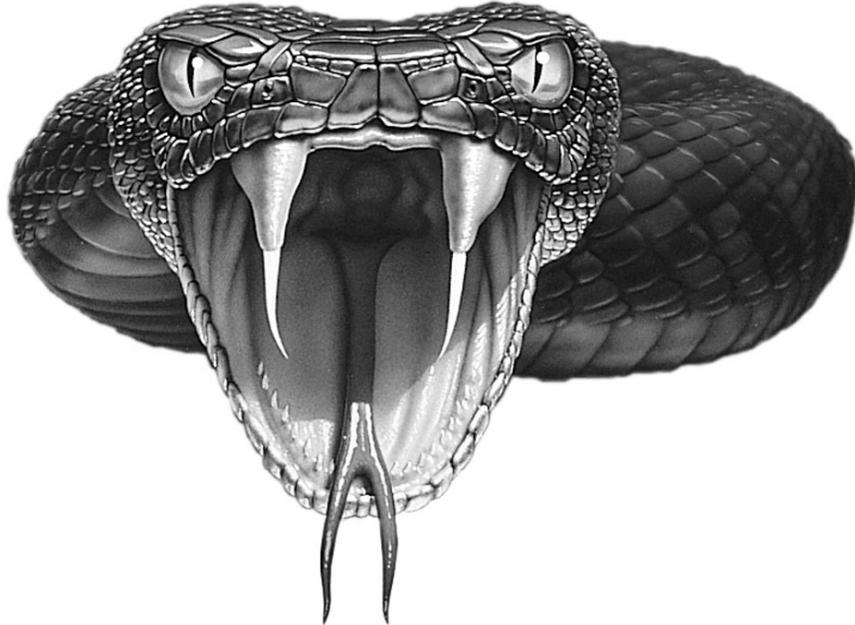


VIPER[®]



700 ESP

Installation Guide

Directed[®]
ELECTRONICS, INC.

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Rev. A 1.1



Version 1.3 or newer
of the Bitwriter[®]
chip is required to
program this unit.

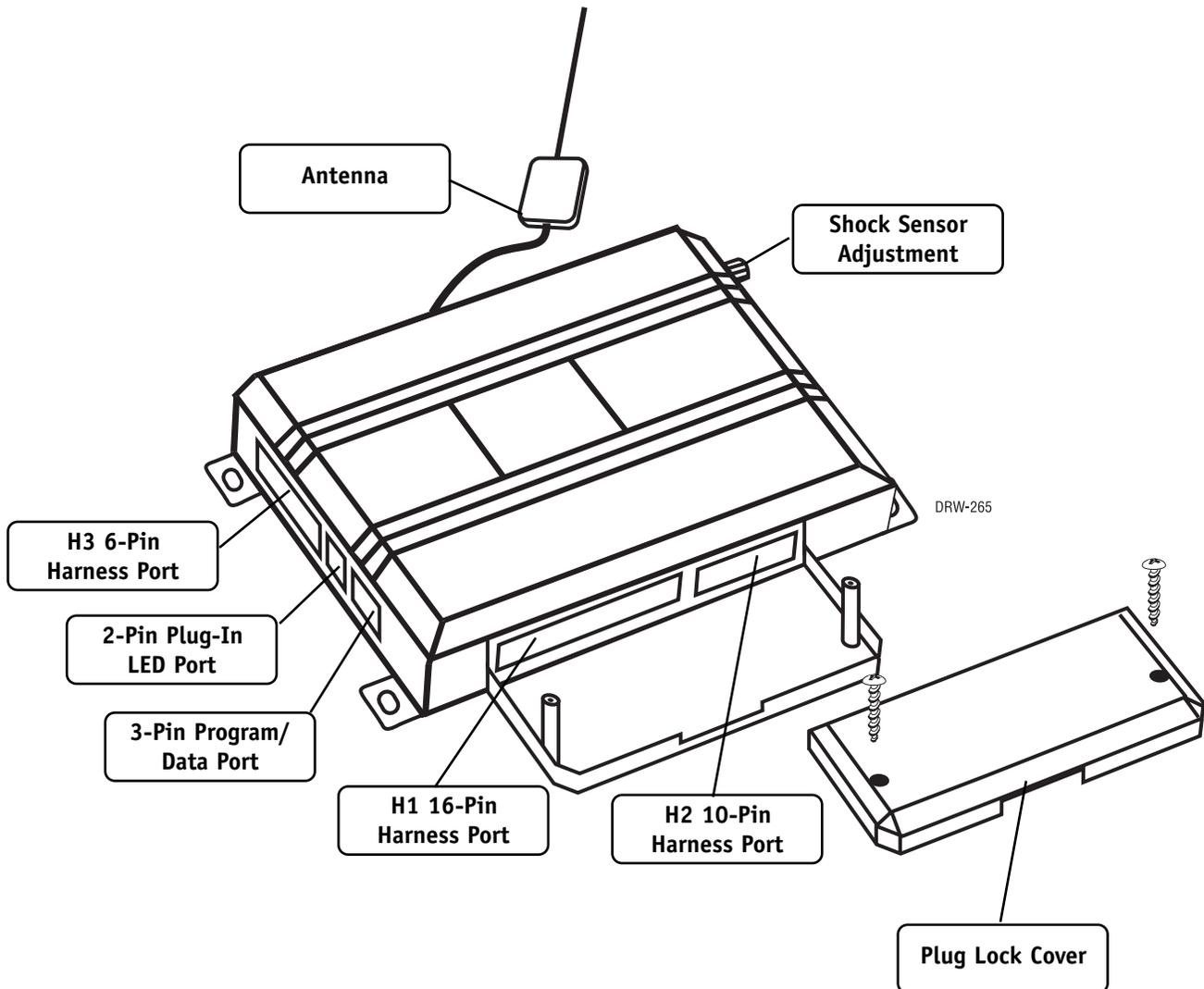
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Bitwriter™, Code Hopping™, DEI®, Doubleguard®, ESP™, FailSafe®, Ghost Switch™, Learn Routine™, Nite-Lite®, Nuisance Prevention Circuitry®, NPC®, Revenger®, Silent Mode™, Soft Chirp®, Stinger®, Valet®, Vehicle Recovery System®, VRS®, and Warn Away® are all Trademarks or Registered Trademarks of Directed Electronics, Inc.

what is included

- The control module (see diagram)
- Two four-button remote transmitters
- A plug-in status LED
- A Valet®/program switch
- A Stinger® shock sensor on-board the control module
- A Revenger® siren with rechargeable back-up battery
- A 15-amp alarm fuse
- A 10-amp light flash fuse
- An antenna (p/n 542H)
- Two siren keys



installation points to remember

This security system represents many years of research and development. It is very sophisticated and should only be installed by experienced security installers. Please do not attempt installation of this product without reading this guide. The system has been designed to provide the ultimate in security, coupled with limitless convenience and expansion options.

This product is not intended for consumer installation. It must be installed by an authorized dealer.

Do not disconnect the battery if the vehicle has an anti-theft coded radio. If equipped with an airbag, avoid disconnecting the battery if possible.

IMPORTANT! Many airbag systems will display a diagnostic code through their warning light after they lose power. Disconnecting the battery requires this code to be erased, a procedure that can require a trip to the dealer.

Before beginning the installation:

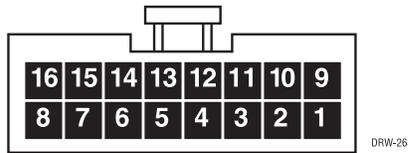
- Check with the customer on status LED location.
- Remove the domelight fuse. This prevents accidentally draining the battery.
- Roll down a window to avoid being locked out of the car.

After the installation:

- Test all functions. The “Using Your System” section of the Owner’s Guide is very helpful when testing.
- When testing, don’t forget that this system is equipped with Nuisance Prevention® Circuitry (NPC™), which can bypass both instant trigger zones, making them appear to not work.

primary harness (H1), 16-pin connector

16-PIN HARNESS



DRW-263

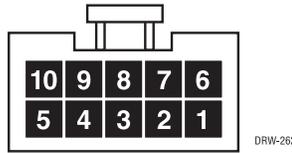
NOTE: The labels for the pin numbers of this harness are located on the front of the plug, which is the same side of the plug depicted in this diagram.

H1/1	(-) DOME 200 mA (NEGATIVE DOMELIGHT SUPERVISION OUTPUT)
H1/2	(-) SENSOR (NEGATIVE SENSOR, ZONE 4 MULTIPLEX)
H1/3	(+) DOOR (POSITIVE DOOR TRIGGER INPUT, ZONE 3)
H1/4	(-) INST (NEGATIVE INSTANT TRIGGER, ZONE 1)
H1/5	(-) DOOR (NEGATIVE DOOR TRIGGER INPUT, ZONE 3)
H1/6	SIREN DATA* SIREN DATA INPUT
H1/7	(-) STARTER 500 mA (NEGATIVE GROUND-WHEN-ARMED OUTPUT)
H1/8	LIGHT OUT 5 AMP (PARKING LIGHT OUTPUT #1)
H1/9	(-) HORN 200 mA (NEGATIVE HORN HONK OUTPUT)
H1/10	NORMALLY OPEN INTERRUPT INPUT #2
H1/11	(-) SIREN 200 mA (NEGATIVE SIREN OUTPUT)
H1/12	NORMALLY OPEN INTERRUPT OUTPUT #2
H1/13	NORMALLY OPEN INTERRUPT INPUT #3
H1/14	NORMALLY OPEN INTERRUPT OUTPUT #3
H1/15	LIGHT OUT 5 AMP (PARKING LIGHT OUTPUT #2)
H1/16	LIGHT IN (PARKING LIGHT INPUT)

***IMPORTANT!** The siren data wire should only be connected to the siren's VIOLET tag wire. Do not connect this wire to anything else.

secondary harness (H2), 10-pin connector

10-PIN HARNESS

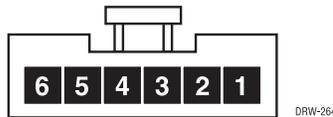


NOTE: The labels for the pin numbers of this harness are located on the front of the plug, which is the same side of the plug depicted in this diagram.

H2/1	(+) IGNITION INPUT, ZONE 5
H2/2	NO FUNCTION
H2/3	GROUND
H2/4	(-) VALET SWITCH INPUT
H2/5	(-) CHANNEL 4, 200 mA OUTPUT
H2/6	(+) 12V CONSTANT POWER INPUT
H2/7	NORMALLY CLOSED INTERRUPT INPUT #1
H2/8	(-) CHANNEL 2, 200 mA OUTPUT
H2/9	(-) CHANNEL 3, 200 mA OUTPUT
H2/10	NORMALLY CLOSED INTERRUPT OUTPUT #1

door lock harness (H3), 6-pin connector

6-PIN HARNESS



NOTE: The labels for the pin numbers of this harness are located on the front of the plug, which is the same side of the plug depicted in this diagram.

H3/1	WHITE/BLACK	NORMALLY CLOSED LOCK RELAY 87A
H3/2	GREEN/BLACK	OUTPUT OF LOCK RELAY 30
H3/3	VIOLET/BLACK	NORMALLY OPEN INPUT TO LOCK RELAY 87 (FUSED 15A)
H3/4	BROWN/BLACK	NORMALLY CLOSED UNLOCK RELAY 87A
H3/5	BLUE/BLACK	OUTPUT OF UNLOCK RELAY 30
H3/6	VIOLET	NORMALLY OPEN INPUT TO UNLOCK RELAY 87

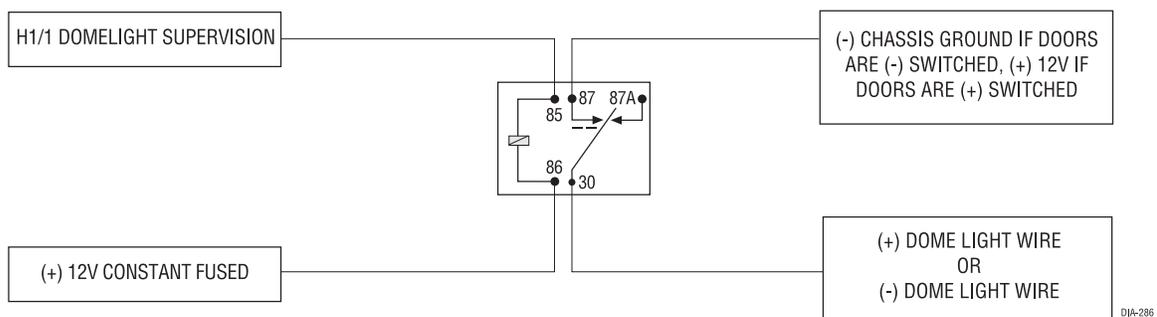
primary harness (H1) wire connection guide

This guide describes in detail the connection of each wire. Also included are possible applications of each wire. This system was designed with the ultimate in flexibility and security in mind. Many of the wires have more than one possible function. Please read carefully to ensure a thorough understanding of this unit.

H1/1 (-) domelight supervision output

Connect this wire to the optional domelight supervision relay as shown in the following diagram:

IMPORTANT! This output is only intended to drive a relay. It cannot be connected directly to the domelight circuit, as the output cannot support the current draw of one or more light bulbs.



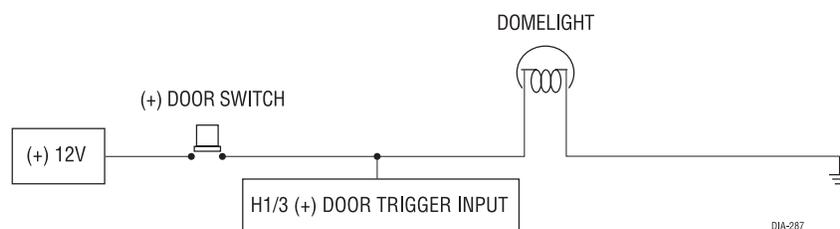
H1/2 (-) sensor, zone 4 multiplex

Inputs shorter than 0.8 seconds will trigger the Warn Away response, while inputs longer than 0.8 seconds will trigger the full alarm sequence and report Zone 4. If installing an optional DEI® dual stage sensor, connect both the blue and the green wires of the optional sensor to this input.

H1/3 (+) door trigger input, zone 3

IMPORTANT! You *MUST* test to make sure that the H1/3 wire "sees" all doors!

If the door switch wire you found in the vehicle is positive (+) when the door is open, use the H1/3 (+) door trigger input. (Positive door triggers are typically used only in Ford vehicles.)



H1/4 (-) instant trigger input (hood pin), zone 1

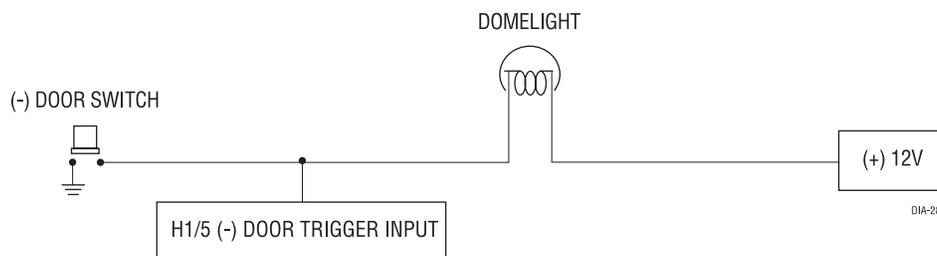
This input will respond to a negative input with an instant trigger that reports on Zone 1. It is ideal for hood and trunk pins, but can also be used with 506T Glass Breakage Sensor, as well as other DEI® single stage sensors. Connect this input to the hood pin wire going through the sleeve of the 515E Siren. (The hood pin wire is labeled with a BLUE tag on the siren harness.)

The H1/4 wire can be used to shunt sensors during operation by using the auxiliary channels. When any of the auxiliary channels are transmitted, the H1/4 (-) instant trigger wire monitors for ground. If ground is detected within 5 seconds of transmission, the sensor and the instant trigger input on the H1/4 wire will be shunted until 5 seconds after ground is removed. This allows the consumer to access the trunk, remote start the vehicle or roll down the windows without first disarming the alarm. (See the *Bypassing the Sensor Inputs* section of this guide.)

H1/5 (-) door trigger input, zone 3

If the door switch wire you found in the vehicle is negative (-) when the door is open, connect it to the H1/5 (-) door trigger input.

IMPORTANT! You *MUST* test to make sure that the H1/5 wire "sees" all doors!



H1/6 siren data input

Connect the H1/6 siren data input wire to the data output of the siren. (The siren's data output wire is labeled with a VIOLET tag on the siren harness.) When the 515E Euro-Siren key is turned to the off position, a data command signal is sent on the H1/6 wire to override the system and disarm the alarm.

IMPORTANT! This wire should only be connected to the siren's VIOLET tag wire. Do not connect this wire to anything else.

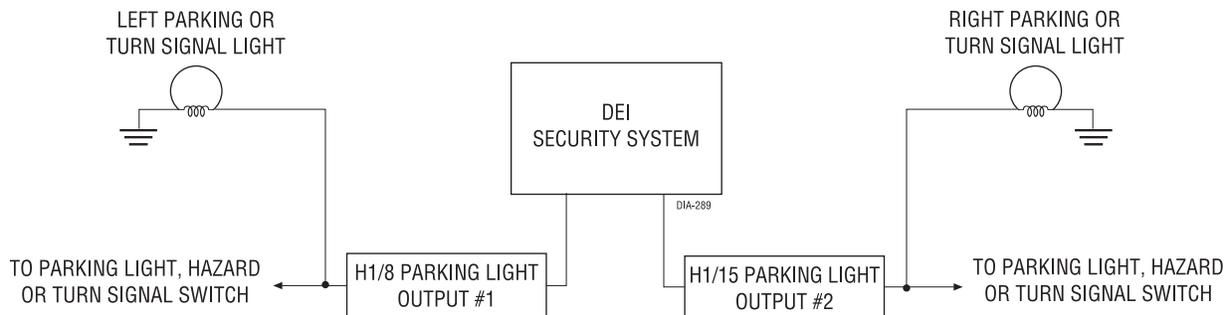
IMPORTANT! Using the siren key is the *ONLY* way to disarm the alarm and the back-up siren without the transmitter.

H1/7 (-) ground-when-armed output

This wire supplies (-) ground as long as the system is armed. This output ceases as soon as the system is disarmed. This wire can be used to turn on an optional sensor or to ready an optional accessory, such as a pager module.

H1/8 parking light output #1 and H1/15 parking light output #2

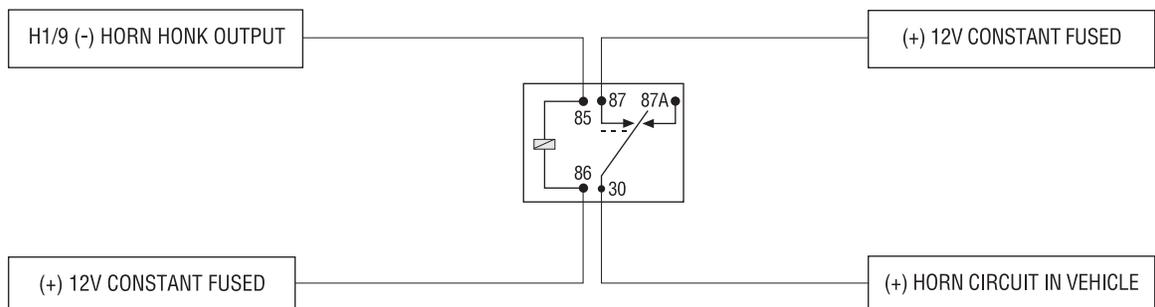
If the vehicle has only one complete parking light wire, connect only one of these parking light outputs directly to the parking light circuit of the vehicle. This is a dual isolated output relay (both outputs are active at the same time). An alternative to using the parking light flash is to use either turn signal flash or hazard light flash. See the following diagram.



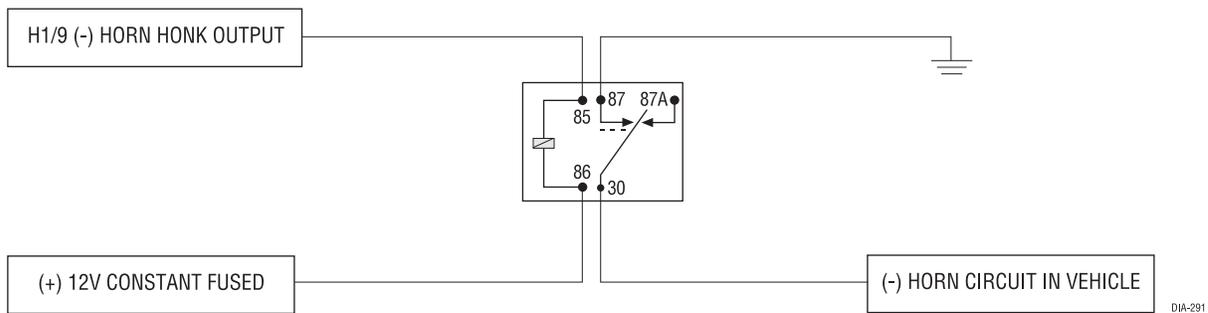
H1/9 (-) horn honk output

This wire supplies a (-) 200 mA output that can be used to honk the vehicle horn. This wire outputs pulses when the alarm is triggered or when Panic Mode is activated. This wire can be programmed to output a single pulse when locking the doors with the remote and two pulses when unlocking the doors with the remote. If the vehicle has a (+) horn circuit or a horn circuit that draws more than 200 mA, an optional relay can be used to interface with the system, as shown in the following diagram.

(+) Positive Horn Circuit



(-) Negative Horn Circuit (High Current)



H1/10 normally open interrupt input #2 and H1/12 normally open interrupt output #2

These wires can be used for fuel interrupt or ignition kill. The H1/10 and H1/12 wires are interchangeable, so it does not matter which half of the interrupted wire they are attached to. Both interrupt wires have continuity when the ignition key is turned on and have no continuity when the key is turned off. If the alarm is armed or triggered, the interrupted circuit will remain interrupted until the alarm is disarmed with the remote or overridden with the siren key lock.

To connect the H1/10 and H1/12 interrupt wires, first you must locate the ignition or fuel wire in the vehicle. Cut the ignition or fuel pump wire, and connect the H1/10 wire to one end of the cut wire. Then connect the H1/12 wire to the other end of the cut ignition or fuel pump wire.

NOTE: If the on-board relay were to fail, the circuit would remain interrupted until the unit is repaired, bypassed or replaced.

H1/11 (-) siren output

The H1/11 wire connects to the siren input wire of the 515E siren. (The siren input wire is labeled with a GREEN tag on the siren harness.) The siren duration is programmable for 25 or 50 seconds, if programming the unit with the Valet switch. If using the Bitwriter for programming, the duration is programmable from 1 to 180 seconds. Connect the siren's BLACK tag wire to (-) chassis ground, preferably at the same point you grounded the control module's H2/3 ground wire. Connect the siren's RED tag (+)12V input wire to a good source of constant 12V. Refer to the H1/6 Siren Data Wire and the H1/4 Hood Pin Input wiring descriptions in the H1 Harness Wire Connection Guide section of this guide for instructions on wiring the remaining siren wires, or refer to the side panel of the 515E siren's box for detailed instructions for wiring all of the siren's connections.

H1/12 normally open interrupt output #2

Refer to the H1/10 wiring description.

H1/13 normally open interrupt input #3 and H/14 normally open interrupt output #3

These wires can be used for fuel interrupt or ignition kill. The H1/13 and H1/14 wires are interchangeable, so it does not matter which half of the interrupted wire they are attached to. Both interrupt wires have continuity when the ignition key is turned on and have no continuity when the key is turned off. If the alarm is armed or triggered, the interrupted circuit will remain interrupted until the alarm is disarmed with the remote or overridden with the siren key lock.

To connect the H1/13 and H1/14 interrupt wires, first you must locate the ignition or fuel wire in the vehicle. Cut the ignition or fuel pump wire, and connect the H1/13 wire to one end of the cut wire. Then connect the H1/14 wire to the other end of the cut ignition or fuel pump wire.

***NOTE:** If the on-board relay were to fail, the circuit would remain interrupted until the unit is repaired, bypassed or replaced.*

H1/14 normally open interrupt output #3

Refer to the H1/13 wiring description.

H1/15 parking light output #2

Refer to the H1/8 wiring description.

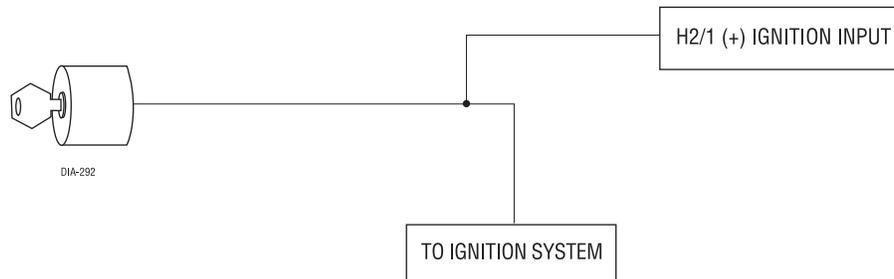
H1/16 parking light input #1

This wire serves as the input to the dual parking light outputs, wires H1/8 and H1/15. It determines what the output polarity of the H1/8 and H1/15 wires will be. If the parking light circuit(s) in the vehicle is positive, connect to a fused 12V source. If the parking light circuit(s) is negative, connect this input to chassis ground. Be sure to fuse this input with the 10-amp fuse that is supplied with this unit.

secondary harness (H2) wire connection guide

H2/1 (+) ignition input, zone 5

Connect this wire to the (+)12V ignition wire. This wire must show (+)12V with the key in run position and during cranking. If the security system is armed and the ignition key is turned on, the H2/1 wire will trigger the alarm and report Zone 5. Take great care that this wire cannot be shorted to the chassis at any point.

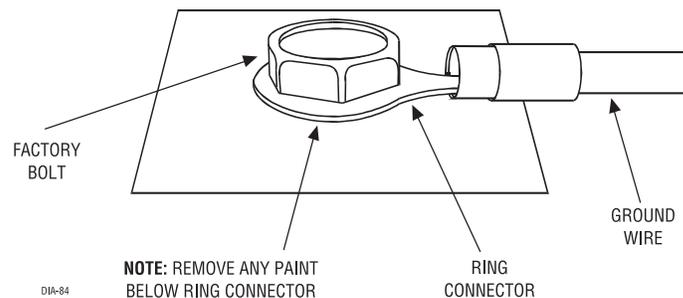


H2/2 no function

This wire has no function.

H2/3 (-) chassis ground connection

Remove any paint and connect this wire to bare metal, preferably with a factory bolt rather than your own screw. (Screws tend to either strip or loosen with time.) We recommend grounding all your components, including the siren, to the same point in the vehicle.



H2/4 (-) valet switch input

The Valet switch is used to program and enter Valet Mode. Connect the grey wire of the Valet switch to the H2/4 wire and the black wire of the Valet switch to chassis ground.

NOTE: The Valet switch will NOT override the alarm. Also, the alarm must be disarmed in order to enter Valet Mode.

H2/5 (-) channel 4 output

This wire provides a (-) 200mA output whenever the transmitter button(s) controlling Channel 4 is pressed. This output can be programmed to provide the following types of outputs (see also the *Feature Menus* section):

- **Validity:** Output that will send a signal as long as the transmission is received.
- **Latched:** Output that will send a signal when the Channel 4 button(s) is pressed and will continue until the same button(s) is pressed again.
- **Latched, reset with ignition:** Similar to the latched output, this type of output turns on the first time the Channel 4 button(s) is pressed and turns off the next time the same button is pressed. This type of output additionally stops and resets whenever the ignition is turned on and then off.
- **30-second timed:** Output that will send a continuous signal for 30 seconds. This output can be shut off during the 30-second period by pressing the Channel 4 button again.
- **60-second timed:** Output that will send a continuous signal for 60 seconds. This output can be shut off during the 60-second period by pressing the Channel 4 button again.
- **90-second timed:** Output that will send a continuous signal for 90 seconds. This output can be shut off during the 90-second period by pressing the Channel 4 button again.

***IMPORTANT!** Never use this wire to drive anything but a relay or a low-current input! This transistorized output can only supply 200 mA, and connecting directly to a solenoid, motor, or other high-current device will cause the module to fail.*

H2/6 (+)12V constant power input

Before connecting this wire to (+)12V, add the 15-amp fuse and fuse holder that are supplied with this unit. Be sure to remove the 15-amp fuse until the installation is complete. Connect this wire to the battery positive terminal or the constant (+)12V supply to the ignition switch.

H2/7 normally closed interrupt input #1 and H2/10 normally closed interrupt output #1

These wires can be used to interrupt the starter wire of the vehicle. They are interchangeable, so it does not matter which half of the interrupted wire they are attached to. The H2/7 and H2/10 two wires have continuity all the time. These wires lose continuity if the ignition key is turned on while the alarm is armed or triggered.

To connect the H2/7 and H2/10 interrupt wires, first you must locate the starter wire in the vehicle. Cut the starter wire, and connect the H2/7 wire to one end of the cut wire. Then connect the H2/10 wire to the other end of the cut starter wire.

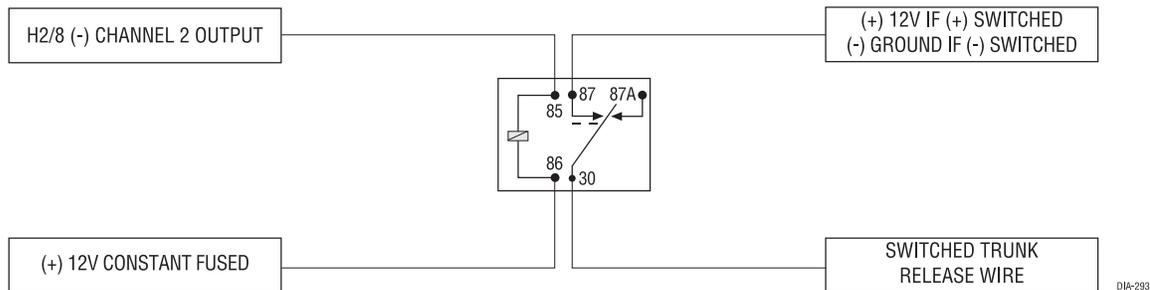
H2/8 (-) channel 2, 200 mA output

When the system receives the code controlling Channel 2 for longer than 1.5 seconds, the H2/8 wire will supply

an output as long as the transmission continues. This output can be used to operate a trunk/hatch release or other relay-driven function.

IMPORTANT! Never use this wire to drive anything but a relay or a low-current input! The transistorized output can only supply 200 mA of current. Connecting directly to a solenoid, motor, or other high-current device will cause it to fail.

(+) Positive Trunk Release Circuit



H2/9 200 mA (-) channel 3 output

This wire provides a (-) 200 mA output whenever the remote button(s) controlling channel three is pressed. This output can be programmed to provide the following types of output (see *System Features Learn Routine* section):

- **Validity:** Output that will send a signal as long as the transmission is received.
- **Latched:** Output that will send a signal when the Channel 3 button(s) is pressed and will continue until the same button(s) is pressed again.
- **Latched, reset with ignition:** Similar to the latched output, this type of output turns on the first time the Channel 3 button(s) is pressed and turns off the next time the same button is pressed. This type of output additionally stops and resets whenever the ignition is turned on and then off.
- **30-second timed:** Output that will send a continuous signal for 30 seconds. This output can be shut off during the 30-second period by pressing the Channel 3 button again.
- **Second unlock:** This output can also be programmed to provide a second unlock pulse when the disarm button is pressed within 15 seconds after disarming the system. This can be used to unlock the passenger doors when installing progressive door locks.

IMPORTANT! Never use this wire to drive anything but a relay or a low-current input! The transistorized output can only supply 200 mA of current. Connecting directly to a solenoid, motor, or other high-current device will cause it to fail.

H2/10 normally closed interrupt output #1

Refer to the H2/7 wiring description.

door lock harness (H3) wire connection guide

H3/1 - H3/6 power door locks

The system has door lock relays on-board, and can directly interface with most electric power door lock systems drawing 15 amps or less. It can also drive after-market actuators directly. (Some vehicles require that an after-market actuator be added to the driver's door to allow system control. See Type D Locks.)

identifying the door lock system

The easiest way to determine which type of door lock system you are working with is to remove the master locking switch itself, which is usually on the driver's door or on the center console. Once you have determined which type of factory door lock circuit you are working with, and the color codes of the switch wires to be used, you can usually simplify the installation by locating the same wires in the vehicle's kick panel. If no central locking switch is found, the installation may require a door lock actuator.

NOTE: Always retest the wires in the kick panel to be sure they work the same as the wires on the switch.

There are eight common types of door lock circuits:

type A: 3-wire (+) pulse controlling factory lock relays

Most GM, some Ford and Chrysler, 1995 and newer Saturns, some new VW, newer BMW.

type B: 3-wire (-) pulse controlling factory lock relays

Most Asian vehicles, early Saturn, some BMW and Porsche.

type C: directly-wired reversing-polarity switches

The switches are wired directly to the motors. This type of system has no factory relays. Most Fords, many GM two-doors cars and trucks, many Chryslers.

type D: adding one or more after-market actuators

These include slave systems without an actuator in the driver's door, but with factory actuators in all the other doors. Type D also includes cars without power locks, which are having actuators added. All Saab before 1994, most Volvo except 850i, most Subaru, most Isuzu, and many Mazda. Some mid-eighties Nissans, pre-1985 Mercedes-Benz and Audi.

type E: electrically activated vacuum systems

The vehicle must have a vacuum actuator in each door. Make sure that locking the doors from the driver's or passenger side using the key activates all the actuators in the vehicle. This requires a slight modification to the door lock harness. Mercedes-Benz and Audi 1985 and newer.

type F: one-wire system - cut to lock, ground to unlock

This system is found in the late-model Nissan Sentra, some Nissan 240SX, and Nissan 300ZX 1992-up. It is also found in older Mitsubishi, and some early Mazda MPV's.

type G: (+) multiplex system

This system is most commonly found in Ford, Mazda, Chrysler and GM vehicles. The door lock switch or door key cylinder may contain either one or two resistors.

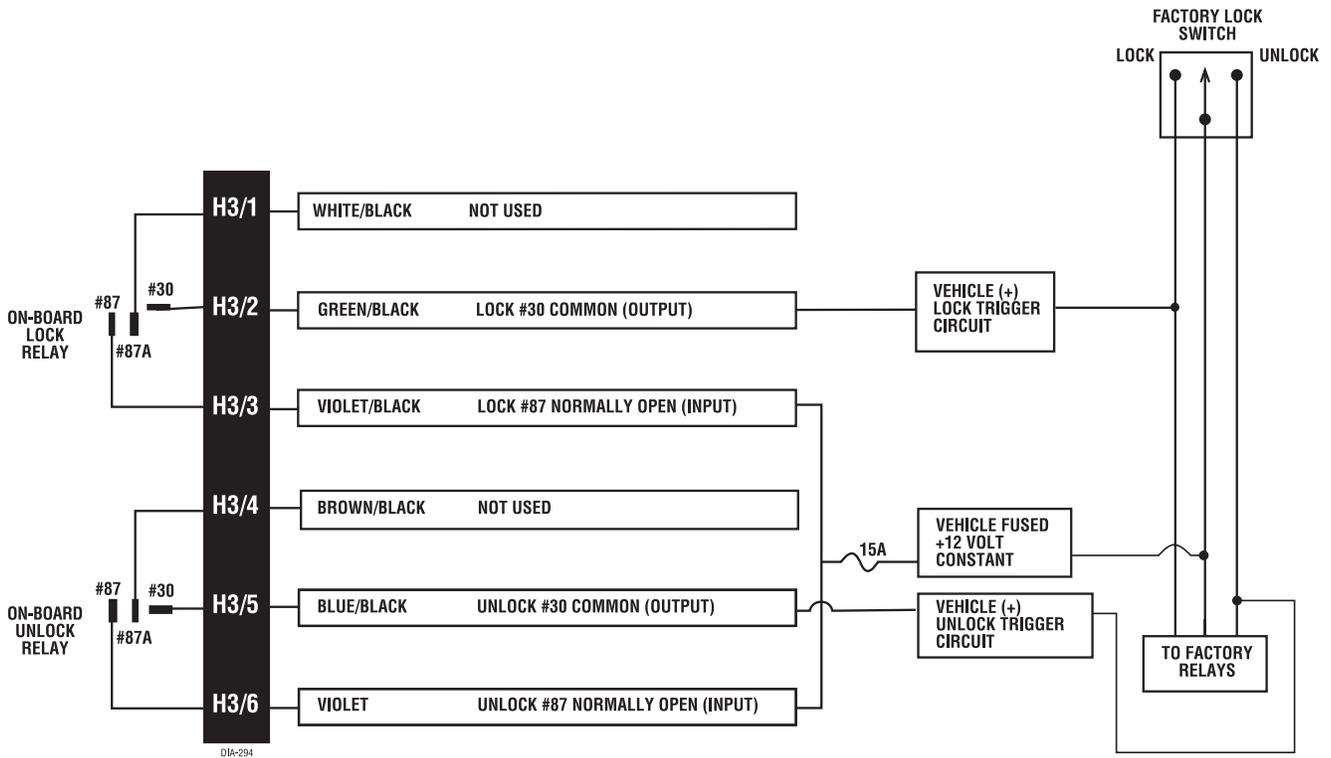
type H: (-) multiplex system

The system is most commonly found in Ford, Mazda, Chrysler and GM vehicles. The door lock switch or door key cylinder may contain either one or two resistors.

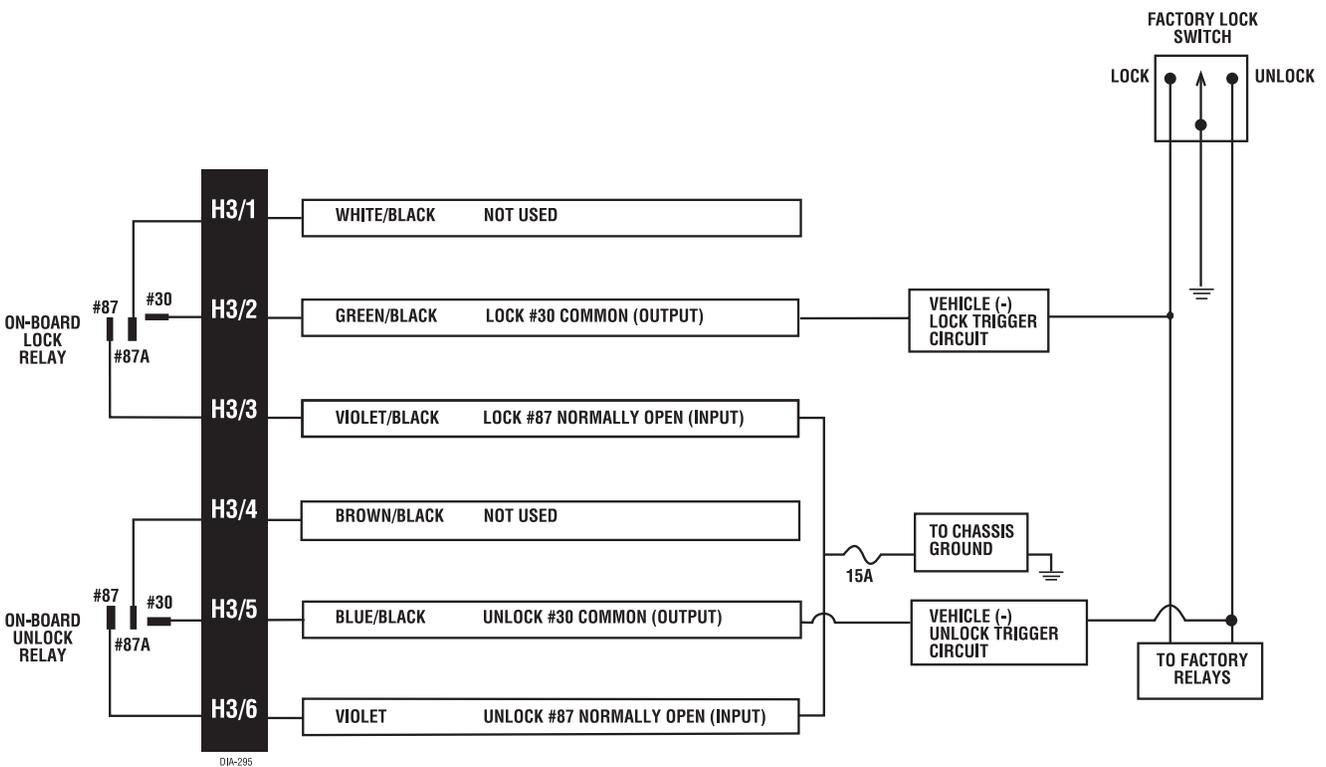
at the switch

- Three-wire switches will have either a constant ground input or a constant (+)12V input, along with the pulsed lock and unlock outputs to the factory relays.
- Many BMW's and VW's have no external switch. The switches are inside the actuator, and instead of pulsing, the proper wires will flip-flop from (+) 12V to (-) ground as the door locks are operated.
- Direct-wired switches will have a (+) 12V constant input and one or two (-) ground inputs, along with two output leads going directly to the lock motors.

type A: positive-triggered, relay-driven systems



type B: negative-triggered, relay-driven systems

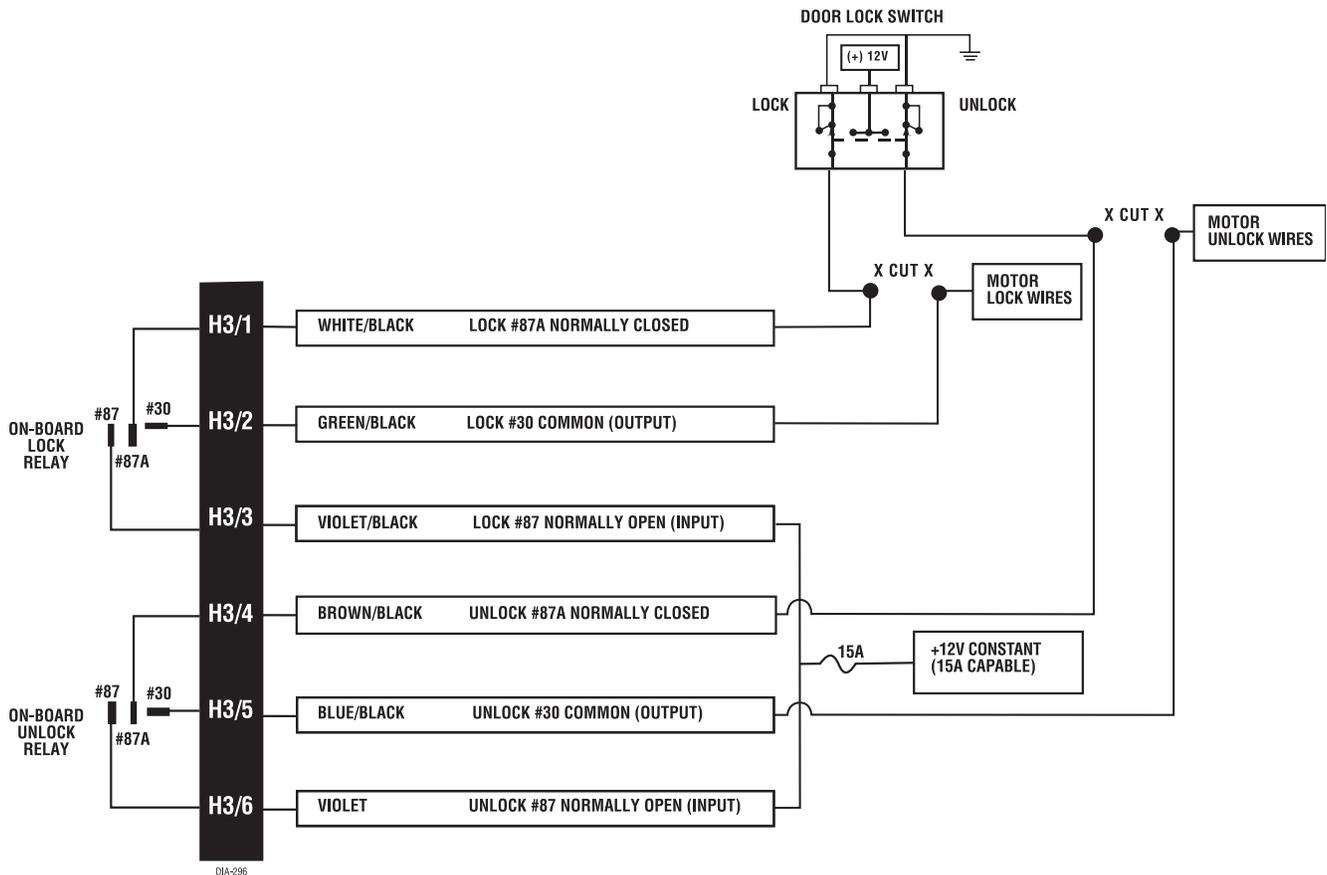


type C: reversing polarity

Use these instructions if the power door lock switch has four or five heavy-gauge wires. This type of switch has two outputs that rest at (-) ground.

IMPORTANT! To interface with Type C systems, you must cut two switch leads. The relays must duplicate the factory door lock switches' operation. The master switch will have one or two ground inputs, one (+)12V input, and two switch outputs going directly to the slave switch and through to the motors. These outputs rest at (-) ground. The lock or unlock wire is switched to (+)12V, while the other wire is still grounded, thus completing the circuit and powering the motor. This will disconnect the switch from the motor before supplying the motor with (+)12V, avoiding sending (+)12V directly to (-) ground.

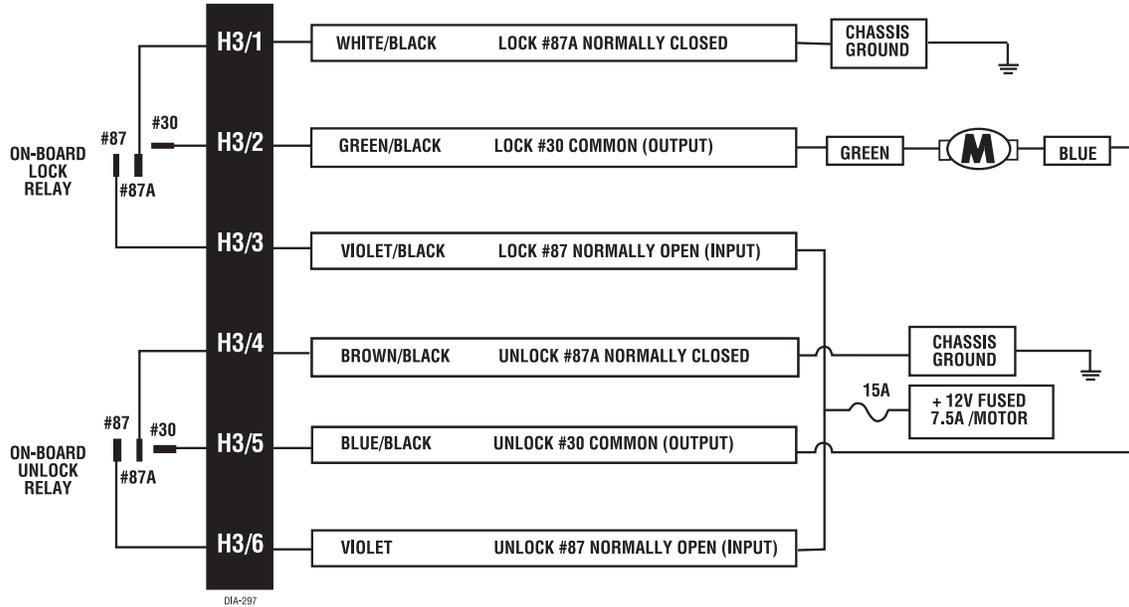
It is critical to identify the proper wires and locate the master switch to interface properly. Locate wires that show voltage when the switch is moved to the lock or unlock position. Cut one of the suspect wires and check operation of the locks from both switches. If one switch loses all operation in both directions then you have cut one of the correct wires and the switch that is entirely dead is the master switch. If both switches still operate in any way and one or more door motors have stopped responding entirely, you have cut a motor lead. Reconnect it and continue to test for another wire. Once both wires have been located and the master switch has been identified, cut both wires and interface as shown in the following diagram.



WARNING! If these wires are not connected properly, you will send (+) 12 volts directly to (-) ground, possibly damaging the control module or the factory switch.

type D: adding one or more after-market actuators

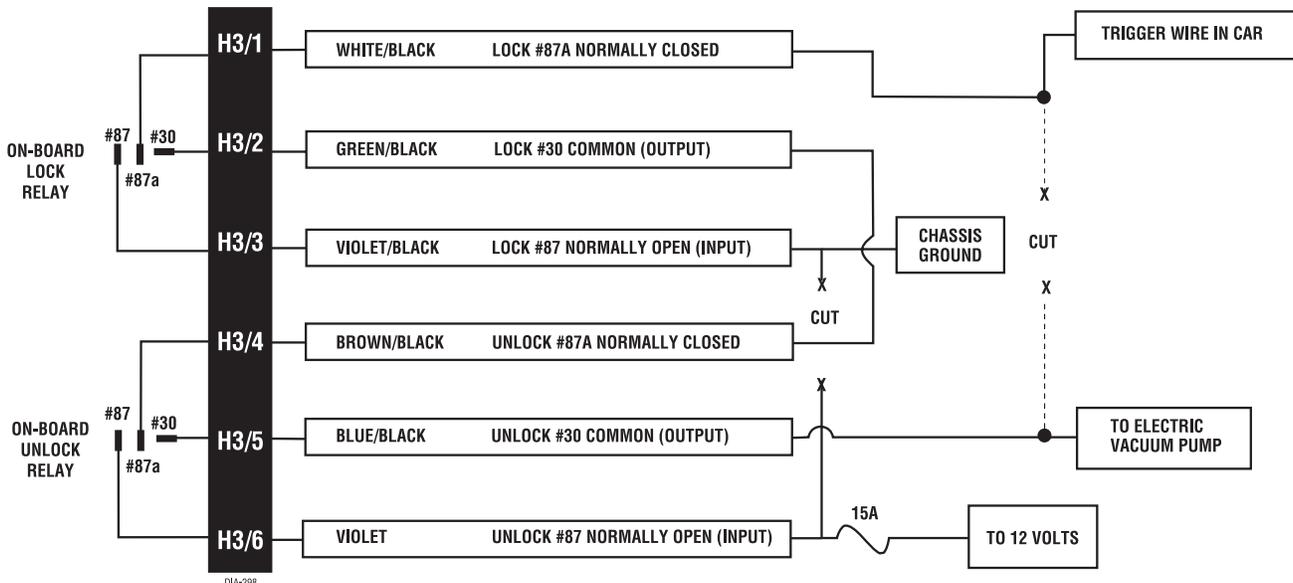
Vehicles without factory power door locks require the installation of one actuator per door. This requires mounting the door lock actuator inside the door. Other vehicles may only require one actuator installed in the driver's door if all door locks are operated when the driver's lock is used.



type E: electrically-activated vacuum

This system is found in Mercedes-Benz and Audi 1985 and newer. The door locks are controlled by an electrically activated vacuum pump. The control wire will show (+) 12V when doors are unlocked and (-) ground when doors are locked.

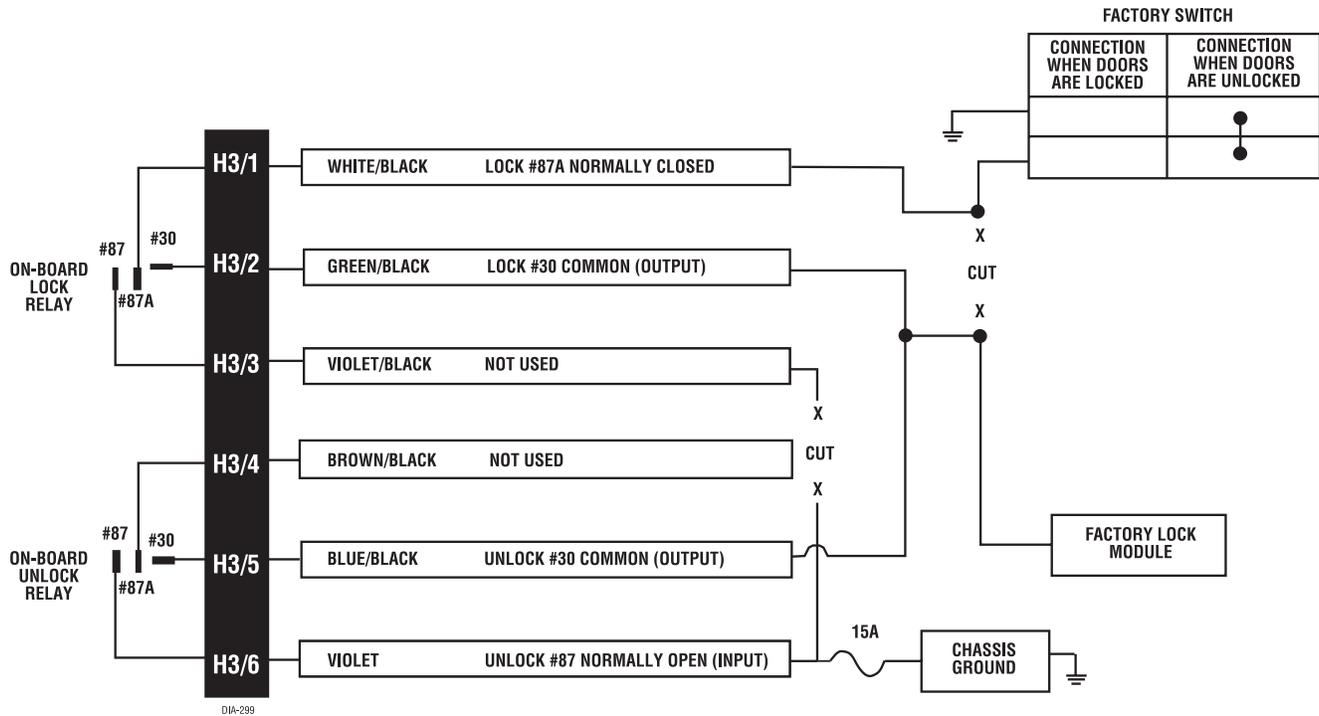
IMPORTANT! The system must be programmed for 3.5 second door lock pulses. Also, the violet jumper between the H3/3 #87 lock terminal and the H3/6 #87 unlock terminal must be cut.



type F: one-wire system - cut to lock, ground to unlock

This system usually requires a negative pulse to unlock, and cutting the wire to lock the door. (With some vehicles, these are reversed.) It is found in the late-model Nissan Sentra, some Nissan 240SX, and Nissan 300ZX 1992-up. It is also found in some Mazda MPV's.

IMPORTANT! Remember that the violet jumper between the H3/3 #87 lock terminal and the H3/6 #87 unlock terminal must be cut.



type G: positive (+) multiplex

This system is most commonly found in Ford, Mazda, Chrysler and GM vehicles. The door lock switch or door key cylinder may contain either one or two resistors.

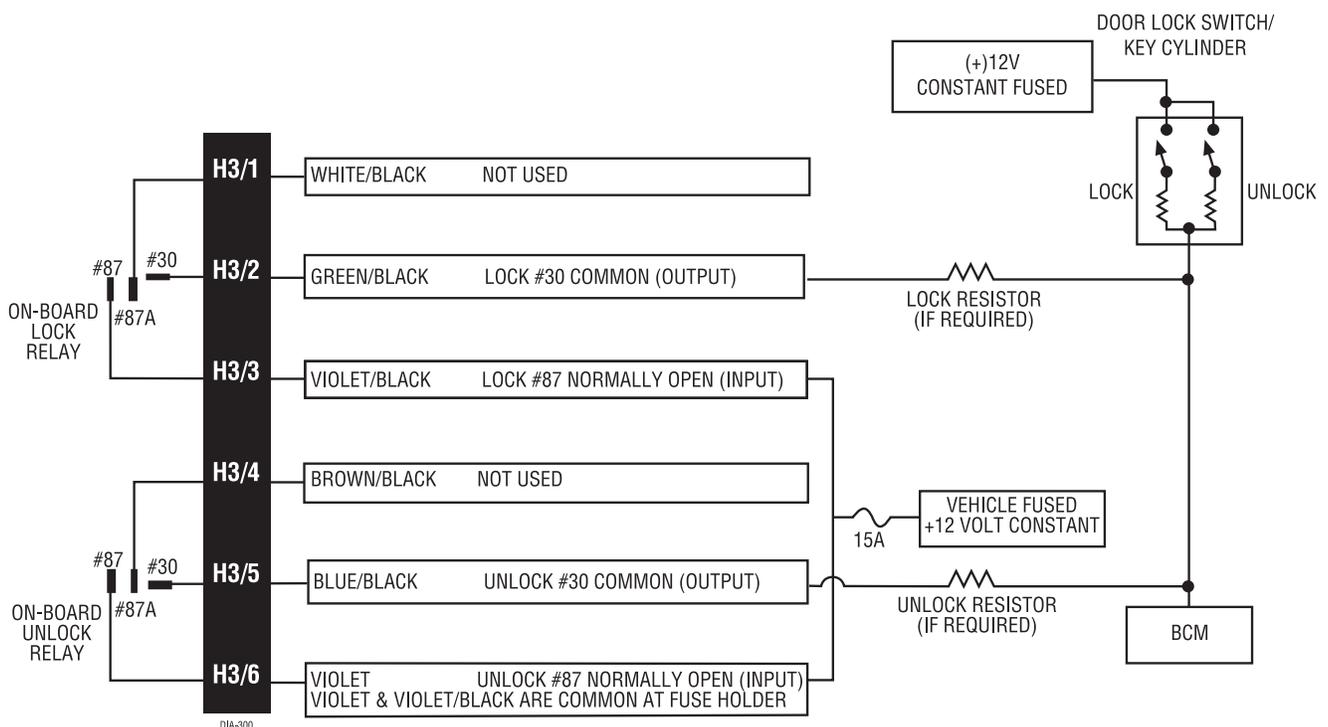
SINGLE-RESISTOR TYPE: If one resistor is used in the door lock switch/key cylinder, the wire will pulse (+)12V in one direction and less than (+)12V when operated in the opposite direction.

TWO-RESISTOR TYPE: If two resistors are used in the factory door lock switch/key cylinder, the switch/key cylinder will read less than (+)12V in both directions.

DETERMINING THE PROPER RESISTOR VALUES: To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For testing, use a calibrated digital multimeter that is set to ohms.

IMPORTANT! To ensure an accurate resistance reading, do not touch the resistor or leads during testing.

1. Cut the output wire from the door lock switch/key cylinder in half.
2. Test with the meter from the switch side of the cut door lock switch/key cylinder wire to a reliable constant (+)12V source. Some good constant (+)12V references are the power input source to the door lock switch/key cylinder, the ignition switch power wire, or the (+) terminal of the battery.
3. Operate the door lock switch/key cylinder in both directions to determine the resistor values. If the multi-meter displays zero resistance in one direction, no resistor is needed for that direction.
4. Once the resistor value(s) is determined, refer to the wiring diagram for proper wiring.



type H: negative (-) multiplex

The system is most commonly found in Ford, Mazda, Chrysler and GM vehicles. The door lock switch or door key cylinder may contain either one or two resistors.

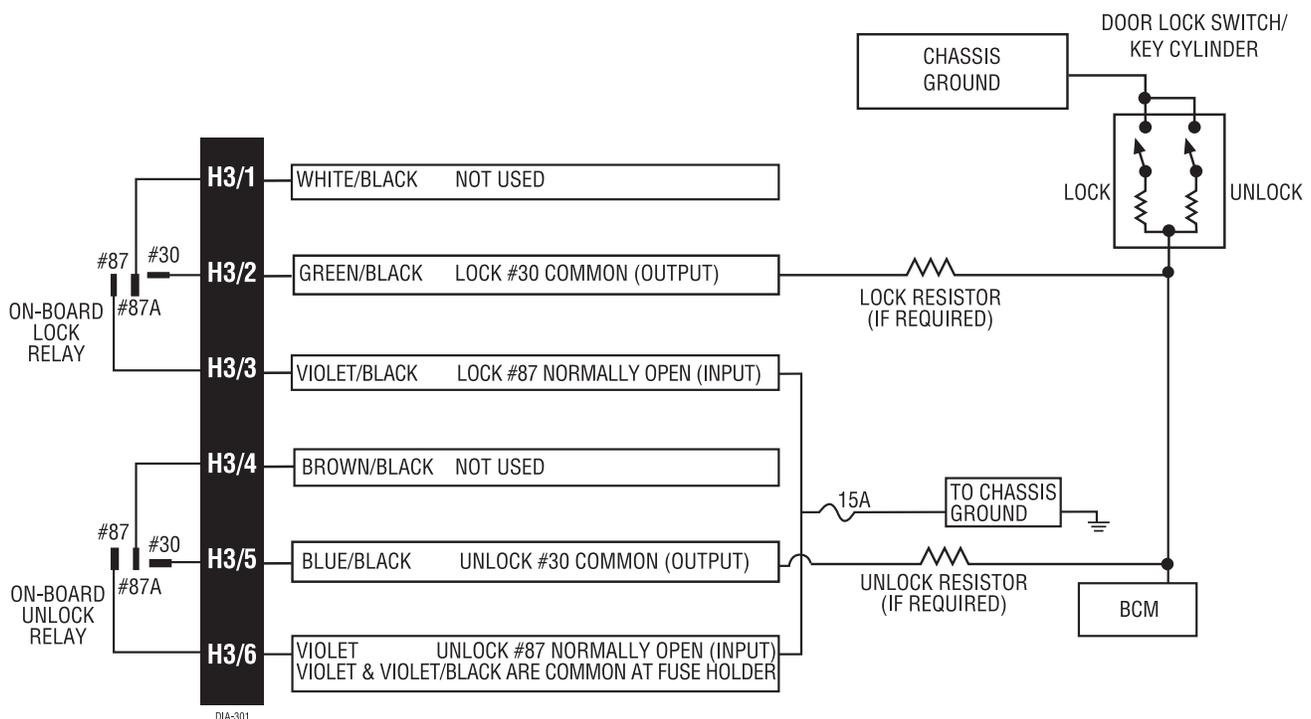
SINGLE-RESISTOR TYPE: If one resistor is used in the door lock switch/key cylinder, the wire will pulse ground in one direction and resistance to ground when operated in the opposite direction.

TWO-RESISTOR TYPE: If two resistors are used in the factory door lock switch/key cylinder, the door lock switch/key cylinder will read resistance to ground in both directions.

DETERMINING THE PROPER RESISTOR VALUES: To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For testing, use a calibrated digital multimeter that is set to ohms.

IMPORTANT! To ensure an accurate resistance reading, do not touch the resistor or leads during testing.

1. Cut the output wire from the door lock switch/key cylinder in half.
2. Test with the meter from the switch side of the cut door lock switch/key cylinder wire to a reliable ground source. Some good ground references are the ground input source to the door lock switch/key cylinder or the battery ground.
3. Operate the door lock switch/key cylinder in both directions to determine the resistor values. If the multi-meter displays zero resistance in one direction, no resistor is needed for that direction.
4. Once the resistor value(s) is determined, refer to the wiring diagram for proper wiring.



plug-in harnesses

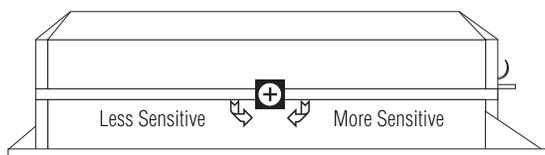
super-bright LED, 2-pin white plug

The super bright LED operates at 2V DC. Make sure the LED wires are not shorted to ground as the LED will be damaged. Multiple LED's can be used, but they must be wired in series. The LED fits into a $\frac{9}{32}$ -inch mounting hole. Be sure to check for clearance prior to drilling the mounting hole.

programmer interface, 3-pin black plug

The black three pin port is provided for personal computer programming of the unit. When using the DEI Bitwriter (P/N 998T) or optional PC Interface module (P/N 996T) it is possible to configure any and all of the programmable functions. For more information please refer to the guide packaged with the programmer.

on-board doubleguard shock sensor



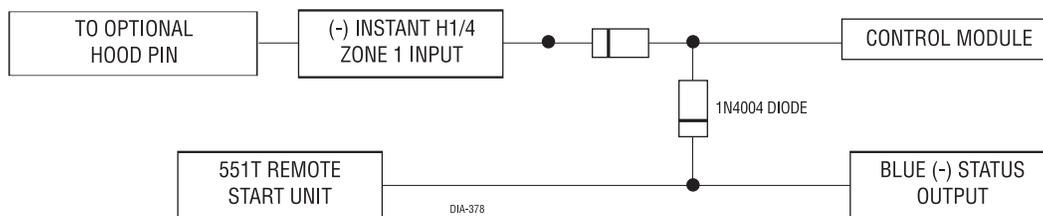
DRW-52

There is a Doubleguard® shock sensor inside the control unit. Adjustments are made via the rotary control as indicated above. Since the shock sensor does not work well when mounted firmly to metal, we recommend against screwing down the control module. We recommend mounting the control module to a large wiring loom. The full trigger of the on-board shock sensor reports Zone 2. (See *Table of Zones* section of this guide.)

NOTE: When adjusting the sensor, it must be in the same mounting location that it will be after the install is completed. Adjusting the sensor and then relocating the module requires readjustment.

bypassing the sensor inputs

There are times when you need to temporarily bypass all sensor inputs to the unit, such as when remote starting the vehicle. Any time an auxiliary channel output is used, all inputs are bypassed for 5 seconds. During the 5-second bypass period, ground can be supplied to the H1/4 (-) instant trigger (Zone 1) wire without triggering the unit. When the 5-second bypass period ends, if the unit detects ground on the H1/4 wire, all trigger inputs except the door trigger input will remain bypassed until 5 seconds after ground is removed from the (-) instant trigger wire. This can be done using the status output of a 551T remote start unit as shown in the following diagram:



transmitter/receiver learn routine

The system comes with two transmitters that have been taught to the receiver. The receiver can store up to four different transmitter codes in memory. Use the following learn routine to add transmitters to the system or to change button assignments if desired.

Using an optional DEI Bitwriter or PC Interface, the transmitter/receiver learn routine may be locked. If the siren generates one long chirp when attempting to program the unit, the learn routine is locked and can only be unlocked by using the Bitwriter or a PC. The learn routine must be unlocked before proceeding with programming.

The Valet/Program switch is used for programming. There is a basic sequence to remember whenever programming this unit: Door, key, choose, hold Valet/Program switch while transmitting, and release.



1. **Open a door.** (The H1/3 wire or the H1/5 wire must be connected.)



2. **Key.** Turn the ignition on.



3. **Select the receiver channel.** Press and release the Valet/Program switch the number of times necessary to access the desired channel. Once you have selected a channel, press and **HOLD** the Valet/Program switch once more. The siren will chirp and the LED will blink the number of times corresponding to the channel that has been accessed.

NOTE: If adding a remote to the system, a remote button must be taught to the unit in the Channel 1 or Channel 5 position prior to programming other channels, unless using one of the Auto Learn routines.

CHANNEL NUMBER	FUNCTION
1	Arm/Disarm/Panic
2	Channel 2 output
3	Channel 3 output
4	Channel 4 output
5	Arm only
6	Disarm only
7	Panic only
8	Auto Learn separate arm/disarm/panic (Standard Configuration*)
9	Auto Learn single-button arm/disarm/panic (Single-Button Arm/Disarm/Panic Configuration*)
10	Delete all transmitters

***NOTE:** For Auto Learn Configurations, see Transmitter Configurations section of this guide.

Channels Five, Six and Seven: Channels Five through Seven are used to assign the arm, disarm and panic functions to separate buttons on the remote control. If the remote is programmed for separate arm, disarm and panic channels and a button from that remote is entered into Channel One, the remote will be erased from memory, and the system will only recognize the button that was entered into Channel One.

Channel Ten: If any transmitter button from a known transmitter is programmed to Channel Ten, all transmitters will be erased from memory. This is useful in cases when one of the customer's transmitters is lost or stolen. This will erase any lost or stolen transmitters from the system's memory. It can also be used to start from scratch if the transmitter buttons were programmed incorrectly.



4. **Press the transmitter button.** While **HOLDING** the Valet/Program switch, press the button from the transmitter that you wish to assign to that channel. The unit will chirp indicating successful programming. It is not possible to teach a transmitter button to the system more than once.



5. **Release.** Once the code is learned, the Valet/Program button can be released.

You can advance from one channel to another by releasing the Valet/Program switch and tapping it to advance channels and then **HOLDING** it. For example, if you want to program Channel Three after programming Channel One, release the Valet/Program switch. Press it twice and release it to advance to Channel Three. Then press it once more and **HOLD** it. The siren will chirp three times to confirm it is ready to receive the code from the transmitter.

The learn routine will be exited if any of the following occurs:

- Ignition is turned off.
- Door is closed.
- Valet®/Program switch is pressed too many times.
- More than 15 seconds elapses between steps.

One long chirp indicates that the learn routine has been exited.

transmitter configurations

The transmitters can be programmed with the standard or single button arm/disarm/panic configurations by using the Auto Learn functions in the Transmitter/Receiver Learn Routine.

standard configuration

A remote that uses the standard configuration operates similarly to many factory keyless entry remotes. A standard configuration transmitter allows arming, disarming, and Panic Mode activation with separate buttons. When programmed for standard configuration, the transmitter buttons are assigned to the following functions:

- operatesArm only
- operatesDisarm only
- AUX**operatesChannel 2
- operatesPanic
-  and operateChannel 3
- AUX** and operateChannel 4

The standard configuration also allows the user to utilize Multi-Level Security Arming (described in the following section), a feature that cannot be accessed from a single button arm/disarm/panic configuration transmitter.

single button arm/disarm configuration

When programmed for single button arm/disarm/panic configuration, the transmitter buttons are assigned to the following functions:

operates	Arm/Disarm/Panic
operates	Channel 2
AUXoperates	Channel 3
operates	Channel 4

multi-level security arming

Multi-Level Security Arming is a feature that allows you to select which of the security system's inputs or sensors will be active and which will be bypassed at the time that the system is armed. (See *Table of Zones* section in this guide.) Pressing the arm button (only on a Standard Configuration transmitter) again within five seconds of arming the security system will activate the Multi-Level Security Arming feature. Each time the arm button is pressed again, a different security level is selected. The different security levels can be selected as follows:

- Pressing  one time: The siren chirps once. The system is armed.
- Pressing  a second time within five seconds: The siren chirps twice followed by a long chirp. Zone Two is now bypassed.
- Pressing  a third time within five seconds: The siren chirps three times followed by a long chirp. Zone Four is now bypassed.
- Pressing  a fourth time within five seconds: The siren chirps four times followed by a long chirp. Zones Two and Four are now bypassed.
- Pressing  a fifth time within five seconds: The siren chirps five times followed by a long chirp. All input zones, except the ignition, are now bypassed.

NOTE: Multi-Level Security Arming only applies to a single arming cycle. Once the system is disarmed and then rearmed, all the zones will be active again.

system features learn routine

The System Features Learn Routine dictates how the unit operates. Due to the number of features, they have been broken up into two menus. It is possible to access and change any of the feature settings using the Valet®/Program switch. However, this process can be greatly simplified by using the optional DEI Bitwriter (P/N 998T) or Personal Computer Interface (P/N 996T). Any of the settings can be changed and then assigned to a particular transmitter, up to four, a feature called Owner Recognition. Each time that a particular transmitter is used to disarm the system, the assigned feature settings will be recalled. Owner Recognition is only possible when programming the unit via the 996T or the 998T DEI Bitwriter.

Using the optional DEI Bitwriter or PC Interface, the System Features Learn Routine may be locked. Make sure the learn routine is unlocked before programming the features. If the siren generates one long chirp when attempting to program the unit, the learn routine is locked and must be unlocked using the DEI Bitwriter or PC before proceeding.



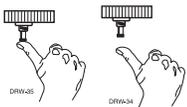
1. **Open a door.** (The H1/5 negative door trigger input or the H1/3 positive door trigger input must be connected.)



2. **Turn the ignition on, then back off.** (The H2/1 ignition input must be connected.)



3. **Select a menu.** (See *System Features Menus* section of this guide.) Press and **HOLD** the Valet/Program switch. After three seconds the siren will chirp once indicating entry to the Basic Features Menu #1. If this is the menu you wish to access, release the switch and go on to Step 4. If the Valet/Program switch is not released, you will jump to the Advanced Features Menu #2 and the siren will chirp twice. Once you have selected the desired menu, release the Valet/Program switch and then go to Step 4.



4. **Select a feature.** Press and release the Valet/Program switch the number of times corresponding to the feature you wish to change. (See *System Features Menus* section of this guide.) For example, to access the third feature, press and release the Valet/Program switch three times. Then press the it once more and **HOLD** it. While still holding the switch, the siren will chirp the number of times corresponding to the feature you have accessed.



5. **Program the feature.** While still **HOLDING** the Valet/Program switch, you can toggle the feature on and off using the remote transmitter. Pressing  will select the one-chirp (default setting). Pressing  will select the two-chirp setting. (See *System Features Menus* section of this guide.)

NOTE: Features 2-9 and 2-10 each have more than two possible settings. Pressing the disarm button on the transmitter will toggle through all the possible settings.



6. **Release the Valet/Program switch.** You can either wait 15 seconds to exit the learn routine, or you can access another feature by following the steps outlined in the following paragraph.

To access another feature in the same menu:

1. Press and release the Valet/Program switch the number of times necessary to advance from the feature you just programmed to the next one you want to program.
2. Then press the Valet/Program switch once more and **HOLD** it.

For example, if you just programmed the third feature in the menu and you would like to program the seventh feature in the menu, you would press and release the Valet/Program switch four times and then press it once more and **HOLD** it. The siren would chirp seven times to confirm access to the seventh feature.

To select another menu:

1. Press and **HOLD** the Valet/Program switch.
2. After three seconds, the unit will advance to the next menu and the siren will chirp, indicating which menu has been accessed.

For instance, if you just programmed some features in Menu #1 (Basic Features) and you want to program a feature in Menu #2, you must press and **HOLD** the Valet/Program switch. After three seconds, the siren chirps twice indicating access to Menu #2.

To exit learn routine:

To exit the System Features Learn Routine, do one of the following:

- Close the open door.
- Turn the ignition on.
- No activity for longer than 15 seconds.
- Press the Valet/Program switch too many times.

system features menus

menu #1 - basic features

The features in **bold** text are the factory default settings.

FEATURE NUMBER	ONE-CHIRP SETTING (DEFAULT)	TWO-CHIRP SETTING
1-1	Active arming	Passive arming
1-2	Chirps on	Chirps off
1-3	Ignition-controlled locking on	Ignition-controlled locking off
1-4	Ignition-controlled unlocking on	Ignition-controlled unlocking off
1-5	Active locking only	Passive locking
1-6	Panic on	Panic off
1-7	0.8 second door lock pulses	3.5 second door lock pulses
1-8	Forced passive arming on	Forced passive arming off
1-9	Automatic engine disable on	Automatic engine disable off
1-10	Code Hopping™ on	Code Hopping™ off

menu #2 - advanced features

FEATURE NUMBER	ONE-CHIRP SETTING (DEFAULT)	TWO-CHIRP SETTING
2-1	Horn honk chirps on	Horn honk chirps off
2-2	25-second siren duration	50-second siren duration (1-180 seconds if using a Bitwriter or PC)
2-3	Nuisance Prevention Circuitry™ on	Nuisance Prevention Circuitry™ off
2-4	Progressive door trigger	Instant door trigger
2-5	Door trigger error chirp on	Door trigger error chirp off
2-6	Ignition-controlled domelight on	Ignition-controlled domelight off
2-7	Disarm with Channel 2 off	Disarm with Channel 2 on
2-8	Double unlock pulse off	Double unlock pulse on
2-9	Channel 3: Validity	Channel 3: latched/latched, reset with ignition/30-second timed/second unlock output
2-10	Channel 4: Validity	Channel 4: latched/latched, reset with ignition/30-second timed/60-second timed/90-second timed

feature descriptions

The features of the system are described in this section. If the system is being programmed with a DEI® Bitwriter™ (P/N 998T) or a Personal Computer Interface (P/N 996T) the options available may change. Extra programming options that are available when programming with the Bitwriter or a PC are indicated by the following icon:



(These options are not available when programming manually with the Valet switch.)

menu #1 - basic feature descriptions

1-1 ACTIVE/PASSIVE ARMING: When active arming is selected, the system will only arm when the transmitter is used. When set to passive, the system will arm automatically 30 seconds after the last door is closed. To alert the consumer of passive arming, the siren will chirp 20 seconds after the door is closed. This provides the consumer with an audible warning prior to the system actually arming. At the 30 second mark, the system will arm but the siren will not chirp.

1-2 CHIRPS ON/OFF: This feature controls the siren chirps that confirm the arming and disarming of the system.

1-3 IGNITION CONTROLLED LOCKING ON/OFF: When turned on, the doors will lock automatically three seconds after the ignition is turned on. In order for this feature to work, the vehicle door must not be open when the key is turned on.

1-4 IGNITION CONTROLLED UNLOCKING ON/OFF: When turned on, the doors will unlock automatically when the ignition is turned off.

1-5 ACTIVE/PASSIVE LOCKING: If passive arming is selected in Feature 1-1, then the system can be programmed to either lock the doors when passive arming occurs, or only lock the doors when the system is armed via the transmitter. Active locking means the system will not lock the doors when it passively arms. Passive locking means that the system will lock the doors when it passively arms.

***NOTE:** Remember, when passive arming is selected, the unit will chirp 20 seconds after the last door is closed. The system does not actually arm or lock the doors until 30 seconds after the door has been closed.*

1-6 PANIC ON/OFF: In the on setting, Panic Mode can be activated by pressing the Panic button on the remote. In the off setting, the Panic Mode is disabled.

1-7 DOOR LOCK PULSE DURATION: Some European vehicles, such as Mercedes-Benz and Audi, require longer lock and unlock pulses to operate the vacuum pump. Programming this feature with the two-chirp setting will provide 3.5 second pulses and will accommodate the door lock interface in these vehicles. The default setting is 0.8 second door lock pulses.

1-8 FORCED PASSIVE ARMING ON/OFF: To use this feature, passive arming must be selected in Feature 1-1. When turned on, forced passive arming will ensure that the system will passively arm, even if a zone is left open or invalid. Forced passive arming occurs one hour after the ignition is turned off.

1-9 AUTOMATIC ENGINE DISABLE (AED) ON/OFF: AED is a full-time, passive engine disable that works independently of the security system. When turned on, the three interrupt wires and the the ground-when-armed wire will activate 30 seconds after the ignition is turned off. The LED will flash at half its normal rate when the ignition is turned off to indicate that AED is active and will interrupt the engine in 30 seconds. AED can be disarmed by pressing the disarm button on the transmitter or by using the emergency override procedure (see *Owner's Guide*). AED does not occur in Valet® mode..

1-10 CODE-HOPPING™ ON/OFF: The system uses a mathematical formula to change its code each time the transmitter and receiver communicate. This makes the group of bits or “word” from the transmitter very long. The longer the word is, the easier it is to block its transmission to the unit. Disabling the Code-Hopping™ feature lets the receiver ignore the Code-Hopping™ part of the transmitted word. As a result, the unit may have better range with Code-Hopping™ off.

menu #2 - advanced feature descriptions

2-1 HORN HONK CHIRPS ON/OFF: If programmed on, the horn will provide audible confirmation when arming and disarming the system. If programmed off, no horn chirps will be heard when arming or disarming, so that the horn honks will only sound when the system is triggering or in Panic Mode.



2-2 SIREN DURATION 25/50 SECONDS (or 1-180 seconds if programming with a Bitwriter or PC): The unit can be programmed to sound the siren for 25 or 50 seconds during the triggered sequence. When programming with the PC Programmer or Bitwriter™, the siren can be programmed to sound for any length of time ranging from 1 to 180 seconds.

***NOTE:** Some regions have laws regulating how long a security system can sound. Be sure to check for any such laws in your region when programming this feature.*

2-3 NUISANCE PREVENTION® CIRCUITRY (NPC™) ON/OFF: NPC™ stops repeated triggering of the same zone. If one zone is triggered three times in one hour, that zone is bypassed for one hour, starting from the time of the third trigger. During that hour, if the system detects a trigger on that zone again, the system resets the one hour timer. If one hour passes and the zone has not triggered again, the zone is activated and can trigger the system again. NPC™ only monitors sensor inputs, and does not bypass the door trigger or the ignition trigger at any time. If NPC™ is turned off, the system will respond to repeated triggers on the sensor inputs and will do so indefinitely. Some regions have laws regulating how many times a security system can trigger before it is considered a nuisance and the vehicle is towed away.

2-4 PROGRESSIVE DOOR TRIGGER ON/OFF: When this feature is on, the system responds to a door trigger input with a progressive response. When the door is opened with the system armed, the siren will chirp 10 times prior to the full triggered sequence. The door trigger is still treated as an instant trigger and closing the door quickly will not prevent a full triggered sequence from occurring. If the progressive door trigger is programmed off, the full siren output will occur the moment the door is opened.

2-5 DOOR TRIGGER ERROR CHIRP ON/OFF: With the door trigger error chirp programmed off, the system will not report an invalid zone on arming when the door trigger wire is active. This eliminates the extra chirps that occur when interfacing with vehicles that have exceptionally long dome light delay circuits.

2-6 IGNITION-CONTROLLED DOMELIGHT SUPERVISION ON/OFF: If turned on, the system will turn on the dome-light for 30 seconds when the ignition is turned off. The optional domelight supervision feature must be installed.

2-7 DISARM WITH CHANNEL TWO OFF/ON: If this feature is programmed on, the security system will disarm whenever Channel 2 is activated with the remote transmitter. This is useful if Channel 2 is used for trunk release. When the trunk is opened with the remote transmitter, the system will disarm, preventing the security system from triggering.

2-8 SINGLE/DOUBLE PULSE UNLOCK: Some vehicles require two pulses on a single wire to unlock the doors. When the double pulse unlock feature is turned on, the BLUE/BLACK H3/5 wire will supply two pulses instead of a single pulse. This makes it possible to directly interface with double pulse vehicles without any extra parts.

2-9 CHANNEL 3 VALIDITY/LATCHED/LATCHED RESET WITH IGNITION/30 SECOND TIMED/SECOND UNLOCK OUTPUT: Channel 3 can be programmed for these different output configurations. The unit is set to the default validity output. To change the configuration, use the disarm button on the transmitter to toggle between the different configurations.

2-10: CHANNEL 4 VALIDITY/LATCHED/LATCHED RESET WITH IGNITION/30 SECOND TIMED/60 SECOND TIMED/90 SECOND TIMED: Channel 4 can be programmed for these different output configurations. The unit is set to the default validity output. To change the configuration, use the disarm button on the transmitter to toggle between the different configurations.

table of zones

ZONE NO.	TRIGGER TYPE	INPUT DESCRIPTION
1	Instant	H1/4 wire. Connect to optional hood input.
2	Multiplexed	On-board shock sensor.
3	Two-stage, progresses from warning to full alarm	H1/3 or H1/5 wire. Door switch circuit.
4	Multiplexed Input	H1/2 optional sensor. Inputs shorter than 0.8 seconds will trigger a Warn Away response, while inputs longer than 0.8 seconds will instantly trigger full alarm sequence.
5	Two-stage, progresses from warning to full alarm	H2/1 wire. Ignition input.

NOTE: *The Warn Away response does not report on the LED.*

nuisance prevention circuitry

NPC requires that you change the way you test the system, as NPC will bypass an input zone for 60 minutes. If the system “sees” the same zone trigger three times AND the triggers are spaced less than an hour apart, the system will bypass that input zone for 60 minutes. If that zone does not attempt to trigger the system during the 60-minute bypass period, the zone’s monitoring will begin again at the end of the hour. If it does attempt to trigger while bypassed, the 60-minute bypass starts over again.

Disarming and rearming the system does not reset NPC. The only way to reset NPC is for the 60 minutes to pass, without a trigger, or for the ignition to be turned on. This allows the system to be repeatedly triggered, disarmed and rearmed, and still allow NPC to bypass a faulty zone.

When disarming the system, 5 chirps indicate NPC is activated. The LED will report the zone that has been bypassed. (See *Table of Zones* section of this guide.)

rapid resume logic

Rapid Resume Logic ensures that when the security system is powered back up after power has been disconnected, the system will resume the same state it was in before power was lost. For example, if power is disconnected during a full trigger sequence, the system will still be in the full trigger sequence when power is reconnected to the unit. If power is disconnected while the unit is disarmed, it will still be disarmed when power is restored.

troubleshooting

■ Shock sensor doesn't trigger the alarm.

Has the NPC™ system been triggered? If so, you will hear five chirps when disarming. To check this, turn the ignition key on and off to clear the NPC™ from memory, and then retest the shock sensor. For a detailed description of NPC™, see Owner's Guide.

■ Door input does not immediately trigger full alarm. Instead, I hear chirps for the first three seconds.

That's how the progressive two-stage door input works! This is the instant response feature of this system. Even if the door is closed immediately, the system provides an instant trigger by chirping, and then progressing to a constant siren.

■ Closing the door triggers the system, but opening the door does not.

Have you correctly identified the type of door switch system? This often happens when the wrong door input has been used.

■ Door input does not respond with the progressive trigger, but with immediate full alarm.

Which zone does the LED indicate? If the LED indicates that the impact sensor caused the trigger, the sensor may be detecting the door opening. Reducing the sensitivity or relocating the sensor can often solve this problem. If the LED indicates that the door caused the trigger, you may have programmed the progressive door trigger off. (See Feature 2-4 in the *Feature Descriptions* section of this guide.)

■ Status LED doesn't work.

Make sure that it is plugged in. (See *Plug-In Harnesses* section of this guide.)