

PAINLESS

PERFORMANCE PRODUCTS

Wire Harness Installation Instructions Manual #90583

For Installing:

#20202 Direct Fit Camaro Harness 1969



Painless Performance Products recommends you, the installer, read this installation manual from front to back before installing this harness and removal of the current harness installed in your vehicle. Due to the variables in modifications that can be done to these Camaros, reading this manual will give you considerable insight on the proper installation of this harness.



Perfect Performance Products, LLC

Painless Performance Products Division

2501 Ludelle Street

Fort Worth, TX 76105-1036

800-423-9696 phone – 817-244-4024 fax

Web Site: www.painlessperformance.com

E-Mail: painless@painlessperformance.com

If you have any questions concerning the installation of this harness or are having trouble in general, feel free to call Painless Performance Products' tech line at 1-800-423-9696. Calls are answered from 8am to 5pm central time, Monday thru Friday, except holidays.

We have attempted to provide you with as accurate instructions as possible, and are always concerned about corrections or improvements that can be made. If you have found any errors or omissions, or if you simply have comments or suggestions concerning these instructions, please write us at the address above, send us a fax at (817) 244-4024 or e-mail us at painless@painlessperformance.com. We sincerely appreciate your business.

Perfect Performance Products, LLC shall in no event be liable in contract or tort (including negligence) for special, indirect, incidental, or consequential damages, such as but not limited to, loss of property damage, or any other damages, costs or expenses which might be claimed as the result of the use or failure of the goods sold hereby, except only the cost of repair or replacement.

Cover photo courtesy of RK MOTORS Charlotte, NC

90583- Installation Manual

July 24, 2015

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CAUTION: BEFORE THE REMOVAL OF YOUR ORIGINAL HARNESS AND/OR THE INSTALL OF YOUR NEW PAINLESS HARNESS, DISCONNECT THE POWER FROM YOUR VEHICLE BY REMOVING THE NEGATIVE OR POSITIVE BATTERY CABLE FROM THE BATTERY. THE BATTERY IS NOT TO BE CONNECTED UNTIL THE PAINLESS HARNESS HAS BEEN INSTALLED AND TESTED.

- A full color copy of these instructions can be found online at <http://www.painlessperformance.com/Manuals/20202.pdf>
- If your vehicle has an existing harness, you will want to retain it for the possible re-use of various pigtails & connector housings particular to your application. During the removal process, avoid making any unnecessary cuts. Included in this kit is a sheet of pre-printed labels, to assist in identifying connections as the existing harness is removed from the vehicle. Place these labels on your factory harness accordingly as you disconnect it from the vehicle.

This harness does **NOT** contain any A/C wiring or power window/power lock wires. It does include the power wires for the A/C switch, PW & PL options. **Do not remove the power window/lock or A/C harness from the vehicle if you have these options and plan on retaining these features.** This harness also does not include the wiring for the TCS relay for turbo 400 transmissions, rear defrost, and wiring for a convertible top. The original wiring for these options will need to be re-used.

- It's a good idea to document how the original harness is routed as this Painless harness follows most of the same routing.
- If you do not have an existing harness, the package of terminals included with the harness will enable you to make most of the connections needed that aren't already provided on the harness.
- Only printed wires will have a 900-series number. These 900-series numbers are used to identify various wires and circuits in the wiring diagrams that are a part of these instructions.
- **In the event that there are unused or unconnected wires, the ends of all wires labeled in this instruction manual as "POWER" or wires printed with "B+" in the description, will need to have the ends terminated with an insulated terminal or taped. Doing so will prevent the wires shorting and causing harness failure or fire.**
- **If any connectors are not used on this Painless harness, especially light sockets, you must tape over the connectors to prevent the possibility of a short circuit. Use electrical tape to insure that no contacts can short to ground.**

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INTRODUCTION

Thank you for your purchase of a Painless Performance product. These instructions, along with the Painless harness, have been designed to allow you, the installer, to perform the cleanest and easiest install possible.

Do not let the length of these instruction manuals intimidate you. Much of the information contained in these manuals is just helpful information about each wire, where the wire comes from, where it goes, why a component needs it, etc. You will find that the actual install portions of this manual are pretty straight forward and easy to follow.

● The install portions are noted with a round bullet note, as seen here.

Individual components and sections are labeled with printed tags for easy identification. The colors used in this harness are the most common colors GM used during the production of these Camaros. In some instances, a wire color may not match your factory color. This is because the colors were not exactly uniform throughout this time frame. In most cases it was a simple stripe color change. These colors, along with the schematic diagrams found throughout this manual, will help you identify the different circuits during installation and later on if additions to the overall system are necessary.

The complete wiring systems, as well as the instruction manuals, have been designed with 3 main harnesses incorporated into it:

ENGINE HARNESS, INTERIOR HARNESS, TAIL HARNESS

With all the factory options this harness covers, and so many variables in modifications that can be done to these Camaros, there may be wires and pre-installed connectors that are not needed in your specific application. Harness routing may also differ according to your model or use of aftermarket components such as gauges, shifters, steering column, etc.

During the course of reading this manual you will notice wire colors with a slash, as an example Black/White. This indicates a wire with a stripe. The first color is the main color of the wire and the color after the slash is the stripe color. In the case of the example, Black/White indicates a black wire with a white stripe.

CONTENTS OF THE PAINLESS WIRE HARNESS KIT

Refer to the **Contents Figure** (below) to take inventory. See that you have everything you're intended to have in this kit. If you find that anything is missing or damaged, please contact the dealer where you obtained the kit or Painless Performance at (800) 423-9696.

The Painless Wire Harness Kit should contain the following:

- Main Wire Harness, with the fuse block and interior bulkhead
- Engine wire harness, with the firewall bulkhead
- Tail section harness
- 4 Tail light pig tails (2 standard and 2 RS pigtails)
- Console harness
- Parts Kit: loose piece terminals, fuses, connectors, etc.
- Alternator bag kit
- Indicator light bag kit
- Un-marked Bag kit: light bulbs, zip ties, etc.
- Dielectric grease
- Installation manual



CONTENT FIGURE- All of the parts in the Painless kit.

SMALL PARTS

Included with the Painless harness is a parts kit containing miscellaneous terminals, fuses, screws, and nuts. The terminals that are supplied are not insulated and require the use of the supplied heat shrink. These terminals include disconnect, ring, and splice terminals and have been provided for engine bay connections.



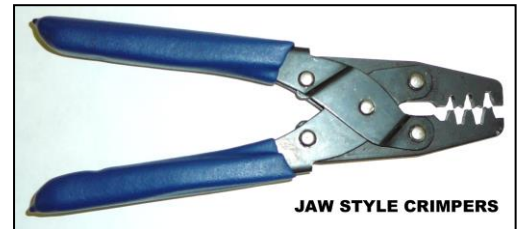
One small bag kit contains all of the components for an inline fuse installation and alternator connections. This fuse is to isolate the battery from the alternator and Painless harness. These parts include the base with cover, fuse, mounting screws and ring terminals. Page 48 will go into detail about this bag.

TOOLS NEEDED

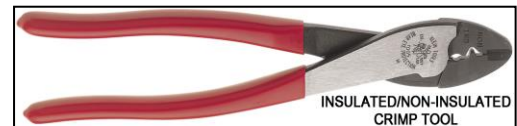
In addition to your regular hand tools, you will need, at least, the following tools:

➤ **Wire Crimping and Stripping Tools:**

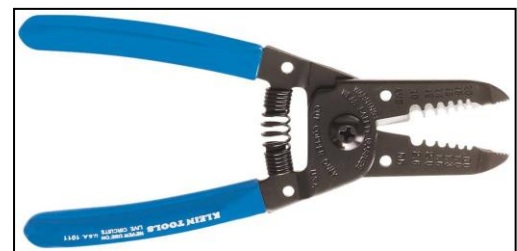
This style of hand crimper can be purchased from just about any local auto parts store, home improvement store or can also be purchased online. You will need this style of crimper to crimp the terminals included in the small parts kit.



Another style of crimpers are “Jaw Crimpers” or “Roll Over Crimpers”. These crimpers will crimp factory style, un- insulated terminals. These types of terminals are provided in the kit for connections to an HEI distributor, engine compartment bulkhead and factory style alternator. If none can be found locally, these crimpers can be found using Painless part # 70900.



A good set of wire strippers are required to strip wire properly. This style of wire stripper is ideal for this harness install because of its ability to properly strip wire gauges 10 to 20. These are available from just about any local auto part store, electrical supply shop, home improvement store or can be purchased online.



➤ **Volt/Ohm Meter:**

A Volt/Ohm meter is always a good tool to have on hand when installing any type of electrical components into any vehicle. Most basic units provide the two functions required to diagnose electrical issues seen during a harness install. These two functions are the ability to read DC Voltage and electrical continuity or Ohms. They can be purchased from any home improvement store, local hardware store and electrical supply shop and online.



➤ **Electric Drill & Bits:**

A drill and bits are needed in order to use the screws provided with the kit for the MIDI fuse holder and the fuse block mounting.

➤ **Heat Gun:**

Very useful to shrink the heat shrink found in the parts kit.



➤ **Small (10 amp or less) Battery Charger**

See **TESTING THE SYSTEM** located on page 113.

➤ **Factory Wire Schematic**

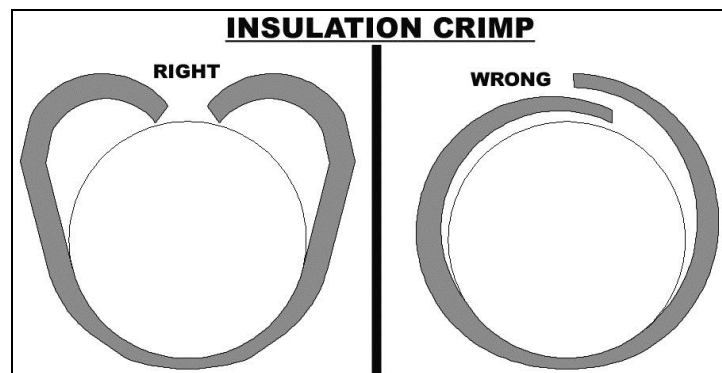
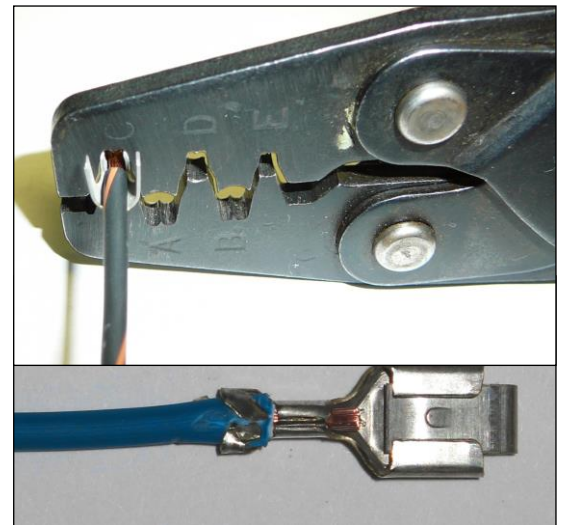
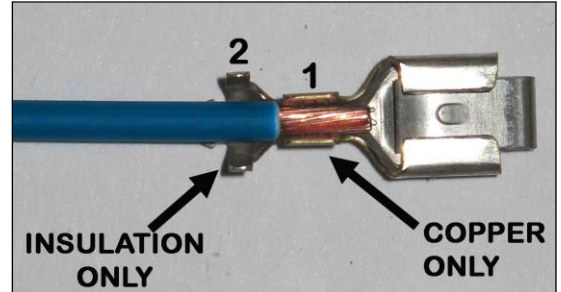
This isn't absolutely necessary; however, having one handy is good practice with any electrical job. Factory Assembly manuals can be found online and usually contain these schematics.

INSTALLING FACTORY STYLE TERMINALS

&UNPINNING CONNECTORS

In the parts kit you will see different non-insulated male and female terminals. These terminals are for connections that do not come pre-installed on the Painless harness. In most cases this is to allow the installer the freedom to route the wires however they best see fit and cut a wire to length, or to utilize some of the optional features designed into the harness..

- Strip about ¼" of insulation off of the wire.
- Insert the wire into the terminal. There are 2 terminal straps on the terminal. For instructional purposes, we will label them 1 and 2. Strap 1 crimps the exposed copper stands of the wire, while strap 2 crimps the wire insulation. Make sure your strip length is long enough to ensure only copper strands are crimped by Strap 1, but make sure it is short enough that only insulation is crimped by Strap 2. The photo to the left best demonstrates this.
- There are 5 jaws on the crimpers, identified with letters A-E, A being the largest, E, the smallest. Using the appropriate jaw on the crimpers, crimp Strap 1. The appropriate jaw depends on the wire gauge as well as the terminal stiffness. If you are unsure which jaw to use, you can always start with the biggest and work your way down until you get a tight crimp. After doing a few crimps, you will get a feel for which jaw a terminal/wire gauge requires for the best results.
- With Strap 1 crimped you can move onto crimping the insulation strap, Strap 2. Place Strap 2 into the appropriate jaw of the crimpers. This jaw will be larger than the one used to crimp the first strap. Slowly crimp down on Strap 2 making sure the strap folds downward into the wire, and not overlapping itself, refer to the drawing below. Overlapping could cause problems with the terminal fitting into the intended connector.



TO REMOVE A TERMINAL



- Locate the tang access slot on the terminal end of the connector. Push a paper clip/stiff wire or a small jeweler's flat head screwdriver into the slot to depress the locking tang of the terminal.
- Once depressed, pull the harness wire from the connector. Do not pull too hard or you could pull the wire from the terminal, leaving the terminal stuck in the connector.

PRE-INSTALLATION GUIDELINES

The installation of your wire harness mainly consists of two parts:

- The physical routing and securing of the wire harness, wires, and groups.
- The proper connection of the individual circuits.

These two major tasks are not separate steps, but are integrated together. That is, you will route some wires and make some connections, route more wires and make more connections. This Painless harness follows much of the same routing the factory harness did. Harness routing also may differ according to your factory options or use of aftermarket components such as gauges, shifters, steering column, engine driven accessory brackets, etc. Harness routing also depends a great deal as the extent you want to secure and conceal the harness. This aspect will be more prominent in the ENGINE SECTION wiring, where some of the harness is visible.

The best pre-installation practice is to become familiar with the harness by locating each of the harness sections. A good way to do this is by laying out the wire harness on the floor and identifying each of the section labels found on the harnesses as you read through the manuals. The wire index in the back of the manual will help to quickly identify each wire in these sections.

During this familiarization process, you will be able to add or remove wires that your particular install may or may not need. Wires that may be removed are outlined throughout this manual; **another good reason to read this manual in its entirety before any actual installation takes place.**

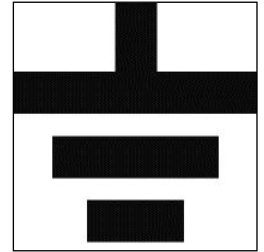
During the familiarization process and during the install, wires should be bundled into groups. Use nylon ties, split loom, or tape. Exposed wires of the engine compartment and wires running to the rear of the vehicles may need some sort of wiring loom or covering.

Painless offers Power Braid Kit part #70920 and Classic Braid Kit part #70970 to fill this need. See the insert card that came with your wire harness) for details.



GROUNDS

Throughout this instruction manual and when looking at the Painless harness you will see the word GROUND, maybe you've seen the ground symbol on wire diagrams? What exactly is a ground and why do you need it?



You've probably noticed the large cable coming from the negative side of your battery going down to the frame or to the engine. This cable allows voltage to get back to the battery through the metal of the frame and all the other metal pieces bolted to the frame. It is also important to have ground cables/straps going from the frame to the engine and from the frame to the body. Painless offers part # 40140, seen in the photo, to supply proper grounds back to the battery.



A ground is simply the common path voltage takes back to the battery. A ground, or chassis ground as it is often called, is any bare metal surface found on the vehicle, which is in turn connected back to the frame through mounting points and ground straps. They are needed in order for the voltage current to have some place to go.

There are two ways that components are grounded in the 1st gen Camaro: through mounting and through wire connection. Some grounds on the 1st gen Camaro are grounded through the mounting of the metal housings in which the bulbs are installed, like the front turn signals. Components such as the headlights, tail lights, radio, and gauge cluster all get their grounds through wires from the chassis harness, which are attached to ground sources which you will find in the harness.

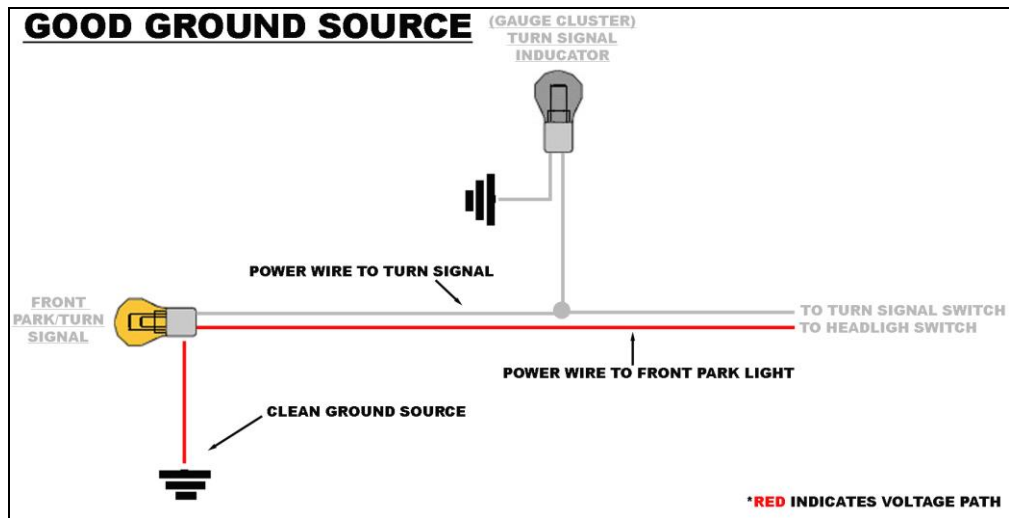
To help avoid grounding problems, all the ground wires in the Painless harness are connected together through a series of splices. All of these splices connect to large 10 gauge wires in the engine compartment to allow a ground connection directly to the battery. Ground wires are also present where the factory had them installed: 2 on the front core support for each headlamp and turn signals, 2 in the interior under the dash, and 1 in the trunk. The [Ground Schematic](#) on page 16 has been provided to show you exactly which wires of the Painless harness are part of the integrated ground circuit.

On light housings that ground through the mounting, and for the harness ground wire connection points, make sure that all mounting points are clean by removing all dirt, corrosion, or paint. This is especially important for cars that have just been painted as paint build up will cause grounding issues. Course sandpaper should be all that's needed to properly clean grounding points.

Why are clean grounds important?

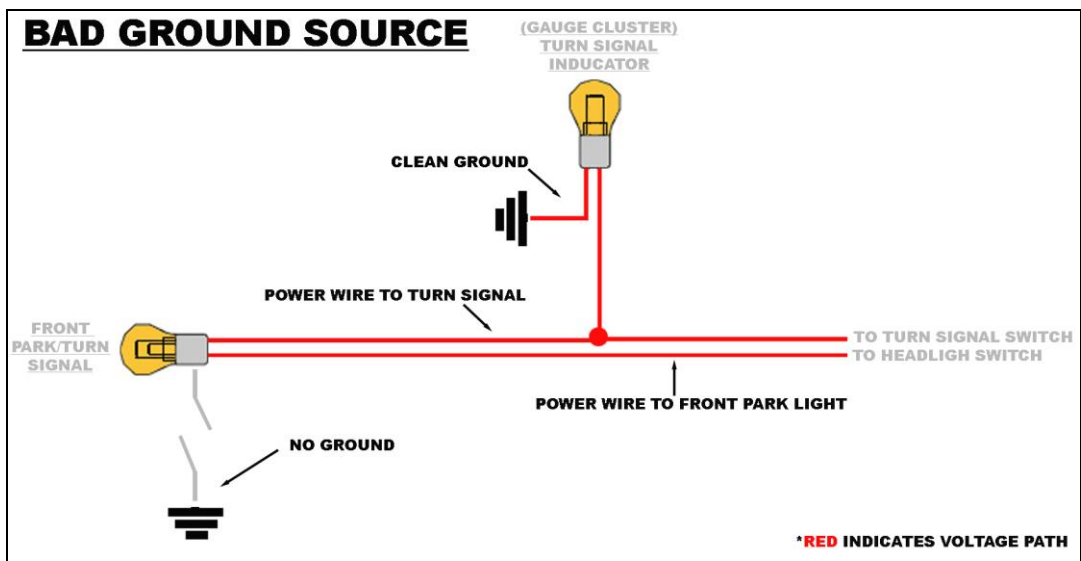
As an example, we will use a park light bulb, like the front park lights on the 1st gen Camaro which have turn signal and park light functions. Follow the red line from right to left in the diagrams on the next page. This red line indicates the path electrical current takes when everything is properly grounded and as represented in the second diagram, when the ground is bad; notice which bulbs illuminate, the yellow bulbs, when good and bad grounds are present.

In our park light example with a good ground source, current travels from the headlight switch when it is pulled to the “ON” position to the park light bulb. Since the bulb is properly grounded, current passes cleanly through the bulb causing it to illuminate and the current exits the bulb through the ground source back to the battery. The ground allows everything to work properly without any issues.

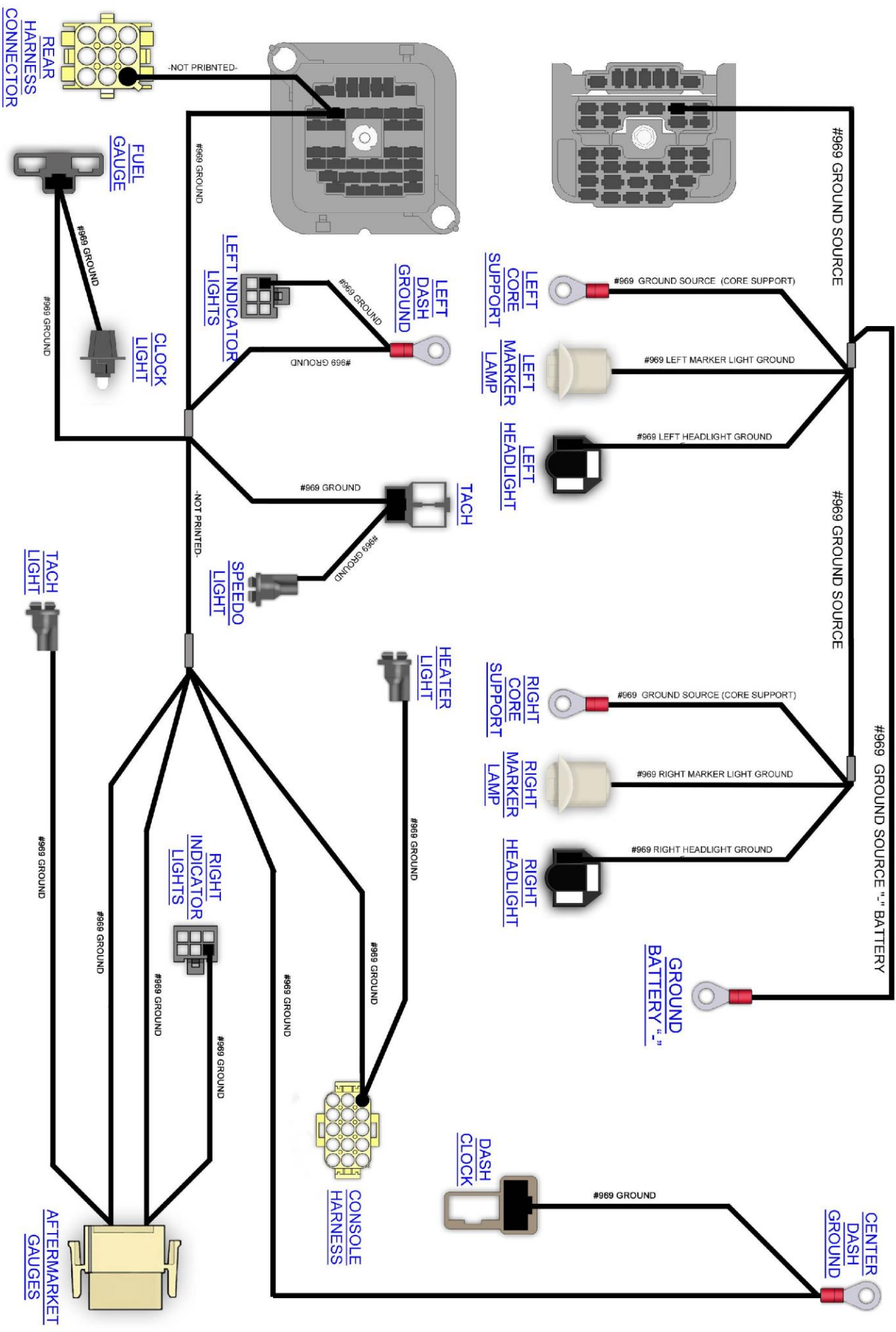


When a ground isn't connected or is contaminated with dirt, corrosion, or paint, the voltage will find the easiest path to ground, which is represented in the diagram below.

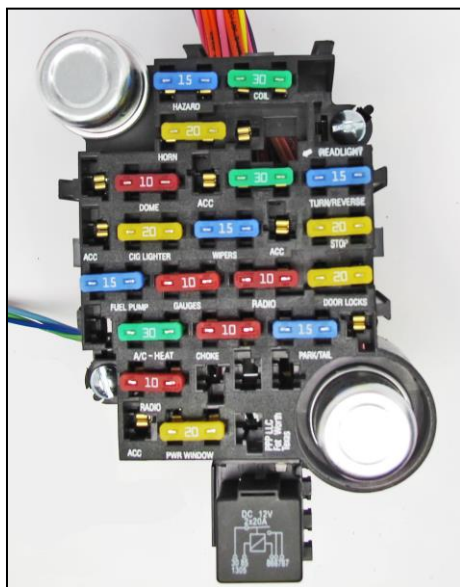
Current travels from the headlight switch to the park light bulb, but wait; there is no ground at the bulb. Since the ground it would normally use is not there, the current will find another way to get to ground and back to the battery. When this happens, things that should not have power receive power coming from the park light bulb. Since the turn signal wire also goes to the bulb, the current will travel out of the bulb through the turn signal wire. Notice in the diagram that a bad ground at the front park light can cause issues on the interior of the vehicle at the turn signal indicator on the dash. In this case, the turn signal indicator light is illuminated when it shouldn't be. Also, since this one power source which was only supposed to power 1 bulb is not powering 2 bulbs, both bulbs may be dimmer than they would have been if everything was grounded properly. This is one of the problems with diagnosing a bad ground; they can cause issues throughout the entire vehicle until a clean ground source is reached.



GROUND SCHEMATIC



FUSE BLOCK



This Painless harness contains an 18 fuse GM style fuse block with the same mounting pattern as the factory installed fuse block. One big difference you will notice, outside of the additional circuits, is the larger fuse block uses modern ATC blade style fuses. This fuse block allows the convenience of having both flashers (turn signal and hazard), as well as the horn relay, to be mounted in one location.

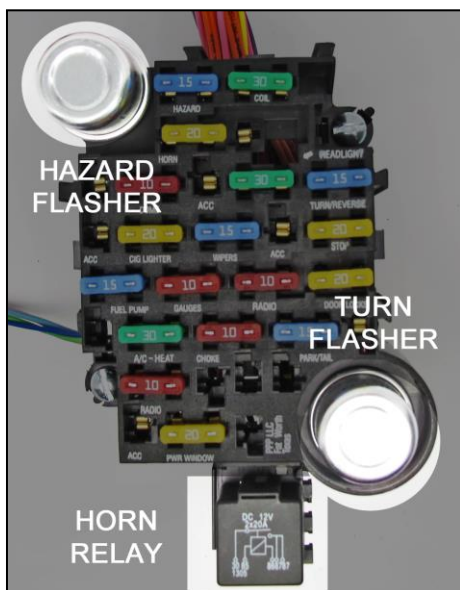
Horn Relay

On the fuse block you will find a horn relay, which replaces the factory core support mounted horn relay. The fuse block mounted horn relay uses a standard 30 amp SPST relay. Replacement relays for the horn relay can be found at any auto parts store or by ordering [Painless part number #80131](#).

Also, because of the new horn relay, the key buzzer found on 1st gen Camaro horn relay is now gone and is not supported by the Painless harness.

Flashers

The two flashers simply switch power off and on going to the turn signal switch and hazard switch. The flasher found in the top left corner is the hazard flasher. The flasher on the bottom right corner is the turn flasher.



How a flasher functions is simple. Power is switched off and on according to heat built in the resistance wire inside the flasher. As soon as power is drawn through the flasher, as when the turn signal or hazard switch is activated, the resistance wire heats up and makes contact with the output side of the flasher. This contact passes power through the flasher, into the switch and to the turn signal lamp(s). Once this contact has been made, the resistance wire is no longer resisting any voltage, so it begins to cool; this cooling causes the flasher to lose contact.

This loss of contact means that there is no longer any voltage going to the switch, causing the turn signal light to turn off. Once contact is lost, the resistance wire begins heating up and the entire

process starts over again until the turn signal switch or hazard switch is disengaged.

Some L.E.D. turn signals do not draw enough current to activate a typical thermal flasher. If you are using L.E.D. turn signals, and your turn signals do not work properly and you are certain everything is connected properly, a no load flasher will be required; Painless [part number #80230](#)

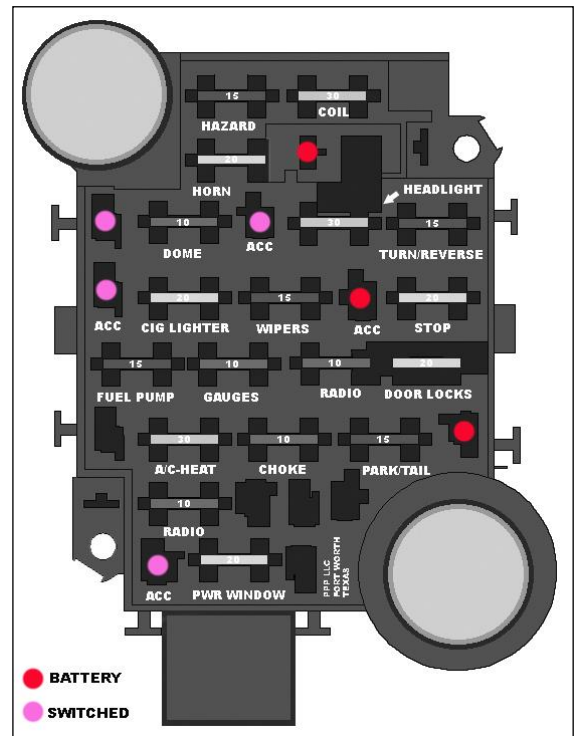


Accessory Ports

You will notice single ports on the fuse block, many of these are labeled “ACC”. These ports will give you access to battery power and switched power to extra circuits you may need now or in the future. You will need to test the ports or refer to the diagram, at right, in order to tell which ports have battery power and which have switched power.



Terminals and connectors have been provided in the parts kit to allow you to tap into these extra sources, seen on the right. **The ports are all unfused power sources and must have an inline fuse, no larger than 15 amps, installed before being routed to a component needing power.** Anything needing more than 15 amps will need to have a relay installed. See relay wiring and activation in the next section for details.



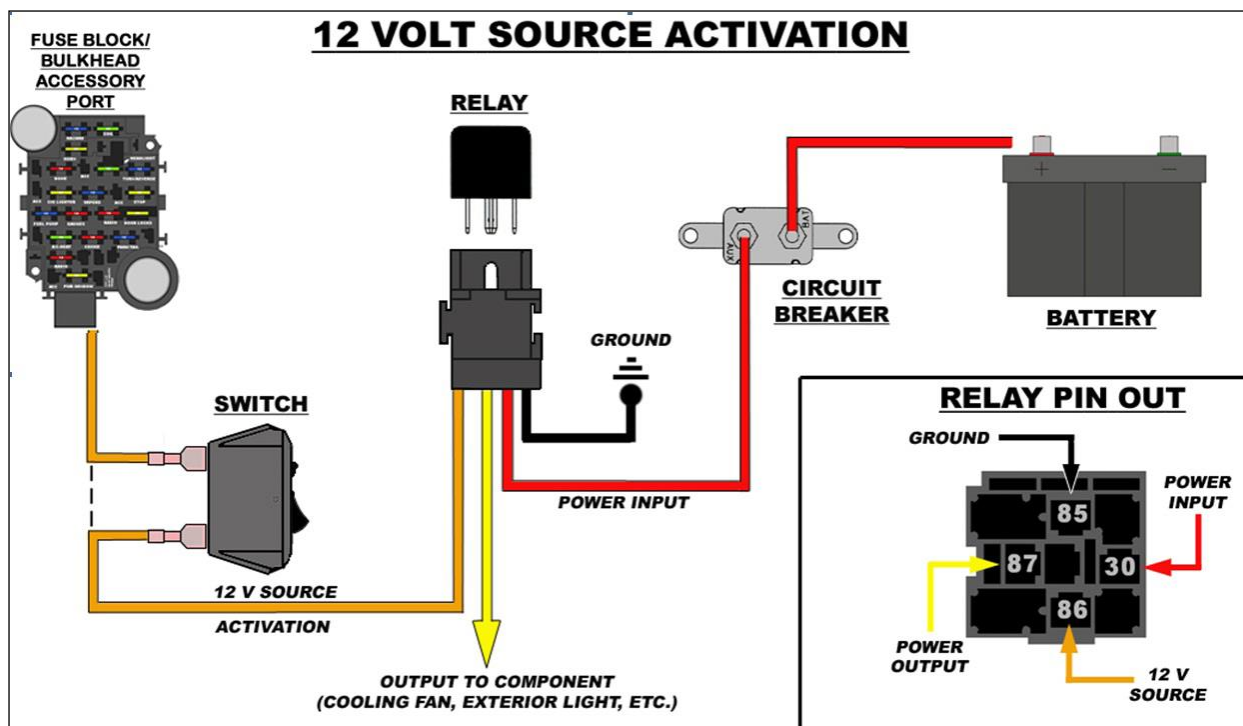
Relays and Switches

All ACCESSORY PORTS on the fuse block and the ports on the engine side of the bulkhead connector can support up to 15 amps. Components requiring more amperage will need to be connected to a relay. An ACCESSORY PORT can be used as a 12 volt activation source or 12 volt source for ground activation in these circumstances. Take a look at [Painless part #'s 30107 & 30108](#) to fill your relay needs.

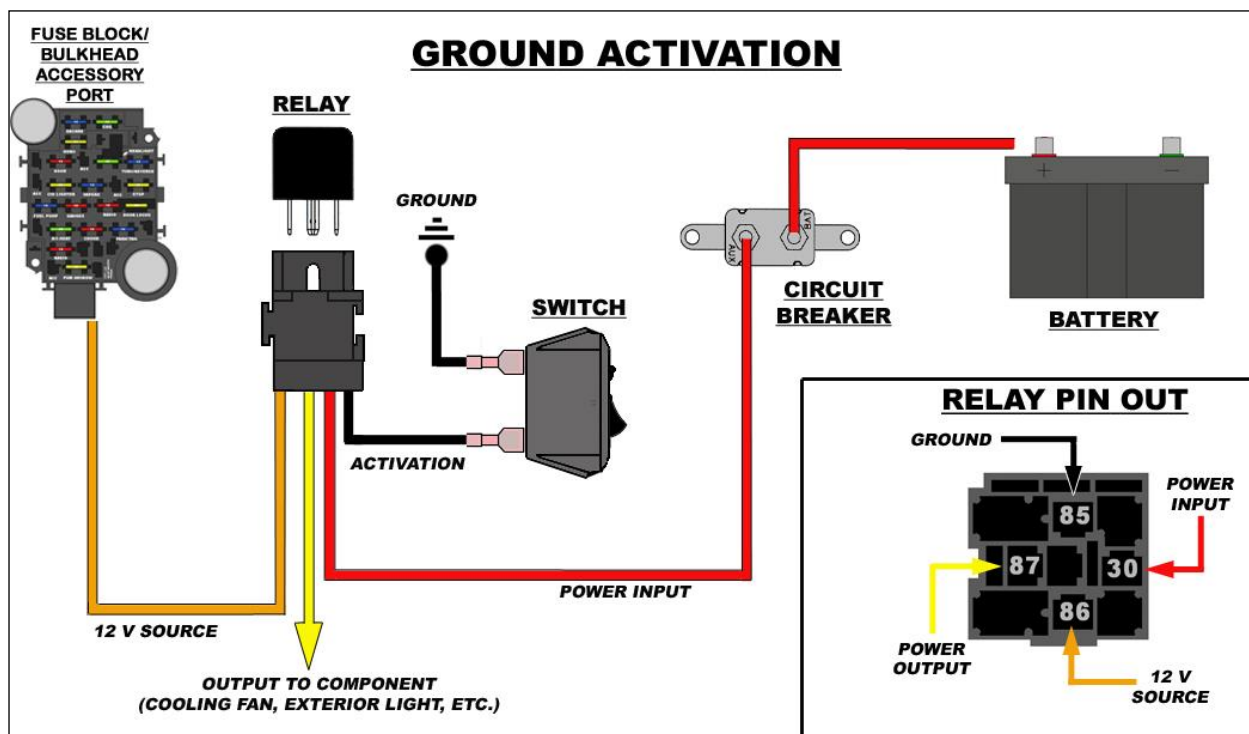
A 12 volt activated relay is constantly grounded and will send power out of the output side of the relay to the component being powered when 12 volts is applied to the relay, as the name implies. The 12 volt source can be wired directly to the relay or interrupted by a switch, as shown in the *12 VOLT SOURCE ACTIVATION* drawing on the top of the next page.

Wiring directly to the relay, as indicated by the dashed line, would be used in the case of wiring a Fuel Pump relay, water pump relay, or any other high amperage component you would want to run continuously while the key is in the “ON” position. In these cases, make certain the 12 volt wire you are using is a Switched 12 volt wire and not a battery constant hot.

The 12 volt activation wire can also be wired to a switch to offer the user OFF/ON capabilities. These are the situations a battery constant power source would be used. This would allow a component to be turned OFF or ON without the key in the ON position. However, unless a lighted switch is being used, a ground activated relay may work better to avoid running power through the switch.



A ground activated relay is just the opposite of the 12 volt activated relay, 12 volts (battery constant or switched) is supplied uninterrupted and the ground wire is switched. The Horn Relay pre-wired in the Painless harness is a Ground Activated Relay. Another example of this method is a thermostat operated fan relay. In this case however, a thermostatic switch would replace the switch in the drawing below. Like mentioned before, ground activation method is best used when a component is operated by an unlit switch from the interior of the vehicle.



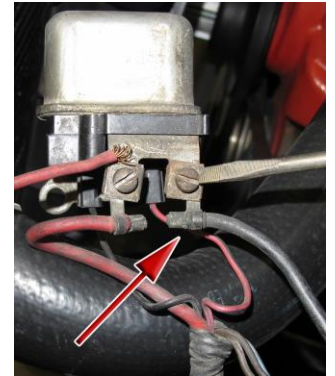
In the event that a toggle/rocker switch is being used without a relay, make sure the amperage of the component you are powering does not exceed the capabilities of the switch. Switch failure will occur.

FACTORY HARNESS REMOVAL

During the removal of the factory harness avoid making any unnecessary cuts to any wires. The entire harness should be able to come out of the vehicle without any cutting, unless someone has modified connections. Labels have been provided to label each connection as it is removed. Individual wires which may have been add-on wires to aftermarket components which do not have a label on the sheet provided can easily be labeled using masking tape.

Labeling the factory harness is highly suggested as it may be helpful to look back at the factory harness during the install of the new Painless harness and will help you identify any things that are not included by the Painless harness that may need to be re-used.

Cars with factory air conditioning: During the removal process, the factory A/C harness does not need to be removed. It is its own separate harness. The power supply wire will simply need to be disconnected at the factory horn relay. This is a large gauge black wire, as seen in the photo, which will feed an inline fuse and then an orange wire. Remove this black wire and reroute it to the ac box on the firewall. This will be connected to a power source later in the manual, on page 56.

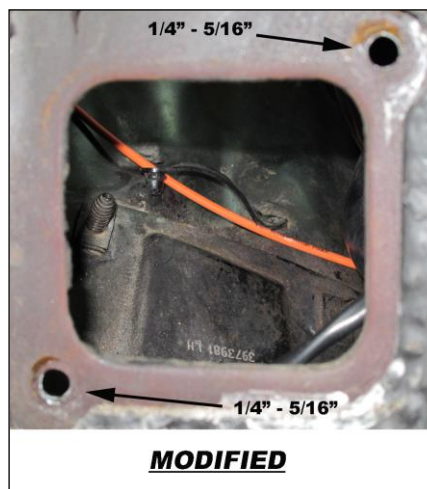
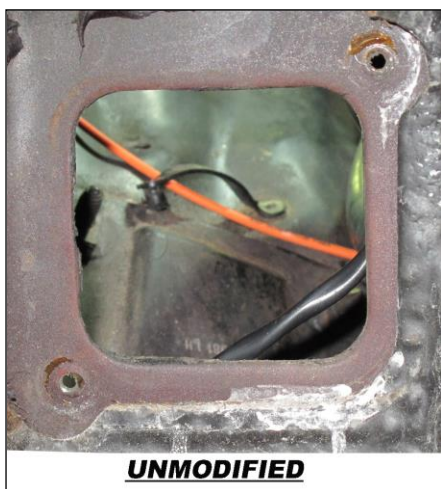


To aid in removal and installation of the harness, remove the driver seat or bench seat and the steering wheel. Steering wheel removal is not a necessary step, however, doing so will allow more movement to comfortably remove the factory harness and install the new Painless harness.

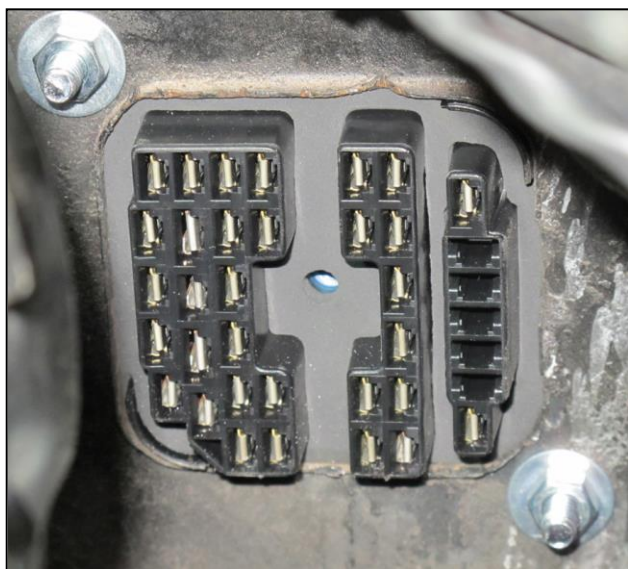


FUSE BLOCK MOUNTING

To begin mounting the fuse block, you will need to enlarge the 2 factory mounting holes; these holes can be found next to the upper right and lower left of bulkhead opening. A 1/4" or 5/16" bit and an electric drill will be required for this modification.



- Using the drill bit, enlarge both firewall mounting holes. This will allow the 1/4" fuse block mounting bolts supplied with the Painless harness to pass through the firewall.



This next step will require a helper.

- On the engine side of the firewall, install the flat washers and nuts previously removed from the fuse block, this will require the use of a 7/16" socket as a wrench may be difficult to operate in the confined space. A helper with a flat head screw driver will be needed on the inside of the vehicle to keep the bolts from turning while the mounting nuts are tightened.

With the holes enlarged, the fuse block can now be mounted.

- Remove the 2 nuts and flat washers pre-installed on the fuse block.
- Before being mounted, ensure you have the dimmer switch connection coming out of the bottom of the fuse block.
- Install the fuse block onto the firewall by inserting the bolts through the fuse block and then through the enlarged firewall mounting holes.



ENGINE COMPARTMENT HARNESS

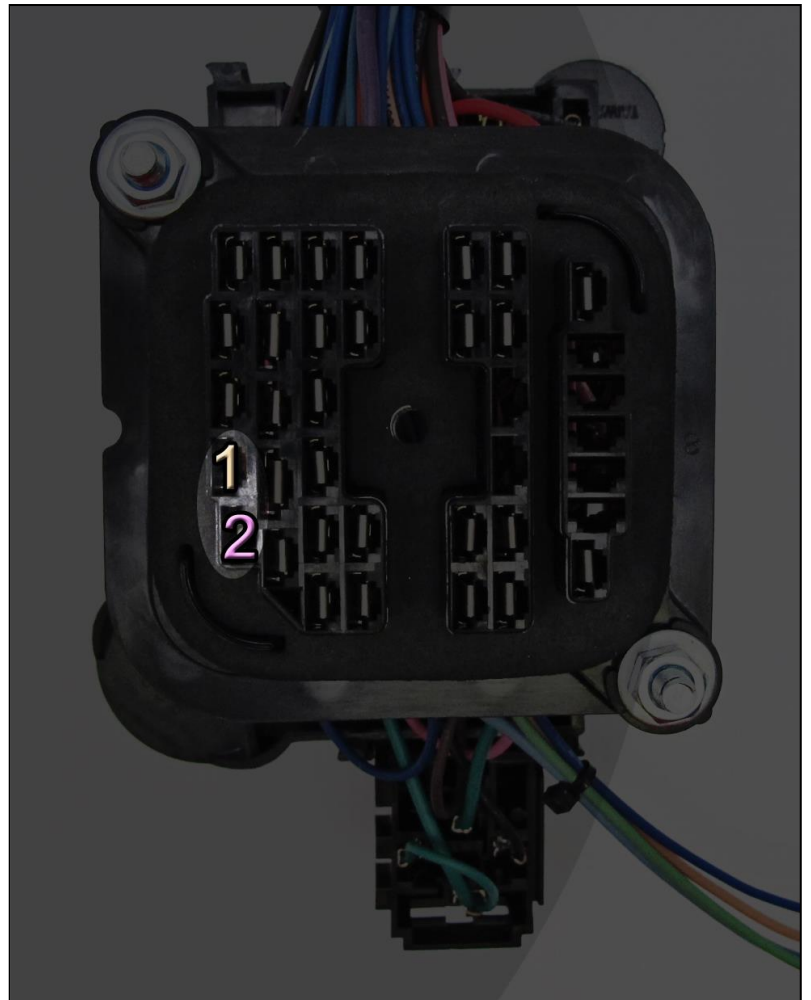
The engine harness is broken down into two groups of wires leaving the bulkhead connector:

- Light Section- contains wiring for the low brake switch, headlights, marker lights, park/turn signals, horns, and grounds.
- Engine Section- contains 6 sub-groups of wiring
 - Wiper Motor- contains wiring for the wiper motor and sprayer
 - Engine Section- Contains wiring for oil pressure, temp sensor, electric choke and ignition connections (for both aftermarket and factory points style ignition)
 - Alternator- Contains wires for Alternator.
 - Starter - contains starter connections
 - Blower- contains the blower motor connection
 - MIDI- Contains wires for MIDI fuse and battery connections to the harness.

Engine Bulkhead

The photo to the right shows the part of the interior bulkhead that you will see coming through the firewall in the engine compartment. The engine harness will plug directly into this connector. However before doing so, there are several optional features built into this connector that can be beneficial to your install.

The first option is highlighted and numbered in the picture to the right. These optional terminals, labeled 1 and 2, will be used if the install includes the factory cowl induction system. These two pins will supply the correct power for the factory cowl induction solenoid. While the factory used the extra accessory ports found in the fuse block, we have added these connections to the bulkhead to make for a cleaner install and eliminate the use of extra holes and grommets on the firewall. More detailed information on how to utilize this option can be found on page 24.



The other optional feature can be found on the right hand side of the interior bulkhead (highlighted/circled in the photo at right), you will see that there is a 7 pin portion with two pins having a terminal pre-installed. Both of these pins will have power anytime the key is in the “ON” / “RUN” position. This will make wiring up any under hood accessories requiring a switched power source easier than having to source power from the inside of the vehicle.

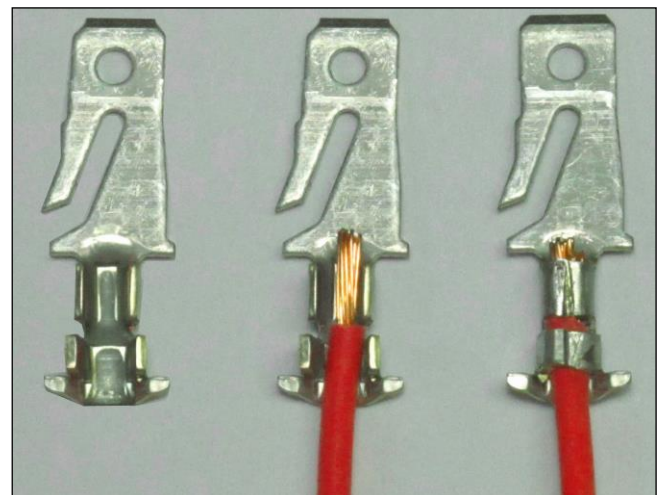
The power on these pins comes directly from the Ignition Switch. These pins are all un-fused power sources and must have an inline fuse, no larger than 15 amps, installed before being routed to a component needing power. Anything needing more than 15 amps will need to have a relay installed. See relay wiring and activation on page 16 for details.



Looking at the mating connector to the bulkhead on the engine harness, you will notice that the wires needed for the accessory switched power pins are not included. This was done to avoid having several un-fused wires running out in the engine compartment; most installs will not require this many additional switched power sources. There is no harm in leaving these ports open if you do not require any addition switched power sources.

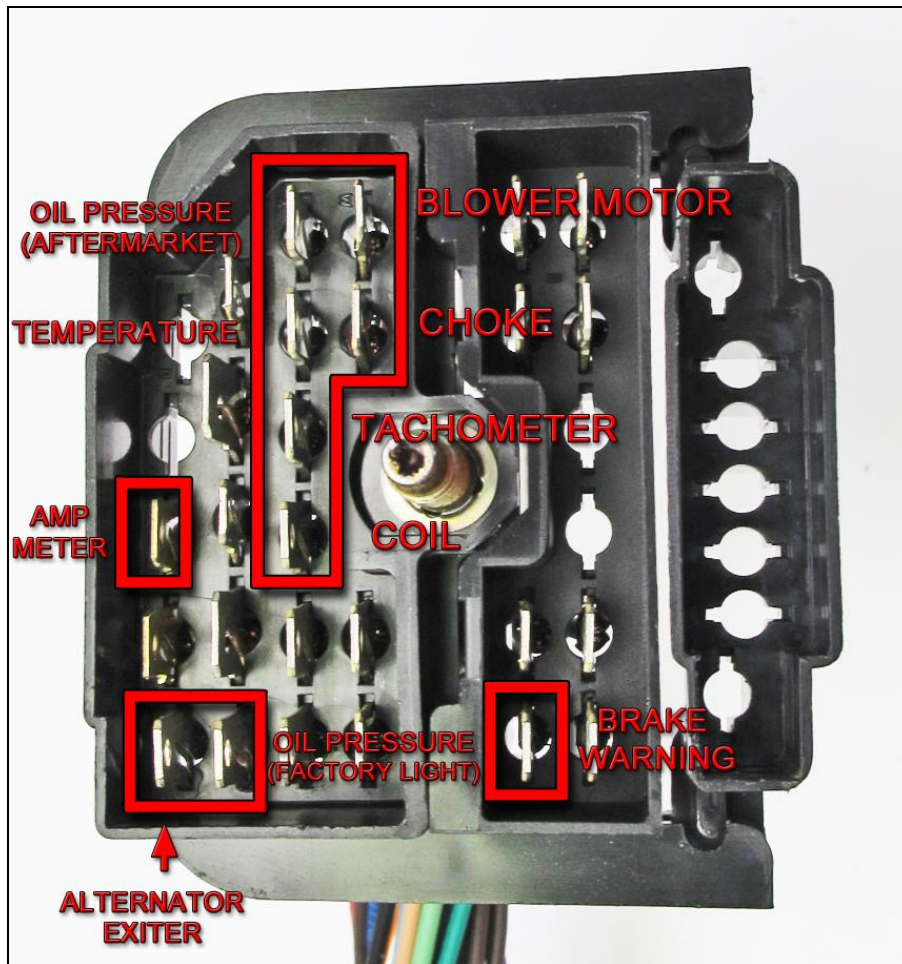
In order to utilize these switched power sources, you must add wires to the engine harness bulkhead. Terminals have been provided in the parts kit for these connections, seen in the photo below. These terminals will accept 18-14 gauge wire, using a ¼” strip length, and will need to be installed with jaw style crimpers as shown on page 11.

If any wires were added to the bulkhead connector for the extra switched power sources, group each wire with one of the 2 sections of wires coming from the bulkhead according to where the fuse will be installed. For instance, if you are mounting an inline fuse on the driver side inner fender to power an accessory, the wire that would connect to this fuse will route with the Light Section.



Bulkhead Pin Out and Optional Cowl Induction Add-on

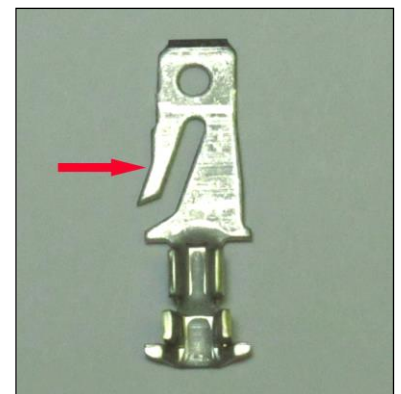
Before connection of the bulkhead takes place, look over the pin out below to see if there are any wires you will not be using. Wires for components like electric choke, blower motor, gauge wires (if you are using aftermarket mechanical gauges), and tachometer may not be used depending on the installation. These unused wires can be removed to clean up the install and to keep unused wires from being taped or wrapped up in the harness. **Read through this entire manual before any wires are removed**, some wires can be repurposed and used for other things. Ideas and instances for other uses of these wires will be found throughout this manual. UNDER NO CIRCUMSTANCES SHOULD YOU REMOVE ANY OTHER WIRES.



Removal of these wires is simple and will require the use of a pair of pliers or a flat head screw driver.

- Squeeze the smaller side of the terminal in towards the center of the terminal. This will allow the terminal to be pulled free of the bulkhead.

Be careful not to damage any of the surrounding terminals



“Cowl Inductions Add on”

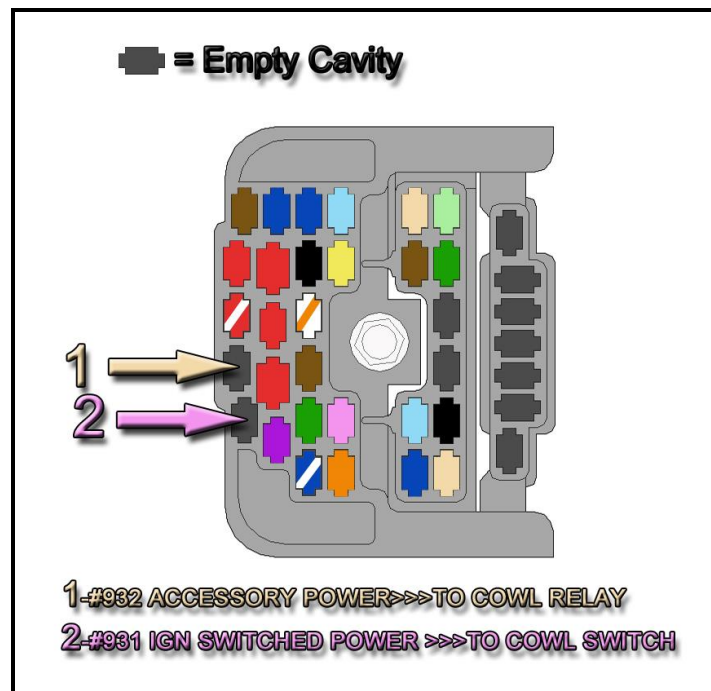
If the installation calls for the use a factory style cowl induction setup as listed in the previous section (Engine Bulkhead) you will want to install the required wiring before mounting the bulkhead. Below you will find instructions on how to correctly install the necessary wiring for the factory cowl induction option. If the Camaro doesn't currently have this option, but you have plans to add it at a later date you can always install the wires and simply cover the loose ends of the wires and secure them until they are needed.

Start by locating the rolled up tan and pink wires that came with your Painless wiring harness. These wires will be labeled as follows:

Tan: 14 gauge wire, printed **#932 ACCESSORY POWER>>>TO COWL RELAY**. This wire will supply accessory switched power to the relay that controls the cowl induction solenoid. This wire will have power when the key is in the ON/RUN or ACCESSORY position.

Pink: 14 gauge wire, printed **#931 IGN SWITCHED POWER>>>TO COWL SWITCH**. This wire will supply ignition switched power to the activation switch for the cowl induction relay. This will only have power when the key is in the ON/RUN position.

- The two wires mentioned above will have terminals preinstalled on one end. These terminasl will plug into the engine bulkhead. Please refer to the pinout below and insert the appropriate wires into the locations shown.
- You can now route the wires. The tan wire **#932** will be routed with the orange wire labeled “**#967 BLOWER MOTOR POWER**, the connection of the unterminated end of this wire will can be found on page 39. The pink wire **#931** will be routed with the wiper motor wires and the connection of this wire will be discussed further on page 39.



Before installing the engine harness you must read pages 27-60, particularly pages 47 and 59. Some optional wires may need to be added, moved to a different section or removed depending on your particular installation. This process will be much easier with the harness out of the vehicle.

Engine Bulkhead Mounting

With all extra wires added to the engine bulkhead connector, if they were needed, it can now be installed onto the firewall connector.

- Push the engine bulkhead onto the firewall connector as far as you can, it will not go all the way on because of the bolt. Make sure the connector is on straight. The terminals of the bulkhead will easily bend
- Using a 3/8" socket, tighten the mounting thru bolt on the engine bulkhead to the fire wall connector.

DO NOT FORCE OR OVER TIGHTEN!



Engine/Light Harness Routing and Installation

The routing of the Engine/Light Harness will follow much of the factory harness routing. It will be up to you, the installer, to position all wires away from sharp edges, hood hinges, moving parts and exhaust heat.

“Umbrella” style clips for zip ties have been provided for you to attach the Painless harness to the core support in the same fashion the factory did. These zip tie clips fit into the 1/4” holes left behind by the factory plastic retainer loops.

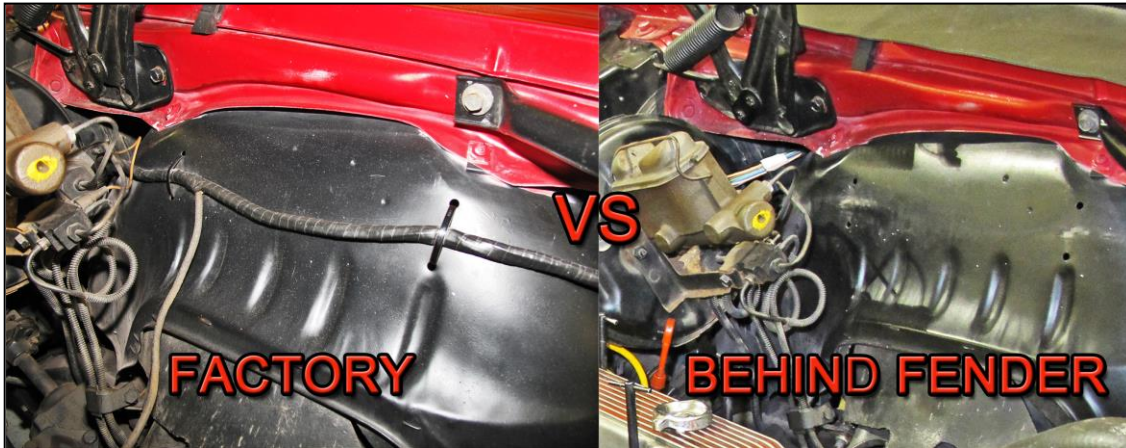
Remember, as the zip ties are installed and the harness is routed, wrap the tie around the harness and LOOSELY tie the harness to the fender/core support. Make sure you leave enough room to pull and push the harness as you make your connections. Only when all connections are made, will the zip ties be tightly snugged down.



If you still have an externally regulated alternator, and the regulator is mounted on the driver side core support, additional wiring (*not included*) may need to be added to the “Lighting Section” of the engine harness. See page 54 for details on these wires.

Light Section

The Light Section has a little extra length added to allow the installer to route the harness over the inner wheel well, behind the driver side fender. Doing so will make for a cleaner install as there will not be wires routed down the fender out in the open as the factory did.



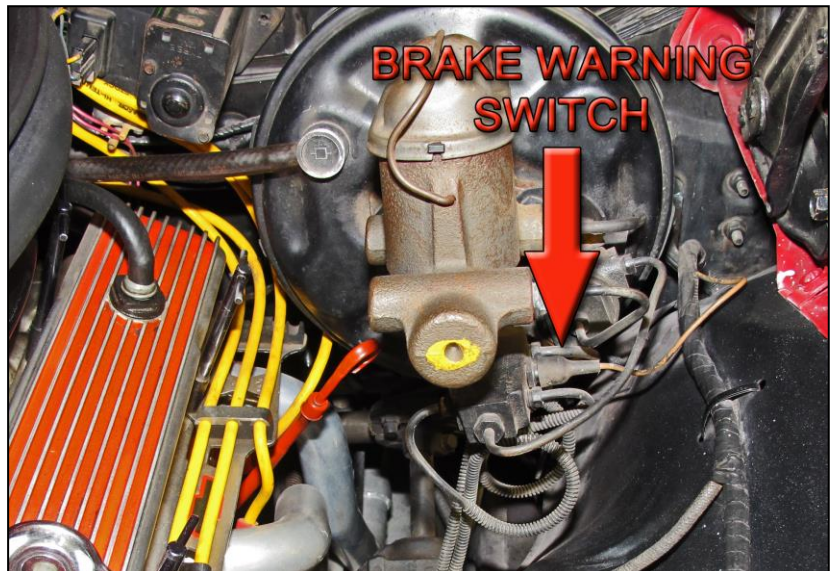
- Route the Light Section towards the front of the vehicle. If this section is routed behind the driver side fender, make sure the “Low Brake Switch” wire remains on the engine compartment side.

If the harness is routed out in the open as the factory harness was, use umbrella zip tie clips, installed into the holes left behind by the factory plastic clips, to loosely secure the new Painless harness.

“Low Brake Switch”

The Low Brake Switch is a normally open switch that will close and send a ground signal to the brake light indicator light on the dash. This is done when the bias valve inside the proportioning valve has shifted forward or back because of line pressure differences. This is usually caused by broken/leaking brake line, faulty caliper or wheel cylinder. Notice, this is a pressure switch not a fluid level switch.

This switch is only necessary if you want the brake warning light in the dash to indicate low brake fluid pressure. If you have aftermarket gauges without a brake warning light, then this connection can be skipped and this wire can either be stowed into the Light section of the harness or removed from the bulkhead, as described on page 24.



The Low Brake Switch is located on the proportioning valve near the brake master cylinder. If you have an aftermarket proportioning valve, you may not have one of these switches. Aftermarket valves that have a two pin switch on them are normally for brake light activation, this type of switch will not work as an activation source for the indicator light on the dash.

The Low Brake Switch is a one wire connection. This will be a wire with a label reading “LOW BRAKE SWITCH”. This wire is:

Tan: 18 gauge wire, printed with **#968 LOW BRAKE SWITCH**, this wire supplies a ground signal to the low brake light on the dash. This wire goes into the bulkhead connector and is spliced together with the wire going to the emergency brake switch on the interior of the vehicle; see the [Gauge Cluster Schematic](#) on page 102.

● Connection to the Low brake switch can be done 2 different ways.

- You can use an insulated bullet or socket terminal found in the parts kit. Some switches require a male terminal, while others require a socket terminal.
- You can remove the connector from your factory harness and splice it to the wire of the Painless kit.

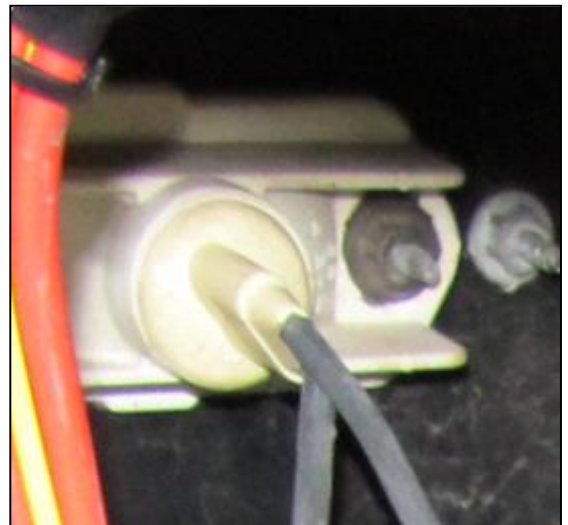
“Left Side Marker”

The driver side fender mounted marker light is the first connection to the front exterior lights. It serves two purposes: it is a park light as well as a turn signal. The park light feature is activated by a power source coming from the headlight switch. This light will illuminate any time the headlight switch is in the *PARK* or *ON* position. The turn signal feature is provided by a power source coming from the turn signal switch. This light does not need a ground, it uses the front turn/park signal filaments for ground.

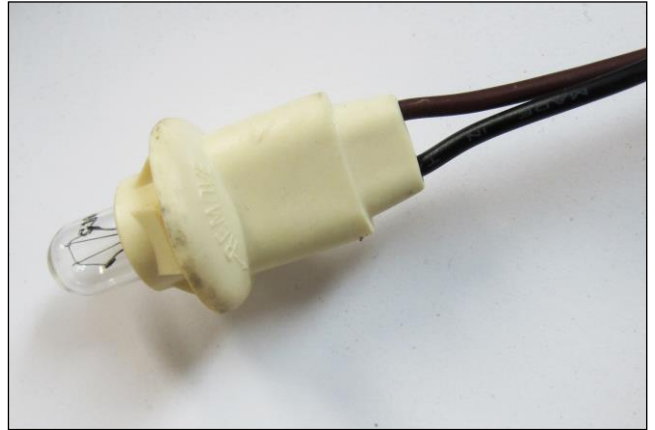
The Left Side Marker requires two wires to work properly, seen in the [Front Lighting Schematic](#) on page 35. A factory style socket comes pre-installed and will have a label reading “MARKER”. The wires spliced to this molded connector are:

Brown: 18 gauge wire, not printed, this is a power wire for the park or marker light function. This wire is spliced to the other #927 wires in the Light Section. This wire will have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position.

Black: 18 gauge wire, not printed, this wire is the power for the turn signal function. This wire goes into a splice with the light blue wire going to the front left turn/park light and to a wire coming from the bulkhead. This wire will have interrupted switched power from the turn flasher any time the left turn signal is activated and interrupted battery power from the hazard flasher any time the hazard switch is in the ON position.



- Install one of the provided wedge base bulbs into the socket. Adding a small amount of dielectric grease to the contacts beforehand will help with any corrosion issues.
- Looking at the back of the marker lamp housing you will see that it has a keyed opening to correspond with the tabs on the socket
- Insert the lamp socket of the Painless harness into the “Left Side Marker” housing and turn ¼ turn clockwise to lock the socket into place.



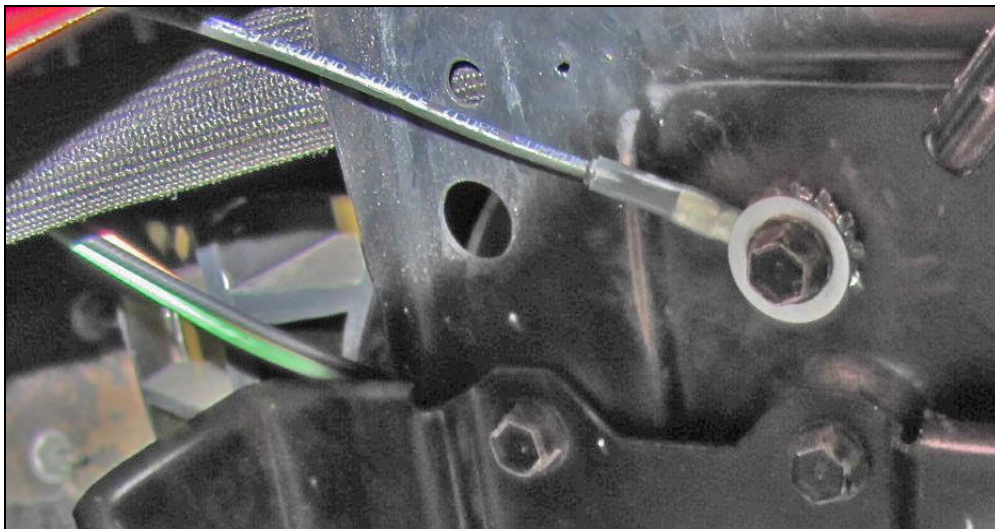
“Left Ground”

The wire labeled “Ground” is the next connection in the install process. This wire is the ground wire for driver side head light and also supplies the ground source for the park/turn signal lamp. See the [Ground Schematic](#) on page 16.

Locate the black wire with the ring terminal pre-installed, this wire will not have a label as it is clearly marked with its function.

Black: 14 gauge wire, not printed, this wire provides a chassis ground source for the headlamp as well as the rest of the integrated ground circuit. This wire can be seen in the [Ground Schematic](#) on page 16.

- Connect this wire to the core support where the factory ground wire was, behind the washer fluid jar on non-RS equipped cars and next to the factory voltage regulator location. Makes sure the ground area is clean of dirt, rust and/or paint. It is also good practice to use a star washer on all ring terminals.



Also, take notice to the use of Painless Classic braid, part # [70970](#), on the harness in the photo above

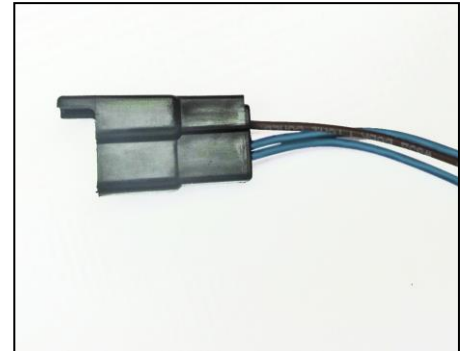
“Left Turn/Park Light”

The next connection in the Light Section is the “Left Turn/Park Light”. This light has a dual filament bulb that works as a turn signal as well as a park light. The turn signal will be the brighter of the two filaments.



New bulbs for the front Turn/Park Light have been supplied. The bulb this lamp requires has universal part number 1157A, replacement bulbs can be found at any auto parts store under this part number. **Clear 1157 bulbs cannot be used.** Amber bulbs must be used as laws require the front turn signals to be amber in color. Most vehicles have colored lenses to comply with this law, in which clear 1157 bulbs may be used. The front lamps of the 1969 Camaro have a clear lens, so **these vehicles must use amber bulbs.**

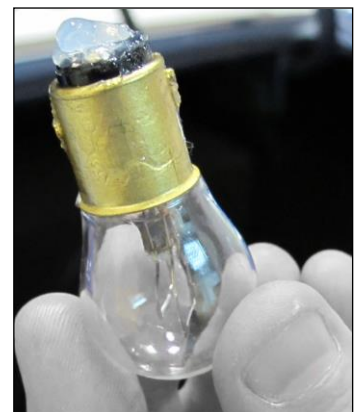
The Left Turn/Park Light of the Painless harness consists of three wires in a two pin connector will be identified by a label reading “L TURN”. These wires can be seen in the Front Lighting Schematic on page 35, they are:



Brown: 18 gauge wire, not printed, is the power source for the park light. This #927 is spliced to the other #927 wires in the Light Section. This wire will have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights On position.

Light Blue: Two 18 gauge wires, printed **#926 FRONT LEFT TURN SIGNAL POWER**, these wires are the turn signal power. One of these wires is coming from the left marker light and the other is from the engine bulkhead. The wire from the bulkhead will have interrupted switched power from the turn flasher any time the left turn signal is activated and interrupted battery power from the hazard flasher any time the hazard switch is in the ON position.

- To ensure the turn signal and park lights work properly, if you are using/reusing an original/old housing, it is a good idea to remove the light housing from the bumper and clean the areas where the housing mounts to the bumper and then reinstall. These points are where this housing is grounded. Cleaning these grounds now can save hours of troubleshooting later.
- Begin by adding a very small amount of dielectric grease to the terminal end of the connector on the pigtail coming from the turn signal, as seen in the photo.
- Plug the 2 pin connector found on the Painless harness into the connector coming from the turn signal housing.
- Install a bulb into the turn signal socket, this is done by removing the two screws that hold the lens in place. Place a small amount of dielectric grease on the bulb to help with corrosion that can make removing the bulb at a later date difficult.



“Left Headlamp”

The last connection needing to be made before routing the [Light Section](#) across the core support is the “Left Headlamp”. You might be able to access the headlight connector through a hole in front of the core support on the left side of the vehicle. However, depending on the size of your hands and your dexterity this may not be possible. Removing the headlamp may be necessary and is recommended to ensure the terminals of the headlamp are not damaged during connection; they are easily bent if the connector is not installed correctly.

Three wires make up the connection to the Left Headlamp. These wires go into a black three pin connector. This group of wires will have a section label reading “LEFT HEAD LAMP”, these wires are:

Light Green: 14 gauge wire, printed **#908 HIGH BEAM POWER**, this wire will provide power to the high beam filament of the head lamp. This wire goes into a splice with a wire going to the right headlamp and also to a wire going to the bulkhead and can be seen in the [Front Lighting Schematic](#) on page 35. This wire will have power when the headlight switch is in the headlight ON position and the dimmer switch is in the high beam position.

Tan: 14 gauge wire, printed **# 909 LOW BEAM POWER**, this wire will provide power to the low beam filament of the head lamp. This wire comes from a splice with a wire going to the right low beam and a wire going to the bulkhead connector and can be seen in the [Front Lighting Schematic](#) on page 35. This wire will have power when the headlight switch is in the headlight ON position and the dimmer switch is in the low beam position.

Black: 14 gauge wire, printed **#969 HEADLIGHT GROUND**, this wire provides a ground source for the headlamp. This wire is tied into the integrated ground circuit and can be seen in the [Ground Schematic](#) on page 16.

- Add small amount of dielectric grease to the terminals before plugging the connector into the headlamp. Doing so will help with any corrosion issues.
- Plug the connector on the Painless harness into the back of the headlamp. Use caution while installing, ensure the connector is installed straight onto the terminals of the headlights; they can easily bend and break.

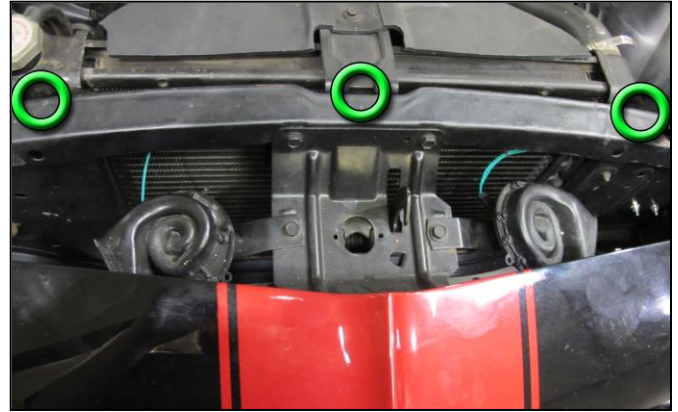
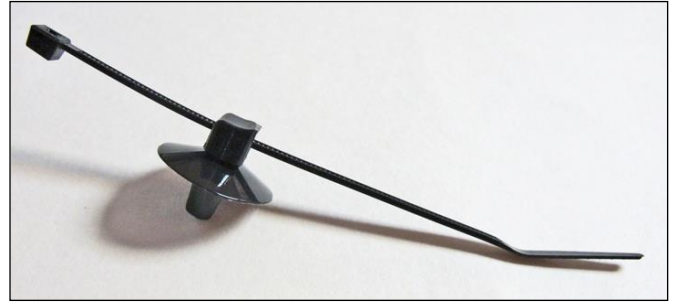
If halogen bulbs are being used Painless recommends using Painless part **# 30815**. This headlight relay kit is needed to avoid overloading the headlight switch with the higher demands of halogen bulbs.



“Passenger Side Light Section Routing”

The remainder of Light Section now needs to be routed across the core support.

- It is easiest to first install the zip tie into the clip, as shown, and then push the clip into the hole. Once the clip is in place, the zip tie can then be tied around the harness. Remember to loosely install the zip ties. The zip ties should not be tightened until all wires of the Light Section are connected.
- Route the wires going to the passenger side across the core support. There are three ¼” holes on the core support from the factory that you can use. There is one in the middle and one on the left and right side of the core support, as indicated by the picture to the right. These holes are located on the back of the core support, between it and the radiator.



“Horn(s)”

This Painless harness is designed to work with the two factory installed horns, mounted in their original location. Both horn connectors in the Light Section will have labels reading “HORN”. The left connector will have two wires and the right connector will have one, they will all be labeled as follows:

Green: 16 gauge wires, printed **#924 HORN POWER**, this power wire comes from the fuse block mounted horn relay which is ground activated by the horn button on the steering column. These wires only have power when the horn button is pressed.

- Locate the power connection tab on the horns, this will simply be a tab coming out of the side. Horns ground through their mounting bracket, so they only require a power connection. A good clean surface where the horn mounts to the hood latch support will help with the ground connection.
- Add a small portion of dielectric grease to each connector and plug them into their respective horns



“Right Turn/Park Light”, “Right Ground”, “Right Headlight”, & “Right Marker Light”

The 4 connections mentioned above all connect in the same manner as those on the left side. The only difference you will find is the Turn signal wire for the right turn signal is a different color than that one used for the left turn signal. The right Turn signal will be an 18 gauge Blue wire.

“Main Ground”

The ground on the right side, or passenger side, of the vehicle is intended to connect directly to the negative side of the battery. This will tie all of the grounds found in the Painless harness directly back to the battery, as explained in the Grounds portion of this manual on page 14.

- Connect the 10 gauge Black wire, printed **#969 BATTERY "-"/ GROUND SOURCE** to the negative side of the battery.
- If the battery has been relocated to the trunk, or a side post battery is being used. Connect this wire to the core support where the factory ground wire for the passenger side headlight was connected, next to the headlamp access hole. Makes sure the ground area is clean of dirt, rust and/or paint. Small star washers have been provided to help with this connection.
- Source a ring terminal and heat shrink from the parts kit to accommodate the bolt of the negative battery lug or screw used on the core support.



“Ammeter B+”

Painless recommends the use of a voltmeter over an ammeter in most applications. Ammeters are notorious for being inaccurate. Many factors will affect the way an ammeter will read, and with the changes from a factory harness, chances are, your ammeter will be even less accurate. For starters, the ammeter will only read properly if the alternator being used has an output no greater than 65 amps. **If you have an alternator exceeding 65 amps, DO NOT CONNECT THE AMMETER.** Other things that will affect the ammeter are: the charge wire provided with this new harness is larger than the factory original charge wire, the core support mounted horn relay (where one side of the ammeter original connected to) is no longer used, and the distance between alternator and battery where the under hood ammeter connections are made now vary. If the factory ammeter in the center console gauge cluster is used it will indicate if the electrical system is charging or discharging, but the displayed amp reading will more than likely be inaccurate. An aftermarket voltmeter is available that will fit in an original style center console gauge cluster, an example can be seen in the picture to the right.

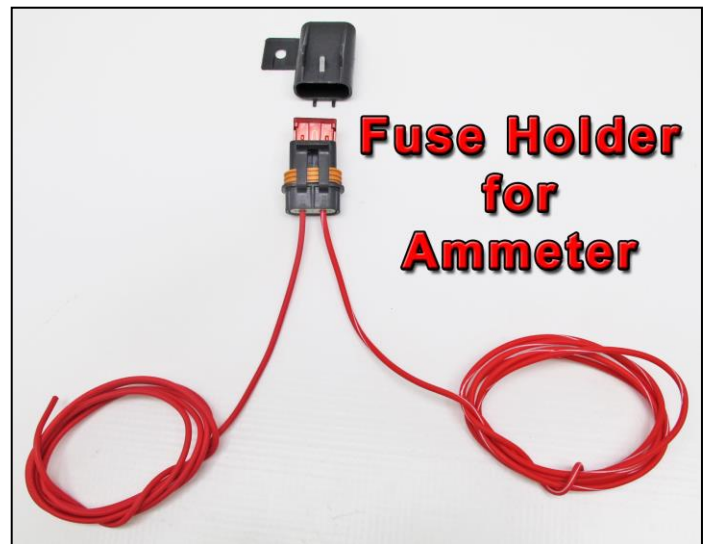


This connection will need to be made if an original style ammeter, mounted in the center console, is going to be used. The single Red/White wire will be connected directly to the battery's positive post using the supplied pigtail with a fuse holder attached, as seen in the picture below. The wire will have a label reading "AMMETER B+" and a description of this wire is provided below:

Red/White: 14 gauge wire, printed **#935 AMMETER BATTERY SOURCE**, this wire will provide a sample of battery voltage through the bulkhead to the factory style ammeter found in the center console, and can be seen in the [Charge/Battery Power Schematic](#) on page 57. This wire will have constant battery voltage if used.

If a factory ammeter is going to be used this wire will need to be connected to the positive post of the battery using the supplied pigtail and fuse holder. The 10 amp fuse is necessary because this wire will not be fused at the fuse block and will be connected directly to the ammeter or voltmeter. If an factory style ammeter will not be used this wire can be removed from the front harness by following the instructions on page 24-25.

- Start by mounting the fuse holder, seen in the picture to the right, in an appropriate location near the battery. A self-taping screw has been provided to secure the fuse holder. The leads on this pig tail are 48" long, so keep that in consideration when picking a mounting location.



- Route the 14 gauge Red/White wire coming from the fuse holder, printed **#935 AMMETER BATTERY SOURCE**, to the location of the 14 gauge Red/White **#935**, which was described above. This wire will be located near the passenger side headlight connection. Cut both **#935** wires to length and splice them together using the supplied splice and weather proof heat shrink.
- Now route the 14 gauge Red wire attached to the fuse holder, printed **#935 AMMETER BATTERY SOURCE>>>TO B+>>>**, to the positive post of your battery, cut to length and terminate with the correct size ring terminal and weather proof heat shrink, then connect to the positive battery cable **(do not connect to cable to the battery until instructed to do so)**. If your battery is remotely mounted simply route this wire to the main battery post on your starter and make the connection there, exactly like the main power feed for the harness, as described on pages 55-56.

This concludes all of the connections in the **Light Section** of the engine harness. Go back and inspect the harness layout and once satisfied it is free of moving parts and sharp edges tighten any loose zip ties.

Engine Harness

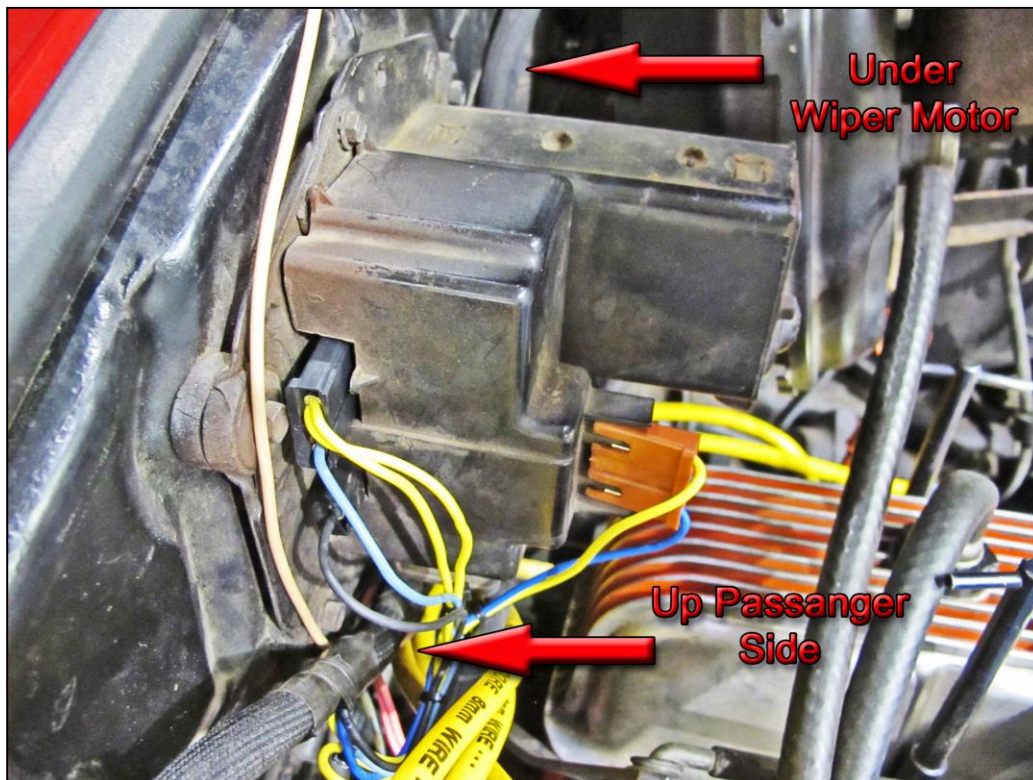
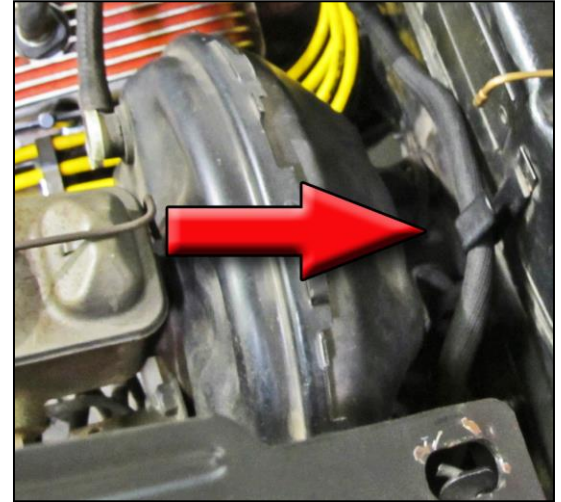
With the exception of the Wiper Motor, Washer Pump and blower motor connections, this section of the harness is universal in nature as it is intended to fit multiple, engine, ignition, and charging system applications. Being universal, means all wires will be open ended and will need to be routed, cut to length, and then have the appropriate terminal installed.

Routing of this section will take the harness across the firewall, towards the passenger side of the vehicle.

- The factory harness sat in a harness hook located above the master cylinder, seen in the picture to the right.

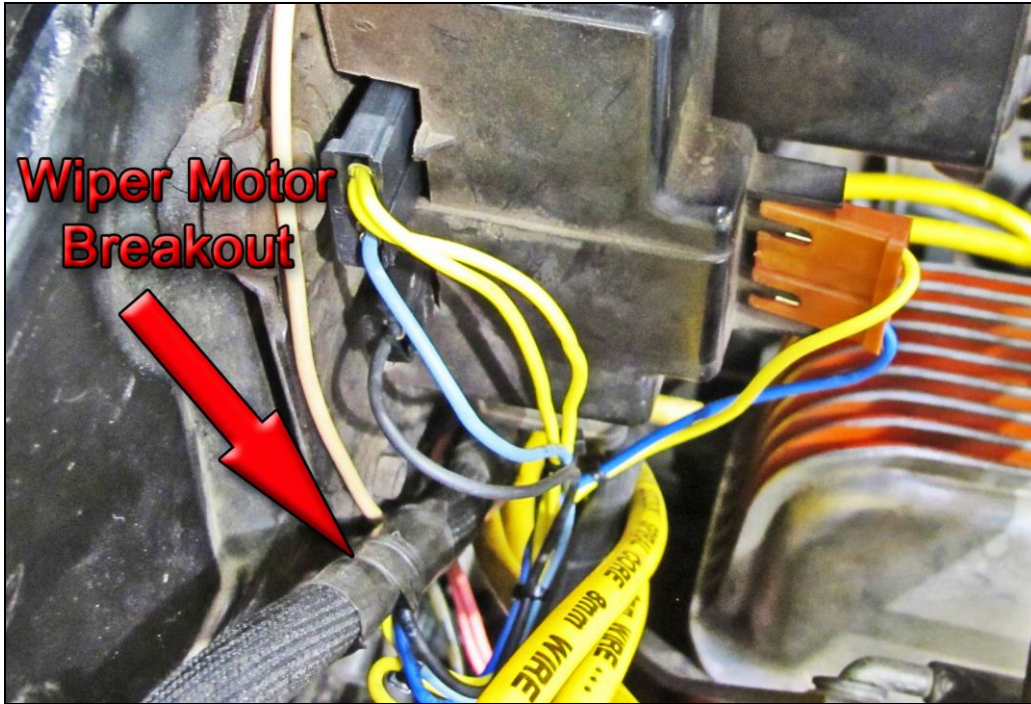
If the hook is no longer in place, an adel clamp has been included. You can either use a supplied self-tapping screw, a Rivnut or simply drill a hole and use any appropriate length 1/4" bolt and nut.

- Once the harness is secure in this location, route the harness under then up the passenger side of the wiper motor, as seen below
- At this point, the remainder of the Engine Harness will be routed as individual connections are made.



“Wiper Motor”

The Wiper Motor is mounted on the firewall. It receives ground signals from the wiper switch in order to operate. The power feeding the wiper motor comes from the 15 amp WIPER fuse and will have power anytime the key is turned in the “ON/RUN” position. The wires that make up the “Wiper Motor” connection can be seen in the [Wiper System Schematic](#) on page 98.



Locate the group of wires in the Painless harness labeled “Wiper Motor”. There will be two connectors, a 2 pin connector and 1 single pin connector; these wires are:

Black 2 Pin Connector

Light Blue: 16 gauge wire, printed **#979 WIPER MOTOR (LOW)**, this is a ground signal from the wiper switch.

(2) Yellow: 16 gauge wires, printed **#982 WIPER MOTOR POWER**, one wire will supply switched ignition power to the wiper motor from the 15 amp WIPERS fuse on the fuse block. The other yellow wire is unprinted and provides power to the washer pump.

Single Pin Connector *(can be a black or red connector depending on the connectors on hand when assembled)*

Black: 16 gauge wire, printed **#977 WIPER SWITCH (HIGH)**, this is a ground signal from the wiper switch.

- Look at the picture above and take note of the location and orientation of the connectors on the wiper motor. Plug the connectors in exactly as shown in the picture, with the yellow wires in the upper position on the two pin connector (towards the back of the wiper motor) and the single pin connector plugged in just below the two pin connector. The Brown 2 pin connector shown will be discussed in the next section.

“Washer Pump”

The Washer Pump receives a ground signal from the wiper switch to activate the pump. Once activated, it will pump washer fluid from the reservoir to the washer nozzles at the base of the wiper cowl below the windshield.

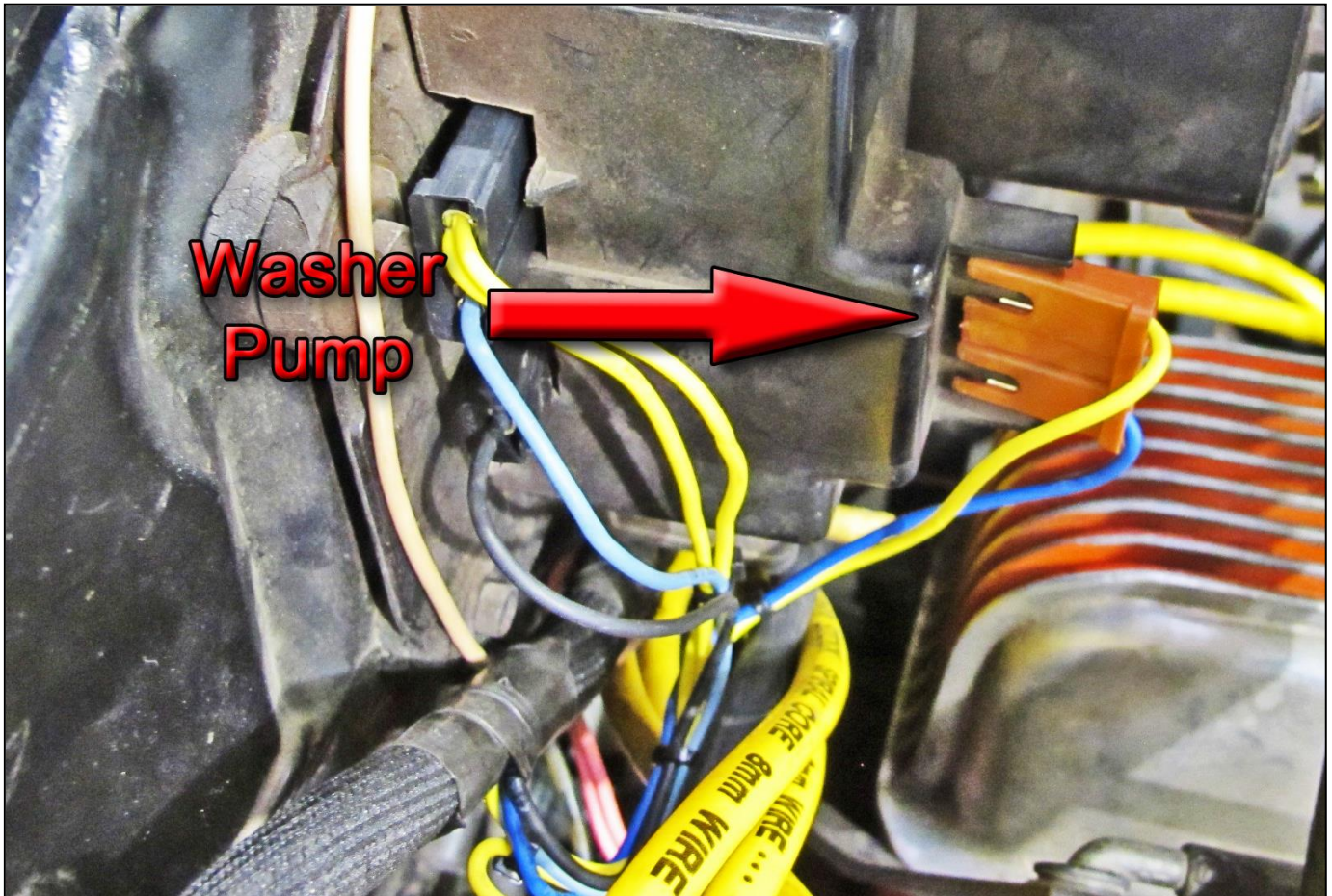
Two wires are required for proper connection to the Washer Pump. This will be a 2 pin brown/tan connector on the Painless harness with a label reading “WASHER PUMP”. The wires in this connector are:

Blue: 16 gauge wire printed with **#984 WASHER PUMP GROUND ACTIVATION**, this wire will provide the Washer Pump with a ground source from the wiper switch when the switch is in the *Wash* position.

Yellow: 16 gauge wire, **not printed**, this wire supplies power to the Washer Pump from the 15 amp Wiper fuse on the fuse block. This wire will have power anytime the key is in the *ON/RUN* or *ACC* positions.

These wires can be seen in the [Wiper System Schematic](#) on page 98.

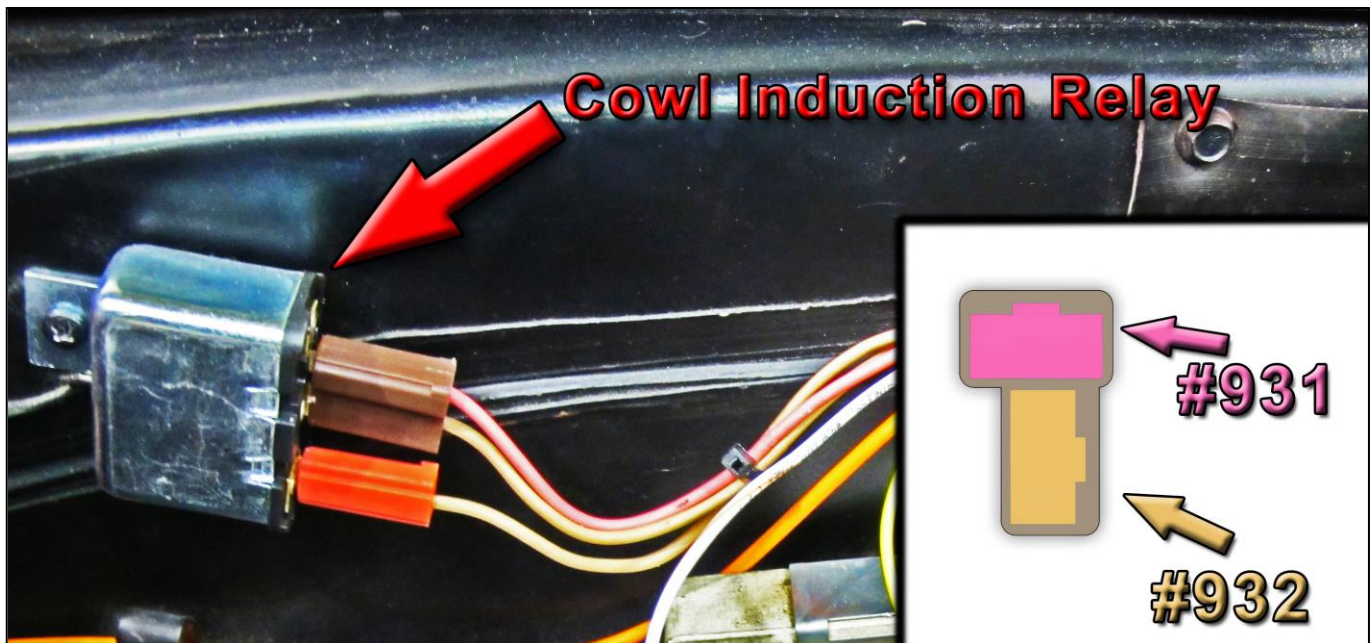
- Connect these wires to the 2 tabs on the front of the Wiper Motor. Make sure when plugging this connector onto the appropriate tabs the yellow wire is on top, as shown in the picture below.



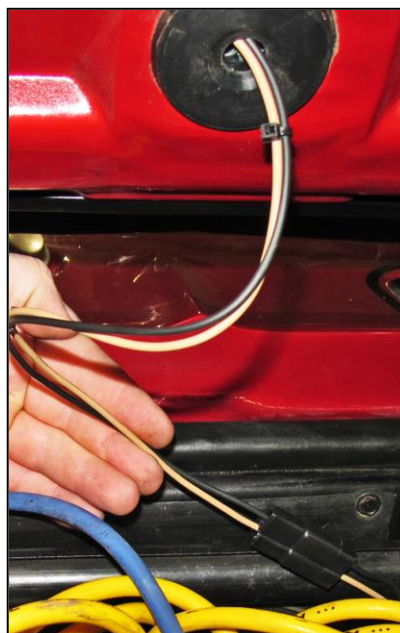
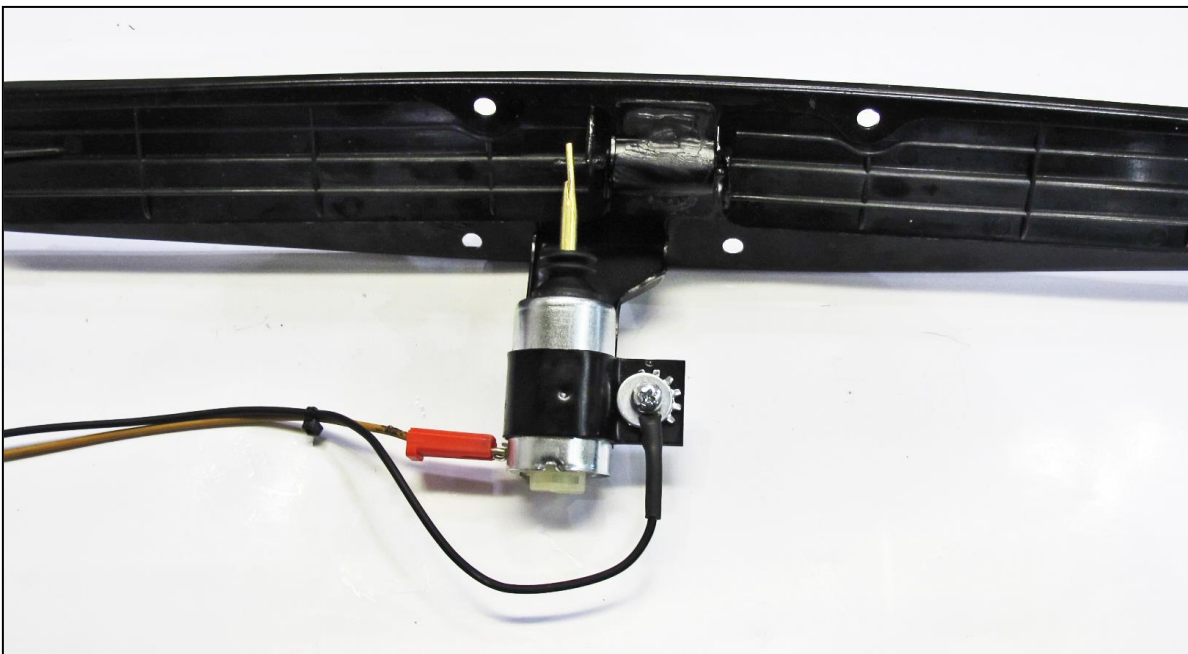
“Factory Cowl Induction- optional”

If you have added the optional wiring for the factory style cowl induction system, as described on page 25, you can now terminate these optional wires. If the factory style cowl induction system is not going to be used please skip to the next section.

- Start by routing the pink wire, printed **#931 IGN SWITCHED POWER>>>TO COWL SWITCH**, to the cowl induction activation switch, which can be found on the rear drivers side of the engine, attached to a lever that is actuated by the throttle. You can either use the supplied two pin connector found in the Cowl induction bag kit or simply reuse the factory molded rubber connector by using the supplied splices. Cut the wire to length (making sure there is enough slack for the switch to move properly), strip ¼” of insulation off the end and terminate it using the supplied terminal and a pair of rollover crimpers. Plug the terminal into one side of the two pin connector that was supplied, it doesn’t matter which location you plug this wire into on the connector.
- Now take the remaining pink wire **#931**, that was cut off in the previous step, and strip ¼” of insulation from it. Use the rollover crimper to crimp on one of the supplied terminals. You can now plug this terminal into the other cavity of the two pin connector. Route the unterminated end of this wire to the same area as the tan wire mentioned on page 25.
- Route the unterminated end of pink **#931** and tan **#932** to the cowl induction system relay that can be found on the passenger side of the fire wall, as seen in the picture below. Cut both wires to length and crimp on the supplied terminals using a pair of rollover crimpers. Plug to terminals into the appropriate cavity, as shown in the picture below.



- Now take the remaining tan wire from the “Cowl Induction” bag kit. This 14ga tan wire, printed #932<<<COWL INDUCTION RELAY TO COWL SOLENOID>>>, and plug the connector end to the remaining tab on the Cowl Induction relay.
- Route the unterminated end of this tan wire to the grommet in the hood for the Cowl Induction Solenoid. Cut this wire to length, then strip ¼” of insulation from the cut end and terminate the wire using the supplied terminal with a set of rollover crimpers. You can now plug the single wire connector onto the tab on the cowl induction solenoid. You may want to run a dedicated ground wire to the solenoid to avoid issue with grounding the solenoid through the hood. Simply use a length of 14ga black wire (not supplied) and a couple of ring terminals to make a grounding wire that will run from the Cowl Solenoid bracket to a good clean grounding spot on the body as seen in the pictures below. Also you may want to put a two pin connector (not supplied) in line on of these wires to make removal of the hood easier in the future.



Engine Section

The Engine Section consists of four wires for connections to oil pressure and coolant temperature sending units for the gauges, and a connection for an electric choke on a carburetor. Locations of all of these components will vary from vehicle to vehicle so no specific routing instructions can be given.

All wires of the Engine Section are open ended wires, meaning they do not have terminals or connectors pre-installed. This is because all wires have ample length to account for the numerous way components can be mounted inside an engine compartment.

“Engine Sending Units/Switches”

If you are using aftermarket mechanical gauges, then no connections will need to be made. You can skip to the next connection, “Electric Choke” on page 43.

Sending units work based on resistance to ground. Meaning the cooler the engine or less oil pressure seen, the more ground (less resistance) these sending units will provide to the wire connected to them. As the ground resistance strengthens as the temps and/or pressure builds, less ground is applied to the gauge. As the ground signal weakens, the needle on the gauge moves to read higher temps and/or higher oil pressure. If you were to not connect these at all, the gauges would peg to their highest reading.

A simple troubleshooting procedure is provided on page 114 to help trouble shoot nonfunctioning gauges after the entire harness has been installed, will further explain how these work and offer you a hands on visual how they work.

Cars equipped with a factory indicator lights, in the dash, have switches instead of sending units. These switches simply send a ground signal to the light to turn it on when the temperature is high or oil pressure low enough to cause the switch to close.

“Coolant Temp”

Locate the 18 gauge Green wire printed **#921 COOLANT TEMPERATURE SIGNAL**. This wire will send a ground signal through the bulkhead into the interior of the vehicle to the gauge cluster and aftermarket gauge connector. If you are using an aftermarket mechanical gauge, this wire will not be used. This wire will work with aftermarket electrical gauges and senders.

The coolant temp sending unit/switch can be mounted in the intake manifold or in the side of either cylinder head. These will have a peg, tab or threaded post to connect to. Two wire temperature sensors on fuel injected engines that have weatherproof connectors are for engine computer input, not for a gauge signal. Also, if connecting to an engine in a vehicle that has electric fans, make certain you know the difference between the coolant temp sensor and the electric fan thermostatic switch. Both of these sensors can look identical.



If you are installing a new temp sensor, if sealant is needed, **use a paste type sealant and not Teflon tape** on the sensor threads. The tape will interfere with the ground source the sensor needs to read correctly.

- Route this Green **#921** wire to the coolant temp sensor, cut to length, install the appropriate terminal for your connection, and connect.

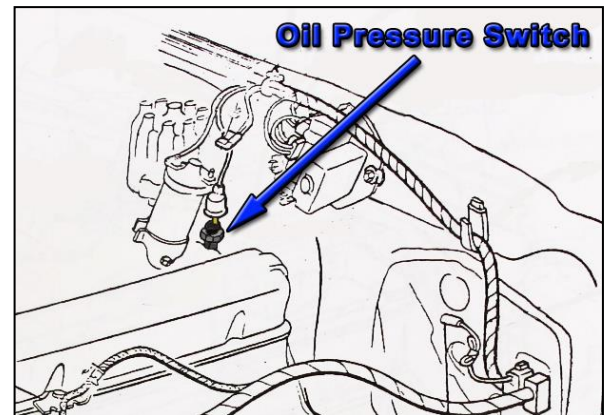
Terminals and a factory style connector, seen in the photo to the right, have been supplied to allow connecting to a factory style sensor; like shown on the previous page. Rollover crimpers will be needed to properly install this terminal.



“Oil Pressure”

This engine harness will have two wires for oil pressure that serve different purposes. There will be an 18 gauge Blue wire and 18 gauge Blue wire with a White stripe in the section labeled “ENGINE SECTION”. Below is brief description of each wire along with their intended usage:

Blue: 18 gauge wire, printed **#969 OIL PRESSURE SWITCH GROUND**, this wire connects the low oil pressure indicator light in the dash, through the bulkhead, to the factory oil pressure switch located near the distributor, as seen in the drawing on the right. This switch will supply a path to ground when the oil pressure in the vehicle drops below a predetermined point. Vehicles that were factory equipped with center console gauges will not have this sensor, as the oil pressure is read by a mechanical gauge which has pressurized oil supplied to it through a small plastic tube, however a factory switch can be added if you would like the indicator light to function on the dash.



Blue/White: 18 gauge wire with a white stripe printed **#922 OIL PRESURE SIGNAL**, this wire will send a ground signal from the sending unit through the bulkhead into the interior of the vehicle to the aftermarket gauge connector. This wire will be used only if an aftermarket electric oil pressure gauge is being used. A picture of a common aftermarket oil pressure sending unit can be seen in the picture to the lower right

Depending on your application you will either use just one, both or none of these wires. If the factory indicator light in the dash is going to be used a factory oil pressure switch, as seen in the drawing above, will need to be installed on the motor. If you will be using an aftermarket electric oil pressure gauge you will need to install the oil pressure sending unit, which was supplied with the oil pressure gauge. Both a factory oil pressure switch and an aftermarket oil pressure gauge can be used, however you will need to determine where to install both sending units, as the location of oil pressure ports will vary depending on the engine being used. If you plan on using just the factory mechanical oil pressure gauge found in the center console then you can opt to not connect either wire.



- Route the Blue/White **#922** wire and/or the Blue **#969** wire to the correct oil pressure sending unit or switch, as described above, and install the appropriate supplied terminal or single pin connector that is correct for your connection, and connect. If either or both wires are unused simply remove them from the bulkhead as described on page 24-25 and keep them in case you make a future change to the vehicle.

“Electric Choke”

Locate the 14 gauge pink wire printed **#954 CHOKE POWER**. This wire will provide a switched ignition power source to the choke from the 10 amp CHOKE fuse. This wire will have power when the ignition switch is in the ON/RUN position.

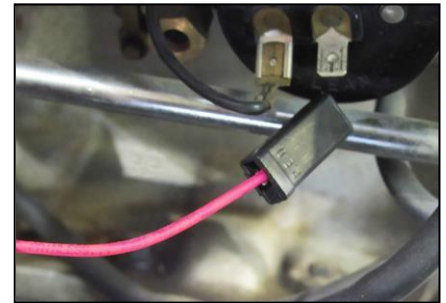
When you turn your key to the “ON/RUN” position, the voltage this wire carries will heat the bi-metal spring attached to the shaft of the choke. This spring will unravel as it is heated causing the choke to slowly open. When the ignition is turned to the “OFF” position, power is no longer on this wire, causing the spring to begin to cool and contract, closing the choke.



If you do not have an electric choke, or even a carburetor, this wire will not be needed and can be removed from the harness. It can also be used to power an aftermarket accessory or a factory component not supported by the Painless harness, like the Turbo 400 TCS relay.

- Route this pink **#954** wire to the + terminal of the electric choke, install the appropriate terminal and connector for your connection, and connect.

Ensure the choke is properly grounded, a ground wire is not supplied in the Painless harness, before continuing with the installation.



Coil/Ignition

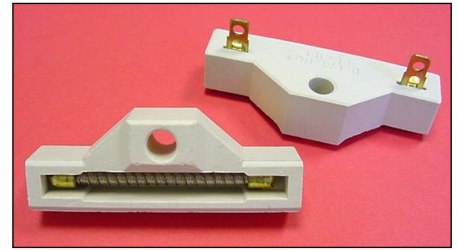
The wires marked **Ignition Section** are for Coil/Ignition connections. Usage of only one or both these wires will depend on the components used in your particular installation. These two wires will be exceptionally long compared to the other wires of the engine harness. This is to account for those who may have an ignition box mounted inside the vehicle or on the passenger side of the vehicle.

“Coil Power”

Locate the 16 gauge White/Orange wire, it will be printed with **#920 COIL POWER (“+”)**. This wire comes through the bulkhead from the 20 amp COIL fuse. An added bonus of the coil fuse is it also provides a built in theft deterrent. Removing the COIL fuse from the fuse block when the car is parked for periods of time will not allow the ignition system to function, making the vehicle impossible to start/run. This wire will provide the Coil or ignition system with switched power in one of four ways depending on your ignition system, one of the processes explained on the following four pages will walk you through this connection:

Points & Electronic Ignition w/ "Resistor Required" Coil

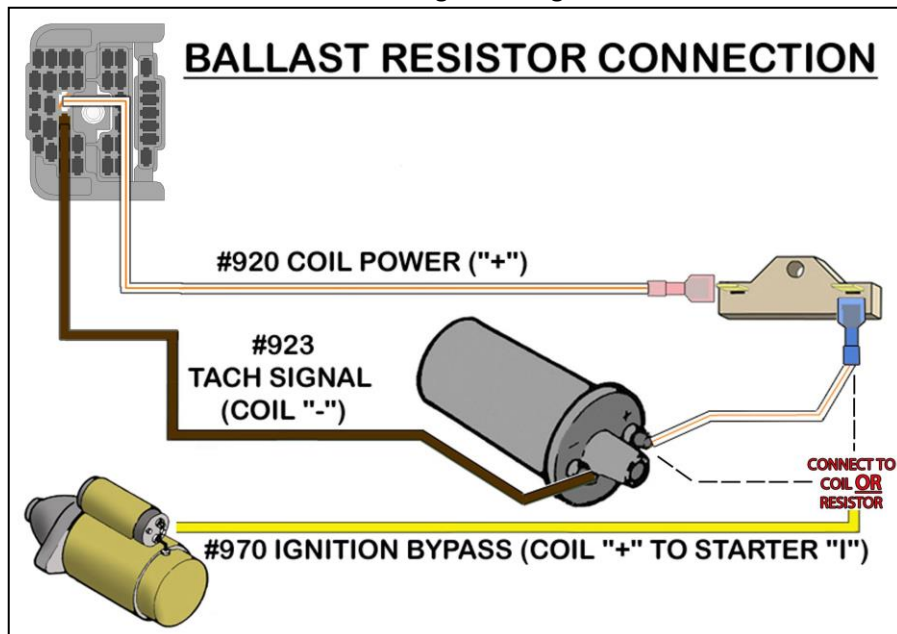
- If the Coil you are using is not internally resisted, a ballast resistor along with the Yellow wire mentioned in the next step, must be used. A coil will usually have some kind of print on it that states "RESISTOR REQUIRED" or "NO RESISTOR REQUIRED". A ballast resistor, not included due to a lack of usage, resists the current going to the coil. **If a coil is not internally resisted and a ballast resistor is not used the coil will overheat within a few minutes to the point it will no longer work.** Your factory harness used a resistance wire to accomplish this. If you need a ballast resistor, which has a universal part number RU-11, contact Painless, your favorite parts supplier, or your local auto parts store. See the [Ballast Resistor Connection Diagram](#) below.



- Using a self-tapping screw or other appropriate hardware, mount the ballast resistor to the firewall. The resistor gets very hot during operation so do not mount this to any kind of plastic.
- Route the #920 to one side of the resistor, it does not matter which side. Cut to length, save the cut off piece of wire, strip ¼ of wire and install either a pink weather proof insulated terminal or a factory style terminal and connector.
- Plug this wire onto one side of the ballast resistor.
- The cut off piece of #920 will now connect the other side of the resistor and to the positive (+) side of the coil. Before making any connections, a bypass wire from the parts kit will also need to be installed, as seen in the [Ballast Resistor Connection Diagram](#) on the bottom of this page.

"Ignition Bypass"

Locate the 16 gauge Yellow wire printed #970 IGNITION BYPASS (COIL "+" TO STARTER "I"). At this time, only connection to the coil or resistor is taking place, however, when this wire is connected to the starter, as indicated in a later step on page 58, it will supply a full 12v to the coil when the ignition switch is in the START or "crank" position. The purpose of this wire is to provide the coil full 12v power when the starter solenoid is engaged by bypassing the ballast resistor and going directly to the coil. This is done to facilitate starting the engine and will not harm the coil.



This wire will only be needed if you are using a ballast resistor. Most installs will not need this wire. Simply remove this wire from the engine harness before installation if it is not needed.

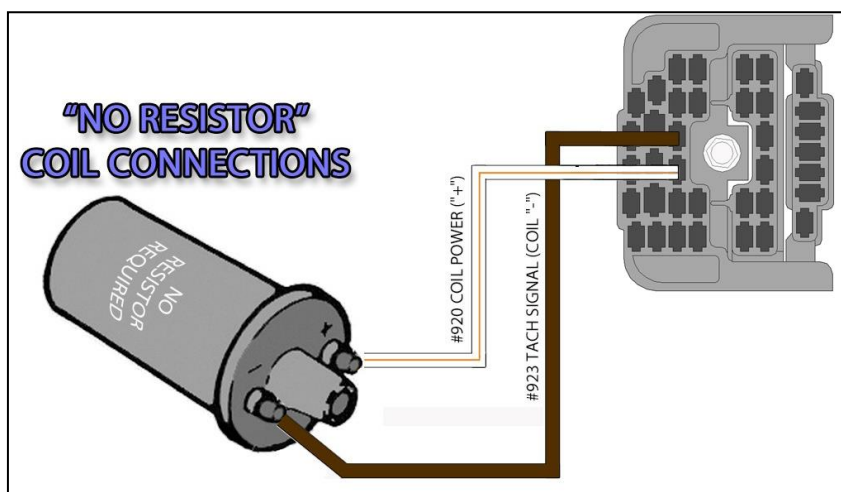
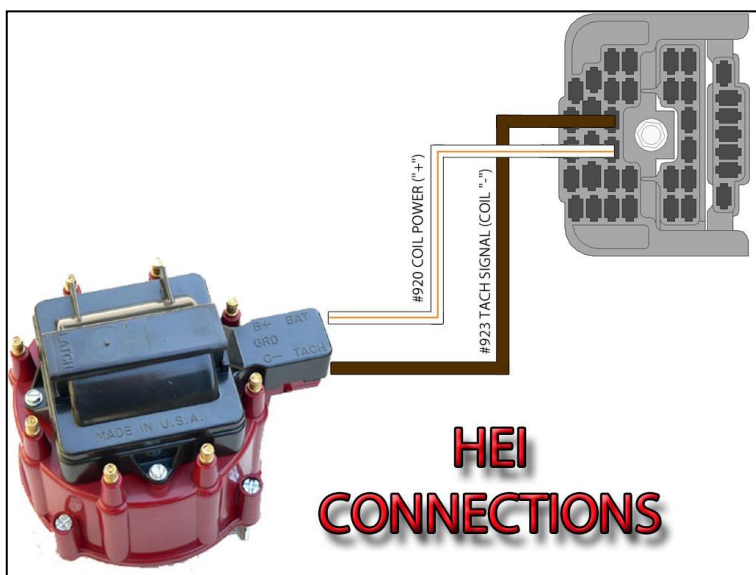
- Connect the Yellow #970 wire to the + side of the Coil or to the output side of the Ballast resistor. The [Ballast Resistor Connection Diagram](#), on the previous page, has been created to aid in this connection. If it is connected to the ballast resistor, double this #970 with the #920 into one terminal as shown in the schematic.

“HEI & Resisted Coils”

- HEI coils and internally resisted coils do not require the use of a ballast resistor. The #920 wire will connect directly to the + side of the coil. See the [“NO Resistor” Connection Diagram](#) below.

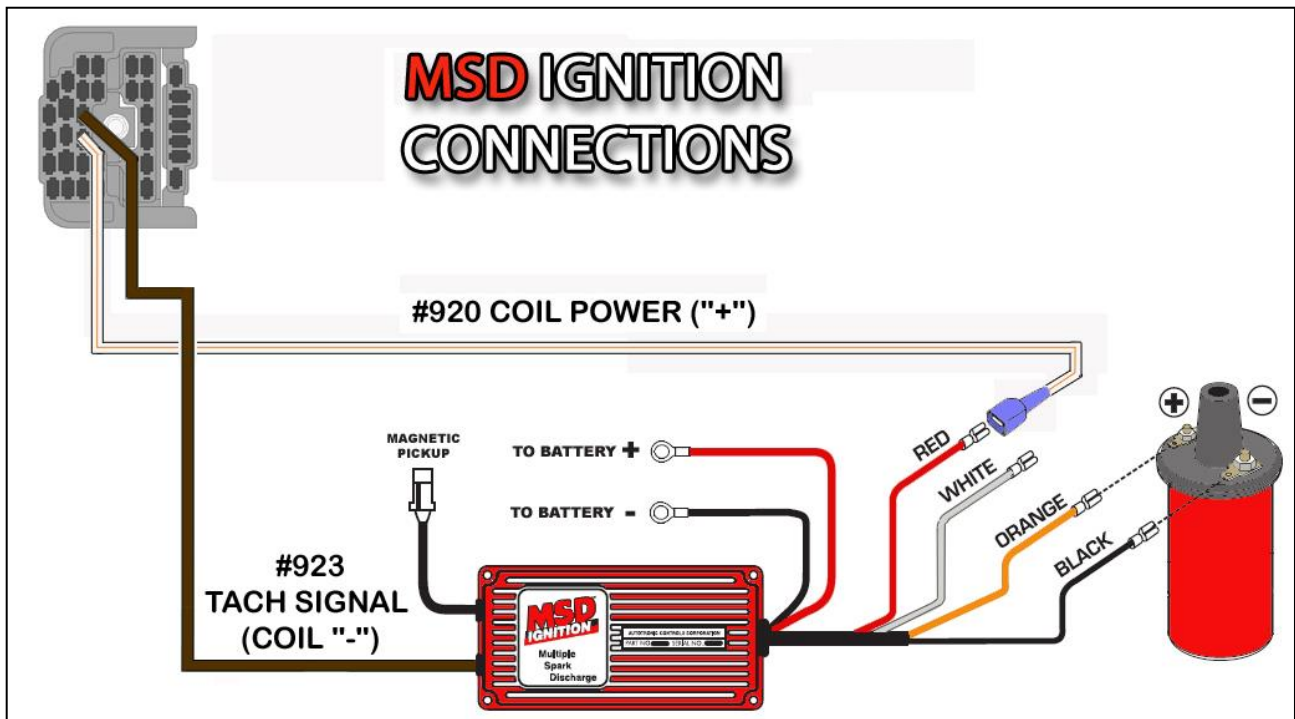
- Route this white/orange #920 wire to its proper connection point and cut to length, install the appropriate terminal for your connection, and connect.

Terminals and a factory style connector, seen in the photo at right, have been supplied to allow connecting to the + side of a HEI Coil. Rollover crimpers will be used to properly install this terminal. Weatherproof insulated terminals have been supplied in the parts kit to make connections to other coils.



“Aftermarket Ignition Box”

- If an aftermarket Ignition box is being used, like an MSD, Accel, etc., this White/Orange #920 wire will supply the Ignition box with the switched power source it requires. This wire will go to the aftermarket ignition box and **not to the Coil**; the Ignition Box will provide the Coil + connection. This White/Orange #920 wire may need to be pulled from the **Engine/Ignition Section** and routed to where the box is mounted; extra length has been added to the #920 wire to accommodate different mounting locations of the ignition box in the engine compartment. See the Ignition box manufacturer's instructions for a specific connection point of this power source. See [MSD Ignition Connection](#) below.



“Fuel Injection”

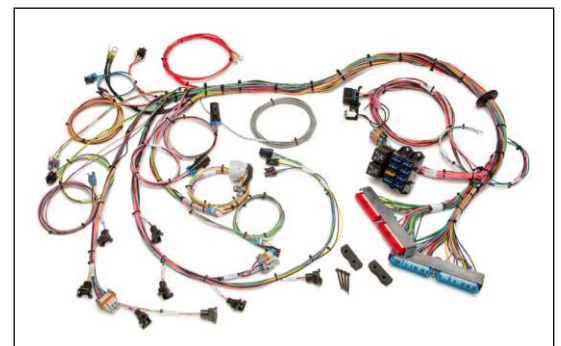
- If you have converted to fuel injection and are using a standalone harness, like all of Painless' fuel injection harnesses, and coil power is supplied though the fuel injection harness. This White/Orange #920 wire will provide the fuel injection harness with the switched power source the harness requires. If using a Painless fuel injection harness, this White/Orange #920 wire will connect to the open ended Pink wire of the fuel injection harness labeled “IGN” or “Fuse Block IGN”.

Painless offers numerous stand-alone fuel injection harness that will allow the transplant of just about any factory GM fuel injection into your Camaro:

TPI Vortec LT1 LS1 LS2 LS3

Gen III 4.8 / 5.3 / 6.0 Gen IV 4.8 / 5.3 / 6.0 / 6.2

[Go to PainlessPerformance.com](http://PainlessPerformance.com) for details

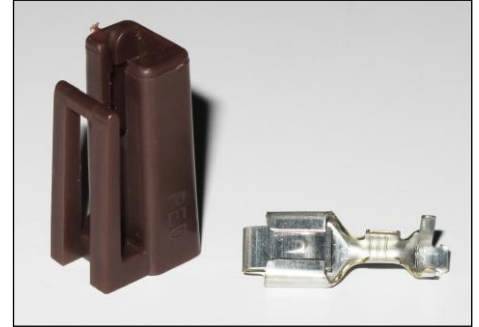


“Tachometer”

Locate the 18 gauge Brown wire printed **#923 TACH SIGNAL (COIL "-")**. This wire will send tachometer signal through the bulkhead into the interior of the vehicle to the gauge cluster. This wire will only be connected if you are using a tachometer (factory or aftermarket). If you do not have a tachometer, this wire may be removed from the harness. Depending on your ignition system (factory or aftermarket) or use of fuel injection, the connection of this **#923** wire can vary:

- Standard factory type of installs with a HEI distributor or external coil ignition systems, will require this **#923** wire to be connected to the negative “-” side of the coil. Refer to the schematics on page 44 and 45.

Terminals and a factory style connector have been supplied to allow connecting to the - side of a HEI Coil, seen in the photo at right, rollover crimpers will be needed to properly install this terminal. Insulated terminals in the parts kit have been supplied to make other connections.



- If an aftermarket ignition box is being used, like an MSD, Accel, etc., this **#923** wire will connect to the tach output found on the ignition box. Refer to the [*MSD Ignition Connection*](#) on the previous page and to the ignition manufacturer’s installation procedure.
- If you are running fuel injection and your ECM has a tach output wire, this **#923** wire will connect to the tach output wire from the ECM.

- Route this Brown **#923** tach signal wire to its proper connection point and cut to length, install the appropriate terminal for your connection, and connect.

Alternator Section

The **Alternator Section** consists of 3 wires for connections to the alternator. Wires for an external voltage regulator are not supplied. Instructions on pages 54-55 are supplied describing how to connect the two wires of this section as well as how to add additional wires to make a connection to an external voltage regulator.

Before routing your alternator wiring you may want to take into consideration several aspects of your build such as battery and alternator location. Due to the large variety of engine and accessory drives installed in 1969 Camaros your alternator may be mounted in one of several different locations. Because of these possible variations you might need to move the alternator and main power wires from the “Engine Section” to the “Lighting Section” of your front harness.

If you leave these wires in the “Engine Section” they will be routed along the top of the firewall in the rear of the engine compartment, allowing you to run your alternator wiring along your intake manifold, which can make for a cleaner looking installation in some cases. If you opt to move the alternator and main power wires to the “Lighting Section” you will be able to route your wiring in the same location the factory did. The top of the next page shows a pictures displaying the two possible routing options.



“Alternator”

Locate the three wires intended for alternator connections; they will be grouped together with a labels reading “ALT”. These wires are:

Red: 6 gauge wire, with a label printed **#915 ALTERNATOR OUTPUT**, this wire will provide power out of the alternator to the chassis harness through a large splice, then back to the battery through the MIDI fuse. See [Charge/Battery Power Schematic](#) on page 57.

Red: 14 gauge wire, printed **#995 ALTERNATOR BATTERY POWER SAMPLE**, this wire will provide a battery power source, or amperage sample that the alternator voltage regulator requires. This wire will have power at all times and comes from the large battery supply splice in the harness. **This wire will not be needed if you have a one wire alternator or any of the CS series alternators.** See [Charge/Battery Power Schematic](#) on page 57.

Brown: 16 gauge brown wire, printed **#914 ALTERNATOR EXCITER**, this wire will have switched ignition power directly from the ignition switch. **This wire will not be needed if you have a one wire alternator.**

1969 Camaros originally had an external voltage regulator, however most have been changed over to the internally regulated 10-SI or 12-SI alternator. If your vehicle has had a fuel injection motor swap or has had the accessory brackets updated to a serpentine system, your vehicle will likely have a newer style alternator: CS-130, CS-144, or CS-130D.

The alternator connections will vary depending on the alternator your vehicle currently has installed. Identify the group of instructions on the following pages that fit the alternator your vehicle has. The alternator may also need to be removed in order to gain access to the connection points.

- Before removing the alternator from the accessory bracket, route the alternator wires to their connection points and cut to length.
- Using the supplied instructions on the following pages, connect the **#995** and **#914** wires to the Alternator or external regulator.
- If a one wire alternator is being used, these wires will not be needed, refer to the next page on what to do with these two wires.

Locate the bag kit provided with the Painless harness labeled "ALTERNATOR". This bag kit will contain hardware needed to make the appropriate connections to the alternator as well as contain a covered inline fuse holder.



The one connection all alternators will have in common is the output post. This will send amperage from the alternator to the battery. Locate the red 6 gauge wire, with a label printed **#915 ALTERNATOR OUTPUT**, then proceed onto the following steps:

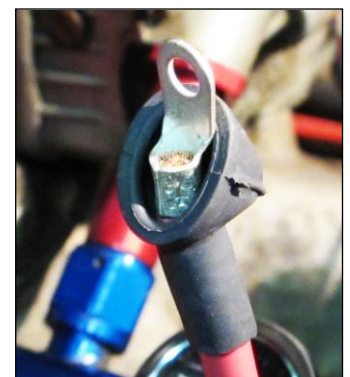
- Route the 6 gauge wire, with a label printed **#915 ALTERNATOR OUTPUT**, to the alternator. Cut the wire to length, making sure that the wire will be able to move freely as the engine revs once the wire is connected.
- Locate the rubber alternator boot and a large un-insulated ring terminal from the "ALTERNATOR" bag that has the right size opening for your alternator post. The piece of red heat shrink may be used over the terminal crimp if the alternator boot is not desired.
- If the rubber boot is being used, the end will need to be cut as shown in the photo below to allow the large gauge wire to pass through.



A very small amount of lubricant like WD-40 or motor oil may be applied on the inside of the rubber boot to allow the boot to slide down the wire more easily.

- With the boot on, strip about 3/8" of insulation from the charge wire and crimp the ring terminal on. You can use a pair of pliers and solder if your crimpers will not accept this large gauge wire/terminal.

If solder is used, do not over heat the wire, it will make the connection brittle and prone to failure



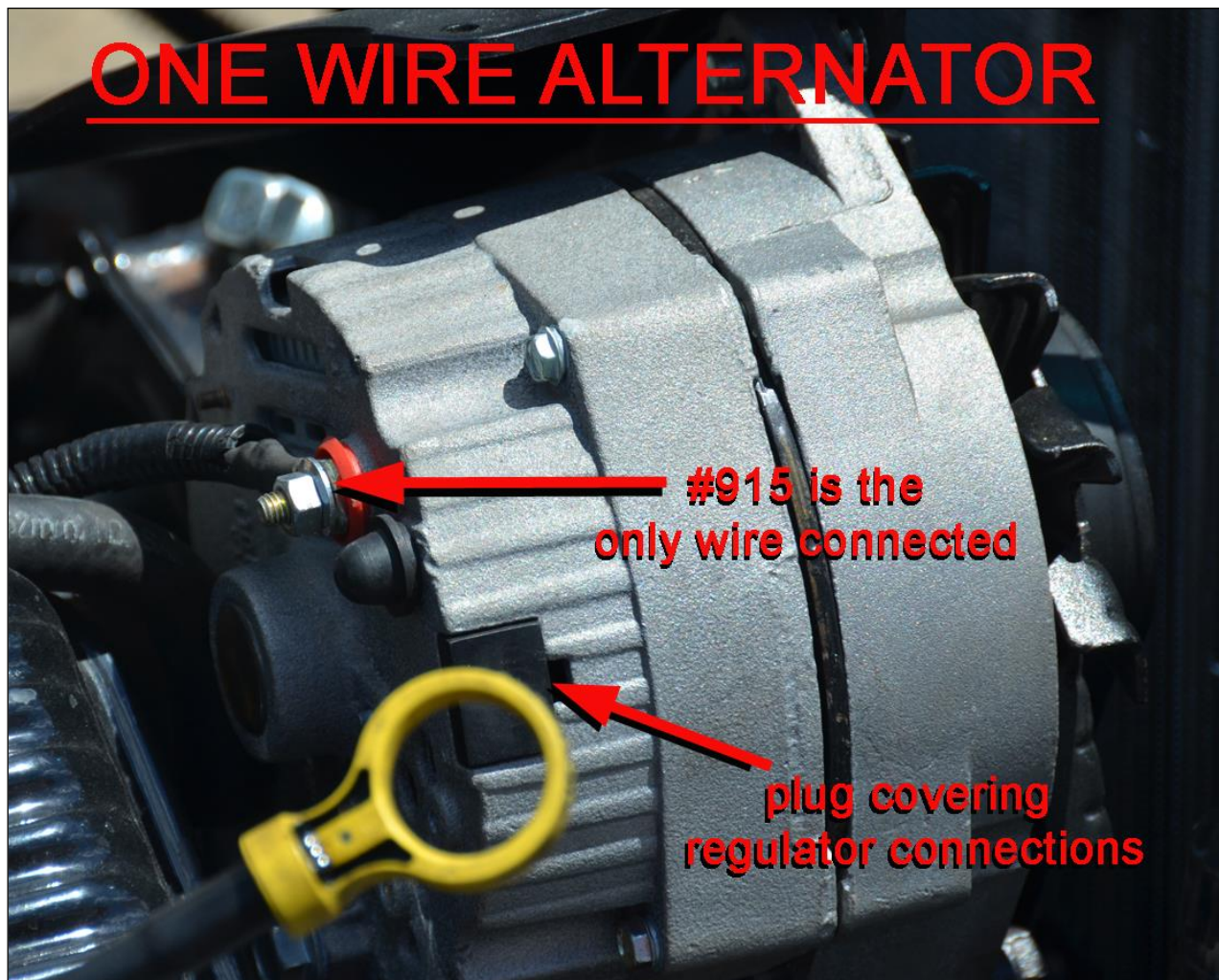
- Connect this wire to the B+/Output stud on the Alternator. Once the nut is on the stud on the output post has been tightened, the boot can now be slid up the wire to cover the nut and ring terminal installed on the Alternator.

One Wire Alternator

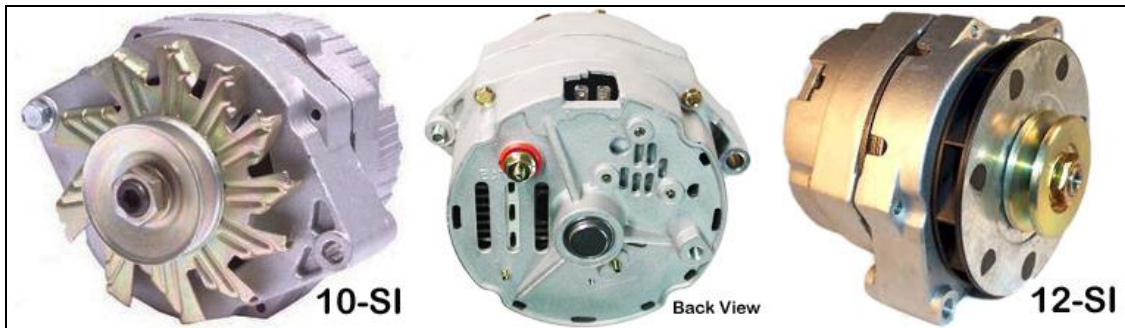
If your vehicle has an aftermarket one wire alternator or if the Painless or other aftermarket fuel injection harness you are using has an alternator connector, then this output wire, **#915**, is the only wire used to make the alternator connection.

The two wires, labeled “ALT.”, a 14 gauge red wire printed **#995 ALTERNATOR BATTERY POWER SAMPLE** and a 16 gauge brown wire labeled **#914 ALTERNATOR EXCITER**, can be removed from the harness. **#995** may be connected to the output post of the alternator with the **#915** output wire to avoid removing it from the harness since this wire goes into the large battery power splice.

The remaining alternator connections will vary based on what alternator is being used. Choose the alternator that best represents the alternator found on your vehicle from the 10-SI, CS-130 and CS-130D information on the next few pages and follow the instructions provided for your particular alternator.



SI Series Alternators



The 10-SI and 12-SI alternators are easy to identify. They will have an external fan behind the pulley, the 12-SI having enclosed style fan blades, and a two pin connection. This 2 pin connection can be seen on the middle image in the diagram above. These are also known as “Delco” or “Delcotron” alternators.

The two remaining wires, a 14 gauge red wire printed **#995 ALTERNATOR BATTERY POWER SAMPLE** and a 16 gauge brown wire labeled **#914 ALTERNATOR EXCITER**, will connect to the two posts on the back edge of the alternator.

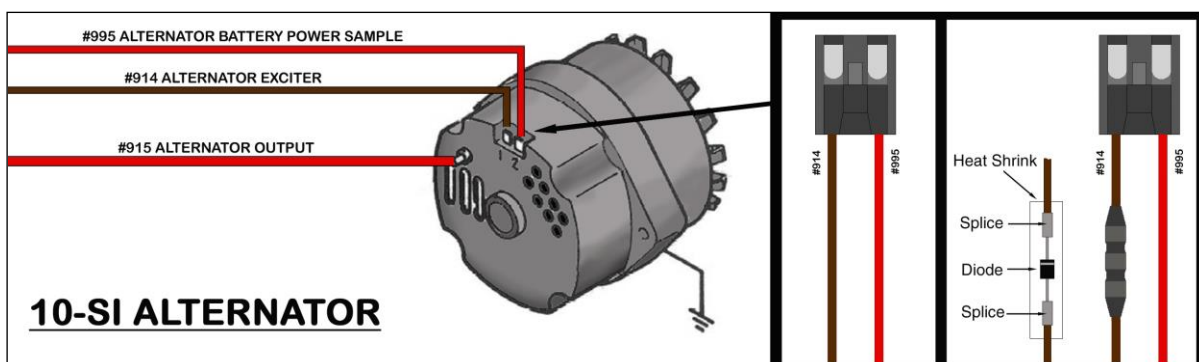
- Route the two wires to the 1 & 2 terminals on the alternator and cut to length. Strip ¼” of insulation from both wires.
- A factory style connector and terminals, seen in the photo, have been provided in the “ALTERNATOR” bag. Crimp a terminal onto each of the two wires.



In some cases, engine run on may be experienced during initial testing of a new harness install. This is caused when the alternator back feeds voltage down the **#914** wire after the key has been turned off. If this should happen unplug the alternator connector to shut the engine off.

If engine run on occurs, simply install the diode as shown below. When the diode is installed inline of the **#914** wire with the stripe towards the alternator, the diode will let voltage flow towards the alternator, but not away from the alternator towards the ignition system. This diode can be installed during connection of the **#914** wire as a precaution without causing any unwanted side effects. However, if the diode is installed backwards, the alternator will not charge.

- Insert the wires into the connector as shown in the diagram below. When terminal pin-out is complete, plug the connector into the alternator.



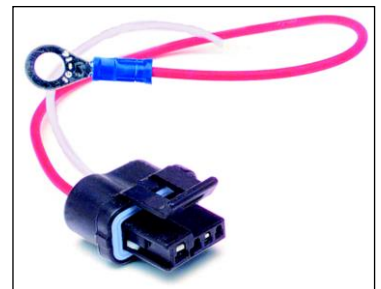
CS-130 Series Alternators



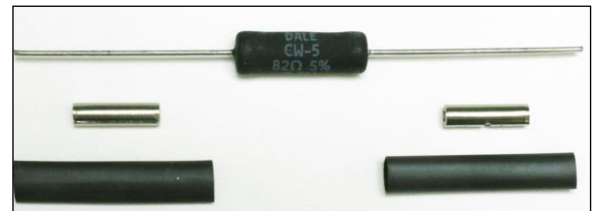
The CS-130, CS-121 and CS-144 alternators closely resemble the SI series alternators. They will have an external fan behind the pulley and they generally have some plastic casing on the side and back. These alternators have a four pin sealed connector, seen in the photo below and in the middle image above. The regulator will be marked P,L,S,F. This type of alternator was used on GM TPI and LT1 fuel injected engines among other late 1980's to mid 1990's GM vehicles.

The two remaining wires, a 14 gauge red wire printed **#995 ALTERNATOR BATTERY POWER SAMPLE** and a 16 gauge brown wire labeled **#914 ALTERNATOR EXCITER**, will connect to the regulator on the back of the alternator.

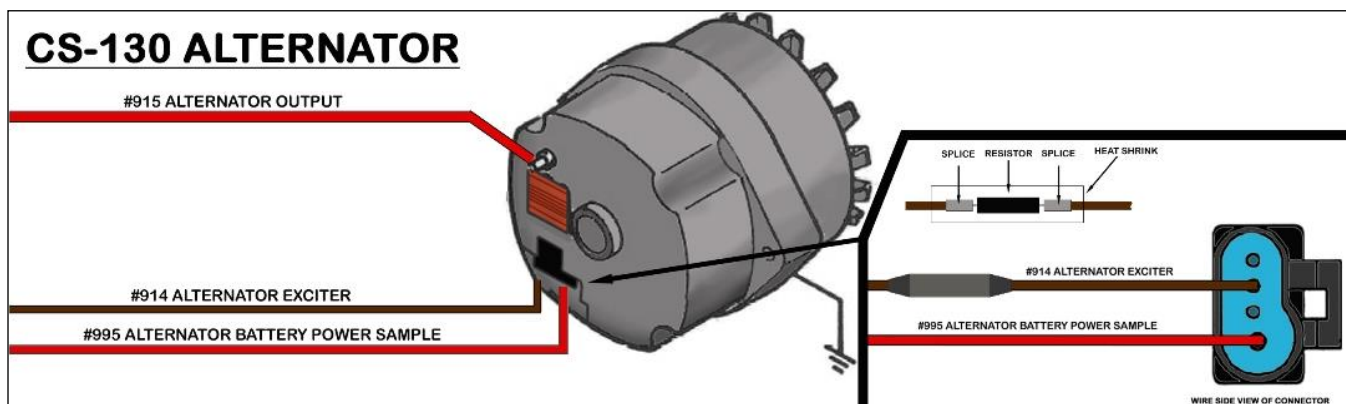
- Route the two wires to the connector on the alternator and cut to length. Strip ¼" of insulation from both wires.
- The 4 pin alternator connector from the harness removed from the vehicle prior to installation of the Painless harness or a CS-130 pigtail purchased from Painless, [part # 30707](#) (see photo), will need to be used. Due to a lack of usage by most customers it is not included with this Painless chassis harness.



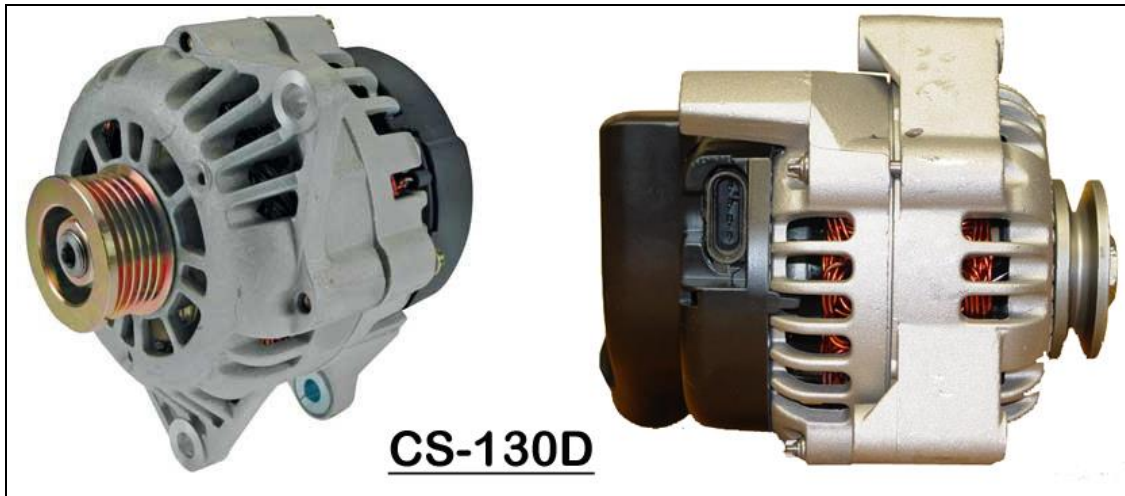
- The CS-130 alternator requires a resistance on the **#914** wire. Without this resistance the regulator on the alternator will burn up. A resistor, splices, and heat shrink, seen in the photo, have been provided in the "ALTERNATOR" bag kit. The resistor* will simply need to be installed inline on the **#914** wire as shown in the diagram on the next page.



- Using two of the splices and heat shrink provided in the "ALTERNATOR" bag kit, splice the CS-130 pigtail to the **#914** and **#995** wires according to the diagram below



CS-130D Series Alternators



The CS-130D can be spotted by their lack of an external fan behind the pulley. These alternators have an internal fan. They also have a plastic casing on the back. These alternators have an elongated oval, four pin sealed connector, seen in the photo below and in the image above. The regulator will be marked P,L,I,S. This type of alternator was used on many engines, including the GM LS series, Vortec and Gen. III Vortec truck fuel injected engines.

Of the two remaining wires, a 14 gauge red wire printed **#995 ALTERNATOR BATTERY POWER SAMPLE** and a 16 gauge brown wire labeled **#914 ALTERNATOR EXCITER**, only the **#914** will be used. The **#995** may be connected to the alternator output post or removed from the harness.

- Route the brown **#914** to the connector on the alternator and cut to length. Strip $\frac{1}{4}$ " of insulation.

- The four pin alternator connector from the harness removed from the vehicle prior to installation of the Painless harness or a CS-130D pigtail purchased from Painless, [part # 30708](#) (see photo), will need to be used. Due to this connector being provided on most fuel injection harnesses, this connector is not included with this Painless chassis harness.

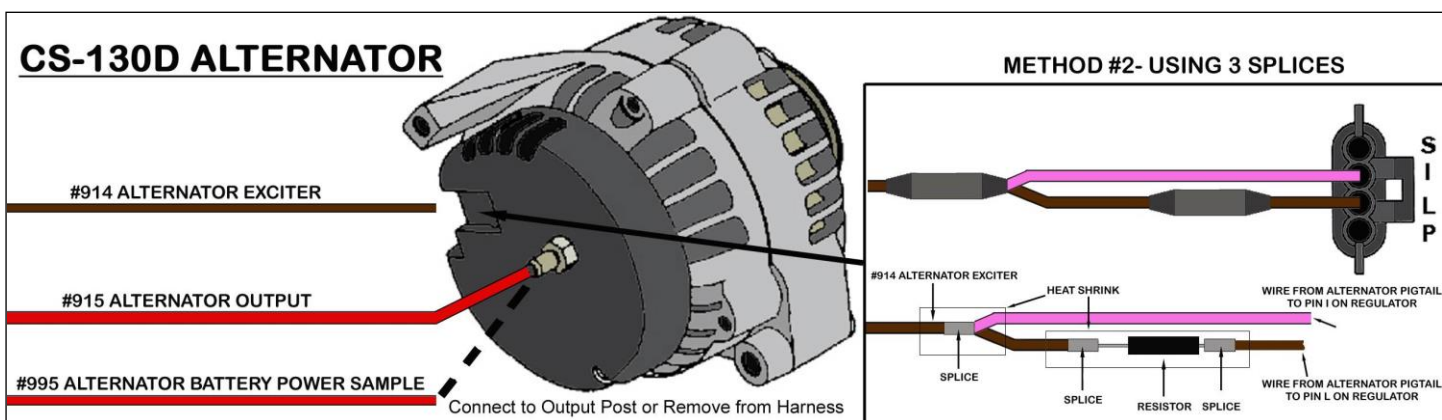
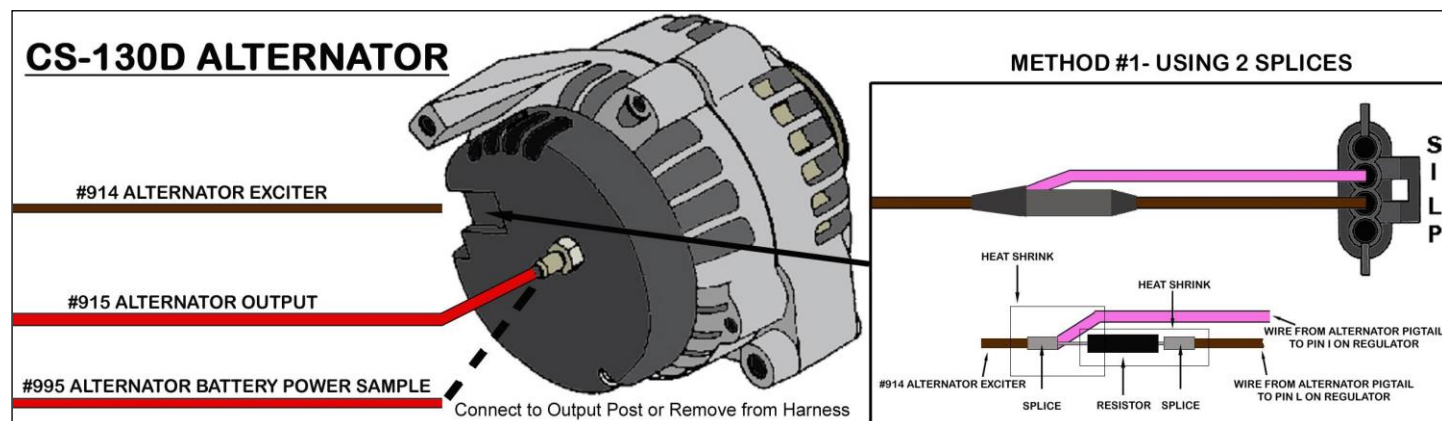


- The CS-130D alternator requires a switched power source to pin I of the regulator, and a resistance on the wire going to pin L of the regulator, the brown wire in the photo on the previous page. Without this resistance the regulator on the alternator will burn up. A resistor, splices, and heat shrink, seen in the photo, have been provided in the "ALTERNATOR" bag kit. The resistor will simply need to be installed inline on the L pin wire as shown in the diagrams below.



- Using a splice and heat shrink provided in the "ALTERNATOR" bag kit, splice the CS-130D pigtail to the brown **#914** wire according to the diagram on the next page that best reflects your application.

Both diagrams accomplish the same task, using the brown **#914 ALTERNATOR EXCITER** wire to provide a switched power source and a resisted power source to the 2 wires of a CS-130D alternator pigtail/connector. The pink wire shown in the diagrams is an installer supplied wire, this will generally be a wire coming from an alternator pigtail. Of the two diagrams below, pick the method that easiest for you to understand, the only difference between the diagrams is how many splices are used.



Externally Regulated Alternators

The 1969 Camaro left the factory with an external voltage regulator mounted on the driver's side core support. To connect to the regulator in the factory location, the wires described below will need to be routed with the Light Section wires down the driver side inner fender to the core support, as described on pages 47-48. Along with these two wires, the **#995** and **#914**, two other wires, blue and white in the diagram on the next page and not supplied, will need to be added to the harness.

The two remaining wires, a 14 gauge red wire printed **#995 ALTERNATOR BATTERY POWER SAMPLE** and a 16 gauge brown wire labeled **#914 ALTERNATOR EXCITER**, will connect to the regulator.

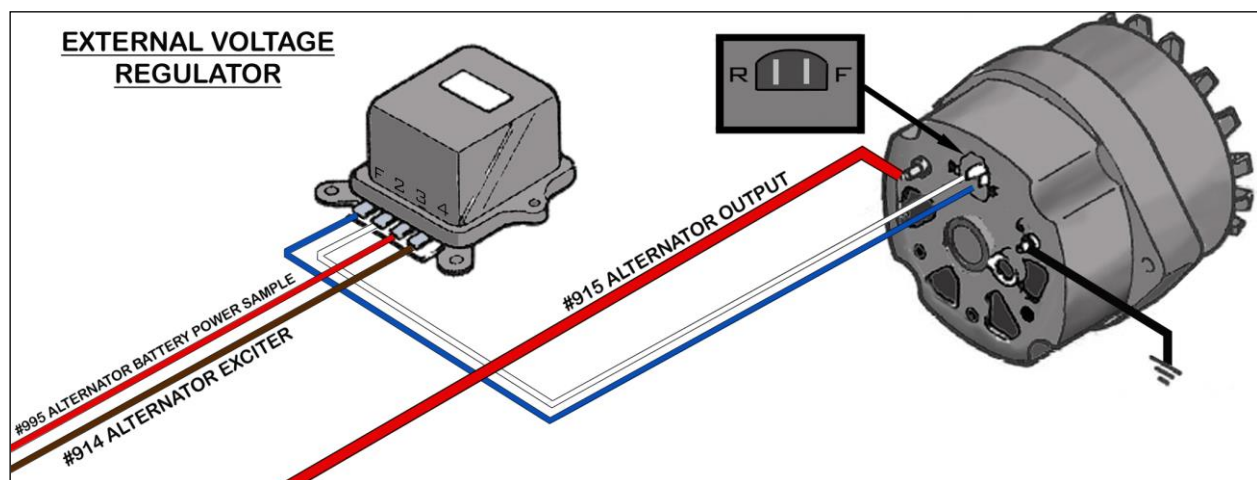
- Route the two wires of the Painless harness to the connection point on the regulator and cut to length. Strip $\frac{1}{4}$ " of insulation from both wires.
- The four pin regulator connector and the two pin alternator connector from the harness removed from the vehicle prior to installation of the Painless will need to be used. Due to a lack of usage by most customers these connectors are not included with this

Painless chassis harness. If you do not have these connectors they can be obtained online or at a local auto parts store, or you can use the loose piece insulated terminals in the parts kit to make connections.

- Connect the brown **#914** wire to the “4” terminal on the regulator.
- Connect the red **#995** to the “3” terminal on the regulator, from the factory this would have been an orange wire.

Two 14 gauge wires which run from the regulator to the alternator and a 14 gauge wire for a ground will need to be provided by the installer to finish the connections. These wires are not in the Painless harness.

- Connect the “2” terminal on the regulator to the “R” terminal on the alternator. This was a white wire from the factory.
- Connect the “F” terminal on the regulator to the “F” terminal on the alternator. This was a blue wire from the factory.
- The last connection will be connecting a wire from the “G” post on the alternator to a chassis ground source.



“MIDI Fuse”



A large in line MIDI fuse has been included in the “Alternator” bag kit. This inline fuse will provide a fused link between the alternator and battery. It will also act as the main power fuse for the harness.

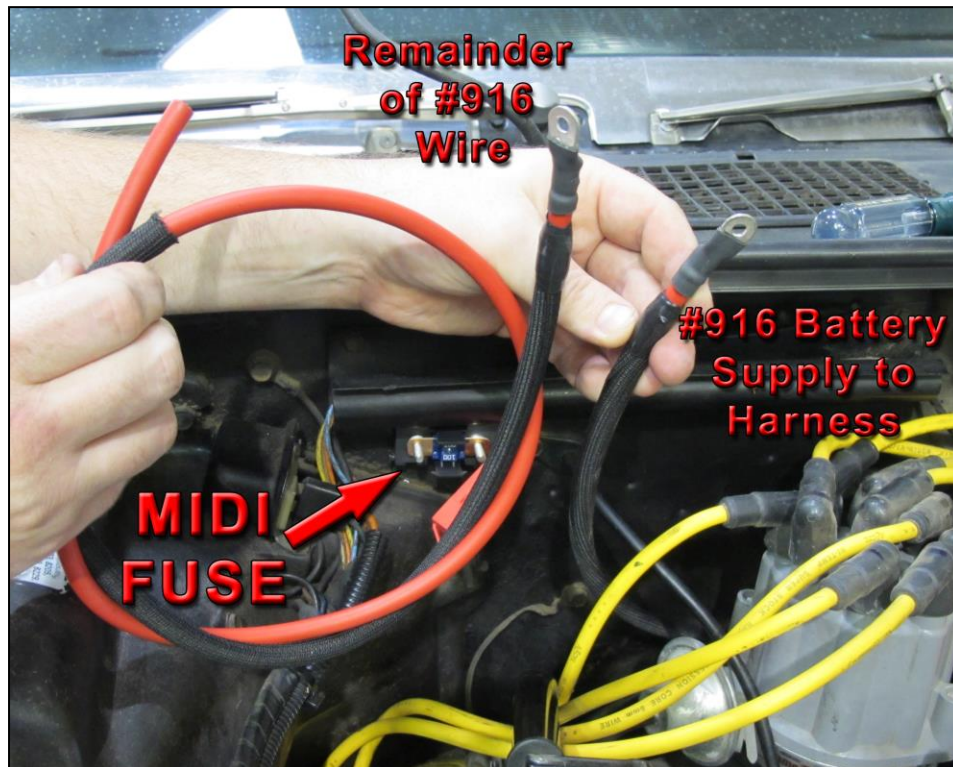
- Find a suitable location to mount the supplied fuse holder using 2 of the self-tapping screws provided. On the firewall, as seen in the photo on the next page, above the passenger side valve cover is a nice place that has easy access if you routed the red 6 gauge wire, with a label printed **#915 ALTERNATOR OUTPUT** with the “Engine Section”. If you routed #915 with the

“Lighting Section” a good place to mount the MIDI holder would be near the battery tray. If is a good idea to mount the MIDI fuse holder somewhere that is easily accessible in case the fuse ever needs to be replaced.

● Route the red 6 gauge wire, with a label printed **#916 BATTERY SUPPLY TO HARNESS** to one side of the fuse holder and cut the wire to length. This wire goes to a large splice that can be seen in [Charge/Battery Power Schematic](#) on the next page. **DO NOT DISCARD THE CUT OFF PORTION OF #916.**

● The length of excess wire cut from the #916 wire will be used to connect the other side of the fuse to the “+” side of the vehicle’s battery or to the battery post on the starter solenoid. **DO NOT CONNECT THE #916 TO THE ACTUAL BATTERY AT THIS TIME.** If routed to the starter solenoid, this wire will NOT replace the battery cable needed by the starter from the positive side of the battery to the “BAT” or + post of the starter solenoid.

- Connection to both sides of the fuse holder will be made using the large ring terminals with the small #10 hole provided with the kit. You can use a pair of pliers if your crimpers will not accept this large gauge wire/terminal, or solder the connections. The heat shrink supplied with this kit is intended to cover the crimped end of each of these two ring terminals. A schematic showing these connections can be found on the next page.



- Remove the 2 nuts on the studs of the fuse holder and install the 150 amp fuse provided in the “Alternator” bag kit. The #916 wire that will connect to the battery or starter solenoid can be installed onto the fuse at this time and the nut can be installed and tightened onto the holder stud. **Remember to route the remaining end of this #916 wire to either the battery lug or to the starter solenoid, but do not connect it until you are completely finished with the entire installation, not just the Engine section.**
- If the factory A/C harness is going to be used you will now route the 10 gauge black wire, that was originally connected to the horn relay, to the midi fuse location. Cut the black wire to length and terminate it using one of the supplied #10 terminals and heat shrink. Connect this wire to the same side of the fuse holder as the #916 wire leading to the harness.

Starter Section

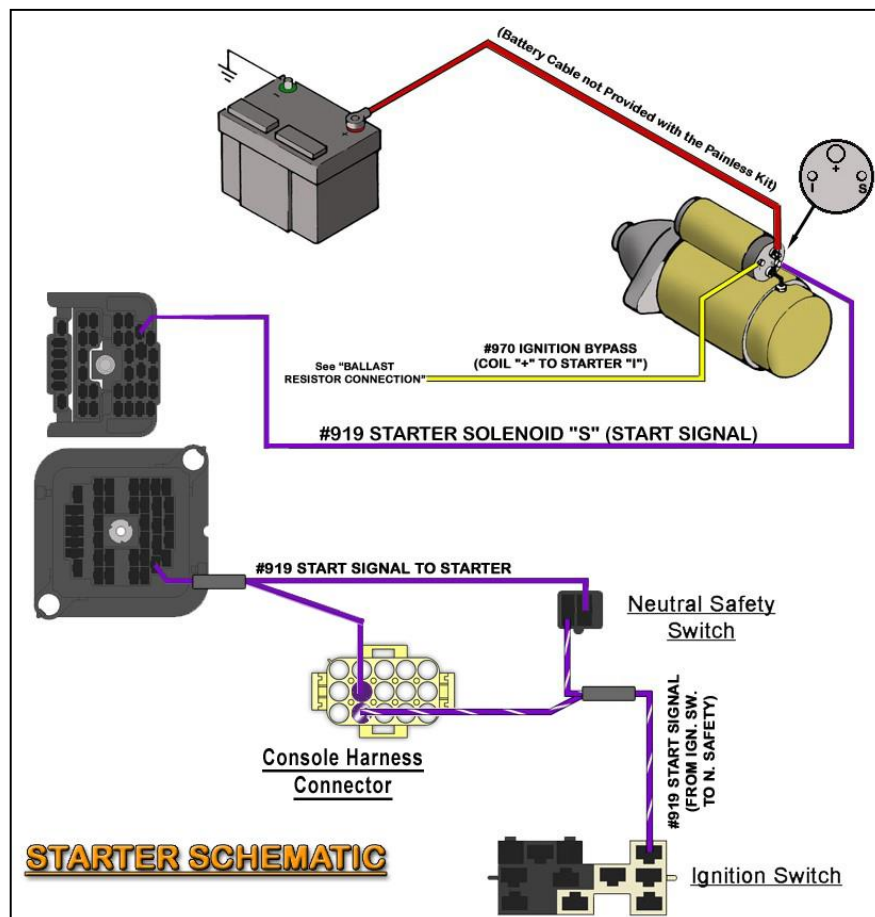
This section will consist of two wires that provide power to the coil during start up (if needed, see ignition section) and a start signal to the starter solenoid. These two wires will be grouped together with a label reading “Starter”. Let’s first address power to the harness this wire is:

Purple: 12 gauge wire, printed **#919 STARTER SOLENOID "S" (START SIGNAL)**, this wire will supply the solenoid with a switched power source from the ignition switch. This power will activate the starter solenoid causing it to turn the engine over for startup. This wire will only have power when the ignition switch is in the **Start/Crank** position.

Yellow: 16 Gauge wire, printed **#970 IGNITION BYPASS (COIL "+" TO STARTER "I")**. This optional wire will supply direct battery voltage to ignition coil, bypassing the ballast resistor if one is used. The other end of this wire has already been connected during the “Ignition Section”

- Route the purple **#919**, and the yellow **#970** (if used, connected at the ballast resistor/coil on page 44), to the starter solenoid and cut to length. Be sure to keep all wires away from the exhaust manifold or header.
- Locate ring terminals and corresponding water proof heat shrink from the parts kit that best fit the posts found on the starter solenoid and install onto the wires going to the starter solenoid. Be sure to apply heat to shrink the insulation to protect the crimp.

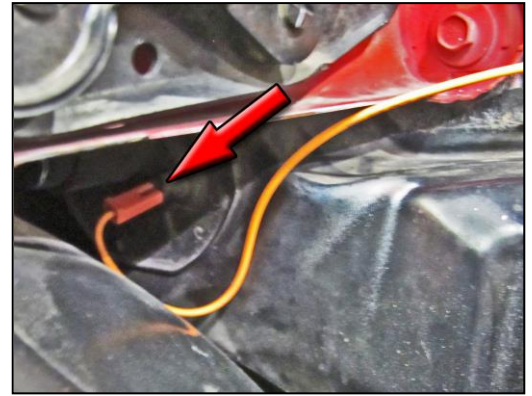
The purple **#919** wire will connect to the “START” or “S” post on the solenoid and the yellow **#970** wire will connect to the “I” or “R” post of the solenoid, as seen in the schematic below.



“Blower Motor”

A single wire is supplied for connection to the blower motor. This wire will only be needed by those with factory heater only (non A/C) vehicles. Cars with factory or aftermarket air conditioning will not need this wire and it may be removed from the harness.

Locate the single orange wire with a section label reading “Blower Motor”, this wire will be:



Orange: 12 gauge wire printed **#967 BLOWER MOTOR POWER**. This wire will provide power to the blower motor from the blower switch.

- Connect the **#967** wire to the terminal on the blower motor, this will be the power terminal. This terminal can be found on the passenger side of the vehicle, under the fender, near the hood hinge. Make sure the hinge can operate correctly without pinching or damaging the wire.

This completes the Engine section wiring. However there is one consideration you may want to take before moving to the interior section of this wiring harness installation. If the installation calls for the use of an electric fuel pump please read the following section, if not continue on to page 61.

“Fuel Pump”

If your installation includes the use of an electric fuel pump you may want to consider the location of the fuel pump and how you are going to power it before continuing on to the interior harness installation. A pink 14 gauge wire, printed **#947 FUEL PUMP POWER**, is supplied as part of the interior harness, however you may want to pass the wire through the bulkhead depending on where you are mounting your fuel pump.

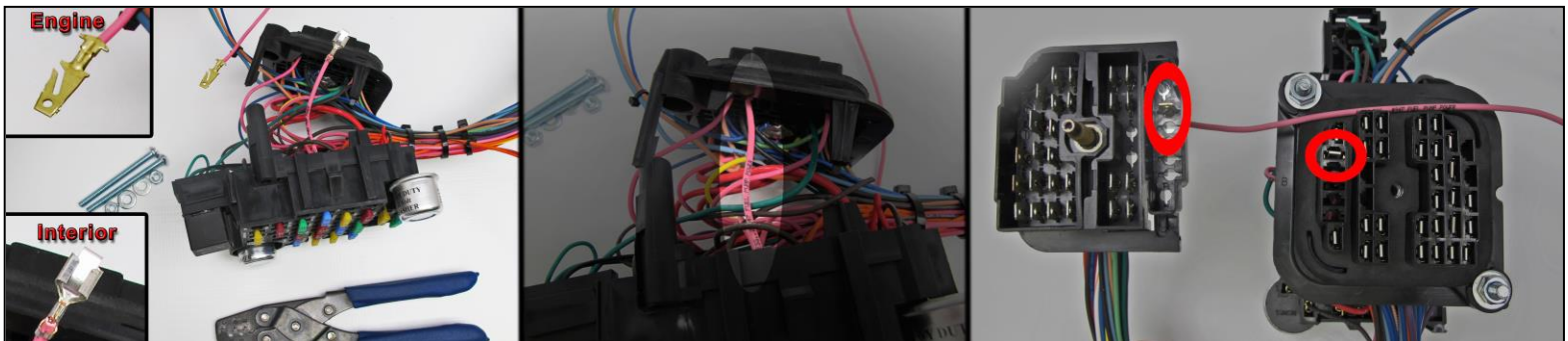
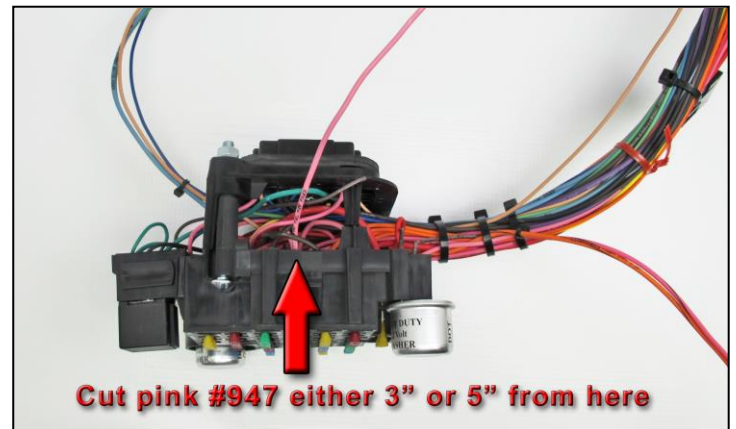
Your two options for powering your fuel pump are to either run wire **#947** through the interior of your vehicle with the rear harness, then pass the wire through the grommet used for the fuel level sender. If this method is used instructions on how to connect your fuel pump can be found on page 65. The second option would be to pass the fuel pump wire through one of unused spots in the engine bulkhead, then run the fuel pump power wire to your fuel pump underneath the vehicle, as described in the following section. Choose which method best suits your particular installation. Also if a mechanical fuel pump is being used disregard this section.

Pink: 14 gauge wire, printed **#947 FUEL PUMP POWER**, this wire will provide a power source to an electric fuel pump. This wire comes from the 15 amp “FUEL PUMP” fuse on the fuse block and will only have power when the ignition switch is in the ON/RUN position and the START position.



Re-Routing Fuel Pump Wiring Through Bulkhead

- First, find pink #947 wire in the interior harness. Pull wire #947 through the two zip ties as seen in the picture to the right. Cut wire #947 to length. If you want to pass the wire through the driver's side of the bulkhead you will cut wire #947 3" from the back of the fuse block. If you would like to pass the wire through the passenger side of the bulkhead you will need to cut the wire 5" from the back of the bulkhead. Don't discard the cut off piece of wire
- Strip ¼" of insulation from one end of both the short piece of wire #947 and the cutoff portion. Install the appropriate terminal, as seen in the picture below, on to the wire using a pair of rollover crimpers. You can now plug the terminals into mating unused slots in both sides of the bulkhead.



- Route the pink #947 wire to the power or + post/tab/wire of the fuel pump.
- Using a terminal and piece of heat shrink that matches the connection your pump requires, connect the #947 wire to the power or + post/tab/wire of the fuel pump.
- At this time you will need to provide a ground wire for the fuel pump. This harness does not provide a ground wire for this component, but a ground can be easily connected using a terminal and heat shrink from the parts kit and a length of scrap wire created during a previous connection. Simply connection the ground or "-" post/tab/wire of the fuel pump to one of the mounting bolts holding the fuel pump to the frame/body.

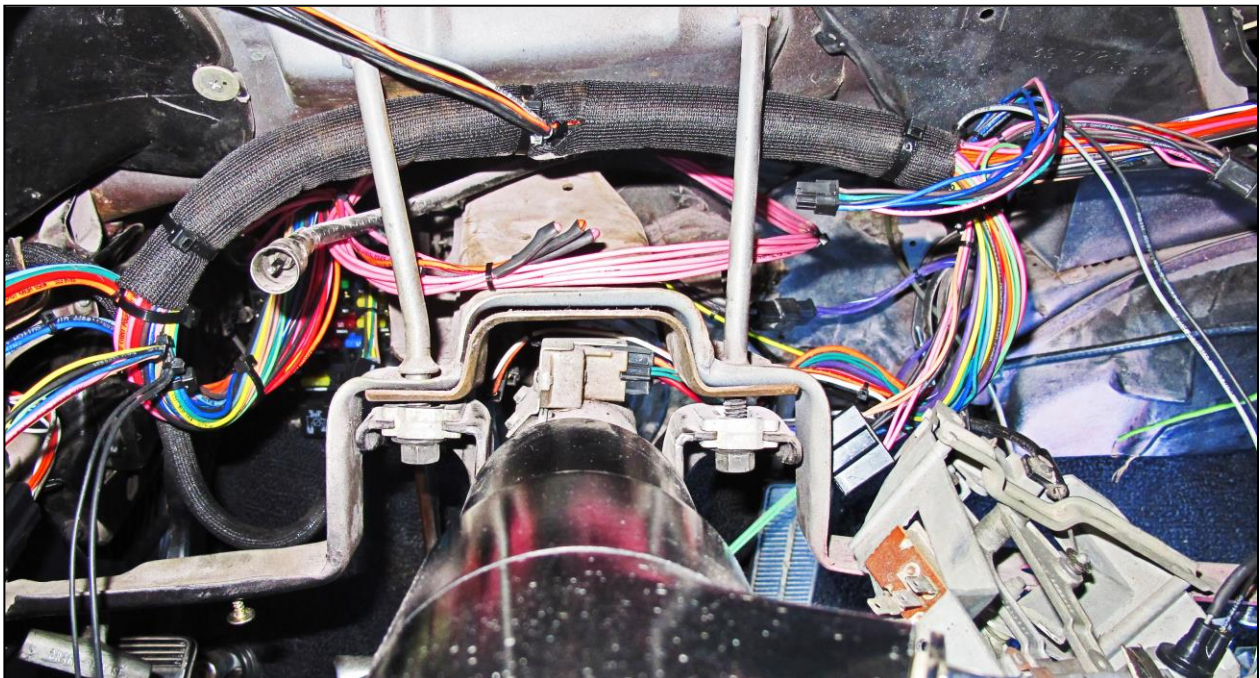
INTERIOR HARNESS

In order to properly route and connect the interior harness, it is recommended that the kick panels, gauge cluster, radio, glove box, driver door sill plate, driver seat/bench seat, and rear seat and seat back be removed. This will allow plenty of access to all installation points and areas where routing will take place to properly install this Painless harness.

The interior harness is broken down into breakouts throughout the dash. These breakouts correspond to the components they connect to as you move from left side of the vehicle or driver side to the right side, passenger side.

- Driver side kick panel and left of the steering Column- contains wiring for the dimmer switch, emergency brake switch, driver door jamb switch, tail harness connection, courtesy light, headlight switch, wiper switch and wiper ground.
- Steering column area- contains wiring for the ignition switch, turn signal switch, neutral safety switch, reverse switch, and gauge cluster connections
- Radio/Glove box/ Pass. side kick panel area- contains wiring for the radio, aftermarket gauge connector, console, cigarette lighter/power port, heater/Ac panel, glove box light connector, a courtesy light, and passenger door jamb switch
- Begin by loosely routing the interior harness over the steering column and towards the passenger side of the vehicle just as the factory harness was routed.

The driver side kick panel area connections such as the driver side door jamb switch and driver side courtesy light will **NOT** route over the column. It is recommended to add a piece of wire loom to the harness to help protect the harness from any rubbing or chaffing on the steering column support, as seen in the photo below.



The following instructions will be in the same order as the connection points of the Painless harness, as you move across the dash starting at the fuse block and working your way through the harness to the passenger side. All connections for the instrument cluster will be done last, to allow better access to the under dash connections.

“Dimmer Switch”

The dimmer switch can be found mounted on the floorboard next to the driver side kick panel. The dimmer switch receives power from the headlight switch and based on the position of the switch will send power out the low beam or high beam wire.

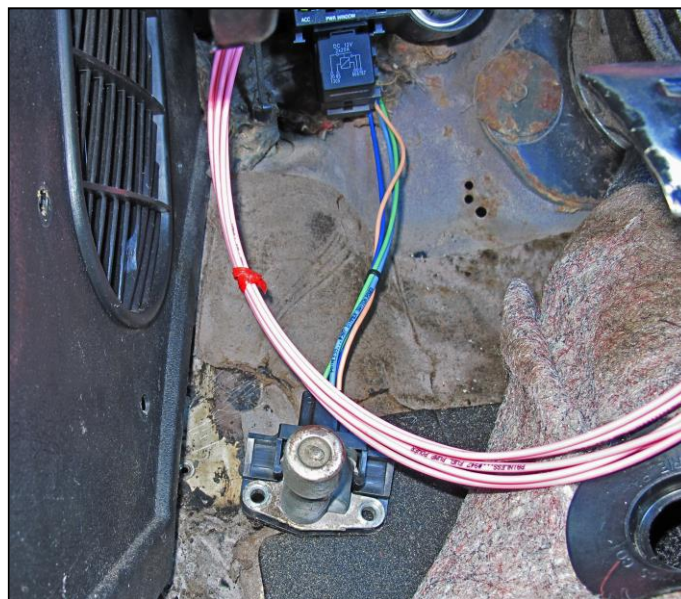
Coming out of the bottom of the fuse block you will notice wires grouped together with a section label reading “DIMMER SWITCH”. These wires have a large black 3 pin connector preinstalled. The three wires that make up the connection to the dimmer switch can be seen in the [*Front Lighting Schematic*](#) on page 35, they are:

Light Blue- 14 gauge wire printed **#907 DIMMER SWITCH POWER**, this comes from the headlight switch and will have power whenever the headlight switch is in the *ON* position.

Tan- 14 gauge wire printed **#909 LOW BEAM POWER**, this wire provides power through the bulkhead to the low beam filament of the headlights whenever the dimmer switch is in the low beam position and the headlight switch is in the headlights *ON* position.

Light Green- 14 gauge wire printed **#908 HIGH BEAM POWER**, this wire provides power through the bulkhead to the high beam filament of the headlights as well as power to the high beam indicator in the dash whenever the dimmer switch is in the high beam position and the headlight switch is in the headlights *ON* position.

- Remove the two screws holding the dimmer switch to the floor board if it is currently mounted.
- Plug the black three pin connector onto the dimmer switch, you will notice the connector will also go underneath the switch and will line up to the mounting holes.
- Using the original screws or two of the black 3/4” self-tapping screws found in the parts kit, mount the dimmer switch to the floor board. There should be adequate length on the wires to enable you to re-use the existing holes in the floor.

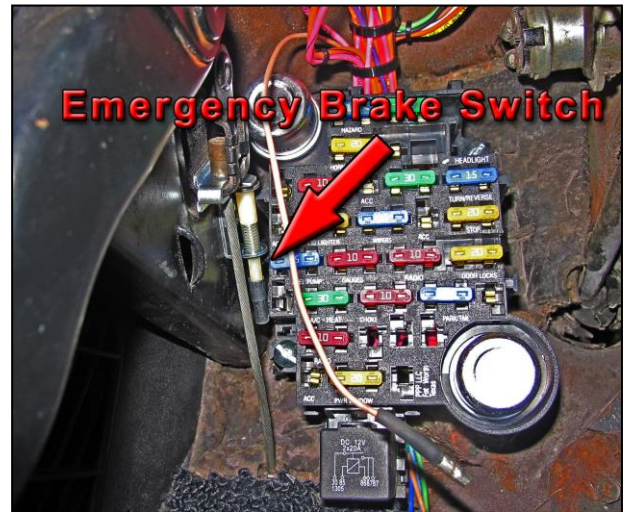


“Emergency Brake Switch”

Of the wires coming out of the top of the fuse block the first connection you come to is a wire labeled “E BRAKE”. This connection is for the emergency brake switch, which activates the brake indicator light in the dash.

Those that are using aftermarket gauges and do not have a brake indicator light, this wire will have no function and can be removed from the harness.

This connection will be one wire and will have an insulated terminal pre-installed; this wire is:



Tan: 18 gauge wire, labeled **#968 EMERGENCY BRAKE SWITCH**, this wire sends a ground source to the brake warning light in the dash, causing it to turn on when the emergency brake pedal is down. This wire can be seen in the [Gauge Cluster Schematic](#) on page 102.

- Route the tan **#968** wire to the emergency brake switch found next to the driver side kick panel on the side of the emergency brake pedal bracket and connect.

To facilitate making this connection, remove the switch from the emergency brake; there is a single bolt or screw found on the top. Removing the switch will also allow you to clean the mounting point on the emergency brake lever body, as well as the contact points of the switch. Cleaning can be done by using rough sandpaper or a soft wire wheel on a drill. Doing so will help provide a clean ground source to the brake warning light and may save you some trouble shooting when testing the system upon installation completion.



“ACC Section”

A section of wires with a label reading “ACC”, short for Accessory, will contain two wires and will be found in a rolled up bundle. These wires will be used for power windows and power locks. In most cases, these wires will be routed away from their current location to components, hence the extra length. These wires can also be used to other components if power windows and locks are not used. READ THE FOLLOWING INSTRUCTIONS REGARDLESS IF YOU NEED THESE WIRES AT THIS TIME.



“Power Window & Power Lock”

There are two wires provided in the Painless harness for connection to power windows and power locks. These two wires will provide constant battery power for the power locks, and ignition switched power, for the power windows. These wires can be used with a factory power window/power lock harness or can be connected to aftermarket systems. These wires will be unterminated, so they will need to be routed, cut to length, terminated using the supplied terminals (picture on next page) and a set of rollover crimpers and plugged into one of the clear connectors shown

If your vehicle is not equipped with these options or only has one, the unused power window/power lock circuit(s) can be used to provide power to other components. You will need to replace the fuse at the fuse block of which ever circuit you are using to match the amperage rating of the component you are connecting it to. **These wires are not to exceed 30 amps.**

The power lock wire will be indicated by a section label reading “Power Lock”. This unterminated wire will be:

Orange/Black: 14 gauge wire printed **#910 POWER LOCK POWER SOURCE (BATTERY)**. This wire comes from the 30 amp Power Lock fuse on the fuse block and is a constant battery power source, as indicated by “(Battery)” being printed on the wire. This wire can be seen in the [Accessory Schematic](#) on page 105.

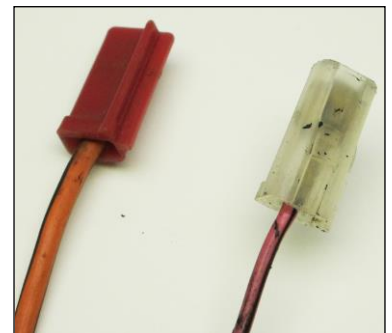
The power window wire will be indicated by a section label reading “Power window”. This unterminated wire will be:

Pink/Black: 14 gauge wire printed **#911 POWER WINDOW POWER SOURCE (IGN)**. This wire comes from the 30 amp Power Window fuse on the fuse block and is an ignition switched power source, as indicated by “(IGN)” being printed on the wire. This wire can be seen in the [Accessory Schematic](#) on page 105.

Two single pin connectors and two terminals, seen in the photo to the right, have been provided to allow connection to the connectors found on the power lock/power window wires of the Painless harness. These connectors will allow you to make a factory style connection to your factory power lock/power window harness, to aftermarket power lock/power window harnesses, or to a component you may be powering with one of these circuits.

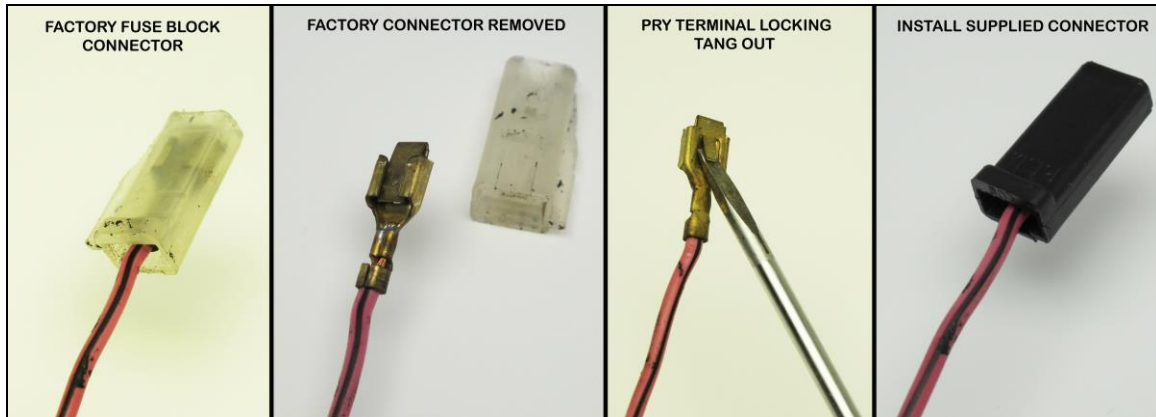
For those reusing the factory power lock/power window harness, the following set of instructions will be used to slightly modify the original harness to work with the Painless harness. For those not connecting a factory harness, proceed to the next connection, the Driver Side Door Jamb Switch.

- Begin by locating the two connectors on the factory power lock/power window harness that connected to the accessory ports at the fuse block. This will be a pink/black wire with a single pin clear connector and an orange/black wire with a red single pin connector. The pink/black



provides power to the window switch. The orange/black provides power to the lock actuators in the doors. Both of these connectors can be seen in the photo to the bottom of the previous page.

These connectors use the same terminal that is provided in the kit that mates to the power lock/power window connectors found on the Painless harness. A simple connector change is all that is needed in order to re-use the factory power lock/ power window harness with the Painless harness.



- Using the terminal removal procedure, found in the “Installing Factory Style Terminals & Unpinning Connectors” section on pages 12-13, remove the two fuse block connectors on the factory harness. Remember to pry the locking tang of the terminal back out once the connector is removed. The factory connectors can also be cut from the original harness and the new terminals that are provided with the Painless kit can be installed.
- Install one of the single pin connectors on each of the factory wires and connect them to the Painless harness. The factory pink/black wire will connect to the power window, pink/black #911, wire on the Painless harness. The factory orange/black wire will connect to the power lock, orange/black #910, wire on the Painless harness.

“Fuel Pump”

This fuel pump power wire is the same wire that was discussed previously on page 59. Please make sure to read the section on the bottom of page 59 before continuing if you haven’t read it already.

PINK: 14 gauge wire, printed **#947 FUEL PUMP POWER**, this wire will provide a power source to an electric fuel pump. This wire comes from the 15 amp “FUEL PUMP” fuse on the fuse block and will only have power when the ignition switch is in the ON/RUN position and the START position.

- If a mechanical pump is being used, insulate the end of this wire with piece of heat shrink from the parts kit and tape the wire up into the harness and proceed to the next connection. If an electric fuel pump is being used, route the pink #947 wire to the power or + post/tab/wire of the fuel pump. This is usually easiest by routing this #947 to the rear of the car with the Tail harness, as it is installed on page 106. Once in the trunk



area, route this #947 out the hole in the trunk floor that the fuel sending unit wire exits the trunk from.

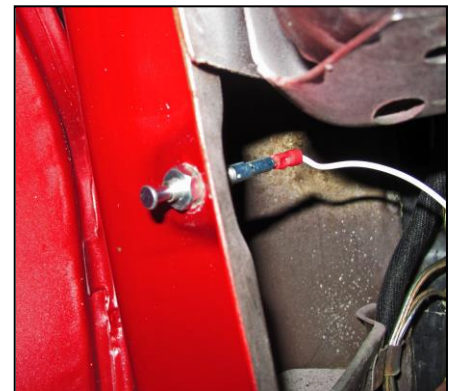
- Using a terminal and heat shrink that matches the connection your pump requires, connect the **#947** wire to the power or + post/tab/wire of the fuel pump.
- At this time you will need to provide a ground wire. This harness does not provide a ground wire for an electric fuel pump, but a ground can be easily connected using terminals from the parts kit and a length of scrap wire created during a previous connection. Simply connection the ground or - post/tab/wire of the fuel pump to one of the mounting bolts holding the fuel pump to the frame/body.

“Tail Section”

We will bypass this connector at this time, the tail harness supplied with this kit will plug into this connector, however, this will be done after all the interior connections have been made. This connection will be handled on page 106 of this manual

“Driver Door Jamb Switch”

The door jamb switches will ground activate the courtesy light sockets installed on the Painless harness. When the door is opened, the plunger on the switch extends out, as it is no longer being pushed in by the door. When the plunger extends, the contact point on the back of the switch makes contact with the body of the switch, which is grounded through the mounting into the metal door jamb. This grounding gives the wires attached to the switch a ground source which will then cause the interior lights to turn on.



Locate the wire with the section label reading “DRVR. DOOR JAMB SWITCH”. This wire will have a pre-installed insulated terminal, it is:

White: 18 gauge wire, printed **#961 DRIVER DOOR JAMB SWITCH**, this wire is pre-terminated and tied to the ground side of the included courtesy lights and dome light. This wire will be grounded anytime either door is opened or when the headlight switch knob is rotated to the “Dome Light On” position. This wire can be seen in the [Headlight Switch Schematic](#) on page 96 and the [Dome/Courtesy Light Schematic](#) on page 68.

- Remove the factory jamb switch and install the new supplied jamb switch into the driver’s side door jamb.
- Route the white **#961** wire to the driver side door jamb switch and connect to the new supplied jamb switch, as seen in the picture on the upper right corner of this page.



You may notice the new jamb switch, labeled 3 in the picture to the right, is longer than factory jamb switch, labeled 1 in the same picture. This is due to the

fact that the depth of the new jamb switch is adjustable, so that it can be made to fit your exact application. The jamb switch labeled 2 in the picture on the previous page is a new jamb switch that has been adjusted to fit the vehicle it is being installed in. There are two ways to adjust the length of the new jamb switch to fit.

The first way to adjust the length of the new jamb switch requires measuring the old jamb switch to determine how long the new jamb switch needs to be. Measure from the top side of the hex area to the end of the plunger, as seen in the picture below (indicated in red). Now, take the same measurement on the new jamb switch and subtract the length measured on the old jamb switch from the measurement of from the new switch. The resulting number will indicate how much shorter the new jamb switch will need to be.

Next you will need to get a 3/8" deep well socket and place the new jamb switch in it as indicated in the picture below. Now place the socket and jamb switch in a vise, as shown, and slowly close the vise until the plunger of the jamb switch is fully compressed, but not enough to actually shorten the length of the jamb switch. You will now take a measurement of the distance between the jaws of the vise. Take this measurement and subtract the length the jamb switch needs to be shortened by, per the end of previous paragraph, to find the final distance between the jaws of your vise. Slowly close the vise until this measurement is archived. Remove the jamb switch from the vise and compare it to the old jamb switch, they should now be the same.



The second way to correct the length of your new jamb switch should only be performed if there is not an old jamb switch to take a measurement from. This method of correcting the jamb switch length could result in damage to the paint on the door jamb and should be done with extreme caution, also it is a good idea to protect the paint on the door jamb with a couple layers of masking tape to avoid damage. Simply thread the new jamb switch into the jamb, as seen in the upper right hand picture on the previous page. Now close the driver's door very slowly to shorten the jamb switch. Resistance may be felt when the jamb switch is contacted by the door, which is normal. Just apply light pressure to the door until it latches. This will result in shorting the new jamb switch to an appropriate length. **DO NOT SLAM THE DOOR ON THE NEW JAMB SWITCH UNTILL ONE OF THE TWO PREVIOUS PROCEDURES IS PREFORMED.**

Even after one of these procedures is preformed it is a good idea to gently open and close the door several times to verify that the door closes without any unusual resistance.

“Driver Courtesy Light”

This connection will allow the under dash/pedals of the driver side of the vehicle to be illuminated any time a door is open or when the headlight switch is activating the dome light. Your vehicle may or may not have had them from the factory; that will not affect these working properly as they



have been pre-wired into the Painless harness.

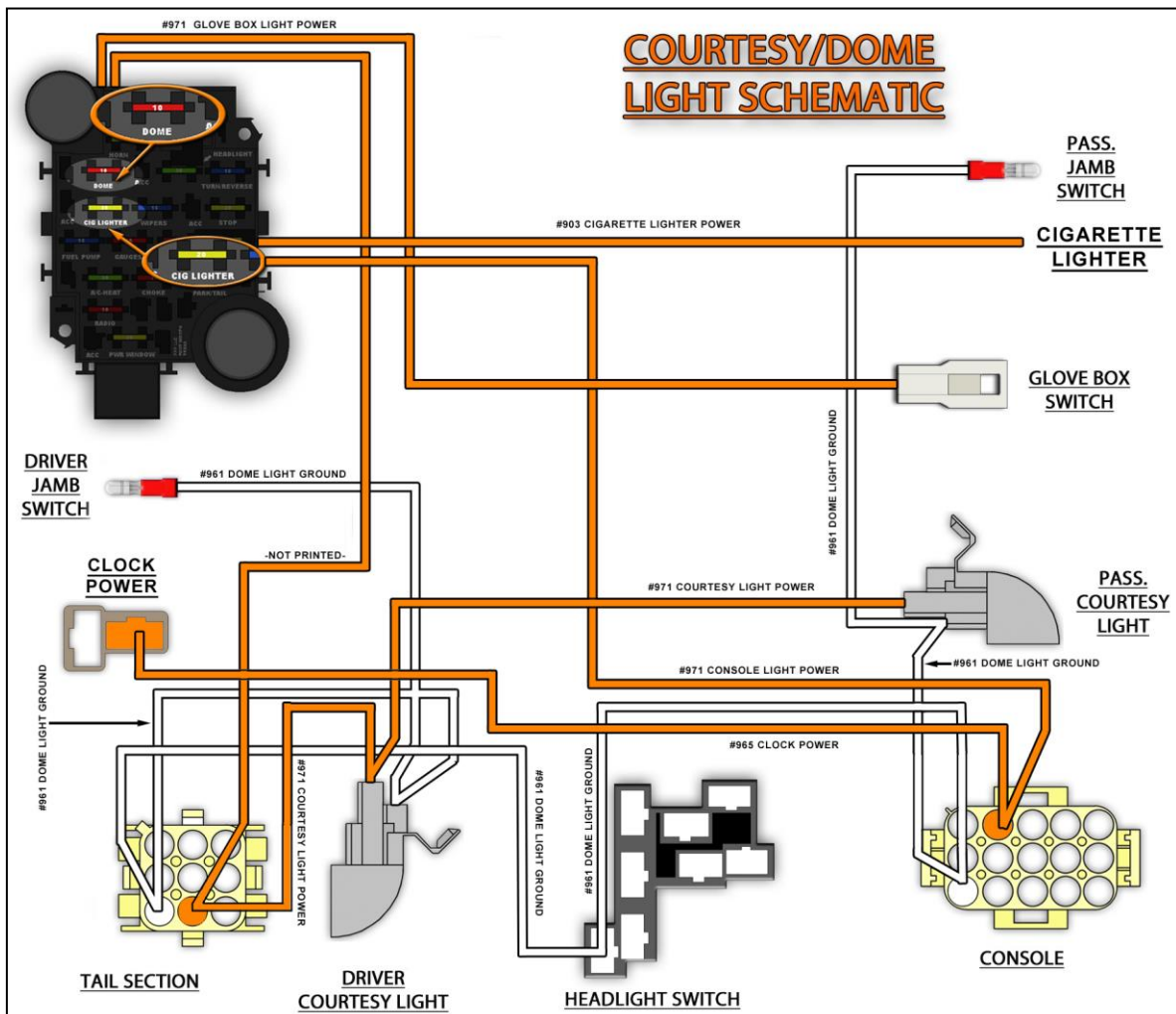
This connection will have a section label reading "COURTESY LIGHT". It will be a large gray colored lamps socket with four wires pre-wired to it, These wires can be seen in the [Courtesy/Dome Light Schematic](#) on the bottom of this page, these wire are:

(2) Orange: 18 gauge, printed **#971 COURTESY LIGHT POWER**. One wire provides constant battery power from the 10 amp DOME fuse on the fuse block through a connection at the tail section connector. The other wire, printed **#971 DOME LIGHT POWER**, provides power to the passenger courtesy light.

(2) White: 18 gauge, printed **#961 COURTESY LIGHT GROUND**. This wire is the ground wire that activates the courtesy light. When this wire is grounded it completes the voltage path causing the light to illuminate. This ground will come from either the door jamb switch or the headlight switch depending on if the door is opened or the headlight switch is turned to the "DOME LIGHT ON" position

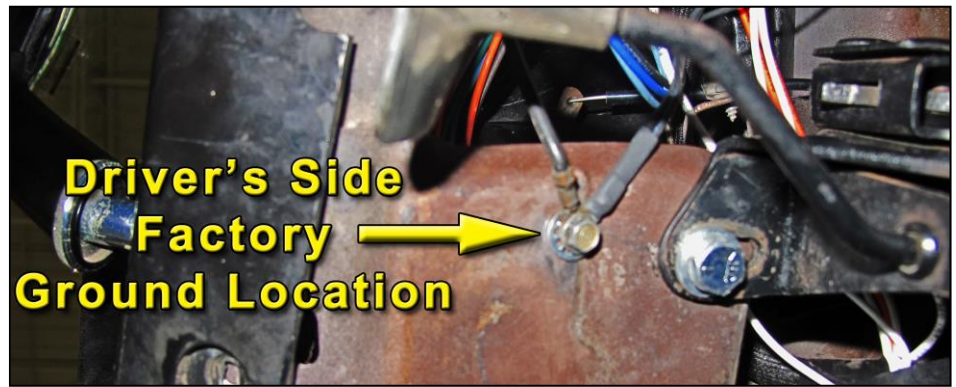
This light socket uses both a 63 and 67 series bulb; a 67 series bulb has been provided.

- Route the socket to a suitable mounting location under the dash. The light socket has a small hole in a mounting tab to allow mounting. Self-tapping screws have been provided as a mounting solution. Small zip ties, provide with this kit, may also come in handy if a suitable location for the light socket cannot accommodate mounting with a screw.



“Driver’s Side Dash Ground”

The next connection that will be made is a ground connection for the driver’s side of the interior harness. This ground consist of a ring terminal with two black wires leading to it, one 20 gauge and one 16 gauge black wire. This ring terminal will be attached using either the factory ground



screw and mounting hole, or with a provided self-taping screw if the factory screw is missing. You will notice in the photo below that there is a second ground wire and ring terminal attached at the same point, this is from the headlight switch ground strap. As with all grounds it is advised that you clean the area with an abrasive and use star washers when possible.

“Turn Signal Switch”

The column mounted turn signal switch will provide power to each turn signal indicator. The turn signal switch connection will exit the bottom of the steering column into a long black connector.

The wires provided in the Painless harness for turn signal connection can be identified by the section label reading “TURN SWITCH”. These eight wires will be terminated, but will need to be plugged into one of the two supplied connectors. The factory style connector, seen on the bottom of the next page, will be used if the installation uses a factory steering column. An aftermarket style connector has also been supplied, due to the common use of aftermarket steering columns. The eight turn signal wires can be seen in the [Turn Signal Schematic](#) on the next page, they are:

Black: 18 gauge wire, printed **#963 HORN RELAY GROUND ACTIVATION**, this wire is a ground activation signal to the horn relay. The only time this wire will be grounded is when the horn button on the steering wheel makes contact to a ground source.

Light Blue: 16 gauge wire, printed **#926 FRONT LEFT TURN SIGNAL POWER**, this wire will provide power to the left turn signal indicator on the gauge cluster as well as power to the front left turn signal. This wire will have power anytime the hazard switch is activated and also when the turn signal lever is in the down/left turn position and the ignition switch is in the ON/RUN position.

Blue: 16 gauge wire, printed **#925 FRONT RIGHT TURN SIGNAL POWER**, this wire will provide power to the right turn signal indicator on the gauge cluster as well as power to the front right turn signal. This wire will have power anytime the hazard switch is activated and also when the turn signal lever is in the up/right turn position and the ignition switch is in the ON/RUN position.

Brown: 16 gauge wire, printed **#951 HAZARD SWITCH POWER**, this wire provides power to the column mounted hazard switch. It comes from the hazard flasher found on the fuse block. It is a battery power wire but it will have power only when the hazard switch is activated, which causes the flasher to send power through this wire. See [Flashers](#) on page 17 for how this process works.

Purple: 16 gauge wire, printed **#952 TURN SIGNAL SWITCH POWER**, this wire provides power to the turn signal switch. It comes from the turn signal flasher found on the fuse block. It is an ignition

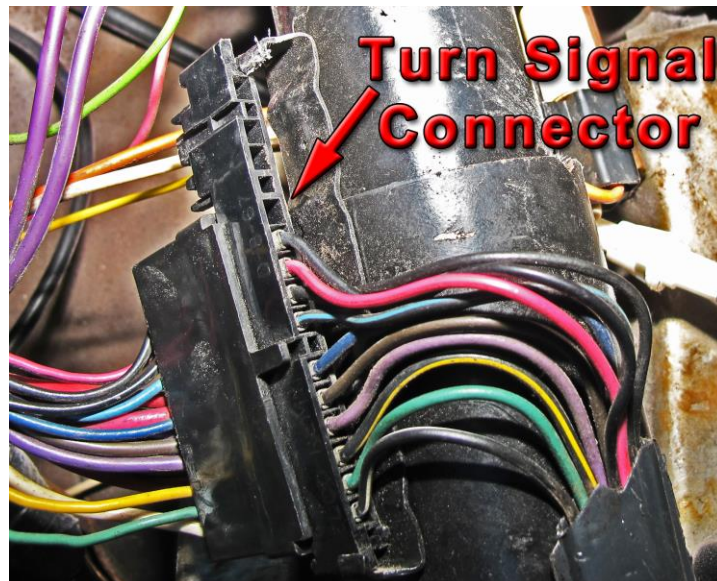
power wire but it will have power only when the turn signal switch is activated, which causes the flasher to send power through this wire. See **Flashers** on page 17 for how this process works.

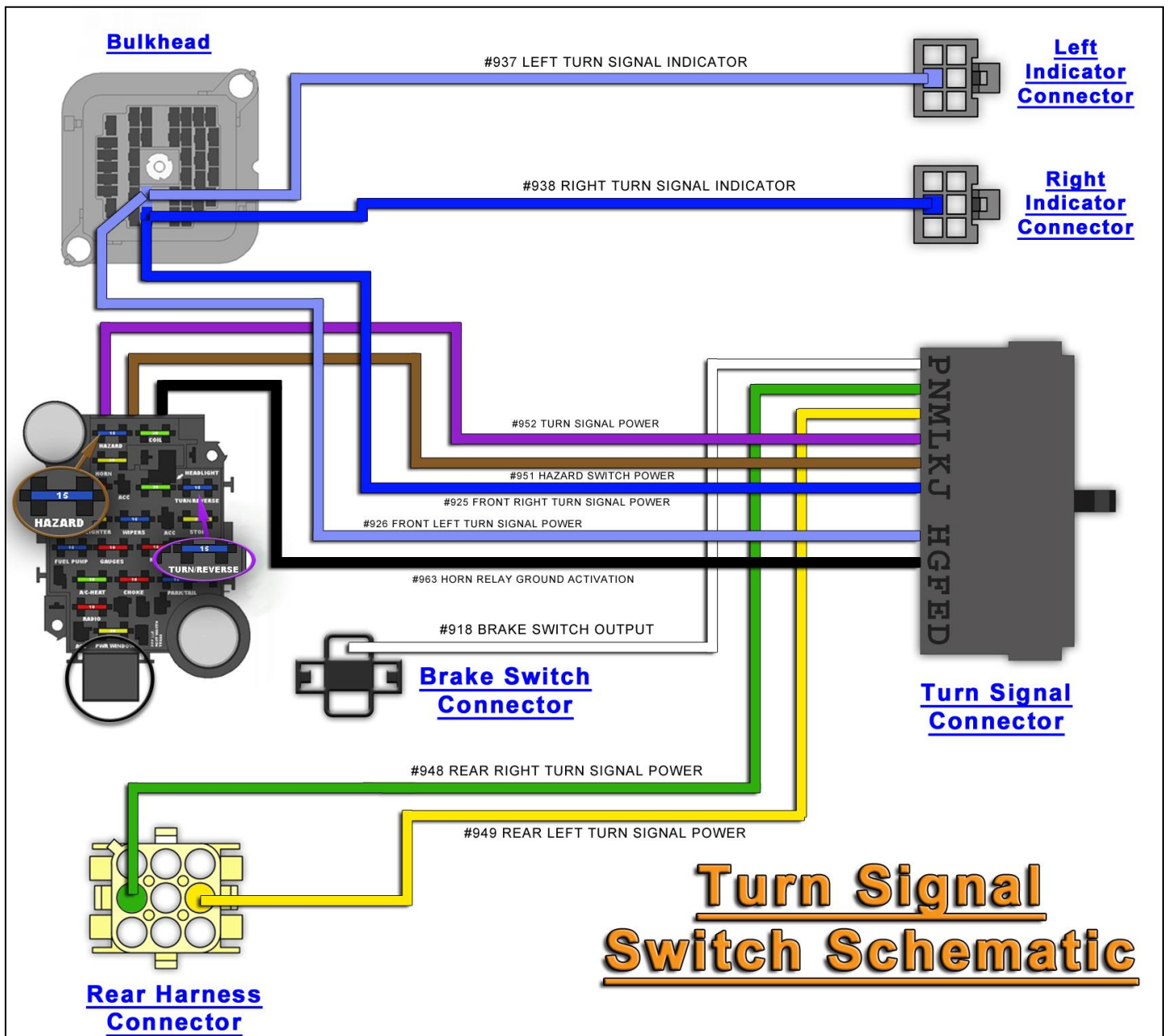
Yellow: 16 gauge wire, printed **#949 REAR LEFT TURN SIGNAL POWER**, this wire provides power to the left rear turn signal. This wire will have power anytime the hazard switch is activated and also when the turn signal lever is in the down/left turn position and the ignition switch is in the ON/RUN position. This wire also handles the brake light power and will also have power anytime the brake pedal is pressed.

Green: 16 gauge wire, printed **#948 REAR RIGHT TURN SIGNAL POWER**, this wire provides power to the right rear turn signal. This wire will have power anytime the hazard switch is activated and also when the turn signal lever is in the up/right turn position and the ignition switch is in the ON/RUN position. This wire also handles the brake light power and will also have power anytime the brake pedal is pressed.

White: 16 gauge wire, printed **#918 BRAKE SWITCH OUTPUT**, this wire will feed the brake light power into the turn signal switch. These vehicles have integrated brake/turn signals. Meaning, the turn signal and brake light share a filament in the bulb. This wire will have power anytime the brake pedal is pressed.

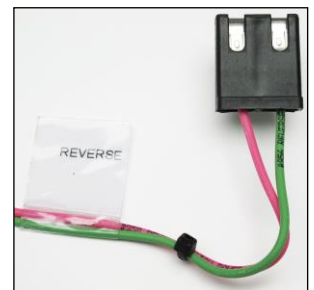
- Locate the correct turn signal connector, found in the parts kit, for your installation. The smooth connector (as seen below) is the factory style connector, while the other connector will be used for aftermarket steering columns. The connector will need to have the correct wires plugged into the correct cavities at this time. The factory pin out can be seen in the schematic on the following page and will be used if the factory style turn signal connector is going to be used. If an aftermarket steering column is being used please refer to the steering column manufacturer for the correct pinout.
- Locate the turn signal connector at the base of the steering column. If the factory steering column is used you'll notice that the connector on the steering column will have several unused terminal locations.
- Plug the turn signal connector, that was just pinned out on the new Painless harness, into the connector found on the steering column, making sure that the connector is plugged in correctly and properly seated, as seen in the picture below. The example below is of a factory steering column, aftermarket turn signal connectors will differ in appearance.





“Reverse Switch”

The reverse switch, also referred to as the backup switch, connection will provide the reverse lights the power they need to illuminate. This switch is a 2 pin normally open switch that has power coming into one side and power going out the other side to the reverse lights. When the shifter is put into the reverse position, contact is made between these two pins, closing the switch. This allows power to flow from one pin to the other, transferring power through the switch out to the backup lamps.



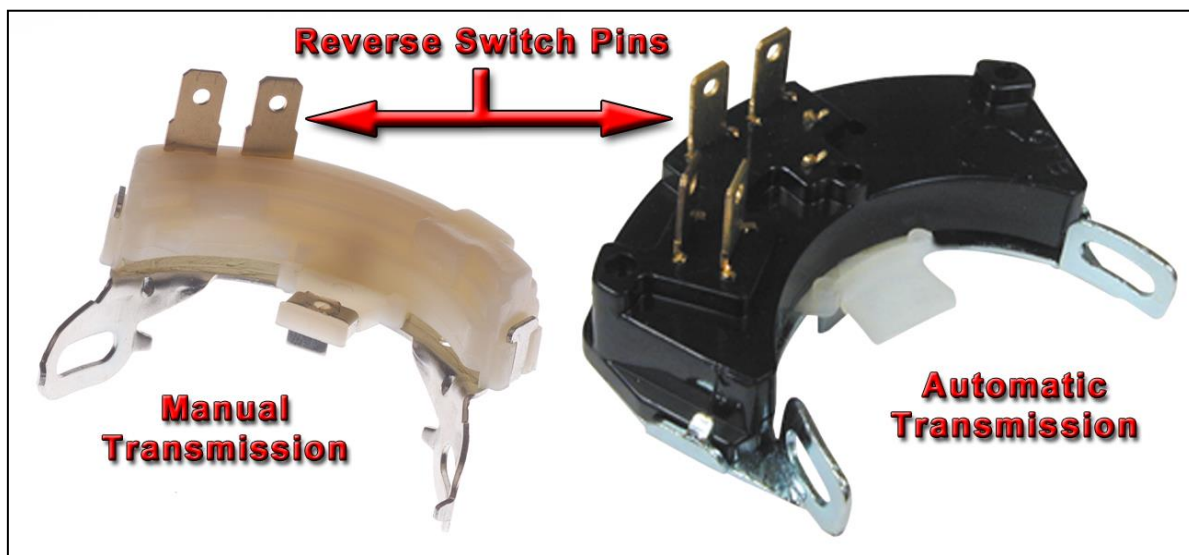
The reverse switch connection will have a section label reading “Reverse”. This will be a black two pin connector with two wires going to it, as seen above. These wires are:

Pink: 16 gauge wire, printed **#958 REVERSE SWITCH POWER INPUT**, this wire comes from the 15 amp TURN/REVERSE fuse on the fuse block. This wire is a switched ignition power wire, meaning it will only have power when the ignition switch is in the ON/RUN position.

Light Green: 16 gauge wire, printed **#956 REVERSE LIGHT POWER**, this wire provides power from the reverse switch to the backup lights in the Tail Section of the Painless harness.

- If you have an automatic transmission with a column shift or a manual transmission, the reverse switch will be located at the base of the steering column, as seen in the photos below. Plug the reverse switch connector onto the 2 pins of the reverse switch.

If you have a factory or aftermarket automatic floor shifter or automatic/manual transmission mounted reverse switch, connection to your switch will be made later in the manual on pages 90-91 in the console section of this instruction manual.



“Neutral Safety/ Clutch Switch”

This switch sits inline of the wire coming from the “Start” terminal of the ignition switch to the “S” terminals of the starter solenoid.

This switch is a 2 pin, normally open, switch that has power coming into one side from the start position of the ignition switch and power going out the other side to the starter solenoid “S” terminal.



This switch is a safety device that will prevent the vehicle from being started while in gear and causing an unfortunate accident. The purpose of this switch is to only allow the engine to be started when the vehicle is in park or neutral (automatic transmissions) or if the clutch is applied (manual transmissions).

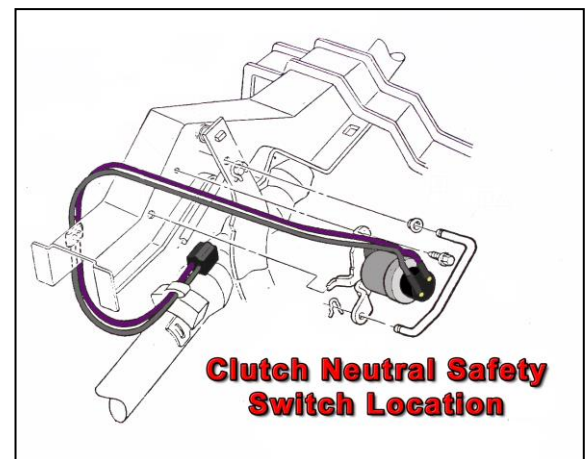
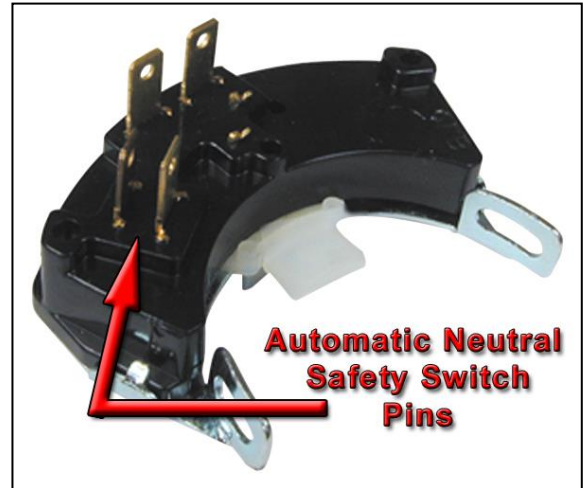
When the transmission is put into park/neutral or the clutch pedal is depressed, contact is made between these two pins, closing the switch. This allows power to flow from one pin to another, transferring power through the switch to the starter solenoid.

The neutral safety/clutch switch connection will have a section label reading “NEUTRAL SAFETY”. This will be a black 2 pin connector with 2 wires going to it, as seen above. These wires are:

Purple/White: 14 gauge wire, printed **#919 START SIGNAL (FROM IGN.SW. TO N.SAFETY)**, this wire comes from the Ignition switch. This wire is a switched ignition power wire. It will only have power when the ignition switch is in the START position. This wire can be seen in the [Starter Schematic](#) on page 58, and on the [Ignition Switch Schematic](#) on page 76 of this manual.

Purple: 14 gauge wire, printed, **#919 START SIGNAL TO STARTER**, this wire provides power from the neutral safety to the Starter solenoid. This wire will have power when the ignition switch is in the START position AND the transmission is in park or neutral (automatic) or the clutch is depressed (manual). This wire can be seen in the [Starter Schematic](#) on page 58.

- If you have an automatic transmission with a column shift, the neutral safety switch, or NSS, will be located at the base of the steering column. If you have a manual transmission, the clutch switch will be located at the top of the clutch pedal much like the brake switch on the brake pedal, except this switch will have a purple and a gray wire (colors may vary on replacement switches) coming from it that will lead to a connector that mates with the neutral safety switch connector found on the Painless harness. See the photos on the right.
- Plug the neutral safety connector onto the two pins of the neutral safety/clutch switch. If you have a floor shifted automatic, leave this connector loose, as connection of the neutral safety switch will take place on page 91.
- If you do not have a neutral safety/clutch switch, and do not plan on getting one, cut the connector from these two wires and connect the purple **#919** and the purple/white **#919** together.



Painless does not recommend operating your Vehicle without a neutral safety/clutch switch

“Brake Switch”

Locate the brake switch at the top of the brake pedal. This will be a small cylindrical switch that has a plunger, like the door switch, that opens and closes the switch based on brake pedal position.

This switch is what is called normally open, meaning the two terminals are not connected together when the switch is in its normal position. As soon as the brake is applied, it closes the switch to internally connect the two posts of the switch.

This switch requires two wires, a battery power wire and an output wire to the brake lights. The pre-installed connector, shown below, will connect to the factory switch. If your switch differs from the connector provided, the connector can be cut off the harness and insulated terminals from the parts kit, like those shown to the right, can be used to make individual wire connections to the brake switch.

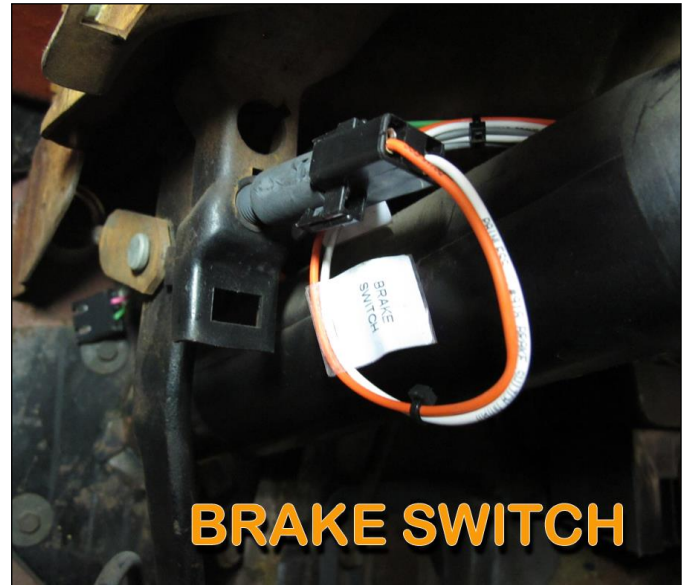


The two wires of the Painless kit that make up the brake switch connection are:

Orange: 16 gauge wire, printed **#917 BRAKE SWITCH POWER INPUT**, which provides power from the 15 amp STOP fuse. This wire will have power at all times.

White: 16 gauge wire, printed **#918 BRAKE SWITCH OUTPUT**, this wire supplies power from the brake switch to the turn signal switch for brake light operation. This wire goes to the turn signal because these vehicles have integrated brake/turn signals. Meaning, the turn signal and brake light share a filament in the bulb. This wire will have power anytime the brake pedal is pressed.

This splice can also be seen in the [Turn Signal Schematic](#) on page 71.



- Route the brake switch wires to the brake switch and connect using the pre-installed connector or loose piece terminals provided in the parts kit. Be sure to route the wires away from the moving parts of the brake pedal and/or clutch pedal.

If your brake switch is an aftermarket brake switch with a four connection pins, two pins will have contact or will be closed when the brakes are not applied and two will be separate or open when the brakes are not applied. You will need the 2 posts that are separate or normally open. The normally closed pins are for cars equipped with cruise control or an automatic transmission with a lockup torque convertor, this harness does not provide wires for these features

“Ignition Switch”

The ignition switch is one of the most important connections of a wire harness. Its function will control power to the switched ignition fuses on the fuse block as well as sending a start signal to the starter to allow engine operation.

The ignition switch connection consists of two connectors with a section label reading “IGNITION SWITCH”. These two connectors will be black and clear. All wires going to the ignition switch connectors can be seen in the [*Ignition Switch Schematic*](#) on page 76.

The black connector is a four pin connector with the following wires:

Red: 12 gauge wire, printed **#934 IGNITION SWITCH POWER**, this wire comes from a buss bar on the fuse block and feeds battery power to the ignition switch. This wire will have power at all times.

Orange: 12 gauge wire, printed **#933 SWITCHED (IGN) POWER TO FUSE BLOCK**, this wire provides the switched power source to the fuse block. This wire powers all of the switched power circuits to the harness, with the exception of the A/C-HEAT, RADIO, and POWER WINDOW fuses. This wire will only have power when the ignition switch is in the ON/RUN position. This wire is in the same pin location on the black ignition switch connector as the brown/white wire.

Green: 18 gauge wire, printed **#921 ENGINE TEMP SIGNAL**, this wire comes from the cooling temp sending unit on the engine. This wire is in the same pin location on the black ignition switch connector as the brown/white wire.

Green: 18 gauge wire, printed **#921 ENGINE TEMP SIGNAL/TEST**, this wire goes to the passenger side indicator light connector to provide the coolant temp gauge/light a ground signal for operation. This will provide a ground source to the coolant light on instrument clusters with indicator lights when the key in the start position. This will indicate that the bulb is operable.

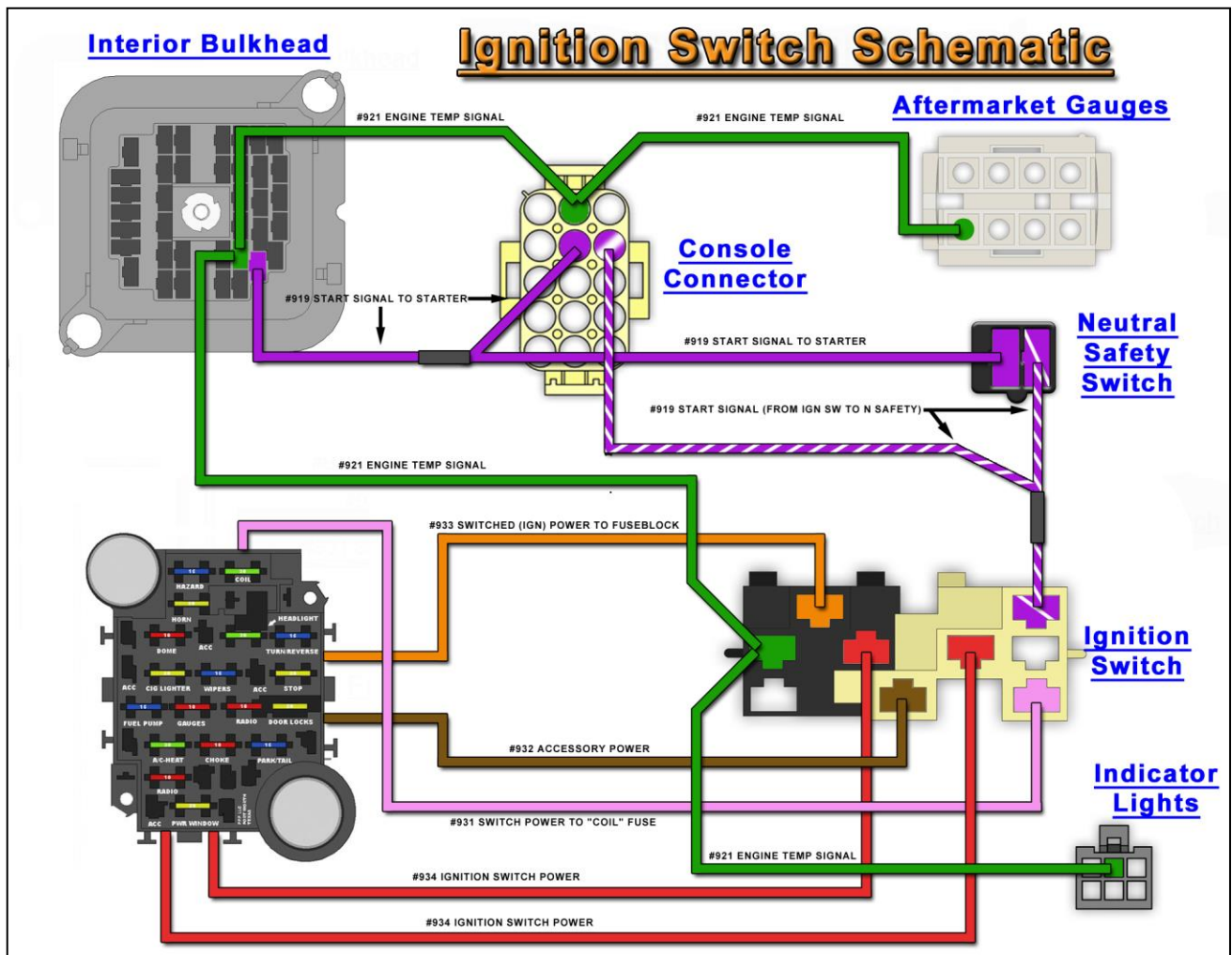
The clear connector is a five pin connector with the following wires:

Pink: 16 gauge wire, printed **#931 SWITCHED POWER TO "COIL" FUSE**, this wire provides power from the ignition switch to the COIL fuse on the fuse block. This wire will have power when the ignition switch is in the ON/RUN position as well as the START position.

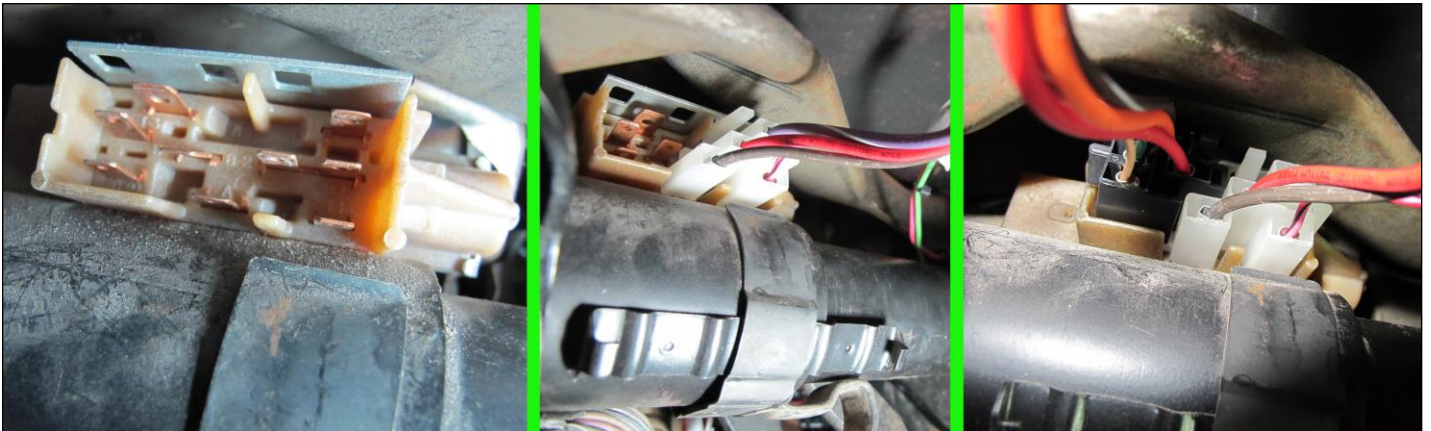
Purple/White: 12 gauge wire that leads to a splice with 2 Purple/White wires, they are printed **#919 START SIGNAL (FROM IGN. SW. TO N. SAFETY)**, these wires will send power to the neutral safety/clutch switch to engage the starter solenoid. These wires will only have power when the ignition switch is in the START position.

Red: 12 gauge wire, printed **#934 IGNITION SWITCH POWER**, this wire comes from a buss bar on the fuse block and feeds power to the ignition switch. This wire will have power at all times.

Brown: 12 gauge wire, printed **#932 ACCESSORY POWER**, this wire carries power to the accessory fuses on the fuse block. These fuses are the A/C-HEAT, RADIO, and POWER WINDOW fuses. This **#932** wire will have power when the ignition is in the ACCESSORY position and when it is in the ON/RUN position.

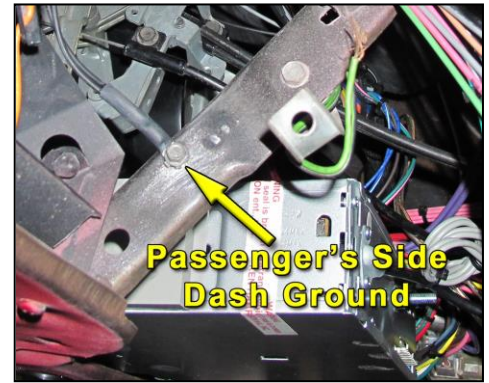


- Locate the ignition switch on the steering column, route the two connectors to the ignition switch.
- **The connectors must be installed in a specific order;** the clear connector will need to be connected first, and then the black. Part of the black connector will overlap the clear connector as seen in the photo below.



“Passenger’s Side Dash Ground”

The next connection to be made is the passenger’s side dash ground. This connection will be made the same way the driver’s side dash ground was, using either the original hardware or a supplied self-taping screw. The factory connection can be found next to the radio, as seen in the picture to the right



“Heater Switch & Resistor”

The next connections are the power supply and control wires from the Painless harness to the blower switch and heater resistor. These connections will be used for any vehicle with either factory installed heater only, factory equipped A/C and vehicles using aftermarket A/C.

The heater switch wires have a section label reading “HEATER SWITCH” and the heater resistor wires will have a section label reading “HEATER RESISTOR”. After a brief description of these wires you will find an overview of how to utilize these connections for the three possible arrangements described at the end of the previous paragraph. Remember not to remove the factory A/C sub wiring harness if you intend to reuse the factory style A/C setup as it will not be supplied with this Painless Performance harness due to low demand.



The black 4 pin connector with the section label reading “HEATER SWITCH” will contain the following wires:

Brown: Two 14 gauge wires, one will be printed **#904 HEATER SWITCH POWER INPUT**, while the other will not be printed. These wires will be connected to a fused 30 amp, ignition switch power source, from the A/C-HEAT fuse on the fuse block. Wire **#904** will supply power to the factory heater switch. The non-printed wire will lead to a single pin connector that will either not be used (factory heat only installation) or used to supply power to either the factory A/C sub harness or Aftermarket A/C system. This single pin connector will plug directly into the factory sub harness and a mating connector and terminal, seen in the picture to the right, has been supplied for aftermarket A/C setups.



Orange: One 12 gauge wire printed **#967 BLOWER MOTOR POWER**, and one 16 gauge orange wire printed **#976 BLOWER MOTOR CONTROL**. Wire **#967** will provide power to the blower motor from the blower switch and will only be needed by those with factory heater only vehicles. Wire **#976** will route to the Heater Resistor on factory heater only vehicles.

Yellow: 16 gauge printed **#975 BLOWER MOTOR LOW**. This wire will supply power from the heater switch to the heat resistors low speed input. Power will then flow through the low speed heater resistor, through wire **#976** to wire **#967** and on to the heater blower under the hood, supplying low speed power to the blower motor.

Light Blue: 16 gauge printed **#974 BLOWER MOTOR MEDIUM**. This wire will supply power from the heater switch to the heat resistors medium speed input. Power will then flow through the medium speed heater resistor then through wire **#976** to wire **#967** and on to the heater blower under the hood, supplying medium speed power to the blower motor.

The black 3 pin connector with the section label reading “HEATER RESISTOR” will contain three wires that have already been described above. These three wires are orange **#976**, yellow **#975** and light blue **#974**.

Installations using an aftermarket A/C, the brown **#904** wire will provide a switched ignition power source your system may need. A connector and terminal, seen in the photo on the previous page, have been provided to allow you to make a factory style connection to your aftermarket system.

- Install the terminal and connector shown onto the wire of your aftermarket A/C system harness that requires a fused switched ignition 12v source.
- The **#964** orange wire will not be needed, with your application. Once the power connection has been made to the wiring of your aftermarket AC unit, continue on to page 79 of this manual.

Those using factory heater only systems:

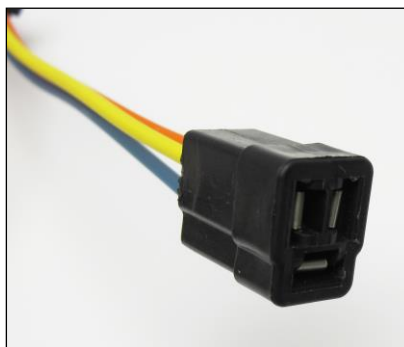
If you will be using the factory heater only system there will only be two simple connections for you to make:

- The first connection will be the 4 pin connector with the section label reading “HEATER SWITCH” This connector will plug into the top of the heater control panel, which is located just to the right of the instrument cluster.
- The second connection will be the 3 pin connection with the section label reading “HEATER RESISTOR”. This connector will be plugged onto the three terminals sticking up from the top of the interior heater enclosure. This will be located behind the glove box on the passenger side of the vehicle.

**HEATER
SWITCH**



**HEATER
RESISTOR**



Those using factory A/C harness:

- As previously mentioned, highlighted on page 3, this harness does not include any wiring for the factory air conditioning (your original harness or a reproduction of the original harness must be used). The Painless harness will plug directly into a factory/reproduction harness with one minor modification. On the under hood portion of the factory A/C harness you will find a 10

gauge black wire that originally went to the horn relay for power. This wire will need to be re-routed to the battery, terminated with a ring terminal and connected to the positive side of the battery.

- Locate the inline connector on the factory A/C harness, it will be a single pin connector with a brown wire several inches away from the blower switch connection. Plug the brown #904 power wire into this connector on the air conditioning harness.

The orange wire #967 of the Painless harness will not be needed.

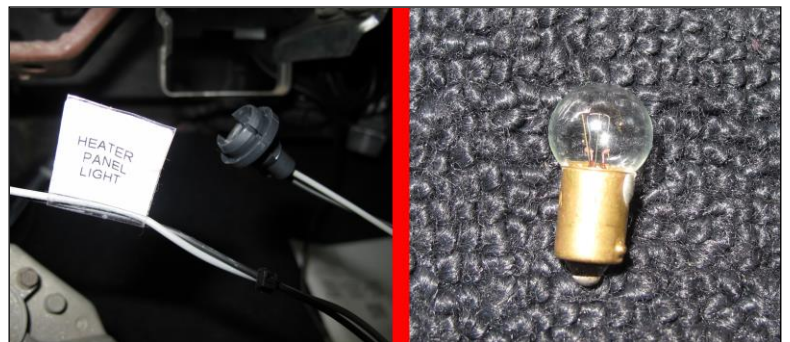
“Heater Panel Light”

The next connection on the new Painless chassis harness is the panel light. This connection will provide a light source to the A/C or blower switch panel. This light socket receives power from the headlight switch whenever the headlight switch is in the Park Lights ON and in the Headlights ON positions.

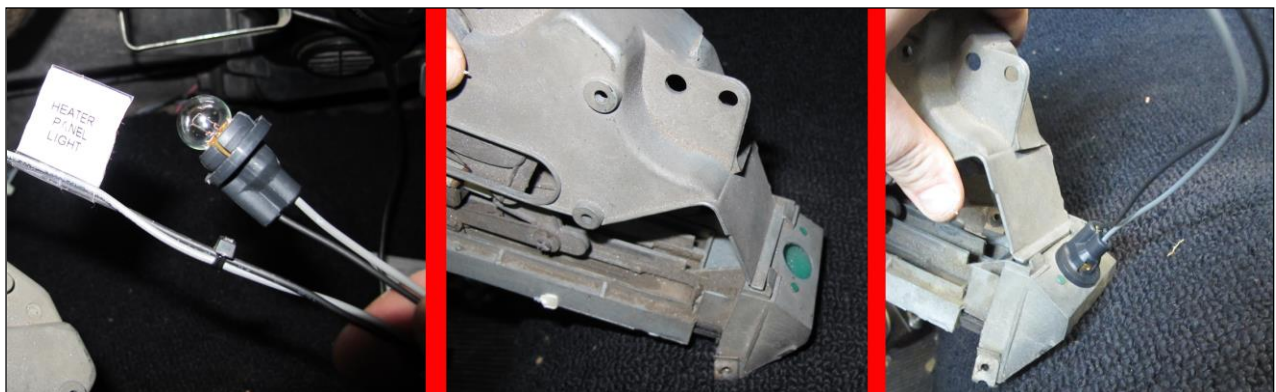
The panel light connector has a section label reading HEATER PANEL LIGHT, as seen in the photo. This will be a two pin black socket pre-installed, the wires in the socket will be:

Gray: 18 gauge wire, printed #930 **PANEL LIGHT POWER**. This wire comes from a splice that distributes power from the headlight switch. This splice can be seen in the [Headlight Switch Schematic](#) on page 96.

Black: 18 gauge wire, this wire is not printed. This wire provides a ground source for the light and comes from a splice that is tied to the integrated grounding circuit. This panel light ground along with the other interior ground wires and splices, can be seen in the [Ground Schematic](#) on page 16.



- Locate a small bulb from the parts kit and install it into the socket. A small dab of dielectric grease on the bulb base before installation will help with bulb removal later down the road if the bulb ever burns out.
- Insert the socket, with the bulb installed, into the panel lamp hole on the back of the A/C or blower switch panel.



“Cigarette Lighter/Power Port”

The Cigarette Lighter/Power Port connection on the Painless harness is set up for a universal application since the factory connector is no longer produced. This connection is a simple two wire, power and ground, connection. In many applications, the cigarette lighter is more commonly used as a power port to charge cell phones and run other electronic components requiring a 12vDC power source.

If you are using an aftermarket cluster panel, you may not have a hole pre-drilled for this component. Extra length has been provided to mount a Cigarette Lighter/Power Port elsewhere on the dash.

The Cigarette Lighter/Power Port connection will be two wires with a section label reading “CIG. LIGHTER”, these wires are:

Orange: 16 gauge wire, printed **#903 CIGARETTE LIGHTER POWER**, this wire will provide constant battery power. This wire comes from the 20 amp CIG LIGHTER fuse on the fuse block and can be seen in the [Accessory Schematic](#) on page 105.

Black; 16 gauge wire, printed **#969 CIGARETTE LIGHTER GROUND**, this wire provides a ground source. This wire is tied into the integrated ground circuit and can be seen in the [Ground Schematic](#) on page 16.

- Route the #903 and the #969 wires to the cigarette lighter/power port.
- Cut the wires to length and connect according to one of the following:
 - Ring terminals and bullet/socket/spade style terminals have been provided in the parts kit to connect universal aftermarket lighters/power ports. Universal Lighter socket part #56458 can be seen to the right. This socket can be found at most local parts store.
 - You can cut the connector from your factory harness, leaving 3” or 4” of orange wire to create a pigtail to splice it to the orange **#903** wire of the Painless kit. Splices have been provided in the parts kit.



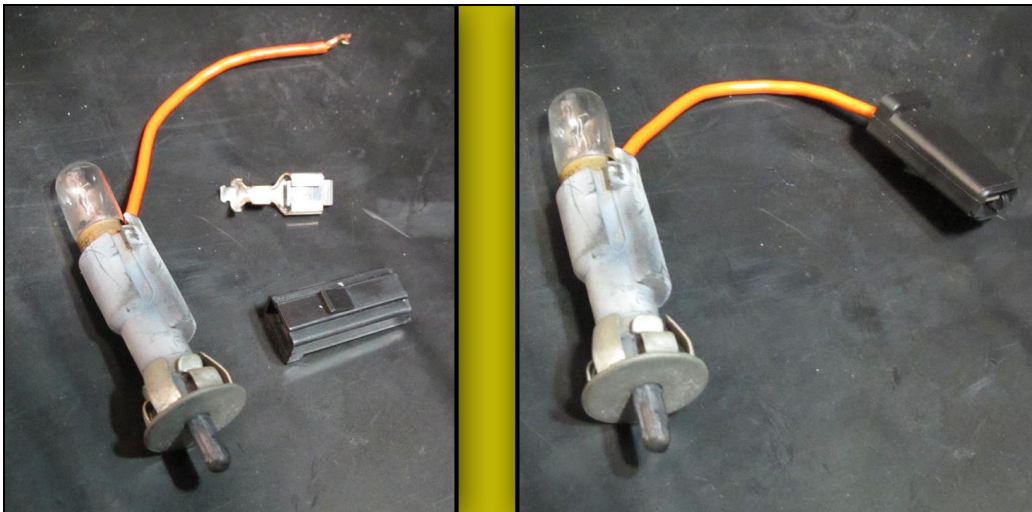
“Glove Box Switch”

The glove box switch is a simple plunger activated light that will illuminate the inside of the glove box when the glove box door is opened. The glove box switch requires a single power wire to function correctly as it grounds through its mounting.

The Painless harness includes a single wire for this connection. This wire, with a connector pre-installed, is:

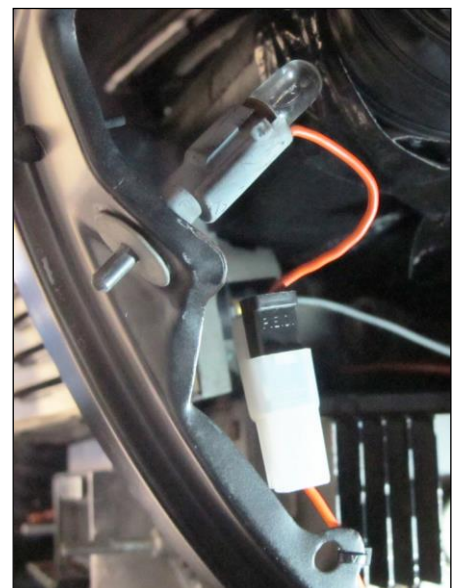
Orange: 18 gauge wire, printed **#971 GLOVE BOX LIGHT POWER**, provides constant 12v power to the switch through the 10 amp dome light fuse found on the fuse block.

Factory Switch: The factory wire for the switch had a single terminal installed into the side of the switch. This wire can be difficult to remove and chances are you will break the switch trying to remove it. Painless recommends cutting the wire going to the switch and installing a terminal and connector as seen in the photo below. This will then allow the connector found on the Painless harness to plug into the existing light.



- With the factory switch now modified, install it into the dash and connect it to the **#971** orange wire on the Painless harness.

You can use the holes found in the edge of the glove box opening and small zip ties included with the kit to help secure the wire.



Aftermarket factory style switch: If you have purchased a new switch from one of the many companies that sell factory style replacements, chances are it came with a considerable amount of wire with connectors pre-installed, like shown above.

- Plug the orange #971 wire on the Painless harness into the mating connector found on your new switch. The other connector on your switch will not connect to anything as in most cases it was used to plug into clocks found on other GM vehicles.



“Aftermarket Gauges”

An addition to the Painless harness, and not found on a factory harness, is a connection providing all the wires needed for aftermarket electric or mechanical gauges.

This connection is intended for those using aftermarket gauges mounted on the lower portion of the dash and for those running an aftermarket tachometer mounted on the steering column or elsewhere on the dash. If you have an aftermarket tach mounted in the actual gauge cluster, connection to this tach will take place on page 101. If you are mounting gauges on the dash below the radio, on the console, steering column, etc, this connection will be useful to you as you do not have to cut and splice into any of the other gauge wiring on your new Painless harness.



This connection on the Painless harness will consist of an eight pin white connector with seven wires and will have a section label reading “AFTERMARKET GAUGES”. The wires in this connector can be seen in the [Gauge Cluster Schematic](#) on page 102, they are:

Black: 16 gauge wire, printed #969 **GROUND**, provides a ground source. This wire is tied into the integrated ground circuit and can be seen in the [Ground Schematic](#) on page 16.

Gray: 18 gauge wire, printed #930 **AFTERMARKET GAUGE LIGHT POWER**, will provide a power source for the gauge light(s). The gray #930 is tied to the other #930 wires coming from the headlight switch, which lead to other components like the radio backlight/dim, panel lights, and gear indicator light. This wire will have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position. This wire can also be seen in the [Headlight Switch Schematic](#) on page 96.

Pink: 18 gauge wire, printed #935 **GAUGE POWER**, provides a switched ignition power source for any gauges. This wire comes from a splice with a wire that leads to the 10 amp GAUGES fuse on the fuse block. This wire will have power anytime the key is in the ON/RUN position.

Tan: 18 gauge wire, printed **#939 FUEL LEVEL SIGNAL**, is a ground signal from a fuel level sending unit in the fuel tank. The resistance to ground will vary on this wire according to how much fuel is in the tank. This wire can also be seen in the [Tail Harness Schematics](#) on pages 109.

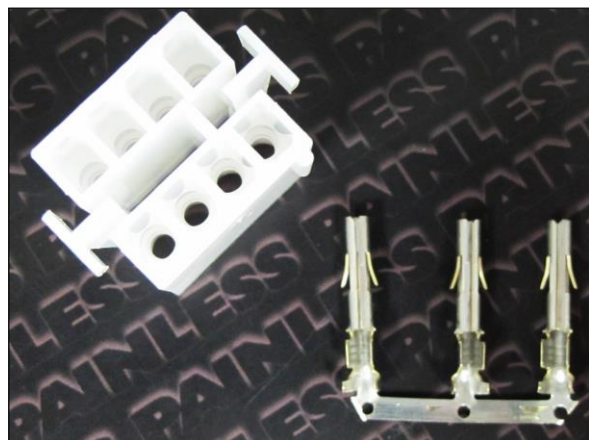
Green: 18 gauge wire, printed **#921 COOLANT TEMPERATURE SIGNAL**, is a ground signal from the engine coolant sending unit. The resistance to ground will vary on this wire according to engine temperature. This wire can also be seen in the [Ignition Switch Schematic](#) on page 76.

Brown: 18 gauge wire, printed **#923 TACH SIGNAL**, is a ground signal from the negative side of the ignition coil. This wire can also be seen in the coil connection diagrams on pages 43-46.

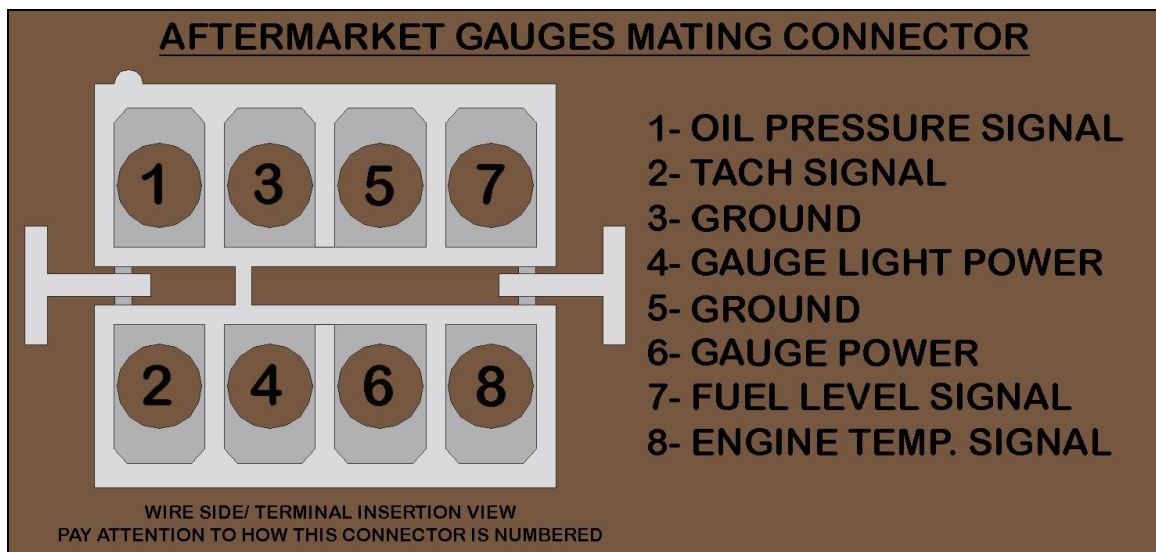
Blue: 18 gauge wire, printed **#922 OIL PRESSURE SIGNAL**, is a ground signal from the oil pressure sending unit. The resistance to ground will vary on this wire according to oil pressure.

A mating connector and terminals have been provided to allow connections to be made to gauges without having to hard wire the chassis harness directly to the gauges.

Refer to the series of diagrams on pages 84-87 to route gauge power/ground and backlighting power/ground from the mating connector to the gauge(s).



- The included terminals will require a ¼" strip length on the wire they are being applied to, and the use of roll over crimpers.
- Using the diagram pin out of the supplied connector, plug the wires going to your aftermarket gauges into their corresponding pin location. The terminals will be inserted into the square opening of the connector and the pin locations can be identified by the numbers printed above the round opening of the connector.

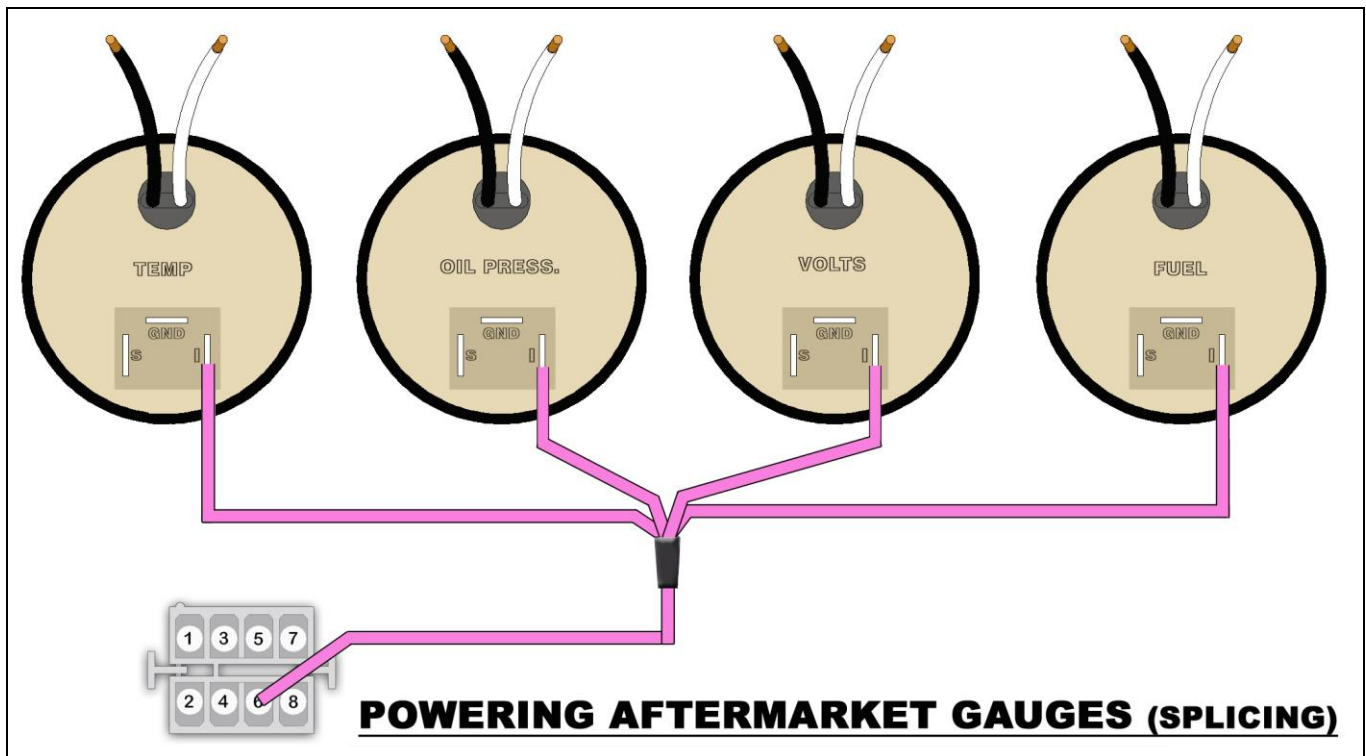


Wiring Aftermarket Gauges:

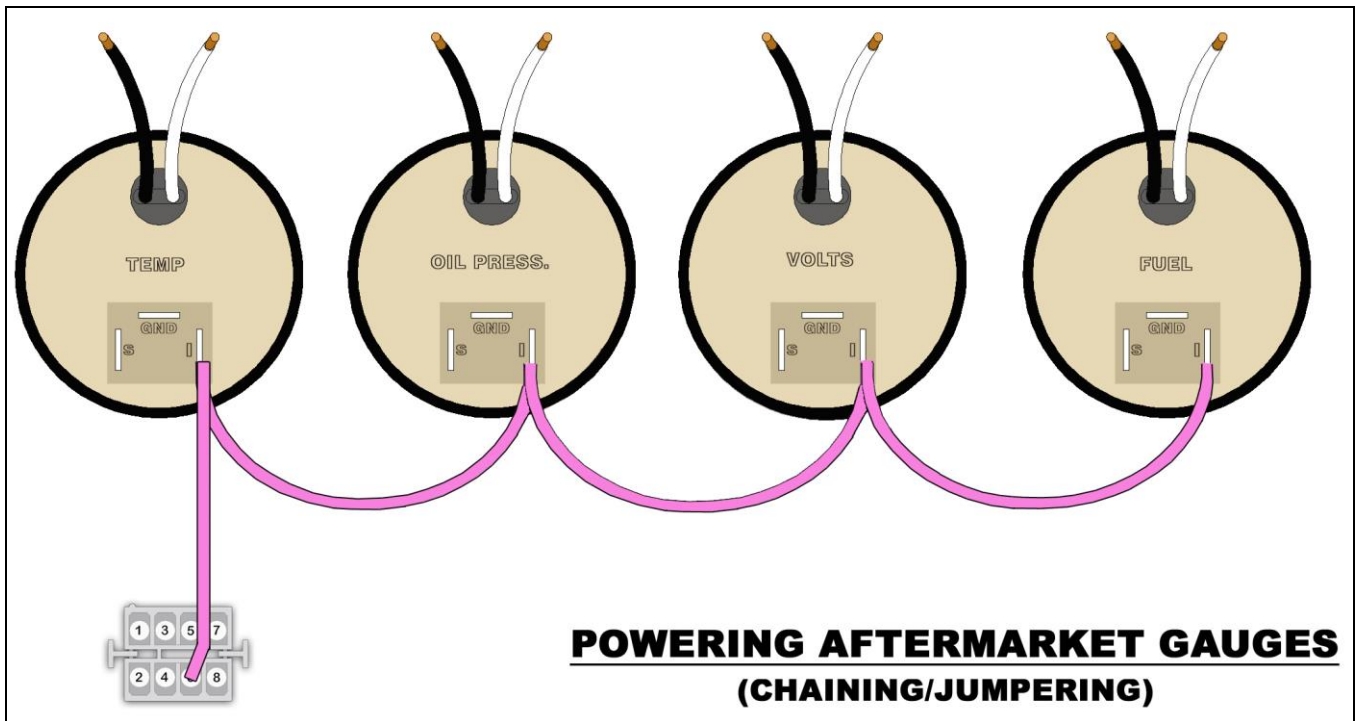
For those wiring aftermarket gauges, please be aware that wiring for actual connection to the gauges themselves is not provided with this harness. You can however use scrap wire cut off from previous connections of this chassis harness and insulated terminals from the parts kit. The following steps will walk you through the process of distributing power and ground, as well as connecting the sender wires. The following diagrams only show temp, oil pressure, volt and fuel level gauges. Power, ground and sender wires will connect in the same manner to tachometers.

Power to the gauges will need to come from the pink **#935 GAUGE POWER** on the connector, **pin 6** in the diagram above. Power will need to be connected to the “I” or “12v” post on the gauge or gauges. The power wire can be connected in one of two ways:

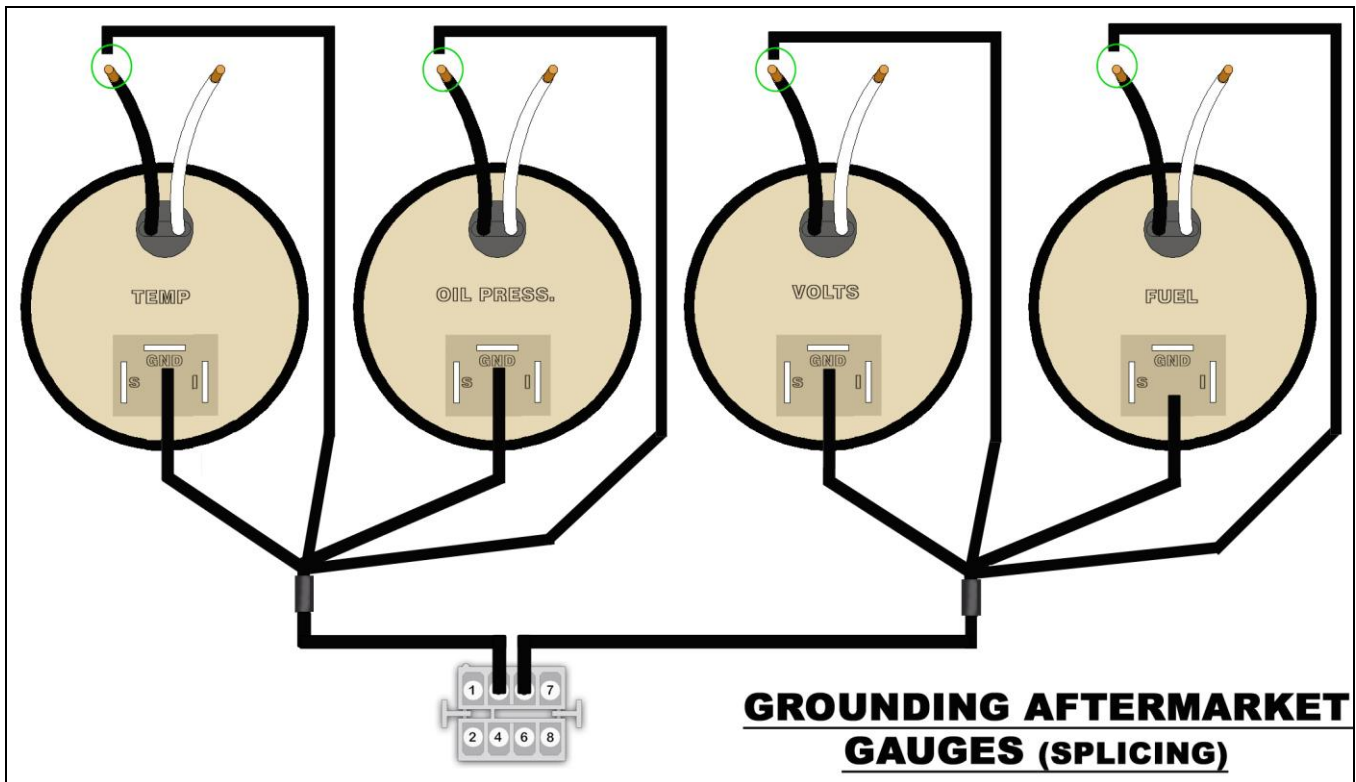
#1) Splicing- Splice off one wire from **pin 6** of the mating connector and running wires to several gauges.

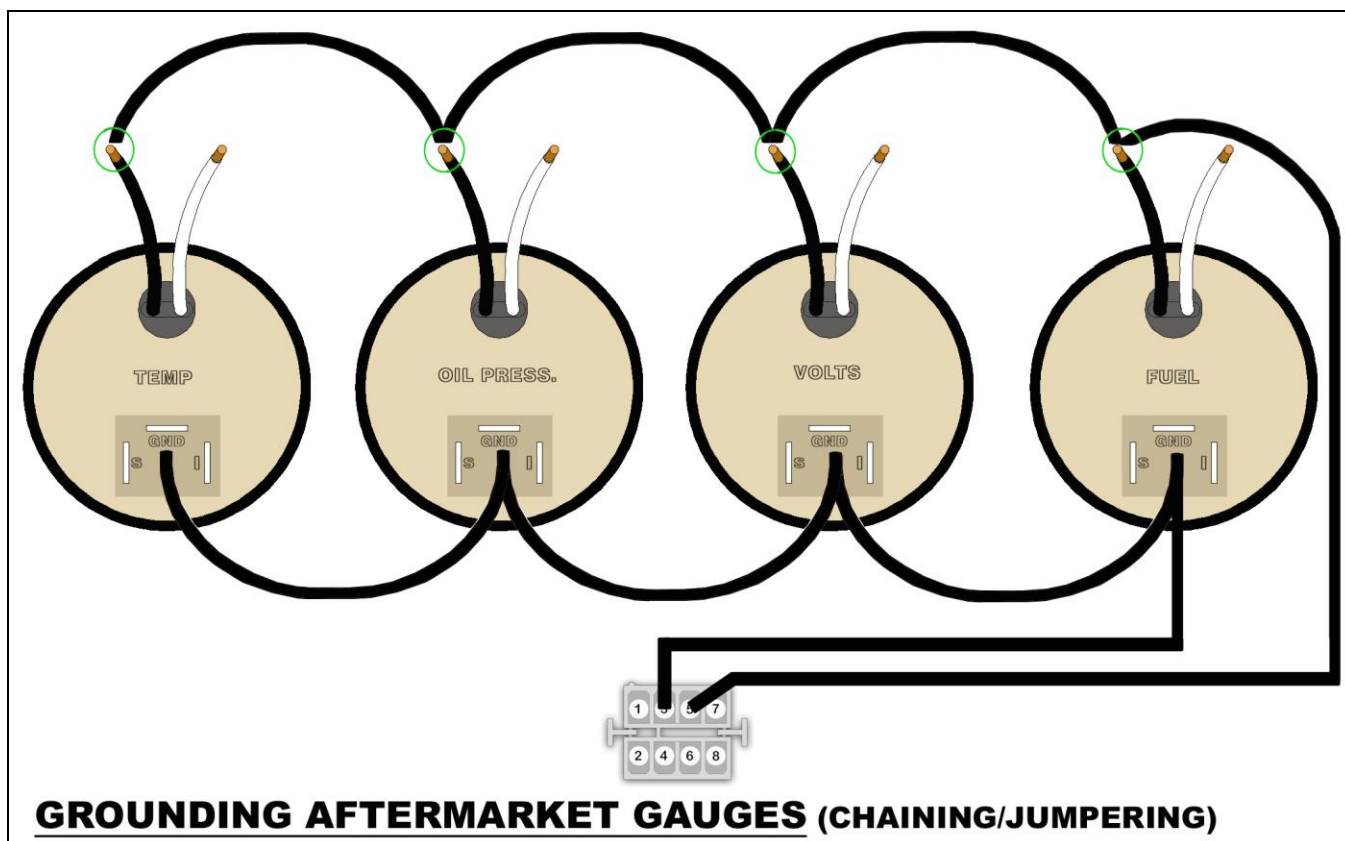


#2) Chaining or Jumpering- Run one wire from **pin 6** of the mating connector to a power post, before terminating the wire with the proper terminal, you will insert another wire into the terminal and crimp. You will now have 2 wires in one terminal. This additional wire will then route to the power post on another gauge. Before terminating the wire with the proper terminal, you will insert another wire into the terminal; and so on.

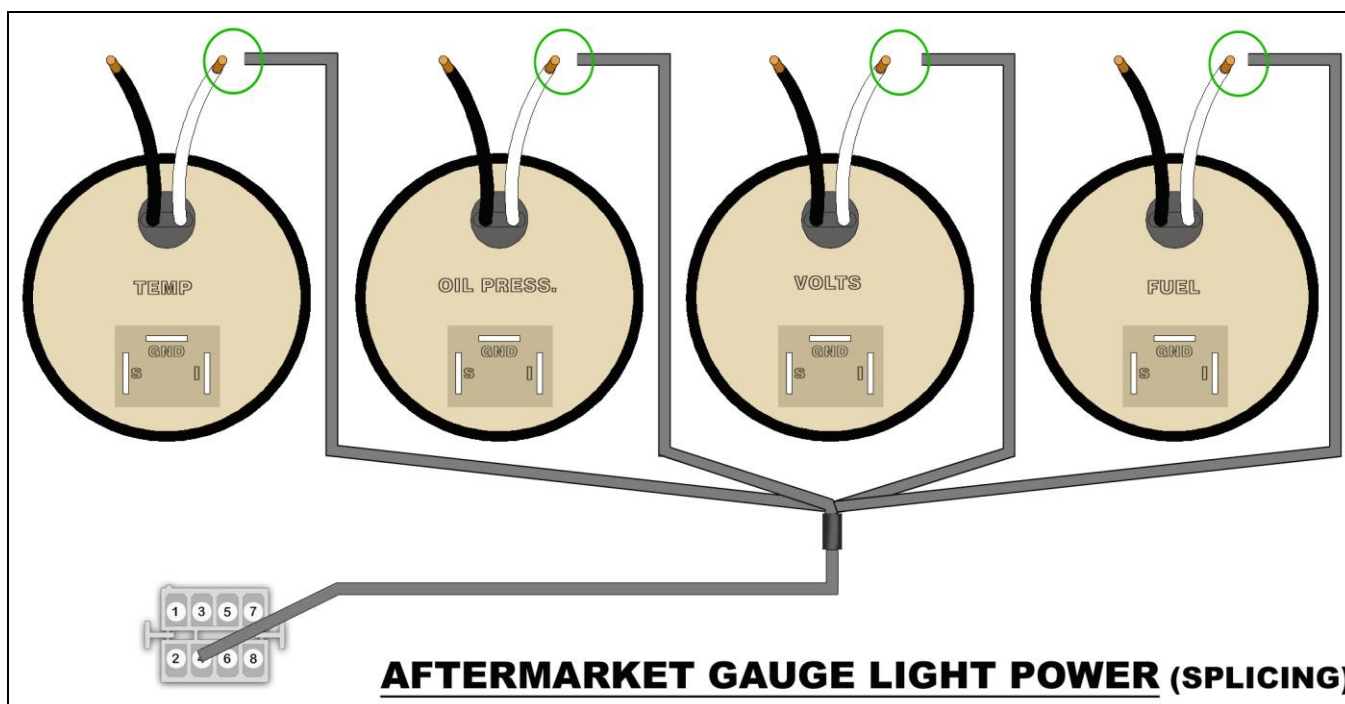


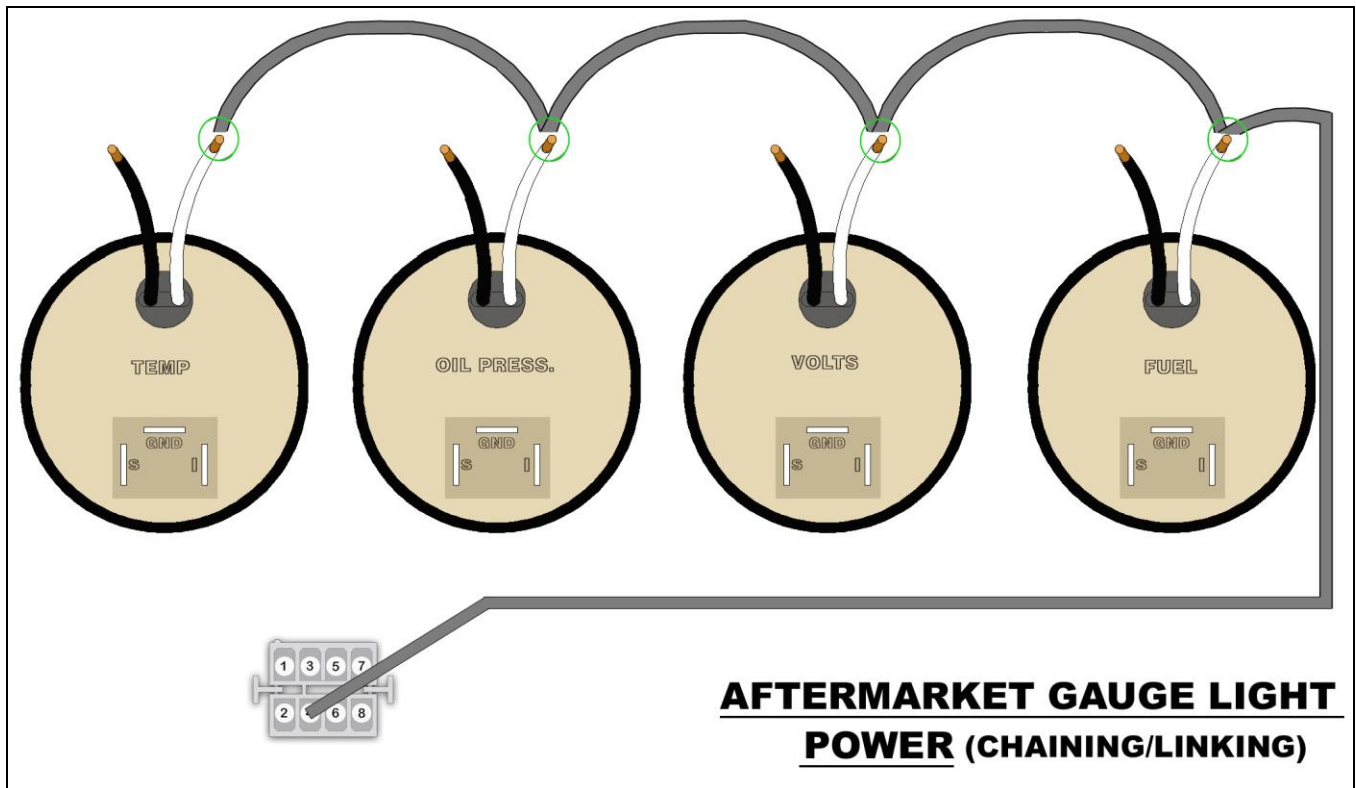
Grounds will need to be supplied to the gauge lights and to any ground tab on the gauges. These grounds can come from **pins 3 & 5** of the mating connector, and/or seeing that a good ground source is not hard to find on these vehicles, the installer could run their own ground circuit for gauge connections. To make these ground connections you can splice from a single wire to all the gauges or chain/jumper it all together. Both methods are shown in the following two drawings:



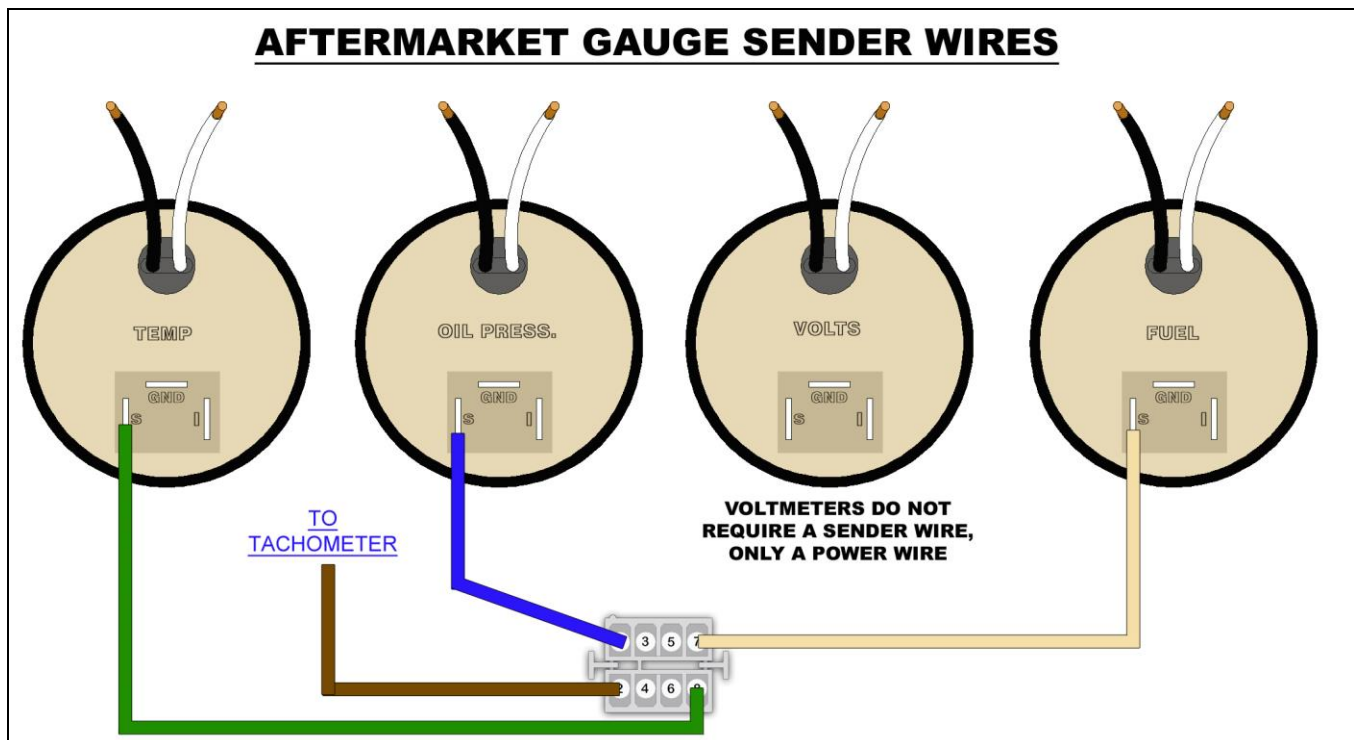


Gauge light power will be supported by **pin 4** of the mating connector. This wire will connect to one of the leads for the gauge light, or to the gauge light tab found on gauges with LED backlighting. To make these connections you can splice from **pin 4** to all the gauges or chain/jumper it all together. Both methods are shown in the following two drawings:





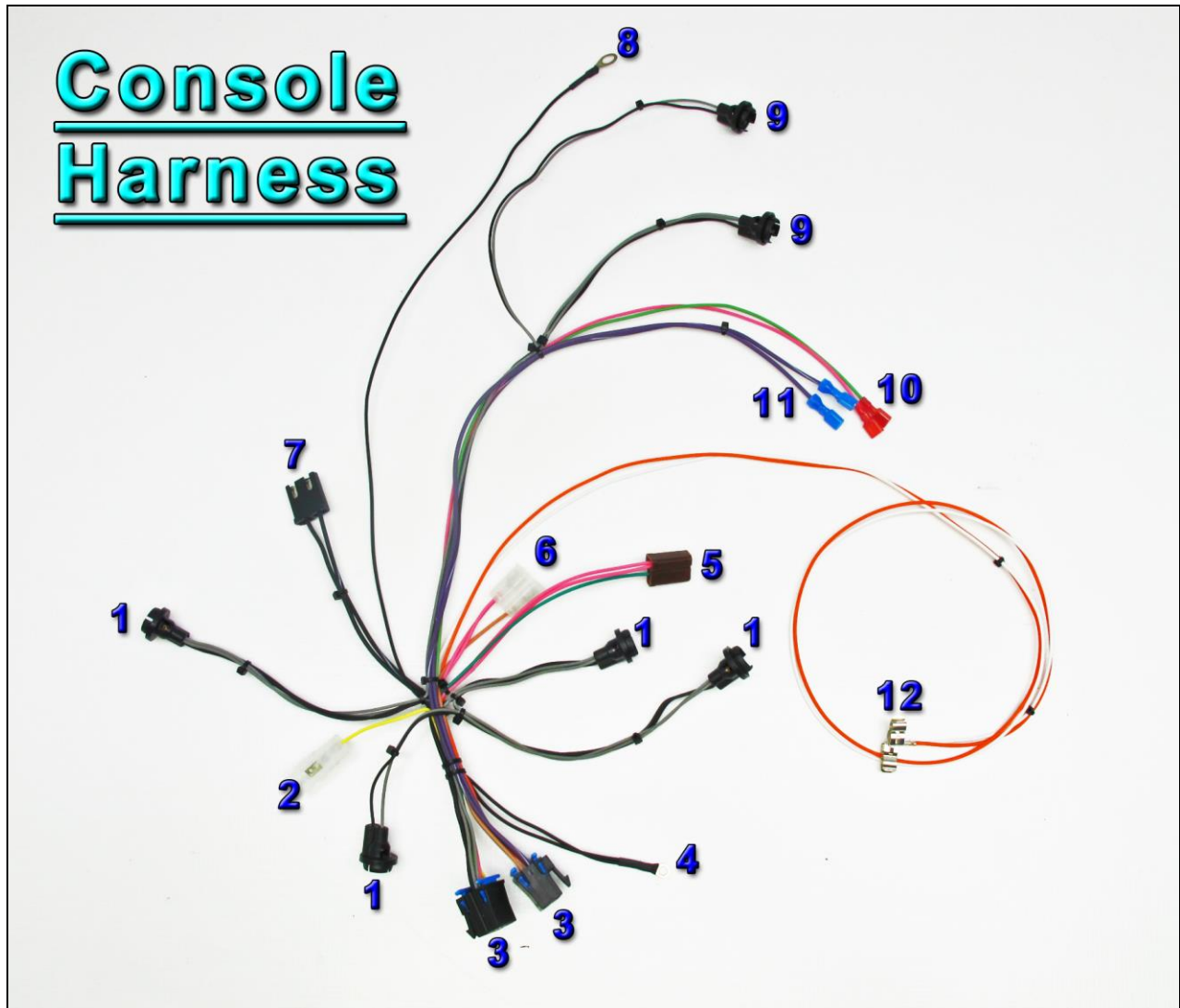
The last connection needing to be made will be the sending unit wires or signal wires. These will be the wires which come from the temperature sending unit, oil pressure sending unit, and fuel level sending unit. These signal wires will come from **pin 1** (oil press), **pin 2** (tachometer), **pin 7** (fuel level), and **pin 8** (engine coolant temp).



“Console Sub-Harness”

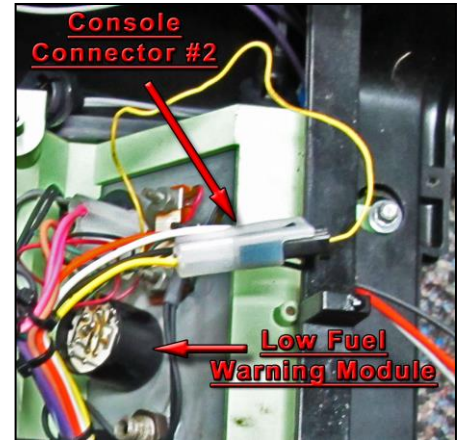
A 15 pin connector, as well as a separate sub harness, has been furnished in the Painless harness kit for connection to a factory style center console. This sub harness can be used for vehicles that either came with a factory center console or vehicles that are having a factory style console added. Connections provided on the console harness include a neutral safety switch, reverse switch, gear indicator lighting, factory console gauges, gauge lights and a courtesy light. All of these components could be found in a factory console, however most consoles will not utilize all of these connections. Those using an aftermarket automatic floor shifter can use this sub harness to make connections to the shifter mounted neutral safety switch, reverse switch, and gear indicator light.

The console sub harness will connect to the dash harness with a 15 pin connector. This connector will be keyed, preventing it from being connected incorrectly. It is recommended that you completely remove the console from the vehicle and install the console sub harness with the console on a work bench. Once the console has been wired with the sub harness you can install the console and simply plug in the connector between the dash harness and the sub harness. Below you will find a large picture of the console sub harness with all of the connections numbered. On the following pages you will find a description of each connection and more detailed pictures of how to make each connection.



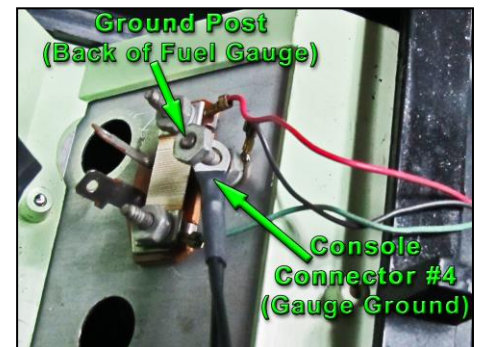
(1) Gauge Lights- These 4 panel lights will illuminate the factory style console gauges. Each panel light will have either one or two gray power wires (seen in the [Headlight Switch Schematic](#) on page 96) and one or two black ground wires that are connected to the integrated chassis ground. The two panel lights with longer leads will be used for the temp and ammeter gauges, while the two with shorter leads will be used on the fuel and oil gauges. You will need to install the supplied panel light bulbs into the housings after applying dielectric grease to their bases, then snap the housings into place on the back of the gauges. **If these lights are not utilized you must tape over the connectors to prevent a short, because the gray wire will have power when the dash lights are on.**

(2) Low Fuel Signal Connector- This one pin clear connector will attach to the signal connector coming from the low fuel warning module. This wire will supply a ground signal to the low fuel indicator light found on in the instrument cluster whenever the low fuel module detects that the fuel level is below a predetermined threshold. The low fuel level module and connector can be seen in the picture to the right.



(3) Main Console Connector- This 15 pin connector is the connection between the console sub harness and the main dash harness. This connection will be the last connection made, after the prewired console is installed in the vehicle. When reinstalling the console into the vehicle make sure to not secure the gauges until after the oil pressure gauge line is connected, as it will be much easier to make this connection with the gauges loose. Once you have secured the console to vehicle you can route the 15 pin connector to its mate, found under the center of the dash.

(4) Gauge Ground- This ring terminal will connect to the back of the gauge housing and will not be used if the console installation doesn't include factory gauges. This wire will provide a ground for all the gauges through the metal backing panel of the gauge housing. This ring terminal will be attached to the ground post located behind the fuel gauge, as seen in the picture to the right.



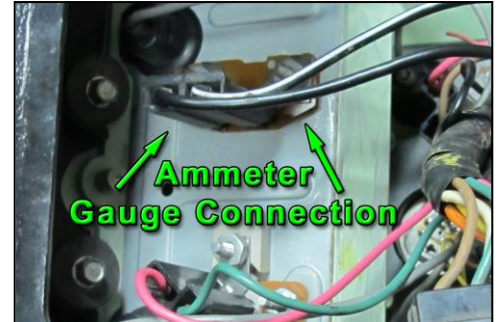
(5) Temperature Gauge Connector- This brown two pin connector will be attached to the back of the temperature gauge, if the console gauges are being installed. This connector will have two pink wires connected to one terminal that supplies ignition switch power to the temperature gauge. The other wire will be a single green wire that will supply a ground signal from the temperature sensor connected to the engine.

(6) Fuel Gauge Connector- This clear two pin connector will be attached to the back of the fuel level gauge, if the console gauges are being installed. The two pink wires that share a terminal will supply the fuel level gauge with an ignition switched 12v source. The single tan wire will supply the fuel level gauge with a ground signal from the fuel level sensor in the fuel tank.

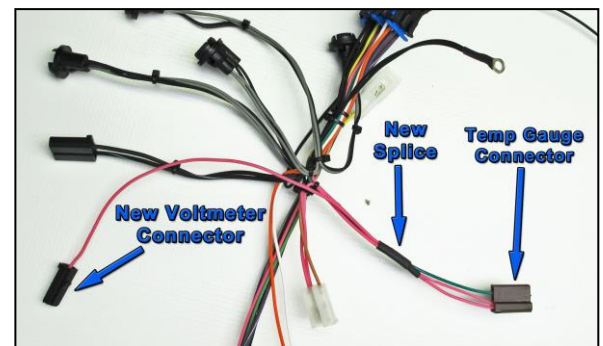
(7) Ammeter Connector- This black two pin connector will attach to the back of the ammeter. If this connection is going to be used, please make sure you have read the "Ammeter B+" section on page 33-34, as it contains important information regarding the use of a factory style ammeter. This connector houses two wires, a 14 gauge black wire, and a 14 gauge black wire with a white stripe. The 14 gauge black wire with the white stripe connects through the bulk

head to the main power splice that connects the alternator charge wire to the battery, these wires and splice can be seen in the [Charge/Battery Power Schematic](#) on page 57. This wire will provide the ammeter with a voltage sample from the alternator main power feed into the harness. The black 14 gauge wire found in the ammeter connector will connect through the bulkhead directly to the battery. Again this wire can be seen in the [Charge/Battery Power Schematic](#), and will supply a sample of direct battery voltage to the ammeter. The ammeter will use these two voltage samples to determine a voltage differential between them and display whether the system is charging or discharging.

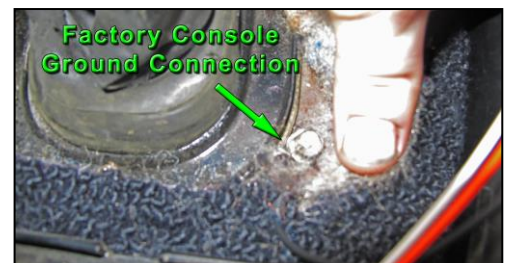
Make sure that when you plug this connector onto the back of the ammeter the wires are in the correct position. In the photo to the right you can see that the black wire with the white stripe is in the bottom position (to the right in the picture shown). If you plug this connector on backwards the ammeter will read backwards, indicating charge when the system is discharging and visa-versa.



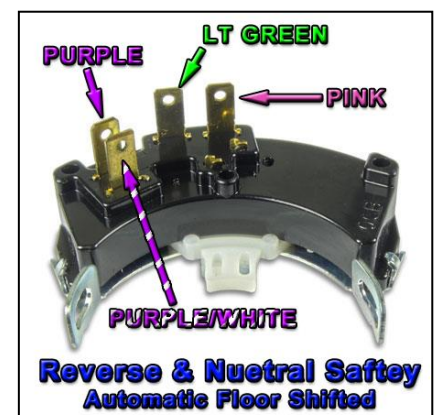
Voltmeter Modification: If an aftermarket voltmeter is used, instead of the factory Ammeter, a small change will need to be made to the console harness. You will need to splice a 10" piece of pink 18ga wire (left over from cowl induction wiring) into one of the pink wires leading to the temperature gauge (5) connector. This splice will be made using one of the supplied butt splices and heat shrink. Once the splice is made route the new wire to the Voltmeter location and terminate the wire using one of the supplied factory style connectors and terminals, as seen to the right.



(8) Console Harness Ground- This connection consists of a single black wire terminated with a ring terminal. This wire ties to the (4) gauge ground and integrated chassis ground, helping to eliminate grounding issues. It will connect to the same spot that the factory console harness ground connected, near the shifter. You will reuse the factory hardware if it is still usable. The picture to the right shows the location of this ground on a factory manual transmission console installation.



(9) Automatic shifter indicator lights- These two panel lights are just like the four (1) gauges lights that were covered on the previous page. As with the gauge light, you will need to install light bulbs found in the parts kit if you are using a floor mount factory automatic that calls for two panel lights. **If these panel lights will not be utilized you will need to tape over the end of the connectors to prevent the possibility of the gray wire shorting to ground, as it will be powered when the gauge light are on.**



(10) Reverse switch- This connection consists of two wires, one light green and one pink, with individual terminals on each wire. The pink wire receives power from the 10 amp "Gauge" fuse in

the fuse block. When the vehicle is put in reverse the reverse switch supplies power from the pink wire to the light green wire, which then sends 12 volts to the reverse lights through the rear harness. This connection will only be made on cars with an automatic floor shifter. This connection can be skipped if the vehicle is equipped with a manual transmission, as this connection was made on the steering column (see page 73 for manual transmission connections).

Factory style automatic floor shifters will have a combination reverse/ neutral safety switch. The picture on the previous page shows which terminals are for the reverse switch wires and which terminals are for the neutral safety switch. Aftermarket shifters are usually equipped with a micro switch for the reverse switch. Please refer to the manufactures instructions if an aftermarket shifter is being used. Also, if the vehicle is equipped with a modern electronically shifted automatic, such as a 4L60e or 4L80e transmission, these connections will be made between the EFI harness and chassis harness, as the connections for both reverse and neutral safety switches are found on the side of the transmission, at the PRNDL. These connections will vary depending on the transmission used, and the harness used to connect the engine and transmission to the computer and chassis harness. Please refer to the instruction that came with the EFI harness for your installation and make this connection at the connector described on page 73.

(11) Neutral Safety Switch- This connections consist of two wires, one purple and one purple with a white stripe. This connection is the same as the neutral safety switch connections found on page 73, but is specific to floor shifted automatics. If you do not have a floor shifted automatic you can skip this connection. The purple wire with the white stripe comes from the ignition switch and supplied power to the neutral safety switch whenever the ignition is in the start position. The purple wire leads to the “S” terminal on the starter, through the bulkhead. This switch prevents the car from being started if the transmission is not in either park or neutral. These wires can be seen in the [Ignition Switch Schematic](#) on page 76.

This connection is similar to the reverse light connection above, in that it will differ depending on whether a factory style floor shifter or aftermarket shifter is used. If a factory style floor shifter is used please refer to the picture in the lower right hand corner of the previous page. If an aftermarket floor shifter is used these wires will connect to the supplied aftermarket neutral safety switch, usually a micro switch, as described by the manufacture of the shifter. Also if an electronically shifted automatic transmission is used these connections will take place between the EFI harness and the chassis harness at the neutral safety switch found on page 73. This procedure will be similar to the reverse connection described above, in that you will need to reference the manufacture of your EFI harness to determine exactly how to make this connection between the EFI system and chassis harness.



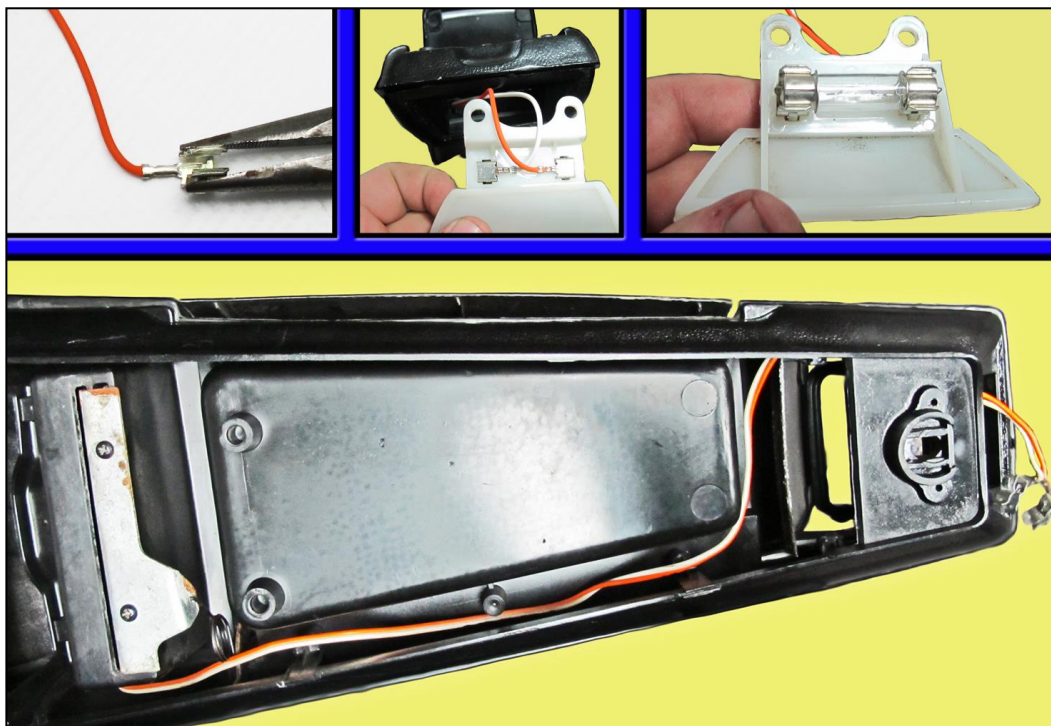
(12) Courtesy Light- This connection consist of two pre terminated wires. The orange wire is a 12v power wire that shares the same circuit as the dome light and courtesy lights and can be seen on the [Courtesy/Dome Light Schematic](#), on page 68. The white wire is a ground activation wire that is controlled by the door jamb switches in both doors, and again is shared with the dome light and courtesy lights.



To install these terminals you will need to start by removing the

ashtray in the rear of the console, as seen in the pictures to the right. You can then remove the two screws which are holding the console light lens in place, again seen in the pictures to the right.

Once the lens is removed you can carefully remove the light bulb and old terminals. **Be careful when removing the terminals because the plastic lens tends to be brittle if it is original.** The easiest way to remove the old terminal is to squeeze the side of them and push them through the opening, as seen in the following pictures. Once the old terminals are removed you can snap the new terminals in place and install the lightbulb. Before reinstalling the lens it is a good idea to make sure the orange and white wire are routed in a similar manner to what is seen in the photos below.



Before continuing to the next step make sure to tape any unused connections with electrical tape to avoid any shorts in the center console.

“Passenger Courtesy Light”

This connection will allow the under dash/floorboard of the passenger side of the vehicle to be illuminated any time a door is open or when the headlight switch is activating the dome light. Your vehicle may or may not have had them from the factory; that will not affect these working properly as they have been pre-wired into the Painless harness.

This connection will have a section label reading “COURTESY LIGHT”. It will be a large gray colored lamps socket with four wires pre-wired to it, These wires can be seen in the [Courtesy/Dome Light Schematic](#) on the page 68, these wire are:



Orange: 18 gauge, printed **#971 COURTESY LIGHT POWER**, provides power from the driver courtesy light, which is fed power from the 10 amp DOME fuse on the fuse block. This fuse has battery power and is hot at all times.

(2) White: 18 gauge, printed **#961 COURTESY LIGHT GROUND**. This wire is the ground wire that activates the courtesy light. When this wire is grounded it completes the voltage path causing the light to illuminate. This ground will come from either of the door jamb switches or the headlight switch depending on if the door is opened or the headlight switch is turned to the “DOME LIGHT ON” position. The other wire in this connection, printed **#961 PASS. DOOR JAMB SWITCH**, will provide a ground source to the **#961** circuit from the passenger door jamb switch

This light socket uses both a 63 and 67 series bulb; a 67 series bulb has been supplied.

- Route the socket to a suitable mounting location under the dash. The light socket has a small hole in a mounting tab to allow mounting. Self-tapping screws have been provided as a mounting solution. Small zip ties, provide with this kit, may also come in handy if a suitable location for the light socket cannot accommodate mounting with a screw.

“Passenger Side Door Jamb Switch”

The passenger side door jamb switch will be the last connection on the passenger side of the vehicle’s interior.

The passenger side door jamb switch will be a one wire connection with a small insulated terminal pre-installed; a section label reading “PASS DOOR JAMB SWITCH” will be found on this wire. This wire will be:



White: 16 gauge, printed **#961 DOME LIGHT GROUND**, will provide a ground source from the jamb switch to the courtesy lights and the dome light. This ground will activate the lights, causing them to illuminate when the door is open. This wire can be seen in the [Courtesy/Dome Light Schematic](#) on page 68.

- Route this white **#961** wire to the passenger side door jamb switch and connect.

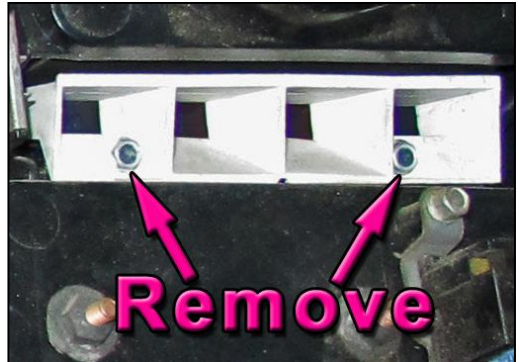
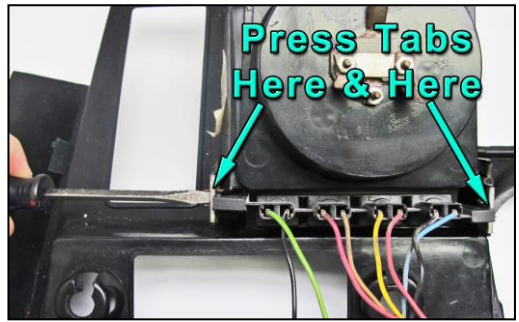
Make sure to perform the procedure outlined on pages 66-67 to correct the length of the new jamb switch before installing it. Failure to do so can result in damage to the door and or jamb.

“Indicator Light Panels”

The last step before installing and connecting the instrument cluster is to install the new Painless supplied indicator light panels. This Painless harness includes two indicator light panels, which are marked “driver side” and “passenger side”. These new indicator light panels are equipped with incandescent lights that are rated at 50,000 hours of service, so they should not need to be replaced. However if an indicator light does burn out please contact our tech line at 1-800-423-9696. The flowing instructions will detail how to properly install these panels into the instrument cluster:



- Start by removing the old indicator light housings, if you haven't already. To remove the housing, simply use a screw driver to push in the retention tabs on either side of the housing, as seen in the picture to the right.
- Now remove the factory screws that retain the white plastic pieces. These screws will be replaced by the new hardware that was included with the new indicator light panels. The picture to the right shows what screws need to be removed.
- Installation of the new Indicator light panels can now begin. Both panels are marked; one says "PASSENGER SIDE" and the other says "DRIVERS SIDE". **These panels must be installed in the correct side of the instrument cluster, failure to do so will result in damage to your harness and possibly cause a fire.** Start by laying the new panel over the white plastic piece, as seen in the photo to the right.
- Now install the new supplied $\frac{3}{4}$ " long screws. You must use the proper supplied screws, due to the brittle plastic that they will be screwed into. These screws are a coarse thread with a self-threading tri-lobe tip, meaning the tip if the screw looks like a circle was squashed into a triangle shape. The fourth picture to right was supplied to help identify these screws.



When installing these screws use extreme caution. As stated earlier, the plastic that these screws will be threaded into is extremely brittle and can be easily broken. Take your time and make sure not to over tighten these screws down. USE EXTREME CAUTION.

Make sure to install both panels before proceeding to the next step.

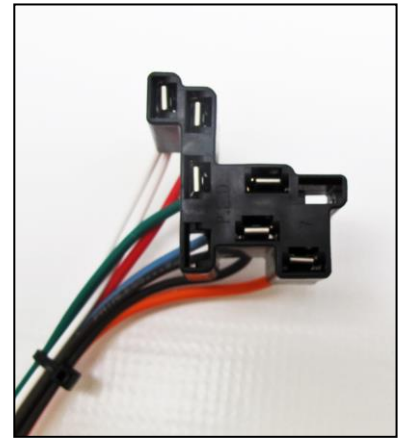


You can now place the instrument cluster in the dash, **but do not permanently install it.** The instrument cluster will need to be loose in order to make connections at its rear and top. You will be instructed to attach the instrument panel after all necessary connections are made.

“Headlight Switch”

The headlight switch connection will control function of the park/tail lights, headlights, gauge lights, and the dome/courtesy lights. This will be a three way switch:

- The first pull of the headlight switch will send power to illuminate the park lights, tail lights, and also the backlighting for the gauges.
- The second pull of the switch will still provide power to everything listed above, but will now send power to the dimmer switch which will then route power to the high beam or low beam headlights depending on the dimmer switch position.
- The third position is dome light/courtesy light control and gauge dimming. By rotating the knob to the left and right, you can dim/brighten the gauge backlighting. This is done through the rheostat (the coiled metal that looks like a spring) on the switch that resists the power going to the gauge lights. Turn the knob to the left to make the gauges brighter, all the way to the left you will feel a click (this click will provide a ground source to the interior lighting circuit causing the dome/courtesy lights to come on without opening a door) Turning the knob to the right will turn the interior lights off and will begin to dim the gauge backlighting.



The headlight switch connection on the Painless harness comes with a black eight pin connector installed. The wires going into these connectors can all be seen in the [Headlight Switch Schematic](#) on the next page. These wires are:

8 pin connector

Orange: 14 gauge wire, printed **#959 HEADLIGHT SWITCH POWER (PARK/TAIL)**, supplies constant battery power for the park/tail lights as well as for the gauge back lighting. This wire comes from the 15 amp PARK/TAIL fuse on the fuse block.

(2)Brown: Two 16 gauge wires, printed **#927 PARK LIGHT POWER**, supply power to the park lights and tail lights. These wires will have constant battery power any time the headlight switch knob is pulled out in the both the first and second positions.

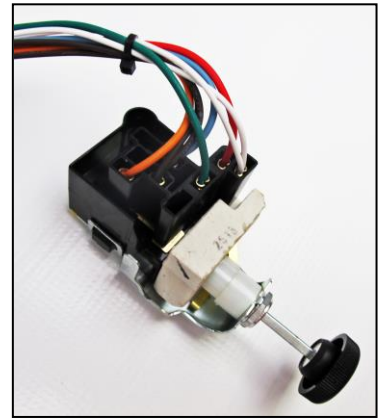
Light blue: 14 gauge wire, printed **#907 DIMMER SWITCH POWER**, supplies power to the dimmer switch for headlight operation. This wire will have constant battery power any time the headlight switch knob is pulled out in the second position.

Green: 14 gauge wire, is not printed due to length but would read **#930 POWER TO GAUGE/PANEL LIGHTS** if printing was possible. This wire provides power to the gauge lights. This wire will have constant battery power any time the headlight switch knob is pulled out in both the first and second positions.

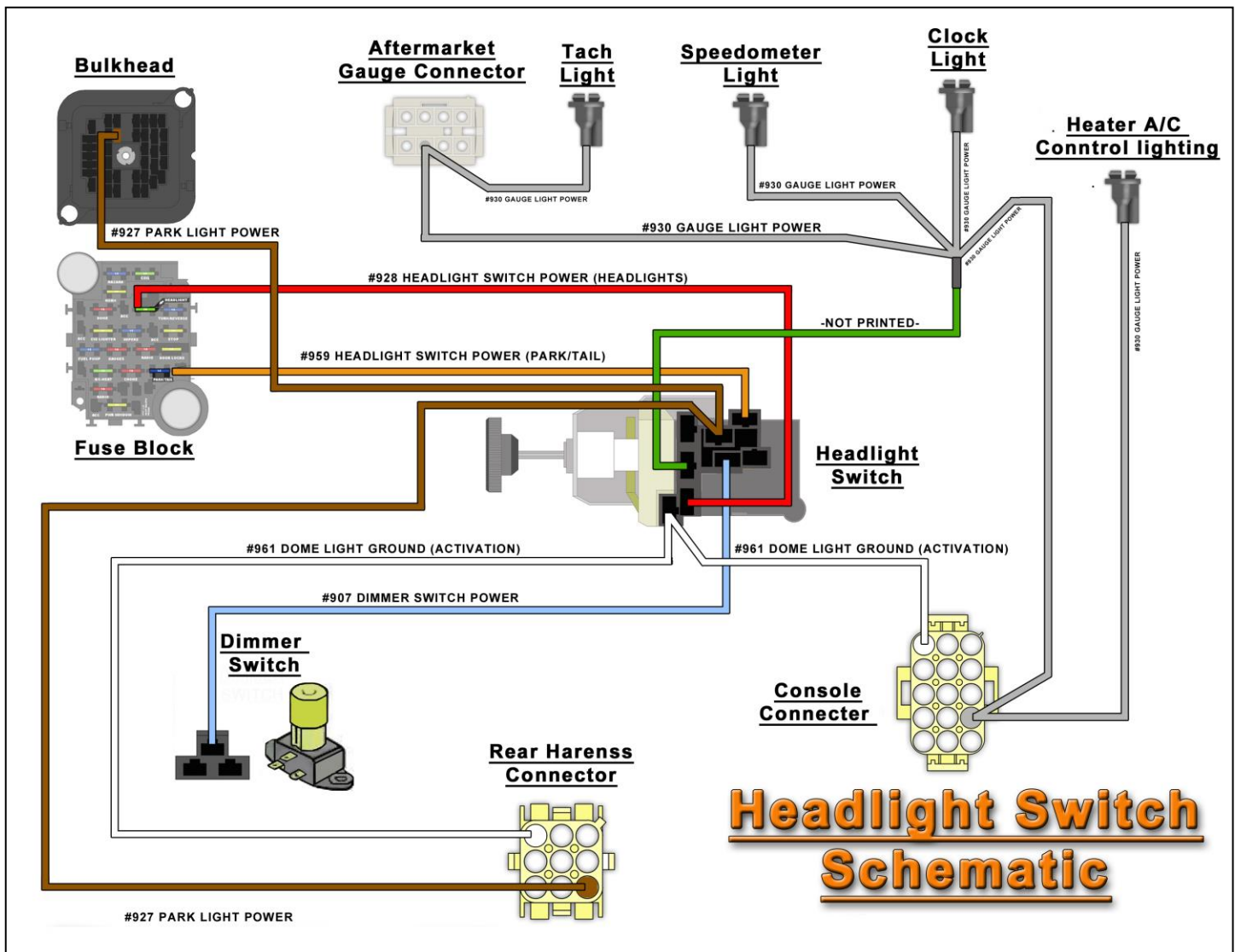
If the knob of the headlight switch is rotated all the way to the right, you will not have power on this wire. If you do not have power to the gauge lights during testing, first check the knob position.

Red: 14 gauge wire, printed **#928 HEADLIGHT SWITCH POWER (HEADLIGHTS)**, provides constant battery power to the headlight switch for headlight operation. This wire comes from the 30 amp HEADLIGHT fuse on the fuse block.

White: 18 gauge wires, printed **#961 DOME LIGHT GROUND (ACTIVATION)**, provides the ground source for interior light activation. These wires will be grounded through the headlight switch ground strap (shown on right) when the knob is turned all the way to the left. The white #961 is spliced into the door switch/ground wires of all the dome and courtesy lights. These wires can also be seen in the [Courtesy/Dome Light Schematic](#) on page 68.



- Connect the eight pin connector to the switch, the connector will only fit one way.



“Wiper Switch”

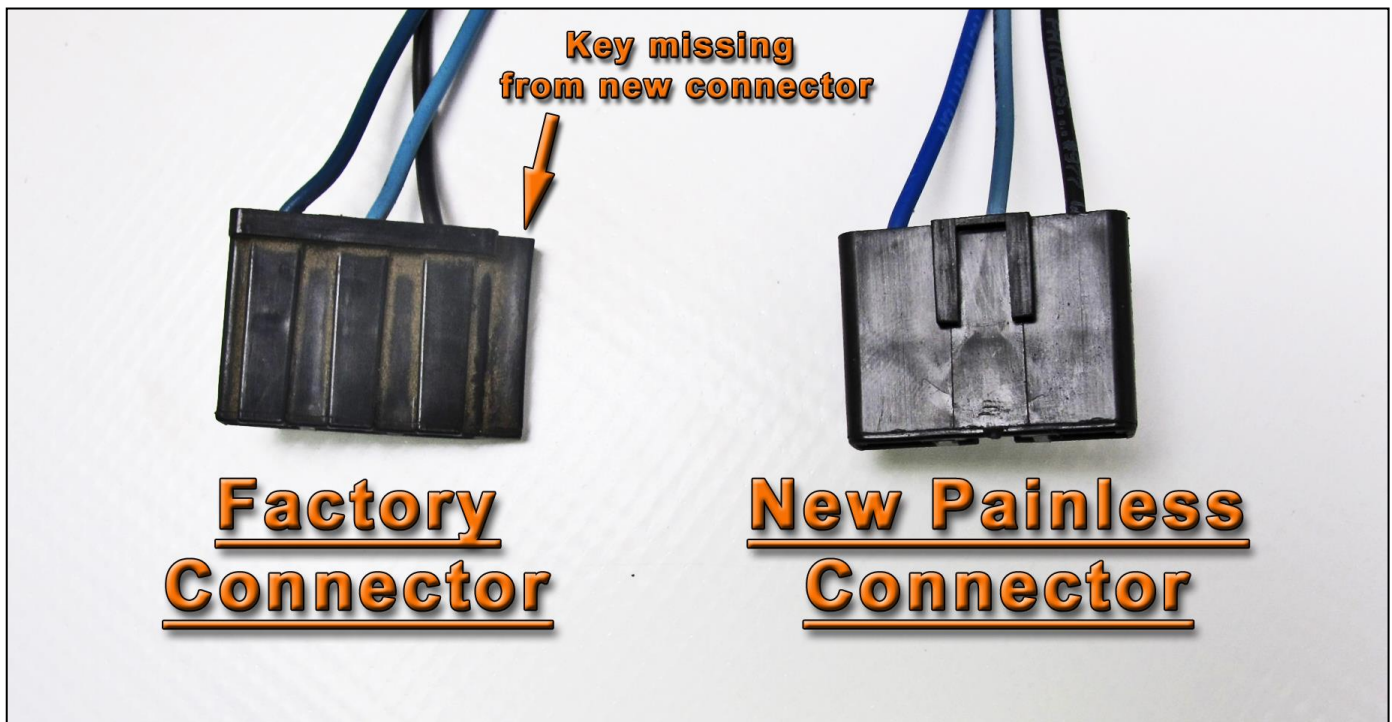
The wiper switch connection is made up of a single three pin and will be the same for all 1969 Camaros using the factory wiper switch in the factory locations. These wires can be seen in the [Wiper Switch Schematic](#) on the next page; they are:

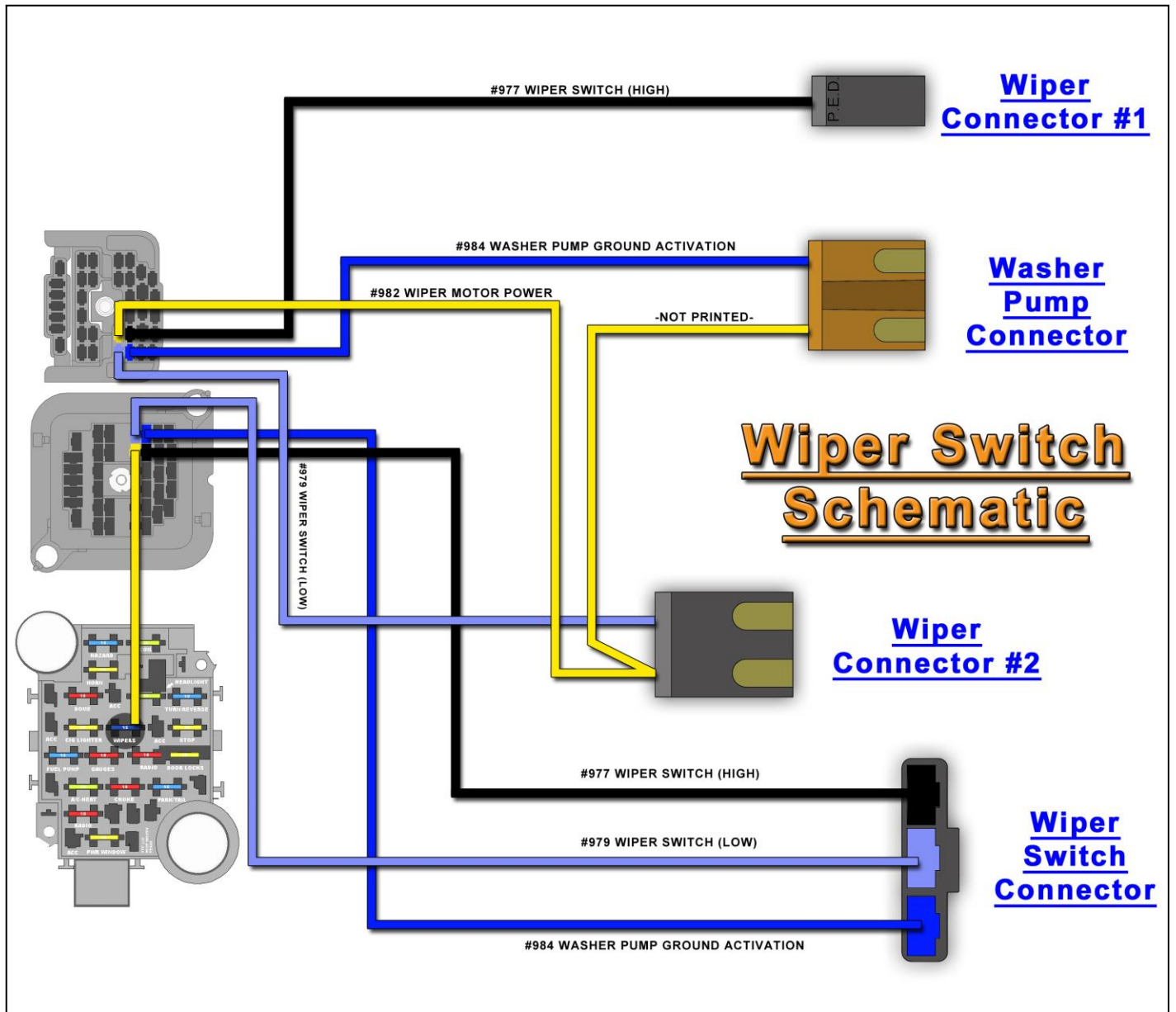
Blue: 16 gauge wire, printed **#984 WASHER PUMP GROUND ACTIVATION**, will send a ground signal to the washer pump causing the pump to begin sending fluid to the windshield spray nozzles.

Light Blue: 16 gauge wire, printed **#979 WIPER SWITCH (LOW)**, is a ground signal to the low speed tab on the wiper motor.

Black: 16 gauge wire, printed **#977 WIPER SWITCH (HIGH)**, is a ground signal to the high speed tab on the wiper motor.

- Plug the three pin connector onto the wiper switch. Pay extra attention when plugging in this connector, as it can be plugged in incorrectly. The factory connector had a key on it that prevented it from being plugged in incorrectly. Because this connector is no longer available a compatible three pin connector has been used in this kit. Below you will find pictures of how to correctly orientate the connector on the wiper switch. The blue wire should be next to the nub protruding from the back of the wiper switch.





"Speedometer Light"

The next connection on the instrument cluster will be the speedometer light, which will be a different color than the factory speedometer light connector, as seen in the picture to the right. This connector will have two wires and a label reading "SPEEDO LIGHT". These wires are:



Gray: 18 gauge wire, printed **#930 GAUGE LIGHT POWER**, leads to a splice that connects all the gauge light power wires to the green wire leading from the headlight switch, as seen in the [Head Light Schematic](#) on the page 96.

Black: 18 gauge wire, printed **#969 GROUND**, provides ground for the speedometer light and is spliced into the integrated chassis ground.

- Install the supplied wedge base light bulb, marked “194”, into the speedometer light socket.
- Insert the socket and bulb into the hole found on the top of the speedometer housing, then turn the socket ¼ turn until it locks in place. Don’t forget to re-install the speedometer cable before permanently installing the instrument cluster and moving on to the rear harness installation.

“Clock”

This step and the step that follows will only be performed if a factory style clock is installed in the center of the instrument cluster, as seen in the picture to the right. If the install does not include the use of a factory clock in this location simply put tape over the end of the connector and proceed to the next step. This two pin connector will have two wires leading to it and a section label reading “CLOCK”. These two wires are:



Orange: 18 gauge wire, printed **#965 CLOCK POWER**, this wire provides power for the clock and receives a constant 12v from the 20 amp “CIG LIGHTER” fuse found in the fuse block. It is connected to the same circuit as the cigarette lighter and console courtesy light. It can be seen in the [Courtesy/Dome Light Schematic](#) on the page 68.

Black/White: 18 gauge wire, printed **#969 GROUND**, provides ground for the clock and is connected to the integrated chassis ground at the passenger side dash ground.

- Plug the brown two pin connector onto the male terminals on the back of the clock in the center of the dash. This connector can only be plugged in one way due to the orientation of the pins on the rear of the clock.

“Clock Light & Fuel/Tachometer Light”

These connections may differ depending on the factory equipment that came on the vehicle and what equipment is being used in the new build. This Painless Performance harness is equipped with generic lamp sockets that will simply snap in place of the old lamp sockets, which are no longer available, even though the new and original lamp sockets may look different (see pictures to the right for examples). In most cases the new socket will work just fine, however some vehicles came equipped with options that call for a small fiber optic cable that sends light either to gear shift indicator or ash tray. Following the description of the sockets will be instructions on how to retain the use of the old sockets if your installation calls for the use of the fiber optic cables.



Locate the two lamp sockets of the Painless harness with labels reading “CLOCK LIGHT” and “TACH LIGHT”. Both sockets will have two wires leading from them that serve the same function. These wires are:

Gray: 18 gauge wire, printed **#930 GAUGE LIGHT POWER**, leads to a splice that ties all the gauge light power wires to the green wire leading from the headlight switch, as seen in the [Head Light Schematic](#) on the page 96.

Black: 18 gauge wire, printed **#969 GROUND**, provides ground for the clock and fuel/tachometer lights and is spliced into the integrated chassis ground.

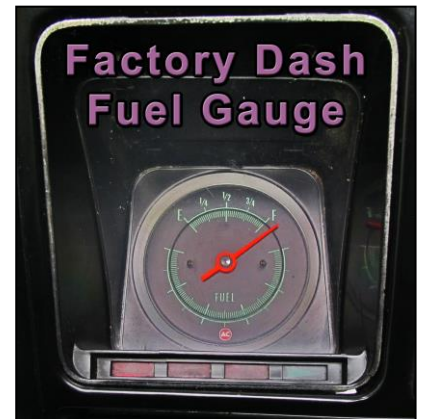
- If the installation does not need the original lamp sockets to be reused skip to the last two steps of this section. If the original lamp sockets will be reused, start by cutting the leads on the old sockets. Cut the wires in a staggered fashion, for example, cut the grey wire 6" from the back of the old lamp socket and the black wire 8" from the back of the old lamp socket.
- Now locate the new socket on the Painless harness that is going to be replaced. Cut the wires leading to the new lamp socket at the same length the wires on the old socket were cut, 6" and 8" for the example given in the previous step.
- Now strip ¼" of insulation from the ends of the wires left on the new Painless harness, and do the same to the wires leading from the old lamp socket that is going to be reused.
- Splice the old grey wire, attached to the lamp socket that will be reused, to the new grey wire coming from the painless harness. Splices and heat shrink have been provided. Repeat this step with the black wires.
- Now install the supplied light bulbs if the lamp sockets that were supplied with the Painless harness are being used. If the old lamp sockets are being used, the bulbs will not be provide with the kit and will need to be sourced from a local parts store if they need to be replaced. The bulbs for the original sockets should be a #194 bulb, but it is best to check fitment before purchasing these bulbs.
- The sockets can now be snapped into place. If the new sockets are being used the orientation of the socket doesn't matter, as they will snap into the mounting hole in any orientation. If the old sockets are being reused make sure to line up the mounting tabs on the socket with the corresponding key holes in the top of the gauge housing.

"Fuel Gauge"

This three pin connector will only be used if the installation includes an in dash fuel gauge, found on vehicles that will not be equipped with the in dash tach. If the fuel gauge is not located in the dash this section can be skipped over, simply put electrical tape on the end of the connector to prevent the possibility of a short. This connector will have six wires leading to it, they are:

(2)Tan: 18 gauge wires, printed **#936 FUEL GAUGE**. One wire supplies the ground signal from the fuel sender in the gas tank, while the other wire sends this same signal to the console for vehicles equipped with a console mounted fuel gauge.

(2)Black: 18 gauge wires, printed **#969 GROUND**, these wires are both part of the integrated chassis ground circuit that has been previously discussed. They provide a ground for the fuel gauge.



(2)Pink: One 20 gauge wire and one 18 gauge wire, printed **#935 GAUGE POWER**. The 18 gauge wire supplies 12v from the 10 amp “GAUGES” fuse in the fuse block. The 20 gauge wire supplies 12v to the driver’s side indicator lights.

- Plug the three pin connector onto the terminals found on the back of the fuel gauge. This connector will only fit onto the terminals on the back of the fuel gauge one way. Again, if an in dash fuel gauge is not being used, make sure to cover this connector with tape and secure it out of the way using a supplied zip tie.

“Tachometer”

This three pin connector will only be used on applications that are utilizing a factory in dash tachometer, like the one seen the picture to the right. If the vehicle doesn’t use an in dash tachometer then this connector will need to be taped over to prevent a short and secured with a zip tie. If an aftermarket tachometer is mounted in the dash, these wires can be connected to it per the aftermarket manufacturers instructions. The connector, labeled “TACHOMETER”, will have six wires leading to it, they are:



(2)Brown: 18 gauge wires, printed **#923 TACH SIGNAL**. One wire leads to the negative post on the ignition coil, through the bulk head, and can be found in the various coil diagrams on pages 44-46. This wire will provide a signal to the tachometer. The other brown wire will send this signal to the Aftermarket Gauges connector.

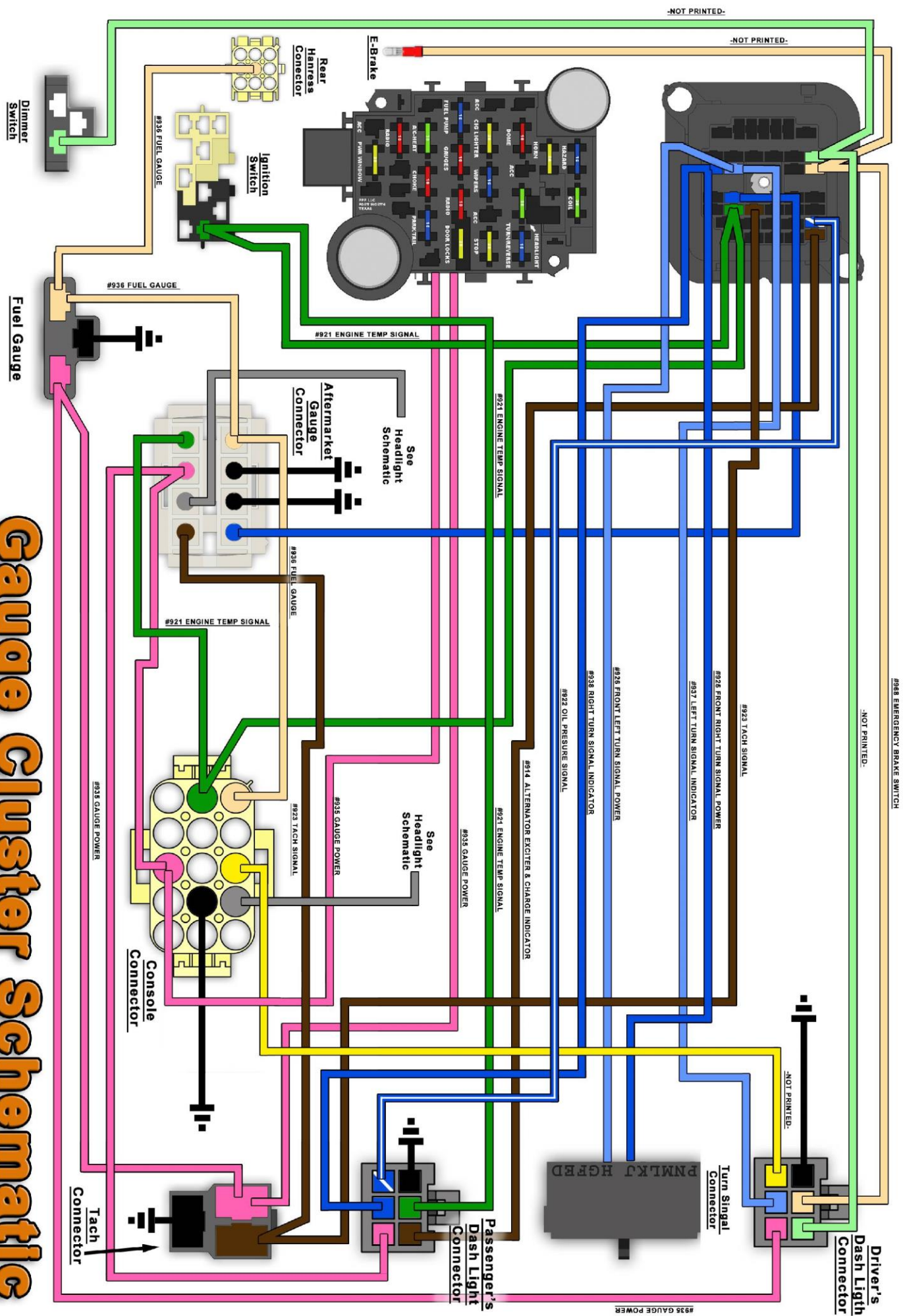
(2)Black: 18 gauge wires, printed **#969 GROUND**, these wires are both part of the integrated chassis ground circuit that has been previously discussed. They provide a ground for the Tachometer.

(2)Pink: One 18 gauge wire and one 16 gauge wire, printed **#935 GAUGE POWER**. The 16 gauge wire supplies 12v from the 10 amp “GAUGES” fuse in the fuse block. The 18 gauge wire supplies 12v fuel gauge connector discussed in the previous section.

- Plug the three pin connector onto the terminals found on the back of the tachometer. This connector, like the fuel gauge connector from the previous section, will only fit onto the terminals on the back of the tachometer one way. Again, if an in dash Tachometer is not being used make sure to cover this connector with tape and secure it out of the way using a supplied zip tie.

“Indicator Light Connectors”

These two connectors, labeled “DRIVER DASH LIGHT” and “PASSENGER DASH LIGHT”, will connect to their respective indicator light boards, which were installed on page 93-94. These connectors supply all necessary power, grounds and signals for the 8 indicator lights found in the dash. It is important to note that most vehicles did not use all of the indicator in their factory configuration. An example of this would be a vehicle that came equipped with the factory center console mounted gauge. A vehicle equipped like this will not use the “TEMP” or “OIL” lights from the factory, but will use the “FUEL” light that vehicles without the console gauges will not utilize. If all the sensor/switch connections are made correctly, per this manual, then the indicator lights should function as they did with the factory harness. Each connector has six wires leading to them, these wires are:



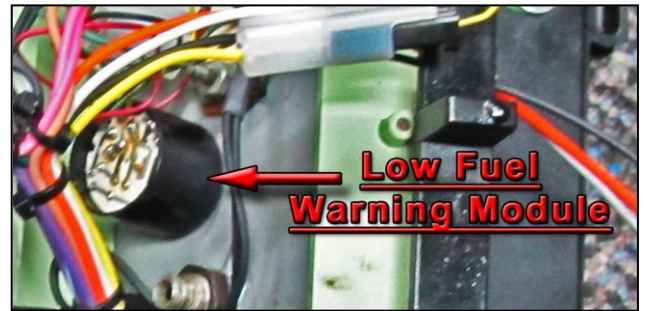
“Drivers Dash Lights”

Light Blue: 20 gauge wire, printed **#937 LEFT TURN SIGNAL INDICATOR**, this wire supplies a signal for the left turn signal indicator. It is tied to the left turn signal wire at the interior bulk head, and can be seen in the [Turn Signal Schematic](#) on page 71.

Black: 20 gauge wire, printed **#969 GROUND**, provides a ground path for left turn signal indicator and high beam indicator. It is tied into the integrated chassis ground.

Pink: 20 gauge wire, printed **#935 GAUGE POWER**, this wire supplies 12v power from the 10 amp “GAUGES” fuse in the fuse block. It powers the ground activated “FUEL” and “BRAKE” indicator lights.

Yellow: 20 gauge wire, which is not printed, connects to the low fuel warning module found on vehicles equipped with a factory style center console gauges through the console connector. When the low fuel warning module detects that the signal from the fuel sender is below a certain level it supplies a ground signal to the low fuel indicator light. If you don't have the low fuel warning module (seen in the picture to the right) connected this indicator light will not function.



Tan: 20 gauge wire, printed **#968 EMERGENCY BRAKE SWITCH**, provides a ground signal from either the emergency/parking brake switch, when its engaged, or from the low brake pressure warning switch, found on page 27.

Light Green: 20 gauge wire, not printed, this wire is connected to high beam power wire at the interior bulk head. It provides power to the high beam indicator light whenever the high beams are turned on.

“Passenger Dash Lights”

Black: 20 gauge wire, printed **#969 GROUND**, provides a ground path for right turn signal indicator. It is tied into the integrated chassis ground.

Blue: 20 gauge wires, printed **#938 RIGHT TURN SIGNAL INDICATOR**, this wire supplies a signal for the right turn signal indicator. It is tied to the right turn signal wire at the interior bulk head, and can be seen in the [Turn Signal Schematic](#) on page 71.

Pink: 20 gauge wire, printed **#935 GAUGE POWER**, this wire supplies 12v power from the 10 amp “GAUGES” fuse in the fuse block. It powers the ground activated “GEN”, “OIL” and “TEMP” indicator lights.

Blue/White: 20 gauge wire, is printed **#922 OIL PRESSURE SIGNAL**, this wire provides a ground signal from the factory oil pressure switch, a description of which can be found on page 42. The “OIL” indicator light that is grounded by this wire and switch will not be used on vehicles equipped with factory style center console gauge setup, because an oil pressure switch is not used in the stock configuration.

Green: 20 gauge wire, printed **#921 ENGINE TEMP SIGNAL**, this wire provides a ground signal from the engine temperature sensor and can be seen in the [Ignition Switch Schematic](#) on page 76. This light may not function correctly depending on the engine temperature sensor that is used. If the console mounted temperature gauge sender or an aftermarket temperature sender is used instead of the temperature switch, found on vehicles that used the “TEMP” light from the factory, it is recommend that you cut this wire and insulate both cut ends with separate pieces of supplied heat shrink to prevent any issues with the temperature gauge.

Brown: 20 gauge wires, printed **#914 ALTERNATOR EXCITER & CHARGE INDICATOR**, this wire leads to the alternator, through the bulkhead, and can be found in the schematics on pages 51-55. This wire will receive a power sample from the fuse block when the alternator is functioning correctly, and will become a ground path if the alternator isn’t functioning correctly, which will then illuminate the “GEN” indicator light.

You can now **permanently install the instrument cluster** using the hardware that was removed at the beginning of the interior section of this installation manual. **Don’t forget to connect the speedometer cable to the back of the speedometer.**

“Radio”

The radio connection on the Painless harness is set up for a universal application since most Camaros no longer have the factory radio in place. The two power wire colors used by Painless reflect the colors most aftermarket companies’ use on radios manufactured today.



The Painless harness includes four wires dedicated for a connection to the radio. The wires can be identified by a section label reading “RADIO”. These four wires are:

Yellow: 16 gauge wire, printed **#940 RADIO BATTERY POWER (MEMORY)**, this wire will provide the radio a battery power source that will allow the time and radio presets to remain every time the ignition is turned off. This wire comes from the 10 amp RADIO fuse found towards the middle of the fuse block. This wire can be seen in the [Accessory Schematic](#) on page 105.

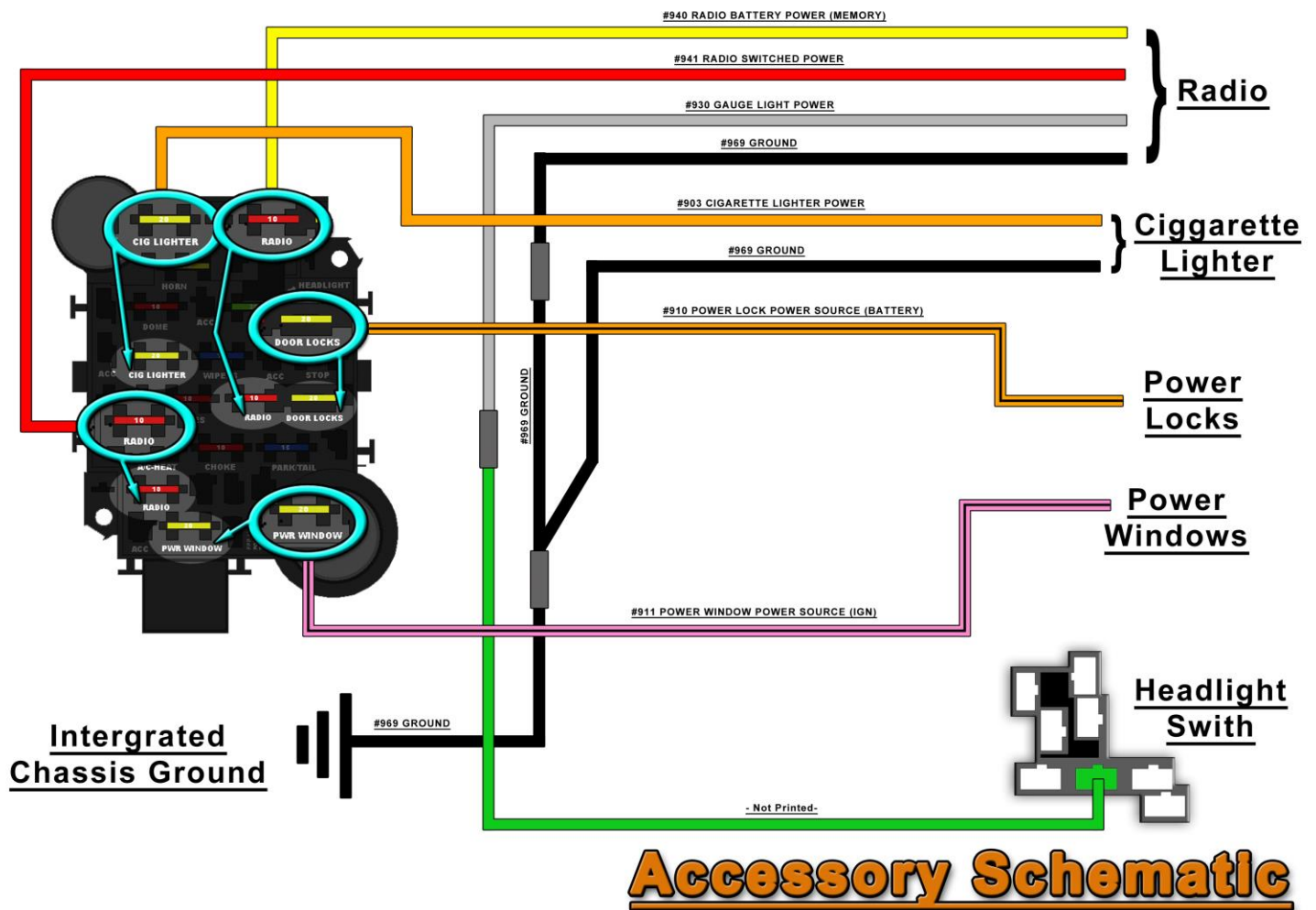
Red: 16 gauge wire, printed **#941 RADIO SWITCHED POWER**, this wire will provide the radio with ignition switched power. This wire will have power when the ignition switch is in the ACCESSORY and ON/RUN positions. This wire comes from the 10 amp RADIO fuse on the lower part of the fuse block. This wire can be seen in the [Accessory Schematic](#) on page 105.

Black: 16 gauge wire, printed **#969 RADIO GROUND**, this wire will supply a ground source to the radio. This wire is part of the integrated ground circuit of the Painless harness. This wire can be seen in the [Ground Schematic](#) on page 16.

Gray: 18 gauge wire, printed **#930 RADIO BACKLIGHT DIM/GAUGE LIGHT POWER**, this wire will provide a power signal to the radio to dim the back lighting/display during low light conditions. On older radios this power source will illuminate the backlighting. The gray #930 is tied to the other #930

wires coming from the headlight switch to things like the gauge lights, panel lights, and gear indicator light. This wire will have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights On position. This wire can be seen in the [Headlight Switch Schematic](#) on page 96.

- Those reusing a factory radio, Yellow wire #940 will not be used, this wire will need to have the end taped /insulated to avoid shorts. The factory connector will need to be reused. Red #941 will connect to the factory yellow wire and Black #969 will connect to the black wire. Splices and quick disconnect terminals have been provided in the parts kit.
- If you are using an aftermarket radio, refer to the manufacturer's installation guide for proper connection. Splices and quick disconnect terminals have been provided in the parts kit.

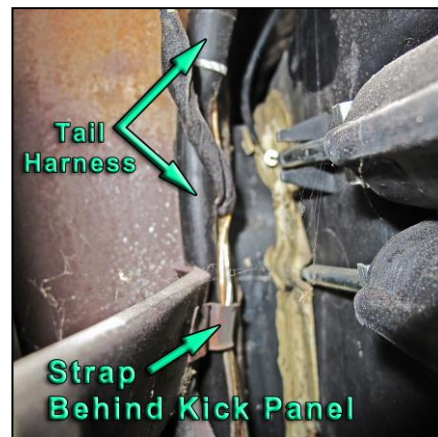
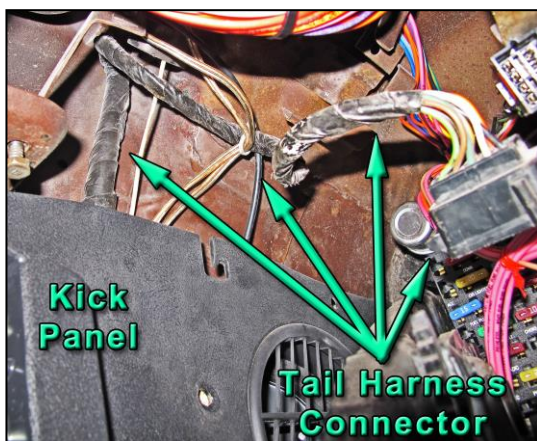


The installation of the Interior Harness is now complete, move on the Tail Section installation.

TAIL SECTION of the MAIN HARNESS

In order to properly route and connect the tail section, it is recommended that the driver side kick panel, door sill plate, driver side rear interior panel, and rear seat be removed. This will allow plenty of access to properly install this section of the Painless harness. The tail section of this Painless harness will be routed in the same location as the stock tail section harness.

- Begin by connecting the tail harness connector near the fuse block, then loosely routing the tail section from the tail harness connector up, over, and behind the driver kick panel, and into the door sill channel, as seen in the pictures below. Behind the kick panel you will find a tab/strap that the harness will be routed behind, then bend the tab over the tail section harness, similar to the tabs/straps found in the door sill channel. There is a stamped steel cover over the door channel that will need to be removed to gain access to the door sill area, and reinstalled once the tail harness installation is complete



- Once in the door sill channel, fold down or route the harness under the straps to secure, as seen in photo above. Finish routing the harness down the length of the channel to the back seat area.
- Now that the tail section is in the back seat area, route the harness over the wheel tub, securing the harness with the factory installed clips. The proper routing is highlighted in green in the photo on the next page. The two pairs of speaker wire seen in the photos are not part of the Painless Performance harness.

- With the harness now secured in the clips, route the tail section of the harness through the hole under the package tray to the trunk.

“Dome Light”

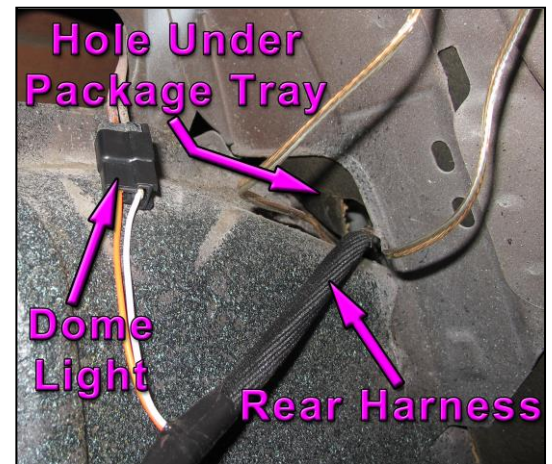
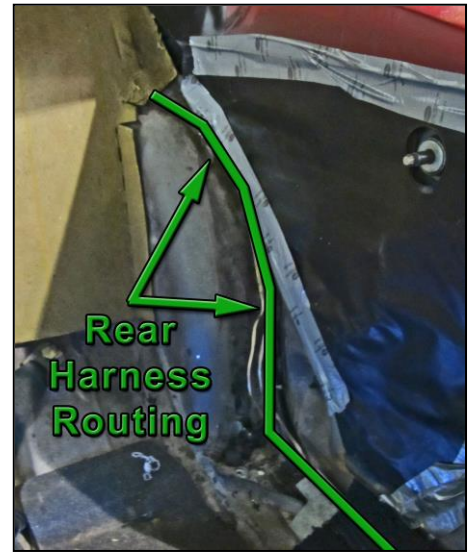
The dome light has constant battery voltage applied to it. This light, along with the under dash courtesy lights and rear console light, are ground activated by the door jamb switches and also by turning the headlamp knob all the way counter clockwise.

The two wires of the Painless harness designated for the dome light connection will have a section label reading “DOME LIGHT”. These two wires will have a two pin connector pre-installed. These wires are:

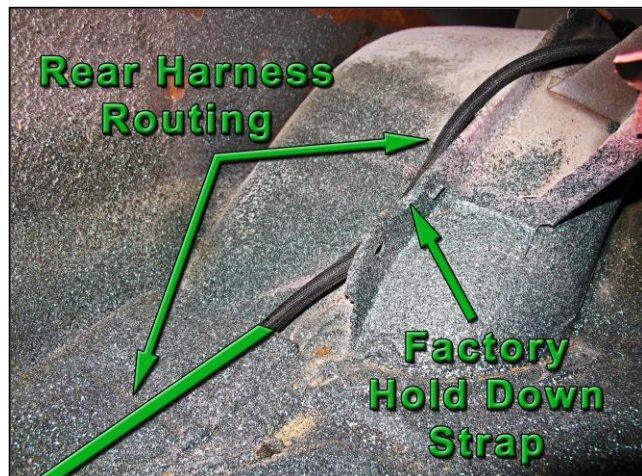
Orange: 18 gauge wire, printed #971 DOME LIGHT POWER. This power wire comes from the 10 amp DOME fuse on the fuse block; this fuse has battery power and is hot at all times. This wire can be seen in the [Tail Harness Schematic](#) on page 109.

White: 18 gauge wire, printed #961 DOME LIGHT GROUND. This wire is the ground wire that activates the dome light. When this wire is grounded it completes the voltage path causing the light to illuminate. This ground will come from either door jamb switch or the headlight switch. This wire can be seen in the [Tail Harness Schematic](#) on page 109.

- Simply plug the two pin connector labeled “DOME LIGHT” onto the factory dome light pig tail, which can be seen in the picture above.

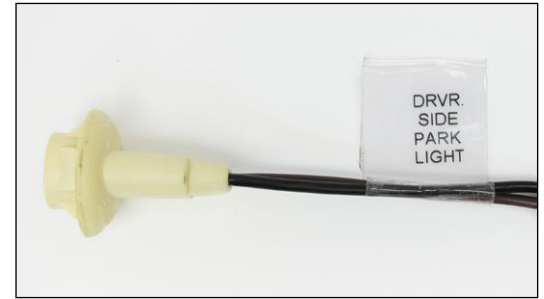


Before continuing to the “Driver Side Park Light” section the rear harness will need to finish being routed to the rear of the vehicle. The harness should be routed between the trunk hinge and the quarter panel, then along the inside of the body seam on top of the wheel well, as seen in the following pictures. Make sure to secure the harness with the factory tabs/straps. The harness will route to the “Driver Side Park Light”, then across the rear of the vehicle, again using the factory tabs/straps to secure the harness.



“Driver Side Park Light”

The driver side mounted park light is the next connection. The park, or marker light as it is often called, is activated by a power source coming from the headlight switch. This light will illuminate any time the headlight switch is in the *PARK* or *ON* position.



The park light requires two wires to work properly. A factory style socket comes pre-installed and will have a label reading “DRVR. SIDE PARK LIGHT”. The wires spliced to this molded connector are:

Brown: 18 gauge wire, not printed, this is a power wire for the park or marker light function. This wire will have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position. This wire, along with all the other wires and splices it is associated with, can be seen in the [Tail Harness Schematic](#) on page 109.

Black: 18 gauge wire, not printed, this wire provides a ground source for the park light and comes from a splice that is tied to a series of other splices that tie all the grounds in this harness together. This wire, along with all the other ground wires and splices, can be seen in the [Tail Harness Schematic](#) on page 109.

- Begin by installing the correct bulb, included with the harness, into the socket. This will be a 194 bulb. The use of dielectric grease on the base of the bulb is recommended.
- Looking at the back of the park light housing you will see that it has a keyed opening to correspond with the tabs on the socket.
- Insert the lamp socket of the Painless harness into the park light housing and turn ¼ turn to lock the socket in place.



At this time the rest of the rear harness can be routed.

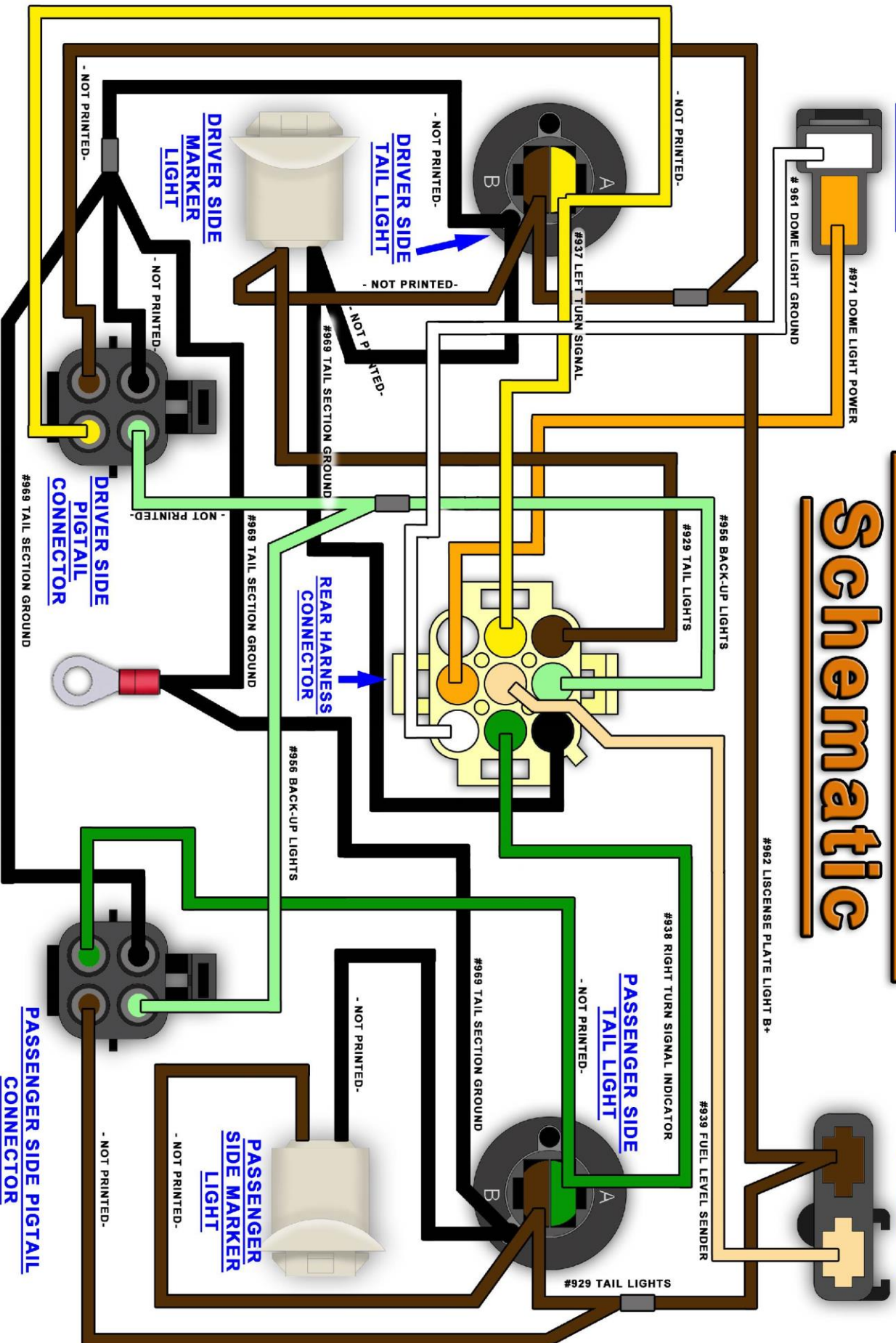
- Route the harness under the tail light housings and behind the trunk latch support. There will be two factory tabs/straps on either side of the trunk latch support that will secure the harness in place, as seen in the picture below.



**DOME LIGHT
CONNECTOR**

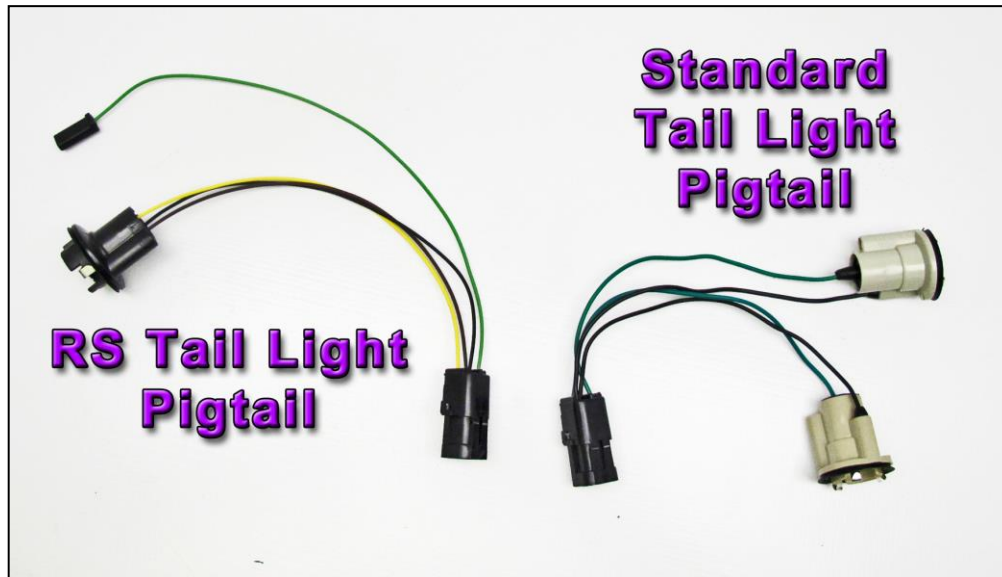
**FUEL SENDER/
PLATE LIGHT
CONNECTOR**

Tail Harness Schematic



“Left Turn/Brake/Tail/Reverse Light”

The 1969 Camaro came equipped with one of two different tail light configurations. This Painless harness is able to work with either setup, by switching out removable pigtails. The standard 1969 tail lights are equipped with three separate light sockets, while a vehicle equipped with RS tail lights will only use two tail light sockets and a single one pin connector for the reverse lights. These pigtails will be labeled and a picture is supplied below to help identify the two different pigtails. This harness can be changed from standard tail lights to RS tail lights at any time, so it is recommended to keep the unused pigtails in case you convert to the other style of tail lights in the future.



Yellow- 18 gauge wire, not printed, this wire is the turn signal power as well as the brake light power. This wire will have interrupted switched power from the turn flasher any time the left turn signal is activated and interrupted battery power from the hazard flasher any time the hazard switch is in the ON position. This wire will also have battery power anytime the brake pedal is pressed. This wire can be seen in the [Tail Harness Schematic](#) on page 109.

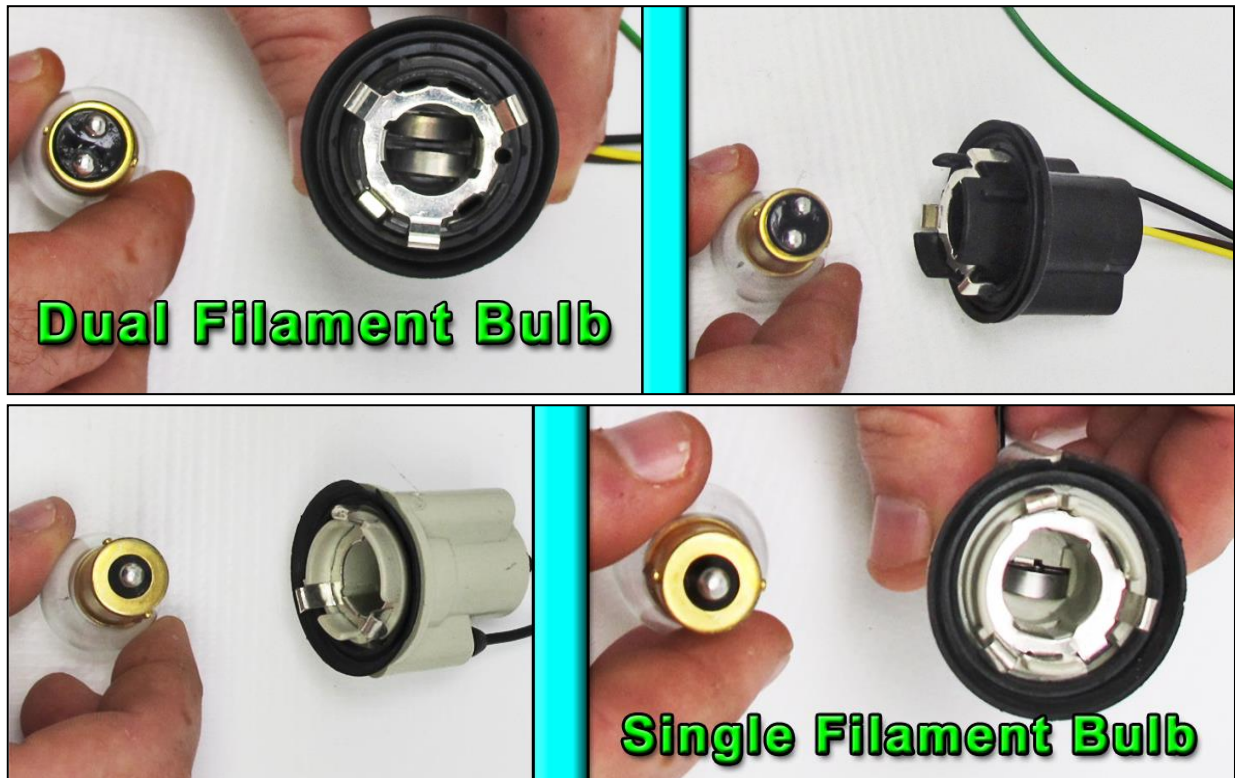
Brown: 18 gauge wire, not printed, this is a power wire for the tail light function. This wire will have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position. This wire, along with all the other wires and splices it is associated with, can be seen in the [Tail Harness Schematic](#) on page 109.

Black: 18 gauge wire, not printed, this wire provides a ground source for the Turn/Brake/Tail Light and comes from a splice that is tied to a series of other splices that ties all the grounds in this harness together. This wire, along with all the other ground wires and splices, can be seen in the [Tail Harness Schematic](#) on page 109.

Light Green- 18 gauge wire, not printed, this wire will provide power to the reverse or back up lights. This wire receives power from the reverse switch and will have power anytime the shifter is in the REVERSE position. This wire can be seen in the [Tail Harness Schematic](#) on page 109.

- Start by plugging the appropriate tail pigtail pig tail into the 4 pin connector labeled “DRVR.SIDE PIG TAIL”
- Now install the supplied light bulbs into the tail light connectors on both the pigtail sockets and the permanently wired tail light socket, making sure to use dielectric

grease. The sockets can now be installed into the housings. The sockets are a quarter turn design, you should feel them “lock” into the housing when they are installed correctly. Below are pictures showing which light bulbs belong to which sockets.

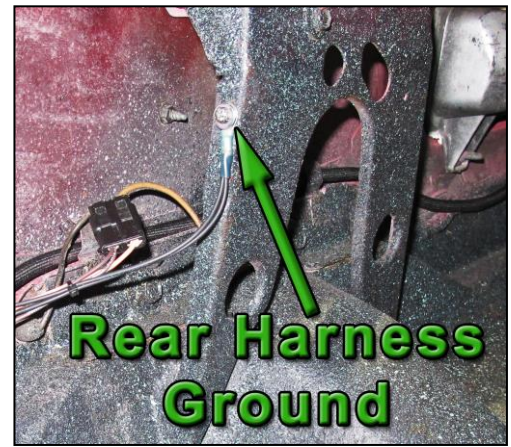


- If the RS pig tails are being used plug the single pin reverse light connector into the mating connector attached to the wire leading to the reverse light, show in the picture below labeled “RS Tail Light”.



“Ground”

This ground connection consist of two 16 gauge black wires connected to a ring terminal. These wires are connected to rest of the integrated ground circuit found throughout the harness, and can be seen in the [Ground Schematic](#) on page 16. The ring terminal will be connected to same location as the factory rear harness ground, on the passenger side of the trunk latch support, using either the factory hardware or one of the supplied self-taping screws. As with all other chassis grounds, it is recommend to make sure that the ground surface is clear of any paint and corrosion and to use a supplied star washer when making the connection. This ground connection can be seen in picture to the right.



“Fuel Sender & License Plate Light”

This connection consist of a two pin connector, labeled “FUEL SENDER/PLATE LIGHT”, with locations to connect the license plate light and fuel level sender. It contains three wires, which are:

Tan: 16 gauge wire, printed **#939 FUEL LEVEL SENDER**, this wire provides a connection between the fuel sender wire in the trunk and the fuel level gauge, either in the dash or in the console gauge cluster. This wire will provide a ground signal from the fuel level sender. This wire can be seen in the [Tail Harness Schematic](#) on page 109.



(2)Brown: two 18 gauge wires, one printed **#962 LICENSE PLATE LIGHT B+**, these wire are connected to the same circuit as the tail lights. The printed wire comes from a splice on the driver side of the vehicle and the non-printed wire leads to a splice on the passenger side of the vehicle, both can be seen in the [Tail Harness Schematic](#) on page 109. These wire provide 12v to the license plate light when the tail lights are on.

- Connect the tan wire leading from the grommet in the trunk floor to the side of the connector with the tab. This connector will only plug into one side of two pin connector
- Connect the brown wire from the license plate light to the other side of the two pin connector. Again, there is only one side of the two pin connector with a provision for the tab on the fuel level sending unit wire, and the license plate light wire will connect to the opposite side

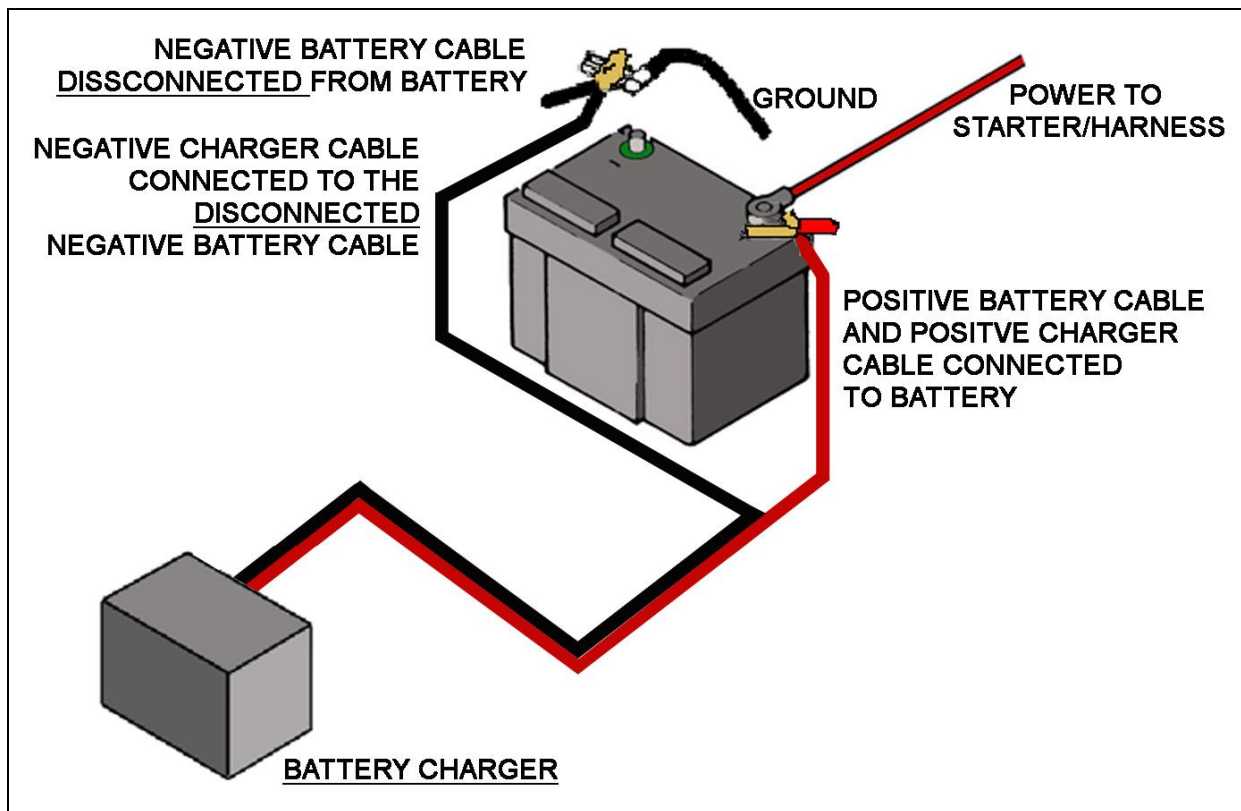
“Right Turn/Brake/Tail/Reverse/Park Light”

These connections will be the same as the “Driver Side Park Light” on page 108 and the “Left Turn/Brake/Tail/Reverse Light” connections on page 110.

This concludes all connections found on this Painless Harness. Go to Testing the System on the next page

TESTING THE SYSTEM

Use a small (10 amp or less) battery charger to power up the vehicle for the first time to test the circuits. If there is a problem anywhere, the battery charger's low amperage and internal circuit breaker will provide circuit protection.



- Make sure the Negative Battery cable is connected to the frame or engine block, and make sure there is a ground between the engine and frame. **The negative battery cable should still be disconnected from the Battery** as instructed on page 5.
- Connect the Battery Positive cable to the Positive side of the Battery and also make sure this cable is connected to the B+ side of the Starter Solenoid. At this point this should also connect the red #915 from the Painless harness to the positive side of the battery, either through the starter lug or the battery lug.
- Connect the Battery Charger's NEGATIVE cable to the automobile chassis, engine block, or to the disconnected Negative Battery cable. **Do NOT connect the Battery Charger's NEGATIVE cable to the Battery.**
- Connect the Battery Charger's POSITIVE cable to the automobile's positive battery terminal lug.
- INDIVIDUALLY turn on each light, ignition, wiper circuit, etc. and check for proper operation.

Note: If you try to test more than one circuit at a time, the charger will not provide enough amperage for each circuit to work correctly.

- After all circuits have been checked, disconnect the battery charger and attach the vehicles battery cables to the battery.

“Gauge Trouble Shooting”

If a malfunctioning gauge is found during testing a simple test procedure can help narrow down what the issue might be. If a gauge isn't functioning there are three likely reasons that have created the issue. The first possibility would be simply that the gauge was wired incorrectly. Start by double checking the gauge manufactures instructions and verifying that the gauge is connected correctly.

If you have verified that the gauge is wired correctly and the gauge is still not working then the issue is either with the gauge itself or the sending unit that the gauge is connected to. Since most gauges operate with a sending unit that varies resistance to ground start by disconnecting the gauge wire from the sending unit and temporarily connecting the disconnected wire to a good ground source. At this point power up the gauge and check if the gauge reading has moved when the sending wire is grounded.

If the gauge moves at this point the issue must be with the sending unit. If the gauge doesn't move with the sending wire grounded, then the gauge is likely the issue. Also, remember that gauges are calibrated to a specific sending unit. If you connect a gauge to a sending unit that it wasn't designed for, such as a factory sending unit and an aftermarket gauge, false reading are likely to occur. Once the issue has been resolved make sure to connect the gauge and sending unit correctly.

- Once testing is complete, re-install any panels, lens, or other parts that were removed during the harness installation. You are now finished installing this Painless Harness, congratulations!

WIRE INDEX

- The index is listed in the same order in which the manual instructed components to be connected.
- The **BLUE** descriptions indicate sections found throughout the harness.
- The **RED** indicate components/connection points.
- The descriptions shown in **ORANGE** are NOT actually printed on the wire. These are simply shown to provide the circuit number and the function in which that particular wire is associated.

ENGINE HARNESS

LIGHT SECTION

LOW BRAKE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	TAN	#968 LOW BRAKE SWITCH	ENGINE BULK HEAD

GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	BLK	#969 GROUND SOURCE (CORE SUPPORT)	FRONT LIGHTING GROUND SPLICE

LEFT TURN SIGNAL

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	LT BLU	#926 FRONT LEFT TURN SIGNAL POWER	ENGINE BULK HEAD
YES	16	BRN	#927 PARK LIGHT POWER	ENGINE BULK HEAD
YES	18	BRN	#927 PARK LIGHT POWER	RIGHT TURN SIGNAL
YES	18	LT BLU	#926 FRONT LEFT TURN SIGNAL POWER	LEFT MARKER LIGHT

LEFT HEADLAMP

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LT GRN	#908 HIGH BEAM POWER	HIGH BEAM SPLICE
YES	14	TAN	#909 LOW BEAM POWER	LOW BEAM SPLICE
YES	14	BLK	#969 LEFT HEADLIGHT GROUND	FRONT LIGHTING GROUND SPLICE

LEFT MARKER LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BRN	#927 PARK LIGHT POWER	ENGINE BULK HEAD
YES	18	BRN	#927 PARK LIGHT POWER	RIGHT MARKER LIGHT
YES	18	LT BLU	#926 FRONT LEFT TURN SIGNAL POWER	FRONT LEFT TURN SIGNAL

HORN

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	GRN	#924 HORN POWER	ENGINE BULK HEAD
YES	16	GRN	#924 HORN POWER	RIGHT HORN

HORN

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	GRN	#924 HORN POWER	LEFT HORN

RIGHT HEADLAMP

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LT GRN	#908 HIGH BEAM POWER	HIGH BEAM SPLICE
YES	14	TAN	#909 LOW BEAM POWER	LOW BEAM SPLICE
YES	14	BLK	#969 RIGHT HEAD LIGHT GROUND	FRONT LIGHTING GROUND SPLICE

GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	BLK	#969 GROUND SOURCE (CORE SUPPORT)	FRONT LIGHTING GROUND SPLICE

RIGHT TURN SIGNAL

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLU	#925 FRONT RIGHT TURN SIGNAL POWER	ENGINE BULKHEAD
YES	18	BRN	#927 PARK LIGHT POWER	LEFT TURN SIGNAL
YES	18	BLU	#925 FRONT RIGHT TURN SIGNAL POWER	FRONT RIGHT MARKER LIGHT

RIGHT MARKER LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLU	#925 FRONT RIGHT TURN SIGNAL POWER	RIGHT TURN SIGNAL
YES	18	BRN	#927 PARK LIGHT POWER	LEFT MARKER LIGHT

MAIN GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	10	BLK	#969 BATTERY "-" / GROUND SOURCE	FRONT LIGHTING GROUND SPLICE

AMMETER B+

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	RED/WHT	#935 AMMETER BATTERY SOURCE	ENGINE BULK HEAD

ENGINE SECTION

WIPER MOTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	LT BLU	#979 WIPER SWITCH (LOW)	ENGINE BULK HEAD
YES	16	YLW	#982 WIPER MOTOR POWER	ENGINE BULK HEAD
NO	16	YLW	#982 WASHER PUMP POWER	WASHER PUMP

WIPER MOTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#977 WIPER SWTCH (HIGH)	ENGINE BULKHEAD

WASHER PUMP

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	16	YLW	#982 WASHER PUMP POWER	WIPER MOTOR
YES	16	BLU	#984 WASHER PUMP GROUND ACTIVATION	ENGINE BULK HEAD

ENGINE SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLU	#969 OIL PRESSURE SWITCH GROUND	ENGINE BULK HEAD
YES	18	GRN	#921 COOLANT TEMPERATURE	ENGINE BULK HEAD
YES	14	PNK	#959 CHOKE POWER OR CARB STOP SOLINOID	ENGINE BULKHEAD
YES	18	BLU/WHT	#922 OIL PRESURE SIGNAL	ENGINE BULK HEAD

IGNITION SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	YLW	#970 IGNITION BYPASS (COIL “+” TO STARTER “I”)	STARTER SECTION
YES	16	WHT/ORG	#920 COIL POWER (“+”)	ENGINE BULK HEAD
YES	18	BRN	#923 TACH SIGNAL (COIL “-“)	ENGINE BULK HEAD

ALTERNATOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	6	RED	#915 ALTERNATOR OUTPUT	BATTERY + SPLICE
YES	14	RED	#995 ALTERNATOR BATTERY POWER SAMPLE	BATTERY + SPLICE
YES	16	BRN	#914 ALTERNATOR EXCITER	ENGINE BULK HEAD

MIDI FUSE

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	6	RED	#916 BATTERY SUPPLY TO FUSEBLOCK	BATTERY + SPLICE

BLOWER MOTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	ORG	#967 BLOWER MOTOR POWER	ENGINE BULKHEAD

STARTER

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	PPL	#919 STARTER SOLENOID "S" (START SIGNAL)	ENGINE BULK HEAD
YES	16	YLW	#970 IGNITION BYPASS (COIL "+" TO STARTER "I")	COIL

INTERIOR HARNESS**DIMMER SWITCH**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LT BLU	#907 DIMMER SWITCH POWER	HEADLIGHT SWITCH
NO	16	TAN	#909 LOW BEAM POWER	INTERIOR BULKHEAD
NO	16	LTGRN	#908 HIGH BEAM POWER	INTERIOR BULKHEAD

E. BRAKE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	TAN	#968 EMERGENCY BRAKE SWITCH	INTERIOR BULKHEAD

ACCESSORY

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	PNK/BLK	#911 POWER WINDOW POWER SOURCE (IGN)	FUSE BLOCK
YES	14	ORG/BLK	#910 POWER LOCK POWER SOURCE (BATTERY)	FUSE BLOCK

FUEL PUMP

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	PNK	#947 FUEL PUMP POWER	FUSE BLOCK

DRVR. DOOR JAMB SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DOME LIGHT GROUND	DRIVER'S COURTESY LIGHT

TAIL SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	16	BLK	#969 GROUND	INTERIOR BULK HEAD
YES	16	LT GRN	#956 REVERSE LIGHT POWER	REVERSE SWITCH
YES	16	BRN	#927 PARK LIGHT POWER	HEADLIGHT SWITCH
YES	16	GRN	#948 REAR RIGHT TURN SIGNAL POWER	TURN SIGNAL SWITCH

TAIL SECTION CONT.

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	TAN	#939 FUEL GAUGE	FUEL GAUGE
YES	16	YEL	#949 REAR LEFT TURN SIGNAL POWER	TURN SIGNAL SWITCH
YES	18	WHT	#961 DOME LIGHT GROUND	HEADLIGHT SWITCH
YES	18	WHT	#961 DOME LIGHT GROUND	DRIVERS COURTESY LIGH
NO	18	ORG	#971 COURTESY LIGHT POWER	FUSE BLOCK
YES	18	ORG	#971 COURTESY LIGHT POWER	DRIVERS COURTESY LIGHT

GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	20	BLK	#969 GROUND	DRIVERS DASH LIGHTS

COURTESY LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#971 COURTESY LIGHT POWER	RIGHT COURTESY LIGHT
YES	18	ORG	#971 COURTESY LIGHT POWER	TAIL SECTION CONNECTOR
YES	18	WHT	#961 DOME LIGHT GROUND	DRIVER JAMB SWITCH
YES	18	WHT	#961 COURTESY LIGHT GROUND	TAIL SECTION CONNECTOR

WIPER SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#977 WIPER SWITCH (HIGH)	INTERIOR BULKHEAD
YES	16	LT BLU	#979 WIPER SWITCH (LOW)	INTERIOR BULKHEAD
YES	16	BLU	#984 WASHER PUMP GROUND ACTIVATION	INTERIOR BULKHEAD

DRIVERS DASH LIGHTS

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	20	LT GRN	#908 HIGH BEAM POWER	INTERIOR BULKHEAD
YES	20	TAN	#968 EMERGENCY BRAKE SWITCH	INTERIOR BULKHEAD
YES	20	LT BLU	#937 LEFT TURN SIGNAL INDICATOR	INTERIOR BULKHEAD
NO	20	YEL	LOW FUEL WARNING	CONSOLE CONNECTOR
YES	20	BLK	#969 GROUND	GROUND RING TERMINAL
YES	20	PNK	#935 GAUGE POWER	FUEL GAUGE

HEADLIGHT CONNECTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	ORG	#959 HEADLIGHT SWITCH POWER (PARK/TAIL)	FUSE BLOCK
YES	16	BRN	#927 PARK LIGHT POWER	TAIL SECTION CONNECTOR
YES	16	BRN	#927 PARK LIGHT POWER	INTERIOR BULKHEAD
YES	14	LT BLU	#907 DIMMER SWITCH POWER	DIMMER SWITCH
NO	14	GRN	#930 GAUGE LIGHT POWER	GAUGE LIGHT SPLICE
YES	14	RED	#928 HEADLIGHT SWITCH POWER (HEADLIGHTS)	FUSE BLOCK
YES	18	WHT	#961 DOME LIGHT GROUND	TAIL SECTION CONNECTOR
YES	18	WHT	#961 DOME LIGHT GROUND	CONSOLE CONNECTOR

CLOCK

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#969 GROUND	GROUND RING TERMINAL
YES	18	ORG	#965 CLOCK POWER	CONSOLE CONNECTOR

SPEEDOMETER LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#969 GROUND	TACHOMETER
YES	18	GRY	#930 GAUGE LIGHT POWER	GAUGE LIGHT SPLICE

CLOCK LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	GRY	#930 GAUGE LIGHT POWER	GAUGE LIGHT SPLICE
YES	18	BLK	#969 GROUND	FUEL GAUGE

TACHOMETER LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#969 GROUND	AFTERMARKET GAUGES
YES	18	GRY	#930 GAUGE POWER	AFTERMARKET GAUGES

FUEL GAUGE

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	TAN	#939 FUEL GAUGE	TAIL SECTION CONNECTOR
YES	18	TAN	#939 FUEL GAUGE	AFTERMARKET GAUGES
YES	18	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	18	BLK	#969 GROUND	CLOCK LIGHT

FUEL GAUGE CONT.

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	20	PNK	#935 GAUGE POWER	DRIVERS DASH LIGHTS
NO	18	PNK	#935 GAUGE POWER	TACHOMETER

TACHOMETER

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	PNK	#935 GAUGE POWER	FUSE BLOCK
NO	18	PNK	#935 GAUGE POWER	FUEL GAUGE
YES	18	BRN	#923 TACH SIGNAL	INTERIOR BULKHEAD
YES	18	BRN	#923 TACH SIGNAL	AFTERMARKET GAUGES
YES	18	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	18	BLK	#969 GROUND	SPEEDOMETER LIGHT

DRIVERS DASH LIGHTS

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	20	BLK	#969 GROUND	AFTERMARKET GAUGES
YES	20	BLU	#938 RIGHT TURN SIGNAL INDICATOR	INTERIOR BULKHEAD
YES	20	PNK	#935 GAUGE POWER	AFTERMARKET GAUGES
YES	20	BLU/WHT	#922 OIL PRESSURE SIGNAL	INTERIOR BULKHEAD
YES	20	GRN	#921 ENGINE TEMP SIGNAL	IGNITION SWITCH
YES	20	BRN	#914 ALTERNATOR EXCITER & CHARGE INDICATOR	INTERIOR BULKHEAD

RADIO

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	YLW	#940 RADIO BATTERY POWER (MEMORY)	FUSE BLOCK
YES	16	RED	#941 RADIO SWITCHED POWER	FUSE BLOCK
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	18	GRY	#930 RADIO BACKLIGHT DIM	GAUGE LIGHT SPLICE

REVERSE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	PNK	#958 REVERSE SWITCH POWER INPUT	FUSE BLOCK
YES	16	LT GRN	#956 REVERSE LIGHT POWER	TAIL SECTION CONNECTOR
YES	16	LT GRN	#956 REVERSE LIGHT POWER	CONSOLE CONNECTOR

TURN SIGNAL SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#963 HORN RELAY GROUND ACTIVATION	FUSE BLOCK
YES	16	LT BLU	#926 FRONT LEFT TURN SIGNAL POWER	INTERIOR BULKHEAD
YES	16	BLU	#925 FRONT RIGHT TURN SIGNAL POWER	INTERIOR BULKHEAD
YES	16	BRN	#951 HAZARD SWITCH POWER	FUSE BLOCK
YES	16	PUR	#952 TURN SIGNAL POWER	FUSE BLOCK
YES	16	YEL	#949 REAR LEFT TURN SIGNAL POWER	TAIL SECTION CONNECTOR
YES	16	GRN	#948 REAR RIGHT TURN SIGNAL POWER	TAIL SECTION CONNECTOR
YES	16	WHT	#918 BRAKE SWITCH OUTPUT	BRAKE SWITCH

IGNITION SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	12	PPL/WHT	#919 START SIGNAL (FROM IGN SW TO N SAFETY)	NEUTRAL SAFETY SPLICE
YES	12	RED	#934 IGNITION SWITCH POWER	FUSE BLOCK
YES	12	BRN	#932 ACCESSORY POWER	FUSE BLOCK
YES	14	PNK	#931 SWITCH POWER TO "COIL" FUSE	FUSE BLOCK
YES	12	ORG	#933 SWITCHED (IGN) POWER TO FUSE BLOCK	FUSE BLOCK
YES	18	GRN	#921 ENGINE TEMP SIGNAL	INTERIOR BULKHEAD
YES	20	GRN	#921 ENGINE TEMP SIGNAL	PASSENGER DASH LIGHTS
YES	12	RED	#934 IGNITION SWITCH POWER	FUSE BLOCK

NEUTRAL SAFETY SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	PPL/WHT	#919 START SIGNAL (FROM IGN SW TO N SAFETY)	IGNITION SWITCH
YES	12	PPL	#919 START SIGNAL TO STARTER	INTERIOR BULKHEAD

BRAKE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	WHT	#918 BRAKE SWITCH OUTPUT	TURN SIGNAL SWITCH
YES	16	ORG	#917 BRAKE SWITCH POWER INPUT	FUSE BLOCK

GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	18	BLK	#969 GROUND	CLOCK

HEATER PANEL LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	GRY	#930 GAUGE LIGHT POWER	GAUGE LIGHT SPLICE
YES	18	BLK	#969 GROUND	CONSOLE CONNECTOR

**AFTERMARKET
GAUGES**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLU	#922 OIL PRESSURE SIGNAL	INTERIOR BULKHEAD
YES	18	BRN	#923 TACH SIGNAL	TACHOMETER
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	20	BLK	#969 GROUND	PASSENGER DASH LIGHTS
YES	16	GRY	#930 GAUGE LIGHT POWER	GAUGE LIGHT SPLICE
YES	18	GRY	#930 GAUGE LIGHT POWER	TACHOMETER LIGHT
YES	18	BLK	#969 GROUND	TACHOMETER LIGHT
YES	18	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	18	PNK	#935 GAUGE POWER	CONSOLE CONNECTOR
YES	20	PNK	#935 GAUGE POWER	PASSENGER DASH LIGHTS
YES	18	TAN	#939 FUEL GAUGE	FUEL GAUGE
YES	18	TAN	#939 FUEL GAUGE	CONSOLE CONNECTOR
YES	18	GRN	#921 ENGINE TEMP SIGNAL	CONSOLE CONNECTOR

HEATER SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	ORG	#967 BLOWER MOTOR POWER	INTERIOR BULK HEAD
YES	16	ORG	#937 BLOWER MOTOR HIGH	HEATER RESISTOR
YES	14	BRN	#904 HEATER SWITCH POWER INPUT	FUSE BLOCK
NO	14	BRN	#904 HEATER SWITH POWER INPUT	A/C POWER CONNECTOR
YES	16	YEL	#975 BLOWER MOTOR LOW	HEATER RESISTOR
YES	16	LT BLU	#974 BLOWER MOTOR MEDIUM	HEATER RESISTOR

COURTESY LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#971 COURTESY LIGHT POWER	DRIVER COURTESY LIGHT
YES	18	WHT	#961 COURTESY LIGHT GROUND	PASSENGER JAMB SWITCH
YES	18	WHT	#961 COURTESY LIGHT GROUND	CONSOLE CONNECTOR

**CONSOLE
CONNECTOR**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	TAN	#939 FUEL GAUGE	AFTERMARKET GAUGES
YES	18	GRN	#921 ENGINE TEMP SIGNAL	INTERIOR BULKHEAD
YES	18	GRN	#921 ENGINE TEMP SIGNAL	AFTERMARKET GAUGES
YES	18	WHT	#961 DOME LIGHT GROUND	COURTESY LIGHT
YES	18	WHT	#961 DOME LIGHT GROUND	HEADLIGHT SWITCH
YES	18	ORG	#971 CONSOLE LIGHT POWER	FUSE BLOCK
YES	18	ORG	#965 CLOCK POWER	CLOCK
YES	12	PPL	#919 START SIGNAL TO STARTER	INTERIOR BULK HEAD
YES	12	PPL/WHT	#919 START SIGNAL (FROM IGN SW TO N SAFETY)	IGNITION SWITCH
NO	20	YEL	LOW FUEL LIGHT SIGNAL	DRIVERS DASH LIGHTS
YES	16	LT GRN	#956 REVERSE LIGHT POWER	REVERSE SWITCH
YES	16	PNK	#935 GAUGE POWER	FUSE BLOCK
YES	18	PNK	#935 GAUGE POWER	AFTERMARKET GAUGES
YES	16	GRY	#930 GAUGE LIGHT POWER	GAUGE LIGHT SPLICE
YES	18	GRY	#930 GAUGE LIGHT POWER	HEATER PANEL LIGHT
NO	14	BLK	#935 AMMETER BATTERY SOURCE	INTERIOR BULKHEAD
NO	14	BLK/WHT	#935 AMMETER ALTERNATOR SOURCE	INTERIOR BULKHEAD
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	18	BLK	#969 GROUND	HEATER PANEL LIGHT

GLOVE BOX LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#971 GLOVE BOX LIGHT POWER	FUSE BLOCK

CIGARETTE LIGHTER

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	ORG	#903 CIGARETTE LIGHTER POWER	FUSE BLOCK
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE

PASS. DOOR JAMB SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DOME LIGHT GROUND	PASSENGER COURTESY LIGHT

HEATER RESISTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	ORG	#973 BLOWER MOTOR HIGH	HEATER SWITCH
YES	16	YEL	#975 BLOWER MOTOR LOW	HEATER SWITCH
YES	16	LT BLU	#974 BLOWER MOTOR MEDIUM	HEATER SWITCH

TAIL SECTION**TAIL SECTION
CONNECTOR**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#969 TAIL SECTION GROUND	DRIVER PARK LIGHT
YES	16	LT GRN	#956 BACK-UP LIGHTS	BACK-UP LIGHT SPLICE
YES	16	BRN	#929 BACK-UP LIGHTS	DRIVER SIDE MARKER
YES	16	GRN	#938 RIGHT TURN SIGNAL INDICATOR	PASSENGER TAIL LIGHT
YES	16	TAN	#939 FUEL LEVEL SENDER	FUEL LEVEL SENDER
YES	16	YEL	#937 LEFT TURN SIGNAL	DRIVER TAIL LIGHT
YES	18	WHT	#961 DOME LIGHT GROUND	DOME LIGHT
YES	18	ORG	#971 DOME LIGHT POWER	DOME LIGHT

DOME LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DOME LIGHT GROUND	TAIL SECTION CONNECTOR
YES	18	ORG	#971 DOME LIGHT POWER	TAIL SECTION CONNECTOR

**DRIVER SIDE
PARK LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BRN	#929 TAIL LIGHTS	TAIL SECTION CONNECTOR
NO	18	BRN	#929 TAIL LIGHTS	DRIVER TAIL LIGHT
YES	16	BLK	#969 TAIL SECTION GROUND	TAIL SECTION CONNECTOR
NO	18	BLK	#969 TAIL SECTION GROUND	DRIVER TAIL LIGHT

**DRIVER SIDE
TAIL LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	YEL	#937 LEFT TURN SIGNAL	TAIL SECTION CONNECTOR
NO	18	YEL	#937 LEFT TURN SIGNAL	DRIVER SIDE PIG TAIL
NO	18	BRN	#929 TAIL LIGHTS	DRIVER PARK LIGHT
NO	18	BRN	#929 TAIL LIGHTS	TAIL LIGHT SPLICE

**DRIVER SIDE
TAIL LIGHT CONT.**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	BLK	#969 TAIL SECTION GROUND	DRIVER PARK LIGHT
NO	18	BLK	#969 TAIL SECTION GROUND	TAIL SECTION GROUND SPLICE

**DRIVER SIDE
PIG TAIL**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	BLK	#969 TAIL SECTION GROUND	TAIL SECTION GROUND SPLICE
NO	18	LT GRN	#956 BACK-UP LIGHTS	BACK UP LIGHT SPLICE
NO	18	BRN	#929 TAIL LIGHTS	TAIL LIGHT SPLICE
NO	18	YEL	#937 LEFT TURN SIGNAL	DRIVER TAIL LIGHT

GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#969 TAIL SECTION GROUND	TAIL SECTION GROUND SPLICE
YES	16	BLK	#969 TAIL SECTION GROUND	PASSENGER TAIL LIGHT

**FUEL SENDER/
PLATE LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	TAN	#939 FUEL LEVEL SENDER	TAIL SECTION CONNECTOR
YES	18	BRN	#962 LISCENSE PLATE LIGHT B+	TAIL LIGHT SPLICE
NO	18	BRN	#929 TAIL LIGHT	TAIL LIGHT SPLICE

**PASSENGER SIDE
PIG TAIL**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#969 TAIL SECTION GROUND	TAIL SECTION GROUND SPLICE
YES	18	LT GRN	#956 BACK-UP LIGHTS	BACK UP LIGHT SPLICE
NO	18	BRN	#929 TAIL LIGHTS	TAIL LIGHT SLICE
NO	18	GRN	#938 RIGHT TURN SIGNAL INDICATOR	PASSENGER TAIL LIGHT

**PASSENGER SIDE
TAIL LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	GRN	#938 TURN SIGNAL INDICATOR	TAIL SECTION CONNECTOR
NO	18	GRN	#938 TURN SIGNAL INDICATOR	PASSENGER PIG TAIL
YES	18	BRN	#929 TAIL LIGHTS	TAIL LIGHT SPLICE
NO	18	BRN	#929 TAIL LIGHTS	PASSENGER PARK LIGHT
YES	16	BLK	#969 TAIL SECTION GROUND	GROUND RING TERMINAL

**PASSENGER SIDE
TAIL LIGHT CONT.**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	BLK	#969 TAIL SECTION GROUND	PASSENGER PARK LIGHT

**PASSENGER SIDE
PARK LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	BRN	#929 TAIL LIGHT	PASSENGER TAIL LIGHT
NO	18	BLK	#969 TAIL SECTION GROUND	PASSENER TAIL LIGHT

NOTES

