CLIFFORD®

The Science of Security™

Matrix RS

Installation Guide

MATRIX™

The Bitwriter® (p/n 998T) requires chip version 1.4 or newer to program this unit.

Bitwriter™, Code Hopping™, DEI®, Directed®, 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., Vista, California.

Table of Contents

What Is Included

The following components are included with this installation kit:

➤ One control module
➤ One XHF receiver/antenna with harness
➤ Two four-button remote transmitters
➤ One 12-Pin Primary Harness (H1)
➤ One 3-Pin Door Lock Harness (H4)
➤ One 6-Pin Remote Start Harness (H3)
➤ One 5-pin harness with relay satellite
➤ One 2-Pin Auxiliary Harness (H2)
➤ One plug-in LED indicator with bezel
➤ One plug-in Valet/program switch
➤ One toggle override switch
➤ One warning label
➤ Two window decals
➤ One patent card
➤ One warranty registration
➤ One installation guide
➤ One owner's guide

Warning! Safety First

The following safety warnings must be observed at all times:

➤ Due to the complexity of this system, installation of this product must only be performed by an authorized Clifford dealer.

➤ When properly installed, this system can start the vehicle via a command signal from the remote control transmitter. Therefore, never operate the system in an area that does not have adequate ventilation. The following precautions are the sole responsibility of the user; however, authorized Clifford dealers should make the following recommendations to all users of this system:

1. Never operate the system in an enclosed or partially enclosed area without ventilation (such as a garage).

2. When parking in an enclosed or partially enclosed area or when having the vehicle serviced, the remote start must be disabled using the installed toggle switch.

3. It is the user's sole responsibility to properly handle and keep out of reach from children all remote transmitters to assure that the system does not unintentionally remote start the vehicle.

4. THE USER MUST INSTALL A CARBON MONOXIDE DETECTOR IN OR ABOUT THE LIVING AREA ADJACENT TO THE VEHICLE. ALL DOORS LEADING FROM ADJACENT LIVING AREAS TO THE ENCLOSED OR PARTIALLY ENCLOSED VEHICLE STORAGE AREA MUST AT ALL TIMES REMAIN CLOSED.

➤ Use of this product in a manner contrary to its intended mode of operation may result in property damage, personal injury, or death. Except when performing the Safety Check outlined in this installation guide, (1) Never remotely start the vehicle with the vehicle in gear, and (2) Never remotely start the vehicle with the keys in the ignition. The user will be responsible for having the neutral safety feature of the vehicle periodically checked, wherein the vehicle must not remotely start while the car is in gear. This testing should be performed by an authorized Clifford dealer in accordance with the Safety Check outlined in this product installation guide. If the vehicle starts in gear, cease remote engine starting operation immediately and consult with the user to fix the problem immediately.

➤ After the remote engine starting module has been installed, test the remote engine starting module in accordance with the Safety Check outlined in this installation guide. If the vehicle starts when performing the Neutral Safety Shutdown Circuit test, the remote engine starting unit has not been properly installed. The remote engine starting module must be removed or properly reinstalled so that the vehicle does not start in gear. All installations must be performed by an authorized Clifford dealer. OPERATION OF THE REMOTE ENGINE STARTING MODULE IF THE VEHICLE STARTS IN GEAR IS CONTRARY TO ITS INTENDED MODE OF OPERATION. OPERATING THE REMOTE ENGINE STARTING SYSTEM

UNDER THESE CONDITIONS MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY. IMMEDIATELY CEASE THE USE OF THE UNIT AND REPAIR OR DISCONNECT THE INSTALLED REMOTE ENGINE STARTING MODULE. DIRECTED ELECTRONICS WILL NOT BE HELD RESPONSIBLE OR PAY FOR INSTALLATION OR REINSTALLATION COSTS.

Installation Points to Remember

> **IMPORTANT!** This product is designed for fuel-injected, automatic transmission vehicles only. Installing it in a standard transmission vehicle is dangerous and is contrary to its intended use.

Before Beginning the Installation

➤ Please read this entire installation guide before beginning the installation. The installation of this remote start system requires interfacing with many of the vehicle's systems. Many new vehicles use low-voltage or multiplexed systems that can be damaged by low resistance testing devices, such as test lights and logic probes (computer safe test lights). Test all circuits with a high quality digital multi-meter before making connections.

➤ Do not disconnect the battery if the vehicle has an anti-theft-coded radio. If equipped with an air bag, avoid disconnecting the battery if possible. Many airbag systems will display a diagnostic code through their warning lights after they lose power. Disconnecting the battery requires this code to be erased, which can require a trip to the dealer.

➤ Check with the customer on LED status indicator location.

➤ Remove the domelight fuse. This prevents accidentally draining the battery.

➤ Roll down a window to avoid being locked out of the car.

Finding the Tachometer Wire

To test for a tachometer wire, a multimeter capable of testing AC voltage must be used. The tachometer wire will show between 1V and 6V AC. In multi-coil ignition systems, the system can learn individual coil wires. Individual coil wires in a multi-coil ignition system will register lower amounts of AC voltage. Also, if necessary, the system can use a fuel injector control wire for engine speed sensing.

> **IMPORTANT!** Do not test tachometer wires using a test light or logic probe! This will damage the vehicle.

How to Find a Tachometer Wire With Your Multimeter

1. Set to ACV or AC voltage (12V or 20V is fine).
2. Attach the (-) probe of the meter to chassis ground.
3. Start and run the vehicle.
4. Probe the wire you suspect of being the tachometer wire with the red probe of the meter.
5. If this is the correct wire the meter will read between 1V and 6V.

Finding the Wait-To-Start Bulb Wire for Diesels

In diesel vehicles it is necessary to interface with the wire that turns on the wait-to-start light in the dashboard. This wire illuminates the bulb until the vehicle's glow plugs are properly heated. When the light goes out the vehicle can be started. This wire is always available at the connector leading to the bulb in the dashboard. It can also be found at the Engine Control Module (ECM) in many vehicles.

How to Test and Determine the Polarity of the Wait-To-Start Wire

1. Set your multimeter to DCV or DC voltage (12 or 20V is fine).
2. Attach the (+) probe of the meter to (+)12V.
3. Probe the wire that you suspect leads to the bulb with the (-) probe of the meter.
4. Turn the ignition switch to the ON position.
5. If the meter indicates 12 volts until the light goes out you have isolated the correct wire and the wire's polarity is negative (ground while the bulb is on).
6. If the meter reads zero volts until the light goes out and then reads 12 volts, you have isolated the correct wire and the wire's polarity is positive.

After the Installation

➤ Test all functions. The "Using Your System" section of the Owner's Guide is helpful for testing.
➤ Review and complete the *Safety Check* section of this guide prior to the vehicle reassembly.

Primary Harness (H1) Wire Connection Guide

Primary Harness (12-Pin Connector) Wiring Diagram

The primary harness supplied with this unit is the standard 12-pin harness used by Directed security systems. Three wires in the plug are not used. The upgrade from this unit to a security system would simply require unplugging and exchanging control units and connecting the necessary wires to the vehicle. The functions of all the wires that are used in the primary harness are outlined in this section.

H1/1	ORANGE	(-) 500 mA Armed Output
H1/2	WHITE	(+)/(-) Selectable Light Flash Output
H1/3	WHITE/BLUE	(-) Activation Input
H1/4	BLACK/WHITE	(-) 200 mA Domelight Supervision Output
H1/5	GREEN	No function
H1/6	BLUE	No function
H1/7	VIOLET	No function
H1/8	BLACK	(-) Chassis Ground Input
H1/9		No Wire
H1/10	BROWN	(-) Horn Honk Output
H1/11	RED	(+) Constant Power Input
H1/12	RED/WHITE	(-) 200 mA Channel 2 Programmable Output

Primary Harness Wire Descriptions

H1/1 ORANGE (-) Ground-When-Armed Output

This wire supplies a (-) 500 mA ground as long as the system is armed. This output ceases as soon as the system is disarmed. The orange wire is pre-wired to control the Directed P/N 8618 starter interrupt relay.

NOTE: If connecting the H1/1 ORANGE wire to control another module, such as a P/N 529T or P/N 530T window module, a 1 amp diode (type 1N4004) will be required. (See the following diagram.)
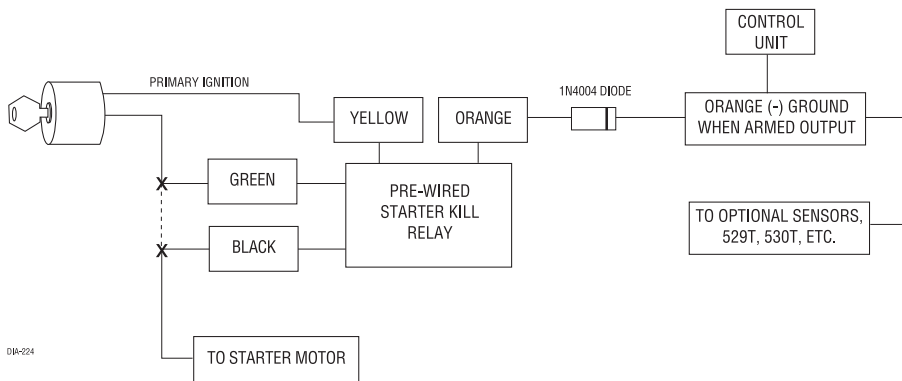
IMPORTANT! Never interrupt any wire other than the starter wire.

H1/2 WHITE (+/-) selectable light flash output

As shipped, the H1/2 WHITE wire should be connected to the (+) parking light wire. If the light flash polarity jumper near the main plug is moved to the opposite position (see the *Programming Jumper* section of this installation guide), this wire supplies a (-) 200 mA output. This is suitable for driving (-) light control wires in Toyota, Lexus, BMW, some Mitsubishi, some Mazda, and other models.

NOTE: For parking light circuits that draw 10 amps or more, the internal jumper must be switched to a (-) light flash output. (See the *Internal Programming Jumpers* section of this guide.) P/N 8617 or a standard automotive SPDT relay must be used on the H1/2 light flash output harness wire.

(+) POSITIVE LIGHT FLASH OUTPUT

PARKING
LIGHT BULB

WHITE H1/2
(+) LIGHT FLASH OUTPUT

(+) 12V

PARKING LIGHT
RELAY OR SWITCH

DIA-1

(-) LIGHT FLASH OUTPUT

WHITE H1/2
(-) LIGHT FLASH OUTPUT

FACTORY PARKING
LIGHT RELAY

PARKING LIGHT
SWITCH
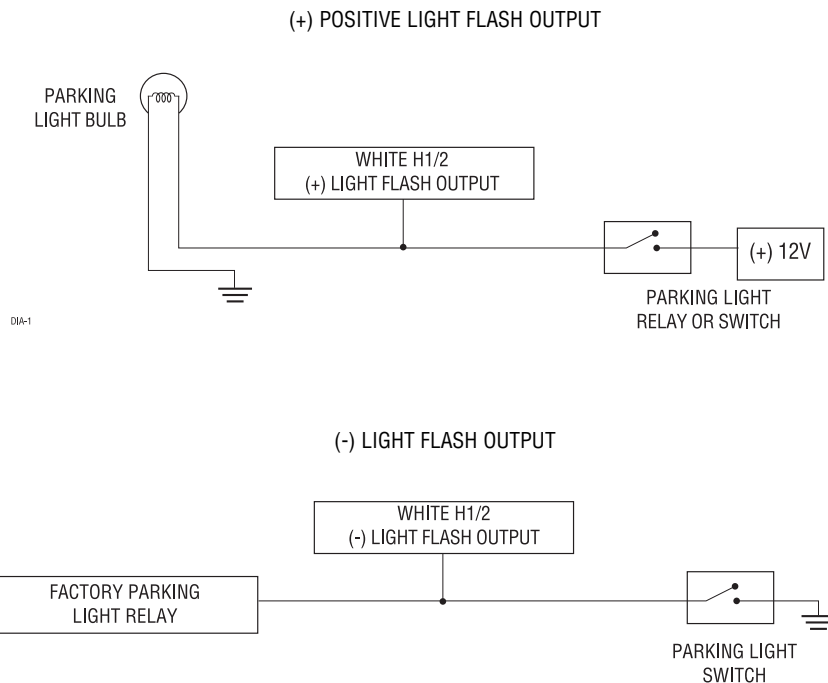
H1/3 WHITE/BLUE (-) Activation Input

Sending a negative pulse to this wire will initiate the remote start sequence. This wire can be wired to an optional momentary switch to activate the remote start system.

See the following diagram.
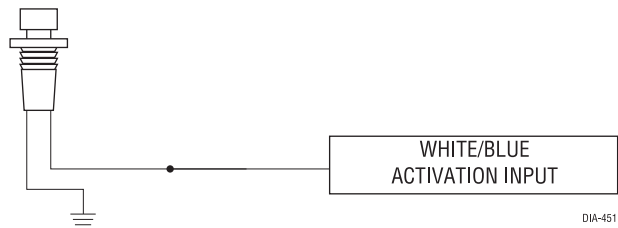
DIA-451

H1/4 BLACK /WHITE (-) 200 mA Domelight Supervision Output

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

| H1/4 BLACK/WHITE | (-) CHASSIS GROUND IF DOORS ARE (-) SWITCHED, (+) 12V IF DOORS ARE (+) SWITCHED |
| (+) 12V CONSTANT FUSED | (-) VEHICLE DOMELIGHT OR (+) VEHICLE DOMELIGHT |
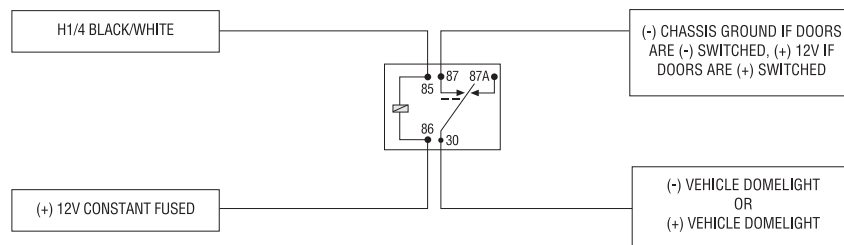
DIA-439

> **IMPORTANT!** The H1/4 output is only intended to drive a relay. It cannot be connected directly to the domelight circuit because the output cannot support the current draw of one or more light bulbs.

H1/8 BLACK (-) 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.

FACTORY BOLT

NOTE: REMOVE ANY PAINT BELOW RING CONNECTOR

RING CONNECTOR

GROUND WIRE
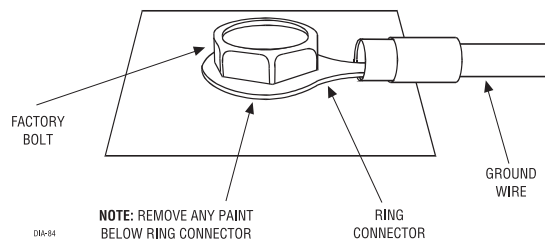
DIA-84

H1/10 BROWN (-) Horn Honk Output

This wire supplies a (-) 200 mA output that can be used to honk the vehicle horn. It outputs a single pulse when locking the doors with the remote, and two pulses when unlocking with the remote.

This wire will also output pulses for 30 seconds when Remote Panic is activated. If the vehicle has a (+) horn circuit, an optional relay can be used to interface with the system, as shown in the following diagram.

H1/11 RED (+)12V Constant Power Input
Before connecting this wire, remove the supplied fuse. Connect to the battery positive terminal or the constant 12V supply to the ignition switch.

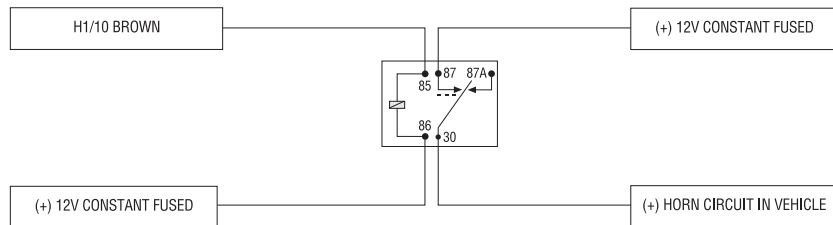> I**MPORTANT!** Always use a fuse within 12 inches of the point you obtain (+)12V. Do not use the 10A fuse in the harness for this purpose. This fuse is intended to protect the module.

H1/12 RED/WHITE Channel 2, (-) 200 mA Output
When the system receives the code controlling Channel 2, for longer than 1.5 seconds, the RED/WHITE wire will supply an output as long as the transmission continues. This is often used to operate a trunk/hatch release or other relay-driven function. This output can also be programmed to provide the following types of output: Instant validity, latched, latched-reset with ignition, 30-second timed, or second unlock output. (See *Features Description* section of this guide for details.)
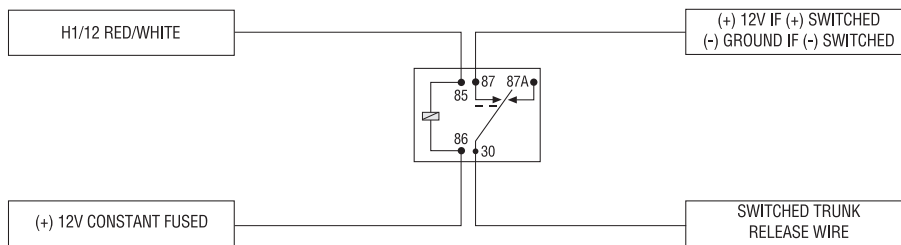
> **IMPORTANT!** Never use this wire to drive anything except a relay or low-current input! The transistorized output can only supply 200 mA of current. Connecting directly to a solenoid, motor, or other high-current device will cause it to fail.

Relay Satellite Key Switch Interface Wire Connection Guide (Heavy Gauge Wires)

Relay Satellite Key Switch Interface Wiring Diagram

1	**RED**	**(+) High Current 12V Input**
2	**RED**	**(+) High Current 12V Input**
3	**PINK**	**(+) Output to Ignition Circuit**
4	**ORANGE**	**(+) Output to Accessory Circuit**
5	**PURPLE**	**(+) Output to Starter Circuit**
6	**PINK/WHITE**	**(+) Output to Second Ignition Circuit**

Relay Satellite Key Switch Interface Wire Descriptions

All except the red heavy gauge wires leading from the relay satellite are used to power high current circuits in the vehicle. It is crucial that these connections are made correctly in order to handle the current demands. For this reason, scotch locks, T-taps and other such connectors should not be used.

RED (2) (+) 12V Input for Relays
Remove the two 30 amp fuses prior to connecting these wires and do not replace them until the satellite has been plugged into the control module. These wires are the source of current for all the circuits the relay satellite will energize. They must be connected to a high current source. Since the factory supplies (+) 12V to the key switch that is used to operate the motor, it is recommended that these wires be connected there.

NOTE: If the factory supplies two separate (+) 12V feeds to the ignition switch, connect one RED wire of the satellite to each feed at the switch.

PINK (+) Ignition Output
Connect this wire to the ignition wire in the vehicle.

ORANGE (+) Accessory Output
Connect this wire to the accessory wire in the vehicle that powers the climate control system.

PURPLE (+) Starter Output
Connect this wire to the starter wire in the vehicle.

PINK/WHITE (+) Output to Second Ignition Circuit
Connect this wire to the second ignition wire in the vehicle.

Remote Start Ribbon Plug-In Harness

1	RED	(+) Constant Power
2	YELLOW	(+) Ignition Input to Remote Start
3	PINK	(-) 200 mA Ignition Relay Turn-On
4	ORANGE	(-) 200 mA Accessory Relay Turn-On
5	PURPLE	(-) 200 mA Starter Relay Turn-On

Auxiliary Harness (H2) Wire Connection Guide

Auxiliary Harness (H2) Wiring Diagram

H2/1	GRAY/BLACK	(-) Wait-to-Start
H2/2	LIGHT GREEN/BLACK	(-) Factory Disarm/Special Accessory

Auxiliary Harness (H2) Wire Descriptions

H2/1 GRAY/BLACK (-) Diesel Wait-to-Start Bulb Input
Connect this wire to the wire in the vehicle that sends the signal to turn on the WAIT-TO-START bulb in the dashboard. In most diesels the wire is negative (ground turns on the bulb) and the GRAY/BLACK can be directly connected to the wire in the vehicle. If the vehicle uses a positive wire (12V to turn on the bulb) a relay must be used to change the polarity. (See *Finding the Wait-To-Start Bulb Wire For Diesels* section of this guide.) Here are some common colors of this wire:

➤ Chevrolet and GMC trucks: Light Blue or Dark Blue
➤ Ford Trucks: Black/Pink
➤ Dodge Ram Trucks: Orange/Black or Black/Orange

> **IMPORTANT!** A 1-amp diode must be installed in line on the factory wire between the wait-to-start indicator and the ECM. (See the following diagram for details.)

(-) WAIT TO START WIRE

WAIT TO START
INDICATOR

GRAY/BLACK
WAIT TO START INPUT

IGNITION (+)

IN4004

ECM

DIA-257

(+) WAIT TO START WIRE

WAIT TO START
INDICATOR

85   87 87A

86   30

GRAY/BLACK
WAIT TO START INPUT

ECM

DIA-311
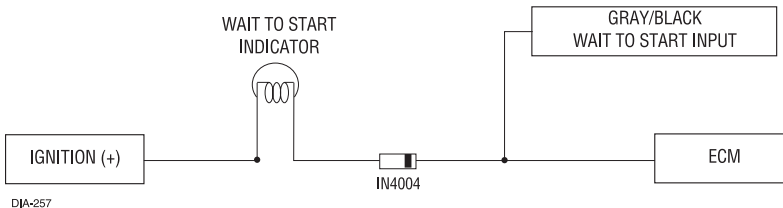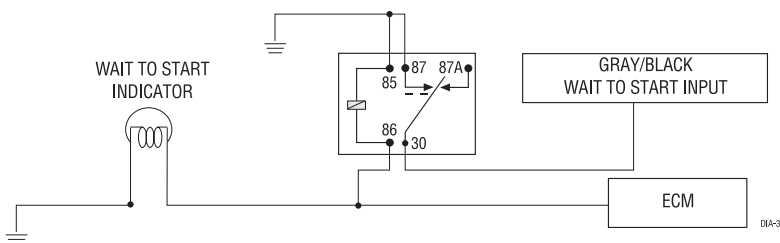
H2/2 LIGHT GREEN/BLACK (-) Auxiliary Output

This wire sends a negative pulse every time the remote start is activated. This can be used to pulse the disarm wire of the vehicle's factory anti-theft device. Use a relay to send a (-) or (+) pulse to the disarm wire as shown in the diagrams below. This wire can also be used as a special accessory output. (See *Feature Descriptions* section of this guide.)

RELAY FOR NEGATIVE (-) DISARM WIRE

LIGHT GREEN/BLACK
FACTORY DISARM OUTPUT

85   87 87A

86   30

(+) 12V
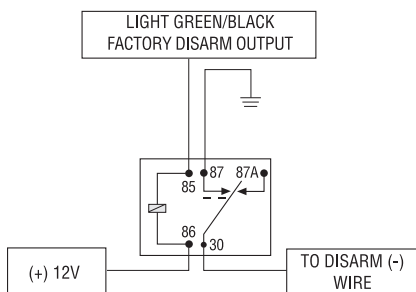
TO DISARM (-)
WIRE

RELAY FOR POSITIVE (+) DISARM WIRE

LIGHT GREEN/BLACK
FACTORY DISARM OUTPUT

(+) 12V

85   87 87A

86   30

(+) 12V

TO DISARM (+)
WIRE

14
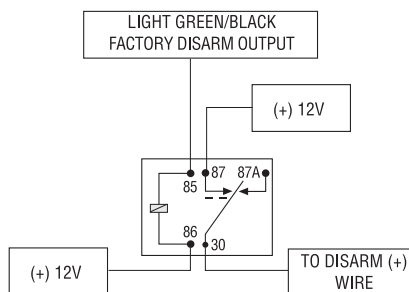
Remote Start Harness (H3) Wire Connection Guide

Remote Start Harness (H3) Wiring Diagram

H3/1	**BLUE**	**(-) 200 mA Status/Factory Security Rearm Output**
H3/2	**BLUE/BLACK**	**(-) 200 mA Optional Third Ignition Output**
H3/3	**GRAY**	**(-) Hood Pinswitch Shutdown Wire**
H3/4	**BROWN**	**(+) Brake Switch Shutdown Wire**
H3/5	**VIOLET**	**Tachometer Input Wire**
H3/6	**BLACK/WHITE**	**(-) Neutral Safety Switch Input**

Remote Start Harness (H3) Wire Descriptions

H3/1 BLUE status/factory security rearm output

This wire supplies a 200mA output as soon as the module begins the remote engine starting process. The H3/1 BLUE wire can also be used to rearm a factory anti-theft system when the remote start shuts down. (See the *Feature Descriptions* section in this guide for details about programming this output.)

H3/2 BLUE/BLACK (-) optional third ignition output

This output provides 200mA as soon as the remote start is activated. It can be used to power a relay to energize a positive (+) third ignition as shown below. This output is capable of driving two relays if necessary.
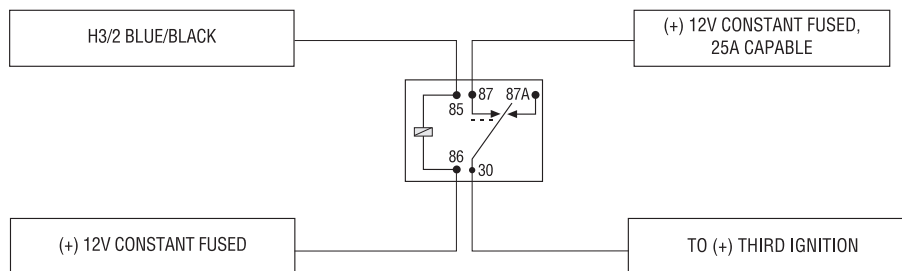
H3/3 GRAY (-) hood pinswitch input

This wire MUST be connected to hood pinswitch. This input will disable or shut down the remote start when the hood is opened.

H3/4 BROWN (+) brake switch input

This wire MUST be connected to the vehicle's brake light wire. This is the wire that shows (+) 12V when the brake pedal is pressed. The remote start will be disabled or shut down any time the brake pedal is pressed.

H3/5 VIOLET/WHITE tachometer input

This input provides the module with information about the engine's revolutions per minute (RPMs). It can be connected to the negative side of the coil in vehicles with conventional coils. In multi-coil and high energy ignition systems locating a proper signal may be more difficult. (See *Installation Points to Remember* section of this guide for finding the tachometer wire.) Once connected, you must teach the system the tach signal. (See *Tach Learning* section of this guide.)

H3/6 BLACK/WHITE neutral safety switch input

Connect this wire to the toggle (override) switch as shown in Figure A. Connect the other wire from the toggle switch to the park/neutral switch in the vehicle. This wire will test with ground with the gear selector either in PARK or NEUTRAL. This will prevent the vehicle from accidentally being started while in a drive gear. This input MUST rest at ground in order for the remote start system to operate. Connected properly the vehicle will only start while in PARK or NEUTRAL.

In some vehicles, the park/neutral position switch activates a factory starter lock out that will not allow the starter to operate in a drive gear. In these vehicles, connect this wire to the toggle switch as shown in Figure B. Connect the other wire from the toggle switch to chassis ground.
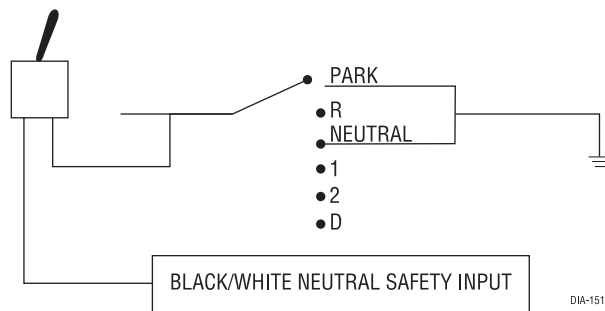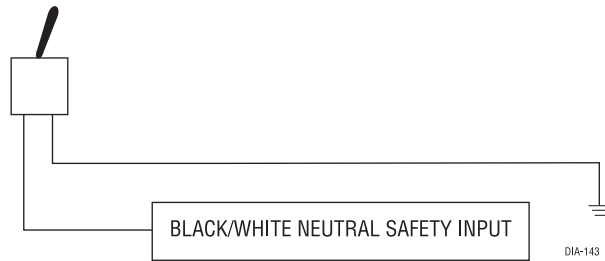
FIGURE A

PARK
R
NEUTRAL
1
2
D

BLACK/WHITE NEUTRAL SAFETY INPUT

DIA-151

FIGURE B

BLACK/WHITE NEUTRAL SAFETY INPUT

DIA-143

> **IMPORTANT!** Always perform the *Vehicle Safety Check* section of this guide to verify that the vehicle cannot be started in ANY drive gear and that the override switch is functioning properly.

Neutral Safety Switch Interface

Some vehicles combine the column shift mechanism and the mechanical neutral safety switch into one mechanical part. In these vehicles, it is impossible to interface the remote start system before the neutral safety switch. With this type of vehicle, if the vehicle is left in a drive gear and the remote start system is activated, the vehicle will move and may cause damage to persons or property.

According to available information, vehicles known to be manufactured this way are most General Motors trucks, sport utility vehicles and column shifting passenger vehicles. Available information also indicates that pre-1996 Dodge Dakota pickups with 2.5 liter motors are also manufactured this way.

GM vehicles that have the neutral safety switch built into the column shifter can usually be identified by a purple starter wire. Typically, vehicles that use an outboard mechanical switch use a yellow wire from the ignition switch to the mechanical switch and a purple wire from the mechanical switch to the starter itself. Remember, this is only a rule of thumb and is not intended as a substitute for proper testing.

We suggest the following procedure to test for vehicles manufactured in this way.

> **IMPORTANT!** You must complete the remote start system installation before doing the following test. Ensure that the remote start system is functioning normally. This includes connecting to the brake as a shut-down.

Testing the Neutral Safety Switch

1. Make sure there is adequate clearance to the front and rear of the vehicle because it may move slightly.
2. Make sure the hood is closed and there are no remote start shut-downs active.
3. Set the emergency brake.
4. Turn the key to the "run" position, this will release the shifter.
5. Place the car in drive (D).
6. Place your foot directly over the brake pedal, but do not depress it. Be ready to step on the brake if the starter engages.
7. Activate the remote start system.
8. If the starter engages, immediately depress the brake to shut the remote start system down. If the starter does not engage, no additional safety system is required.

If the starter engages and the vehicle is a General Motors product or Dodge Dakota pickup, refer to the following text and diagrams for an alternative shut-down method which will prevent the starter from engaging. If the vehicle is not a General Motors product or a Dodge Dakota pickup, please call Directed Technical Support for an alternative shut-down method. Do not return the vehicle to the customer until this feature is properly installed!

Every vehicle built this way requires that the shifter be placed in park to remove the keys from the ignition. As a result, it is possible to use the key-in-ignition sense switch to prevent remote starting if the keys are in the ignition. The diagrams in this section illustrate how to accomplish this.

Diagram A applies to all General Motors vehicles at the time of publication of this guide. Diagram B applies to all pre-1996 Dodge Dakota pickup trucks with 2.5 liter motors. This solution has one side effect - if the customer inserts the key in the ignition with the driver's door open, the remote start system will shut down. If this interface is used it is important to inform the customer to close the driver's door before inserting the key into the ignition when the remote start is active. This will allow the customer to turn the key on and shut the remote start down by pressing the brake without the key sense wire shutting down the unit prematurely.

In addition, you must connect a tan (+) shut-down input to the yellow wire on the relay satellite ribbon cable. This prevents the remote start system from activating if the key is left in the "run" position. If your remote start system only has one tan input, you must use diodes to isolate the ignition circuit from the brake switch input. However, due to future manufacturer changes in vehicles, it is possible that this may not apply to all vehicles. In addition, color variations are possible from model to model; make sure to test the circuit carefully. Please call Directed Technical Support if you need assistance in making this interface.

IMPORTANT! Once the interface is complete, attempt to remote start the vehicle with the door closed and the key in the ignition. The vehicle should not start. If it does, recheck the connections.

DIAGRAM A - GENERAL MOTORS TRUCKS, SPORT UTILITY VEHICLES AND COLUMN SHIFTING PASSENGER VEHICLES:

DRIVER'S
DOOR SWITCH

PURPLE (-)
START OUTPUT
FROM REMOTE START

(-) CHASSIS
GROUND

KEY
CYLINDER

TAN

(-) CHASSIS
GROUND

87 87A

85

GREEN

86 30

(+) 12V
CONSTANT
FUSED

GRAY (-)
SHUTDOWN INPUT

CONVENIENCE CENTER
OR KEY BUZZER
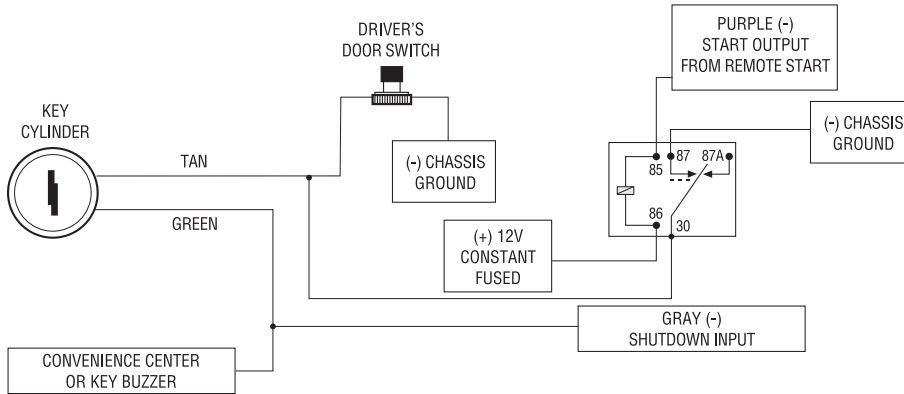
DIAGRAM B - PRE-1996 DODGE DAKOTA PICKUPS WITH 2.5 LITER MOTORS:

DRIVER'S
DOOR SWITCH

PURPLE (-)
START OUTPUT
FROM REMOTE START

(-) CHASSIS
GROUND

KEY
CYLINDER

BLACK/LT. BLUE

(-) CHASSIS
GROUND

87 87A

85

LT. BLUE

86 30

(+) 12V
CONSTANT
FUSED

GRAY (-)
SHUTDOWN INPUT

CONVENIENCE CENTER
OR KEY BUZZER
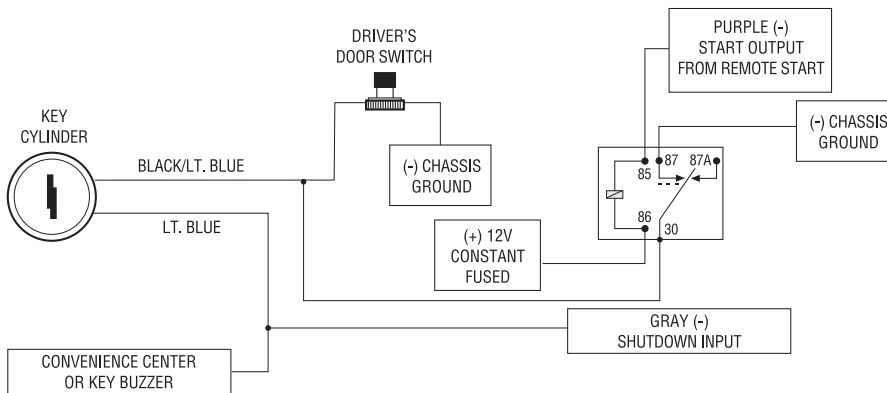
1995 and Newer Vehicle Anti-Theft Systems (Immobilizers)

1995 and newer vehicle anti-theft systems (immobilizers) require a bypass module. The bypass module allows for easy interfacing, while still maintaining the OEM system's integrity.

Passlock I and Passlock II (PL-1 and PL-2)

The Passlock I and Passlock II systems can be found in the following General Motors vehicles:

➤ 1995 and newer Cavalier and Sunfire
➤ 1996 and newer Achieva, Grand Am, and Skylark
➤ 1997 and newer Intrigue, Malibu, and Cutlass
➤ 1998 and newer trucks, vans, SUVs
➤ 1999 and newer Alero
➤ 2000 and newer Impala and Saturn

Passlock I and II systems are VATS-evolved. Passlock systems still rely on the R-code to start, but the pellet is no longer placed in the key. The resistor can now be found in the key switch. This allows for a greater number of possible R-codes. In addition, Passlock systems require "seeing" the correct R-code at the correct time. To bypass Passlock I and II, p/n 555L or p/n 555T is required.

Passkey III (PK-3), Transponder-Based Systems

The Passkey III system can be found in the following vehicles:

➤ 1997 and newer Park Avenue
➤ 1998 and newer Cadillac
➤ 1999 and newer U vans, Transport, Montana, and Silhouette
➤ 2000 and newer Grand Prix, Lesabre, Monte Carlo, Lumina, Bonneville
➤ 2001 and newer Aurora, Aztek and Rendezvous

Other transponder-based systems include: Acura, BMW, Dodge/Chrysler/Jeep, Ford, Honda, Infinity, Mazda, Mercedes, Mitsubishi, Nissan, Toyota, Volkswagon, and Volvo.

PK-3 and the transponder-based systems use a transponder system that locks out the ignition and fuel system. This transponder system is comprised of two parts. The first part, the transceiver, circles

the key switch and is activated when the key is placed in the key switch or turned to the run position. Upon activation, the transceiver will excite the transponder, which is located (but not visible) in the head of the ignition key. The key transponder will then send a unique code back to the transceiver for evaluation. If the code matches a valid code of the system, the vehicle will be allowed to start.

Most of these transponder-based systems can be bypassed using p/n 555U. Some may require additional parts from the vehicle manufacturer. Consult you dealer for the applications. For most Ford PATS transponders, as well as Lexus and Toyotas, p/n 555F can be used, except for the following vehicles, which will require p/n 555U: '97 and newer Mark VII, and 2000 and newer Taurus/Sable, Contour/Mystique and Focus.
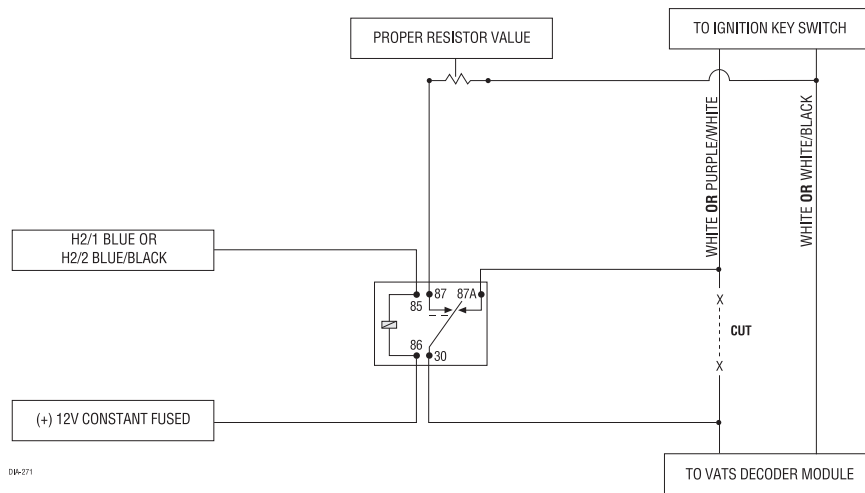
Bypassing GM Vehicle Anti-Theft Systems (VATS)

Vehicles with the GM VATS (Pass Key) systems have a resistor embedded in the ignition key. If the VATS decoder module does not measure the proper resistance value when the vehicle is started, the starter and fuel pump may be disabled for up to ten minutes. An optional "VATS pack" of resistors is available (Directed P/N 652T). One of the resistors in the pack will match the resistor in the key.

The VATS wires will be two very light-gauge wires coming out of the steering column. The colors of the wires vary, but they are often contained in orange tubing - either both will be white wires, or one wire will be purple/white and the other white/black. Determine the value of the resistor in the key. Then follow the wiring outlined in the following diagram to bypass VATS during remote start operation. If the BLUE status output has been programmed for factory security re-arm, use the H2/2 BLUE/BLACK third ignition output to control the relay.

NOTE: When connecting to the VATS wires, it is not important which wire is cut.

See the following diagram.

PROPER RESISTOR VALUE

TO IGNITION KEY SWITCH

WHITE **OR** PURPLE/WHITE

WHITE **OR** WHITE/BLACK

H2/1 BLUE OR
H2/2 BLUE/BLACK

85 87 87A

86 30

CUT

X

X

(+) 12V CONSTANT FUSED

TO VATS DECODER MODULE

DIA-271

# 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 LEDs can be used, but they must be wired in series. The LED can be top-mounted or flush-mounted. If top-loading the LED with a bezel, the LED fits into a $^5/_{16}$-inch mounting hole. If flush-mounting the LED from the back of a panel, drill a mounting hole using a $^{17}/_{64}$-inch drill bit. Be sure to check for clearance prior to drilling the mounting hole.

LED

CONTROL
MODULE

QUICK
DISCONNECT

BLUE

RED

DIA-452
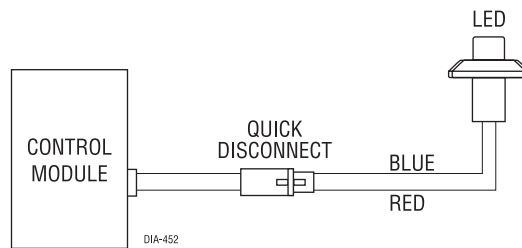
Valet/Program Switch, 2-Pin Blue Plug

The Valet/Program switch should be accessible from the driver's seat. It plugs into the blue port on the side of the unit. Since the system features Valet by using the remote transmitter, the switch can be well hidden. Consider how the switch will be used before choosing a mounting location. Check for rear clearance before drilling a $^9/_{32}$-inch hole and mounting the switch. The GRAY wire in the

two-pin plug may also be used as a (+) Ghost Switch input and can be connected to any (+) switch in the vehicle. (See *Feature Descriptions* section of this guide.)
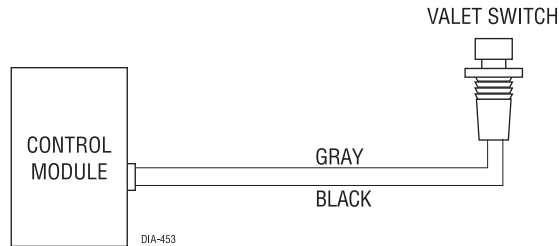
# Programmer Interface, 3-Pin Port

The black three pin port is provided for either a DEI Bitwriter (P/N 998T) or a personal computer using a PC interface (P/N 996T) to program the unit. When using the Directed Bitwriter or optional PC Interface Module (P/N 996T) it is possible to configure any or all of the programmable functions. The PC Interface Module works with an IBM compatible PC. (The 998T does not require the IBM compatible PC.) For more information please refer to the guide packaged with the programmer.

Door Lock Harness (H4) Wire Connection Guide

H4/A	GREEN	(-) Lock, (+) Unlock Output
H4/B	EMPTY	Unless Using 451M
H4/C	BLUE	(-) Unlock, (+) Lock Output

For detailed instructions on wiring the vehicle's door locks, please refer to the Door Lock Wiring Guide (**Document No. 1041**) provided on the **www. directechs.com** website or through **DirectFax 1-800-999-1FAX (1329)**.

Internal Programming Jumpers

DIA-440

TACH THRESHOLD JUMPER
LIGHT FLASH JUMPER
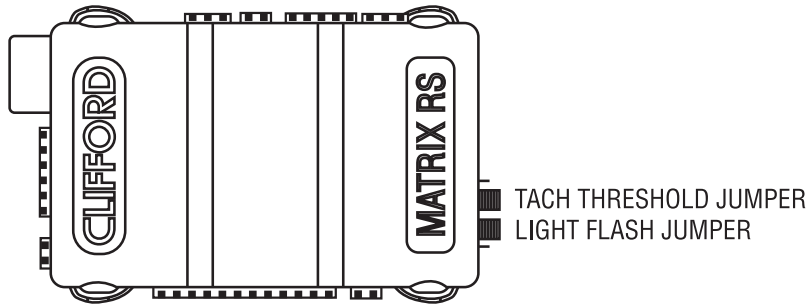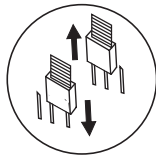
TO CHANGE JUMPER SETTINGS

TACH THRESHOLD ON

TACH THRESHOLD OFF (DEFAULT)

(+) LIGHT FLASH OUTPUT (DEFAULT)

(-) LIGHT FLASH OUTPUT

Light Flash Jumper

This jumper is used to determine the light flash output polarity. In the (+) position, the on-board relay is enabled and the unit will output (+)12V on the WHITE wire, H1/2. In the (-) position, the on-board relay is disabled. The WHITE wire, H1/2, will supply a 200mA (-) output suitable for driving factory parking light relays.

NOTE: For parking light circuits that draw 10 amps or more, the internal jumper must be switched to a (-) light flash output. P/N 8617 or a standard automotive SPDT relay must be used on the H1/2 light flash output harness wire.

Digital Tach Threshold On/Off

In most cases, this jumper can be left in the OFF position. Some new vehicles use less than 12 volts in their ignition systems. The unit may have trouble learning the tach signal in these vehicles. Changing the jumper to the ON setting changes the trigger threshold of the digital tach circuit so it will work properly with these vehicles. The vehicles affected include many newer Dodge/Chrysler/Plymouth vehicles, such as the Neon, Cirrus, Stratus, Breeze and LH-based vehicles.

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 transmitter/receiver learn routine to add transmitters to the system or change transmitter button assignments.

If the Directed Bitwriter or PC Interface has previously been used to program the system, the unit may have been locked, so that the features and channels cannot be altered via manual programming with the Valet switch. If the horn emits one long honk when attempting to program the transmitter/receiver, this indicates that the unit is locked. You must unlock it with the Bitwriter or PC Interface before you will be able to manually program the transmitter/receiver.

The Valet/Program switch, plugged into the blue port, is used for programming. There is a basic sequence of steps to remember whenever programming this unit: Key, choose, transmit, confirm and release.

1. **Key.** Turn the ignition key on.

2. **Choose.** Within 10 seconds, press and release the Valet/Program switch the number of times corresponding to the channel you wish to program. Once you have selected the channel, press the switch once more and HOLD it. The LED will flash to indicate the selected channel and the horn will honk (if connected) to confirm the selected channel. Do not release the Valet/Program switch.

Channel Number	Function	Wire Color
1	Arm/Disarm/Panic	
2	Silent Mode/Remote Valet/Trunk Release	RED/WHITE
3	Remote Start or other accessories	WHITE/BLUE
4	Arm only (only available with Radar Master remote)[1]	
5	Disarm only (only available with Radar Master remote)[1]	
6	Panic only (only available with Radar Master remote)[1]	
7	Auto-learn 3-Button Transmitter Configuration[2]	
8	Auto-learn 4-Button Transmitter Configuration[2]	
9	Zap (delete all transmitters)[3]	

[1]NOTE: Channels 4-6 are only available when using an optional Radar Master remote.

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

[3]NOTE: See Channel 9 description in this section.

3. **Transmit.** While HOLDING the Valet/Program switch, press the button from the transmitter that you wish to assign to the selected channel. The horn will honk (if connected) indicating that the channel has been entered.

4. **Confirm.** While still HOLDING the Valet/Program switch, press the same transmitter button that you just programmed. The horn will honk twice (if connected) to confirm that the desired channel has been successfully programmed to the transmitter button. If this step is not performed, the channel will not be programmed to the button. 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 switch can be released.

Channels 4-6 (available only when using a Radar Master remote)

Channels 4 through 6 are used to assign the arm, disarm and panic functions to separate buttons on the remote control. These channels are only available when using an optional Radar Master remote. (See *Transmitter Configurations* section of this guide.) Teaching a transmitter button to Channel 4 erases all previous programming from the transmitter's memory. Similarly, if the transmitter is set up to use the separate arm, disarm and panic channels and a button from that transmitter is programmed to Channel 1, the transmitter's memory will be erased, and the system will only recognize the button that was programmed to Channel 1.

Channel 9

If any transmitter button from a known transmitter is programmed to Channel 9, all transmitters will be erased from memory and will revert to the default feature settings (see the *Features Menu* section of this guide). This is useful in cases where the 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.

To advance from one channel to another

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 instance: You have programmed Channel 1 and you want to program Channel 2. Release the Valet/Program switch. Press it one time and release it to advance from Channel 1 to Channel 2. Now, press and HOLD the Valet/Program switch. The LED will flash two times and the horn will honk twice (if connected). As before, do not release it.

To exit the learn routine

One long horn honk indicates that Learn Routine has been exited. Learn Routine will be exited if any of the following occurs:

➤ Ignition is turned off.
➤ Valet/Program switch is pressed too many times.
➤ More than 15 seconds elapse between steps.

Transmitter Configurations

Using the Auto Learn functions in the Transmitter/Receiver Learn Routine, transmitters can be programmed either with the 3-button configuration or 4-button configuration.

3-Button Transmitter Configuration

This configuration can be programmed to an optional 3-button transmitter using Channel 7 of the Transmitter/Receiver Learn Routine. The transmitter buttons are assigned to the following functions:

🔓/🔒 ....operates.......................Arm/Disarm/Panic

🗝 ....operates.......................Channel 2 (Optional auxiliary function, such as trunk release)

✳ ....operates.......................Remote Start

4-Button Transmitter Configuration

The 4-button transmitter configuration can be used when using the 4-button remotes that come standard with this system. This configuration can be programmed to a 4-button transmitter using Channel 8 of the Transmitter/Receiver Learn Routine. In the 4-button transmitter configuration, the buttons are assigned to the following functions:

🔓/🔒 ....operates ....Arm/Disarm/Panic

🗝 ....operates ....Channel 2 (Optional auxiliary function, such as trunk release)

✳ ....operates ....Remote Start

✳✳...............................is ....Unassigned

Optional Radar Master Transmitter

Separate transmitter button arming/disarming/panic (Channels 4-6, see channel chart in *Transmitter/Receiver Learn Routine* section) can only be utilized when upgrading to an optional Radar Master transmitter. When using a Radar Master transmitter with this system, Channels 4-6 may be programmed to the transmitter in a variety of configurations.

System Features Learn Routine

The System Features Learn Routine dictates how the unit operates. Due to the number of features, they have been divided 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 Directed Bitwriter or 996T Personal Computer Interface. Any of the settings can be changed and then assigned to one of up to four transmitters, a feature called Owner Recognition. Each time that 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 Directed Bitwriter.

If using the Directed Bitwriter or PC Interface to program the System Features Learn Routine, you may lock the unit so that the features cannot be altered via manual programming with the Valet switch. If you later wish to program the system manually, you must unlock the unit using the Directed Bitwriter or PC Interface before you will be able to reprogram the features. If the horn generates one long honk when attempting to program the unit, this indicates that the unit has been locked and must be unlocked with the Bitwriter or PC Interface before proceeding.

The Valet/Program switch, plugged into the blue port, is used for programming. There is a basic sequence of steps to remember whenever programming this unit: Key, select, choose, transmit and release.

1. **Key.** Turn the ignition on and then back off.

2. **Select Menu.** Press and HOLD the Valet/Program switch until either the LED flashes once and the horn honks once to select Menu One, or the LED flashes twice and the horn honks twice to select Menu Two.

3. **Choose.** Within 10 seconds, press and release the Valet/Program switch the number of times corresponding to the feature number you want to program. (See *Feature Menus.* section of this guide.)

Once the Valet/Program switch has been pressed and released the desired number of times, press it once more and HOLD it. After a second, the LED will flash to indicate which feature you have accessed. For example, in Menu Two, groups of eight flashes would indicate access to the status output feature (Feature 2-8). The horn will also honk eight times (if connected).

4. **Transmit.** The transmitter is used to select the desired setting. As shipped, the unit is configured to the LED ON settings. These are the default settings. Pressing 🔓/🔒 will set it to the LED ON setting. The LED will light solid (stop flashing) to indicate the setting. The horn will honk once (if connected). Pressing 📷 will change the setting to the LED OFF setting. The LED will go out indicating the change and the horn will honk twice (if connected).

5. **Release.** The Valet/Program switch can now be released.

For example, to program the arming mode from active to passive, within 10 seconds of turning the ignition off, select Menu One and press and release the Valet/Program switch once. Then press it again and HOLD it. The LED will flash in groups of one and the horn will honk once (if connected). While HOLDING the Valet/Program switch, press 📷 . The LED will stop flashing and go out. The horn will honk twice if connected. Passive arming is now programmed. If that was not the desired setting, without releasing the Valet/Program switch, press 🔓/🔒. The LED will light solid and the horn will honk once if connected. Active arming is now programmed. Release the Valet/Program switch after the selection has been made.

Once a feature is programmed:
➤ Other features can be programmed within the same menu.
➤ Another menu can be selected.
➤ The learn routine can be exited if programming is complete.

To access another feature in the same menu:
You can advance from feature to feature by pressing and releasing the Valet/Program switch the number of times necessary to get from the feature you just programmed to the feature you wish to access. For example, in Menu One, if you just programmed Feature 1-2 and you next want to program Feature 1-3 to off, release the Valet/Program switch. Press and release it once to advance

from Feature 1-2 to Feature 1-3. Then press it once more and HOLD it. The LED will flash in groups of 3 and the horn will honk 3 times (if connected) to confirm that you have accessed Feature 1-3.

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 horn will honk, indicating which menu has been accessed.

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

The learn routine will be exited if:
➤ The ignition is turned on.
➤ The Valet/Program switch is pressed too many times.
➤ More than 15 seconds elapses between programming steps.

One long horn honk (if connected) indicates that the learn routine has been exited.

Feature Menus

Factory default settings are indicated in **bold** in the following feature tables. *NOTE: The numbers in parentheses indicate the number of times the LED will flash.

Feature Menu 1

Feature Number	Default - LED ON Setting (Press Arm/Disarm Remote Button)	LED OFF Setting (Press Channel 2/Trunk Release Remote Button)
1-1	**Active arming**	Passive arming
1-2	**Chirps ON**	Chirps off
1-3	**Ignition controlled door locks ON**	Ignition controlled door locks off
1-4	**Active locking**	Passive locking
1-5	**0.8 second door lock pulses**	3.5 second door lock pulses
1-6	**Double pulse unlock OFF**	Double pulse unlock ON
1-7	**Channel 2 output - Delayed validity (1)***	Channel 2 output - Instant validity (2)/ latched (3)/latched reset with ignition (4)/ 30-second timed (5)/second unlock (6)*
1-8	**Factory alarm disarm with Channel 2 ON**	Factory alarm disarm with Channel 2 OFF
1-9	**Anti-Code Grabbing ON**	Anti-Code Grabbing OFF

Feature Menu 2

Feature Number	Default - LED ON Setting (Press Arm/Disarm Remote Button)	LED OFF Setting (Press Channel 2/Trunk Release Remote Button)
2-1	**Engine checking ON**	Engine checking OFF
2-2	**Tachometer checking type**	Voltage checking type
2-3	**12 minutes run time**	24 minutes, 60 minutes run time
2-4	**Flashing parking light output**	Constant parking light output
2-5	**Cranking time 0.6 sec. (1)***	Cranking time 0.8 (2), 1.0 (3), 1.2 (4), 1.4 (5), 1.6 (6), 1.8 (7), 2.0 (8), 4.0 (9) sec.*
2-6	**High voltage check level**	Low voltage check level
2-7	**Auxiliary output - factory alarm disarm**	Auxiliary output - special accessory
2-8	**Normal status output**	Factory re-arm output
2-9	**Anti-Grind ON**	Anti-Grind OFF

Feature Descriptions

The features of the system are described below. Features that have additional settings that can be selected only when programming with the PC interface or Bitwriter are indicated by the following icon:

Feature Menu 1

1-1 ACTIVE/PASSIVE ARMING: When active arming is selected, the starter interrupt will arm (if connected) only when the transmitter is used. When set to passive arming, the starter interrupt will arm (if connected) 30 seconds after the ignition key is turned off.

1-2 CHIRPS ON/OFF: This feature controls the chirps that confirm arming and disarming of the system. A siren or horn must be connected to the H1/10 BROWN wire.

1-3 IGNITION CONTROLLED DOOR LOCKS ON/OFF: When turned on, the doors will lock three seconds after the ignition is turned on and unlock when the ignition is turned off.

1-4 ACTIVE/PASSIVE LOCKING: If passive arming is selected in Menu One, 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 with a transmitter. Active locking means the doors will not lock when the system passively arms. Passive locking means that the doors will lock whenever the system passively arms the starter interrupt (if connected).

1-5 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 the system to provide 3.5 second pulses will accommodate the door lock interface in these vehicles. The default setting is 0.8 second door lock pulses.

1-6 DOUBLE PULSE UNLOCK OFF/ON: Some vehicles require two pulses on a single wire to unlock the doors. When the double pulse unlock feature is turned on, the BLUE H2/C wire will supply two negative pulses instead of a single pulse. At the same time, the GREEN H2/A wire will supply two positive pulses instead of a single pulse. This makes it possible to directly interface with double pulse vehicles without any extra parts.

1-7 CHANNEL TWO OUTPUT:
➤ In the delayed validity default setting the Channel 2 output will output a negative (-) signal after ◼ is pressed for more than 1.5 seconds and will continue until the button is released.
➤ Selecting instant validity will output a negative signal from the Channel 2 output immediately when ◼ is pressed and will continue until the button is released.
➤ The latched output selection will output a negative signal as soon as ◼ is pressed and will continue until the button is pressed again.
➤ The latched/reset with ignition output selection operates just like the latched output but will reset or stop when the ignition is turned on.
➤ The 30-second timed output selection will latch the Channel 2 output on for 30 seconds when ◼ is pressed or until the button is pressed again within the 30 seconds.
➤ A second unlock output will provide a second unlock pulse whenever ◼/◼ is pressed within 15 seconds after unlocking the system. This setting could be used to unlock the passenger doors when installing progressive door locks, for instance.

NOTE: Programming Channel 2 for second unlock will link the RED/WHITE wire to the unlock button. Pressing ◼/◼ will send the output to the H4/A or H4/C unlock output. Pressing ◼/◼ a second time within 15 seconds will send a negative (-) unlock pulse to the RED/WHITE wire.

1-8 FACTORY ALARM DISARM WITH CHANNEL 2: Any time Channel 2 is activated from the remote transmitter the factory disarm output will pulse to disarm the vehicle's factory anti-theft device. This option can be programmed off if desired.

1-9 ANTI-CODE GRABBING 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 this feature lets the receiver ignore the Anti-Code Grabbing part of the trans-

mitted word. As a result, the unit may have better range with the Anti-Code Grabbing feature off.

Feature Menu 2

2-1 ENGINE CHECK ON/OFF: In the default setting the remote start will monitor either the vehicle's tach wire or voltage depending on the programming of Feature 2-2. If programmed off, the vehicle will crank for the programmed crank time (Feature 2-5) and will not verify with tach or voltage that the vehicle is running. In the off setting, if the vehicle fails to start, the ignition can stay on for the entire run duration. Using tach or voltage check is always recommended if possible.

2-2 TACH WIRE SENSE/VOLTAGE SENSE: If the tachometer signal wire is used, this feature must be left in the default (tach wire connected) setting. If programmed to the voltage sense setting, the unit will crank the starter for a preset time that can be programmed in Feature 2-5. Once the starter has been engaged, the system will check the voltage level to verify the engine is running. The threshold for the voltage level test can be programmed in Feature 2-6. When using voltage sense mode, connection of the H3/5 WHITE tachometer input is not necessary.

2-3 RUN TIME 12/24/60 MINUTES: This feature controls how long the engine will run before it "times out" and shuts down. Programmed to the default setting the engine will run for 12 minutes. If the 24- or 60-minute run time is desired, change this feature using the on-board LED off setting.

2-4 PARKING LIGHTS FLASHING/CONSTANT: In the default setting, the unit will flash the vehicle's parking lights while remote started. The constant setting will turn the parking lights on solidly for the entire run duration.

2-5 CRANK TIME 0.6/0.8/1.0/1.2/1.4/1.6/1.8/2.0/4.0: If Feature 2-2 is programmed to the voltage sense setting, the crank time must be set to the appropriate duration. The default setting is 0.6 second. If a different crank time is desired, select Feature 2-5 and (while pressing the Valet/Program switch) advance to the next time by pressing 🐞. The unit will flash the LED to indicate which time is selected. Once the 4.0 second setting is reached the next press of 🐞 will reset the system to the shortest setting.

2-6 VOLTAGE CHECK LEVEL HIGH/LOW: This feature only functions when Feature 2-2 is programmed to voltage sense. Some vehicles have many accessories, which are turned on when remote started. In these vehicles, the variation of voltage between the engine off and the vehicle running is very slight and the remote start unit may "think" the vehicle has not started. This can cause the remote start to shut down after the vehicle has been started. If this is the case, program this feature to the LOW position.

2-7 AUXILIARY OUTPUT: Factory alarm disarm/ignition three output: In the default setting this wire sends a negative pulse that may be used to disarm the vehicle's factory security system. If programmed for an ignition three output, the wire can be used to energize a relay to power up extra ignition wires in the vehicle.

2-8 BLUE WIRE STATUS OUTPUT/FACTORY RE-ARM OUTPUT: The blue (H3/1) wire will supply a (-)200mA output for the entire remote start run time. If programmed for factory re-arm output, this wire will supply a momentary (-)200mA pulse whenever the remote start times out or is shut down with the transmitter. This can be used to re-arm many factory security systems.

2-9 AUTOMATIC ANTI-GRIND ON/OFF: With the anti-grind on (default) the ground-when-armed output will be active during remote start operation. If accessories such as a voice module or window module are added to the unit, it may be necessary to program this feature off.

Tach Learning

To learn the tach signal:

1. Start the vehicle with the key.

2. Within 5 seconds, press and HOLD the Valet/Program switch.
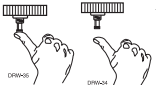
3. The LED will light constant when the tach signal is learned.

4. Release the Program switch.

Shutdown Diagnostics

The unit has the ability to report the cause of the last shutdown of the remote start system. To enter diagnostic mode:

---

1. Turn the ignition off.

2. Press and HOLD the Valet/Program switch.

3. Turn the ignition on and then off.

4. Release the Valet/Program switch.

5. Press and release the Valet/Program switch. The LED will now report the last system shutdown by flashing for one minute in the following grouped patterns:

LED Flashes	Shutdown Mode
One	System timed out
Two	Over-rev shutdown
Three	Low or no RPM
Four	Transmitter Shutdown (or optional push-button)
Five	(-) Shutdown
Six	(+) Shutdown
Seven	(-) Neutral safety shutdown (H3/6 BLACK/WHITE)
Eight	Wait-to-start timed out

NOTE: The LED will stop flashing when the ignition is turned on.

Smart Power Up II

This feature 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.

Timer Mode

This unit can be programmed to start and run the engine every three hours. The engine will run for the programmed run time and then shut down. After three hours, the unit will restart the engine. A maximum of six cycles can occur.

> **IMPORTANT!** Timer Mode should be used only in open areas. Never start and run the vehicle in an enclosed space such as a garage or carport.

The same procedure may be used to enter or exit Timer Mode using the remote transmitter:

1. Remote start the vehicle by pressing ✳.
2. Press and release 🐷.
3. Within 2 seconds, press and release ✳ again.
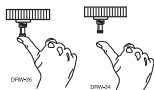
When entering Timer Mode, the engine should shut down. The parking lights (if connected) will flash four times and the engine will restart. The system is in Timer Mode. The engine may be allowed to run for its programmed run time, or the transmitter can be used to shut down the engine. Either way, the remote start system will restart the engine again in three hours. Timer Mode is exited automatically after the sixth run cycle.

Timer Mode can also be exited manually as follows:

1. Make sure the remote start system is not operating the engine.
2. Turn the ignition on. Timer Mode will be exited and the parking lights will flash four times.

Valet Mode

To enter or exit Valet Mode with the Valet/Program switch:

1. Turn the ignition on and then off.

2. Within 10 seconds, press and release the Valet/Program switch.

The LED status indicator will light solid if you have entered Valet Mode, and will go out if you have exited Valet Mode.

Safety Check

Before vehicle reassembly, the remote system must be checked to ensure safe and trouble-free operation. The following test procedure must be used to verify proper installation and operation of the system. The installation must be completed before testing, including connection to the brake switch and hood switch.

1. Test the BRAKE shutdown circuit: With the vehicle in Park (P), activate the remote start system. Once the engine is running, press the brake pedal. The engine should shut down immediately. If the engine continues to run, check the brake circuit connection.
2. Test the HOOD PIN shutdown circuit: With the vehicle in Park (P), open the hood. Activate the remote start system. The vehicle should not start. If the starter engages, check your hood pin and connections.

NOTE: If programmed for Diesel Mode, the system will turn on the ignition, but the starter should not engage with the hood open.

3. Test the NEUTRAL SAFETY shutdown circuit:

> **IMPORTANT!** Make sure there is adequate clearance to the front and rear of the vehicle before attempting this test.

   a. Make sure the hood is closed and no other shutdown circuits are active.
   b. Set the emergency brake.
   c. Turn the ignition key to the run position but do not start the engine.
   d. Put the vehicle in Drive (D).
   e. Put your foot over the brake pedal but do not press down on it. Be ready to step on the brake to shutdown the remote start system.
   f. Activate the remote start system.
      ➤ If the starter engages, immediately step on the brake to shut down the system. If it does engage, recheck the neutral safety input connection. The vehicle may use a mechanical neutral safety switch. (See H2/6 BLACK/WHITE neutral safety switch input in *Remote Start Harness H3 Wire Connection Guide* section of this guide.)
      ➤ If the starter does not engage, the test is complete.

Once the system passes the three tests, the vehicle can be re-assembled and delivered. Do not the use the remote start system or finalize the installation if it fails any of the safety check tests.

Troubleshooting

The ignition comes on, but the starter will not crank.

➤ Does it start with the key in the ignition? If so, does the vehicle have a VATS Pass-Key system?

➤ Will it start with the brake pedal depressed? (Make sure to disconnect the brake shutdown when performing this test.) If so, it may have a brake/starter interlock.

➤ Is the correct starter wire being energized? Check by energizing it yourself with a fused test lead.

The starter cranks for six seconds but does not start.

➤ Either the wrong ignition wire is being energized, the unit's ignition and accessory wires have been connected backwards, or the vehicle has two ignition circuits. Try activating the unit with the ignition key in the "run" position. If the vehicle then runs normally, retest your ignition system.

The starter continues to crank even though the engine has started.

➤ Has the tach wire been learned? See *Tach Learning* section of this guide.

➤ Is the tach wire receiving the correct information? Either the wrong tach wire has been used, or a bad connection exists.

The climate control system does not work while the unit is operating the vehicle.

➤ Either the wrong accessory wire is being energized or more than one ignition or accessory wire must be energized in order to operate the climate control system.

The remote start will not activate.

1. Check harnesses and connections. Make sure the harnesses are fully plugged into the remote start module. Make sure there are good connections to the vehicle wiring.
2. Check voltage and fuses. Use a meter and check for voltage between the red wire in the 5 pin ribbon harness and the black ground wire. If you have less than battery voltage, check the 3A and both 30A fuses on the relay satellite. Also make sure that the ground wire is going to a chassis ground and not to something under the dash.
3. Check diagnostics. The diagnostics will tell you which shutdown is active or not connected.

The remote start will activate but the starter never engages.

1. Check for voltage on the purple starter wire two seconds after the remote start becomes active. If there is voltage present, skip to Step 4. If there is not voltage present, advance to Step 2.
2. Check the 30A fuses.
3. Check diagnostics. If the gray/black wire is detecting ground upon activation, the starter will not crank.

---

4. Make sure the purple starter wire is connected on the starter side of the starter interrupt relay.

5. Does the vehicle have an immobilizer? Some immobilizer systems will not allow the vehicle to crank if active.

6. Check connections. The two red heavy gauge input wires on the relay satellite should have solid connections. "T-taps", or "scotch locks" are not recommended for any high current heavy gauge wiring. Also, if the vehicle has more than one 12-volt input wire, then connect one red wire to each.

The vehicle starts, but immediately dies.

1. Does the vehicle have an immobilizer? The vehicles immobilizer will cut the fuel and/or spark during unauthorized starting attempts.

2. Is the remote start programmed for voltage sense? If so, the start time may not be set high enough, or you may have to adjust the voltage threshold in programming. Voltage sense will not work on some vehicles.

3. Check diagnostics. Sometimes a shutdown will become active during cranking or just after cranking.

The vehicle starts, but the starter keeps running.

➤ Is the system programmed for engine checking off or voltage sense? When programmed for either of these features, the engine cranks for the preprogrammed crank time regardless of how long it takes to start the vehicle to actually start. Adjust to a lower cranking time.

➤ Was the Tach Learn successful? The LED must light solidly and brightly to indicate a successful learn.

➤ Make sure that there is a tach signal right at the purple/white tach input wire of the remote start. If not, recheck the connection to the vehicle's tach wire and make sure the wire is not broken or shorted to ground leading to the remote start.

The vehicle will start and run only for about 10 seconds.

➤ Is the remote start programmed for voltage sense? Try programming the unit for low voltage reference. If this does not work, a tach wire should be used.

➤ Check diagnostics.

Wiring Quick Reference Guide

RED
(+) High Current 12V Input

RED
(+) High Current 12V Input

PINK
(+) Output to Ignition Circuit

ORANGE
(+) Output to Accessory Circuit

PURPLE
(+) Output to Starter Circuit

PINK/WHITE
(+) Output to Second Ignition Circuit

Heavy Gauge Relay Satellite

5-Pin Remote Start Ribbon Harness

PURPLE
ORANGE
PINK
YELLOW
RED

3-Pin 2-Wire Door Lock Harness

GREEN
(-) Lock, (+) Unlock Output

Empty
(Unless Using a 451M)

BLUE
(-) Unlock, (+) Lock Output

Jumpers

Valet/Program Switch

MATRIX RS

CLIFFORD

LED

ORANGE
(+) 500 mA Ground-When-Armed Output — To Starter Kill Relay

WHITE
(+)/(+) Selectable Light Flash Output — Vehicle Parking Light Wire

WHITE/BLUE
(-) 200 mA Channel 3 Programmable Output — Activation Input

BLACK/WHITE
(-) 200 mA Output — Domelight Supervision Relay

GREEN — Not Used

BLUE — Not Used

VIOLET — Not Used

BLACK
(-) Chassis Ground Input — Chassis Ground

BROWN
(-) Horn Output — Vehicle Horn

RED
(+) Constant Power Input

RED/WHITE
(-) 200 mA Output — Vehicle Trunk Release Wire (Optional)

12-Pin H1 Primary Harness

2-Pin Auxiliary Harness

GRAY/BLACK
(-) Wait-to-Start Input (For Diesels)

LIGHT GREEN/BLACK
(-) Factory Disarm/Special Accessory Output

Optional Bitwriter or PC Interface   or

Antenna

Toggle Override Switch

BLACK/WHITE
(-) Neutral Safety Switch Input

Vehicle Tachometer Wire — VIOLET/WHITE
Tachometer Input Wire

Vehicle Brake Light Wire — BROWN
(+) Brake Switch Shutdown Wire

Hood Pinswitch — GRAY
(-) Hood Pinswitch Shutdown Wire

Vehicle Third Ignition Wire — BLUE/BLACK
(-) 200 mA Optional Third Ignition Output (Relay Required)

Programmable Output — BLUE
(-) 200 mA Status/Factory Security Rearm Output

6-Pin H3 Remote Start Harness

LIGHT FLASH OUTPUT   TACH THRESHOLD JUMPER

LIGHT FLASH JUMPER

(-) LIGHT FLASH OUTPUT (DEFAULT)   (+) LIGHT FLASH OUTPUT (DEFAULT)

TACH THRESHOLD OFF (DEFAULT)   TACH THRESHOLD ON