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11/00 MA_RS-7K2

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OMEGA
RESEARCH AND DEVELOPMENT, INC.

OPERATING & INSTALLATION INSTRUCTIONS

RS-7K2
DELUXE KEYLESS ENTRY & REMOTE STARTER
FOR AUTOMATIC TRANSMISSION VEHICLES ONLY

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the unit, all of the transmitters must be programmed.

To program transmitters to operate the RS unit:

- 1) Turn the ignition switch "On".
- 2) Within 7 seconds flip the Valet Switch "on" and "off" 5 times. The parking lights will flash once, then turn back on indicating that the unit is ready to receive the first transmitter's code.
- 3) Press the transmitter's lower right "START" button. The RS unit will acknowledge learning and storing the transmitter code by turning off the parking lights, quickly flashing them once and then turning them back on.
- 4) Repeat the previous step for each remaining transmitter. Be sure to wait for the parking lights to turn back on before pressing the next transmitter's "START" button.

The RS unit will automatically exit the transmitter programming mode, which is indicated by the parking lights turning off, 8 seconds after the last transmission, if the ignition switch is turned "On", or if a fourth transmitter code is entered.

doorlocking systems or 3 seconds for certain vehicles having vacuum pump actuated doorlocking systems.

Feature #3- “Double Unlock Pulse” is for certain newer vehicles requiring two pulses for unlocking the doors.

Feature #4- “Engine Running Time” selects the remote start engine run period to be 15 minutes or 30 minutes.

Feature #5- “Starter Cranking Time” slightly lengthens the starter engagement, which is useful for vehicles which may have difficult-to-start engines.

Feature #6- “1 Or 2 Pulse Remote Start Activation” changes the Pink “Start Activation Input” wire’s operation so that two Negative pulses instead of one is required for an external device to activate the remote starting feature. This feature, explained on page 24, will allow an existing keyless entry system to activate the RS unit’s remote start feature.

Programming Transmitters

The RS-7K2 comes with two pre-programmed transmitters, but up to four transmitters total may be programmed to operate the RS unit. Each transmitter has its own unique “code”, and when a new transmitter is programmed, all previous codes will be erased. So when an additional or replacement transmitter is added to operate

Introduction & Safety Considerations

Congratulations on your purchase of the RS-7K2 Keyless Entry and Remote Starter unit. The RS-7K2 offers you the convenience of locking and unlocking your vehicle’s doors with the press of a button, and the starting of your vehicle’s engine from the comfort of your home or office, allowing your vehicle to warm up in winter and cool down in summer. The RS-7K2 can also be optionally configured to remotely open your vehicle’s trunk.

We highly recommend that this system be professionally installed, as the complexity of the modern automobile and the nature of circuits to be accessed is often beyond the abilities of most do-it-yourselfers.

There are several important safety considerations with using and installing the RS-7K2 keyless entry and remote starter. Among them are:

- This unit is for vehicles with an automatic transmission only. Installation in a vehicle equipped with a manual transmission can result in property damage or personal injury.
- This unit is for fuel injected gasoline or diesel engines.
- Children should not be left unattended in, or be allowed to play with the activating transmitters of any remote starter equipped vehicle.
- Do not use the remote starter feature in an enclosed garage or other structure.

Basic Transmitter Functions

The RS-7K2 comes with two 4-button remote transmitters. Please familiarize yourself with the buttons and operations of the transmitters which are explained in the following pages.

Upper left button

with “**LOCK**” icon
locks the doors, or activates the “carfinder” feature

Upper right button

with “**UNLOCK**” icon
unlocks the doors

Lower left button

with “**START**”
activates the remote engine start feature



Lower right button

with “**OPEN TRUNK**” icon
opens the trunk

3) Select the feature to be changed by flipping the Valet Switch the same number of times as the feature number; the RS-unit’s response is an equal number of parking light flashes.

4) Once the feature has been confirmed by the parking light flashes, press either the transmitter’s upper left “**LOCK**” button or the upper right “**UNLOCK**” button.

- The “**LOCK**” button sets the feature to the “default” position, and the RS unit will flash the parking lights once to acknowledge receiving this command.
- The “**UNLOCK**” button sets the feature to the “optional” position, and the RS unit will flash the parking lights twice to acknowledge receiving this command.

5) Select another feature by repeating step 3), or allow the unit to exit Features Programming Mode by simply not performing any programming actions- after 8 seconds the RS unit briefly turns on the parking lights to indicate its exit from Features Programming Mode.

The programmable features:

Feature #1- “Doors Lock/Unlock Upon Ignition On/Off” configures the RS unit to automatically lock the doors when the ignition is turned “On” and unlock the doors when the ignition is turned “Off”.

Feature #2- “Door Lock Pulse Time” selects .75 second for most vehicles’ power

Programmable Features

The RS-7K2 has six programmable features. These features can be changed using the transmitter when the unit is in Features Programming Mode. These six features, their default and optional settings, are:

#	FEATURE	DEFAULT	OPTION
#1	Doors Lock/Unlock Upon Ignition On/Off	ON	OFF
#2	Door Lock Pulse Duration	.75 Second	3 Seconds
#3	Single Or Double Unlock Pulse	Single	Double
#4	Engine Running Time	15 Minutes	30 Minutes
#5	Starter Cranking Time (in seconds)	.8, 1.2, 1.5	1.2, 1.5, 2
#6	1 Or 2 Pulse Remote Start Activation	1 Pulse	2 Pulses

To access Features Programming Mode and changing features:

- 1) Turn the ignition switch "On", then "Off".
- 2) Within 7 seconds flip the Valet Switch "on" and "off" 5 times. The parking lights flash once indicating Features Programming Mode.

Locking & Unlocking the Doors

To Lock the Vehicle's Doors: Press & Release the upper left transmitter button



THE PARKING LIGHTS WILL FLASH ONCE



THE DOORS WILL LOCK

- The parking lights will flash once to confirm and the doors will lock.

To Unlock the Vehicle's Doors: Press & Release the upper right transmitter button



THE PARKING LIGHTS WILL FLASH TWICE

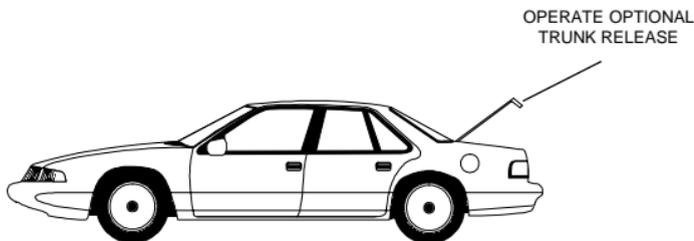


THE DOORS WILL UNLOCK

- The parking lights will flash twice to confirm and the doors will unlock.

Remote Trunk Release & Carfinder

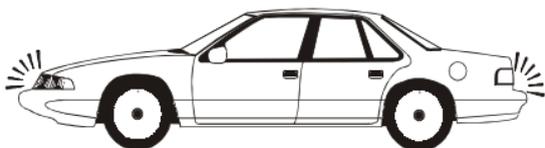
To Activate the Trunk Release: Press & Release the lower right transmitter button



To Activate Carfinder: Press & Hold the upper left transmitter button for 3 seconds



THE PARKING LIGHTS
WILL FLASH ONCE, THEN
SIX TIMES



Receiver Module & Valet Switch:

Receiver Module:

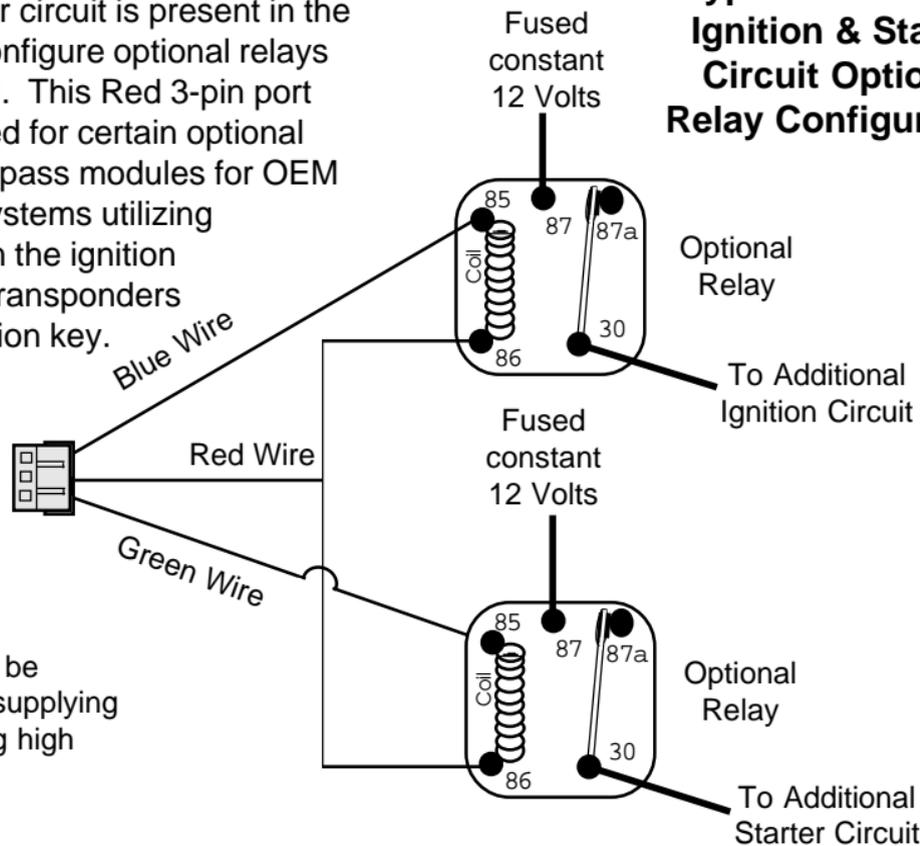
An essential part of the RS-7K2 is the plug-in window mount Receiver Module. The unit will not operate unless this Receiver Module is plugged-in. Select a desired mounting location for the Receiver Module; optimum performance is obtained by mounting this module high and unobstructed on the vehicle's glass, such as the windshield behind the rearview mirror. Make sure the glass surface is clean and free of dust, grease, or debris. Peel the backing off of the adhesive tape and affix the Receiver Module. Carefully route the module's 3-wire ribbon cable to the RS unit control module, and plug the cable into the Black 3-pin port on the rear of the module.

Valet Switch:

Mount this switch in a location that's easily accessible to the user. Route the wires to the RS unit's control module and plug the 2-wire connector into the matching 2-pin port on the control module. The Valet Switch is used to place the system into Valet Mode, Features Programming Mode, and Transmitter Programming Mode. In everyday operation, the "on" or "off" status of this switch controls Valet Mode. For the two programming modes, this switch is toggled "on" and "off" within 7 seconds of the ignition switch being turned "On" (for transmitter programming mode) or "Off" (for features programming mode).

In cases where an additional Ignition or second Starter circuit is present in the vehicle, configure optional relays as needed. This Red 3-pin port also is used for certain optional Omega bypass modules for OEM security systems utilizing resistors in the ignition switch or transponders in the ignition key.

The wires used and the power source for the optional relays must be capable of supplying and carrying high amperage.



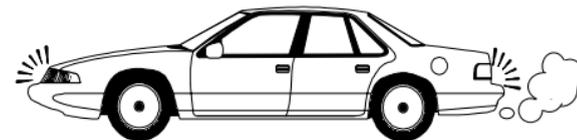
Typical Additional Ignition & Starter Circuit Optional Relay Configuration

Remote Starting

To Activate Remote Start: Press & Release the lower left transmitter button



THE PARKING LIGHTS WILL TURN ON, OFF, THE ENGINE STARTS, THEN THE PARKING LIGHTS RESUME ILLUMINATION



To Remote Start: Press & Release the lower left transmitter button

- 1) The parking lights will turn on to confirm the starting process.
- 2) The ignition circuit will turn on.
- 3) Within a few seconds the parking lights will turn off and the starter will engage.
- 4) The engine will start, run, and the starter will be disengaged.
- 5) The parking lights will turn back on while the RS unit is controlling the engine.
- 6) If the engine stalls, the RS unit will make two attempts to restart it.

When you leave your vehicle, simply set the climate controls for what you desire to be operating upon remote start - heater, defroster or air conditioning. Upon entering the vehicle place the ignition key in the switch and turn it to the "On"

position. **Do not turn the key to the "Start" position.**

Deactivation

- After 15 or 30 minutes (programmable) the RS unit will turn the engine off.
- To stop the engine by remote control, simply press the lower left button again.
- Stepping on the brake pedal will turn the engine off.
- Opening the hood will turn the engine off. If the hood is open when an activation attempt is made, the RS unit will not respond, and will not start the engine.
- Turning "on" the Valet Switch will also stop the engine.

Valet Mode

The RS unit may be placed into a "valet mode" which prevents the remote start feature from being activated. Valet Mode should always be used when you do not wish for remote start to be operated, such as when you leave your vehicle with a valet parking attendant, mechanic or if you loan it to another person. An "on/off toggle" switch, the Valet Switch, is used for this, and it is typically mounted within easy reach of the driver. To engage the Valet Mode:

- At any time simply flip the Valet Switch to the "on" position. Three seconds later the parking lights will flash 3 times to indicate Valet Mode.

Once the RS unit is in Valet Mode, an attempt to remote start will instead be acknowledged by 4 parking light flashes, but no starting attempt.

- To turn off Valet Mode, with the ignition switch "On" simply flip the Valet Switch

WIRING - 3 Wire Connector

This harness, which plugs into the Red 3-pin port on the control module, can be used, if needed, to configure optional relays to energize additional Ignition or Starter circuits. Also, Omega OEM security bypass interfaces use the Blue port.

22 Gauge Blue Wire: *500mA Negative Ignition Output*

Connection If Needed. This 22 gauge Blue wire is a 500mA Negative output having basically the same operation as the 12 gauge Blue Ignition output. If two or more Primary Ignition wires are present in the vehicle an optional relay is needed, connected to this wire as shown in the diagram on the next page.

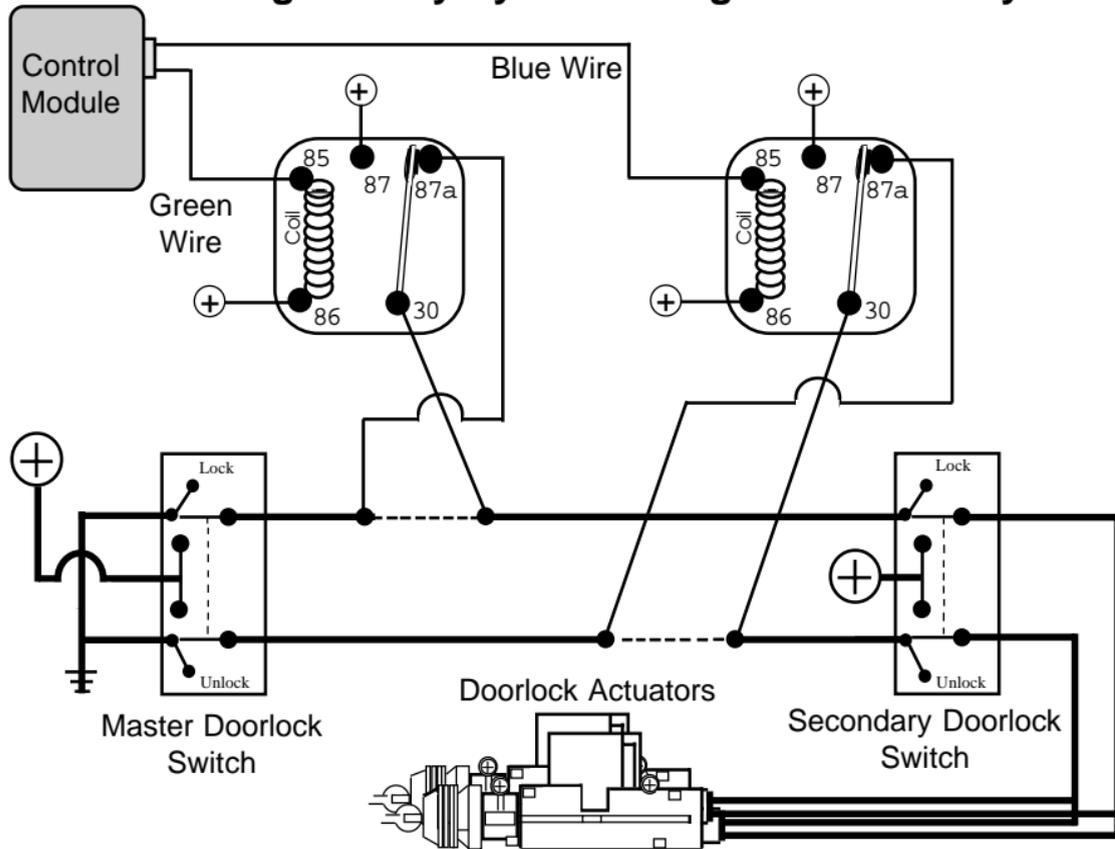
22 Gauge Red Wire: *+12 Volt Output For Optional Relay Coil*

Connection If Needed. The Red wire supplies constant 12 Volts that can be used to power the relay's coil only- DO NOT use this Red wire for the optional relay(s) pin.

22 Gauge Green Wire: *500mA Negative Starter Output*

Connection If Needed. This 22 gauge Green wire is a 500mA Negative output, which has the same operation as the 12 gauge Green Starter output. If a second Starter wire is present in the vehicle, an optional relay will be needed, connected to the 22 gauge Green wire as shown in the diagram on the next page.

Reversing Polarity System Using External Relays



Switch "off"; the parking lights will flash once. If the Valet Switch is turned "off" while the ignition switch is "Off", the RS unit will remain in Valet Mode until the ignition switch is next turned "On".

Installation Cautions and Warnings

Do not attempt to install this Remote Car Starter into a manual transmission vehicle! Doing so could cause serious property damage, personal injury, and will void all warranties!

Be aware of, and avoid, any airbag circuitry! Due to the fact that an installer will not be in a normal, upright seated position, severe injury may occur in an accidental airbag deployment!

The use of a Digital Multimeter (DMM) or Volt-Ohm Meter (VOM) instead of a standard testlight is required. This can greatly reduce the risk of an accidental airbag deployment or on-board computer damage.

Battery gases are explosive! Avoid sparks and do not smoke while working near the vehicle's battery!

Always protect wires ran through the firewall from sharp metal edges and hot parts of the engine! Always fuse positive wires at their source!

Installation Instructions

IMPORTANT!

After reading this manual, start the installation by affixing the WARNING DECAL to a visible area in the engine compartment!

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

This Remote Start Unit duplicates the actions that occur within the ignition switch when you use your key to start the engine. Because of this, most of the main wiring harness connections will be made at the ignition switch harness. The ignition switch wires usually are high amperage circuits, which means that high reliability connections must be made- soldering of all connections is recommended.

Caution! *Avoid the Airbag circuit!* Especially avoid any harness or wires encased in Yellow or Red tubing or sleeves. Do not use a standard test light, as it can deploy an airbag or damage on-board computers and sensors.

5 Wire Reversing Polarity Systems

This power doorlock system differs from the negative and positive pulse systems in that there is no doorlock control unit or relays. In this type of system, the switches themselves supply the positive voltage directly to the doorlock actuators, and, more importantly, provide the return ground path. It is important to note that the lock and unlock wires in this system *actually rest at chassis ground*. This means that both the lock and unlock wires must be "opened", or cut, to make the proper connections.

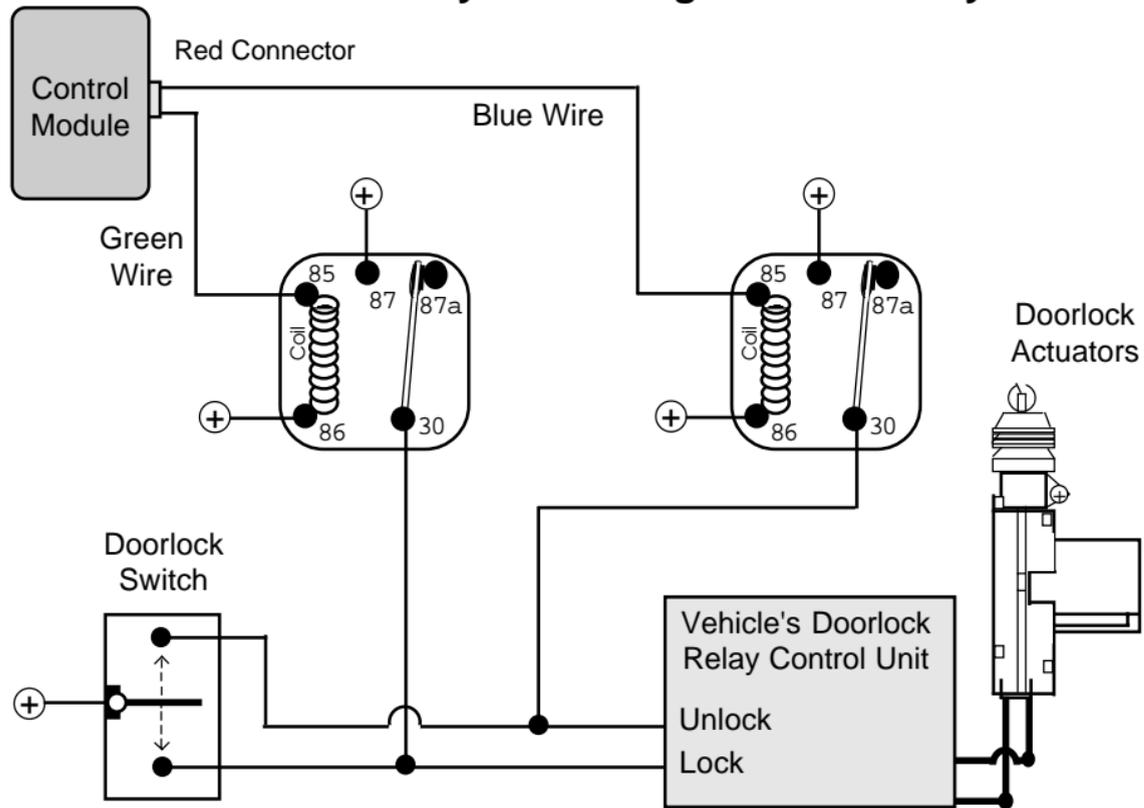
Examine the wires on the back of the switch. (Normally 5 wires will be found)

- 1) One wire will show +12 Volts, regardless of the switch's position.
- 2) Two wires will be grounded regardless of the switch's position.
- 3) One wire will show +12 Volts only when the switch is pushed to "Lock".
- 4) One wire will show +12 Volts only when the switch is pushed to "Unlock".

- When the lock/unlock wires are found, they must be cut one at a time. If the correct wires are cut the door locking system should not operate from the primary switch.

- Notice that in the diagram the driver's switch is the primary or "Master" switch (in some vehicles, the primary switch is on the passenger's side). The half of the cut wires which come from this primary switch are referred to as the "Switch" side. The half of the cut wires which go to the secondary switch are referred to as the "Motor" side even though the cut is made between the switches.

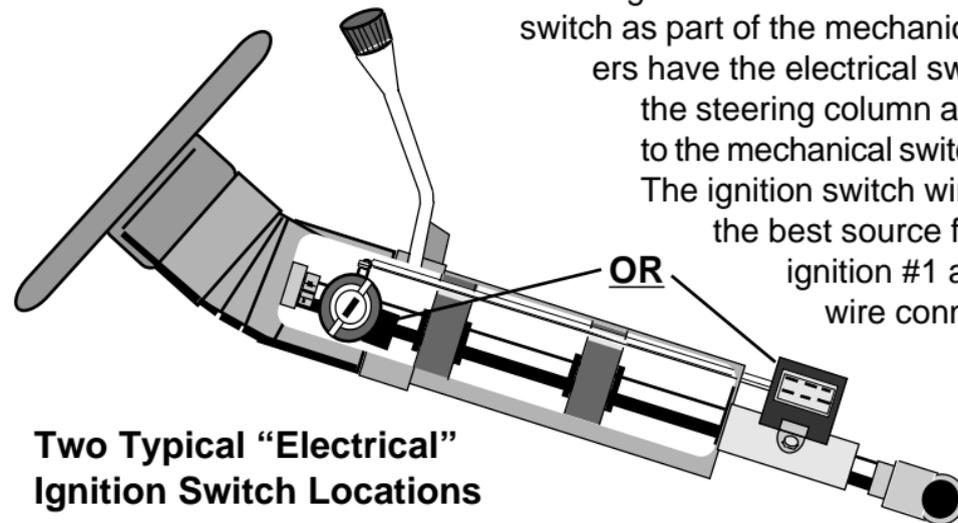
Positive Pulse System Using External Relays



WIRING - 5 Wire Connector

(Two 12-Gauge) Red Wires: *Constant +12 Volts Input Connection Required.* Connect both Red wires to constant 12 Volts. The source used must supply adequate amperage. The most common sources are the battery's Positive terminal and the ignition switch wiring harness. Good reliable connections and use of the included fuses are a must. Please note that

some Ignition Switches have the electrical switch as part of the mechanical switch; others have the electrical switch lower on the steering column and connected to the mechanical switch by a linkage. The ignition switch wiring harness is the best source for this and the ignition #1 and accessory wire connections.



12-Gauge Green Wire:

Starter Output

Connection Required. Connect the Green wire to the vehicle's Starter wire. This wire will show +12 Volts only when the ignition key is in the "Start" position. This wire is also found in the ignition switch wiring harness (see diagram on previous page). Some vehicles have a second Starter wire known as a "Cold Start" wire. When this is encountered, an optional relay may be needed, configured to the 3-pin Red port, to energize the second Starter wire (see pages 33-34).

Note: If a security system is present which utilizes a starter interrupt circuit, the Green wire must be connected to the Starter Motor side of the interrupt.

12-Gauge Blue Wire:

Ignition Output

Connection Required. Connect the Blue wire to the vehicle's Ignition wire (also known as "Primary Ignition"). This wire will show +12 Volts when the ignition key is in the "Run" and "Start" positions and no voltage in the "Off" and "Accessory" positions. This wire is found in the ignition switch wiring harness (see diagram on previous page).

Note: If two or more Primary Ignition wires are present, you will need to connect an optional relay or relays to the 3-pin Red port (see pages 33-34).

3 Wire Positive Pulse Systems

This doorlock system is similar to the 3 wire negative pulse system except the doorlock switches send +12 Volt pulses to operate the doorlock relays/control unit.

Examine the wires on the back of the doorlock switch:

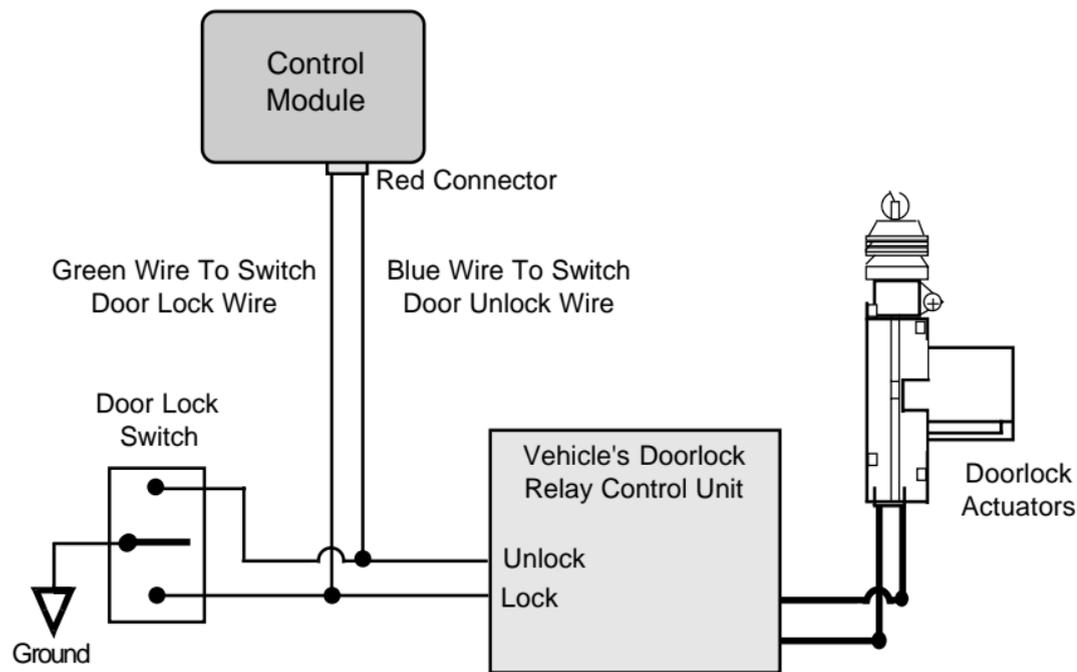
- 1) One wire will show +12 Volts, regardless of the switch's position.
- 2) One wire will show +12 Volts only when the switch is pushed to "lock".
- 3) One wire will show +12 Volts only when the switch is pushed to "unlock".

Warning: The Positive pulse system can be confused with the 5-wire Reversing Polarity system. This is because both systems show +12 Volt pulses on the "Lock" and "Unlock" wires when the vehicle's switch is pressed respectively. It is critical to identify which system is present, since if +12 Volts is pulsed into a Reversing Polarity system, which rests at ground, a direct short circuit will occur.

3 main differences between a Positive pulse and a Reversing Polarity system:

- 1) In a Reversing system the Lock/Unlock wires *rest at ground*, while in a Positive system the wires *show partial ground* through the relay's coils.
- 2) The doorlock switch in a Reversing system will have 5 wires, while a Positive pulse system the switch will have 3 wires.
- 3) A *Positive pulse system* uses *factory relays or a control unit*, a Reversing system *does not*.

Negative Pulse System Using Direct Connection



12-Gauge Yellow Wire:

Accessory Output

Connection Required. Connect the Yellow wire to the vehicle's Accessory wire. This circuit supplies power to the Heat, Ventilation and Air Conditioning (HVAC) system. This wire will show 12 Volts when the ignition key is in the "Run" and "Accessory" positions and No voltage in the "Start" and "Off" positions. The connection point for this wire is also found in the ignition switch wiring harness (see diagram on page 11).

WIRING - 10 Wire Connector

22-Gauge Black Wire:

System Ground

Connection Required. Connect the Black wire to a very good, clean chassis ground. A recommended connection is to an existing machine-thread bolt, either in the driver's kick panel, steering column area or a major structural member behind the dash. Small dash braces are not adequate, and the area must be clean, bright metal. Use of a sheet metal screw or otherwise grounding to the vehicle's sheet metal is least desirable, and in some cases will result in an inadequate grounding of the system.

22-Gauge Yellow/Black Wire: (+) Brake Input

Connection Required- The Yellow/Black wire must be connected. It is part a critical safety feature which disables the RS unit whenever the brake pedal is pressed. Connect the Yellow/Black wire to the brake switch wire which shows +12 Volts when the brake pedal is pressed. The brake switch is typically located above the brake pedal, and usually mounted to the brake pedal support bracket. Always make this connection in a fashion ensuring its long-term reliability; soldering is highly recommended. Upon completing the Yellow/Black wire's connection, thoroughly test the operation of this circuit.

22-Gauge Dark Blue Wire: (-) Hood Input

Connection Required- The Hood Safety Switch must be installed and the Dark Blue wire must be connected. This prevents operation of the RS unit if the hood is open.

Carefully install the included pin switch so that it is open (pin down) when the hood is shut and closed (pin up) when the hood is open. Connect the Dark Blue wire to the pin switch and carefully route this wire through the firewall, using an added or existing grommet, avoiding any hot or moving parts.

If there is an existing hood pin switch for an alarm system, you may use it for the Dark Blue wire connection; but the two systems must be diode-isolated.

The following sections describe typical power doorlocking systems, which are categorized as "3 Wire Negative Pulse"; "3 Wire Positive Pulse", and "5 Wire Reversing Polarity" systems

3 Wire Negative Pulse Systems

This power doorlock system is simplest of all doorlocking systems. A Negative pulse system will have only three wires at the doorlock switch.

Examine the wires on the back of the doorlock switch:

- 1) One wire will show Ground, regardless of the switch's position.
- 2) One wire will show Ground only when the switch is pushed to "Lock".
- 3) One wire will show Ground only when the switch is pushed to "Unlock".

The lock & unlock wires coming out of the switch operate the vehicle's doorlock relays or a control unit with on-board relays, therefore the lock & unlock wires will read Positive voltage, up to +12 Volts, when the switch is at rest. The correct connection point is between the switches and the relays. The Red connector's Green and Blue wires can be connected directly to the vehicle's Negative pulse system since only a Negative pulse is required to operate the vehicle's on-board doorlocking relays. If the vehicle's Negative pulse doorlocking system requires more than 500mA Negative output, optional relays must be used.

WIRING - 2 Wire (3 Cavity) Connector

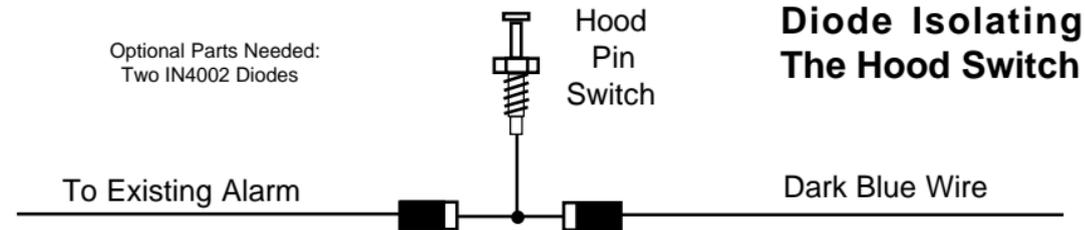
22 Gauge Green Wire: ***Negative Lock Output***
Connection If Desired

The Green wire supplies a negative pulse for locking the vehicle's doors.

22 Gauge Blue Wire: ***Negative Unlock Output***
Connection If Desired

The Blue wire supplies a negative pulse for locking the vehicle's doors. Programmable feature #3 changes the single unlock pulse to be a double unlock pulse.

This harness, which plugs into the White 3-pin port on the control module, is the power doorlock outputs which allow the RS unit to operate the vehicle's existing power doorlock system. The vehicle must have existing power doorlocks; or, if it does not, power doorlocks may be added to the vehicle in the form of installing a model DS-2 actuator to each of the doors, along with a doorlock interface. The doorlock interface needed to allow the RS unit to operate the doorlocks will depend upon the type of power doorlocking system the vehicle is equipped with.



Instead of using a pin switch to monitor the hood's open or shut status, an Omega AU-46 Mercury Tilt Switch may be used. Connect one of the AU-46's wires to Negative Chassis Ground and connect the remaining wire to the Dark Blue wire.

22-Gauge Orange/Black Wire: ***Engine Detect Input***
Connection Required. The Orange/Black wire is the engine detect wire.

The RS unit utilizes two different methods of monitoring the vehicle during the remote starting process. Consider both methods before deciding which one to use. Normally the Smart Start method is used, especially for diesel engine applications in which the vehicle has no true tach signal available. An adjustment control and LED indicator for each method are on the side of the unit's case.

1) Smart Start:

This method uses a voltage sensing circuit which reads the vehicle's voltage before attempting to start, and then monitors for a voltage increase which occurs when the alternator has output. The Orange/Black wire connects to a constant 12 Volt source; the recommended location is the vehicle's battery. Once all of the wiring connections are made, the Smart Start voltage sensing input must be adjusted, and Programmable Feature #5 offers two levels of the starter motor preset cranking times. To make the initial Smart Start adjustment:

- 1) Position the selector switch for Smart Start (right position).
- 2) Locate the Smart Start adjustment and LED indicator on the side of the unit. Ensure that both adjustment screws are completely counterclockwise.
- 3) Now start the engine with the key; then, turn the Smart Start adjustment screw slowly clockwise until the LED indicator begins to flash. The flashes confirm that the unit is sensing the engine.
- 4) Turn the engine off.
- 5) Confirm that unwanted noise is not being picked up from other vehicle circuits:

22-Gauge Green Wire:

(+) Glow Plug Input

Connection If Needed. The Green wire allows the RS-7K2 to be used with diesel engines. Connect the Green wire to the wire in the vehicle which powers the glow plugs, or the wire which illuminates the "Wait To Start" light on the instrument panel. When connected, the RS unit will not engage the starter if the Green wire has +12 Volts; in other words, using this wire simply delays the RS unit's engagement of the starter. If the "Wait To Start" light in the vehicle has a Negative switching circuit, it can still be used by simply reversing the polarity with an optional relay.

22-Gauge Light Blue Wire:

(-) OEM Disarm Output

Connection If Needed. If needed, the Light Blue wire allows the RS-7K2 to disarm a factory alarm system. Connect the Light Blue wire to the wire in the vehicle which is connected to one of the doorlock key cylinders. The typical OEM alarm has an electrical switch in the key cylinders which switches -Ground when the key unlocks the door. This wire can usually be located in the vehicle in either kick panel area, in the wiring harness which is routed into the cab from the door. The Light Blue wire has a -Ground pulse whenever the RS unit has an unlock output or its remote start operation is activated.

22-Gauge Pink Wire: (-) *Start Activation Input*

Connection If Needed. The Pink wire allows for alternative devices such as an existing keyless entry or alarm system to activate the remote start operation. If the Pink wire receives a Negative pulse, the RS unit will start the vehicle's engine, provided that all safety circuits are in the proper status. After the engine has been started by remote control, another Negative pulse on the Pink wire will turn the RS unit off, stopping the engine.

The Pink wire can be connected to an available auxiliary output of an existing Remote Security System, and the RS-7K2's remote control may also be used to activate the remote start operation.

Should it be desired to activate the RS unit's remote start operation from an existing keyless entry system, programmable feature #6 will configure the Pink wire to activate the remote start feature only if it receives two Negative pulses within 10 seconds. This allows configuring the RS unit to remote start when the OEM transmitter's "LOCK" button is pressed twice. In most cases the existing keyless entry system will have Negative switching door lock circuits to which the Pink wire may be connected directly. In the other cases, an optional relay is needed to reverse Positive polarity to Negative. When feature #6 is selected for "two pulse" operation, once the RS unit has started the engine, the Pink wire must receive two more Negative pulses within 10 seconds to stop the engine.

- a. Without starting the engine, turn the ignition key to the "On" position.
- b. If the LED indicator remains off the unit has been properly tuned.
- c. If the LED indicator flashes there is noise on the Orange/Black wire's connection and it will be necessary to relocate the connection.

2) Tach Sense:

If the vehicle is generally hard to start (example: requiring the starter to be engaged for more than 1 second) this method will produce more consistent remote starting. With this method the Orange/Black wire reads the engine speed (tach) information from a wire in the vehicle. The Orange/Black wire connects to the vehicle's tach wire, which is found in the engine compartment, although in some cases it may also be located inside the vehicle. To use a multimeter to verify the correct tach wire, set it for AC Volts scale. The correct wire will read 1 to 6 volts AC with the engine idling, and will increase with engine speed. An additional adjustment control and LED indicator allows tuning the unit's tach wire sensitivity.

- 1) Position the selector switch for Tach Sense (left position).
- 2) Locate the Tach Sense adjustment and LED indicator on the side of the unit. Ensure that both adjustment screws completely counterclockwise.

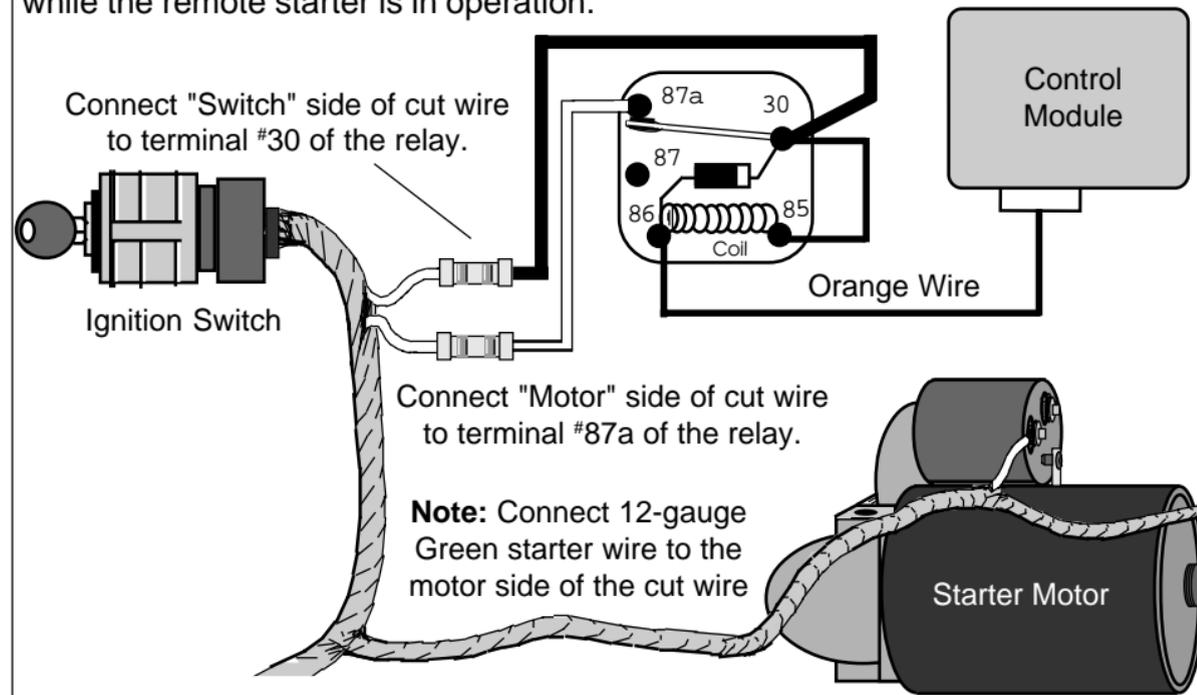
- 3) Start the engine with the key; then turn the Tach Sense adjustment screw slowly clockwise until the LED indicator illuminates solid.
 - To increase sensitivity, thus the crank time, turn the adjustment screw counterclockwise.
 - To decrease sensitivity, thus the crank time, turn the adjustment screw clockwise.

22-Gauge White Wire: **Parking Light Output**

Connection Recommended. The White wire is a +12 Volt output to the vehicle's exterior parking lights and its function is to visually confirm system operations. The parking lights are also used as indicators when programming features. Connect the White wire to the vehicle's 12 Volt parking light circuit as shown in the accompanying diagrams. The correct wire will show 12 Volts only when the headlight switch is in the "Parking Light" and "Head Light" positions. This wire can usually be found at the headlight switch, and various other locations within the vehicle, such as the rear body harness or firewall connector. **Caution:** When such a wire is located, be sure to also test that it is non-rheostated: While metering the wire, operate the dash light dimmer control. The correct wire will show no change in voltage when the dimmer is operated. Some vehicles have a parking-light relay which is triggered by a Negative signal from the headlight switch. In these vehicles, the White wire must be connected after the relay, usually at the Fuse/Junction Block. Do NOT connect the White wire directly to

22-Gauge Orange Wire: **Anti-Grind Output**

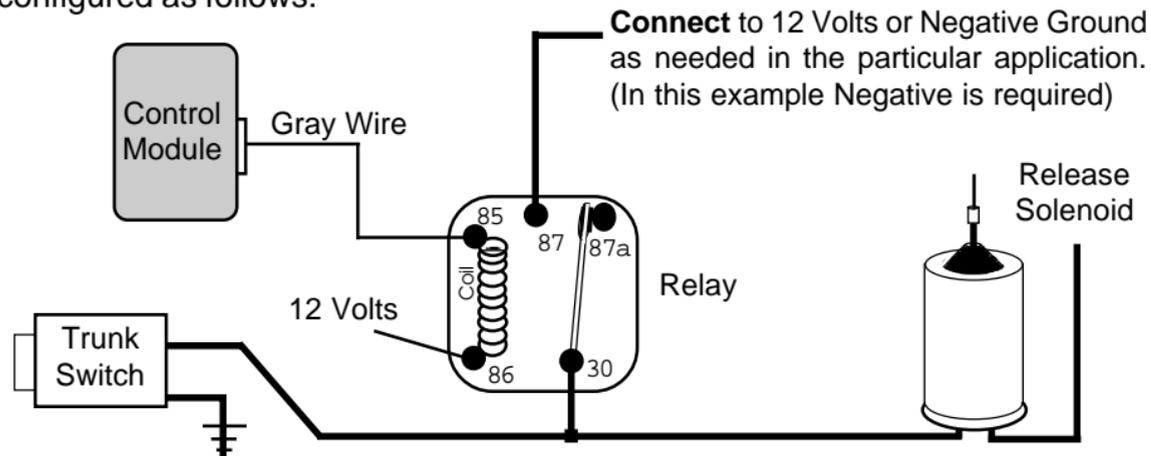
Connection If Desired. The function of the Orange wire is to provide a 250mA Negative auxiliary output which may be used to operate a starter motor "Anti-Grind" relay, which prevents accidental starter grind should the key be turned while the remote starter is in operation.



22-Gauge Gray Wire:

Trunk Release Output

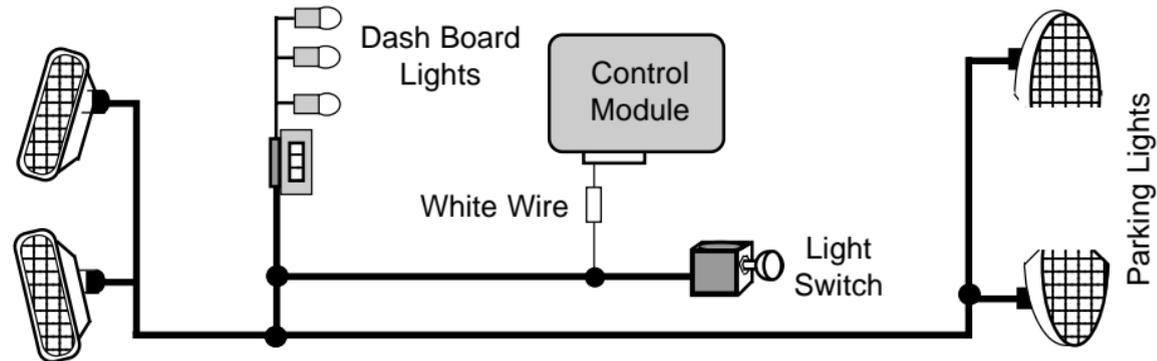
Connection If Desired. The Gray wire has a 500mA Negative output which is operated by the transmitter button with the open trunk icon, and this output is designed for trunk release. In most cases, an optional external relay will be needed, configured as follows:



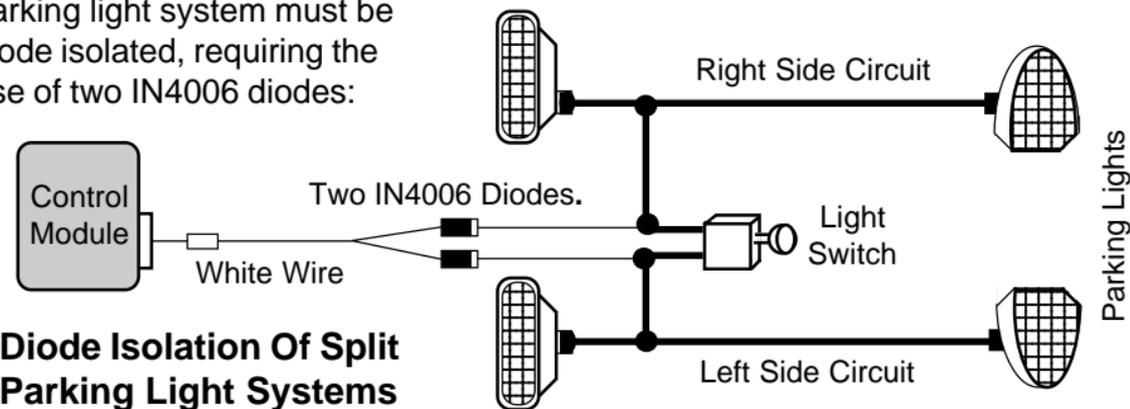
In some applications the solenoid wire will rest at ground. In these cases:

- Cut the solenoid wire:
- Connect the switch side to pin #87a of the external relay.
- Connect the solenoid side to pin #30 of the external relay.
- Connect 12 Volts to pin #87 of the external relay (Fused).

Typical Parking Lights Connection



the vehicle's headlights. An external relay is required. Vehicles having a split parking light system must be diode isolated, requiring the use of two IN4006 diodes:



Diode Isolation Of Split Parking Light Systems

