Modular Wire Harness Installation Instructions

10301

MODULAR 4-CIRCUIT CHASSIS HARNESS

Manual #90529

Painless Performance Products Division

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P/N 90529 Painless Wiring Manual July 2004

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF DIAGRAMS

1.0 10301 FUSE BLOCK INSTALLATION INSTRUCTIONS

1.1 Fuse Block Mounting

1.1.1 Find a suitable location to mount the fuse block where the fuses will be accessible.

1.1.2 Secure the fuse block using the four bolts, lock washers and nuts included.

NOTE: The fuse block and legs fit loosely together so that once the fuse block mounting hardware has been tightened the fuse block and mounting legs will all tighten and hold each other securely in place.

1.2 Maxi Fuse Holder Mounting and Connections

1.2.1 Mount the Maxi Fuse holder as close as possible to the battery or power source.

1.2.2 Route the Large Red wire, from the fuse block, out to the maxi fuse holder, cut to length, strip the wire, crimp a ring terminal onto it and connect it to either side of the fuse holder. (**Figure 1-1, Red Wire "A"**)

1.2.3 Take the remaining piece of red wire that was cut off, strip, crimp a terminal to one end, connect it to the other terminal on the fuse holder, route it out to battery or starter solenoid, cut to length, strip, crimp on required terminal and connect to power source. (**Figure 1-1, Red Wire "B"**)

1.3 Fuse Block Connections

1.3.1 Route the Orange wire to the ignition switch, strip the wire, crimp on a terminal and connect it to the ignition switch "IGN" terminal.

1.3.2 Route the Orn/Blk, Red/Blk, Red/Wht and Green wires out to the items they are to power.

Recommended Wire Usage:

ORN/BLK wire – Constant Power (15 amp max load)
RED/BLK wire – Constant Power (25 amp max load)
GREEN wire – Constant Power (10 amp max load)
RED/WHT wire – Key-on Power (10 amp max load)

1.3.3 Cut, strip, install connector or terminal and connect to each item.

1.4 Maxi Fuse Installation

1.4.1 After all connections are made; install the maxi fuse and maxi fuse cover.

Included in this kit are the following: a diode (to prevent alternator feed back), connector and terminals for the GM Delcotron alternator, dimmer switch connector and terminals and a label to record what fuses are used.

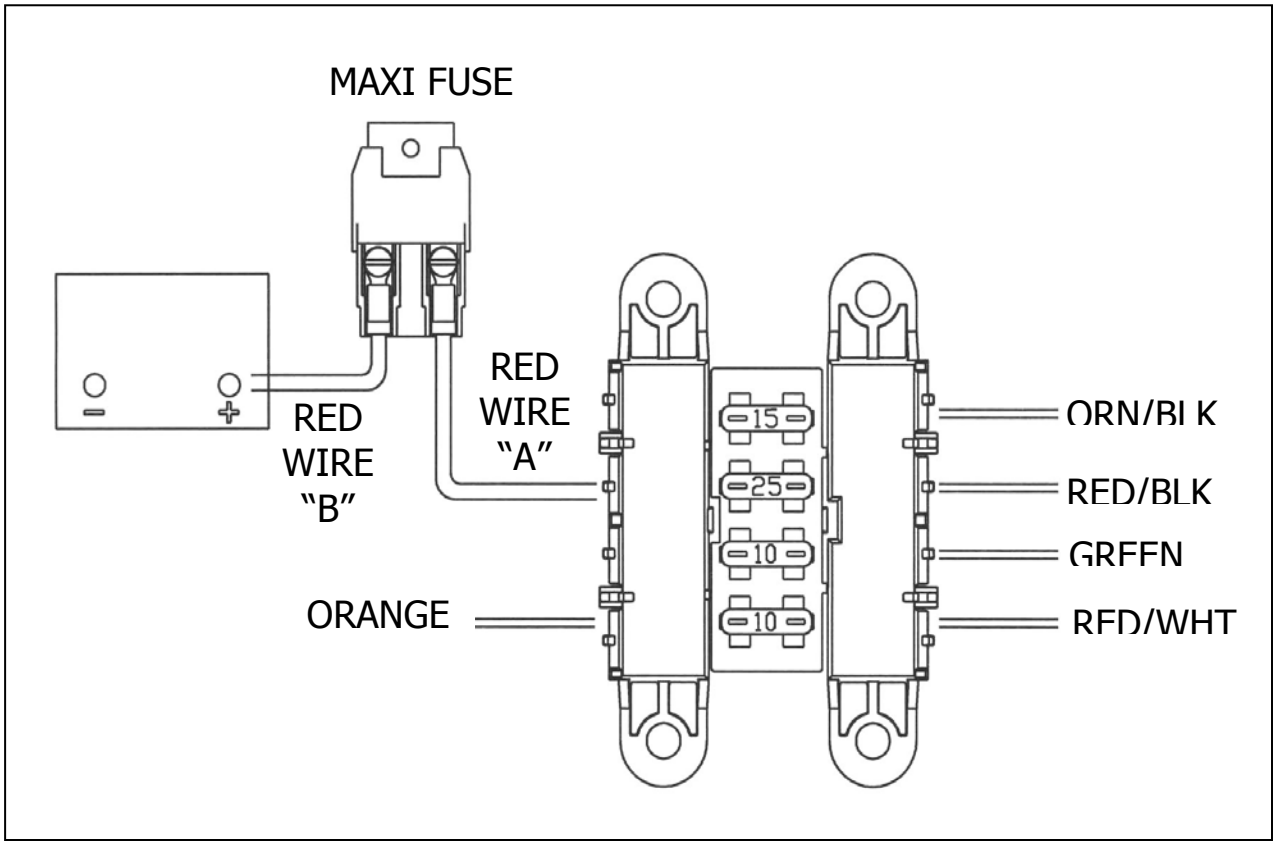


Figure 1-1 10301 Fuse Block Connections

Optional add-on items that can be purchased separately are listed below.

10302	- Add 4 Circuits #1 (Add 2 10 amp & 2 15 amp circuits)
10303	- Add 4 Circuits #2 (Add 2 5 amp & 2 15 amp circuits)
10304 -	Add 4 Circuits #3 (Add 10 amp, 15 amp & 2 20 amp circuits)
10310	- Turn Signal Flasher Kit
10311	- Hazard Flasher Kit
10320	- Horn Relay Kit
10321	- Universal Relay Kit
30709	- High Output Alternator Wire Kit
30806	- GM Conversion Kit (Connectors and terminals to connect to GM Steering Column Ignition switch, turn switch & dimmer switch)
80300	- Headlight Plug (2 sealed beam headlight connectors)

Table 1-1 Optional Add-On Items

The following covers model specific and all make typical wiring connections.

Note: The wire colors and numbers referred to in the following pages are for circuit reference purposes only.

2.0 GM – SPECIFIC CIRCUIT CONNECTIONS

*Note: Your alternator may not appear exactly as represented in the **Figures**. The circuits are wired the same way, though.*

2.1 Early GM Alternator (before 1969)-External Regulator. See Figure 2-1

2.1.1 With a short 16-gauge jumper wire, connect Voltage Regulator terminals 3 & 4 together. Connect Key-On power wire #914 (wht) to Voltage Regulator terminal 3 or 4.

2.1.2 Connect Battery wire #915 (red) to the Alternator Output lug (Bat).

2.1.3 Connect a 14-gauge wire from Voltage Regulator terminal 2 to Alternator terminal R. Connect a 14-gauge wire from Voltage Regulator terminal F to Alternator terminal F.

2.1.4 Connect a 16-gauge ground wire from the Alternator Ground lug (G) to chassis ground.

2.2 Late GM Alternator (after 1972)-Internal Regulator. See Figure 2-2.

2.2.1 Connect Key-On power wire #914 (wht) to Alternator terminal 1. Connect Battery wire #915 (red) to the Alternator Output lug (Bat).

CAUTION: IF USING AN ALTERNATOR WITH AN OUTPUT LARGER THAN 65 AMPS, YOU WILL NEED TO USE JUMPER WIRE #960 (RED) (PURCHASED SEPARATELY– PAINLESS PART NUMBER, 30709). THE END WITH HE RING TERMINAL AND RUBBER BOOT WILL CONNECT TO THE ALTERNATOR OUTPUT LUG. ROUTE THE OTHER END TO THE STARTER SOLENOID. CUT THE WIRE AND CRIMP ON A RING TERMINAL. INSTALL ON SOLENOID TERMINAL WITH CABLE COMING FROM BATTERY. SEE FIGURE 7-2B. YOU WILL NOW HAVE TWO (2) HEAVY WIRES ON THE OUTPUT POST.

2.2.2 Connect a short 14-gauge jumper wire from Alternator terminal 2 to the Alternator Output lug (Bat).

2.2.3 A connector and terminal spades for late GM Alternators are included in the parts box.

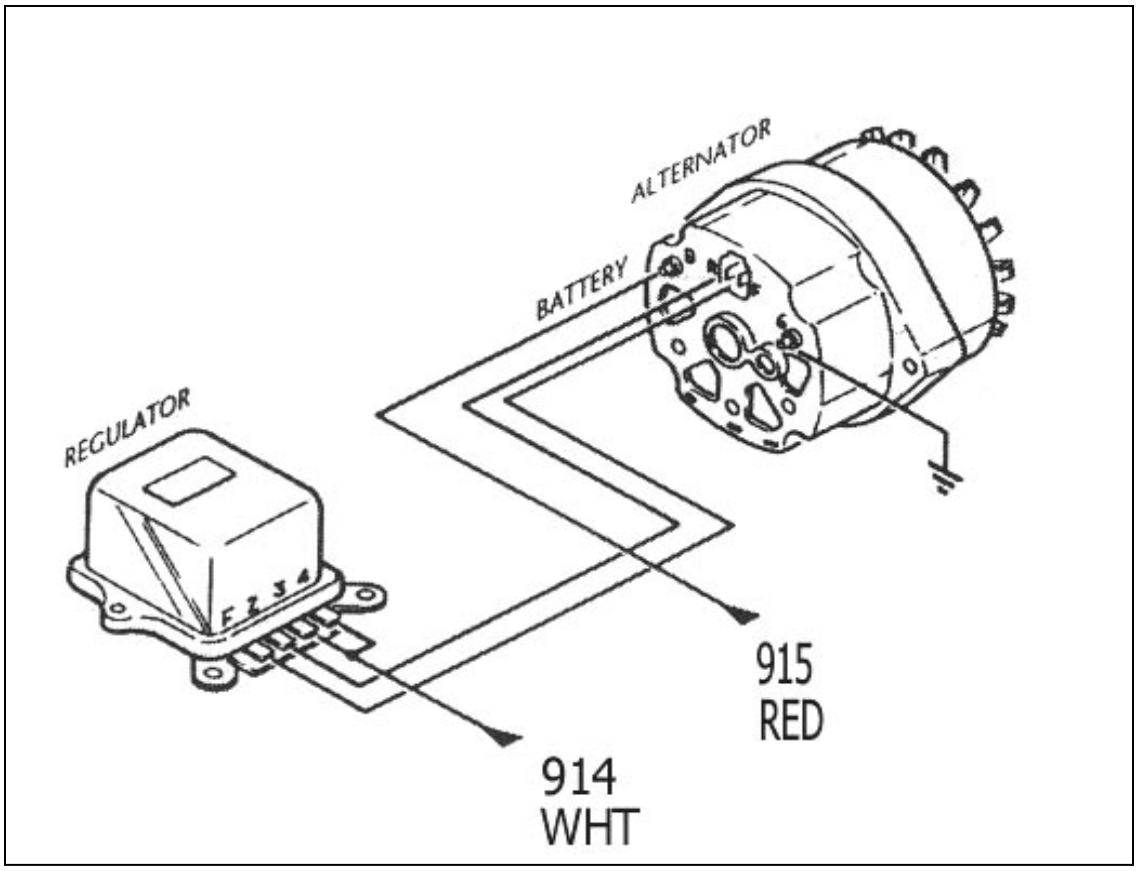


Figure 2-1 Early GM Alternator - External Regulator

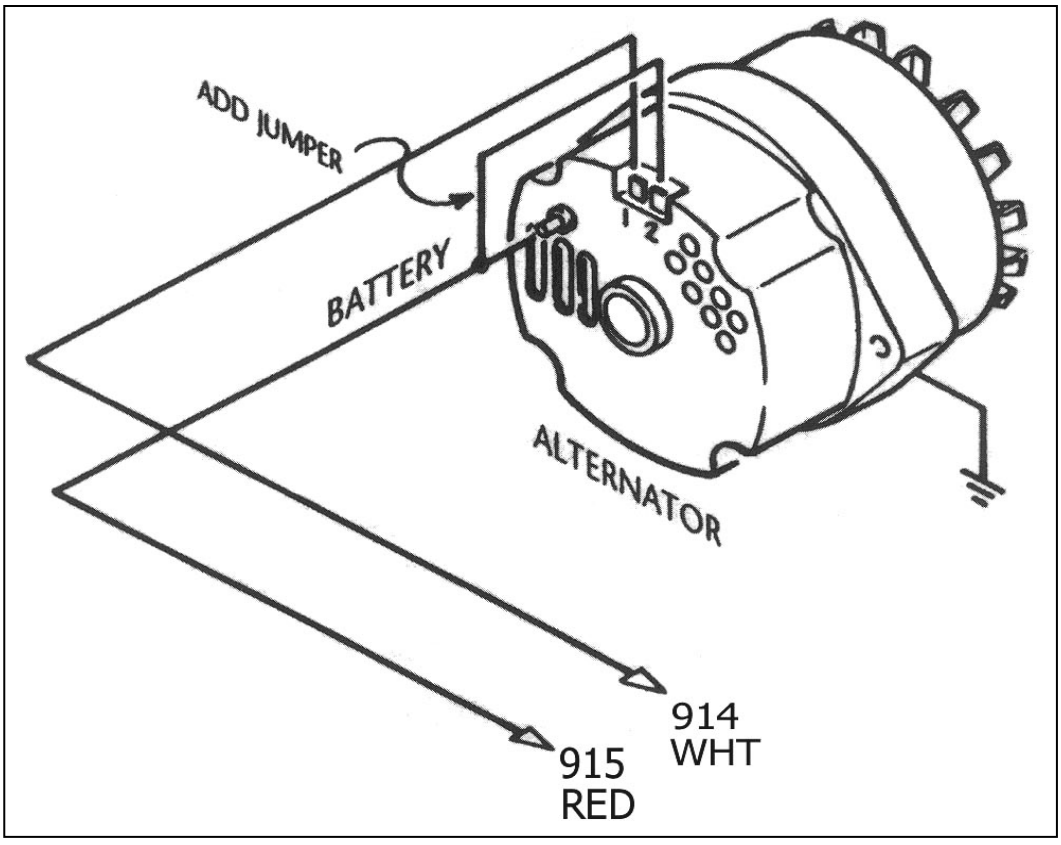


Figure 2-2A Late GM Alternator - Internal Regulator

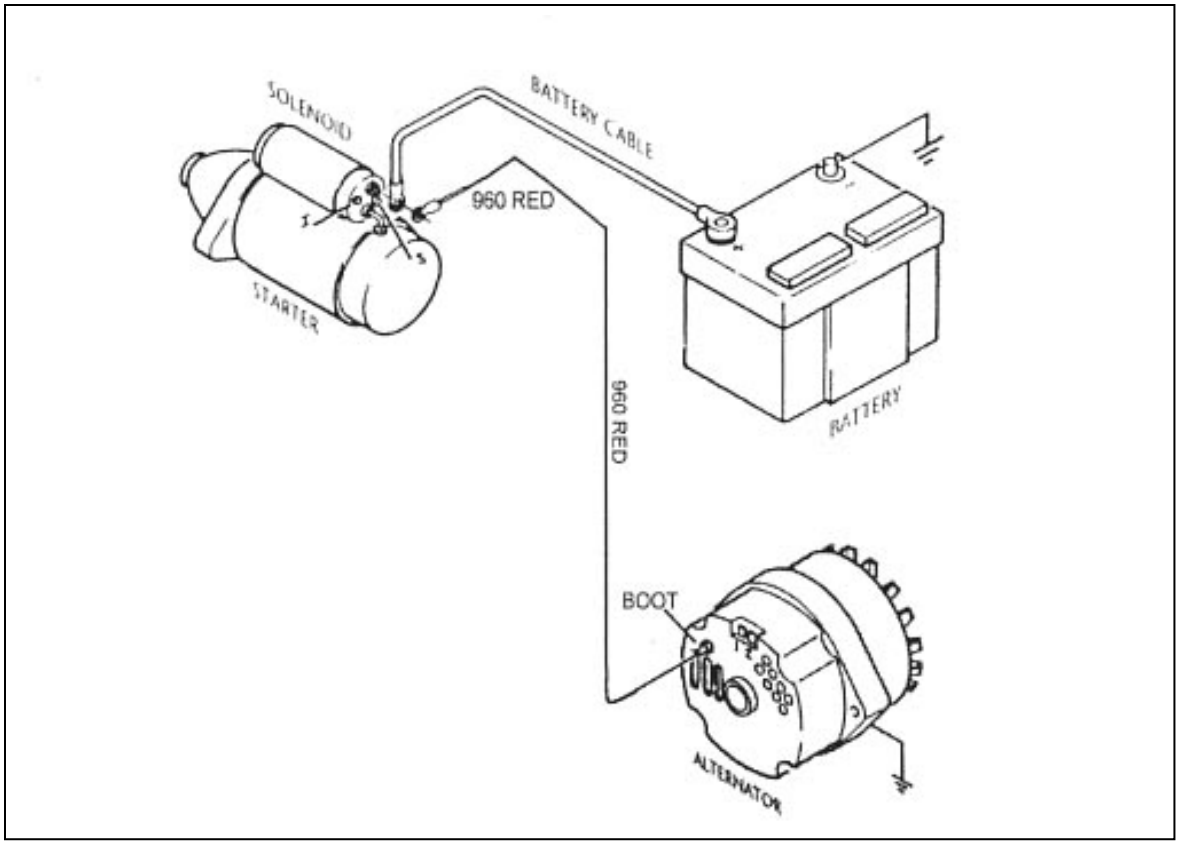


Figure 2-2B High Output Wire

2.3 GM One-Wire Alternator.

2.3.1 Connect Battery wire #915 (red) to the Alternator Output lug (Bat).

CAUTION:IF USING AN ALTERNATOR WITH AN OUTPUT LARGER THAN 65 AMPS, SEE CAUTION ON PAGE 3 UNDER PARAGRAPH 2.2.1.

2.3.2 No wires are connected to Alternator terminals 1 & 2.

2.3.3 When using a 1-wire alternator you must use a voltmeter or ammeter. A WARNING LIGHT CANNOT BE WIRED IN.

2.4 GM Ignition (Start/Run) System. See Figure 2-4.

*Note: If you are going to install an ammeter, see **Section 5.3** first.*

2.4.1 Connect wire #916 – with Maxi Fuse installed – to the Starter Solenoid Battery terminal. This is the same lug that the large red cable from the battery is normally connected to.

2.4.2 Connect wire #919 (pur) to the Starter Solenoid Start (S) terminal. (See illustration on page 29)

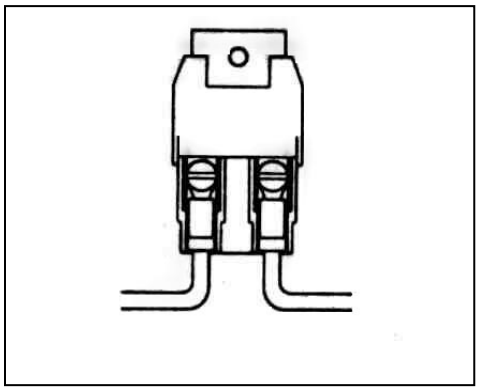


Figure 2-3 Maxi Fuse

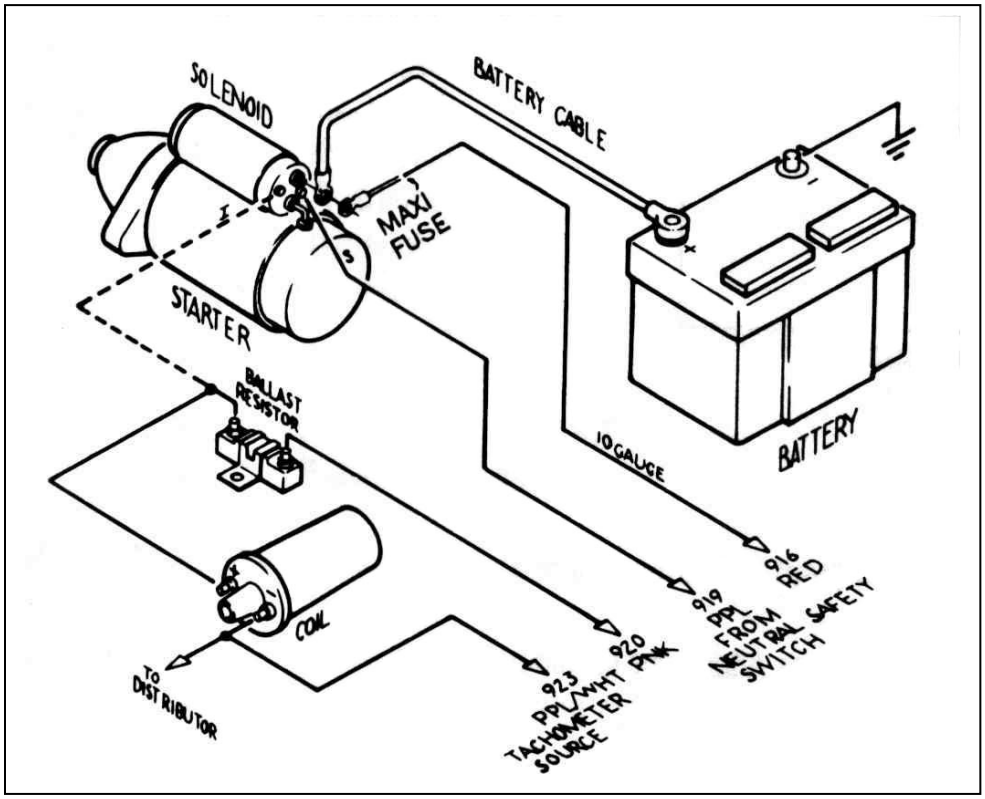


Figure 2-4 GM Ignition (Start-Run) System

2.4.3 If you are using the Ballast Resistor, mount it away from other wiring or hoses. The Ballast Resistor gets very hot during operation. Connect Key-On power wire #920 (pnk) to one end of the Ballast Resistor. Connect the other end of the Ballast Resistor to the Ignition Coil B+ terminal with 14-gauge wire. If you are not using a Ballast Resistor, connect wire #920 directly to the Ignition Coil B+ terminal.

Important Note! For HEI systems route wire #920 (pnk) to the Distributor and attach it to the terminal labeled BAT. No Ballast Resistor is required.

2.4.4 The Ignition Coil NEGATIVE (-) terminal is connected to the Distributor. Also Connect wire #923 (pur/wht) to the Ignition Coil NEGATIVE (-) terminal. This is the tachometer source.

2.4.5 A 14-gauge wire connected from the Starter Solenoid Ignition (I) terminal to the ignition coil side of the Ballast Resistor is optional. This wire (the dashed line in **Figure 2-4**) serves as a ballast resistor BYPASS during engine starting. However, if the starter solenoid shorts out, which is not unusual, the engine will stop running and will not restart as long as this wire is connected. You may therefore choose to omit it. If you are not using a Ballast Resistor, leave the Starter Solenoid Ignition (I) terminal unconnected and do not install the bypass wire.

2.5 Steering Column Wiring-Turn Signal & Ignition Switch Connectors

Note: The connectors and terminals referred to in 2.5.1 and 2.5.2 are Painless # 30806 and are purchased separately.

2.5.1 There are two different plugs on most tilt columns. The difference is in the length of the male plug that is mounted ON THE COLUMN. One plug is 3-7/8" (3.875") long and the other is 4-1/4" (4.250"). This is only a difference of 3/8" (0.375"), so measure the plug carefully. The Painless # 30806 (Purchased separately) has two different female connectors to mate with the column-mounted plug. See **Figure 2-5** to determine which female connector is correct for your automobile.

Crimp terminals onto the wires to be connected to the turn signal switch. Choose the proper plug and install the terminals according to **Table 2-1**, as shown in **Figure 2-5**. The GM wire color codes have been included for reference.

*Note: The terminals will only insert into the connector ONE WAY, as shown in **Figure 2-5**. Make certain you are inserting the wire Into the CORRECT LOCATION as the terminals are difficult if not impossible to remove once inserted.*

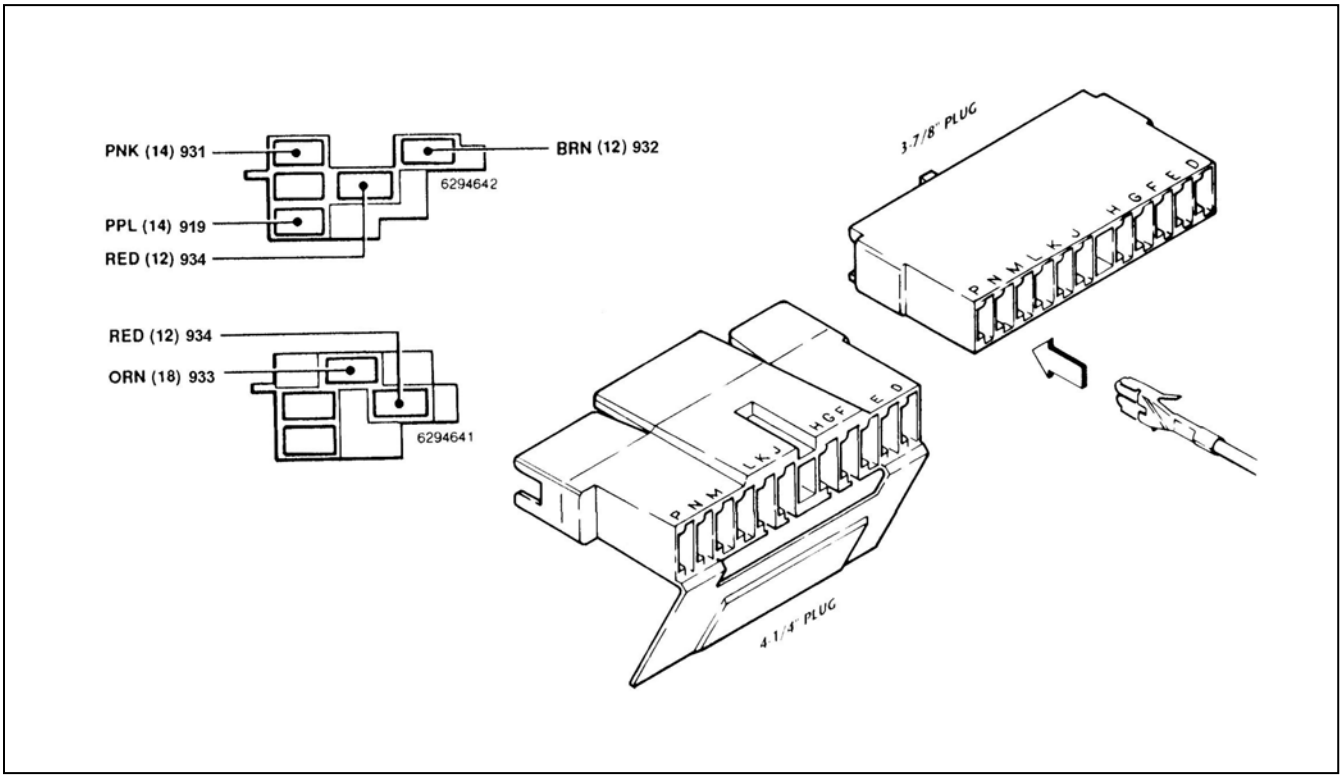


Figure 2-5 GM Turn Signal Connectors

2.5.2 See **Table 2-1** and **Figure 2-5** for color codes, wire numbers, and wire designations for the GM Ignition Switch Connectors.

2.5.3 IGNITION SWITCH SECTION wire #919 (pur) needs to be cut and spade lugs installed. These spade lugs are to be connected to the Neutral Safety Switch at the base of the steering column (if so equipped). If using a neutral safety switch on a floor shifter or in the transmission, the (pur) #919 needs to be routed to the **neutral safety switch, cut and connected to it, then continued on to the starter solenoid.**

2.5.4 To supply power to a throttle body or tuned port fuel injection use Key-On power wire #920 (pnk) as the fused ignition power source.

NOTE: If your engine will not shut off when the ignition switch is turned off you may have a power back-feed coming from the #914 (wht) wire and going thru the ignition switch out to the coil. To fix this problem you will need to cut the #914 (wht) wire and crimp the supplied diode between the cut wire ends with the silver stripe towards the alternator.

TURN SIGNAL SECTION

GM Color	Designation	Painless Wire No.	Painless Color	Turn Signal Connector
Blk	Horn	953	Blk	G
Lt.Blu	LF Turn Signal	926	Lt.Blu	H
Dk.Blu	RF Turn Signal	925	Dk.Blu	J
Brn	Hazard Flasher	951	Brn	K
Pur	Turn Flasher	952	Pur	L
Ylw	LR Turn Signal	949	Ylw	M
Grn	RR Turn Signal	948	Grn	N
Wht	Stop Lamp Switch	918	Wht	P

IGNITION SWITCH SECTION		Painless Wire No.	Painless Color
Pur/Wht	Ignition Start	919	Pur
Pnk	Ignition Coil	931	Pnk
Brn	Accessory Fuse Panel	932	Brn
Orn	Ignition Switched Fuse Panel	933	Orn
Red*	Battery B+	934	Red
Red*	Battery B+	934	Red

* See note 8 on page 27

Table 2-1 GM Ignition & Turn Signal Wiring

3.0 FORD - SPECIFIC CIRCUIT CONNECTIONS

3.1 Ford Alternator (2 configurations). See Figure 3-1.

*Note: Your Alternator may not appear exactly as represented in **Figure 3-1**. The circuits are wired the same way, though.*

3.1.1 Connect Battery wire #915 (red) to the Alternator Output lug (Bat). Connect Key-On power wire #914 (wht) to the Voltage Regulator (I) terminal.

CAUTION:IF USING AN ALTERNATOR WITH AN OUTPUT LARGER THAN 65 AMPS, YOU WILL ALSO NEED TO USE JUMPER WIRE #960 (RED) (PURCHASED SEPARATELY – PAINLESS # 30709). THE WIRE END WITH THE RING TERMINAL AND RUBBER BOOT WILL CONNECT TO THE ALTERNATOR OUTPUT LUG. ROUTE THE OTHER END TO THE STARTER RELAY. CUT THE WIRE AND CRIMP ON A RING TERMINAL. INSTALL ON RELAY TERMINAL WITH CABLE COMING FROM BATTERY. SEE FIGURE 3-1B.

3.1.2 Connect a 14-gauge jumper from the Voltage Regulator A terminal to the Alternator Output lug (Bat).

3.1.3 Connect a 14-gauge wire from the Voltage Regulator S terminal to the Alternator Stator (S) terminal. Connect a 14-gauge wire from the Voltage Regulator F terminal to the Alternator Field (F) terminal.

3.1.4 Connect the Alternator Ground lug and the Voltage Regulator to chassis ground.

3.1.5 An alternate (and less-used) method is to omit the Alternator Stator wire, install a 14-gauge jumper across Voltage Regulator terminals A & S, and connect wire #914 to either the A or S terminal of the Voltage Regulator. The FIELD wire and wire #915 are connected as above. Do **NOT** install a jumper as in **Paragraph 3.1.2**. The Voltage Regulator Ignition (I) terminal is not connected. Install ground wires as in **Paragraph 3.1.4**. This alternate configuration is illustrated in dashed lines in **Figure 3-1A**.

3.2 Ford Ignition (Start/Run) System. See Figure 3-2.

*Note: If you are going to install an ammeter, see **Section 5.3** first.*

Note: Original ignition module wire should be retained if possible. Connectors for the module are no longer serviced.

3.2.1 Connect wire #916 - with Maxi Fuse installed - to the Starter Relay Battery terminal. This is the same lug that the large red cable from the battery is normally connected to.

3.2.2 Connect wire #919 (pur) to the Starter Relay Start (S) terminal.

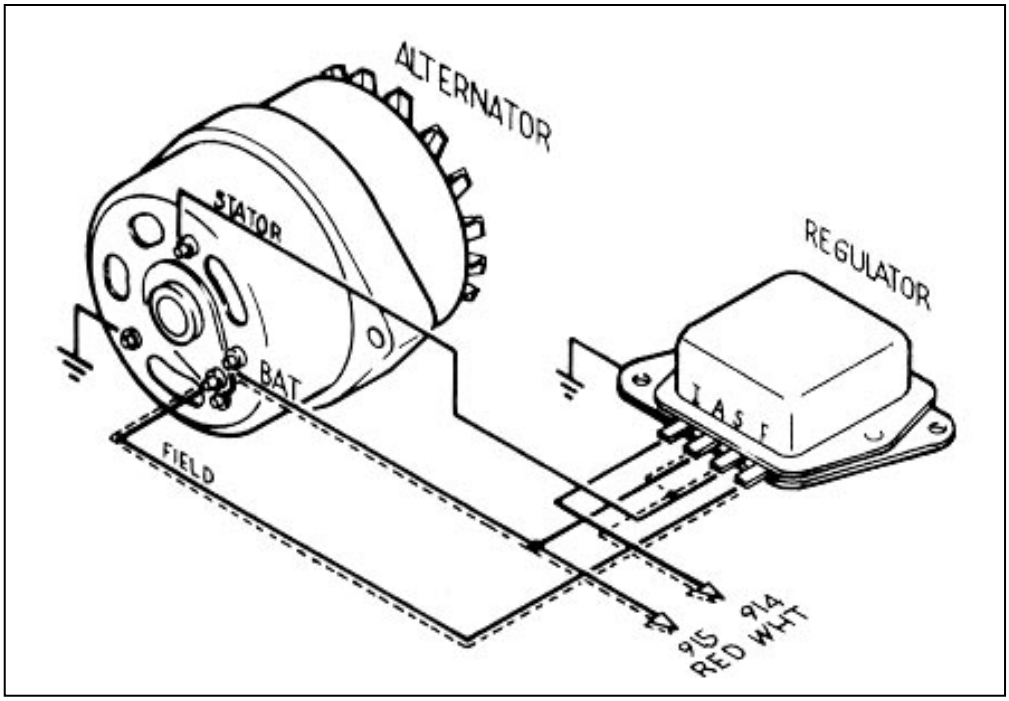


Figure 3-1A Ford Alternator (2 configurations)

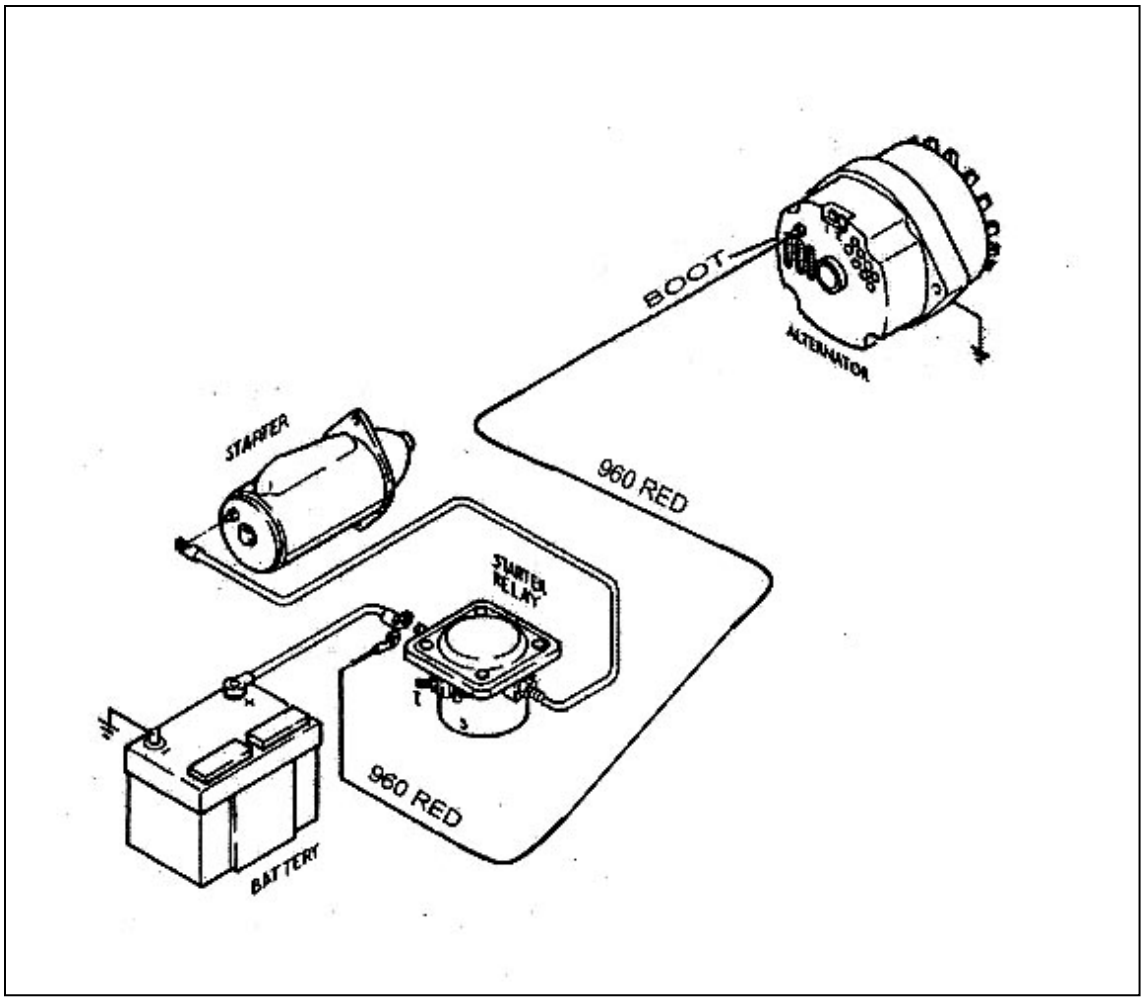


Figure 3-1B High Output Wire

3.2.3 If you are using the Ballast Resistor, mount it away from other wiring or hoses. The Ballast Resistor gets very hot during operation. Connect Key-On power wire #920 (pnk) to one end of the Ballast Resistor. Connect the other end of the Ballast Resistor to the Ignition Coil B+ terminal with 14-gauge wire. If you are using a Ballast Resistor, connect wire #920 directly to the Ignition Coil B+ terminal.

3.2.4 The Ignition Coil NEGATIVE (-) terminal is connected to the Distributor. Also connect wire #923 (pur/wht) to the Ignition Coil NEGATIVE (-) terminal. This is the tachometer source.

3.2.5 Connect a 14-gauge wire from the Starter Relay Ignition (I) terminal to the ignition coil side of the Ballast Resistor. This wire serves as a ballast resistor BYPASS during engine starting. If you are not using a ballast resistor, leave the Starter Relay Ignition (I) terminal unconnected and do not connect the bypass wire.

3.2.6 Be sure the large, red battery cable is connected from the other side of the Starter Relay to the Starter Motor.

NOTE: If your engine will not shut off when the ignition switch is turned off you may have a power back-feed coming from the #914 (wht) wire and going thru the ignition switch out to the coil. To fix this problem you will need to cut the #914 (wht) wire and crimp the supplied diode between the cut wire ends with the silver stripe towards the alternator.

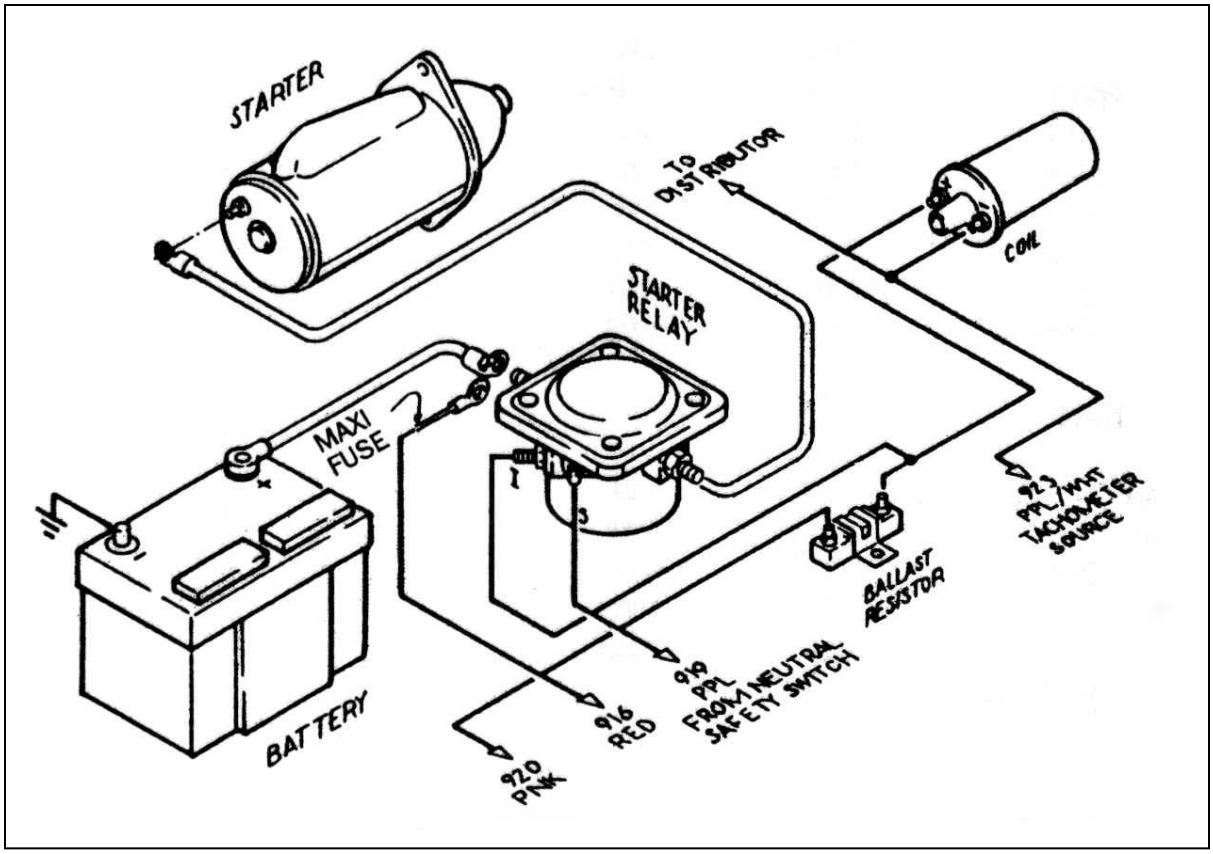


Figure 3-2 Ford Ignition (Start/Run) System

3.3 Steering Column Wiring - Turn Signal Connections

3.3.1 Connect the turn signal wires to your automobile's existing Turn Signal Connector according to **Table 3-1**. Ford wire color codes are provided for reference. Ford has not been uniform in assigning wire colors over the years; so you may find that the wire colors in your existing Ford harness differ from those shown.

3.3.2 If there is any doubt, be on the safe side. Trace the wire(s) with an ohmmeter, circuit tester, or test light. DON'T GUESS!

Note: Disconnect one end of the wire you are tracing. If you leave it connected, there is the possibility of tracing it back through some other circuit and getting false results.

3.3.3 Connect the Horn Ground wire to chassis ground.

3.4 Steering Column Wiring - Ignition Switch Connections

3.4.1 Connect the wires of the ignition switch according to **Table 3-1**. **Figure 3-3** represents three (not all) possible Ford ignition switch connector configurations and how they should be wired.

Note: The connectors are shown from the wire side, NOT the connection side. It is important to understand the difference. Trace the wires if in doubt.

3.4.2 On some Fords, the Ignition Switch is designed to bypass the ballast resistor during start. In **Table 3-1**, the red/blu wire supplies power to the coil, bypassing the ballast resistor when the switch is in the "Start" position. Once the engine has started and the switch is released (Run), power is supplied to the coil (through the ballast resistor) by the (variously-colored) wire shown. Jumper these two terminals to the Ignition Switch Connector and connect wire #931 (pnk) to one or the other. **DO NOT** Route an additional wire. The ballast resistor bypass circuit was wired at **Paragraph 3.2.3**.

3.4.3 IGNITION SWITCH SECTION wire #919 (pur) needs to be routed to the neutral safety switch, cut and connected to it. FOR SAFETY, PLEASE USE A NEUTRAL SAFETY SWITCH!

TURN SIGNAL SECTION

Ford Color	Designation	Painless Wire No.	Painless Color
Grn	Stop Light	918	Wht
Wht/Blu	RF Turn Signal	925	Blu
Grn/Wht	LF Turn Signal	926	Lt.Blu
Orn/Blu	RR Turn Signal	948	Grn
Grn/Orn	LR Turn Signal	949	Ylw
Wht/Red	Hazard Flasher	951	Brn
Blu	Turn Flasher	952	Pur
Ylw	Horn	953	Blk
Dk.Blu	Horn Ground	Gnd	----

IGNITION SWITCH SECTION

Brn/Pur or Wht/Blu[1]	Start	919	Pur
Wht/Grn, Red/Grn, Wht/Blu or Brn/Pur	Ignition Coil (run)	931	Pnk
Red/Blu	Ignition Coil (start)	[2]	----
Blk/Grn or Blk/Ylw	Accessory Fuse Panel	932	Brn
Gry, Gry/Ylw, or Blk	Ignition Switched Fuse Panel	933	Orn
Ylw	Battery B+	934	Red

NOTES: Wires may be the colors shown, or some other color. See **Paragraph 3.3.1**.
Jumper to wire #931. See **Paragraph 3.4.2**.

Table 3-1 Ford Ignition and Turn Signal Wiring

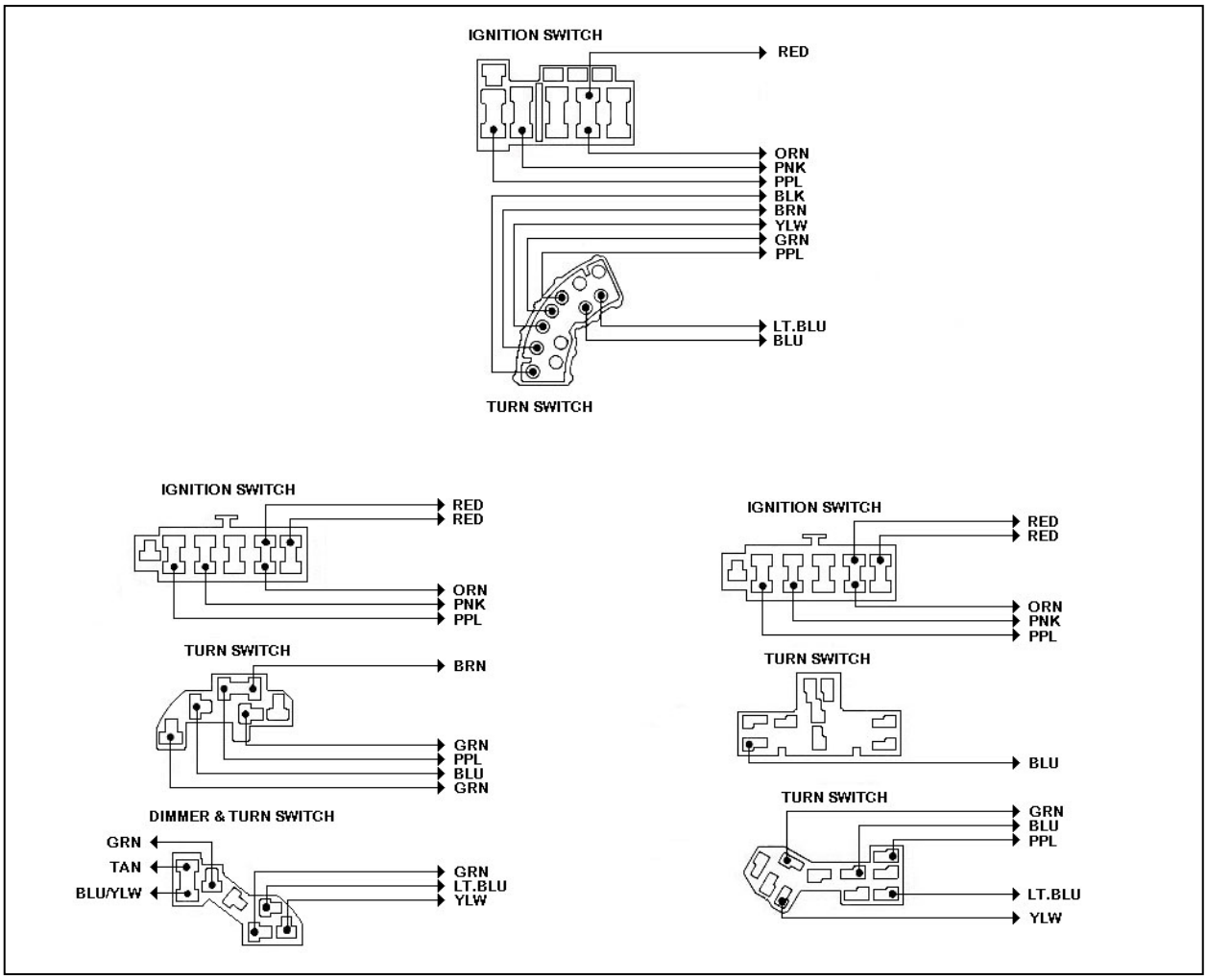


Figure 3-3 Ford Ignition Switch Connectors (See note on Page 10, Sec.3.4)

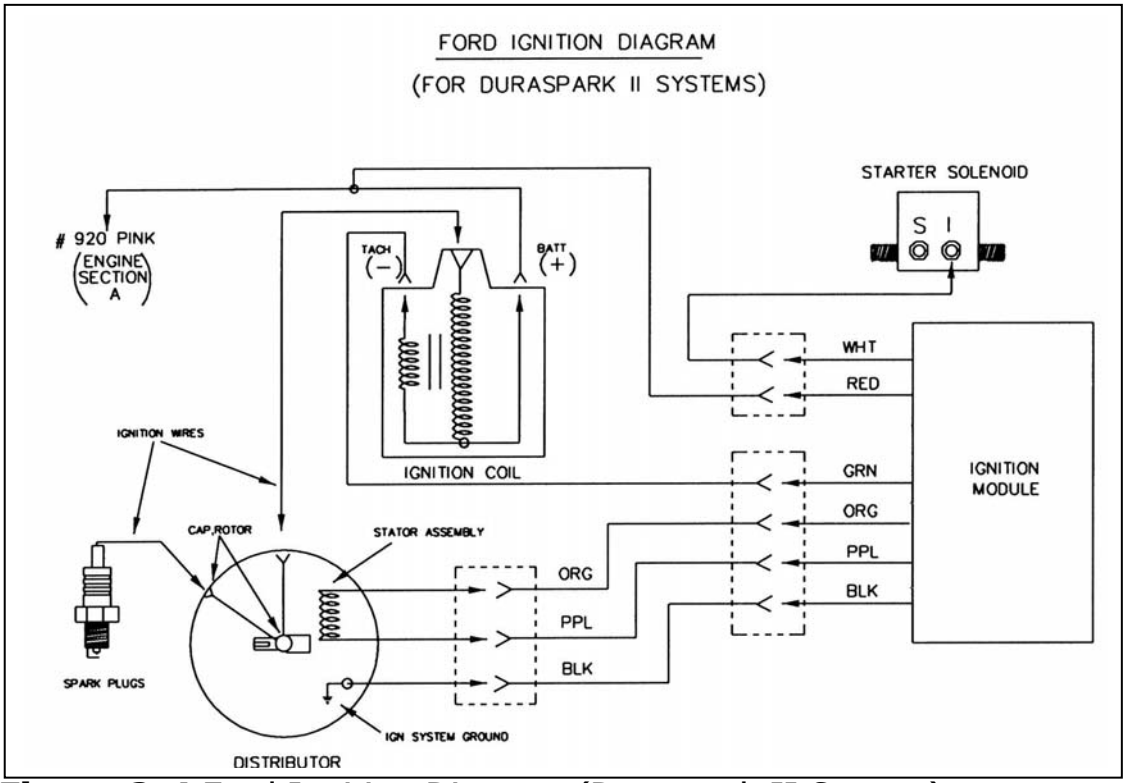


Figure 3-4 Ford Ignition Diagram (Duraspark II System)

4.0 MOPAR - SPECIFIC CIRCUIT CONNECTIONS

4.1 Mopar Alternator. See Figure 4-1

*Note: Your Alternator may not appear exactly as represented in **Figure 4-1**. The circuits are wired the same way, though.*

4.1.1 Mopar uses one of two kinds of voltage regulators: An electronic regulator and a mechanical one. The electronic voltage regulator is represented in **Figure 4-1**. It does not matter how the two terminals are connected, so long as they are BOTH connected. The mechanical regulator has terminals marked "F" (Field) and "I" (Ignition). In contrast to the electronic regulator, it DOES make a difference how the mechanical regulator is connected.

4.1.2 Connect Key-On power wire #914 (wht) to the Alternator Field (F) terminal as shown in **Figure 4-1A**. Connect Battery wire #915 (red) to the Alternator Output lug (Bat).

CAUTION: IF USING AN ALTERNATOR WITH AN OUTPUT LARGER THAN 65 AMPS, YOU WILL ALSO NEED TO USE JUMPER WIRE #960 (RED) (PURCHASED SEPARATELY– PAINLESS # 30709). THE WIRE END WITH THE RING TERMINAL AND RUBBER BOOT WILL CONNECT TO THE ALTERNATOR OUTPUT LUG. ROUTE THE OTHER END TO THE STARTER. CUT THE WIRE AND CRIMP ON A RING TERMINAL. INSTALL ON STARTER TERMINAL WITH CABLE COMING FROM BATTERY. SEE FIGURE 4-1B.

4.1.3 Connect a 14-gauge wire from the Alternator terminal where wire #914 is connected to either of the ELECTRONIC Voltage Regulator terminals OR terminal (I) of the MECHANICAL Voltage Regulator. On existing Mopar harnesses, this would be a blue wire.

4.1.4 Connect a 14-gauge wire from the other Alternator Field terminal (as shown in **Figure 4-1**) to the second terminal of the ELECTRONIC Voltage Regulator OR terminal (F) of the MECHANICAL Voltage Regulator. On existing Mopar harnesses, this would be a green wire.

4.1.5 Finally, be sure Both the alternator and the voltage regulator are grounded.

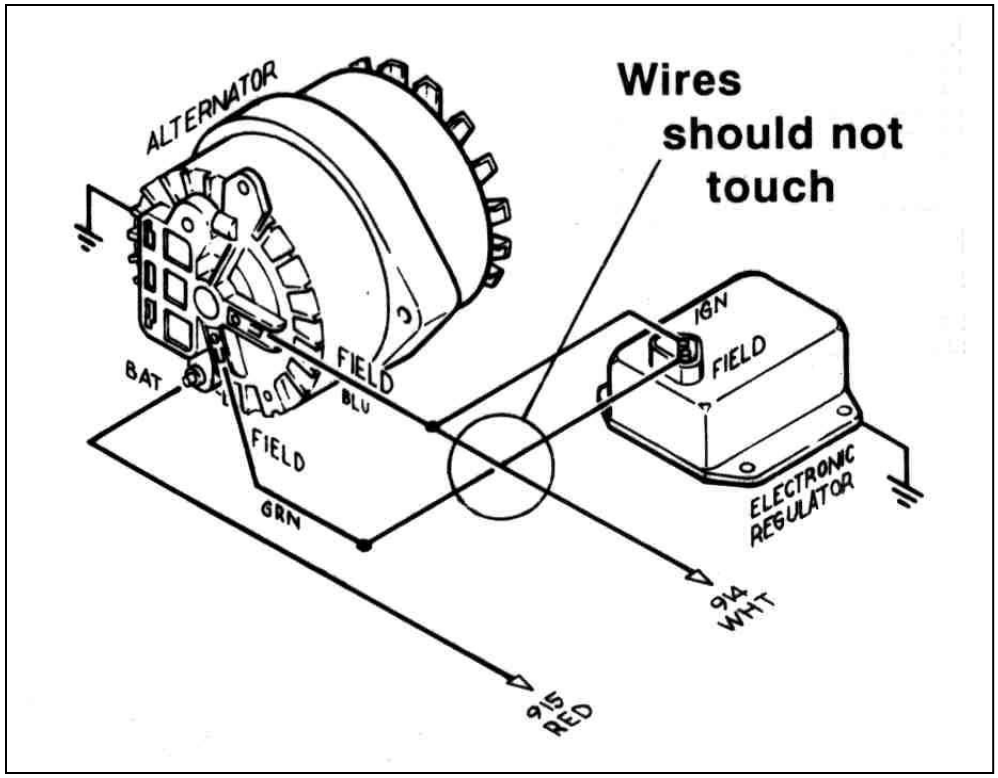


Figure 4-1A Mopar Alternator

4.2 Mopar Ignition (Start/Run) System. See Figure 4-2

*Note: If you are going to install an ammeter, see **Section 5.3** first.*

4.2.1 Connect 10-gauge red wire #916 (with or without ammeter) to the Starter Relay Battery Terminal.

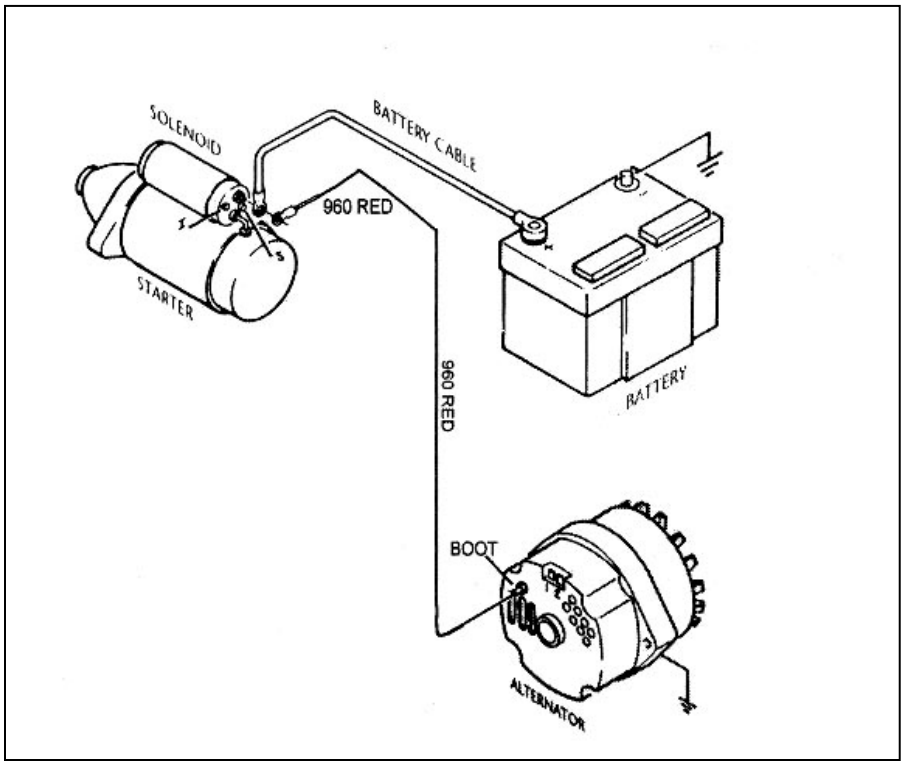


Figure 4-1B High Output Wire

4.2.2 Connect wire #919 (pur) to the Starter Relay Ignition (I) terminal.

4.2.3 Connect a 14-gauge wire from the Starter Relay Ground (G) terminal to the center terminal of the transmission mounted Neutral Safety Switch. Older Mopar neutral safety switches have only one terminal. On newer switches, the two outside terminals are for backup lights. Use existing wiring to connect these two terminals as shown in **Figure 4-2**.

4.2.4 If the Neutral Safety Switch is mounted in the floor shifter, connect the Starter Relay Ground (G) terminal to chassis ground. Refer to **Paragraph 4.4.2** to wire the Neutral Safety Switch.

4.2.5 If you are using the Ballast Resistor, mount it away from other wiring or hoses. The ballast resistor gets very hot during operation. Connect Key-On power wire #920 (pnk) to one end of the Ballast Resistor. Connect the other end of the ballast resistor to the Ignition Coil POSITIVE (+) terminal with 14-gauge wire. If you are not using a Ballast Resistor, connect wire #920 directly to the Ignition Coil B+ terminal.

4.2.6 Connect a 14-gauge wire from the Starter Relay Ignition (I) terminal to the ignition coil side of the Ballast Resistor. This wire serves as a ballast resistor BYPASS during engine starting. You must add a diode (8 amp min., 100 PIV) to this wire as shown in **Figure 4-2**. If you are not using a ballast resistor, do not connect this wire.

4.2.7 The Ignition Coil NEGATIVE (-) terminal is connected to the Distributor. Also connect wire #923 (pur/wht) to the Ignition Coil NEGATIVE (-) terminal. This is the tachometer source.

4.2.8 Be sure the large, red battery cable is connected from the Battery to the Starter Motor Battery terminal (the same place the Maxi Fuse is connected).

NOTE: If your engine will not shut off when the ignition switch is turned off you may have a power back-feed coming from the #914 (wht) wire and going thru the ignition switch out to the coil. To fix this problem you will need to cut the #914 (wht) wire and crimp the supplied diode between the cut wire ends with the silver stripe towards the alternator.

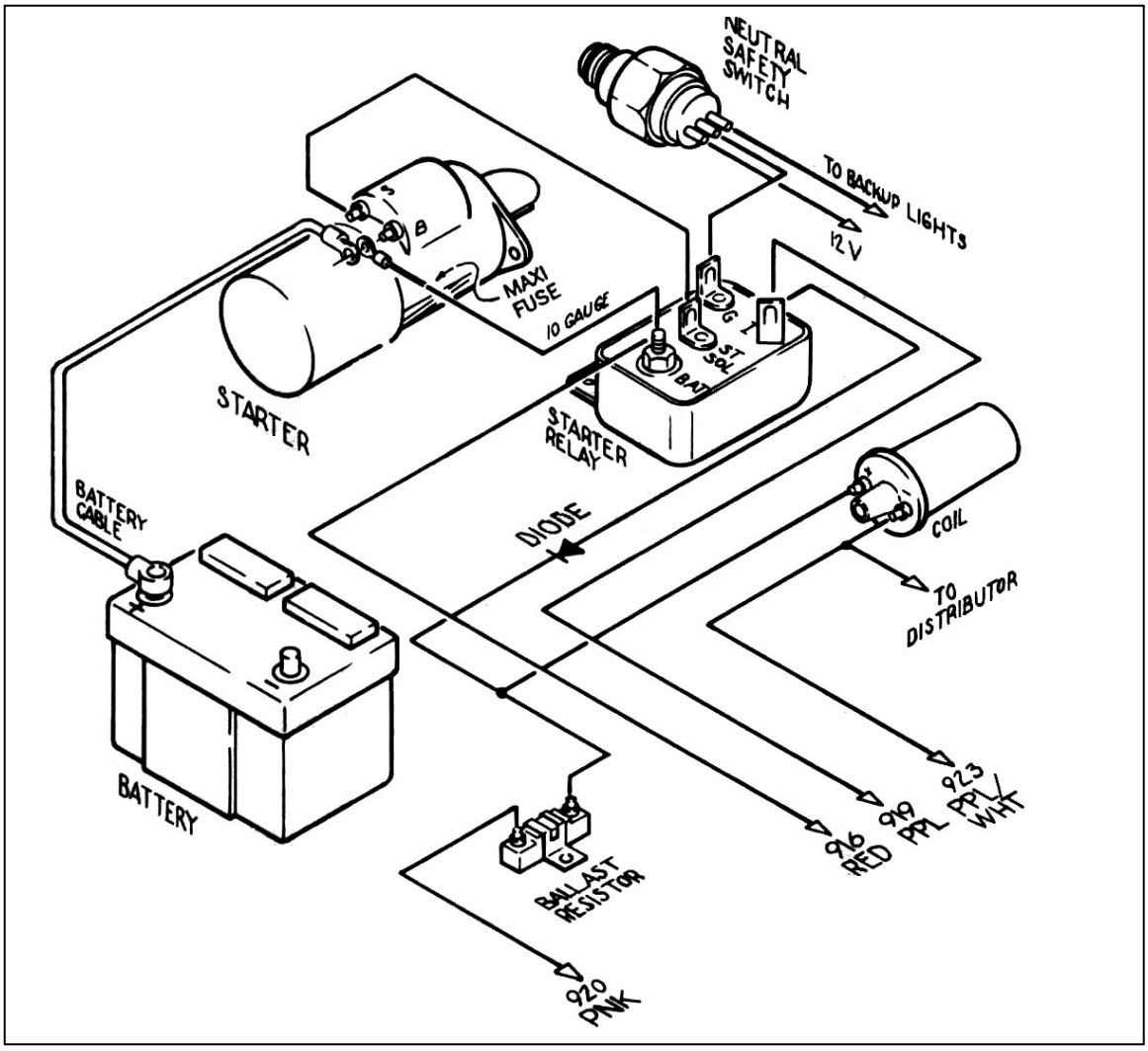


Figure 4-2 Mopar Ignition (Start/Run) System

4.3 Steering Column Wiring - Turn Signal Connections

Refer to **Table 4-1**. Check your existing wiring (by tracing the wire, if necessary) against the data given.

4.3.1 Connect the turn signal wires to your automobile's existing Turn Signal Connector according to **Table 4-1**. Mopar wire color codes for a number of years are provided for reference. Mopar has not been uniform in assigning wire colors over the years; so you may find that the wire colors in your existing Mopar harness differ from those shown.

4.3.2 If there is any doubt, be on the safe side. Trace the wire(s) with an ohmmeter, circuit tester, or test light. DON'T GUESS!

Note: Disconnect one end of the wire you are tracing. If you leave it connected, there is a possibility of tracing it back through some other circuit and getting false results.

4.3.3 If your existing Turn Signal Connector requires a Horn Ground wire, install one.

4.4 Steering Column Wiring - Ignition Switch Connections

4.4.1 Connect the wires of the ignition switch according to **Table 4-1**.

4.4.2 Ignition switch wire #919 (pur) is to be connected to a Neutral Safety Switch. However, Mopar switches are mounted in the transmission. The transmission-mounted neutral safety switch was wired at **Paragraph 4.2.4**. FOR SAFETY, PLEASE USE A NEUTRAL SAFETY SWITCH!

4.4.3 If the switch is mounted on a floor shifter, route wire #919 purple (pur) to the neutral safety switch, cut and connect to it.

1970-74 WITHOUT TILT COLUMN

TURN SIGNAL CONNECTOR

Mopar Color	Designation	Painless Wire No.	Painless Color
Wht	Stop Light Switch	918	Wht
Tan	RF Turn Signal	925	Blu
Grn	LF Turn Signal	926	Lt.Blu
Brn	RR Turn Signal	948	Grn
Grn	LR Turn Signal	949	Ylw
Pnk	Hazard Flasher	951	Brn
Red	Turn Flasher	952	Pur
Blk	Horn	953	Blk

IGNITION SWITCH CONNECTOR

Ylw[1]	Ignition Start	919	Pur
Brn	Ignition Coil	931	Pnk
Blk	Accessory Fuse Panel	932	Brn
Blu	Ignition Switched Fuse Panel	933	Orn
Red	Battery B+	934	Red
Vio	Ground	----	----
Ylw[2]	Buzzer Switch	[3]	----
Ylw[2]	Buzzer Switch	[3]	----
Orn	Gear Shift Lamp	[3]	----

NOTES:

1. 12 gauge wire
2. 20 gauge wire
3. The Painless harness does not support these.

Table 4-1 Mopar Ignition and Turn Signal Wiring 1 of 2

TURN SIGNAL CONNECTOR

Designation	79 w/tilt	79 w/o tilt	82 RWD w/o tilt	82 RWD w/tilt
Stop Light	Wht	Wht	Wht	Wht
RR Turn Signal	Dk.Grn	Brn	Brn/Red	Brn/Red
LR Turn Signal	Ylw	Dk.Grn	Dk.Grn/Red	Dk.Grn/Red
Turn Signal Flasher	Pur	Red	Red	Red
Hazard Signal Flasher	Brn	Pnk	Pnk	Pnk
RF Turn Signal	Dk.Blu	Tan	Tan	Tan
LF Turn Signal	Lt.Blu	Lt.Grn	Lt.Grn	Lt.Grn
Horn	Blk	Blk	Blk/Red	Blk/Red
Not supported by the Painless wire harness:				
Horn	----	Blk/Red	----	----
Horn Ground	----	Blk	Blk	----
Key Alarm	Pnk	----	Blk/Lt.Blu	----
Key Alarm	Blk	----	Lt.Blu	----
R Corner Lamp	Blk/Wht	Tan/Wht	Tan/Wht	Tan/Wht
L Corner Lamp	Gry	Lt.Grn/Blk	Lt.Grn/Blk	Lt.Grn/Blk
Corner Feed Lamp	Brn	Vio	Vio	Vio

Table 4-1 Mopar Ignition and Turn Signal Wiring 2 of 2

5.0 ALL MAKES - SPECIFIC CIRCUIT CONNECTIONS

5.1 Generator Charging System. See Figure 5-1.

5.1.1 Connect Generator ARMATURE terminal (A) to Voltage Regulator terminal A. Connect Generator FIELD terminal (F) to Voltage Regulator terminal F. Use 14-gauge wire (color optional) for FIELD and 12-gauge wire for Armature.

5.1.2 Be sure both the generator and the voltage regulator are securely grounded. The voltage regulator may have a terminal for this purpose, (labeled "G") or you may have to ground the regulator case.

5.1.3 Connect Battery wire #915 (red) to Voltage Regulator terminal B.

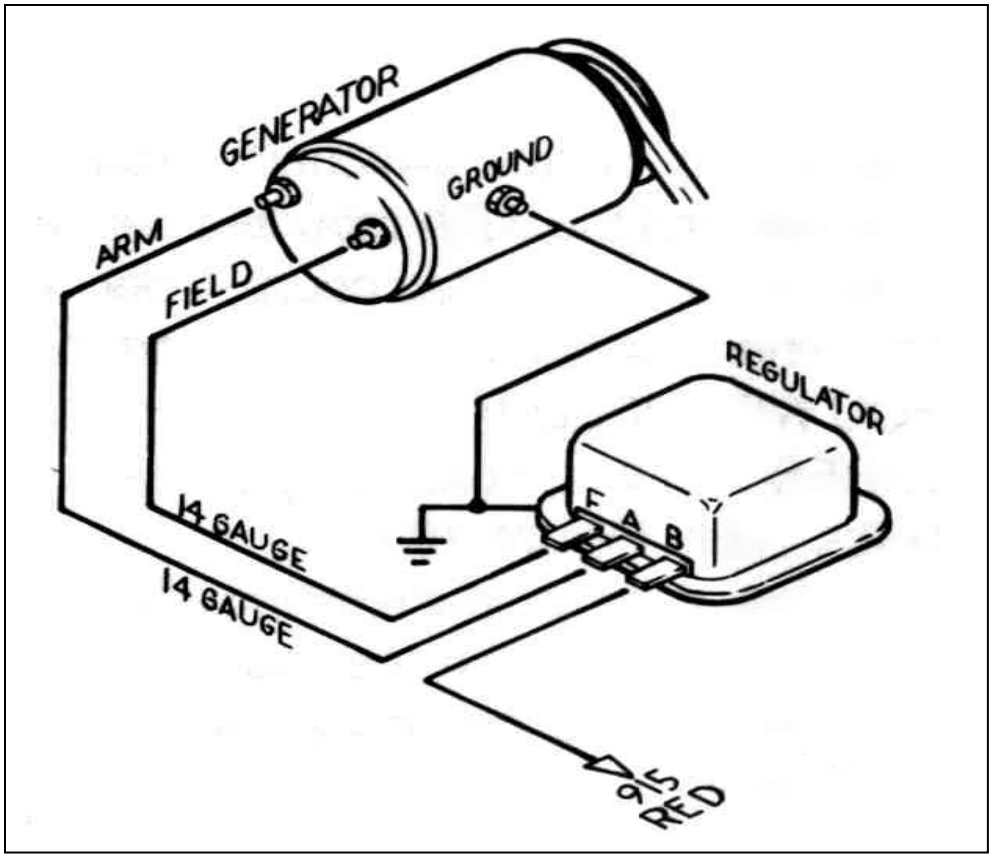


Figure 5-1 Generator Charging System

5.2 Generator to Alternator Conversion

5.2.1 You may be able to convert your generator charging system to use an alternator and external regulator without altering or re-routing existing wires.

5.2.2 Install the new alternator and replace the existing generator voltage regulator with the new, alternator compatible one.

5.2.3 Connect the existing wiring according to either **Section 2.0, 3.0** or **4.0**, as appropriate.

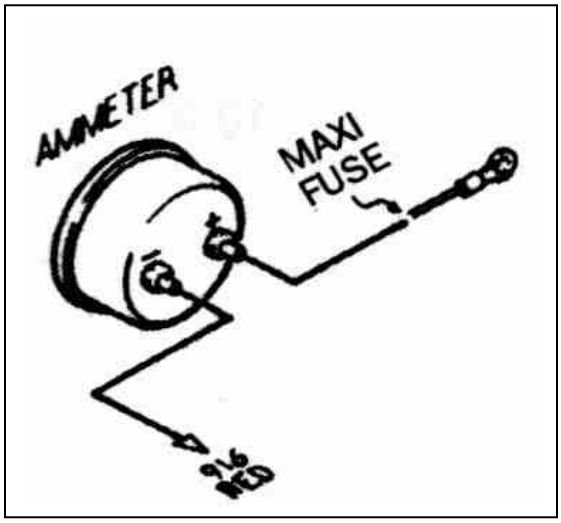


Figure 5-2 Ammeter & Maxi Fuse

5.3 Connecting an Ammeter and the Maxi Fuse. See Figure 5-2.

5.3.1 Most, but not all Ammeters must be inserted IN SERIES onto the Battery 10-gauge wire #916 (red) that routes from the Fuse Panel to the Starter Solenoid on GM (**Section 2.4**) and from the Fuse Panel to the Starter Relay on Ford (**Section 3.2**) and Mopar (**Section 4.2**).

5.3.2 The overall physical length of this circuit should be as short as possible (allow some slack, however). You may have to cut wire #916 and you may have to add some additional length of 10-gauge wire. USE ONLY 10-GAUGE WIRE OR LARGER.

5.3.3 Route wire #916 (from the Fuse Panel) and connect to the Ammeter NEGATIVE terminal. To complete the installation, follow ONE of the next three (3) paragraphs, as appropriate.

5.3.4 If you are using a GM starter, route wire #916 from the Ammeter POSITIVE terminal to the Maxi Fuse terminal. Connect the other side of the Maxi Fuse (**Figure 2-3**) to the Starter Solenoid Battery (B+) terminal.

5.3.5 If you are using a Ford starter with a starter relay, route wire #916 from the Ammeter POSITIVE terminal to the Maxi Fuse terminal. Connect the other side of the Maxi Fuse (**Figure 2-3**) to the Starter Solenoid Battery (B+) terminal.

5.3.6 If you are using a Mopar starter with a starter relay, route wire #916 from the Ammeter POSITIVE terminal to the Maxi Fuse terminal. Connect the other side of the Maxi Fuse (**Figure 2-3**) to the Starter Solenoid Battery (B+) terminal.

CAUTION:BOTH AMMETER TERMINALS MUST ABSOLUTELY BE ISOLATED FROM GROUND. IF EITHER AMMETER TERMINAL COMES IN CONTACT WITH GROUND A HARNESS FIRE IS INEVITABLE. USE EXTREME CARE AND DILIGENCE IN CONNECTING AMMETERS.

CAUTION:BE SURE YOUR AMMETER'S CURRENT (AMPS) RATING EXCEEDS THE CURRENT OUTPUT OF YOUR ALTERNATOR. PERFECT PERFORMANCE PRODUCTS, LLC DOES NOT RECOMMEND USING ANY AMMETER RATED AT LESS THAN 65 AMPS. DO NOT USE AN AMMETER WITH ANY HIGH OUTPUT ALTERNATOR (MORE THAN 65 AMPS).**18**

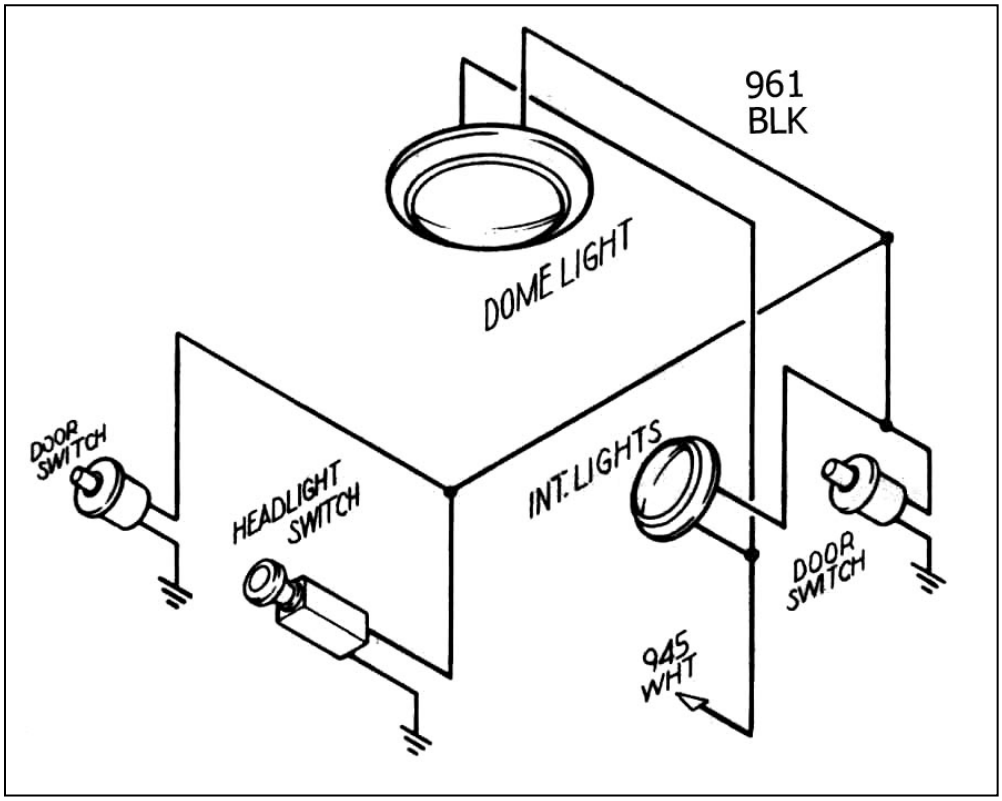


Figure 5-3 Interior Lighting **(GM Style Jamb Switch – Painless Part #80170)**

5.4 Interior Lighting. See Figure 5-3

5.4.1 Interior Lights are switched through the door switches and the dash-mounted headlight switch, which is usually rotated counter-clockwise to turn on. These switches apply ground to the circuit. 12V is continually present at the light bulbs. See **Figure 5-6**.

5.4.2 If possible leave your existing interior light wiring intact. The Painless harness supplies the 12V feed (B+) wire #945 (wht).

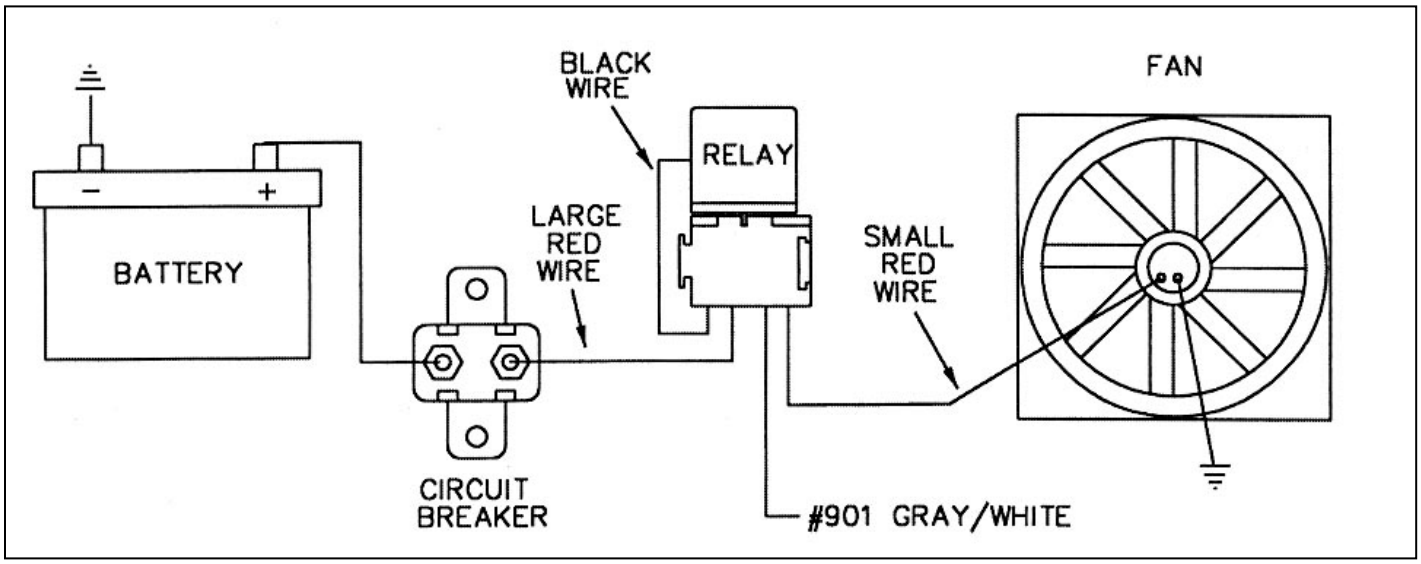


Figure 5-4A Typical Fan Relay Installation **(Fan Relay Kit – Painless Part #30101)**

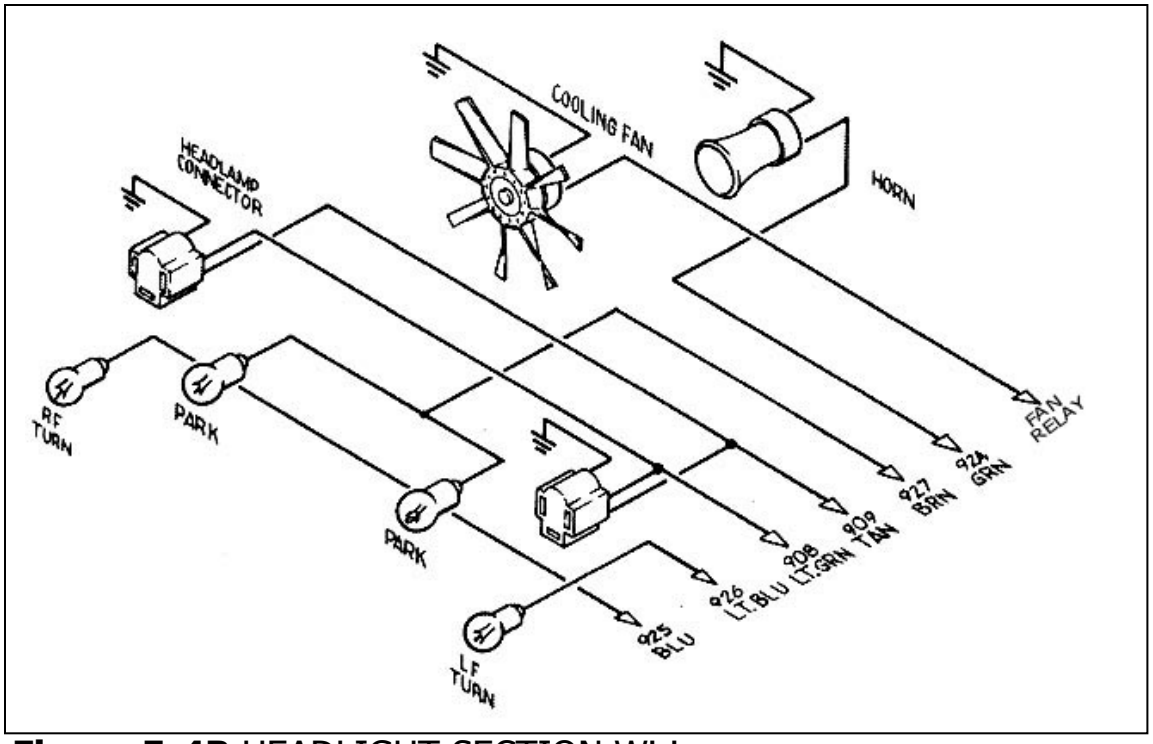


Figure 5-4B HEADLIGHT SECTION Wiring

5.5 HEADLIGHT SECTION See Figure 5-4B.

5.5.1 Connect wire #924 (grn) to the Horn's hot terminal. Turn signal wire #953 (blk) was connected in the Turn Signal Connector section of these instructions.

5.5.2 Connect wires #908 (lt.grn) and #909 (tan) to the green and tan wires of BOTH Headlamp Connectors. Connect the black wires of the Headlamp Connectors to Chassis Ground. You have been supplied with two small grommets should you need to pass these wires through a fender well. Don't forget to thread them onto the wires BEFORE you connect the wires.

5.5.3 Connect wire #927 (brn) to ALL front Park Lights. Connect wire #925 (blu) to the RIGHT FRONT Turn Signal. Connect wire #926 (lt.blu) to the LEFT FRONT Turn Signal.

Note: Don't confuse Park Lights with Turn Signals.

5.5.4 Connect wire #901 (gry/wht) to the Electric Fan Relay. This wire is an activation wire for the relay, **NOT A POWER FEED**. The other end of wire #901 should be connected to the electric fan switch in the dash. **Figure 5-4A** shows a typical fan relay installation.

Note: The wire going to the fan in Figure 5-4B will be coming from the fan relay output terminal. Wire #901 (gry/wht) from the fan switch is an activation wire for the fan relay.

5.5.5 Connect the DIMMER SWITCH Connector to your floor-mounted Dimmer Switch or column-mounted Dimmer Switch.

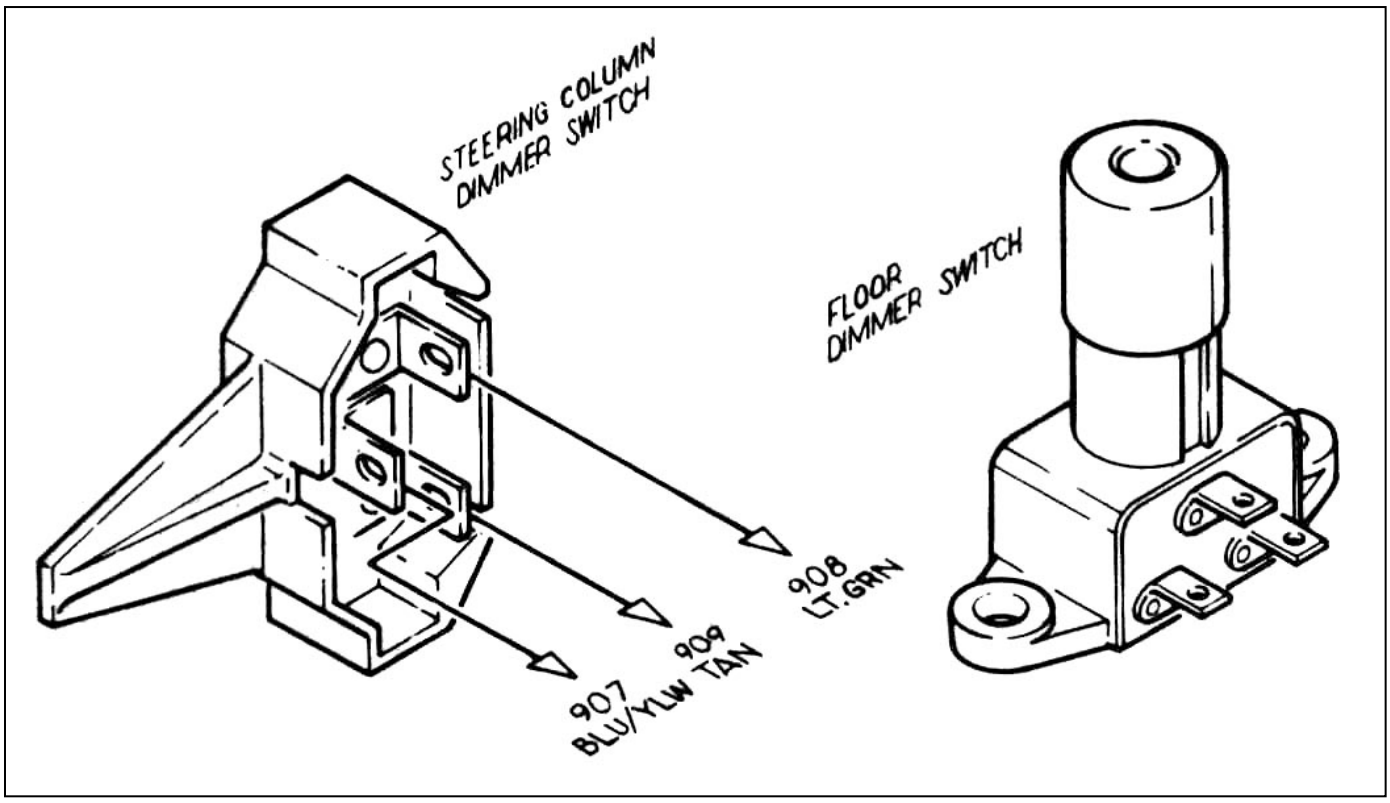


Figure 5-5 Dimmer Switches **(Push Button Style – Painless Part #80150)**

5.6 HEADLIGHT SWITCH Wiring. See Figure 5-6.

5.6.1 Connect the Dome and Interior Light return circuit, and the Headlamp Switch Ground as shown. If you do not have a GM headlight switch, you should trace out the wires of your existing harness and connect the new harness according to **Table 6-1**.

*Note: On late-style GM headlight switches, the park lights terminal to which wire #927 (brn) is connected (shown in **Figure 5-6**) has been omitted. In this case, wire #927 must be connected as indicated by the dashed line in **Figure 5-6**.*

5.7 Instrument Panel Wiring

5.7.1 Connect the instrument panel wires as indicated in **Table 6-1**.

5.7.2 Connect a jumper from wire #935 (red/wht) to all Gauges' power or "I" terminals. Connect a jumper from wire #930 (brn) to all Gauges' Instrument Lighting terminals. Connect a jumper to all Gauges' Ground terminals and connect to Chassis Ground.

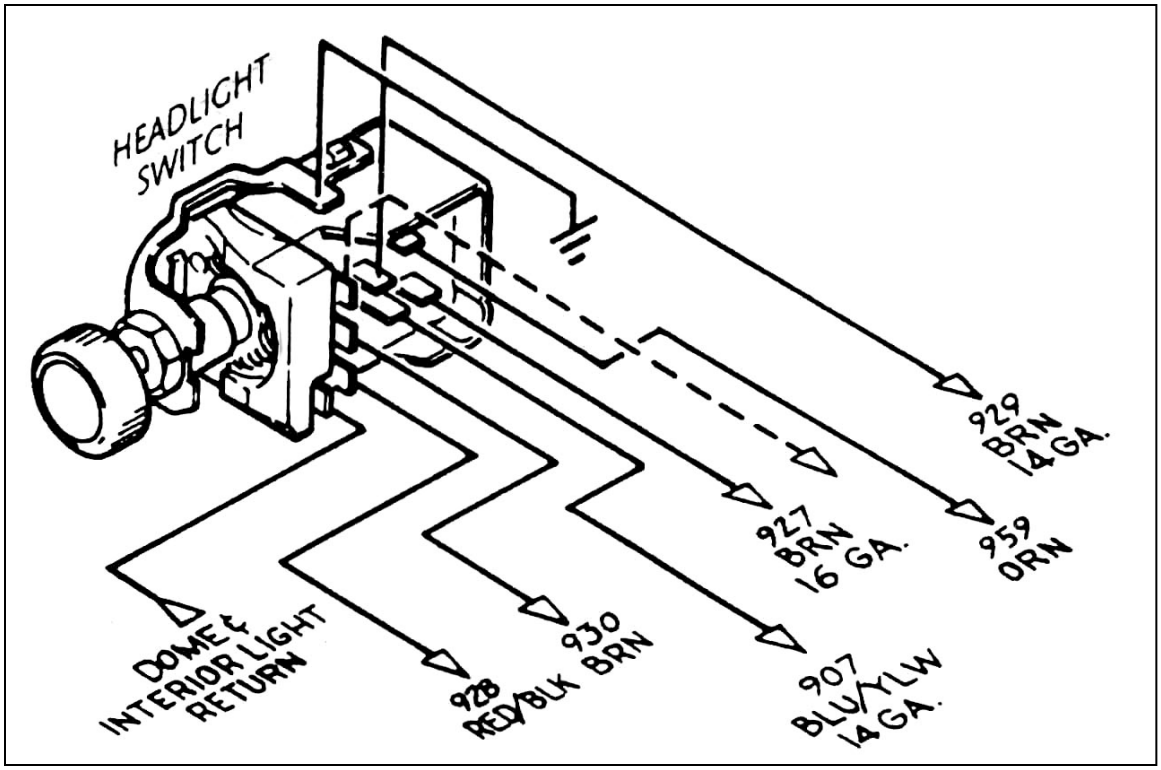


Figure 5-6 HEADLIGHT SWITCH **(GM Style – Painless Part #80152)**

5.8 Brake Light Switch

5.8.1 Connect wires #917 (orn) and #918 (wht) to the Brake Light Switch wherever it may be mounted.

5.9 Tail Section Wiring

5.9.1 Connect wires #918 (wht), #948 (grn), #949 (ylw) and #950 (orn).

5.9.2 These 4 wires will be connected according to <u>one</u> of the diagrams shown in **Figure 5-7**. Which diagram you will use depends on whether or not you have <u>one</u> bulb on each side of the vehicle that is for the brake/tail **<u>and</u>** Turn Signal Lights (this is referred to as integrated lights) **or** you have **<u>more than one</u>** bulb on each side **<u>and</u>** the Brake and Turn Signal Lights are hooked to different bulbs (referred to as separate Brake/Turn Lights).

***Note A**: If you have Integrated Brake Lights you must use bulbs that have two (2) filaments in them such as in an 1157 bulb.*

***Note B**: The three wires shown in these diagrams are connected to the "brighter" of the two filaments when using a two-filament bulb (the Tail Lights are usually connected to the "Dimmer" filament). The Tail Lights, License Plate Lights, Reverse Lights, etc. are not shown on the diagrams for clarity.*

***Note C**: In the <u>separate</u> Brake Light diagram the arrangement shown is only one of several ways to wire a vehicle. The important thing is that the Brake and Turn Signal Lights use <u>completely</u> separate bulbs.*

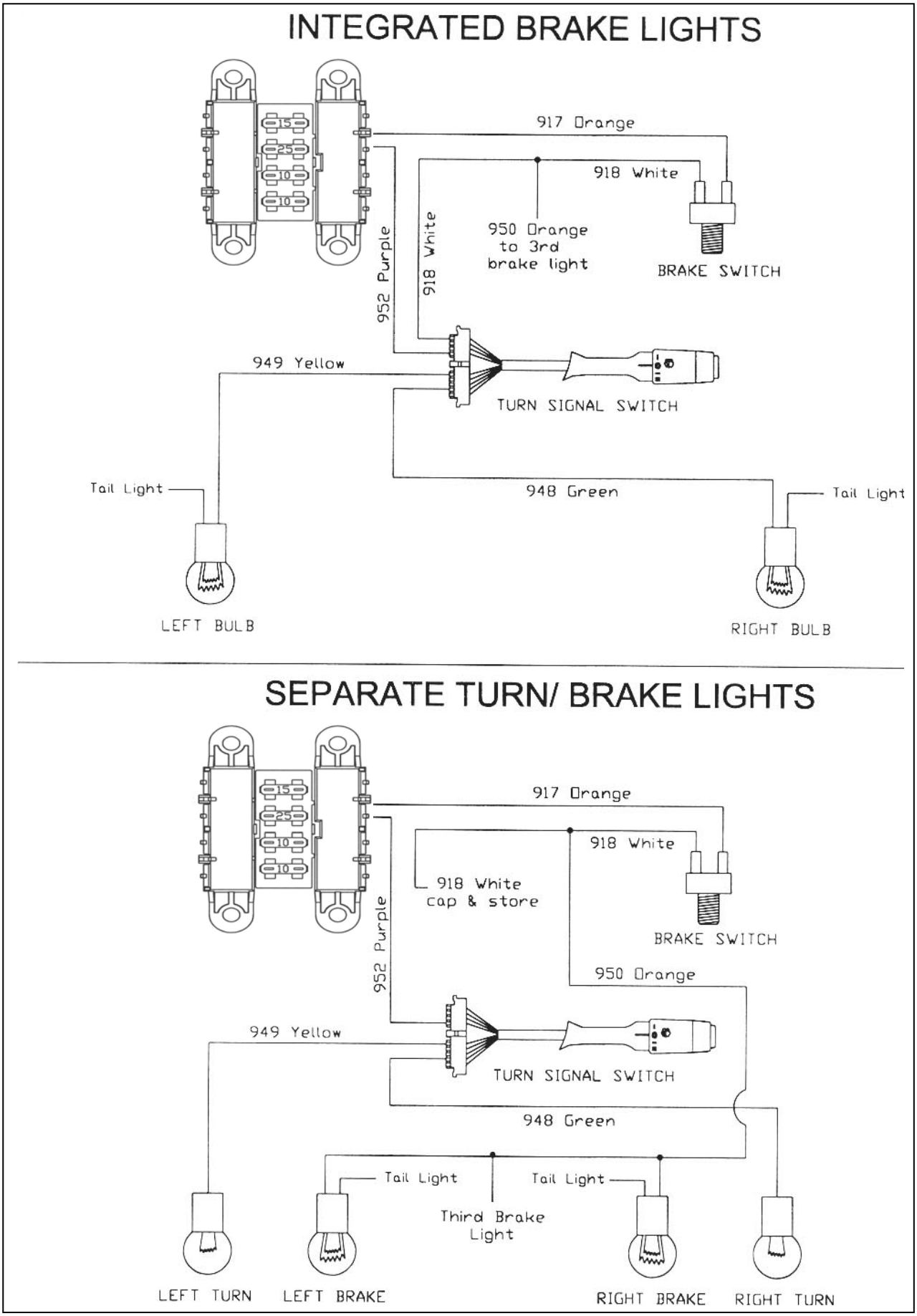


Figure 5-7 Integrated Brake Lights & Separate Turn/Brake Lights

5.10 Helpful Hints for Tail Section Wiring

5.10.1 When you have Integrated Brake Lights on your vehicle the Turn Signal switch acts as a brain to control when the Lights in the rear are on constantly (braking) or flashing (turning) or a combination of both. **The Turn Signal switch you use must be built to do this! If you are using a steering column out of a salvage yard that was originally in a vehicle that had <u>separate</u> Brake Lights then the switch will not work for <u>Integrated</u> Brake Lights.**

5.10.2 Almost all light bulbs get the ground they need through the socket housing. If you mount your socket housing into anything other than a grounded metal part then you will need to provide a separate ground wire.

6.0 WIRE CONNECTION INDEX

6.1 Wire Connection Index

The following Table is to be used as a reference as to recommended wire size, wire connections and circuits.

Table 6-1 is divided into sections that correspond to common vehicle sections. (ACCESSORY SECTION B+, DIMMER SWITCH SECTION, etc.). The index is divided vertically into six columns. COLOR, GAUGE, NUMBER, CONNECT TO, ORIGIN, and SECTION OF ORIGIN.

The columns labeled ORIGIN and SECTION OF ORIGIN are for your reference ONLY. The items in these columns tell you where each wire should originate (ORIGIN) and from which section (SECTION OF ORIGIN).

The column labeled NO. contains a 900-series number that is used to identify various wires in the wiring diagrams that are a part of these instructions.

Pay close attention to the **Notes** in this section, as identified by a small, raised number such as the one at the end of this sentence.❶

Many (but not all) of the wire numbers occur TWICE in this index. That is because you will be connecting BOTH ENDS of many of the particular wire segments. However, some wire segments should be pre-connected at one end. For instance, all wires originating from the fuse panel and certain other wires such as those originating from the horn relay, the dimmer switch, and the instrument panel section. These pre-connected wires are identified by an asterisk (*) in the ORIGIN column.

Color	Ga.	No.	Connect to	Wire Starting Point	Section of Starting Point
ACCESSORY SECTION SWITCHES					
Gry/Wht	18	901	Cooling Fan Switch	Fan Relay	Headlight Section A
Blk/Wht	14	902	AC/Heat Switch	A/C Compressor	Engine Section A
ACCESSORY SECTION B+					
Tan	14	903	Cigarette Lighter B+	Fuse Panel*	Fuse Panel
Blk/Wht	14	904	AC/Heat Switch B+	Fuse Panel*	Fuse Panel
Blu	16	905	Wiper Switch B+	Fuse Panel*	Fuse Panel
Gry/Wht	18	906	Cooling Fan Switch B+	Fuse Panel*	Fuse Panel
DIMMER SWITCH SECTION					
Blu/Ylw❶	14	907	Dimmer Switch	Headlight Switch	Headlight Section B
Lt.Grn	14	908	Dimmer Switch	High Beam	Headlight Section A
Tan	14	909	Dimmer Switch	Low Beam	Headlight Section A
DOOR SECTION A					
Ylw/Blk	14	910	Right Door Lock B+	Fuse Panel*	Fuse Panel
Ylw	14	911	Right Power Window B+	Fuse Panel*	Fuse Panel
DOOR SECTION B					
Ylw/Blk	14	912	Left Door Lock B+	Fuse Panel*	Fuse Panel
Ylw	14	913	Left Power Window B+	Fuse Panel*	Fuse Panel
			ENGINE SECTION		
Wht	14	914	Alternator Exciter	Fuse Panel*	Fuse Panel
Red	10	915	Alternator B+	Fuse Panel*	Fuse Panel
Blk/Wht	14	902	A/C Compressor	A/C Central Switch	Accy. Section Switches
ENGINE SECTION (SINGLE WIRE)					
Red❷	10	916	Battery Positive or Starter Solenoid (Large Terminal)	Fuse Panel*	Fuse Panel
ENGINE SECTION					
Orn❸	14	917	Brake Switch B+	Fuse Panel*	Fuse Panel
Wht	16	918	Brake Switch	Turn Signal Switch	Turn Signal Section
Pur	12	919	Start Solenoid ("S" Terminal)	Ignition Switch Start	Ignition Switch Section
Pnk	14	920	Coil B+	Fuse Panel*	Fuse Panel
Lt.Grn	18	921	Temperature Sending Unit	Temperature Gauge	Instrument Panel Section
Lt.Blu/Blk	18	922	Oil Pressure Sending Unit	Oil Pressure Gauge	Instrument Panel Section
Pur/Wht	18	923	Tachometer Source	Tachometer	Instrument Panel Section
Red	18	954	Electric Choke	Fuse Panel*	Fuse Panel
HEADLIGHT SECTION					
Grn	14	924	Horn B+	Horn Relay*	Fuse Panel
Blu	18	925	Right Front Turn Signal	Turn Signal Switch	Turn Signal Section
Lt.Blu	18	926	Left Front Turn Signal	Turn Signal Switch	Turn Signal Section
Brn	18	927	Park Lights	Headlight Switch	Headlight Switch Section
Lt.Grn	16	908	High Beam	Dimmer Switch	Dimmer Switch Section
Tan	16	909	Low Beam	Dimmer Switch	Dimmer Switch Section
Gry/Wht	18	901	Fan Relay	Fan Switch	Accessory Section Switches

Table 6-1 Wire Connection Index, 1 of 3

Color	Ga.	No.	Connect to	Wire Starting Point	Section of Starting Point
HEADLIGHT SWITCH SECTION					
Red/Blk❼	12	928	Headlight Switch B+	Fuse Panel*	Fuse Panel
Blu/Ylw	14	907	Headlight Switch	Dimmer Switch	Dimmer Switch Section
Brn	14	929	Headlight Switch	Tail Lights	Tail Section
Brn	18	927	Headlight Switch	Park Lights	Headlight Section A
Brn❻	18	930	Headlight Switch	Instr. Panel Lighting	Instrument Panel Section
Orn❸	14	959	Headlight Switch B+	Fuse Panel*	Fuse Panel
IGNITION SWITCH SECTION					
Pnk	14	931	Ignition Switch (Coil Ignition)	Fuse Panel*	Fuse Panel
Brn	12	932	Ignition Switch Accessory	Fuse Panel*	Fuse Panel
Orn	12	933	Ignition Switch Ignition	Fuse Panel*	Fuse Panel
Red	12	934	Ignition Switch B+	Fuse Panel*	Fuse Panel
Pur❹	12	919	Ignition Switch Start	Starter Solenoid	Engine Section A
INSTRUMENT PANEL SECTION					
Red/Wht	18	935	Voltmeter Source & Gauges B+	Fuse Panel*	Fuse Panel
Grn	18	936	High Beam Indicator	Dimmer Switch*	Dimmer Switch Section
Lt.Blu	18	937	Left Turn Indicator	Left Front Turn Signal*	Turn Signal Section
Blu	18	938	Right Turn Indicator	Right Front Turn Sig.*	Turn Signal Section
Brn	18	930	Instrument Panel Lighting	Headlight Switch	Headlight Section B
Pnk	18	939	Fuel Gauge	Fuel Sending Unit	Tail Section
Lt. Grn	18	921	Temperature Gauge	Temp. Sending Unit	Engine Section A
Lt.Blu/Blk	18	922	Oil Pressure Gauge	Oil Pres. Sending Unit	Engine Section A
Pur/Wht	18	923	Tachometer	Tachometer Source	Engine Section A
Orn/Blk	18	955	4 Wheel Drive Switch	Fuse Panel*	Fuse Panel
RADIO SECTION					
Red	18	940	Radio B+ Unswitched Const.	Fuse Panel*	Fuse Panel
Red/Blk	18	941	Radio B+ Switched	Fuse Panel*	Fuse Panel
Pur/Blk	18	942	Radio: Power Antenna	Power Antenna	Tail Section
Clear❺	20	943	Radio Rt. Rear Speaker Out	Right Rear Speaker	Speaker Section
Clear❺	20	944	Radio Left Rear Speaker Out	Left Rear Speaker	Speaker Section
SPEAKER SECTION					
Clear❺	20	943	Right Rear Speaker	Radio R. Rear Spkr.Out	Radio Section
Clear❺	20	944	Left Rear Speaker	Radio L. Rear Spkr.Out	Radio Section
TAIL SECTION					
Wht	18	945	Dome Lights B+	Fuse Panel*	Fuse Panel
Grn/Blk	16	946	Trunk Accessory Light B+	Fuse Panel*	Fuse Panel
Ylw/Wht	14	947	Electric Fuel Pump B+	Fuse Panel*	Fuse Panel
Grn	14	948	Right Rear Turn Signal	Turn Signal Switch	Turn Signal Section
Ylw	14	949	Left Rear Turn Signal	Turn Signal Switch	Turn Signal Section
Pnk	18	939	Fuel Sending Unit	Fuel Gauge	Instrument Panel Section
Brn	14	929	Tail Lights	Headlight Switch	Headlight Section B
Pur/Blk	18	942	Power Antenna	Radio: Power Antenna	Radio Section
Orn	18	950	Third Brake Light	Turn Signal Switch*	Turn Signal Section
Lt.Grn	18	956	Backup Lights	Backup Switch	Cruise Control Section
Blk	18	961	Dome Light Ground	Interior Light Harness	Near Fuse Panel

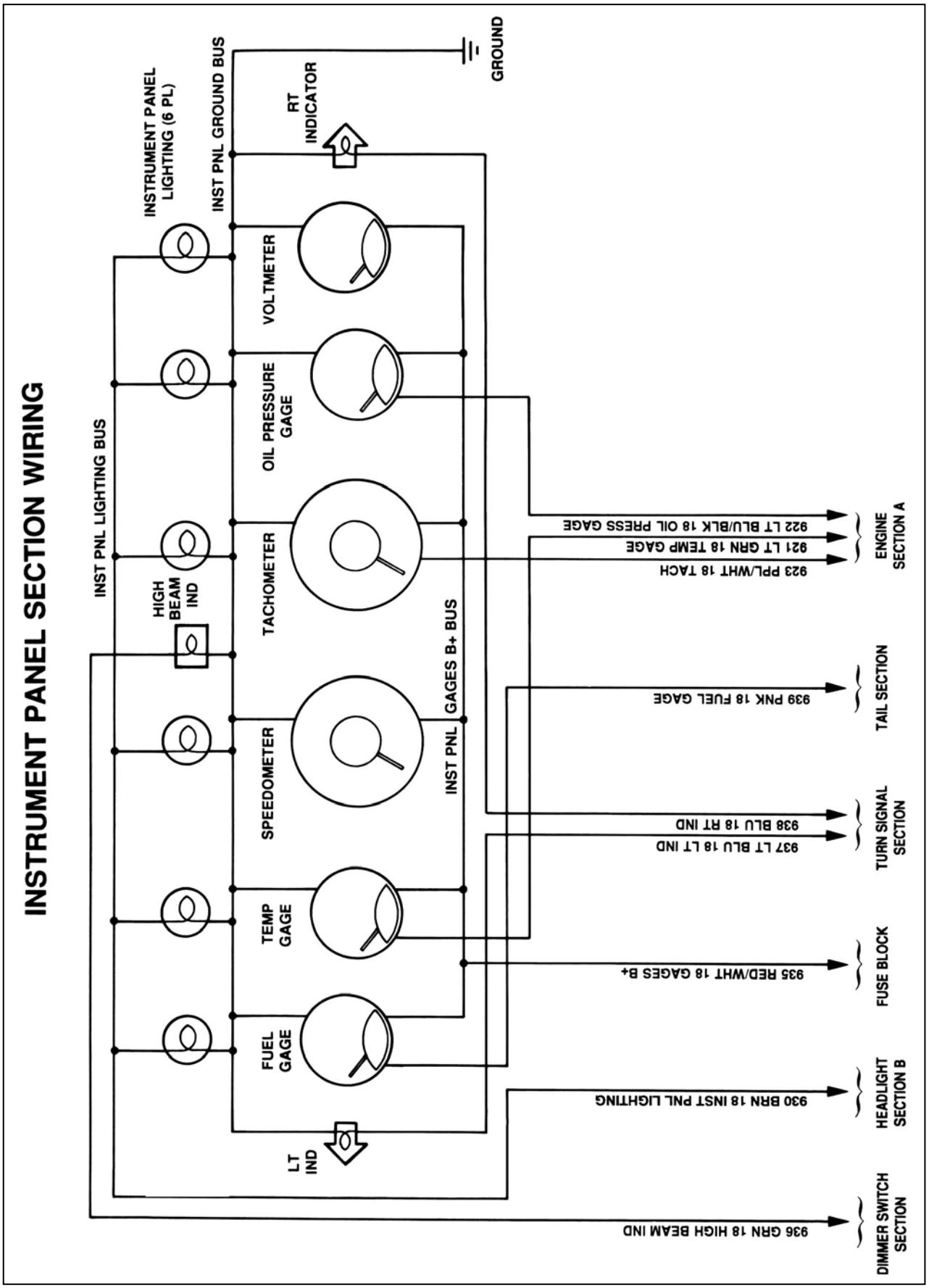
Table 6-1 Wire Connection Index, 2 of 3

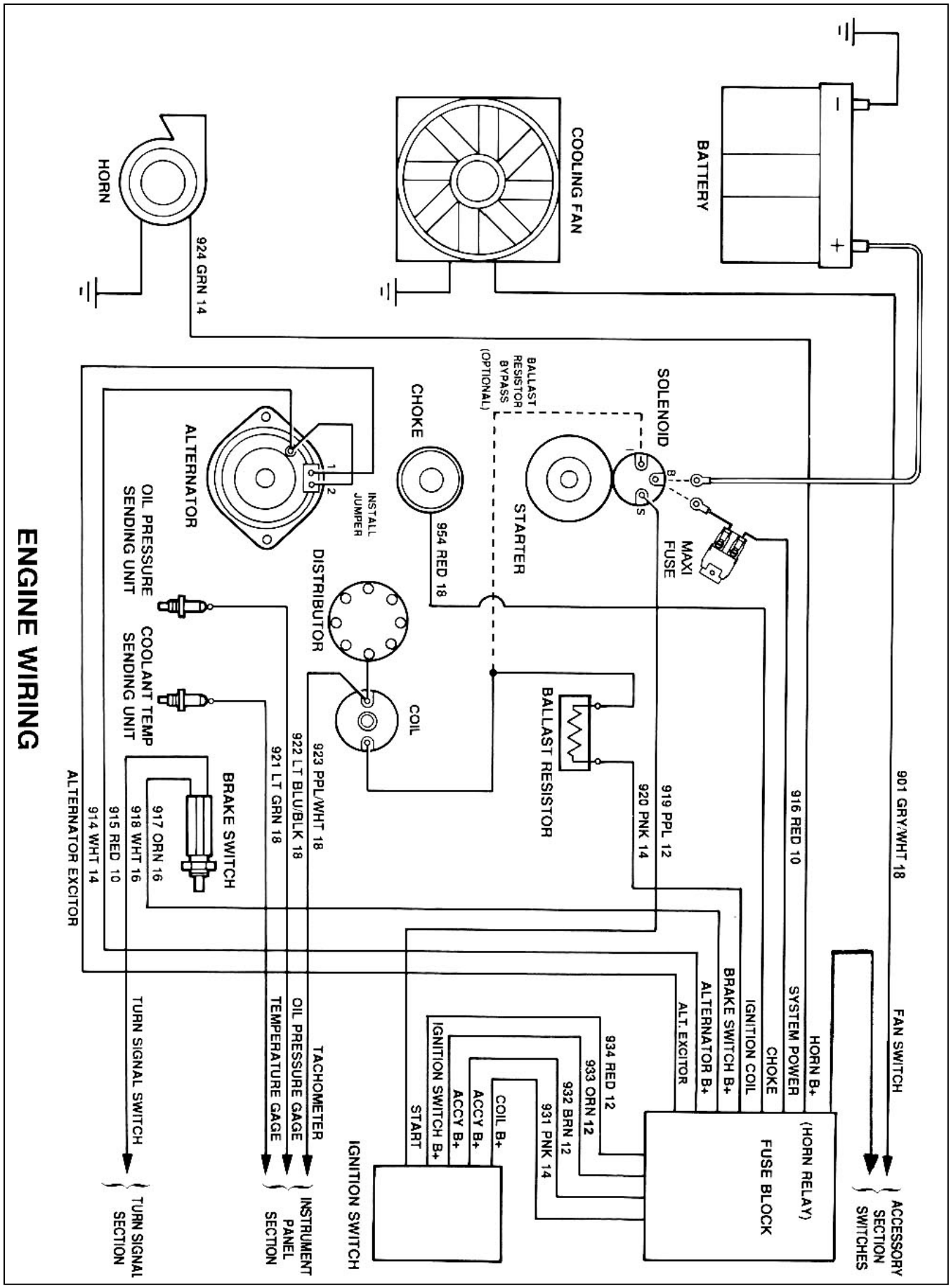
Color	Ga.	No.	Connect to	Wire Starting Point	Section of Starting Point
TURN SIGNAL SWITCH SECTION					
Brn	14	951	Emergency Flasher Switch B+	Emer. Flasher Relay*	Fuse Panel
Pur	14	952	Turn Signal Swt. Flasher B+	Turn Flasher Relay*	Fuse Panel
Blk	18	953	Horn Switch	Horn Relay*	Fuse Panel
Grn	14	948	Turn Signal Switch	Right Rear Turn Signal	Tail Section
Ylw	14	949	Turn Signal Switch	Left Rear Turn Signal	Tail Section
Blu	18	925	Turn Signal Switch	Right Front Turn Signal	Headlight Section A
Wht	16	918	Turn Signal Switch	Brake Switch	Engine Section A
Lt.Blu	18	926	Turn Signal Switch	Left Front Turn Signal	Headlight Section A
BACKUP SWITCH SECTION					
Lt.Grn	18	958	Backup Switch	Fuse Panel*	Fuse Panel
Lt.Grn	18	956	Backup Switch	Backup Lights	Tail Section

Table 6-1 Wire Connection Index, 3 of 3

NOTES:

1. 2-color wires: 2nd color (stripe) may not be intense color. Observe two-color wires closely.
2. This section consists of only one large (10 gauge) wire.
3. From fuse panel to brake switch.
4. This wire is to be cut and spade lugs installed (GM-keyed columns only) so that your existing neutral safety switch circuit can be wired into your harness. The neutral safety switch is located at the base of General Motors and Ford steering columns and in Mopar transmissions. Do not attempt to defeat your automobile's neutral safety switch. If your automobile does not have a neutral safety switch, please install one.
5. These are two (2) wires, bonded together. One wire is Speaker POSITIVE (+) and the other wire is Speaker NEGATIVE (-).
6. This wire needs to go from the headlight switch to the instrument panel lights.
7. This wire is power for the portion of the headlight switch that goes out to the headlights and front parking lights.
8. This wire is power for the portion of the headlight switch that goes out to the instrument panel lights and the tail lights. **NOTE: This wire is only used if your headlight switch has two power input terminals.**


INSTRUMENT PANEL SECTION WIRING
INSTRUMENT PANEL LIGHTING (6 PL)
INST PNL GROUND BUS
GROUND
RT INDICATOR
VOLTMETER
OIL PRESSURE GAGE
TACHOMETER
SPEEDOMETER
TEMP GAGE
FUEL GAGE
INST PNL LIGHTING BUS
HIGH BEAM IND
LT IND
INST PNL GAGES B+ BUS
922 LT BLU/BLK 18 OIL PRESS GAGE
921 LT GRN 18 TEMP GAGE
923 PPL/WHT 18 TACH
ENGINE SECTION A
939 PNK 18 FUEL GAGE
TAIL SECTION
938 BLU 18 RT IND
937 LT BLU 18 LT IND
TURN SIGNAL SECTION
935 RED/WHT 18 GAGES B+
FUSE BLOCK
930 BRN 18 INST PNL LIGHTING
HEADLIGHT SECTION B
936 GRN 18 HIGH BEAM IND
DIMMER SWITCH SECTION



ENGINE WIRING

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

Painless Performance Limited Warranty and Return Policy

Chassis harnesses and fuel injection harnesses 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.