



Model APS-45 Installation Manual

Keyless Entry System With Two Auxiliary Outputs Installation Instructions

This Unit Is Intended For Installation In Vehicles With
12 Volt Negative Ground Electrical Systems Only.

Kit Contents:

- ◆ APS-45 Control Module
- ◆ (2) - Two Button Transmitters
- ◆ 4 Channel Code Learning Receiver
- ◆ On Board Antenna
- ◆ (1) - Multi Pin Input/Output Harness
- ◆ (1) - Three Pin Door Lock Harness
- ◆ (1) - Two Pin LED Indicator
- ◆ (1) - Two Pin Valet / Override Switch
- ◆ (1) - 10 Amp In-line Fuse Holder With Fuse
- ◆ (1) - 5 Amp In-line Fuse Holder With Fuse
- ◆ (1) - Installation Manual
- ◆ (1) - Operator's Manual
- ◆ (1) - Limited Warranty
- ◆ (2) - Window Decals

The APS-45 Keyless Entry System is designed to provide a convenient electronic means to gain access to the vehicle by providing RF remote control over the vehicle's power door lock system. The unit also includes outputs to control the vehicle's dome lights, as well as exterior parking lights. Although not an alarm system, the APS-45 also includes a starter interrupt circuit output. It also includes two additional auxiliary outputs designed to allow for control over optional devices such as a power trunk release or engine starting device.

BEFORE BEGINNING THE INSTALLATION:

1. Control Module
Dash Mounted L.E.D.
Valet / Manual Override Switch
2. Determine the type of factory power door lock system in use. Knowing the type of system up front before beginning the installation can make the installation easier and faster since you can build whatever interface (if needed) beforehand.
3. Determine whether the vehicle includes a power trunk release system, and if so what type it is.

INSTALLATION OF COMPONENTS:

CONTROL MODULE:

The Control Module is NOT waterproof, DO NOT mount it in the Engine Compartment. Select a mounting location under the dashboard. Choose a mounting location that will not interfere with proper operation of the vehicle's steering column mechanism, and brake and gas pedals. Secure the Control Module in the chosen location. Wait until all components have been installed and all connections made before plugging in the main connectors.

DASH MOUNTED L.E.D.:

The small Red LED included in the kit serves as a visual indicator of the system's status and provides a visual deterrent to a potential thief. The LED also provides important feed back information during the transmitter and feature program modes. The LED should be installed in the dashboard in a highly visible area that may be seen from the driver's seat as well as from outside the vehicle. Try to choose a location close enough to the Control Module so that the LED's wires will reach. Carefully inspect the area behind your chosen location to insure that the drill will not penetrate any existing factory wiring or fluid lines. Drill a 1/4" hole and pass the connector end of the LED through the hole, and route the wires toward the location of the Control Module. Press the LED firmly into place until it is fully seated.

VALET / MANUAL OVERRIDE SWITCH :

Since much of the use of this switch by the vehicle operator requires concurrent operation of the ignition key switch, it is recommended that the Valet / Manual Override Switch be placed such that it can be reached by the driver's left hand, while they operate the ignition key switch with their right hand. The switch can be mounted to the lower dash panel in the drivers area. Inspect behind the chosen location to insure that adequate clearance is allowed for the body of the switch, and also that the drill will not penetrate any existing factory wiring or fluid lines. Drill a 1/4" hole in the desired location and mount the switch by passing it through the panel from the opposite side. Secure the switch using the nut, star washer, and on/off face plate. It is suggested that the switch be oriented to allow the on position to be up toward the driver and the off position to be down or away from the driver. Route the switch's wires and connector toward the location of the Control Module.

RED Wire (Connects to RED/WHITE wire at harness plug): Main 12 Volt Input Wire

These are the main power input wires for the APS-45 system. Both wires connect to a separate fuse holder contained in the harness. These fuse holders each hold a separate ATC fuse, one 5AMP and one 10AMP. This RED wire must be connected to a constant power wire at the vehicle's ignition switch harness or fusebox.

Locate a constant power wire at the vehicle's ignition switch harness. This wire will read +12VDC at all times, regardless of the position of the ignition key switch. Attach the RED wire of the harness to this point by splicing and taping the connection.

YELLOW Wire: Ignition Input Wire

This wire provides the APS-45 system with an ignition power input from the vehicle. Connect this wire to the Ignition wire (primary ignition wire) from the ignition switch. This vehicle wire will show +12VDC when the ignition key is turned to the "ON" or "RUN" position *and* when turned to the "START" or CRANK" positions, and will have 0VDC when the key is turned to the "OFF" and "ACCESSORY" positions.

Locate an ignition power wire at the vehicle's ignition switch harness. By splicing and taping the connection, attach the YELLOW wire of the system to this point.

WHITE Wire: Positive Parking Light Flash Wire

This wire is designed to output a +12VDC positive light flash output, driven by the APS-45's internal relay, to be connected directly to the vehicle's positive parking light circuit. Once the wire is located, confirm that all the vehicle's parking lights will illuminate when +12VDC is connected to it.

NOTE: Some vehicles, (mostly European) have isolated "left" and "right" side parking lights. To connect to the parking

light systems in these vehicles, you must use a separate SPDT relays to connect to each side in order to keep them isolated.

Attach the WHITE wire of the system to this point.

BROWN Wire: Negative (-) Door Sense Input Wire

If the vehicle's interior lights are controlled by *grounding* door pinswitches (typical of most GM, Chrysler, and import vehicles), the Brown *negative* door sense wire should connect to one of the vehicle's factory door pin switches. In many cases the factory door pinswitches are wired in parallel, making it necessary to connect to only one door switch in order to detect the opening of all doors. In a few cases this will not be true, making it necessary to connect to the vehicle dome light, which typically is the intersection point of all doors.

Locate the vehicle's negative door trigger wire in the vehicle's kick panel or underdash. Connect the BROWN wire of the system to this point.

PURPLE Wire: Positive (+) Door Sense Input Wire

If the vehicle's interior lights are controlled by *+12VDC* (Positive) door pinswitches (typical of most Ford vehicles), the Purple *positive* door sense wire should connect to one of the vehicle's factory door pin switches. In many cases the factory door pinswitches are wired in parallel, making it necessary to connect to only one door switch in order to detect the opening of all doors. In a few cases this will not be true, making it necessary to connect to the vehicle domelight, which typically is the intersection point of all doors.

Locate the vehicle's positive door trigger wire in the vehicle's kickpanel or underdash. Using the appropriate connector, attach the PURPLE wire of the system to this point.

BLACK Wire: Main System Ground

This is one of the most important wires of the APS-45 installation. It must be connected properly to a solid chassis ground. Special care must be taken to locate a clean metal part of the chassis as an attachment point for this wire. Some installers prefer to locate a sturdy metal bolt under the dashboard or at the kickpanel, and use it as the attachment point.

If you find a suitable factory bolt that reads ground when tested, attach a ring terminal connector to the Black wire, remove the bolt, place the ring terminal over the bolt and reinstall it, tightening it securely. If you choose instead to drill your own mounting hole into the vehicle's chassis, be certain to remove any paint or grease and secure the ring terminal.

BLACK/WHITE Wire: Horn/Siren Output Wire

This wire provides a ground output (300 mA Max.) designed to drive a relay, which in turn can drive either the vehicle's horn or an optional electronic siren. Depending upon which sounding device you decide to drive, the Black/White output wire must first be programmed to control either the Horn or the Siren. The factory default setting is for the wire to control the horn. Please refer to the section titled; "Programming System Features" later on in this manual for the programming procedure.

To connect this output to drive a vehicle horn, locate the vehicle's horn wire, almost always a negative switched wire, (typically found among the wires of the steering column), and connect it.

BLACK/WHITE Wire: Horn/Siren Output Wire

This wire provides a ground output (300 mA). To connect this output to drive an optional siren, a relay must be used to convert the negative output to a positive output. The output wire must be programmed for siren output. Please refer to the section titled; "Programming System Features" later on in this manual for the programming procedure.

Find a suitable mounting location for the siren and mount it properly. Run the siren's positive wire into the passenger compartment to the location of the APS-45, and connect it to the additional relay.

GREEN/WHITE: Dome Light Supervision Output Wire

This wire provides a 30 second ground output (300 mA Max.) whenever the remote is used to unlock the doors with the APS-45. This allows for the illumination of the vehicle's interior before entry. It also provides a flashing output that duplicates the parking light output flash rate whenever the "Panic Mode" is engaged. This wire must be connected to an external relay, and wired to the vehicle's interior entry lighting whenever the optional Interior Illumination feature circuit is desired.

DARK BLUE Wire: Delayed 300mA Pulsed, Channel 2 Output

The Dark Blue wire supplies a 300mA ground pulsed output whenever channel two of the receiver is accessed. Pressing transmitter Button 2 for three seconds will access Channel 2. This is a low current output and must be connected to a relay to supply power to the trunk release or the circuit you wish to control. Connect the Dark Blue wire to terminal # 86 of a VF45F11 P&B relay or equivalent. Connect terminal # 85 of the relay to a fused +12VDC source. Connect the common, normally open, and normally closed contacts of the relay to perform the selected function of Channel 2.

GREEN/BLACK Wire: Immediate, 300mA Duration of Transmit, Channel 3 Output

The Green/Black wire supplies a 300mA switched output whenever Channel 3 of the receiver is accessed. Pressing both

transmitter buttons simultaneously will access Channel 3 and will remain active for as long as the transmitter button(s) is held. This is a low current output and must be connected to a relay to supply power to the device you intend to control. Connect Green/Black Trace wire to terminal #86 of a VF45F11 P&B relay or equivalent. Connect terminal #85 of the relay to a fused + 12 volt source. Connect the common, normally open, and normally closed contacts of the relay to perform the selected function of the Channel 3 output.

ORANGE Wire: Ground When Armed Output

This wire provides a 300mA ground output when the keyless entry is locked to control the optional starter inhibit relay. Connect the Orange wire to terminal #86 of a standard SPDT relay. Connect terminal #85 of the relay to an ignition wire in the vehicle that is +12VDC when the ignition key is turned to the on and start positions and off when the key is in the off position. Locate and cut the low current starter solenoid wire found at the vehicle's ignition switch harness. This wire will have +12VDC when the ignition key is moved to the start (crank) position and will have 0 volts in all other key positions. Connect one side of the cut wire to terminal #87a of the relay. Connect the other side of the cut wire to terminal #30 of the relay.

DOOR LOCK/UNLOCK CONTROL HARNESS

3PIN White Plug w/3 Wires; RED, GREEN, & GREEN/BLACK

The Red and Green Door Lock/Unlock output wires provide either a momentary pulsed ground (-) or a momentary pulsed +12VDC (+) output for controlling a vehicle's power door lock/unlock circuit. To better understand this, refer to the table below:

Wire Color	Function	Polarity
Red	Lock	Ground (-)
Red	Unlock	Positive (+)
Green	Lock	Positive (+)
Green	Unlock	Ground (-)
Green/White	2nd Unlock Pulse	Ground (-)

The Red w/Black trace wire will provide a pulsed ground only, and will only provide an output when the lock/unlock button of the transmitter is pressed a second time after a first unlock command was issued. This is used for second step unlock or all doors unlock in a two step circuit. In this arrangement, Red is used to control the drivers door unlock relay, and the Red/Black will be used to control unlock of all other doors.

3 Wire Ground Switched Signal Step Door Locks

In this application, the **red wire** provides a ground pulse during arming, or the **pulsed ground lock** output. Connect the red wire to the wire that provides a low current ground signal from the factory door lock switch to the factory door lock control relay. The **green wire** provides a ground pulse during disarming, or the **pulsed ground unlock** output. Connect the green wire to the wire that provides a low current ground signal from the factory door unlock switch to the factory door lock control relay. Red/Black Not Used.

3 Wire Ground Switched 2 Step Door Locks

In this application, the **red wire** provides a ground pulse during locking, or the **pulsed ground lock** output. Connect the red wire to the wire that provides a low current ground signal from the factory door lock switch to the factory door lock control relay. The **green wire** provides the first ground pulse during unlocking, or the **drivers door pulsed ground unlock** output. Connect this wire to the **drivers door unlock** relay that requires a low current ground signal to unlock only the drivers door. If the vehicle does not have a separate drivers door relay, one will have to be added. Locate the drivers door unlock motor wire and cut it at a convenient location to allow wiring of an optional relay. Connect the door side of the cut wire to terminal 30 of the optional relay added. Connect the vehicle side of the cut wire to terminal 87a of the optional relay added. Connect the green wire of the 3 pin harness to terminal 86 of the optional relay added. Connect terminal 85 of the optional relay added to a fused constant + 12 volt source. Most vehicles door lock/unlock motor legs rest at ground, and switch +12 volts to the door lock/unlock motor legs for operation, if this is the case in the vehicle you are working on, connect the remaining terminal 87, to a fused + 12 volt source. In the rare instance that the vehicle door lock/unlock motor legs rest at + 12 volts and switches ground to the door lock/unlock motors, connect the remaining terminal 87, to chassis ground.

The Green/Black wire provides a pulse ground output when the lock/unlock button of the transmitter is pressed a second time after unlocking the driver's door. Connect the Green/Black wire to the wire that provides a low current ground signal from the factory door unlock switch to the factory door lock control relay.

3 Wire Positive Switched Door Locks

In this application, the **red wire** provides a positive pulse during unlocking, or the **pulsed + 12 volt unlock** output. Connect the red wire to the wire that provides a low current positive signal from the factory door unlock switch to the factory door lock control relay.

The **green wire** provides a positive pulse during locking, or the **pulsed + 12 volt lock** output. Connect the green wire to the

wire that provides a low current positive signal from the factory door lock switch to the factory door lock control relay.

3 Wire Positive Switched 2 Step Door Locks

The **green wire** provides a positive pulse during locking, or the **pulsed + 12 volt lock** output. Connect the green wire to the wire that provides a low current positive signal from the factory door lock switch to the factory door lock control relay.

The **red wire** provides a positive pulse during unlocking, or the **drivers door pulsed positive unlock** output. Connect this wire to the **drivers door unlock** relay that requires a low current positive signal to unlock only the drivers door. If the vehicle does not have a separate drivers door relay, one will have to be added. Locate the drivers door unlock motor wire and cut it at a convenient location to allow wiring of an optional relay. Connect the door side of the cut wire to terminal 30 of the optional relay added. Connect the vehicle side of the cut wire to terminal 87a of the optional relay added. Connect the red wire of the 3 pin harness to terminal 86 of the optional relay added. Connect terminal 85 of the optional relay added to chassis ground. Most vehicles door lock/unlock motor legs rest at ground, and switch +12 volts to the door lock/unlock motor legs for operation, if this is the case in the vehicle you are working on, connect the remaining terminal 87, to a fused + 12 volt source. In the rare instance that the vehicle door lock/unlock motor legs rest at + 12 volts and switches ground to the door lock/unlock motors, connect the remaining terminal 87, to chassis ground.

The Green/Black wire provides a pulse ground output when the locking/unlock button of the transmitter is pressed a second time after unlocking the driver's door. Because the vehicle you are working on requires a positive pulse from the factory door lock switch to the factory door lock control relay, you will have to add a relay to invert the output polarity of this wire. Connect the Green/Black wire to terminal 86 of the optional added relay. Connect terminal 85 & 87 to a fuse + 12 volt source. Connect terminal 30 to the low current door unlock wire from the factory door switch to the door unlock control relay.

Resistive Circuits, As Well As 4 Wire Polarity Reversal and 5 Wire Alternating 12 Volt Door Lock Control Circuits

These applications require the use of additional components which may include relays or fixed resistors.

PLUG-IN CONNECTIONS AND COMPLETING THE INSTALLATION:

Now that all the other components have been installed, and most of the main connections completed, it is time to finish connecting the remaining plug-in components and completing the installation. Even though these are plug-in connections, and the plugs have been shaped such that they cannot be plugged in wrong, please read and follow the instructions for each connection to make certain each component is properly installed.

DASH MOUNTED LED

2PIN White Plug w/2 Wires; Red & Blue

The Red & Blue wires in the 2PIN mini white connector control the anode and cathode of the dash mounted LED. Route the twin lead Red and Blue wires from the LED to the control unit and plug the two pin connector into the mating white mini connector shell of the control module. Do not force the connector, it will only plug in one way.

VALET/PROGRAM/MANUAL OVERRIDE SWITCH

2PIN Blue Plug w/2 Wires; Black & Gray

The Black & Gray wires in the 2PIN blue connector are the ground supply and Valet/Program input of the APS-45 unit. When the Gray wire is grounded, under certain conditions, the unit will enter the valet mode. When the Gray wire is sequentially grounded under other conditions, the unit will enter the various program modes. Route the Black and Grey wires from the Valet/Program/Manual Override switch to the APS-45 unit and plug the blue 2PIN connector into the mating blue connector shell of the APS-45 control module. Do not force the connector, it will only plug in one way. Note: Please refer to the section; "Programming System Features" shown later in this installation guide to learn the operation of the valet/program/manual override switch.

POWER DOOR LOCK HARNESS

3PIN White Plug w/3 Wires; Red, Green, and Green/Black

The connection of the power door lock/unlock wires has already been explained. Route the Red, Green, and Green/Black wires to the APS-45 unit and plug the white 3PIN connector into the mating white three pin connector shell of the APS-45 control module. Do not force the connector, it will only plug in one way.

TRANSMITTER PROGRAMMING:

The transmitters supplied with the APS-45 are pre-programmed at the factory to provide the following function:

Button 1, pressed and released quickly	=	Lock & Unlock w/Siren or Horn Chirps
Button 1, pressed for ~ 2 second	=	Lock & Unlock w/o Siren or Horn Chirps
Button 1, pressed for ~ 3 seconds	=	Engage/Disengage Panic Mode
Button 2, pressed for ~ 3 seconds	=	Channel 2 Output
Buttons 1 & 2, pressed and HELD	=	Channel 3 Output

If you desire to have the transmitters operate differently from this factory configuration, please refer to the separate Transmitter Programming Guide that came with the APS-45 system.

PROGRAMMING FEATURES:

There are seven (7) Programmable Features on the APS-45 system. Study the list below, keeping in mind the features and their defaults, (how it comes programmed from the factory), and decide how best to program the APS-45 for your particular installation.

Programmable Features:

<u>Features</u>	<u>1 Chirp</u>	<u>2 Chirp</u>	<u>3 Chirps</u>	<u>Default</u>
First	Passive Arming	Active Arming		Active Arming
Second	Ignition D/L ON	Ignition D/L OFF		Ignition D/L OFF
Third	Ignition D/UL ON	Ignition D/UL OFF		Ignition D/UL OFF
Fourth	Chirps ON	Chirps OFF		Chirps ON
Fifth	Passive D/L	Active D/L		Active D/L
Sixth	Siren Output	Horn Output		Horn Output
Seventh	800ms D/L Pulse	3.5 Sec. D/L Pulse	800ms D/L Pulse	800ms Door Lock
			Double 800ms D/UL Pulses	

To Program These Features:

Entering the Programming Mode involves operating the Ignition Switch and the Valet/Program/Manual Override Switch in a particular sequence. This sequence is very time dependent, in other words it must be performed quickly in order for you to enter the mode. This sequence is also only one step different from the Transmitter Programming Mode, so make certain you perform the sequence properly.

Upon entering the Programming Mode, the system is immediately set to allow adjustment of the First Programmable Feature. That First feature, "Passive or Active Arming", can then be set ON or OFF by pressing button 1 of the transmitter. The system confirms that it is set to adjust the First feature by repeatedly flashing the LED once, with a pause in between each flash. The system will then report how the feature has been set by the number of chirps heard after pressing the transmitter button. Toggling the Valet/Program/Manual Override Switch once again will advance you to the Second Programmable Feature, confirmed by a repeating two LED flashes, with a pause in between each flash, etc., etc.

It is important to note that when you first enter the Programming Mode, you are automatically positioned to adjust the First Programmable Feature, and that the Valet/Program/Manual Override Switch allows you to toggle from there through each of the six more programmable features. However, it will not allow you to return to any feature once you have toggled past it. Should you accidentally toggle past the feature you wanted to program, you must exit and re-enter the Programming Mode and then adjust the feature you missed.

It is also important to note that you may toggle past as many programmable features as you wish without having to adjust them. Each time you toggle forward to a new feature, the horn will chirp the appropriate number of times (1, 2, or 3 times) to indicate how that feature is currently set, and the LED will flash the appropriate number of times to indicate the number of the feature (First through Seventh) that you are set to adjust. For example, you might enter the mode and toggle the Valet/Program/Manual Override Switch 3 times in order to adjust the Fourth programmable feature. The system would respond with 1 Chirp, and the LED would begin to flash 4 Flashes, pause, and repeat. This has told you that the system is ready for you to adjust the Fourth programmable feature, and that it is currently programmed for Chirps ON. A single press of button 1 of the transmitter will cause the system to produce 2 Chirps. This signifies that you have changed the programming to Chirps OFF. Please follow the programming procedure on the next page, and refer to the list of the Programmable Features above when programming the APS-45.

<u>FEATURE</u>	<u>ACTION TO PERFORM</u>	<u>RESPONSE FROM SYSTEM</u>	<u>LED FLASH PATTERN</u>
To Enter The Programming Mode	Turn the Ignition Switch ON Toggle the Valet/Program/Manual Override Switch ON then OFF 3 Times Within 3 seconds, turn the Ignition Switch OFF, then ON	LED Turns OFF 1 Siren/Horn Chirp & 1 LED Flash 1 Short Chirp, and 1 Long Chirp	
You have now engaged the Programming Mode, and are set to adjust the First feature This mode will time out automatically in 15 seconds, or can be cancelled by turning the Ignition Switch OFF			
First	Press Transmitter Button 1 to Change Feature	1 Chirp = Passive Arming ON 2 Chirps = Active Arming ON	1 Flash, Pause, Repeat
OR Toggle the Valet/Program/Manual Override Switch once to Advance to the next feature			
Second	Press Transmitter Button 1 to Change Feature	1 Chirp = Ign Locking ON 2 Chirps = Ign Locking OFF	2 Flashes, Pause, Repeat
OR Toggle the Valet/Program/Manual Override Switch once to Advance to the next feature			
Third	Press Transmitter Button 1 to Change Feature	1 Chirp = Ign Unlocking ON 2 Chirps = Ign Unlocking OFF	3 Flashes, Pause, Repeat
OR Toggle the Valet/Program/Manual Override Switch once to Advance to the next feature			
Fourth	Press Transmitter Button 1 to Change Feature	1 Chirp = Chirps ON 2 Chirps = Chirps OFF	4 Flashes, Pause, Repeat
OR Toggle the Valet/Program/Manual Override Switch once to Advance to the next feature			
Fifth	Press Transmitter Button 1 to Change Feature	1 Chirp = Passive Doorlock ON 2 Chirps = Passive Doorlock OFF	5 Flashes, Pause, Repeat
OR Toggle the Valet/Program/Manual Override Switch once to Advance to the next feature			
Sixth	Press Transmitter Button 1 to Change Feature	1 Chirp = Steady Output (siren) 2 Chirps = Pulsed Output (horn)	6 Flashes, Pause, Repeat
OR Toggle the Valet/Program/Manual Override Switch once to Advance to the next feature			
Seventh	Press Transmitter Button 1 to Change Feature	1 Chirp = 800ms Lock Pulse 2 Chirps = 3.5sec Lock Pulse 3 Chirps = 800ms Lock Pulse 800ms Double Unlock	7 Flashes, Pause, Repeat
OR Turn the Ignition Switch OFF to exit the Programming Mode			
NOTE: If you accidentally toggled past the feature you intended to adjust, you must exit and re-enter the mode.			

NOTE: Once you've entered the program mode DO NOT allow more than 15 seconds to pass between steps, or the programming mode will be terminated.

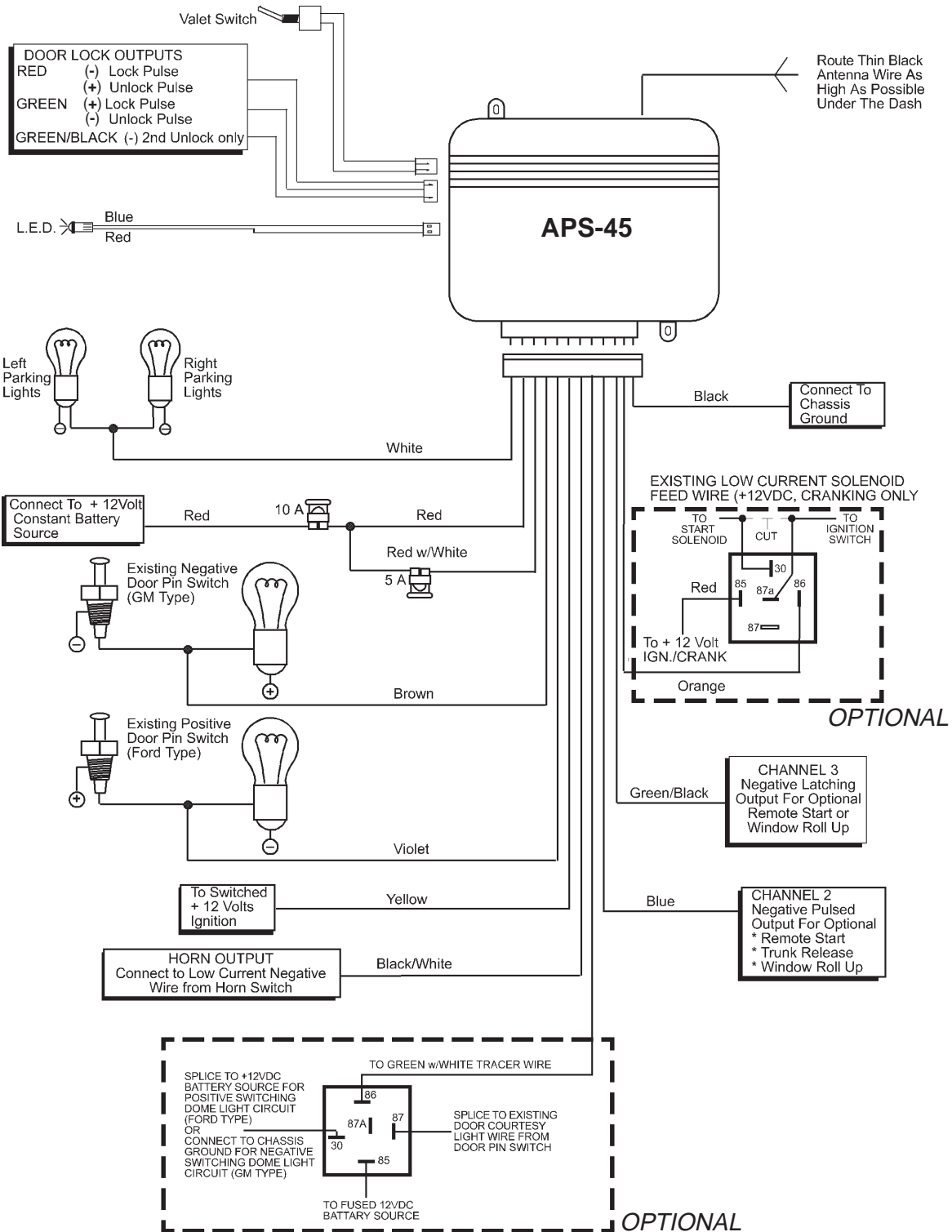
COMPLETING THE INSTALLATION:

After you have confirmed the operation of the APS-45, and tested any and all optional features of the system:

1. Mount the control module up and behind the dash securing it in place with cable ties or screws. Be certain that the chosen mounting location will not inhibit any of the controls of the vehicle.
2. Securely harness and tie all wiring up and away from all hot and moving parts that they may come in contact with under the dash board or in the engine compartment areas.

CAUTION: Particularly avoid the area around the steering shaft and column, as wires can wrap around these mechanisms and impair the safe operation of the vehicle.

3. Check the vehicle's wipers, lights, horn, etc... to insure proper operation.
4. Replace all panels that were removed during installation, and retest the system.
5. Explain the operation of the system and its various features to the end user if available, and place the Owner's Manual on the dashboard for them to find and review.



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