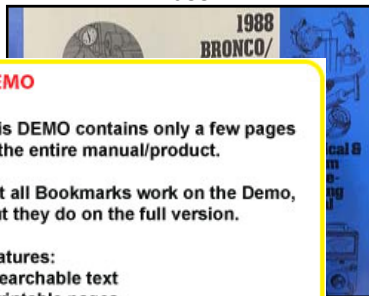


1987-1991 Bronco/F150-350 Electrical & Vacuum Trouble-Shooting Manual

1987



1988



1990



198



DEMO

This DEMO contains only a few pages of the entire manual/product.

Not all Bookmarks work on the Demo, but they do on the full version.

Features:

- Searchable text
- Printable pages
- Bookmarked for easy navigation
- High Resolution images
- Zoom to see exact details
- Money back Guarantee
- Available on USB and eBook download

5 Manual Collection



Copyright © 2023, Forel Publishing Company, LLC, Woodbridge, Virginia

All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, Woodbridge, VA 22192

**1987-1991 Bronco/F150-F350 Electrical & Vacuum
Trouble-Shooting Manual - 5 Manual Collection**

EAN: 978-1-60371-424-2

ISBN: 1-60371-424-3

Forel Publishing Company, LLC
Woodbridge, VA 22192
Email: sales@ForelPublishing.com
<https://www.ForelPublishing.com>



This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

Note from the Publisher

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

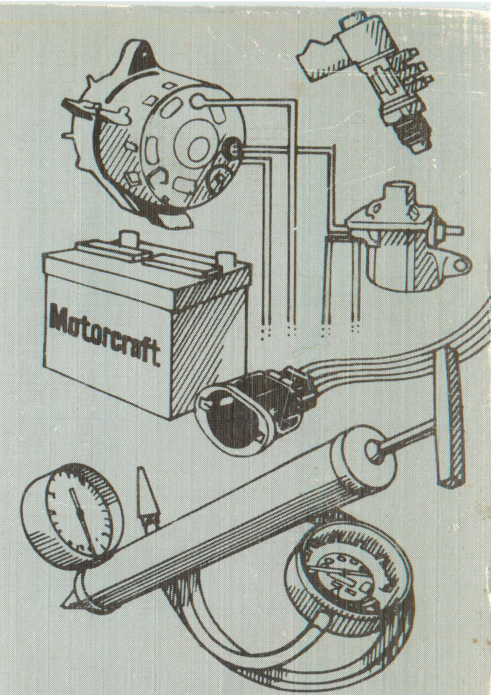
Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the professional should be sought.

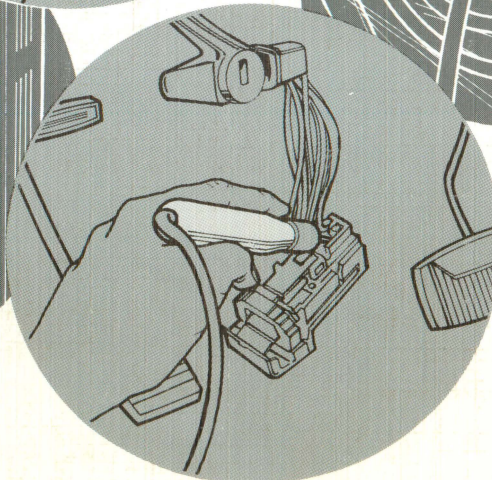
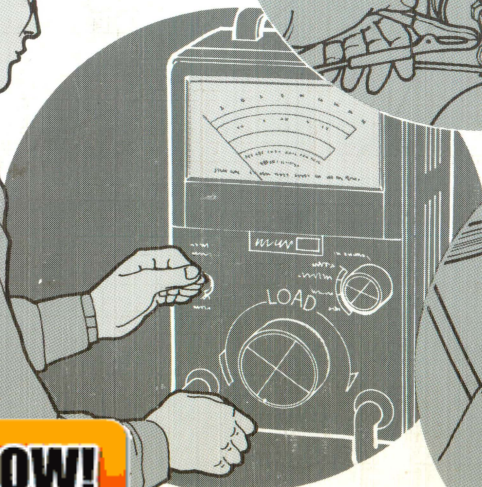
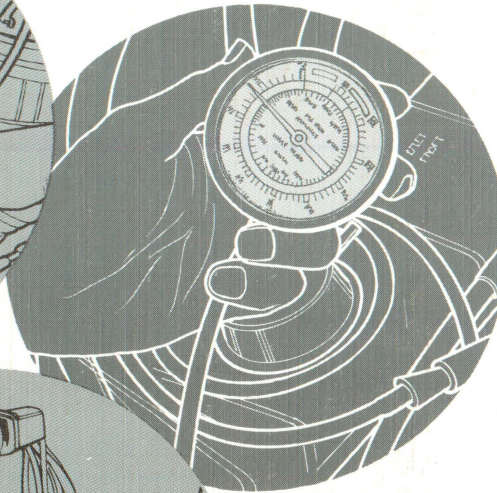
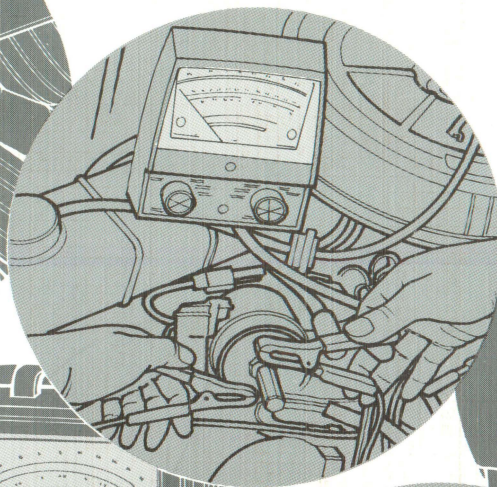
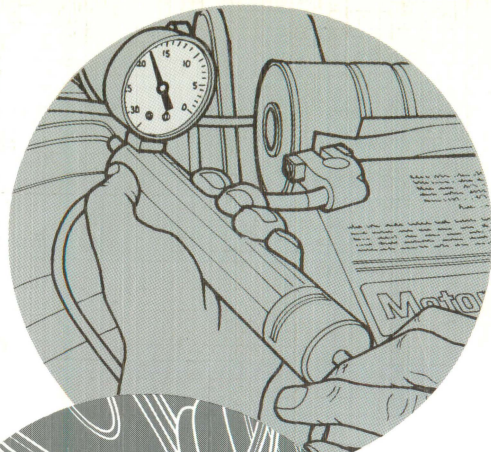
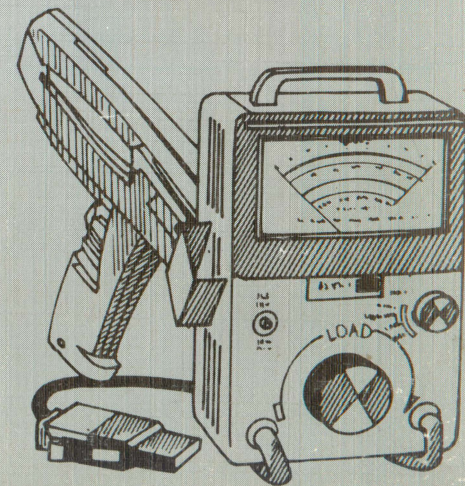


1987 BRONCO / F150-350

1987 BRONCO/ F150-350



Electrical & Vacuum Trouble- Shooting Manual



BUY IT NOW!

Click Here To Order



License #84356800

Copyright © 2023, Forel Publishing Company, LLC, Woodbridge, Virginia

All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, Woodbridge, VA 22192

**1987 Bronco/F150-F350 Electrical & Vacuum Trouble-
Shooting Manual (EVTM)
EAN: 978-1-60371-410-5
ISBN: 1-60371-410-3**

Forel Publishing Company, LLC
Woodbridge, VA 22192
Email: sales@ForelPublishing.com
<https://www.ForelPublishing.com>



This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

Note from the Publisher

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the professional should be sought.



How to Use This Manual	1
How to Find the Electrical Problem	2, 3
Symbols (Electrical)	4
(Vacuum)	127
How to Find the Vacuum Problem	129
Instrument Panel (Back View)	
Component Testing	
Introduction	142
Main Light Switch	142
Hazard Switch	144
Ignition Switch	143
Turn Switch	144
Windshield Wiper/Washer Switch	145
Interval Wiper/Washer Switch	146
A/C-Heater Function Selector	147
A/C-Heater Blower Switch	148
.....	
A/C-Heater	135
Anti-Lock Brakes	87
Brake Warning Indicator	83
Carburetor Circuits	45
Charge (Gasoline)	46
(Diesel)	22
Choke Heater	17
Cigar Lighter	106
Coolant Temperature	
Gage	93
Diesel Glow Plug Control	40
Electric Fuel Pump Control	101
Electronic Engine Control	49
Electronic Shift — 4 Wheel Drive	89
Four-Wheel Drive Indicator	90
Fuel Injector Cooling Fan — (4.9L Only)	60
Fuel Tank Selector/Gages (Diesel)	97
(Gasoline)	92
Instrument Panel (Gasoline)	19
(Diesel)	24

Gages (Diesel)	97
(Gasoline)	92
Grounds	5
Heater	134
Horn	106
Ignition	27
Instrument Illumination	80
Lamps On Warning	76
Lamps	
Backup	74
Body Marker	66
Cargo	74
Dome	76
Exterior	64
Hazard	70
Headlamps	62
Instrument Illumination	80
License	65
Map	77
Marker	65
Park	65
Radio Illumination	80
Stop	70
Tail (Rear Park)	64
Trailer	66
Turn	70
Main Light Switch	80, 151
Power Distribution (Diesel)	22
(Gasoline)	18
Power Door Locks	120
Power Windows	113
Radio (Stereo) (Electronic)	123
(Stereo)	124
Rear Window Defrost	116
Seatbelt Warning	82
Speed Control	130
Start (Diesel)	40
(Gasoline)	30

Tachometer	96
Tailgate Power Window	116
Trailer	125
Vacuum Distribution	128
Warning Indicators (Diesel)	85
Warning Indicators (Gasoline)	82
Windshield Wiper/Washer	108
Windshield Wiper/Washer (Interval)	110

IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the personal safety of the individual doing the work. This Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

The purpose of this manual is to show electrical and vacuum circuits of these vehicles in a clear and simple fashion to make troubleshooting easier. With each circuit is a description of *How the Circuit Works* and some *Troubleshooting Hints*. A *Component Location* chart lists components, connectors, and grounds in that circuit. The chart includes a description of where each item is located, and references to pictures in the manual.

Wiring Diagrams give a schematic picture of when and how the circuit is powered, what the current path is to circuit components, and how the circuit is grounded. Each circuit component is named (underlined titles). Wire and connector colors are listed (standard Ford color abbreviations are used):

COLOR ABBREVIATIONS

BL	Blue	N	Natural
BK	Black	O	Orange
BR	Brown	PK	Pink
DB	Dark Blue	P	Purple
DG	Dark Green	R	Red
GR	Green	T	Tan
GY	Gray	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		

Where two colors are shown for a wire, the first color is the basic color of the wire. The second color is the stripe marking. It should be noted that the use of dots and hashes for circuit identification has been eliminated. Dots may be encountered as an additional identification. The manufacturer has the same identification for the same connector.

Connector end views of switches and other components are shown to help with bench testing. The views show the harness wire colors that connect to the mating terminals. Connector colors and locations are shown in the *Component Location* chart. Two-color listings indicate separate colors for each connector half.

Components which work together are shown together. For example, all electrical components used in any circuit are shown on one diagram. The circuit breaker or fuse is shown at the top of the page. All wires, connectors, splices, switches, and motors are shown in the flow of current to ground at the bottom of the page. Notes are included which describe how switches and other components work. If a component is used in several different circuits, it is shown in several places. For example, the **Main Light Switch** is an electrical part of many circuits, and is repeated on many pages. In some cases, however, a component may seem, by its name, to belong on a page where it has no electrical connection. For example, **Radio Illumination** is electrically part of **Instrument Illumination**. Since it has no electrical connection at all with the actual **Radio** circuit, it is not shown on the **Radio** page.

Troubleshooting Hints point the technician in a general direction, but are not intended as a step-by-step procedure. Ignition troubleshooting is an exception to this. It includes a step-by-step procedure of basic quick checks to locate some of the more common **Ignition System** problems. Read the Shop Manual for more detailed repair procedures.

The **Grounds** pages show detailed views of multiple component ground points. This is useful for checking interconnections among the ground circuits of different diagrams.

Notes, Cautions, and Warnings appear in boxes on text pages and contain important **vehicle and mechanic safety information**.

Notes give added information to help complete a particular procedure. Cautions are included to prevent making an error that could damage the vehicle. Warnings highlight areas where carelessness can cause personal injury. The following list contains some general **Warnings** that should be followed when working on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires being under a vehicle.
- Be sure that the **Ignition Switch** is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on any vehicle. An automatic transmission should be in PARK. A manual transmission should be in NEUTRAL.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
- Keep away from moving parts when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter, and muffler.
- Do not allow flame or sparks near the battery. Gases are always present in and around the battery cell. An explosion could occur.
- Do not smoke.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

2 HOW TO FIND THE ELECTRICAL PROBLEM

TROUBLESHOOTING STEPS

These six steps present an orderly method of troubleshooting:

Step 1. Verify the problem.

- Operate the complete system and see all symptoms for yourself in order to:
 - check the accuracy and completeness of the customer's complaint.
 - learn more that might give a clue to the nature and location of the problem.

Step 2. Narrow the problem.

- Using this manual, narrow down the possible causes and locations of the problem in order to more quickly find the exact cause.
- Read the description of *How the Circuit Works* and study the wiring diagram. You should then know enough about the circuit operation to figure out where to check for this trouble.

Step 3. Test the cause.

- Use electrical test procedures to find the specific cause of the symptoms.
- *Troubleshooting Hints* will give some helpful ideas.
- The *Component Location* charts and the pictures will help you find components, grounds, and connectors.

Step 4. Verify the cause.

- Confirm the fact that you have found the correct cause through operating the parts of the circuit you think are good.

Step 5. Make the repair.

- Repair or replace the faulty component.

Step 6. Verify the repair.

1 and check symptoms, any new

Special test See the

Shop Manual and other service books for details. You will find the circuits in this manual to be helpful with these special tests.

TROUBLESHOOTING TOOLS

JUMPER WIRE

This is a test lead used to connect two points of a circuit. A **Jumper Wire** can complete a circuit by bypassing an open.

Uses: Bypassing Switches or Open Circuits

WARNING

Never use a jumper wire across loads (motors, etc.) connected between hot and ground. This direct battery short may cause injury or fire.

VOLTMETER

A DC **Voltmeter** measures circuit voltage. Connect negative (- or black) lead to ground, and positive (+ or red) lead to voltage measuring point.

OHMMETER

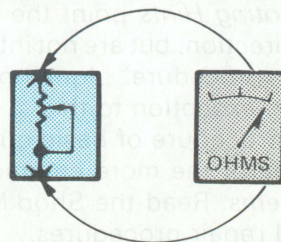


Figure 1— Resistance Check

An **Ohmmeter** shows the resistance between two connected points (Figure 1).

TEST LIGHT

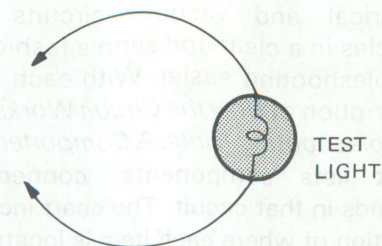


Figure 2— Test Light

A **Test Light** is a 12-volt bulb with two test leads (Figure 2).

Uses: Voltage Check. Short Check

SELF-POWERED TEST LIGHT

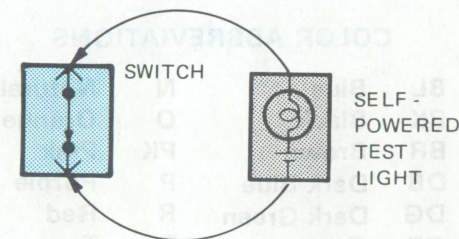


Figure 3—Continuity Check

The **Self-Powered Test Light** is a bulb, battery and set of test leads wired in series (Figure 3). When connected to two points of a continuous circuit, the bulb glows.

Uses: Continuity Check. Ground Check

CAUTION

When using a self-powered test light or ohmmeter, be sure power is off in circuit during testing. Hot circuits can cause equipment damage and false readings.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Cards DISCOVER NOVUS MasterCard VISA

TROUBLESHOOTING CHECKS

SWITCH CIRCUIT CHECK

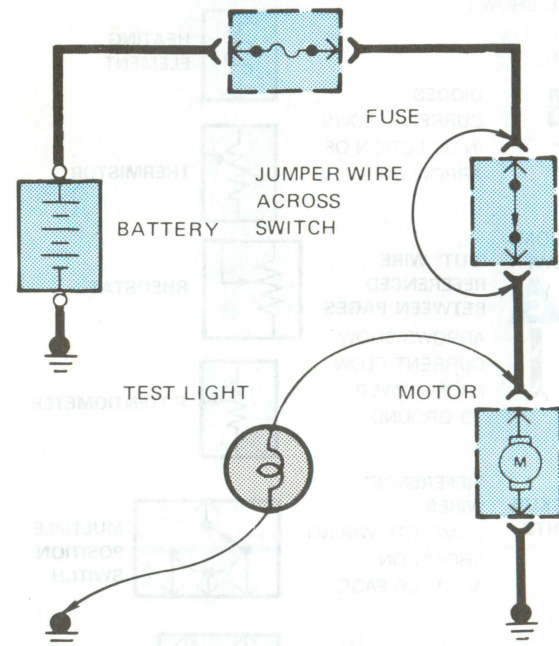


Figure 4—Switch Circuit Check and Voltage Check

In a bad circuit with a switch in series with the load, jumper the terminals of the switch to power the load. If jumping the terminals powers the circuit, the switch is bad (Figure 4).

CONTINUITY CHECK (Locating open circuits)

With power off, connect one lead of **Self-Powered Test Light** or **Ohmmeter** to each end of circuit (Figure 3). Light will glow if circuit is closed. Switches and fuses can be checked in same way.

SHORT CHECK (short to ground)

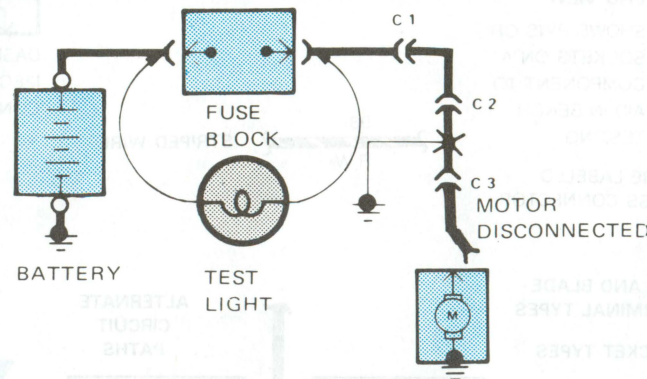


Figure 5—Short Check

A fuse that repeatedly blows is usually caused by a short to ground. It's important to be able to locate such a short quickly (Figure 5).

- 1) Turn off everything powered through the fuse.
- 2) Disconnect other loads powered through the fuse:
 - Motors: disconnect motor connector.
 - Lights: remove bulbs.
- 3) Turn **Ignition Switch** to RUN (if necessary) to power fuse.
- 4) Connect one **Test Light** lead to hot end of blown fuse. Connect other lead to ground. Bulb should glow showing power to fuse. *(This step is just a check to be sure you have power to the circuit.)*
- 5) Disconnect the **Test Light** lead from ground and reconnect it to the load side of the fuse.
 - If the **Test Light** is off, the short is in the disconnected equipment.
 - If the **Test Light** goes on, the short is in the wiring. You must find the short by disconnecting the circuit connectors one at a time until the **Test Light** goes out. For example: with a ground at X, the bulb goes out when C1 or C2 is disconnected, but stays on after disconnecting C3. This

means the ground is between C2 and C3.

"GOOD GROUND" CHECK

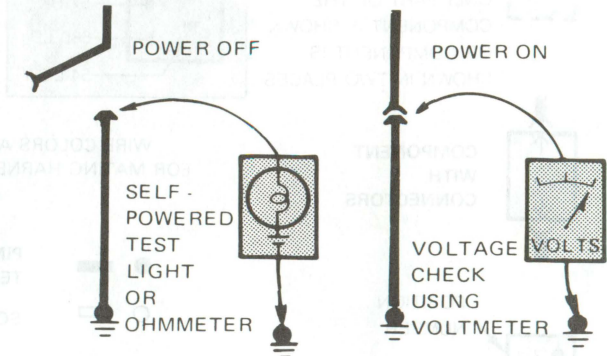


Figure 6—Grounds Checks

Turn on power to circuit. Perform Voltage Check between suspected bad ground and frame. Any voltage means ground is bad.

Turn off power to circuit. Connect one lead of **Self-Powered Test Light** or **Ohmmeter** to wire in question, and the other to known ground. If bulb glows, circuit ground is OK (Figure 6).

TROUBLESHOOTING HINTS

The circuit schematics in this manual are designed to make it easy to identify common points in circuits. This knowledge can help narrow the problem to a specific area. For example, if several circuits fail at the same time, check for a common power or ground connection. (See *Power Distribution* or *Grounds*). If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

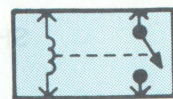
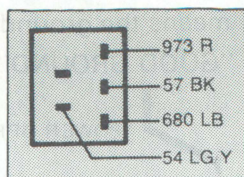
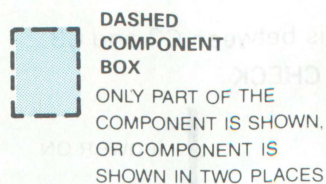
For example, if low beam headlights work but high beams and the indicator light don't work, then power and ground paths must be good. Since the dimmer switch is the component which switches this power to the high beam lights and indicator, it is most likely the cause of failure.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

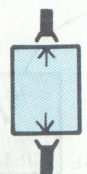
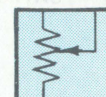
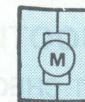
PayPal, American Express, Discover, MasterCard, VISA



DASHED LINE SHOWS MECHANICAL CONNECTIONS

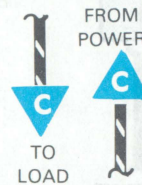
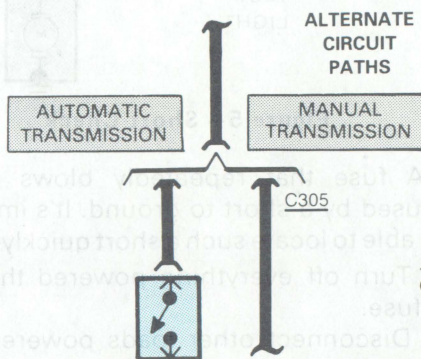
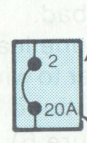
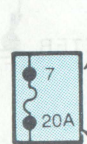


CURRENT FLOWS IN DIRECTION OF ARROW ONLY

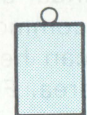


COMPONENT WITH CONNECTORS

WIRE COLORS ARE LABELED FOR MATING HARNESS CONNECTOR



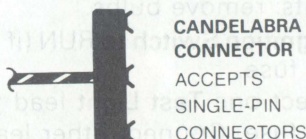
"CUT" WIRE REFERENCED BETWEEN PAGES
ARROWS SHOW CURRENT FLOW FROM POWER TO GROUND



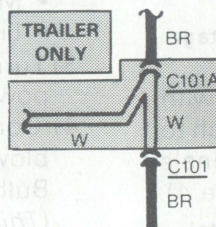
SCREW TERMINAL ON COMPONENT



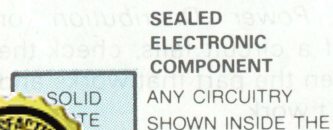
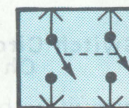
SPLICE OR CRIMP CONNECTION MOST ARE BUILT INTO HARNESS AND ARE NOT ACCESSIBLE



JUNCTION BLOCK



OPTIONAL WIRING
BR WIRES (INCLUDING C101) ARE ON ALL VEHICLES, BUT W WIRES (INCLUDING C101A) ARE USED ONLY WITH TRAILER



SEALED ELECTRONIC COMPONENT ANY CIRCUITRY SHOWN INSIDE THE

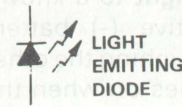
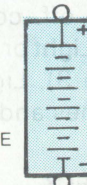


GROUND CONNECTION

SEE GROUNDS PAGE 5-15



DASHED WIRE CIRCUITRY IS NOT SHOWN IN COMPLETE DETAIL, BUT IS COMPLETE ON ANOTHER PAGE

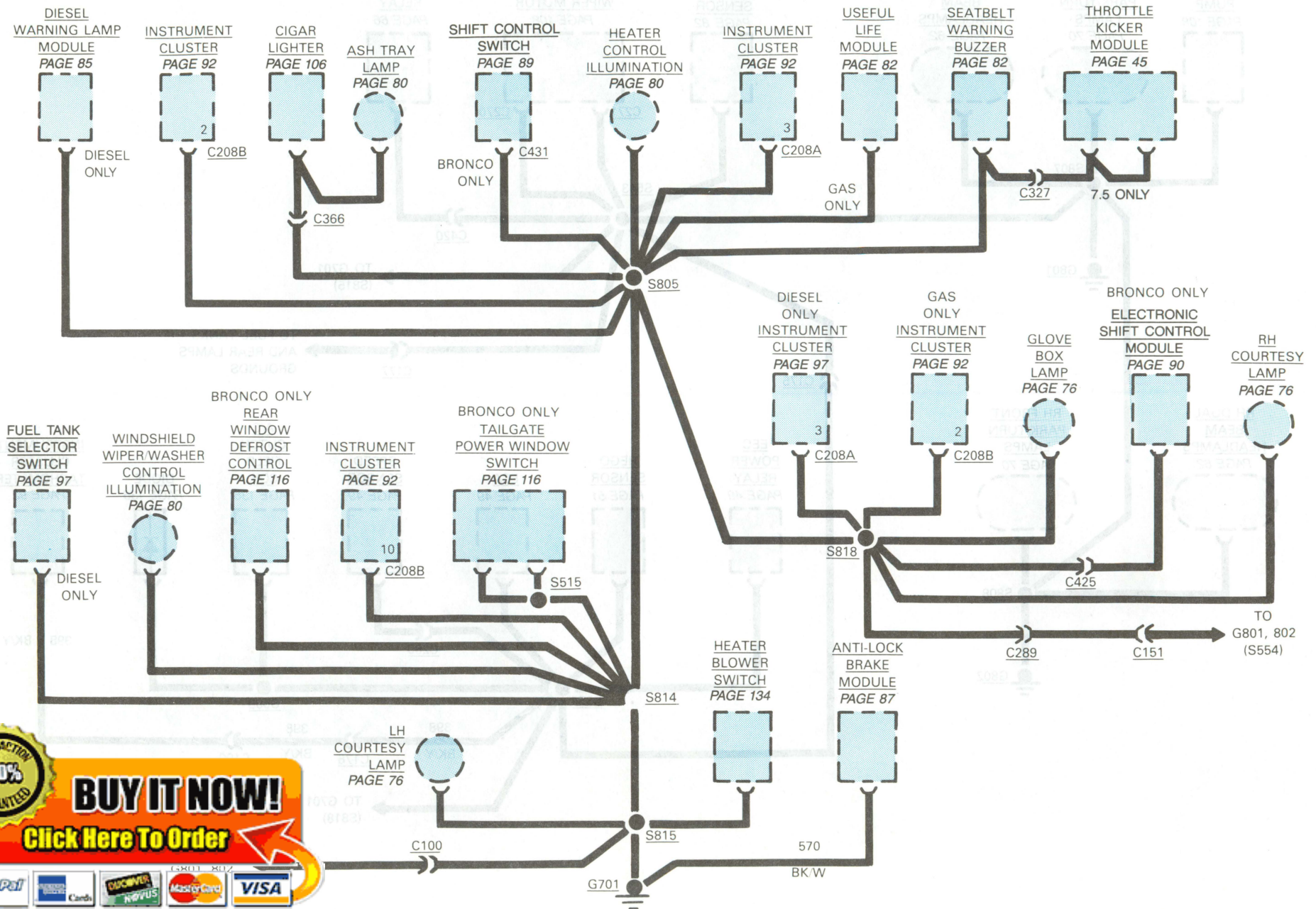


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

INSTRUMENT PANEL GROUND

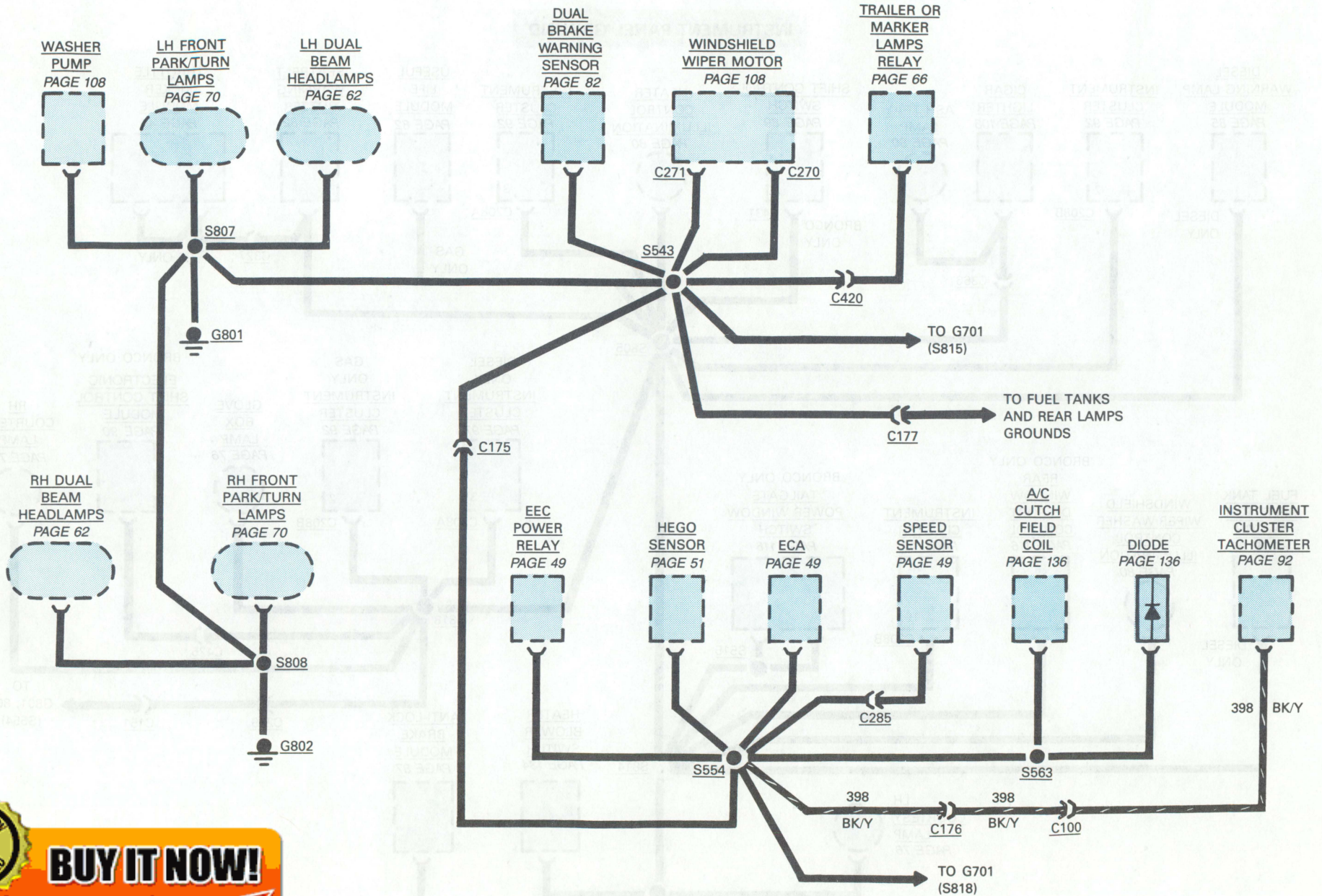


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

6 GROUNDS (G801, 802) (4.9L AND 5.0L GASOLINE)

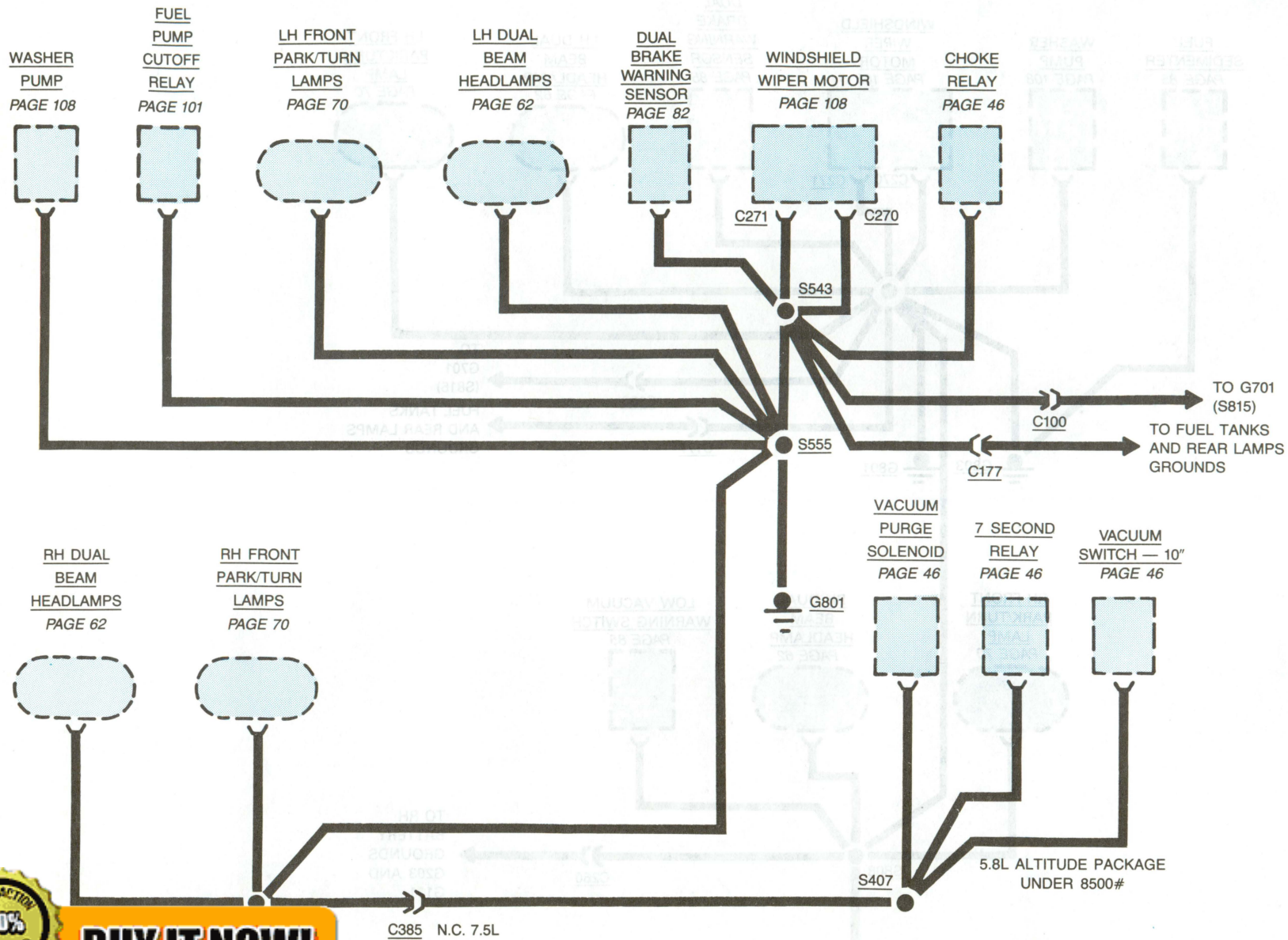


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

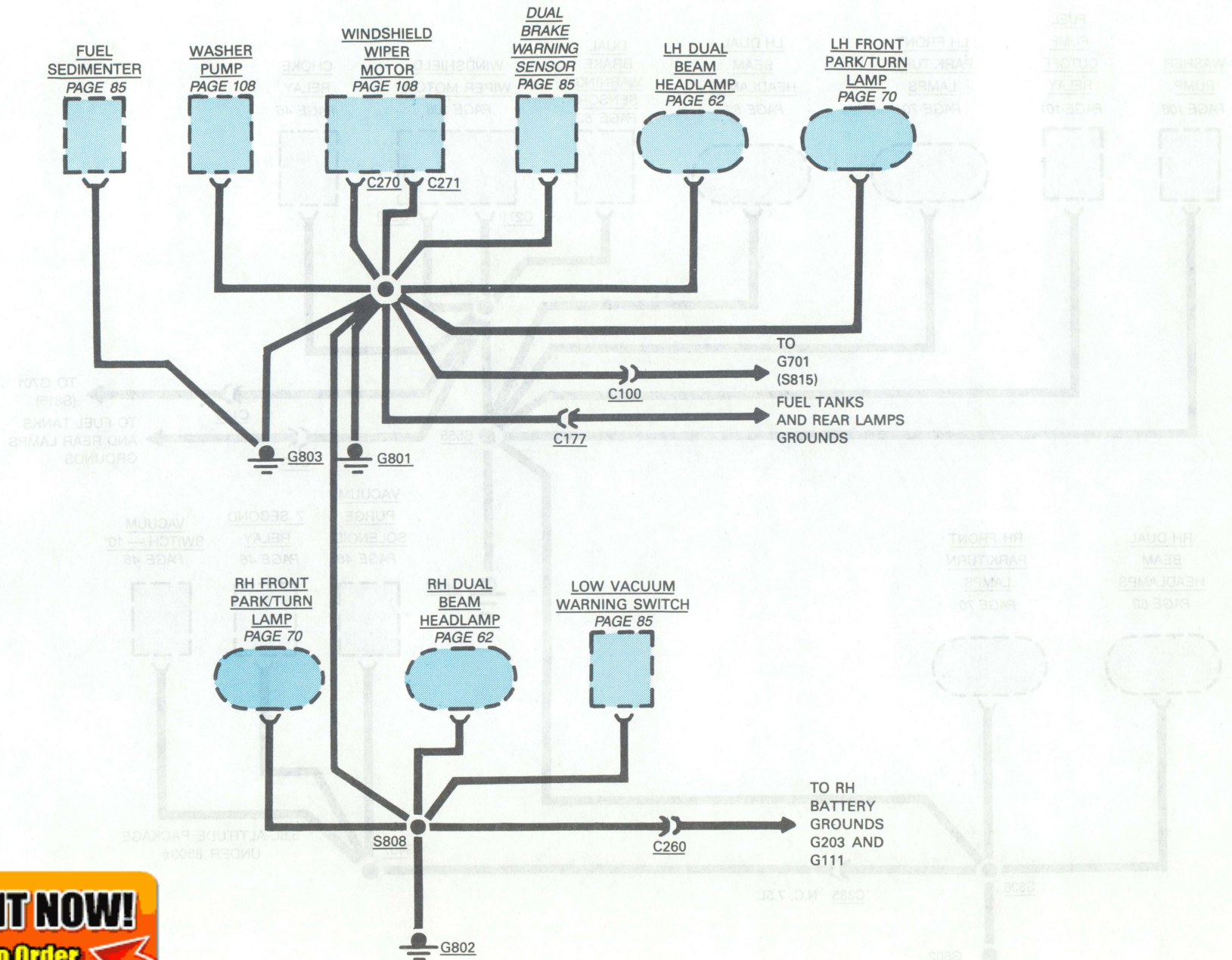
PayPal, American Express, Discover, MasterCard, VISA



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

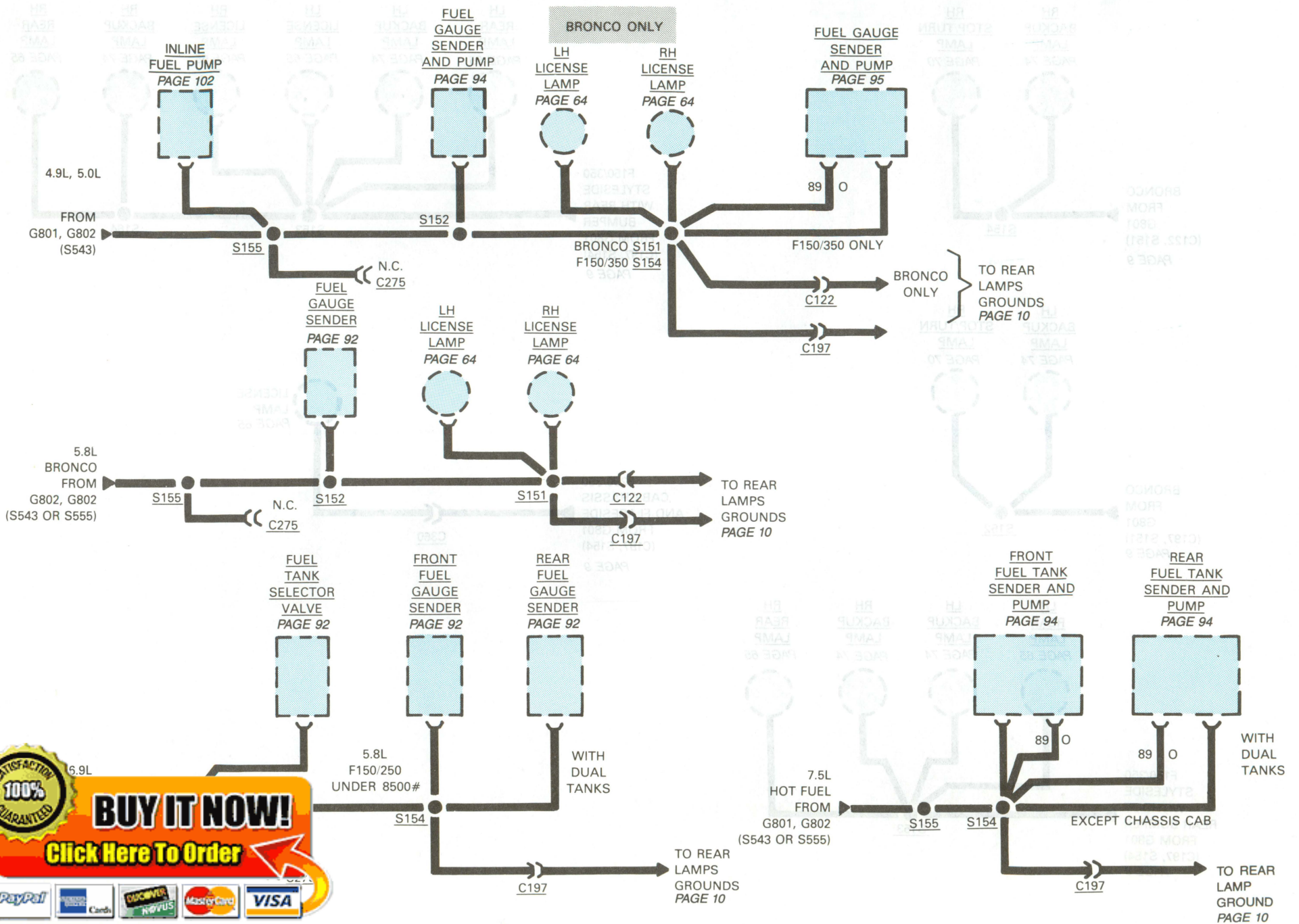


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

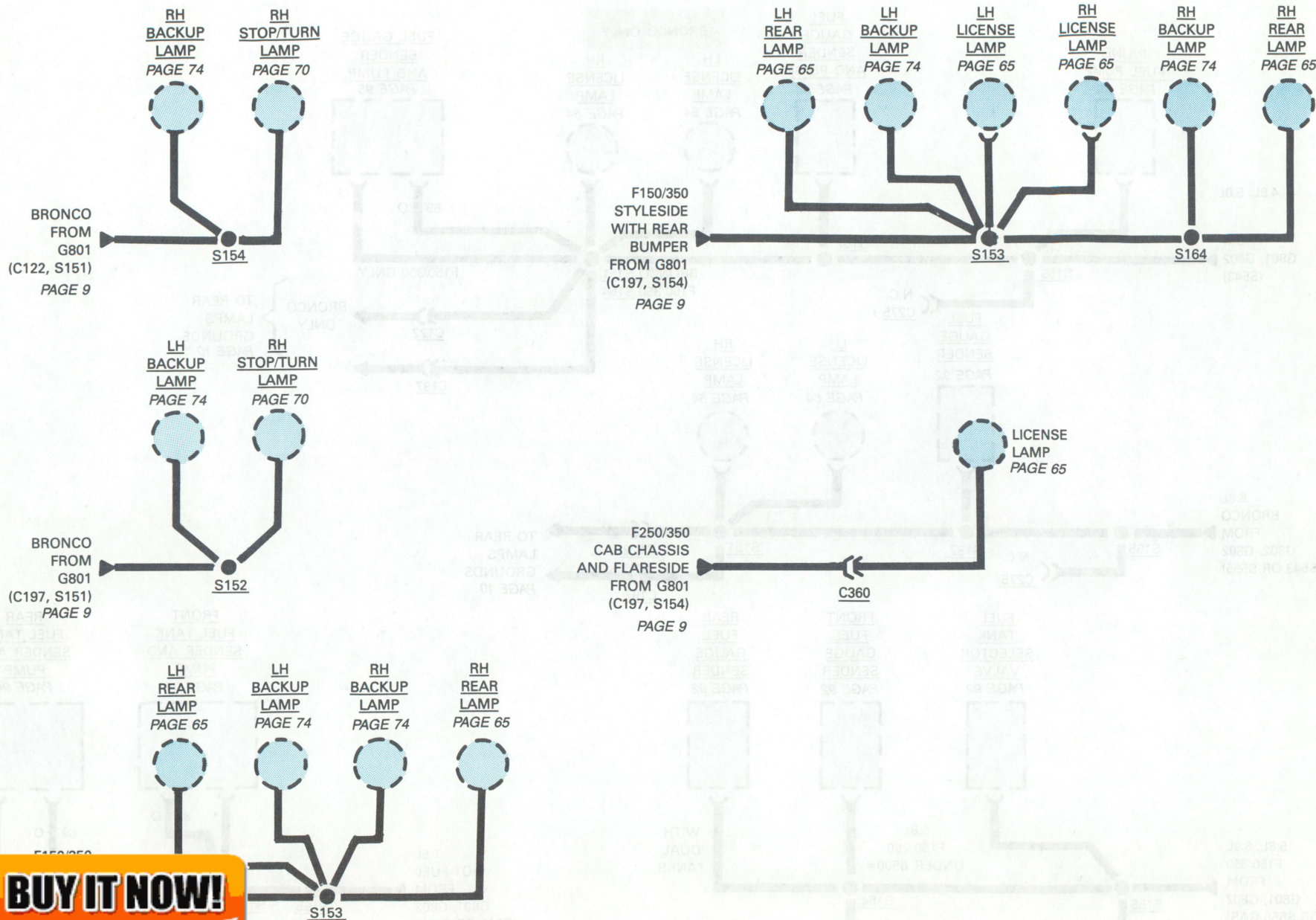


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

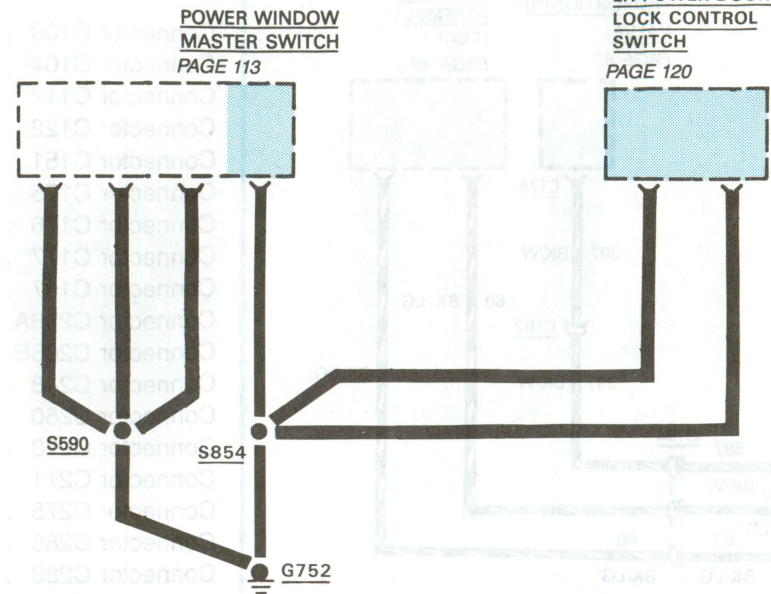
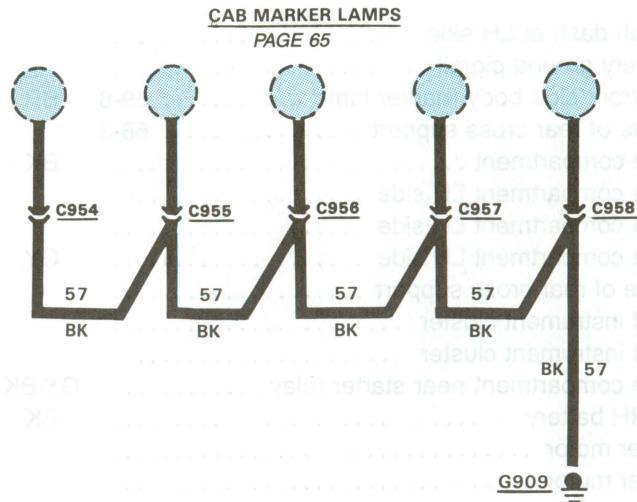
PayPal American Express Discover/Novus MasterCard VISA



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

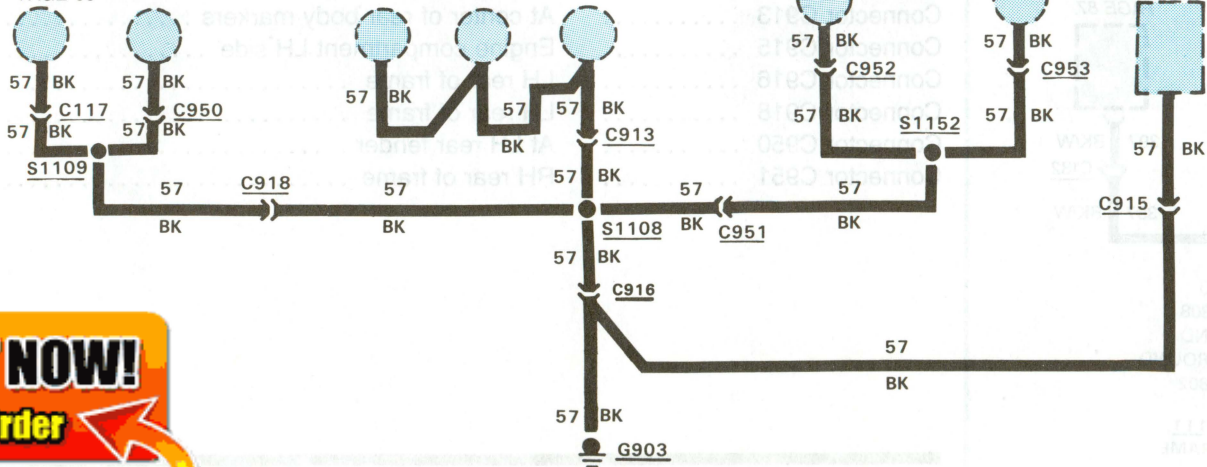


LH SIDE BODY MARKER LAMPS
PAGE 66

REAR BODY MARKER LAMPS
PAGE 66

RH SIDE BODY MARKER LAMPS
PAGE 66

MARKER OR TRAILER LAMP RELAY
PAGE 66

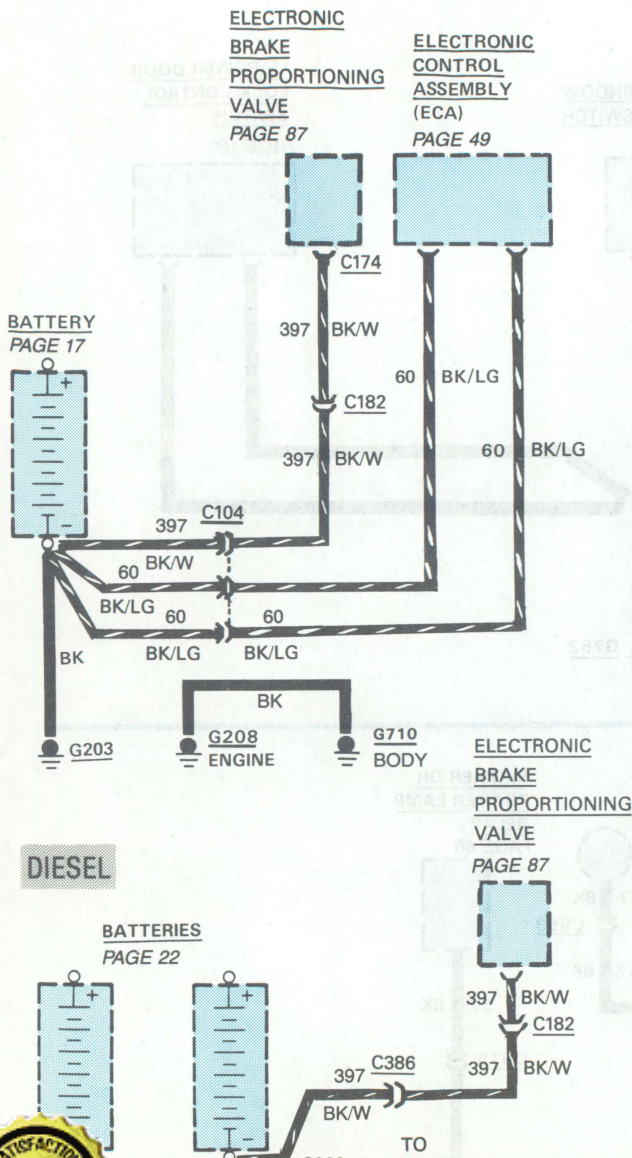


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA



COMPONENT LOCATION

Connector	Location	Page-Figure	Color	Terminals
Connector C100	Through dash at LH side			53
Connector C104	At battery ground pigtail			4
Connector C117	At LH front side body marker lamp	69-8	BR	2
Connector C122	RH side of rear cross support	68-3		4
Connector C151	Engine compartment		BK	2
Connector C175	Engine compartment LH side			10
Connector C176	Engine compartment LH side			8
Connector C177	Engine compartment LH side		GY	12
Connector C197	LH side of rear cross support			8
Connector C208A	Behind instrument cluster			14
Connector C208B	Behind instrument cluster			14
Connector C248	Engine compartment near starter relay		GY/BK	4
Connector C260	Near RH battery		BK	1
Connector C270	At wiper motor			3
Connector C271	At wiper motor			3
Connector C275	Engine compartment LH rear			8
Connector C285	At speed sensor		BR	2
Connector C289	RH cowl		BK	4
Connector C327	Behind LH side of I/P	48-1		3
Connector C366	Behind center of I/P		GY	3
Connector C386	Near RH battery			1
Connector C420	Engine compartment LH side		BK	4
Connector C425	RH cowl		BK	6
Connector C431	At electronic shift switch			6
Connector C913	At center of rear body markers	69-5	GY	2
Connector C915	Engine compartment LH side		BK	2
Connector C916	LH rear of frame	68-1	BK	2
Connector C918	LH rear of frame	68-1	GY	2
Connector C950	At LH rear fender	69-8	BR	2
Connector C951	RH rear of frame	69-6	BR	2

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

(Continued on next page)

HOW THE CIRCUIT WORKS

The ground circuits shown here are complete and connect several components together to screw terminal ground points. On other pages only parts of these circuits may be shown. Partial ground circuits are shown dashed on those pages.

All simple or component ground circuits are shown on the individual circuit pages and are complete on those pages.

All ground wires are **57 BK** unless otherwise noted.

COMPONENT LOCATION

(Continued from previous page)

		Page-Figure	Color	Terminals
Connector C952	At front of RH rear fender		BR	2
Connector C953	At rear of RH rear fender	69-8	BR	2
Connector C954	At front of cab roof	67-1	BR	2
Connector C955	At front of cab roof	67-1	BK	2
Connector C956	At front of cab roof	67-1	BK	2
Connector C957	At front of cab roof	67-1	BK	2
Connector C958	At front of cab roof	67-1	BK	2
Ground G111	RH frame near battery	26-2		
Ground G203	RH side of engine	21-1		
Ground G208	Near throttle position solenoid	35-2, 37-4		
Ground G210	At electronic voltage regulator			
Ground G211	Near starter motor relay			
Ground G701	Behind I/P near center			
Ground G710	LH side of dash panel			
Ground G752	In LH door	114-1		
Ground G801	LH inner fender behind headlamps			
Ground G802	RH inner fender behind headlamps			
Ground G803	At fuel sedimenter bolt			
Ground G903	At LH side of rear crossmember	68-1		
Ground G909	At lower LH cowl access hole	69-7		
Ground G1201	At front LH side of engine	26-1		
Splice S151	Near license lamp T/O			
Splice S152	Near LH backup lamp T/O			
Splice S153	Near license lamp T/O			
Splice S154	Near front fuel gage sender T/O			
Splice S155	Near electronic rear brake pressure valve T/O			
Splice S164	Near license lamp T/O			
Splice S515	Behind I/P near liftgate power window switch T/O			
Splice S543	Engine compartment near brake sensor T/O			
Splice S554	Engine compartment near speed sensor T/O			
Splice S555	Engine compartment near ignition module T/O			
Splice S563	Engine compartment near A/C compressor clutch T/O			
Splice S590	In LH door near power window switch T/O			
Splice S805	Near cigar lighter T/O			
Splice S807	Near LH headlamp T/O			
Splice S808	Near RH front park lamp T/O			



BUY IT NOW!

Click Here To Order



14 GROUNDS

Splice S814	Near W/S wiper illumination lamp T/O
Splice S815	Near G701 T/O
Splice S818	Near RH courtesy lamp T/O
Splice S854	Near LH master window switch T/O
Splice S1108	Near rear marker lamp T/O
Splice S1109	Near LH front side marker lamp T/O
Splice S1152	Near RH front side marker lamp T/O



BUY IT NOW!

Click Here To Order 



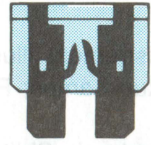




REPLACEMENT OF FUSES/ CIRCUIT BREAKERS



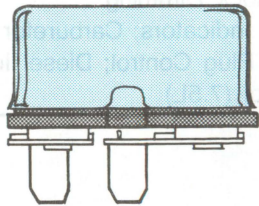
GOOD FUSE



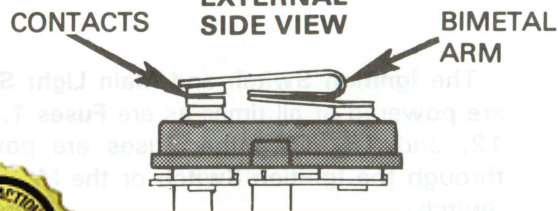
BLOWN FUSE

Fuses are mounted either in the **Fuse Panel** or in-line. They are identified by the numbered value in amperes, and by a color code. Some positions may have either a fuse with adapter or a circuit breaker. Be sure to replace a fuse or circuit breaker with the same kind of unit and with the same ampere rating. Remove fuses in order to check them.

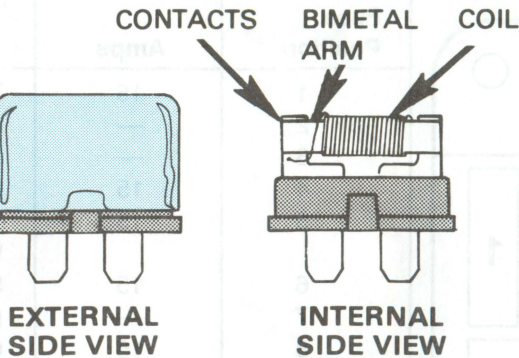
CIRCUIT BREAKER OPERATION



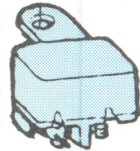
**EXTERNAL
SIDE VIEW**



CONTACTS **BIMETAL
ARM**



Non-Cycling Fuse Block Type



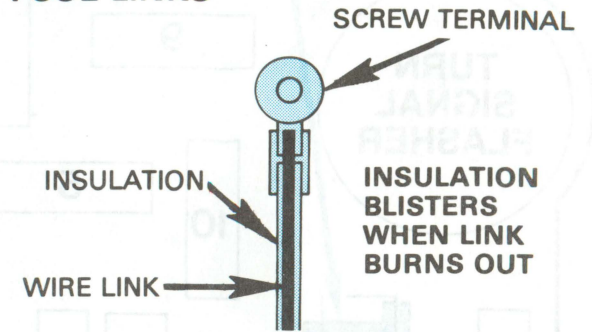
Cycling In-Line Type

Some circuits are protected by circuit breakers. (Abbreviated "c.b." in fuse chart.) They can be **Fuse Panel** mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal bonded together (bimetal arm). If the arm starts to carry too much current, it heats up. As one metal expands faster than the other, the arm bends, opening the contacts. Current flow is broken. In the cycling type, the arm cools and straightens out. This closes the circuit again. This cycle repeats as long as the overcurrent exists, with power applied.

In the non-cycling type, there is also a coil wrapped around the bimetal arm. When an overcurrent exists and the contacts open, a small current passes through the coil. This current through the coil is not large enough to

FUSE LINKS

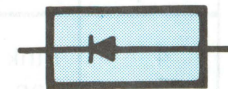


operate a load, but it does heat up both the coil and bimetal arm. This keeps the arm in the open position until power is removed.

The fuse link is a short length of wire smaller in gage than the wire in the protected circuit. The wire is covered with a thick non-flammable insulation. An overload causes the link to heat and the insulation to blister. If the overload remains, the link will melt, causing an open circuit.

When replacing, make tight crimp joints or hot solder joints for good connections.

DIODES



Diodes are electrical devices that permit current to flow in one direction only. The current flows in the direction indicated by the arrow.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

16 FUSE PANEL/CIRCUIT PROTECTION

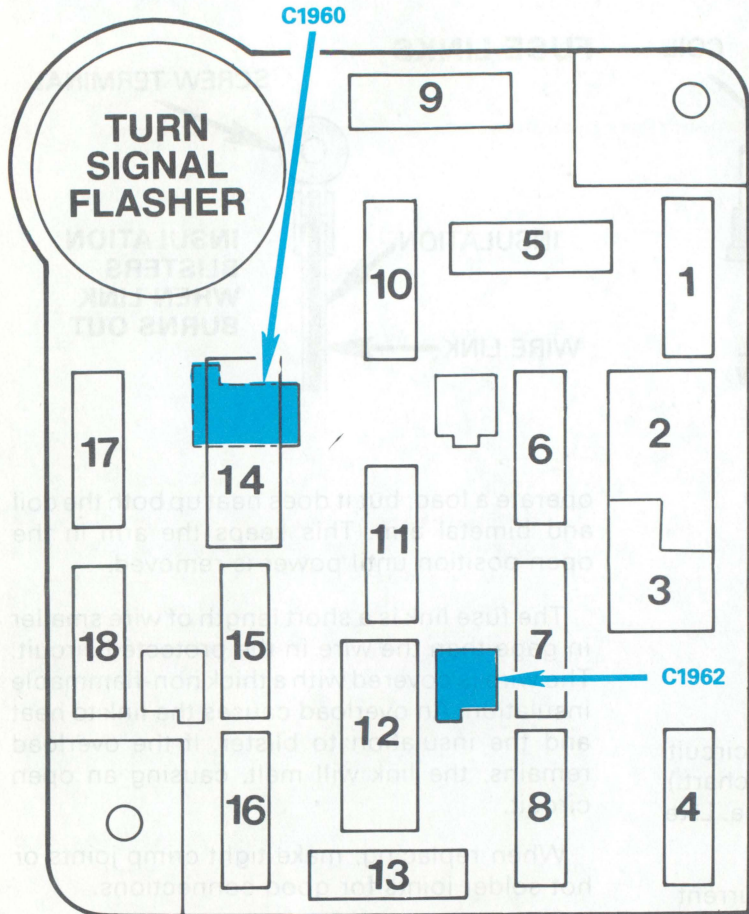


Figure 1 - Fuse Panel

Fuse Position	Amps	Circuits Protection
1	15	Turn/Stop/Hazard Lamps; Speed Control
2	—	(Not used)
3	—	(Not used)
4	15	Exterior Lamps; Instrument Illumination
5	15	Turn Lamps; Backup Lamps; Rear Window Defrost
6	15	Speed Control; Electronic Shift-4 Wheel Drive
7	—	(Not Used)
8	15	Courtesy, Dome, Cargo Lamps; Warning Buzzer
9	30	Heater; A/C-Heater
10	20	Anti-lock Brakes
11	15	Radio; Main Light Switch; Clock Illumination
12	25	Tailgate Power Window; Power Mirrors
13	30 c.b.	Power Door Locks; Electronic Shift-4 Wheel Drive
14	—	(Not used)
15	25	Tailgate Power Window
16	30 c.b.	Power Windows
17	10	Auxiliary Fuel Tank Selector
18	30	Horn; Cigar Lighter; Speed Control; 4.9L EFI After Run Blower
19	5	Instrument Illumination; Clock Dimming
20	15	Seatbelt Buzzer; Warning Indicators; Carburetor Circuits; Tachometer; Diesel Glow Plug Control; Diesel Indicators; Electric Fuel Pump Control (7.5L)

Fuse Value Amps	Color Code
4	Pink
5	Tan
10	Red

Power Distribution

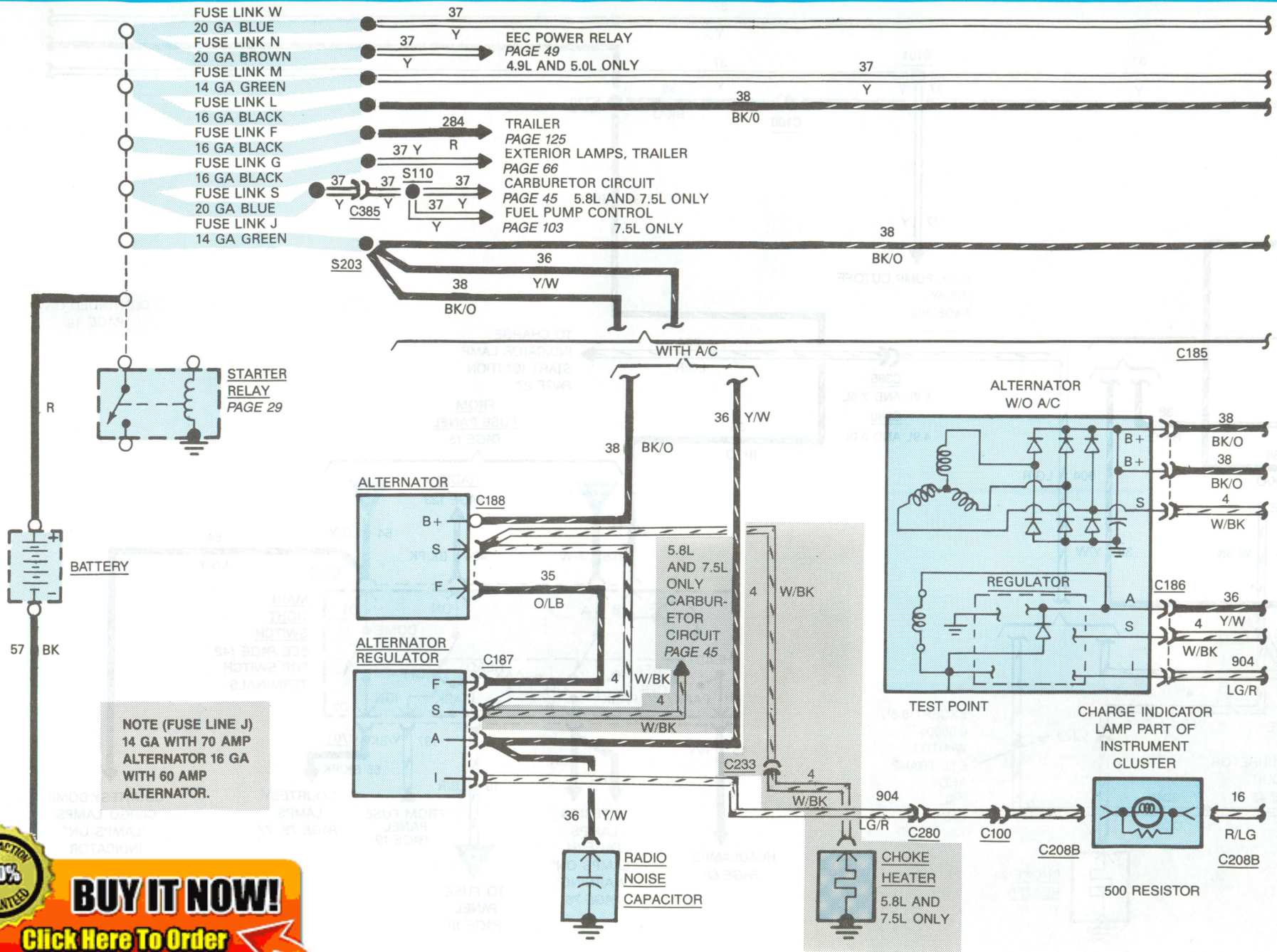
The **Alternator** and **Battery** are connected together at the **Starter Relay** hot terminal. Other circuits originate at the **Starter Relay** hot terminal and are protected by fuse links. Low power circuits are also protected by fuses.

The **Ignition Switch** and **Main Light Switch** are powered at all times as are **Fuses 1, 4, 8, 12, and 16**. The other fuses are powered through the **Ignition Switch** or the **Main Light Switch**.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

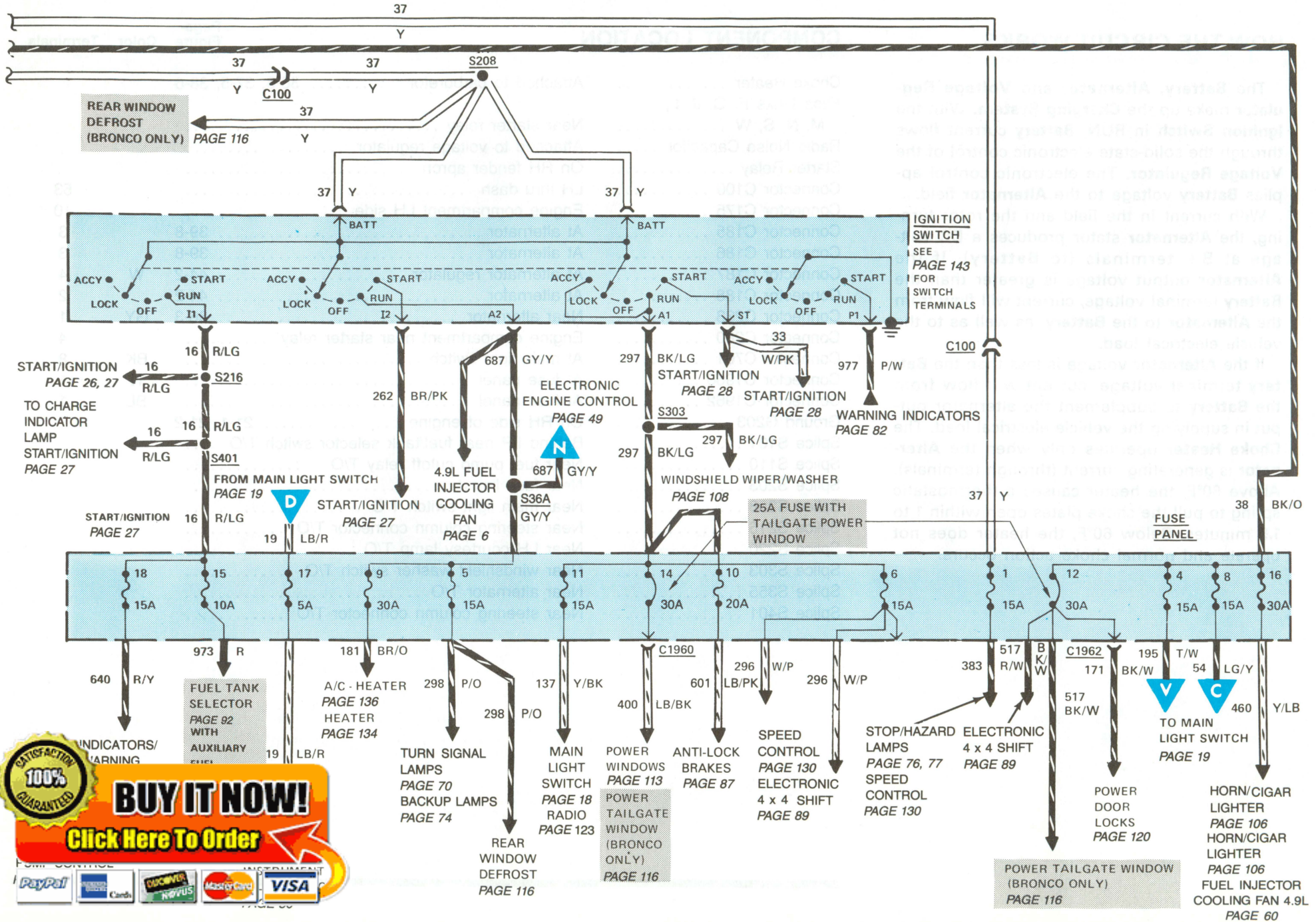


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

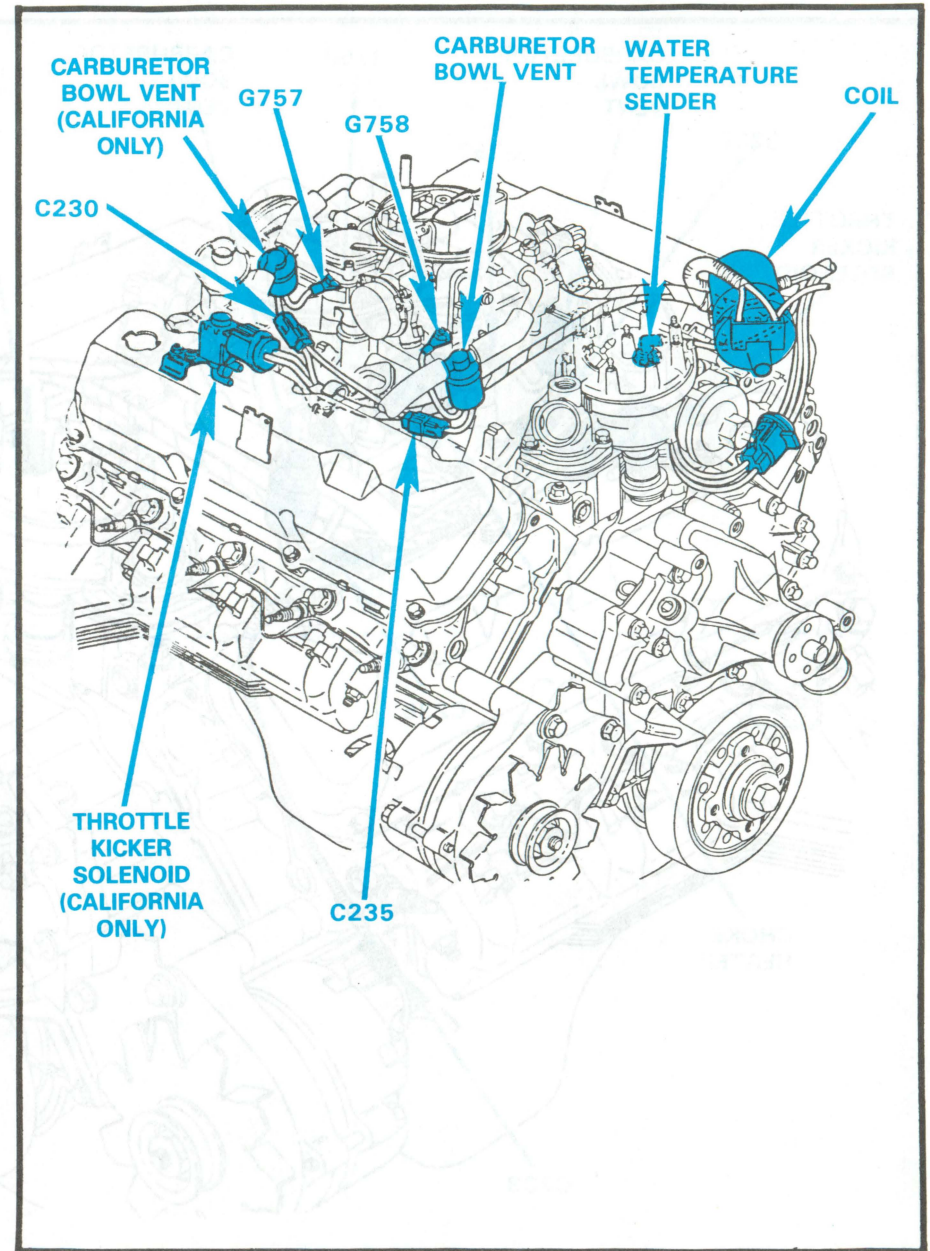
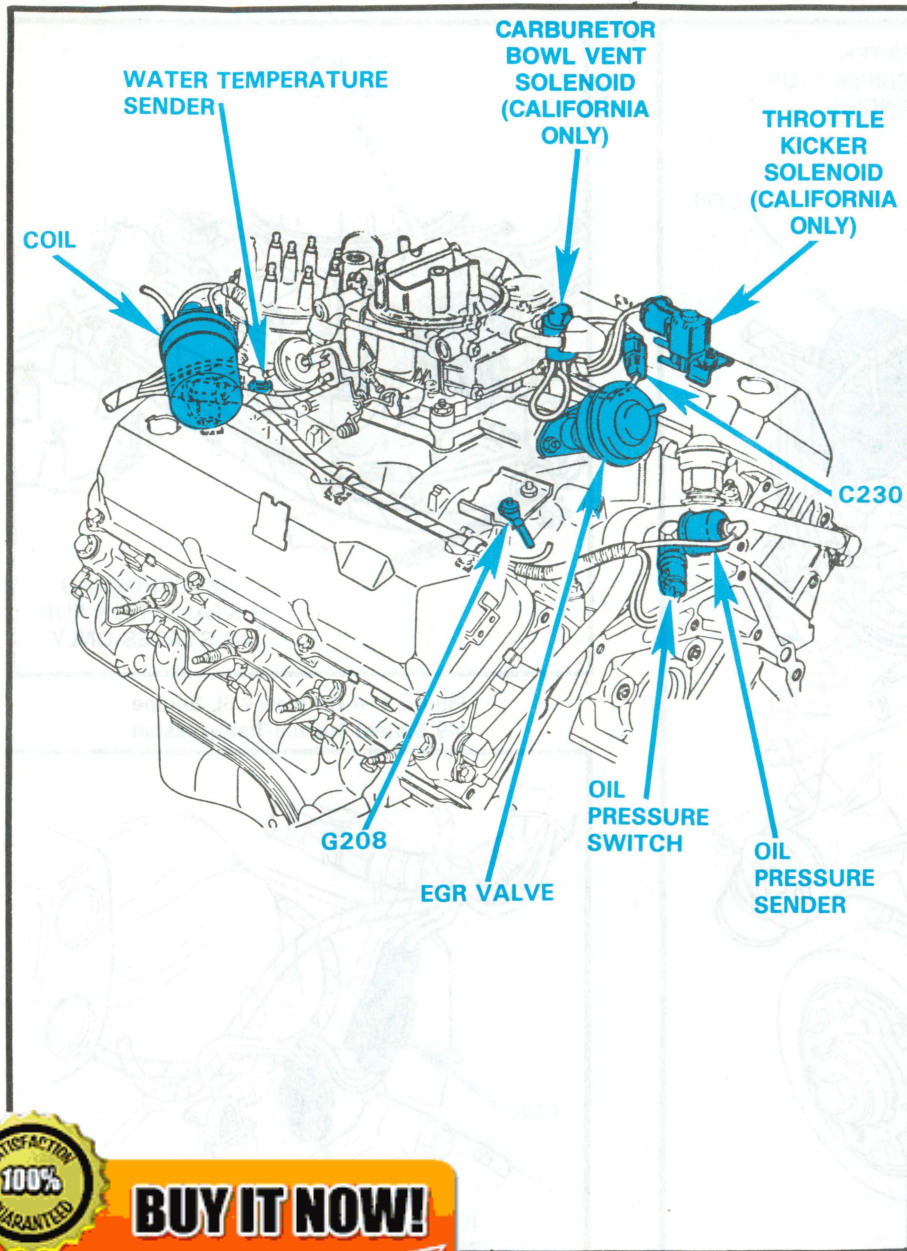
PayPal American Express Discover MasterCard VISA



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



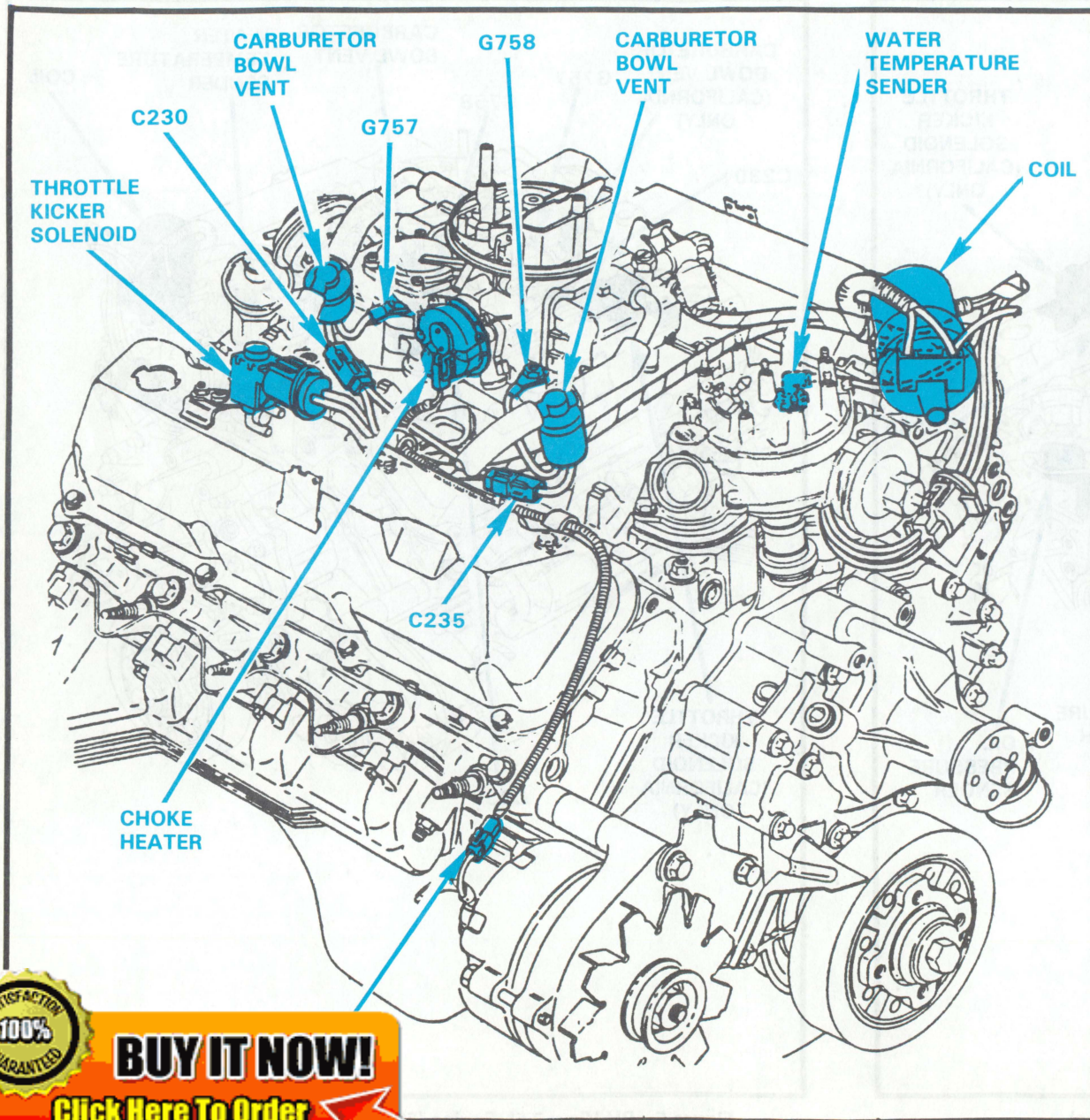
7.5L Engine (50 States)

Figure 5—RH View 7.5L Engine (50 States) Automatic Transmission

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



7.5L Engine (50 States) Manual Transmission

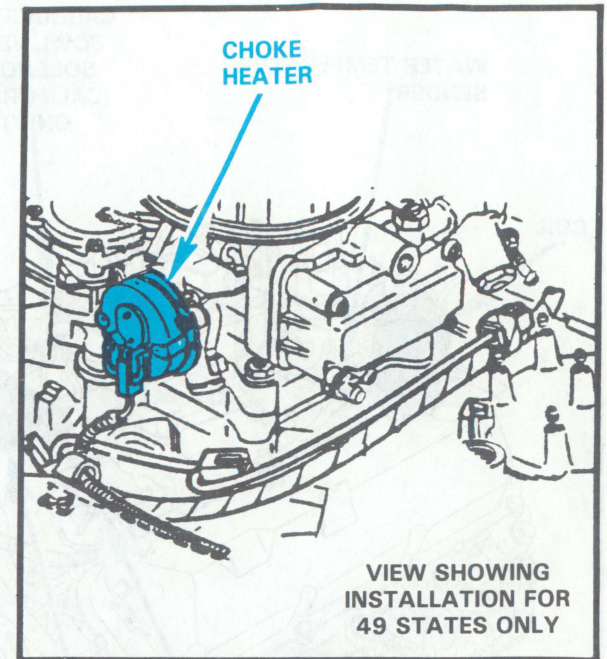


Figure 7 — RH View 7.5L Engine (49 States) Manual Transmission

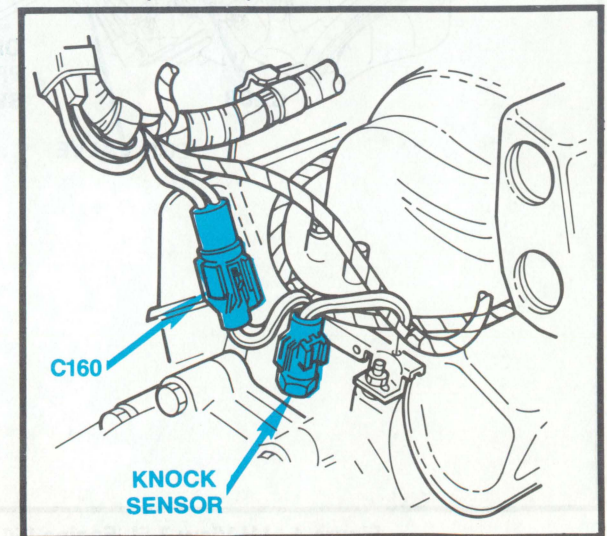
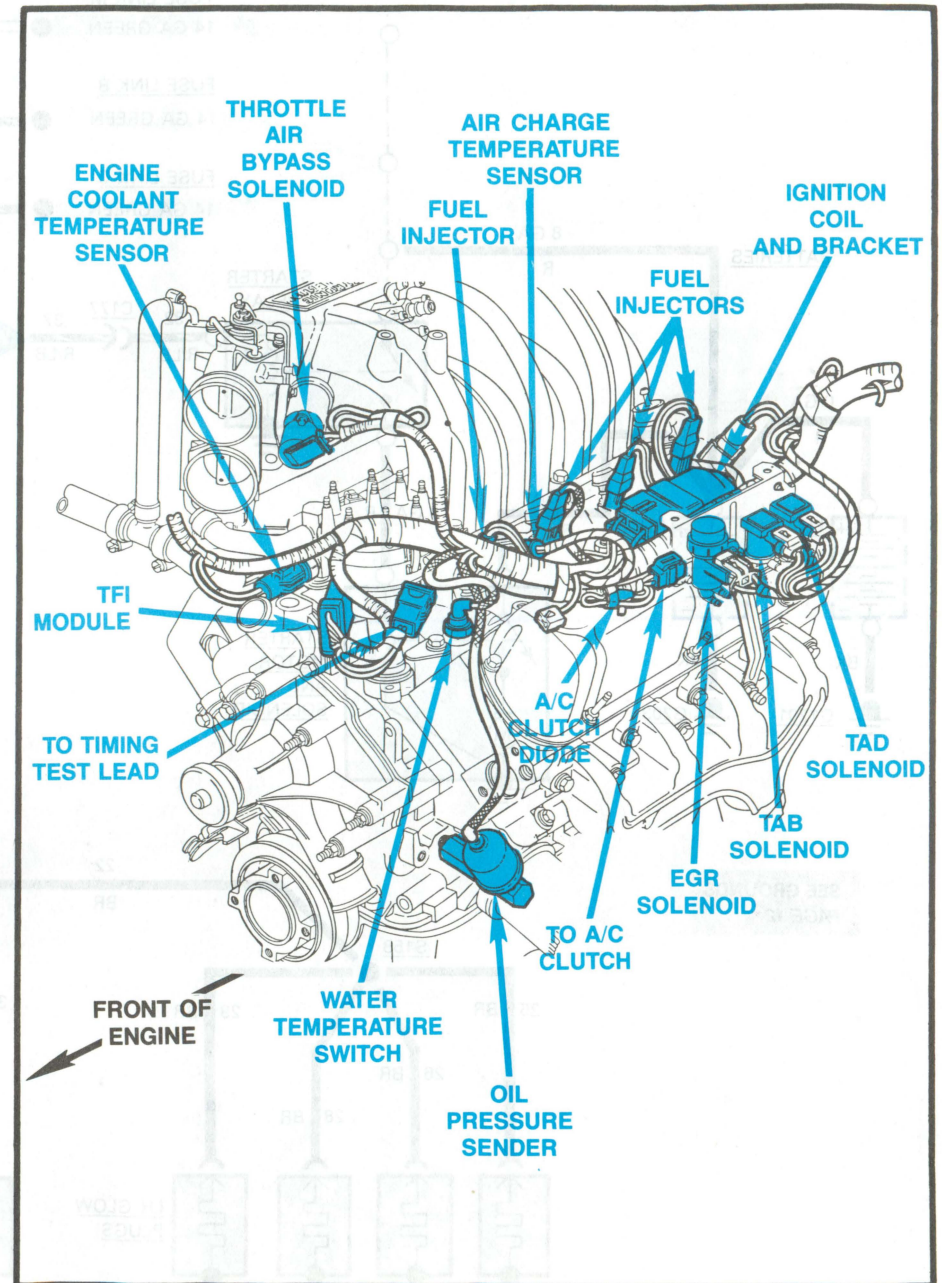
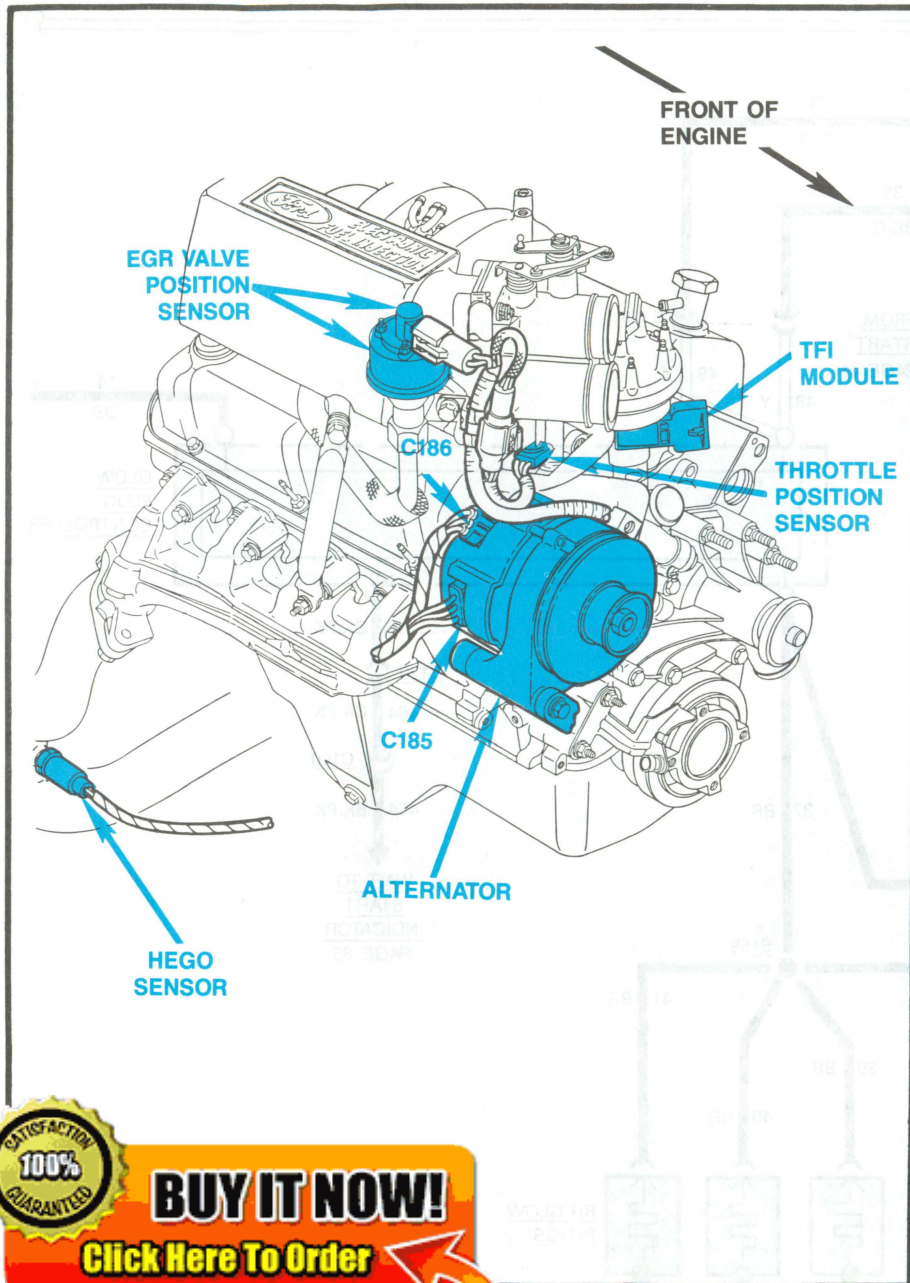


Figure 8 — Knock Sensor Location — 5.0L EFI

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal

MasterCard

DISCOVER NOVUS

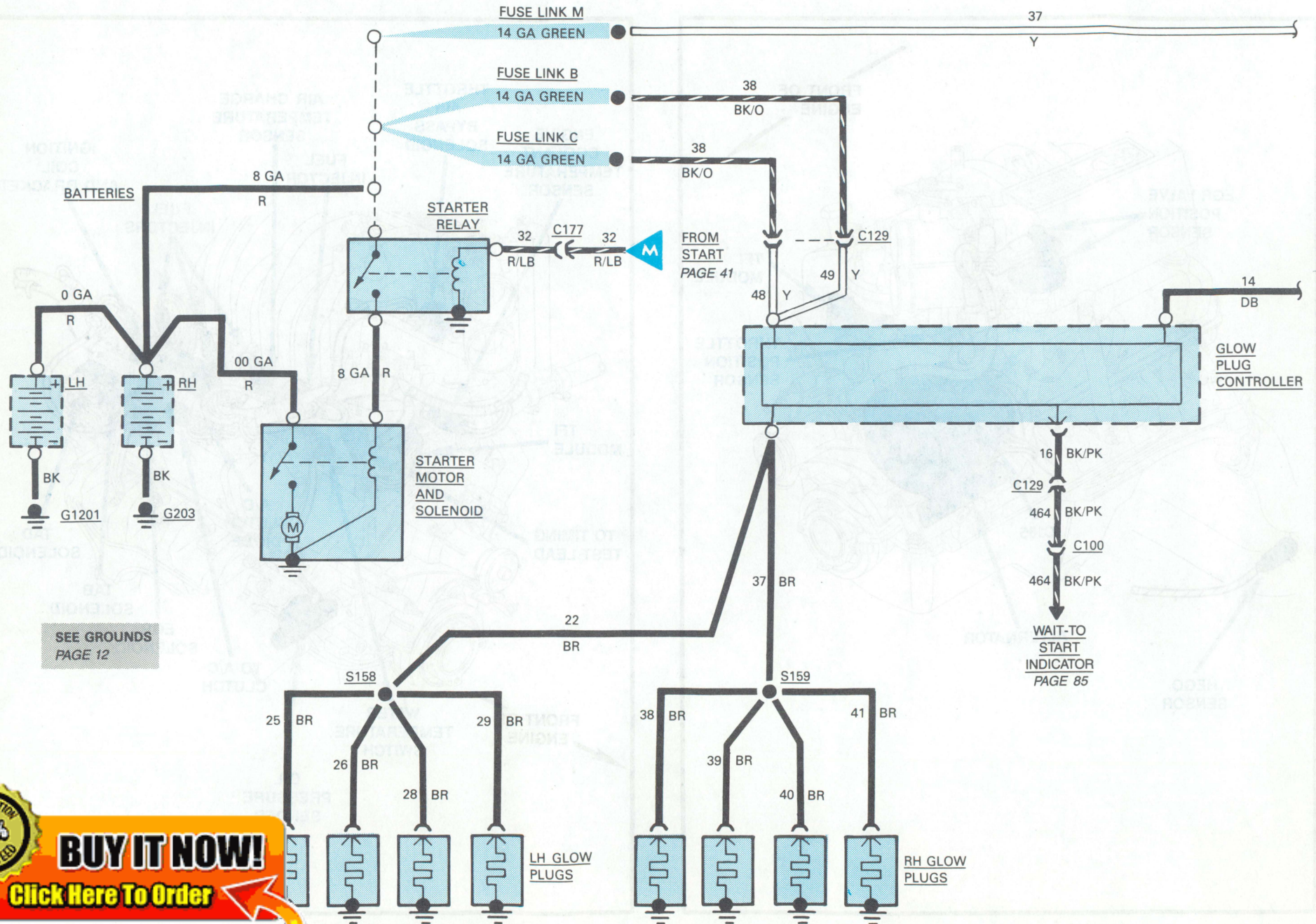
MasterCard

VISA

(50 States) (EEC-IV)

Figure 10 — LH View 5.0L Engine (50 States) (EEC-IV)

40 START/GLOW PLUG CONTROL/RUN (DIESEL)



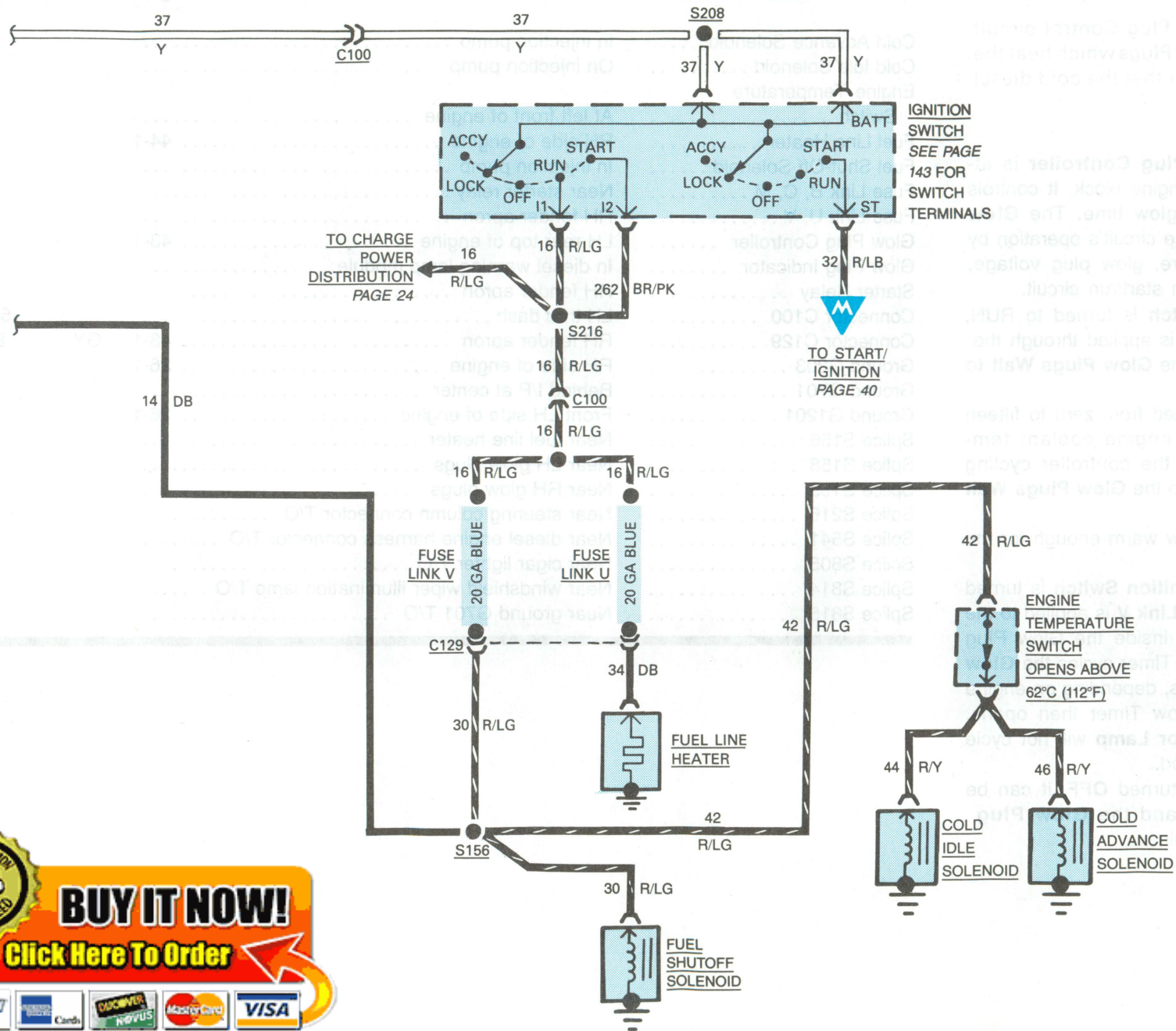
SEE GROUNDS
PAGE 12

SATISFACTORY 100% GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

HOW THE CIRCUIT WORKS

The Diesel Start/Glow Plug Control circuit applies power to the **Glow Plugs** which heat the combustion chambers, so that the cold diesel engine can be started.

Glow Plug Control

The solid state **Glow Plug Controller** is attached to the top of the engine block. It controls glow plug pre-glow after-glow time. The **Glow Plug Controller** controls the circuit's operation by sensing engine temperature, glow plug voltage, and after-glow voltage from start/run circuit.

When the **Ignition Switch** is turned to RUN, voltage from **Fuse Link V** is applied through the **Glow Plug Controller** to the **Glow Plugs Wait to Start Indicator Lamp**.

The glow plugs are heated from zero to fifteen seconds, depending on engine coolant temperature. After this time, the controller cycling switch opens and voltage to the **Glow Plugs Wait to Start Indicator Lamp**.

The **Glow Plugs** are now warm enough for the engine to be started.

At the same time the **Ignition Switch** is turned to Run, voltage from **Fuse Link V** is applied to the After-Glow Timer (located inside the Glow Plug Controller). The After-Glow Timer cycles the **Glow Plugs** for up to two minutes, depending on engine temperature. The After-Glow Timer then opens. The **Wait to Start Indicator Lamp** will not cycle during the After-Glow period.

If the ignition switch is turned **OFF**, it can be turned **ON** immediately and the **Glow Plug** starting cycle will start again.

COMPONENT LOCATION

		Page-Figure	Color	Terminals
Cold Advance Solenoid	In injection pump			
Cold Idle Solenoid	On injection pump			
Engine Temperature Switch	At left front of engine			
Fuel Line Heater	RH side of engine	44-1		
Fuel Shut-Off Solenoid	In injection pump			
Fuse Link B, C, M	Near starter relay			
Fuse Link U, V	RH fender apron			
Glow Plug Controller	LH rear top of engine	43-1		
Glow Plug Indicator	In diesel warning lamp module			
Starter Relay	RH fender apron			
Connector C100	LH thru dash			53
Connector C129	RH fender apron	43-1	GY	8
Ground G203	RH side of engine	26-1		
Ground G701	Behind I/P at center			
Ground G1201	Front LH side of engine	26-1		
Splice S156	Near fuel line heater			
Splice S158	Near LH glow plugs			
Splice S159	Near RH glow plugs			
Splice S216	Near steering column connector T/O			
Splice S541	Near diesel engine harness connector T/O			
Splice S805	Near cigar lighter T/O			
Splice S814	Near windshield wiper illumination lamp T/O			
Splice S815	Near ground G701 T/O			

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

Diesel Start/Run

The diesel engine uses two batteries to provide extra power for starting and glow plug heating. Power is applied from the batteries through heavy gauge wires to the Starter Solenoid in the Starter motor assembly. When the **Glow Plug Indicator** goes out, the **Ignition Switch** can be turned to START. With the transmission selector in park or neutral (automatic transmission), or the clutch pedal depressed (manual transmission), power is applied to the **Starter Relay**. The relay applies power to the solenoid coil which closes contacts to apply battery power to the starter motor.

With the **Ignition Switch** in Start or Run,

voltage is supplied to the **Fuel Line Heater**, **Fuel Shut-Off Solenoid**, **Engine Temperature Switch**, **Cold Advance Solenoid**, and the **Cold Idle Solenoid**, through **Fuse Links U and V**.

The **Fuel Line Heater** is wrapped around the fuel line. It heats the diesel fuel to melt any wax which might clog the filter. The heater has an interval thermostat to turn it on as needed.

The **Fuel Shut-Off Solenoid** controls the flow of fuel into the Injection Pump. With the **Ignition Switch** in Start or Run, the solenoid is energized, and fuel is allowed to flow into the Injection Pump. When the **Ignition Switch** is turned Off, the solenoid is de-energized, fuel flow stops, and the engine stops running.

The **Engine Temperature Switch** provides

voltage to the **Cold Advance Solenoid** and the **Cold Idle Solenoid**. When engine temperature is below 62°C (112°F), the **Engine Temperature Switch** is closed. When the **Ignition Switch** is turned to Start or Run, the Solenoids are energized, advancing Injection Pump timing and Engine Idle, allowing the engine to run more smoothly when cold. When the engine temperature reaches 62°C (112°F), the **Engine Temperature Switch** opens. This de-energizes the Solenoids, returning the Timing and Idle to normal.

TROUBLESHOOTING HINTS

See the Engine/Emission Diagnosis Manual.

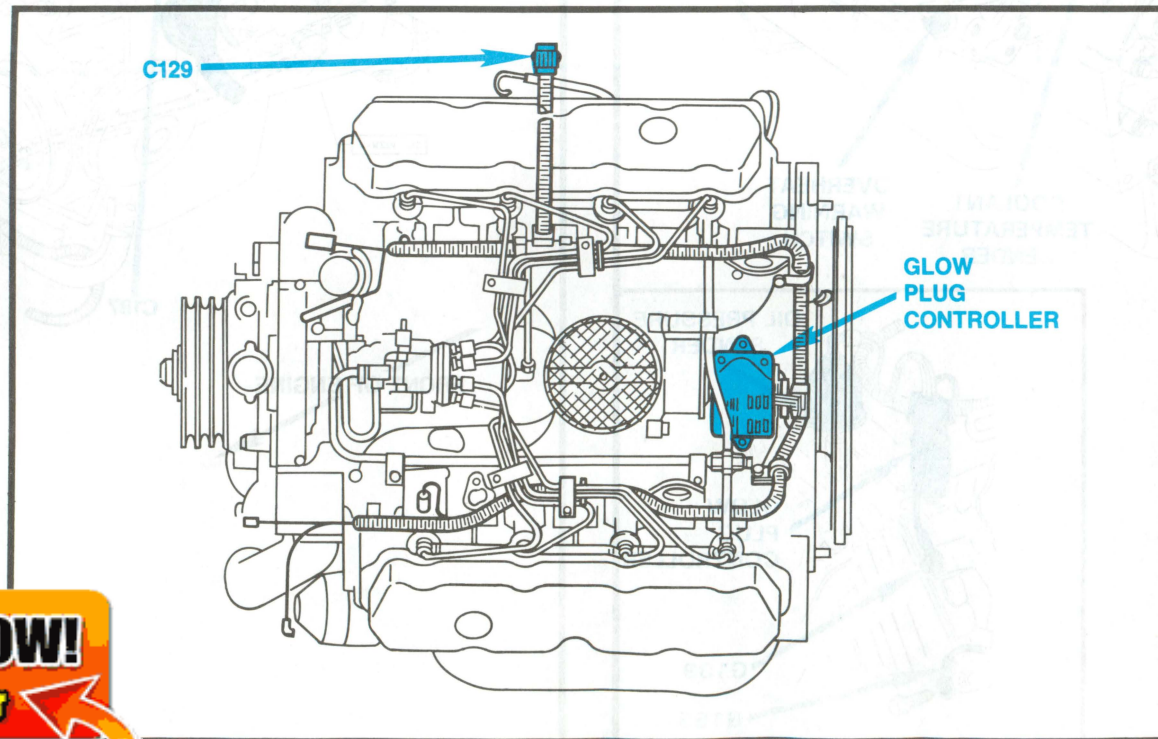


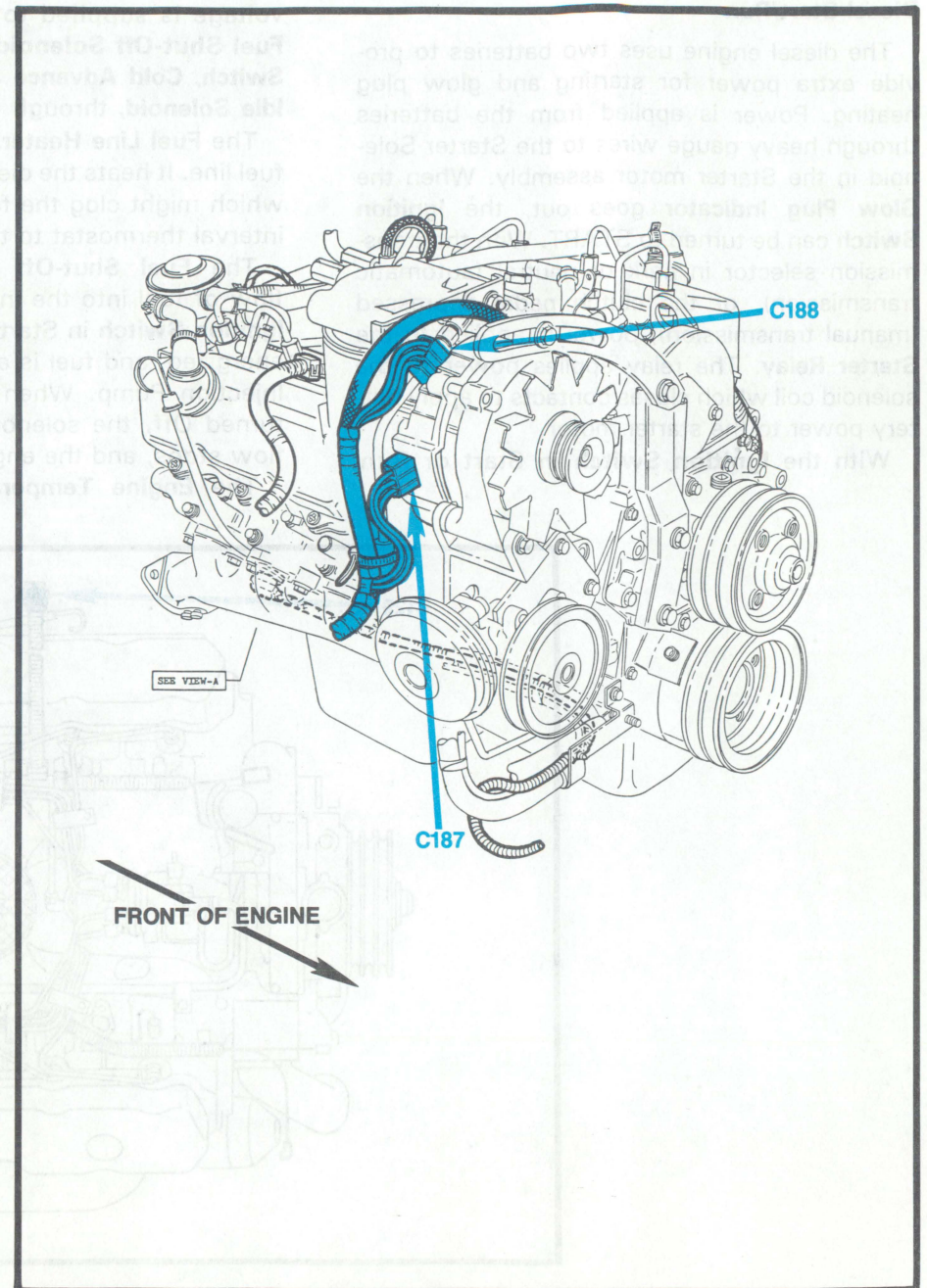
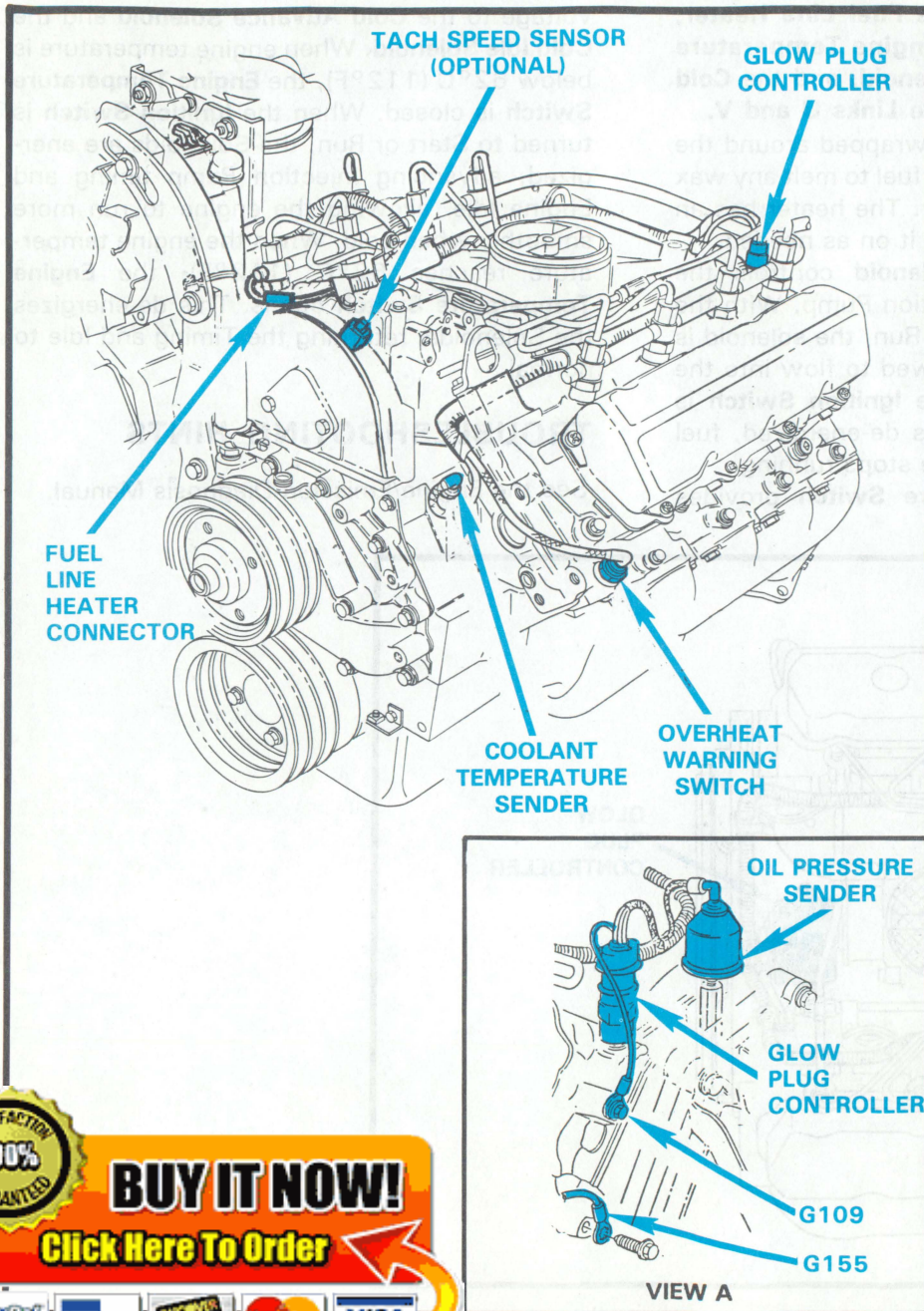
Figure 1 — Glow Plug Controller

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

44 START/GLOW PLUG CONTROL/RUN (DIESEL)



SATISFACTORY 100% GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

Figure 2 — Front of 6.9L Diesel Engine

Figure 3 — RH Side of 6.9L Diesel Engine



**WE SUPPORT VOLUNTARY
TECHNICIAN CERTIFICATION**



**Ford Parts and Service Division
Training and Publications Department**

100% SATISFACTION GUARANTEED

BUY IT NOW!

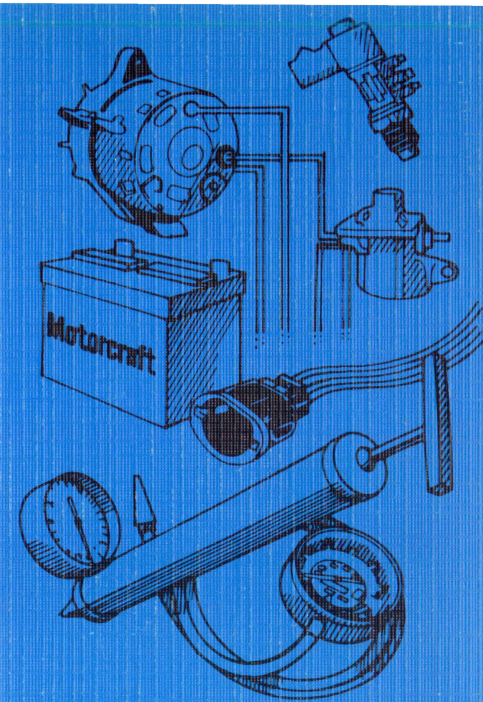
Click Here To Order 

PayPal    

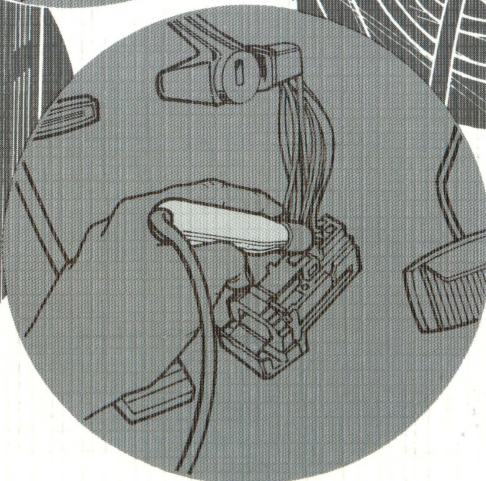
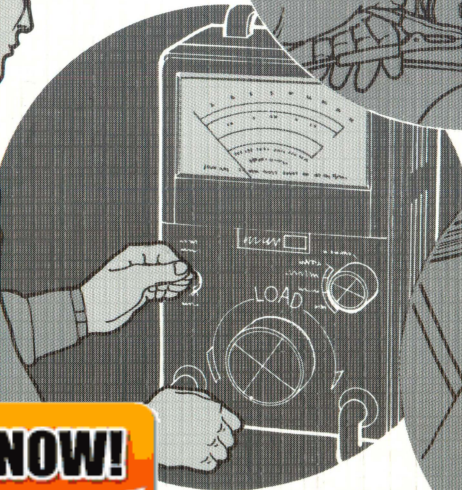
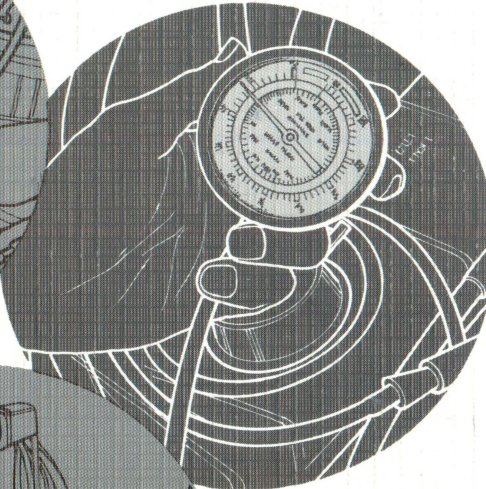
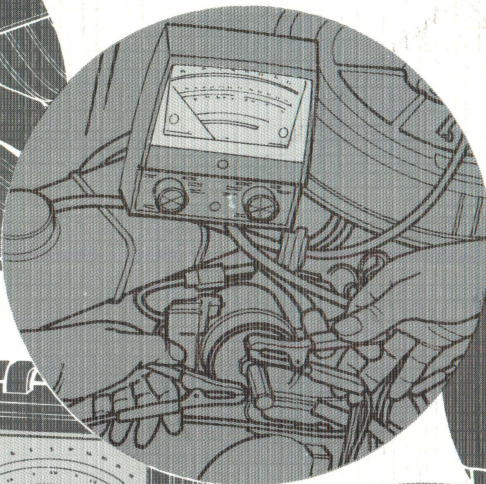
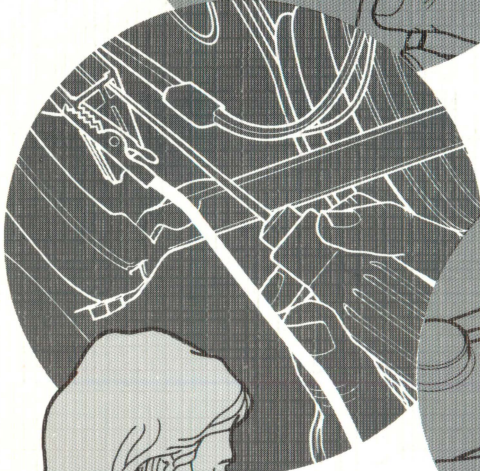
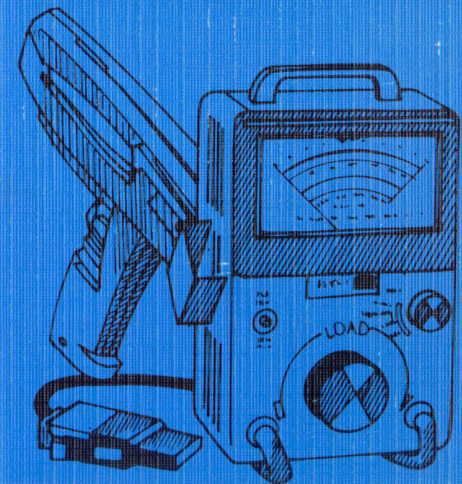


FPS-12129-87

1988 BRONCO/ F150-F350/ F-SUPER DUTY



Electrical & Vacuum Trouble- Shooting Manual



BUY IT NOW!

Click Here To Order



License #84356800

Copyright © 2023, Forel Publishing Company, LLC, Woodbridge, Virginia

All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, Woodbridge, VA 22192

**1988 Bronco/F150-F350/ F-Super Duty Electrical &
Vacuum Trouble-Shooting Manual (EVTM)**

EAN: 978-1-60371-411-2

ISBN: 1-60371-411-1

Forel Publishing Company, LLC
Woodbridge, VA 22192
Email: sales@ForelPublishing.com
<https://www.ForelPublishing.com>



This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

Note from the Publisher

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the professional should be sought.



ELECTRICAL AND VACUUM TROUBLESHOOTING MANUAL

FPS — 12129 - 88

ORDER INFORMATION

Information on how to order additional copies of this publication or other Ford publications, may be obtained by writing to Helm Incorporated at the address shown below. Other publications available include:

- Shop Manuals
- Service Specification Books
- Car/Truck Wiring Diagram Books
- Engine/Emissions Diagnosis Manuals

Helm Incorporated
P.O. Box 07150
Detroit, Michigan 48207



TABLE OF CONTENTS

How to Use This Manual	1
How to Find the Electrical Problem	2,3
Symbols (Electrical)	4
(Vacuum)	110
How to Find the Vacuum Problem	112
Component Testing	
Introduction	123
Main Light Switch	123
Hazard Switch	125
Ignition Switch	124
Turn Signal Switch	125
Windshield Wiper/Washer Switch	126
Interval Wiper/Washer Switch	127
A/C-Heater Function Selector	128
A/C-Heater Blower Switch	129
Location Index	130

INDEX

A/C-Heater	117
Anti-Lock Brakes	75
Brake Warning Indicator	69
Charge (Gasoline)	15
(Diesel)	20
Cigar Lighter	88
Coolant Temperature Gage	82
Diesel Glow Plug Control	30
Electric Fuel Pump Control	86
Electronic Engine Control	35
Electronic Shift—4 Wheel Drive	77
Four-Wheel Drive Indicator	78
Fuel Injector Cooling Fan—(4.9L Only)	46
Fuel Tank Selector/Gages (Diesel)	83
(Gasoline)	81
Fuse Panel (Diesel)	22
(Gasoline)	17

Gages (Diesel)	83
(Gasoline)	81
Grounds	5
Heater	116
Horn	88
Ignition	25
Instrument Illumination	67
Lamps On Warning	63
Lamps	
Backup	61
Body Marker	52
Cargo	61
Dome	63
Exterior	50
Hazard	57
Headlamps	48
Instrument Illumination	67
License	51
Map	63
Marker	51
Park	51
Radio Illumination	67
Stop	57
Tail (Rear Park)	50
Trailer	52
Turn	57
Main Light Switch	67
Power Distribution (Diesel)	20
(Gasoline)	15
Power Door Locks	103
Power Windows	96
Radio (Stereo) (Electronic)	106
Rear Window Defrost	99
Seatbelt Warning	69
Speed Control	113
Start (Diesel)	30
(Gasoline)	25

Tachometer	82
Tailgate Power Window	99
Trailer	103
Vacuum Distribution	111
Warning Indicators (Diesel)	72
(Gasoline)	69
Windshield Wiper/Washer	91
Windshield Wiper/Washer (Interval)	93

IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the personal safety of the individual doing the work. This Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.



BUY IT NOW!

Click Here To Order



contents are hyperlinks to pages

This manual contains the following diagnostic information:

- Electrical and Vacuum Schematics
- Component Location Indexes and Views
- Troubleshooting Hints
- Descriptions of Circuit Operation
- Component Testing

The vehicle's entire electrical system is broken down into individual systems. There are also sections for the vehicle's ground and power distribution circuitry. Each system section begins with a wiring schematic. The **Schematics** should always be your starting point in using this manual. These schematics show the paths of electrical current during proper circuit operation. The source of voltage (circuit breaker or fuse) is shown at the top of the page. All wire, connectors, splices, switches, and motors are shown in the flow of current to ground at the bottom of the page. Connector end views of switches and other components are shown to help with bench testing. Each circuit component is named (underlined titles). Wire and connector colors are listed (standard Ford color abbreviations are used). These abbreviations are:

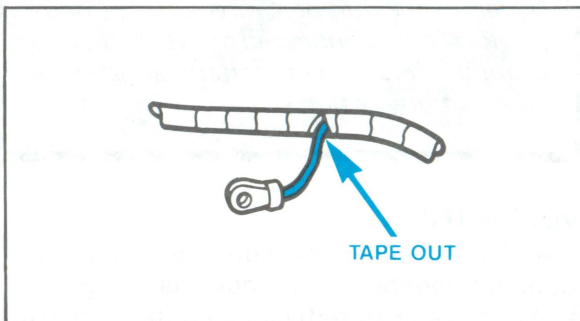
COLOR ABBREVIATIONS

BL	Blue	N	Natural
BK	Black	O	Orange
BR	Brown	PK	Pink
DB	Dark Blue	R	Red
DG	Dark Green	P	Purple
GR	Green	T	Tan
GY	Gray	W	White
LB	Light Blue	Y	Yellow
	Light Green		

The **Component Location** section of each system helps you locate the circuit's components in the vehicle. A brief statement of the location is given as well as a reference to an illustrative figure in the manual. There is also a full listing of connector, ground, and splice locations in the **Location Index** in the back of the manual.

OTHER ABBREVIATIONS

T/O (Tape Out) The point at which a harness branches to feed a component.



The **Troubleshooting Hints** offer shortcuts or tests that help you determine the cause of an electrical problem. They are not intended to be a rigid procedure for solving an electrical situation. Rather, Troubleshooting Hints represent a common-sense approach that is based on an understanding of the circuit.

A description of **How the Circuit Works** is written to help you understand the operation of the circuit as a whole. Emphasis is placed on how the components and circuitry interact in a properly working system.

A **Component Testing** section provides procedures to determine whether a component is good or bad.

Notes, Cautions, and Warnings appear in boxes on text pages and contain important vehicle and mechanic **safety** information.

Notes give added information to help complete a particular procedure. Cautions are included to prevent making an error that could damage the vehicle. Warnings highlight areas where carelessness can cause personal injury. The following list contains some general **Warnings** that should be followed when working on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires being under a vehicle.
- Be sure that the **Ignition Switch** is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on any vehicle. An automatic transmission should be in PARK. A manual transmission should be in NEUTRAL.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
- Keep away from moving parts when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter, and muffler.
- Do not allow flame or sparks near the battery. Gases are always present in and around the battery cell. An explosion could occur.
- Do not smoke.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing.

... wire, the
... The sec-

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

TROUBLESHOOTING STEPS

These six steps present an orderly method of troubleshooting:

Step 1. Verify the problem.

- Operate the complete system and see all symptoms for yourself in order to:
 - check the accuracy and completeness of the customer's complaint.
 - learn more that might give a clue to the nature and location of the problem.

Step 2. Narrow the problem.

- Using this manual, narrow down the possible causes and locations of the problem in order to more quickly find the exact cause.
- Read the description of *How the Circuit Works* and study the wiring diagram. You should then know enough about the circuit operation to figure out where to check for this trouble.

Step 3. Test the cause.

- Use electrical test procedures to find the specific cause of the symptoms.
- *Troubleshooting Hints* will give some helpful ideas.
- The *Component Location* charts and the pictures will help you find components, grounds, and connectors.

Step 4. Verify the cause.

- Confirm the fact that you have found the correct cause through operating the parts of the circuit you think are good.

Step 5. Make the repair.

- Repair or replace the faulty component.

Step 6. Verify the repair.

Step 1 and check all symptoms. If any new special test procedures and special procedures. See the

Shop Manual and other service books for details. You will find the circuits in this manual to be helpful with these special tests.

TROUBLESHOOTING TOOLS

JUMPER WIRE

This is a test lead used to connect two points of a circuit. A **Jumper Wire** can complete a circuit by bypassing an open.

Uses: Bypassing Switches or Open Circuits

WARNING

Never use a jumper wire across loads (motors, etc.) connected between hot and ground. This direct battery short may cause injury or fire.

VOLTMETER

A DC **Voltmeter** measures circuit voltage. Connect negative (- or black) lead to ground, and positive (+ or red) lead to voltage measuring point.

OHMMETER

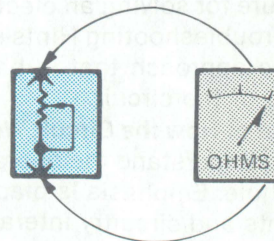


Figure 1— Resistance Check

An **Ohmmeter** shows the resistance between two connected points (Figure 1).

TEST LIGHT

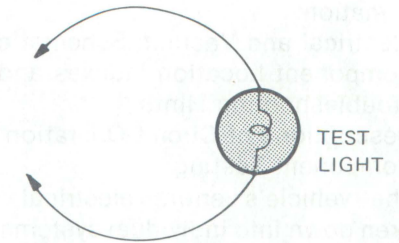


Figure 2 – Test Light

A **Test Light** is a 12-volt bulb with two test leads (Figure 2).

Uses: Voltage Check. Short Check

SELF-POWERED TEST LIGHT

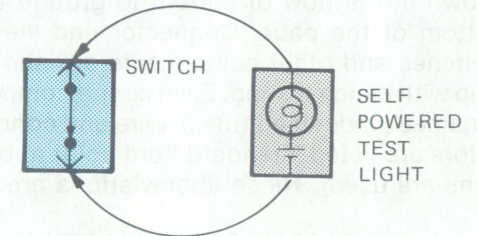


Figure 3—Continuity Check

The **Self-Powered Test Light** is a bulb, battery and set of test leads wired in series (Figure 3). When connected to two points of a continuous circuit, the bulb glows.

Uses: Continuity Check. Ground Check

CAUTION

When using a self-powered test light or ohmmeter, be sure power is off in circuit during testing. Hot circuits can cause equipment damage and false readings.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

TROUBLESHOOTING CHECKS

SWITCH CIRCUIT CHECK

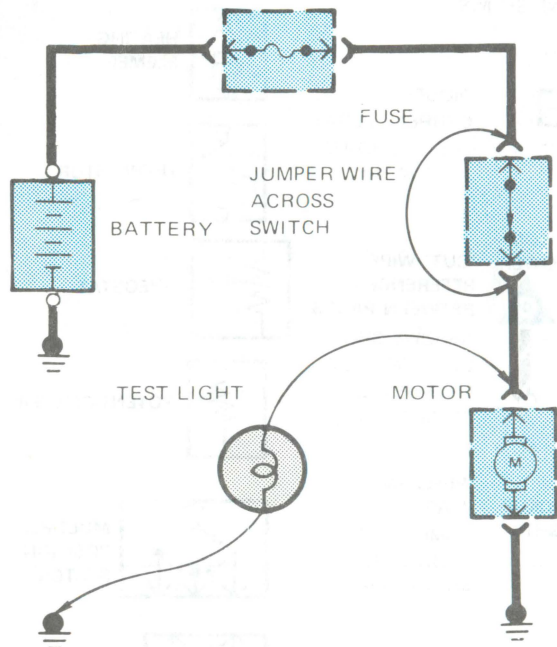


Figure 4—Switch Circuit Check and Voltage Check

In a bad circuit with a switch in series with the load, jumper the terminals of the switch to power the load. If jumping the terminals powers the circuit, the switch is bad (Figure 4).

CONTINUITY CHECK (Locating open circuits)

With power off, connect one lead of **Self-Powered Test Light** or **Ohmmeter** to each end of circuit (Figure 3). Light will glow if circuit is closed. Switches and fuses can be checked in the same way.

SHORT CHECK (short to ground)

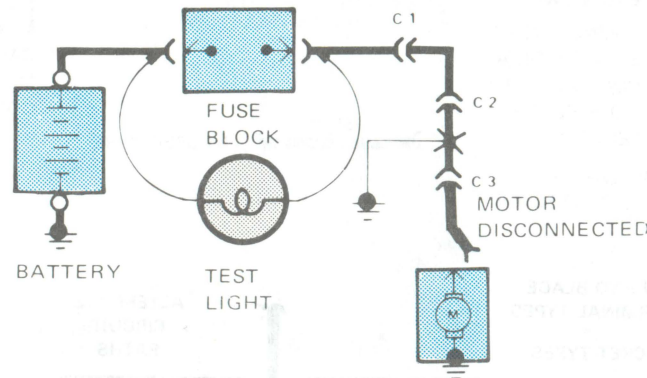


Figure 5—Short Check

A fuse that repeatedly blows is usually caused by a short to ground. It's important to be able to locate such a short quickly (Figure 5).

- 1) Turn off everything powered through the fuse.
- 2) Disconnect other loads powered through the fuse:
 - Motors: disconnect motor connector.
 - Lights: remove bulbs.
- 3) Turn **Ignition Switch** to RUN (if necessary) to power fuse.
- 4) Connect one **Test Light** lead to hot end of blown fuse. Connect other lead to ground. Bulb should glow showing power to fuse. *(This step is just a check to be sure you have power to the circuit.)*
- 5) Disconnect the **Test Light** lead from ground and reconnect it to the load side of the fuse.
 - If the **Test Light** is off, the short is in the disconnected equipment.
 - If the **Test Light** goes on, the short is in the wiring. You must find the short by disconnecting the circuit connectors one at a time until the **Test Light** goes out. For example: with a ground at X, the bulb goes out when C1 or C2 is disconnected, but stays on after disconnecting C3. This

means the ground is between C2 and C3.

"GOOD GROUND" CHECK

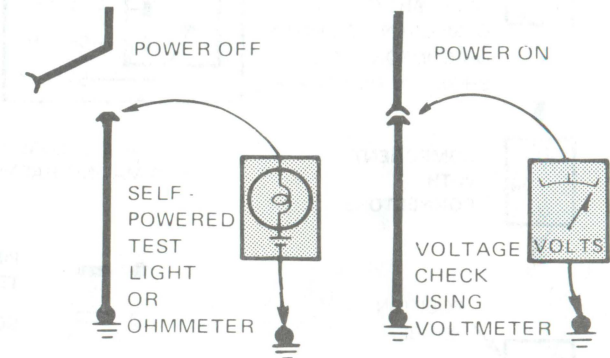


Figure 6 — Grounds Checks

Turn on power to circuit. Perform Voltage Check between suspected bad ground and frame. Any voltage means ground is bad.

Turn off power to circuit. Connect one lead of **Self-Powered Test Light** or **Ohmmeter** to wire in question, and the other to known ground. If bulb glows, circuit ground is OK (Figure 6).

TROUBLESHOOTING HINTS

The circuit schematics in this manual are designed to make it easy to identify common points in circuits. This knowledge can help narrow the problem to a specific area. For example, if several circuits fail at the same time, check for a common power or ground connection. (See *Power Distribution* or *Grounds*). If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

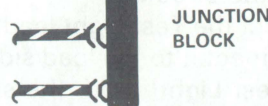
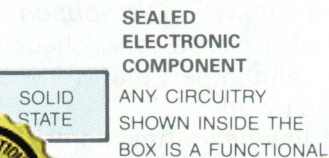
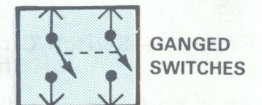
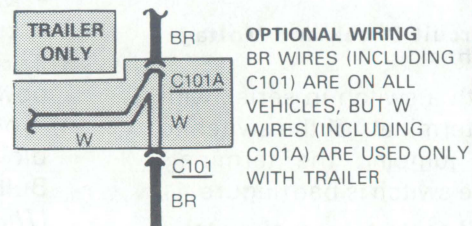
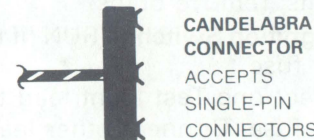
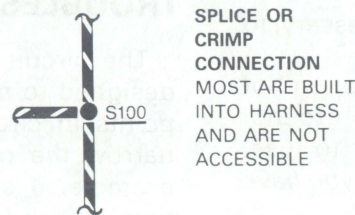
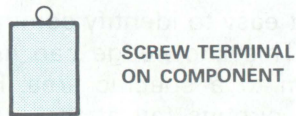
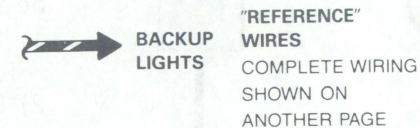
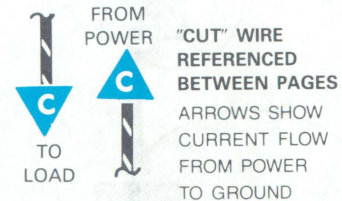
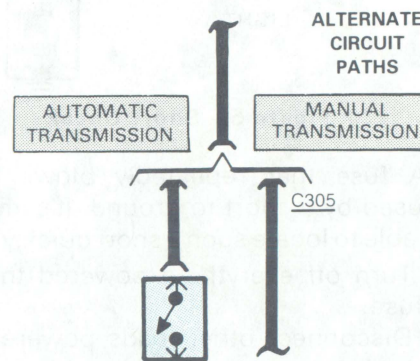
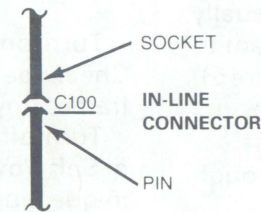
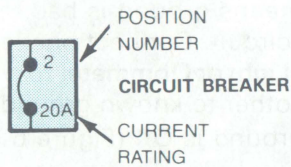
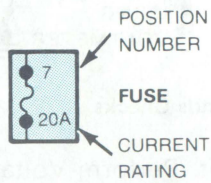
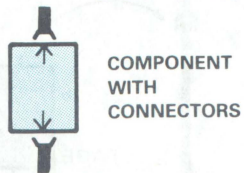
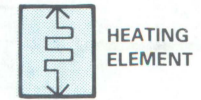
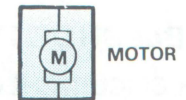
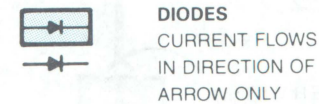
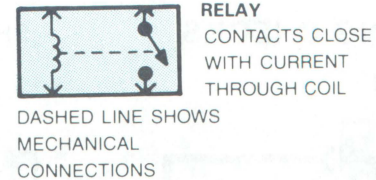
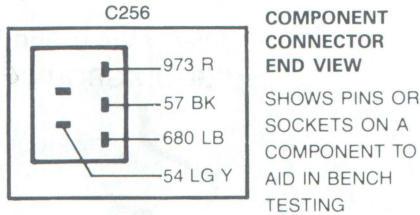
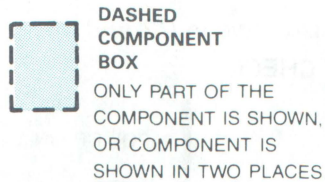
For example, if low beam headlights work but high beams and the indicator light don't work, then power and ground paths must be good. Since the dimmer switch is the component which switches this power to the high beam lights and indicator, it is most likely the cause of failure.

100% SATISFACTION GUARANTEED

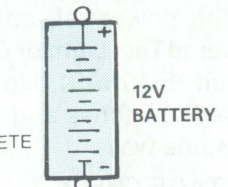
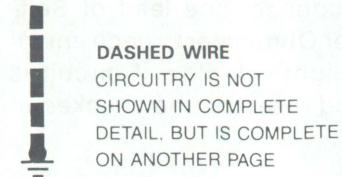
BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA



SEE GROUNDS PAGE 5-15



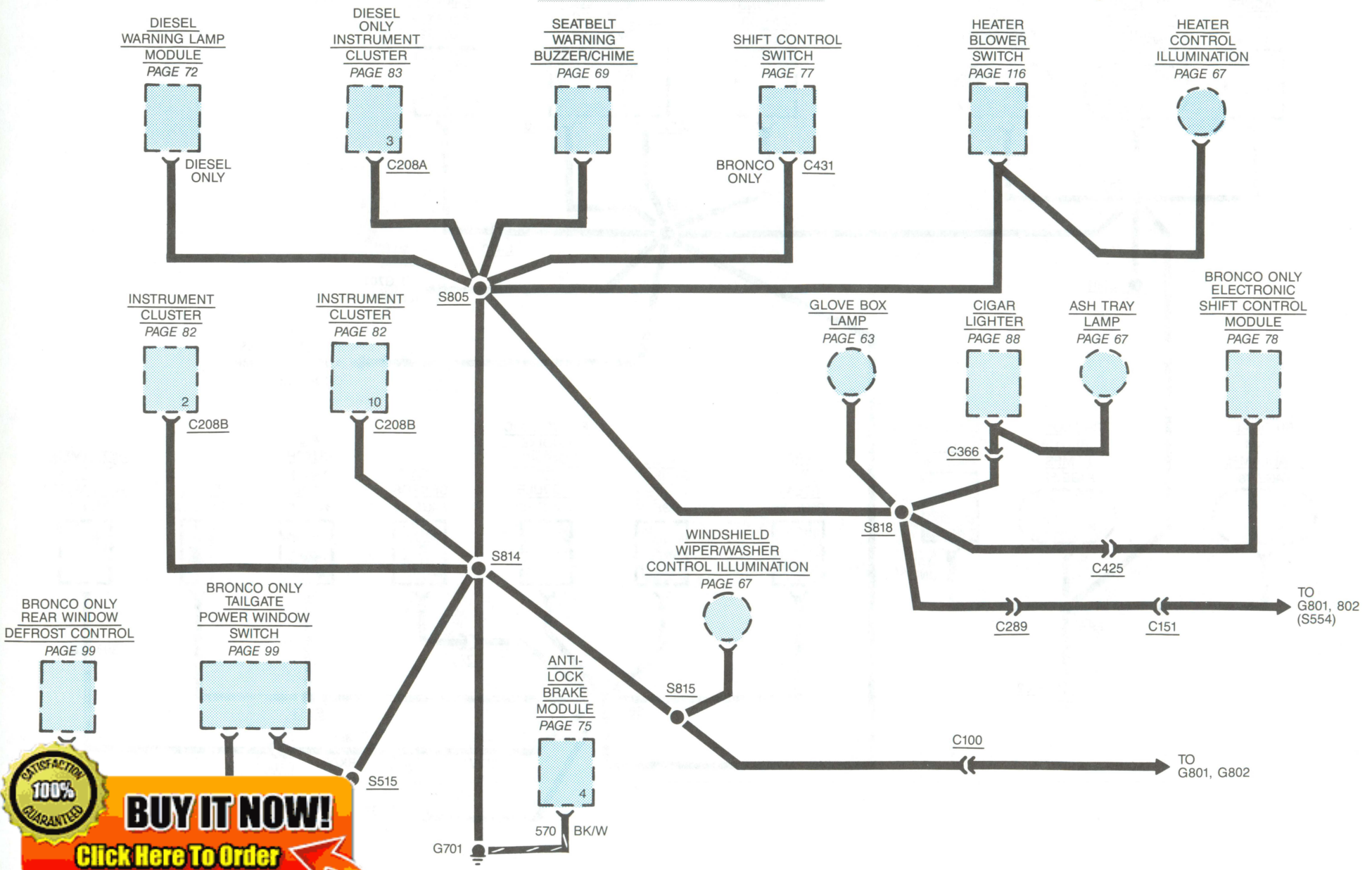
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

INSTRUMENT PANEL GROUND

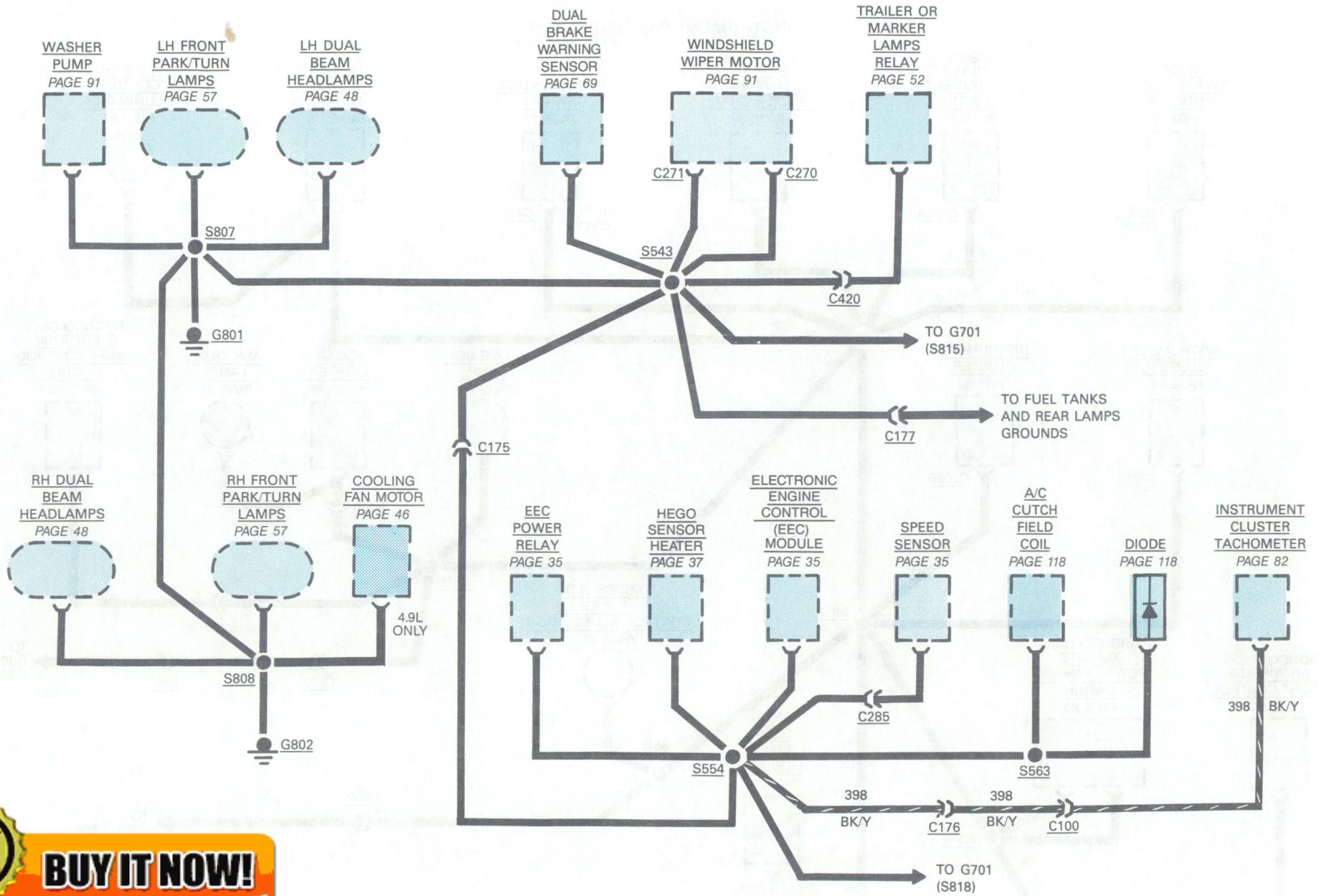


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal | American Express | Discover | MasterCard | VISA

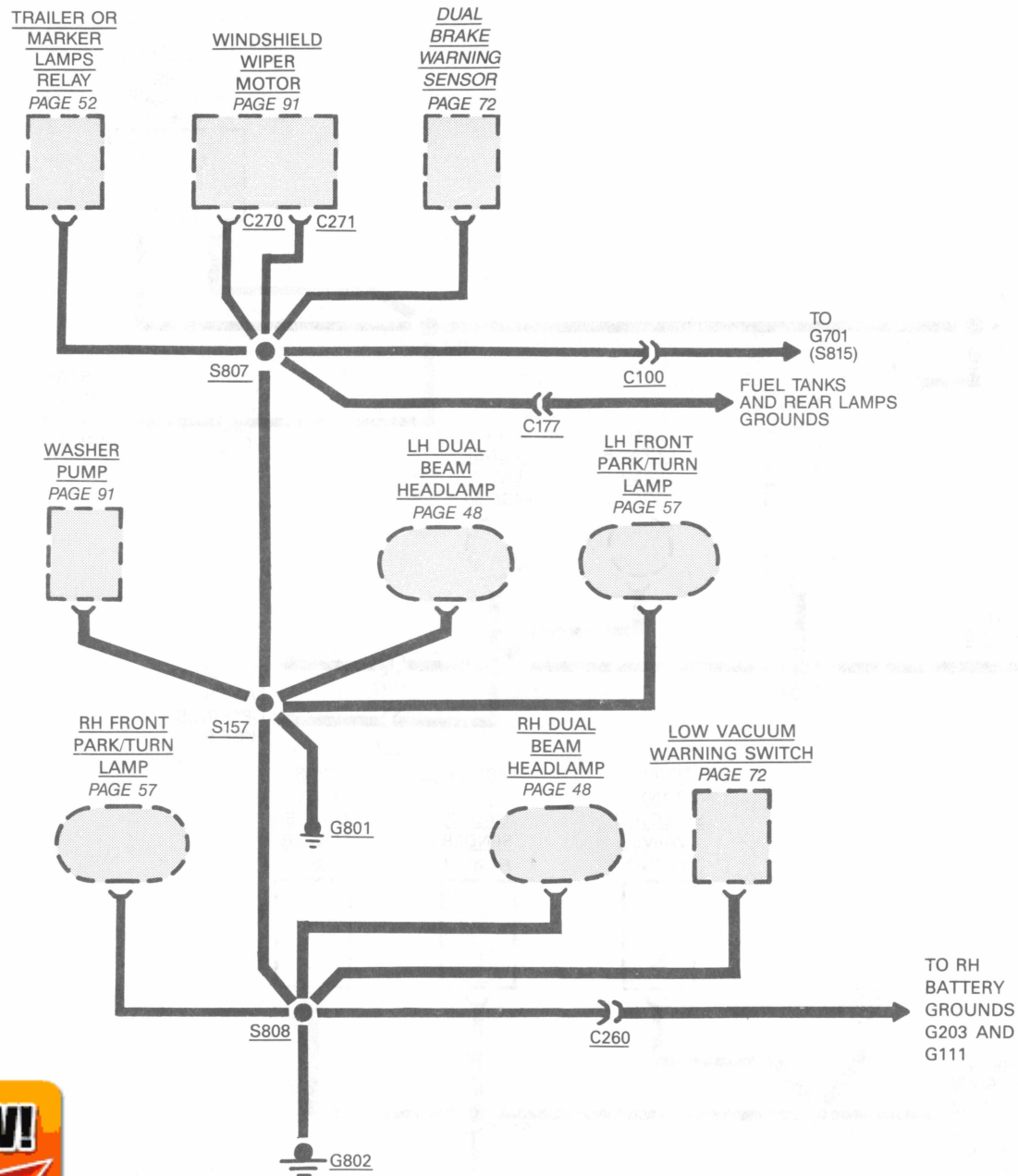


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

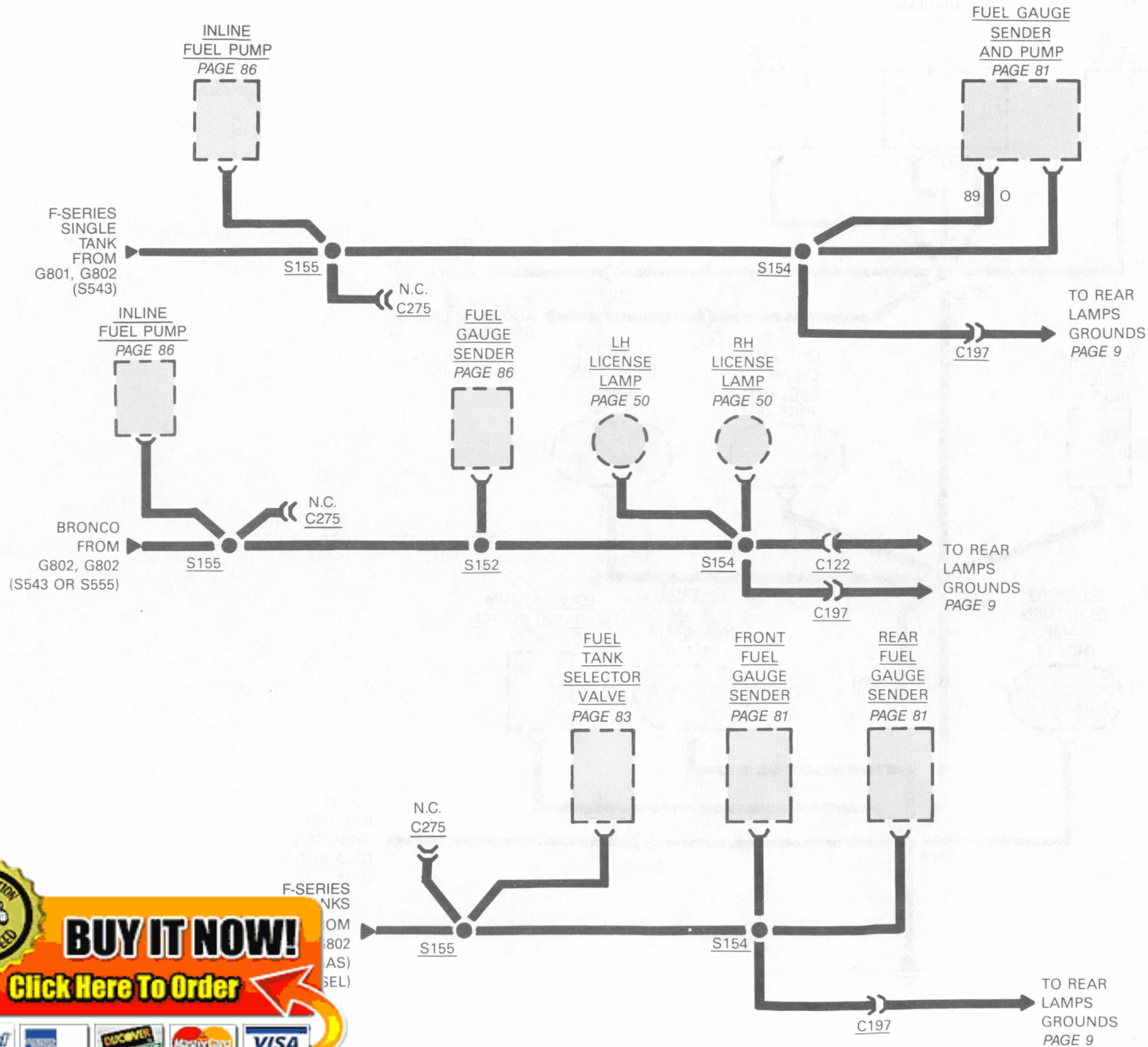


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

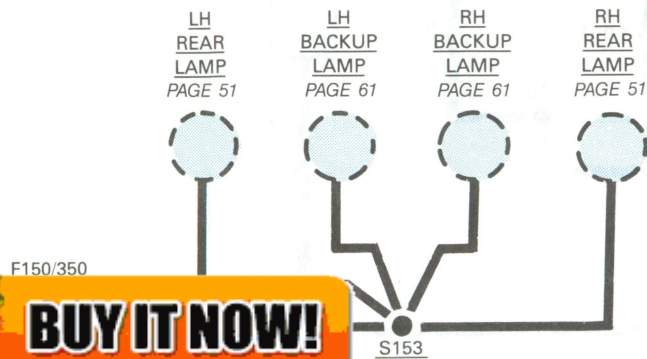
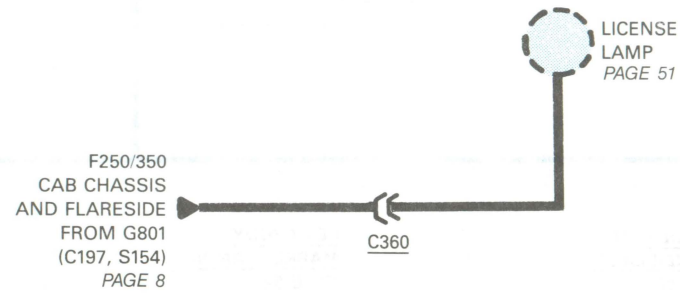
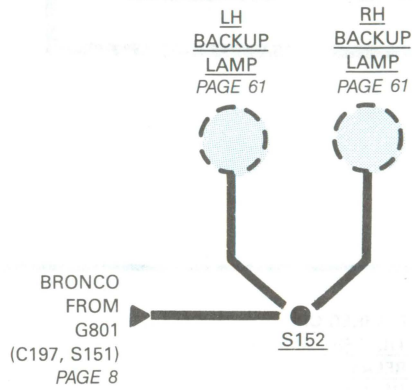
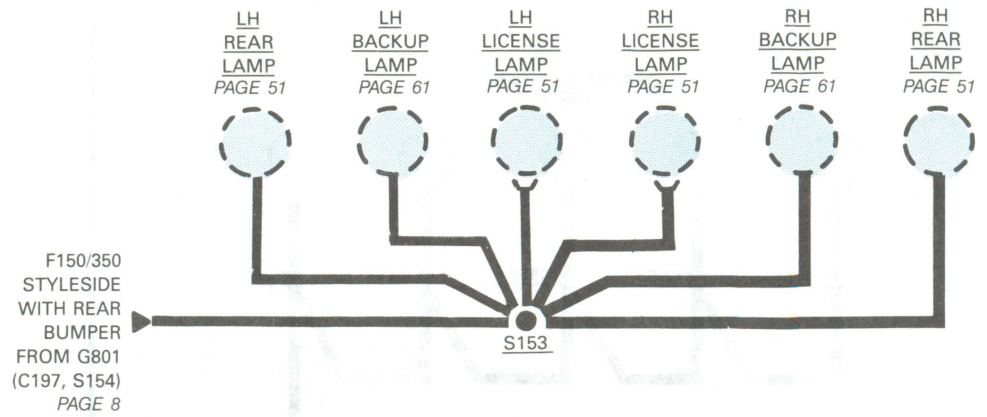
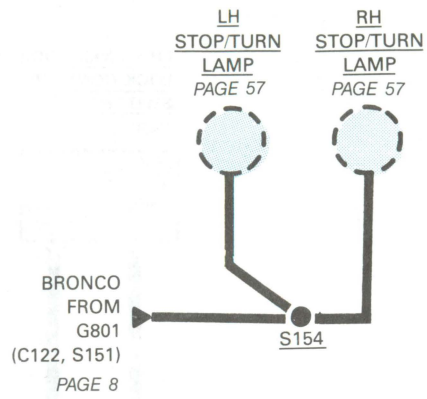
8 GROUNDS (FUEL TANKS AND REAR LAMPS)



100% SATISFACTION GUARANTEED

BUY IT NOW!

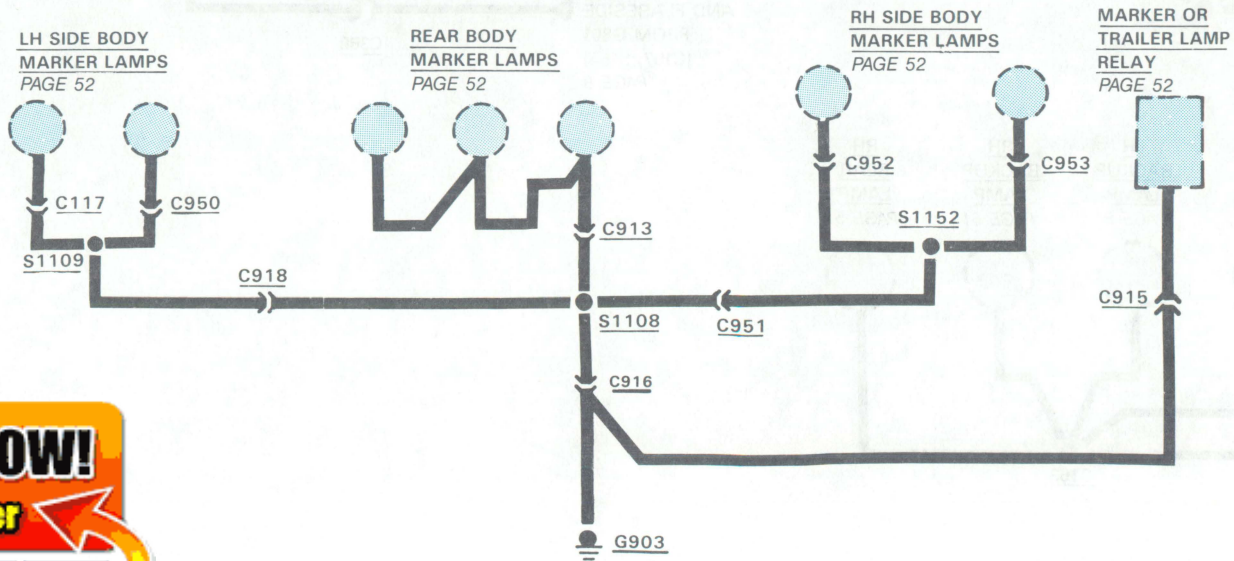
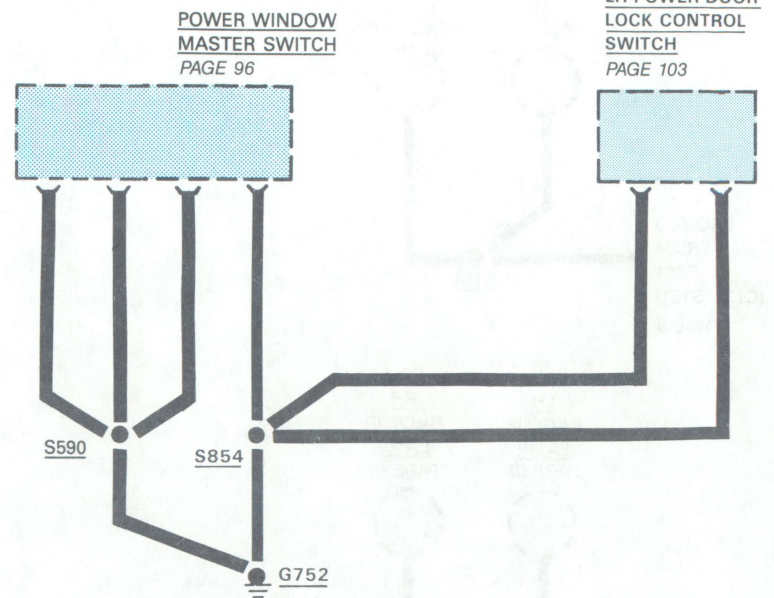
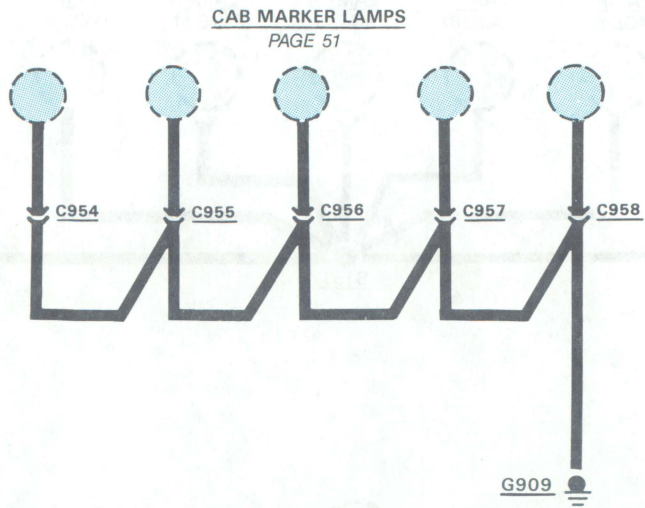
Click Here To Order



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

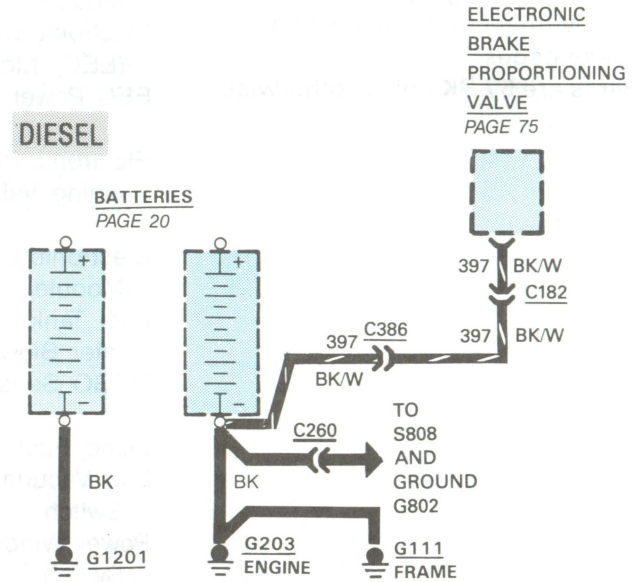
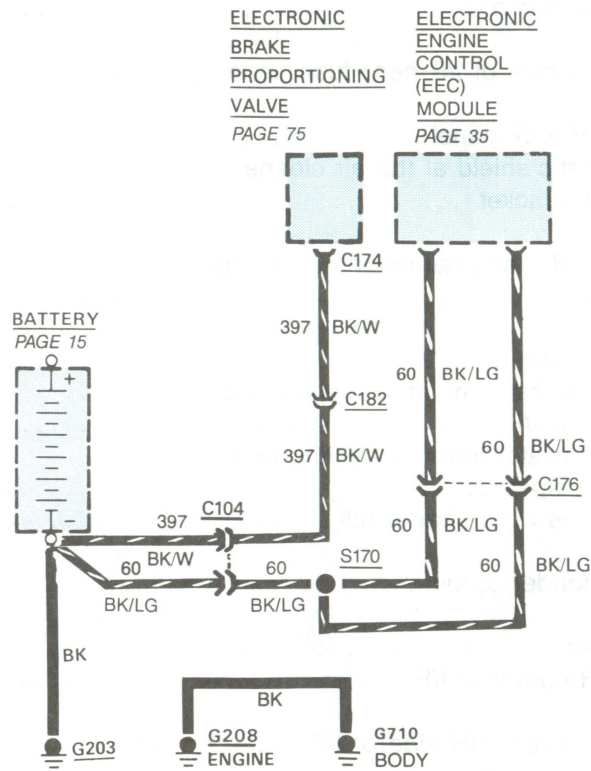


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

HOW THE CIRCUIT WORKS

The ground circuits shown here are complete and connect several components together to screw terminal ground points. On other pages only parts of these circuits may be shown. Partial ground circuits are shown dashed on those pages.

All simple or component ground circuits are shown on the individual circuit pages and are complete on those pages.

All ground wires are **57 BK** unless otherwise noted.

COMPONENT LOCATION

Page-
Figure

A/C Clutch Field Coil	Part of compressor	
Anti-Lock Brake Module	Behind I/P left of center	
Brake Sensor	Part of master cylinder	
Cooling Fan Motor	RH fender apron	
Diesel/Warning Lamp Module	Behind LH side of I/P near fuse panel	
Electronic Engine Control (EEC) Module	Behind LH kick panel	
EEC Power Relay	Under plastic shield at the air cleaner support bracket	
Electronic Brake Proport- ioning Valve	Inside of LH frame rail behind #1 cross- member	
Electronic Shift Control Module	RH cowl panel	
Fuel Tank Selector Valve	On LH side frame member behind cab	85-1
Heater Blower Switch	At center of I/P	
HEGO Sensor	In communicator tube connecting both exhaust pipes	29-3,122-2
Inline Fuel Pump	Inboard side of LH frame rail	
Low Vacuum Warning Switch	7.3L RH fender apron	
Power Window Master Switch	In LH door	
Rear Defrost Control	Under LH corner of I/P	
Seatbelt Warning Buzzer/Chime	Attached to rear RH side of I/P	101-2
Shift Control Switch	On LH side of I/P	
Speed Sensor	At transmission	
Tailgate Power Window Motor	In center of tailgate	102-3
Washer Pump	In washer reservoir	
Windshield Wiper Motor	Attached to center of dash panel	

Refer to the **Location Index** in the back of the manual for connector, ground, and splice descriptions and locations.

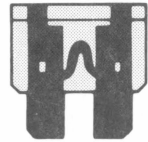
100% SATISFACTION GUARANTEED

BUY IT NOW!

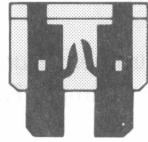
Click Here To Order

PayPal American Express Discover MasterCard VISA

REPLACEMENT OF FUSES/ CIRCUIT BREAKERS



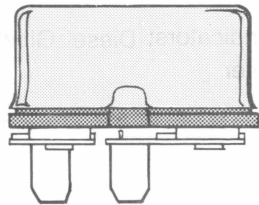
GOOD FUSE



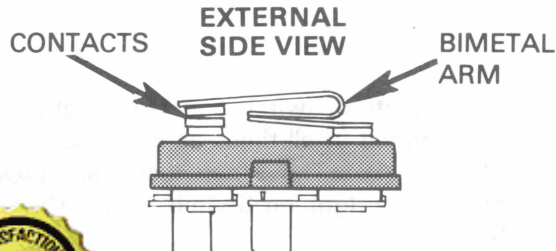
BLOWN FUSE

Fuses are mounted either in the **Fuse Panel** or in-line. They are identified by the numbered value in amperes, and by a color code. Some positions may have either a fuse with adapter or a circuit breaker. Be sure to replace a fuse or circuit breaker with the same kind of unit and with the same ampere rating. Remove fuses in order to check them.

CIRCUIT BREAKER OPERATION



EXTERNAL
SIDE VIEW



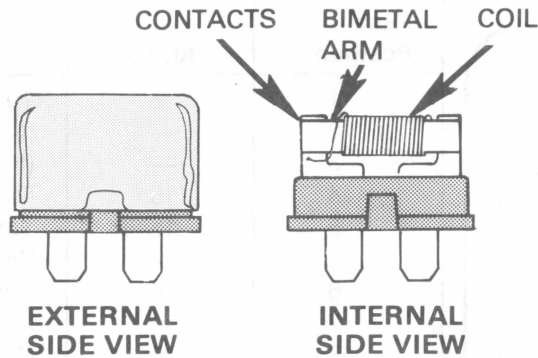
CONTACTS

BIMETAL
ARM

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



Non-Cycling Fuse Block Type



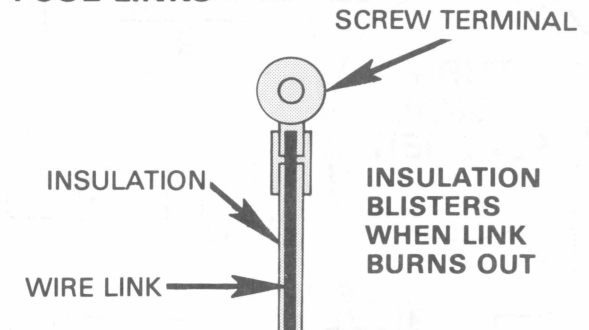
Cycling In-Line Type

Some circuits are protected by circuit breakers. (Abbreviated "c.b." in fuse chart.) They can be **Fuse Panel** mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal bonded together (bimetal arm). If the arm starts to carry too much current, it heats up. As one metal expands faster than the other, the arm bends, opening the contacts. Current flow is broken. In the cycling type, the arm cools and straightens out. This closes the circuit again. This cycle repeats as long as the overcurrent exists, with power applied.

In the non-cycling type, there is also a coil wrapped around the bimetal arm. When an overcurrent exists and the contacts open, a small current passes through the coil. This current through the coil is not large enough to

FUSE LINKS

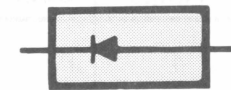


operate a load, but it does heat up both the coil and bimetal arm. This keeps the arm in the open position until power is removed.

The fuse link is a short length of wire smaller in gage than the wire in the protected circuit. The wire is covered with a thick non-flammable insulation. An overload causes the link to heat and the insulation to blister. If the overload remains, the link will melt, causing an open circuit.

When replacing, make tight crimp joints or hot solder joints for good connections.

DIODES



Diodes are electrical devices that permit current to flow in one direction only. The current flows in the direction indicated by the arrow.

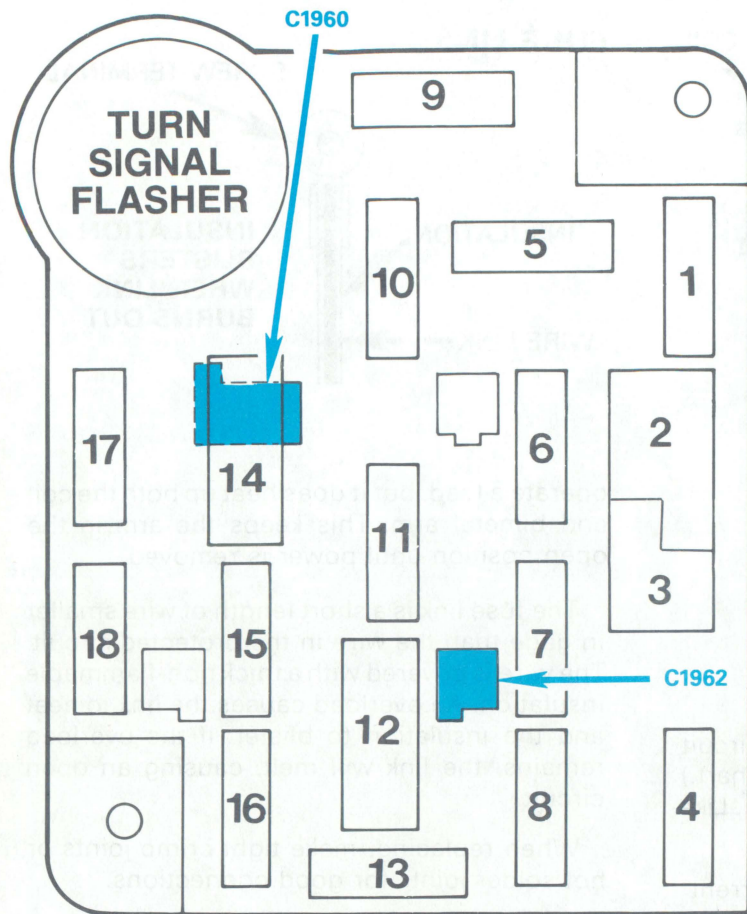


Figure 1 - Fuse Panel

Fuse Position	Amps	Circuits Protection
1	15	Turn/Stop/Hazard Lamps; Speed Control
2	—	(Not used)
3	—	(Not used)
4	15	Exterior Lamps; Instrument Illumination
5	15	Turn Lamps; Backup Lamps; Rear Window Defrost
6	15	Speed Control; Electronic Shift-4 Wheel Drive
7	—	(Not Used)
8	15	Courtesy, Dome, Cargo Lamps; Warning Buzzer
9	30	Heater; A/C-Heater
10	5	Instrument Illumination; Clock Dimming
11	15	Radio; Main Light Switch; Clock Illumination
12	25	Tailgate Power Window; Power Mirrors
13	30 c.b.	Power Door Locks; Electronic Shift-4 Wheel Drive
14	—	(Not used)
15	25	Tailgate Power Window
16	30 c.b.	Power Windows
17	10	Auxiliary Fuel Tank Selector
18	30	Horn; Cigar Lighter; Speed Control; 4.9L EFI After Run Blower
19	20	Anti-lock Brakes
20	15	Seatbelt Buzzer; Warning Indicators; Diesel Glow Plug Control; Diesel Indicators; Tachometer

Fuse Value Amps	Color Code
4	Pink
5	Tan
10	Red

Power Distribution

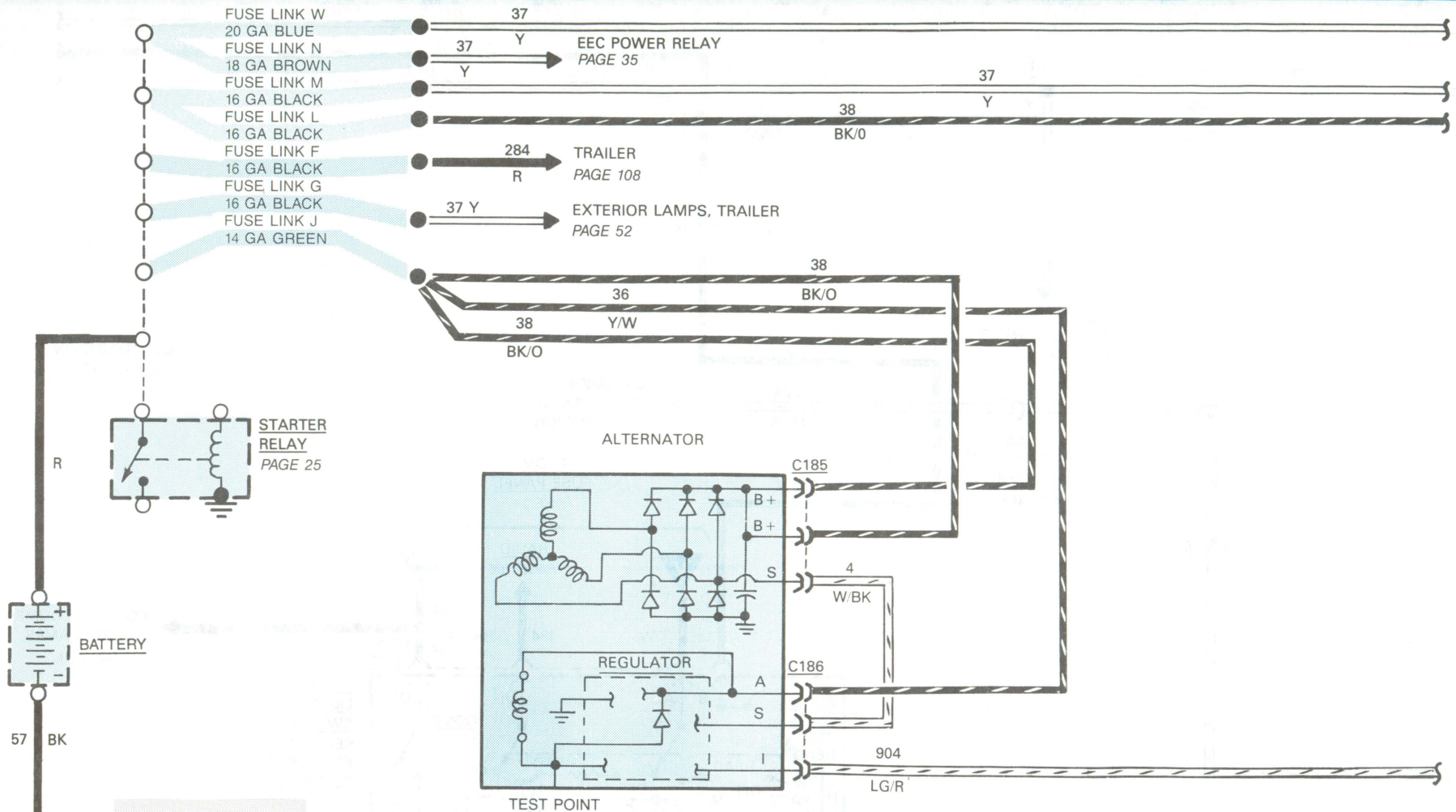
The Alternator and Battery are connected together at the Starter Relay hot terminal. Other circuits originate at the Starter Relay hot terminal and are protected by fuse links. Low power circuits are also protected by fuses.

The Ignition Switch and Main Light Switch are powered at all times as are Fuses 1, 4, 8, 12, and 16. The other fuses are powered through the Ignition Switch or the Main Light Switch.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



NOTE (FUSE LINE J)
14 GA WITH 70 AMP
ALTERNATOR 16 GA
WITH 60 AMP
ALTERNATOR.

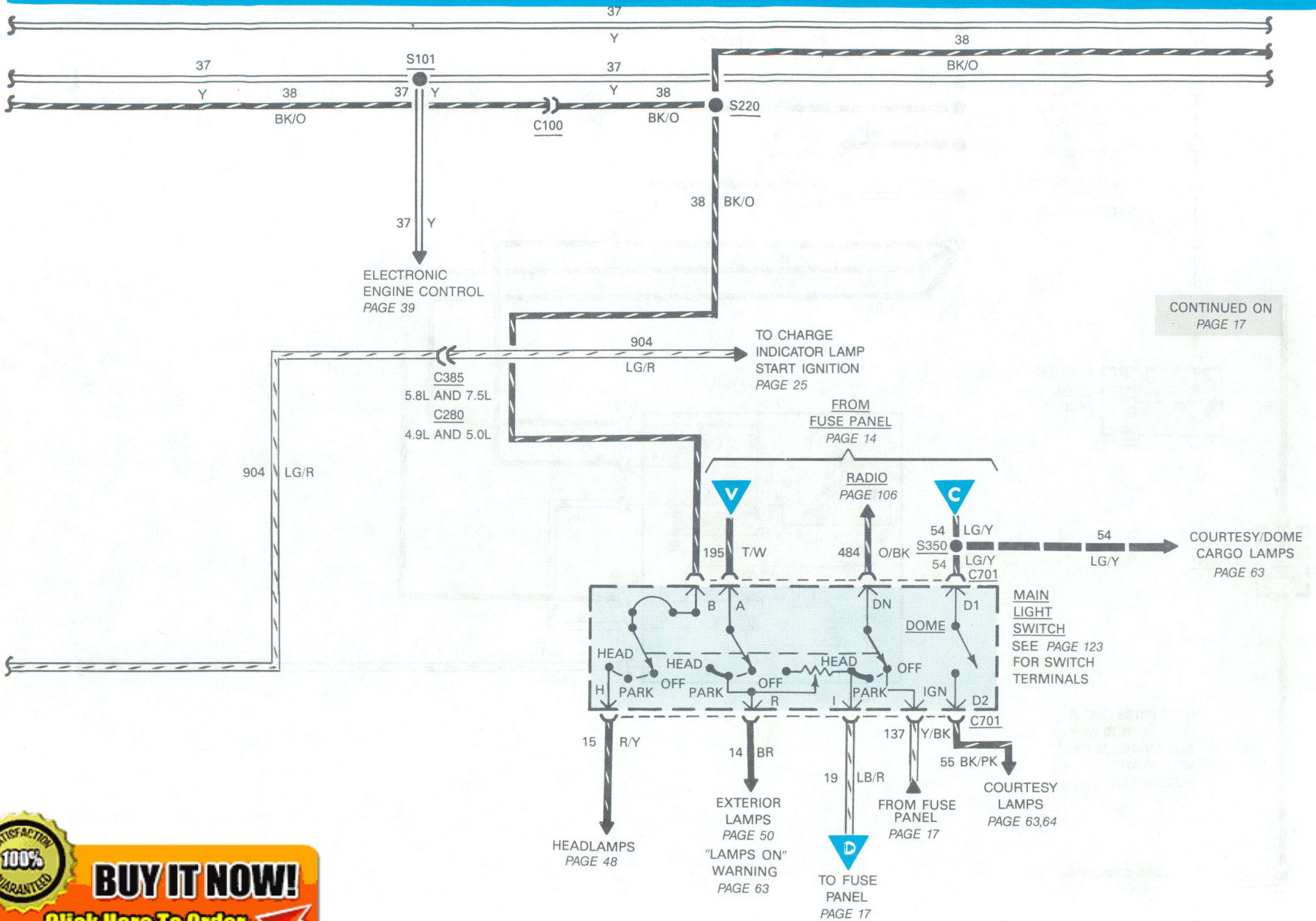


BUY IT NOW!

[Click Here To Order](#)



16 CHARGE/POWER DISTRIBUTION (GASOLINE)



CONTINUED ON
PAGE 17

SATISFACTION 100% GUARANTEED

BUY IT NOW!

Click Here To Order

HOW THE CIRCUIT WORKS

The **Battery**, **Alternator** and **Voltage Regulator** make up the **Charging System**. With the **Ignition Switch** in RUN, **Battery** voltage is applied through the solid-state electronic control of the **Voltage Regulator**. The electronic control applies **Battery** voltage to the **Alternator** field.

With current in the field and the rotor turning, the **Alternator** stator produces a DC voltage at B+ terminals (to **Battery**). If the **Alternator** output voltage is greater than the **Battery** terminal voltage, current will flow from the **Alternator** to the **Battery**, as well as to the vehicle electrical load.

If the **Alternator** voltage is less than the **Battery** terminal voltage, current will flow from the **Battery** to supplement the alternator output in supplying the vehicle electrical load.

Refer to section 31-01 of the shop manual.

COMPONENT LOCATION

Page-
Figure

Fuse Links F, G, J, L, M, N, W	Near starter relay
Radio Noise Capacitor ...	Attached to voltage regulator
Starter Relay	On RH fender apron

Refer to the **Location Index** in the back of the manual for connector, ground, and splice descriptions and locations.

TROUBLESHOOTING HINTS

CONDITION	POSSIBLE CAUSE	ACTION
<ul style="list-style-type: none"> Improper Charging 	<ul style="list-style-type: none"> Loose/worn alternator belt Defective/dead battery Fuse Link J open at starter relay Poor connection between battery terminals and cable clamps/damaged cables 	<ul style="list-style-type: none"> Tighten/replace Replace battery Visually check for open in link, replace Clean, tighten and/or replace
<ul style="list-style-type: none"> Alternator Warning Indicator remains on after initial start up 	<ul style="list-style-type: none"> Poor connection on Alternator, Regulator, Starter Relay, and/or Alternator Output Control Relay 	<ul style="list-style-type: none"> Make sure connections are tight and free of debris and refer to shop manual section 31-01, Charging System Diagnosis



BUY IT NOW!

Click Here To Order



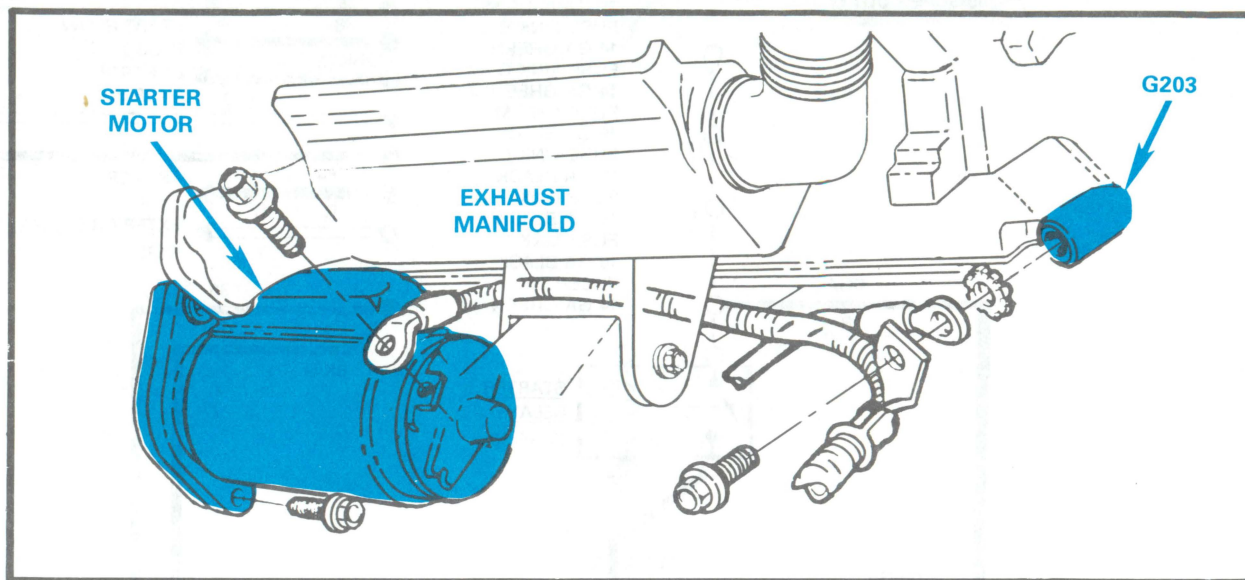


Figure 1 — Lower RH Side of Engine (5.0L, 5.8L, 7.5L, 8 Cyl.)

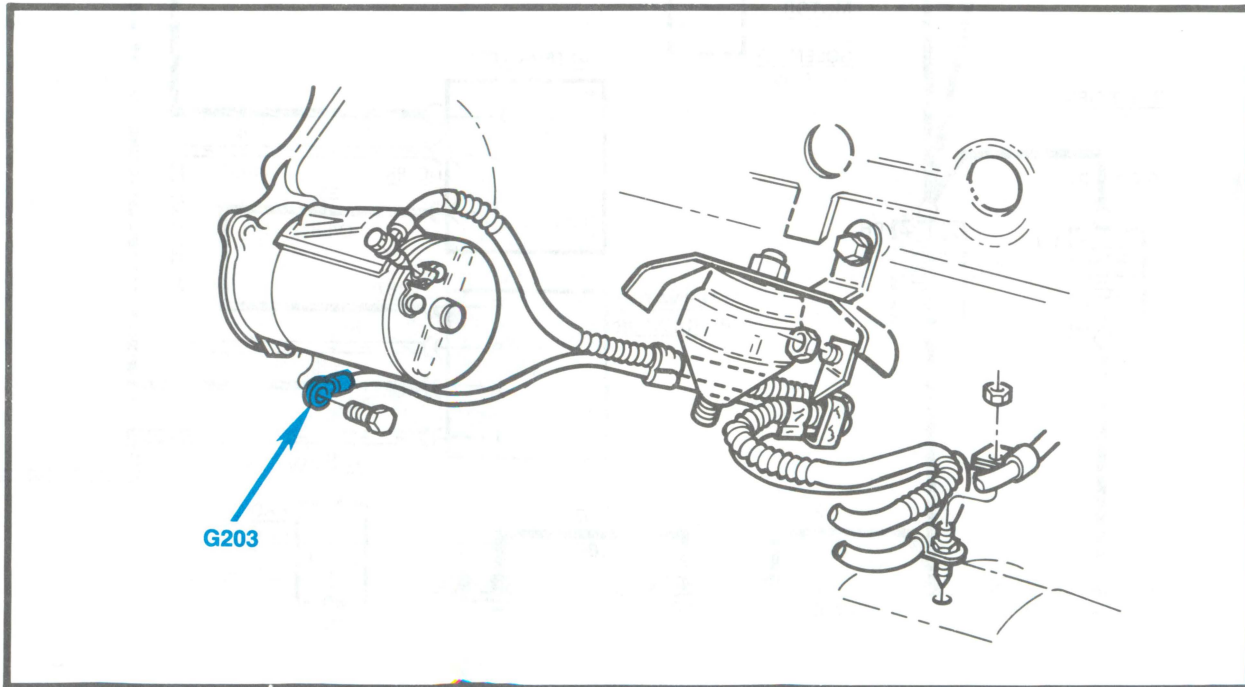


Figure 2 — Lower RH Side of Engine (4.9L 6 Cyl. ONLY)

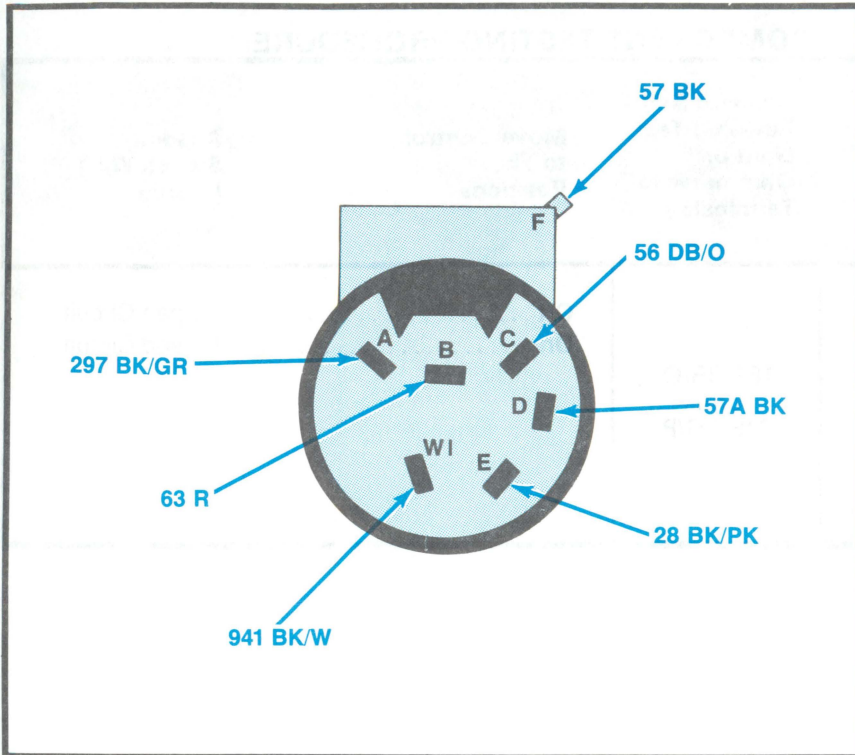
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Cards DISCOVER NOVUS MasterCard VISA

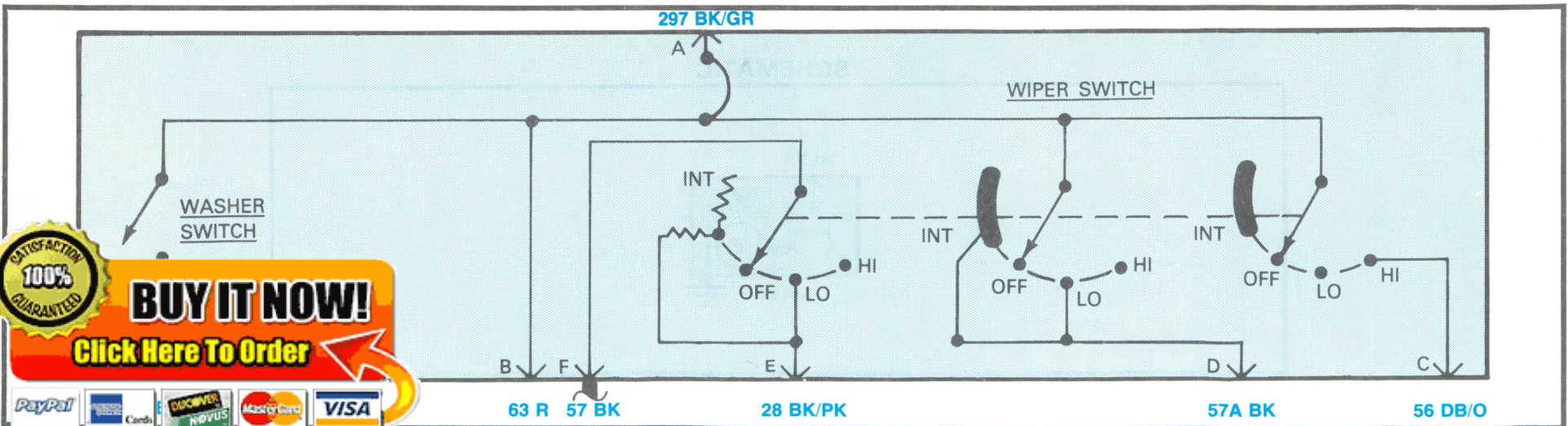
TERMINAL LOCATIONS ON SWITCH



COMPONENT TESTING PROCEDURE

TO TEST	Connect Self-Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Wiper Switch Circuit	57 BK (F) and 57A BK (D)	Off All other positions	Open Circuit Closed Circuit
	63 R (B) and 56 DB/O (C)	Hi All other positions	Closed Circuit Open Circuit
	28 BK/PK (E) and 57 BK (F)	Off Rotate Control Clockwise Into Position (as Viewed from Connector Side). All other positions	Open Circuit Ohmmeter will indicate smoothly increasing resistance from 200-1000 ohms minimum to 5600-8400 ohms maximum Closed Circuit

SCHMATIC

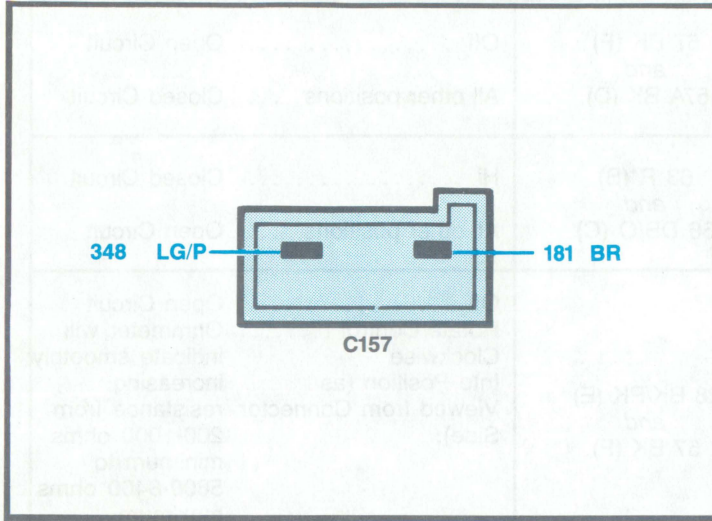


BUY IT NOW!

[Click Here To Order](#)



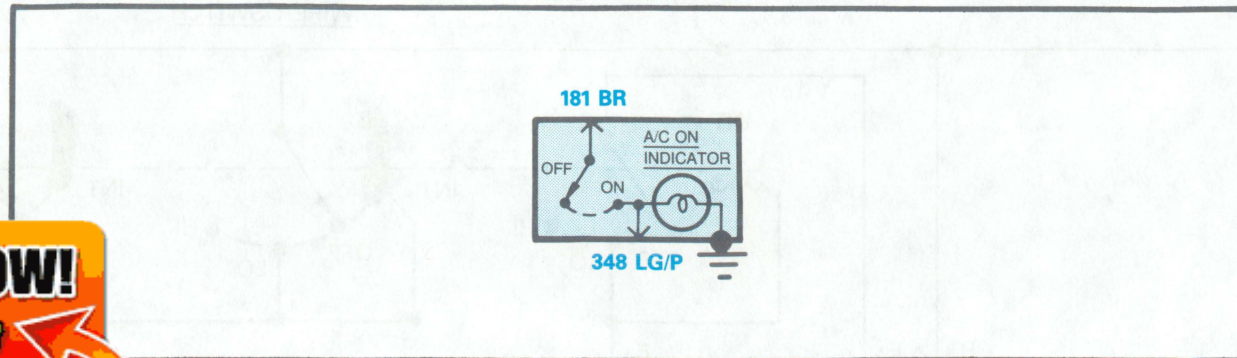
TERMINAL LOCATIONS ON SWITCH



COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Control to These Positions	A Good Switch Will Indicate
A/C Clutch Circuit	181 BR/O and 348 LG/P	Off On	Open Circuit Closed Circuit

SCHEMATIC

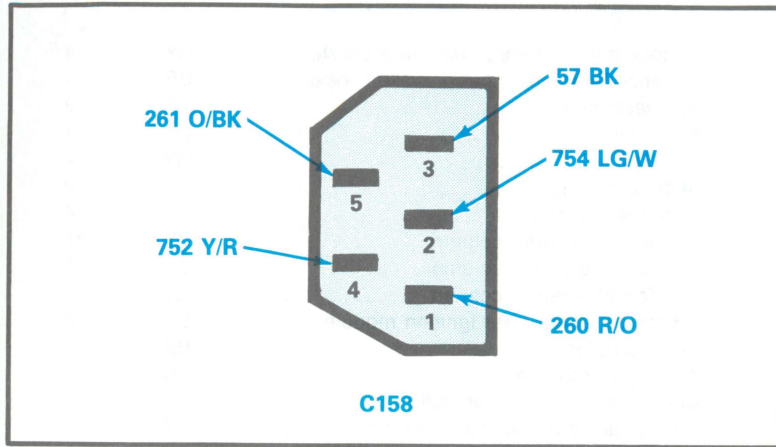


BUY IT NOW!

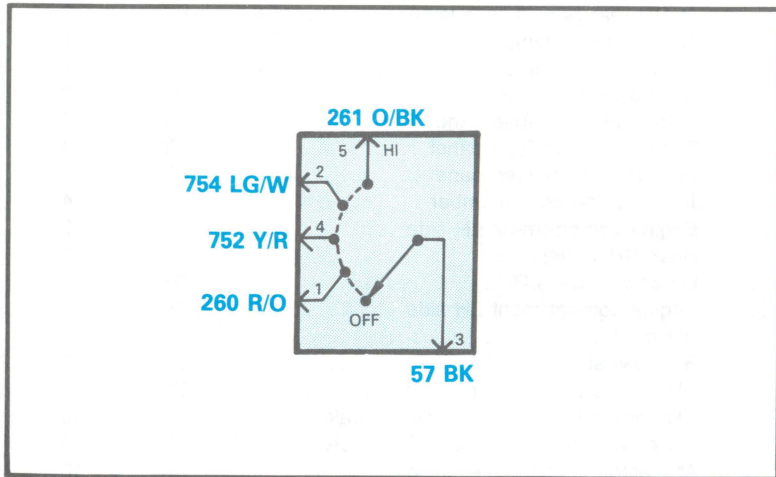
Click Here To Order



TERMINAL LOCATIONS ON SWITCH



SCHEMATIC



COMPONENT TESTING PROCEDURE

TO TEST	Connect Self-Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Medium-Lo Speed	57 BK (3) and 752 Y/R (4)	Lo Medium-1 Medium-2 Hi	Open Circuit Closed Circuit Open Circuit Open Circuit
Low Speed	57 BK (3) and 260 R/O (1)	Lo Medium-1 Medium-2 Hi	Closed Circuit Open Circuit Open Circuit Open Circuit
Medium-High Speed (M2)	57 BK (3) and 754 LG/W (2)	Lo Medium-1 Medium-2 Hi	Open Circuit Open Circuit Closed Circuit Open Circuit
Hi Speed	57 BK (3) and 261 O/BK (5)	Lo Medium-1 Medium-2 Hi	Open Circuit Open Circuit Open Circuit Closed Circuit
Off	57 BK (3) and all others	Lo Medium-1 Medium-2 Hi	Open Circuit Open Circuit Open Circuit Open Circuit

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

130 LOCATION INDEX

CONNECTOR LOCATION

		Page- Figure	Color	Terminals
C100	Through dash at LH side			53
C103	Near HEGO sensor			4
C104	At battery ground pigtail			4
C107	At license lamps	54-2	BR	1
C111	Behind I/P LH end (test)		BK	1
C117	At LH front side body marker lamp	55-8	BR	2
C122	RH side of rear cross support	54-3	BK	4
C123	LH side of frame at rear crossmember	102-5	BK	4
C126	LH side of rear crossmember	54-2		2
C129	At RH fender apron (diesel only)	33-1	GY	8
C151	Engine compartment		BK	2
C157	At A/C clutch switch		W	2
C158	At blower switch		GY	5
C168	Engine compartment test		GY	6
C170	Near ignition module	121-1	BK	2
C171	Engine compartment test			1
C174	At proportioning valve, LH frame rail		BK	4
C175	LH fender apron		BK	10
C176	LH fender apron		BK	8
C177	Engine compartment LH side		GY	12
C178	On rear of engine		BK	8
C182	Engine compartment LH		GY	6
C183	Engine compartment LH		BR	2
C185	At alternator	29-3		3
C186	At alternator	29-3		3
C187	At alternator regulator	34-3	W	4
C188	At alternator	34-3		2
C190	At clutch lockout switch	34-1	GY	2
C197	LH side of rear cross support		GY	5
C202	Lower hole of LH quarter panel	66-2,3,4	GY	3
C202A	Lower hole of LH quarter panel	66-2,3,4	GY	3
C203	Lower hole of LH quarter panel	66-2,3,4	GY	3
C208A	At instrument cluster			14
C208B	At instrument cluster			14
C233	Near alternator		GY	1
C240	At ignition key, seat belt warning buzzer			7
C244	Behind center of I/P		BK	8
C247	Engine compartment RH side			4
	Engine compartment near starter relay		GY/BK	4
	Near RH battery		BK	1
				3
				3
				8
				5
				4
			BK	2

CONNECTOR LOCATION

		Page- Figure	Color	Terminals
C285	LH fender apron near power brake booster		GY	4
C285A	LH fender apron near power brake booster		BR	4
C285B	At speed sensor		BK	2
C289	RH cowl		BK	4
C290	RH cowl		GY	4
C292	At blower motor			2
C293	At blower resistor		W	4
C305	LH side of steering column		GY	11
C305A	LH side of steering column		GY	11
C305B	LH side of steering column		GY	11
C321	LH fender apron near ignition module		BK	3
C322	At distributor		BK	3
C323	At ignition module		BK	4
C333	Behind center of I/P at radio			8
C343	LH fender apron near ignition module		BK	8
C344	LH fender apron near ignition module		BK	8
C353	Rear LH side of frame at rear crossmember	54-4	Y	1
C354	At LH rear park & turn lamp	54-4	BK	2
C355	At RH rear park & turn lamp	54-4	BK	2
C356	At RH backup lamp	54-4	Y	1
C357	At LH backup lamp	54-4	Y	1
C358	Behind center of I/P		GY	2
C366	Behind I/P near fuse panel		GY	3
C366A	Behind I/P near fuse panel		GY	3
C366B	Behind I/P near fuse panel		GY	3
C370	Transmission crossmember		GY	4
C380	Engine compartment LH side			2
C386	Near RH battery			1
C406	LH cowl under I/P		GY	4
C420	Engine compartment LH side		BK	4
C425	RH cowl		BK	6
C426	RH cowl side		GY	2
C427	RH cowl side — electric shift module		GY	8
C428	RH cowl side — electric shift module		W	10
C429	RH cowl side — electric shift module		BR	5
C430	At electric shift transfer case		BK	10
C431	At electronic shift switch			6
C450	LH side rear support cross		BK	2
C522	Behind center of I/P at radio			8
C523	Lower LH cowl access hole		BR	2
C524	Lower RH cowl access hole	107-1	BR	2
C550	At windshield wiper/washer switch	95-1	BK	10
C650	At RH door lock motor		BK	2
C701	At main light switch		BK	8
C714	At speed control amplifier		GR	8



BUY IT NOW!

Click Here To Order



CONNECTOR LOCATION

		Page- Figure	Color	Terminals
C717	At speed control amplifier		GY	6
C752	LH side of hood at engine compartment lamp		GY	1
C753	At speed control servo		BR	6
C755	At clutch switch		GR	2
C789	LH side of driver's seat on floor pan	72-1	GY	2
C850	Lower LH cowl access hole		GY	4
C906	At LH cowl access hole	54-7	BR	1
C913	At center of rear body markers	54-5	GY	2
C915	Engine compartment LH side		BK	2
C916	At LH side of rear crossmember	54-2	BK	2
C918	Near LH side of rear crossmember	54-2	GY	2
C950	At rear of LH rear fender	55-8	BR	2
C951	Near RH side of rear crossmember	54-6	BR	2
C952	At front of RH rear fender		BR	2
C953	At rear of RH rear fender	55-8	BR	2
C954	In forward part of cab roof	53-1	BK	2
C955	In forward part of cab roof	53-1	BK	2
C956	In forward part of cab roof	53-1	BK	2
C957	At front of cab roof	53-1	BK	2
C958	At front of cab roof	53-1	BK	2
C1002	At rear crossmember	60-1		3
C1101	Behind I/P LH end		BK	3
C1102	Behind I/P LH end		BR	6
C1105	LH side of frame at rear crossmember	55-9	BK	2
C1110	LH rear engine compartment	55-9	BR	6
C1111	LH rear of frame		BR	3
C1114	LH rear of frame			3
C1206	At rear crossmember	60-1		3
C1907	Behind LH rear lamp	102-4	BR	3
C1951	Behind LH rear crossmember	102-5 & 60-1	BR	1
C1952	Behind LH rear lamp	102-4	BR	1
C1953	LH cowl center access hole		GY	8
C1954	RH cowl center access hole		GR	8
C1955	LH cowl area			2
C1960	On fuse panel		N	1
C1962	At fuse panel		BL	1
C1963	LH frame rail		BK	2
C1964	Engine compartment LH side		BK	4

SPLICE LOCATION

S110	Near fuel pump relay T/O
S140	Between S142 and S143
S142	Near T/O to no. 4 fuel injector
S143	Near T/O to no. 8 fuel injector
S150	In ignition coil lead
S151	Near license lamp T/O
S152	Near LH backup lamp T/O
S153	Near license lamp T/O
S154	Near front fuel gage sender T/O
S155	Near ERBP Valve T/O
S156	Near fuel line heater T/O
S157	Near LH headlamp T/O
S158	Near LH glow plugs T/O
S159	Near RH glow plugs T/O
S160	Near ignition coil T/O
S161	Near clutch interlock switch T/O
S162	Near heater control switch T/O
S163	Near heater control switch T/O
S165	In T/O to throttle air by pass solenoid
S167	In T/O to map sensor
S168	Near T/O to EEC diode
S170	Near battery
S172	Near T/O to EEC diode
S173	Near throttle position sensor T/O
S174	Near T/O to EEC power relay
S175	Near cooling fan relay T/O
S176	Near fuel tank selector valve T/O
S177	Near fuel tank selector valve T/O
S185	Near radio T/O
S190	Near backup lamp T/O
S200	Near clutch switch T/O
S208	Near main light switch T/O
S216	Near steering column connector T/O
S220	Near LH courtesy lamp T/O
S221	Near ignition switch T/O
S270	Between T/O's to EEC power relay
S271	Near T/O to C178 (LH side)
S272	Near main light switch T/O
S276	Near T/O to C178 (LH side)
S277	Near T/O to C178 (RH side)
S303	Near main light switch T/O
S305	In ignition coil lead
S350	Near main light switch T/O
S352	Near vehicle speed sensor T/O
S353	Near vehicle speed sensor T/O
S360	Near LH horn T/O



BUY IT NOW!

[Click Here To Order](#)



S selector switch T/O
S w switch T/O
S rear engine compartment LH side switch T/O

132 LOCATION INDEX

SPLICE LOCATION

		Page- Figure
S404	Near clutch switch T/O	
S410	Behind I/P in cooling fan harness	
S450	Near license lamp T/O	
S451	Near license lamp T/O	
S452	Near rear turn/stop lamp T/O	
S501	Near RH courtesy lamp T/O	
S503	Near instrument cluster T/O	
S504	Near instrument cluster T/O	
S507	Near warning buzzer T/O	
S508	Near warning buzzer T/O	
S509	Near anti-lock brake module T/O	
S510	Near anti-lock brake module T/O	
S511	Near anti-lock brake module T/O	
S512	Near fuel tank selector T/O	
S513	Near fuse panel T/O	
S515	Near driver's tailgate window switch T/O	
S517	Near LH courtesy lamp T/O	
S520	Near warning buzzer T/O	
S522	Near trailer lamp relay T/O	
S523	Behind I/P near marker lamp relay T/O	
S530	Near clutch interlock switch T/O	
S536	Near windshield wiper motor T/O	
S538	Engine compartment near air charge sensor T/O	
S541	Near diesel engine harness connector T/O	
S543	Near brake sensor T/O	
S545	Near LH headlamp T/O	
S547	Engine compartment near HEGO ground T/O	
S548	Engine compartment near #5 fuel injector T/O	
S549	Engine compartment near #3 fuel injector T/O	
S550	Near brake sensor T/O	
S551	Engine compartment near #3 fuel injector T/O	
S552	Engine compartment near throttle air bypass solenoid T/O	
S554	Near speed sensor T/O	
S555	Near ignition module T/O	
S556	Near ignition module T/O	
S560	Near fuel sedimenter bowl T/O	
S562	Near A/C clutch T/O	
S563	Near A/C clutch T/O	
	Engine compartment near clutch interlock switch T/O	
	Near T/O to A/C pressure cycling switch	

SPLICE LOCATION

S590	In LH door near power window switch T/O	
S591	In LH door near window control switch T/O	
S603	Near blower motor switch T/O	
S701	Near blower resistor T/O	
S801	Near headlamp switch T/O	
S805	Near cigar lighter T/O	
S806	Near T/O to windshield wiper switch	
S807	Near LH headlamp T/O	
S808	Near RH park lamp T/O	
S811	Near ignition switch T/O	
S814	Near windshield wiper illumination lamp T/O	
S815	Near G701 T/O	
S850	Near main light switch T/O	
S852	Near LH master window control switch T/O	
S853	Near LH master window control T/O	
S854	Near 4x4 indicator lamp T/O	
S856	Near RH front door lock motor T/O	
S857	Near RH front door lock motor T/O	
S858	Near LH master window control T/O	
S902	Near RH side marker lamp T/O	
S903	Near fuel gage sender and pump T/O	
S904	Near license lamp T/O	
S1004	Near ignition switch T/O	
S1103	Near RH courtesy lamp T/O	
S1108	Near rear marker lamp T/O	
S1109	Near LH front side marker lamp T/O	
S1152	Near RH front side marker lamp T/O	
S1205	Near rear license lamp T/O	
S1207	Near dome lamp T/O	
S1208	Near dome lamp T/O	
S1902	Near tailgate power window switch T/O	

GROUND LOCATION

		Page- Figure
G111	RH frame near battery	24-2
G116	Near electronic engine control	
G117	Near ignition coil	
G119	Behind I/P near center	
G155	LH rear of engine	
G156	Center of dash panel	
G203	On RH side of engine	19-1,19-2,24-2

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

GROUND LOCATION

Page-
Figure

G208	Near throttle position solenoid	
G209	Center of dash panel	
G210	At electronic voltage regulator	
G211	Near starter motor relay	
G301	Near underhood lamp	
G502	Behind LH side of I/P	95-1
G701	Behind I/P at center	
G703	At brace under steering column	
G710	LH side of dash panel	
G711	LH rear of engine	
G751	At LH side of tailgate	
G752	In LH door	98-1
G801	LH inner fender behind headlamp	
G802	At RH inner fender behind headlamp	
G803	At fuel sedimenter bowl	
G804	At lower hole of LH quarter panel	65-1,66-2,3,4
G903	At LH side of crossmember	54-2
G909	At lower LH cowl access hole	54-7
G1006	Rear LH side of frame at rear crossmember	55-9
G1201	At front LH side of engine	24-1

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



**WE SUPPORT VOLUNTARY
TECHNICIAN CERTIFICATION**



**Ford Parts and Service Division
Training and Publications Department**

100% SATISFACTION GUARANTEED

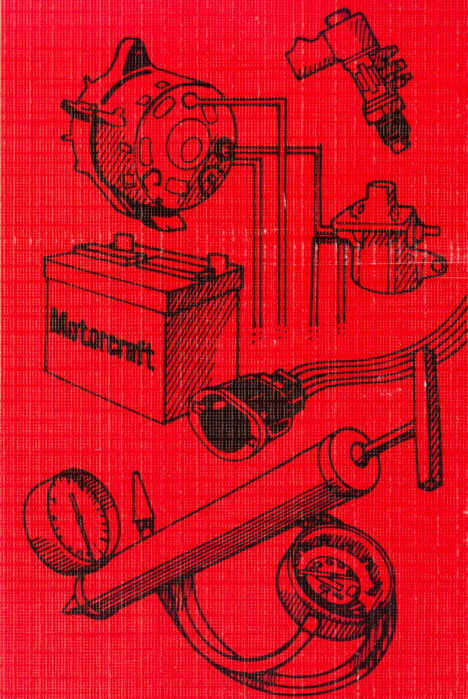
BUY IT NOW!

Click Here To Order 

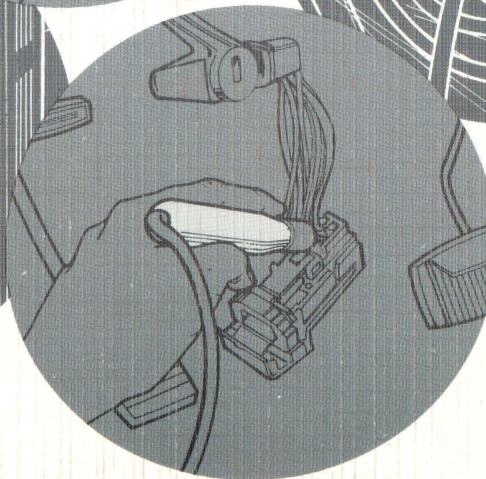
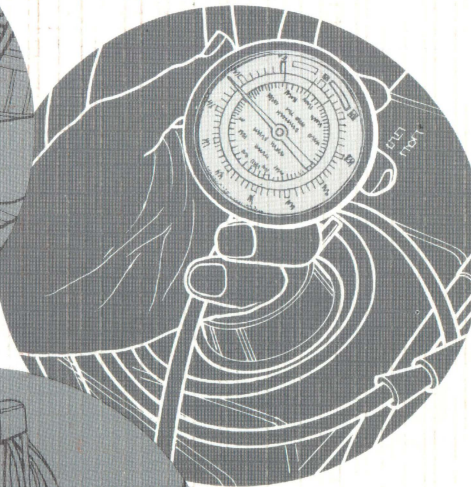
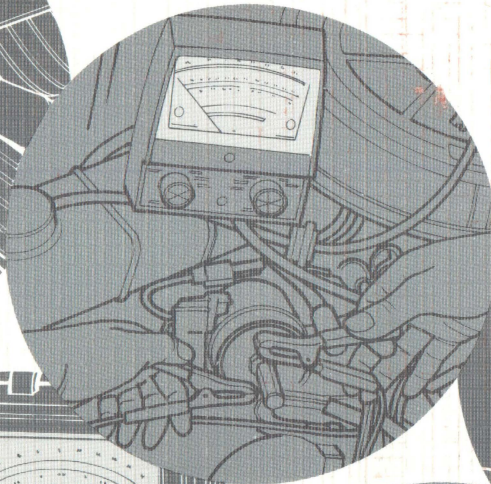
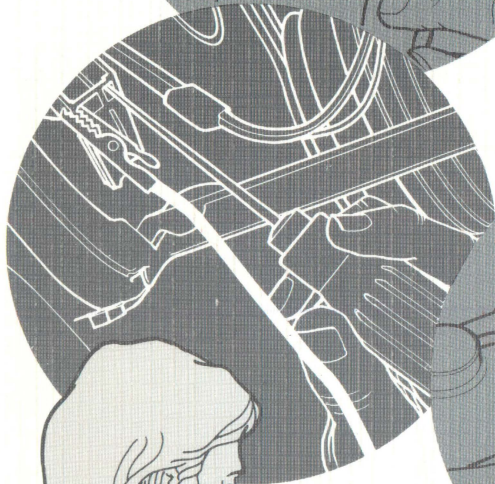
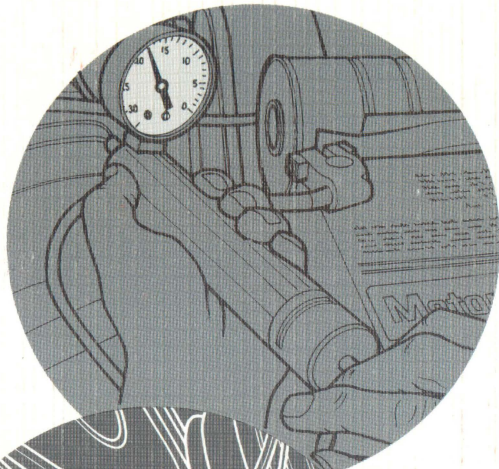
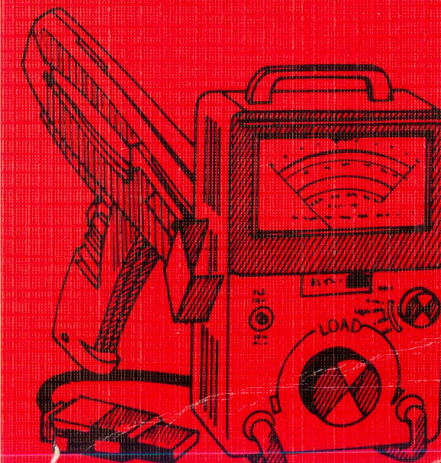
PayPal    



1989 BRONCO/ F150-F350/ F-SUPER DUTY



Electrical & Vacuum Trouble- Shooting Manual



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

Ford

**Official
Licensed
Product**

License #84356800

Copyright © 2023, Forel Publishing Company, LLC, Woodbridge, Virginia

All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, Woodbridge, VA 22192

**1989 Bronco/F150-F350/ F-Super Duty Electrical &
Vacuum Trouble-Shooting Manual (EVTM)**

EAN: 978-1-60371-412-9

ISBN: 1-60371-412-X

Forel Publishing Company, LLC
Woodbridge, VA 22192
Email: sales@ForelPublishing.com
<https://www.ForelPublishing.com>



This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

Note from the Publisher

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the professional should be sought.



ELECTRICAL AND VACUUM TROUBLESHOOTING MANUAL

FPS — 12129 - 89

ORDER INFORMATION

Information on how to order additional copies of this publication or other Ford publications, may be obtained by writing to Helm Incorporated at the address shown below. Other publications available include:

- Shop Manuals
- Service Specification Books
- Car/Truck Wiring Diagram Books
- Engine/Emissions Diagnosis Manuals

Helm Incorporated
P.O. Box 07150
Detroit, Michigan 48207



TABLE OF CONTENTS

How to Use This Manual	1
How to Find the Electrical Problem	2,3
Symbols (Electrical)	4
(Vacuum)	119
How to Find the Vacuum Problem	121
Component Testing	
Introduction	141
Main Light Switch	141
Hazard Switch	143
Ignition Switch	142
Turn Signal Switch	143
Windshield Wiper/Washer Switch	144
Interval Wiper/Washer Switch	145
A/C-Heater Function Selector	146
A/C-Heater Blower Switch	147
Location Index	148

SYSTEM INDEX

A/C-Heater	129
Anti-Lock Brakes	80
Brake Warning Indicator	74
Charge (Gasoline)	18
(Diesel)	23
Cigar Lighter	95
Coolant Temperature Gauge	88
Diesel Glow Plug Control	33
Electric Fuel Pump Control	92
Electronic Engine Control	37
Electronic Shift—4 Wheel Drive	82
E40D Transmission	44,47
Four-Wheel Drive Indicator	83
Fuel Injector Cooling Fan—(4.9L Only)	52
Fuel Tank Selector/Gauges (Diesel)	89
(Gasoline)	86
Fuse Panel (Diesel)	24
(Gasoline)	19

Gauges (Diesel)	89
(Gasoline)	86
Grounds	5
Heater	126
Horn	95
Ignition	27
Instrument Illumination	72
Lamps On Warning	68
Lamps	
Backup	66
Body Marker	58
Cargo	68
Dome	68
Exterior	56
Hazard	62
Headlamps	54
Instrument Illumination	72
License	57
Map	68
Marker	57
Park	57
Radio Illumination	72
Stop	62
Tail (Rear Park)	56
Trailer	58
Turn	62
Main Light Switch	18
Power Distribution (Diesel)	22
(Gasoline)	17
Power Door Locks	110
Power Windows	103
Radio (Stereo) (Electronic)	113
Rear Window Defrost	106
Seatbelt Warning	74
Speed Control	122
Start (Diesel)	32
(Gasoline)	27

Tachometer	88
Tailgate Power Window	106
Trailer	117
Vacuum Distribution	120
Warning Indicators (Diesel)	77
(Gasoline)	74
Windshield Wiper/Washer	98
Windshield Wiper/Washer (Interval)	100

IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the personal safety of the individual doing the work. This Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

Contents are hyperlinked to pages

This manual contains the following diagnostic information:

- Electrical and Vacuum Schematics
- Component Location Indexes and Views
- Troubleshooting Hints
- Descriptions of Circuit Operation
- Component Testing

The vehicle's entire electrical system is broken down into individual systems. There are also sections for the vehicle's ground and power distribution circuitry. Each system section begins with a wiring schematic. The **Schematics** should always be your starting point in using this manual. These schematics show the paths of electrical current during proper circuit operation. The source of voltage (circuit breaker or fuse) is shown at the top of the page. All wire, connectors, splices, switches, and motors are shown in the flow of current to ground at the bottom of the page. Connector end views of switches and other components are shown to help with bench testing. Each circuit component is named (underlined titles). Wire and connector colors are listed (standard Ford color abbreviations are used). These abbreviations are:

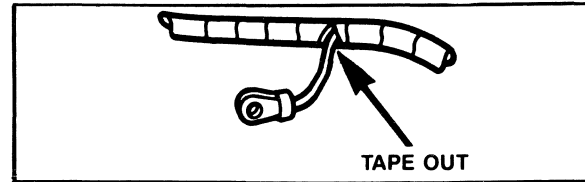
COLOR ABBREVIATIONS

BL	Blue	N	Natural
BK	Black	O	Orange
BR	Brown	PK	Pink
DB	Dark Blue	R	Red
DG	Dark Green	P	Purple
GR	Green	T	Tan
GY	Gray	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		

Illustrative figure in the manual. There is also a full listing of connector, ground, diode, and splice locations in the **Location Index** in the back of the manual.

Resistors and diodes are currently covered with pvc molds and are taped to the harness outside of the tubing. Many of the 1989 model year assemblies will be covered with heat shrinkable tubing making the assembly small enough to be placed within the harness bundle. The wiring diagrams show the number of times the resistor and diodes are used as well as the distance from connector/length of wire in exact centimeters. Resistors and diodes are identified on the wiring diagrams by the following base part numbers:

Resistor/diode assembly	14A601
Diode only	14A604



OTHER ABBREVIATIONS

T/O (Tape Out) The point at which a harness branches to feed a component.

The **Troubleshooting Hints** offer shortcuts or tests in a three-column format that help you determine the cause of an electrical problem. They are not intended to be a rigid procedure for solving an electrical situation. Rather, Troubleshooting Hints represent a common-sense approach that is based on an understanding of the circuit.

A description of **How the Circuit Works** is written to help you understand the operation of the circuit as a whole. Emphasis is placed on how the components and circuitry interact in a properly working system.

A **Component Testing** section provides procedures to determine whether a component is

good or bad.

Notes, Cautions, and Warnings appear in boxes on text pages and contain important vehicle and mechanic **safety** information.

Notes give added information to help complete a particular procedure. Cautions are included to prevent making an error that could damage the vehicle. Warnings highlight areas where carelessness can cause personal injury. The following list contains some general **Warnings** that should be followed when working on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires being under a vehicle.
- Be sure that the **Ignition Switch** is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on any vehicle. An automatic transmission should be in PARK. A manual transmission should be in NEUTRAL.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
- Keep away from moving parts when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter, and muffler.
- Do not allow flame or sparks near the battery. Gases are always present in and around the battery cell. An explosion could occur.
- Do not smoke.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing.

When two colors are shown for a wire, the first is the base color of the wire. The second is the color of each component's component of the circuit.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

Payment is given as well as a receipt to an ill-

2 HOW TO FIND THE ELECTRICAL PROBLEM

TROUBLESHOOTING STEPS

These six steps present an orderly method of troubleshooting:

Step 1. Verify the problem.

- Operate the complete system and see all symptoms for yourself in order to:
 - check the accuracy and completeness of the customer's complaint.
 - learn more that might give a clue to the nature and location of the problem.

Step 2. Narrow the problem.

- Using this manual, narrow down the possible causes and locations of the problem in order to more quickly find the exact cause.
- Read the description of *How the Circuit Works* and study the wiring diagram. You should then know enough about the circuit operation to figure out where to check for this trouble.

Step 3. Test the cause.

- Use electrical test procedures to find the specific cause of the symptoms.
- *Troubleshooting Hints* will give some helpful ideas.
- The *Component Location* charts and the pictures will help you find components, grounds, and connectors.

Step 4. Verify the cause.

- Confirm the fact that you have found the correct cause through operating the parts of the circuit you think are good.

Step 5. Make the repair.

- Repair or replace the faulty component.

6. Verify the repair.

Operate the system as in Step 1 and check for symptoms. See the

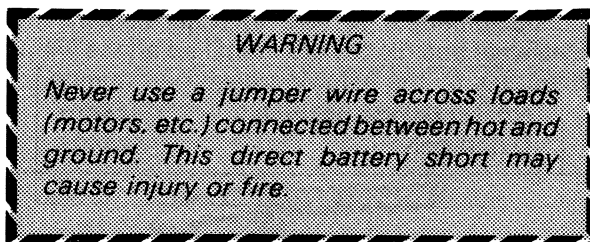
Shop Manual and other service books for details. You will find the circuits in this manual to be helpful with these special tests.

TROUBLESHOOTING TOOLS

JUMPER WIRE

This is a test lead used to connect two points of a circuit. A **Jumper Wire** can complete a circuit by bypassing an open.

Uses: Bypassing Switches or Open Circuits



VOLTMETER

A DC **Voltmeter** measures circuit voltage. Connect negative (- or black) lead to ground, and positive (+ or red) lead to voltage measuring point.

OHMMETER

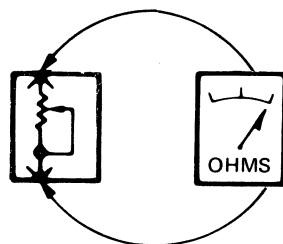


Figure 1— Resistance Check

An **Ohmmeter** shows the resistance between two connected points (Figure 1).

TEST LIGHT

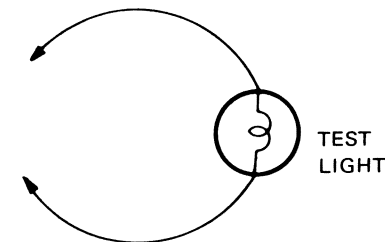


Figure 2—Test Light

A **Test Light** is a 12-volt bulb with two test leads (Figure 2).

Uses: Voltage Check. Short Check

SELF-POWERED TEST LIGHT

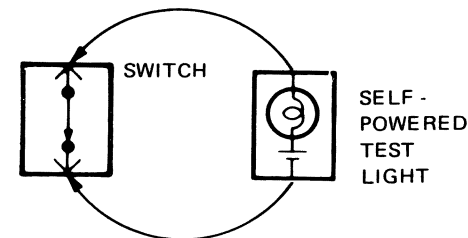
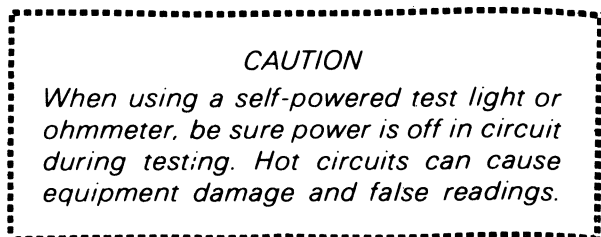


Figure 3—Continuity Check

The **Self-Powered Test Light** is a bulb, battery and set of test leads wired in series (Figure 3). When connected to two points of a continuous circuit, the bulb glows.

Uses: Continuity Check. Ground Check



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

Special test equipment and special procedures. See the

PayPal American Express Discover Novus MasterCard VISA

TROUBLESHOOTING CHECKS

SWITCH CIRCUIT CHECK

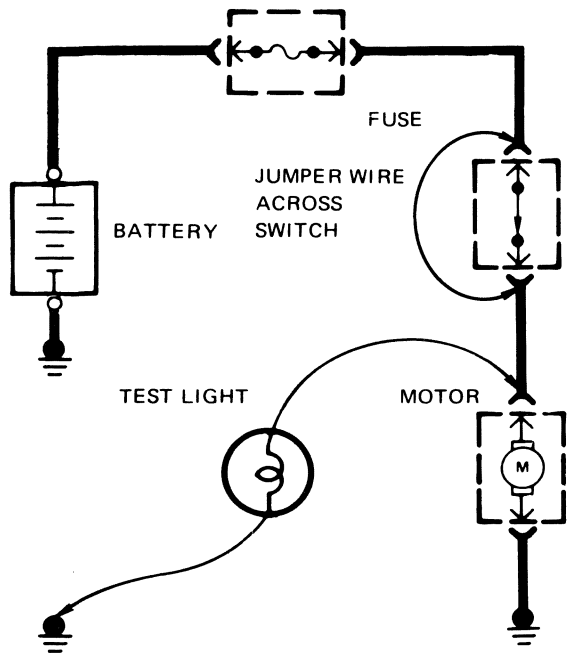


Figure 4—Switch Circuit Check and Voltage Check

In a bad circuit with a switch in series with the load, jumper the terminals of the switch to power the load. If jumping the terminals powers the circuit, the switch is bad (Figure 4).

CONTINUITY CHECK (Locating open circuits)

With power off, connect one lead of **Self-Powered Test Light** or **Ohmmeter** to each end of circuit (Figure 3). Light will glow if circuit is closed. Switches and fuses can be checked in the same way.

SHORT CHECK (short to ground)

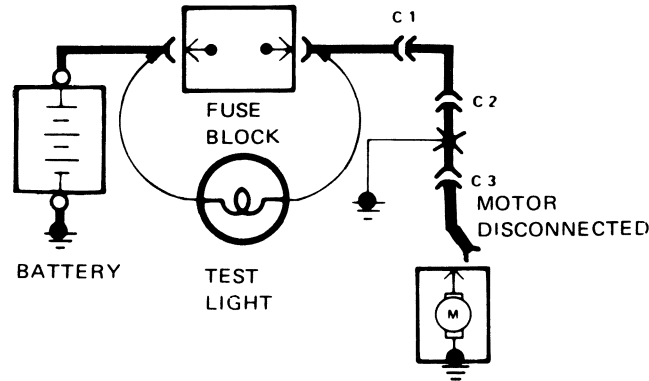


Figure 5— Short Check

A fuse that repeatedly blows is usually caused by a short to ground. It's important to be able to locate such a short quickly (Figure 5).

- 1) Turn off everything powered through the fuse.
- 2) Disconnect other loads powered through the fuse:
 - Motors: disconnect motor connector.
 - Lights: remove bulbs.
- 3) Turn **Ignition Switch** to RUN (if necessary) to power fuse.
- 4) Connect one **Test Light** lead to hot end of blown fuse. Connect other lead to ground. Bulb should glow showing power to fuse. *(This step is just a check to be sure you have power to the circuit.)*
- 5) Disconnect the **Test Light** lead from ground and reconnect it to the load side of the fuse.
 - If the **Test Light** is off, the short is in the disconnected equipment.
 - If the **Test Light** goes on, the short is in the wiring. You must find the short by disconnecting the circuit connectors one at a time until the **Test Light** goes out. For example: with a ground at X, the bulb goes out when C1 or C2 is disconnected, but stays on after disconnecting C3. This

means the ground is between C2 and C3.

"GOOD GROUND" CHECK

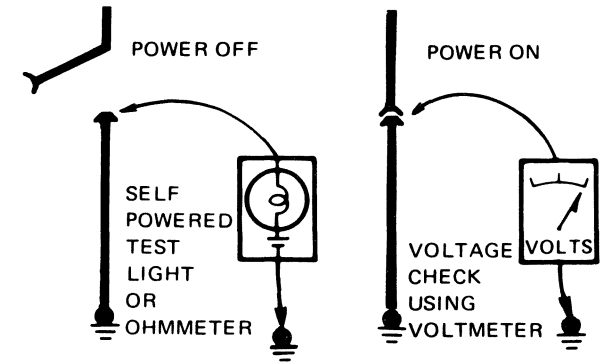


Figure 6 – Grounds Checks

Turn on power to circuit. Perform Voltage Check between suspected bad ground and frame. Any voltage means ground is bad.

Turn off power to circuit. Connect one lead of **Self-Powered Test Light** or **Ohmmeter** to wire in question, and the other to known ground. If bulb glows, circuit ground is OK (Figure 6).

TROUBLESHOOTING HINTS

The circuit schematics in this manual are designed to make it easy to identify common points in circuits. This knowledge can help narrow the problem to a specific area. For example, if several circuits fail at the same time, check for a common power or ground connection. (See *Power Distribution* or *Grounds*). If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

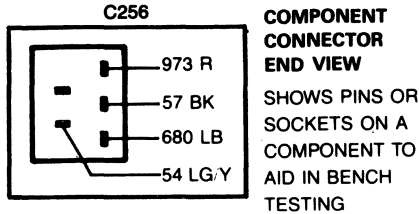
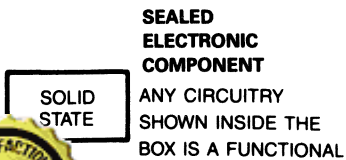
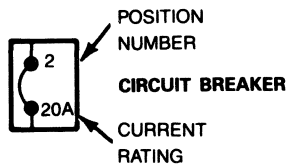
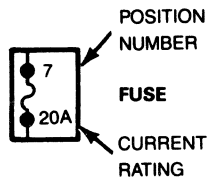
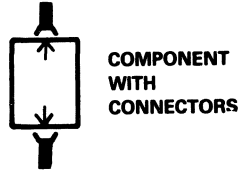
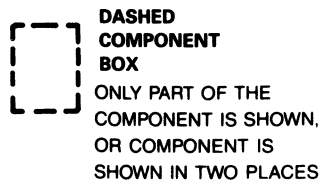
For example, if low beam headlights work but high beams and the indicator light don't work, then power and ground paths must be good. Since the dimmer switch is the component which switches this power to the high beam lights and indicator, it is most likely the cause of failure.

100% SATISFACTORY GUARANTEED

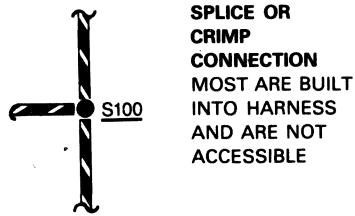
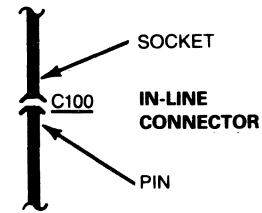
BUY IT NOW!

Click Here To Order

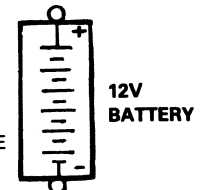
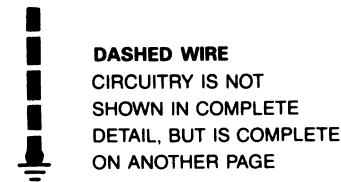
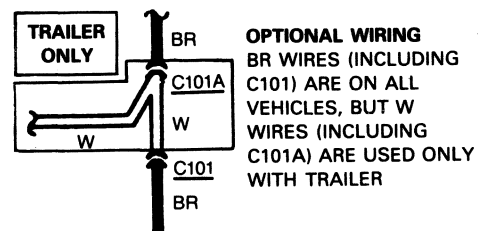
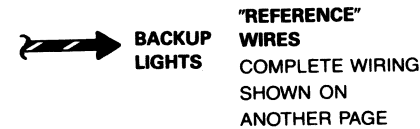
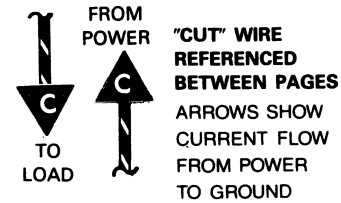
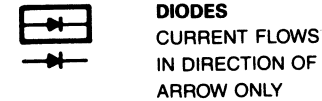
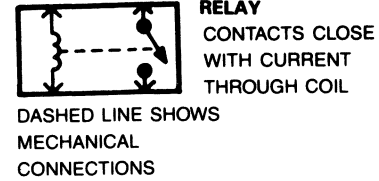
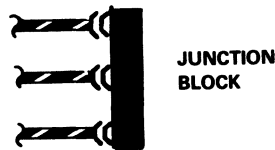
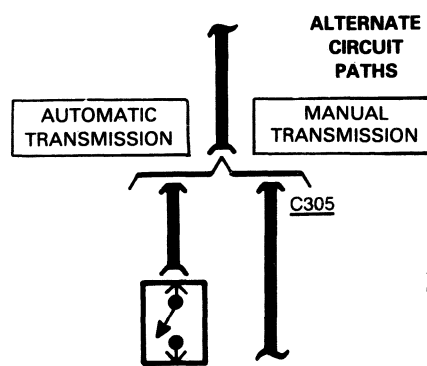
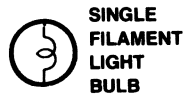
a known
) battery
the other
then the



WIRE COLORS ARE LABELED FOR MATING HARNESS CONNECTOR



20 GA BLUE ● FUSE LINK

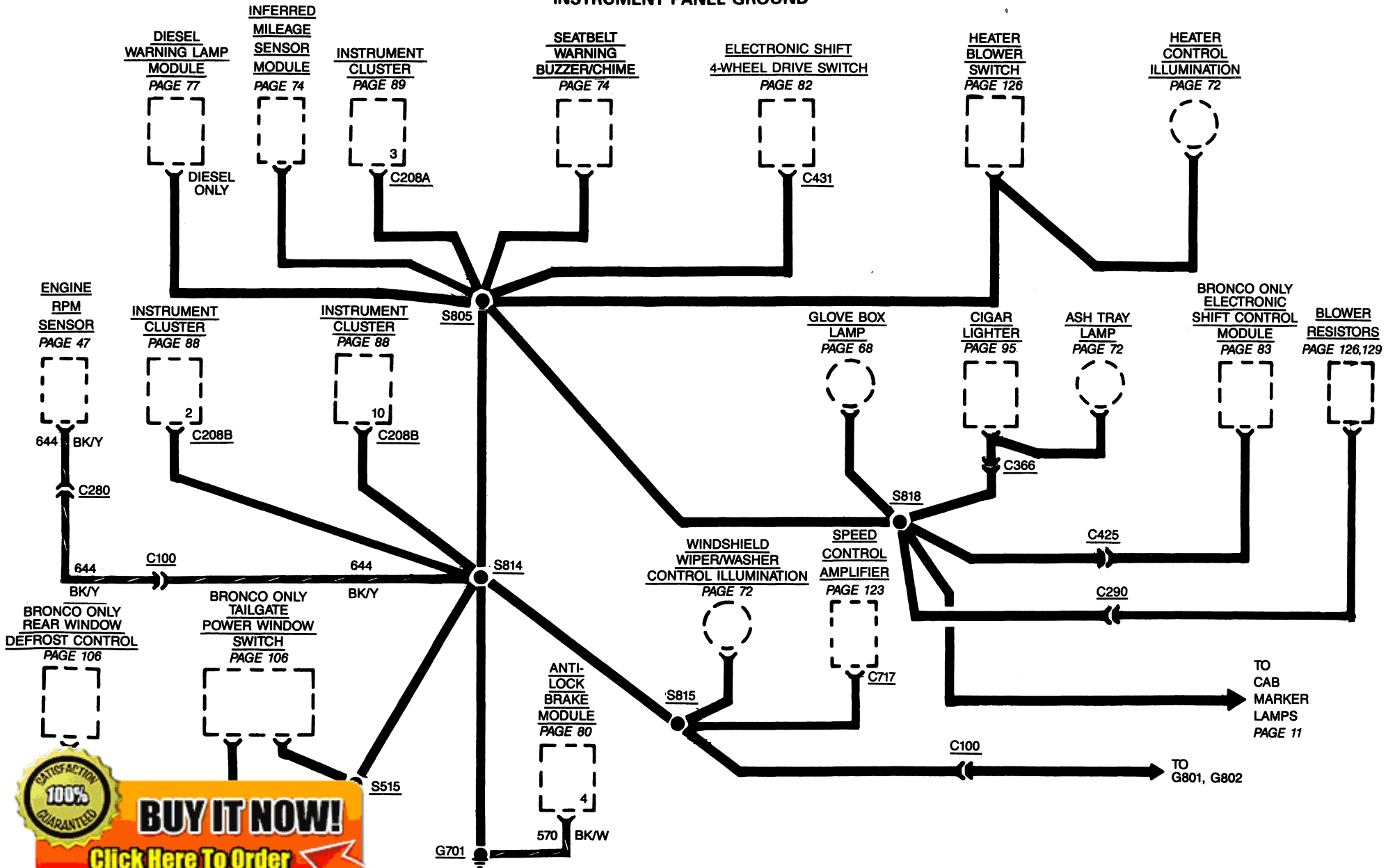


100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

INSTRUMENT PANEL GROUND



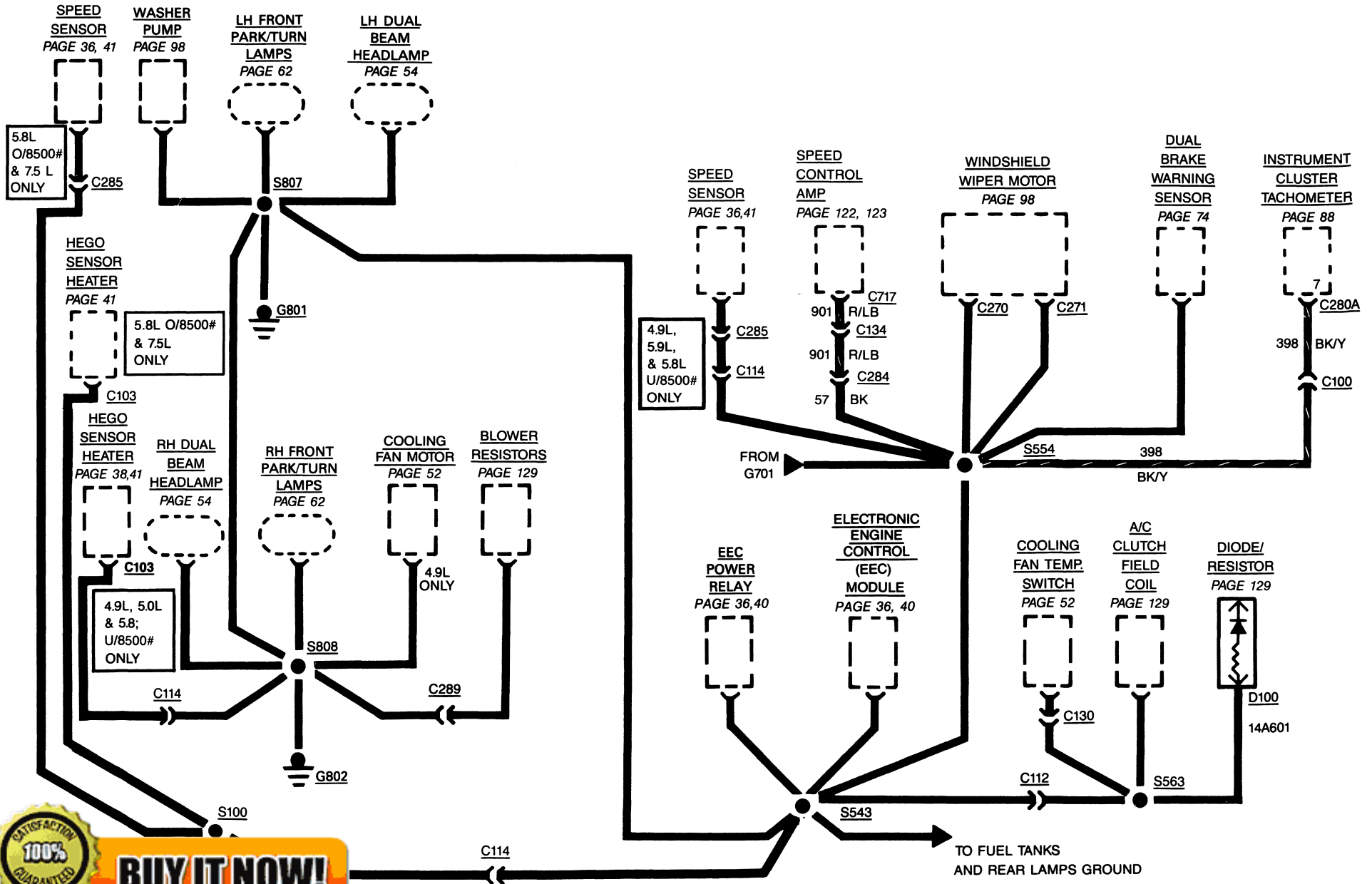
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

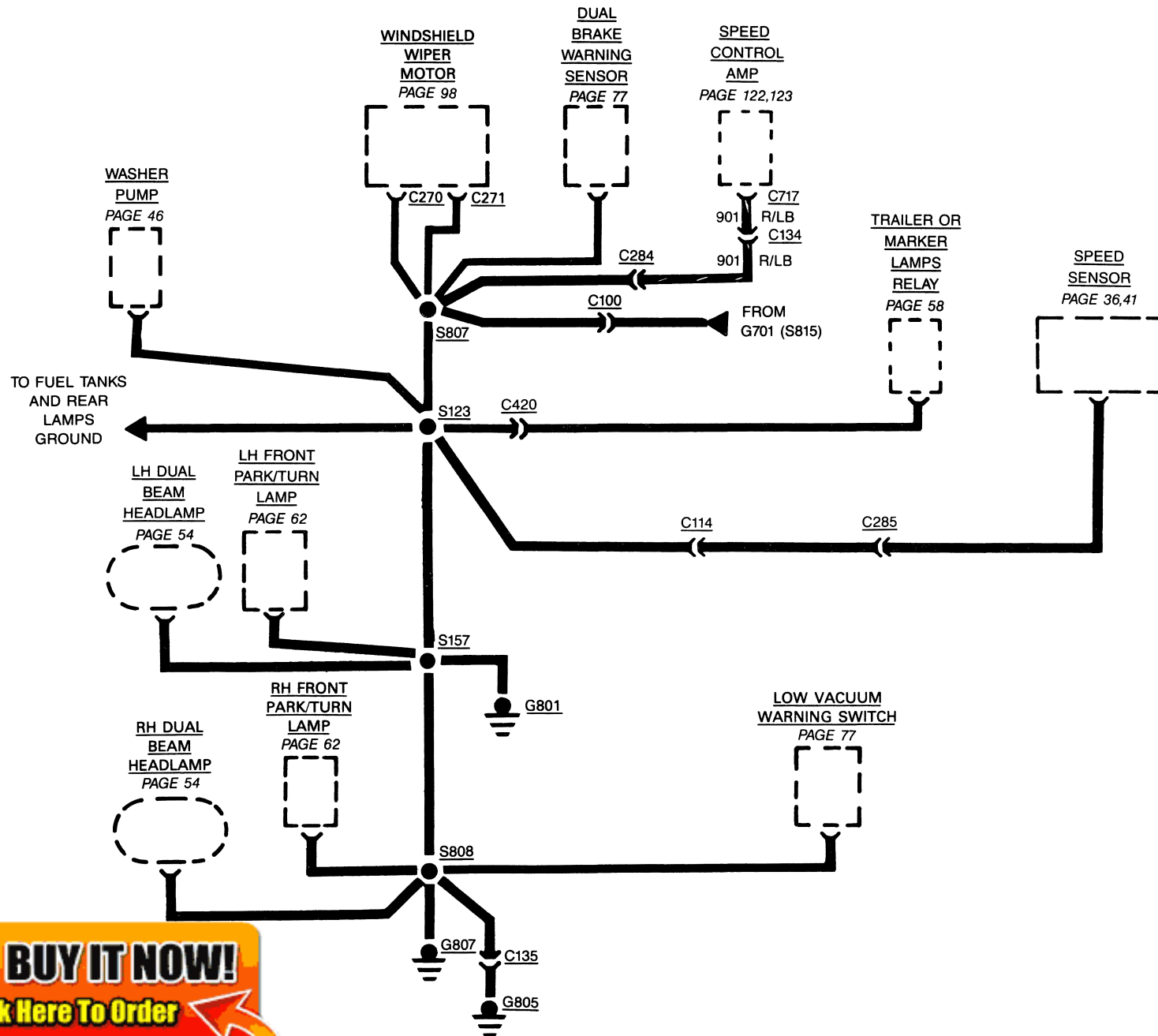
6 GROUNDS (G801, 802)



100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

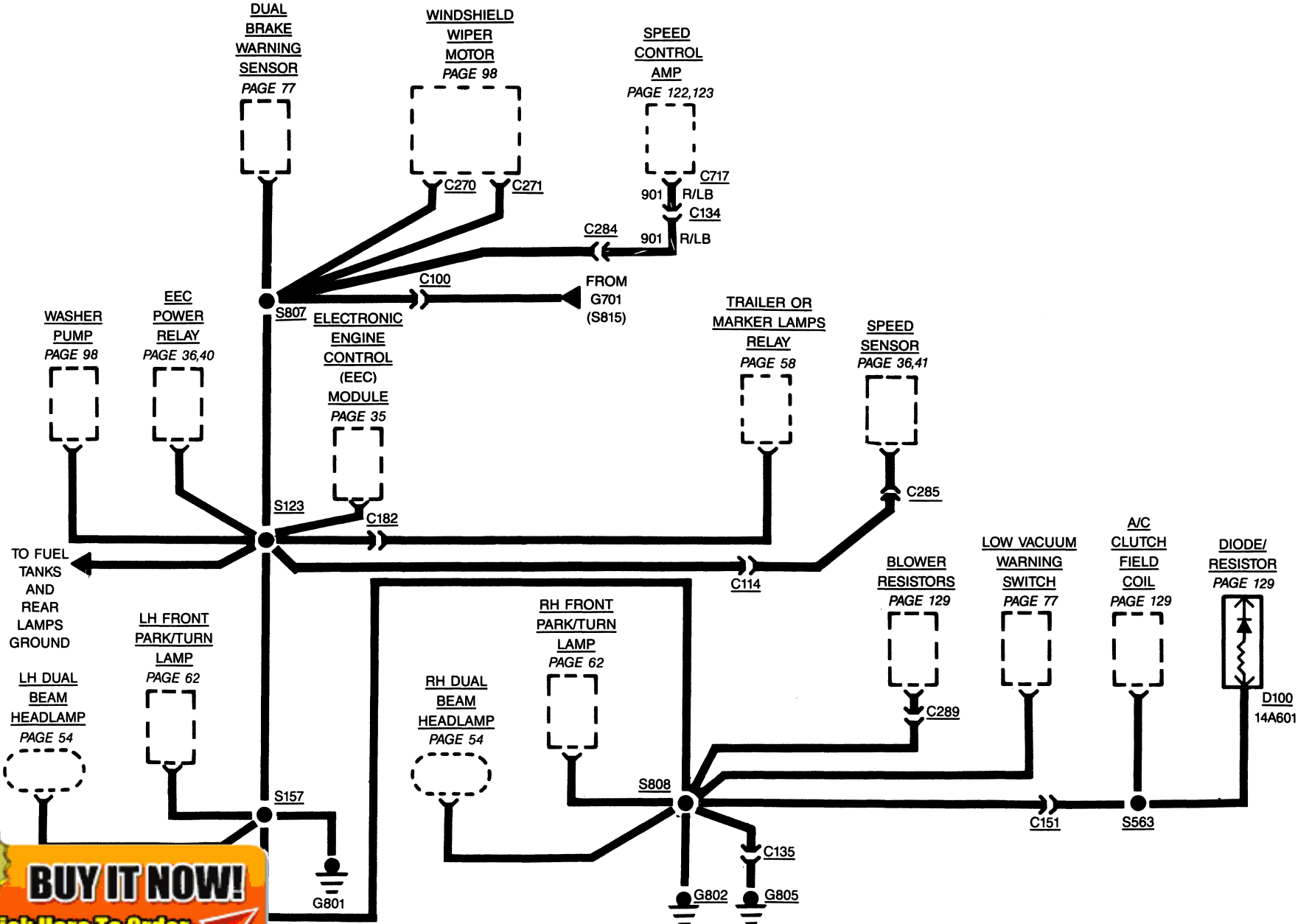


100% SATISFACTORY GUARANTEED

BUY IT NOW!

Click Here To Order

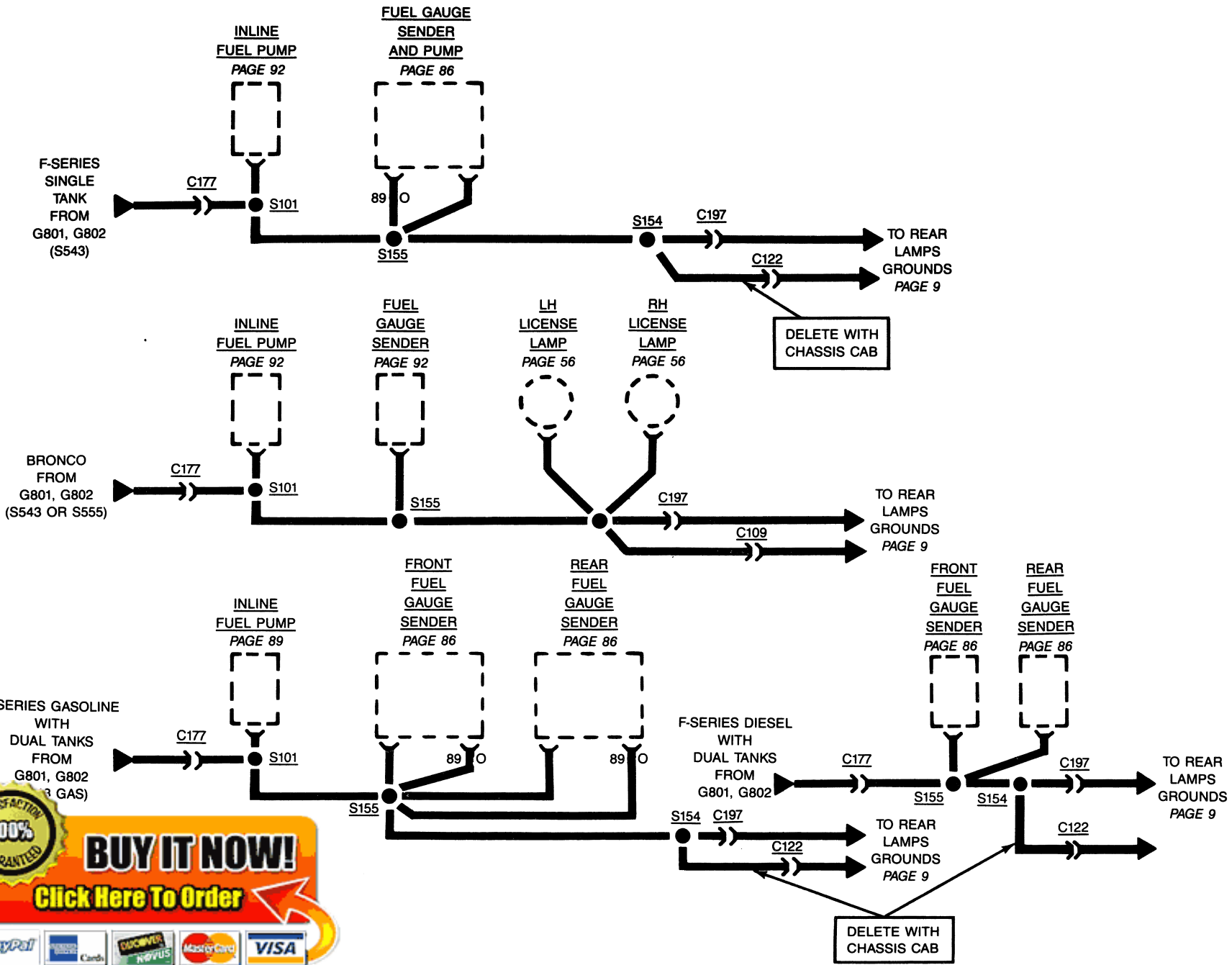
8 GROUNDS (G801, G802, G805) (7.3L DIESEL WITH E40D TRANS.)



100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

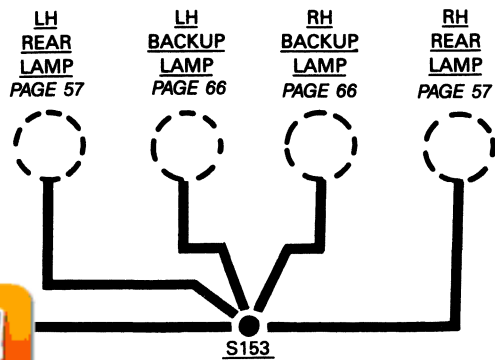
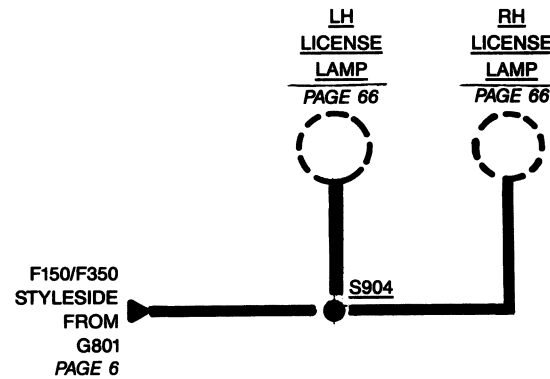
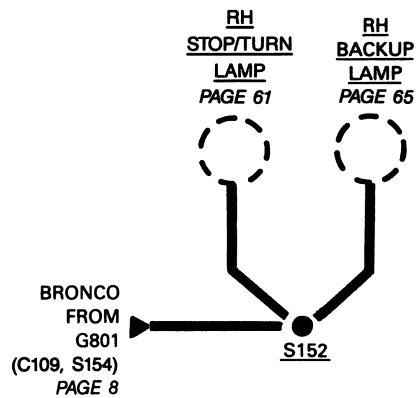
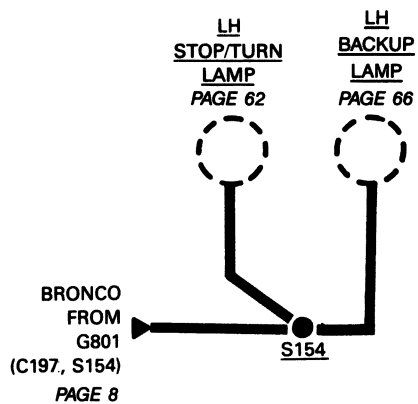


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

10 GROUNDS (REAR LAMPS)

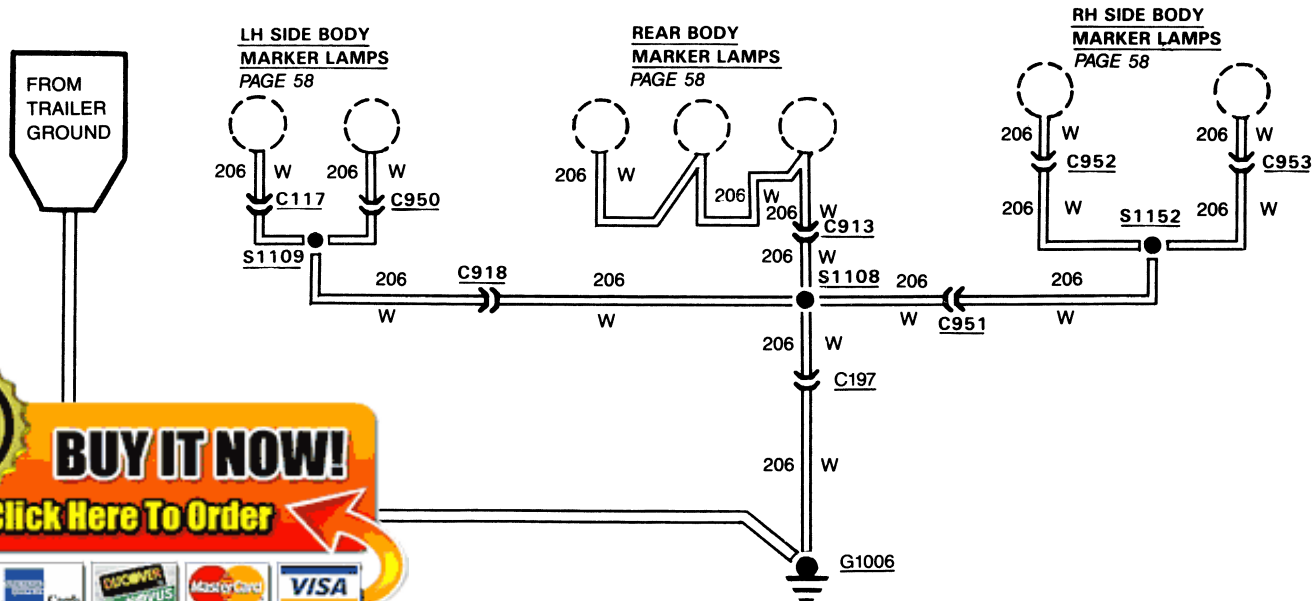
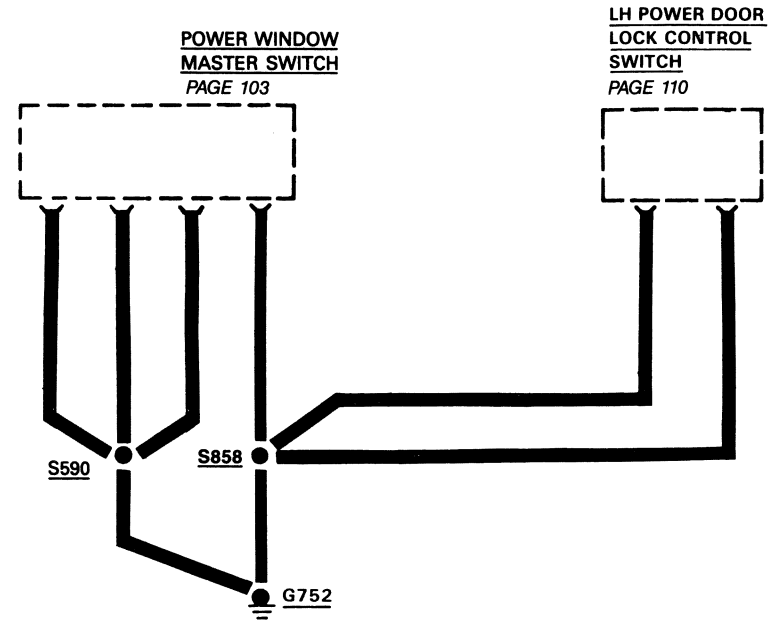
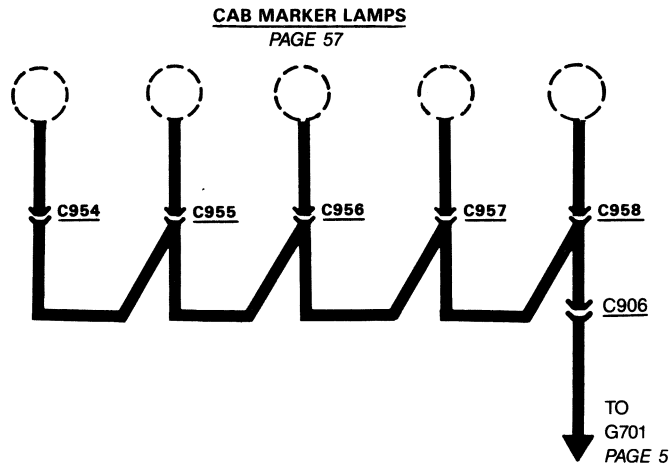


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover Novus MasterCard VISA



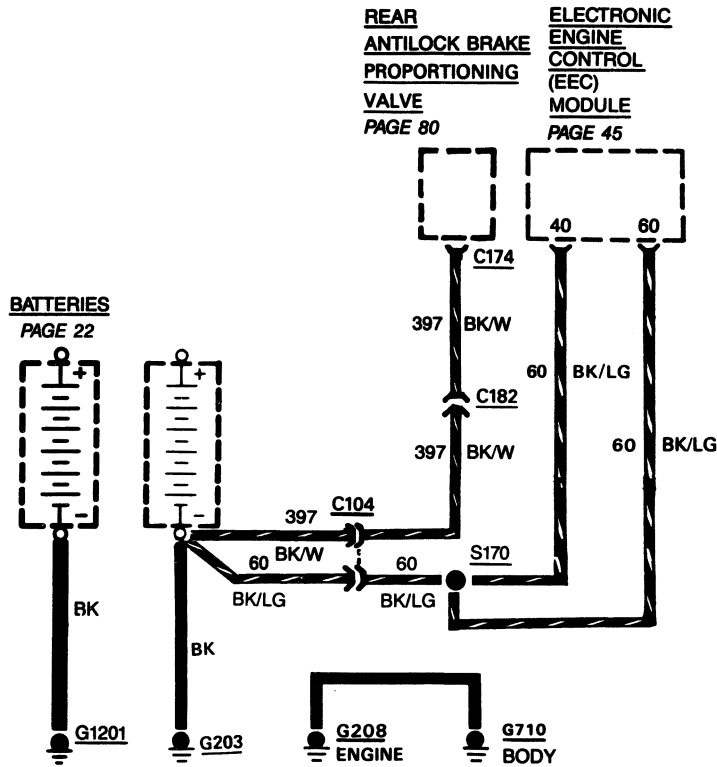
100% SATISFACTION GUARANTEED

BUY IT NOW!

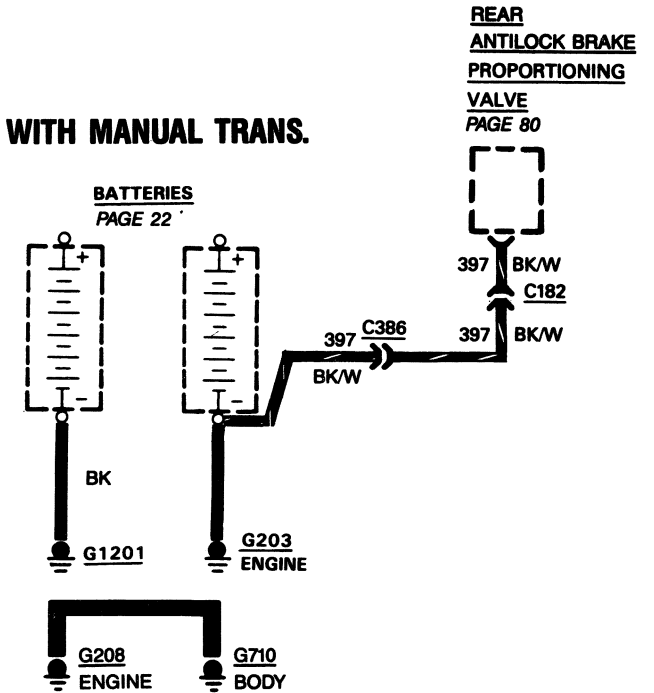
Click Here To Order

PayPal American Express Discover MasterCard VISA

12 GROUNDS (G203)



DIESEL WITH MANUAL TRANS.



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

HOW THE CIRCUIT WORKS

The ground circuits shown here are complete and connect several components together to screw terminal ground points. On other pages only parts of these circuits may be shown. Partial ground circuits are shown dashed on those pages.

All simple or component ground circuits are shown on the individual circuit pages and are complete on those pages.

All ground wires are **57 BK** unless otherwise noted.

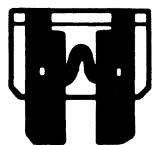
COMPONENT LOCATION

	Page- Figure
A/C Clutch Field Coil	Part of compressor
Anti-Lock Brake Module . .	Behind I/P left of center
Blower Resistors	Mounted to plenum next to blower 131-1
Brake Sensor	Part of master cylinder
Cooling Fan Motor	RH fender apron
Diesel/Warning Lamp Module	Behind LH side of I/P near fuse panel
Electronic Engine Control (EEC) Module	Behind LH kick panel
EEC Power Relay	Under plastic shield at the air cleaner support bracket
Rear Anti-lock Brake Proportioning Valve	Inside of LH frame rail behind #1 cross- member
Electronic Shift 4 Wheel Drive Control Module . .	RH cowl panel
Fuel Tank Selector Valve .	On LH side frame member behind cab 91-1
Heater Blower Switch	At center of I/P
Refer to Component Testing	Page 000 for additional testing details.
HEGO Sensor	In communicator tube connecting both exhaust pipes 134-2,135-3
Inferred Mileage Sensor . .	Attached to instrument panel to left of steering column
Inline Fuel Pump	Inboard side of LH frame rail
Low Vacuum Warning Switch	7.3L RH fender apron
Power Window Master Switch	In LH door
Rear Defrost Control	Under LH corner of I/P
Seatbelt Warning Buzzer/Chime	Attached to rear RH side of I/P
Electronic Shift 4-Wheel Drive Switch	On LH side of I/P
Speed Sensor	At transmission
Tailgate Power Window Motor	In center of tailgate 109-3
Washer Pump	In washer reservoir
Windshield Wiper Motor . .	Attached to center of dash panel

Refer to the **Location Index** in the back of the manual for connector, ground, diode and splice descriptions and locations.

14 FUSE PANEL/CIRCUIT PROTECTION

REPLACEMENT OF FUSES/ CIRCUIT BREAKERS



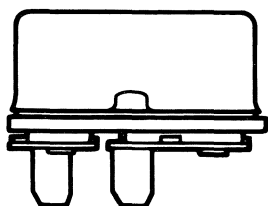
GOOD FUSE



BLOWN FUSE

Fuses are mounted either in the **Fuse Panel** or in-line. They are identified by the numbered value in amperes, and by a color code. Some positions may have either a fuse with adapter or a circuit breaker. Be sure to replace a fuse or circuit breaker with the same kind of unit and with the same ampere rating. Remove fuses in order to check them.

CIRCUIT BREAKER OPERATION



EXTERNAL
SIDE VIEW

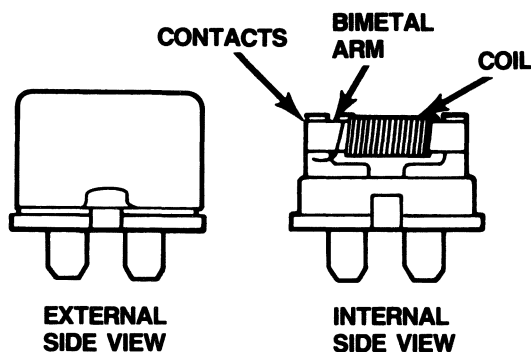
CONTACTS

BIMETAL
ARM

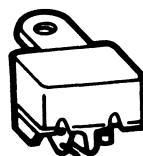
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



Non-Cycling Fuse Panel Type



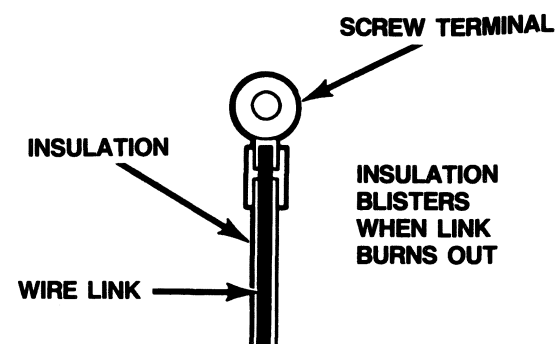
Cycling In-Line Type

Some circuits are protected by circuit breakers. (Abbreviated "c.b." in fuse chart.) They can be **Fuse Panel** mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal fastened together (bimetal arm). If the arm starts to carry too much current, it heats up. As one metal expands faster than the other the arm bends, opening the contacts. Current flow is broken. In the cycling type, the arm cools and straightens out. This closes the circuit again. This cycle repeats as long as the overcurrent exists, with power applied.

In the non-cycling type, there is also a coil wrapped around the bimetal arm. When an overcurrent exists and the contacts open, a small current passes through the coil. This current through the coil is not large enough to operate a load, but it does heat up both the coil and bimetal arm. This keeps the arm in the open position until power is removed.

FUSE LINKS



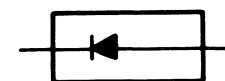
The fuse link is a short length of wire smaller in gauge than the wire in the protected circuit. The wire is covered with a thick non-flammable insulation. An overload causes the link to heat and the insulation to blister. If the overload remains, the link will melt, causing an open circuit. The links are color coded for wire size as follows:

COLOR CODE

BLUE	20 GA
BROWN	18 GA
BLACK	16 GA
GREEN	14 GA

When replacing, make tight crimp joints or hot solder joints for good connections.

DIODES



Diodes are electrical devices that permit current to flow in one direction only. The current flows in the direction indicated by the arrow.

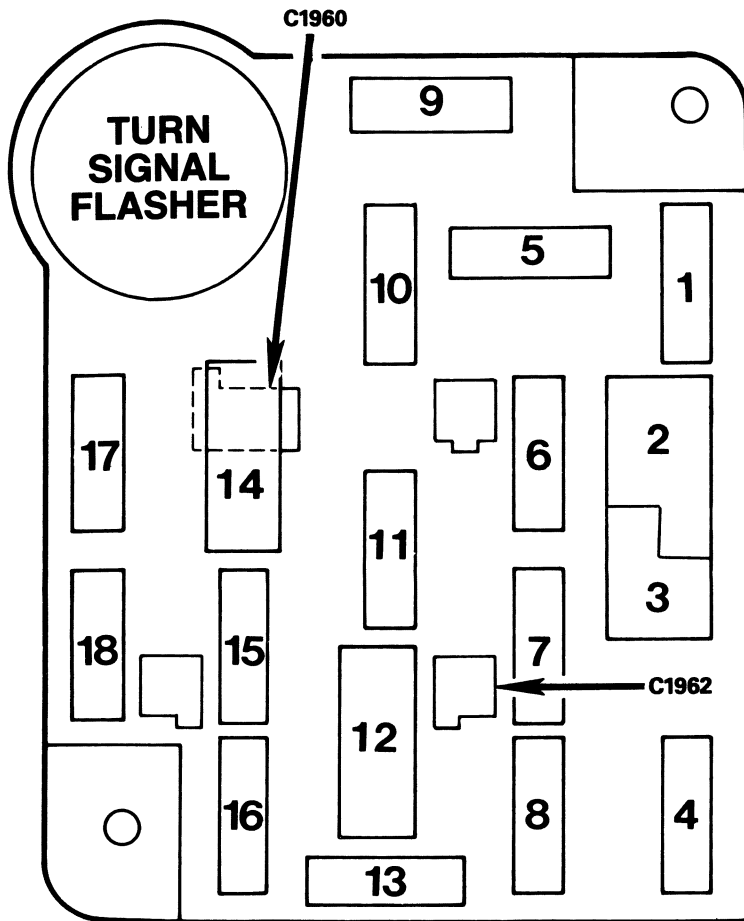


Figure 1 - Fuse Panel

Fuse Position	Amps	Circuits Protection
1	15	Stop/Hazard Lamps; Speed Control
2	—	(Not used)
3	—	(Not used)
4	15	Exterior Lamps; Instrument Illumination; Glove Compartment Lamp;
5	15	Map Lamp; Turn Lamps; Backup Lamps; Rear Window Defrost; E40D Transmission
6	15	Speed Control; Electronic Shift-4 Wheel Drive; Cargo Lamp (Bronco)
7	—	(Not Used)
8	15	Courtesy, Dome, Cargo Lamp (F-Series); Warning Buzzer
9	30	Heater; A/C-Heater
10	5	Instrument Illumination; Clock Dimming
11	15	Radio; Main Light Switch; Clock Illumination
12	25	Tailgate Power Window; Power Mirrors
13	30 c.b.	Power Door Locks; Electronic Shift-4 Wheel Drive
14	—	(Not used)
15	25	Tailgate Power Window
16	30 c.b.	Power Windows
17	10	Auxiliary Fuel Tank Selector
18	30	Horn; Cigar Lighter; Speed Control; 4.9L EFI After Run Blower
	20	Anti-lock Brakes
	15	Seatbelt Buzzer; Warning Indicators; Diesel Glow Plug Control; Diesel Indicators; Tachometer

Fuse Value Amps	Color Code
4	Pink
5	Tan
10	Red

Power Distribution

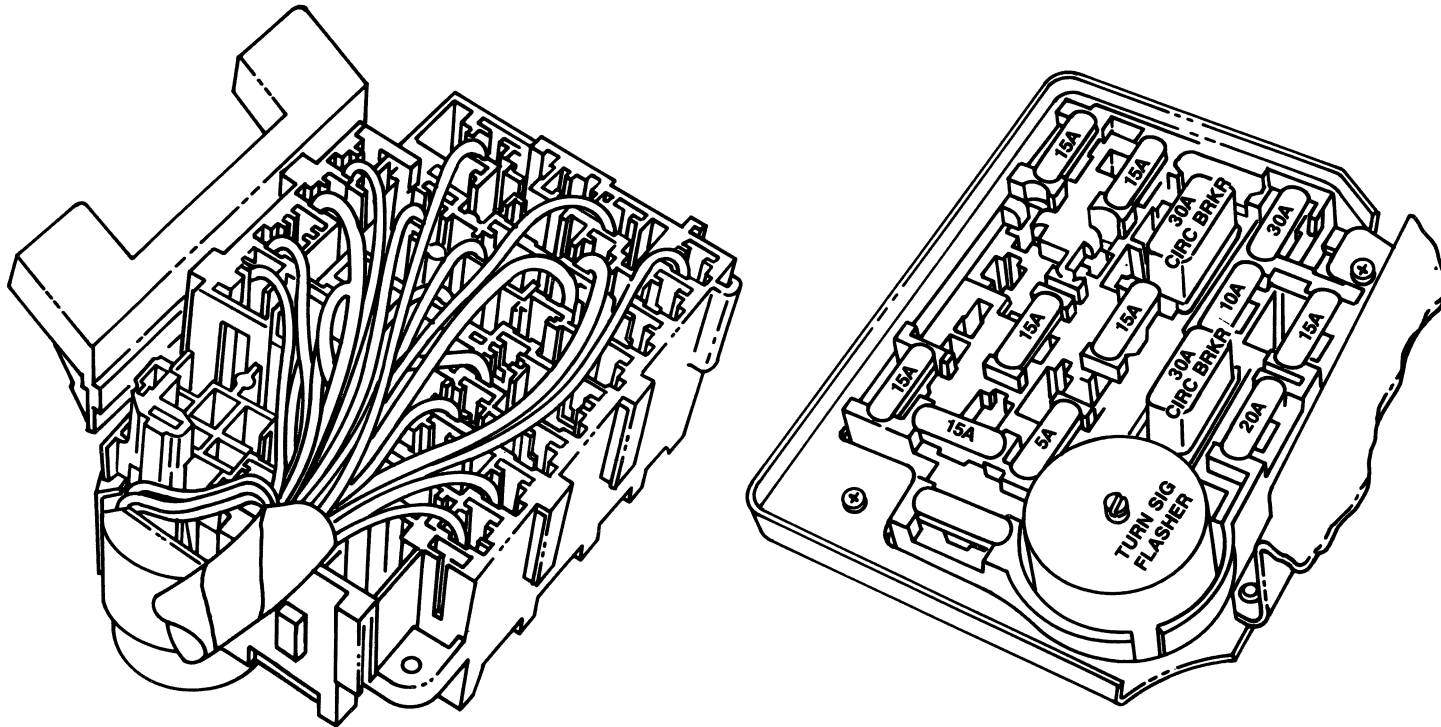
The **Alternator** and **Battery** are connected together at the **Starter Relay** hot terminal. Other circuits originate at the **Starter Relay** hot terminal and are protected by fuse links. Low power circuits are also protected by fuses.

The **Ignition Switch** and **Main Light Switch** are powered at all times as are **Fuses 1, 4, 8, 12, and 16**. The other fuses are powered through the **Ignition Switch** or the **Main Light Switch**.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

Figure 1 - Fuse Panel

142 COMPONENT TESTING: IGNITION SWITCH (WITH SWITCH INSTALLED)

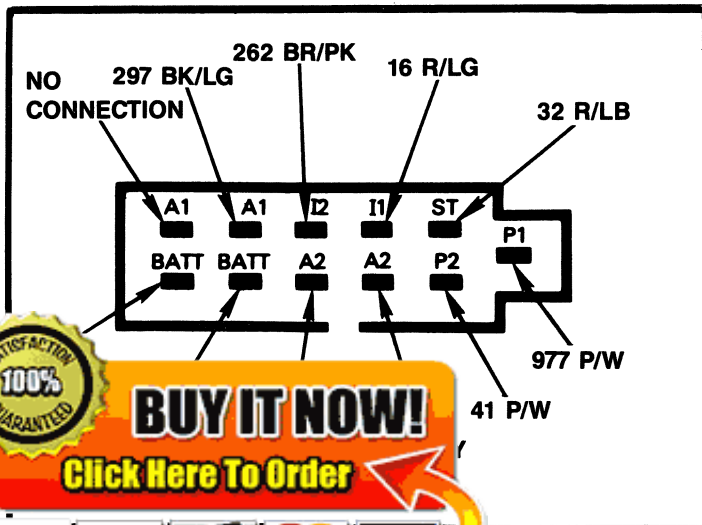
COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Internal Switch Connections (perform these tests first)	37 Y (BATT) and 37 Y (BATT)	Accy, Lock, Off, Run, Start	Closed Circuit in all five positions
Starter Relay Circuit	37 Y (BATT) (either terminal) and 32 R/L B (ST)	Accy, Lock, Off, Run, Start	Closed Circuit in Start position only
A/C, Heater Circuit, Turn/Stoplamps, Backup Lamps	37 Y (BATT) (either terminal) and 687 GY/Y (A2) (either terminal)	Accy, Lock, Off, Run, Start	Closed Circuit in Run position only

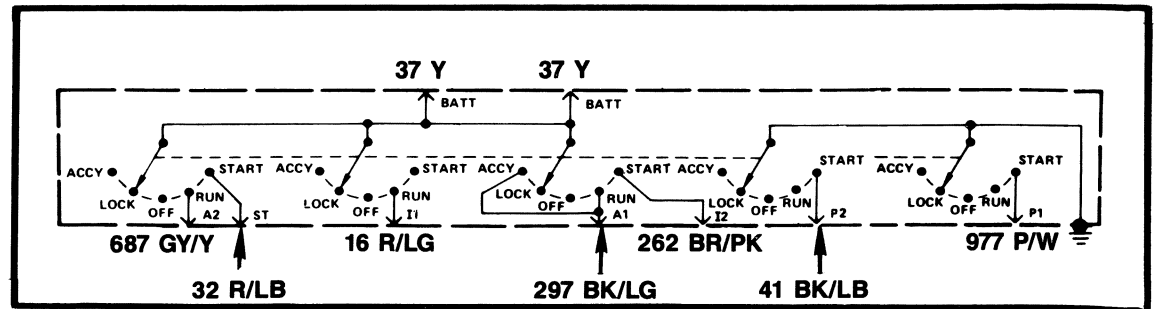
COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Ignition Circuit	37 Y (BATT) (either terminal) and 16 R/LG	Accy, Lock, Off, Run, Start	Closed Circuit in Run.
	37 Y (BATT) (either terminal) and 262 BR/PK (I2)	Accy, Lock, Off, Run, Start	Closed Circuit in Start position only
"Accy" Circuit	37 Y (BATT) (either terminal) and 297 BK/LG (A1)	Accy, Lock, Off, Run, Start	Closed Circuit in Run and Accy position only
Bulb-Test Circuit	41 BK/LB (P2) and Ignition Switch Case	Accy, Lock, Off, Run, Start	Closed Circuit in Start position only
	977 P/W (P1) and Ignition Switch Case	Accy, Lock, Off, Run, Start	Closed Circuit in Start position only

TERMINAL LOCATIONS



SCHEMATIC



100% GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

PayPal, American Express, Discover, MasterCard, VISA

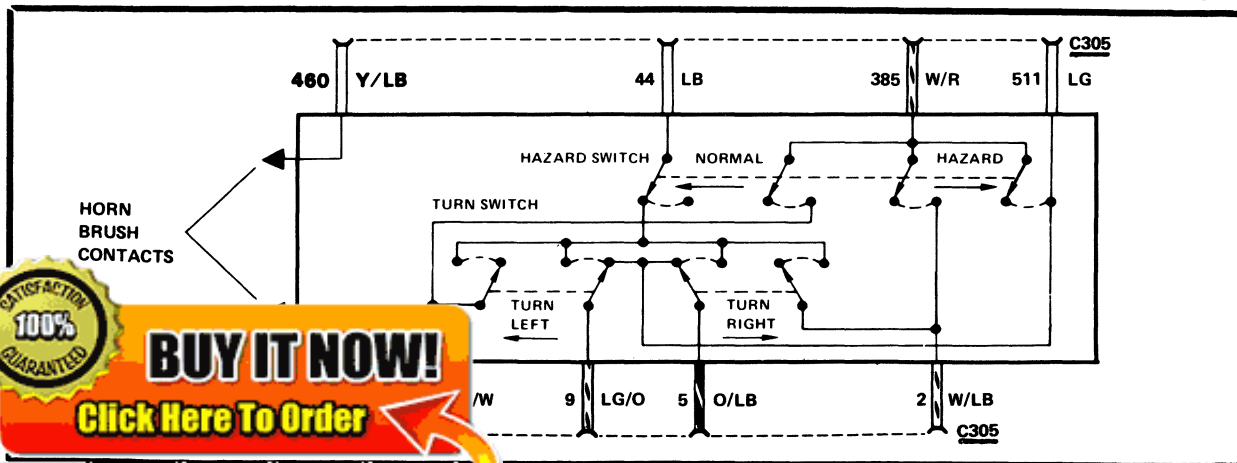
COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Horn Switch Circuit	460 Y/LB and 1 DB	Depress Horn Switch (If removed from truck, jumper brush contacts)	Closed Circuit.
LH Rear Turn Circuit	44 LB and 9 LG/O	Turn Switch to Turn Left and Hazard Switch to Normal	Closed Circuit
LH Front Turn Circuit	44 LB and 3 LG/W	Turn Left	Closed Circuit
RH Rear Turn Circuit	44 LB and 5 O/LB	Turn Right	Closed Circuit
RH Front Turn Circuit	44 LB and 2 W/LB	Turn Right	Closed Circuit

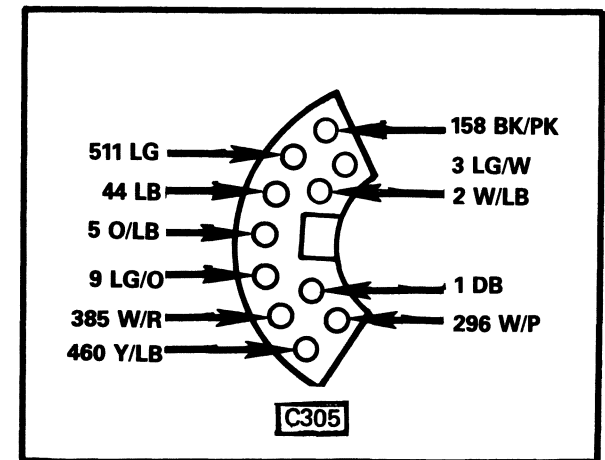
COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Hazard Switch Circuit	385 W/R and 511 LG	Hazard	Closed Circuit
	385 W/R and 2 W/LB	Hazard	Closed Circuit
	385 W/R and 3 LG/W	Hazard	Closed Circuit
Stoplamp Feed-Through Circuit	511 LG and 9 LG/O	Turn Switch to center (No Turn) position or Turn Right	Closed Circuit
	511 LG and 5 O/LB	Turn Switch to center (No Turn) position or Turn Left	Closed Circuit

SCHEMATIC



TERMINAL LOCATIONS



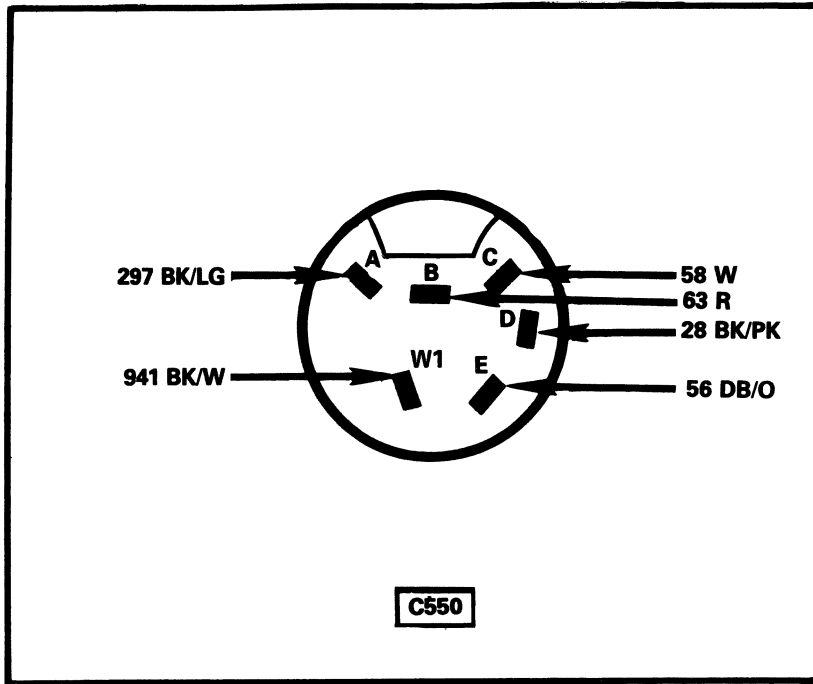
100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

144 COMPONENT TESTING: WINDSHIELD WIPER/WASHER SWITCH

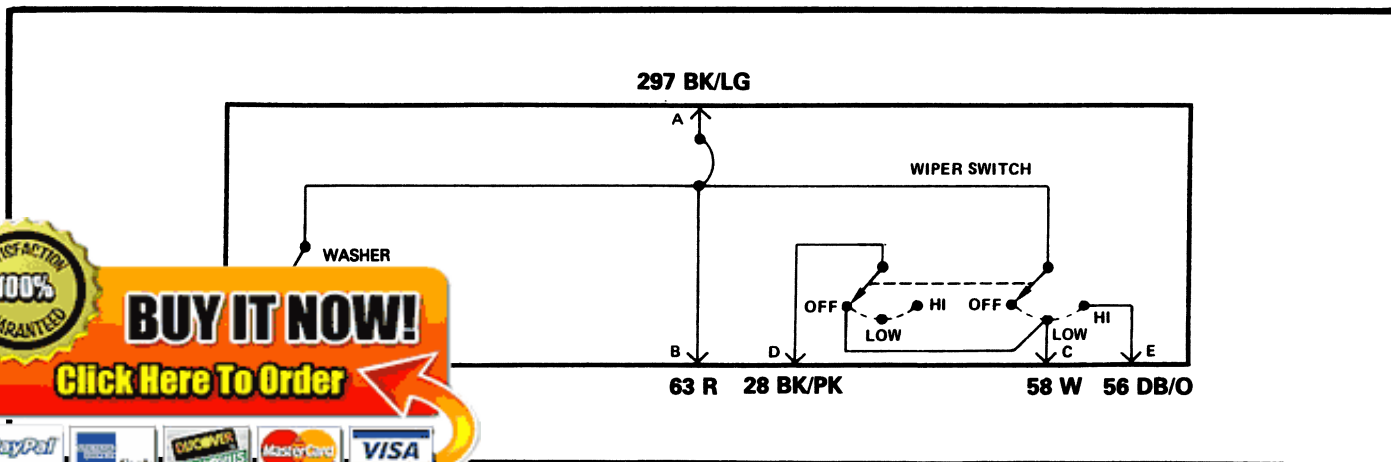
TERMINAL LOCATIONS ON SWITCH



COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Washer Switch Circuit	941 BK/W (W1) and 63 R (B)	Push knob	Closed Circuit
		Release knob	Open Circuit
Wiper Switch Circuit	63 R (B) and 58 W (C)	Off	Open Circuit
		Lo	Closed Circuit
		Hi	Open Circuit
Wiper Switch Circuit	63 R (B) and 56 DB/O (E)	Off	Open Circuit
		Lo	Open Circuit
		Hi	Closed Circuit
Wiper Switch Circuit	58 W (C) and 28 BK/PK (D)	Off	Closed Circuit
		Lo	Open Circuit
		Hi	Open Circuit
Circuit Breaker	297 BK/LG (A) and 63 R (B)	All positions	Closed Circuit

SCHEMATIC

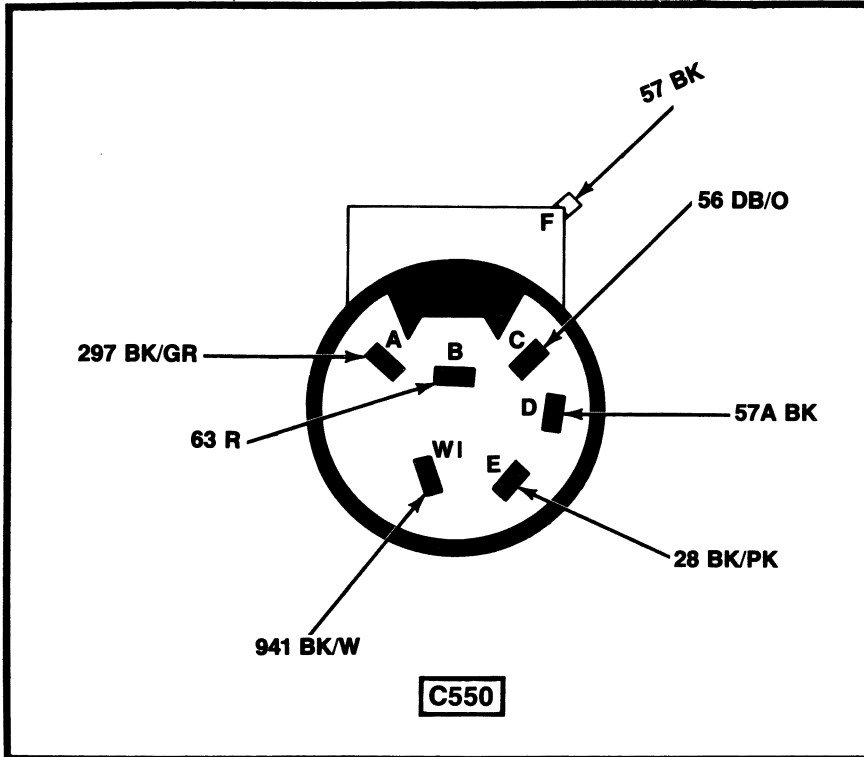


100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

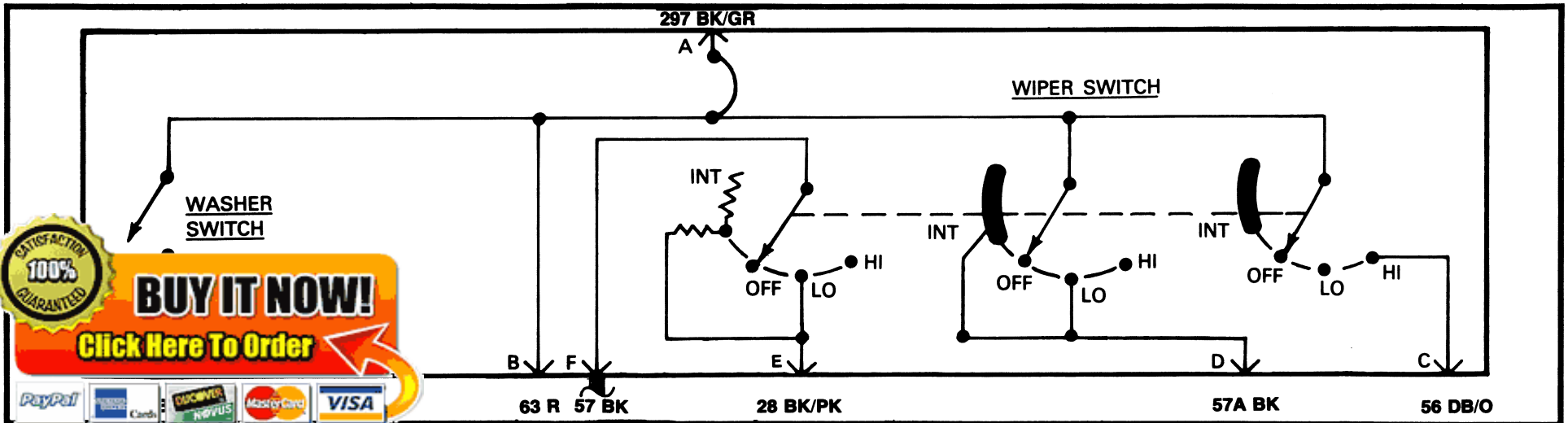
TERMINAL LOCATIONS ON SWITCH



COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
Wiper Switch Circuit	57 BK (F) and 57A BK (D)	Off All other positions	Open Circuit Closed Circuit
	63 R (B) and 56 DB/O (C)	Hi All other positions	Closed Circuit Open Circuit
	28 BK/PK (E) and 57 BK (F)	Off Rotate Control Clockwise Into Position (as Viewed from Connector Side).	Open Circuit Ohmmeter will indicate smoothly increasing resistance from 200-1000 ohms minimum to 5600-8400 ohms maximum Closed Circuit
		All other positions	Closed Circuit

SCHEMATIC



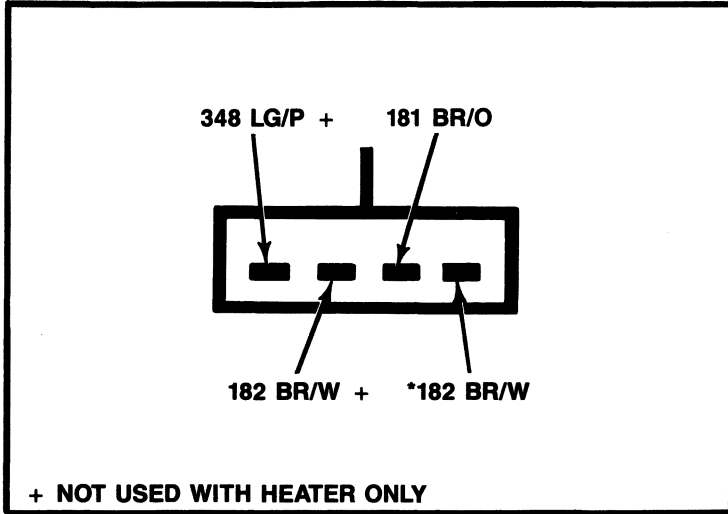
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

146 COMPONENT TESTING: A/C HEATER FUNCTION SELECTOR SWITCH

TERMINAL LOCATIONS

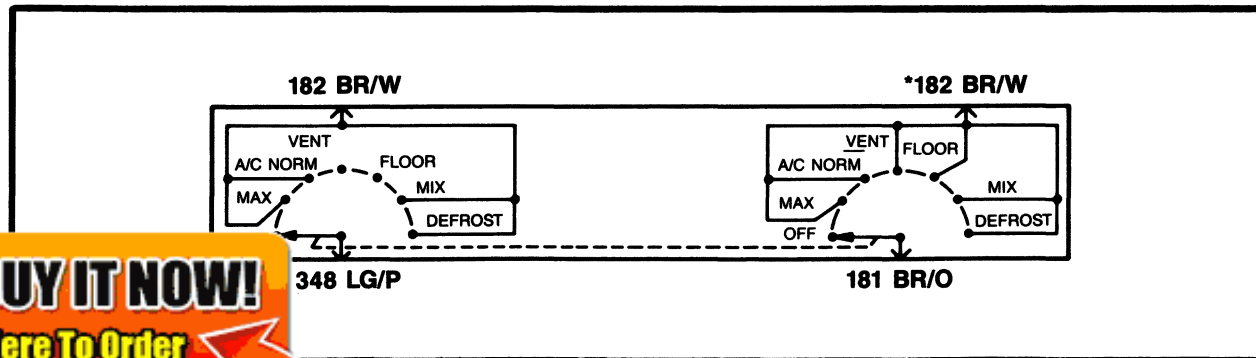


COMPONENT TESTING PROCEDURE

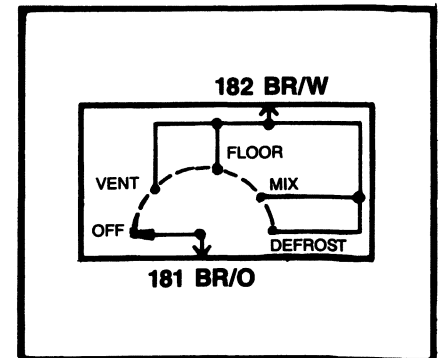
TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
A/C Clutch Circuit	182 BR/W and 348 LG/P	Off A/C Max A/C Norm Vent Floor Mix Defrost	Open Circuit Closed Circuit Closed Circuit Open Circuit Open Circuit Closed Circuit Closed Circuit
Blower Motor Circuit	*182 BR/W and 181 BR/O	Off All other positons	Open Circuit Closed Circuit

NOTE: HEATER ONLY USES BLOWER MOTOR CIRCUIT ONLY.

SCHEMATIC A/C HEATER



SCHEMATIC - HEATER ONLY

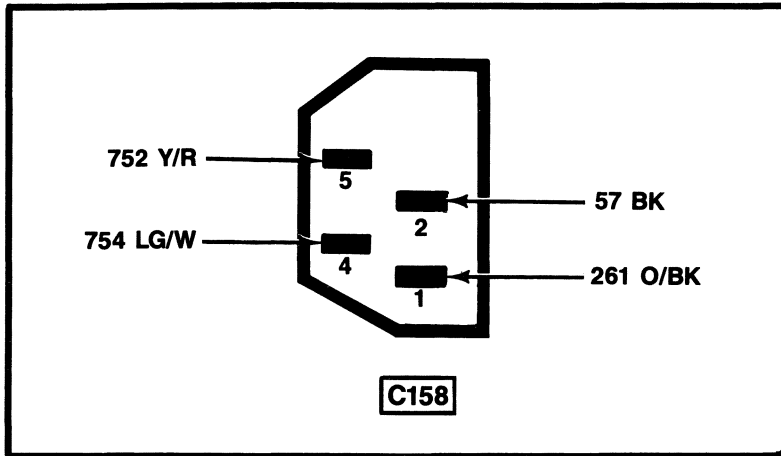


100% SATISFACTION GUARANTEED

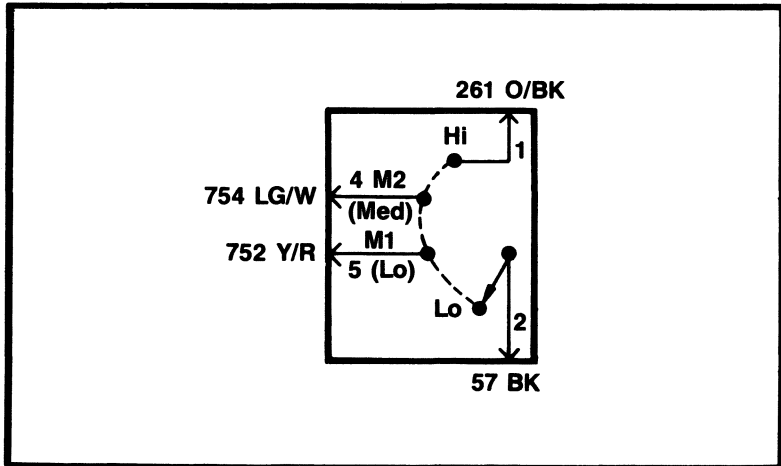
BUY IT NOW!

Click Here To Order

TERMINAL LOCATIONS



SCHEMATIC



COMPONENT TESTING PROCEDURE

TO TEST	Connect Self Powered Test Light or Ohmmeter to Terminals	Move Switch to These Positions	A Good Switch Will Indicate
LO	57 BK (2)	Lo	Open Circuit
Medium-Low Speed (M1)	57 BK (2) and 752 Y/R (5)	Lo	Open Circuit
		Medium-1	Closed Circuit
		Medium-2	Open Circuit
		Hi	Open Circuit
Medium-High Speed (M2)	57 BK (2) and 754 LG/W (4)	Lo	Open Circuit
		Medium-1	Open Circuit
		Medium-2	Closed Circuit
		Hi	Open Circuit
Hi Speed	57 BK (2) and 261 O/BK (1)	Lo	Open Circuit
		Medium-1	Open Circuit
		Medium-2	Open Circuit
		Hi	Closed Circuit

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

148 LOCATION INDEX

CONNECTOR LOCATION

		Page-Figure	Color	Terminals
C100	Through dash at LH side	—		53
C103	Near HEGO sensor	—	BK	4
C104	At battery ground pigtail	—		4
C107	At license lamps	60-2	BR	1
C108	Engine compartment LH side	—	BK	4
C109	RH side #6 crossmember	60-3	GY	4
C110	LH fender apron	—	GY	8
C111	Behind I/P LH end (test)	—	BK	1
C112	LH fender apron	—	BR	8
C113	LH fender apron	—	N	8
C114	LH fender apron	—	BK	8
C115	On rear of engine	—	BK	8
C116	LH fender apron	—	BK	8
C117	At LH front side body marker lamp	61-8	BK	4
C118	LH fender apron	—	BK	8
C119	On dash panel	—	GY	4
C122	RH side of rear cross support	60-3	GY	4
C123	LH side of frame at rear crossmember	109-5	BK	4
C126	LH side of rear crossmember	60-2		2
C129	At RH fender apron (diesel only)	35-1	GY	8
C132	LH fender apron	—	BK	8
C133	LH fender apron/#5 crossmember on dual tank	—	BK	4
C134	LH fender apron	—	BK	8
C135	RH inner fender behind headlamp	—	BK	1
C136	At rear left quarter panel	71-2		
C151	Engine compartment	—	BK	4
C157	At A/C clutch switch	—	W	2
C158	At blower switch	—	GY	5
C168	Engine compartment test	—	GY	6
C170	Near ignition module	133-1	BK	2
C171	Engine compartment test	—		1
C174	At proportioning valve, LH frame rail	—	BK	4
C177	Engine compartment LH side	—	GY	4
C182	Engine compartment LH	—	GY	4
C183	Engine compartment LH	—	BR	2
C185	At alternator	135-3		3
C186	At alternator	—		3
	At alternator regulator	139-7	W	4
	At alternator	—		2
	h	—	GY	2
	upport	—	GY	8
	ter panel	71-2	GY	4
	ter panel	70-1	GY	4
	r panel	—	GY	4
		—		14

CONNECTOR LOCATION

		Page-Figure	Color	Terminals
C208B	At instrument cluster	—		14
C233	Near alternator	—	GY	1
C240	At ignition key, seat belt warning buzzer	—		7
C244	Behind center of I/P	—	BK	8
C248	Engine compartment near starter relay	—	GY/BK	4
C260	Near RH battery	—	BK	1
C270	At wiper motor	—		3
C271	At wiper motor	—		3
C276	At automatic transmission	—		5
C280	Engine compartment near starter relay	—		6
C284	At 4x4 switch	—	BK	2
C285	LH fender apron near power brake booster	—	GY	4
C285A	LH fender apron near power brake booster	—	BR	4
C285B	At speed sensor	—	BK	2
C289	RH cowl	—	BK	4
C290	RH cowl	—	GY	4
C292	At blower motor	—		2
C293	At blower resistor	—	W	4
C300	Inline fuel pump	—	BK	2
C305	LH side of steering column	—	GY	11
C305A	LH side of steering column	—	GY	11
C305B	LH side of steering column	—	GY	11
C321	LH fender apron near ignition module	—	BK	3
C322	At distributor	—	BK	3
C323	At ignition module	—	BK	4
C333	Behind center of I/P at radio	—		8
C343	LH fender apron near ignition module	—	BK	8
C344	LH fender apron near ignition module	—	BK	8
C353	Rear LH side of frame at rear crossmember	60-4	Y	1
C354	At LH rear park & turn lamp	60-4	BK	2
C355	At RH rear park & turn lamp	60-4	BK	2
C356	At RH backup lamp	60-4	Y	1
C357	At LH backup lamp	60-4	Y	1
C358	Behind center of I/P	—	GY	2
C366	Behind I/P near fuse panel	—	GY	3
C366A	Behind I/P near fuse panel	—	GY	3
C366B	Behind I/P near fuse panel	—	GY	3
C370	Transmission extension housing	—	GY	4
C380	Engine compartment LH side	—		2
C385	Near alternator/regulator	—	BK	1

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

CONNECTOR LOCATION

		Page- Figure	Color	Terminals
C386	Near RH battery	—		1
C406	LH cowl under I/P	—	GY	4
C420	Engine compartment LH side	—	BK	4
C425	RH cowl	—	BK	6
C426	RH cowl side	—	GY	2
C427	RH cowl side — electric shift module	—	GY	8
C428	RH cowl side — electric shift module	—	W	10
C429	RH cowl side — electric shift module	—	BR	5
C430	At electric shift transfer case	—	BK	10
C431	At electronic shift switch	—		6
C450	LH side rear support cross	—	BK	2
C522	Behind center of I/P at radio	—		8
C523	Lower LH cowl access hole	—	BR	2
C524	Lower RH cowl access hole	114-1	BR	2
C550	At windshield wiper/washer switch	102-1	BK	10
C650	At RH door lock motor	—	BK	2
C701	At main light switch	—	BK	8
C714	At speed control amplifier	—	GR	8
C717	At speed control amplifier	—	GY	6
C752	LH side of hood at engine compartment lamp	—		1
C753	At speed control servo	—	BR	6
C755	At clutch switch	—	GR	2
C789	LH side of driver's seat on floor pan	79-1	GY	2
C850	Lower LH cowl access hole	—	GY	4
C906	At LH cowl access hole	—		2
C913	At center of rear body markers	60-5		4
C915	Engine compartment LH side	—	BK	2
C918	Near LH side of rear crossmember	60-2	BK	4
C950	At LH rear	61-8		4
C951	Near RH side of rear crossmember	60-6	BR	2
C952	At front of RH side body marker	—	BK	4
C953	At RH rear	61-8	BK	4
C954	In forward part of cab roof	59-1	BK	2
C955	In forward part of cab roof	59-1	BK	2
C	In forward part of cab roof	59-1	BK	2
C	At front of cab roof	59-1	BK	2
C		59-1	BK	2
C		—	BK	3
C		—	GY	4
C		61-9	BK	4
C1114	LH rear of frame	61-9	BR	6
C		—	BR	3

		Page- Figure	Color	Terminals
C1114	LH rear of frame			4
C1206	At rear crossmember	65-1	GY	3
C1907	Behind LH rear lamp	109-4	BR	3
C1951	Behind LH rear crossmember	109-5	BR	1
C1952	Behind LH rear lamp	109-4	BR	1
C1953	LH cowl center access hole	—	GY	8
C1954	RH cowl center access hole	—	GR	8
C1955	LH cowl area	—		2
C1960	On fuse panel	—	N	1
C1962	At fuse panel	—	BL	2
C1963	LH frame rail	—	BK	2
C1964	Engine compartment LH side	—	BK	4

SPLICE LOCATION

S101	Near inline fuel pump T/O	—		
S108	Near tailgate power window switch T/O	—		
S109	Near tailgate power window switch T/O	—		
S110	Near fuel pump relay T/O	—		
S111	Near starter relay T/O	—		
S112	Near EEC module T/O	—		
S113	Near C115 T/O	—		
S114	Near C114 T/O	—		
S115	Near manifold pressure sensor T/O	—		
S116	Near manifold pressure sensor T/O	—		
S117	Near C100 T/O	—		
S118	Near EEC module T/O	—		
S119	Near E40D T/O	—		
S120	Near speed control amplifier T/O	—		
S121	Near C112 T/O	—		
S123	Near EEC module T/O	—		
S124	Near backup lamp switch T/O	—		
S125	Near backup lamp switch T/O	—		
S126	Near C100 T/O	—		
S129	Near E40D Transmission	—		
S140	Between S142 and S143	—		
S142	Near T/O to no. 4 fuel injector	—		
S143	Near T/O to no. 8 fuel injector	—		
S150	In ignition coil lead	—		
S152	Near LH backup lamp T/O	—		
S153	Near license lamp T/O	—		
S154	Near front fuel gauge sender T/O	—		
S155	Near ERBP valve T/O	—		
S156	Near fuel line heater T/O	—		
S157	Near LH headlamp T/O	—		



BUY IT NOW!

Click Here To Order



150 LOCATION INDEX

SPLICE LOCATION

S158	Near LH glow plugs T/O	—
S159	Near RH glow plugs T/O	—
S160	Near ignition coil T/O	—
S161	Near clutch interlock switch T/O	—
S162	Near heater control switch T/O	—
S163	Near heater control switch T/O	—
S165	In T/O to throttle air bypass solenoid	—
S167	In T/O to map sensor	—
S168	Near T/O to EEC diode	—
S170	Near battery	—
S172	Near T/O to EEC diode	—
S174	Near T/O to EEC power relay	—
S175	Near cooling fan relay T/O	—
S176	Near fuel tank selector valve T/O	—
S177	Near fuel tank selector valve T/O	—
S185	Near radio T/O	—
S190	Near backup lamp T/O	—
S200	Near clutch switch T/O	—
S201	Near T/O to C100	—
S202	Near T/O to fuel pump relay	—
S208	Near main light switch T/O	—
S216	Near steering column connector T/O	—
S217	Near ignition switch T/O	—
S220	Near LH courtesy lamp T/O	—
S221	Near ignition switch T/O	—
S270	Between T/O's to EEC power relay	—
S271	Near T/O to C178 (LH side)	—
S272	Near main light switch T/O	—
S276	Near T/O to C178 (LH side)	—
S277	Near T/O to C178 (RH side)	—
S303	Near main light switch T/O	—
S305	In ignition coil lead	—
S350	Near main light switch T/O	—
S352	Near vehicle speed sensor T/O	—
S353	Near vehicle speed sensor T/O	—
S354	Near LH horn T/O	—
S355	Near clutch switch T/O	—
S356	Near fan harness	—
S357	Near fan harness	—
S358	Near fan harness	—
S359	Near fan harness	—
S360	Near fan harness	—
S361	Near fan harness	—
S362	Near fan harness	—
S363	Near fan harness	—
S364	Near fan harness	—
S365	Near fan harness	—
S366	Near fan harness	—
S367	Near fan harness	—
S368	Near fan harness	—
S369	Near fan harness	—
S370	Near fan harness	—
S371	Near fan harness	—
S372	Near fan harness	—
S373	Near fan harness	—
S374	Near fan harness	—
S375	Near fan harness	—
S376	Near fan harness	—
S377	Near fan harness	—
S378	Near fan harness	—
S379	Near fan harness	—
S380	Near fan harness	—
S381	Near fan harness	—
S382	Near fan harness	—
S383	Near fan harness	—
S384	Near fan harness	—
S385	Near fan harness	—
S386	Near fan harness	—
S387	Near fan harness	—
S388	Near fan harness	—
S389	Near fan harness	—
S390	Near fan harness	—
S391	Near fan harness	—
S392	Near fan harness	—
S393	Near fan harness	—
S394	Near fan harness	—
S395	Near fan harness	—
S396	Near fan harness	—
S397	Near fan harness	—
S398	Near fan harness	—
S399	Near fan harness	—
S400	Near fan harness	—
S401	Near fan harness	—
S402	Near fan harness	—
S403	Near fan harness	—
S404	Near fan harness	—
S405	Near fan harness	—
S406	Near fan harness	—
S407	Near fan harness	—
S408	Near fan harness	—
S409	Near fan harness	—
S410	Near fan harness	—
S411	Near fan harness	—
S412	Near fan harness	—
S413	Near fan harness	—
S414	Near fan harness	—
S415	Near fan harness	—
S416	Near fan harness	—
S417	Near fan harness	—
S418	Near fan harness	—
S419	Near fan harness	—
S420	Near fan harness	—
S421	Near fan harness	—
S422	Near fan harness	—
S423	Near fan harness	—
S424	Near fan harness	—
S425	Near fan harness	—
S426	Near fan harness	—
S427	Near fan harness	—
S428	Near fan harness	—
S429	Near fan harness	—
S430	Near fan harness	—
S431	Near fan harness	—
S432	Near fan harness	—
S433	Near fan harness	—
S434	Near fan harness	—
S435	Near fan harness	—
S436	Near fan harness	—
S437	Near fan harness	—
S438	Near fan harness	—
S439	Near fan harness	—
S440	Near fan harness	—
S441	Near fan harness	—
S442	Near fan harness	—
S443	Near fan harness	—
S444	Near fan harness	—
S445	Near fan harness	—
S446	Near fan harness	—
S447	Near fan harness	—
S448	Near fan harness	—
S449	Near fan harness	—
S450	Near fan harness	—
S451	Near fan harness	—
S452	Near fan harness	—
S453	Near fan harness	—
S454	Near fan harness	—
S455	Near fan harness	—
S456	Near fan harness	—
S457	Near fan harness	—
S458	Near fan harness	—
S459	Near fan harness	—
S460	Near fan harness	—
S461	Near fan harness	—
S462	Near fan harness	—
S463	Near fan harness	—
S464	Near fan harness	—
S465	Near fan harness	—
S466	Near fan harness	—
S467	Near fan harness	—
S468	Near fan harness	—
S469	Near fan harness	—
S470	Near fan harness	—
S471	Near fan harness	—
S472	Near fan harness	—
S473	Near fan harness	—
S474	Near fan harness	—
S475	Near fan harness	—
S476	Near fan harness	—
S477	Near fan harness	—
S478	Near fan harness	—
S479	Near fan harness	—
S480	Near fan harness	—
S481	Near fan harness	—
S482	Near fan harness	—
S483	Near fan harness	—
S484	Near fan harness	—
S485	Near fan harness	—
S486	Near fan harness	—
S487	Near fan harness	—
S488	Near fan harness	—
S489	Near fan harness	—
S490	Near fan harness	—
S491	Near fan harness	—
S492	Near fan harness	—
S493	Near fan harness	—
S494	Near fan harness	—
S495	Near fan harness	—
S496	Near fan harness	—
S497	Near fan harness	—
S498	Near fan harness	—
S499	Near fan harness	—
S500	Near fan harness	—

SPLICE LOCATION

S504	Near instrument cluster T/O	—
S507	Near warning buzzer T/O	—
S508	Near warning buzzer T/O	—
S509	Near anti-lock brake module T/O	—
S510	Near anti-lock brake module T/O	—
S511	Near anti-lock brake module T/O	—
S512	Near fuel tank selector T/O	—
S513	Near fuse panel T/O	—
S515	Near driver's tailgate window switch T/O	—
S517	Near LH courtesy lamp T/O	—
S520	Near warning buzzer T/O	—
S530	Near clutch interlock switch T/O	—
S536	Near windshield wiper motor T/O	—
S538	Engine compartment near air charge sensor T/O	—
S543	Near brake sensor T/O	—
S545	Near LH headlamp T/O	—
S547	Engine compartment near HEGO ground T/O	—
S548	Engine compartment near #5 fuel injector T/O	—
S549	Engine compartment near #3 fuel injector T/O	—
S550	Near brake sensor T/O	—
S551	Engine compartment near #3 fuel injector T/O	—
S552	Engine compartment near throttle air bypass solenoid T/O	—
S554	Near speed sensor T/O	—
S555	Near ignition module T/O	—
S556	Near ignition module T/O	—
S560	Near fuel sedimenter bowl T/O	—
S562	Near A/C clutch T/O	—
S563	Near A/C clutch T/O	—
S567	Near T/O to A/C pressure cycling switch	—
S570	Near fuel tank sender T/O	—
S571	Near fuel tank sender T/O	—
S576	Near LH backup lamp T/O	—
S578	Near LH backup lamp T/O	—
S583	Near T/O to A/C clutch coil	—
S584	Near T/O to A/C clutch coil	—
S590	In LH door near power window switch T/O	—
S603	Near blower motor switch T/O	—
S701	Near blower resistor T/O	—
S801	Near headlamp switch T/O	—
S805	Near cigar lighter T/O	—
S806	Near T/O to windshield wiper switch	—
S807	Near LH headlamp T/O	—
S808	Near RH park lamp T/O	—

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

SPLICE LOCATION

S811	Near ignition switch T/O	—
S814	Near windshield wiper illumination lamp T/O	—
S815	Near G701 T/O	—
S850	Near main light switch T/O	—
S852	Near LH master window control switch T/O	—
S853	Near LH master window control T/O	—
S854	Front LH door near speaker T/O	—
S858	Near LH master window control T/O	—
S902	Near RH side marker lamp T/O	—
S903	Near fuel gauge sender and pump T/O	—
S904	Near license lamp T/O	—
S1004	Near ignition switch T/O	—
S1103	Near RH courtesy lamp T/O	—
S1108	Near rear marker lamp T/O	—
S1109	Near LH front side marker lamp T/O	—
S1152	Near RH front side marker lamp T/O	—
S1205	Near rear license lamp T/O	—
S1207	Near dome lamp T/O	—
S1208	Near dome lamp T/O	—
S1902	Near tailgate power window switch T/O	—

GROUND LOCATION

G208	Near throttle position solenoid	—
G209	Center of dash panel	—
G210	At electronic voltage regulator	—
G211	Near starter motor relay	—
G301	Near underhood lamp	—
G502	Behind LH side of I/P	102-1
G701	Behind I/P at center	—
G703	At brace under steering column	—
G710	LH side of dash panel	—
G711	LH rear of engine	—
G751	At LH side of tailgate	—
G752	In LH door	—
G801	LH inner fender behind headlamp	—
G802	At RH inner fender behind headlamp	—
G803	At fuel sedimenter bowl	—
G804	At lower hole of LH quarter panel	—
G805	At RH inner fender behind headlamp	—
G903	At LH side of crossmember	60-2
G909	At lower LH cowl access hole	—
G1006	Rear LH side of frame at rear crossmember	61-9
G1201	At front LH side of engine	26-1

DIODE LOCATION

D100	150 mm (5.9 in.) from a/c clutch	132-3,4
D101	910 mm (35.9 in.) from cargo lamp	70-1
D200	1117 mm (44 in.) from parking brake switch	—
D201	520 mm (20.5 in.) from ignition switch	—

GROUND LOCATION

G	RH frame near battery	26-1
C	control	—
G1		—
G15		—
G19		—
G21		21-1, 2

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA



**WE SUPPORT VOLUNTARY
TECHNICIAN CERTIFICATION**



**Ford Parts and Service Division
Training and Publications Department**

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order 

PayPal    



FPS-12129-89

100% SATISFACTORY GUARANTEE

Click Here To Order

BUY IT NOW!

PayPal
MasterCard
Discover
American Express
VISA



0 ONCO / F150-F350 UPER DUTY



**Electrical &
Vacuum
Trouble-
Shooting
Manual**



License #84356800

Copyright © 2023, Forel Publishing Company, LLC, Woodbridge, Virginia

All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, Woodbridge, VA 22192

**1990 Bronco/F150-F350/F-Super Duty Electrical &
Vacuum Trouble-Shooting Manual (EVTM)**

EAN: 978-1-60371-413-6

ISBN: 1-60371-413-8

Forel Publishing Company, LLC
Woodbridge, VA 22192
Email: sales@ForelPublishing.com
<https://www.ForelPublishing.com>



License #84356800

This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

Note from the Publisher

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the professional should be sought.



1990 BRONCO/F150-F350/F SUPER DUTY

ELECTRICAL AND VACUUM TROUBLESHOOTING MANUAL FPS-12129-90

FORD PARTS and SERVICE DIVISION

Quality is Job 1

For customer satisfaction, Ford Parts and Service Division has developed an EVTVM for the 1990 model year. The EVTVM is directed to you--the technician. Our goal is to provide accurate and timely service information for product maintenance.

1990 EVTVM FEATURES

- A "How to Use This Manual" section that orients the user to the manual and its use.
- **Electrical Schematics** categorized by system and circuit.
- "How the Circuit Works" descriptions that explain how each circuit works. These descriptions are designed to be used in conjunction with the Electrical Schematic.
- **Component Location** information that tells where each component is located on the car as well as a reference to a **Component Location View**.
- **Troubleshooting Hints** presented in a "condition-cause-action" format.
- **Component Testing Procedures** that tell the user how to perform diagnostic tests on various circuits.
- **Connector End Views** designed to help with troubleshooting.
- **Notes, Cautions, and Warnings** that contain important safety information.
- Full view **Component Location Illustrations** to help locate on-vehicle components.
- **Component Base Part Numbers** and **Harness Base Part Numbers** to aid in ordering

in locating systems for easier referencing.
help with the EVTVM System Location.

ORDERING INFORMATION

Information about how to order additional copies of this publication or other Ford publications may be obtained by writing to Helm Incorporated at the address shown below or by calling 1-800-782-4356. Other publications available include:

- Shop Manuals
- Service Specification Books
- Car/Truck Wiring Diagrams
- Engine/Emissions Diagnosis Manuals

Helm Incorporated
P.O. Box 87150
Detroit, Michigan 48207

**SATISFACTORY
100%
GUARANTEED**

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

1-1 CONTENTS/INDEX

Table Of Contents

How to Use This Manual	2-1
Helpful Reminders	3-1
How to Find the Electrical Problems ..	4-1
Electrical Symbols	5-1
Vacuum Symbols	141-1
How to Find the Vacuum Problem ..	142-1
Component Testing	
Introduction	149-1
Main Light Switch	149-1
Ignition Switch	149-2
Multi-function Switch	149-3
Wiper/Washer	149-5
Interval Wiper/Washer Switch	149-6
A/C-Heater	
Function Selector Switch	149-7
Blower Switch	149-8
Tank Selector Valve	149-10
Connector Faces	150-1
Component Location Views	151-1
Location Index	152-1
Vehicle Repair Location Codes	160-1

Index

All Wheel Drive	34-1
Anti-lock Brakes	42-1
A/C-Heater	
Vacuum	54-1
Electrical	54-2
Charge/Power Distribution	
With External Regulator	12-1
Internal Regulator	12-2
.....	12-4
.....	44-1
.....	11-1
.....	149-1

100% SATISFACTION GUARANTEED







BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

Connector Faces/Pinout Charts	150-1
Courtesy Lamps	89-1
Daytime Running Lamps	97-1
Electronic Engine Control	
4.9L	23-1
5.0L & 5.8L	24-1
7.5L	25-1
E4OD Transmission	30-1
Fuel Tank Selector	
Diesel	49-1
Gas	49-2
Fuse Panel	
Gas	12-3
Diesel	12-5
Fuse 4	12-12
Fuse 5	12-9, 12-10
Fuse 8	12-12
Fuse 10	12-6
C.B.12	12-11
Fuse 11	12-12
Fuse 18	12-7, 12-8
Fuse Panel	11-1
Gauges	
Coolant Temperature ...	60-1, 60-2, 60-3
Fuel	
Gas	60-1, 60-2
Diesel	60-3
Oil Pressure	60-1, 60-2, 60-3
Voltmeter	
Gas	60-1, 60-2
Diesel	60-3
Glow Plug Control	26-1
Grounds	26-1
G100	
4.9L, 5.0L, 5.8L	10-2
7.3L	10-4
7.5L	10-5

G101	
4.9L, 5.0L, 5.8L	10-2
7.3L	10-4
7.5L	10-5
G102	10-9
G103	10-8
G104	10-10
G105	10-10
G201	10-11
G401	10-13
Headlamps	85-1
Heater	53-1
Horn	44-1
Ignition Switch	20-2
Gas	12-3
Diesel	12-5
Indicators	
Amp	12-1, 12-2, 12-4
Anti-lock Brakes	42-1
Check Engine	60-4
Brake	
Gas	60-4
Diesel	65-1
Fasten Seatbelt	60-5
4x4 Indicator	60-4
Glow Plugs	65-1
High Beam	85-1, 85-2
Low Range	60-4
Plugged Fuel Filter	65-1
Turn	90-1
Wait To Start	65-1
Water-in-fuel	65-1
Instrument Illumination	71-1
Lamps (Exterior)	
Backup	93-1
Daytime Running Lamps	97-1

Hazard	90-1	Transmission Control	29-1
License		Vacuum Distribution	140-1
F-Series	92-1	Warning Chimes	66-1
Bronco I	92-2	Warning Indicators	65-1
Marker	92-1, 92-3	Windshield Wiper/Washer	80-1
Park		Windshield Wiper/Washer-Interval	81-1
F-Series	92-1		
Bronco	92-2		
Stop	90-1		
Turn			
Front	90-1		
Rear	90-2, 90-3		
Lamps (Interior)			
Cargo/Dome			
F-Series	89-1		
Bronco	89-2		
Courtesy Lamps			
F-Series	89-1		
Bronco I	89-2, 89-3		
Leece and Neville Alternator	13-1		
Main Light Switch	12-11		
Power Door Locks	110-1		
Power Windows			
F-Series	100-1		
Bronco I	100-2		
Radio	130-1		
Rear Window Defrost	56-1		
Speed Control			
Gas	31-1		
Diesel	31-2		
Start			
 BUY IT NOW!	20-2		
Click Here To Order	20-1		
    	20-7		
	20-6		
	95-1		

Publisher Note - table of contents are hyperlinked to pages

2-1 HOW TO USE THIS MANUAL

The purpose of this manual is to show electrical and vacuum circuits of these vehicles in a clear and simple fashion to make troubleshooting easier. With each circuit is a description of *How the Circuit Works* and some *Troubleshooting Hints*. A Component Location chart lists components and references to pictures in the manual.

Notes, Cautions and Warnings containing important information appear in boxes on text pages. Notes provide additional information to help complete a particular procedure. Cautions provide information that could prevent making an error that could damage the vehicle. Warnings provide information to prevent personal injury. The warnings list on the previous page contains general warnings to follow when working on a vehicle.

Components which work together are shown together. For example, all electrical components used in any circuit are shown on one diagram. The circuit breaker or fuse is shown at the top of the page. All wires, connectors, splices, switches, and motors are shown in the flow of current to ground at the bottom of the page. Notes are included which describe how switches and other components work. If a component is used in several different circuits, it is shown in several places.

For example, the Main Light Switch is an electrical part of many circuits and is repeated on many pages. In some cases, how a component may seem (by its name) on a page where it has no electrical termination, termination, or action at a location shown

Troubleshooting Hints point the technician in a general direction, but are not intended as a step-by-step procedure. Ignition troubleshooting is an exception to this. It includes a step-by-step procedure of basic quick checks to locate some of the more common Ignition System problems. Reading the Shop Manual provides more detailed repair procedures.

Connector end views of switches and other components are shown in Cell 149 (beginning on page 149-1) to help with bench testing. The views show the harness wire colors that connect to the mating terminals. Connector colors and locations are shown in the *Location Index* chart. Two-color listings indicate separate colors for each connector half.

A Location Index in Cell 152 (beginning on page 152-1) identifies individual components, connectors, and splices. This index describes the component, connector, or splice location and directs you to the component illustrations. In addition, the component base part number has been included for your convenience in ordering parts. A list of harness base numbers, harness names and major systems associated with the respective harness base part number is also included within the Location Index.

The Grounds pages show detailed views of multiple component ground points. This is useful for checking interconnections among the ground circuits of different diagrams.

Component Connectors with more than 5 cavities are shown in Cell 150 (Beginning on page 150-1) to help with system troubleshooting. Any component connector with 5-9 cavities will be shown with a connector end

view of the connector. A component with 10 or more connector cavities will have a pinout chart in addition to the connector face. The pinout chart contains information such as cavity number, wire number and color, and circuit function.

Resistors and Diodes are currently covered with PVC molds and are taped to the harness outside the tubing. Many of the resistor and diode assemblies will be covered with heat shrinkable tubing making the assembly small enough to be placed within the harness bundle.

The wiring diagrams show the number of times the resistors and diodes are used. The wiring diagrams also show the distance from connector/length of wire in exact centimeters. Resistors and diodes are identified on the wiring diagrams by the following base part numbers:

Resistor/diode assembly	14A601
Diode only	14A604

We welcome any comments you may have regarding this EVTM. Use the Feedback Sheet at the back of this manual to submit comments. The information submitted on this sheet will improve future editions.

100% SATISFACTION GUARANTEED

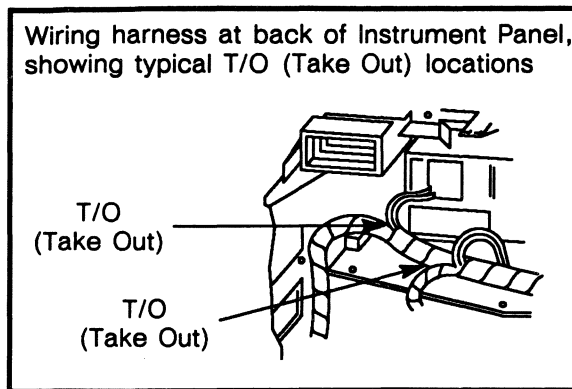
BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

Before using the EVTMM for troubleshooting, refer to the HELPFUL REMINDERS described on this page.

1. The abbreviation T/O, for take out, used in the Component Location Chart, refers to the point at which a harness branches to feed a component. Refer to the wiring harness illustration.



2. If a connector serves the same purpose in two separate versions (e.g., EFI/Carb), but is physically different, two connector numbers are used. However, if a connector serves the same purpose in two separate versions (e.g., EFI/Carb) and is physically the same, but the wire colors are different, only *one* connector number is used. If the same physical connector is used more than once, then more than *one* connector number is used.

3. Wiring diagrams provide a schematic picture of how and under what conditions the circuit is powered, of the current path to circuit components, and of how a circuit is grounded. Each circuit component is named (underlined titles). Wire and connector colors are listed (standard Ford color abbreviations are used):

COLOR ABBREVIATIONS

BL	Blue	N	Natural
BK	Black	O	Orange
BR	Brown	PK	Pink
DB	Dark Blue	P	Purple
DG	Dark Green	R	Red
GR	Green	T	Tan
GY	Gray	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		

Whenever a wire is labeled with two colors, the first color listed is the basic color of the wire, and the second color listed is the stripe marking of the wire.

4. When reporting Vehicle Repair Location Codes to Ford Parts and Service Division, refer to Cell 160 (Beginning on page 160-1).

Note: Do *not* use the illustrations in Cell 151 (Beginning on page 151-1) for reporting Vehicle Repair Location Codes.

5. WARNINGS

- *Always wear safety glasses for eye protection.*
- *Use safety stands whenever a procedure requires being under a vehicle.*
- *Be sure that the Ignition Switch is always in the OFF position, unless otherwise required by the procedure.*
- *Set the parking brake when working on any vehicle. An automatic transmission should be in PARK. A manual transmission should be in NEUTRAL.*
- *Operate the engine only in a well-ventilated area to avoid danger of carbon monoxide.*
- *Keep away from moving parts when the engine is running, especially the fan and belts.*
- *To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter, and muffler.*
- *Do not allow flame or sparks near the battery. Gases are always present in and around the battery cell. An explosion could occur.*
- *Do not smoke.*
- *To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing.*

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

4-1 HOW TO FIND THE ELECTRICAL PROBLEM

TROUBLESHOOTING STEPS

These six steps present an orderly method of troubleshooting.

Step 1. Verify the problem.

- Operate the complete system to check the accuracy and completeness of the customer's complaint.

Step 2. Narrow the problem.

- Using the EVTM, narrow down the possible causes and locations of the problem to pinpoint the exact cause.
- Read the description of *How the Circuit Works* and study the wiring diagram. You should then know enough about the circuit operation to determine where to check for the trouble. Further information can be found in the Shop Manual pages listed after *How the Circuit Works*.

Step 3. Test the cause.

- Use electrical test procedures to find the specific cause of the symptoms.
- *Troubleshooting Hints* will give you helpful ideas.
- The *Component Location Charts* and the pictures will help you find components. Following each chart, there is a reference to the Location Index at the end of the manual. This index gives component location information for connectors, diodes, resistors, splices and grounds.

Step 4. Verify the cause.

Confirm that you have found the correct cause by connecting jumper wires and/or

Step 5. Make the repair.

- Repair or replace the inoperative component.

Step 6. Verify the repair.

- Operate the system as in Step 1 and check that your repair has removed all symptoms without creating any new symptoms.

Some engine circuits may need special test equipment and special procedures. See the *Shop Manual* and other service books for details. You will find these circuits in this manual to be helpful with these special tests.

TROUBLESHOOTING TOOLS

JUMPER WIRE

This is a test lead used to connect two points of a circuit. A Jumper Wire can complete a circuit, bypassing an open.

WARNING

Never use a jumper wire across loads (motors, etc.) connected between hot and ground. This direct battery short may cause injury or fire.

VOLTMETER

A DC Voltmeter measures circuit voltage. Connect negative (- or black) lead to ground, and positive (+ or red) lead to voltage measuring point.

OHMMETER

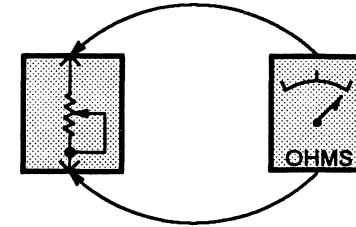


Figure 1-Resistance Check

An Ohmmeter shows the resistance between two connected points (Figure 1).

TEST LAMP

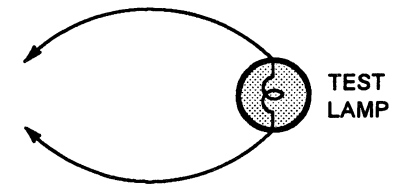


Figure 2-Test Lamp

A Test Light is a 12-volt bulb with two test leads (Figure 2).

Uses: Voltage Check, Short Check

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

SELF-POWERED TEST LAMP

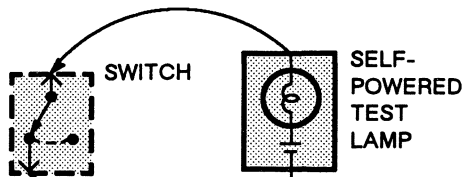


Figure 3—Continuity Check

The Self-Powered Test Lamp is a bulb, battery and set of test leads wired in series (Figure 3). When connected to two points of a continuous circuit, the bulb glows.

Uses: Continuity Check, Ground Check

CAUTION

When using a self-powered test lamp or ohmmeter, be sure power is off in circuit during testing. Hot circuits can cause equipment damage and false readings.

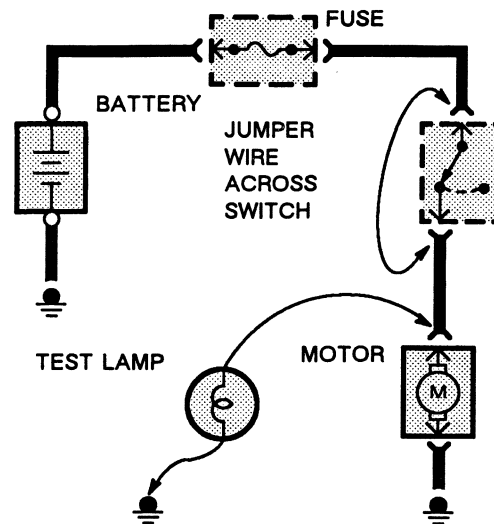


Figure 4—Switch Circuit Check and Voltage Check

In an inoperative circuit with a switch in series with the load, jumper the terminals of the switch to power the load. If jumpering the terminals powers the circuit, the switch is inoperative (Figure 4).

CONTINUITY CHECK (Locating open circuits)

Connect one lead of Self-Powered Test Lamp or Ohmmeter to each end of circuit (Figure 3). Lamp will glow if circuit is closed. Switches and fuses can be checked in the same way.

VOLTAGE CHECK

Connect one lead of test lamp to a known good ground or the negative (-) battery terminal. Test for voltage by touching the other lead to the test point. Bulb goes on when the test point has voltage (Figure 4).

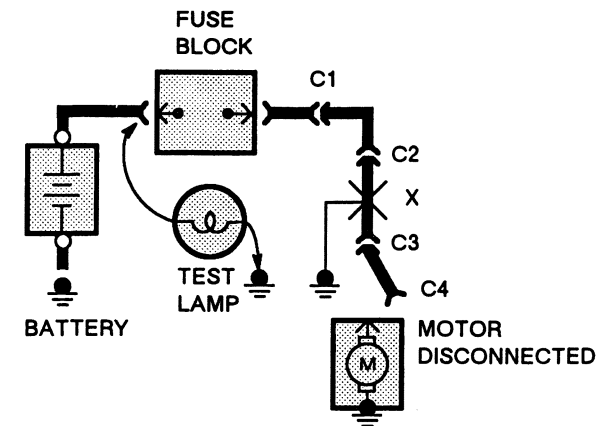


Figure 5—Short Check

A fuse that repeatedly blows is usually caused by a short to ground. It's important to be able to locate such a short quickly (Figure 5).

1. Turn off everything powered through the fuse.
2. Disconnect other loads powered through the fuse:
 - Motors: disconnect motor connector (Connector C4 in Figure 5)
 - Lights: remove bulbs.
3. Turn Ignition Switch to RUN (if necessary) to power fuse.
4. Connect one Test Lamp lead to hot end of blown fuse. Connect other lead to ground. Bulb should glow, showing power to fuse. *(This step is just a check to be sure you have power to the circuit.)*

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

4-3 HOW TO FIND THE ELECTRICAL PROBLEM

5. Disconnect the test lamp lead that is connected to ground, and reconnect it to the load side of the fuse at the connector of the disconnected component. (In Figure 5, connect the test lamp lead to connector C4.)
- If the Test Lamp is off, the short is in the disconnected component.
 - If the Test Lamp goes on, the short is in the wiring. You must find the short by disconnecting the circuit connectors, one at a time, until the Test Lamp goes out. For example, in figure 5 with a ground at X, the bulb goes out when C1 or C2 is disconnected, but stays on after disconnecting C3. This means the short is between C2 and C3.

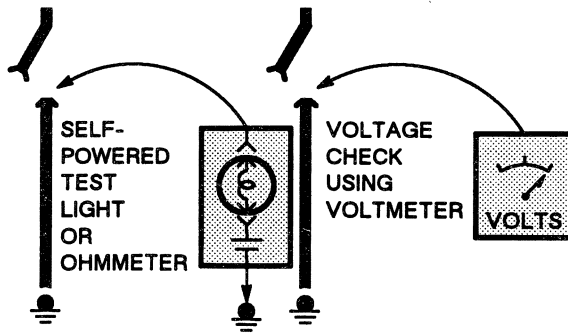


Figure 6—Ground Checks

Turn on power to the circuit. Perform a Voltage Check between the suspected inoperative ground and the frame. Any indicated voltage means that the ground is inoperative.

ect one
ohmme-
ner lead
the cir-

TROUBLESHOOTING HINTS

The circuit schematics in this manual make it easy to identify common points in circuits. This knowledge can help narrow the problem to a specific area. For example, if several circuits fail at the same time, check for a common power or ground connection. (See *Power Distribution* or *Grounds*.) If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

For example, if low beam headlamps work, but high beams and the indicator lamp don't work, then power and ground paths must be good. Since the dimmer switch is the component that switches this power to the high beam lights and indicator, it is most likely the cause of failure.

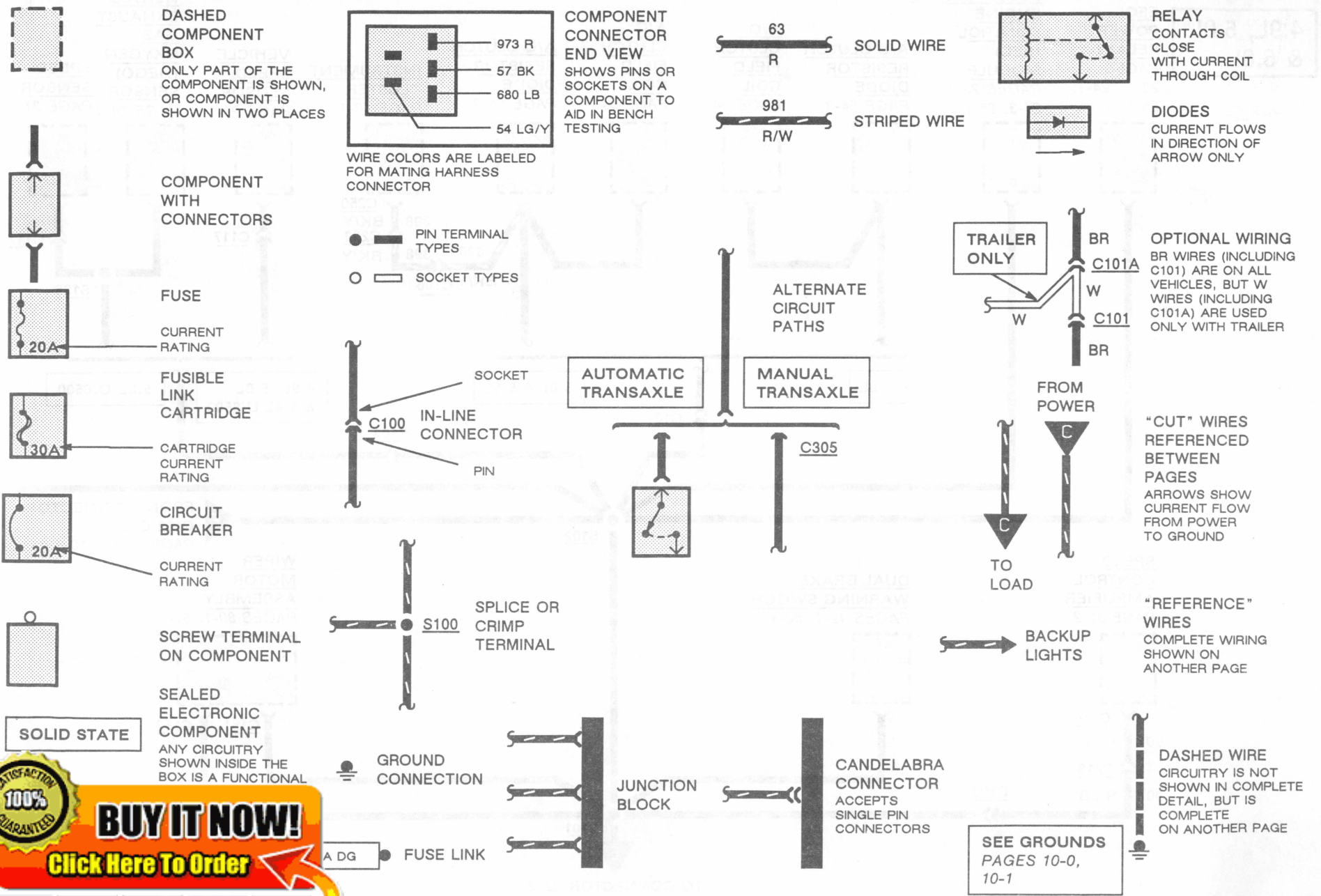
Troubleshooting Hints unique to a particular circuit are given in a new, three column format. Included in the charts are conditions that may develop, possible causes, and one or more tests that can be done quickly to determine the cause of the condition.

100% SATISFACTORY GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Cards Discover World MasterCard VISA



100% SATISFACTORY GUARANTEED

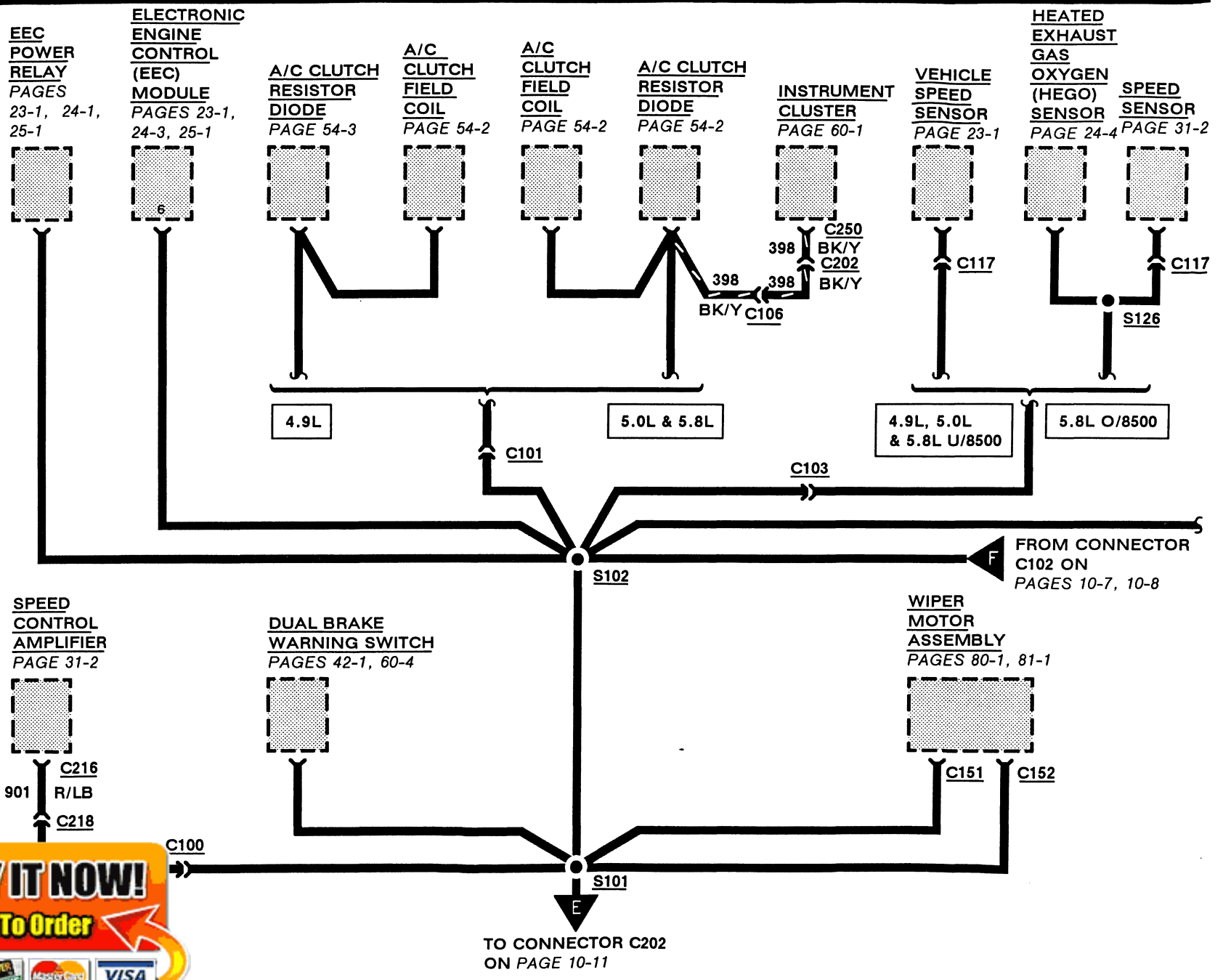
BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

10-1 GROUNDINGS

4.9L, 5.0L
& 5.8L



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

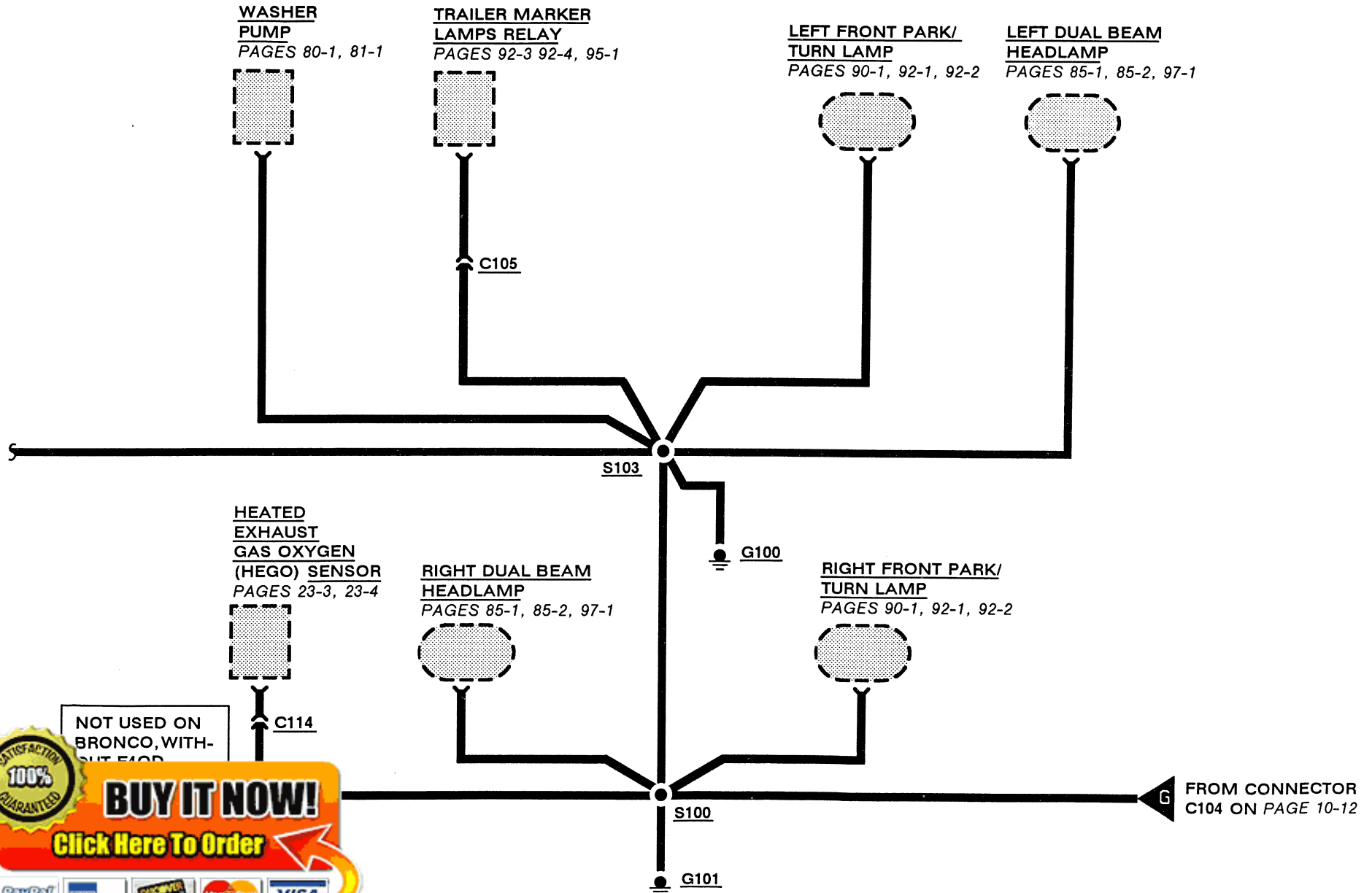
PayPal

Discover Cards

AMERICAN EXPRESS

MasterCard

VISA



100% SATISFACTORY GUARANTEED

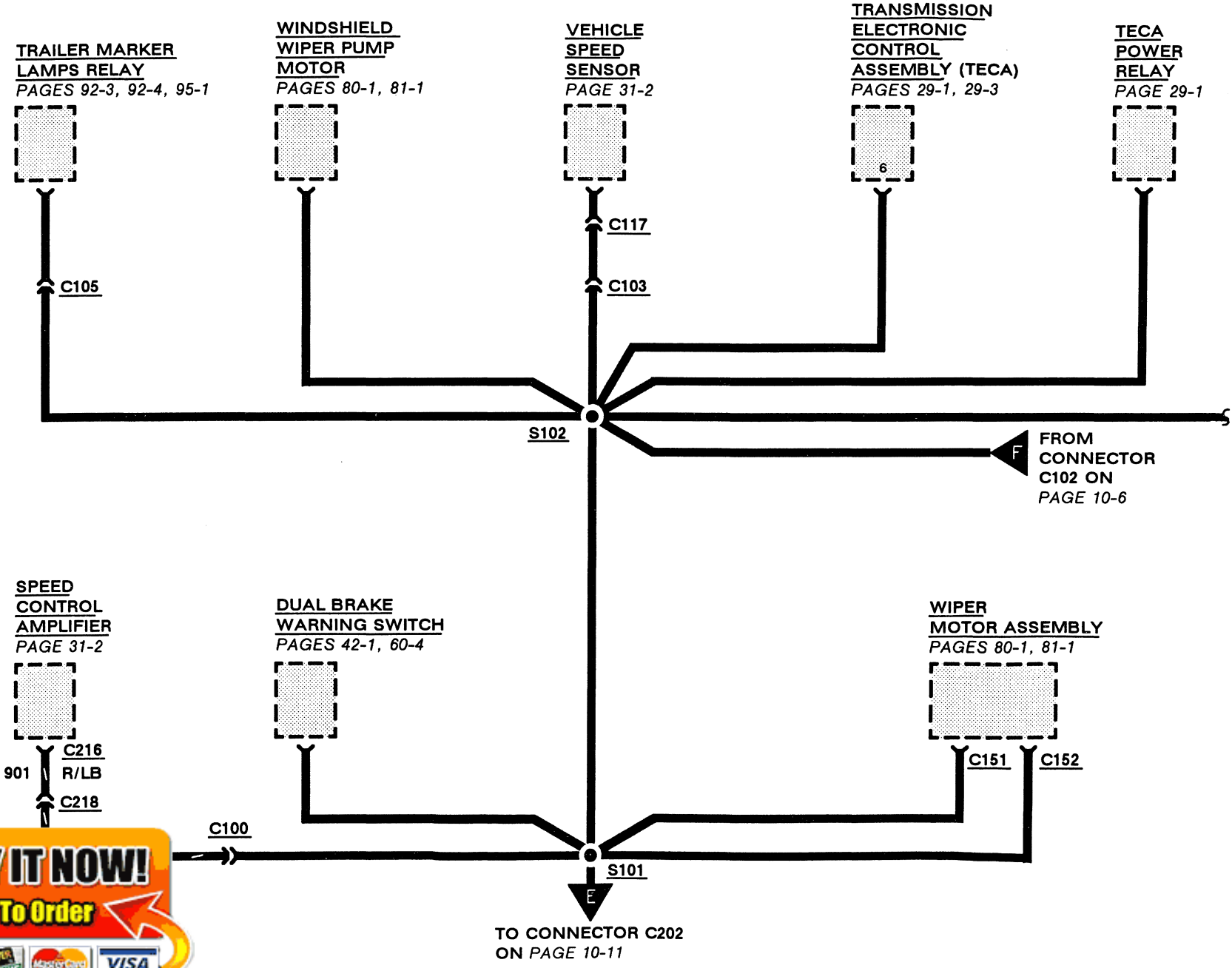
BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

10-3 GROUNDS

**DIESEL
(7.3L)**



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal

Discover Cards

AMERICAN EXPRESS

MasterCard

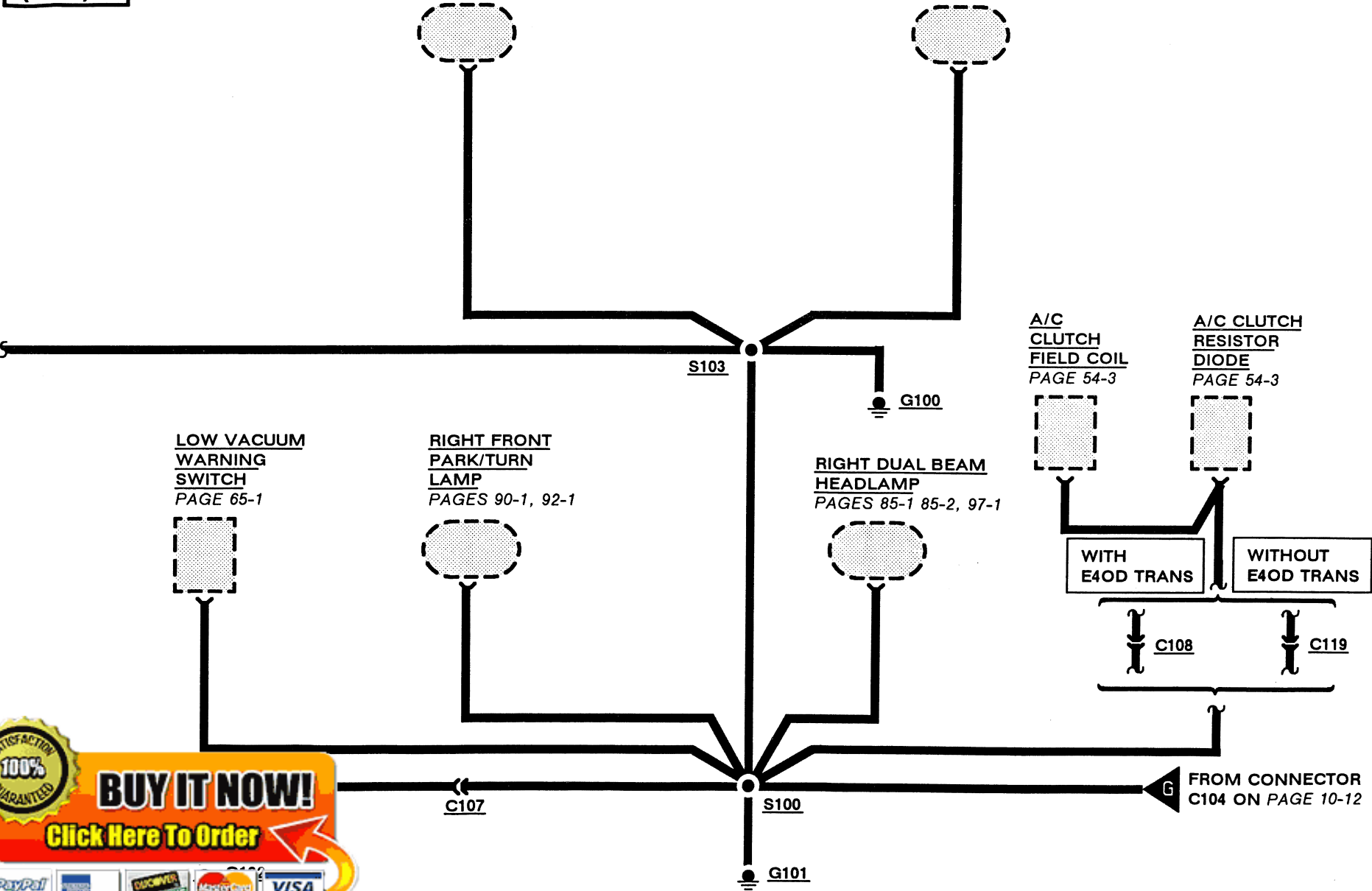
VISA

GROUNDS (G100, G101, G102) 10-4

**DIESEL
(7.3L)**

LEFT FRONT
PARK/TURN
LAMP
PAGES 90-1, 92-1

LEFT DUAL BEAM
HEADLAMP
PAGES 85-1, 85-2, 97-1



100% SATISFACTORY GUARANTEED

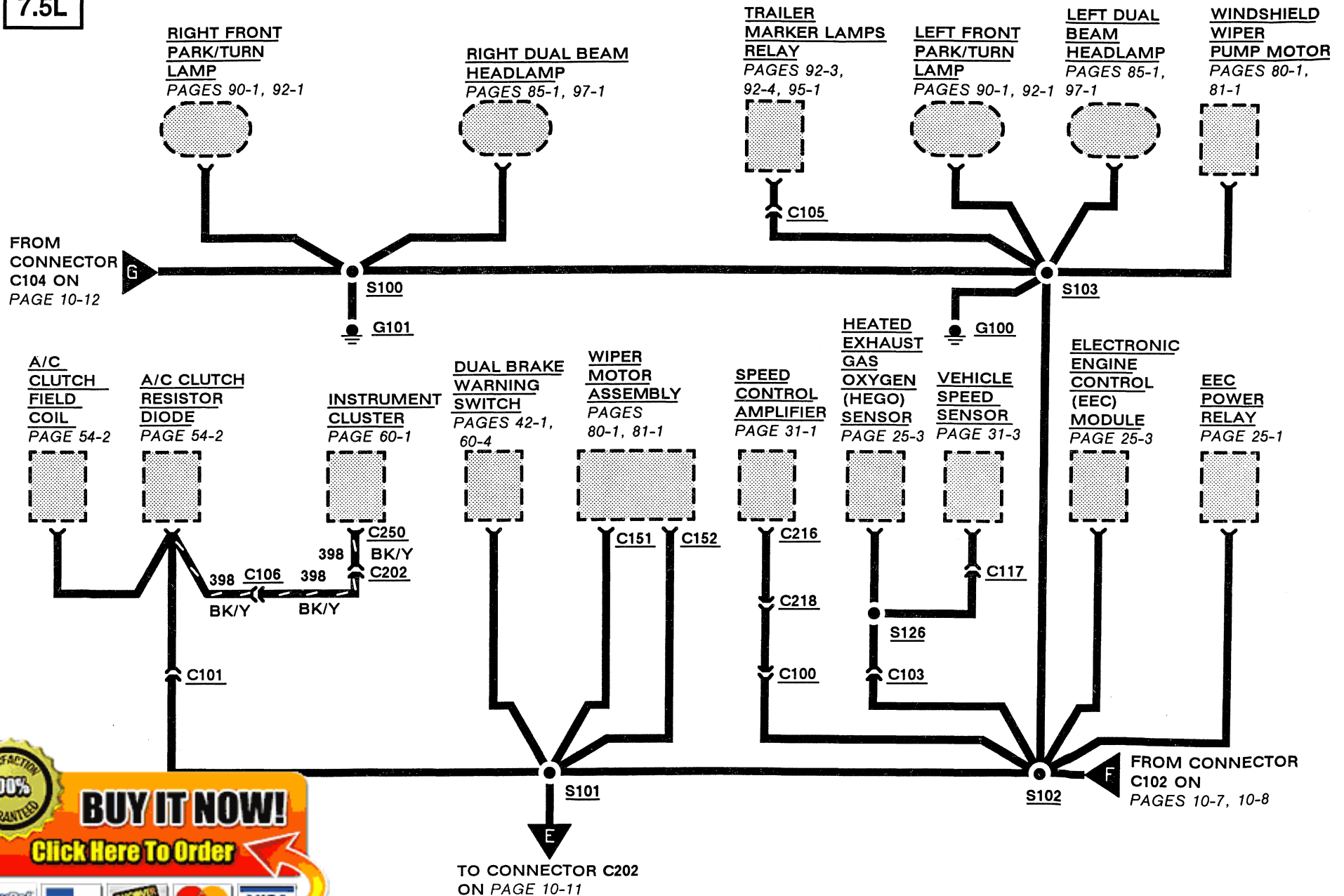
BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

10-5 GROUNDS (G100, G101)

7.5L



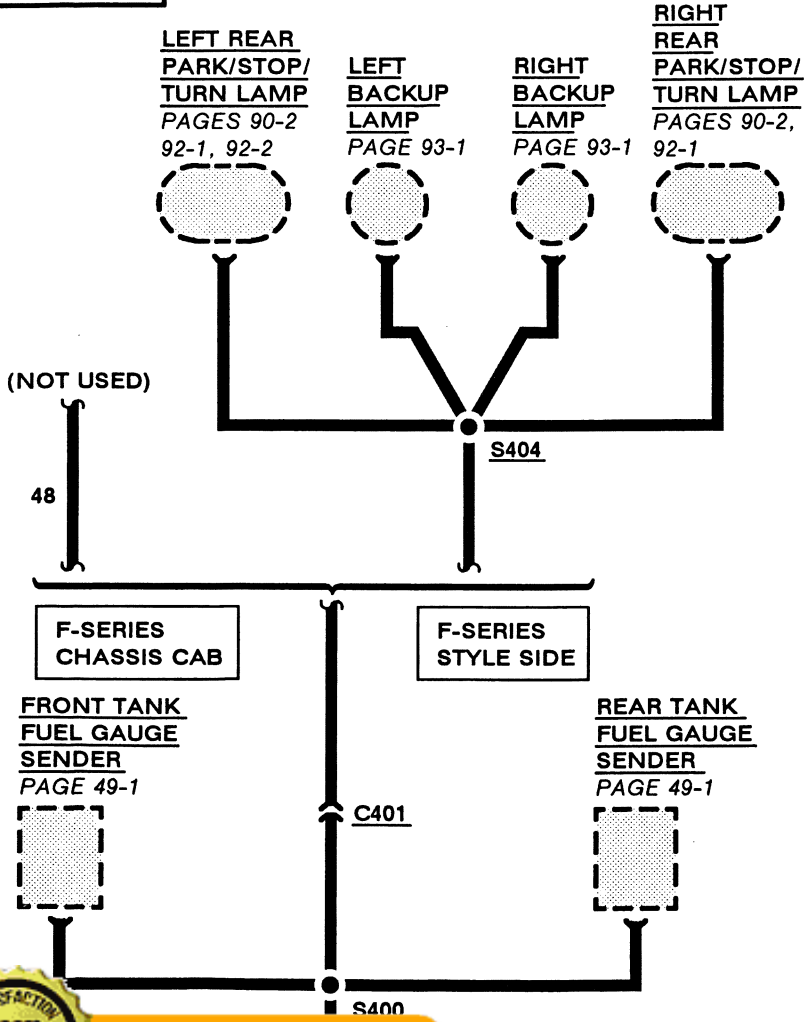
100% SATISFACTION GUARANTEED

BUY IT NOW!

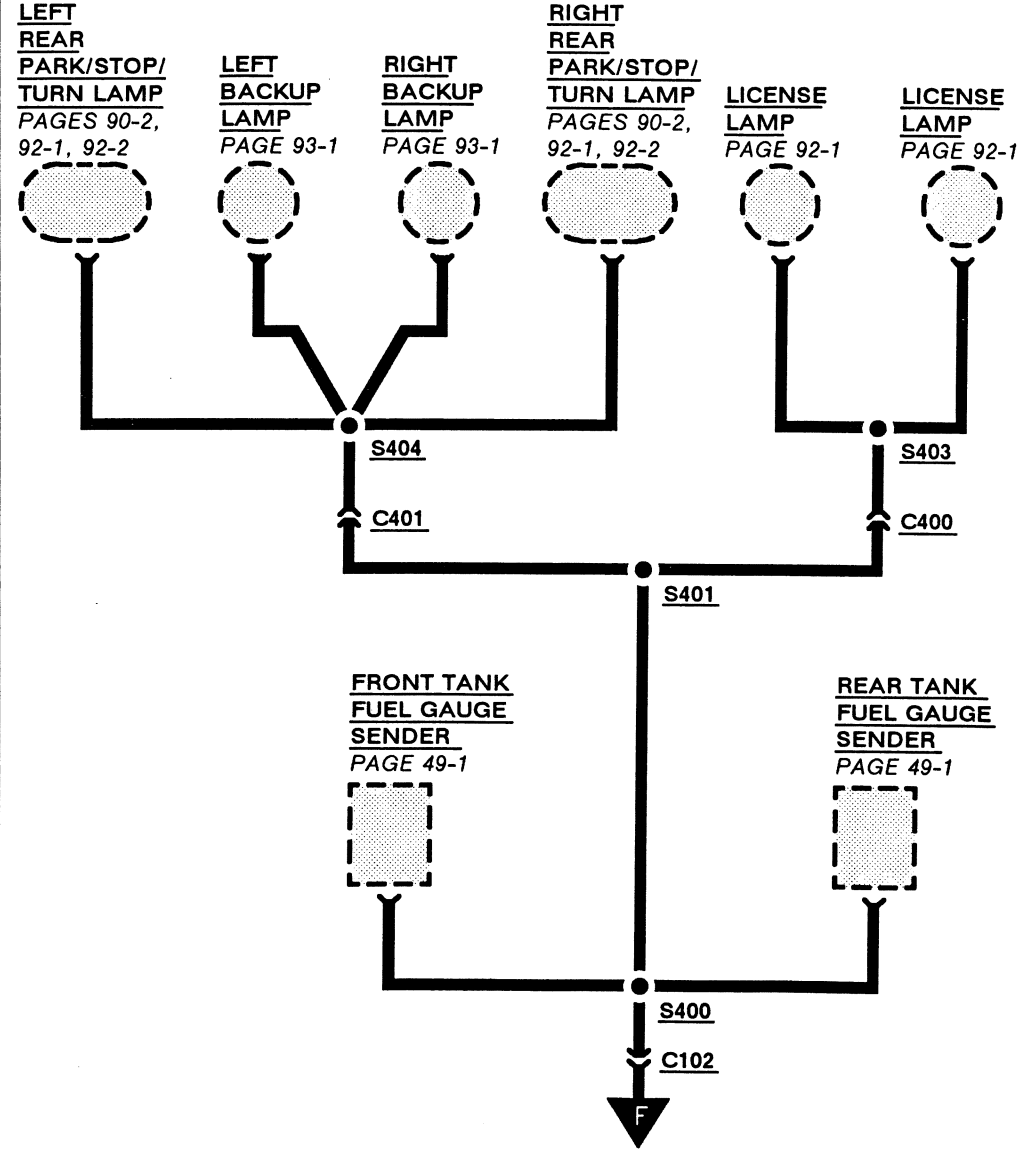
Click Here To Order

**DIESEL
(7.3L)**

137" + 161" W.B.



133" + 155" W.B.



TO SPLICE S102
ON PAGE 10-3

100% SATISFACTORY GUARANTEED

BUY IT NOW!

Click Here To Order

10-7 GROUNDS

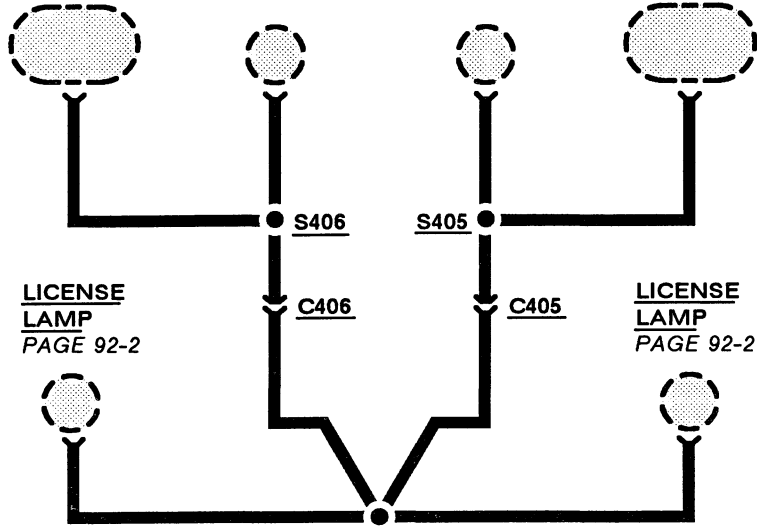
BRONCO

LEFT REAR
PARK/STOP/
TURN LAMP
PAGES 90-2,
92-1, 92-2

LEFT
BACKUP
LAMP
PAGE 93-1

RIGHT
BACKUP
LAMP
PAGE 93-1

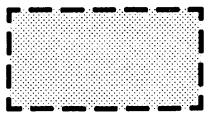
RIGHT REAR
PARK/STOP/
TURN LAMP
PAGES 90-2,
92-1, 92-2



LICENSE
LAMP
PAGE 92-2

LICENSE
LAMP
PAGE 92-2

FUEL GAUGE
SENDER
AND PUMP
PAGES 23-6, 24-6,
25-5, 49-2



89 O

100% SATISFACTION GUARANTEED

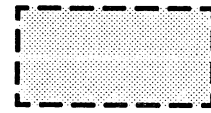
BUY IT NOW!

Click Here To Order

WIRING
PAGES 10-1, 10-5

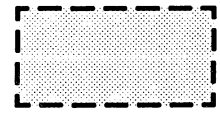
F-SERIES CHASSIS CAB

FRONT TANK
FUEL GAUGE
SENDER
AND PUMP
PAGES 23-6, 24-6,
25-5, 49-2

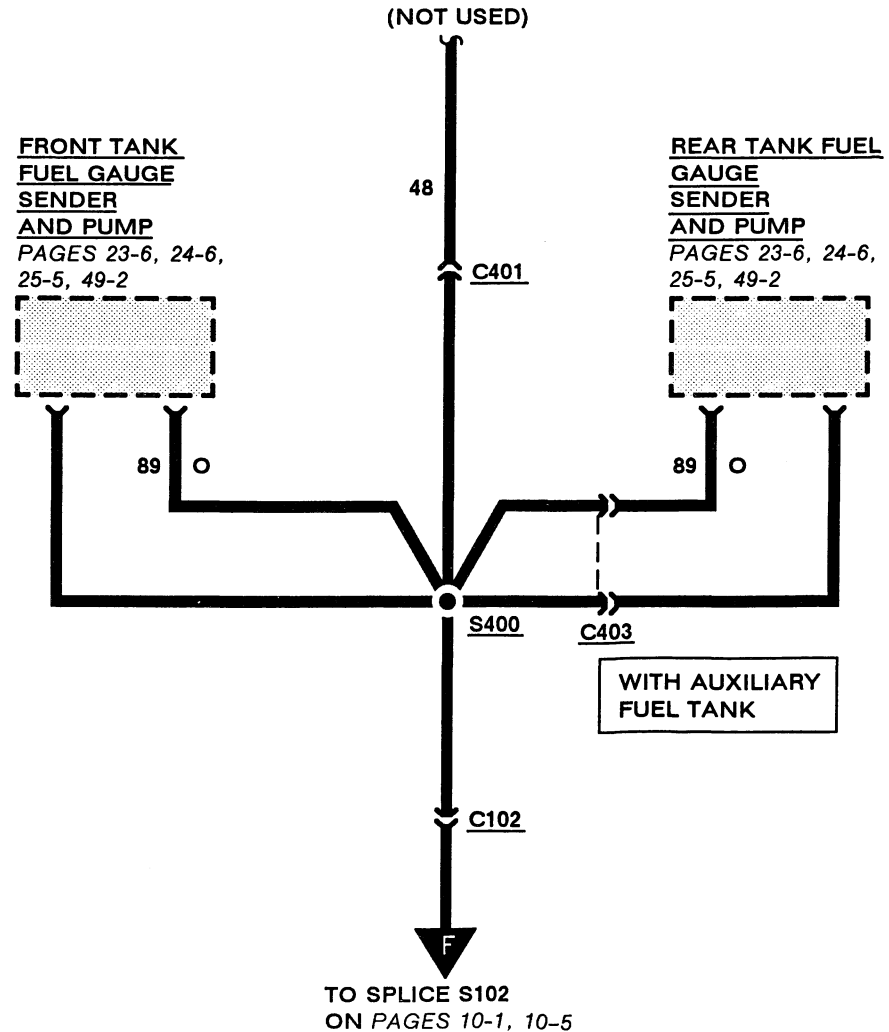


89 O

REAR TANK FUEL
GAUGE
SENDER
AND PUMP
PAGES 23-6, 24-6,
25-5, 49-2

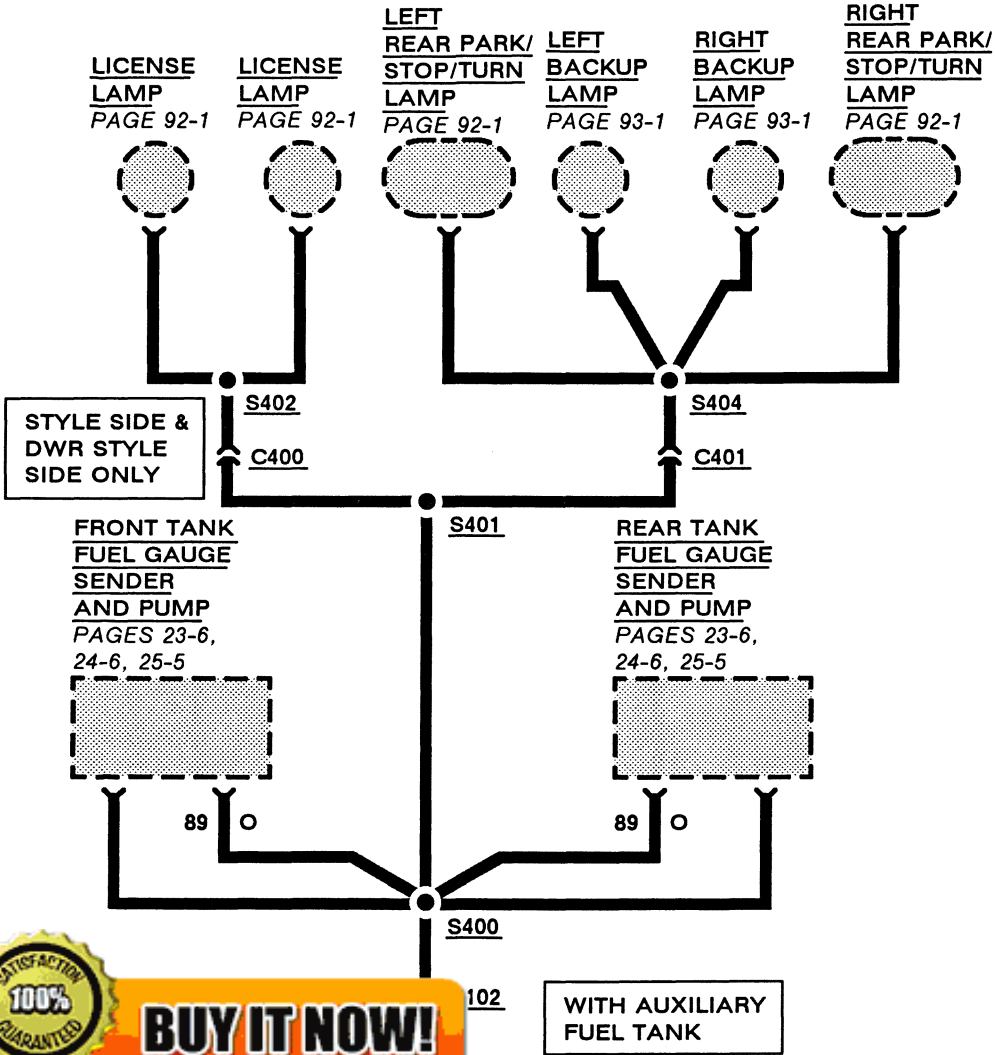


89 O

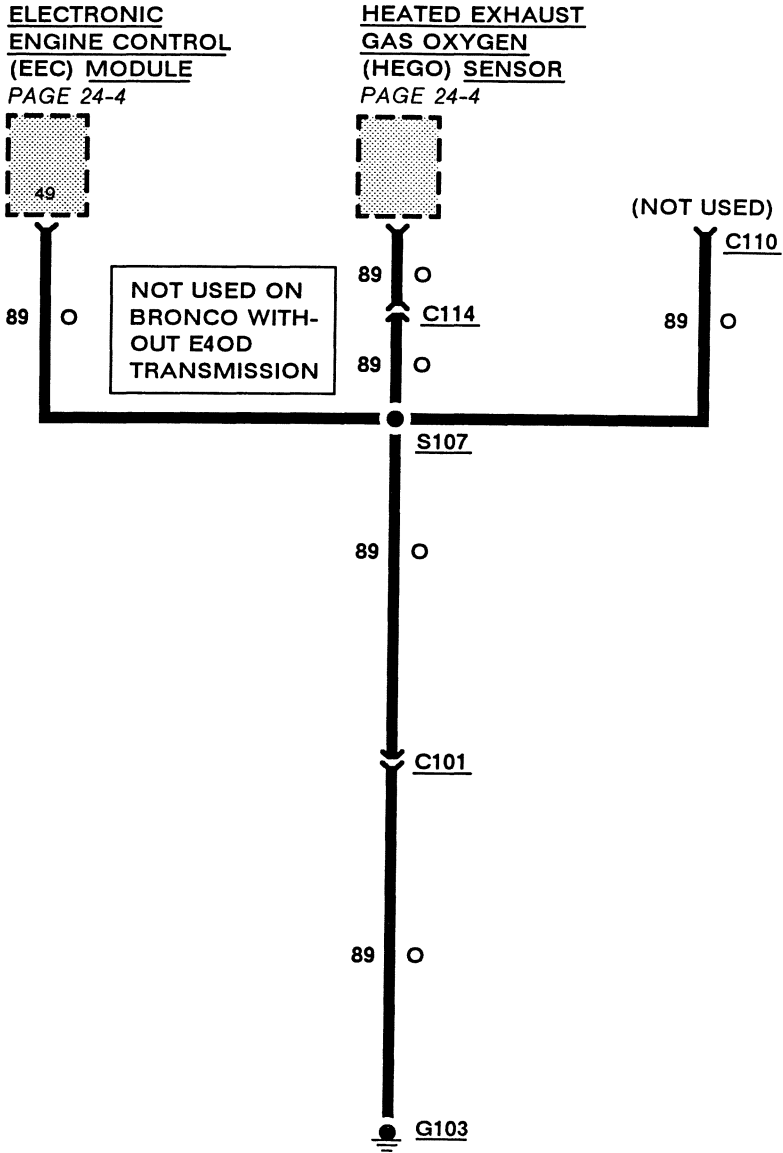


WIRING
ON PAGES 10-1, 10-5

F-SERIES, STYLE SIDE & DWR STYLE SIDE



5.0L



100% SATISFACTION GUARANTEED

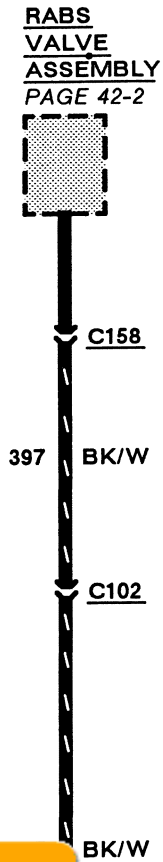
BUY IT NOW!

Click Here To Order

PayPal, Discover, MasterCard, VISA

10-9 GROUNDS (G102)

**F-SERIES
DIESEL WITHOUT E40D
TRANSMISSION**

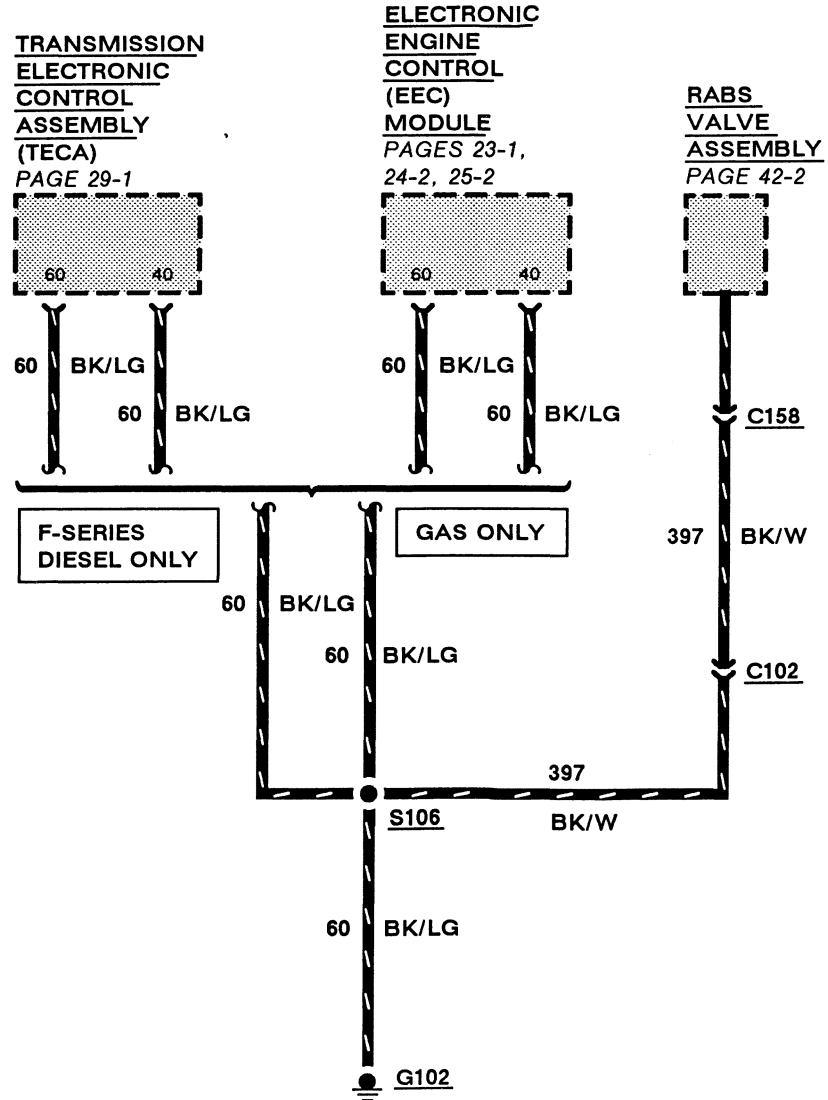


100% SATISFACTION GUARANTEED

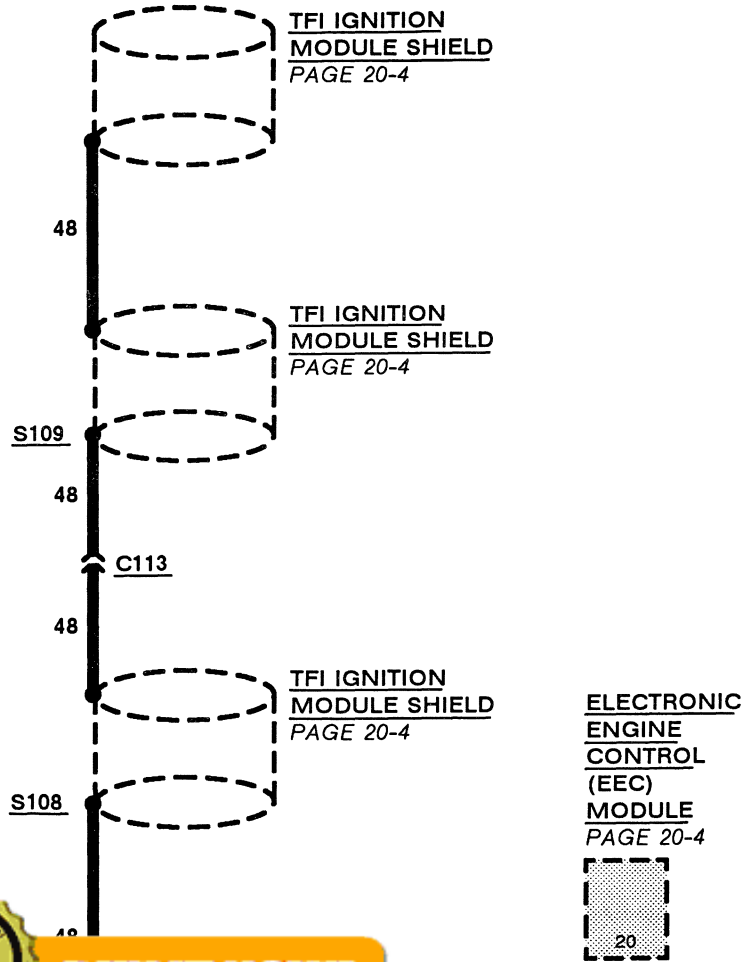
BUY IT NOW!

Click Here To Order

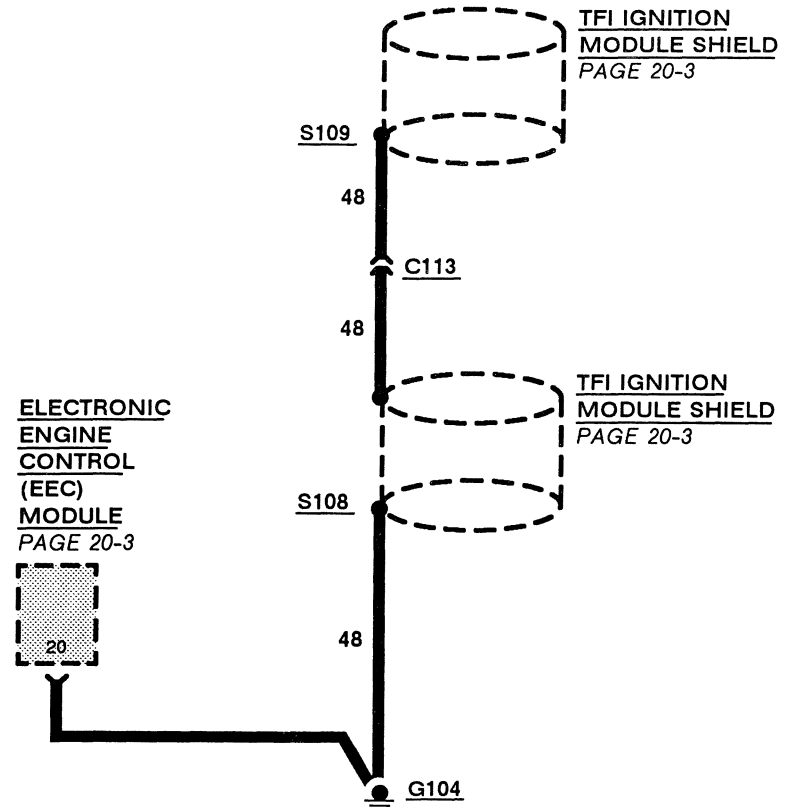
ALL OTHER MODELS



5.0L & 5.8L



4.9L



SATISFACTION 100% GUARANTEED

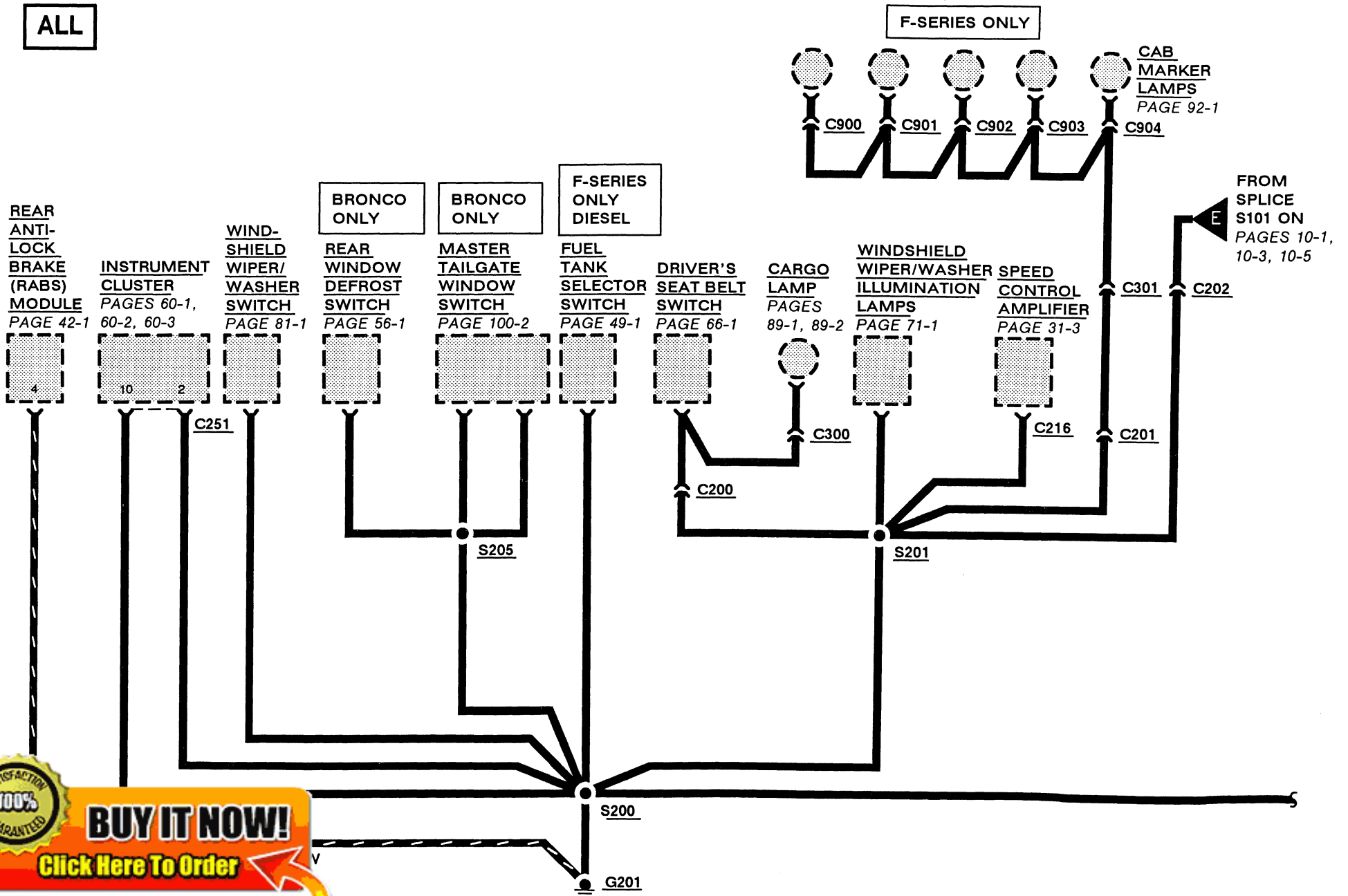
BUY IT NOW!

Click Here To Order

PayPal Discover American Express MasterCard VISA

10-11 GROUNDS (G201)

ALL

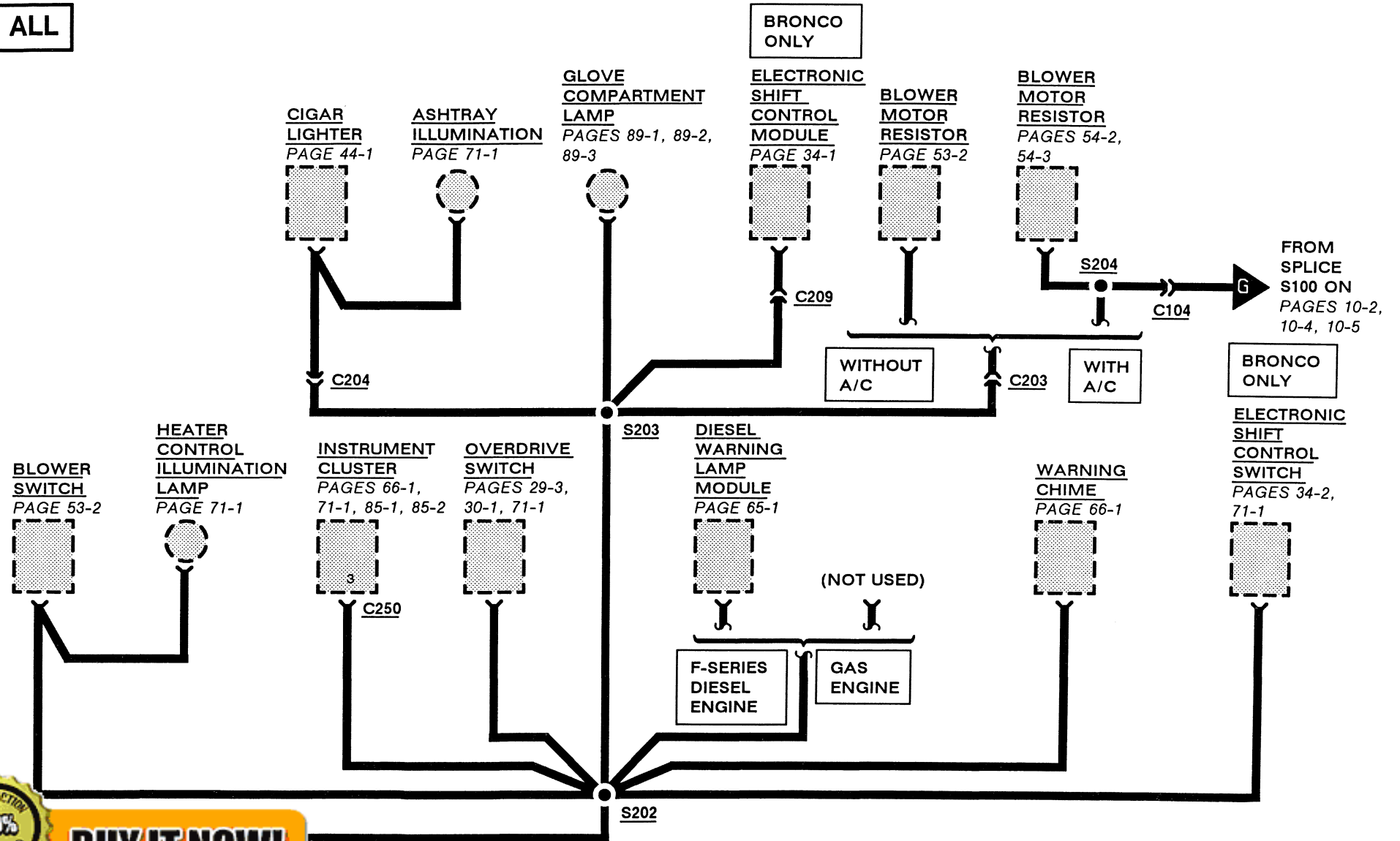


100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

ALL



100% SATISFACTION GUARANTEED

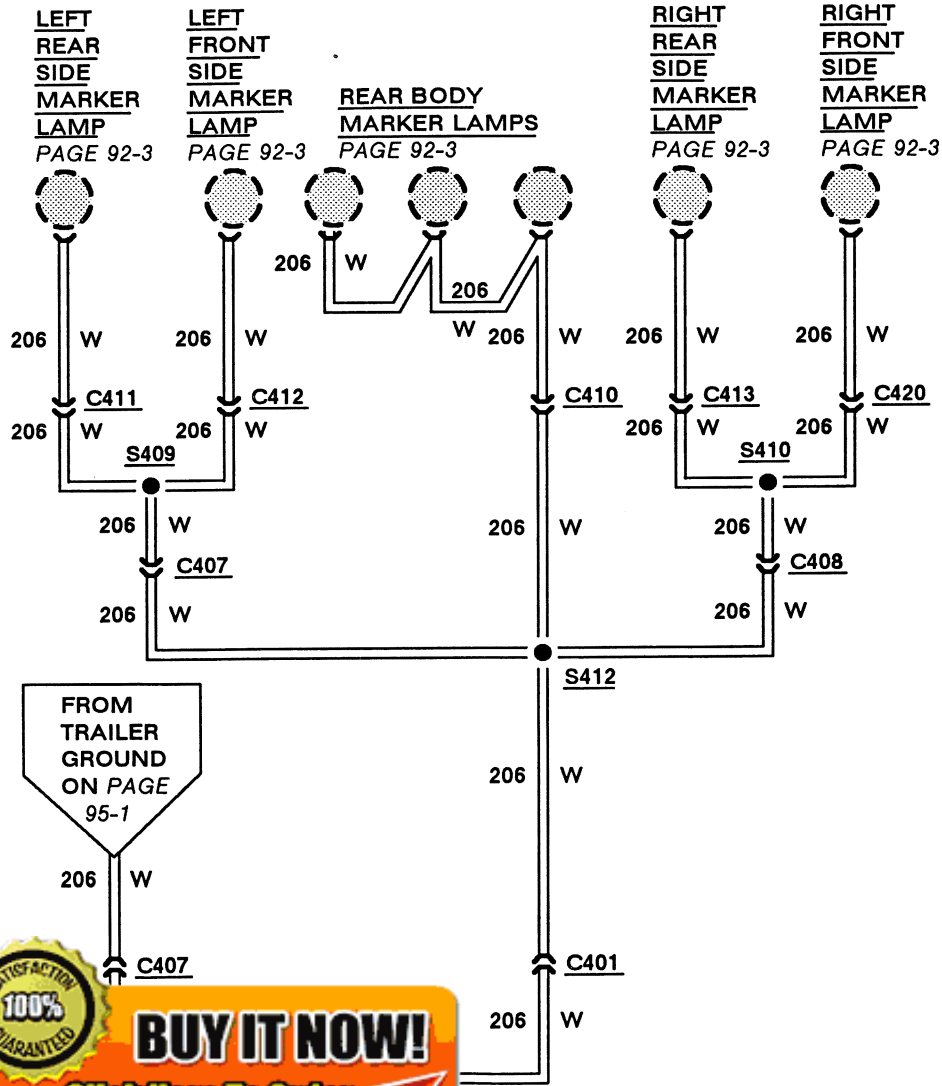
BUY IT NOW!

Click Here To Order

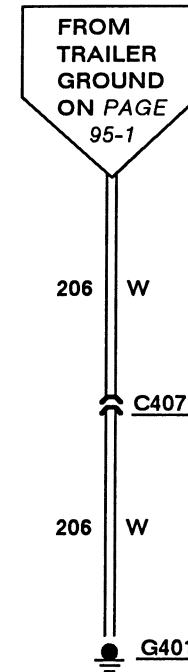
PayPal, American Express, Discover, MasterCard, VISA

10-13 GROUNDS (G401)

DRW STYLE SIDE



TRAILER TOW LESS DRW STYLE SIDE



100% SATISFACTION GUARANTEED
BUY IT NOW!
[Click Here To Order](#)

PayPal American Express Discover MasterCard VISA

HOW THE CIRCUIT WORKS

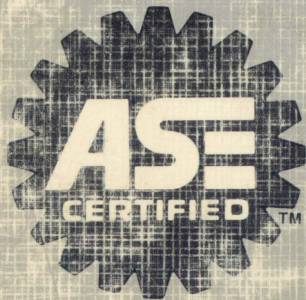
The ground circuits shown here are complete and connect several components together to screw terminal ground points. Parts of these circuits may be shown on other pages throughout the book. Partial ground circuits are shown dashed on those pages.

All simple or component ground circuits are shown on the individual circuit pages and are complete on those pages.

All wires are 57 BK unless otherwise noted.

Refer to Location Index page 152-1 for Connector, Diode, Resistor, Splice, Ground and Base Part Number descriptions and locations.





**WE SUPPORT VOLUNTARY
TECHNICIAN CERTIFICATION**



**Service
Publications**

Ford Parts and Service Division

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express DISCOVER MasterCard VISA

FPS-12129-90

1991 BRONCO / F150-F350 F-SUPER DUTY



**Electrical &
Vacuum
Trouble-**

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order 

PayPal American Express Discover MasterCard VISA



License #84356800

Copyright © 2023, Forel Publishing Company, LLC, Woodbridge, Virginia

All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, Woodbridge, VA 22192

**1991 Bronco/F150-F350/F-Super Duty Electrical &
Vacuum Trouble-Shooting Manual (EVTM)**

EAN: 978-1-60371-414-3

ISBN: 1-60371-414-6

Forel Publishing Company, LLC
Woodbridge, VA 22192
Email: sales@ForelPublishing.com
<https://www.ForelPublishing.com>



This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

Note from the Publisher

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the professional should be sought.



1991 BRONCO/F150-F350/F SUPER DUTY

ELECTRICAL AND VACUUM TROUBLESHOOTING MANUAL ART-12129-91

FORD PARTS and SERVICE DIVISION

Quality is Job 1

Ford Parts and Service Division has developed a new format for the EVTVM for the 1991 Thunderbird/Cougar. Our goal is to provide accurate and timely electrical and vacuum service information.

1991 EVTVM FEATURES

- **"HOW THE CIRCUIT WORKS"** descriptions that explain how each circuit works. These descriptions are designed to be used in conjunction with the Electrical Schematic.
- **Component Location** information, within each system, that tells where each component is located on the vehicle as well as a reference to a **"COMPONENT LOCATION VIEW."**
- **"COMPONENT TESTING"** procedures (CELL 149) that tell the user how to perform diagnostic tests on various circuits.
- **Connector End Views** (**"COMPONENT CONNECTOR FACES"** CELL 150) are shown for connectors with five or more cavities; and for connectors with ten or more cavities, a circuit function chart is provided.
- **NOTES, CAUTIONS and WARNINGS** that contain important safety information.
- Full view **"COMPONENT LOCATION VIEWS"** (CELL 151) to help locate on-vehicle components.
- **Component Base Part Numbers** and **Harness Base Part Numbers** to aid in ordering parts.
- **Cellular Pagination:** A specific section (or cell) in all EVTVMs is numbered by cell and starts with page 1. For example: **"HOW TO FIND ELECTRICAL CONCERNS"** is CELL 5 and begins with page 5-1.

igned for all electrical connectors. "C" numbers are listed
are listed in numerical order in the "LOCATION INDEX"

" - A feedback sheet is provided on the last page.

ORDERING INFORMATION

Information about how to order additional copies of this publication or other Ford publications may be obtained by writing to Helm Incorporated at the address shown below or by calling 1-800-782-4356. Other publications available include:

- Shop Manuals
- Service Specification Books
- Car/Truck Wiring Diagrams
- Engine/Emissions Diagnosis Manuals

Helm Incorporated
P.O. Box 87150
Detroit, Michigan 48207



1-1 TABLE OF CONTENTS/INDEX

Table Of Contents

How to Use This Manual	2-1
Helpful Reminders	3-1
Electrical Symbols	4-1
How to Find the Electrical Concern	5-1
Grounds	10-1
Circuit Protection/Fuse Panel	11-1
Charging System	12-1
Power Distribution	13-1
Starting System	20-1
Ignition System	21-1
Electronic Engine Control (4.9L EFI)	23-1
Electronic Engine Control (5.0L and 5.8L EFI)	24-1
Electronic Engine Control (7.5L EFI)	25-1
Glow Plug Control	26-1
E4OD Transmission (Diesel)	29-1
E4OD Transmission (Gasoline)	30-1
Speed Control	31-1
Cooling Fan	33-1
All Wheel Drive	34-1
Anti-Lock Brakes	42-1
Horn/Cigar Lighter	44-1
Fuel Tank Selector	49-1
Heater	53-1
Air Conditioner/Heater	54-1
Rear Window Defrost	56-1
Instrument Cluster (4 Gauge)	60-1
Instrument Cluster (5 Gauge)	61-1
Vehicle Speed Sensor (VSS)	64-1
Warning Indicators	65-1
Warning Chime	66-1
Interior Illumination	71-1
Exterior Lamps	80-1
Backup Lamps	81-1
Trailer Adapter	85-1
Daytime Running Lamps	89-1
Power Windows	90-1
Power Door Locks	90-1

Exterior Lamps	92-1
Backup Lamps	93-1
Trailer Adapter	95-1
Daytime Running Lamps	97-1
Power Windows	100-1
Power Door Locks	110-1
Radio	130-1
Vacuum Symbols	140-1
How to Find Vacuum Concern	141-1
Vacuum Distribution	142-1
Component Testing	149-1
Connector Faces	150-1
Component Location Views	151-1
Location Index	152-1
Vehicle Repair Location Codes	160-1

Index

All Wheel Drive	34-1
Anti-lock Brakes	42-1
A/C-Heater	
Vacuum	54-1
Electrical	54-2
Charging System	12-1
Cigar Lighter	44-1
Circuit Protection/Fuse Panel	11-1
Component Testing	
A/C Function Selector Switch	149-7
Backup/Neutral Safety Switch	149-12
Blower Switch	149-8
Heater Function Selector Switch	149-9
Ignition Switch	149-2
Interval Wiper/Washer Switch	149-6
Introduction	149-1
Main Light Switch	149-1
Manual Lever Position Switch	149-11
Multi-Function Switch	149-3, 149-4
Tank Selector Valve	149-10
Wiper/Washer Switch	149-5

Connector Faces/Pinout Charts	150-1
Courtesy Lamps	89-1
Electronic Engine Control	
4.9L	23-1
5.0L & 5.8L	24-1
7.5L	25-1
E4OD Transmission	30-1
Fuel Tank Selector	
Diesel	49-1
Gas	49-2
Fuse Panel	
Diesel	12-5
Gas	12-3
Fuse 4	12-12
Fuse 5	12-9, 12-10
Fuse 8	12-12
Fuse 10	12-6
C.B.12	12-11
Fuse 11	12-12
Fuse 18	12-7, 12-8
Gauges	
Coolant Temperature	60-1, 61-1, 61-2
Fuel	
Diesel	61-2
Gas	60-1, 61-1
Oil Pressure	
Diesel	61-2
Gas	60-1, 61-1
Tachometer	
Diesel	61-2
Gas	61-1
Voltmeter	
Diesel	61-2
Gas	60-1, 61-1
Glow Plug Control	26-1
Grounds	
G100	
4.9L, 5.0L, 5.8L	10-1

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

TABLE OF CONTENTS/INDEX 1-2

7.3L	10-3	Instrument Illumination	71-1	Starting System	
7.5L	10-5	Lamps (Exterior)		Diesel	20-3
G101		Backup	93-1, 93-2	Gas	20-1
4.9L, 5.0L, 5.8L	10-2	Daytime Running Lamps	97-1	Trailer Adapter	95-1
7.3L	10-4	Hazard	90-1	Transmission Control	29-1
7.5L	10-6	License		Vacuum Distribution	140-1
G102	10-4	F-Series	92-1	Vehicle Speed Sensor (VSS)	64-1
G201	10-10	Bronco I	92-2	Warning Chimes	66-1
G401	10-9	Marker	92-1, 92-3	Warning Indicators	65-1
Headlamps	85-1	Park		Windshield Wiper/Washer	80-1
Heater	53-1	F-Series	92-1	Wiper/Washer (Interval)	81-1
Horn	44-1	Bronco I	92-2		
Ignition Switch	20-2	Stop	90-1		
Diesel	12-5	Turn			
Gas	12-3	Front	92-1		
Ignition System	21-1	Rear	92-2, 90-3		
Indicators		Lamps (Interior)			
4 x 4	60-2, 61-3	Cargo/Dome			
Anti-lock	42-1, 60-2, 61-3	F-Series	89-1		
Brake Warning		Bronco I	89-2		
Diesel	65-1	Courtesy Lamps			
Gas	60-2, 61-3	F-Series	89-1		
Charge	12-1, 12-2	Bronco I	89-2, 89-3		
Check Engine	60-2, 61-3	Leece and Neville Alternator	13-1		
Engine Warning	61-2	Main Light Switch	12-12		
Fasten Seat Belt	60-3, 61-4	Power Distribution	13-1		
High Beam	85-1, 85-2	Power Door Locks	110-1		
Low Range	60-2, 61-3	Power Windows			
Plugged Fuel Filter	61-2, 65-1	F-Series	100-1		
Turn		Bronco I	100-2		
Left	60-3, 61-4, 90-1	Radio	130-1		
Right	60-3, 61-4, 90-1	Rear Window Defrost	56-1		
to Start	65-1	Speed Control			
to Stop	65-1	Diesel	31-3		
to Turn	60-1	Gas	31-2		
to Start	61-1				

IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the personal safety of the individual doing the work. This Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.



2-1 HOW TO USE THIS MANUAL

The purpose of this manual is to make troubleshooting easier by showing the electrical and vacuum circuits of these vehicles in a clear and simple fashion. With each circuit is a description of *How the Circuit Works* and some *Troubleshooting Hints*. A Component Location chart lists components and references to pictures in the manual.

Notes, Cautions and Warnings containing important information appear in boxes on text pages. Notes provide additional information to help complete a particular procedure. Cautions provide information that could prevent making an error that could damage the vehicle. Warnings provide information to prevent personal injury. The warnings list on the following page contains general warnings to follow when working on a vehicle.

Components which work together are shown together. For example, all electrical components used in any circuit are shown on one diagram. The circuit breaker or fuse is shown at the top of the page. All wires, connectors, splices, switches, and motors are shown in the flow of current to ground at the bottom of the page. Notes are included which describe how switches and other components work. If a component is used in several different circuits, it is shown in several places.

For example, the Main Light Switch is an electrical part of many circuits and is repeated on many pages. In some cases, however, a component may seem (by its name) to belong on a page where it has no electrical connection. This is because the component is repeated on many pages. For example, the Main Light Switch is an electrical part of many circuits and is repeated on many pages. In some cases, however, a component may seem (by its name) to belong on a page where it has no electrical connection. This is because the component is repeated on many pages.

Troubleshooting Hints point the technician in a general direction, but are not intended as a step-by-step procedure. Ignition troubleshooting is an exception to this. It includes a step-by-step procedure of basic quick checks to locate some of the more common Ignition System problems. Reading the shop manual provides more detailed repair procedures.

Connector end views of switches and other components are shown in Cell 149 (beginning on page 149-1) to help with bench testing. The views show the harness wire colors that connect to the mating terminals. Connector colors and locations are shown in the *Location Index* chart. Two-color listings indicate separate colors for each connector half.

A Location Index, in Cell 152 (beginning on page 152-1), identifies individual components, connectors and splices. This index describes the component, connector or splice location and directs you to the component illustrations. In addition, the component base part number has been included for your convenience in ordering parts. A list of harness base numbers, harness names and major systems associated with the respective harness base part number is also included within the Location Index.

The Grounds pages show detailed views of multiple component ground points. This is useful for checking interconnections among the ground circuits of different diagrams.

Component Connectors with 5 or more cavities are shown in Cell 150 (beginning on page 150-1) to help with system troubleshooting. Any component connector with 5-9 cavities will be shown with a connector end

view of the connector. A component with 10 or more connector cavities will have a pinout chart in addition to the connector face. The pinout chart contains information such as cavity number, wire number and color, and circuit function.

On some car lines, resistors and diodes are covered with PVC molds; terminals are also part of the molded assembly. The assembly plugs into a harness connector and is taped to the harness, outside the conduit.

In other cases, the resistor and diode assemblies will be covered with heat-shrinkable tubing, making the assembly small enough to be placed within the harness conduit.

The wiring diagrams show the number of times the resistors and diodes are used. The wiring diagrams also show the distance from connector/length of wire in exact centimeters. Resistors and diodes are identified on the wiring diagrams by the following base part numbers:

Resistor/diode assembly	14A601
Diode only	14A604

We welcome any comments you may have regarding this EVT.M. Use the Feedback Sheet at the back of this manual to submit comments. The information submitted on this sheet will improve future editions.



SATISFACTION 100% GUARANTEED

BUY IT NOW!

Click Here To Order

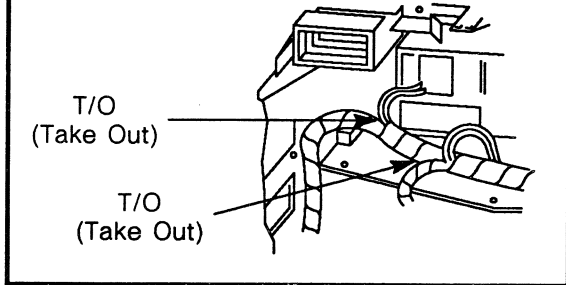
PayPal American Express Discover MasterCard VISA

3-1 HELPFUL REMINDERS

Before using the EVTM for troubleshooting, refer to the HELPFUL REMINDERS described on this page.

1. The abbreviation T/O, for take out, used in the Component Location Chart, refers to the point at which a harness branches to feed a component. Refer to the wiring harness illustration.

Wiring harness at back of Instrument Panel, showing typical T/O (Take Out) locations



2. If a connector serves the same purpose in two separate versions (e.g., EFI/Carb), but is physically different, two connector numbers are used. However, if a connector serves the same purpose in two separate versions (e.g., EFI/Carb) and is physically the same, but the wire colors are different, only *one* connector number is used. If the same physical connector is used more than once, then more than *one* connector number is used.

3. Wiring diagrams provide a schematic picture of how and under what conditions the circuit is powered, of the current path to circuit components, and of how a circuit is grounded. Each circuit component is named (underlined titles). Wire and connector colors are listed (standard Ford color abbreviations are used):

COLOR ABBREVIATIONS

BL	Blue	N	Natural
BK	Black	O	Orange
BR	Brown	PK	Pink
DB	Dark Blue	P	Purple
DG	Dark Green	R	Red
GR	Green	T	Tan
GY	Gray	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		

Whenever a wire is labeled with two colors, the first color listed is the basic color of the wire, and the second color listed is the stripe marking of the wire.

4. When reporting Vehicle Repair Location Codes to Ford Parts and Service Division, refer to Cell 160 (beginning on page 160-1).

Note: Do *not* use the illustrations in Cell 151 (beginning on page 151-1) for reporting Vehicle Repair Location Codes.

5. WARNINGS

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires being under a vehicle.
- Be sure that the **Ignition Switch** is always in the OFF position, unless otherwise required by the procedure.
- Set the park brake when working on any vehicle. An automatic transmission should be in PARK. A manual transmission should be in NEUTRAL.
- Operate the engine only in a well-ventilated area to avoid danger of carbon monoxide.
- Keep away from moving parts when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter and muffler.
- Do not allow flame or sparks near the battery. Gases are always present in and around the battery cell. An explosion could occur.
- Do not smoke.
- To avoid injury, always remove rings, watches, loose hanging jewelry and loose clothing.

100% SATISFACTION GUARANTEED

BUY IT NOW!

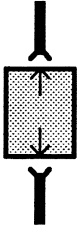
Click Here To Order

PayPal American Express Discover MasterCard VISA

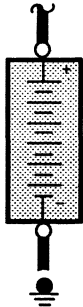
4-1 ELECTRICAL SYMBOLS



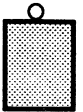
DASHED COMPONENT BOX
 ONLY PART OF THE COMPONENT IS SHOWN ON THE PAGE; THE COMPONENT IS SHOWN COMPLETE IN ANOTHER LOCATION



COMPONENT WITH CONNECTORS



BATTERY



SCREW TERMINAL ON COMPONENT

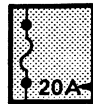
SOLID STATE

SEALED ELECTRONIC COMPONENT
 ANY CIRCUITRY SHOWN INSIDE THE BOX IS A FUNCTIONAL EQUIVALENT ONLY

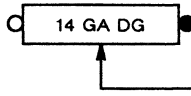
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



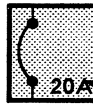
FUSE
 CURRENT RATING



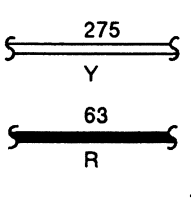
FUSIBLE LINK
 WIRE SIZE AND COLOR



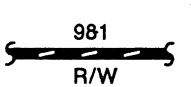
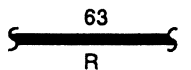
FUSIBLE LINK CARTRIDGE
 CARTRIDGE CURRENT RATING



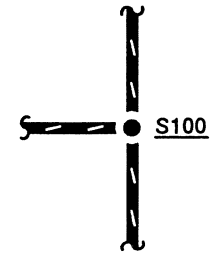
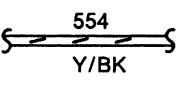
CIRCUIT BREAKER
 CURRENT RATING



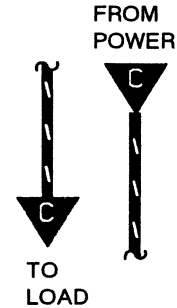
SOLID WIRES



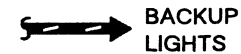
STRIPED WIRES



SPLICE OR CRIMP TERMINAL

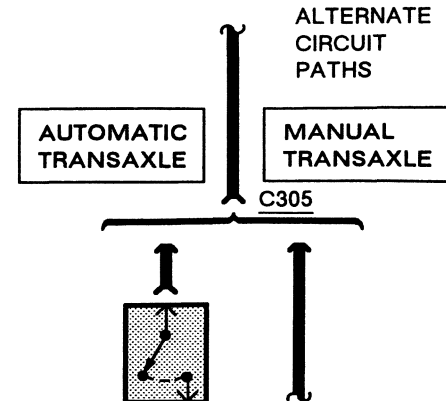


"CUT" WIRES REFERENCED BETWEEN PAGES
 ARROWS SHOW CURRENT FLOW FROM POWER TO GROUND

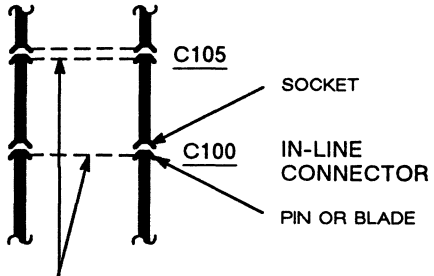


BACKUP LIGHTS

"REFERENCE" WIRES
 COMPLETE WIRING SHOWN ON ANOTHER PAGE

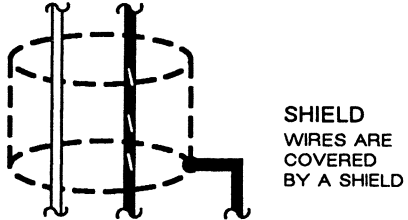
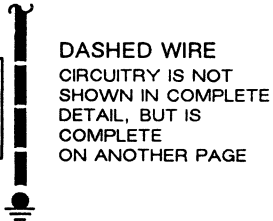


ALTERNATE CIRCUIT PATHS



SINGLE OR DOUBLE DASHED LINE INDICATES THAT WIRE ON LEFT ALSO PASSES THROUGH THE SAME CONNECTOR

SEE GROUNDS
PAGES 10-1,
10-2



SHIELD WIRES ARE COVERED BY A SHIELD

FIELD COIL

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



MOTOR



HEATING ELEMENT



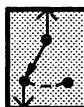
THERMISTOR



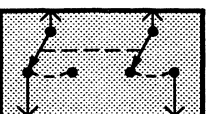
RHEOSTAT OR POTENTIOMETER



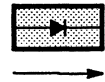
SOLENOID



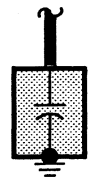
SWITCH



GANGED SWITCHES CONTACTS MOVE AT THE SAME TIME



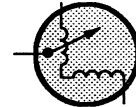
DIODES CURRENT FLOWS IN DIRECTION OF ARROW ONLY



CAPACITOR



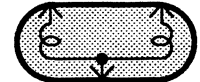
TRANSISTOR



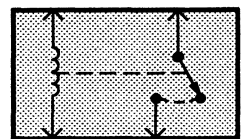
GAUGE



LIGHT BULB



DUAL FILAMENT LIGHT BULB



RELAY CONTACTS CHANGE POSITION WITH CURRENT THROUGH COIL

5-1 HOW TO FIND THE ELECTRICAL CONCERN

TROUBLESHOOTING STEPS

These six steps present an orderly method of troubleshooting.

Step 1. Verify the concern.

- Operate the complete system to check the accuracy and completeness of the customer's complaint.

Step 2. Narrow the concern.

- Using the EVTM, narrow down the possible causes and locations of the concern to pinpoint the exact cause.
- Read the description of *How the Circuit Works* and study the wiring diagram. You should then know enough about the circuit operation to determine where to check for the trouble. Further information can be found in the shop manual pages listed after *How the Circuit Works*.

Step 3. Test the cause.

- Use electrical test procedures to find the specific cause of the symptoms.
- *Troubleshooting Hints* will give you helpful ideas.
- The *Component Location Charts* and the pictures will help you find components. Following each chart, there is a reference to the Location Index at the end of the manual. This index gives component location information for connectors, diodes, resistors, splices and grounds.

Step 4. Verify the cause.

- Confirm that you have found the correct cause by connecting jumper wires and/or

Step 5. Make the repair.

- Repair or replace the inoperative component.

Step 6. Verify the repair.

- Operate the system as in Step 1 and check that your repair has removed all symptoms without creating any new symptoms.

Some engine circuits may need special test equipment and special procedures. See the *shop manual* and other service books for details. You will find these circuits in this manual to be helpful with these special tests.

TROUBLESHOOTING TOOLS

JUMPER WIRE

This is a test lead used to connect two points of a circuit. A Jumper Wire can complete a circuit, bypassing an open.

WARNING

Never use a jumper wire across loads (motors, etc.) connected between hot and ground. This direct battery short may cause injury or fire.

VOLTMETER

A DC Voltmeter measures circuit voltage. Connect negative (- or black) lead to ground, and positive (+ or red) lead to voltage measuring point.

OHMMETER

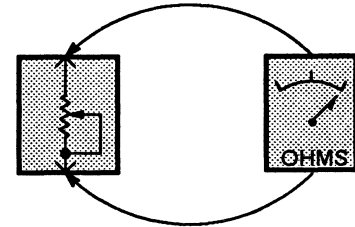


Figure 1-Resistance Check

An Ohmmeter shows the resistance between two connected points (Figure 1).

TEST LAMP

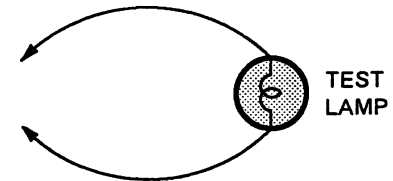


Figure 2-Test Lamp

A Test Light is a 12-volt bulb with two test leads (Figure 2).

Uses: Voltage Check, Short Check.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal American Express Discover MasterCard VISA

SELF-POWERED TEST LAMP

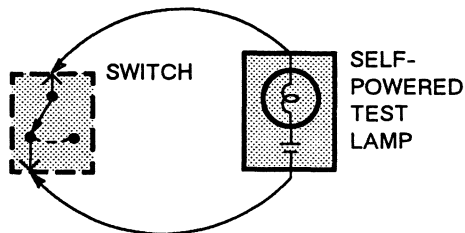


Figure 3—Continuity Check

The Self-Powered Test Lamp is a bulb, battery and set of test leads wired in series (Figure 3). When connected to two points of a continuous circuit, the bulb glows.

Uses: Continuity Check, Ground Check.

CAUTION

When using a self-powered test lamp or ohmmeter, be sure power is off in circuit during testing. Hot circuits can cause equipment damage and false readings.

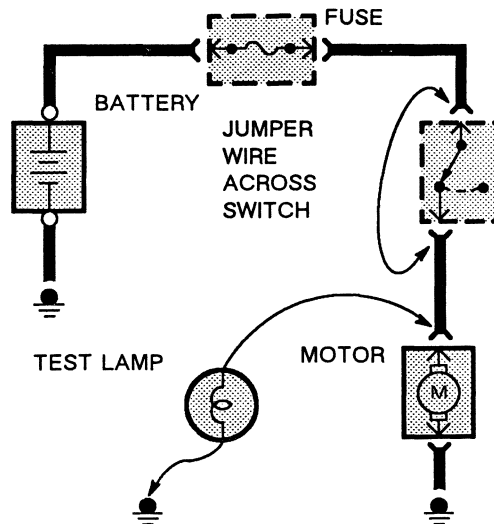


Figure 4—Switch Circuit Check and Voltage Check

In an inoperative circuit with a switch in series with the load, jumper the terminals of the switch to power the load. If jumpering the terminals powers the circuit, the switch is inoperative (Figure 4).

CONTINUITY CHECK (Locating open circuits)

Connect one lead of Self-Powered Test Lamp or Ohmmeter to each end of circuit (Figure 3). Lamp will glow if circuit is closed. Switches and fuses can be checked in the same way.

VOLTAGE CHECK

Connect one lead of test lamp to a known good ground or the negative (-) battery terminal. Test for voltage by touching the other lead to the test point. Bulb goes on when the test point has voltage (Figure 4).

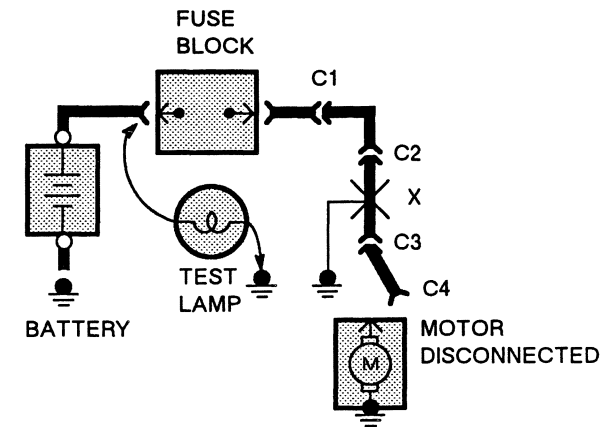


Figure 5—Short Check

A fuse that repeatedly blows is usually caused by a short to ground. It's important to be able to locate such a short quickly (Figure 5).

1. Turn off everything powered through the fuse.
2. Disconnect other loads powered through the fuse:
 - Motors: disconnect motor connector (Connector C4 in Figure 5).
 - Lights: remove bulbs.
3. Turn Ignition Switch to RUN (if necessary) to power fuse.
4. Connect one Test Lamp lead to hot end of blown fuse. Connect other lead to ground. Bulb should glow, showing power to fuse. (This step is just a check to be sure you have power to the circuit.)

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

5-3 HOW TO FIND THE ELECTRICAL CONCERN

5. Disconnect the test lamp lead that is connected to ground, and reconnect it to the load side of the fuse at the connector of the disconnected component. (In Figure 5, connect the test lamp lead to connector C4.)
- If the Test Lamp is off, the short is in the disconnected component.
 - If the Test Lamp goes on, the short is in the wiring. You must find the short by disconnecting the circuit connectors, one at a time, until the Test Lamp goes out. For example, in figure 5 with a ground at X, the bulb stays on when C1 or C2 is disconnected, but goes out after disconnecting C3. This means the short is between C2 and C3.

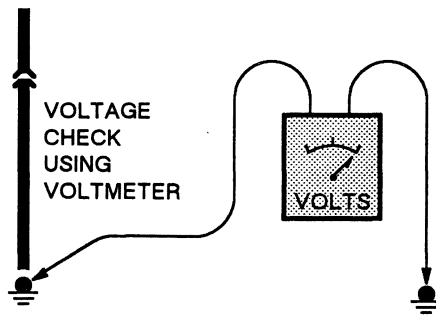


Figure 6—Ground Check

Turn on power to the circuit. Perform a Voltage Check between the suspected inoperative ground and the frame. Any indicated voltage means that the ground is inoperative.

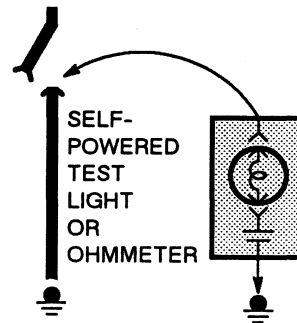


Figure 7—Ground Check

Turn off power to the circuit. Connect one lead of a Self-Powered Test Lamp or Ohmmeter to the wire in question and the other lead to a known ground. If the bulb glows, the circuit ground is OK (Figure 7).

TROUBLESHOOTING HINTS

The circuit schematics in this manual make it easy to identify common points in circuits. This knowledge can help narrow the concern to a specific area. For example, if several circuits fail at the same time, check for a common power or ground connection (See *Power Distribution* or *Grounds*). If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

For example, if lo beam headlamps work, but hi beams and the indicator lamp don't work, then power and ground paths must be good. Since the dimmer switch is the component that switches this power to the high beam lights and indicator, it is most likely the cause of failure.

Troubleshooting Hints unique to a particular circuit are given in a new, three column format. Included in the charts are conditions that may develop, possible causes, and one or more tests that can be done quickly to determine the cause of the condition.

100% SATISFACTION GUARANTEED

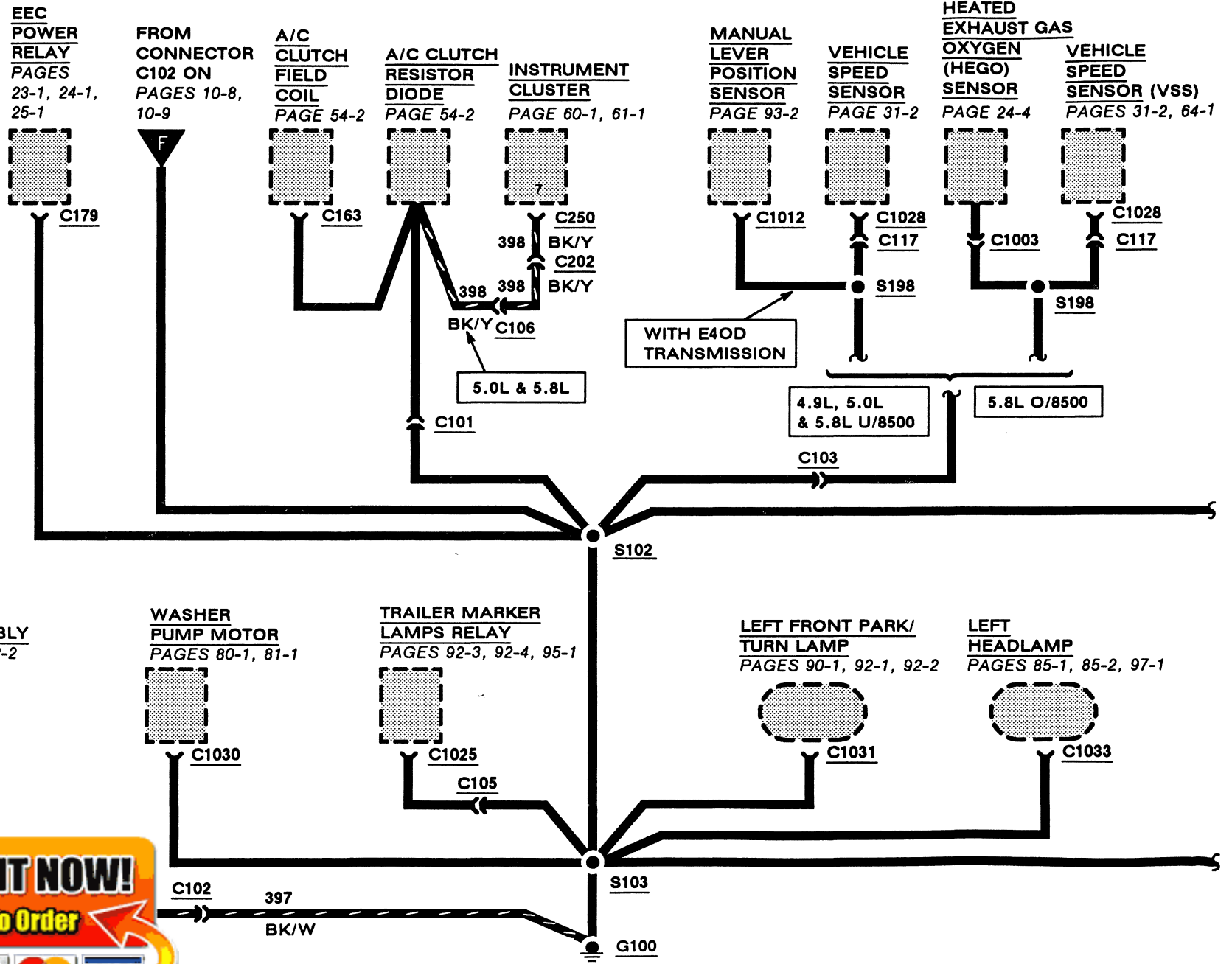
BUY IT NOW!

Click Here To Order

PayPal American Express Discover PLUS MasterCard VISA

10-1 GROUNDS (G100, G101)

4.9L, 5.0L
& 5.8L

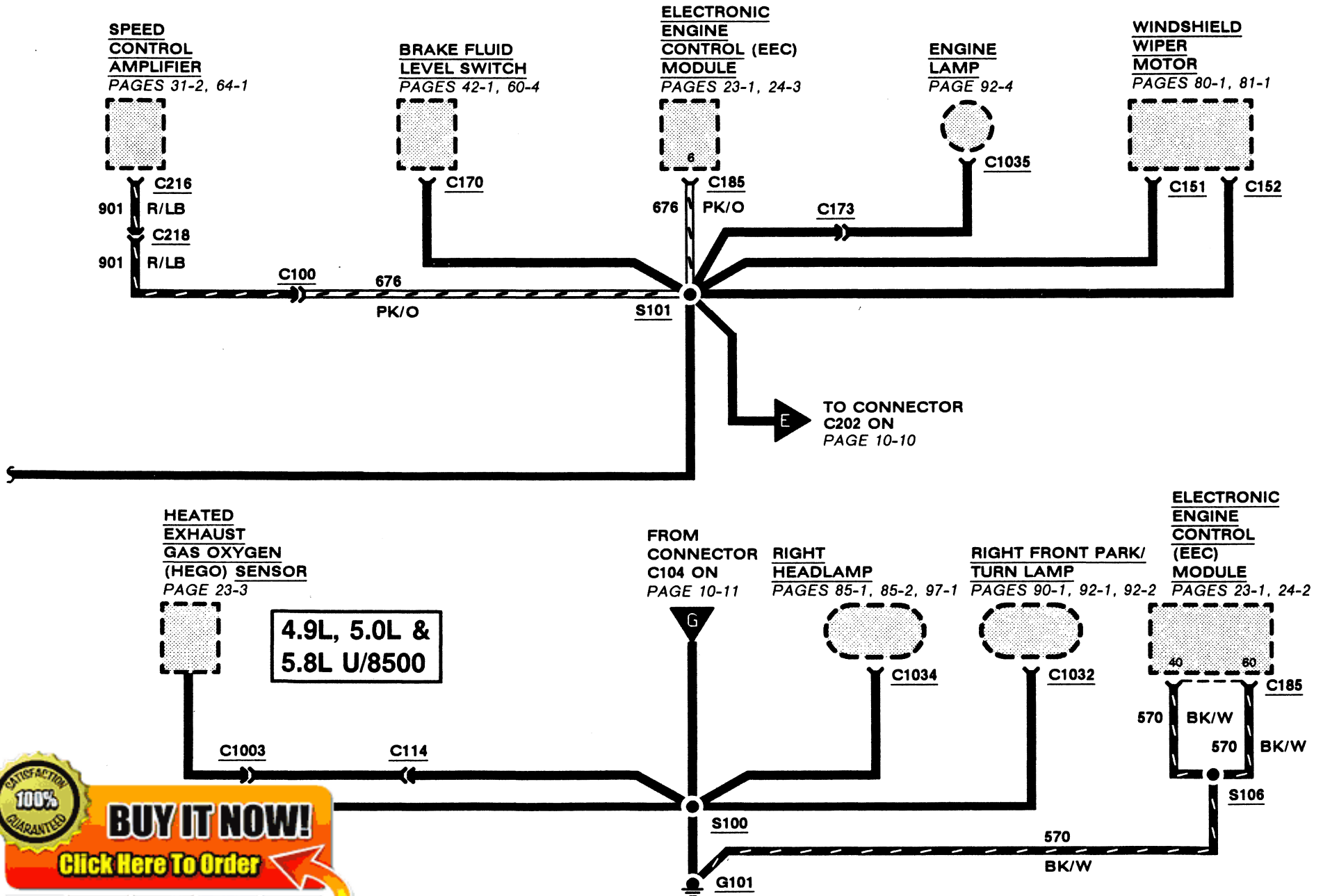


100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

GROUNDS (G100, G101) 10-2



100% SATISFACTION GUARANTEED

BUY IT NOW!

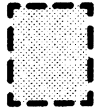
Click Here To Order

PayPal
American Express Cards
Discover
MasterCard
VISA

10-3 GROUNDS (G100, G101, G102)

**DIESEL
(7.3L)**

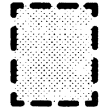
**TRAILER MARKER
LAMPS RELAY**
PAGES 92-3, 92-4,
95-1



C1025

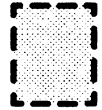
C105

**WASHER
PUMP
MOTOR**
PAGES 80-1, 81-1



C1030

**VEHICLE
SPEED
SENSOR (VSS)**
PAGES 31-2, 64-2

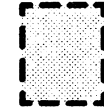


C1028

C117

C103

**TECA
POWER
RELAY**
PAGE 29-1



C1020

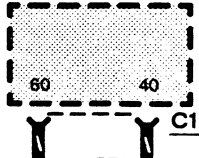
WITH E4OD
TRANSMISSION

FROM CONNECTOR
C102 ON
PAGE 10-7



WITH E4OD
TRANSMISSION

**TRANSMISSION
ELECTRONIC
CONTROL
ASSEMBLY (TECA)**
PAGE 29-1



C1027

570

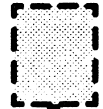
570

BK/W

S106

WITHOUT E4OD
TRANSMISSION

**RABS
VALVE
ASSEMBLY**
PAGE 42-2



**LEFT FRONT
PARK/TURN
LAMP**
PAGES 90-1, 92-1



C1031

**LEFT
HEADLAMP**
PAGES 85-1, 85-2, 97-1



C1033

S102

S103

G100

C158

397

BK/W

C102

397

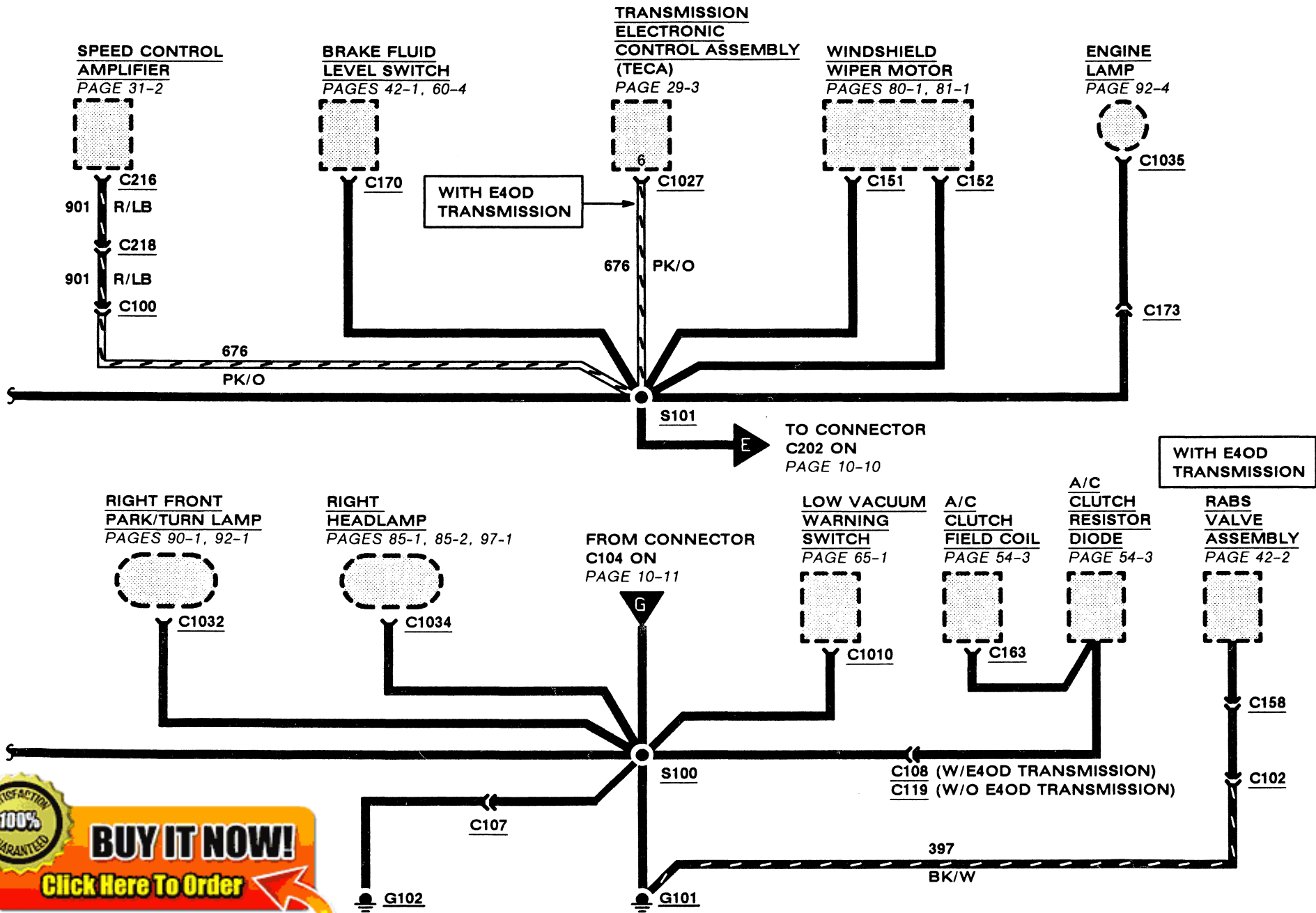
BK/W

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

GROUNDS (G100, G101, G102) 10-4



100% SATISFACTION GUARANTEED

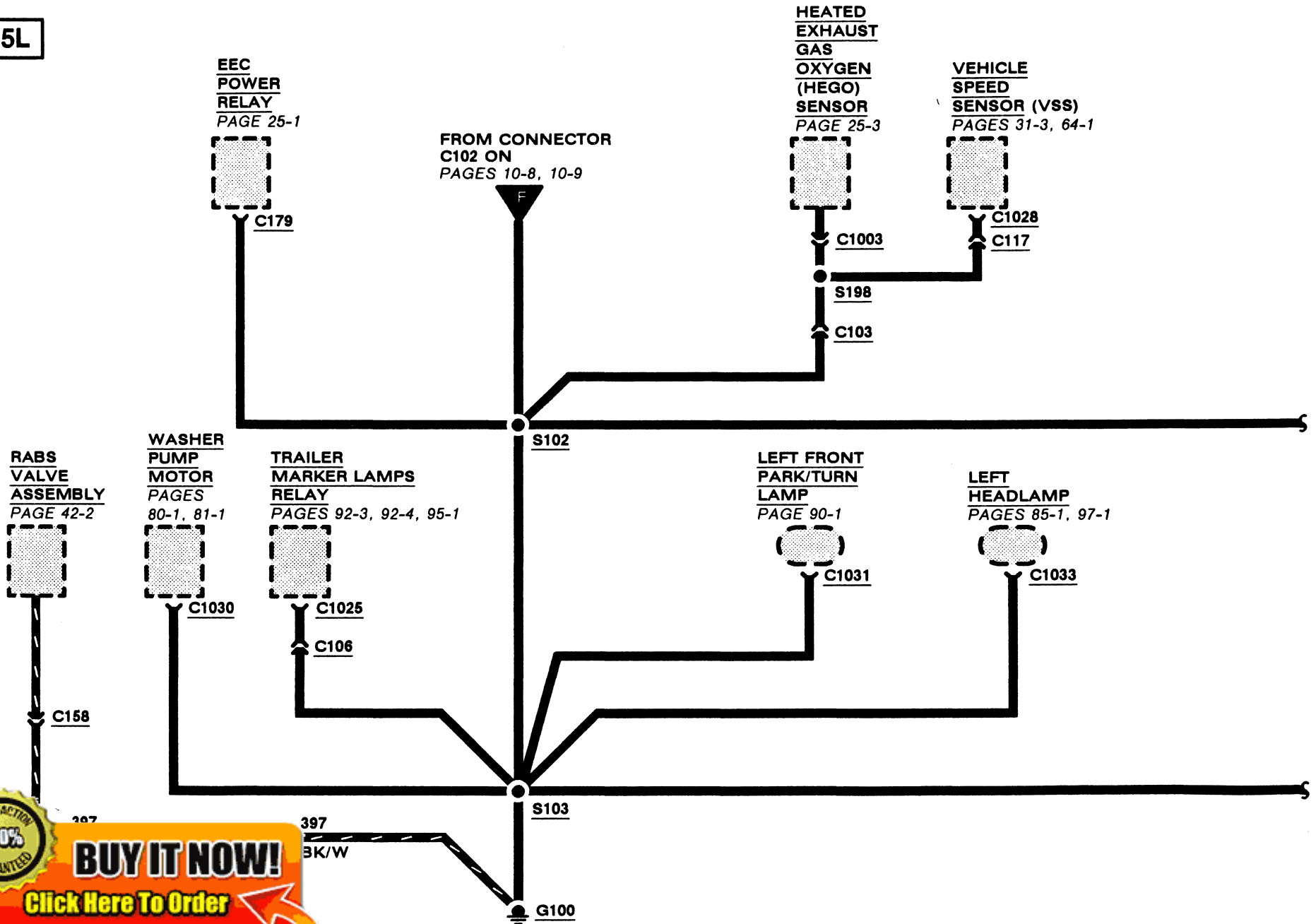
BUY IT NOW!

Click Here To Order

PayPal | American Express | Discover | MasterCard | VISA

10-5 GROUNDS (G100, G101)

7.5L



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

207

397 BK/W

PayPal

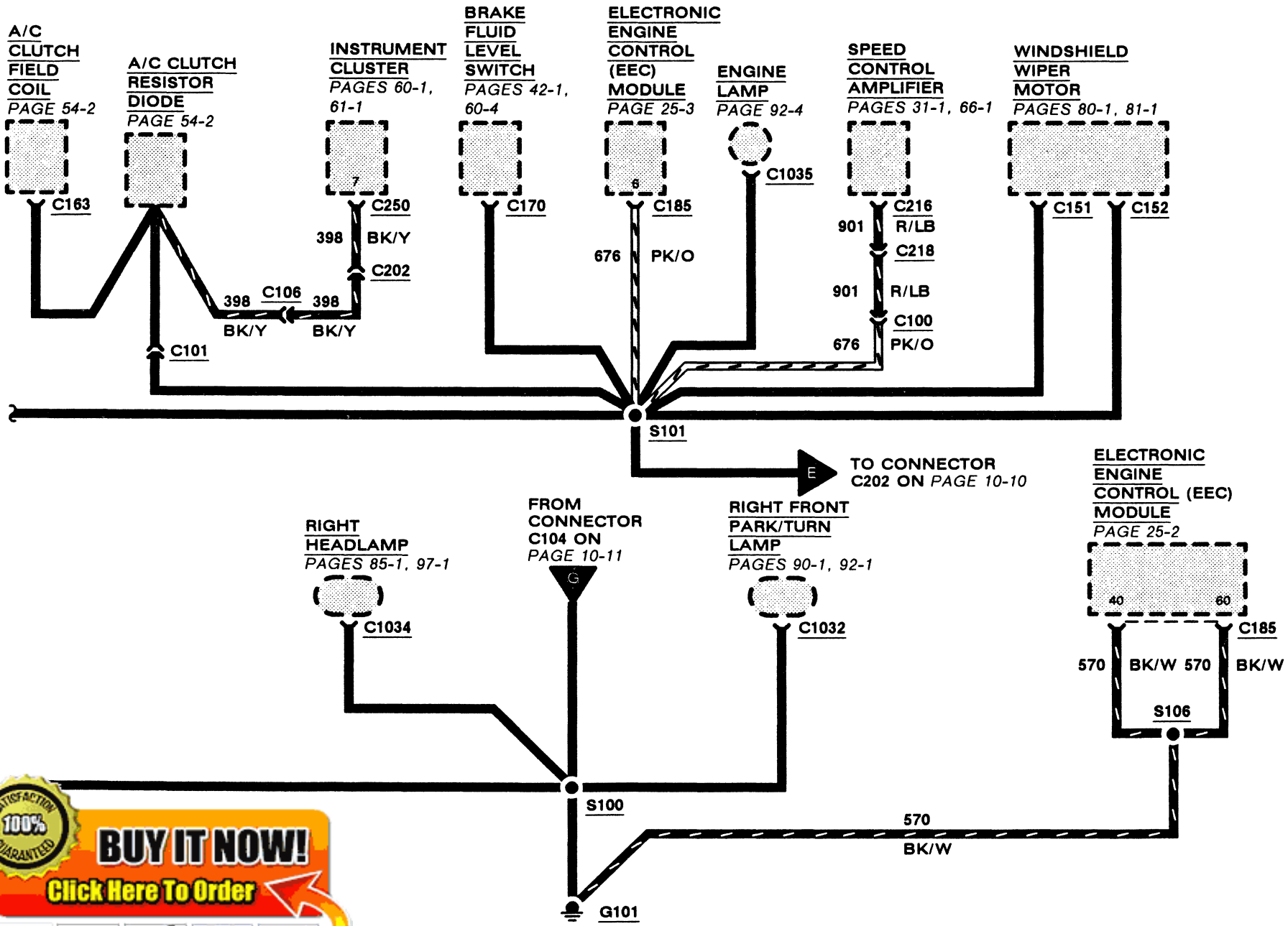
Discover Cards

DISCOVER NOVUS

MasterCard

VISA

7.5L



100% SATISFACTION GUARANTEED

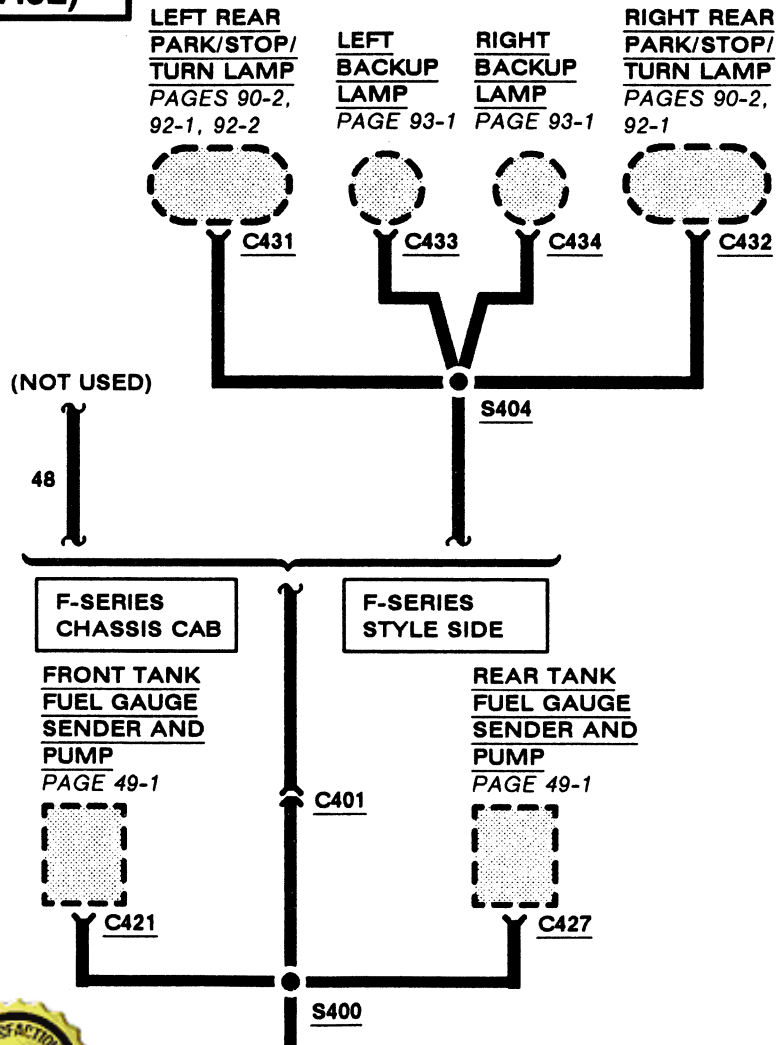
BUY IT NOW!

Click Here To Order

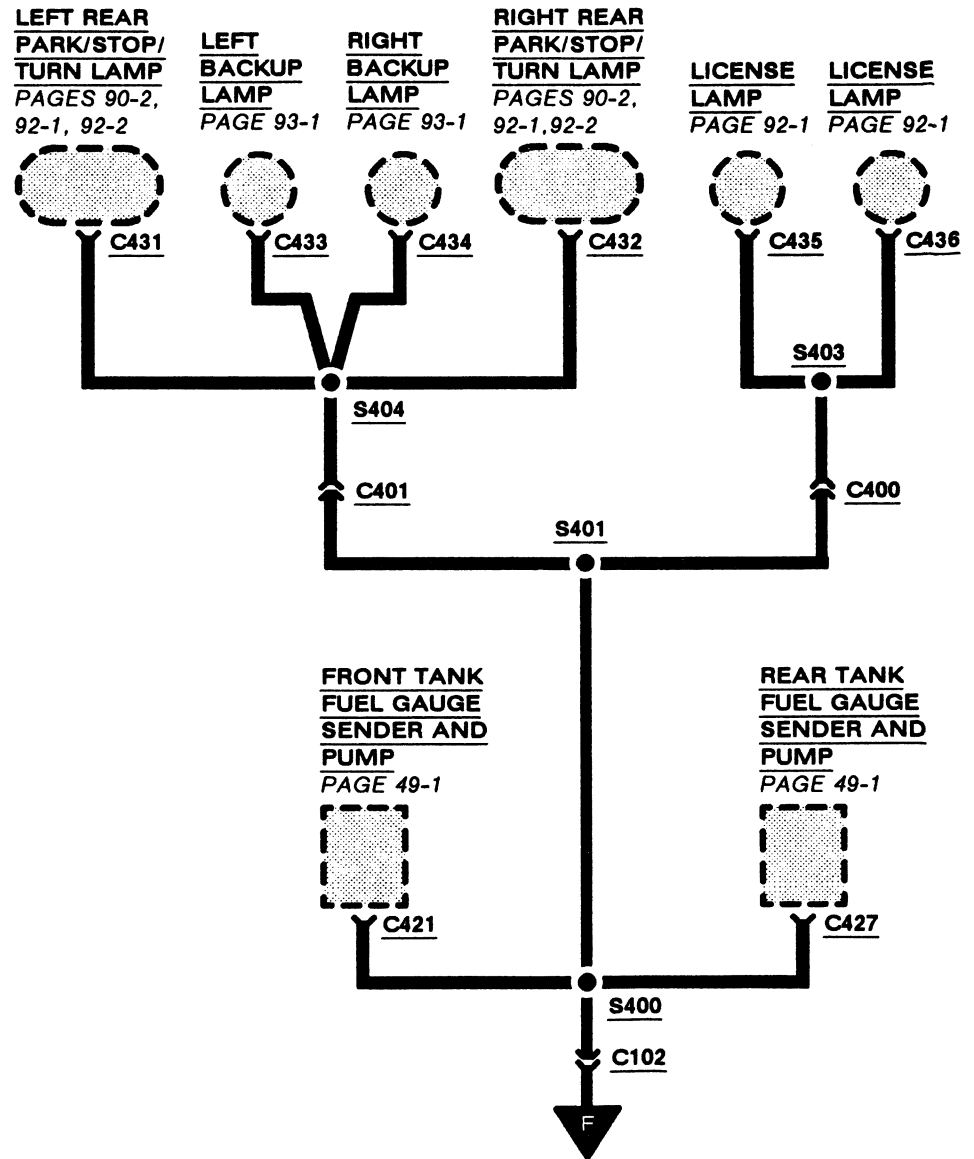
10-7 GROUNDS

**DIESEL
(7.3L)**

137" + 161" W.B.



133" + 155" W.B.



TO SPLICE S102
ON PAGE 10-3

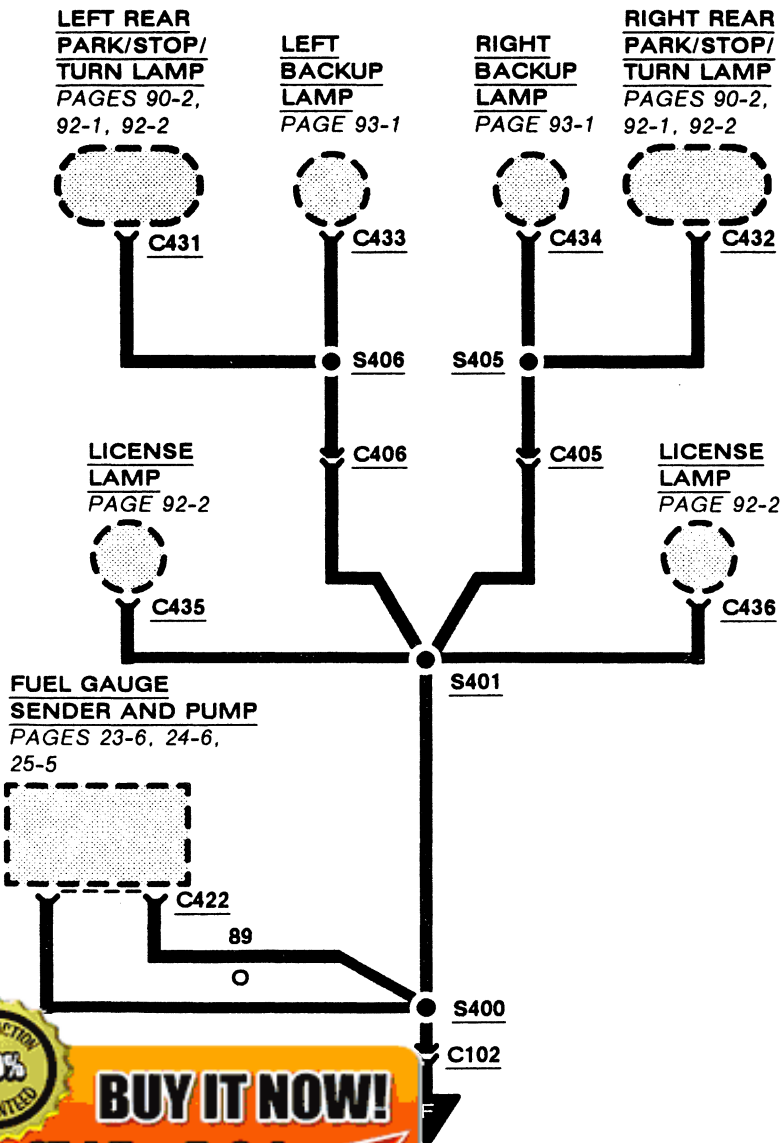
100% SATISFACTION GUARANTEED

BUY IT NOW!

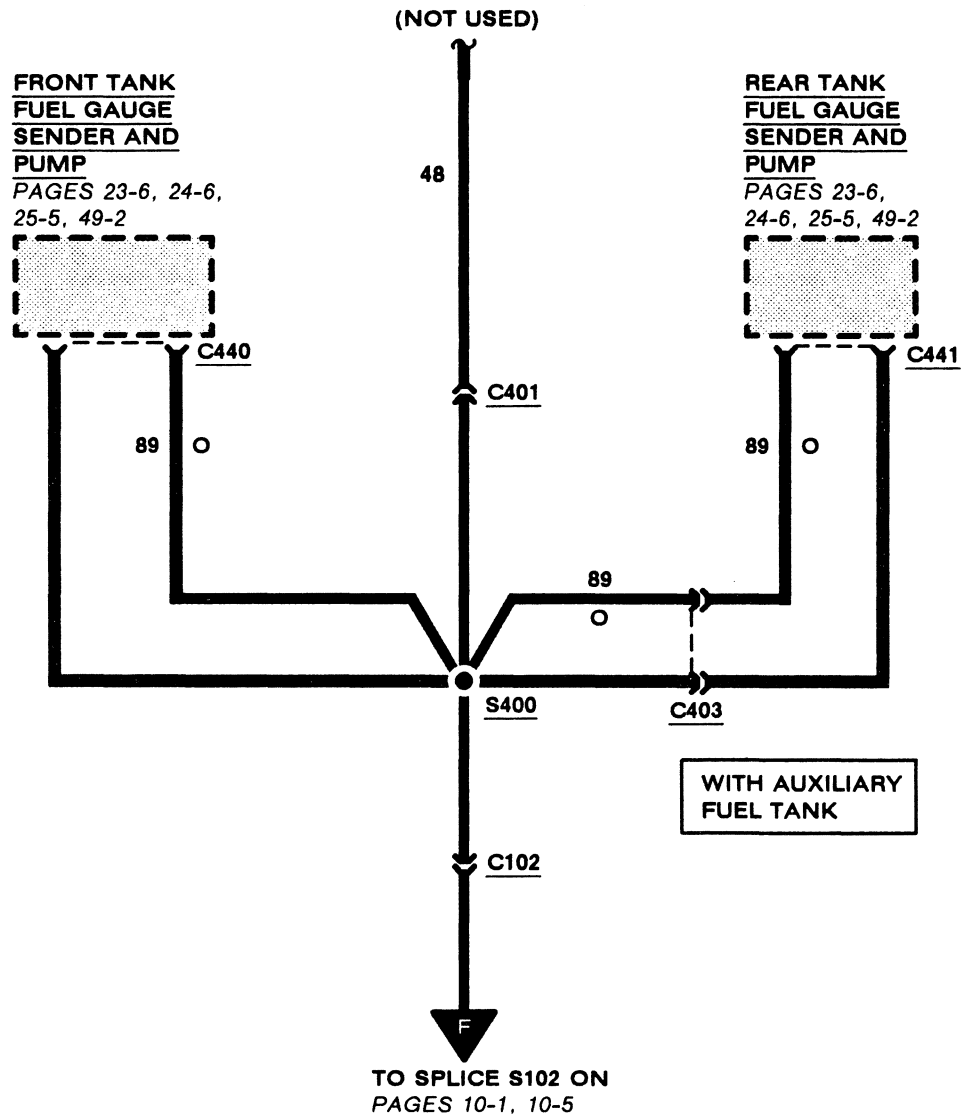
Click Here To Order

ON PAGE 10-3

BRONCO



F-SERIES CHASSIS CAB



100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

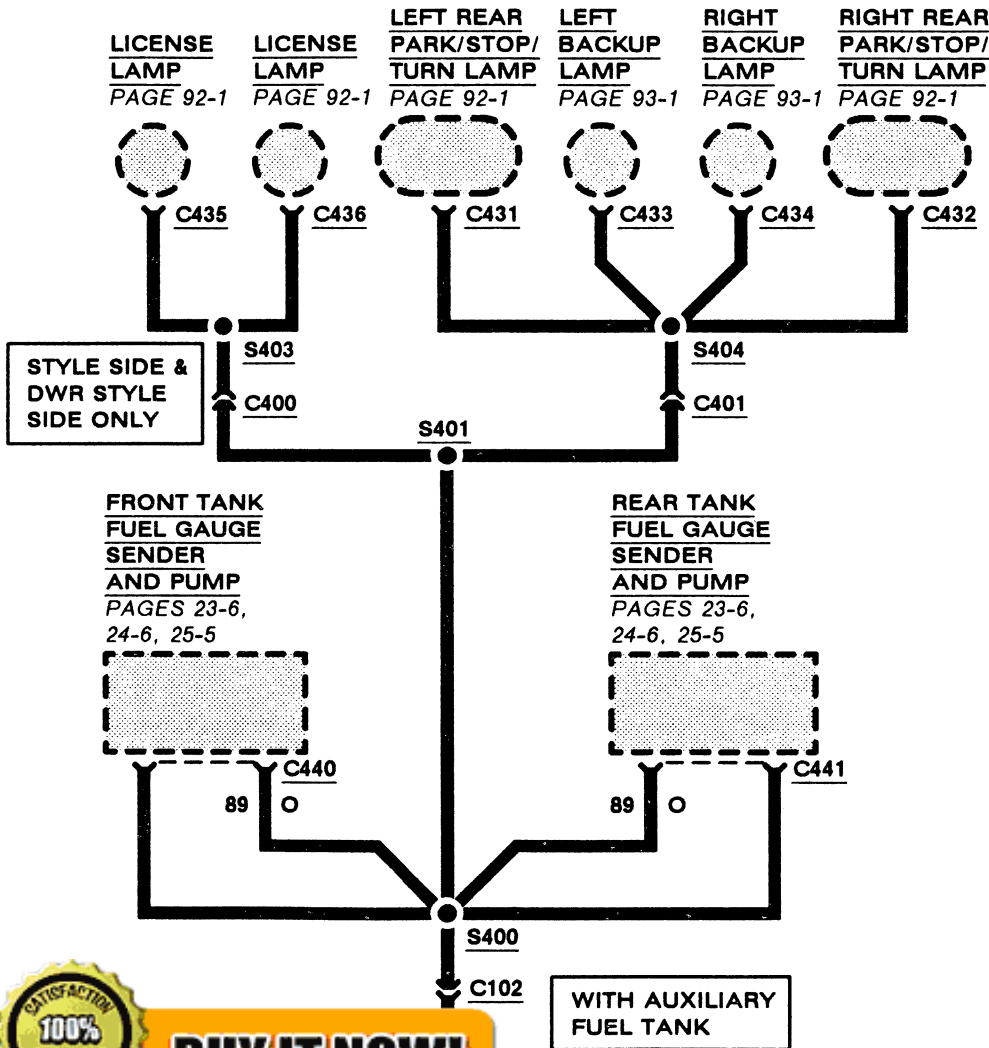
PayPal | American Express | Discover | MasterCard | VISA

SPICE S102 ON PAGES 10-1, 10-5

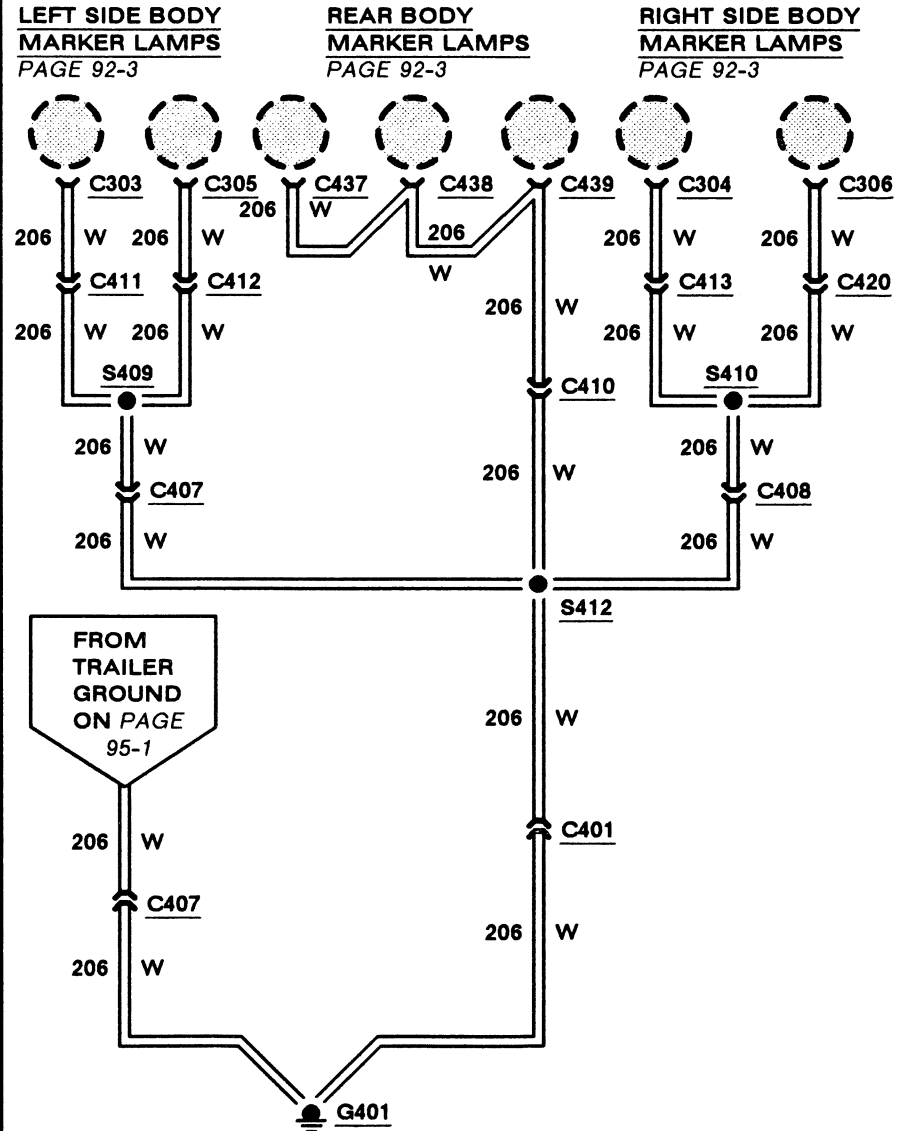
TO SPLICE S102 ON PAGES 10-1, 10-5

10-9 GROUNDS (G401)

F-SERIES, STYLE SIDE & DWR STYLE SIDE



DRW STYLE SIDE



100% SATISFACTION GUARANTEED

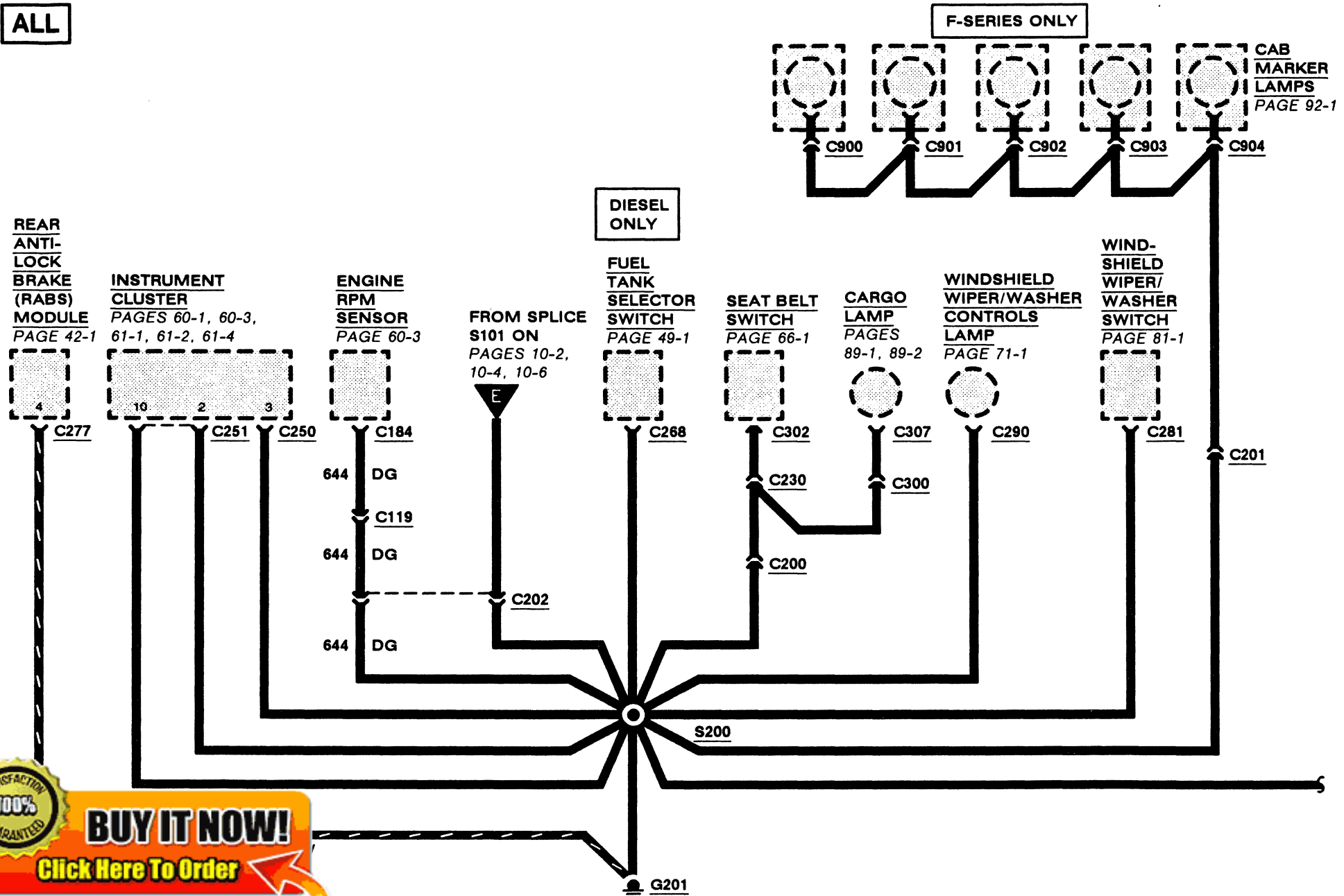
BUY IT NOW!

Click Here To Order

PayPal, American Express, Discover, MasterCard, VISA

S102
10-1, 10-5

ALL

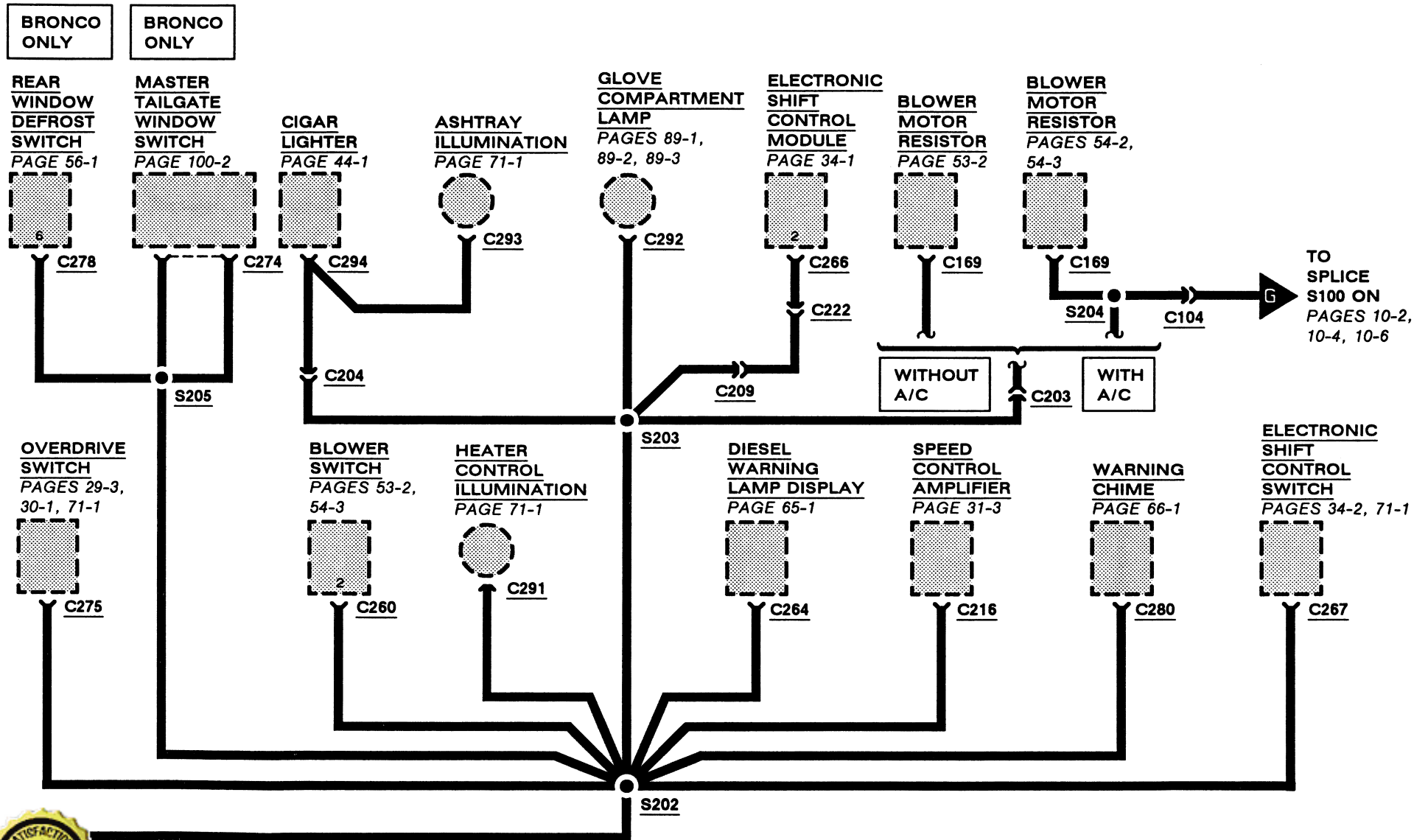


100% SATISFACTION GUARANTEED

BUY IT NOW!

[Click Here To Order](#)

10-11 GROUNDS (G201)



100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

HOW THE CIRCUIT WORKS

The ground circuits shown here are complete and connect several components together to screw terminal ground points. Parts of these circuits may be shown on other pages throughout the book. Partial ground circuits are shown dashed on those pages.

All simple or component ground circuits are shown on the individual circuit pages and are complete on those pages.

All wires are 57 BK unless otherwise noted.

Refer to Location Index, Cell 152, for Base Part Number information and Connector, Splice, Ground, Resistor and Diode locations.



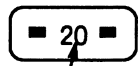
11-1 CIRCUIT PROTECTION/FUSE PANEL

CIRCUIT PROTECTION DEVICES

Electrical circuits on this vehicle may be protected by fuses, fusible links, fusible link cartridges, circuit breakers, or a combination of these devices.

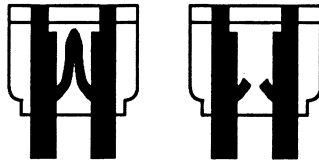
BLADE TYPE FUSE

TOP VIEW



AMPERE RATING

SIDE VIEW



GOOD FUSE

BLOWN FUSE

Blade type fuses have a transparent plastic housing. To check a fuse, pull it from the fuse panel and look at the fuse element through the housing. Always replace a blown fuse with a new fuse that has the same ampere rating.

The ampere rating of a blade type fuse can also be determined by following the color code shown here:

BLADE FUSE COLOR CODING	
AMPERE RATING	HOUSING COLOR
4	Pink
5	Tan
10	Red

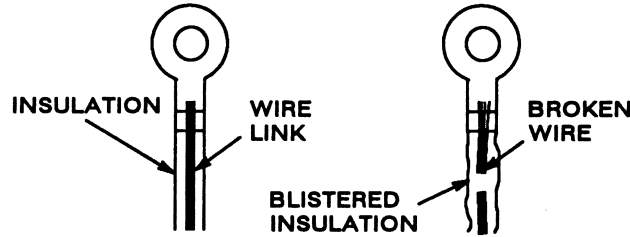
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

FUSIBLE LINK

CUT-AWAY VIEW



GOOD LINK

BLOWN LINK

Fusible links are short lengths of wire that are smaller in diameter than the wires they are protecting. Fusible link wire is covered with a special thick, non-flammable insulation. An overload condition causes the insulation to blister. If the overload condition continues, the wire link will melt. To check a fusible link, look for blistered insulation. If the insulation is okay, pull lightly on the wire; if the fusible link stretches, the wire has melted.

When replacing fusible links, first cut the protected wire where it is connected to the fusible link. Then, tightly crimp or solder the new link to the protected wire.

Fusible links are often identified by color coding of the insulation, as shown here:

FUSIBLE LINK COLOR CODING	
WIRE LINK SIZE	INSULATION COLOR
20 GA	Blue
18 GA	Brown or Red
16 GA	Black or Orange
14 GA	Green
12 GA	Gray

FUSIBLE LINK CARTRIDGE

SIDE VIEW

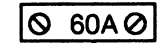


GOOD



BLOWN

TOP VIEW



AMPERE RATING

Fusible link cartridges have a transparent colored plastic housing. To check a fusible link cartridge, look at the fuse element through the side of the housing.

To replace a fusible link cartridge, pull it from the fuse box or panel. Always replace a blown fusible link cartridge with a new one having the same ampere rating.

The ampere rating of a fusible link cartridge can also be determined by following the color code shown here:

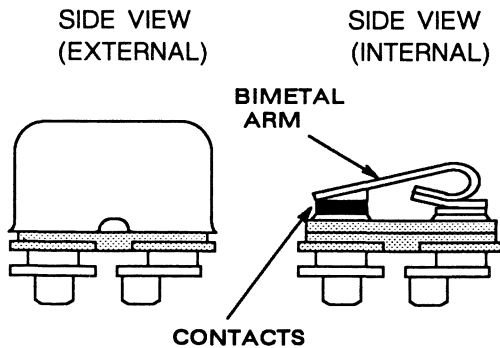
FUSIBLE LINK CARTRIDGE COLOR CODING	
AMPERE RATING	HOUSING COLOR
30	Light Green
40	Amber
50	Red
60	Blue

CIRCUIT BREAKER

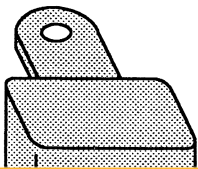
Some circuits are protected by circuit breakers (abbreviated "c. b." in fuse chart). They can be Fuse Panel mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal bonded together (bimetal arm). If the arm starts to carry too much current, it heats up. As one metal expands faster than the other the arm bends, opening the contacts. Current flow is broken. A circuit breaker can be the cycling or non-cycling type.

FUSE PANEL MOUNTED CYCLING TYPE

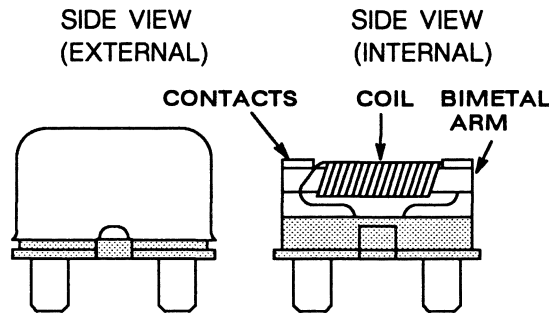


IN-LINE MOUNTED CYCLING TYPE

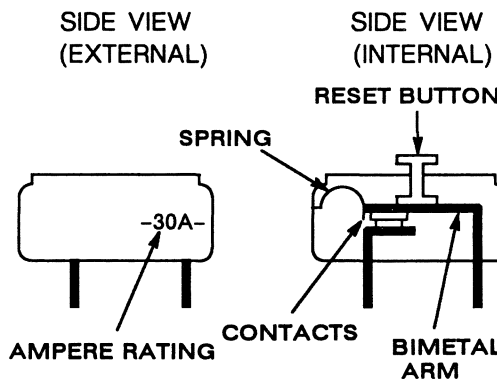


In the cycling type, the bimetal arm cools and straightens out. This cycle repeats as long as the overcurrent exists and power is applied.

FUSE PANEL MOUNTED NON-CYCLING TYPE



FUSE PANEL MOUNTED MANUAL RESET TYPE



Two types of non-cycling circuit breakers are used; one is reset by removing power from the circuit, and the other is reset by depressing a reset button.

In the first type, there is a coil wrapped around the bimetal arm. When an overcurrent exists and the contacts open, a small current passes through the coil. This current through the coil is not enough to operate a load, but it does heat up both the coil and the bi-metal arm. This keeps the arm in the open position until power is removed.

In the second type, a spring pushes the bimetal arm down and holds the contacts together. When an overcurrent condition exists and the bimetal arm heats up, the bimetal arm bends enough to overcome the spring and the contacts snap open. The contacts stay open until the reset button is pushed and the contacts snap together again.

DIODE



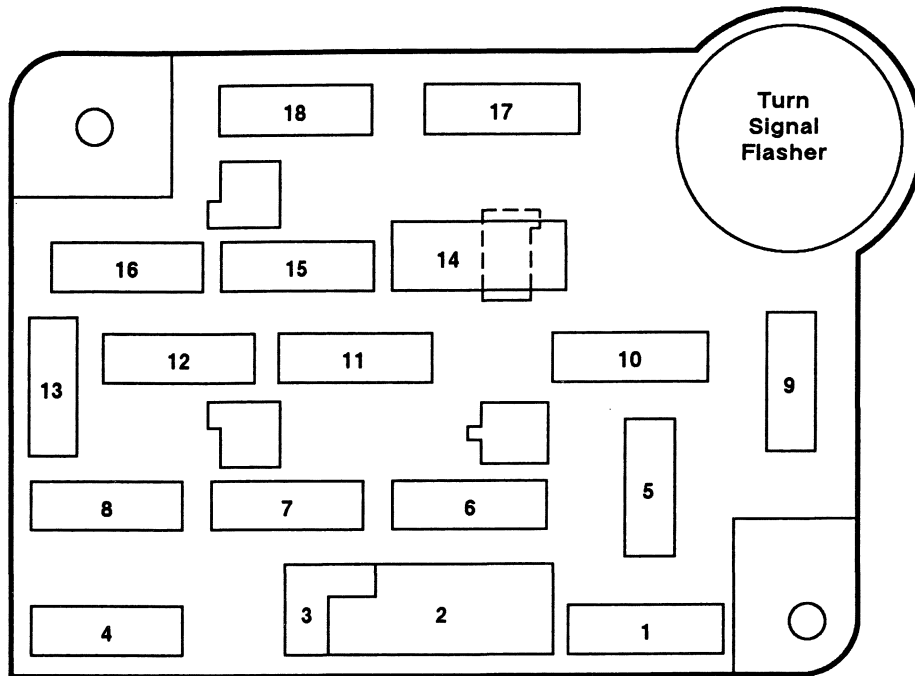
Diodes are electrical devices that permit current to flow in one direction only. The current flows in the direction indicated by the arrow.

100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order

11-3 CIRCUIT PROTECTION/FUSE PANEL



Fuse Position	Amps	Circuits Protected
1	15	Stop and Hazard Lamps, Anti-lock Brakes, Speed Control
2	—	(Not Used)
3	—	(Not Used)
4	15	Exterior Illumination, Instrument Illumination, Radio Clock Illumination
5	15	Turn Lamps, Daytime Running Lamps, Overdrive Switch, Backup Lamps, Hego Sensor and Rear Window Defrost (Bronco Only)
6	15	Speed Control and All Wheel Drive (Bronco Only)
7	—	(Not Used)
8	15	Dome Lamp, Map Lamp, Radio Memory, Cargo Lamps
9	30	A/C-Heater Blower Motor Relay Coil, A/C Clutch
10	5	Instrument Illumination
11	15	Radio and Clock
12	30 c.b.	Power Door Lock, All Wheel Drive, Power Tailgate Window (Bronco Only)
13	—	(Not Used)
14	30 c.b.	Power Windows
15	10	Fuel Tank Selector (Diesel Only)
16	30	Horn, Cigar Lighter and Speed Control
17	20	Anti-lock Brakes
18	15	Instrument Cluster Gauges and Indicators, Warning Chime, Diesel Warning Indicators and IMS/EVL Module

Fuse Value Amps	Color Code
4	Pink
5	Tan
10	Red
15	Light Blue
20	Yellow
25	Natural
30	Light Green

Power Distribution

The Alternator and Battery are connected together at the Starter Relay hot terminal. Other circuits originate at the Starter Relay hot terminal and are protected by fuse links. Low power circuits are also protected by fuses.

The Ignition Switch and Main Light Switch are powered at all times, as are fuses 1, 4, 8, 12 and 16. The other fuses are powered through the Ignition Switch or the Main Light Switch.

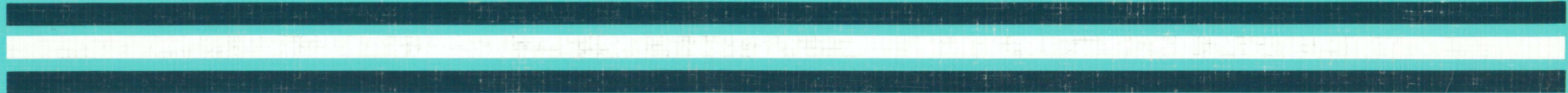
100% SATISFACTION GUARANTEED

BUY IT NOW!

Click Here To Order



**WE SUPPORT VOLUNTARY
TECHNICIAN CERTIFICATION**



**Service
Publications**

Ford Parts and Service Division

**SATISFACTION
100%
GUARANTEED**

BUY IT NOW!

Click Here To Order

FPS-12129-91
Copyright © 1990
Ford Motor Company