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One or more of these patents may apply to this product:

#5,612,669 #5,654,688 #5,663,704 #5,729,191 #5,818,329 #5,612,578 #5,739,747 #382,558 #385,878 #5,750,942
#5,739,748 #5,719,551 #406,107 #701,285 #5,973,592 #5,982,277 #5,986,571 #6,011,460 #6,037,859 #6,049,268
#6,130,605 #6,130,606 #6,140,938 #6,140,939 #6,150,926 #6,144,315 #6,184,780 #6,188,326 #6,243,004 #6,249,216
#6,275,147 #6,297,731 #6,320,514 #6,320,498 #6,346,876 #6,346,877 #6,366,198 #6,392,534 #6,429,768 #6,433,677
#6,480,095 #6,480,117 #6,480,098 Foreign Patent #199700312 #EP0817734B1 #98906445.6 #2,320,248 #701,285



OPERATING & INSTALLATION INSTRUCTIONS

RS-11

REMOTE STARTER

FOR AUTOMATIC TRANSMISSION VEHICLES ONLY

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26 prevents accidental starter grind should the key be turned while the remote starter is in operation. Additionally, the Orange wire also provides the vehicle immobilizing feature for the Anti-Carjacking operation. Connection instructions are included with optional starter interrupt socket and relay.

Introduction

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Congratulations for choosing your Remote Starter and enjoy the luxury of starting your vehicle's engine from the comfort of your home or office.

Excalibur has a complete series of convenience and security systems; this version is "remote starting only", although the flexibility of its design allows its use in two distinct forms:

The system utilizes a Status Light for visual indicators, and a Valet Switch to turn the system off and to program it. The unit has a small window-mountable receiver piece, in addition to its single-button transmitter.

Safety Considerations

- 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 trans-mitter device of any remote starter equipped vehicle.
- Do not use the remote starter feature in an enclosed garage or other structure.

This unit is a very flexible system. It has capabilities and features which may or may not be utilized in your installation. It also has programmable features which can affect its operation. While these are explained as thoroughly as possible in this guide, your Omega dealer or installer is the best source for information about your system.

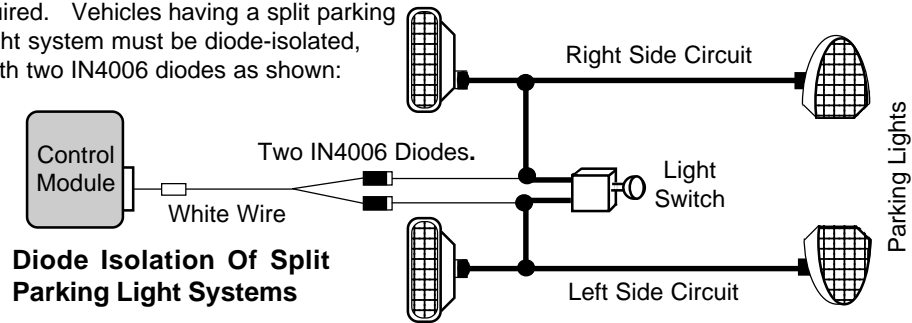
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To Activate Remote Start:

- The parking lights will flash 3 times.
- The unit will turn on the ignition circuit, turn the parking lights back on steady, and the system's interior Status Light will also start flashing.
- Within a few seconds the parking lights will turn off and the starter will engage.
- The engine will start, run, and the starter will be disengaged.
- The parking lights will turn back on and remain on while the unit is controlling the engine. The status light will pause, and then continue to flash slowly.
- Should the engine stall, the unit will make two attempts to restart it.

diagrams. The correct wire will show 12 Volts only when the headlight switch is in **25** 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 the vehicle's headlights. An external relay is required. Vehicles having a split parking light system must be diode-isolated, with two IN4006 diodes as shown:



20-Gauge Orange Wire:

Connection If Desired. The function of the Orange wire is to provide a 500mA Negative auxiliary output which may be used to operate a starter motor "Anti-Grind" relay, which

(-) Anti-Grind Output

6 Once the unit is in Valet Mode, an attempt to remote start will instead be acknowledged by the parking lights turning on, then flashing rapidly, then 3 slow flashes, but no engine starting attempt will occur.

- To turn off Valet Mode, simply press the Valet Switch until the Status Light turns off, and the parking lights flash once to confirm exiting valet mode.

Programming Transmitters

The unit can be operated by additional transmitters, up to four total. Additional or replacement transmitters must be programmed to operate the unit.

- Have present all of the transmitters which are to operate the unit. Whenever a transmitter is programmed to the system, any existing ones are automatically erased for security. Therefore, all of the transmitters which are to operate the system must be programmed at the same time.

1) Turn the ignition key "On" (and leave it "on").

2) Within 7 seconds press the Valet Switch 5 times.

The parking lights flash once, and the system Status Light turns on steady.

3) Within 15 seconds press the first transmitter's button.

The unit will acknowledge the transmission by momentarily turning off the Status Light, and flashing the parking lights once.

- Another transmitter to program? Go to step 4.
- Only needed to program the one transmitter? Allow the unit to exit programming mode.

factory alarm system. Connect the Yellow/Green 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 Yellow/Green wire has a -Ground pulse whenever the unit has an unlock output or its remote start operation is activated. **23**

20-Gauge Yellow/Red Wire:

(-) OEM Arm Output

Connection If Needed. This output may be used to arm a factory-installed alarm, or, if the vehicle is equipped with a Retained Accessory Power circuit, this output can be used to "spike" the door pin switch wire, which will turn off the Retained Accessory Power circuit.

To arm a factory alarm after remote start engine run stops, connect the Yellow/Red wire to the vehicle's factory arm wire. This wire will show Negative polarity when a key is held in the "lock" position in the door key cylinder. This wire can usually be located in either kick panel, in the wiring harness from the door, as it is routed between the door key cylinder and the factory alarm.

To use this wire to turn off Retained Accessory Power, locate a vehicle wire within the door or doorjamb which shows Negative when the door is open. Should such a wire be found which is positive, a relay is needed to reverse the Yellow/Red wire's Negative output to Positive. The Yellow/Red wire produces a Negative pulse output whenever the system turns off the engine after it has been remotely started.

20-Gauge Pink/Black Wire:

(-) Start Activation Input

Connection If Needed. The Pink/Black wire allows for alternative devices such as an

- 22** 1) **Connect** the Black/Yellow wire to the vehicle's tach wire, which is found in the engine compartment, although in many 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 at idle, and will increase with engine speed.
- 2) **Switch** the selector slide switch on the unit's control module to the right toward the 12-pin secondary harness (see diagram or the markings on the control module).
- 3) **Adjust** the tach signal by starting the engine and turning the right adjustment screw on the control module slowly clockwise until the indicator LED lights solid.
- 4) **Test** the operation by remote starting and checking that the indicator LED lights solid. The starter engagement is long enough for the engine to start, but without grinding. If needed adjust the crank time by turning the adjustment screw clockwise for more signal sensitivity and counterclockwise for less.

20-Gauge Green/Red Wire:

(+/-) Glow Plug Input

Connection If Needed. The Green/Red wire allows the unit to be used with diesel engines, operates only if programmed (feature #13) and is also polarity-programmable. Connect the Green/Red 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 unit will not engage the starter if the Green/Red wire has +12 Volts; in other words, using this wire simply delays the unit's engagement of the starter. If the "Wait To Start" light in the vehicle has a Negative switching circuit, change the position of the White "Glow Plug +/- Select" Jumper on the module to reverse the Green/Red wire's polarity input.

20-Gauge Yellow/Green Wire:

(-) OEM Disarm Output

Connection If Needed. If needed, the Yellow/Green wire allows the unit to disarm a

- 4) Within 15 seconds press the next transmitter's button.

The Status Light turns off and the parking lights flash once.

Repeat this action for each remaining transmitter.

Exiting Transmitter Programming Mode: Simply allow the unit to time out of the programming mode, by not transmitting for 15 seconds; or, turn the ignition "Off" to exit immediately.

The unit indicates its exit from programming mode by turning off the Status Light. If it is allowed to time out, the ATV display shows the number of operating transmitters for 10 seconds afterward.

Installation

It is highly recommended that this system be professionally installed, as the sophistication of the modern automobile and the complexity of this type of product installation is often beyond the abilities of most do-it-yourselfers. The remainder of this booklet is comprised of the Installation instructions, which includes the programming of features.

Programming Features

The unit has 5 “programmable features” which are “installation”-related, in that they set parameters, or make allowances, for certain conditions which may be set by the vehicle the system is installed in, or by the remote start activation means. There is only one programmable feature, feature #1 “Engine Run Time”, which is of any benefit or interest to the vehicle owner or system user. Otherwise, the programmable features should not be changed after installation.

#	FEATURE	DEFAULT <small>1 brake pedal press</small>	OPTION <small>2; 3 or 4 brake pedal presses</small>
#1	Engine Running Time	10 Minutes	20, 30, 40 Min.
#2	Starter Cranking Time	.5 Second	.75, 1.25, 1.5 Sec.
#3	Single or Double Pulse Activation	Single	Double
#4	Gasoline or Diesel Engine	Gasoline	Diesel Monitor, 10, 20
#5	Reset All Features To Default	Press brake pedal 1 time to reset all features to the default setting	

20-Gauge Black/Yellow Wire:

Engine Detect Input **21**

Connection Required.

The Black/Yellow wire is the engine detect wire. The unit utilizes two different methods of monitoring the vehicle during the remote starting process. Consider both methods before selecting one to use, and then connect the Black/Yellow wire accordingly. Either connection method must be performed at the completion of the installation, after all other wiring connections are made.

Smart Start sensing is more commonly used, for its ease of installation. The unit as received has Smart Start selected. Smart Start “reads” the vehicle’s battery voltage level via the Black/Yellow wire to determine engine running status. To use Smart Start:

- 1) Connect** the Black/Yellow wire to constant “Battery” 12 volts. This may done at the ignition switch harness, or at the battery itself for better sensitivity.
- 2) Switch** the selector slide switch on the unit’s control module to the left toward the module corner (see the wiring diagram and the markings on the control module).
- 3) Adjust** Smart Start by starting the engine and turning the left adjustment screw on the control module slowly clockwise until the indicator LED starts flashing. Turn the adjustment until the LED is flashing in a consistent and regular manner.
- 4) Test** the operation by remote starting and checking that the indicator LED shows the same consistent flashing (good voltage signal learned), and that the starter engagement is long enough for the engine to start, but without grinding. Turn clockwise for more crank time and counterclockwise for less crank time.

Tach Wire sensing is generally more reliable, and preferable in cases were the engine normally starts inconsistently, or is hard to start . With this method the Black/Yellow wire reads the engine speed (tach) information directly from a wire in the vehicle. To use the Tach Wire method:

20 18-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.

20-Gauge Red/Black Wire:

(+) Brake Input

Connection Required- The Red/Black wire **must be connected**. It is part a critical safety feature which disables the unit whenever the brake pedal is pressed. Connect the Red/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. Make this connection securely for long-term reliability, and thoroughly test the operation of this circuit.

20-Gauge Blue Wire:

(-) Hood Input

Connection Required- The Hood Safety Switch **must be installed and the Blue wire must be connected**. This prevents operation of the unit if the hood is open. The Blue wire's second function is being a sensing wire to trigger the alarm, if the unit is armed. 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 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. Instead of using a pin switch to monitor the hood's open or shut status, an Omega AU-46 Mercury Tilt Switch may used. Connect one of the AU-46's wires to Negative Chassis Ground and connect the remaining wire to the Blue wire.

How to program features:

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- 1) Turn the ignition key "On", then "Off".
- 2) Within 7 seconds press the Valet Switch 5 times.
The Status Light will flash twice, then turn off
The parking lights flash twice, and then stays on while in programming mode.
- 3) Select the feature to be changed by pressing the Valet Switch the same number of times as the feature number (*example: feature #3 = 3 presses*).
The Status Light will flash the same number as the Valet Switch presses just entered. The parking lights will flash off the same number, then come back on. Count the number of flashes to confirm that the desired feature has been chosen (if needed, reenter the Valet Switch presses).
- 4) Once the feature has been confirmed, press the brake pedal 1 time for the first, default setting, choice; or press the brake pedal 2, 3 or 4 times to select the second, third or fourth settings (*feature #3 only has two settings; see chart on previous page*).
The Status Light will flash on the same number of brake presses, and the parking lights will flash off the same number. Once these flashes occur, the feature is set.
 - More features to program? Go to step 5.
 - Only needed to program the one feature? Allow the unit to exit Programming Mode.
- 5) Select another feature by again making a new entry of Valet Switch presses (repeating step 3) and again setting the newly chosen feature with the brake pedal (as in step 4).

10 Exiting Programming Mode:

Simply allow the unit to time out of Features Programming Mode by not performing any programming actions for 15 seconds; or, turn the ignition "On" to immediately exit the programming mode.

The unit indicates its exit from Features Programming Mode with 2 short and 1 long Status Lights flashes and the parking lights turning off.

About the Programmable Features

Of the five Programmable Features, four are strictly "installation"-related, and one is "operational" in nature. Installation-related features adapt the unit to certain vehicle situations; these are to be utilized at the time of the installation only.

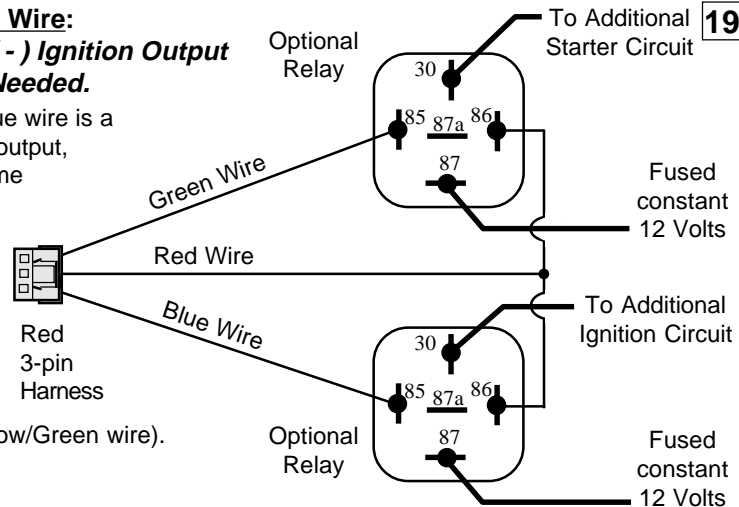
Only Features #1 has a "daily use" benefit to the vehicle operator:

- Feature #1 is "**Engine Running Time**". When it remotely starts the engine, the run time before automatic shut-off is adjustable. A 10 minute run time is the factory setting, with options of 20, 30 or 40 minutes. When programming press the brake pedal 1 time for the default-set 10 minute run time; or press the brake 2 times for 20 minutes; 3 times for 30 minutes; or 4 times for 40 minutes.
- Feature #2 is "**Starter Cranking Time**", which sets the base starter cranking time for the Smart Start voltage sensing engine detection method (page 34). When using Smart Start, a longer starter cranking time may be used for engines which do not start on the first remote start attempt. Programming choices are: .5 second (1 brake press, the default setting); .75 second (2 brake presses); 1.25 second (3 brake presses); and 1.5

22 Gauge Blue Wire: 500mA (-) Ignition Output Connection If Needed.

This 22 gauge Blue wire is a 500mA Negative output, which has the same operation as the 12 gauge Blue Ignition output.

NOTE: If an additional Accessory output is needed, use the programmable built-in relay (Yellow/Green wire).

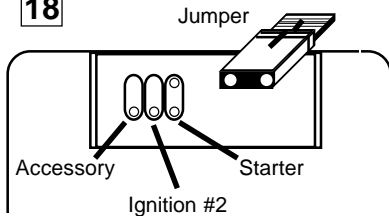


Wiring Connections - 12 Wire Harness

NOTE: On the 12 Wire Harness, the

20-Gauge Gray Wire: is NOT Used.

20-Gauge Brown Wire: is NOT Used.



Programming the Yellow/Green Wire

operation: Locate and open the small access panel on the top of the control module case. Place the Jumper as shown on the pins below the removable panel on the control module. The factory setting is the center “Ignition #2” position.

Wiring - 3 Wire Connector / Satellite Relay Port

The Red satellite relay port can be used, if needed, to configure optional relays to energize additional Ignition or Starter circuits, and Omega OEM security bypass interfaces also plug into this port. Prewired dual relay sockets are available, and a plain 3-wire harness is provided to use this port.

22 Gauge Green Wire:

500mA (-) Starter Output

Connection If Needed. This 22 gauge Green wire is a 500mA Negative output having basically the same operation as the 12 gauge Green Starter output wire. If two or more Starter wires are present in the vehicle an optional relay is needed, connected to satellite port Green wire as shown in the diagram.

22 Gauge Red Wire:

(+) 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) power input (pin 87).

second (4 brake presses).

- Feature #3 is “**Single or Double Pulse Activation**”. The “Double Pulse” option allows the unit, in certain vehicles, to activate remote starting by locking the vehicle doors two times with the original keyless entry transmitter. Exact operations and vehicle suitability varies; consult with the installer for specific details.
 - Feature #4 is “**Gasoline or Diesel Engine**”. When programming, press brake pedal once for the “Gasoline” setting. Diesel engines have three options: pressing the brake twice selects “Monitor Glow Plug Wire”, by which the unit delays engaging the starter until its glow plug input wire detects the glow plugs turning off; and two preset delay periods before starter engagement: 10 seconds (press brake 3 times) and 20 seconds (press brake 4 times).
 - Feature #5 is “**Reset**”, and returns all Programmable Features to their factory default settings. To do this, enter programming mode, select Feature #5, and press the brake pedal once. The unit will acknowledge resetting the features turning off the parking lights, flashing the Status Light once, and then immediately exiting programming mode with the normal confirmation of 2 short and 1 long Status Light flashes and turning off the parking lights.
- Note:** When a Programmable Features Reset is used, any feature which needs to be in a setting different from the default setting will have to be reprogrammed.

Installation Instructions

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

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

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 deter-

the 3-pin Red port to energize the second Starter wire.

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 Yellow Wire:

Ignition Output

Connection Required. Connect the Yellow 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.

Note: If two Primary Ignition wires are present, use the Yellow/Green wire for the second, or configure an optional relay to the 3-pin Red port.

12-Gauge White Wire:

Accessory Output

Connection Required. Connect the White 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.

12-Gauge Yellow/Green Wire:

Programmable Output

Connection If Needed. The Yellow/Green wire is an additional output which can be programmed to operate as an Ignition output, Accessory output or Starter output. As received, it is programmed as an Ignition #2 output. This wire may be used in cases where the vehicle has more than one of any of these three circuits.

16**Receiver Module:**

The unit has a plug-in window mount **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 receiver's 3-wire ribbon cable to the control module; plug the cable into the Black 3-pin port on the rear of the module

Wiring Connections - 6 Wire Main Harness**(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 (+) terminal or the ignition switch wiring harness. Good reliable connections and use of the included fuses are a must. 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 these wires, and the Starter, Ignition #1 and Accessory wiring 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. Some vehicles have a second Starter wire known as a "Cold Start" wire. When this is encountered, two options are available: program the Yellow/Green wire as a second starter output, or use an optional relay configured to

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mined 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 unit's control module, which is mounted upon completion of the installation.

The remote starting 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.

Main Module:

The **Main Module** should be mounted in a location close to the ignition switch (where many of the wiring connections are made); typically, hidden behind the driver's side dash.

Valet Switch and Status Light:

Carefully select locations in which the **Valet Switch** may be easily reached, and the **Status Light may** be easily seen, by the driver. Both locations will need clear space behind the panel. Drill a 15/64" hole for the Status Light, and a 17/64" hole for the Valet Switch. Mount these items and carefully route their wires to the Main Module.

WIRING DIAGRAM

