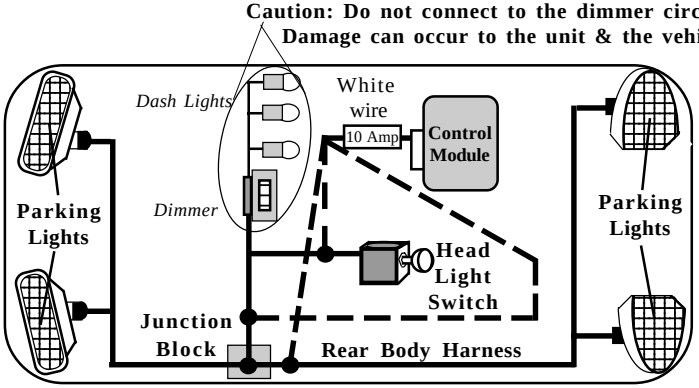
Optional Relay For Horn Wiring Diagram



White Wire - (Flashing Light Output): All Models

This is a Positive 12 Volt output to flash the vehicle's parking lights for visual arming confirmation, to illuminate them for disarming confirmation, and to attract attention while the system is activated.

CONNECTION: Connect this wire to the vehicle's Positive 12 Volt parking light circuit, which can usually be found at the following locations: at the headlight switch, at the fuse/junction block, or in the rear body harness in the driver kick panel. Some vehicles, notably Toyota, have a parking light relay which is triggered by a Negative Ground circuit from the headlight switch. The White wire can still be connected directly in these vehicles by finding the parking light circuit after the relay, typically at the Fuse/Junction Block.



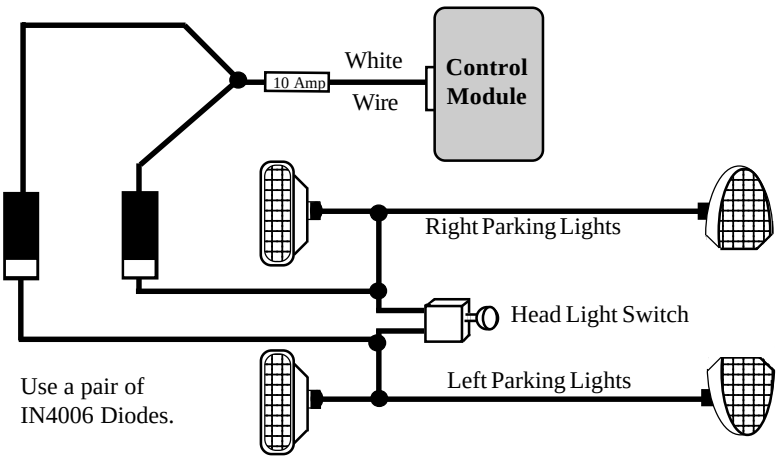
Recommended Connection Points For The White Wire

The correct wire will show Positive 12 Volts when the headlight switch is in the "Parking Light" and "Head Light" positions. When such a wire is located, also test to ensure that it is non-rheostated: while metering the wire, operate the dash light dimmer control. The correct wire will show no change in voltage when the dimmer is operated. Do not connect the White wire to a rheostated (dimmer) circuit! This will backfeed the parking lights through the rheostat or illumination control module, and possibly cause damage to the vehicle or security system control unit. Flashing the headlights is not recommended. The halogen headlights found in modern vehicles are not designed to be rapidly turned on and off, and if connected to the security system, a reduction of their useful life may be occur. If flashing the headlights is still desired, a relay must be used, since the headlight's current draw exceeds

the 7 amp rating of the built-in relay. If flashing headlights and parking lights are desired, use two relays - configure one relay to supply the parking lights and the other relay to supply the headlights.

MULTIPLE PARKING LIGHT CONNECTIONS: Many European imports have separate left and right side parking lights. When left & right parking lights are on separate circuits, a pair of 6 to 10 amp diodes or a pair of SPDT relays must be used to connect the White wire to each parking light side.

Connecting Separate Left And Right Parking Lights Using Two Diodes



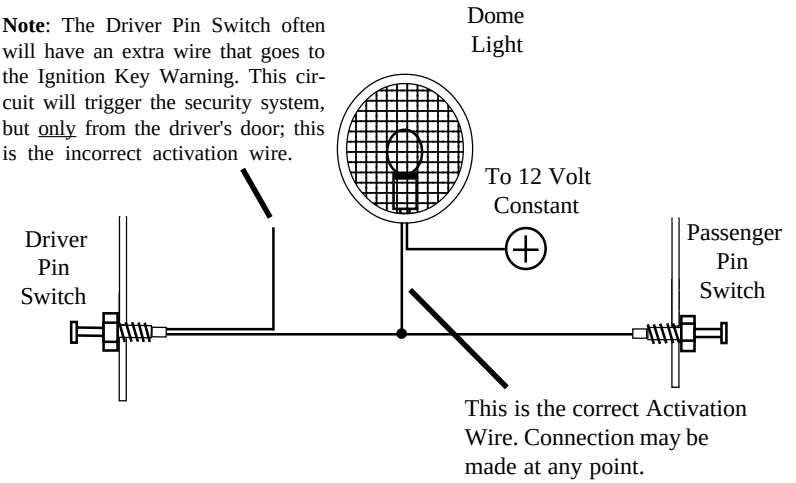
The Green & Violet wires are Negative & Positive door trigger inputs. Most typically, only one or the other of these wires are needed. The Crime Guard 745i³ also has "Smart Trigger", which is covered in a later section of this Installation Manual.

Green Wire - (Negative Door Trigger): All Models

The Green wire is an "open door" input to the control module for vehicles having *Negative switching* door pin switches.

CONNECTION: Connect the Green wire to a wire in the vehicle which is common to all of the door pin switches; the correct wire in this type of dome light/door jamb pin switch system will have no voltage present and will also show chassis ground when the doors are opened, and up to 12 volts when the doors are closed.

Typical Negative Switching Dome Light System



Notes, both types of dome light systems: The correct wire will show this change when any of the doors are opened. If the vehicle has delay dome lights, remember to take this into account when testing the wire. If the pin switch is mounted in the metal structure of the vehicle, and the dome light goes out when the switch is removed, suspect a grounding-type dome light system. While the traditional pin switch is mounted in the front door jamb area, also be aware that many vehicles utilize other types of switch devices to operate the interior lights. Some imports have a sliding type of switch and many have the pin or sliding switches in the rear door jamb area. In addition, some vehicles utilize switches in the doors, either connected to the exterior door handles or to the latching mechanism. A vehicle which has the dome lights illuminating when the exterior door handle is lifted is an example of this type of switching system. Also be aware of vehicles which diode-isolate each door. Typically, this is usually encountered with dash displays that indicate

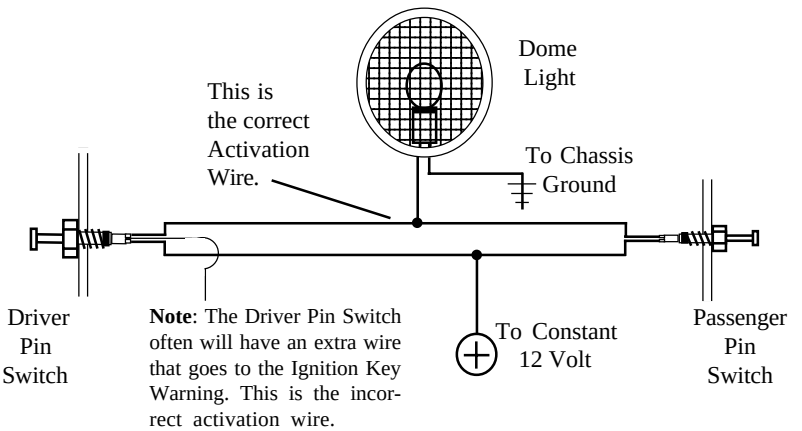
individual doors being ajar. The proper wire to connect to in this type of system is the common wire which is routed to the dome light itself.

Violet Wire - (Positive Door Trigger): All Models

The Violet wire is identical to the Green Door Trigger wire, with the sole exception that it is an open door input to the control module for vehicles having *Positive 12 volt* door pin switches.

CONNECTION: Connect the Violet wire to a wire in the vehicle which is common to all the door pin switches; the correct wire for this type of dome light/door jamb pin switch system will have 12 volts present when the doors are opened, and chassis ground when the doors are closed.

Typical Positive Switching Dome Light System



Blue Wire - (Negative Instant Trigger): All Models

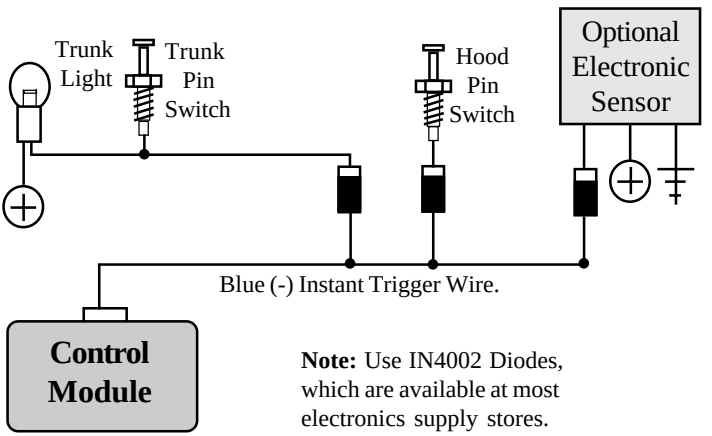
The Blue wire is a Negative instant trigger used primarily to detect entry into the hood or trunk area of a vehicle.

CONNECTION: The included pin switches may be installed to provide this trigger circuit; or, if there are existing switches (example: a light in the luggage compartment or a "Trunk Ajar" light in the dash), the Blue wire may be connected directly, provided this is a negative ground switching circuit. An indication of such a circuit is the wire having no voltage present when the

hood or trunk is open, and up to 12 volts when the hood or trunk is closed. This wire cannot be used with mercury switch types of hood or trunk lights. If the vehicle is equipped with a usable trunk or hood circuit, locate the proper wire and splice the Blue wire directly to the vehicle's wire.

When wiring more than one of the vehicle's circuits and/or additional circuits to this wire, diode-isolation may be required to maintain each circuit's proper operation. An example would be wiring a hood pin switch and trunk light switch together. Without isolating, the trunk light will turn illuminate whenever the hood is raised. Also, diode-isolation is necessary when combining electronic sensors together, or when adding a sensor in the same circuit as the pin switches.

Diode-Isolating Multiple Negative Instant Triggers



Note: Use IN4002 Diodes, which are available at most electronics supply stores.

Pink Wire - (Auxiliary Output #3): 533i³ & 745i³

The Pink wire is an optional output similar to the Gray trunk release wire; however, this output is not capable of disarming the system when it is used and therefore has no audible or visual confirmation.

CONNECTION: For most applications an optional relay will be needed; connect the Pink wire to relay pin #85, and connect Constant Positive 12 Volts to relay pin #86. Connect pin #30 to power, or ground, as needed. Pin #87 is the output, and connected to the target wire. Please refer to the relay wiring instructions on the back cover.

Black/Red & Green/Violet Wires - 745i³ Only (Domelight Supervision Input & Output)

The Crime Guard 745i³ offers an additional safety and security feature- "domelight supervision". Upon disarming the 745i³, the interior lights will flash, in conjunction with the parking lights. If desired, programmable feature #9 may be used to configure the parking and dome lights to flash, then illuminate steady upon disarming. This allow the convenience of a lighted approach to the vehicle and the safety of being able to inspect the vehicle's interior before entry.

The Green/Violet wire is the dome light supervision output, and the Black/Red wire is used to select the Positive or Negative polarity which is needed for the 745i³ to operate the vehicle's dome light.

Smart Trigger Feature: The 745i³'s dome light supervision circuit can be configured to also serve as the "door open" trigger input. This is the "Smart Trigger" feature which saves installation time while offering enhanced integration flexibility. The Green/Violet Domelight Supervision output wire has an additional function; it is also a door trigger input circuit, serving the same purpose as either the Green or Violet door trigger wires.

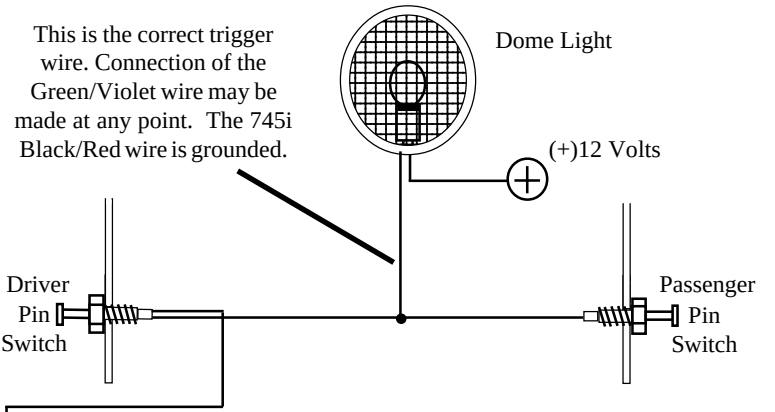
CONNECTION GREEN/VIOLET: The proper vehicle wire to connect the Green/Violet wire to, the dome light activation wire, is common to all the door pin switches. **The dome light activation wire is the same wire that the Green or Violet wire would be connected to, if either is used instead of utilizing the Smart Trigger.** The correct wire will change polarity as the doors are opened and closed.

If the vehicle uses a Negative switching dome light system, the activation wire will have no voltage present and show chassis ground when the doors are opened, and up to 12 volts when the doors are closed. The correct wire for a Positive switching type of dome light/door jamb pin switch system will have 12 volts present when the doors are opened, and chassis ground when the doors are closed. The correct wire will show these changes when any of the doors are opened. If the vehicle has delay dome lights, remember to take this into account when testing.

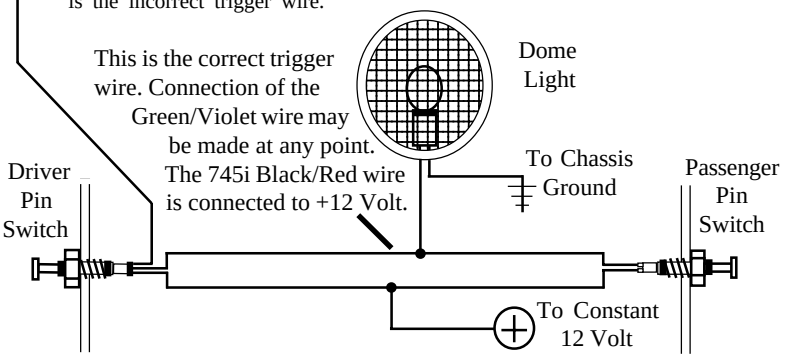
CONNECTION BLACK/RED: The polarity of the dome light supervision output must be selected by the connection of the Black/Red wire as Positive or Negative. Connection of the Green/Violet should have determined which polarity the vehicle uses to operate the dome light; this is either

"Negative switching" or "Positive switching"; these diagrams show both types. Once “Positive switching” or “Negative switching” has been determined, connect the Black/Red wire to Negative (for “Negative switching”) or Positive (for “Positive switching”) as needed.

Typical Negative Switching Dome Light System



Note: In both types the Driver Pin Switch will often have an extra wire that activates the “ignition key in switch” warning chime. This is the incorrect trigger wire.



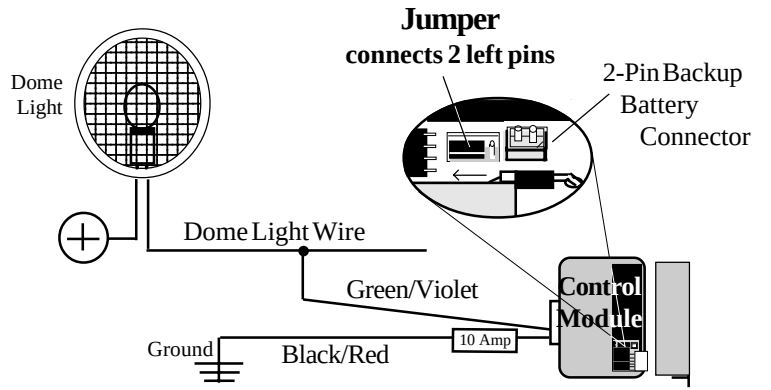
Typical Positive Switching Dome Light System

Typically, “Negative switching” systems show voltage with doors closed, and ground when the doors are opened; while “Positive switching” systems show the reverse indications.

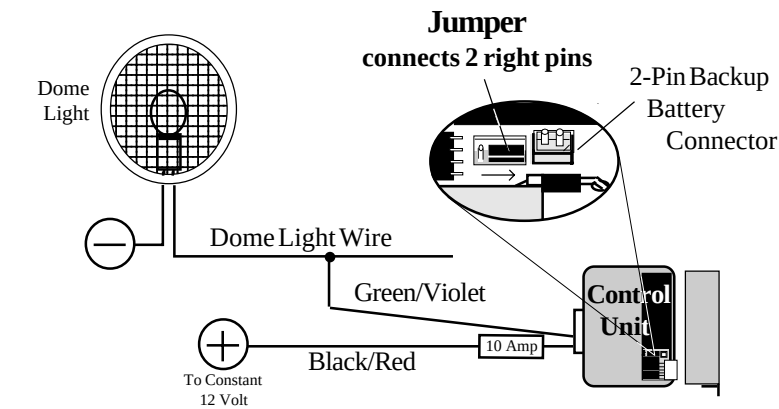
To Use Smart Trigger: After connection of the Green/Violet and Black/Red wire is completed, all that is needed is to **install the Smart Trigger jumper in the correct polarity setting**. To set the polarity, open the access door on the 745i^3's case. Next to the White 2-pin port for the backup battery is the Smart Trigger standup; refer to the below diagrams.

If the Black/Red wire was connected to Negative polarity, the Smart Trigger jumper should be aligned to the left two pins (i.e.- inboard); if the Black/Red wire was connected to Positive polarity, the Smart Trigger jumper should be aligned right two pins (i.e.- outboard).

"Negative Switching" Dome Light Smart Trigger



Setting "Positive Switching" Dome Light Smart Trigger



Not Using Smart Trigger: If the Smart Trigger feature is not desired, connect the Green/Violet and Black/Red wires for the dome supervision operation, but do not install the polarity selecting jumper. If this is done, either the Green Negative door trigger wire or the Violet Positive Door Trigger wire **must be connected** in order for the control unit to detect an open door.

Power Doorlock Interfaces

Although its primary purpose is the security of vehicle and contents, an added benefit of a Crime Guard system is the convenience offered through the remote control operation of functions such as power doorlocks. All three Crime Guard systems are capable, with the proper interface, of operating the vehicle's existing power doorlocks. Even if the vehicle is not equipped with power doorlocks, it is still possible to add actuators to operate the manual mechanical doorlocks via remote control.

It is important to note that power doorlocking systems vary from vehicle to vehicle; therefore where one interface may be performed with parts included with the Crime Guard system, another installation may require optional parts. Basically, there are two approaches to performing the power doorlock interface: the use of a “plug-in” Quick Interconnect Harness; or “hardwiring” by direct wire-to-wire splicing between the security system interface and the vehicle’s wires. The Quick Interconnect Harness offers the easiest, safest and most accurate method of interfacing a power doorlock system. Otherwise, if hardwiring, a basic understanding of the vehicle’s power doorlock system is most helpful.

Basic Types Of Power Doorlock Systems: The vast majority of power doorlocks are found as only three different system types. All other power doorlock systems which may be encountered, such as the vacuum pump types found in older Mercedes vehicles and the single wire types which have appeared in some late model vehicles, are actually variations or even combinations of the these three basic types:

3 Wire Negative

3 Wire Positive

5 Wire Reversal

The best way to identify a doorlock system is to examine the doorlock switch's wiring . The names of the three systems are in fact derived from the number of wires, and their polarity, as found at the doorlock switch, although variations can be encountered*.

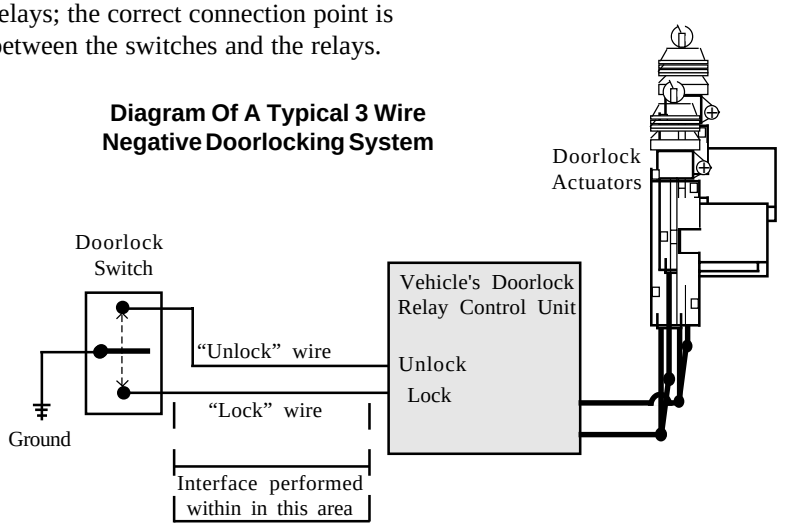
* These "variations" include illuminated switches, which will have more than the described number of wires, and "multiple switch assemblies" which have Power and/or Ground "bussed" internally, and therefore appear to have less than the described number of wires.

3-Wire Negative Systems: In **3 Wire Negative** systems, the vehicle's doorlock switch activates "lock" and "unlock" relays present in the vehicle, which can be found separate, within a bank of relays, or sometimes within a doorlock control unit. This power doorlock system is indicated by the presence of three wires at the switch. Typically, of the three wires at the switch:

- One wire is constant Ground.
- One wire shows Ground when the switch is pushed to "lock".
- One wire shows Ground when the switch is pushed to "unlock".

With the switch at "rest" (not being operated), these two wires will read voltage, usually 12 volt positive but in some cases less. The wires from the switches operate doorlock relays or a doorlock control unit with built-in relays; the correct connection point is between the switches and the relays.

Diagram Of A Typical 3 Wire Negative Doorlocking System

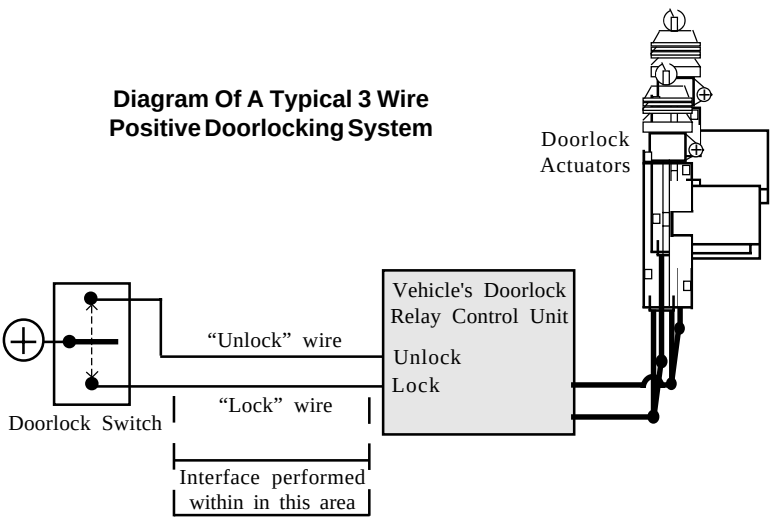


3 Wire Positive Systems: A **3 Wire Positive** is the same basic system as the 3 Wire Negative, except the vehicle's doorlock switches use 12 volt positive pulses to operate the vehicle's doorlock relays or control unit. Examine the wires on the back of the switch. Of the three wires:

- One wire is Constant Positive 12 Volts.
- One wire will show Positive 12 Volts when the switch is pushed to "lock".
- One wire will show Positive 12 Volts when the switch is pushed to "unlock".

With the switch at “rest” (not being operated), these two wires will read Ground, but unlike the following 5 Wire Reversal system, this Ground is not a full, or “chassis” Ground. A Digital Multimeter (DMM) can be used to test this. Set the meter for “ohms”, and put one meter lead on the target doorlock wire and the other to Chassis Ground. A 5 Wire Reversal system will read very close to “zero ohms”, which indicates that the target wire is resting at Chassis Ground. If the target wire is indeed a 3 Wire Positive “switch” wire, the reading will indicate Ground which is present through the vehicle’s relay coil, which typically produces a reading of approximately 150 ohms. As in a 3 Wire Negative system, the wires from the switches operate doorlock relays or a doorlock control unit with built-in relays, and the correct connection point is between the switches and the relays.

Diagram Of A Typical 3 Wire Positive Doorlocking System



5 Wire Reversal Systems: The **5 Wire Reversal** system first of all differs from the negative and positive pulse systems in the fact that there are no relays or doorlock control unit.* As a side note, the 5 Wire Reversal system is also the type of circuit found *after* the relays in the other two types of power doorlock systems. The five wires found at the doorlock switch are:

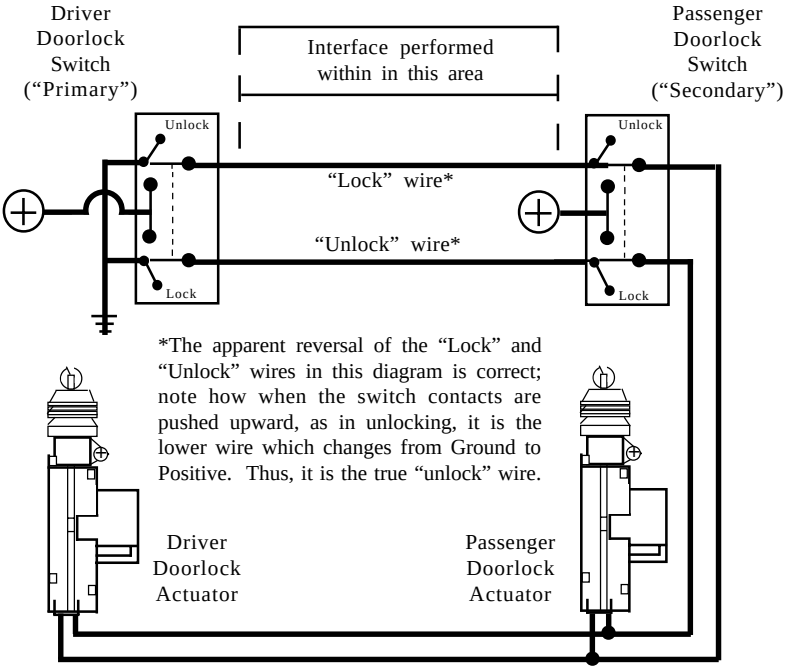
- One is Positive 12 Volts at all times.
- Two show Ground at all times.
- The remaining two are Grounded until the switch is operated, with one wire changing from Ground to Positive 12 Volts upon "lock" and the other changing from Ground to Positive 12 Volts upon "unlock".

The 5 Wire Reversal system resembles the 3 Wire Positive system, as it also shows Positive 12 Volt pulses as it is operated, but the 5 Wire Reversal system's wires *rest* at a full chassis Ground when not in operation. In this type of system, the switches themselves supply the positive voltage directly to the doorlock actuators, and, more importantly, provide the return ground path. The important thing to remember is the wires in this system *rest at ground*, which means that the wires must be "opened", or cut, to make the connections. As in the example explained in the 3 Wire Positive section, a DMM would read around 0 ohms on the 5 Wire Reversal's target wires.

The correct target wires are found *between* the vehicle's power doorlock switches. These two wires are both routed to the doorlock actuators and are connected to either end of the actuator's motor winding. When either switch is pushed to one position, one of these two wires will have 12 volts. This voltage flows through the wire to the actuator's motor winding, and since the other wire is still *resting at ground* an electrical circuit is completed. When the switch is pushed to the opposite position the electrical flow is *reversed*. When the correct wires are found, they must be cut. Notice in the diagram (following page) that the driver's switch is the primary switch and referred to as the "switch" wires. The wires that go to the secondary switch are referred to as the "motor" wires. Even though the cut is made between the switches, the two sides are still correctly called the "switch" and the "motor" sides, with consideration of "Primary" and "Secondary" switch.

* As always with the wide array of vehicle power doorlocking systems, it is possible to encounter variations, especially in the case of an existing aftermarket doorlock system. A vehicle having a 5 Wire Reversal system does not absolutely rule out the absence of existing relays, most notably if the vehicle is pre-equipped with a remote entry or automatic locking system.

Diagram Of A Typical 5 Wire Reversal Doorlocking System



Other Doorlocking Systems: Beyond these three basic types of power doorlocking systems, the scope of this Installation Manual will cover the interfacing of vacuum power doorlocking systems and how to interface an added actuator. As the Crime Guard 533i^3 and 745i^3 are capable of "driver door priority unlock", this option is also explained and diagramed in this booklet for the three basic power doorlock circuit types.

For properly detailed instructions on the various, specialty doorlocking systems, please refer to Omega's comprehensive Automotive Wiring Index, which consists of wiring information for each vehicle. Should the vehicle in question have a specialty power doorlocking system, a detailed wiring diagram is included.

Differences By Model

This section explains the differences in the power doorlock interface outputs of the three Crime Guard models, notes each model's out-of-the-box capabilities, and lists the optional interfaces. Also referenced is a diagram which shows each type of interface connected to each of the power doorlock system types. **The 328i^3 and 533i^3 have Red plug-in ports inside the control module case**, accessible behind the removable door, and the 745i^3 has a plug-in connector on the outside of its case.

Crime Guard 328i^3: The 328i^3 has a plug-in port having Negative outputs for lock and unlock. The included doorlock harness (DLP-N3) can interface 3 Wire Negative doorlock systems directly (diagram #1). Applicable optional interfaces include the DLP-P3 (diagram #4), the DLR-1 (diagram #3), and the DLS (diagram #2). The DLS-3 can be used with the 328i^3, but not in a driver door priority unlock application.

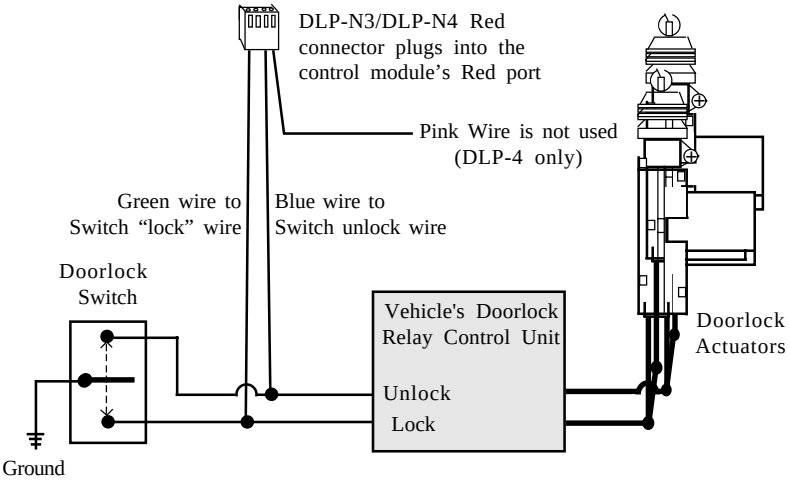
Crime Guard 533i^3: The 533i^3 also has a plug-in port, but with two enhancements over the 328i^3. First, there are two unlock outputs, giving the 533i^3 the driver door priority unlock capability. Second, the lock and unlock #1 outputs are dual polarity, which allows the 533i^3 to operate both 3-Wire Negative (diagram #1) and 3-Wire Positive (diagram #5) doorlocks out-of-the-box with its included DLP-N4 doorlock harness. Applicable optional interfaces include the DLR-1 (diagram #3), the DLS (diagram #2), and the DLS-3 which is used for driver door priority unlock applications. If this configuration is desired, use of a Quick Interconnect Harness is highly recommended, or the optional DLS-3 and three relays are needed (diagrams #13, #14, or #15).

Crime Guard 745i^3: The 745i^3 features built-in door lock and unlock relays, giving it out-of-the-box capability for all three power doorlock systems. In certain cases, the 745i^3 will include a special adapter harness which allows the convenient use of an optional plug-in Quick Interconnect Harness, inn addition to the optional use of the DLS and DLS-3.

The 745i^3 also includes an additional unlock #2 output which allows configuration of the driver door priority unlock feature. If this configuration is desired, use of a Quick Interconnect Harness is highly recommended, or the optional DLS-3 and three relays are needed (diagrams #13, #14, or #15).

Doorlock Diagram #1

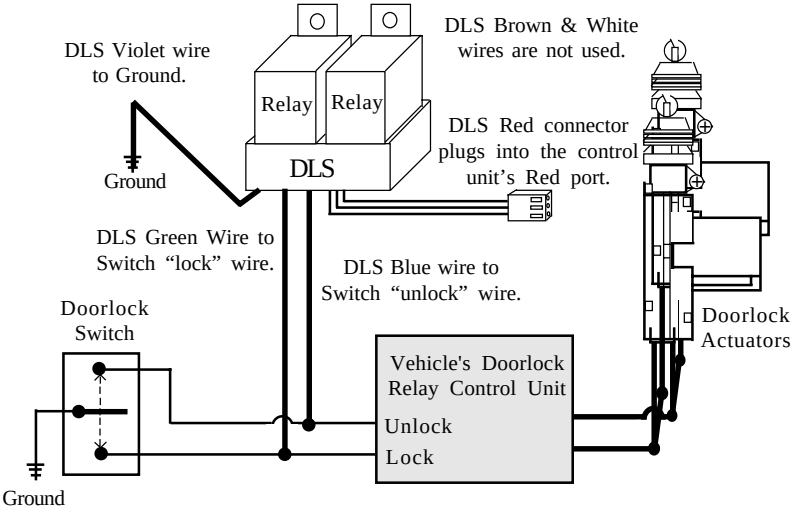
3 Wire Negative Doorlocks Using The Control Unit Outputs



Used With Crime Guard 328i³ & 533i³: The 328i³ includes a doorlock harness with 2 wires, theDLP-N3; and the 533i³ includes a doorlock harness with 3 wires, the DLP-N4. This interface will lock and unlock all doors in the host vehicle.

Doorlock Diagram #2

3 Wire Negative Doorlocks Using The Optional DLS & 2 Relays



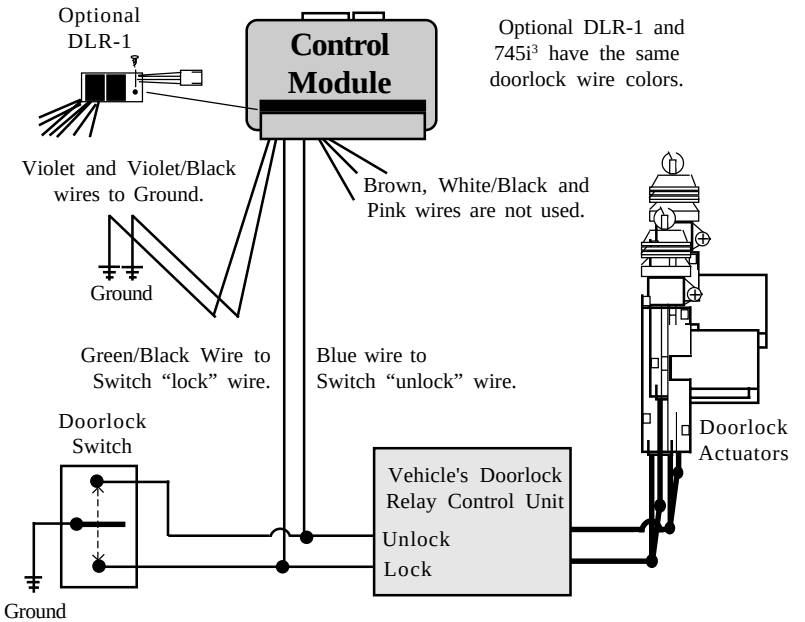
Text continued on next page

Can Be Used With Crime Guard 328i³ & 533i³: The optional DLS and two relays is a universal power doorlock interface which will lock and unlock all doors in the host vehicle. The DLS can operate all three power doorlock systems, although it is rarely needed for 3 Wire Negative systems.

Doorlock Diagram #3

3 Wire Negative Doorlocks For 745i³
3 Wire Negative Doorlocks Using The Optional DLR-1

The Crime Guard 745i³ has built-in doorlock relays, and the DLR-1 is an optional relay module which can be added to the 328i³ and 533i³ Both have identical wire colors, so instructions are the same.

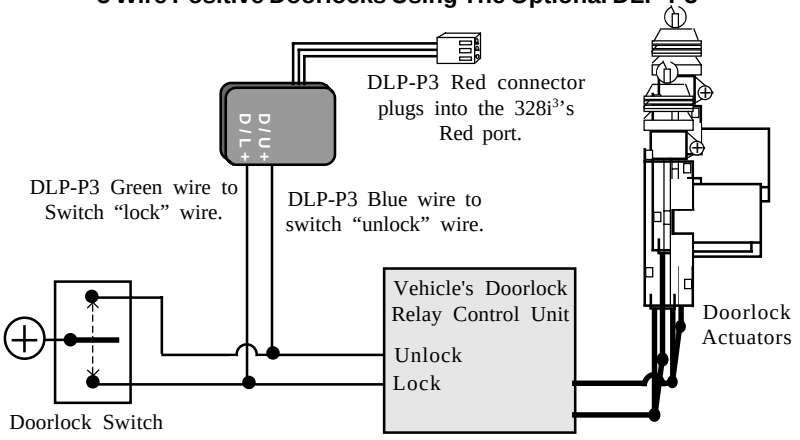


Crime Guard 328i³ & 533i³: The optional DLR-1 relay module installs into the control module, secured by a small screw, and its Red connector plugs into the Red doorlock port. The DLR-1 can operate all three power doorlock systems.

Crime Guard 745i³: Features built-in doorlock relays, which can operate all three power doorlock systems.

Doorlock Diagram #4

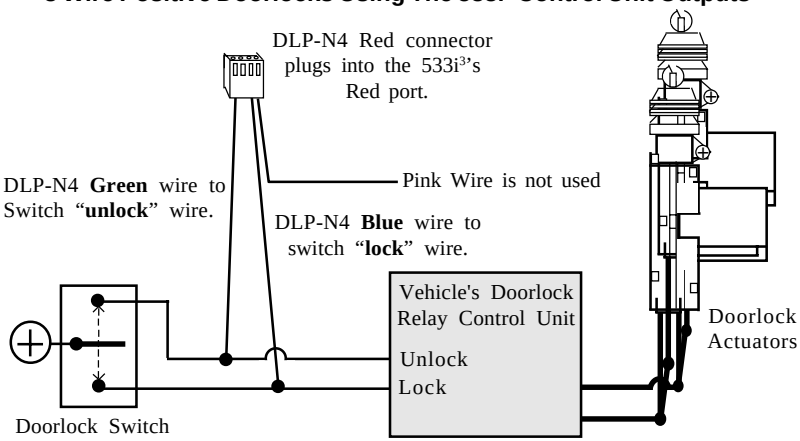
3 Wire Positive Doorlocks Using The Optional DLP-P3



Used With Crime Guard 328i³: The optional DLP-P3 converts the 328i³'s Negative doorlock outputs in order to lock and unlock all doors in vehicles having a 3 Wire Positive system.

Doorlock Diagram #5

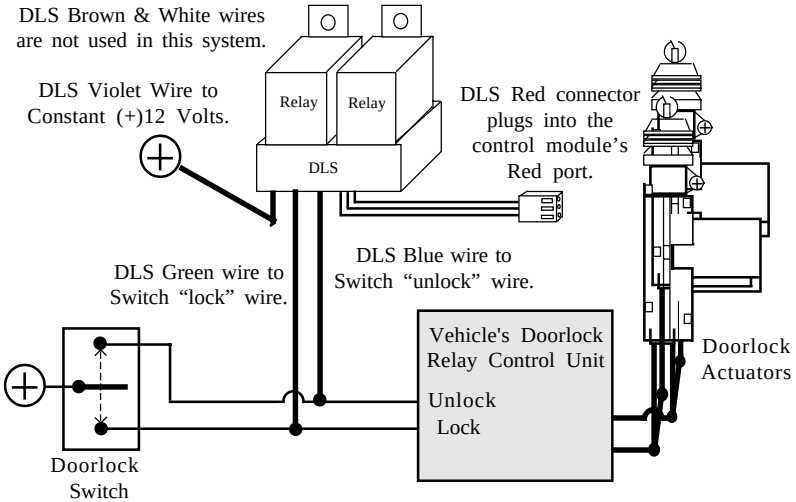
3 Wire Positive Doorlocks Using The 533i³ Control Unit Outputs



Crime Guard 533i³: As explained on page 24, the 533i³ features dual polarity doorlock outputs. To interface a 3 Wire Positive system, use the included DLP-N4 doorlock harness and simply reverse the lock and unlock wires.

Doorlock Diagram #6

3 Wire Positive Doorlocks Using The Optional DLS & 2 Relays



Can Be Used With Crime Guard 328i³ & 533i³: The optional DLS and two relays is a universal power doorlock interface which will lock and unlock all doors in the host vehicle. The 328i³ will require a DLS, DLR-1, or DLP-P3 to operate 3 Wire Positive systems; the 533i³ has dual polarity doorlock outputs which can operate most 3 wire Positive doorlock systems. The DLS and two relays can operate all three power doorlock systems.

Doorlock Diagram #7

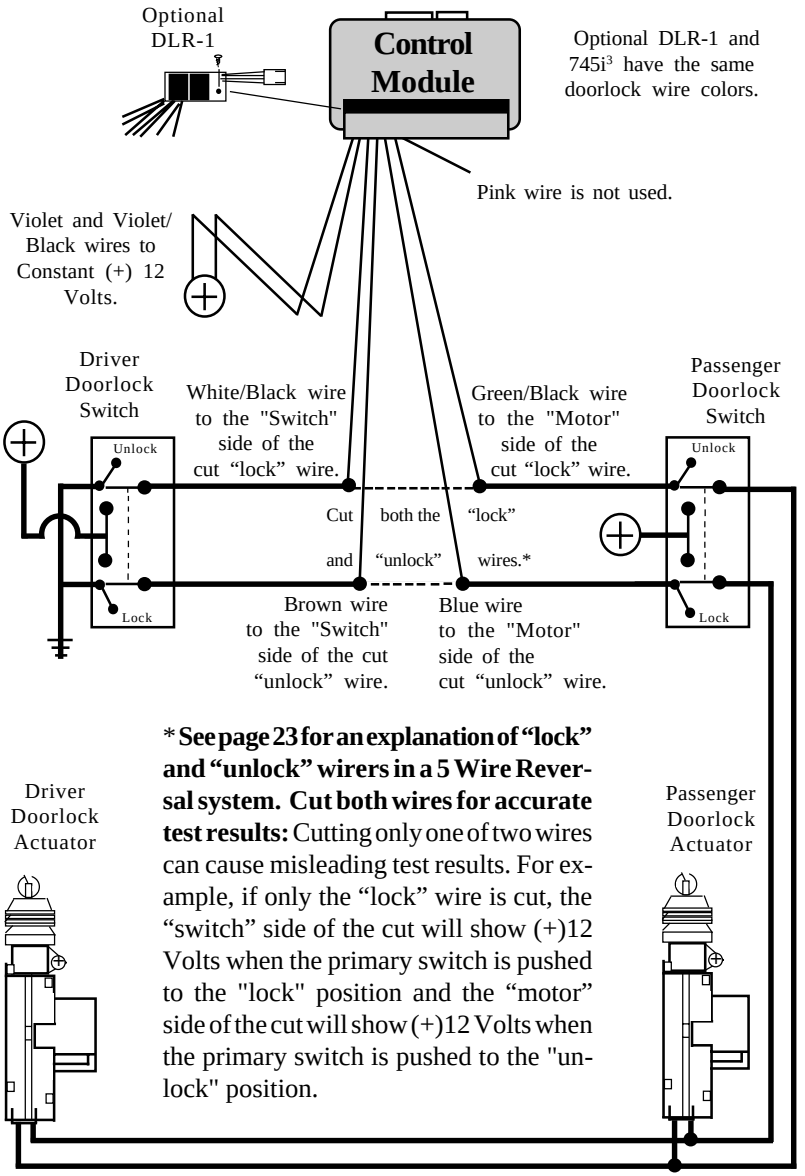
5 Wire Reversal Doorlocks For 745i³

5 Wire Reversal Doorlocks Using The Optional DLR-1 - 328i³ And 533i³

The Crime Guard 745i³ has built-in doorlock relays, and the DLR-1 is an optional relay module which can be added to the 328i³ and 533i³ Both have identical wire colors, so instructions are the same.

Crime Guard 328i³ & 533i³: The optional DLR-1 relay module installs into the control module, secured by a small screw, and its Red connector plugs into the Red doorlock port. The DLR-1 can operate all three power doorlock systems.

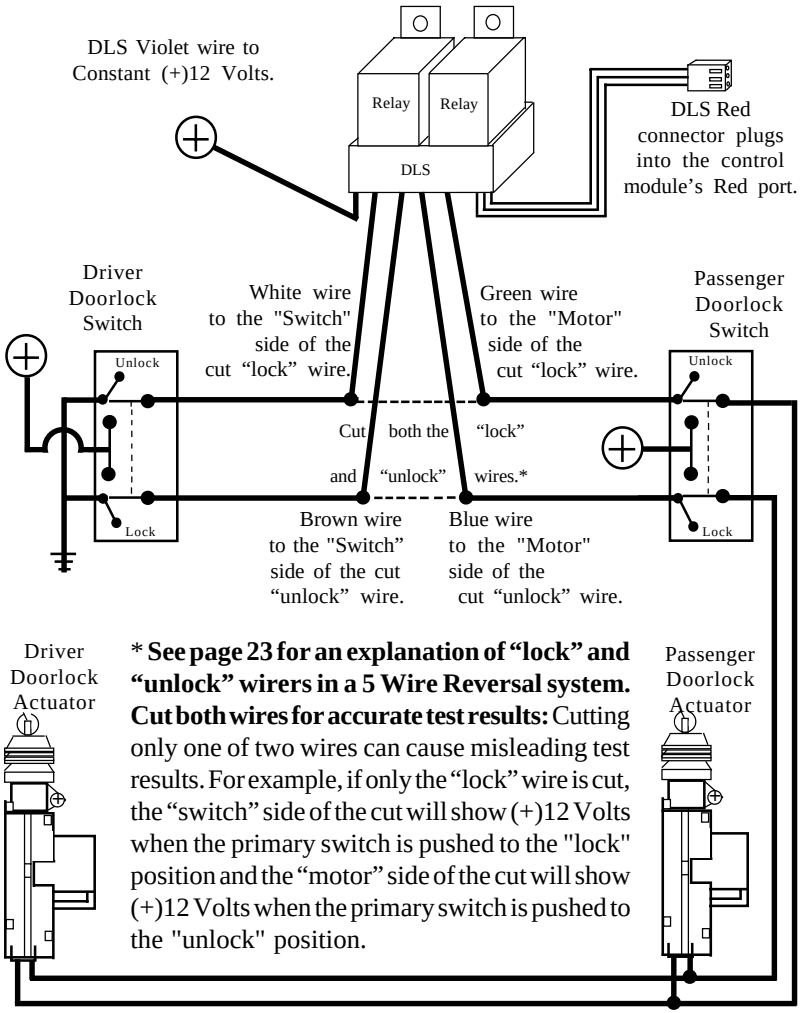
Crime Guard 745i³: Features built-in doorlock relays, which can operate all three power doorlock systems.



*** See page 23 for an explanation of "lock" and "unlock" wirers in a 5 Wire Reversal system. Cut both wires for accurate test results:** Cutting only one of two wires can cause misleading test results. For example, if only the "lock" wire is cut, the "switch" side of the cut will show (+)12 Volts when the primary switch is pushed to the "lock" position and the "motor" side of the cut will show (+)12 Volts when the primary switch is pushed to the "unlock" position.

Doorlock Diagram #8

5 Wire Reversal Doorlocks Using The Optional DLS & 2 Relays

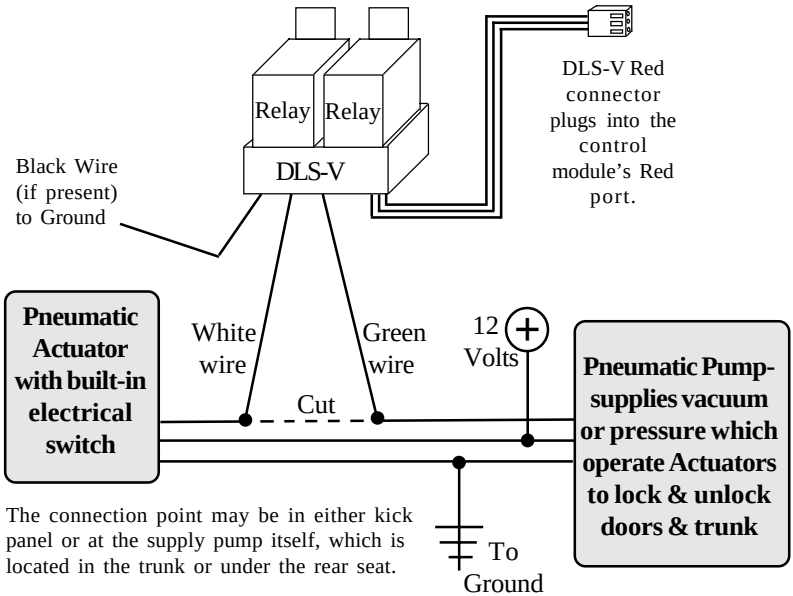


*** See page 23 for an explanation of "lock" and "unlock" wirers in a 5 Wire Reversal system. Cut both wires for accurate test results:** Cutting only one of two wires can cause misleading test results. For example, if only the "lock" wire is cut, the "switch" side of the cut will show (+)12 Volts when the primary switch is pushed to the "lock" position and the "motor" side of the cut will show (+)12 Volts when the primary switch is pushed to the "unlock" position.

Used With Crime Guard 328i³ & 533i³: The optional DLS and two relays is a universal power doorlock interface which will lock and unlock all doors in the host vehicle. Both models will require a DLS or DLR-1 to operate 5 Wire Reversal systems. The DLS and two relays can operate all three power doorlock systems.

Doorlock Diagram #9

Vacuum Doorlocks Using The Optional DLS-V & 2 Relays

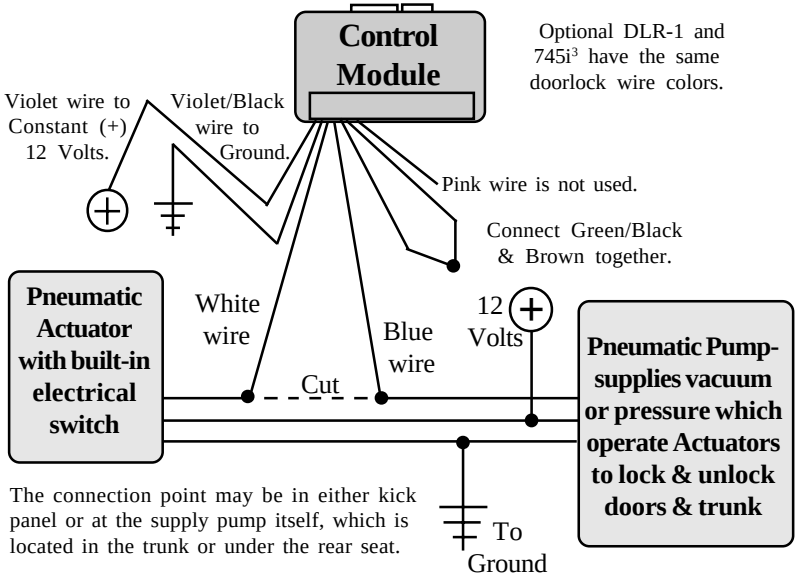


Used With Crime Guard 328i³ & 533i³: This doorlock system is used on older Mercedes Benz vehicles and consists of electrical switches (built into pneumatic actuators) which supply 12 volts or ground to a pneumatic pump. The switches are operated when the doors are locked or unlocked by the inside doorlock knob or the key in the exterior doorlock cylinders. The polarity supplied by the switch determines if the pump sends vacuum or pressure through hoses to the actuator. Since the pump must operate for about 3 seconds, the doorlock pulse must be changed (Programmable Feature #11). An alternative interface for vacuum doorlock systems is to add an actuator to one of the doors.

Technically, the vacuum doorlock system can be described as a hybrid of all of the three basic power doorlock types; the vehicles activation wire reverses polarity, with Negative operating the pump to lock the doors, and Positive voltage operating the pump to unlock the doors.

Doorlock Diagram #10

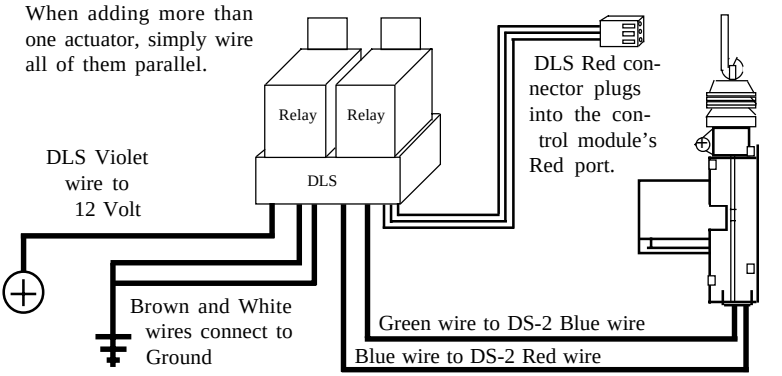
Interfacing Vacuum Doorlocks With The 745i³ (May Also Be Used With The 328i³, 533i³ And Optional DLR-1)



Crime Guard 745i³: For a description of a vacuum power doorlock system's operation, please see the previous page.

Doorlock Diagram #11

Adding Actuator(s), DLS And 2 Relays



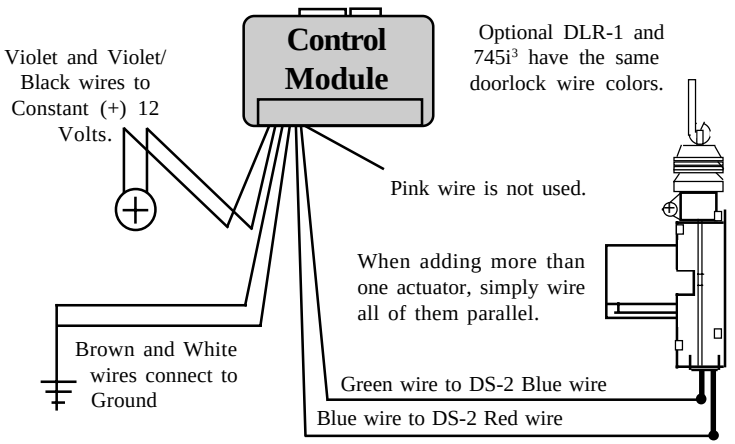
Can Be Used With Crime Guard 328i³ & 533i³: Some vehicles have a type of power doorlock system in which mechanically locking and unlocking the driver's door will operate an electrical switch in that door which supplies voltage to actuators in the other doors. There is no actuator in the driver's door, only a switch. An indication of this type of power doorlock system is when the driver door key will operate the passenger door, but the passenger side will not operate the driver door.

This interface may also be used to convert vehicles without power doorlocks to remote operation via the security system. Optional parts needed are one DLS, two relays, and one actuator per door to be operated. Multiple actuators are simply wired in parallel to the DLS.

Doorlock Diagram #12

Adding Actuator(s) With The 745i³

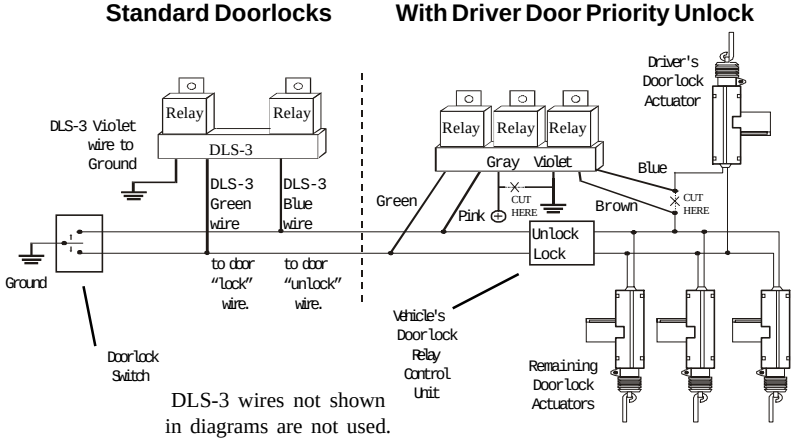
(May Also Be Used With The 328i³, 533i³ And Optional DLR-1)



Can Be Used With Crime Guard 745i³: The 745i³'s built-in doorlock relays will operate the DS-2 actuator(s) in place of the DLS and two relays used with the 328i³ and 533i³. Please see the text at the top of this page for an explanation of this type of power doorlocking system.

Doorlock Diagram #13

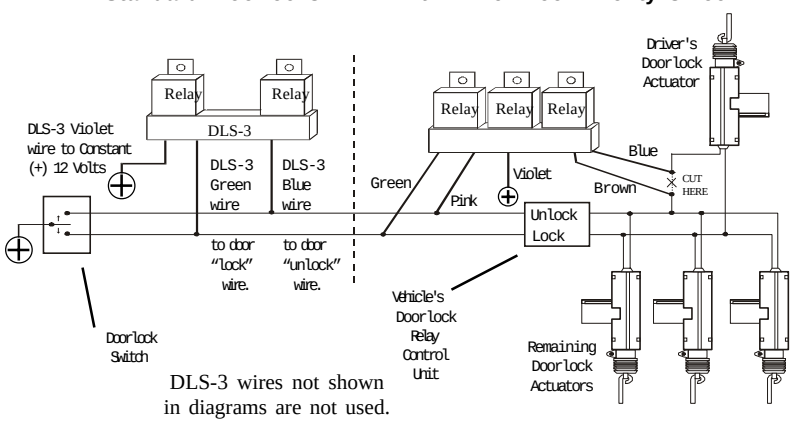
Optional DLS-3 And 2 Or 3 Relays With 3 Wire Negative Systems-
Standard Or Driver Door Priority Unlock For 533i³ And 745i³



DLS-3 wires not shown in diagrams are not used.

Doorlock Diagram #14

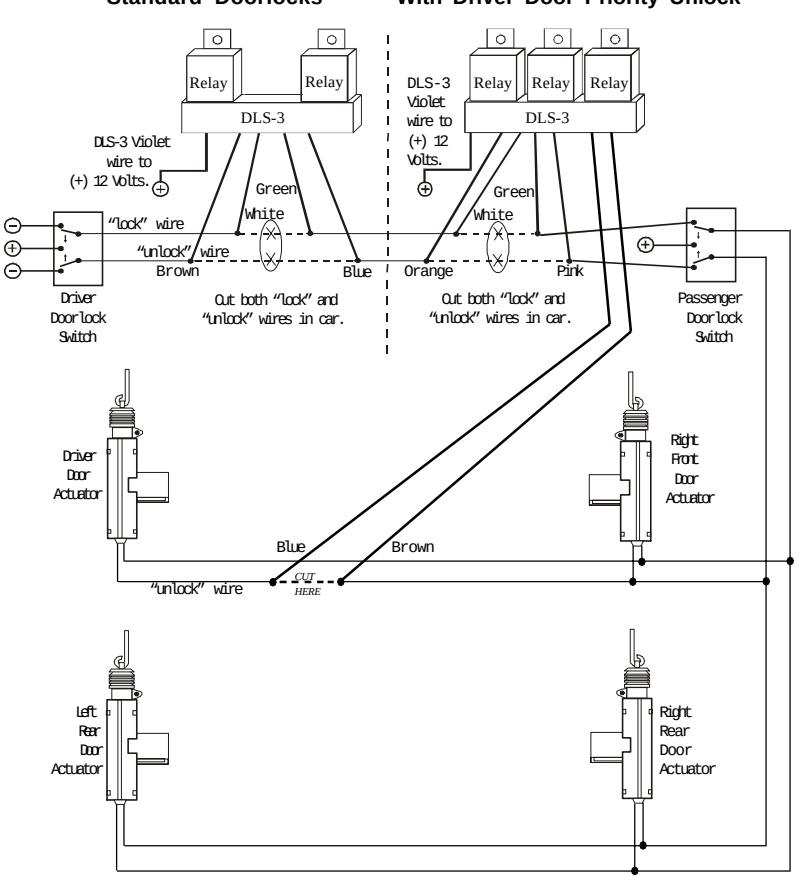
Optional DLS-3 And 2 Or 3 Relays With 3 Wire Positive Systems-
Standard Or Driver Door Priority Unlock For 533i³ And 745i³



DLS-3 wires not shown in diagrams are not used.

Doorlock Diagram #15

Optional DLS-3 And 2 Or 3 Relays With 5 Wire Reversal Systems-Standard Or Driver Door Priority Unlock For 533i³ And 745i³



The Optional DLS-3

Can Be Used With Crime Guard 533i³ & 745i³: The optional DLS-3 is a triple relay socket (relays are also needed), and is the most universal interface, which can be configured to lock and unlock all doors (two relays needed), or perform driver door priority unlocking (three relays needed). Driver door priority unlock allows the 533i³ or 745i³ to lock all of the vehicle's

doors, unlock only the driver's upon disarming ("driver's door priority unlock") and, if desired, a second press of the transmitter's large button within 5 seconds will unlock all of the doors.

The DLS-3 used with two relays can be used in place of the DLS to lock and unlock all doors ("standard doorlocks"). Although the 328i^3 does not feature a driver door priority unlock output, the optional DLS-3 and two relays can be used with the 328i^3 to lock and unlock all of the vehicle's doors.

Testing The System
All Models

Important: Upon completion of all wiring connections, the system should be tested for proper operation before the final mounting of the control module. Most experienced installers prefer to make all wiring connections, and then plugging in all of the wiring harness connectors to the control module. Whenever the control module is first powered up, it will sound briefly, then revert to its last condition, typically the disarmed state. If the system was armed, or triggered when power and ground were last removed, then when next powered up, the system will be in the triggered state. Once the system is tested and found to operate properly, the backup battery should be installed, the control module mounted, wiring harnesses neatened, and any removed vehicle's interior parts reinstalled.

Plug-in Backup Battery
All Models

All three Crime Guard models include a battery and plug-in harness for a backup battery circuit. This 9 volt alkaline battery is all that is required to provide alternate power to operate the security system in the event that the vehicle's battery is disconnected. A built-in protection circuit will not allow the 9 volt battery to feed back into the vehicle's electrical system, nor will the system flash the parking lights for confirmations or when it is triggered, thereby conserving the 9 volt battery's power. Also, the starter interrupt circuit will stay activated to prevent the vehicle from being started and driven away (the 533i^3 and 745i^3 include the starter interrupt socket and relay, but this is optional on the 328i^3).

Always make the security system's Black and Red wire connections first. To install, insert the battery into the built-in battery compartment inside the control module. Snap the connector and harness onto the 9 volt battery and then plug the connector into the system's White port marked "Battery Backup".

Replacement 9 volt alkaline batteries can be purchased anywhere batteries are sold. It is recommended that the battery be replaced with another alkaline battery every 18 months or after the 9 volt battery has operated the security system on its own for any length of time.

Anticipated life for the backup battery under following conditions:

1. 2 days as the system's only power source while Armed.
2. 25 triggered cycles: A trigger cycle has a 60 second duration during which the siren is sounding. The cycle ends when the system automatically resets to the armed state.
3. 50 separate remote control Arm/Disarm commands.
4. 18 months if the 9 volt battery circuit has not been activated.

Plug-in Port For Optional Pager
Crime Guard 745i³

The Crime Guard 745i³ features a plug-in port for an optional Omega pager system. The Omega pager is a great security enhancement to the Crime Guard 745i³, and comes complete with its own operation and installation instructions.

Programming Transmitters
All Models

Before attempting transmitter programming, please carefully read the section on "Programmable Feature #1" section in the Operation Manual. All three Crime Guard models come with two preprogrammed transmitters, and additional or replacement transmitters can be easily programmed to operate the system. If a third or fourth transmitter is to be added to operate the system, all of the transmitters must be programmed into system's memory at the same time, as the first new transmitter code entered will erase the existing transmitter codes.

Follow Steps 1 to 4 in the following section, "Features Programming

Checklist"; at Step 2 the Valet Switch will be pressed and released one time only. The system's response will be one siren chirp, and the Status Light flashing one time, pausing, then repeating. Within 10 seconds, press and release the Large Upper Button of the first transmitter. The system confirms "learning" the transmitter's code chirping the siren once. Repeat this action with each transmitter to be programmed. Only the Large Upper Button of the transmitter needs pressing and release; all of the other transmitter button's operations will be learned automatically.

Features Programming Checklist

Before attempting feature programming, please carefully read the "Programmable Features" section in the Operation Manual. A detailed explanation of each of the programmable features is found in the Operation Manual. This "quick checklist" will assist the programming of features once they are fully understood. For the entire features programming details and instructions to become familiar with the features and the programming procedure.

To best use this abbreviated checklist, mark each applicable box with "\" next to the feature to be changed before entering features Programming Mode. As each feature is programmed, change its mark to "X". To program features, follow these steps:

Step 1 - Turn the ignition "off", and press the Valet Switch 5 times.
(the system will respond a siren chirp, then briefly sounding the siren and the LED Status Light begins flashing)

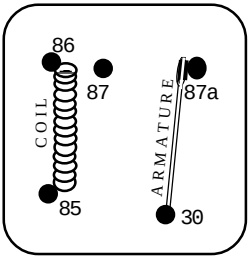
Step 2 - Press the Valet Switch the same number of times as the desired feature number.
(the system will acknowledge the Valet Switch entry by repeating the same number of siren chirps and the LED Status Light flashes an equal amount of times)

Step 3 - Press the transmitter's Large Upper Button to turn the feature "on", or press the Small Lower Button to turn the feature "off".
(turning the feature "on" is indicated by one siren chirp and the LED Status Light being on; turning the feature "off" is indicated by two siren chirps and the LED Status Light being off)

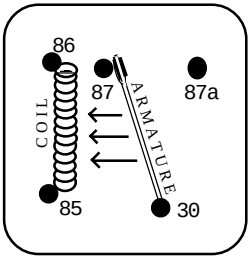
Repeat - Steps 2 and 3 for each feature to be changed. If no programming activity occurs within a 10 second period, the features Programming Mode will expire.
(the system exiting features Programming Mode is indicated by the siren briefly sounding)

#		FEATURE	DEFAULT
1	☐	TRANSMITTER PROGRAMMING	See Operation Manual
2	☐	SECURECODE PROGRAMMING	1 press- see Operation Manual
3	☐	Chirp Confirmation	ON (large upper button)
4	☐	30 / 60 Second Activated Alarm Cycle	30 Seconds (large upper button)
5	☐	Automatic Sensor Zone Bypass	ON (large upper button)
6	☐	Auxiliary Output #2 Also Disarms System	ON (large upper button)
7	☐	Last Door Arming	ON (large upper button)
8	☐	Doors Lock With Last Door Arming	OFF (small lower button)
9	☐	Parking Light Illumination Upon Disarm	OFF (small lower button)
10	☐	Starter Interrupt Operates In Valet Mode	OFF (small lower button)
11	☐	.8 / 3 Second Doorlock Pulse	.8 Second (large upper button)
12	☐	Ignition-Activated Vehicle Recovery	OFF (small lower button)
13	☐	Door-Activated Vehicle Recovery	OFF (small lower button)
14	☐	Transmitter-Activated Vehicle Recovery	OFF (small lower button)
15	☐	Automatic Rearming	ON (large upper button)
16	☐	Doors Lock With Automatic Rearming	ON (large upper button)
17	☐	3 / 45 Second Arming Delay	3 Second (large upper button)
18	☐	Doors Lock At Ignition “On”	ON (large upper button)
19	☐	Unlock #1 At Ignition OFF	ON (large upper button)
20	☐	Unlock #2 At Ignition OFF (533i^3 & 745i^3 only)	OFF (small lower button)
21	☐	Open Door Bypass To Features 18, 19, 20	ON (large upper button)
22	☐	One / Two Button Arming / Disarming	One Button (large upper button)

Universal Relay Wiring Instructions



At Rest
(Coil Not Energized)

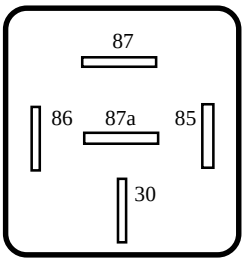


Activated
(Coil Energized)

In the views above, note the five terminals, or "pins". A relay's operation is really very simple. To understand its operation, consider the relay as having two sections - the coil, pins 85 and 86; and the contacts, pins 30, 87 and 87a. When Negative Ground is supplied to one end of the coil, and Positive Voltage is supplied at the other end, the coil creates a magnetic field which activates the relay. This magnetic field attracts the armature, which is attached to pin 30 with a flexible joint, just like a hinge. Inactivated, or "at rest", the armature connects pin 30 to pin 87a. When the relay is activated, the armature connects pin 30 to pin 87.

The terms used to describe the contact points are thus: pin 30 switches between pins 87a and 87, so it is "Common" to both and is usually referred to as COM. In the relay's normal condition, at rest, pin 30 is connected to pin 87a, making pin 87a "Normally Closed" or NC. Pin 87 is not connected to pin 30 at rest, so its status is "Normally Open" or NO.

This type of relay is defined as "Single Pole Double Throw" or SPDT. This term means that the single armature terminal (or pole, pin 30) can be connected (or "thrown") to two other terminals, pins 87a and 87. The SPDT relay is one of the most useful configurations due to its flexibility - it can be used as a switching device, to isolate circuits, to interrupt circuits and to interrupt and switch at the same time. For convenience, this booklet shows the relay's "footprint" view in its diagrams.



Footprint View