

# **PAINLESS**

## **PERFORMANCE PRODUCTS**

### **Wire Harness Installation Instructions Manual #90587 For Installing:**

**#20130 Direct Fit 1970-72 Chevelle/Malibu  
26 Circuit Chassis Harness**



**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 a Chevelle/Malibu, reading this manual will give you considerable insight on the proper installation of this harness.**



# **Painless Performance Products, LLC**

**2501 Ludelle Street**

**Fort Worth, TX 76105-1036**

**800-423-9696 phone – 817-244-4024 fax**

**Web Site: [www.painlessperformance.com](http://www.painlessperformance.com)**

**E-Mail: [painless@painlessperformance.com](mailto:painless@painlessperformance.com)**

If you have any questions concerning the installation of this harness, 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 Thursday, 8am-4:30pm Friday, except holidays.

Here we have provided you with instructions, which are as accurate as possible, but always welcome suggestions for improvement. If you feel you have found any errors or omissions, or if you simply have comments/suggestions concerning these instructions, please call or email us (our contact information can be found at the top of this page or online at [www.painlessperformance.com](http://www.painlessperformance.com)). We sincerely appreciate your business.

**Painless 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, 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.

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Installation Manual 90587

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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 COMPLETELY INSTALLED AND TESTED.**

- Should you damage or lose part of your manual, a full color copy of these instructions can be found online at <http://www.painlessperformance.com/Manuals/20130.pdf>
- If your vehicle has an existing harness, retain it for the possible re-use of various pigtails and connector housings particular to your application. During the removal process, avoid making any unnecessary cuts. You should be able to remove the entire harness without making any cuts. Included in this kit is a sheet of pre-printed labels. These are there 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 (Transmission Controlled Spark) relay, rear defogger, or wiring for a convertible top; nor does not support ammeters found on Super Sport gauges. The ammeter worked based on the resistance of the factory, ten-gauge wiring found going to the core support mounted horn relay and a small junction box mounted behind the battery. All of these are removed with the install of this new Painless harness.**

- During the removal of the original harness, it is 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 enables you to make most of the connections needed that are not already provided on the harness.
- Only printed wires have a 900-series number. The numbers are used to identify various wires and circuits in the wiring diagrams that are part of these instructions.
- **In the event that there are unused or unconnected wires, the end of any wire labeled in this instruction manual as "POWER" needs to be terminated with an insulated terminal or taped. Doing so prevents the wires from shorting and causing harness failure or fire.**

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# **INTRODUCTION**

Thank you for your purchase of a Painless Performance product. This instruction manual and the Painless harness have been designed to allow you, the installer, the cleanest and easiest install possible.

Do not let the length of this instruction manual intimidate you. Much of the information contained in this manual is simply 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 of the harness 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 Chevelles/Malibus. In some instances, a wire color may not match your factory color. The harness colors were not exactly uniform throughout this time period, and, in most cases, it was a simple stripe color change. These colors, coupled with the schematic diagrams found throughout this manual, allow you to identify the different circuits during installation and later on if additions to the overall system are necessary.

The complete wiring harness, as well as this instruction manual, is designed with three major harnesses and a couple of smaller sub-harnesses incorporated into it.

**ENGINE HARNESS, INTERIOR HARNESS, TAIL HARNESS**, and sub harnesses for heater only vehicles, factory center console, and factory sweep dash

**With the many options provided by Chevrolet, and with so many variables in modifications that can be done to a Chevelle/Malibu, 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.**

This manual describes some wire colors consisting of two colors separated by a forward slash (ex: Black/White). This indicates a wire with a stripe. The first color is the main color of the wire and the color after the forward slash is the stripe color. In this example, Black/White indicates a black wire with a white stripe.

On many wires there is a printed, 900-series circuit number and text describing the wires' function. **These 900-series numbers are random numbers Painless assigns to these wires and have nothing to do with any factory circuit designations or any numbers you may find on a factory schematic.** In some cases, multiple wires share the same number, such as ground wires. There are multiple #969 GROUND wires throughout this harness since they all belong to the same circuit. Other wires, such as the electric choke, wire #954, only appear once. The wiring index in the back of this manual lists the print on all the wires. This helps if for some reason you find the print difficult to read. Also, some wires do not have any print at all. These wires are either too short, or the gauge of the wire is too large/small to print on. In such cases, like the red charge wire #915, important wires have print applied to a white tag and attached to these wires.

# **CONTENTS OF THE PAINLESS WIRE HARNESS KIT**

Please refer to the **Contents Figure** (see [Fig. 1](#)) to check and make certain that you have everything included in this kit. If you find that anything is missing or damaged, please contact the dealer where you purchased this kit or call Painless Performance directly at **(800) 423-9696**.

## **The Painless Wire Harness Kit should contain the following:**

- 1) Main Wire Harness, with the Fuse Block and Interior Bulkhead
- 2) Engine Wire Harness, with the Firewall Bulkhead
- 3) High Beam Pigtails & Plugs
- 4) "#915 Charge Wire, Ballast Bypass, Th400 Transmission" Bag Kit
- 5) Super Sport Gauge Cluster Pigtail
- 6) Tail Light Harness
- 7) Console Harness
- 8) Blower Motor Harness
- 9) Sweep Cluster Pigtail
- 10) Connector, Bulbs, and Parts Bag Kit
- 11) 1971-1972 Front Turn Signal pigtails
- 12) Small Parts Kit

**Not Pictured:** Grease and installation manual



*Fig. 1*

## **SMALL PARTS**

Included with the Painless harness is one parts kit containing an assortment of insulated terminals, fuses, screws, and nuts (see [Fig. 2](#)). The terminals that have a semi-transparent insulation are heat shrinkable to provide weatherproof connections. These terminals include disconnect, ring, and splice terminals and have been provided for engine bay connections.

The parts kit also contains non insulated, factory style terminals to help make connections to things like the sending units on the engine, alternator, ignition system, and other items that are not pre-terminated on this harness. A pair of rollover crimpers, shown on [page 10](#), are necessary to allow proper crimp installation of these terminals. Proper use of this crimper and installation of these terminals can be found on [page 13](#).

One small bag kit, labeled “ALTERNATOR,” contains all of the components for an inline fuse installation and alternator connections (see [Fig. 2](#)). This fuse is to isolate the battery from the alternator and Painless harness. These parts include the fuse holder base with cover, fuse, mounting screws and ring terminals. See [page 51](#) for more details about the contents of this bag.

The last of the small parts includes a larger bag with cable ties, bulbs, and various connectors (see [Fig. 2](#)). These connectors are used throughout the install for things such as the turn signal switch and optional aftermarket gauges under the dash.



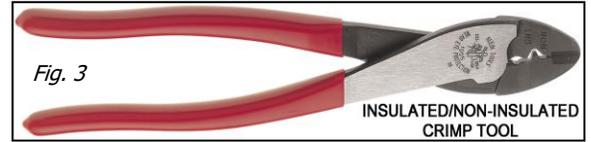
Fig. 2

# **TOOLS NEEDED**

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

## **Wire Crimping and Stripping Tools:**

*Fig. 3* - This style of hand crimper can be purchased from just about any local auto parts store or home improvement store or can be purchased online. You need this style of crimper to crimp both the insulated and non-insulated terminals included in the small parts kit and “Alternator” bag.



*Fig. 4* - The “Jaw Crimpers,” or “Rollover Crimpers,” crimp factory style, un-insulated terminals. These types of terminals are provided in the kit for connections to an HEI style distributor, engine compartment bulkhead, factory style alternator, etc. If none can be found locally, these crimpers can be found using Painless part # 70900.



*Fig. 5* - 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 thru 20. These are available from just about any local auto part store, electrical supply shop, home improvement store and/or can be purchased online.



## **Volt/Ohm Meter:**

*Fig. 6* - A Volt/Ohm meter is always a good tool to have on hand when installing any type of electrical component into a vehicle. The most basic units provide the two functions required to diagnose electrical issues commonly seen during a harness install. These two functions are the ability to read DC voltage and to test electrical continuity or measure resistance in ohms. They can be purchased from any home improvement store, local hardware store, electrical supply shop, or online.



## **Electric Drill & 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:**

*Fig. 7* - Very useful to apply heat to the heat-shrinkable terminals found in the parts kit.



## ❖ **Small (10-amp or less) Battery Charger**

See **TESTING THE SYSTEM** located on [page 127](#).

## ❖ **Factory Wire Schematic**

This is not absolutely necessary; however, having one handy is good practice with any electrical job. Clymer and Haynes manuals, which can be found at most auto parts stores and online, usually contain these schematics.

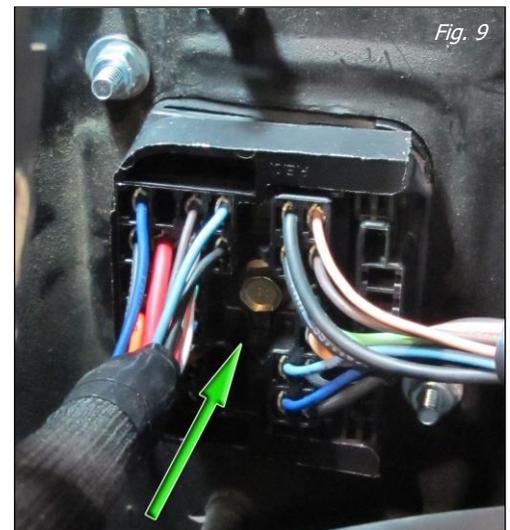
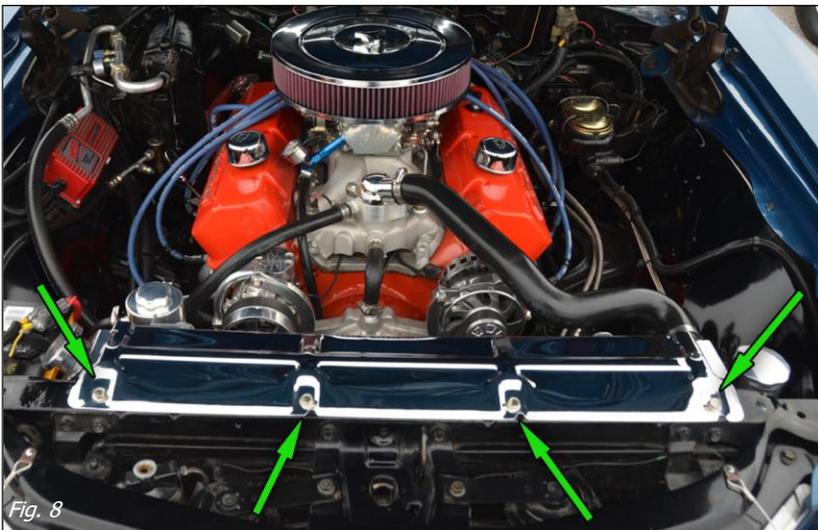
# **FACTORY HARNESS REMOVAL**

During the removal of the factory harness, avoid making any unnecessary cuts to any wires. Unless someone has modified the connections, you should be able to remove the entire harness from the vehicle without making any cuts to it. Try not to break any of the retaining clips holding the factory harness in the vehicle. Painless provides cable tie hold downs with the harness; however, leaving the factory clips intact provides a safety net in case you need additional clips. This also helps to identify how the factory harness was routed when it comes time to route the wires of the new Painless harness.

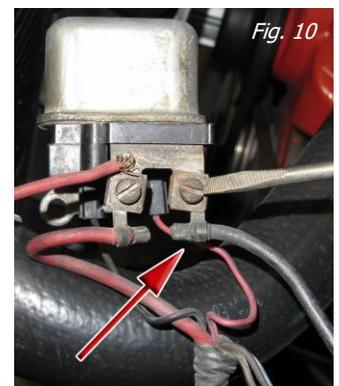
Labels are provided to identify each connection of the old harness as it is disconnected and removed. Individual wires may have been add-ons to aftermarket components and, as such, do not have a label on the sheet provided. These wires can be easily labeled using masking tape. Labeling the factory harness is highly recommended as it may be helpful to look back at the factory harness during the install of your new Painless harness. This helps you identify anything not included by the Painless harness that may need to be re-used.

## **Front Lighting & Engine Harness Removal:**

Before removing the front lighting harness, remove all the bulbs to make it easier to route the harness back to the firewall bulkhead. Remove the radiator hold down across the top of the core support (see [Fig. 8](#)). This is held down with four 1/2" bolts across the top that are easy to get to. To remove the front lighting and engine harness from the firewall, a 3/8" bolt holds the engine bulkhead to the factory fuse block, removing/loosening this bolt allows the factory harness to be removed (see [Fig. 9](#)).



**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 simply needs to be disconnected at the factory horn relay. This is the large-gauge, black wire on the horn relay which feeds an inline fuse on the firewall and then an orange wire to the A/C harness (see [Fig 10](#)). Remove this black wire and reroute it to the A/C box on the firewall. You will connect this wire to a power source later in the manual, on [page 60](#).



## Interior Harness Removal:

To aid in the removal and installation of the harness, remove the front driver seat, the steering wheel, and the rear seat. Removing the steering wheel is not absolutely necessary; however, doing so allows more room and movement to remove the factory harness and comfortably install the new Painless harness.

Before you remove any wiring in the dash, look at the fuse block and label what kind of power supply (constant battery power or switched ignition power) any additional wires, which may be attached to the accessory ports, are connected to (see [Fig. 11](#)). This helps in connecting these extra components to the Painless harness when you install the interior harness. It also aids in determining what ports on the Painless fuse block you need to connect these additional wires to.



Fig. 11

The dash pad needs to be removed. You easily accomplish this by removing the six screws along the underneath side of the pad (see [Fig. 12](#)). Complete removal of the dash is not always necessary, but it does make removal of the factory harness easier. It also allows you to inspect the grounding of the headlight switch and wiper switch as outlined on [page 71](#). Complete removal of the dash can also assist in making connections to the gauge cluster easier when installing the new Painless interior harness.

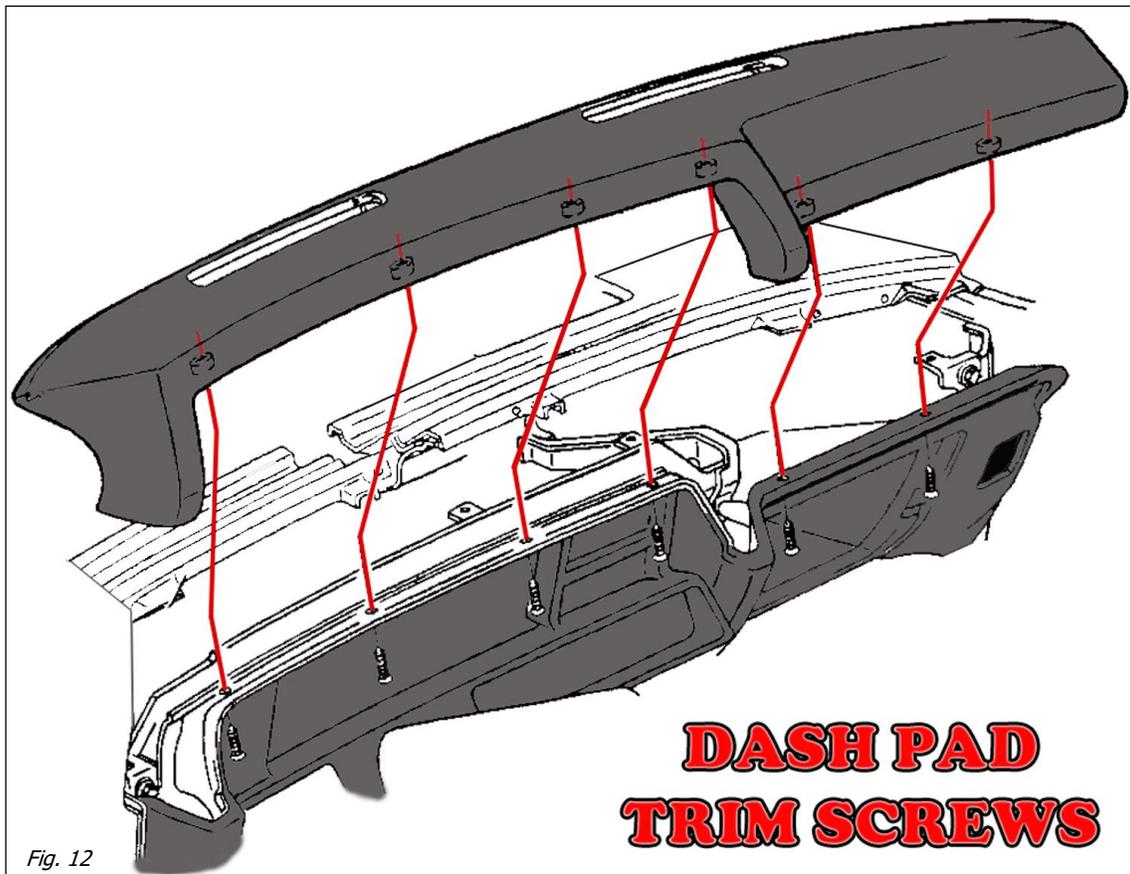
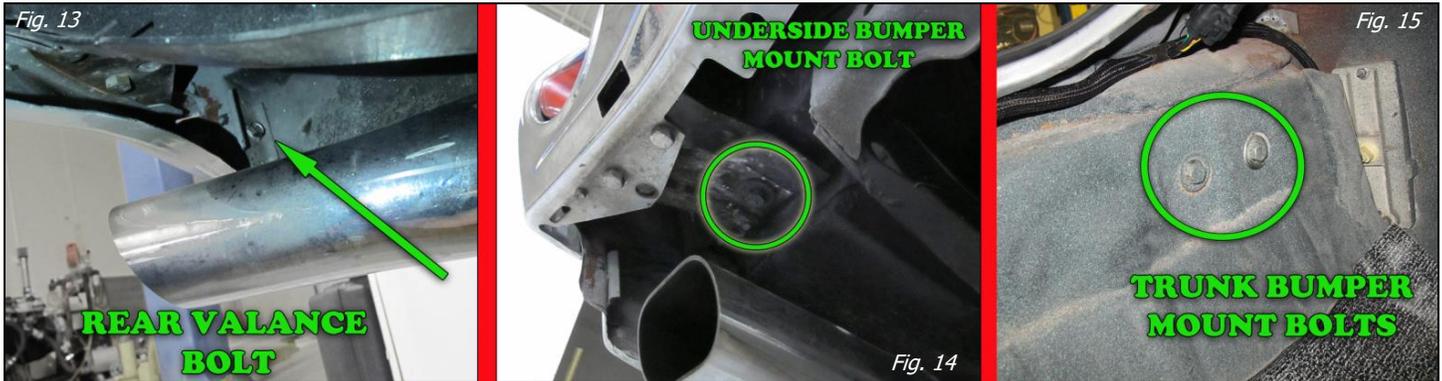


Fig. 12

## Tail Harness Removal:

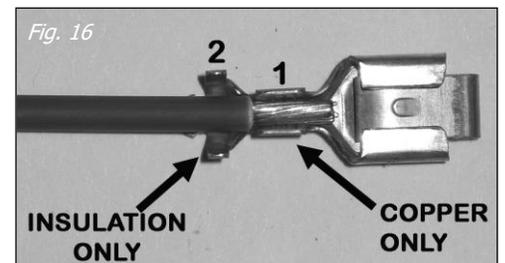
To remove the factory tail harness and install the new Painless tail harness, you must first remove the rear bumper from the car. Do this by first removing the two 1/2" bolts holding the rear valance to the body; one bolt on each end of the valance (see [Fig. 13](#)). Next, remove the two 5/8" bolts holding the bumper mount to the bottom of the car, one on the driver and one on the passenger side (see [Fig. 14](#)). The last bolts holding the bumper to the car are four 5/8" bolts in the trunk, two that go through the tail panel on each side (see [Fig. 15](#)). Before you remove these bolts, disconnect the factory tail harness from the harness in the trunk.



## INSTALLING FACTORY STYLE TERMINALS & UNPINNING CONNECTORS

The terminals provided in the parts kit that allow for a factory style connection require rollover crimpers to be installed properly. These terminals are for connections that do not come pre-installed on the Painless harness, and for modifying existing connections that need to be changed to adapt to your specific application.

- Strip about 1/4" of insulation off of the wire.
- Insert the wire between the two sets of terminal straps on the terminal. For instructional purposes, we labeled them strap sets "1" and "2." Strap set 1 crimps the exposed copper strands of the wire, while strap set 2 crimps the wire insulation. Make sure your strip length is long enough to ensure only copper strands are crimped by strap set 1, but make sure it is short enough that only insulation is crimped by strap set 2 (see [Fig. 16](#)).
- Strap set 1 and Strap set 2 require two different jaws or openings in the crimper. 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 (see [Fig. 17](#)).



- With strap set 1 crimped, you can move onto crimping the insulation with strap set 2. Place strap set 2 into the appropriate jaw of the crimpers. This jaw will be larger than that used to crimp the first strap. Slowly crimp down on strap set 2; make sure the strap folds downward onto the wire insulation and does not overlap itself (see [Fig. 18](#)). Overlapping can cause problems with the terminal fitting into the intended connector (see [Fig. 19](#)).

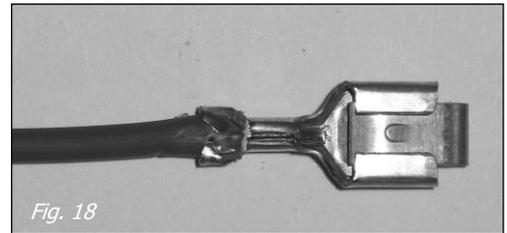


Fig. 18

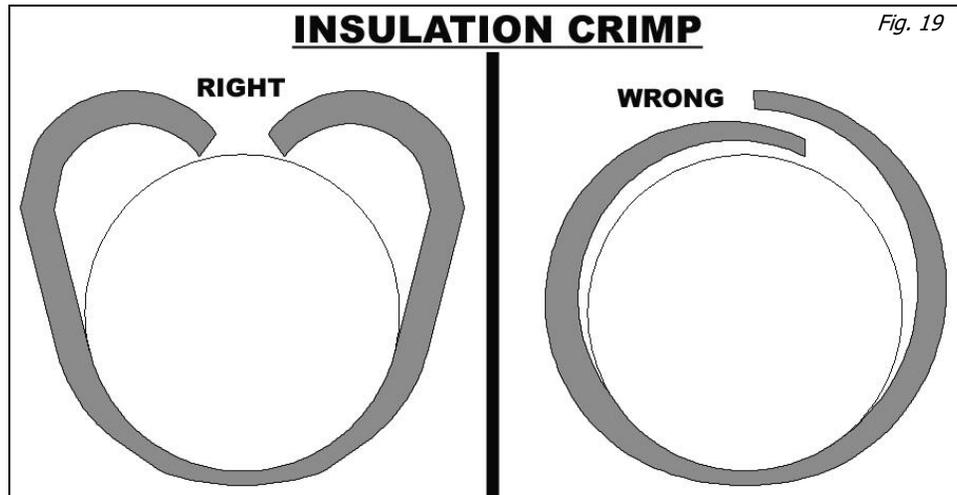


Fig. 19

## TO REMOVE A TERMINAL



- Notice the locking tang that holds the harness end in the connector (see [Fig. 20](#)). Locate the tang access slot on the terminal end of the connector (see [Fig. 21](#)). Push a paper clip, stiff wire, or a small flat head screwdriver into the slot to depress the locking tang on the terminal (see [Fig. 22](#)).
- Once depressed, pull the harness wire from the connector. Do not pull too hard or you could pull the wire out of the terminal; this leaves 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 wiring 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 route some wires and make some connections, route some more wires and make some more connections. This Painless harness follows much of the same routing the factory harness did. Harness routing may slightly differ according on your year model or use of aftermarket components such as gauges, shifters, steering column, engine driven accessory brackets, etc. Harness routing also depends a great deal on the extent you want to secure and conceal the harness. This aspect is more prominent in the ENGINE SECTION wiring, where much of the harness is visible.

The best pre-installation practice is to first 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 this manual. Use the wire index in the back of the manual to quickly identify each wire in these sections.

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

Throughout the familiarization process, and during the install, wires should be bundled into groups using nylon zip ties or tape. Painless highly recommends that you apply loom to the exposed wires in the engine compartment and the wires that run to the rear of the vehicle.

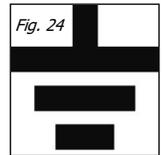
*Painless offers Power Braid Chassis Kit part #70920 and Classic Braid Chassis Kit part #70970 to fill this need (see Fig. 23).*

*See the insert card that came with your wire harness for details and samples of each product.*

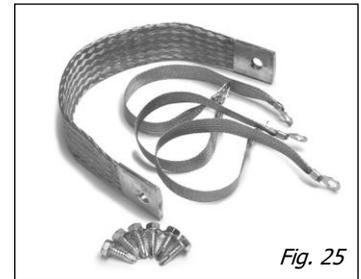


# GROUNDS

Throughout this instruction manual and when looking at the Painless harness you will see the word GROUND. Maybe you have seen the ground symbol on wire diagrams (see [Fig. 24](#)), but what exactly is a ground and why do you need it?



The large, normally black cable coming from the negative side of your battery and ending either at a bolt on the vehicles frame, or on a bolt on the engine block is your vehicles main ground cable. This cable allows DC voltage current 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** (Universal Body/Engine Ground Strap Kit; see [Fig. 25](#)) to supply proper grounds back to the battery.



A ground is simply the common path DC current takes back to the battery. A ground, or chassis ground as it is often called, is a bare metal surface found on the vehicle which is in turn connected back to the battery through mounting points and ground straps. They are needed to allow the DC current to return to the battery.

Electrical components in the Chevelle/Malibu are basically grounded in two ways: through mounting hardware and through direct wire connection. Some grounds on the Chevilles/Malibus are grounded though the mounting of metal housings, such as the headlight switch and cowl induction relay. Components such as the headlights, tail lights, radio, and gauge cluster all get their grounds through wires in the chassis harness. These wires are attached to a common ground source and are already built in for you.

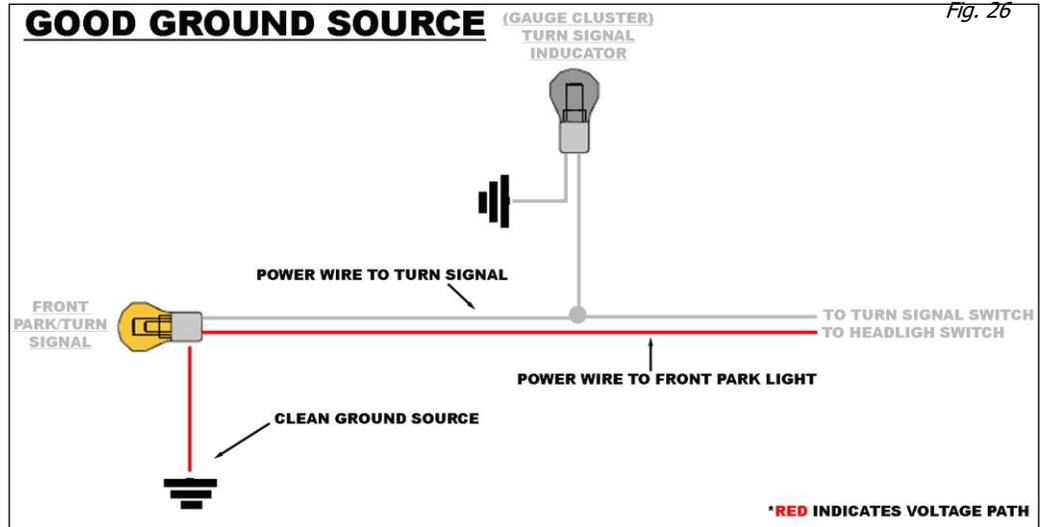
To help avoid ground issues, all of the ground wires in this Painless harness are connected together through a series of splices. All of these splices connect to large ten-gauge wires in the engine compartment and in the trunk to allow a ground connection directly to the battery, regardless of battery location. The [Ground Schematic](#) on [page 18](#) has been provided to show you exactly which wires in the Painless harness are part of the integrated ground circuit (see [Fig. 28](#)).

On components that ground through their mounting hardware, and for the harness ground wire connection points, **make sure that all ground connection points are clean by removing all dirt, corrosion, and paint.** You should see clean shiny metal before a ground is connected. This is especially important for cars that have just been painted as paint build up causes grounding issues. Course sandpaper should be all that is needed to properly ground connection points. External/Internal star washers also help making clean ground connections as they “bite” through paint to establish a proper path to a ground.

## Why are clean grounds important?

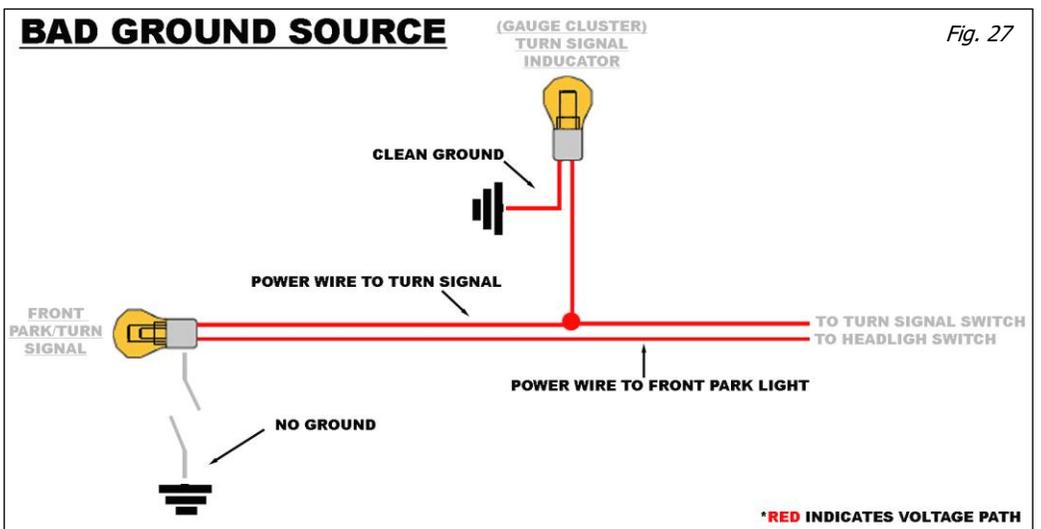
For example, take the front park lights on the Chevelle/Malibu, which have turn signal and park light functions. Follow the red line from right to left in [Fig. 26](#) and [Fig. 27](#). This red line indicates the path electrical current takes when everything is properly grounded and as represented in [Fig. 27](#), when the ground is bad. Notice the yellow bulbs illuminate 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 is disconnected or is contaminated with dirt, corrosion, or paint, the voltage will find the easiest path to ground (see [Fig. 27](#)).

Current travels from the headlight switch to the park light bulb, but what if there is no ground at the bulb? Since the ground it would normally use is not there, the current will find the path of least resistance to ground and complete the circuit 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 can flow out of the park signal bulb through the turn signal wire. Notice in the diagram that a bad ground at the front park light can cause issues at the turn signal indicator on the dash. In this case, the turn signal indicator bulb is illuminated when it shouldn't be. Also, since this one power source was only supposed to power one bulb and is now powering two bulbs, both bulbs will likely be dimmer than they would have been if everything was properly grounded. 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.



# FUSE BLOCK

The Painless harness contains an eighteen-fuse, GM style fuse block with the same firewall mounting pattern as the factory installed fuse block (see [Fig. 29](#)). 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 also allows for the convenience of having both flashers (turn signal and hazard), and the horn relay, mounted in one location (see [Fig. 30](#)).

## Horn Relay

On the bottom of fuse block you will find a horn relay that replaces the factory core support mounted horn relay. The fuse block mounted horn relay uses a standard 30-amp SPST relay. A replacement for this horn relay can be found at any auto parts store or by ordering [Painless part number #80131](#).

## Flashers

The thermal flashers simply switch power on and off going to the turn signal switch and hazard switch. The flasher on the top left corner is the hazard flasher. The flasher on the bottom right corner is the turn signal flasher (see [Fig. 30](#)).

How a flasher functions is simple. There is a resistance wire inside the flasher. Power is switched on and off according to heat built up within this wire. As power is drawn through the flasher, when the turn signal or hazard switch is activated, the resistance wire heats up causing a spring metal strip to make contact with the output side of the flasher. This contact passes power through the flasher, into the switch, and out to the turn signal lamp(s). Once this contact has been made, the resistance wire is no longer resisting any current, and it begins to cool. This cooling causes the flasher to lose contact. This loss of contact means there is no longer any power going to the switch, and causes the turn signal lamps 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 signal lamps do not draw enough current to activate a typical thermal flasher. **If you are using L.E.D. turn signal bulbs, your turn signals do not operate properly (i.e. staying on and not blinking or blinking too fast), and you are certain everything is connected properly, a no load flasher is required.** [Painless offers part number #80230](#) to fill this need (see [Fig. 31](#)).

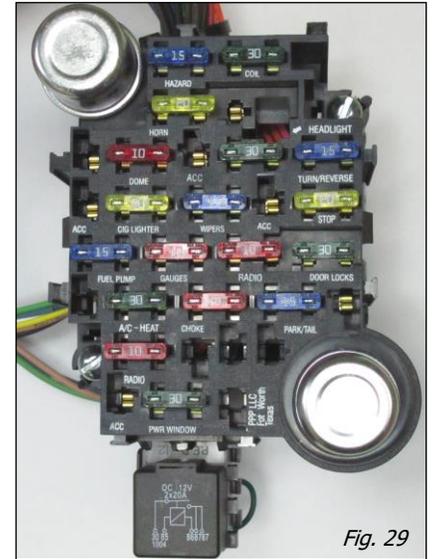


Fig. 29

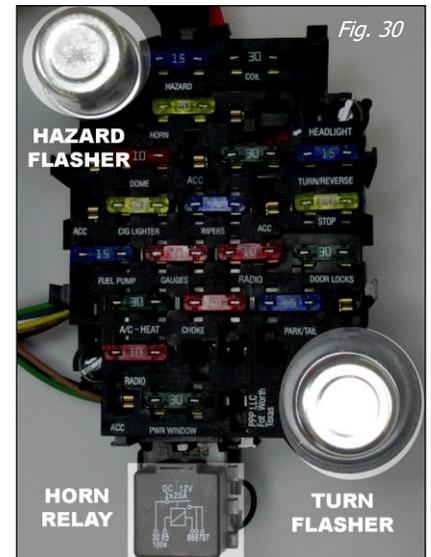


Fig. 30



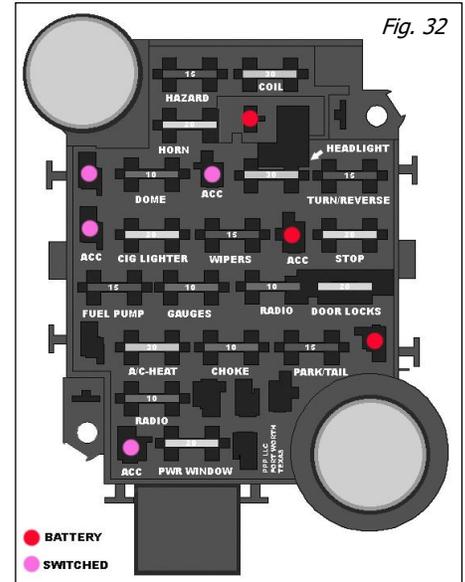
Fig. 31

"NO LOAD" LED FLASHER

## Accessory Ports

You will notice single ports on the fuse block; many of these are labeled "ACC." These ports give you access to battery power and switched IGN power you may need now or in the future for extra circuits. You need to test the ports (see [Fig. 32](#)) in order to tell which ports have battery power and which have switched power.

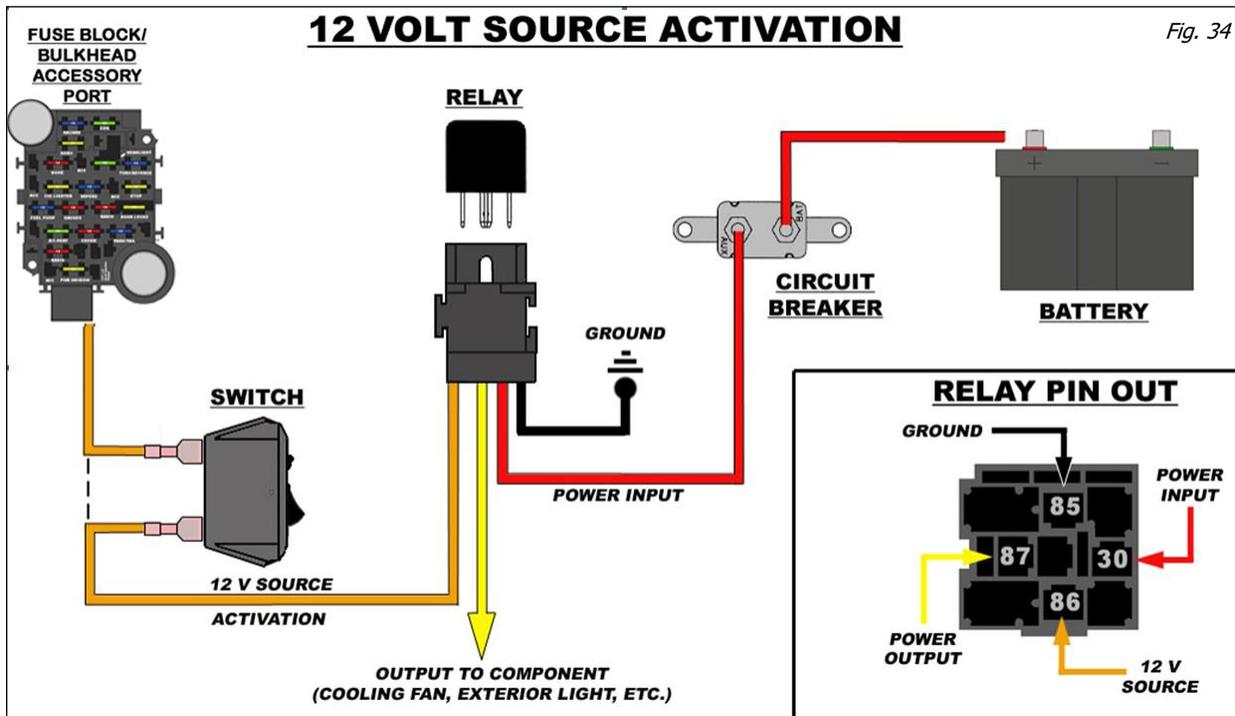
Painless provides terminals and connectors in the parts kit to allow you to tap into these extra power sources (see [Fig. 33](#)). **The ports are all un-fused power sources, must have an inline fuse, no larger than 15-amps, and be installed before being routed to any component needing power.** Anything needing more than 15-amps needs to have a relay installed. See relay wiring and activation on the next page 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. You can use an ACCESSORY PORT as a 12-volt (12v) source activation or a 12v source for ground activation in these circumstances. [Take a look at Painless part #'s 30107 & 30108 to find the relay you need.](#)

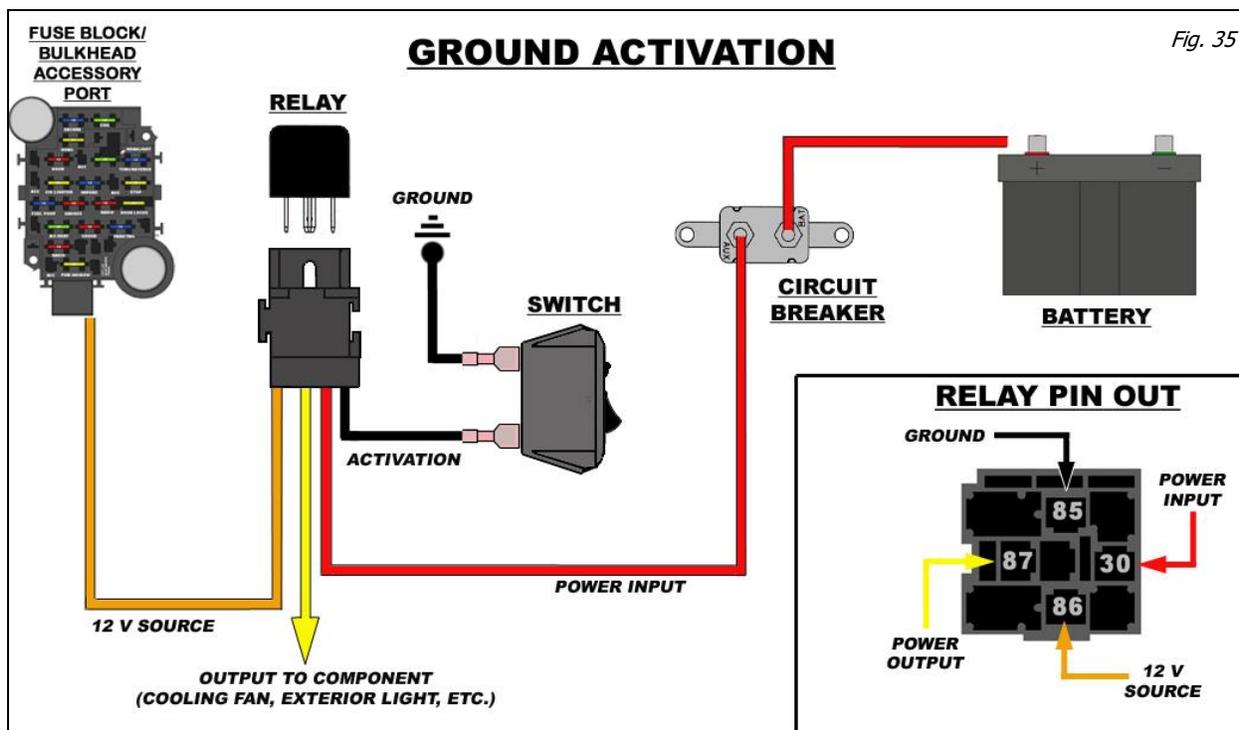
A 12v activated relay is constantly grounded and sends power out of the output side of the relay to the component being powered when 12v is applied to the relay, as the name implies. The 12v source can be wired directly to the relay or interrupted by a switch, as shown in the [12 Volt Source Activation Schematic](#) (see [Fig. 34](#)).



Wiring directly to the relay, as indicated by the dashed line, is 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 12v wire you are using is a switched 12v wire and not a battery constant hot.

The 12v, 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 is used. This allows 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 Activation Relay is just the opposite of the 12v activated relay. 12 volts (battery constant or switched) are 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 (*Fig. 35*).



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, or switch failure will occur.

# FUSE BLOCK MOUNTING

To begin mounting the fuse block, you need to enlarge the two mounting bolt holes; these holes can be found next to the upper right and lower left of bulkhead opening. This modification requires a 1/4" or 5/16" bit and an electric drill.

- Using the drill bit, enlarge both firewall mounting holes (see [Fig.36](#)). This allows the 1/4" fuse block, mounting bolts supplied with the Painless harness to pass through the firewall. This is easiest if done from the inside of the vehicle as shown below.



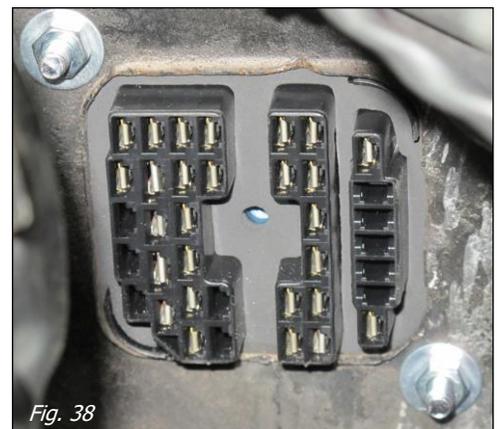
With the holes now enlarged in the firewall, the fuse block can now be mounted (see [Fig. 37](#)).

- Before permanently mounting the fuse block, make sure the dimmer switch wires are coming out of the bottom of the fuse block.
- Remove the two nuts and two flat washers pre-installed on 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.

**This next step requires a helper.**

- On the engine side of the firewall, install the flat washers and nuts previously removed from the fuse block; this requires the use of a 7/16" socket and a ratchet to help operate in the confined space (see [Fig.38](#)). You need a helper with a flat head screw driver on the inside of the vehicle to keep the bolts from turning while the mounting nuts are tightened.

**(Terminal position of your harness may vary from the one in the photo)**



# ENGINE HARNESS

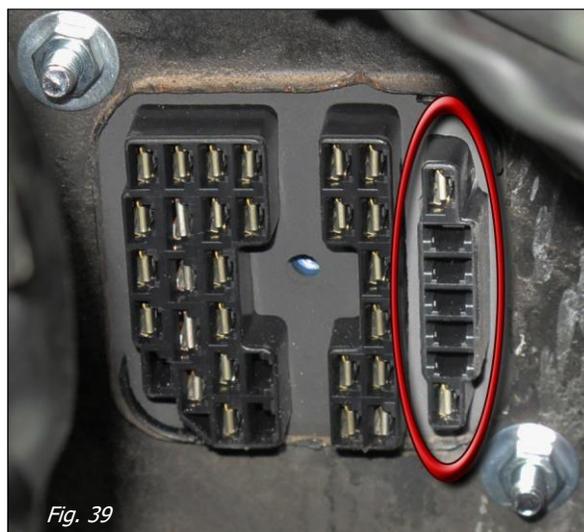
The engine harness is broken down into two major groups of wires leaving the bulkhead connector:

- ❖ Light Section- contains wiring for the brake failure warning switch, headlights, high beams, marker lights, park/turn signals, horn(s), and grounds.
  
- ❖ Engine Group- contains six groups of wires
  - Wiper Motor - contains wiring for the wiper motor.
  - Alt - contains wires needed for the charging system.
  - Engine Section - contains wires for oil pressure, temperature sensor & electric choke.
  - Ignition - contains wires for the coil or aftermarket ignition box (power and tachometer signal).
  - Start - contains wires for the MIDI fuse and starter connections.
  - Blower Motor - a single power wire for the blower motor for vehicles that only have a heater.

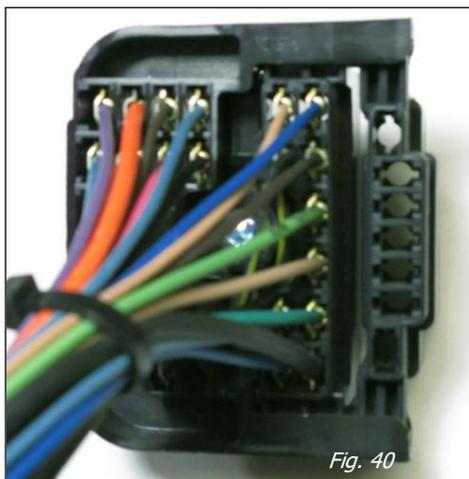
## Engine Bulkhead

*Fig. 39* shows the interior bulkhead properly mounted and passing through the firewall in the engine compartment. The engine harness plugs directly into this connector. However, before doing so, there is an optional feature built into this connector that can be beneficial to your install.

In the engine compartment, on the right hand side of the interior bulkhead, and circled in **RED** in *Fig. 39*, there is a seven-pin portion of the bulkhead. Both of these pins have power anytime the ignition is in the ON/RUN position. This feature makes wiring up many under hood accessories, which require a switched power source, easier than having to source power from inside the vehicle by drilling a new hole in the firewall.



*Fig. 39*

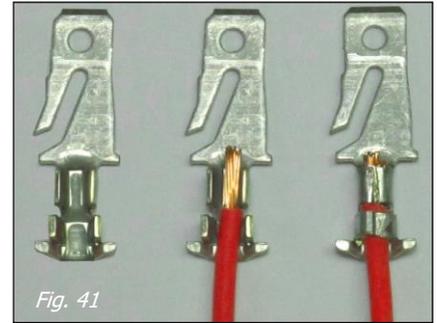


*Fig. 40*

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 (not supplied) no larger than 15 amps, installed before being routed to a component needing power.** Anything needing more than 15 amps will have to have a relay installed. See relay wiring and activation on [pages 20-21](#) for details (**These pins will not supply any radiator cooling fan(s) enough power**).

The mating connector to the bulkhead on the engine harness (see *Fig. 40*) does not include the wires needed for the accessory switched power pins. This is done so there are not any un-fused and disconnected wires running out into the engine compartment. There is no harm in leaving these ports open if you do not require any additional switched power sources.

In order to utilize these optional, switched power sources, you must first add wires to the engine harness bulkhead. Painless provides terminals in the parts kit for these connections (see [Fig. 41](#)). These terminals accept 18 to 14-gauge wire, using a 1/4" strip length, and need to be installed with rollover crimpers (see [Fig. 4](#)).



If any wires are added to the bulkhead connector for the extra switched power sources, group each wire with the section 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's side inner fender to power an accessory, the wire connected to this fuse should be routed with the **Light Section**.

## **Cowl Induction/Turbo 400 Add on**

If your Chevelle/Malibu has the factory style cowl induction relay, and/or a turbo 400 transmission, 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 solenoid and the wire to activate the kick down function of a turbo 400 transmission. **Please note: the cowl induction solenoid does NOT control the visible flapper door that raises and closes on top of the hood; that is controlled by vacuum.** The cowl hood solenoid controls an inner door that lets in fresh air. In most cases, this solenoid and door assembly have been removed or not installed as most people are only concerned with the aesthetics of the vacuum operated flapper door.

Start by locating the rolled up tan, pink, and orange wires in one of the bags that came with this Painless wiring harness. These wires can be seen in the schematics on [pages 42-44](#) and are labeled as follows:

**Tan:** 16-gauge wire, printed **#997 SWITCHED 12V POWER (COWL HOOD RELAY)**. This wire supplies accessory switched power from the PWR WINDOW fuse out to the relay that controls the cowl induction solenoid. This wire has power when the key is in the "ON/RUN" or the ACCESSORY position.

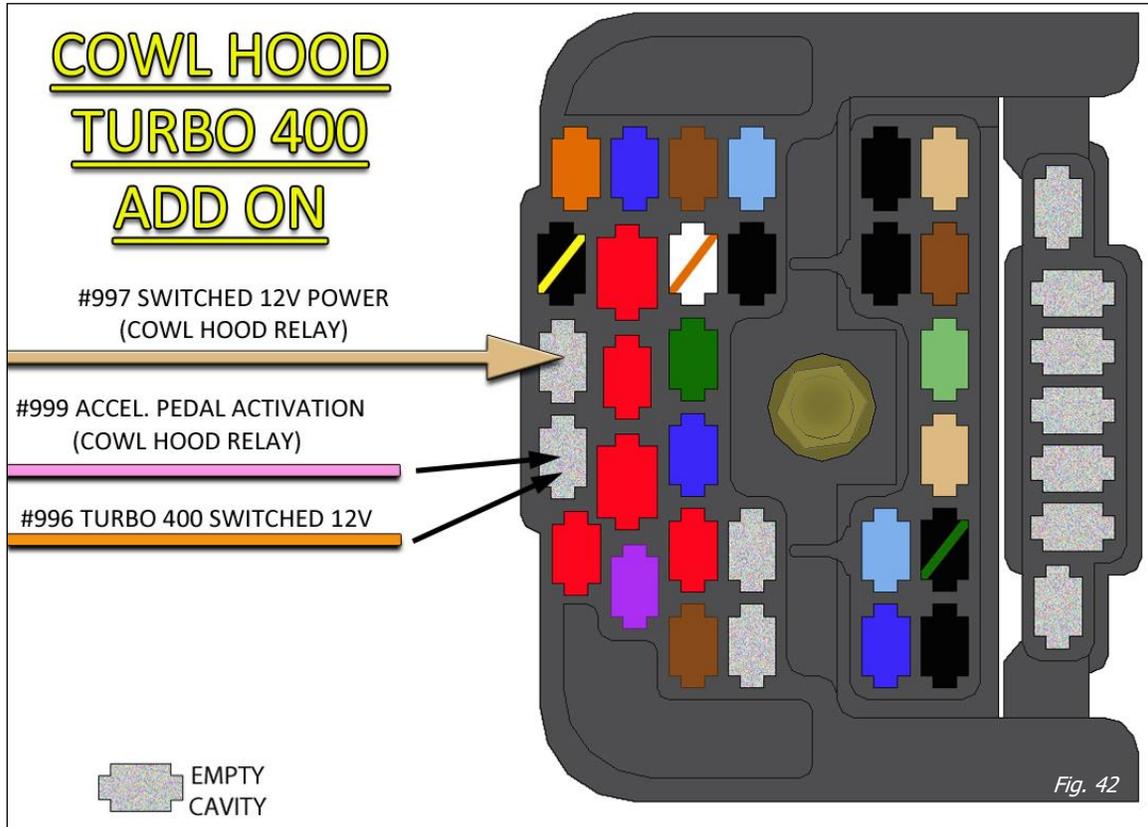
**Pink:** 16-gauge wire, printed **#999 ACCEL. PEDAL ACTIVATION (COWL HOOD RELAY)**. This wire supplies ignition switched power from the CHOKE fuse to the activation tab on the cowl induction relay. This wire only has power when the key is in the "ON/RUN" position **AND** the accelerator pedal is depressed close to wide open throttle.

**Orange:** 16-gauge wire, printed **#996 TURBO 400 SWITCHED 12V**. This wire supplies ignition switched power to the kick down solenoid for a turbo 400 transmission.

- The wires mentioned above have terminals preinstalled on one end. These terminals plug into the engine bulkhead. Please refer to [Fig. 42](#) on [page 25](#) and insert the wires into the appropriate locations shown.

If you have a cowl hood relay, only the tan, **#997** and pink, **#999** wires plug into the bulkhead. If you have a cowl relay and a turbo 400 transmission, the orange, **#996** wire is not needed at this time. It is used on [page 42](#).

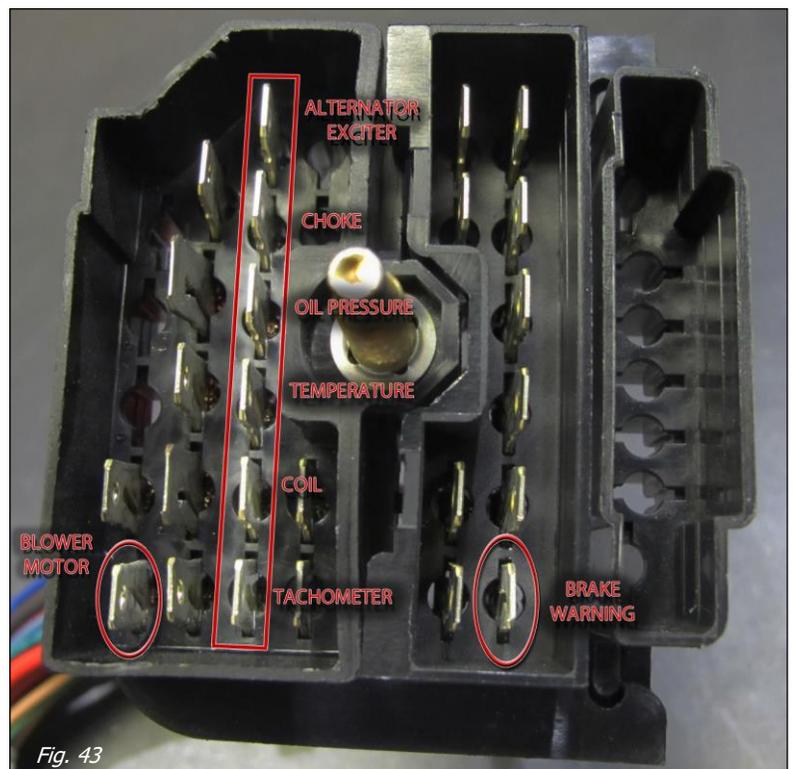
If you have a turbo 400 transmission, and do not have a cowl hood relay, only the orange, #996 wire plugs into the bulkhead. The tan, #997 wire and pink, #999 wire are not needed.



- Any wire(s) added to the bulkhead will be grouped and cable tied to the main harness breakout with the Engine Section, Alt, Starter, Blower Motor, and the Coil/Ignition wires.

### Bulkhead Pin-Out

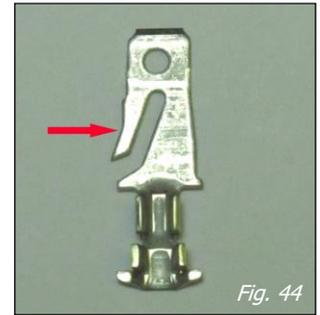
Before connection of the bulkhead takes place, look over the pin out to see if there are any wires you will not be using. Things like electric choke, blower motor, gauge wires (if you are using aftermarket mechanical gauges), and tachometer wire are all things some people may not be using (see Fig. 43). 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 are found in the section of the manual where conventional connections are explained. **UNDER NO CIRCUMSTANCES SHOULD YOU REMOVE ANY OTHER WIRES.**



Removal of these wires is simple and requires 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 its cavity in the bulkhead (see [Fig. 44](#)).

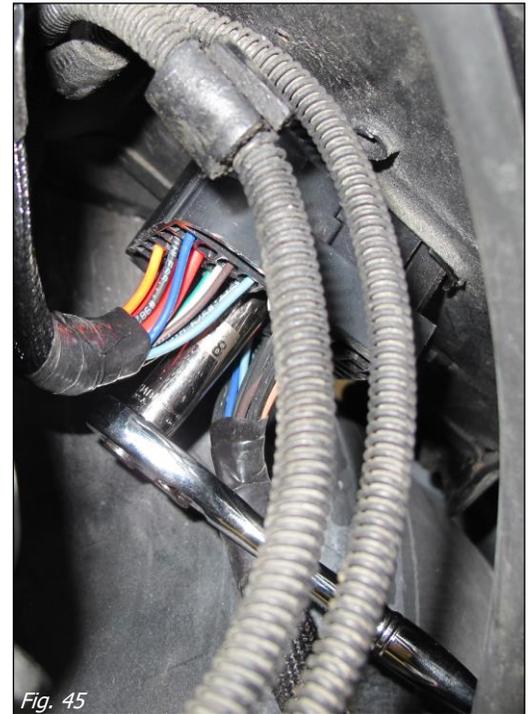
Be careful not to damage any of the surrounding terminals.



## Engine Bulkhead Mounting

With all the extra wires added to the engine bulkhead connector, 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 on all the way because of the bolt. Be sure the connector is on straight, as the terminals of the bulkhead can easily bend.
- Using a 3/8" socket, tighten the mounting thru bolt on the engine bulkhead to the fire wall connector. It only needs to be fully seated and tight (see [Fig. 45](#)). **DO NOT FORCE OR OVER TIGHTEN!**



## Engine Harness/Light Section Harness Routing and Installation

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

“Umbrella” style clips for cable ties have been provided for you to attach this Painless harness to the inner fender and the core support in the same fashion as the factory did. These cable tie clips fit into the 1/4” holes left behind by the factory plastic retainer loops (see [Fig. 46](#)).

Remember, as the cable 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 cable ties be tightly snugged down.



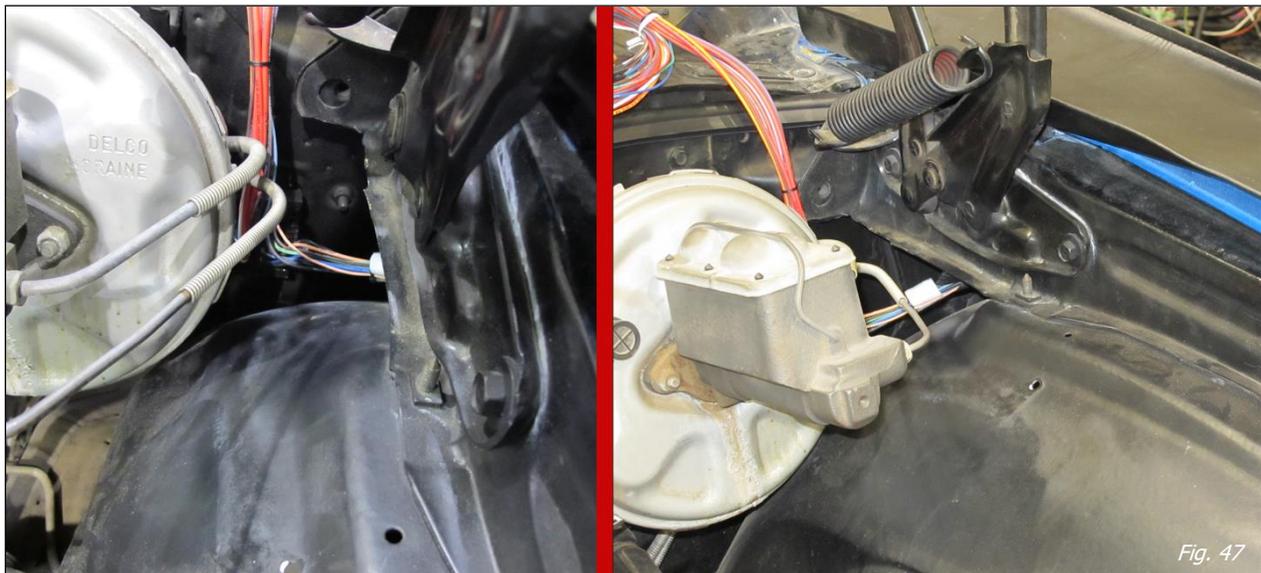
If you still have an externally mounted voltage regulator for the original style alternator, and the regulator is mounted on the driver side core support, re-routing of the “Alternator Section” and additional wiring (*not included*) need to be added to the “Lighting Section” of the engine harness. See [page 57](#) for details on these wires before routing any of the Light Section.

## Light Section

The LIGHT SECTION has a little extra length added to allow routing the harness over the inner wheel well, behind the driver side fender (see [Fig. 47](#)). Doing so makes 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 originally, be sure to use the provided “umbrella” cable tie clips. Install these clips into the original holes left behind by the factory, plastic clips and loosely secure the new Painless harness.



## Brake Warn Switch

The Brake Warn Switch is a normally open switch that closes and sends a ground signal to the brake 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. Note: this is a pressure switch not a fluid level switch.

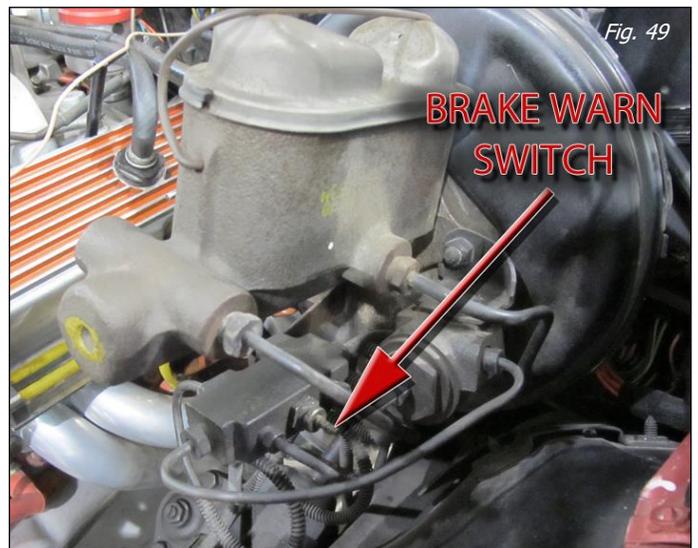
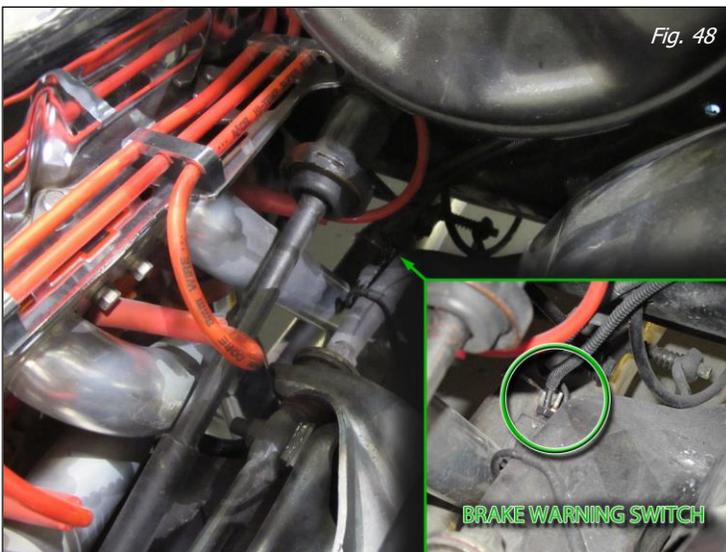
This switch is only necessary if you want the brake warning light in the dash to indicate low brake fluid pressure. If you have aftermarket gauges without a brake warning light, this connection can be skipped and this wire can either be stowed into the Light Section of the harness or removed from the bulkhead, as described on [page 25-26](#).

The factory valve is located on the driver side frame, about where the floor pan and firewall meet; follow the brake lines down from the master cylinder (see [Fig. 48](#)). Those who have upgraded their brake system, or have switched to a newer style master cylinder, may find this valve on the underside of the master cylinder itself (see [Fig. 49](#)). If you have an aftermarket proportioning valve, you may not have one of these switches at all. Aftermarket valves that have a two-pin switch on them are normally for brake light activation, and this type of switch does not work as an activation source for the indicator light on the dash.

The “Brake Warn Switch” is a one-wire connection and has a label reading “LOW BRAKE SWITCH.” This wire is a:

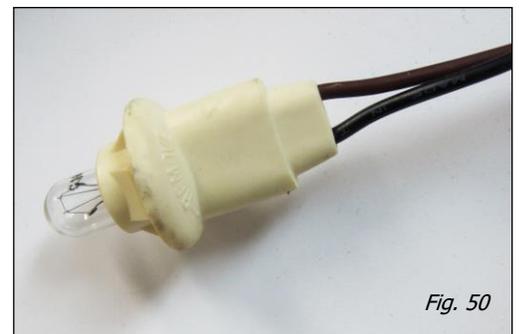
**Tan:** 18-gauge wire, printed with **#968 BRAKE WARN SWITCH**. This wire supplies a ground signal to the low brake light on the dash. The wire goes into the bulkhead connector and is spliced together with the wire going to the emergency brake switch on the interior of the vehicle; see the [Gauge Cluster Schematic](#) on [page 93](#) (see [Fig. 158](#)).

- Connection to the low brake switch can be done two 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 cut the molded connector from your factory harness and splice it to the wire of the Painless kit; uninsulated splices and heat shrink have been provided.



## Left Side Marker

The driver side, fender mounted, marker light is the first connection of 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 illuminates any time the headlight switch is in the PARK or HEADLIGHT 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 (see [Fig. 50](#)).



The **Left Side Marker** requires two wires to work properly, seen in the [Front Lighting Schematic](#) on [page 37](#) (see [Fig. 67](#)). A factory style socket comes pre-installed and has 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/marker light function, and is spliced to the other **#927** wires in the Light Section. This wire has power anytime the headlight switch is in the Park/Tail Lights ON position 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.

#### On 1970 models:

- Install one of the provided wedge base bulbs into the socket. Add a small amount of dielectric grease to the contacts beforehand to help prevent any corrosion issues.
- Route the marker light socket through the opening behind the core support down to the marker light. Grommets have been supplied in the parts kit to protect the wires going through this hole.
- 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 (see [Fig. 51](#)).
- Insert the lamp socket of the Painless harness into the "Left Side Marker" housing and turn 1/4 turn clockwise to lock the socket in place.



**On 1971 & 1972 models** turning the socket can be difficult, due to limited space around the keyed hole:

- Remove the turn signal/marker light lens from the front of the vehicle.
- Insert the socket into the keyed hole and give it a 1/4 turn to lock into place. This socket can be difficult to get turned and locked into place (see [Fig. 52](#)).



To help, if yours is difficult, while applying firm pressure to the molded connector from behind, use a pair of needle nose pliers to twist from the front. The molded connector is soft plastic and can be damaged by the pliers, so care should be taken not to damage the connector when installing it. A close up view of this socket locked into place can be seen on [page 33](#) (see [Fig. 61](#)).

- Install one of the provided wedge base bulbs into the socket. Adding a small amount of dielectric grease to the contacts beforehand to help prevent any corrosion issues.

## Left Headlight

Your next connection in the **Light Section** is the left headlight. Three wires make up the connection, and go into a black, three-pin connector. This group of wires has a section label reading "HEADLIGHT," these wires are:

**Light Green:** 14-gauge wire, printed **#908 HIGH BEAM POWER**. This wire provides power to the high beam filament of the head lamp. This wire goes into a splice with a wires going to both inner high beam lamps and the right headlamp and also to a wire going to the bulkhead. This wire can be seen in the [Front Lighting Schematic](#) on [page 37](#) (see [Fig. 67](#)). This wire has 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 provides power to the low beam filament of the head lamp. This wire comes from the bulkhead connector, and can be seen in the [Front Lighting Schematic](#) on [page 37](#) (see [Fig. 67](#)). This wire has power when the headlight switch is in the headlight ON position and the dimmer switch is in the low beam position. Another tan wire can be found in this connector; it feeds power to the passenger side headlamp.

**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 18](#) (see [Fig. 28](#)).

- Add a small amount of dielectric grease to the terminals before plugging the connector into the headlamp. Do this to help prevent any corrosion issues (see [Fig. 53](#)).
- Holes in the core support will allow access to the headlight terminals, so removal of the bulb is not necessary. 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 off (see [Fig. 54](#)).



Fig. 53



Fig. 54

**If halogen bulbs are being used** Painless recommends using Painless part **# 30814** (1970 models) or **# 30815** (1971/1972 models). This additional relay harness is needed to avoid overloading the headlight switch with the higher demands of halogen bulbs (see [Fig. 55](#)).

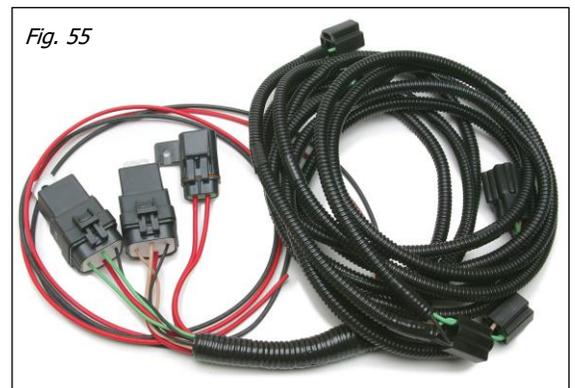


Fig. 55

## Left High Beam

Connecting the left high beam follows the connection of the headlight. This connector is a black, weather resistant connection with two wires. This group of wires will have a section label reading "HIGH BEAM," these wires are:

**Light Green:** 14-gauge wire, printed **#908 HIGH BEAM POWER**. This wire provides power to the high beam filament of the head lamp. This wire goes into a splice with wires going to both inner high beam lamps, the right headlamp, and a wire going to the bulkhead. It can be seen in the [Front Lighting Schematic](#) on [page 37](#) (see [Fig. 67](#)). This wire has power when the headlight switch is in the headlight ON position and the dimmer switch is in the high beam position.

**Black:** 14-gauge wire, printed **#969 HIGH BEAM 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 18](#) (see [Fig. 28](#)).

- Included with this kit is a bag labeled "HIGHBEAM PIGTAILS & PLUGS." This bag contains the parts needed to complete the high beam connection.

### Those with the dual headlight 1970 front end (see [Fig. 57](#)):

If you have halogen headlights, use the high beam connector found on your halogen headlight harness. The high beam connection on this chassis harness should be plugged as described below in the 1971/1972 instructions.

Those with standard headlight bulbs:

- Plug one of the supplied pigtails into the connector found on the Painless harness (see [Fig. 56](#)).
- On the other end of the pigtail is a headlight connector, add small amount of dielectric grease to the terminals before plugging the connector into the headlamp. Doing so will help prevent corrosion.
- Holes in the core support will allow access to the high beam terminals, so removal of the bulb is not necessary. 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 as they can easily bend and break

### Those with the single headlight 1971 or 1972 front end (see [Fig. 57](#)):

- Connect one of the supplied plugged connectors from the "HIGHBEAM..." bag into the connector on the Painless harness.

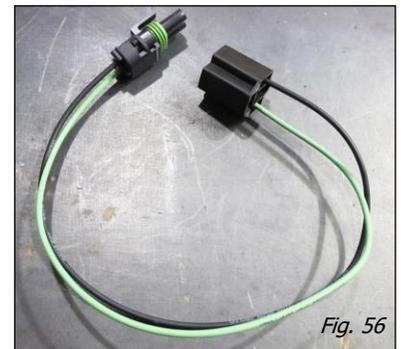


Fig. 56



Fig. 57

The plugged connectors will be the ones with NO wires pre-installed but instead, have small green plugs inserted into the connector cavities.

- With the plugs now installed, tape or cable tie the “Left High Beam” connection to the harness and out of the way, it is not needed.

## Left Turn/Park Light

The last connection to make before routing the **Light Section** across the core support 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 in this kit. The bulb this lamp requires has the universal part number 1157; replacement bulbs can be found at any auto parts store under this part number (see [Fig. 58](#)).



The Left Turn/Park Light of the Painless harness consists of two wires in a two-pin connector and is identified by a label reading “L TURN.” These wires can be seen in the [Front Lighting Schematic](#) on [page 37](#) (see [Fig. 67](#)). They are:

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

**Light Blue:** 18-gauge wire, not printed. This wire is the turn signal power and part of the **#926** circuit, and goes into a splice with the light blue wire going to the front left marker light and to a wire coming from the bulkhead. This wire has 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.

**Those with a 1970 front end** (turn signals in the front bumper; see [Fig. 57](#)):

- To ensure the turn signal and park lights work properly, if you are reusing an original/old turn signal 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 grounds through. 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 (see [Fig. 59](#)).

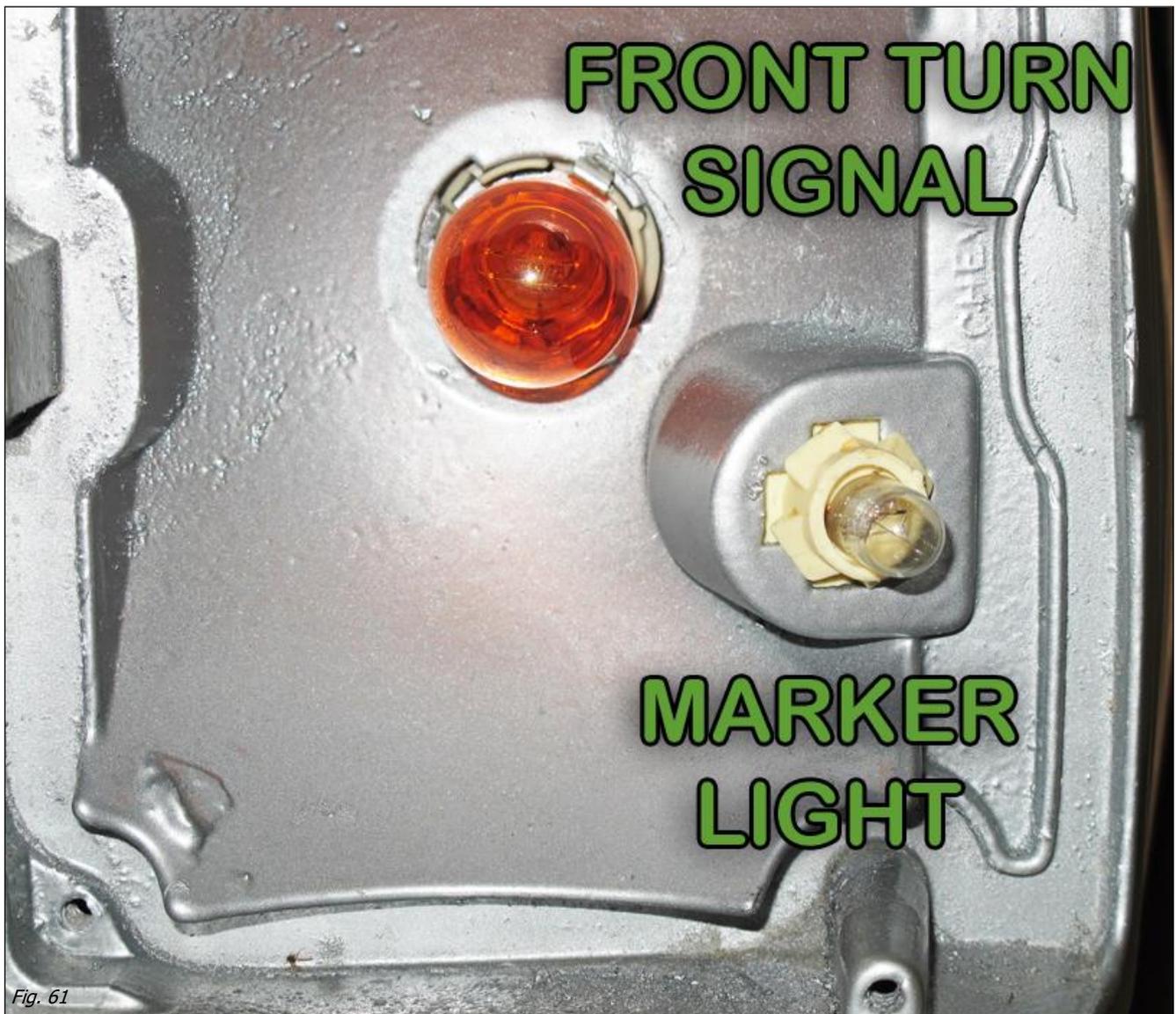


- Plug the two-pin connector found on the Painless harness into the connector coming from the turn signal housing. The turn signal ground connector will not be used as it is intended for 1971/1972 front ends

- 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 contacts to help with corrosion that can make removing the bulb at a later date difficult (see [Fig. 60](#)).

**Those with a 1971 or 1972 front end** (turn signals beside the headlights, see [Fig. 57](#)):

- Locate one of the light socket pigtails supplied with this kit. This light socket plugs into the turn signal and turn signal ground connectors found on the Painless harness, which can be done at this time.
- Install a bulb into the turn signal socket. 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 (see [Fig. 60](#)).
- Install the socket into the opening for the turn signal socket. This is a keyed opening so the socket only goes in one way. Once inserted, turn the socket to lock it into place (see [Fig. 61](#)).



*Fig. 61*

## Passenger Side Light Section Routing

The remainder of the **Light Section** now needs to be routed across the core support. In order to do this properly, the radiator hold down must be removed.

- Removal requires a 1/2" socket or wrench to remove the four bolts. Take notice of the rubber isolator at each end of the hold down; these could fall off during hold down removal. If so, then they simply need to be put back in place before the hold down is reinstalled.



With the hold down removed, you will now have access to the channel that runs on the underneath side of the top part of the core support. This is a great place to make use of the "umbrella" cable tie clips included with kit as this channel has 1/4" holes along the top at each end, circled in the photo below (see [Fig. 62](#) & [Fig. 63](#)).

- It is easiest to first install the cable tie into the clip, as shown, and then push the clip into the hole. Once the clip is in place, the cable tie can then be tied around the harness. Remember to loosely install the cable ties. The cable 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.

## Horn(s)

Some vehicles have one horn, while others have two. The Painless harness has a single open ended wire that must be cut to length and terminated but can accommodate single or dual horn cars by following the instructions below. This single open ended wire in the **Light Section** can be seen in the [Turn Signal Switch Schematic](#) on [page 78](#) (see [Fig. 138](#)), it has a label reading "HORN." It is:

**Black/Green:** 14-gauge wire, 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. This wire only has power when the horn button is pressed.

- Locate the power connection tab on the horn; this is simply a tab coming out of the side. Horns ground through their mounting so they only require a power connection. A good clean surface where the horn mounts to the hood latch support helps with the ground connection.
- Route the wire to the power connection point on the horn, or one of the horns if you have two. Before the wire is cut to length, make sure there is enough length to secure the wire to the latch support if so desired.

- Cut the wire to length and strip 1/4" of insulation from the wire. If you have a second horn, strip 1/4" of insulation from the cut off piece of wire as well.
- In the parts kit, locate the connector and a terminal (see [Fig. 64](#)).
- Using the rollover crimpers, crimp the terminal onto the #924 wire.

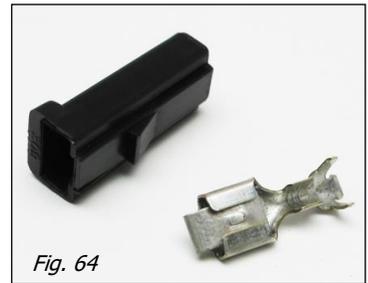


Fig. 64

If you have two horns, the cut off piece of wire that was stripped will double up with the #924 coming from the harness, giving you two wires in one terminal (see [Fig. 65](#)). This is known as "Chaining," "Linking," or "Jumping;" like in the schematics on [pages 102-104](#).

- Install a connector on to this terminal and plug it into the horn. If you have a second horn, route the wire from this first horn over to the second horn, cut to length, strip, terminate, and connect.



Fig. 65

## Right Turn/Park Light, Right Headlight, & Right Marker Light

The three 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 un-printed, 18-gauge, blue wire.

## 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 (see [Fig. 66](#)). This ties all of the grounds found in the Painless harness directly back to the battery, as explained in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

- 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. This is located next to the headlamp access hole. Make sure the ground area is clean of dirt, rust, and/or paint. Painless provides small star washers in your kit to help with this connection.



Fig. 66

- Use a heat shrink ring terminal from the parts kit to accommodate the bolt of the negative battery lug or screw used on the firewall.

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

## **NOTES**



## Engine Harness Routing

With the exception of the “Wiper Motor” & “Washer Pump” 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 are open ended and need to be routed, cut to length, and then have the appropriate terminal installed.

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

- The factory harness sits in a harness hook located above the master cylinder (see [Fig. 68](#)).

If the hook is no longer in place, an Adel clamp has been included with this kit (see [Fig. 69](#)). Painless provides this since drilling a hole for a cable tie mount may not be an option due to the brake booster. Using this clamp will require re-using the factory harness hook bolt, or a bolt that fits the factory hole.

- Once the harness is secure in this location, route the harness over the booster and behind the wiper motor (see [Fig. 70](#)).



Fig. 68



Fig. 69



Fig. 70

- At this point, the remainder of the Engine Harness gets 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 has 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 Schematic](#) on page 72 (see [Fig. 129](#)).

Locate the group of wires in the Painless harness labeled “WIPER MOTOR.” This should be two connectors: a two-pin connector and single-pin connector. These wires are:

### Two-Pin Connector

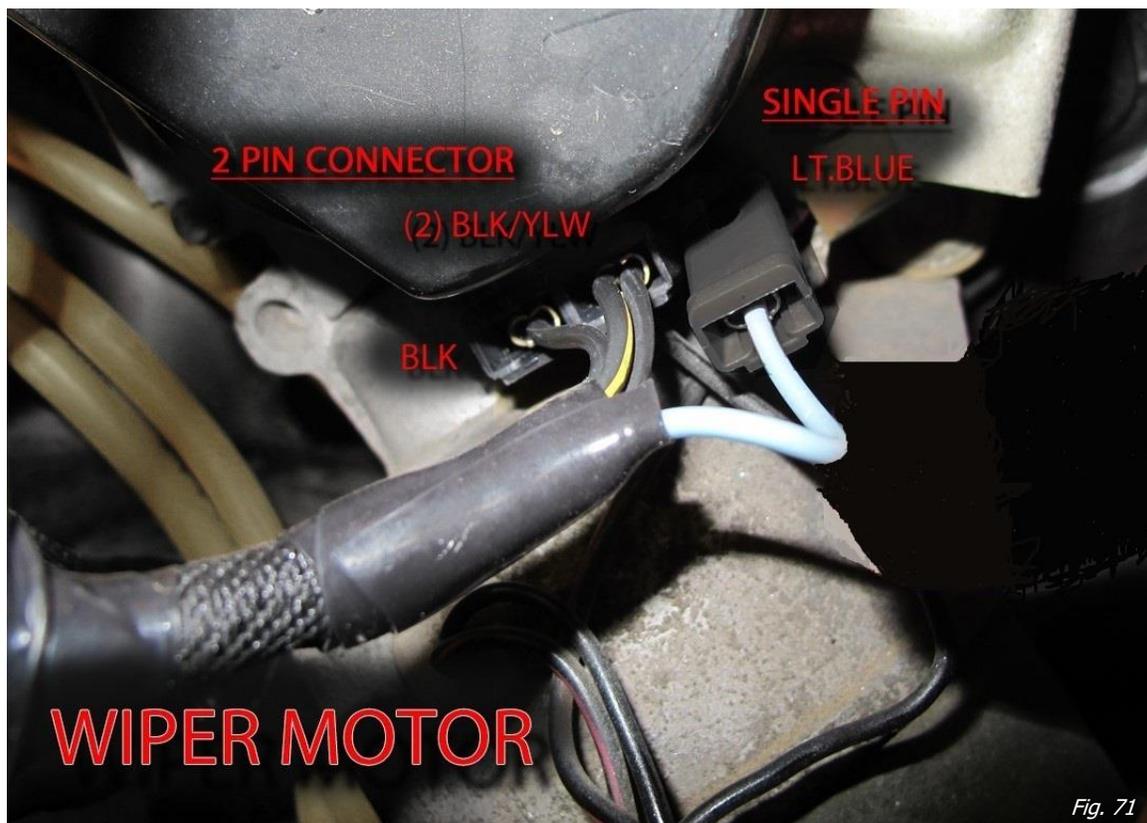
**Black:** 16-gauge wire, printed **#979 WIPER MOTOR (LOW/PARK)**. This wire is a ground signal from the wiper switch.

**(2) Black/Yellow:** 16-gauge wire, printed **#982 WIPER MOTOR POWER**. This wire supplies switched ignition power to the wiper motor from the 15-amp, WIPERS fuse on the fuse block. The unprinted black/yellow doubled up with the black wire provides power to the washer pump.

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

**Light Blue:** 16-gauge wire, printed **#977 WIPER MOTOR (HIGH)**. This is a ground signal from the wiper switch.

- On the bottom side of the motor there are three tabs sticking out; these are the connection points for the Wiper Motor. Attach the two-pin connector to the tabs closest to the engine. The black wire should be on the bottom tab, the (2) black/yellow on the middle tab (see [Fig. 71](#)).
- Connect the single-pin connector with the light blue wire to the top tab (see [Fig. 71](#)).



*Fig. 71*

## Washer Pump

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

For the washer pump, there is a brown/tan, two-pin connector on the Painless harness with a label reading "WASHER PUMP." The wires in this connector are:

**Blue:** 16-gauge wire, printed **#984 WASHER PUMP GROUND**. This wire provides the washer pump with a ground source from the wiper switch when the switch is in the WASH position.

**Black/Yellow:** 16-gauge wire, printed **#983 WASHER PUMP POWER**. This wire supplies power to the washer pump from the 20-amp, WIPER fuse on the fuse block, and has power anytime the key is in the ON/RUN or ACC positions.

These wires can be seen in the [Wiper Schematic](#) on [page 72](#) (see [Fig. 129](#)).

- Connect these wires to the two-spade tab on the washer pump. The tab is in the center of the wiper motor's black cover (see [Fig. 72](#)).



## Cowl Induction/Turbo 400

If the installation calls for the use of a factory style cowl induction relay, and/or a turbo 400 transmission, then one or two wires are to be installed into the bulkhead before mounting, as instructed on [page 25](#). The wires are necessary for the factory cowl induction solenoid and/or the power source required for proper kick down function of a turbo 400 transmission. **Please note: the cowl induction solenoid does NOT control the visible flapper door the raises and closes on top of the hood; that is controlled by vacuum.** These open ended wires can be seen in the [Cowl Hood Relay w/ Turbo 400 Transmission Schematic](#) on [page 41](#) (see [Fig. 74](#)). They are:

**Tan:** 14-gauge wire, printed **#997 SWITCHED 12V POWER (COWL HOOD RELAY)**. This wire supplies accessory switched power to the relay that control the cowl induction solenoid. This wire receives power from the PWR WINDOW fuse and has power when the key is in the ON/RUN or ACCESSORY position.

**Pink:** 14-gauge wire, printed **#999 ACCEL. PEDAL ACTIVATION (COWL HOOD/ TURBO 400 TRANS.)**. This wire supplies ignition switched power to activate the cowl induction relay. This wire only has power when the key is in the ON/RUN position and the accelerator pedal is depressed close to wide open throttle.

**Orange:** 16-gauge wire, printed **#996 TURBO 400 SWITCHED 12V**. This wire supplies ignition switched power to the kick down solenoid on a turbo 400 transmission.

Connect these wires using items provided in the parts kit according to the drawings and instructions on the following pages that best represents your particular installation. Those without a cowl hood relay but need to connect a turbo 400 transmission, go to [page 43-44](#).

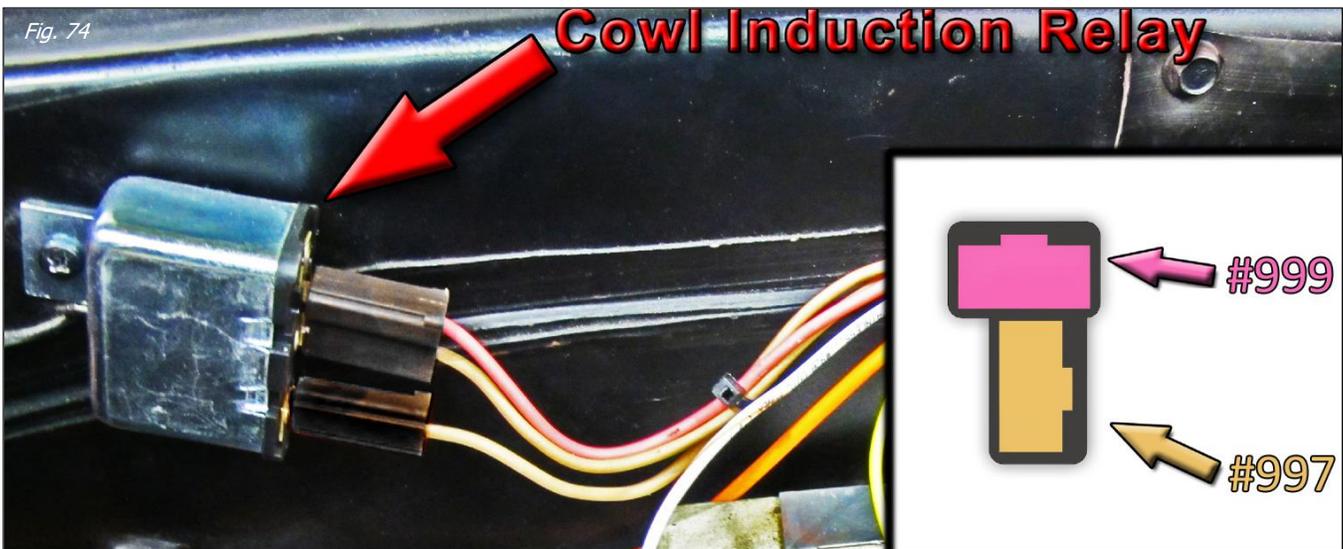
**Factory Cowl Hood Relay with or without turbo 400 transmission**

- Route the tan, #997 and pink, #999 wires to the firewall mounted relay and cut to length. Save the cut off piece of tan wire, as it will be needed to connect the relay to the solenoid.
- Locate the two-pin connector for the relay and two terminals in the parts kit (see [Fig. 73](#)). These terminals require a 1/4" strip on the #997 and #999 wires and a pair of rollover crimpers.

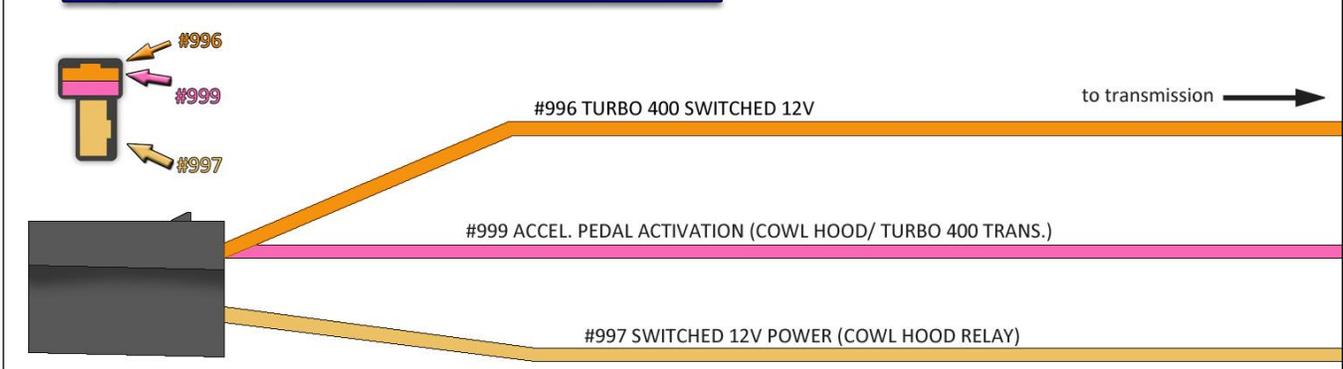


If you are using a turbo 400 transmission, double up the orange, #996 with the pink, #999. This gives you two wires in one terminal (see [Fig. 74](#)). Doing so provides power from the pink #999 wire to the orange #996 wire, which comes from the throttle switch on the accelerator pedal, and is connected later on [page 43](#).

- With terminals now installed, plug the terminals into the appropriate cavity of the connector (see [Fig. 74](#)).



**COWL HOOD RELAY**  
**W/TURBO 400 TRANSMISSION**



- Locate two, single-pin connectors and terminals, and install one terminal onto the cut off piece of tan, #997 wire (see [Fig. 75](#)).
- Install the single-pin connector onto the tan, #997 wire and connect it to the single-pin on the relay (see [Fig. 74](#)).
- 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 1/4" 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 (see [Fig. 76](#)).
- See the turbo 400 instructions on [page 43-44](#) for connection of the #996, orange wire. If you do not have a turbo 400 transmission, continue on to the **Engine Section** on [page 45](#).

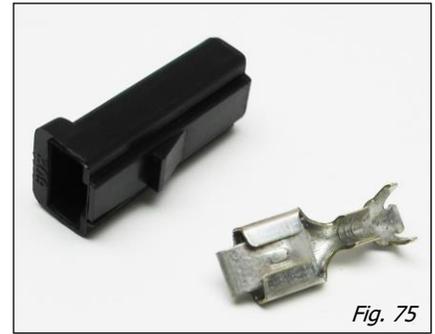
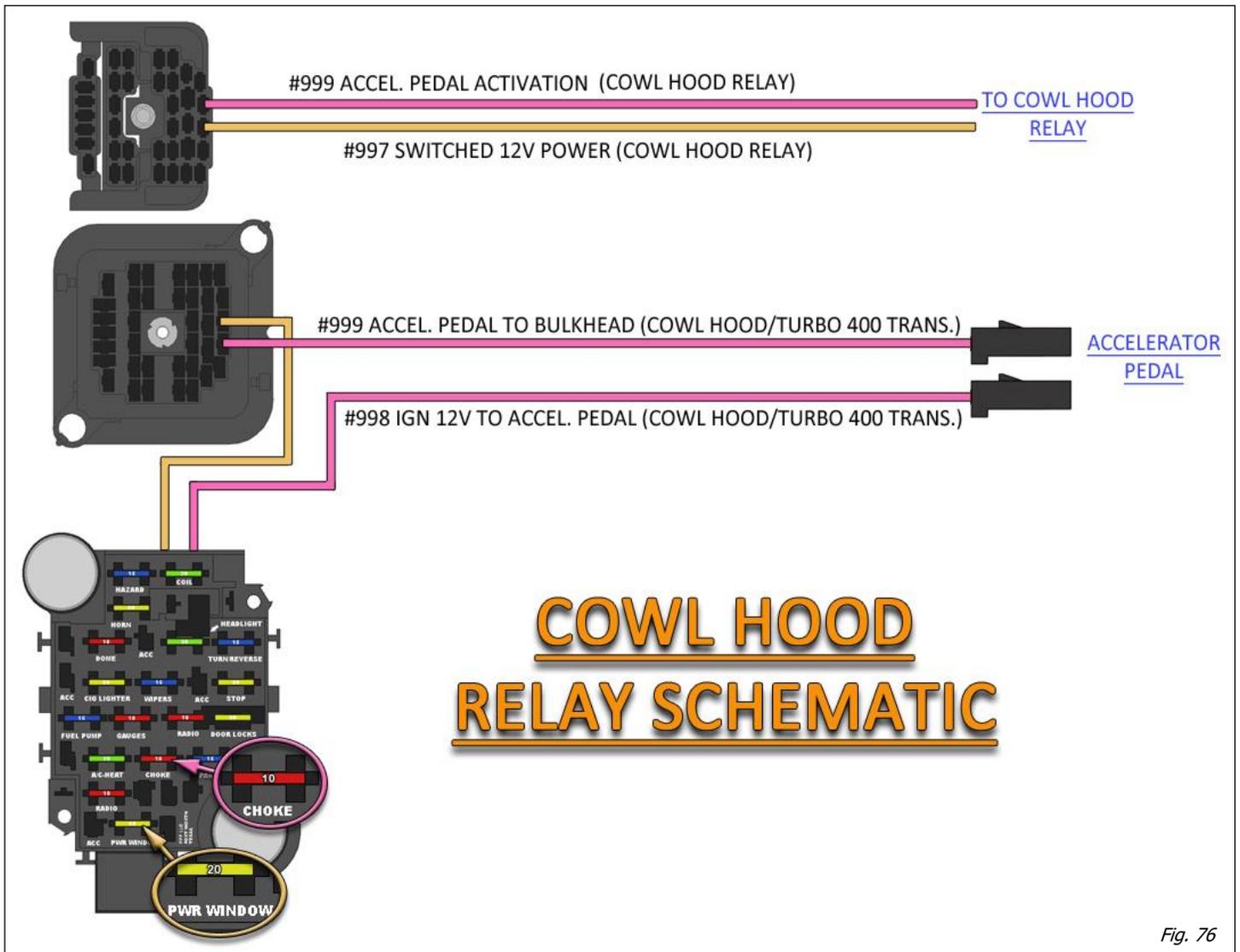
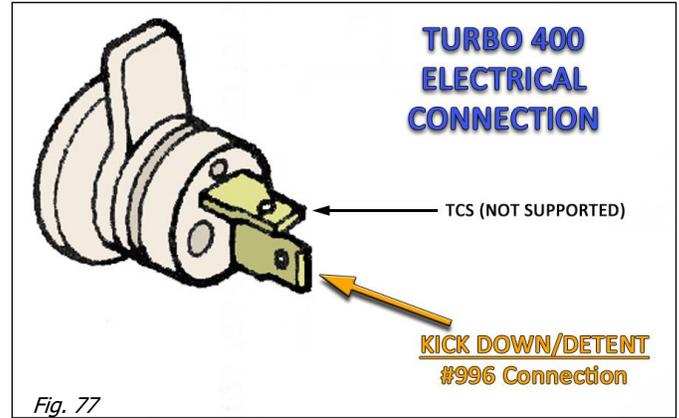


Fig. 75



## Turbo 400 transmission

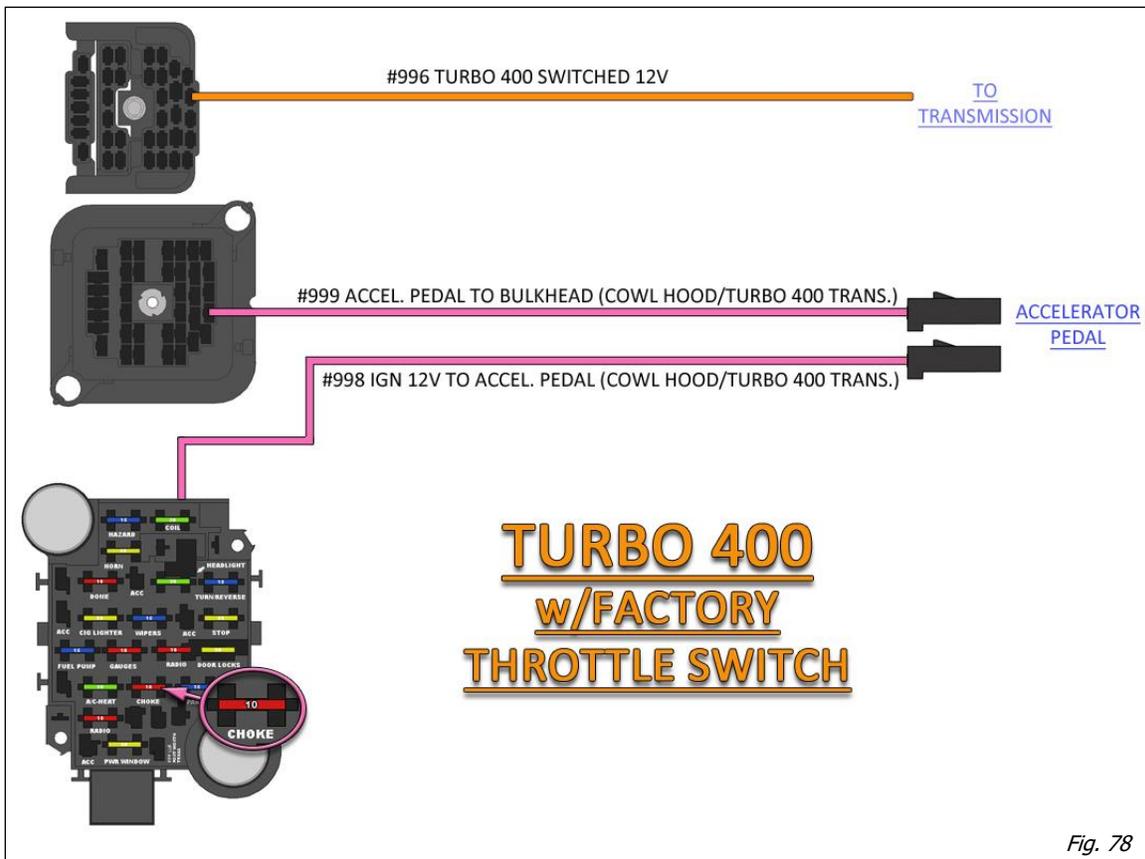
The turbo 400 transmission requires a 12v power source to down shift the transmission under wide open throttle. This is done through the use of a throttle switch located on the accelerator pedal from the factory. The throttle switch is connected later on in the manual on [page 84](#). If you do not have a factory throttle switch, and are using an aftermarket switch in the engine compartment, the orange, **#996** can be used as the switched ignition, 12v source your throttle switch needs (see [Fig. 79](#); [page 44](#)).



- If you have a factory, accelerator pedal mounted switch, route the orange, **#996** wire to the driver side of the transmission and cut to length. Make sure to keep this wire away from exhaust and moving parts, like the shift linkage (see [Fig. 78](#)).

If you are using an aftermarket throttle switch, route the orange, **#996** to your switch and cut to length. Using pieces from the parts kit, connect the **#996** to your throttle switch. Save the cut off portion of **#996** and connect to the other side of your switch in the same manner. Route the **#996** wire to the transmission (see [Fig. 79](#)).

- Using pieces from the parts kit connect the orange, **#996** wire to the kick down/ detent prong on the transmission. The connection differs depending on the transmission; single or dual pin connection. Use the diagram to identify the kick down/ detent prong on a dual pin connector (see [Fig. 77](#)).



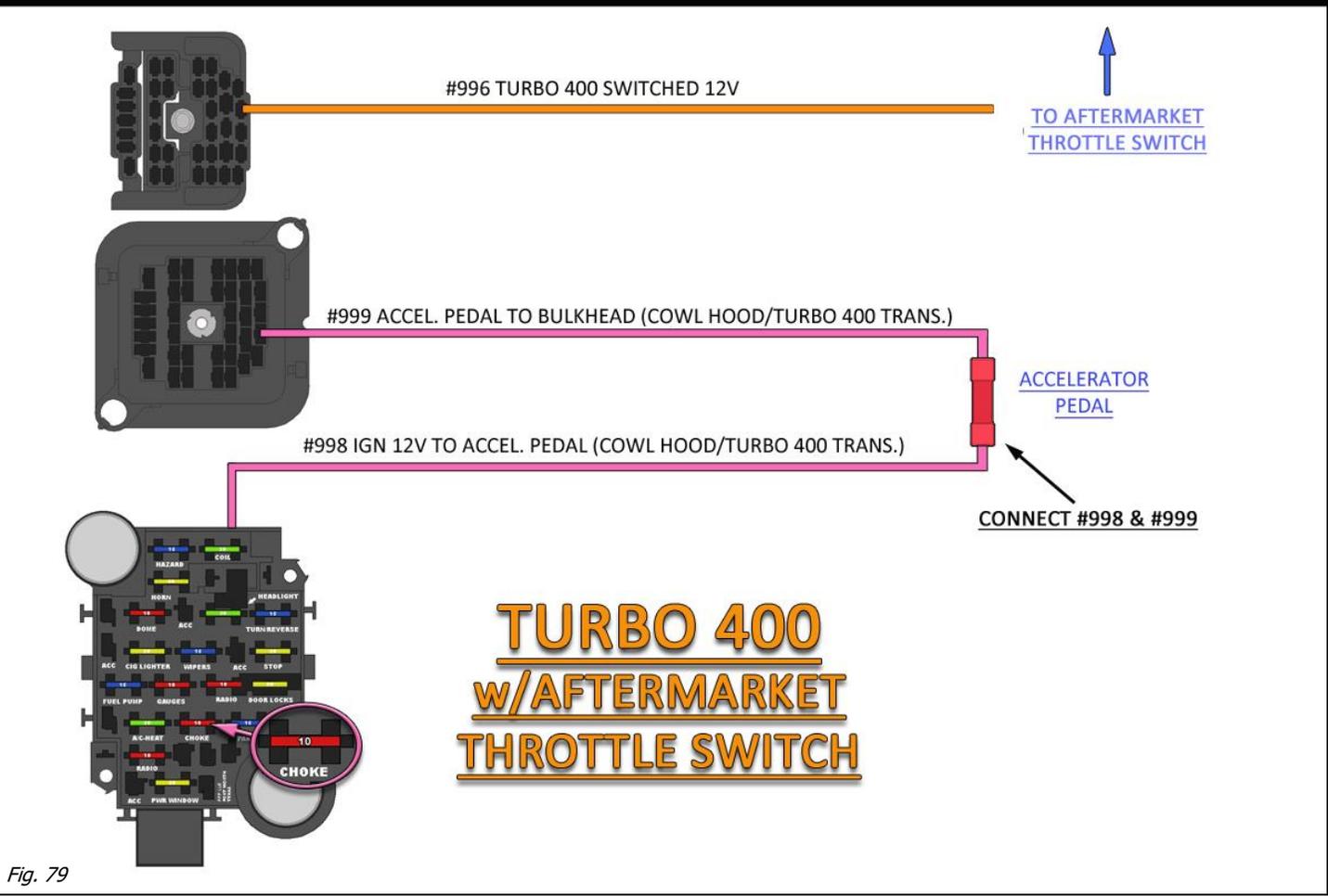
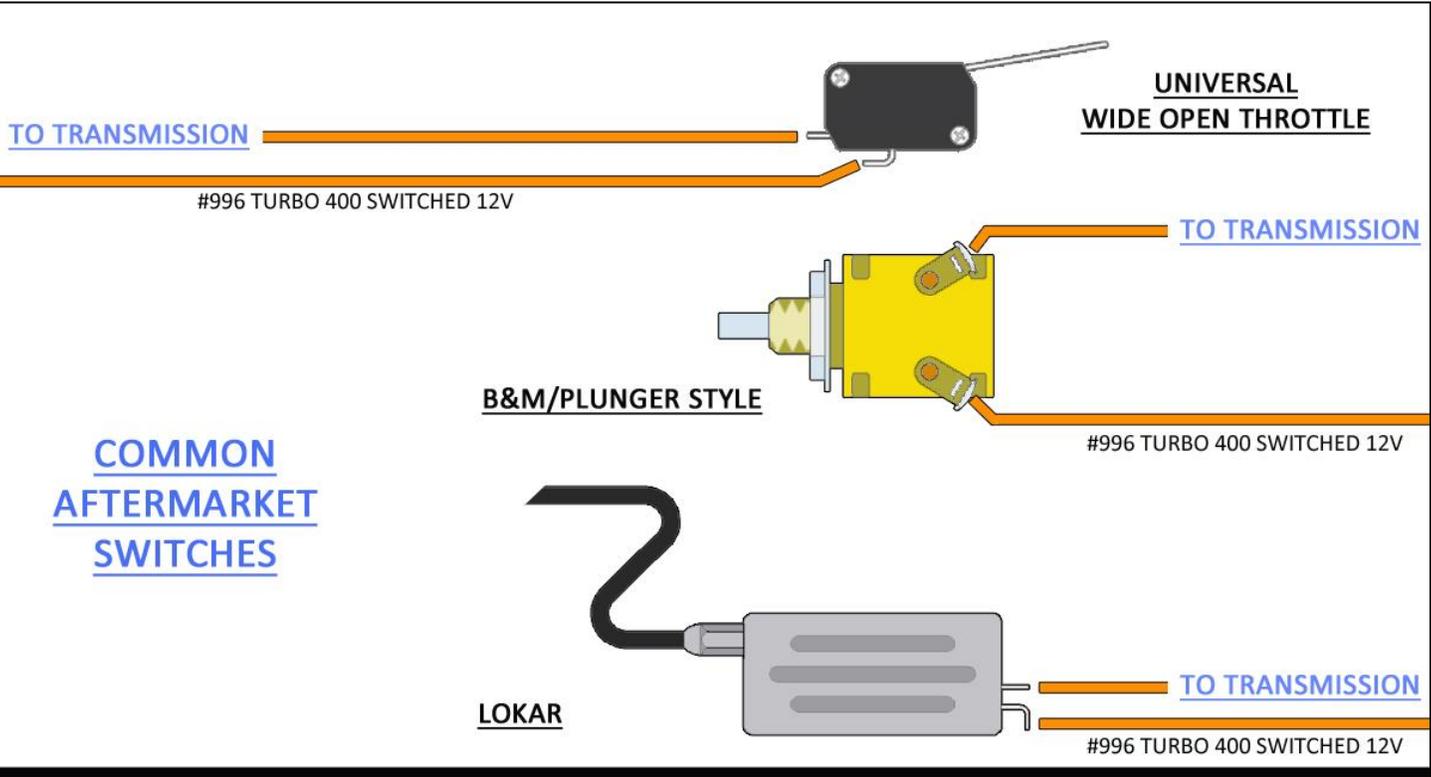


Fig. 79

## Engine Section

The Engine Section consists of three wires. There are connections to the 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 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 on the engine.

### Engine Sending Units/Switches

If you are using aftermarket, mechanical gauges, or aftermarket gauges with their own senders and wiring, then no connections needs to be made. You can skip to the next connection, “Electric Choke” on [page 46](#).

Sending units work based on resistance to ground. This means that the cooler the engine, or less oil pressure at the sending unit, the more ground (less resistance) these sending units provide to the wires connected to them. The ground resistance strengthens as the temps and/or pressure builds, and 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 did not connect these at all, the gauges would peg to their highest reading.

**Helpful Troubleshooting Tip:** *If you have gauge issues after the harness has been installed, disconnect the wire at the sending unit going to the gauge. With the ignition in the “ON/RUN” position, to power up the gauges, leave it disconnected and then ground this wire. If the needle on the gauge moves, when grounding the wire, the gauge is in working order, has good power and ground, and you may have sending unit issues. If the gauge doesn’t respond to this grounding, then there is an issue with the power going to the gauge or the gauge isn’t working.*

Cars equipped with a factory dash indicator lights have switches instead of sending units, although they look alike. These switches simply send a ground signal to the light to turn it on when the temperature is high or oil pressure is low enough to cause the switch to close. Grounding these wires will make the light come on.

### Coolant Temp

Locate the 18-gauge, green wire printed **#921 COOLANT TEMPERATURE SIGNAL**. This wire sends 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 is not used. This wire works 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 have a peg, tab or threaded post to connect to (see [Fig. 80](#)). Two-wire temperature sensors, on fuel injected engines that have weatherproof connectors, are for engine computer input and not for 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.



When installing a new temp sensor, if sealant is needed, **use a paste type sealant and NOT TEFLON TAPE on the sensor threads.** The Teflon tape interferes with the ground source the sensor requires in order 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.

Painless supplies terminals and a factory style connector (see [Fig. 81](#)) to allow connecting to a factory style sensor (see [Fig. 80](#)). You need rollover crimpers to properly install this terminal.



## Oil Pressure

Locate the 18-gauge, blue wire printed **#922 OIL PRESSURE SIGNAL**.

The **#922** wire sends a ground signal from the sending unit/switch through the bulkhead into the interior of the vehicle to the gauge cluster and to the aftermarket gauge connector.

The oil pressure sending unit is generally located near the oil filter. On later model fuel injected engines this pressure sensor will generally be found at the back the engine behind the intake manifold (see [Fig. 82](#)).



- Route this blue, **#922** wire to the oil pressure sending unit, install the appropriate terminal for your connection, and connect.

Terminals and a factory style connector have been supplied to allow connecting to a factory “stud” style sensor (see [Fig. 81](#)).

## Electric Choke

Locate the 18-gauge, red wire printed **#954 CHOKE POWER**. This wire provides a switched ignition power source to the choke from the 10-amp, CHOKE fuse. This wire has 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 heats the bi-metal spring attached to the choke’s shaft. This spring unravels 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 is not needed and can be removed from the harness. However, it can also be used to power an aftermarket accessory that requires a switched 12v source or a factory component not supported by the Painless harness.

- Route this red, **#954** wire to the positive (+) terminal of the electric choke, install the appropriate terminal and connector for your connection, and connect (see [Fig. 83](#)).



Ensure the choke is properly grounded. The ground wire is not supplied in the Painless harness, as it is usually just a short piece of wire going to the body of the carb (see [Fig. 84](#)).



Fig. 84

## Ignition Section

The wires marked **Ignition Section** are for coil/ignition connections. Usage of only one wire or both wires depends on the components used in your particular installation. These two wires are 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 is printed with **#920 COIL POWER ("+")**. This wire comes through the bulkhead from the 20-amp, COIL fuse. This wire provides the coil or ignition system with switched ignition power in one of four ways depending on your ignition system; these are explained on the following pages.

**Helpful Tip:** *As a theft deterrent, removing the COIL fuse from the fuse block, when the car is parked for periods of time, does not allow the ignition system to function. This makes the vehicle impossible to start/run.*

## 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 usually has 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 (see [Fig. 85](#)). **If a coil is not internally resisted and a ballast resistor is not used, the coil overheats within a few minutes to the point that it no longer works.** 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 or your favorite parts supplier (see the [Ballast Resistor Connection Diagram](#) on [page 48](#); [Fig. 86](#)).

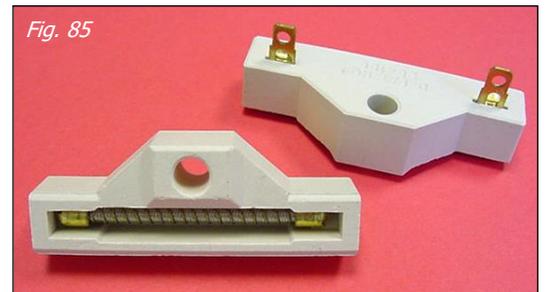


Fig. 85

- Use a self-tapping screw from the parts kit to 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, and it does not matter which side. Cut to length and save the cut off piece of wire. Strip 1/4" of wire and install either a pink, weatherproof, 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 also needs to be installed (see [Ballast Resistor Connection Diagram](#) on [page 48](#); [Fig 86](#))



## HEI & Resisted Coils

HEI coils and internally resisted coils do not require the use of a ballast resistor. The #920 wire connects directly to the + side of the coil (see [Fig. 88](#) & [Fig. 89](#)).

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

Terminals and a factory style connector are supplied to allow connecting to the (+) side of a HEI Coil (see [Fig. 87](#)). Use rollover crimpers to properly install this terminal. Weatherproof, insulated terminals are supplied in the parts kit to make connections to other coils.

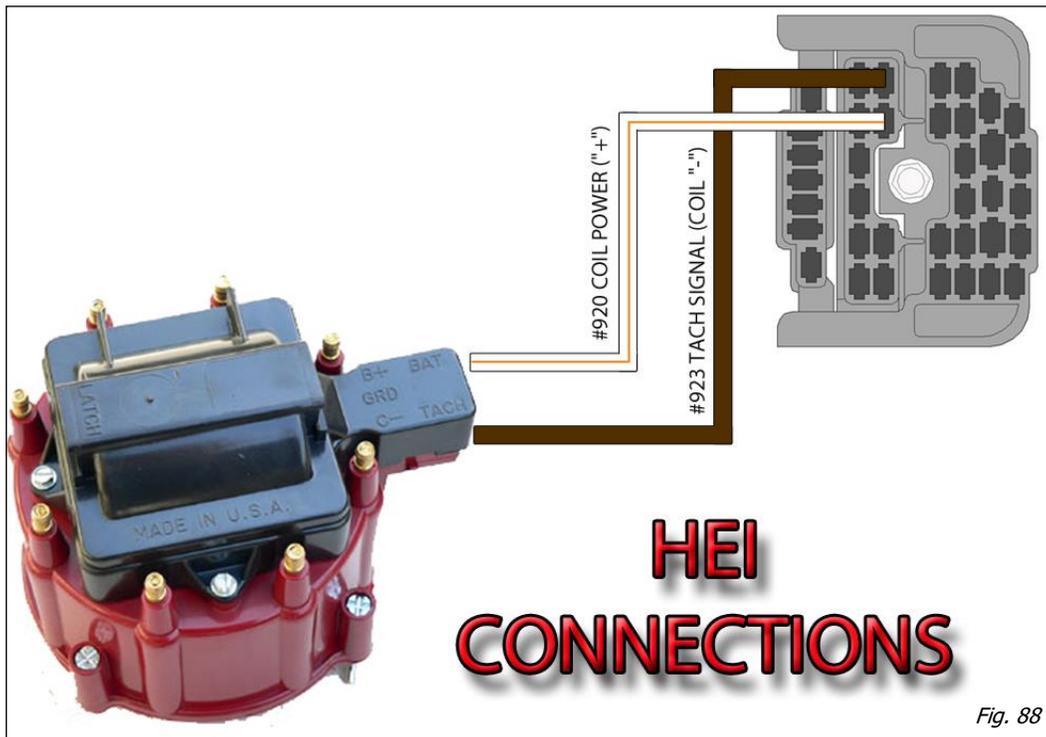


Fig. 88

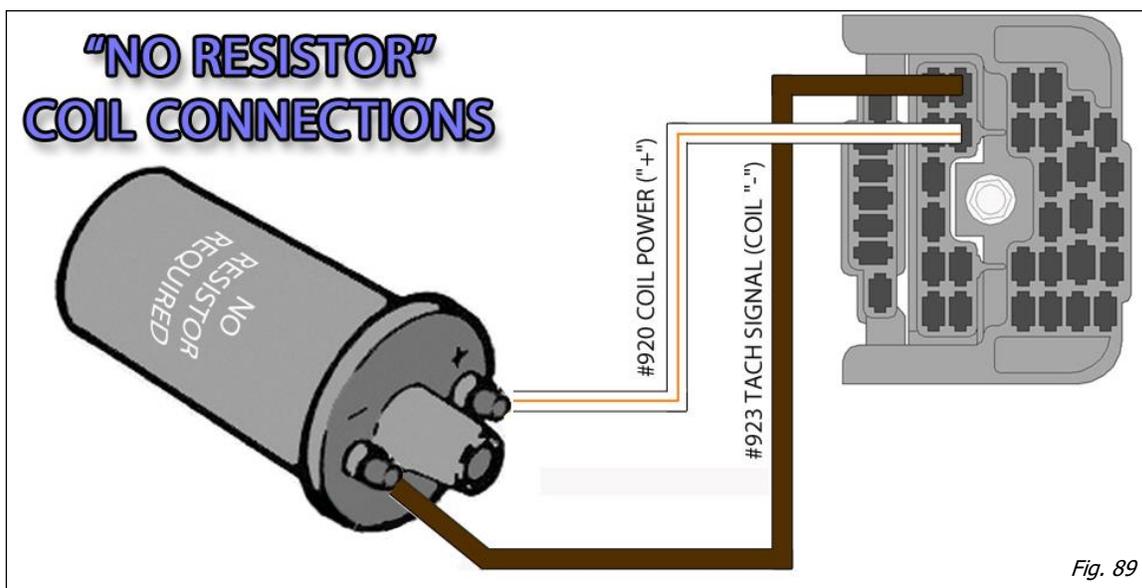


Fig. 89

## Aftermarket Ignition Box

If an aftermarket ignition box is being used, like an MSD, Accel, etc., then this white/orange #920 wire supplies the ignition box with the switched power source it requires. **This wire goes to the aftermarket ignition box and not to the coil**; the ignition box provides 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 for the 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](#); Fig. 90.

## MSD IGNITION CONNECTIONS

### ANALOG

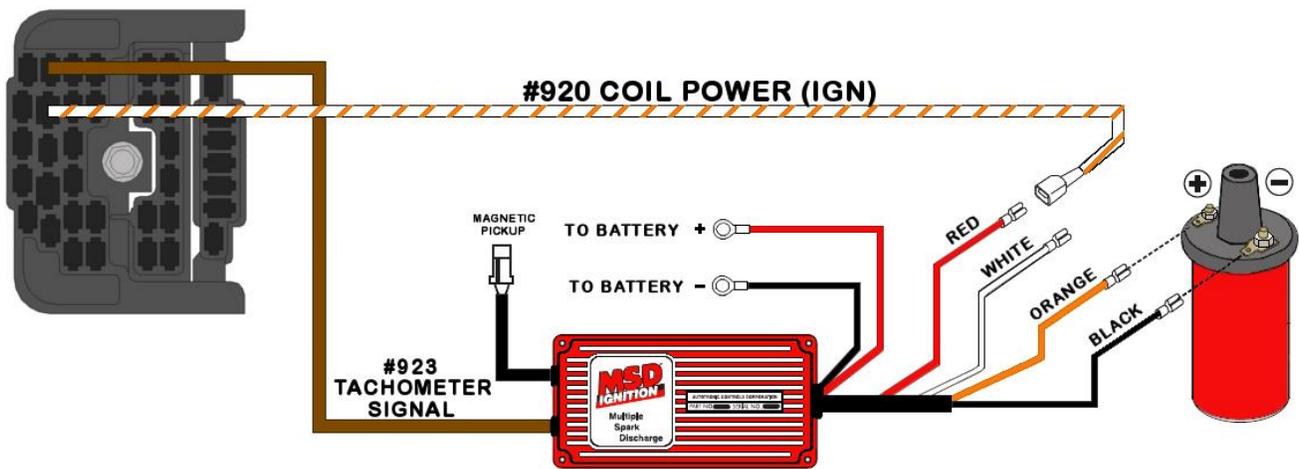
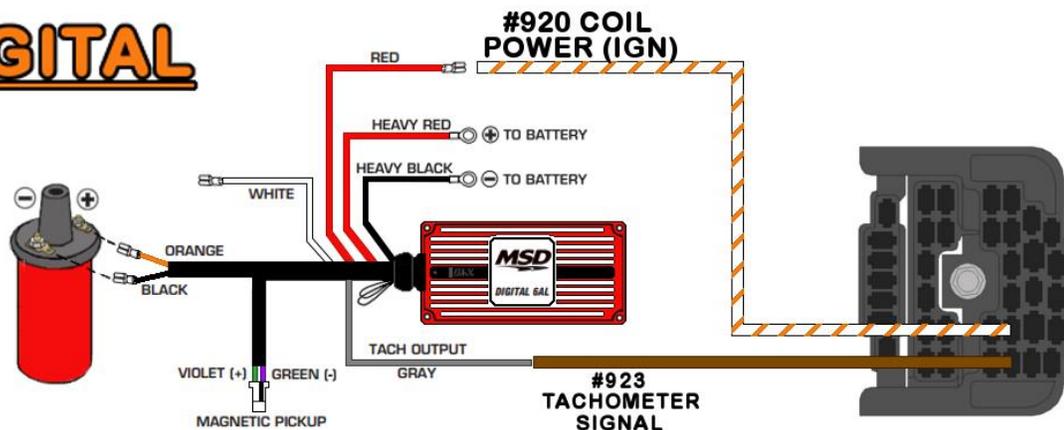


Fig. 90

### DIGITAL



## Fuel Injection

- If you have converted to fuel injection, are using a standalone harness, like all of Painless' fuel injection harnesses, and coil power is supplied through the fuel injection harness, then 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 connects to the open ended pink wire of the fuel injection harness labeled "IGN" or "Fuse Block IGN."

Painless offers numerous stand-alone fuel injection harnesses that allow the transplant of just about any factory GM fuel injection into your Chevelle (see *Fig. 91*):

**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 [www.PainlessPerformance.com](http://www.PainlessPerformance.com) for details



*Fig. 91*

## Tachometer

Locate the 18-gauge, brown wire printed **#923 TACH SIGNAL (COIL "-")**. This wire sends the tachometer signal through the bulkhead into the interior of the vehicle to the gauge cluster. This wire is only 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 installs with an HEI distributor or external coil ignition systems require this **#923** wire to be connected to the negative (-) side of the coil. Refer to the schematics on [pages 48 & 49](#) that best fit your application.

Terminals and a factory style connector have been supplied to allow connecting to the - side of a HEI Coil (see *Fig. 92*). Rollover crimpers are needed to properly install this terminal. Insulated terminals in the parts kit have been supplied to make other the connection to other coils.



*Fig. 92*

- If an aftermarket ignition box is being used, like an MSD, Accel, etc., this **#923** wire connects to the tach output found on the ignition box. Refer to the [MSD Ignition Connection](#) (see *Fig. 90*) 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 connects to the tach output wire from the ECM.
- Route this brown, **#923**, tach-signal wire to its proper connection point, cut to length, install the appropriate terminal for your connection, and connect.

If a tachometer is not being used, and there is no plan for one, this wire can be removed from the harness.

## Alternator Section

The **Alternator Section** consists of two wires for connections to the alternator. All wires for an external voltage regulator are not supplied. Instructions on 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.

### Alternator

Locate the two wires intended for alternator connections; they are grouped together with a label reading "ALT." These wires are:

**Red:** 14-gauge wire, printed **#995 ALTERNATOR BATTERY POWER SAMPLE**. This wire provides a battery power source, or amperage sample, that some alternator voltage regulators require. This wire has power at all times and comes from the large battery supply splice in the harness. **This wire is not be needed if you have a one-wire alternator or any of the CS series alternators** (see [Charge/Battery Power Schematic](#) on page 61; [Fig. 113](#)).

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

1970-1972 Chevilles 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 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.

- If the alternator needs to be removed, route the alternator wires to their connection points and cut to length before removing the alternator from the accessory bracket.
- 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 (**#995** and **#914**) are not 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 contains hardware needed to make the appropriate connections to the alternator as well and a covered inline fuse holder (see [Fig. 93](#)).



*Fig. 93*

The one connection alternators have in common is the output post. This connection sends amperage from the alternator to the battery. Locate the large-gauge, red wire supplied separately with this harness. This wire is:

**Red:** 6-gauge wire, with a label printed **#915 ALTERNATOR OUTPUT**. This wire provides power out of the alternator to the chassis harness and back to the battery through the MIDI fuse (see [Charge/Battery Power Schematic](#) on page 61; [Fig. 113](#)).

- 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 (see [Fig. 94](#) upper).



- If the rubber boot is being used, the end needs to be cut as shown in the photo below to allow the large-gauge wire to pass through (see [Fig. 94](#) lower).

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 easier.



- If you are using a Painless harness that has a charge wire provided, as is the case with many of our “LSX” harnesses, the #915 wire is not needed. Use the charge wire supplied with the fuel injection harness.
- With the boot on, strip about 3/8” of the 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 (see [Fig. 95](#)).

If solder is used, DO NOT over heat the wire because it makes the connection brittle and prone to failure.

- Connect this wire to the B+/Output stud on the Alternator. Once the nut is 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.



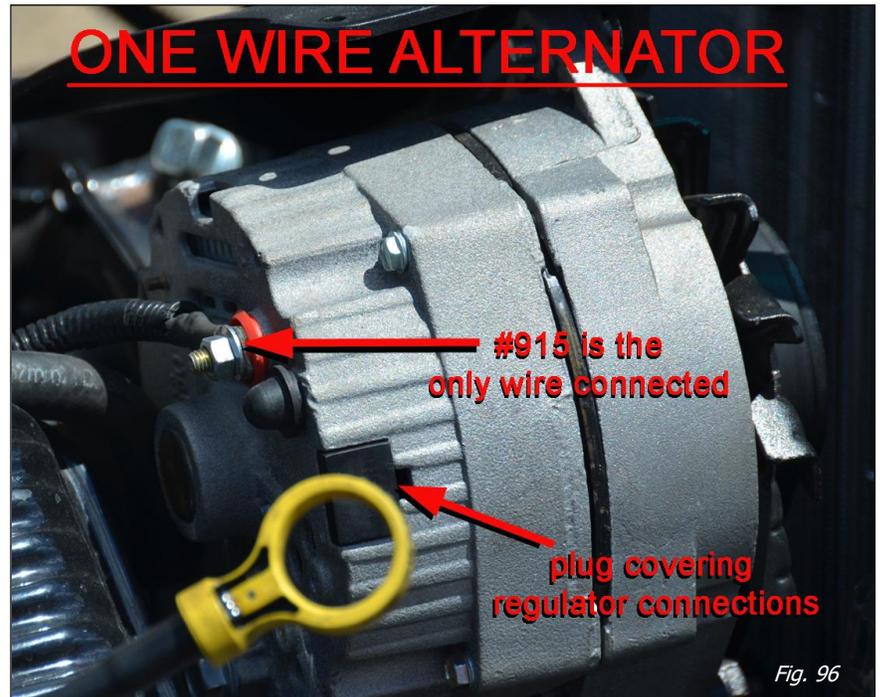
Once connected, route this output wire to the back of the engine and across the firewall to the passenger side of the vehicle. It is connected to the inline MIDI fuse as explained later in this manual on [page 59](#).

The remaining alternator connections 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

## 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. Wire #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 big battery power splice (see [Fig. 96](#)).



## SI Series Alternators



The 10-SI and 12-SI alternators are easy to identify. They have an external fan behind the pulley (the 12-SI has enclosed style fan blades) and a two-pin connection (see Fig. 97). 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**, connect to the two posts on the back edge of the alternator.

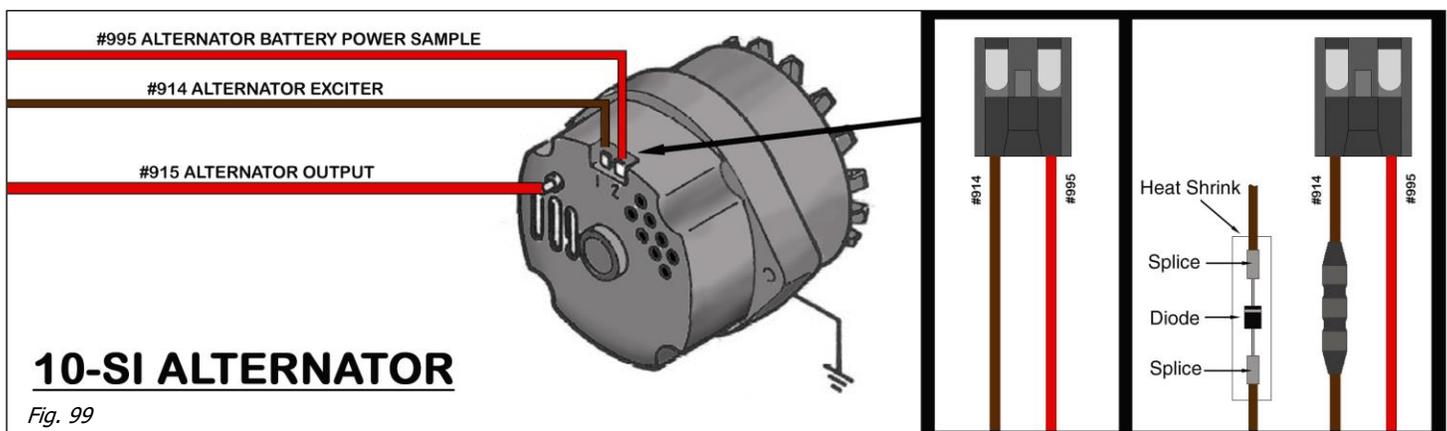
- Route the two wires to the one & two terminals on the alternator and cut to length. Strip 1/4” of insulation from both wires.
- A factory style connector and terminals, are provided in the ALTERNATOR bag (see Fig. 98). Crimp a terminal onto each of the two wires.



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 in the *10-SI Alternator diagram* (see Fig. 99). When the diode is installed inline of the **#914** wire **with the stripe towards the alternator**, the diode allows 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 Fig. 99. When terminal pin-out is complete, plug the connector into the alternator.



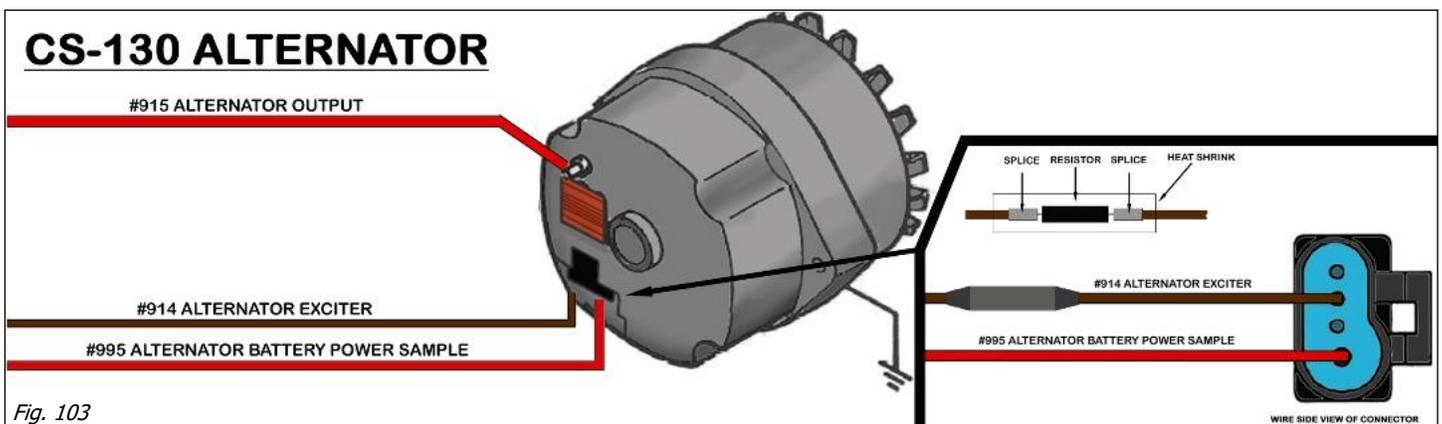
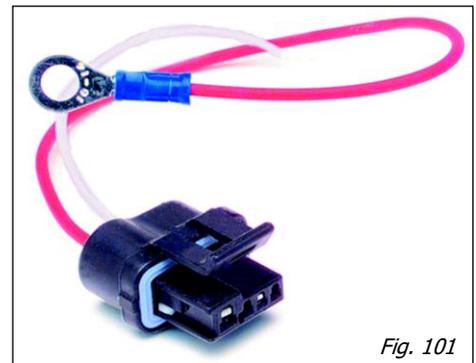
## CS-130 Series Alternators



The CS-130, CS-121, and CS-144 alternators closely resemble the SI series alternators. They have an external fan behind the pulley and generally have some plastic covering on the side and back. These alternators have a four-pin, sealed connector (see [Fig. 100](#) & [Fig. 101](#)). The regulator is marked P, L, S, F. This type of alternator is used on GM, TPI, and LT1 fuel injected engines among other late 1980s to mid-1990s 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**, 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 1/4" of insulation from both wires.
- Use the four-pin alternator connector from the original harness (see [Fig. 101](#)). 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 burns up.** A resistor, splices, and heat shrink, are provided in the ALTERNATOR bag kit (see [Fig. 102](#)). The resistor simply needs to be installed inline on the **#914 wire** as shown in the [CS-130 Alternator diagram](#) (see [Fig. 103](#)).



- Using two of the splices and the heat shrink provided in the ALTERNATOR bag kit, splice the CS-130 pigtail to the **#914** and **#995** wires according to the *CS-130 Alternator diagram* (see *Fig. 103*).

## CS-130D Series Alternators



*Fig. 104*

The CS-130D can be identified 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 (see *Fig. 104* & *Fig. 105*). The regulator is marked P, L, I, S. This type of alternator is 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** is used. The **#995** can 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 1/4" of insulation.
- Use the four-pin alternator connector from the original harness, or a CS-130D pigtail purchased from Painless (part # 30708; see *Fig. 105*). Due to this connector being provided on most fuel injection harnesses, it 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. **Without this resistance the regulator on the alternator will burn up.** A resistor, splices, and heat shrink (see *Fig. 106*) are provided in the ALTERNATOR bag kit. The resistor will simply need to be installed inline on the L pin wire (see *Fig. 107* & *Fig. 108*).



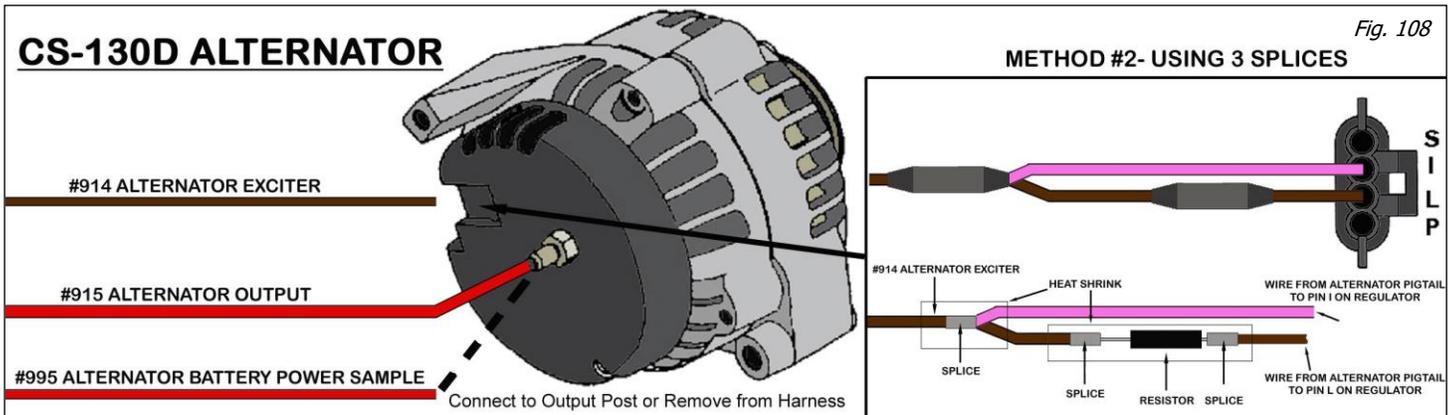
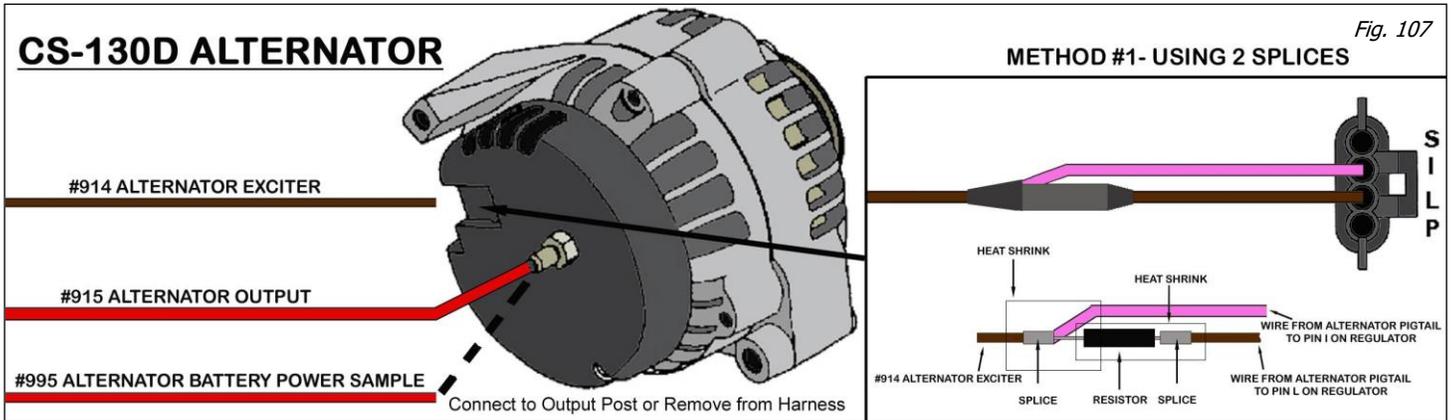
*Fig. 105*



*Fig. 106*

- Using a splice and heat shrink provided in the ALTERNATOR bag kit, splice the CS-130D pigtail to the brown, #914 wire according to [Fig. 107](#) or [Fig. 108](#) depending on which 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 two wires of a CS-130D alternator pigtail/connector. The pink wire shown in the diagrams is an installer supplied wire, this is generally 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

1970-1972 Chevilles left the factory with an external voltage regulator mounted on the core support. To connect to the regulator in the factory location, the wires described below need to be routed with the Light Section wires down the driver side inner fender to the core support. Along with these two wires, the **#995** and **#914**, two other wires (blue and white in [Fig. 109](#), not supplied), 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**, connect to the regulator.

- Route these wires to the connection point on the regulator and cut to length. Strip a 1/4" of insulation from both wires.
- Use the four-pin regulator connector and the two-pin alternator connector removed from the harness. 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, 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** wire 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 are 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.
- Lastly, connect a wire from the "G" post on the alternator to a chassis ground source.

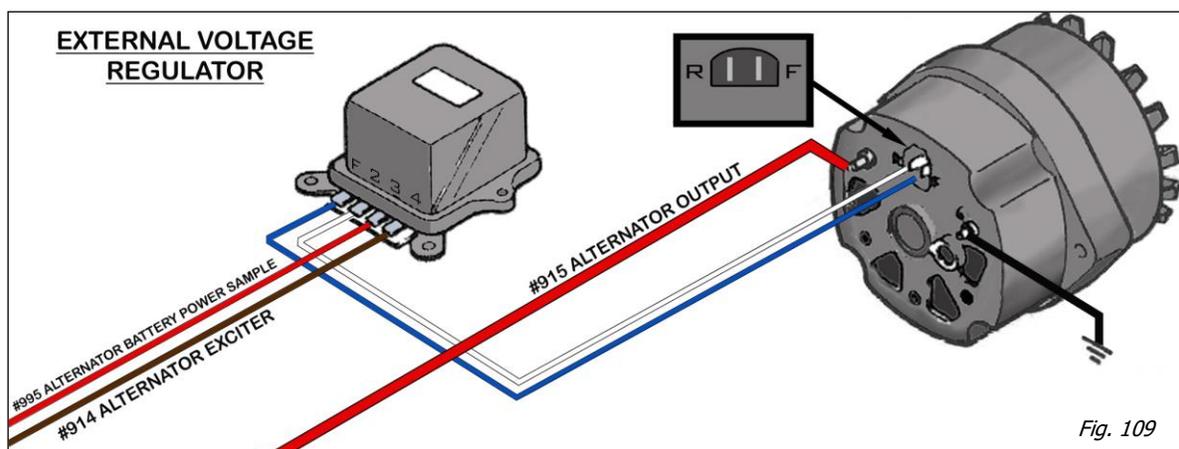


Fig. 109

## MIDI Fuse

A large, inline MIDI fuse has been included in the ALTERNATOR bag kit. This inline fuse provides a fused link between the alternator and battery.

- Find a suitable location to mount the supplied fuse holder using the two of the self-tapping screws provided. On the firewall, above the passenger side valve cover, is a nice place that has easy access (see [Fig. 110](#)). *The fuse has been upgraded since this photo was taken.*
- Route the large #915 wire that is attached to the output of the alternator to one side of the fuse holder and cut the wire to length. **DO NOT DISCARD THE CUT OFF PORTION OF #915.**

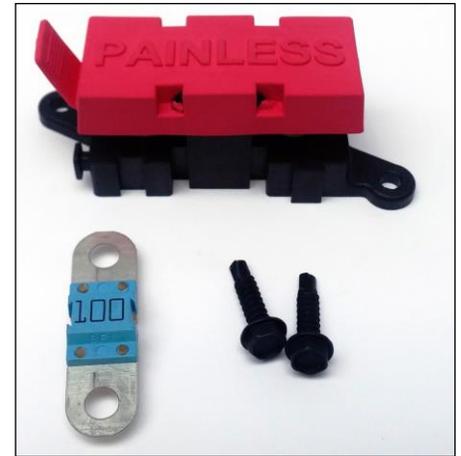


Fig. 110

The length of excess wire cut from the #915 wire is 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 #915 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 (see [Fig. 111](#)).

- Connection to both sides of the fuse holder are 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 do not accept this large-gauge wire/terminal. The heat shrink supplied with this kit is intended to cover the crimped end of each of these two ring terminals (see [Charge/Battery Power Schematic](#) on page 61; [Fig. 113](#)).

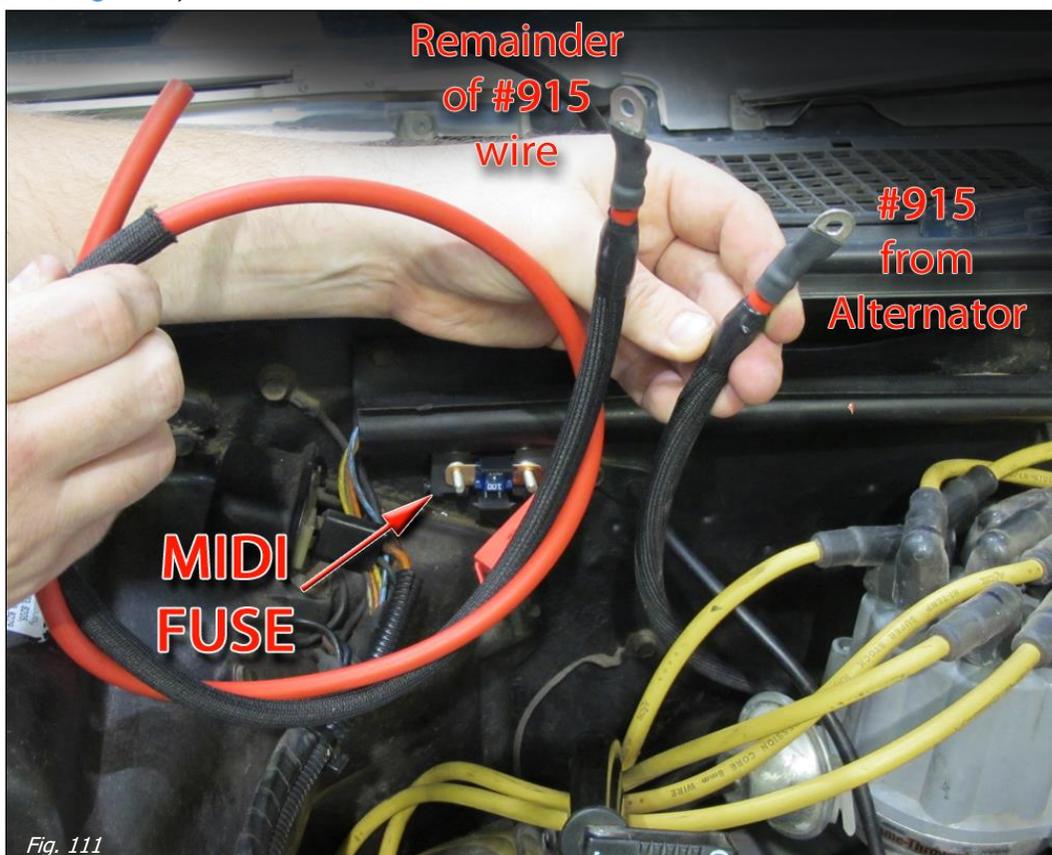


Fig. 111

- Remove the two nuts on the studs of the fuse holder and install the 150-amp fuse provided in the ALTERNATOR bag kit.\* Install the **#915** wire that connects to the battery or starter solenoid onto the fuse at this time. Then, install the nut and tighten it onto the holder stud. Remember to route the remaining end of this **#915** wire to either the battery lug or to the starter solenoid.

\* Those with factory A/C, connect the black wire you removed from the horn relay (see [page 11](#)) to the same side of the MIDI fuse as the power wire from the starter or battery. Ring terminals are provided in the parts kit to cut this black wire to length. This supplies power to the blower motor relay. The factory, inline, glass fuse on this A/C wire will need to be reused (see [Fig. 112](#)).



Before the **#915** coming from the alternator is installed onto the fuse holder, the harness power wire needs to be routed, cut to length, and terminated. This wire will be found in the **Starter Section**.

## **Starter Section**

This section consists of two wires that provide power to the harness and a start signal to the starter solenoid. These two wires are grouped together with a label reading “STARTER.” Let’s first address power to the harness. This wire is:

**Red:** 8-gauge charge wire, with the label reading **#916 BATTERY POWER SOURCE**. This wire feeds the harness, fuse block, and ignition switch battery power (see [Charge/Battery Power Schematic](#) on [page 61](#); [Fig. 113](#)).

- Route the red, **#916** wire to the MIDI fuse holder and cut to length. Install one of the #10 ring terminals from the ALTERNATOR bag to connect this wire to the fuse holder.
- Install this wire along with the **#915** wire coming from the alternator to the same side of the fuse holder. This is the opposite side of the holder from the wire going to the starter or battery (see [Charge/Battery Power Schematic](#) on [page 61](#); [Fig. 113](#)).

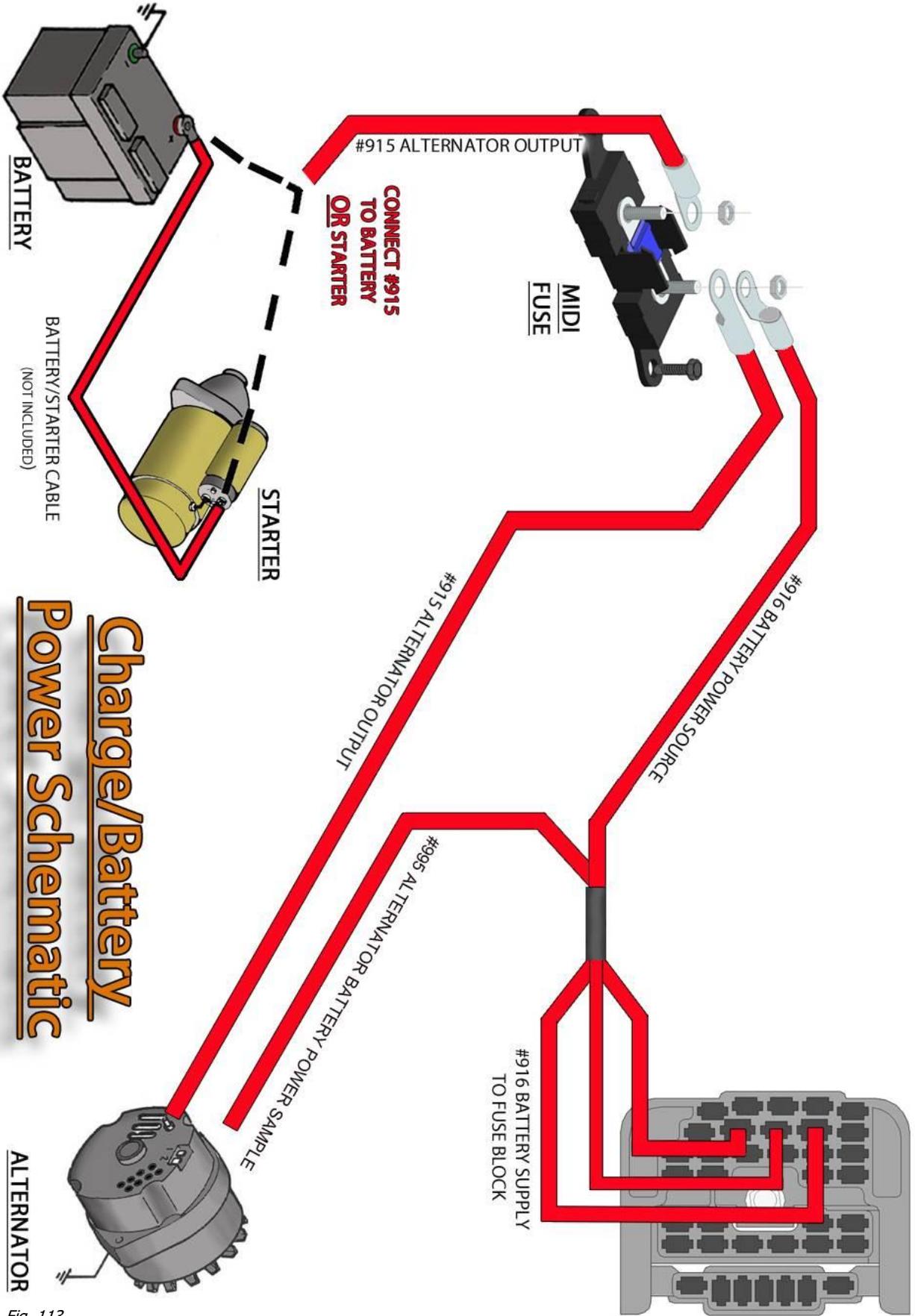


Fig. 113

The other wire in the group labeled "STARTER" is the wire used for actual starter engagement. This wire is:

**Purple:** 12-gauge wire, printed **#919 STARTER SOLENOID "S" (START SIGNAL)**. This wire supplies the solenoid with a switched power source from the ignition switch. This power activates the starter solenoid causing it to turn the engine over for startup. This wire only has power when the ignition switch is in the START/CRANK position.

- Route the purple, **#919** wire and the yellow, **#970** wire (if used, connected at the ballast resistor/coil on [page 48](#)) to the starter solenoid and cut to length. If the remainder of **#916** from the MIDI fuse is being connected to the BAT or (+) post of the starter solenoid it may be routed at this point as well. Be sure to keep all wires away from the exhaust manifold or header.
- Choose the heat-shrinkable ring terminals from the parts kit that best fit the posts found on the starter solenoid and install them 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 connects to the START or "S" post on the solenoid, and the yellow, **#970** wire connects to the "I" or "R" post of the solenoid (see [Starter Schematic](#); [Fig. 114](#)).

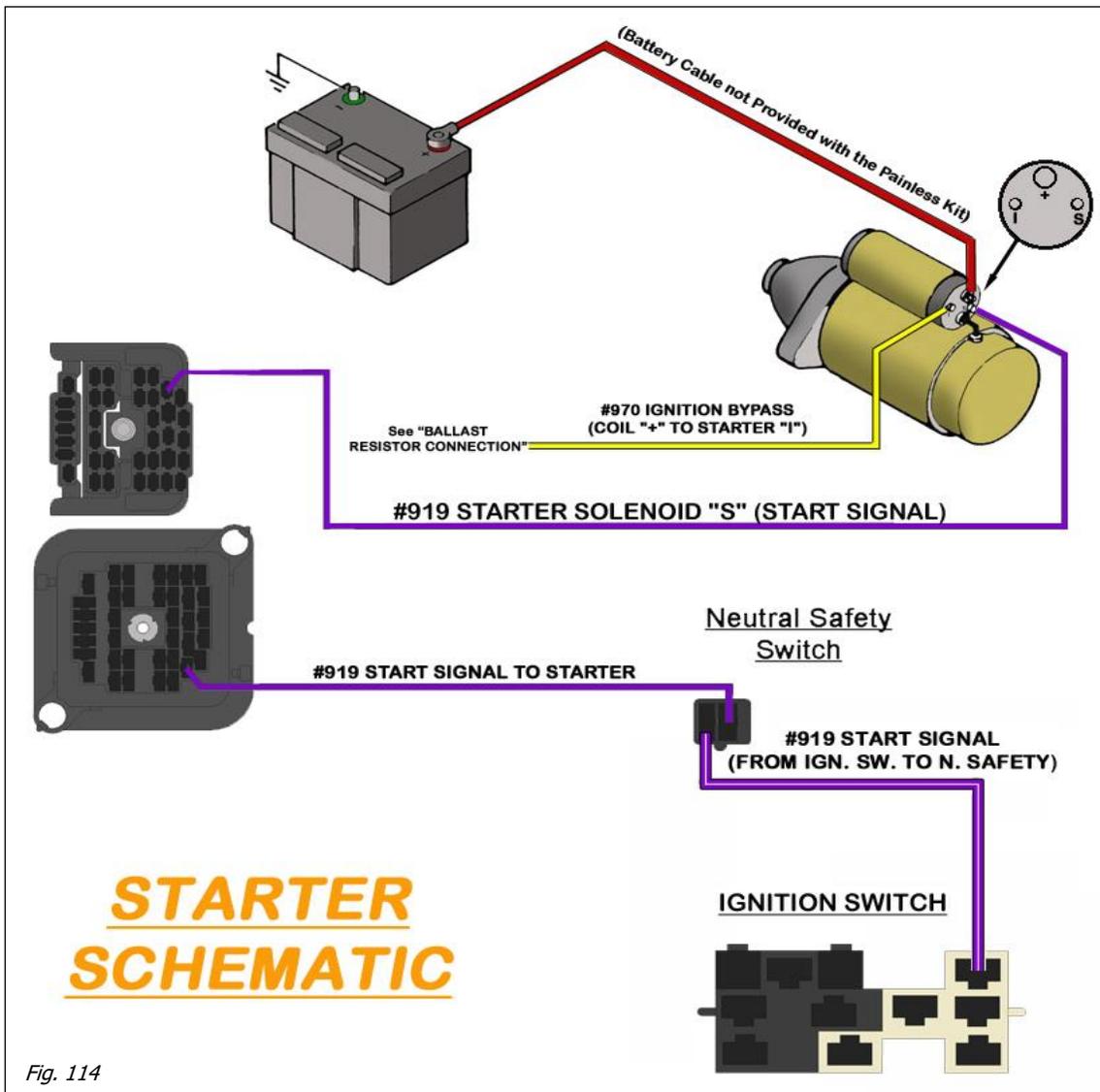


Fig. 114

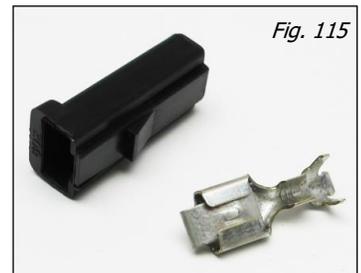
## **Blower Motor**

A single wire is supplied to connect to the blower motor. **This wire is only needed by those with factory heater only (non A/C) vehicles. Cars with factory or aftermarket air conditioning do not need this wire, and you can remove it 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 provides power to the blower motor from the blower switch (see [Heater Only Schematic](#) on page 109; [Fig. 185](#)).

- Route the **#967** wire towards the blower motor, cut to length, and install the proper terminal and connector (see [Fig. 115](#)).
- Connect the **#967** wire to the top terminal on the blower motor; this is the power terminal. The bottom terminal connects to ground. This ground wire is not included with the Painless harness because it is a dedicated ground and not part of the factory chassis harness.



*Fig. 115*

**This completes the Engine Harness wiring.**

# INTERIOR HARNESS

In order to properly route and connect the interior harness, it is recommended that the dash pad, driver side kick panel, driver door sill plate, driver seat/bench seat, and rear seat and seat back be removed. This allows plenty of access to all installation points and areas where this Painless Harness will be properly routed. Removal of the steering wheel also helps, but it is not necessary.

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 or 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, 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, console, and gauge cluster connections
  - ❖ Radio/Glove box/ Pass. side kick panel area - contains wiring for the radio, cigarette lighter/power port, aftermarket gauge connector, heater/AC panel, glove box light connector, a courtesy light, and passenger door jamb switch
- Using the factory harness as a guide, begin routing the interior harness over the steering column and towards the passenger side of the vehicle.

The following instructions are in the same order as the connection points of the Painless harness you come across. You should start at the fuse block and work your way across the harness to the passenger side to maintain the proper order.

## Dimmer Switch

Find the dimmer switch 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, sends power out the low beam or high beam wire.

Notice the group of wires coming out of the bottom of the fuse block you will with a section label reading DIMMER SWITCH. These wires have a large, black, three-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 37](#). They are:

**Light Blue:** 14-gauge wire, printed **#907 DIMMER SWITCH POWER**. This comes from the headlight switch, and has 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 that the connector also goes underneath the switch and lines 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 (see [Fig. 116](#)).



Fig. 116

## 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 on the dash (see [Fig. 117](#)).

For 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/White:** 18-gauge wire, printed **#968 EMERGENCY BRAKE SWITCH**. This wire sends a ground source to the brake warning light in the dash; this causes it to turn on when the emergency brake pedal is down (see [Gauge Cluster Schematic](#) on [page 93](#); [Fig. 158](#)).

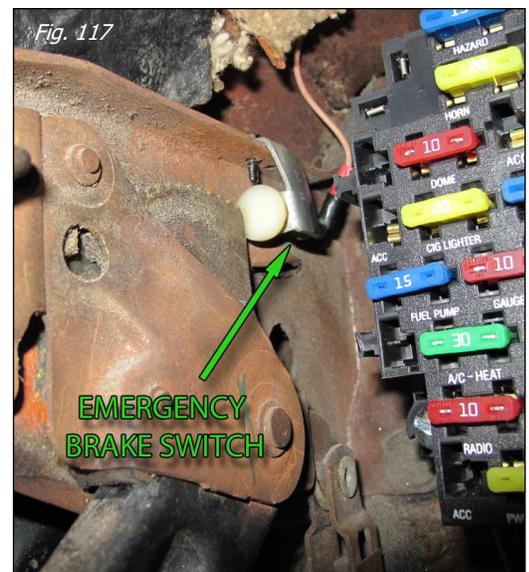


Fig. 117

- Route the tan/white, **#968** wire to the emergency brake switch found next to the driver side kick panel 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 also allows 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 wire wheel on a drill. Doing so helps provide a clean ground source to the brake warning light, and may save you some time trouble shooting when testing the system upon installation completion. Make sure to clean the mounting surface on the emergency brake as well (see [Fig. 118](#)).

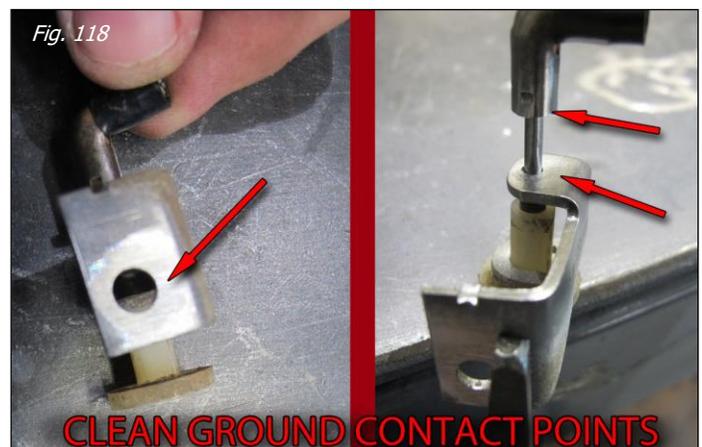


Fig. 118

## Tail Section

Bypass this bundle of wires at this time. The tail harness supplied with this kit plugs into this connector when this bundle is routed to the trunk; however, this is done after all the interior connections have been made. This routing is handled on [page 113](#) of this manual.

## Accessory Section

A section of wires with a label reading “ACC,” short for Accessory, contains three wires and is found in a rolled up bundle. These wires are labeled for use for an electric fuel pump, power windows, and power locks. In most cases, these wires are routed away from their current location to components, hence the extra length. These wires can also be used to power other components if power windows, locks, and/or an electric fuel pump 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 this Painless harness for connection to power windows and power locks. These two wires provide battery power for power locks and ignition switched power for power windows. These wires can be used with a factory power window/power lock harness or can be connected to aftermarket systems.

If your vehicle is not equipped with these options, the ends of the wires need to be insulated and the fuses removed from the fuse block, or the unused power window/power lock circuit(s) can be used to provide power to other components. At the fuse block, replace the fuse of which ever circuit you are using in order to match the amperage rating of the component you are connecting it to. **These wires are not to exceed 30 amps.**

**Electric Fuel Pump** - This is a 14-gauge, red wire, printed **#947 FUEL PUMP/SWITCHED IGN POWER**. This wire comes from the 15-amp, FUEL PUMP 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 106](#) (see [Fig. 178](#)). If you have an electric fuel pump, this wire is used to power the pump. This is further explained on [page 116](#). If you do not have an electric fuel pump, this wire can be used to power any component needing a switched ignition power source, not exceeding 15 amps.

**Power Window/Power Lock-** The two wires intended for power window & power lock are:

**Orange:** 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 has a single-pin, white connector pre-installed and can be seen in the [Accessory Schematic](#) on [page 106](#) (see [Fig. 178](#)).

**Pink:** 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 106](#) (see [Fig. 178](#)).

Single-pin connectors and terminals are provided to allow a linkage to the connectors found on the power lock/power window wires of the factory harness (see [Fig. 119](#) & [Fig. 120](#)). These connectors 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 are potentially powering with one of these circuits.

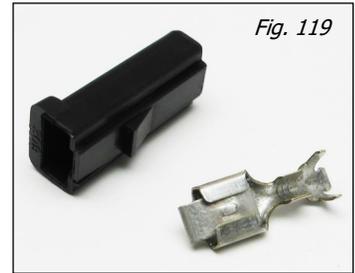


Fig. 119

- For those installing aftermarket power locks, connect the orange, #910 wire to the wire or switch/relay input that requires a fused battery power source.
- For those installing aftermarket power windows, connect the pink, #911 wire to the wire or switch/relay input that requires a fused switched ignition power source



Fig. 120

For those reusing the factory power lock/power window harness, the following set of instructions are used to slightly modify the original harness to work with the Painless harness.

- 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 (see [Fig. 121](#)).

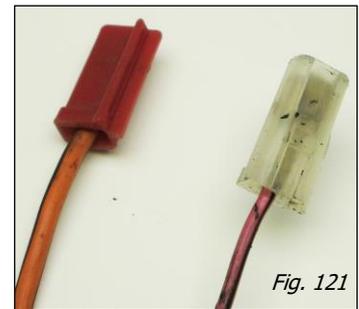


Fig. 121

These connectors use the same terminals provided in the kit that mate 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 (see [Fig. 122](#)).

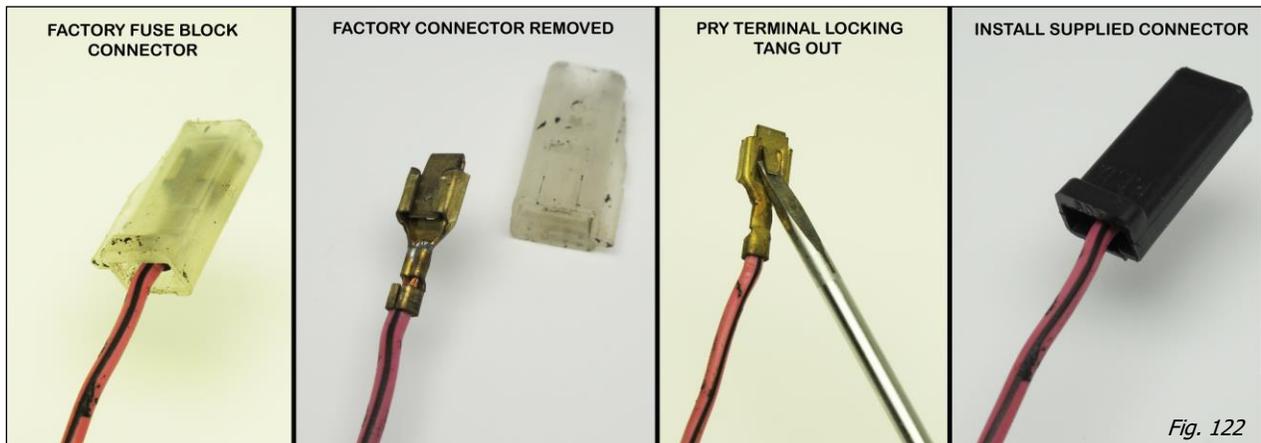


Fig. 122

- Using the terminal removal procedure, found on [page 14](#), 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 wires connect to the power window, pink, #911 wire on the Painless harness. The factory, orange/black wire connects to the power lock, orange, #910 wire on the Painless harness.

### Dash Brace

In order to make the connections to the door jamb switch and headlight switch easier, remove the bolt on the upper, driver side dash brace (see [Fig. 123](#)). This allows enough movement of the dash to get a hand on these connection points.

**Be extra careful when trying to get to these connections, as the remaining braces that are still bolted to the car are mounted to plastic tabs on the dash itself and can break.**

### Driver Door Jamb Switch

The door jamb switches 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. The switch is grounded through the mounting into the metal door jamb. This grounding gives the wires attached to the switch a ground source which then causes the interior lights to turn on.

Locate the two wires with the section label reading DRVR. DOOR JAMB SWITCH. Both of these wires go into a single, pre-installed, insulated terminal. They are:

**White:** 18-gauge wire, printed #961 DRIVER DOOR JAMB SWITCH. This wire is tied to the ground side of the included courtesy lights. This wire is 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 70 (see [Fig.126](#)) and the [Dome/Courtesy Light Schematic](#) on page 75 (see [Fig.135](#)).

**White:** 18-gauge wire, printed #961 DOME LIGHT GROUND. This wire is provides a ground source to the dome light connection found in the Tail Section of the harness. This wire is 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 70 (see [Fig.126](#)) and the [Dome/Courtesy Light Schematic](#) on page 75 (see [Fig.135](#)).

- Route the white, #961 wires to the driver side door jamb switch and connect to one of the two terminals. It does not matter which terminal either wire is connected to (see [Fig. 124](#)).

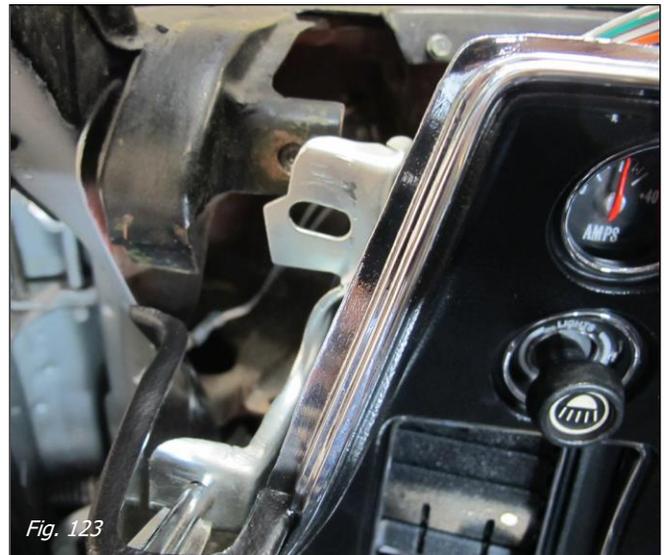


Fig. 123



Fig. 124

- If your jamb switches have a socket style connection, the insulated terminals found on both **#961** wires need to be removed from the harness and installed into an insulated male terminal provided in the parts kit.

## Headlight Switch

The headlight switch connection controls the 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 sends power to illuminate the park lights, tail lights, and the backlighting for the gauges.
- The second pull of the switch maintains power to everything listed above, but now sends power to the dimmer switch. The dimmer switch routes power to the high beam or low beam headlights depending on the switch's position.
- The third position is dome light/courtesy light control and gauge dimming. By rotating the knob to the left or 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. Turning the switch all the way to the left you will feel a click; this click will provide a ground source out 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 large, black, eight-pin connector pre-installed. The wires going into these connectors can all be seen in the [Headlight Switch Schematic](#) on [page 70](#) (see [Fig. 126](#)). These wires are:

### Eight-pin connector

**Orange:** 14-gauge wire, printed **#959 HEADLIGHT SWITCH POWER (PARK/TAIL)**. This wire 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.

**Brown:** 16-gauge wire, printed **#927 PARK LIGHT POWER**. This wire supplies power to the park lights and tail lights. This wire has constant battery power any time the headlight switch knob is pulled out in both the first and second positions.

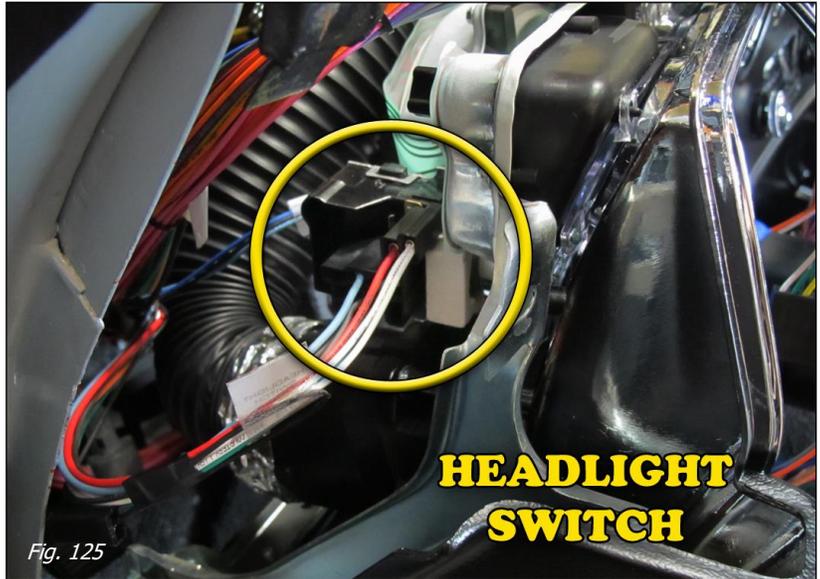
**Light blue:** 14-gauge wire, printed **#907 DIMMER SWITCH POWER**. This wire supplies power to the dimmer switch for headlight operation. This wire has constant battery power any time the headlight switch knob is pulled out in the second position.

**Green:** 16-gauge wire, printed **#930 POWER TO GAUGE/PANEL LIGHTS**. This wire provides power to the gauge lights. This wire has constant battery power any time the headlight switch knob is pulled out in both the first and second positions.

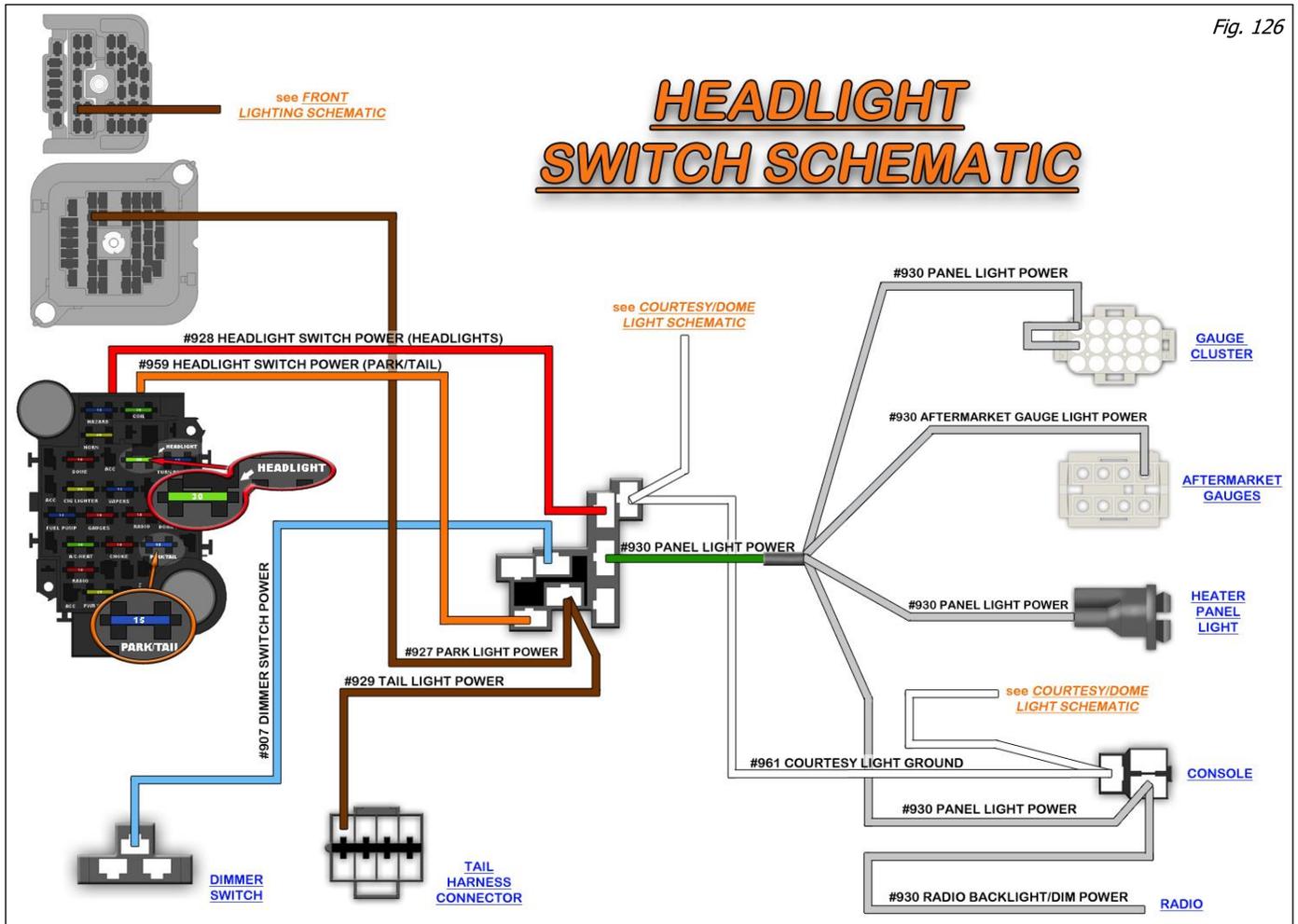
If the knob of the headlight switch is rotated all the way to the right, you will not have power on this wire. If you do not have power to the gauge lights during testing, first check the knob position.

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

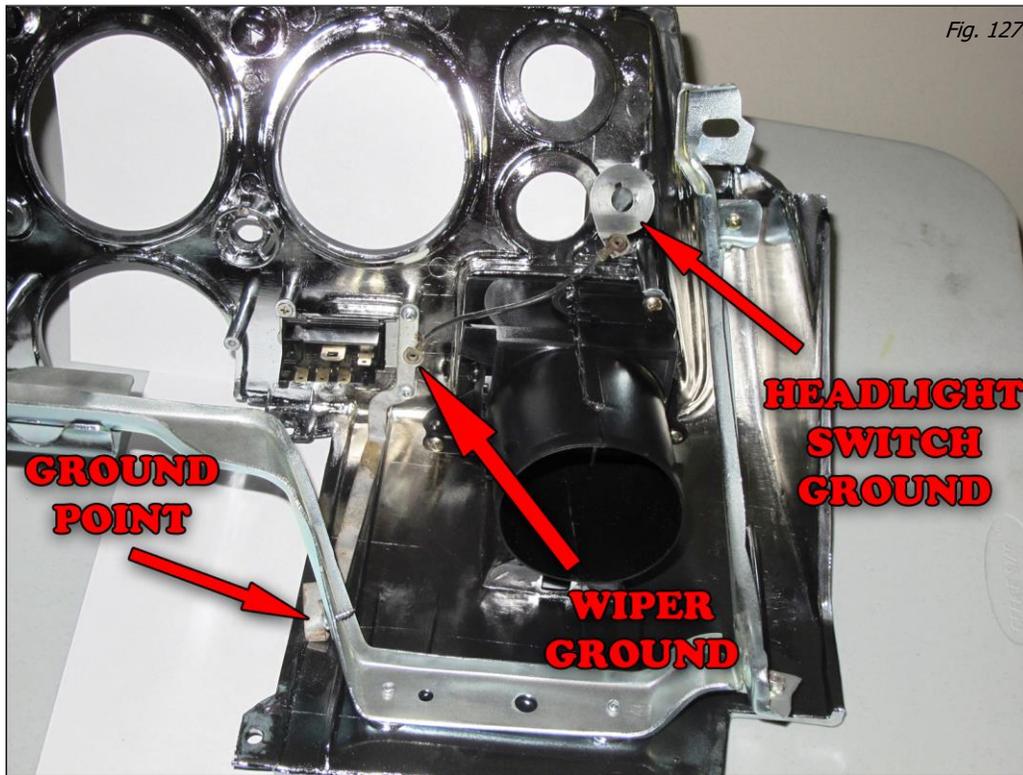
**White:** 16-gauge wire, printed **#961 DOME LIGHT GROUND (ACTIVATION)**. This wire provides the ground source for interior light activation. This wire is grounded when the knob is turned all the way to the left (see the note at the top of the next page). The white, #961 is spliced into the door switch/ground wires of all the dome and courtesy lights (see [Courtesy/Dome Light Schematic](#) on page 75; Fig. 135).



- Connect the eight-pin connector to the switch, the connector only fits one way. Make sure the connector goes on straight as the tabs of the headlight switch can bend (see Fig. 125).



\* In order for the headlight switch to operate the dome light, the body of the switch must be grounded. This is done from the factory through a large ring terminal on the mounting surface of the headlight switch, which came from a ground strap going to a dash brace (see [Fig. 127](#)).



If you do not have this grounding ring terminal, and want the headlight switch to be able to activate the dome light, a little modification is required (see [Fig. 128](#)).

- With the headlight switch removed, use pliers to bend the pictured tab away from the switch body; about a 45° angle.
- Locate one of the 1/2" self-tapping screws from the parts kit and create a mounting hole in the tab. This mounting hole allows you to create a ground from some scrap wire and two ring terminals. One end connects to the headlight switch and the other end connects to a ground source.



## Wiper Switch

The wiper switch sends ground sources to the wiper motor and washer pump connections. A clean ground source from the metal strap on the dash trim to the body of the wiper switch is very important. This is why you will also find a wire labeled WIPER GROUND with the wiper switch wires.

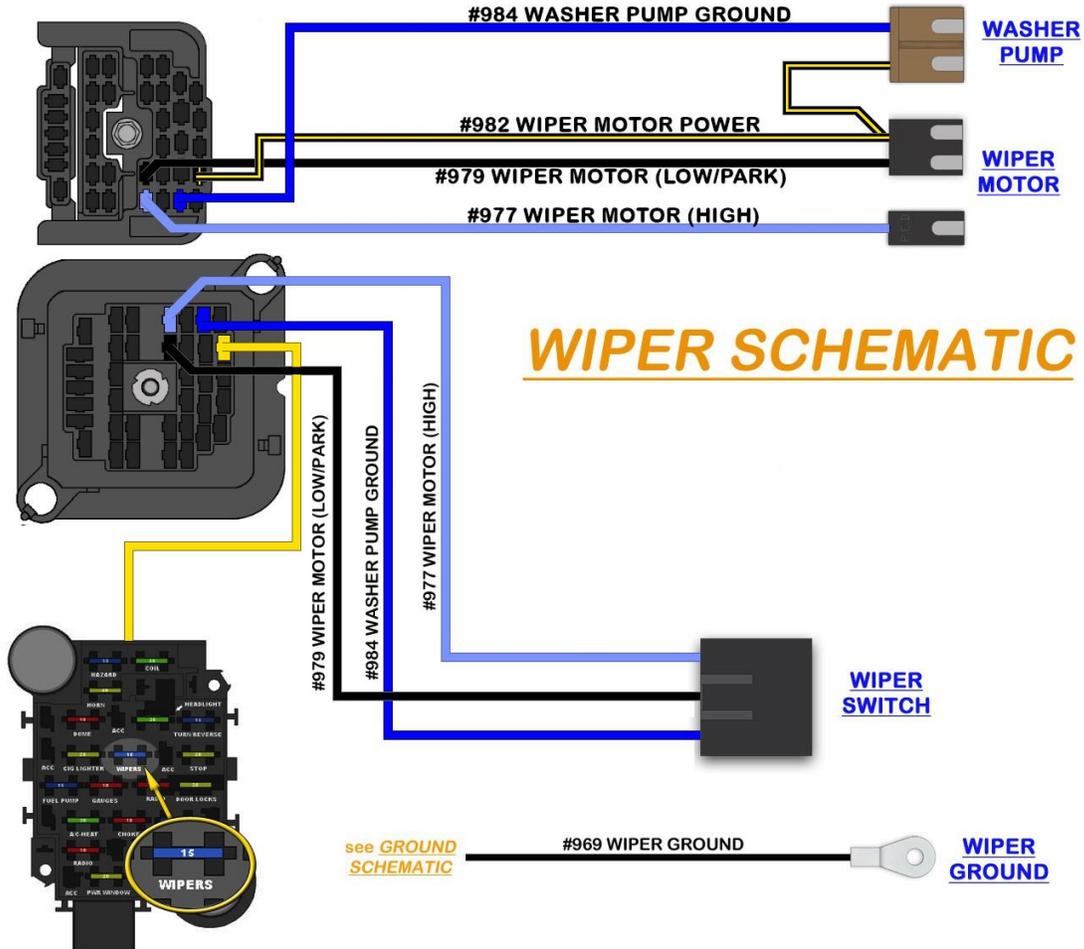
All of the wires in the wiper switch section can be seen in the [Wiper Schematic](#) (see [Fig. 129](#)). These wires are:

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

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

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

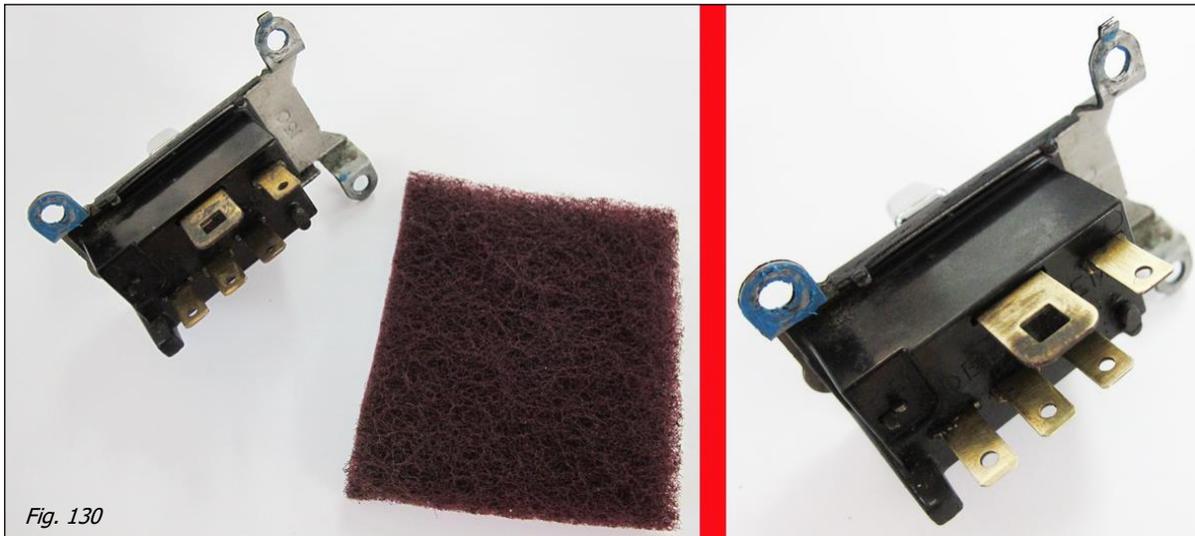
Fig. 129



## Wiper Switch Ground

**Black:** 16-gauge wire, printed **#969 WIPER SWITCH GROUND**. This is the ground source to the wiper switch. This #969 wire is part of the integrated ground circuit of this Painless harness. It can also be seen in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

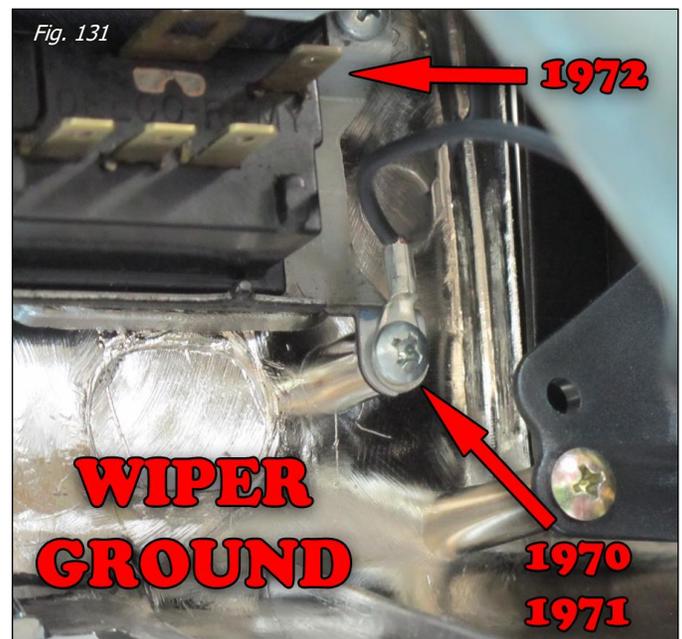
- To ensure you have good contact use something abrasive, like a scouring pad or fine sandpaper, to clean the terminals of the wiper switch (see [Fig. 130](#)).



- Begin by connecting the **#969** ground wire to the wiper switch. The connection of this ground will depend on what switch you have.

**1970 & 1971** model year switches, which only have three tabs found on the back of the switch, ground to 1 of the mounting screws of the switch. The factory set up had a metal ground strap in place here to provide a ground source. Even if you still have this strap in place, Painless recommends using the ground wire supplied to ensure a proper ground.

For **1972** model year switches, which have a ground tab above and to the right of the three function tabs (see [Fig. 130](#) & [Fig. 131](#)), need you to cut the ring terminal from the **#969** wire of the Painless harness and install a factory style terminal and connector (see [Fig. 132](#)).



## Driver Courtesy Light

This connection allows the under dash/pedals of the vehicle's driver side 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 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 is a large gray colored lamp socket with four wires pre-wired to it (see [Fig. 133](#)). These wires can be seen in the [Courtesy/Dome Light Schematic](#) on [page 75](#) (see [Fig. 135](#)). These wires are:



Fig. 133

**(2) Orange:** 18-gauge, printed **#971 COURTESY LIGHT POWER**. One wire provides power from the 10-amp, DOME fuse on the fuse block; this fuse has battery power and has power at all times. The other wire, printed **#971 DOME LIGHT POWER**, provides power to the dome light through the tail harness connectors.

**(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 comes 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 supplied in the parts kit.

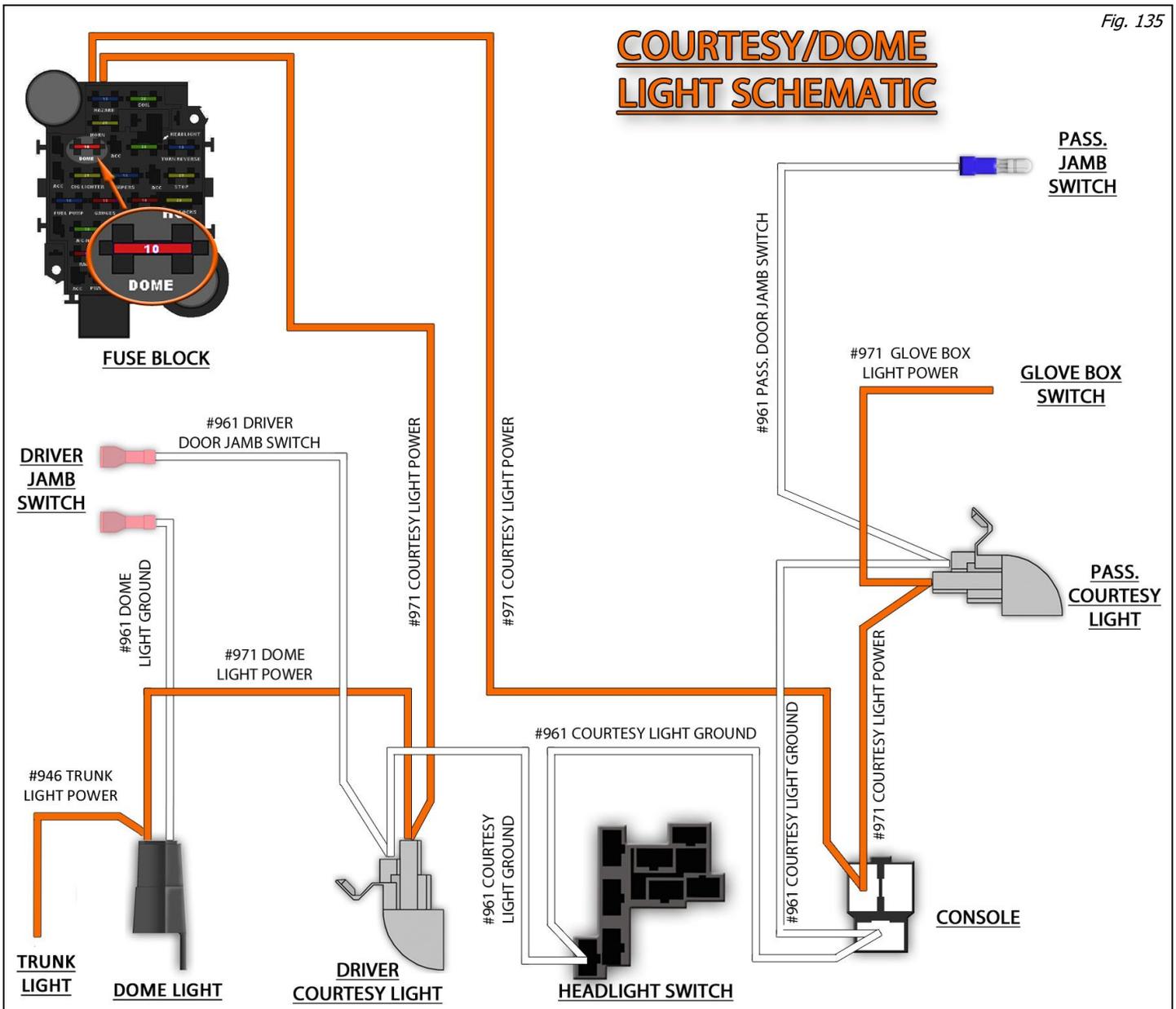
- Route the socket to a suitable mounting location under the dash. The light socket has a small hole in a mounting tab to allow mounting. The bottom screw of the steering column cover makes for a great mounting location. However, mounting may need to wait until the steering column connections have been made as the column may need to be dropped in order to easily make those connections (see [Fig. 134](#)).

- Install one of the supplied bulbs once mounted.



Fig. 134

## COURTESY/DOME LIGHT SCHEMATIC



### Brake Switch

Locate the brake switch at the top of the brake pedal. This is 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 connects 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 can be used to make individual wire connections to the brake switch (see Fig. 136).



The two wires of the Painless kit that make up the brake switch connection can be seen in the [Tail Harness Schematic](#) on [page 119](#) (see [Fig. 202](#)). These wires are:

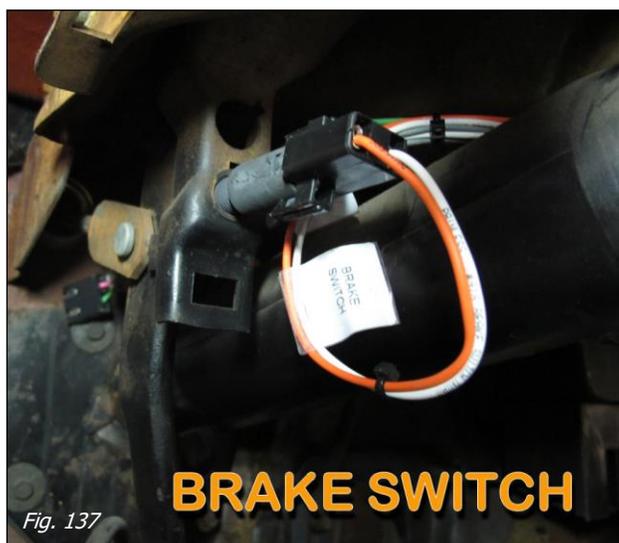
**Orange:** 16-gauge wire, printed **#917 BRAKE SWITCH POWER INPUT**. This wire provides power from the 15-amp, STOP fuse and has power at all times.

**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. This means that the turn signal and brake light share a filament in the bulb. This wire has power anytime the brake pedal is pressed.

This splice can also be seen in the [Turn Signal Schematic](#) on [page 78](#) (see [Fig. 138](#)).

- Route the brake switch wires to the brake switch and connect them using the pre-installed connector or loose piece insulated 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 car has an aftermarket brake switch with four connection pins, two pins have contact, or are closed when the brakes are not applied, and two are separate, or open when the brakes are not applied. You will the two posts that are separate or open. The 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.



## Turn Signal Switch

The column mounted turn signal switch provides power to each turn signal indicator. The turn signal switch connection will exit the bottom of the steering column.

The wires provided in the Painless harness for turn signal connection can be identified by the section label reading "TURN SWITCH." These are ten pre-terminated wires that will need to be used with one of the turn signal connectors supplied with this kit. These wires are shown in the [Turn Signal Schematic](#) on the [page 78](#) (see [Fig. 138](#)). 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 is 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 has 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 provides power to the right turn signal indicator on the gauge cluster as well as power to the front right turn signal. This wire has 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.

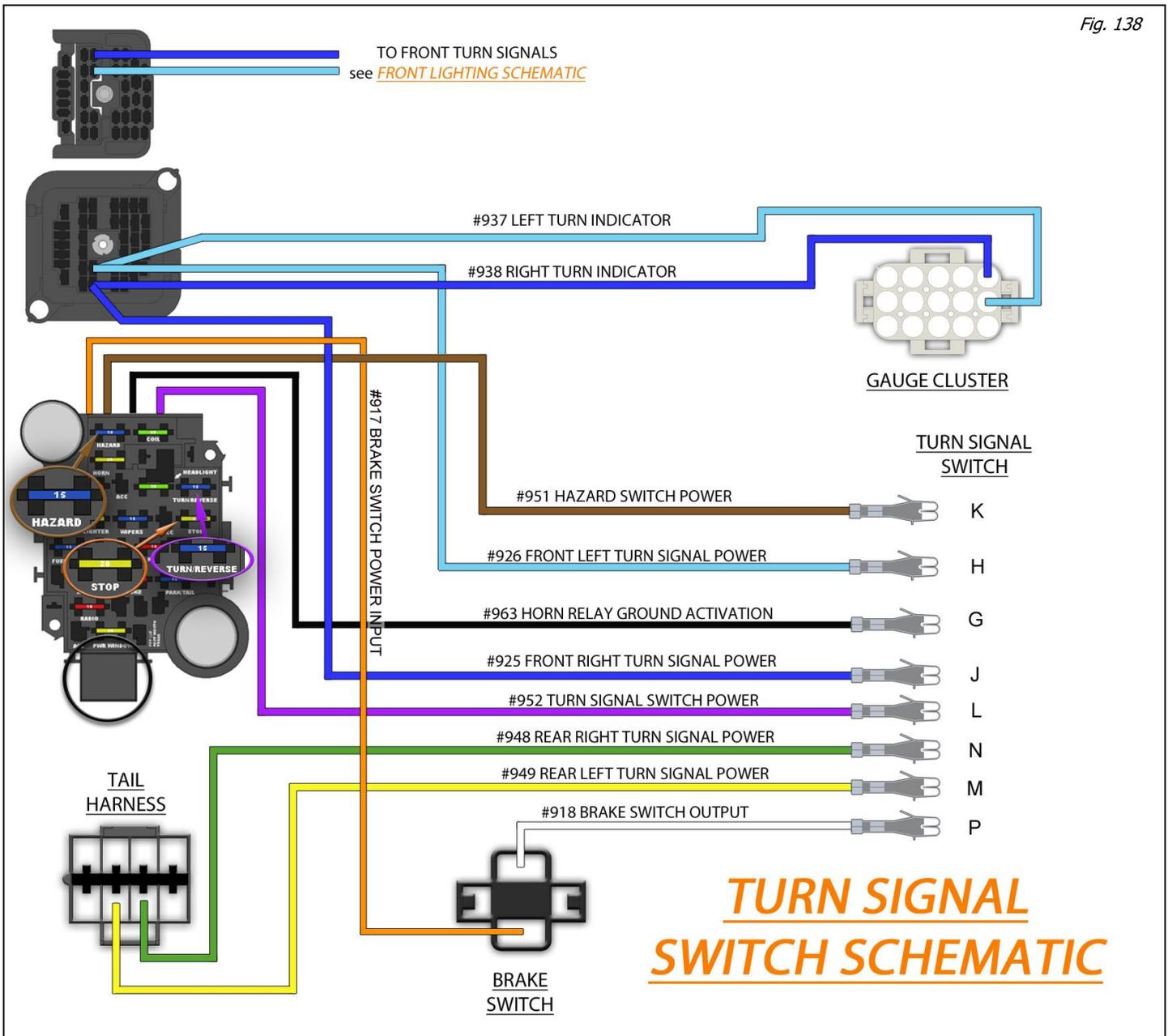
**Brown:** 16-gauge wire, printed **#951 HAZARD SWITCH POWER**. This wire provides power to the column mounted hazard switch. It comes from the hazard flasher found on the fuse block. It is a battery power wire, but it will have power only when the hazard switch is activated. This causes the flasher to send power through this wire. See **Flashers** on [page 19](#) 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. This causes the flasher to send power through this wire. See **Flashers** on [page 19](#) 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 has 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 has power anytime the brake pedal is pressed.

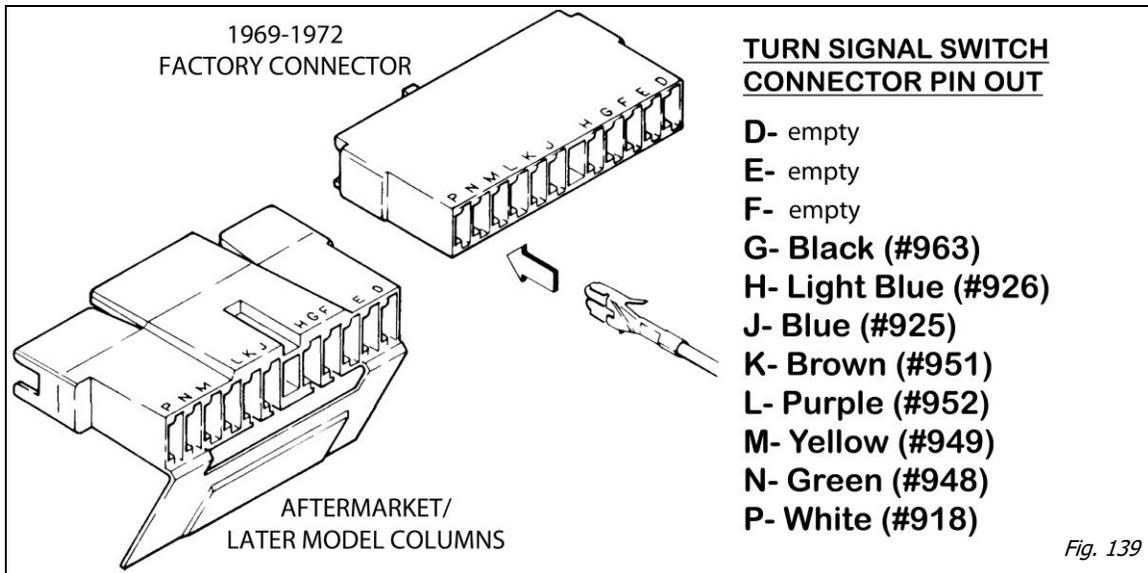
**White:** 16-gauge wire, printed **#918 BRAKE SWITCH OUTPUT**. This wire feeds the brake light power into the turn signal switch. These vehicles have integrated brake/turn signals; the turn signal and brake light share a filament in the bulb. This wire will have power anytime the brake pedal is pressed.



- The turn signal wires of this harness have terminals but no connectors pre-installed. This is to allow connection to a factory 1970 - 1972 column as well as to any aftermarket column utilizing a later model GM turn signal switch.
- In the bag kit there are two large, black turn signal connectors. These connectors fit 1970-1972 Chevelle columns and aftermarket columns made by companies like Ididit and Flaming River, which have a later model GM turn signal switch. Choose the connector that fits the column in your car. **The earlier production turn signal switches, like those found on 1970-1972 factory Chevelle columns, require the smooth connector (The top connector in the turn signal pin out drawing on the next page).**

- One by one, plug the wires of the pigtail into the connector according to the turn signal pin out drawing below, letters identifying pin locations are molded into the connector as well.

The terminals will only insert into the connector ONE WAY (see [Fig. 139](#)). **Make certain you are inserting the wire into the CORRECT LOCATION as the terminals are very difficult to remove once inserted.**



## Ignition Switch

The ignition switch is one of the most important connections of a wiring harness. Its function is to control power to the switched ignition fuses in the fuse block and the alternator exciter, as well as send a start signal to the starter to allow engine operation.

The ignition switch connection consists of a black connector and a white/transparent connector with a section label reading "IGNITION SWITCH". All wires going to the ignition switch connectors are shown in the [Ignition Switch Schematic](#) on [page 81](#) (see [Fig. 141](#)).

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, and 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 has 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 gauge cluster to provide the coolant temp gauge/light a ground signal for operation. This provides a ground source to the coolant light on instrument clusters with indicator lights when the key in the start position. This indicates that the bulb is operable. This also cause a coolant temp gauge to swing to the high side during engine start.

The white/transparent connector is a five-pin connector with the following wires:

**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 has power when the ignition is in the ACCESSORY position and when it is in the ON/RUN position.

**Pink/Black:** 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, printed **#919 START SIGNAL (FROM IGN. SW. TO N. SAFETY)**. This wire sends power to the neutral safety/clutch switch to engage the starter solenoid. This wire only has 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 battery power to the ignition switch. It has power at all times.

- 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 (see [Fig. 140](#)).

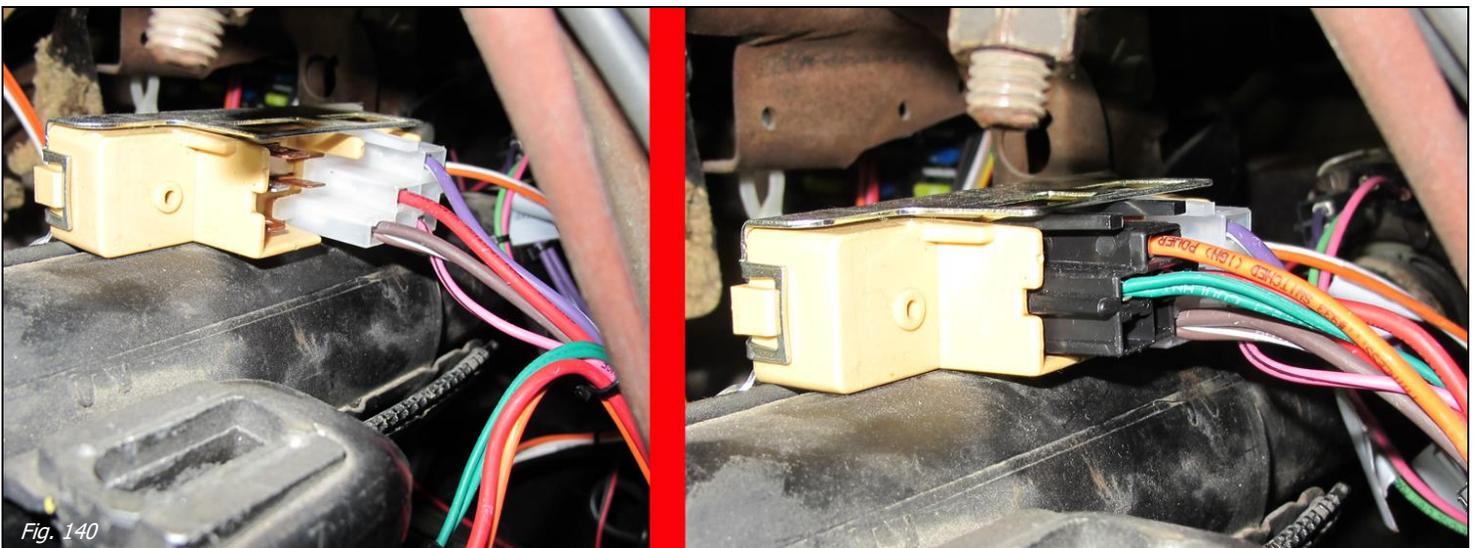
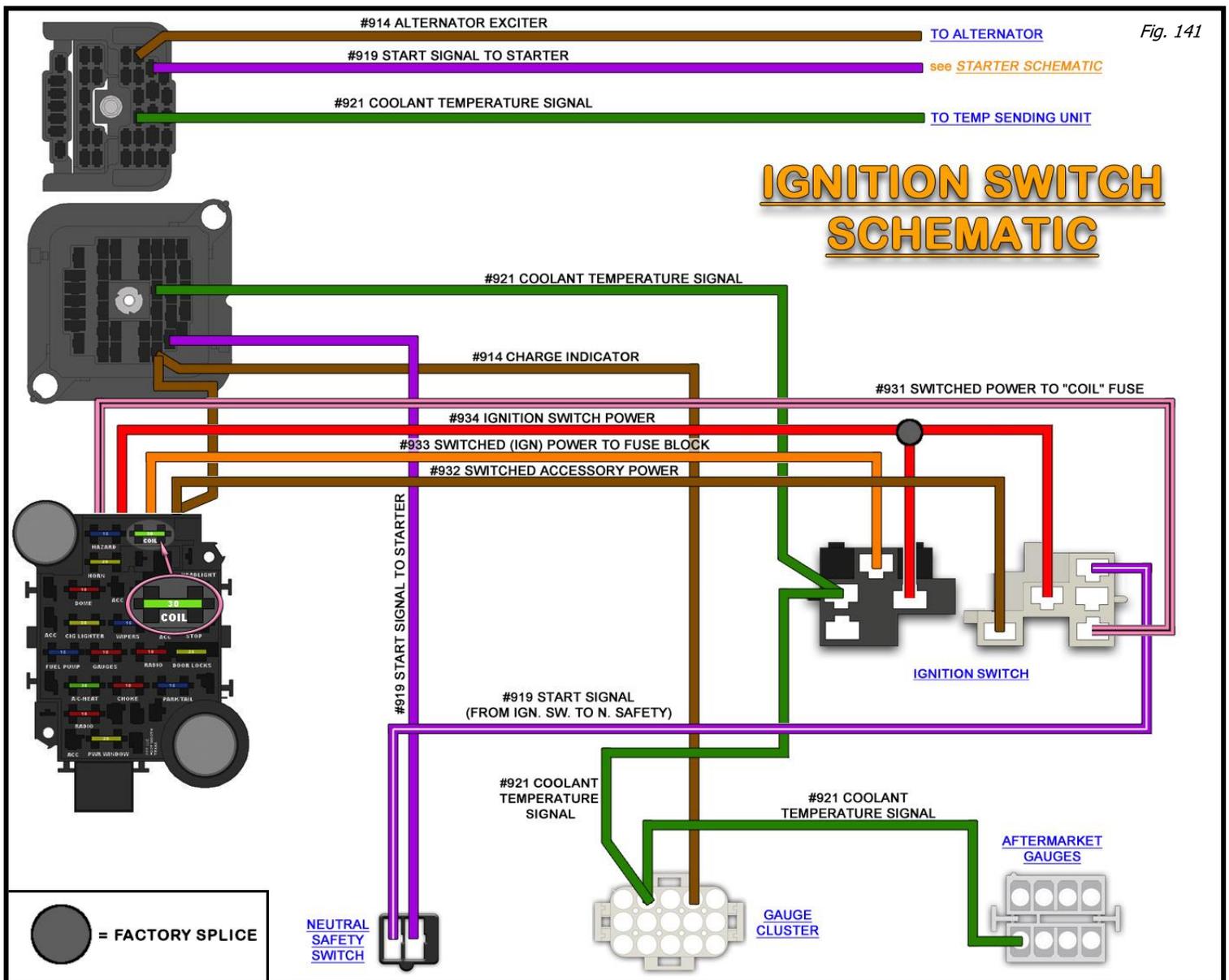


Fig. 140



### Neutral Safety/ Clutch switch

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

This switch is a two-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 is applied, 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.

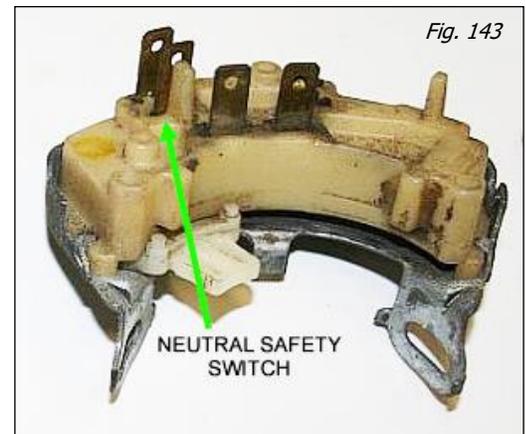
The neutral safety/clutch switch connection has a section label reading “NEUTRAL SAFETY.” This is a black, two-pin connector with two wires going to it (see [Fig. 142](#)). These wires are:



**Purple/White:** 14-gauge wire, printed **#919 START SIGNAL (FROM IGN.SW. TO N.SAFETY)**. This wire comes from the ignition switch, and 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 62](#) (see [Fig. 114](#)), and on the [Ignition Switch Schematic](#) on [page 81](#) (see [Fig. 141](#)) 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 applied (manual). This wire can be seen in the [Starter Schematic](#) on [page 62](#) (see [Fig. 114](#)).

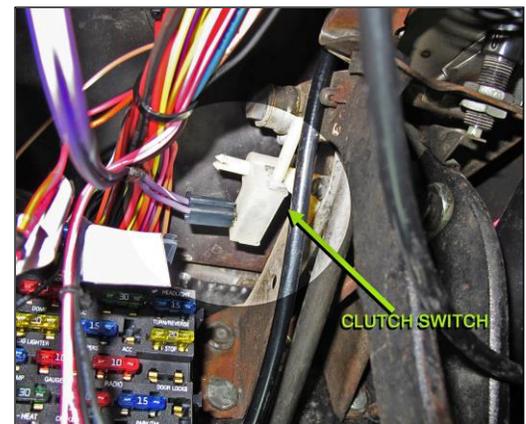
- If you have an automatic transmission with a column shift, the neutral safety switch (NSS), is located at the base of the steering column. If you have a manual, the clutch switch is located at the top of the clutch pedal, much like the brake switch on the brake pedal (see [Fig. 143](#) for automatic, [Fig. 144](#) for manual)



- Plug the neutral safety connector into the two pins of the neutral safety/clutch switch.

If you are have a factory, or aftermarket, automatic floor shifter or an automatic/manual transmission mounted NSS, connection to your NSS is made later in the manual on [page 89](#), and this neutral safety switch connection under the dash connects to the included console harness as described later in the manual on [page 85](#).

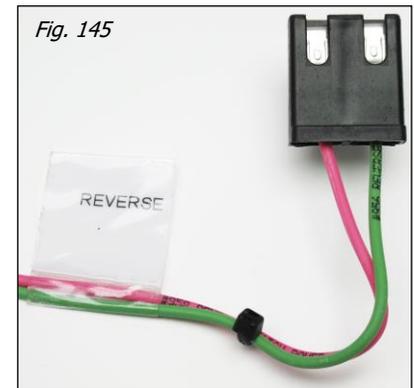
- If you do not have a neutral safety/clutch switch, and do not plan on getting one, cut the connector from these two wires and connect the purple **#919** and the purple/white **#919** together. **If this is not done, your car will NOT start.**



**Painless does not recommend operating your vehicle without a neutral safety/clutch switch.**

## Reverse Switch

The reverse switch, also referred to as the backup switch, connection provides the reverse lights the power they need to illuminate. This switch is a two-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 and the switch closes. This allows power to flow from one pin to the other and transfer power through the switch out to the backup lamps.



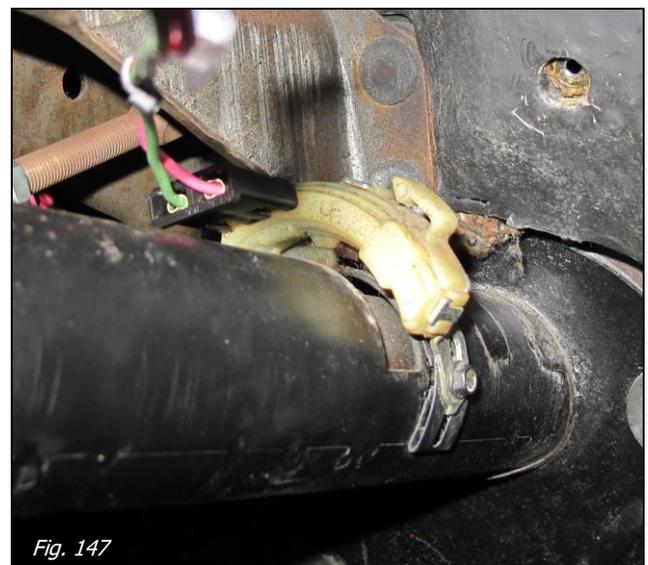
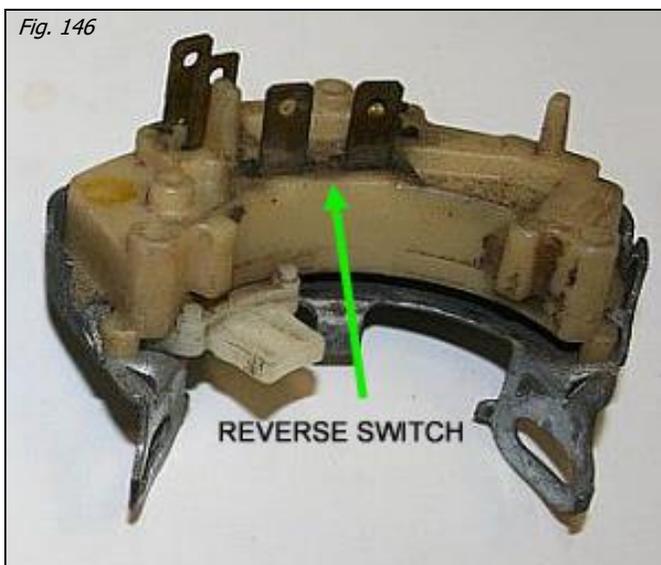
The reverse switch connection has a section label reading REVERSE. This is a black, two-pin connector with two wires going to it (see [Fig. 145](#)). These wires can be seen in the [Tail Harness Schematic](#) on [page 119](#) (see [Fig. 202](#)). These wires are:

**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 only has 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, the reverse switch is located at the base of the steering column (see [Fig. 146](#) & [Fig. 147](#)). Plug the reverse switch connector onto the two pins of the reverse switch.

If you are have a factory or aftermarket automatic floor shifter or an automatic/manual transmission mounted reverse switch, connection to your switch is made later in the manual on [page 89](#). This reverse switch connection is completed to the included console harness as described in the [Console](#) section.



## Accelerator Pedal

The following connection only needs to be made by those using a cowl induction relay and/or a turbo 400 (th400) transmission. This connection provides a 12v activation source to a wire in the engine compartment if add on wires are installed into the bulkhead as instructed on [page 24](#). The wires for the accelerator pedal can be seen in the [Cowl Hood Relay Schematic](#) on [page 42](#) (see [Fig. 76](#)) and the [Turbo 400 Schematics](#) on [page 43](#) and [44](#) (see [Fig. 78](#) & [Fig. 79](#)). They are:

**Pink:** 18-gauge, printed **#998 IGN 12V TO ACCEL. PEDAL (COWL HOOD/TURBO 400 TRANS.)**. This wire provides switched ignition power, from the CHOKE fuse, to the accelerator pedal switch. This wire will have power anytime the ignition switch is in the ON/RUN position.

**Pink:** 18-gauge, printed **#999 ACCEL. PEDAL TO BULKHEAD (COWL HOOD/TURBO 400 TRANS.)**. This wire provides switched ignition power, from the accelerator pedal switch, to the accelerator pedal switch. This wire will have power anytime the ignition switch is in the ON/RUN position and the accelerator pedal is pressed to or past 3/4 wide open throttle.

- Locate the throttle switch at the top of the accelerator pedal.
- Route the two pink wires of the Painless harness to the accelerator pedal switch (see [Fig. 148](#)). Be sure to keep the wires away from moving parts of the pedal assembly and the throttle cable.
- Connect the two pink wires to the two tabs coming out of the switch, it does not matter which wire connects to each tab.

For those using an aftermarket throttle switch located in the engine compartment:

- Remove the terminals and connectors from the two pink wires on the Painless harness. These wires can be cut shorter if desired, however leave them long enough to splice together.
- Strip 1/4" of insulation from each wire. Using a red insulated butt splice, splice the wires together; as shown [Turbo 400 w/Aftermarket Throttle Switch Schematic](#) on [page 44](#) (see [Fig. 79](#)).

By splicing these wires together, switched ignition 12v power is fed from the **#998** wire from the fuse block to the **#999** wire. This **#99** wire feeds power to the bulkhead and from the engine bulkhead to your throttle switch.



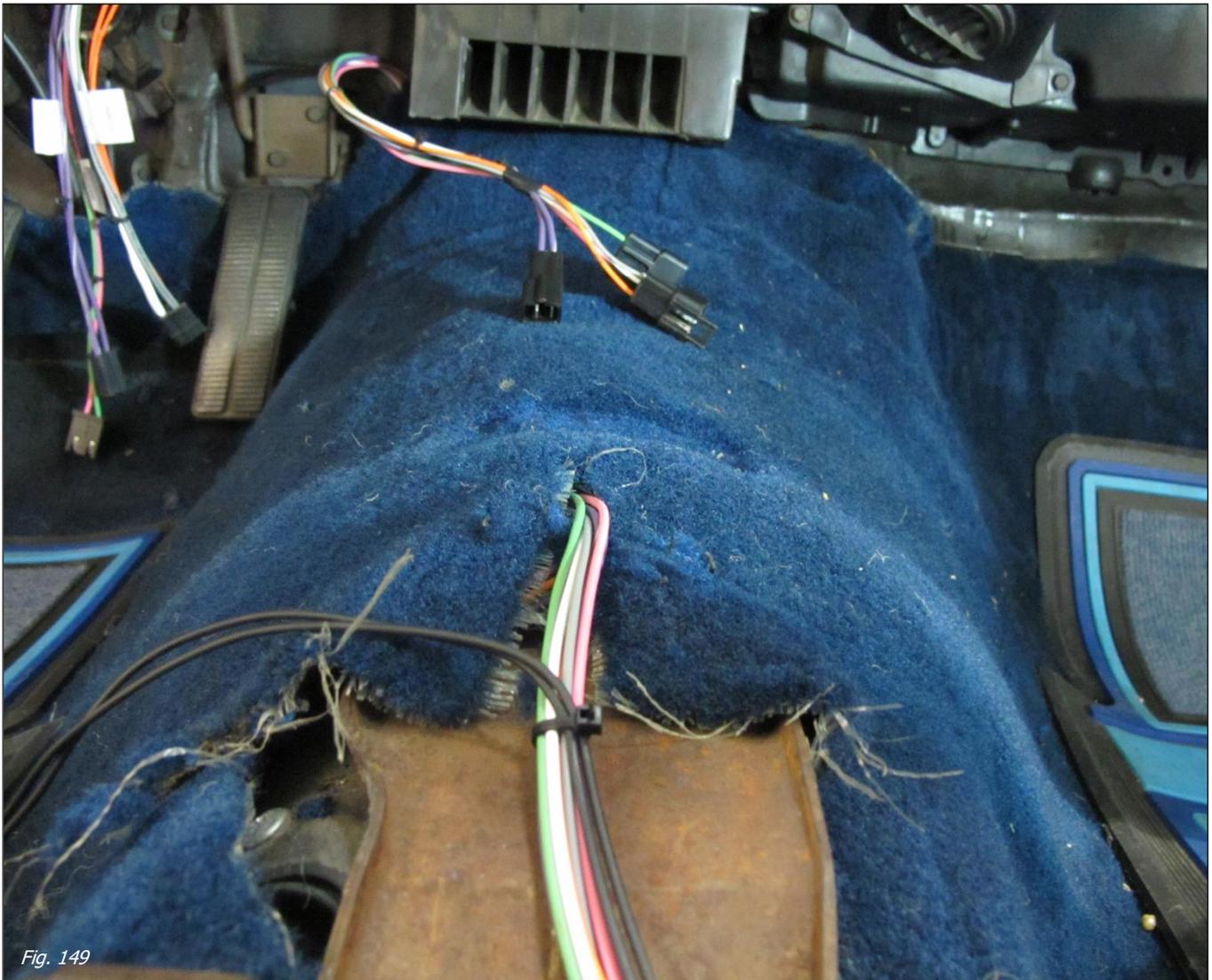
## Console

If your NSS and reverse lights are connected on the steering column and you have no need for any console connections, this connector can be skipped. Simply cable tie it to the harness and move on to the next step on [page 90](#), **Ground**.

A connection, as well as a separate sub harness, is furnished in the Painless harness kit for connection to a center console. Connections provided on the console harness include a neutral safety switch, reverse switch, gear indicator lighting, and a courtesy light. All of these components can be found in a factory console. Those using an aftermarket automatic floor shifter can also use this sub harness to make connections to the shifter mounted neutral safety switch, reverse switch, and gear indicator light.

The console connection on the Painless chassis harness will consist of the following three wires:

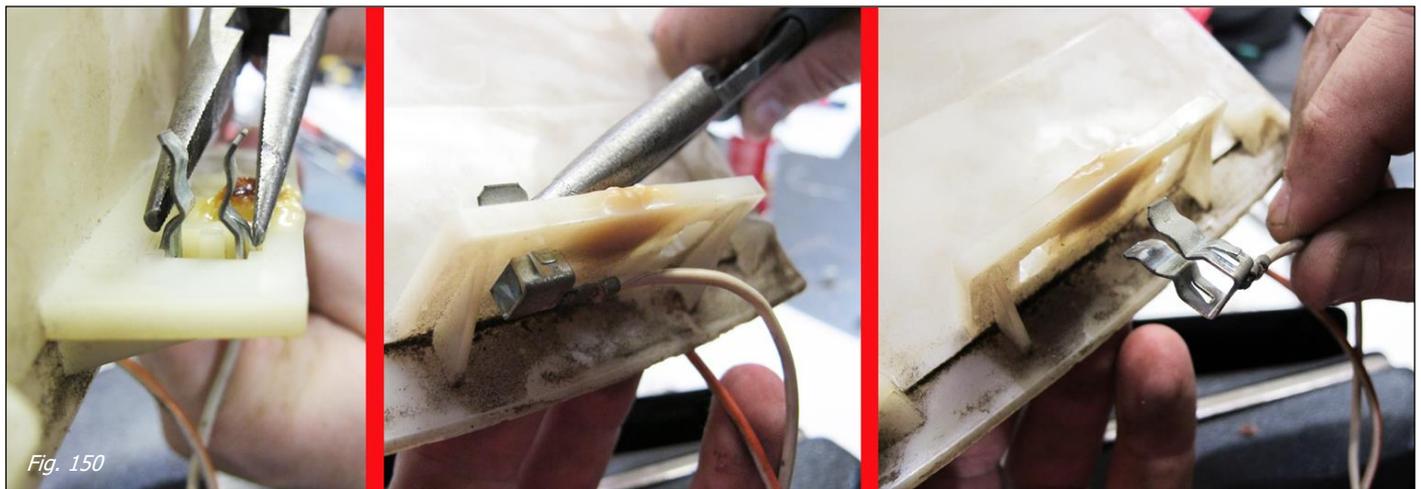
- (2) Orange:** 18-gauge, printed **#971 COURTESY LIGHT POWER**. This wire provides power from the 10-amp, DOME fuse on the fuse block. This fuse has battery power and is hot at all times. The other wire provides power to the passenger side courtesy light, as seen in the [Courtesy/Dome Light Schematic](#) on [page 75](#) (see [Fig. 135](#)). These wires provide power to the courtesy light found on the back of factory consoles.
- (2) White:** 18-gauge, printed **#961 COURTESY LIGHT GROUND**. These wires are the ground wires that activate the courtesy light. When these wires are grounded it completes the voltage path causing the light to illuminate. This ground comes 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. Please refer to [Courtesy/Dome Light Schematic](#) on [page 75](#) (see [Fig. 135](#)). These wires provide a ground activation to the courtesy light found on the back of factory consoles.
- (2) Gray:** 18-gauge wire, printed **#930 PANEL LIGHT POWER**. This wire goes into a splice from the headlight switch that supplies power to all the gauge and panel back lighting. This wire, as well as the mentioned splice, can be seen in the [Headlight Switch Schematic](#) on [page 70](#) (see [Fig. 126](#)). The other gray wire in this connector, printed **#930 RADIO BACKLIGHT/DIM POWER**, provides a power source to the radio for either backlighting, like found on older radios, or to control the dimming feature found on modern head units.



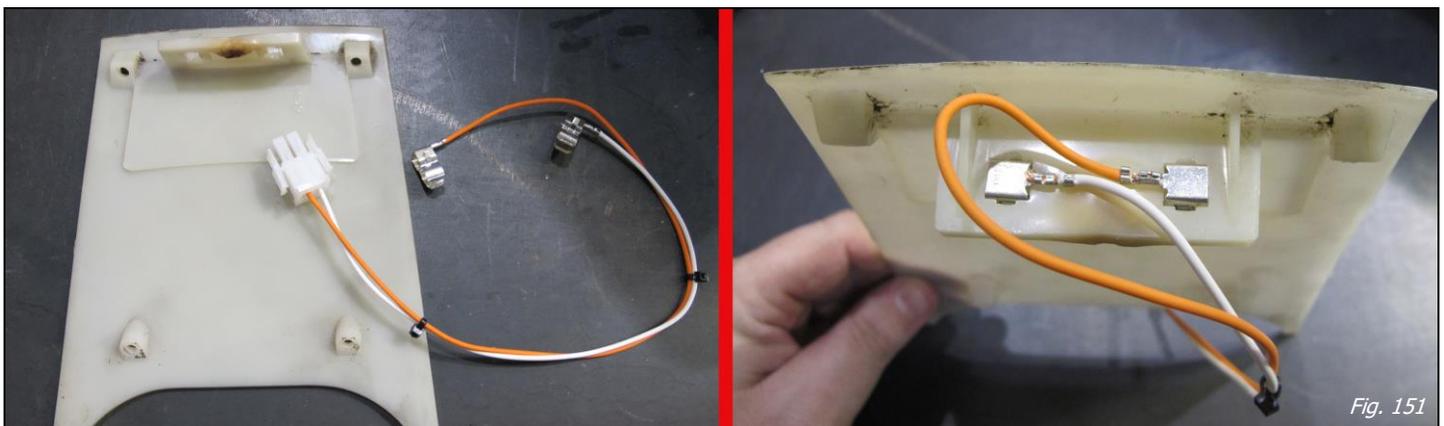
- Begin by locating the supplied console sub harness. This is a large bundle of wire labeled CONSOLE HARNESS.
- With the console removed from the car, start at where the shifter is located on the transmission tunnel and route the sub harness under the carpet, towards the fire wall (see [Fig. 149](#)). The portion of the console harness that needs to be routed forward is at the end of the harness with three connectors labeled, "To Console Conn.," "To NSS," and "To Reverse."
- Connect these three connectors to the "NSS," "Reverse Switch," and "Console" connectors found on the Painless chassis harness.

Connections found on the console sub-harness are determined by the transmission, shifter, and switches being used in your particular application. If you have transmission mounted switches, you may find that length needs to be added to the NSS and reverse switch wires.

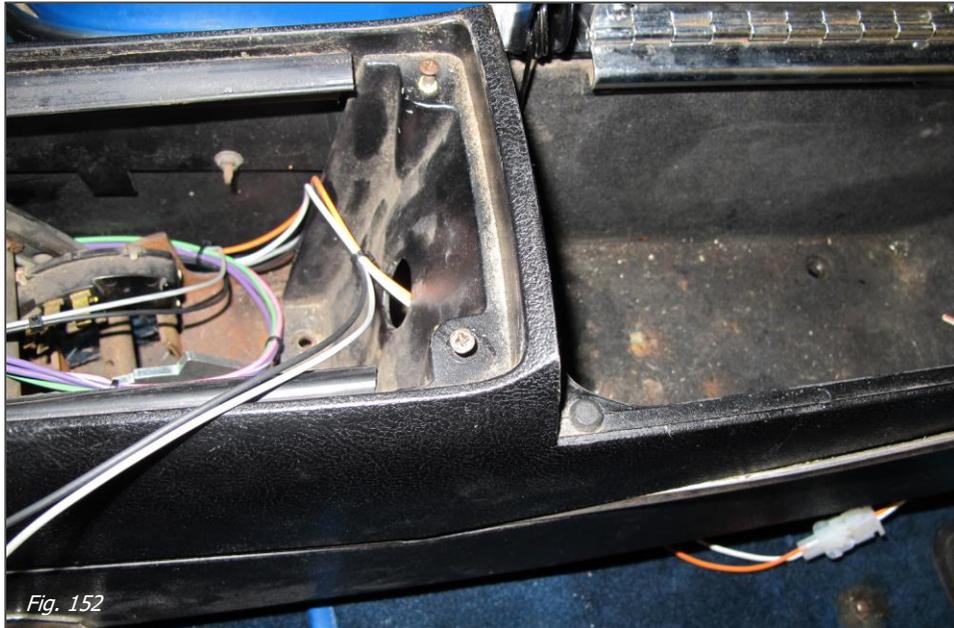
Before you install the factory console, you must install the small courtesy light pigtail from the sub-harness into the console. This pigtail allows easier removal of the console if it ever needs to be taken out.



- Remove the factory terminals/bulb contacts from the rear courtesy light lens; the sub harness has new terminal/bulb contacts. This is done by using a pair of pliers. Squeeze the base of the contact and push it down through the openings in lens (see [Fig. 150](#)). If you have an original lens, use caution. The plastic is usually brittle because of age and the countless heat cycles generated by the bulb.
- Unplug the courtesy light pigtail from the Painless console sub harness. Insert the terminals into the flange on the lens and install a bulb (not supplied) (see [Fig. 151](#)). This bulb is found at your local auto parts store using part **#212-2**, and is for a 6 candle power bulb. **Do not use a higher powered bulb, like the one used in the overhead dome light, as they get too hot and melt the plastic lens** (as evident in [Fig. 150](#) & [Fig 151](#)).



- Install the lens back on to the console, and then set the console into place on the transmission tunnel. **Do not bolt the console down at this time.** Simply place it in its location. The pigtail needs to exit the side of the console and is connected/stashed under the console in the next step.



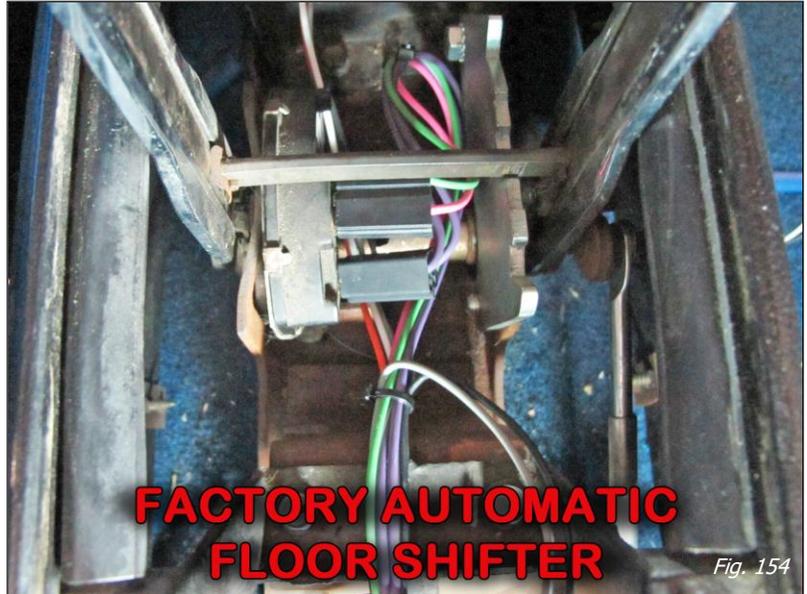
- At the front of the console, route the sub harness over any portions of the console interfere with the console lying flat on the carpet and toward the rear of the console. Insert the white, two-pin connector that plugs into the courtesy light pigtail into the pass through the hole (see [Fig. 152](#)).

With the mating connector now under the console compartment, connect it to the courtesy light pigtail. Now, push the connectors under the console compartment out of sight.

- Locate the two black wires at the front of the console. These wires provide ground to the gear indicator sockets. If equipped with a manual transmission, skip this connection/step.
- Using one of the mounting bolts of the console, connect this ground connection to a clean chassis ground source (see [Fig. 153](#)).



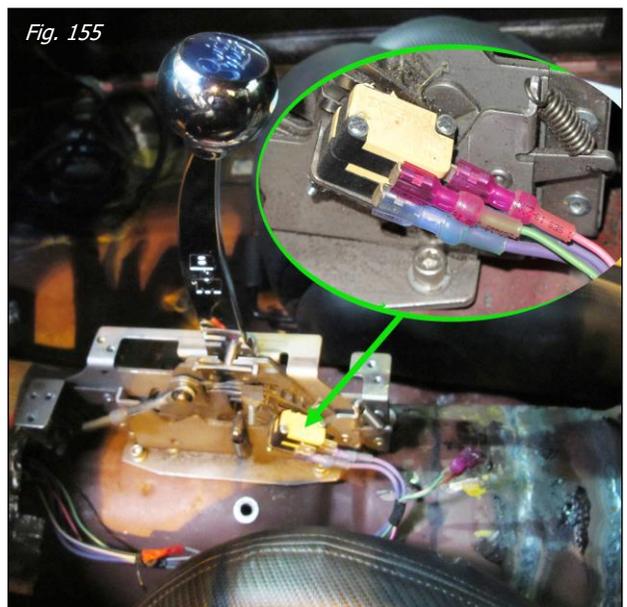
- For factory automatic shifters, connect the NSS and reverse switch found on the base of the shifter. Use cable ties to keep the wires out of the shifter gates and away from moving parts (see Fig. 154).



- For aftermarket automatic shifters, in many cases, NSS and Reverse switches are found at the base of the shifter. These are normally small micro switches. Remove the connectors found on the console sub harness and install insulated terminals from the parts kit that fit the tabs coming from the aftermarket switches (see Fig. 155).

- For manual transmissions or later model automatic transmissions such as 700R4, 4L60E, 4L80E, etc, if your connections are on the transmission, the two connectors found on the console sub harness need to be removed. Additional length may need to be added to the NSS and reverse switch wires in order for them to reach the connections found on your transmission. Connect the wires for NSS function and reverse switch operation to the transmission mounted switches.

- At this time, install all the mounting bolts for the console and secure it into place. For manual transmissions, the gear indicator bulbs are not used. Tape or cable tie these sockets to the harness. Make sure the gray wire has zero chance of shorting to a ground source because this wire has power any time the panel lights are on.



- Those with automatic transmission shifters, install a bulb from the parts kit into one or both sockets, depending on how many bulbs your indicator lens requires. If you only require one bulb, as most aftermarket shifters require, tape or cable tie the extra socket to the harness. Make sure the gray wire has zero chance of shorting to a ground source because this wire has power any time the panel lights are on.

- Once the gear indicator sockets have been installed, secure the gear indicator lens. All of the console connections are now completed.

**This concludes all of the connections found on the console sub harness, this manual will now continue on to the "Ground" connection found on the chassis harness.**

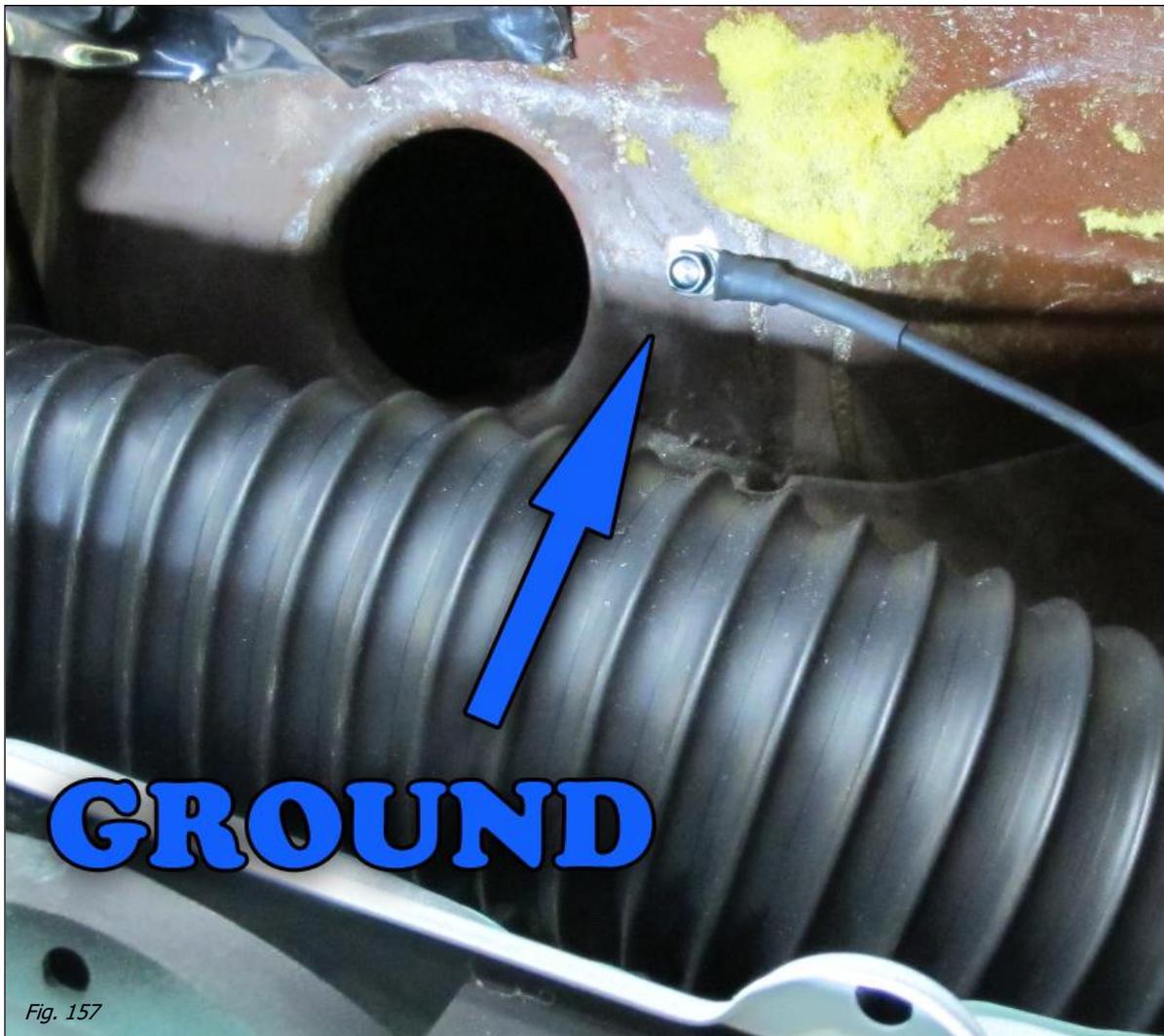
## Interior Ground

The interior ground wire is the next connection you come to. It helps provide a clean ground source to interior components such as the gauge cluster, radio, wiper switch, headlight switch, etc. This connection also supplies another good ground source to the integrated ground circuit that is incorporated into this Painless kit.

This ground wire has a section label reading "GROUND" and a ring terminal pre-installed. The wires going to this ring terminal are:

**(2) Black:** 12-gauge wires, both printed **#969 GROUND**. These wires provide the ground source for the **#969** circuit as it is spliced into the ground circuit. This ground wire, along with all the other wires it is spliced to, can be seen in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

- Locate a small 1/2" self-tapping screw and star washer from the parts kit and locate the ground wire on the Painless harness (see [Fig. 156](#)).
- Route this ground wire to a clean ground source and clean the connection point by sanding away any paint that may interfere with a solid contact to ground (see [Fig. 157](#)).



## Gauge Cluster Connection

The gauge cluster on the Painless chassis harness provides an easy way to unplug the gauge cluster from the chassis harness without having to undo each individual connection at the gauge cluster itself. This connection has all the wires needed for proper operation of the factory gauges. These wires can be seen in the [Gauge Cluster Schematic](#) on [page 93](#) (see [Fig. 158](#)). They are:

**Black:** 16-gauge wire, printed **#969 INSTRUMENT CLUSTER GROUND**. This wire provides a ground source and is tied into the integrated ground circuit. It can be seen in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

**(2) Gray:** 18-gauge wires, one printed **#930 GAUGE LIGHT POWER**. These wires provide power to the cluster back lighting. The gray **#930** is spliced with the other **#930** wires coming from the headlight switch to things like the radio backlight/dim, panel lights, and gear indicator light. These wires have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position. These wires can also be seen in the [Headlight Switch Schematic](#) on [page 70](#) (see [Fig. 126](#)).

**Tan:** 18-gauge wire, printed **#939 FUEL LEVEL SIGNAL**. This wire is a ground signal from the fuel level sending unit in the fuel tank. The resistance to ground varies on this wire according to how much fuel is in the tank. This wire can also be seen in the [Tail Harness Schematic](#) on [page 119](#) (see [Fig. 202](#)).

**(2) Pink:** 18-gauge wires, both printed **#935 GAUGE POWER**. These wires provide a switched ignition power source to the cluster. These wires come from the 10-amp, GAUGES fuse on the fuse block and have power anytime the key is in the ON/RUN position.

**Green:** 18-gauge wire, printed **#921 ENGINE TEMP SIGNAL/TEST**. This wire is a ground signal from the engine coolant sending unit and ignition switch. The resistance to ground varies on this wire according to engine temperature. This wire has a ground signal on it when the ignition key is in the START position. This is to flash the coolant temp light to the driver to let them know the bulb is in good operating condition. This also causes the coolant temp gauge to momentarily swing to the high side. This wire can also be seen in the [Ignition Switch Schematic](#) on [page 81](#) (see [Fig. 141](#)).

**Brown:** 18-gauge wire, printed **#923 TACH SIGNAL**. This wire is a ground signal from the negative side of the ignition coil or aftermarket ignition box.

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

**Tan/White:** 18-gauge wire, printed **#968 LOW BRAKE SIGNAL**. This wire is a ground activation wire for the brake light on the cluster. You ground this wire causing the light to illuminate when a brake fluid pressure imbalance occurs or if the emergency brake is applied.

**Light Blue:** 18-gauge wire, printed **#937 LEFT TURN INDICATOR**. This wire is a power activation wire for the left turn signal indicator. This wire has interrupted switched ignition power, through the turn flasher, anytime the left turn signal is activated. It also has interrupted switched battery power, through the hazard flasher, anytime the hazard switch is activated. This wire can be seen in the [Turn Signal Switch Schematic](#) on [page 78](#) (see [Fig. 138](#)).

**Light Green:** 18-gauge wire, printed **#936 HIGH BEAM INDICATOR POWER**. This wire is a power activation wire for the high beam indicator. This wire has power anytime the headlight switch is in the HEADLIGHT ON position and the dimmer switch in the HIGH BEAM position. This wire can also be seen in the [Front Lighting Schematic](#) on [page 37](#) (see [Fig. 67](#)).

**Blue:** 18-gauge wire, printed **#938 RIGHT TURN INDICATOR**. This wire is a power activation wire for the right turn signal indicator. The blue wire has interrupted switched ignition power, through the turn flasher, anytime the right turn signal is activated. It also has interrupted switched battery power, through the hazard flasher, anytime the hazard switch is activated. This wire can be seen in the [Turn Signal Switch Schematic](#) on [page 78](#) (see [Fig. 138](#)).

### **Gauge Cluster Harness and pigtail**

A gauge cluster harness and separate pigtail are provided with your new Painless kit. This harness allows for an easy inline connection to the chassis harness making the installation, and any future removal, of the instrument panel...painless.

The included sub harness is provided to support factory full sweep clusters. This sub harness can also be modified to fit aftermarket gauges. A simple pigtail is provided for those with, or who may in the future swap to, super sport clusters. This harness **does not** support any speed warning connections on clusters with that option.

On the next two pages you see diagrams showing the back of the three different styles of clusters used on the 1970-1972 Malibu and Chevelle. The three styles are: Malibu, Super Sport with indicator lights, and Super Sport with gauges. The pictures on the following pages show the cluster removed from the plastic dash trim. Your gauge cluster **does not** have to be removed from the dash trim for installation. For those using aftermarket gauges, basic instructions for you are included as well.



## Factory 1970-1972 Full Sweep Clusters:

- Locate the supplied full sweep sub harness. Notice that there are terminals preinstalled on some wires, but no connectors. This is because the factory connector is no longer produced and the holes are too large for any light sockets currently available.

**You must re-use the cluster connectors found on your factory harness.**

The terminals pre-installed on the Painless sub-harness plug into the factory connectors.

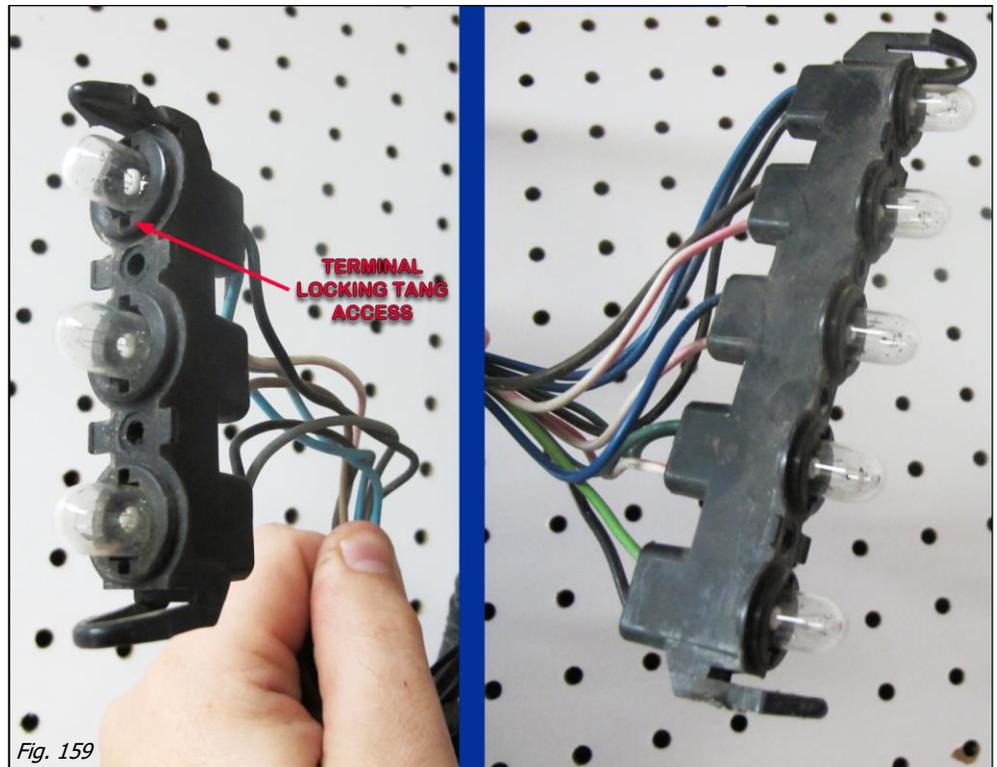


Fig. 159

- To un-pin the factory connector, you need a tool like a really small flat head screw driver, a paper clip, or stiff wire (a small piece of MIG welding wire works great). Insert your unpinning “tool” into the square slot next to the terminal (see Fig. 159). This slot gives you access to the locking tang of the terminal. With the tool inserted, pull the wire from the connector.
- Using the diagram below, install the wires found on the Painless sub harness into the factory connectors (see Fig. 160). Pay attention to the locks on the connector shown with the arrows in the diagrams. These arrows will help identify the proper sockets that the wires will need plug into.
- Begin by installing the bulbs supplied with this kit into the sockets of the sub harness and into the factory connectors that are now installed onto the sub harness.

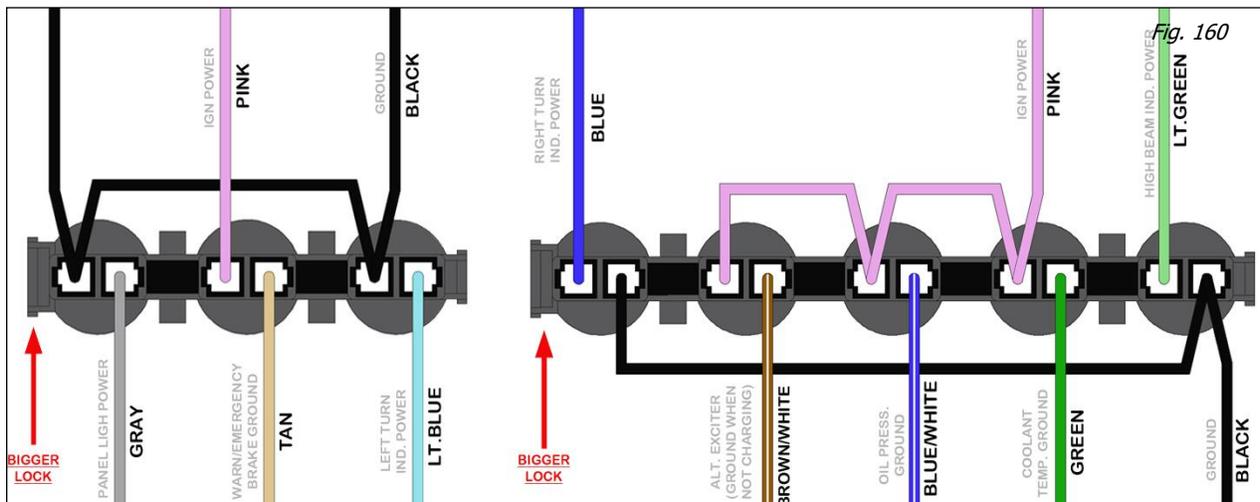


Fig. 160

- Use the diagram below to insert the sockets and connectors into their correct location. The red arrows in the diagram show which end of the cluster the bigger connector locks fit into (see [Fig. 161](#)).

Note: The printed circuit strip found along the top of the full sweep cluster is not needed. The new sub harness has sockets individually wired.



- Your cluster may or may not have a clock on the back of the cluster to the left. The clock has a one-wire connection provided by the sub-harness; an orange wire with a black, single-pin connector is pre-installed. You, the installer, need to provide a ground from one of the ground mounting points (see [Fig. 162](#); [page 96](#)). These points only have ground when the fuel gauge connector is plugged in AND the sub-harness is plugged into the chassis harness. If you do not have a clock, simply cable tie the clock connection to the gauge harness.

# GROUNDS FOR CLOCK or TACH

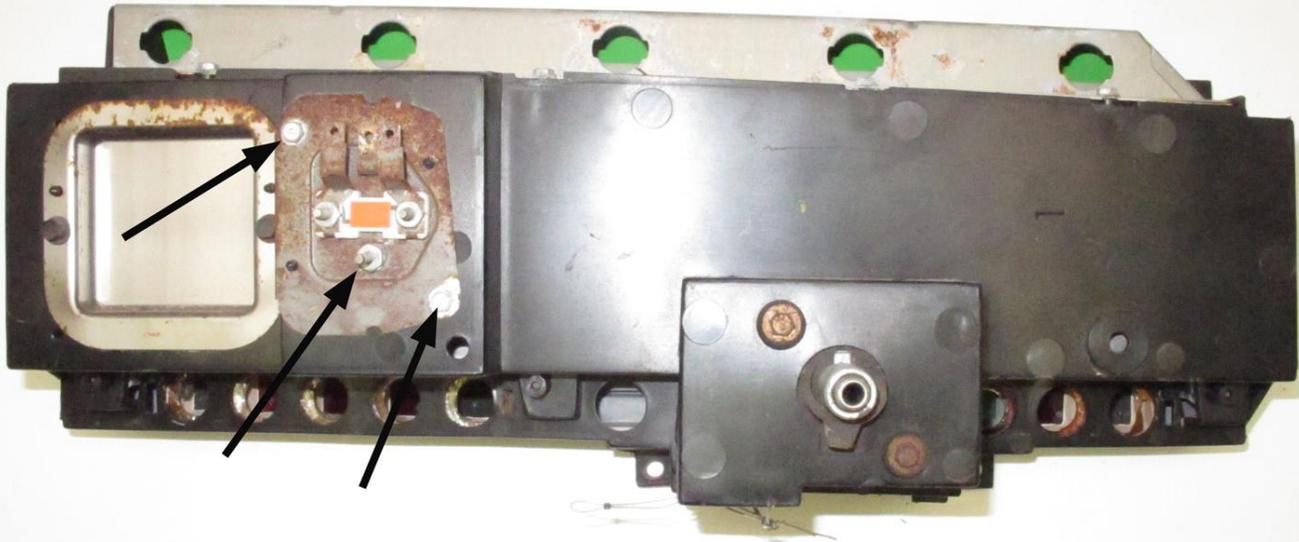
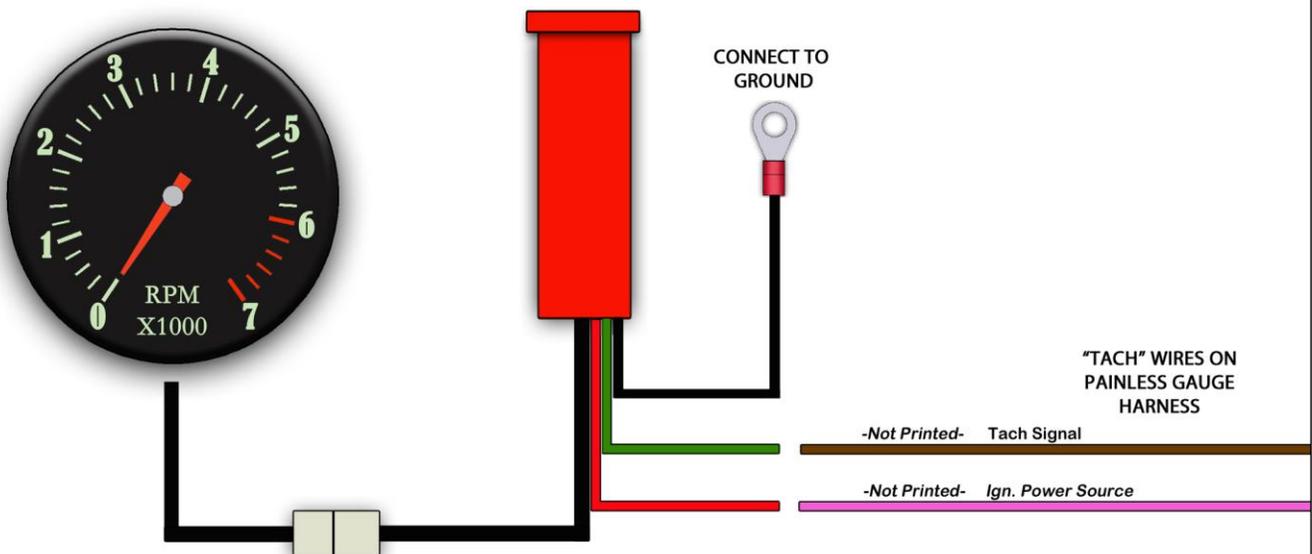


Fig. 162

- In some cases, the factory clock location may have an aftermarket tachometer installed. These are tachs specifically designed to fit in the clock location for 1970-72 full sweep clusters. Connection to these special tachs is provided on the sub-harness. Splice the brown signal wire from the gauge harness to the signal wire on the tach. Then splice the pink power wire from the gauge harness to the power wire on the tach (see Fig. 163). **If you are not using an aftermarket Tach, insulate the end of this pink wire.** The wire has power any time the ignition is in the ON/RUN position.

Fig. 163



## AFTERMARKET IN-CLUSTER TACH

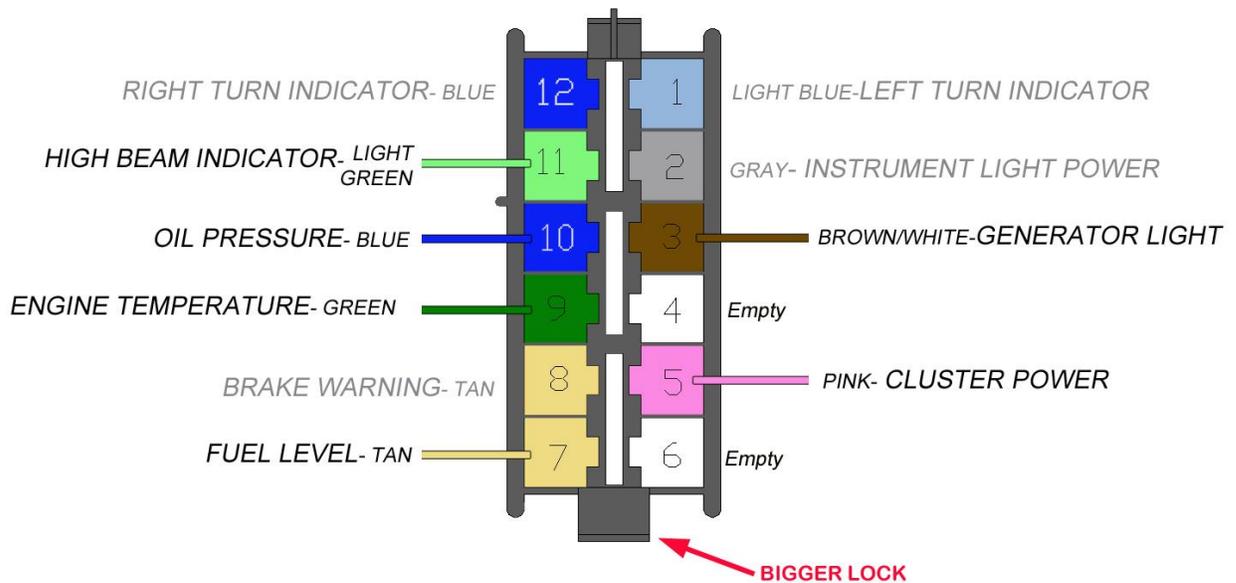
## Factory 1970-1972 Super Sport Clusters:

- Locate the supplied pigtail that plugs into the harness. Notice that there are some terminals not pre-installed into the connector. This is because the two factory super sport clusters have different connector pinouts (see [Fig. 164](#)).
- Plug the remaining wires into the connector; use the appropriate diagram below for the cluster have installed. **See the note at the top of the next page before plugging the Pink wire into the connector** (see [Fig. 165](#)).

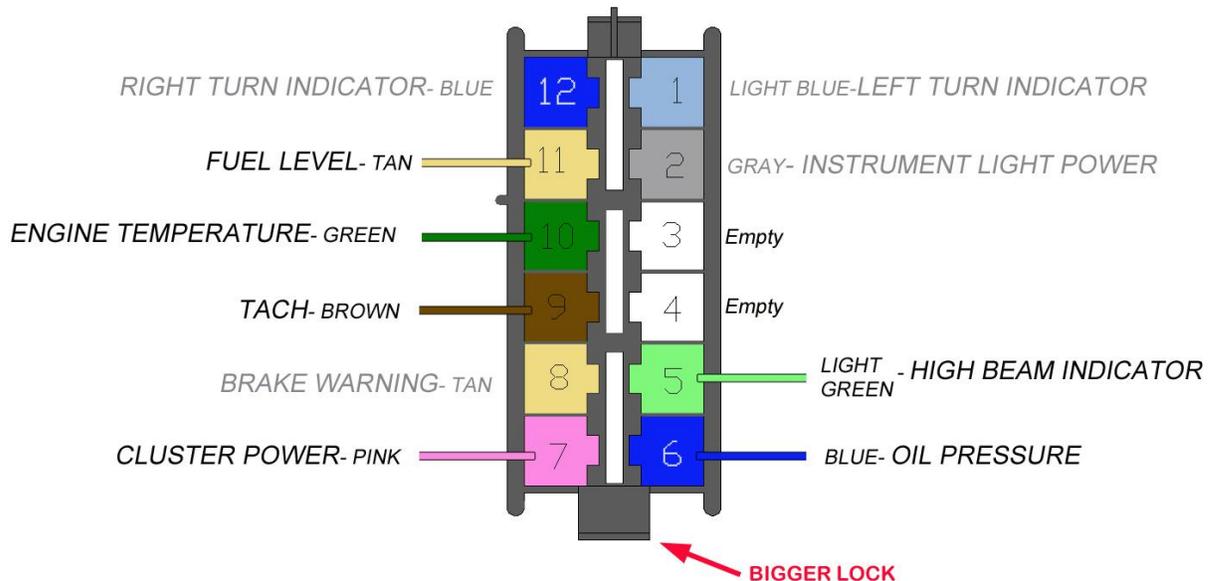
For those using a cluster with actual gauges, remove the terminal from the brown/white wire and insulate the wire. This wire is not needed and has switched ignition power.

SS CLUSTER with INDICATOR LIGHTS

Fig. 164



SS CLUSTER with GAUGES



- In some cases the factory clock location may have an aftermarket tachometer installed. These are tachs specifically designed to fit in the clock location for 1970-72 super sport clusters. Connection to these special tachs has been provided on the sub harness.
- Remove the terminal from the brown tach signal on the pigtail and connect it to the signal wire on the tach.
- Notice the one terminal on the pigtail has two pink wires going into, **cut one of the pink wires at the terminal** (see [Fig. 165](#)). This gives you the power wire needed to connect to the aftermarket tach and still provide power to the rest of the cluster. Connect the pink wire you cut to the power wire for the tach. Then, plug the pink wire with the terminal into the correct location on the gauge cluster connector (see [Fig. 166](#)).

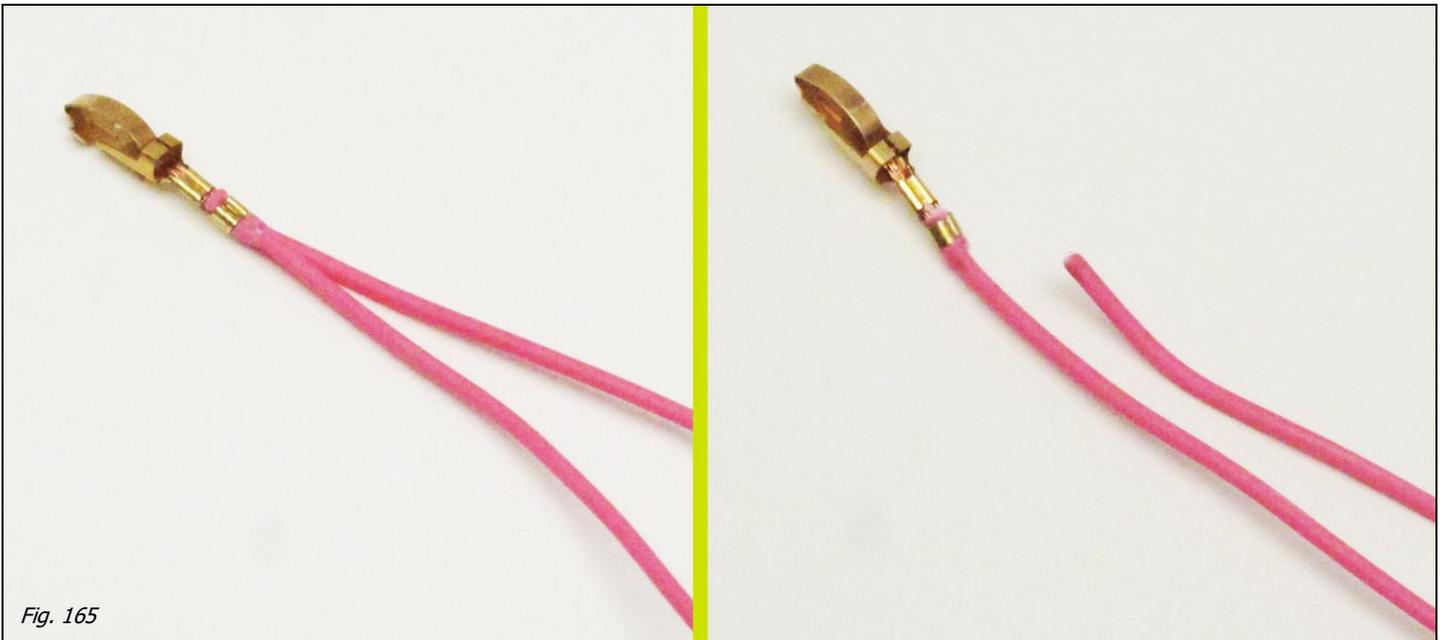
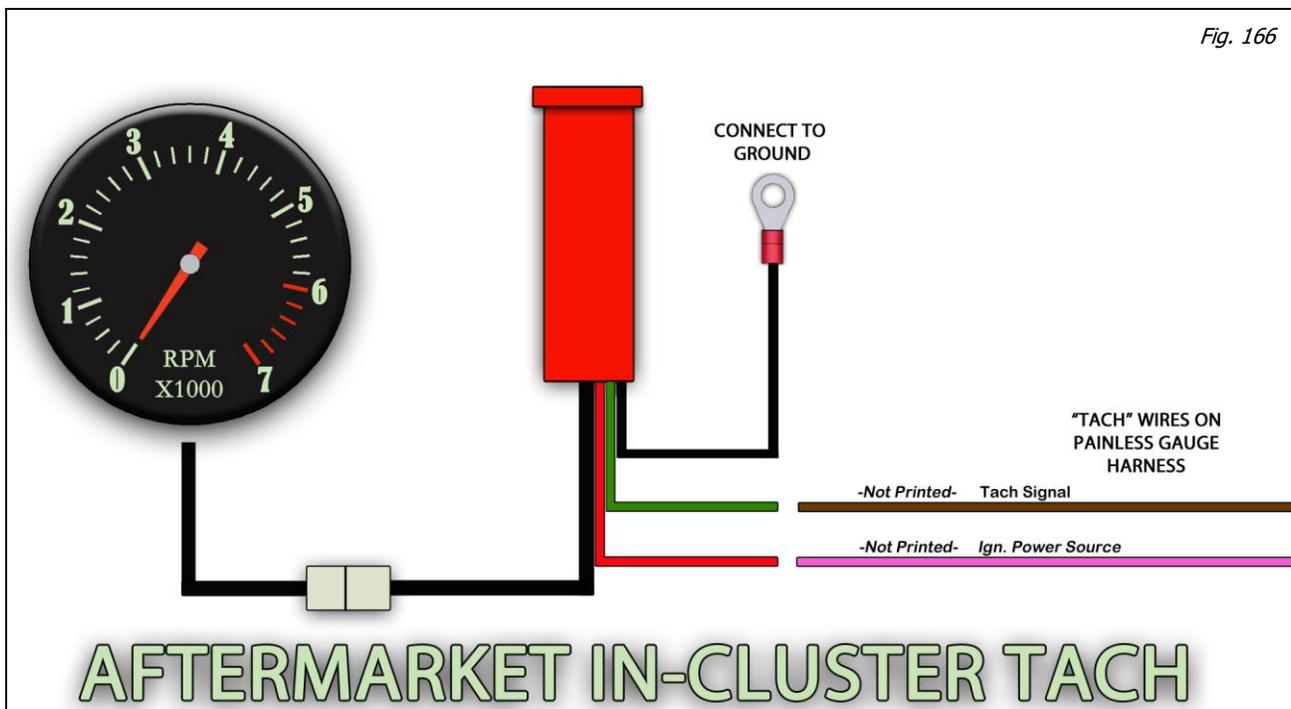


Fig. 165



- Plug the printed circuit connector into the back of the cluster. Refer to [Fig. 167](#) to see the orientation of the bigger lock of the connector.
- Connect the ground wire of the cluster harness to one of the mounting screws on the back of the cluster. This grounds the housing as well as provide ground to the panel lights.
- If your cluster is equipped with a clock, plug that connection in now.



## AFTERMARKET UNIVERSAL GAUGES

If you have aftermarket gauges installed in place of a factory gauge cluster, the terminals/connections found on the full sweep gauge cluster harness can be cut from the harness. The wires then can be connected to your aftermarket gauges. All pink wires of the gauge cluster harness provide gauges with a switched 12v power source from the 10-amp, GAUGES fuse on the fuse block.

The [Gauge Cluster Schematic](#) on [page 93](#) helps to identify the wires as the gauge cluster harness does not have any printed wires (see [Fig. 158](#)). The schematics beginning on [page 102](#) show you your options of distributing power and ground to the gauges.

## Aftermarket Gauges

An addition to the Painless harness, and not found on a factory harness, is a connection that provides 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 (see [Fig. 168](#)). If you have an aftermarket tach mounted in the actual gauge cluster, connection to this tach took place on [pages 96 or 98](#) (see [Fig. 163](#) & [Fig. 166](#)). If you are mounting gauges on the dash below the radio, on the console, steering column, etc., this connection is useful to you as you do not have to cut and splice into any of the other gauge wires on your new Painless harness.



This connection on the Painless harness consists of an eight-pin white connector with seven wires and has a section label reading "AFTERMARKET GAUGES." The wires in this connector, which can be seen in the [Gauge Cluster Schematic](#) on [page 93](#) (see [Fig. 158](#)), are:

**Black:** 16-gauge wire, printed **#969 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 18](#) (see [Fig. 28](#)).

**Gray:** 18-gauge wire, printed **#930 AFTERMARKET GAUGE LIGHT POWER**. This wire provides a power source for the gauge light(s). The gray #930 is tied to the other #930 wires coming from the headlight switch to things like the radio backlight/dim, panel lights, and gear indicator light. This wire has 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 70](#) (see [Fig. 126](#)).

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

**Tan:** 18-gauge wire, printed **#939 FUEL LEVEL SIGNAL**. This wire is a ground signal from a fuel level sending unit in the fuel tank. The resistance to ground varies on this wire according to how much fuel is in the tank. This wire can also be seen in the [Tail Harness Ground Schematics](#) on [pages 119](#) (see [Fig. 202](#)).

**Green:** 18-gauge wire, printed **#921 COOLANT TEMPERATURE SIGNAL**. This wire is a ground signal from the engine coolant sending unit. The resistance to ground varies on this wire according to engine temperature. This wire can also be seen in the [Ignition Switch Schematic](#) on [page 81](#) (see [Fig. 141](#)).

**Brown:** 18-gauge wire, printed **#923 TACH SIGNAL**. This wire is a ground signal from the negative (-) side of the ignition coil. This wire can also be seen in the coil/ignition connection diagrams on [pages 48-50](#).

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

A mating connector and terminals are provided to allow connections to be made to gauges without having to hard wire the chassis harness directly to the gauges (see [Fig. 169](#)).

The next few pages outline routing gauge power/ground and backlighting power/ground from the mating connector to the gauge(s).

- The included terminals require a 1/4" strip length on the wire they are being applied to and the use of rollover crimpers.
- Using the diagram pin out of the supplied connector, plug the wires going to your aftermarket gauges into their corresponding pin location (see [Fig. 170](#)). The terminals are inserted into the square opening of the connector and the pin locations are identified by the numbers printed above the round opening of the connector.



Fig. 169

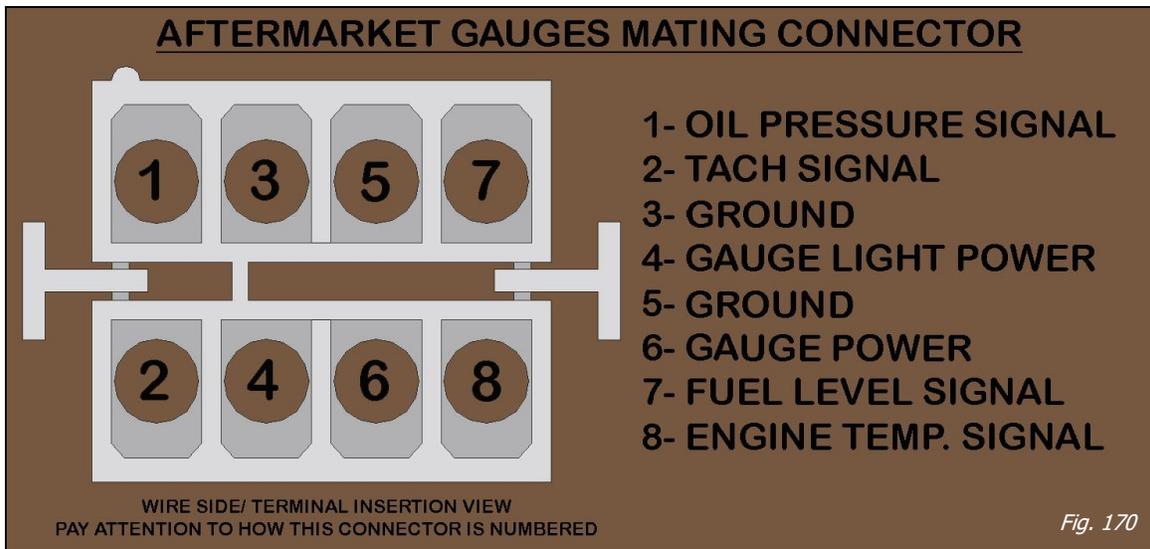


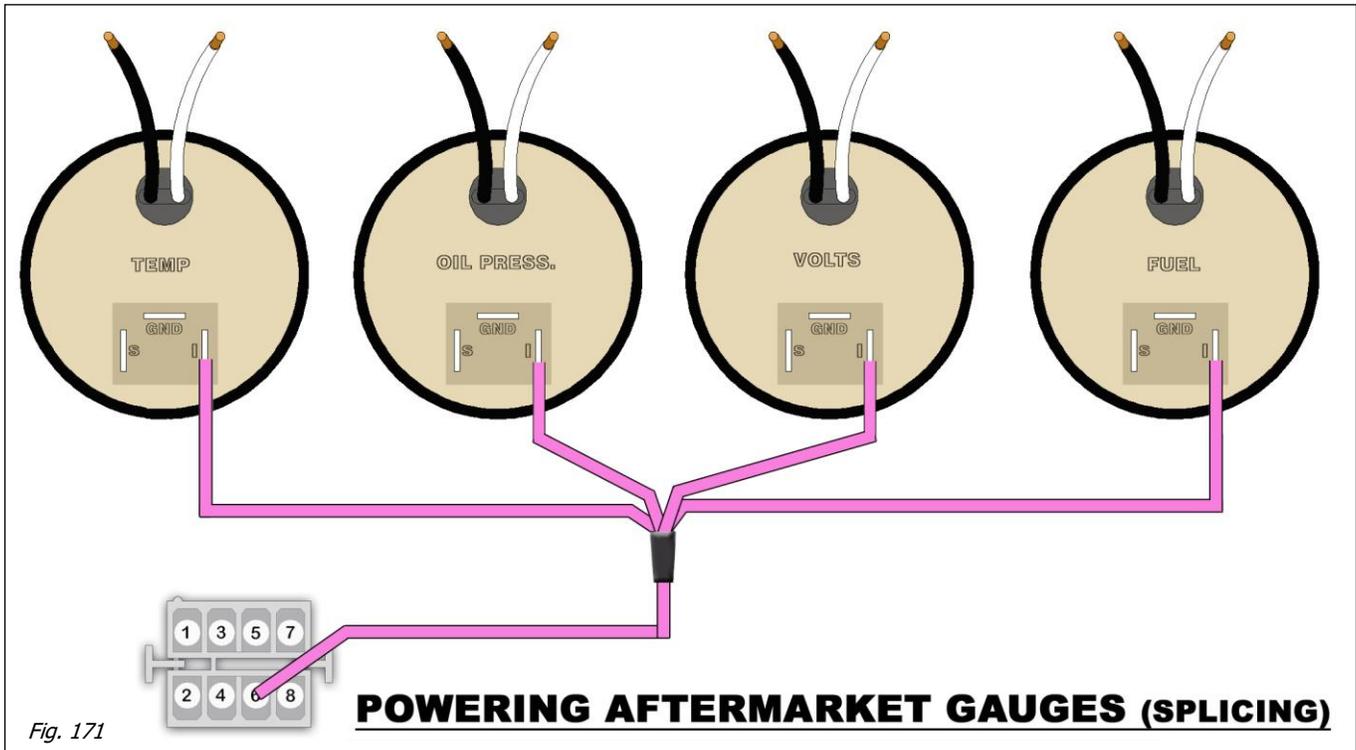
Fig. 170

## Wiring Aftermarket Gauges

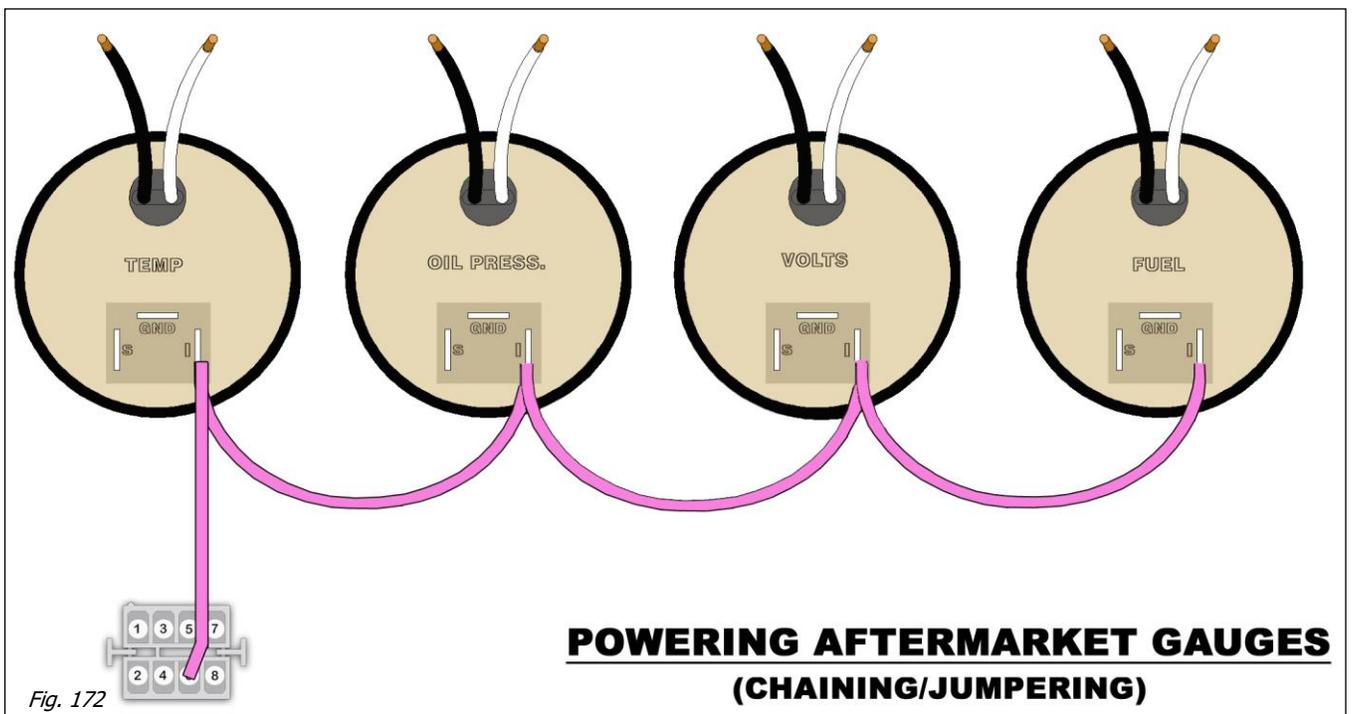
For those wiring aftermarket gauges, please be aware that wiring for actual connection to the gauges themselves is not provided with this harness. You can, however, use scrap wire cut off from previous connections of this chassis harness and insulated terminals from the parts kit. The following steps 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 all connect in the same manner to tachometers.

Power to the gauges needs to come from the pink **#935 GAUGE POWER** wire on the connector, **pin 6** in the diagram above. Power needs 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** (Fig. 171) - Splice off one wire from **pin 6** of the mating connector and wires to several gauges.



#2) **Chaining or Jumping** (Fig. 172) - 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 now have two wires in one terminal. This additional wire is routed 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 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, you can run your own ground circuit for gauge connections. To make these ground connections you splice from a single wire to all the gauges or chain/jumper it all together. Both methods are shown in the following two drawings (see [Fig. 173](#) & [Fig. 174](#)):

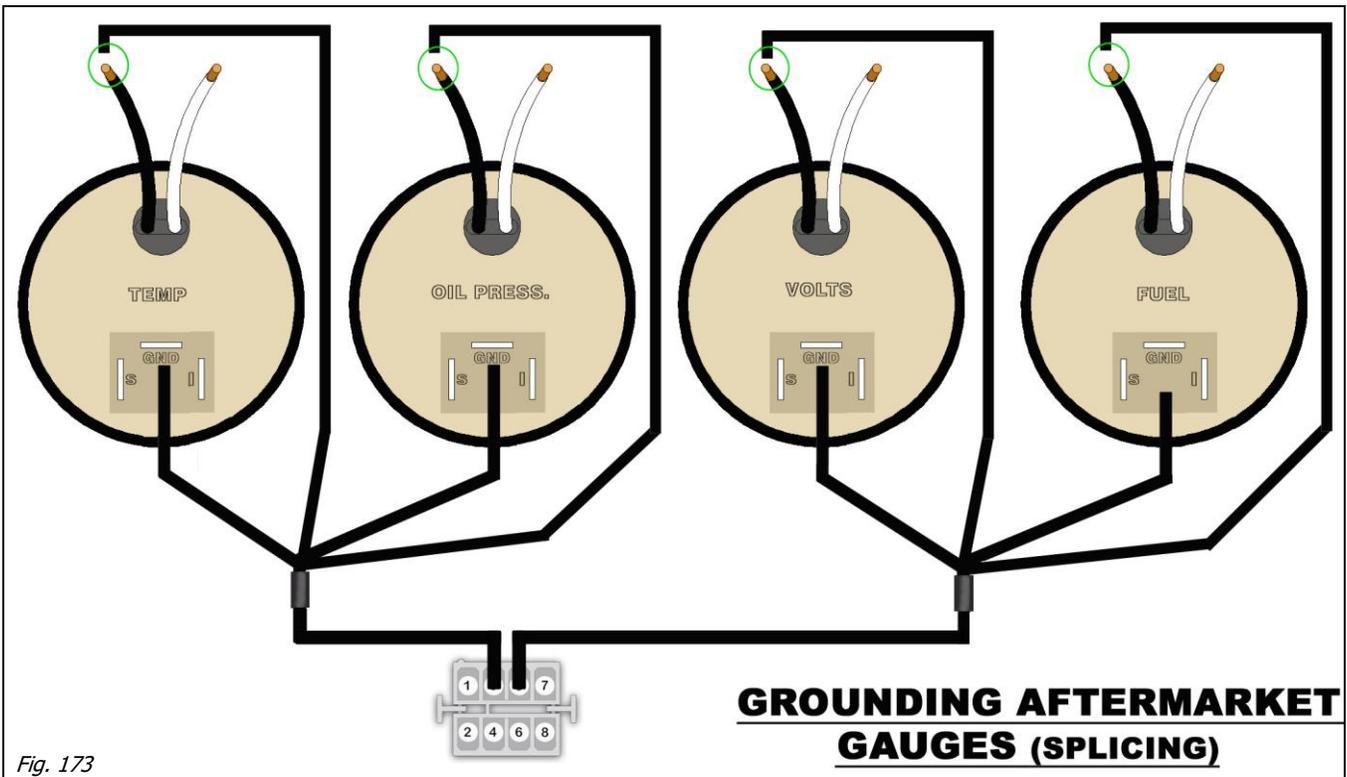


Fig. 173

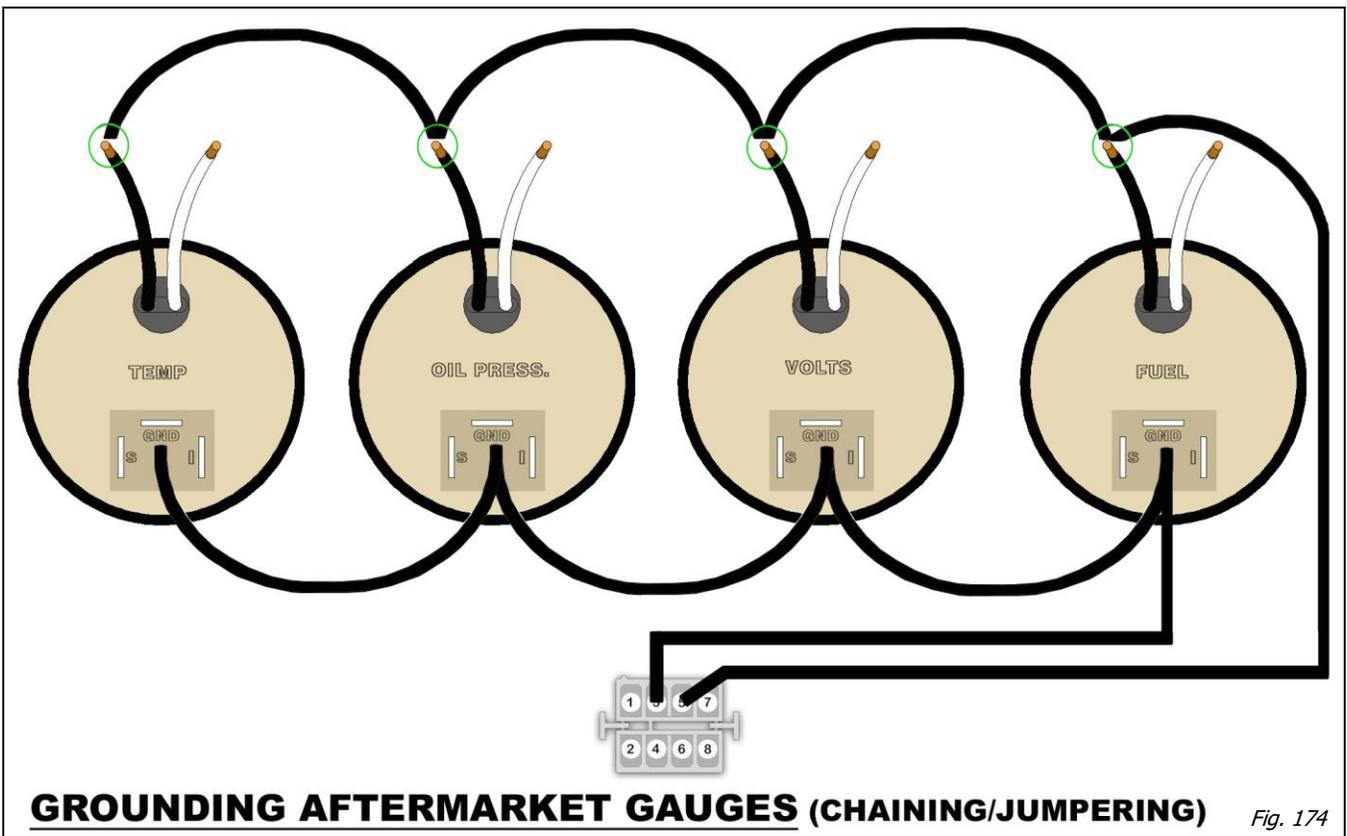
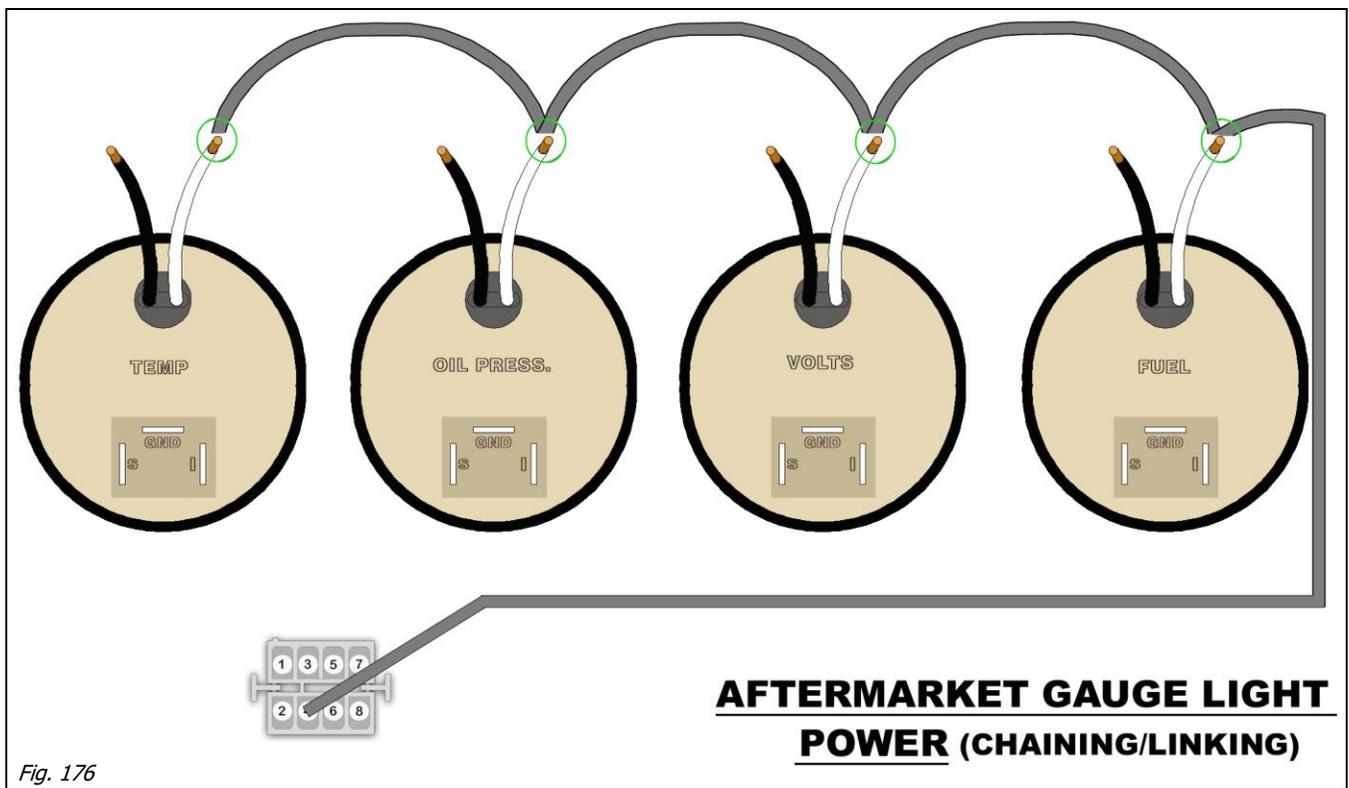
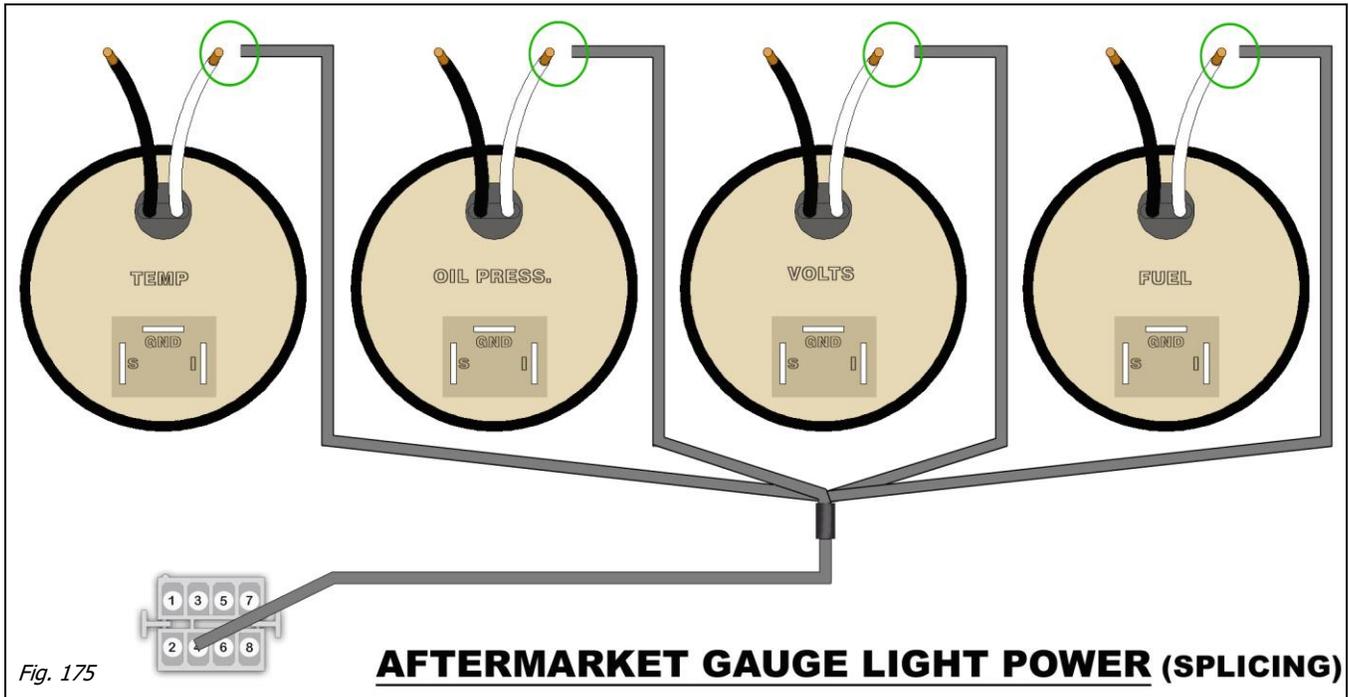
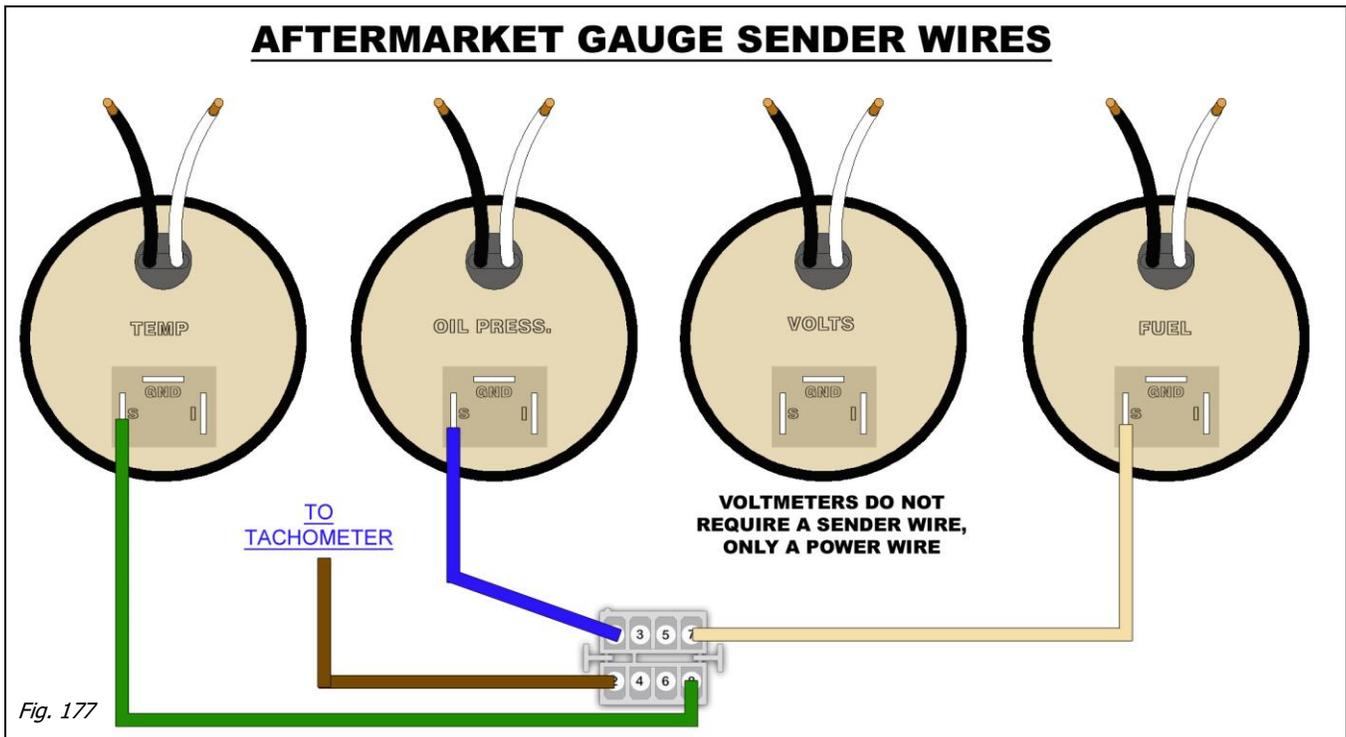


Fig. 174

Gauge light power is supported by **pin 4** of the mating connector. This wire connects 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 (see [Fig. 175](#) & [Fig. 176](#)):



The last connection to be made is the sending unit wires or signal wires. These wires come from the temperature sending unit, oil pressure sending unit, and fuel level sending unit. These signal wires come from **pin 1** (oil press), **pin 2** (tachometer), **pin 7** (fuel level), and **pin 8** (engine coolant temperature) (see [Fig. 177](#)).



## Radio

The radio connection on the Painless harness is set up for a universal application since most Chevilles 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:

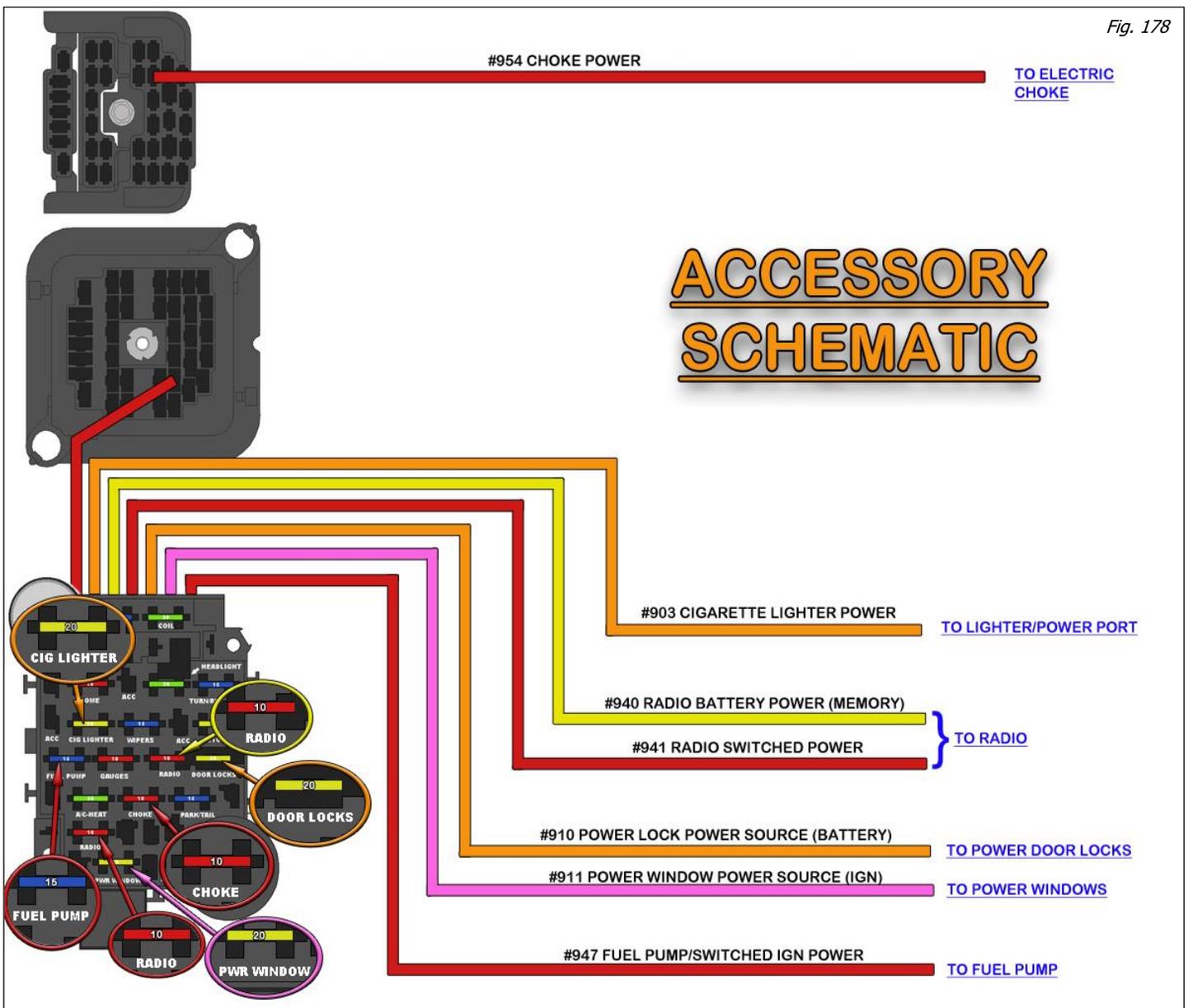
**Yellow:** 16-gauge wire, printed **#940 RADIO BATTERY POWER (MEMORY)**. This wire provides the radio a battery power source that allows the time and radio presets to remain every time the ignition is turned off. This wire comes from the 10-amp, RADIO fuse found towards the middle of the fuse block. This wire can be seen in the [Accessory Schematic](#) on [page 106](#) (see [Fig. 178](#)).

**Red:** 16-gauge wire, printed **#941 RADIO SWITCHED POWER**. This wire provides the radio with ignition switched power for operation. This wire has power when the ignition switch is in the ACCESSORY and ON/RUN positions, and 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 106](#) (see [Fig. 178](#)).

**Black/White:** 16-gauge wire, printed **#969 RADIO GROUND**. This wire supplies a ground source to the radio, and is part of the integrated ground circuit of the Painless harness. This wire can be seen in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

**Gray:** 18-gauge wire, printed **#930 RADIO BACKLIGHT DIM**. This wire provides a power signal to the radio to dim the back lighting/display during low light conditions. On older radios this power source illuminates 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 has 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 70 (see Fig. 126).

- For those reusing a factory radio, Yellow wire **#940** is not used. This wire needs to have the end taped /insulated to avoid shorts. The factory connector needs to be reused. Red **#941** connects to the factory yellow wire, Gray **#930** connects to the gray wire, and black/white **#969** connects to the black wire. Splices and quick disconnect terminals are provided in the parts kit.
- If you use 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.



## Heater Switch

The next connection is the power supply from the Painless harness to the blower switch. This connection is also used for a power source if you are installing an aftermarket A/C system.

The heater switch wires have a section label reading “HEATER” (see [Fig. 179](#)). There are two wires in this group with connectors pre-installed. The wires can be seen in the [Accessory Schematic](#) on [page 106](#) (see [Fig. 178](#)) and also in the [Heater Only Schematic](#) on [page 109](#) (see [Fig. 185](#)). These wires are:



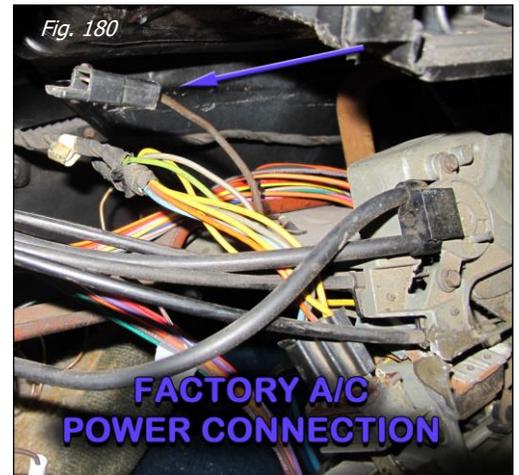
**Brown:** 14-gauge wire, printed **#904 HEATER SWITCH POWER INPUT**. This connection is a 30-amp, ignition switch power source, from the A/C-HEAT fuse on the fuse block.

**Orange:** 12-gauge orange wire printed **#967 BLOWER MOTOR POWER**. This wire has a one-pin, black connector pre-installed. This wire provides power to the blower motor from the blower switch and is needed by those with factory heater only vehicles.

Make the two connections of the HEATER group of wires to the inline connectors on the supplied blower switch harness or to the inline power connector on your factory A/C harness. **Those with factory A/C equipped vehicles will re-use your original harness.**

### Installs using factory A/C harness:

- As previously mentioned, 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 plugs directly into a factory/reproduction harness without any modifications.
- Locate the inline connector on the factory A/C harness (see [Fig. 180](#)). It is a one-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 is not needed.

### Installs using an aftermarket A/C:

The brown, **#904** wire provides a switched ignition power source your system may need. A connector and terminal have been provided to allow you to make a factory style connection to your aftermarket system (see [Fig. 181](#)).

- 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 orange, #964 wire is not needed with your application and may be removed from the harness. Once the power connection is made to the wiring of your aftermarket A/C unit, continue on to [page 109](#). Information there will provide your aftermarket A/C unit a power source for panel backlighting.

**Those using factory heater only systems:**

If you have a heater only system, locate the supplied blower switch sub-harness and remove it from the bag (see [Fig. 182](#)). **The supplied blower switch harness will ONLY work on vehicles that have heater only systems.**



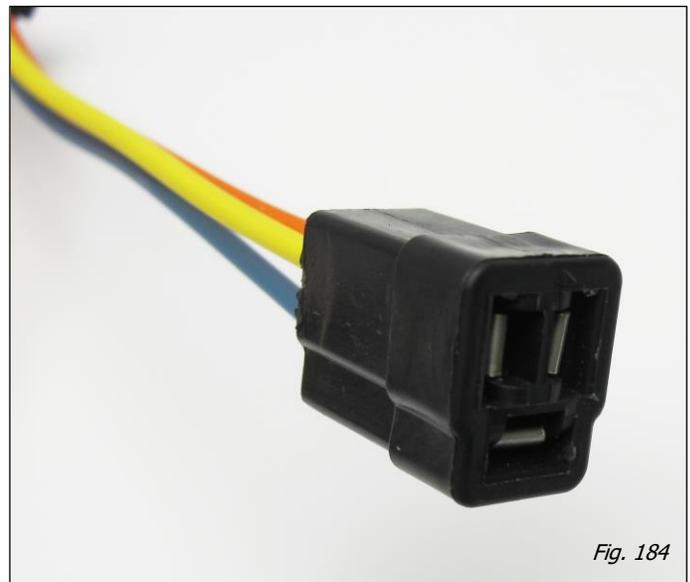
*Fig. 182*

- On the heater only sub-harness provided with this kit, connect the four-pin connector, labeled “BLOWER SWITCH” to the blower switch on the HVAC panel.
- Connect the brown #904 and orange #967 wires on the Painless chassis harness to the two single pin connectors coming from the blower switch connector. The brown wire connects to brown and orange to orange as seen in the [Heater Only Schematic](#) on [page 109](#) (see [Fig. 185](#)).
- Connect the four-pin connector, found on the sub-harness, to the blower switch (see [Fig. 183](#)).
- The remainder of the A/C harness, or blower switch sub-harness, routes to the passenger side of the vehicle with the remainder of the chassis harness.
- Connect the three-pin connector found on the sub-harness to the blower motor resistor (see [Fig. 184](#)).



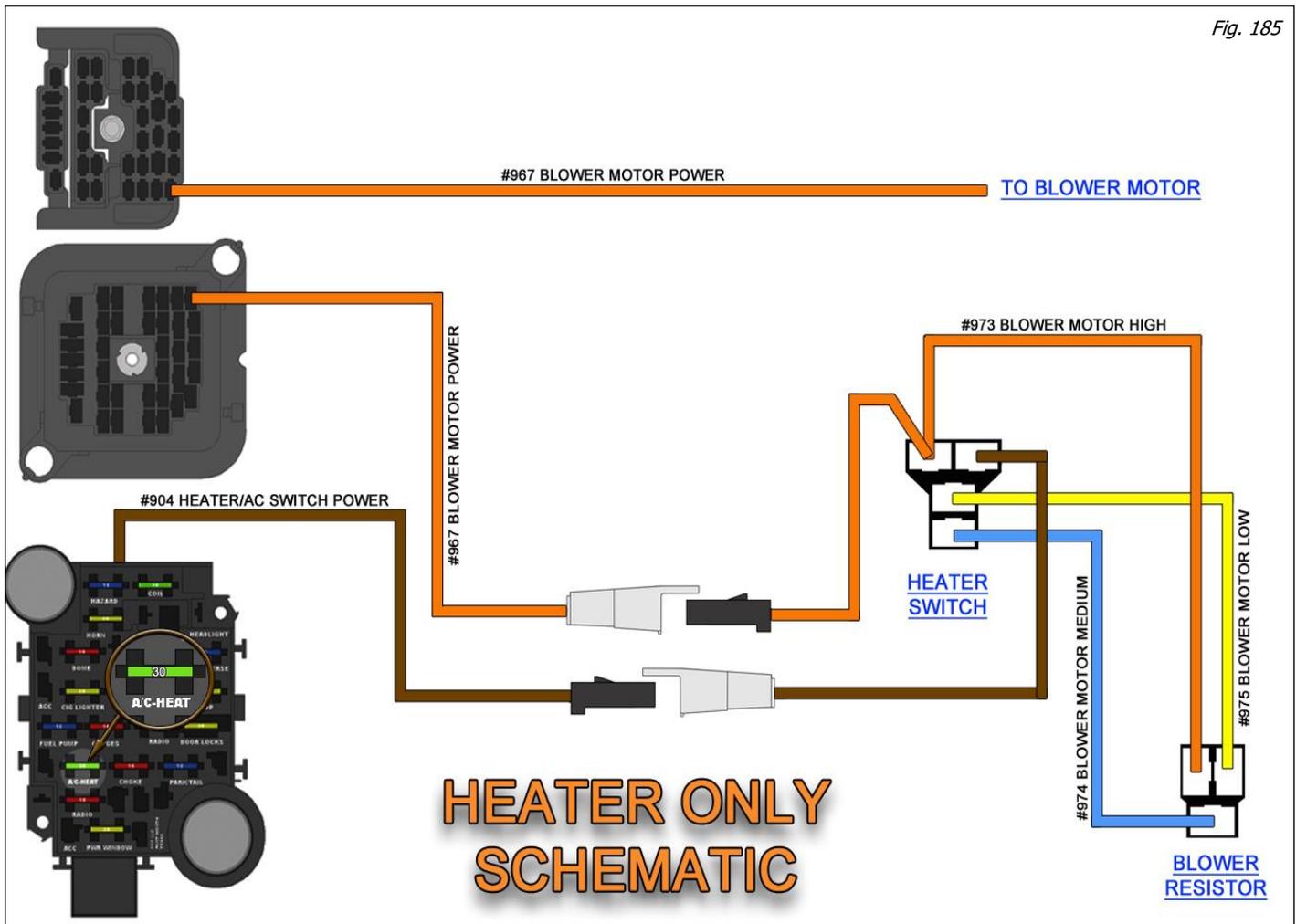
*Fig. 183*

**Blower Switch**



*Fig. 184*

**Blower Resistor**



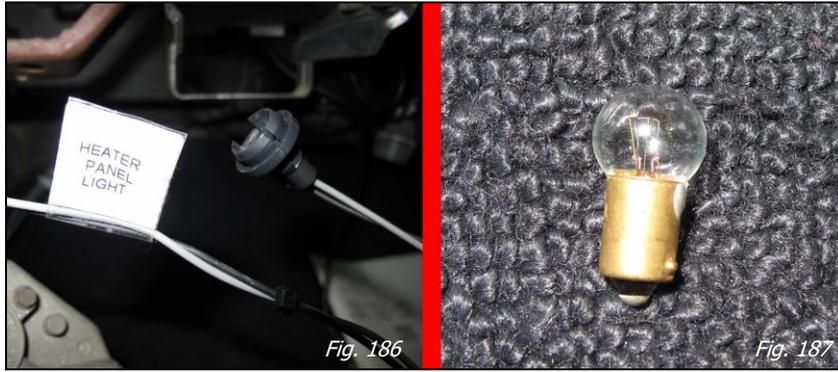
## Heater Panel Light

The next connection on the new Painless chassis harness is the panel light. This connection provides 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.

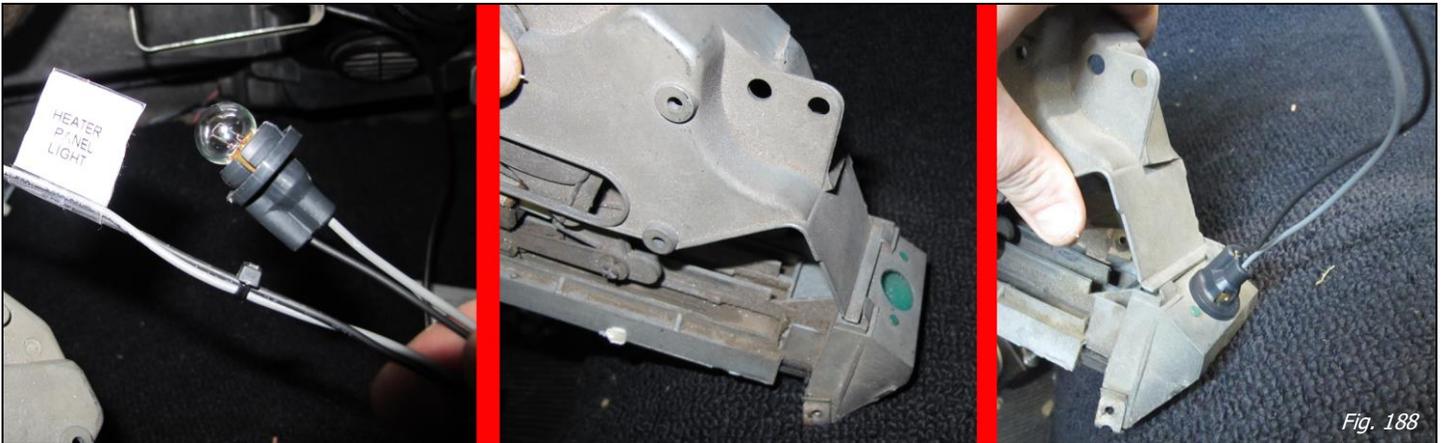
The panel light connector has a section label reading "HEATER PANEL LIGHT" (see [Fig. 186](#); page 110). This is a pre-installed two-pin black socket. The wires in the socket are:

**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 70 (see [Fig. 126](#)).

**Black:** 18-gauge wire (wire is not printed). This wire provides a ground source for the light and comes from a splice that is tied to the interior ground wire. This panel light ground and the other interior ground wires and splices, can be seen in the [Ground Schematic](#) on page 18 (see [Fig. 28](#)).



- Locate a small bulb from the parts kit and install it into the socket (see [Fig. 187](#)). A small dab of dielectric grease on the bulb base before installation helps with bulb removal later down the road should the bulb ever burn out.
- Insert the socket, with the bulb installed, into the panel lamp hole on the back of the A/C or blower switch panel (see [Fig. 188](#)).



### Installs using an aftermarket A/C

- If you are using an aftermarket A/C system, which may require a power source for illumination to the panel, the gray #930 wire provides the illumination power source.
- Remove the socket from the Painless harness, connect the gray wire to the illumination wire coming from the A/C control panel. The black ground wire is not used.

### 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, and most sockets have been replaced by aftermarket sockets.

The Cigarette Lighter/Power Port connection is two wires with a section label reading “CIG. LIGHTER.” These wires are:

**Orange:** 16-gauge wire, printed #903 CIGARETTE LIGHTER POWER. This wire provides 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 the [page 106](#) (see [Fig. 178](#)).

**Black:** 16-gauge wire, printed **#969 CIGARETTE LIGHTER GROUND**. This wire provides a ground source and is tied into the integrated ground circuit. The wire can be seen in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

- 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 found at most local parts store (see [Fig. 189](#)).

For those with a factory socket, you can cut the connector and ground from your factory harness. Leave 3" or 4" of wire to create a pigtail and splice them to the orange **#903** and black **#969** wires of the Painless harness (see [Fig. 190](#)). Splices have been provided in the parts kit.



Fig. 189



Fig. 190

## Passenger Courtesy Light

This connection allows 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. Whether or not your vehicle came equipped with them from the factory does not affect these working properly, because they have been pre-wired into the Painless harness.

This connection has a section label reading "COURTESY LIGHT." It is a large gray colored lamp socket with four wires pre-wired to it (see [Fig. 191](#)). These wires can be seen in the [Courtesy/Dome Light Schematic](#) on the [page 75](#) (see [Fig. 135](#)). These wires are:

**(2) Orange:** 18-gauge, printed **#971 COURTESY LIGHT POWER**. This wire draws power from the console connector, which is supplied power from the 10-amp, DOME fuse on the fuse block. This fuse has battery power and is "hot" at all times. The other wire in this socket, printed **#971 GLOVE BOX LIGHT POWER**, provides power to the glove box switch.



Fig. 191

**(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 and causes the light to illuminate. This ground comes 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. The other wire in this connection, printed **#961 PASS. DOOR JAMB SWITCH**, provides a ground source to the **#961** circuit from the passenger door jamb switch

This light socket uses either a 63 and 67 series bulb; a 67 series bulb has been included with this kit.

- 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 cable ties, provided with this kit, may also come in handy if a suitable location for the light socket cannot accommodate mounting with a screw.

## Glove Box Switch

The glove box switch is a simple plunger activated light that illuminates the inside of the glove box when the glove box door is opened. The Painless harness includes a factory style connector pre-installed. The wires in this connector are:

**Orange:** 18-gauge wire, printed **#971 GLOVE BOX LIGHT POWER**. This wire provides power to the switch through a couple of doubled up wire connections from the passenger Courtesy light and the console connector. Power for this wire comes from the 10-amp, DOME fuse.

**Black:** 16-gauge wire, printed **#969 GLOVE BOX LIGHT GROUND**. This wire provides a ground source and is tied into the integrated ground circuit. The wire can be seen in the [Ground Schematic](#) on [page 18](#) (see [Fig. 28](#)).

- Route this connection to the top of the glove box and connect; it does not matter which way the connector goes on (see [Fig. 192](#)).

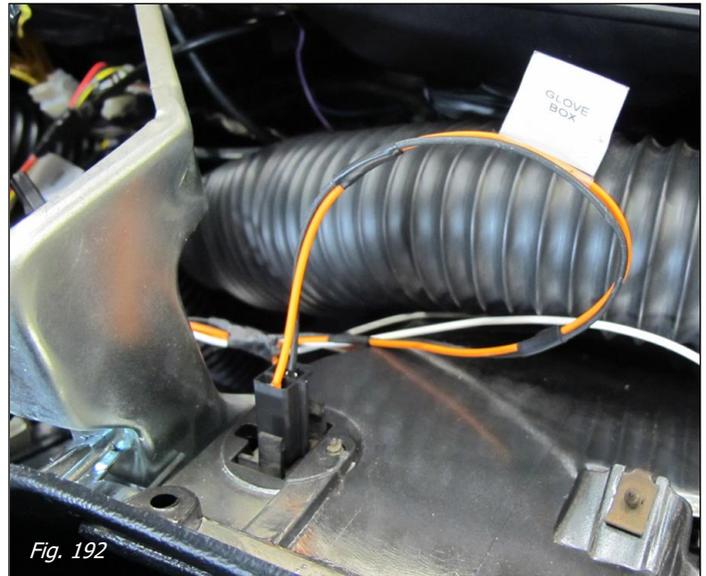


Fig. 192

## Passenger Side Door Jamb Switch

The passenger side door jamb switch is the last connection on the passenger side of the vehicle's interior (see [Fig. 193](#)).

The passenger side door jamb switch is a one-wire connection with a small insulated terminal pre-installed; this wire section reads "PASS DOOR JAMB SWITCH." This wire is:

**White:** 16-gauge, printed **#961 PASS. DOOR JAMB SWITCH**. This wire provides a ground source from the jamb switch to the courtesy lights and the dome light. This ground activates the lights, causing them to illuminate when the door is open. This wire can be seen in the [Courtesy/Dome Light Schematic](#) on [page 75](#) (see [Fig. 135](#)).

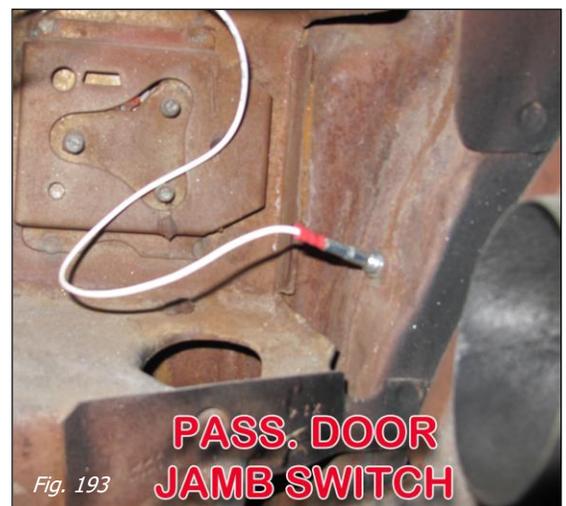


Fig. 193

- Route this white #961 wire to the passenger side door jamb switch and connect. You may find that there is extra length on this wire; this is to account for those with aftermarket AC mounted under the dash.

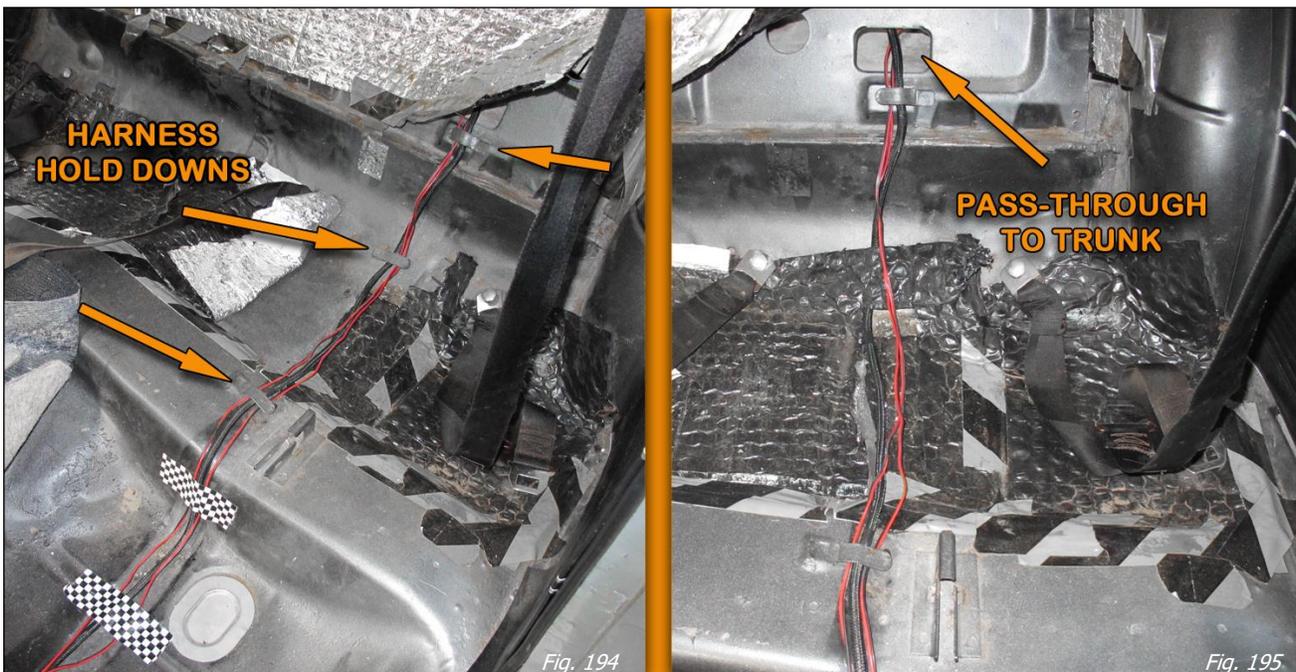
## Tail Section

The last portion of the interior harness is the length of wire found coiled at the fuse block that was skipped on [page 66](#). These are wires for the rear exterior lights, the dome light, and a power wire for a trunk light if your car is so equipped.

- If an electric fuel pump is being used, and power is not provided by a fuel injection harness, the red wire, found in the ACC SECTION and printed **#947 FUEL PUMP/SWITCHED IGN POWER**, is then routed to the rear of the vehicle with the Tail light section. Once in the Trunk, this wire can exit the tail light panel, with the fuel sending unit wire to go underneath the car to the electric fuel pump.
- In order to properly route the tail harness to the trunk, the driver seat/bench seat and the rear seat (back and bottom) need to be removed. This allows the carpet to be pulled up and folded out of the way and allows access to the driver side floor pan.
- With the seats out of the way, the harness can be routed under the carpet and to the trunk (see [Fig. 194](#)). Use tape and the factory floor mounted harness hold downs to keep the harness in place.

The red wires in [Fig. 194](#) are speaker wires running to the speakers located in the package tray; **these wires are not included in the Painless harness. If your speaker wires were removed during the removal of the factory harness, be sure to re-install them now.** The pre-installed loom on the tail harness is not taped to allow routing the speaker wire inside the loom with the rest of the tail harness.

- Once routed to the back seat area, pass the tail harness through the large rectangular opening above the harness hold down and into the trunk (see [Fig. 195](#)).



## Dome Light

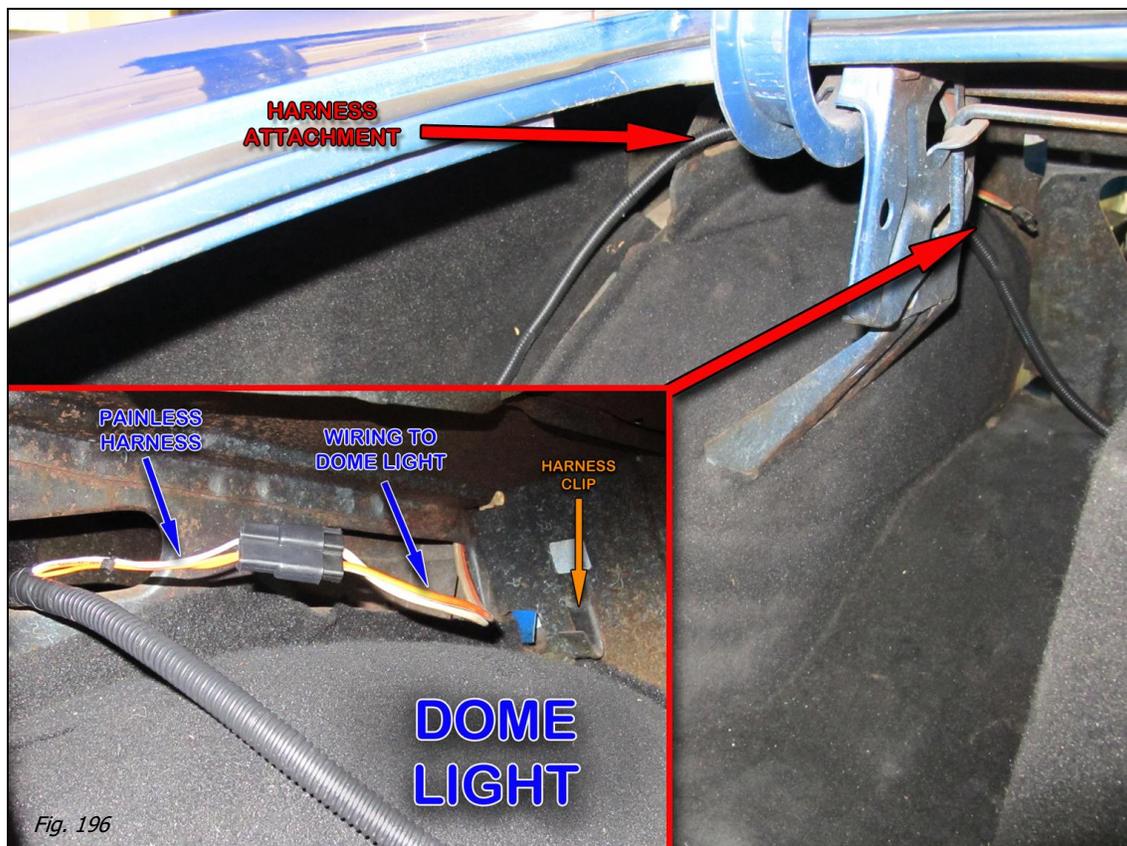
The dome light has constant battery applied to it. This light, along with the under dash courtesy lights, are ground activated by the door jamb switches and also by turning the headlamp knob counter clockwise.

The two wires of the Painless harness designated for dome light connections have a two-pin black connector pre-installed. These wires plug into the factory dome light harness that runs from the dome light, behind the headliner, and into the trunk. These wires can be seen in [Tail Section Schematic](#) on the [page 118](#) (see [Fig. 201](#)). They are:

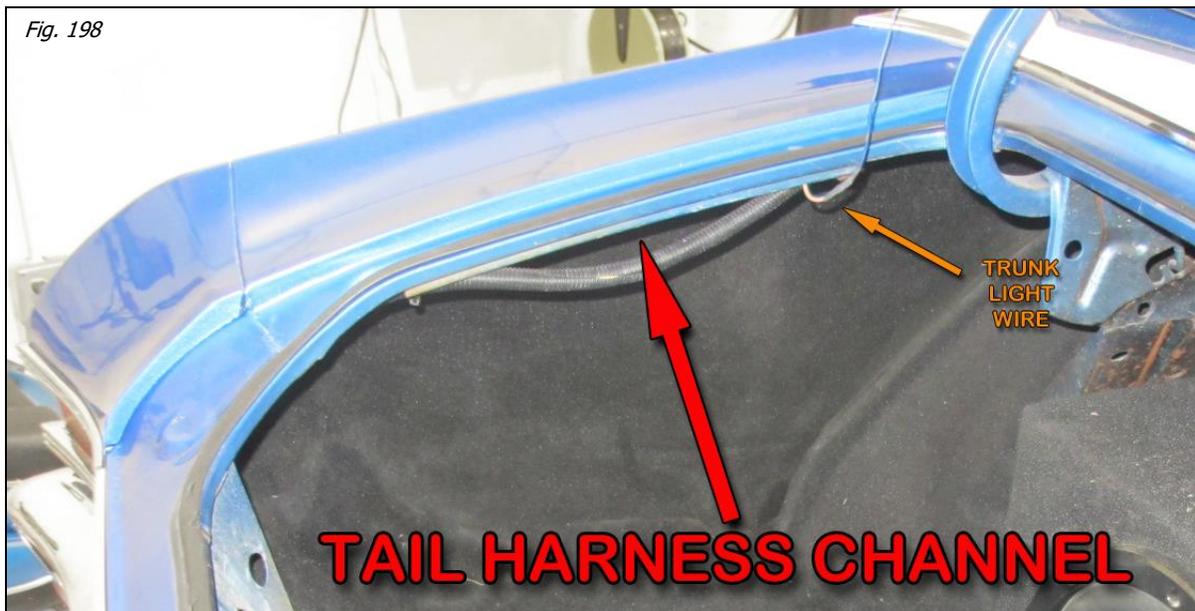
**(2) Orange:** 18-gauge wire, printed **#971 DOME LIGHT POWER**. This power wire comes from the 10-amp, DOME fuse on the fuse block; this fuse has battery power and is hot at all times. This wire can also be seen in the [Courtesy/Dome Light Schematic](#) on [page 75](#) (see [Fig. 135](#)). Another orange wire leaves this connector, printed **#946 TRUNK LIGHT POWER**. This wire provides a power source to the trunk/deck lid mounted light.

**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 comes from either door jamb switch or the headlight switch. This wire can also be seen in the [Courtesy/Dome Light Schematic](#) on [page 75](#) (see [Fig. 135](#)).

- From the trunk, route the tail harness up towards the driver side, rear wheel well, behind the trunk hinge. The factory wires coming from the dome light can be seen in this area.
- Plug the Painless harness into the connector for the dome light (see [Fig. 196](#)). There is also a factory mounted harness clip that can be used to help hold the tail harness in place.



- Route the tail light harness section towards the tail panel of the trunk. The harness needs to be attached to the quarter panel brace (see [Fig. 197](#)). A small 1/4" hole can be drilled and a cable tie clip, like those used in the engine compartment, can be installed or you can simply install a large cable tie around the harness and to the brace.
- The tail harness needs to route to the rear of the car along the harness channel found on the driver side of the trunk opening (see [Fig. 198](#)). See the trunk light information below before routing the tail harness in this channel.



## Trunk Light

Some vehicles have a trunk light mounted to the underneath side of the trunk lid (see [Fig. 199](#)). This light requires a single power wire for proper operation. This wire can be seen in the [Courtesy/Dome Light Schematic](#) on page 75 (see [Fig. 135](#)) and the [Tail Section Schematic](#) on page 119 (see [Fig. 202](#)), it is:

**Orange:** 18-gauge wire, printed **#946 TRUNK LIGHT POWER**. This wire receives power from the 10-amp, DOME fuse on the fuse block through a connection at the dome light connector; this wire has battery power and is "hot" at all times.



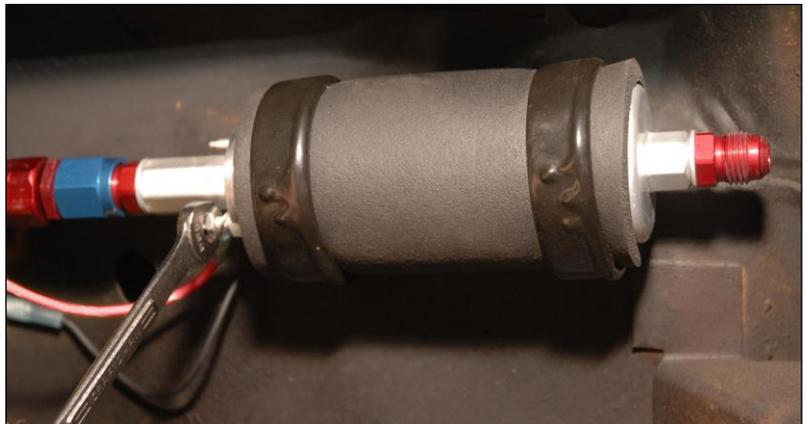
- If a trunk light is not being used on your vehicle, install an insulated splice on the end of this wire to keep it from shorting to ground. With the wire now insulated, insert the wire into the loom on the tail harness to hide and secure it. Route the tail harness to the tail panel in the aforementioned channel.
- Those with a trunk light, connect this **#946** wire to the wire coming from the trunk light socket. The wire from the trunk light socket should exit the trunk/deck lid close to the driver side hinge.
- Using a one-pin connector and mating terminal from the parts kit, connect the **#946** wire to the wire coming from the trunk light socket.
- The tail harness can now be routed to the tail panel in the aforementioned channel.

## Fuel Pump Add on

The third wire in the rolled up section, labeled “ACC,” is provided to allow a power connection to an electric fuel pump. This wire is:

**RED:** 14-gauge wire, printed **#947 FUEL PUMP POWER**. This wire provides a power source to an electric fuel pump. This wire comes from the 15-amp, FUEL PUMP fuse on the fuse block and only has 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 an insulated terminal from the parts kit and tape the wire up into the harness. Also, remove the fuse from the fuse block and proceed to the next connection. If an electric fuel pump is being used, route the red **#947** wire to the power or + post/tab/wire of the fuel pump. The easiest way to do this is by routing the **#947** to the rear of the car with the Tail harness, as it is installed on [page 113](#). Once in the trunk area, route the **#947** out the hole in the tail panel where the fuel sending unit wire exits the trunk from.
- Use an insulated terminal 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 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 insulated terminals from the parts kit and a length of scrap wire created during a previous connection. Simply connect 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 Harness Connector

This is a black, eight-pin connector. All wires can be seen in [Tail Section Schematic](#) on page 119 (see Fig. 202). They are:

**Yellow:** 16-gauge wire, printed **#949 REAR LEFT TURN SIGNAL POWER**. This wire provides power to the left turn signal. This wire has power anytime the turn signal is in the down position and the ignition switch is in the *ON/RUN* position or anytime the hazard switch is activated. This wire is also the brake light power and has power anytime the brake pedal is pressed. This wire can be seen in the [Turn Signal Schematic](#) on page 78 (see Fig. 138).

**Green:** 16-gauge wire, printed **#948 REAR RIGHT TURN SIGNAL POWER**. This wire provides power to the right turn signal. This wire has power anytime the turn signal is in the up position and the ignition switch is in the *ON/RUN* position or anytime the hazard switch is activated. This wire is also the brake light power and has power anytime the brake pedal is pressed. This wire can be seen in the [Turn Signal Schematic](#) on page 78 (see Fig. 138).

**Tan:** 18-gauge wire, printed **#939 FUEL LEVEL SENDING UNIT**. This wire sends a ground signal from the fuel level sending unit to wires for the fuel gauge at the gauge cluster and aftermarket gauge connector. This wire is seen in the [Gauge Cluster Schematic](#) on page 93 (see Fig. 158).

**Black:** 14-gauge wire, printed **#969 GROUND SUPPLY TO REAR LIGHTS**. This wire provides a ground source for the rear lights. It comes from a splice that is tied to a series of other splices that in turn tie all the grounds in this harness together. This wire, along with all the other ground wires and splices, can be seen in the [Ground Schematic](#) on page 18 (see Fig. 28).

**Brown:** 16-gauge wire, printed **#927 TAIL LIGHT POWER**. This wire will provide the tail lights and license plate light power. This wire receives power from the headlight switch and has power anytime the headlight switch is pulled into the first or second positions. This wire can also be seen in the [Headlight Switch Schematic](#) on page 70 (see Fig. 126).

**Light Green:** 16 gauge wire, printed **#956 REVERSE LIGHT POWER**. This wire will provide power to the reverse or back up lights. This wire receives power from the reverse switch and has power anytime the shifter is in the *REVERSE* position.

**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 also seen in the [Courtesy/Dome Light Schematic](#) on page 75 (see Fig. 135).

**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 comes from either the door jamb switch or the headlight switch. This wire can also be seen in the [Courtesy/Dome Light Schematic](#) on page 75 (see Fig. 135).

- This connector plugs into the new tail harness supplied with this kit. Locate that tail harness now.

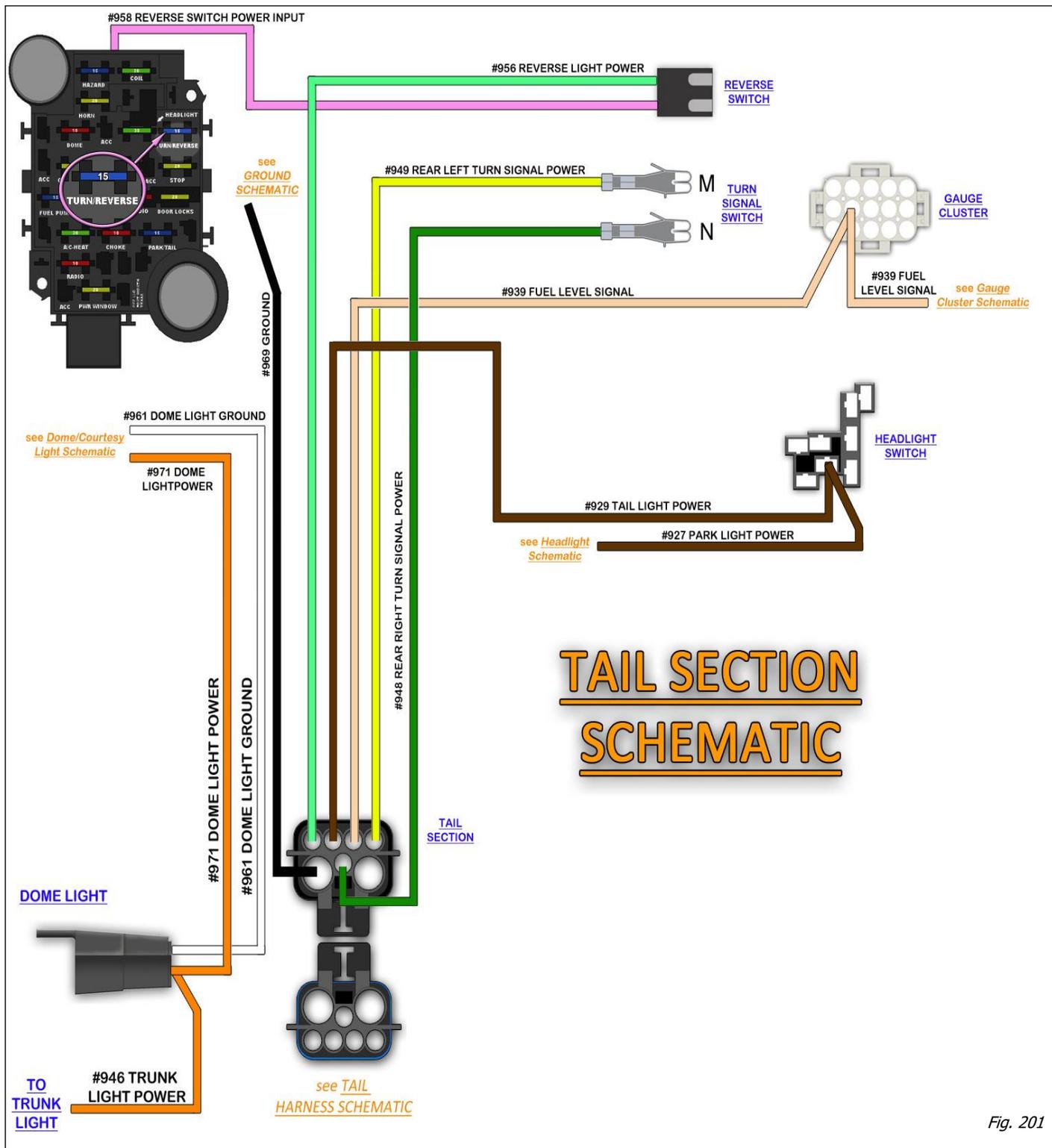


Fig. 201

SEE TAIL SECTION SCHEMATIC

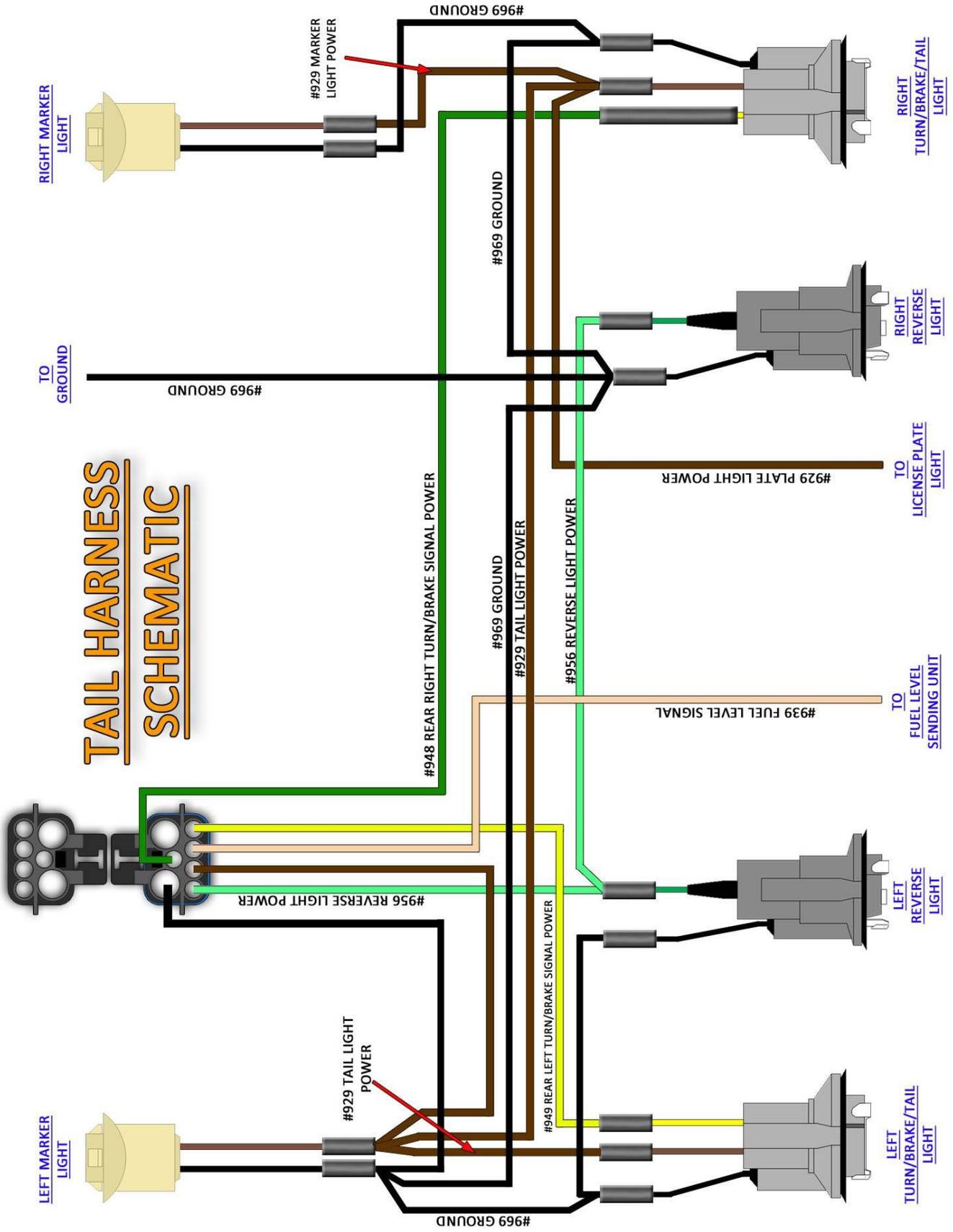
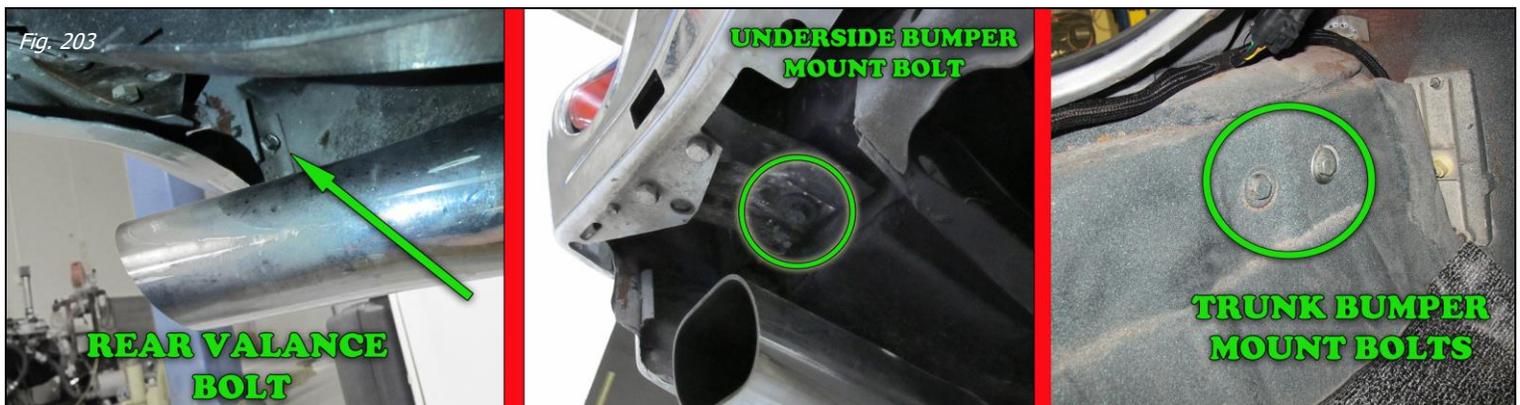


Fig. 202

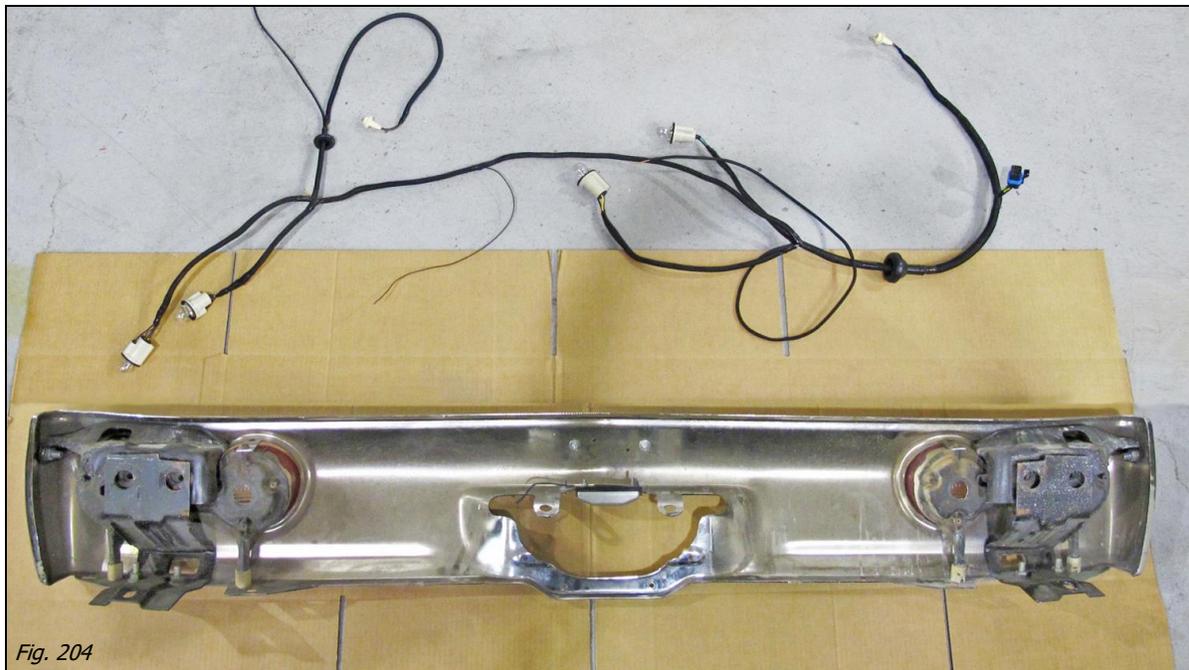
## TAIL HARNESS

- Begin by ensuring you have the correct tail harness for your application. Do this by examining the white label near the black connector on the supplied tail sub-harness. The section label should read “**1970-72 CHEVELLE WH-520.**” WH-520 is simply an internal part number used by Painless to help us identify sub-harnesses. If you find that you do not have the correct sub-harness, please contact the Painless tech line at 1-800-423-9696.
- Connection of this sub-harness requires the rear bumper to be removed from the car. This entails using a 5/8” socket and removing the lower valance bolt, bottom bumper mount bolt, and the two bolts inside the trunk on both sides of the car (see [Fig. 203](#)).

**Painless highly recommends that a second person aid in the removal and installation of the bumper.**



- Once removed, lay the supplied tail harness along the bumper. **Making sure the black connector is on the same side of the bumper as the left turn signal** (see [Fig. 204](#)). Make sure to set the chrome side of the bumper on a towel or cardboard to avoid scratching.



- Connections to the turn/brake/tail lights, license plate light, and reverse lights are made at this time. The marker lights and ground are fished back up into the trunk when the bumper is re-installed. The fuel level sending unit is then connected when the bumper is re-installed.

## Left Turn/Brake/Tail Light

The left turn/brake/tail light connection has a three-wire socket pre-installed. These wires can be seen in the [Tail Harness Schematic](#) on page 119 (see Fig. 202). They are:

**Yellow:** 18-gauge wire, printed **#949 REAR LEFT TURN/BRAKE SIGNAL POWER**. This wire is the turn signal power as well as the brake light power. This wire has 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 has battery power anytime the brake pedal is pressed.

**Brown:** 18-gauge wire, printed **#929 TAIL LIGHT POWER**. This is a power wire for the tail light function. This wire has power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position.

**(2) Black:** 16 & 18-gauge wires, printed **#969 GROUND**. This wire provides a ground source for the rear lights and comes from a splice that is tied to a series of other splices. This series, in turn, ties all the grounds in this harness together.

- Locate an 1157 bulb from the parts kit. This is one of the larger bulbs with two filaments and two contacts on the bottom. Apply a very small amount of the provided dielectric grease to the bulb base, and insert the bulb into the socket pre-installed on the tail harness.

- While paying attention to the keyway on the tail light housing and the keying on the tail light socket, insert the socket into the tail light housing, and turn 1/4 turn.

## Driver Reverse Light

This connection has a section label reading "REVERSE LIGHT" and a one-pin lamp socket pre-installed. This can be seen in the [Tail Harness Schematic](#) on page 119 (see Fig. 202). It is:

**(2) Light Green:** 18-gauge wires, both printed **#956 REVERSE LIGHT POWER**. These wires provide power to the reverse or back up lights. One wire receives power from the reverse switch and has power anytime the shifter is in the REVERSE position. The other wire in this connector provides power over to the passenger side reverse light.

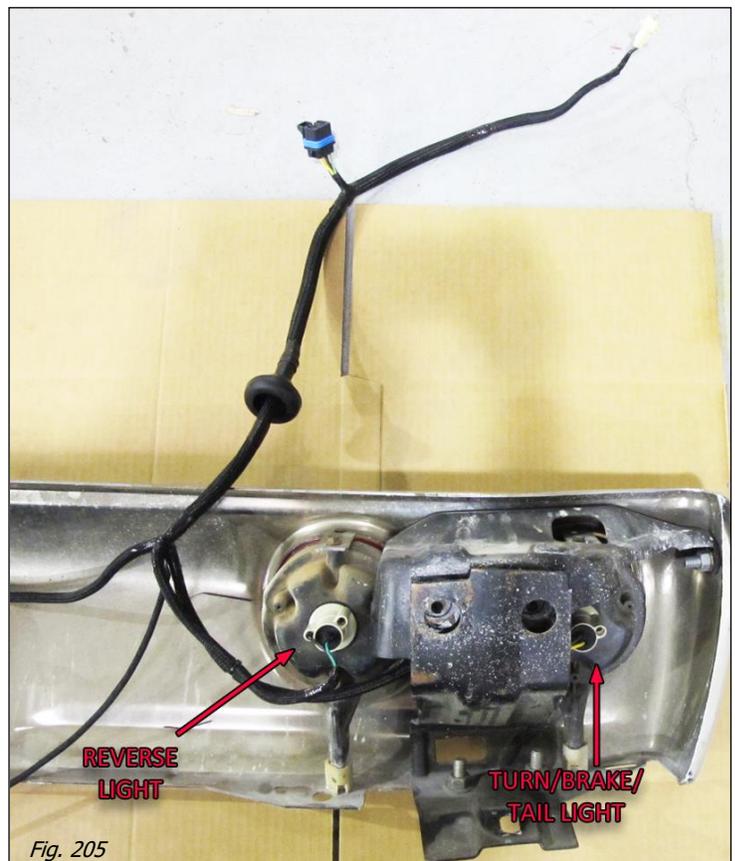


Fig. 205

**Black:** 18-gauge wire, printed **#969 GROUND**. This wire provides a ground source for the reverse lights and comes from a splice that is tied to a series of other splices. This series, in turn, ties all the grounds in this harness together.

- Install a single-filament, 1156 bulb from the parts kit into the reverse light socket and remember to use a little dielectric grease on the bulb base.
- Paying attention to the keyway on the reverse light housing and the key on the reverse light socket, insert the socket into the light housing with the clear lens, and turn 1/4 turn (see [Fig. 205](#); [page 121](#)).

## **License Plate Light**

The plate light is the next connection you make. The light only requires one wire, as the light socket grounds itself through the housing. The wire in the Painless harness for this function has a label reading “PLATE LIGHT.” This wire is:

**Brown:** 18-gauge wire, printed **#929 PLATE LIGHT POWER**. This wire provides power for the license plate light function. This wire has 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 119](#) (see [Fig. 202](#)).

- Locate the wire coming from the license plate light.

If you do not have a factory wire coming from the plate light, extra length is given to the **#929** wire to allow it to be routed directly to the license plate light or whatever length of wire may be coming from the plate light.

- A one-pin connector and terminal are provided in the parts kit (see [Fig.206](#)). Install this terminal and connector onto the **#929 PLATE LIGHT POWER** wire. Then, connect it to the one-pin connector found on the factory wire coming from the plate light.
- Insulated terminals and splices from the parts kit can be used by those who have a plate light which has had the factory connector cut.
- Use the cushion clamps provided in the parts bag on the mounting bolts to the license, plate light, or bumper emblem to secure the tail light harness to the bumper.



## Passenger Reverse Light

The reverse light connection has a one-pin lamp socket pre-installed, and can be seen in the [Tail Harness Schematic](#) on [page 119](#) (see [Fig. 202](#)). It is:

**Light Green:** 18-gauge wire, printed **#956 REVERSE LIGHT POWER**, this wire will provide power to the reverse or back up lights. One wire receives power from the other reverse light wire on the driver side and has power anytime the shifter is in the *REVERSE* position.

**(3) Black:** 10, 16, & 18-gauge wires, all printed **#969 GROUND**. These wires provide a ground source for the reverse lights and come from splices that are tied to a series of other splices. This series, in turn, connects all the grounds in this harness together.

- Connect this socket according to the instruction given for the reverse lights on [page 121](#).

## Right Turn/Brake/Tail Light

The last connection left to discuss is for the Right Turn/Brake/Tail Light. This connection has a two-wire socket pre-installed. These wires can be seen in the [Tail Harness Schematic](#) on [page 119](#) (see [Fig. 202](#)). They are:

**Green:** 18-gauge wire, printed **#948 REAR RIGHT TURN/BRAKE SIGNAL POWER**. This wire is the turn signal power as well as the brake light power. This wire has interrupted switched power from the turn flasher any time the right 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.

**(3) Brown:** 18-gauge wire, printed **#929 TAIL LIGHT POWER**. This is a power wire for the tail light function. This wire has power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position.

**(2) Black:** 16 & 18-gauge wires, printed **#969 GROUND**. These wires provide a ground source for the rear lights and comes from a splice that is tied to a series of other splices. This, in turn, ties all the grounds in this harness together.

- Connect this socket according to the instruction given for the Left Turn/Brake/Tail Light given on [page 121](#).

## Installing the Rear Bumper

Now that the tail harness is installed onto the rear bumper, install it back onto the car. This step is, again, easiest with a helper. As the bumper is raised into place, the marker lights and grommets on both ends of the tail harness must be routed into the trunk through the factory pass through holes.

With the bumper in place, the side marker lights, ground, and fuel level sending unit can now be connected.

## Tail Harness Connector

- The tail harness connector, defined in detail on [page 117](#), is attached to the connector found on the harness previously routed to the trunk of the car (see [Fig. 207](#)). This connection will only plug in one way.

## Left Side Marker

The Left Side Marker requires two-wires to work properly. They can be seen in the [Tail Light Schematic](#) on [page 119](#) (see [Fig. 202](#)). A factory style socket comes pre-installed and has a label reading "MARKER." The wires spliced to this molded connector are:

- (3) **Brown:** 16 & 18-gauge wires, printed **#929 TAIL LIGHT POWER**. These are power wires for the park or marker light function. These wires also feed the other **#929** wires and splices in the tail harness. These wires have power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position.

- (3) **Black:** 12 & 16-gauge wires printed **#969 GROUND**. These wires go into a splice with the other wires of the integrated ground circuit of the tail harness.

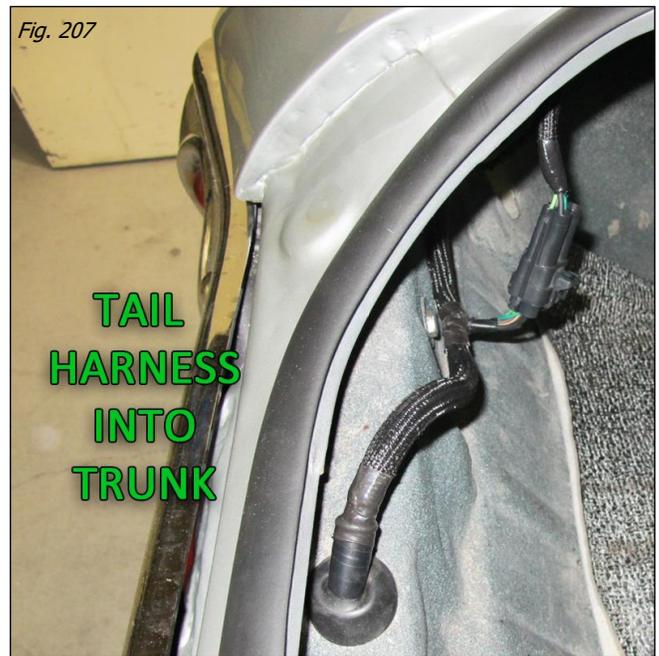
- Install one of the provided wedge base bulbs into the socket. Add a small amount of dielectric grease to the contacts beforehand to help prevent any corrosion issues.

- Look at the back of the marker lamp housing and you see that it has a keyed opening to correspond with the tabs on the socket (see [Fig. 208](#)). Insert the lamp socket of the Painless harness into the "Left Side Marker" housing and turn 1/4 turn clockwise to lock the socket in place.

## Fuel Sending Unit

The fuel sending unit connection is a one-wire connection. This wire sends a resisted ground source from the fuel level sending unit inside the fuel tank up to the fuel gauge on the dash. This resistance is based off how much fuel remains in the tank. This causes the needle on the gauge to move between empty and full.

The wire provided in the TAIL HARNESS has a section label reading "FUEL SENDER." This wire has a one-pin, black connector pre-installed. This wire is:



**Tan:** 18-gauge wire, printed **#939 FUEL LEVEL SIGNAL**. This wire is a ground signal. It can be seen in the [Tail Harness Schematic](#) on page 119 (see [Fig. 202](#)).

- Locate the factory wire coming from the fuel level sending unit. Route the tan **#939** wire to this connection and cut to length.
- If your factory wire has a molded connector and male terminal on the end of it, an insulated terminal from the parts kit can be crimped to the **#939** wire for an easy connection (see [Fig. 209](#)).
- Single-pin, Weather-Pac connectors are provided for those that no longer have a factory molded connector (see [Fig. 210](#)). Those who do may not have a factory sending unit wire, or for those who simply want a better connection than the original. Follow the instructions on page 13 to properly crimp these terminals.



- For those without a factory sending unit wire still connected to the sending unit, a scrap piece of 16-gauge wire is used to create a connection from the sending unit to the **#939** wire. A #10 ring terminal and nut are provided in the parts kit to make the connection to the fuel level sending unit on top of the fuel tank. Removal of the gas tank may be necessary to make this connection
- Cut the **#939** wire to length and install a green seal, Weather-Pac terminal (**female terminal for the male connector/ male terminal for the female connector**; see [Fig. 210](#)). Install the connector onto the **#939** and attach it to the connector coming from the sending unit.

## **Right Side Marker**

The Left Side Marker requires two wires to work properly, as seen in the [Tail Light Schematic](#) on page 119 (see [Fig. 202](#)). A factory style socket comes pre-installed and has a label reading "MARKER." The wires spliced to this molded connector are:

**Brown:** 18-gauge wire, printed **#929 TAIL LIGHT POWER**. This is a power wire for the park or marker light function. This wire is spliced to the other **#928** wires in the tail harness and has power anytime the headlight switch is in the Park/Tail Lights ON or Headlights ON position.

**Black:** 18-gauge wire, printed **#969 GROUND**. This wire goes into a splice with the other wires of the integrated ground circuit of the tail harness.

- For proper connection of this socket, follow the instructions given for the left side marker on [page 124](#).

## Ground

For those with trunk a mounted battery, a ground wire is supplied in the tail harness to connect all of the integrated ground wires throughout the entire chassis harness back to the negative side of the battery. If your battery is still in the engine compartment, this ground connection was handled during the front exterior lighting connections and this ground connection just provides a chassis ground source. This wire can be seen in the [Tail Harness Schematic](#) on [page 119](#) (see [Fig. 202](#)). It is:

**Black:** 10-gauge wire, printed **#969 GROUND**. This wire provides a ground source to the rest of the #969 wires in the Painless chassis harness.

For those with a trunk mounted battery:

- Route this **#969** wire to the negative battery terminal or to where ever the negative battery cable connects to the frame, which ever option offers the cleanest and easiest install.
- Cut the **#969** wire to length and strip 1/4" of insulation. Locate a ring terminal from the parts kit that fits the connection point and crimp onto the **#969** ground wire. Once the terminal is crimped, install the **#969** wire to its connection point

For those with a factory engine compartment mounted battery:

- Locate the stud below the tail light housing that holds the tail light to the tail panel. This stud allows for a good ground connection to the tail light housing.
- Remove the nut on this stud. If the threads have rust, paint, or any other build up, clean the threads with a wire brush or a scotch brite. **DO NOT USE** sand paper or anything that will damage the threads.
- Route the **#969** wire to this stud, cut it to length, and strip 1/4" of insulation.
- Locate a ring terminal from the parts kit that fits the stud and crimp onto the #969 ground wire. Once the terminal is crimped, install it onto the stud and reinstall the retaining nut.

## **TESTING THE SYSTEM**

As shown in [Fig. 211](#) on the next page, 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 provide circuit protection.

During testing, do not try to start the vehicle. The low amperage of the battery charger is not enough to engage the starter solenoid. Also, only test one component at a time, by turning a component off before turning another component on. When you leave a component on, and then try to test others, it can cause problems. This may then lead you to believe you have issues with the way something was installed.

- 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 3](#).
- 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.
- 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 (see [Fig. 211](#)).
- **INDIVIDUALLY** turn on each light, ignition, wiper circuit, etc. and check for proper operation. Do not try to start the vehicle. **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 are checked, disconnect the battery charger and attach the vehicles negative battery cable to the battery.
- Once testing is complete, re-install any panels, lens, or other parts that are removed during the harness installation. You are now finished installing this Painless Harness, congratulations!

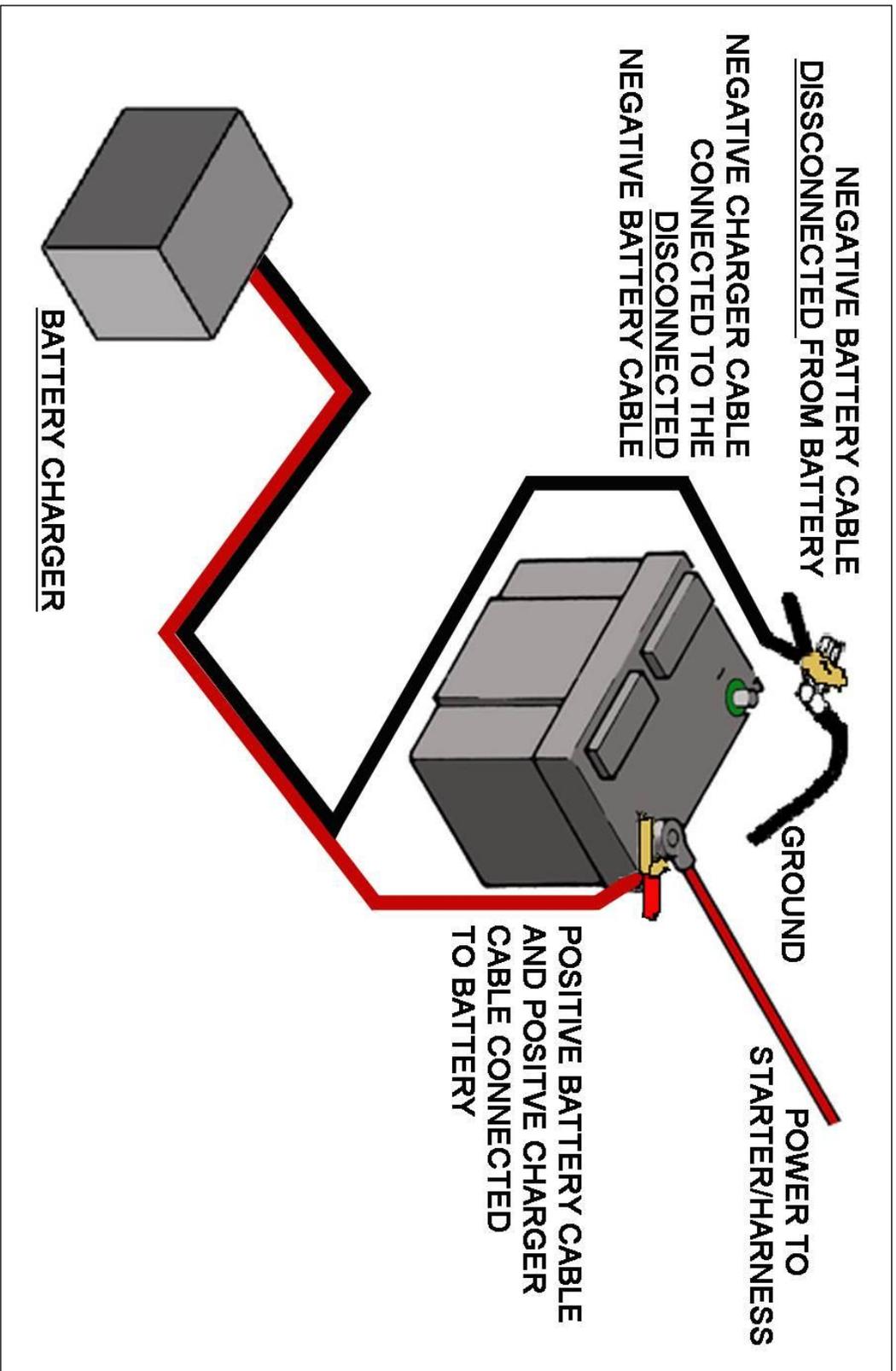


Fig. 211

# **WIRE INDEX**

- The **UNDERLINED** descriptions indicate the separate harnesses and sections found throughout the harness.
- The **BOLD** titles above the tables indicate components/connection points.
- The descriptions shown in *ITALICS* 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.
- When a power wires starting is the fuse block, the fuse which powers the wire will be stated in the STARTING POINT column.
- “STARTING POINT” simply means where the opposite end of that wire is located.

## **ENGINE HARNESS**

### **LOW BRAKE SWITCH**

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

### **LIGHT SECTION**

#### **LEFT SIDE MARKER**

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

#### **LEFT HEADLIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LTGRN	#908 HIGH BEAM POWER	HIGH BEAM SPLICE
YES	14	TAN	#909 LOW BEAM POWER	ENGINE BULKHEAD
YES	14	TAN	#909 LOW BEAM POWER	RIGHT HEADLIGHT
NO	16	BLK	#969 TURN SIGNAL GROUND	LEFT TURN SIGNAL
YES	14	BLK	#969 HEADLAMP GROUND	FRONT GROUND SPLICE

#### **LEFT HIGH BEAM**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LTGRN	#908 HIGH BEAM POWER	HIGH BEAM SPLICE
YES	14	BLK	#969 HIGH BEAM GROUND	FRONT GROUND SPLICE

**LEFT TURN SIGNAL**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	LTBLU	#926 FRONT LEFT TURN SIGNAL POWER	LEFT MARKER LIGHT
NO	16	BLK	#969 TURN SIGNAL GROUND	LEFT HEADLIGHT
YES	18	BRN	#927 PARK LIGHT POWER	PARK LIGHT SPLICE

**HORN**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	BLK/GRN	#924 HORN POWER	ENGINE BULK HEAD

**RIGHT TURN SIGNAL**

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

**RIGHT HIGH BEAM**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LTGRN	#908 HIGH BEAM POWER	HIGH BEAM SPLICE
YES	14	BLK	#969 HIGH BEAM GROUND	FRONT GROUND SPLICE

**RIGHT HEADLIGHT**

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

**RIGHT SIDE MARKER**

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

**GROUND**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	8	BLK	#969 BATTERY "-" / GROUND SOURCE	FRONT GROUND SPLICE

# ENGINE HARNESS

## **WIPER MOTOR**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#979 WIPER MOTOR (LOW/PARK)	ENGINE BULKHEAD
YES	16	BLK/YLW	#982 WIPER MOTOR POWER	ENGINE BULKHEAD- Wiper Fuse
NO	16	BLK/YLW	<i>#982 WASHER PUMP POWER</i>	WASHER PUMP
YES	16	LTBLU	#977 WIPER MOTOR (HIGH)	ENGINE BULKHEAD

## **WASHER PUMP**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK/YLW	<i>#982 WASHER PUMP POWER</i>	WIPER MOTOR
YES	16	BLK	#969 HIGH BEAM GROUND	FRONT GROUND SPLICE

## ENGINE SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	GRN	#921 COOLANT TEMPERATURE SIGNAL	ENGINE BULKHEAD
YES	18	BLU	#922 OIL PRESSURE SIGNAL	ENGINE BULKHEAD
YES	18	RED	#954 CHOKE POWER	ENGINE BULKHEAD

## COIL/IGNITION SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	WHT/ORG	#920 COIL POWER ("+")	ENGINE BULKHEAD- Coil Fuse
YES	18	BRN	#923 TACH SIGNAL (COIL "-")	ENGINE BULKHEAD
YES	16	YLW	#970 IGNITION BYPASS (COIL "+" TO STARTER "I")	*BAG

\*The YLW #979 wire listed above is not installed in the harness, but is found in a separate bag accompanying this harness; it will not be needed in most applications

## ALTERNATOR SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	RED	#995 ALTERNATOR BATTERY POWER SAMPLE	BATTERY POWER SPLICE
YES	14	BRN	#914 ALTERNATOR EXCITER	ENGINE BULKHEAD
YES	6	RED	Has a section label reading: #915 ALTERNATOR OUTPUT	*BAG

\*The RED #915 wire listed above is not installed in the harness, but is found in a separate bag accompanying this harness

## STARTER SECTION

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	8	RED	#916 BATTERY POWER SOURCE	BATTERY POWER SPLICE
YES	18	PUR	#919 STARTER SOLENOID "S" (START SIGNAL)	ENGINE BULKHEAD
YES	16	YLW	#970 IGNITION BYPASS (COIL "+" TO STARTER "I")	*BAG

\*The YLW #979 wire listed above is not installed in the harness, but is found in a separate bag accompanying this harness; it will not be needed in most applications

## **BLOWER MOTOR**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	ORG	#967 BLOWER MOTOR POWER	ENGINE BULKHEAD

This concludes all connections/wires found in the Engine Harness.

## INTERIOR HARNESS

### **DIMMER SWITCH**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	LTBLU	#909 LOW BEAM POWER	INTERIOR BULK HEAD
YES	14	TAN	#907 DIMMER SWITCH POWER	HEADLIGHT SWITCH
YES	14	LT.GRN	#908 HIGH BEAM POWER	INTERIOR BULK HEAD

### **EMERGENCY BRAKE SWITCH**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	TAN	#968 BRAKE WARN SIGNAL	ENGINE BULKHEAD

### **ACC (accessories)**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	ORG	#910 POWER LOCK POWER SOURCE (BATTERY)	FUSE BLOCK/ Lock Fuse
YES	14	PNK	#911 POWER WINDOW POWER SOURCE (IGN)	FUSE BLOCK/ Window Fuse
YES	14	RED	#947 FUEL PUMP/SWITCHED IGN POWER	FUSE BLOCK/ Fuel Pump Fuse

### **DRIVER DOOR JAMB SWITCH**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DRIVER DOOR JAMB SWITCH	DRIVER COURTESY LIGHT
YES	18	WHT	#961 DOME LIGHT GROUND	TAIL HARNESS CONNECTOR

## HEADLIGHT SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 COURTESY LIGHT GROUND	DRIVER COURTESY LIGHT
YES	18	WHT	#961 COURTESY LIGHT GROUND	CONSOLE CONNECTOR
YES	14	RED	#928 HEADLIGHT SWITCH POWER (HEADLIGHTS)	FUSE BLOCK/ HEADLIGHT FUSE
YES	16	GRN	#930 PANEL LIGHT POWER	PANEL LIGHT SPLICE
YES	14	LTBLU	#907 DIMMER SWITCH POWER	DIMMER SWITCH CONNECTOR
YES	16	BRN	#927 PARK LIGHT POWER	INTERIOR BULKHEAD
YES	16	BRN	#929 TAIL LIGHT POWER	TAIL HARNESS CONNECTOR
YES	14	ORG	#959 HEADLIGHT SWITCH POWER (PARK/TAIL)	FUSE BLOCK/ PARK-TAIL FUSE

## WIPER SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLU	#984 WASHER PUMP GROUND	INTERIOR BULKHEAD
YES	18	BLK	#979 WIPER MOTOR (LOW/PARK)	INTERIOR BULKHEAD
YES	18	LTBLU	#977 WIPER MOTOR (HIGH)	INTERIOR BULKHEAD
YES	18	BLK	#969 WIPER GROUND	INTERIOR GROUND SPLICE

## DRIVER COURTESY LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#971 COURTESY LIGHT POWER	FUSE BLOCK/ Dome Fuse
YES	18	ORG	#971 COURTESY LIGHT POWER	TAIL HARNESS CONNECTOR
YES	18	WHT	#961 COURTESY LIGHT GROUND	HEADLIGHT SWITCH
YES	18	WHT	#961 COURTESY LIGHT GROUND	DRIVER DOOR JAMB SWITCH

## TURN SIGNAL SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#963 HORN RELAY GROUND ACTIVATION	FUSE BLOCK/ HORN RELAY
YES	16	LTBLU	#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/ Hazard Flasher
YES	16	PUR	#952 TURN SIGNAL SWITCH POWER	FUSE BLOCK/ Turn Flasher
YES	16	YLW	#949 REAR LEFT TURN SIGNAL POWER	TAIL HARNESS CONNECTOR
NO	16	GRN	#948 REAR RIGHT TURN SIGNAL POWER	TAIL HARNESS CONNECTOR
YES	16	WHT	#918 BRAKE SWITCH OUTPUT	BRAKE SWITCH

## 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/ Stop Fuse
YES	12	PUR	#919 START SIGNAL TO STARTER	INTERIOR BULKHEAD

## REVERSE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	PNK	#958 REVERSE SWITCH POWER INPUT	FUSE BLOCK/ Turn-Reverse Fuse
YES	16	LTGRN	#956 REVERSE LIGHT POWER	TAIL HARNESS CONNECTOR

## NEUTRAL SAFETY/CLUTCH SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	PUR/WHT	#919 START SIGNAL (FROM IGN. SW. TO N. SAFETY)	NSS/CLUTCH SWITCH CONNECTOR MATE
YES	12	PUR	#919 START SIGNAL TO STARTER	NSS/CLUTCH SWITCH CONNECTOR MATE

## ACCELERATOR PEDAL

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	PNK	#998 IGN 12V TO ACCEL. PEDAL (COWL HOOD/TURBO 400 TRANS.)	FUSE BLOCK/ Choke Fuse
YES	18	PNK	#999 ACCEL. PEDAL TO BULKHEAD (COWL HOOD/TURBO 400 TRANS.)	INTERIOR BULKHEAD

## IGNITION SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	GRN	#921 COOLANT TEMPERATURE SIGNAL	GAUGE CLUSTER CONNECTOR
YES	18	GRN	#921 COOLANT TEMPERATURE SIGNAL	INTERIOR BULKHEAD
YES	16	PNK/BLK	#931 SWITCHED POWER TO "COIL" FUSE	FUSE BLOCK/ COIL FUSE
YES	12	RED	#934 IGNITION SWITCH POWER	FUSE BLOCK
YES	12	ORG	#933 SWITCHED (IGN) POWER TO FUSE BLOCK	FUSE BLOCK
YES	12	PUR/WHT	#919 START SIGNAL (FROM IGN. SW. TO N. SAFETY)	NEUTRAL SAFETY/CLUTCH SWITCH
YES	12	BRN	#932 SWITCHED ACCESSORY POWER	FUSE BLOCK

## CONSOLE

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 COURTESY LIGHT GROUND	HEADLIGHT SWITCH
YES	18	WHT	#961 COURTESY LIGHT GROUND	PASSENGER COURTESY LIGHT
YES	18	ORG	#971 COURTESY LIGHT POWER	FUSE BLOCK/ DOME FUSE
YES	18	ORG	#971 COURTESY LIGHT POWER	PASSENGER COURTESY LIGHT
YES	18	GRY	#930 PANEL LIGHT POWER	PANEL LIGHT SPLICE
YES	18	GRY	#930 RADIO BACKLIGHT/DIM POWER	RADIO

## CONSOLE HARNESS

### TO NEUTRAL SAFETY/CLUTCH SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	PUR/WHT	#919 START SIGNAL (FROM IGN. SW. TO N. SAFETY)	CONSOLE NSS CONNECTOR
YES	12	PUR	#919 START SIGNAL TO STARTER	CONSOLE NSS CONNECTOR

### TO REVERSE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	PNK	#958 REVERSE SWITCH POWER INPUT	CONSOLE REVERSE SWITCH CONNECTOR
YES	16	LTGRN	#956 REVERSE LIGHT POWER	CONSOLE REVERSE SWITCH CONNECTOR

### TO CONSOLE

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 CONSOLE COURTESY LIGHT GROUND	CONSOLE COURTESY LIGHT
YES	18	ORG	#971 CONSOLE COURTESY LIGHT POWER	CONSOLE COURTESY LIGHT
YES	18	GRY	#930 GEAR IND. LIGHT POWER	GEAR INDICATOR LIGHT SPLICE

## GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BLK	#969 GEAR IND. LIGHT GROUND	CONSOLE GEAR IND. LIGHT
YES	18	BLK	#969 GEAR IND. LIGHT GROUND	CONSOLE GEAR IND. LIGHT

### GEAR INDICATOR LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	18	GRY	#930 GEAR IND. LIGHT POWER	GEAR INDICATOR LIGHT SPLICE
YES	18	BLK	#969 GEAR IND. LIGHT GROUND	GROUND

## NEUTRAL SAFETY/CLUTCH SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	PUR/WHT	#919 START SIGNAL (FROM IGN. SW. TO N. SAFETY)	NSS/CLUTCH SWITCH CONNECTOR MATE
YES	12	PUR	#919 START SIGNAL TO STARTER	NSS/CLUTCH SWITCH CONNECTOR MATE

## REVERSE SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	PNK	#958 REVERSE SWITCH POWER INPUT	REVERSE SWITCH CONNECTOR MATE
YES	16	LTGRN	#956 REVERSE LIGHT POWER	REVERSE SWITCH CONNECTOR MATE

## GEAR INDICATOR LIGHT

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

## CONSOLE COURTESY LIGHT

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

## INTERIOR HARNESS (continued)

### GROUND

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	12	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	12	BLK	#969 GROUND	INTERIOR GROUND SPLICE

## GAUGE CLUSTER

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#965 CLOCK POWER	FUSE BLOCK/ Cig.Lighter Fuse
YES	18	GRN	#921 COOLANT TEMPERATURE SIGNAL	IGNITION SWITCH CONNECTOR
YES	18	GRN	#921 COOLANT TEMPERATURE SIGNAL	FTERMARKET GAUGE CONNECTOR
YES	18	BLU	#922 OIL PRESSURE SIGNAL	INTERIOR BULKHEAD
YES	18	BLU	#922 OIL PRESSURE SIGNAL	AFTERMARKET GAUGE CONNECTOR
YES	18	BRN	#923 TACH SIGNAL	AFTERMARKET GAUGE CONNECTOR
YES	18	BRN	#923 TACH SIGNAL	INTERIOR BULKHEAD
YES	18	PNK	#935 GAUGE POWER	FUSE BLOCK/ Gauges Fuse
YES	18	PNK	#935 GAUGE POWER	AFTERMARKET GAUGE CONNECTOR
YES	18	BLK	#969 GROUND	INTERIOR GROUND SPLICE
YES	16	BRN/WHT	#914 ALT. EXCITER/CHARGE INDICATOR	IGNITION SWITCH CONNECTOR
YES	16	BRN	#914 ALTERNATOR EXCITER	INTERIOR BULKHEAD
YES	18	LTGRN	#936 HIGH BEAM INDICATOR POWER	INTERIOR BULKHEAD
YES	18	TAN	#968 BRAKE WARN SIGNAL	INTERIOR BULKHEAD
YES	18	GRY	#930 PANEL LIGHT POWER	PANEL LIGHT SPLICE
NO	18	GRY	<i>#930 PANEL LIGHT POWER</i>	GAUGE CLUSTER
YES	18	LT.BLU	#937 LEFT TURN INDICATOR	INTERIOR BULKHEAD
YES	18	BLU	#938 RIGHT TURN INDICATOR	INTERIOR BULKHEAD
YES	18	TAN	#939 FUEL LEVEL SIGNAL	TAIL HARNESS CONNECTOR
YES	18	TAN	#939 FUEL LEVEL SIGNAL	AFTERMARKET GAUGE CONNECTOR

## AFTERMARKET GAUGES

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	BLK	#969 GROUND	INTERIOR GROUND SPLICE
NO	18	BLK	<i>#969 GROUND</i>	AFTER MARKET GAUGE CONNECTOR
YES	18	GRY	#930 AFTERMARKET GAUGE LIGHT POWER	PANEL LIGHT SPLICE
YES	18	PNK	#935 GAUGE POWER	GAUGE CLUSTER
YES	18	TAN	#939 FUEL LEVEL SIGNAL	GAUGE CLUSTER
YES	18	GRN	#921 COOLANT TEMPERATURE SIGNAL	GAUGE CLUSTER
YES	18	BRN	#923 TACH SIGNAL	GAUGE CLUSTER
YES	16	BLU	#922 OIL PRESSURE SIGNAL	GAUGE CLUSTER

## HEATER SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	BRN	#904 HEATER/AC SWITCH POWER	FUSE BLOCK/ AC/Heat Fuse
YES	14	ORG	#967 BLOWER MOTOR POWER	INTERIOR BULKHEAD

## HEATER HARNESS

### BLOWER SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
NO	14	BRN	<i>#904 HEATER/AC SWITCH POWER</i>	HEATER SWITCH MATE
NO	14	ORG	<i>#967 BLOWER MOTOR POWER</i>	HEATER SWITCH MATE
YES	14	ORG	#973 BLOWER MOTOR HIGH	BLOWER RESISTOR
YES	14	YLW	#975 BLOWER MOTOR LOW	BLOWER RESISTOR
YES	14	LTBLU	#974 BLOWER MOTOR MEDIUM	BLOWER RESISTOR

### HEATER RESISTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	ORG	#973 BLOWER MOTOR HIGH	BLOWER SWITCH
YES	14	YLW	#975 BLOWER MOTOR LOW	BLOWER SWITCH
YES	14	LTBLU	#974 BLOWER MOTOR MEDIUM	BLOWER SWITCH

## INTERIOR HARNESS (continued)

### HEATER SWITCH INDICATOR LIGHT

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

### CIGARETTE LIGHTER

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	ORG	#903 CIGARETTE LIGHTER POWER	FUSE BLOCK/ CIG LIGHTER FUSE
YES	14	BLK	#969 GROUND	INTERIOR GROUND SPLICE

## RADIO

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

## PASSENGER COURTESY LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#971 COURTESY LIGHT POWER	CONSOLE CONNECTOR
YES	18	ORG	#971 COURTESY LIGHT POWER	GLOVE BOX
YES	18	WHT	#961 COURTESY LIGHT GROUND	CONSOLE CONNECTOR
YES	18	WHT	#961 PASS. DOOR JAMB SWITCH	PASS. DOOR JAMB SWITCH

## GLOVE BOX

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#971 COURTESY LIGHT POWER	PASS. COURTESY LIGHT
YES	18	BLK	#969 GLOVE BOX LIGHT GROUND	INTERIOR GROUND SPLICE

## PASSENGER JAMB SWITCH

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 PASS. DOOR JAMB SWITCH	PASS. COURTESY LIGHT

## TAIL SECTION CONNECTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DOME LIGHT GROUND	DRIVER DOOR JAMB SWITCH
YES	18	ORG	#971 DOME LIGHT POWER	DRIVER COURTESY LIGHT
YES	16	LTGRN	#956 REVERSE LIGHT POWER	REVERSE SWITCH CONNECTOR
YES	16	BRN	#929 TAIL LIGHT POWER	HEADLIGHT SWITCH CONNECTOR
YES	18	TAN	#939 FUEL LEVEL SIGNAL	GAUGE CLUSTER CONNECTOR
YES	16	YLW	#949 REAR LEFT TURN SIGNAL POWER	TURN SIGNAL SWITCH CONNECTOR
YES	16	GRN	#948 REAR RIGHT TURN SIGNAL POWER	TURN SIGNAL SWITCH CONNECTOR
YES	14	BLK	#969 GROUND	INTERIOR GROUND SPLICE

# TAIL HARNESS

## TAIL HARNESS CONNECTOR

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DOME LIGHT GROUND	DOME LIGHT CONNECTOR
YES	18	ORG	#971 DOME LIGHT POWER	DOME LIGHT CONNECTOR
YES	16	LTGRN	#956 REVERSE LIGHT POWER	REVERSE LIGHT CONNECTOR
YES	16	BRN	#929 TAIL LIGHT POWER	TAIL LIGHT SPLICE
YES	18	TAN	#939 FUEL LEVEL SIGNAL	FUEL LEVEL SENDING UNIT
YES	16	YLW	#949 REAR LEFT TURN SIGNAL POWER	LEFT TURN-BRAKE-TAIL SOCKET
YES	16	GRN	#948 REAR RIGHT TURN SIGNAL POWER	RIGHT TURN-BRAKE-TAIL SOCKET
YES	14	BLK	#969 GROUND	TAIL HARNESS GROUND SPLICE

## DOMELIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	WHT	#961 DOME LIGHT GROUND	TAIL HARNESS CONNECTOR
YES	18	ORG	#971 DOME LIGHT POWER	TAIL HARNESS CONNECTOR
YES	18	ORG	#946 TRUNK LIGHT POWER	TRUNK LIGHT

## TRUNK LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	ORG	#946 TRUNK LIGHT POWER	DOME LIGHT CONNECTOR

## LEFT TURN/BRAKE/TAIL

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	YLW	#949 REAR LEFT TURN/BRAKE SIGNAL POWER	TAIL HARNESS CONNECTOR
YES	18	BRN	#929 TAIL LIGHT POWER	TAIL LIGHT SPLICE

## GROUND

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

## REVERSE LIGHT

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	LTGRN	#956 REVERSE LIGHT POWER	TAIL HARNESS CONNECTOR
YES	18	LTGRN	#956 REVERSE LIGHT POWER	PASS. REVERSE LIGHT

**FUEL LEVEL**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	TAN	#939 FUEL LEVEL SIGNAL	TAIL HARNESS CONNECTOR

**PLATE LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	BRN	#929 PLATE LIGHT POWER	TAIL LIGHT SPLICE

**REVERSE LIGHT**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	18	LTGRN	#956 REVERSE LIGHT POWER	DRIVER. REVERSE LIGHT

**GROUND**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	14	BLK	#969 GROUND	TAIL HARNESS GROUND SPLICE

**RIGHT TURN/BRAKE/TAIL**

PRINT	GAUGE	COLOR	PRINTED MESSAGE ON WIRE	STARTING POINT
YES	16	GRN	#948 REAR RIGHT TURN SIGNAL POWER	TAIL HARNESS CONNECTOR
YES	18	BRN	#929 TAIL LIGHT POWER	TAIL LIGHT SPLICE

**NOTES**

## **Painless Performance Products, LLC**

### **Limited Warranty and Return Policy**

Chassis harnesses, fuel injection harnesses, and Trail Rocker units are covered under a lifetime warranty.

All other products manufactured and/or sold by Painless Performance are warranted to the original purchaser to be free from defects in material and workmanship under normal use. Painless Performance will repair or replace defective products without charge during the first 12 months from the purchase date. No products will be considered for warranty without a copy of the purchase receipt showing the sellers name, address, and date of purchase. You must return the product to the dealer you purchased it from to initiate warranty procedures.