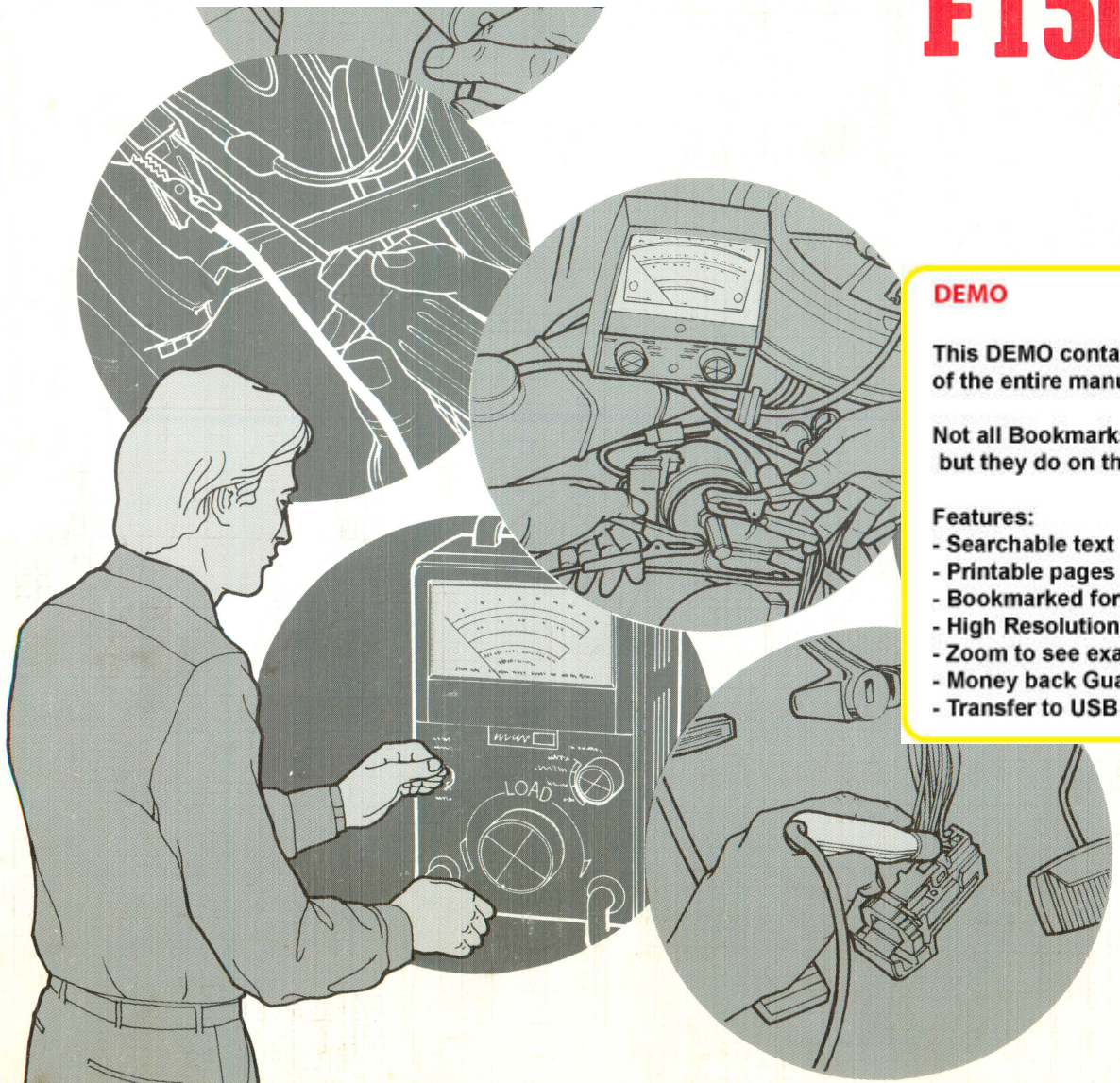
1987 BRONCO/ F150-350

Ford



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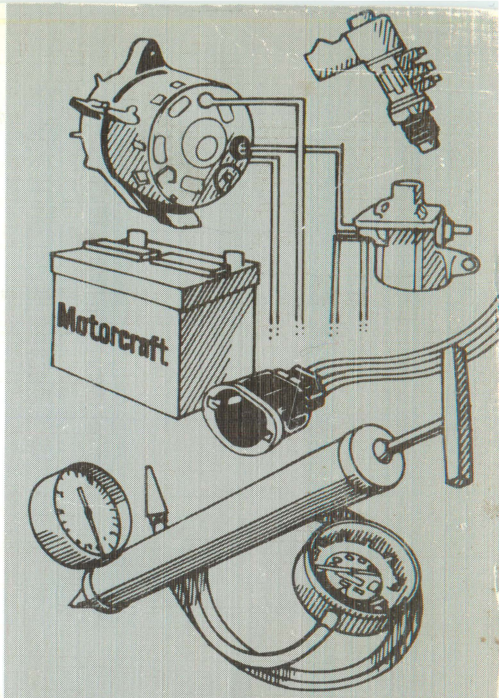
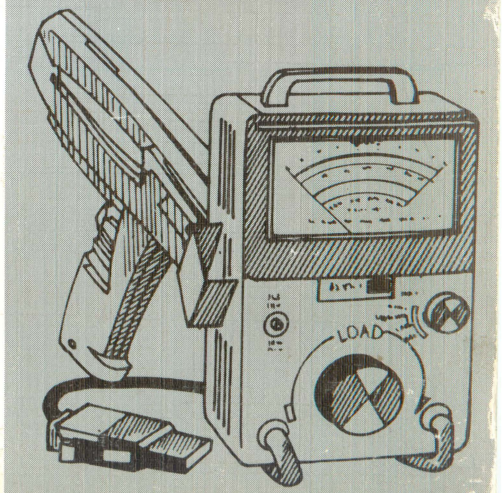


Electrical & Vacuum Trouble-Shooting Manual



1987 BRONCO/F150-350

1987 Bronco/F150-F350 Electrical & Vacuum Trouble-Shooting Manual (EVTM)

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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.

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 still be encountered as an additional identification where the wire harness manufacturer has encountered multiple wires with the same identification colors (solid or stripe) in a connector and requested a deviation.

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.

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.

- Operate the system as in Step 1 and check that your repair has removed all symptoms, and also has not caused 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 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

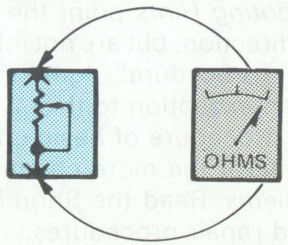


Figure 1— Resistance Check

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

TEST LIGHT

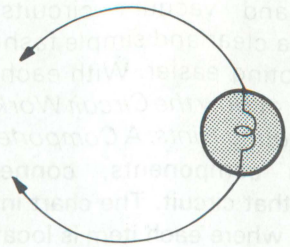


Figure 2 —Test Light

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

Uses: Voltage Check. Short Check

SELF-POWERED TEST LIGHT

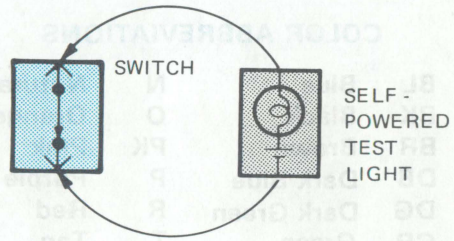


Figure 3—Continuity Check

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.

TROUBLESHOOTING CHECKS

SWITCH CIRCUIT CHECK

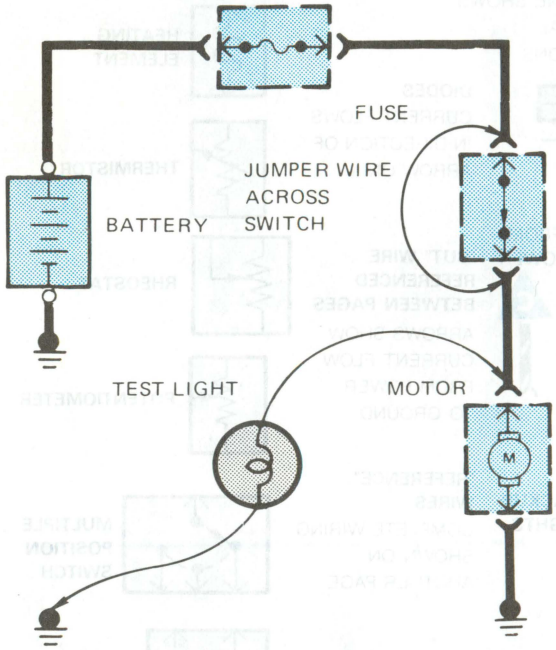


Figure 4—Switch Circuit Check and Voltage Check

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.

VOLTAGE CHECK

Connect one lead of **Test Light** 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).

SHORT CHECK (short to ground)

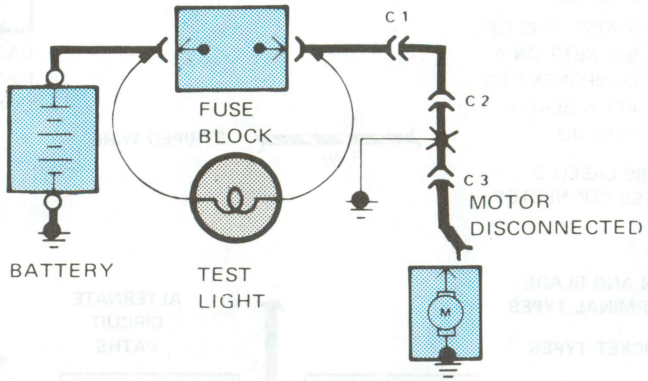


Figure 5— Short Check

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

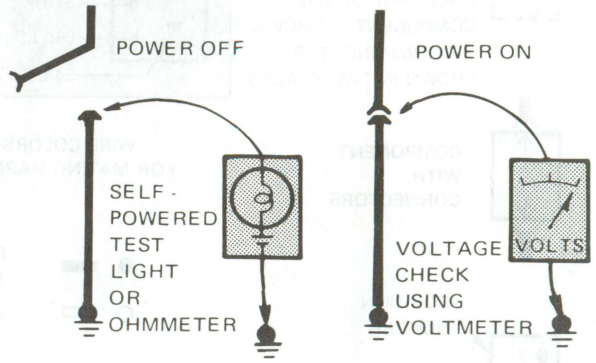


Figure 6 — Grounds Checks

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

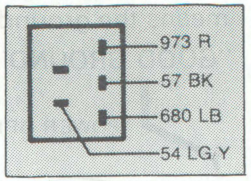
Turn off power to circuit. Connect one lead of **Self-Powered Test Light** or **Ohmmeter** to wire in question, and the other to known ground. If bulb glows, circuit ground is OK (Figure 6).

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.

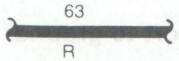
For example, if low beam headlights work but high beams and the indicator light don't work, then power and ground paths must be good. Since the dimmer switch is the component which switches this power to the high beam lights and indicator, it is most likely the cause of failure.

DASHED COMPONENT BOX
ONLY PART OF THE COMPONENT IS SHOWN, OR COMPONENT IS SHOWN IN TWO PLACES

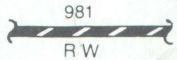


COMPONENT CONNECTOR END VIEW
SHOWS PINS OR SOCKETS ON A COMPONENT TO AID IN BENCH TESTING

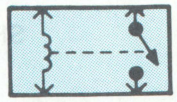
WIRE COLORS ARE LABELED FOR MATING HARNESS CONNECTOR



SOLID WIRE



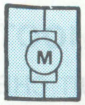
STRIPED WIRE



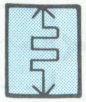
RELAY
CONTACTS CLOSE WITH CURRENT THROUGH COIL

DASHED LINE SHOWS MECHANICAL CONNECTIONS

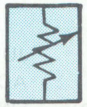
DIODES
CURRENT FLOWS IN DIRECTION OF ARROW ONLY



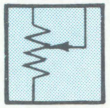
MOTOR



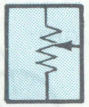
HEATING ELEMENT



THERMISTOR

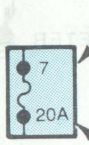


RHEOSTAT

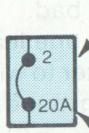


POTENTIOMETER

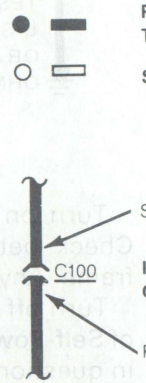
COMPONENT WITH CONNECTORS



FUSE



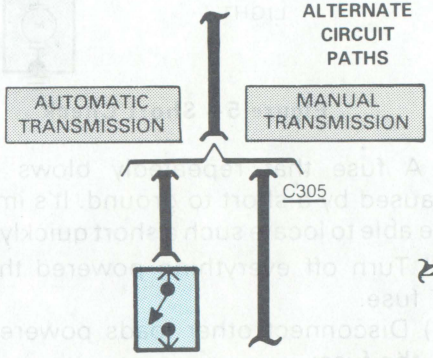
CIRCUIT BREAKER



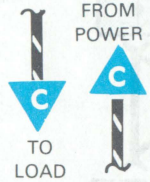
IN-LINE CONNECTOR

PIN AND BLADE TERMINAL TYPES

SOCKET TYPES



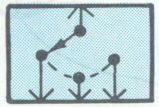
ALTERNATE CIRCUIT PATHS



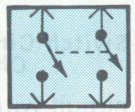
"CUT" WIRE REFERENCED BETWEEN PAGES
ARROWS SHOW CURRENT FLOW FROM POWER TO GROUND

BACKUP LIGHTS

"REFERENCE" WIRES
COMPLETE WIRING SHOWN ON ANOTHER PAGE



MULTIPLE POSITION SWITCH

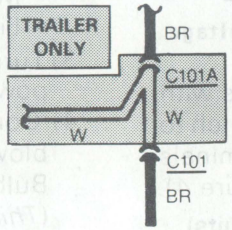


GANGED SWITCHES

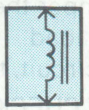
SCREW TERMINAL ON COMPONENT

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

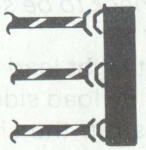
CANDELABRA CONNECTOR
ACCEPTS SINGLE-PIN CONNECTORS



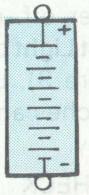
OPTIONAL WIRING
BR WIRES (INCLUDING C101) ARE ON ALL VEHICLES, BUT W WIRES (INCLUDING C101A) ARE USED ONLY WITH TRAILER



SOLENOID

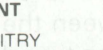


JUNCTION BLOCK



12V BATTERY

SEALED ELECTRONIC COMPONENT
SOLID STATE
ANY CIRCUITRY SHOWN INSIDE THE BOX IS A FUNCTIONAL EQUIVALENT ONLY AND IS NOT EXACT



GROUND CONNECTION

SEE GROUNDS *PAGE 5-15*

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

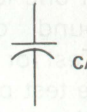
FUSE LINK

RESISTOR

TRANSISTOR

LIGHT EMITTING DIODE

ZENER DIODE



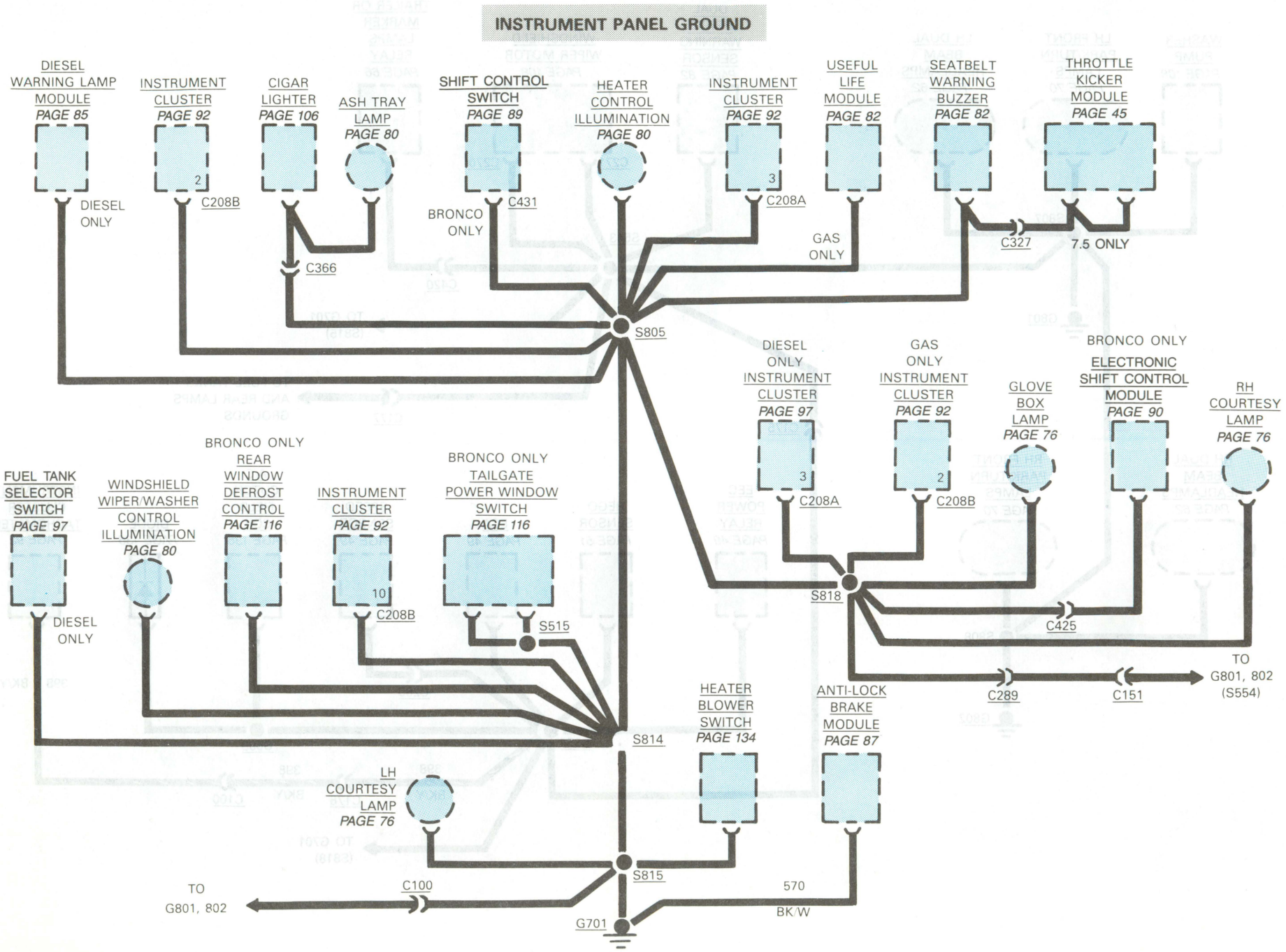
CAPACITOR

GAUGE

SIGNAL GENERATOR

SINGLE FILAMENT LIGHT BULB

DUAL FILAMENT LIGHT BULB


INSTRUMENT PANEL GROUND
DIESEL WARNING LAMP MODULE PAGE 85
INSTRUMENT CLUSTER PAGE 92
CIGAR LIGHTER PAGE 106
ASH TRAY LAMP PAGE 80
SHIFT CONTROL SWITCH PAGE 89
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C327
7.5 ONLY
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2
C208B
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C425
TO G801, 802 (S554)
C289
C151
FUEL TANK SELECTOR SWITCH PAGE 97
WINDSHIELD WIPER/WASHER CONTROL ILLUMINATION PAGE 80
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INSTRUMENT CLUSTER PAGE 92
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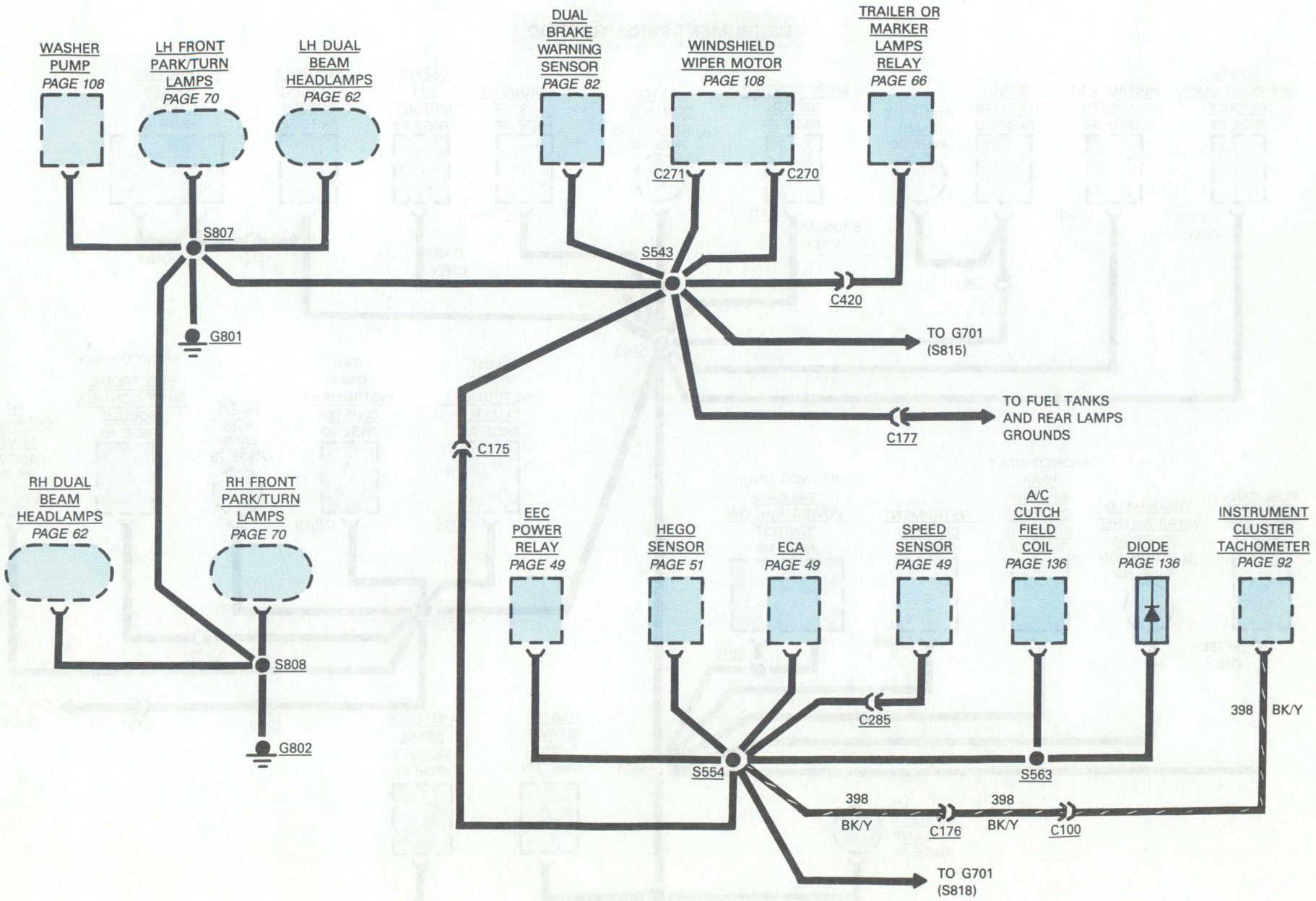
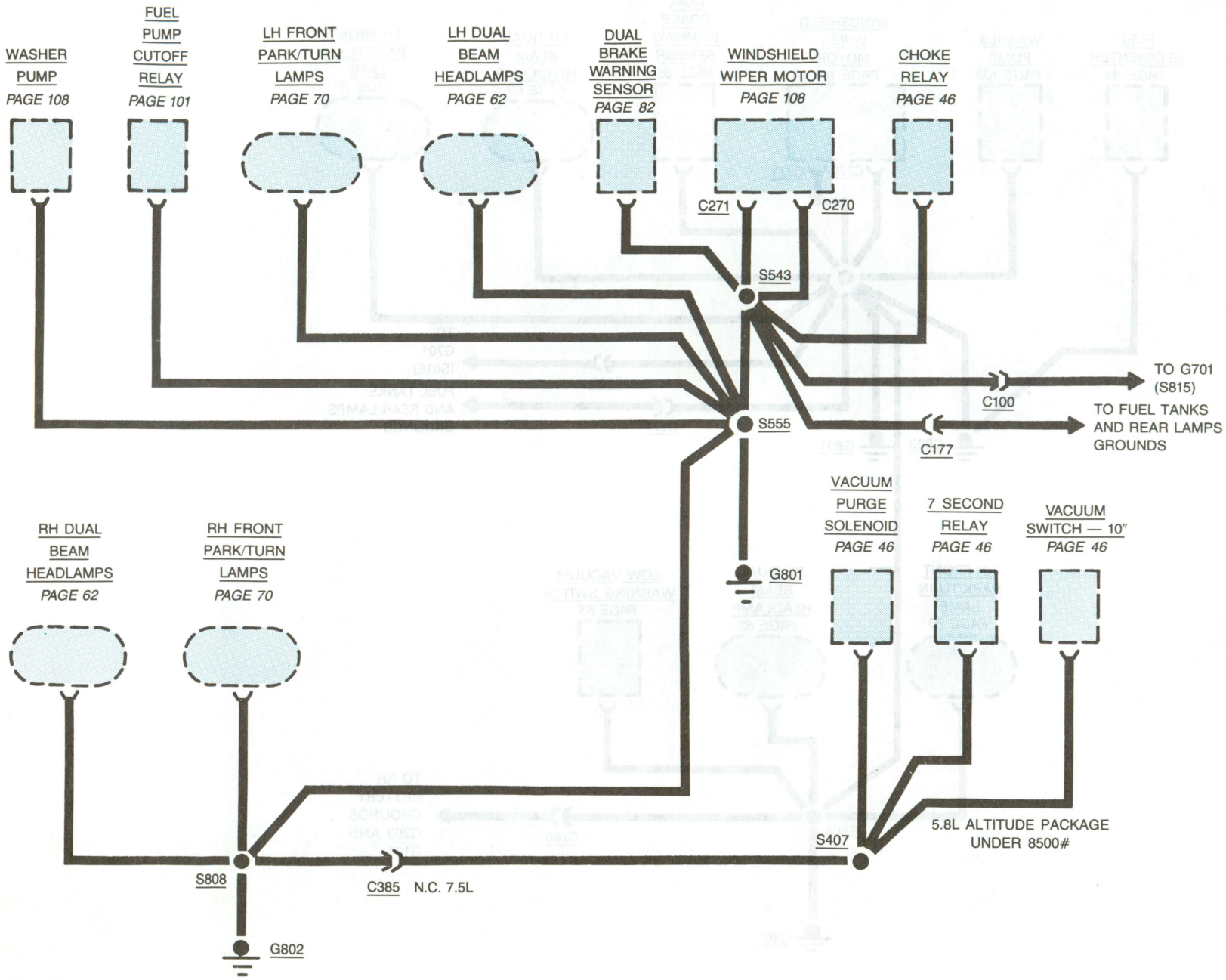
C100
570
BK/W
G701

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

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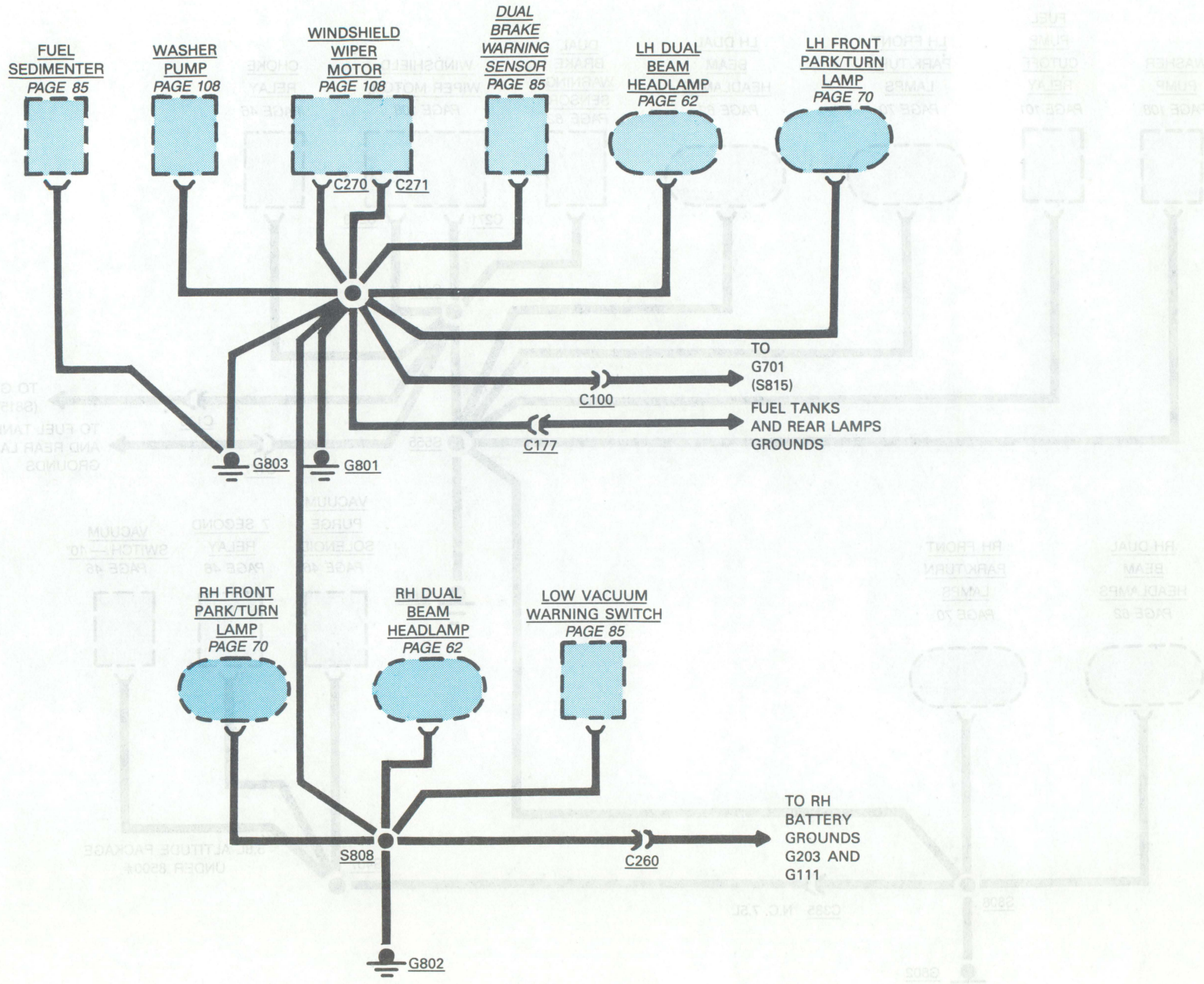
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TO RH BATTERY GROUNDS G203 AND G111
S808
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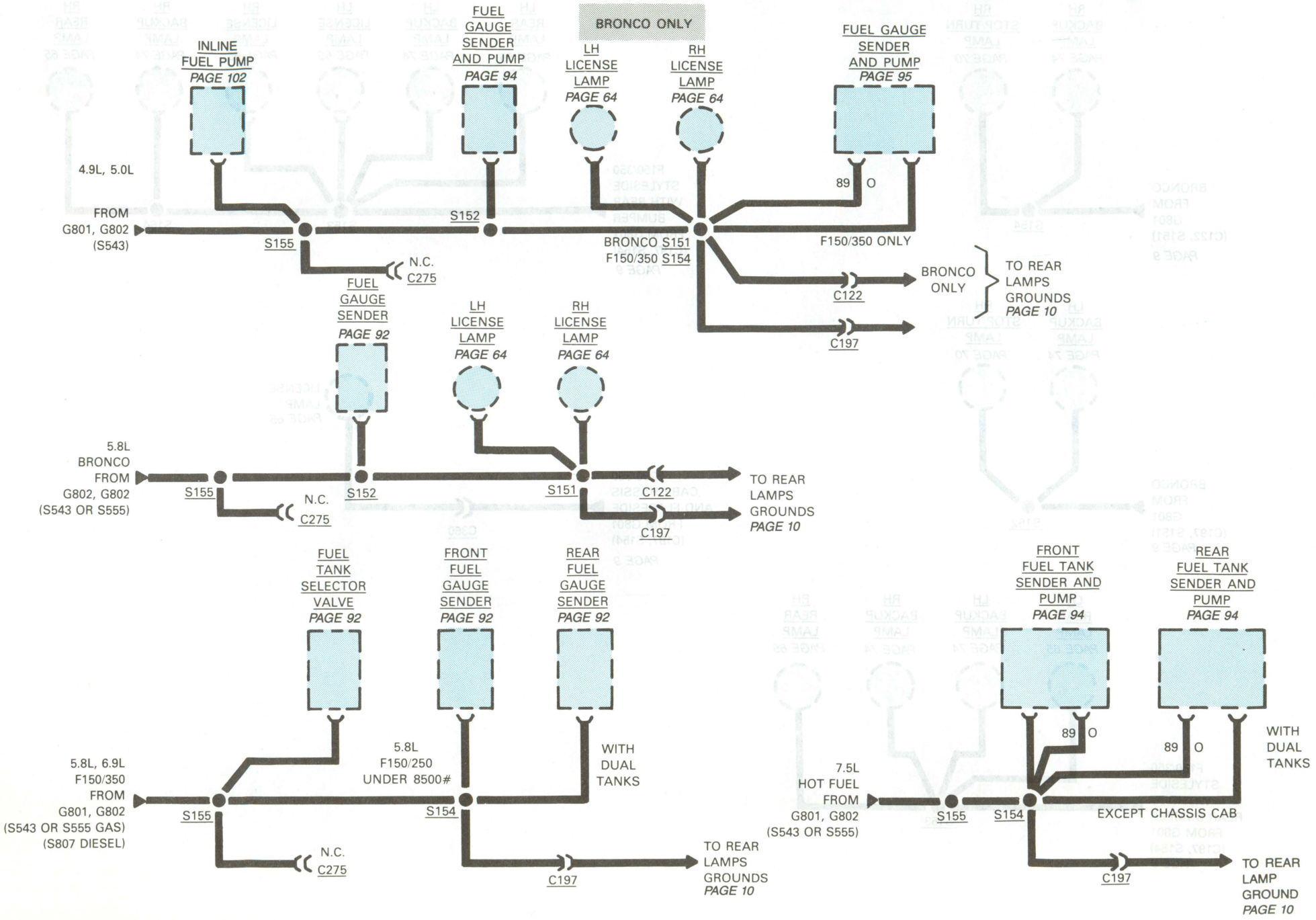
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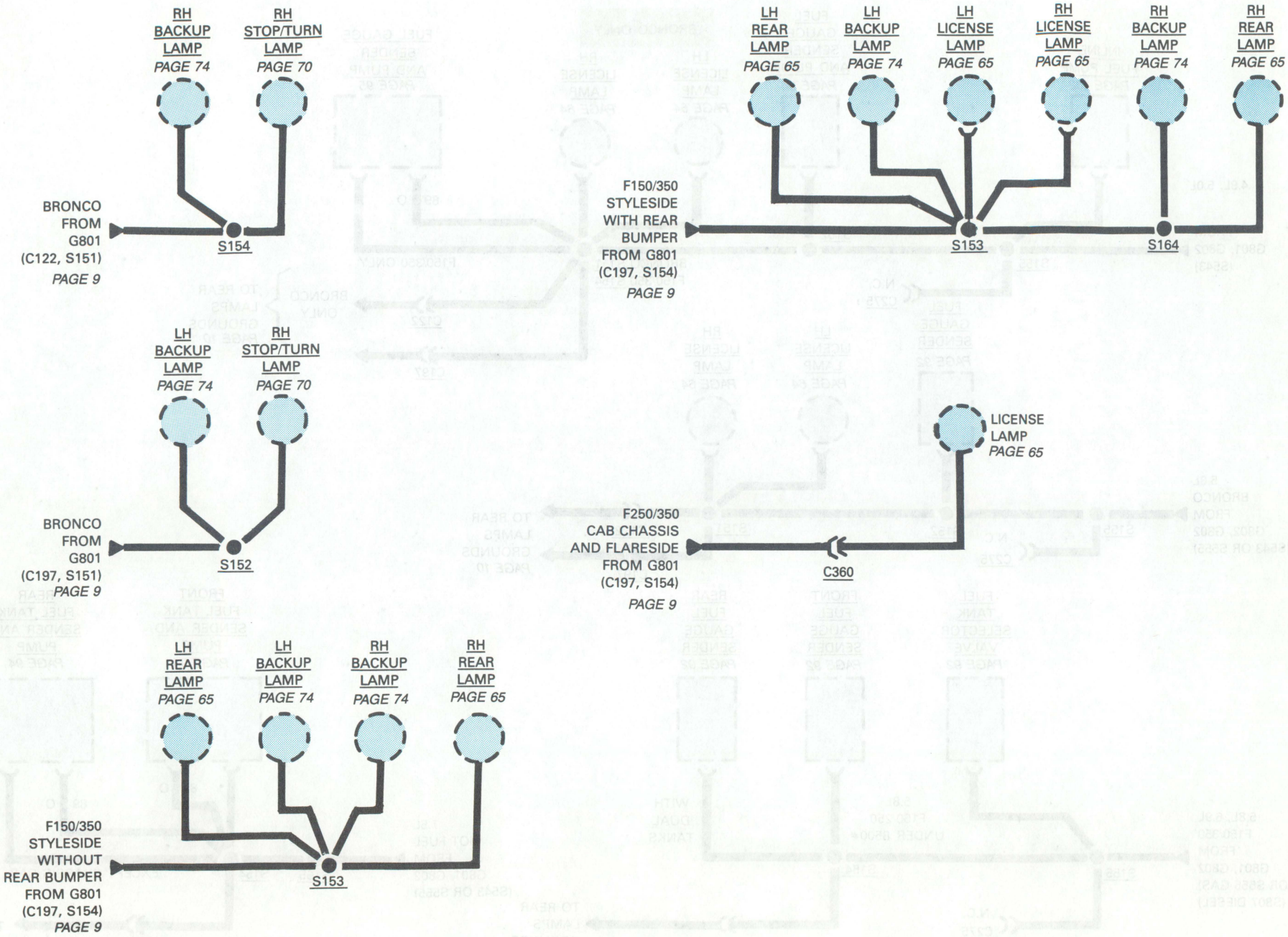
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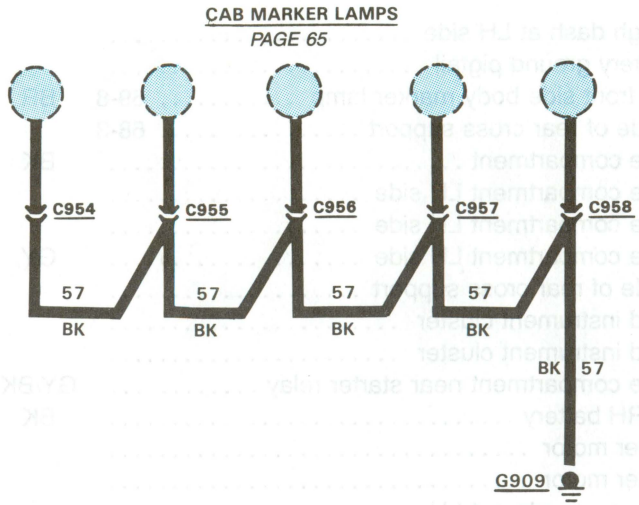
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57 BK
57 BK
57 BK
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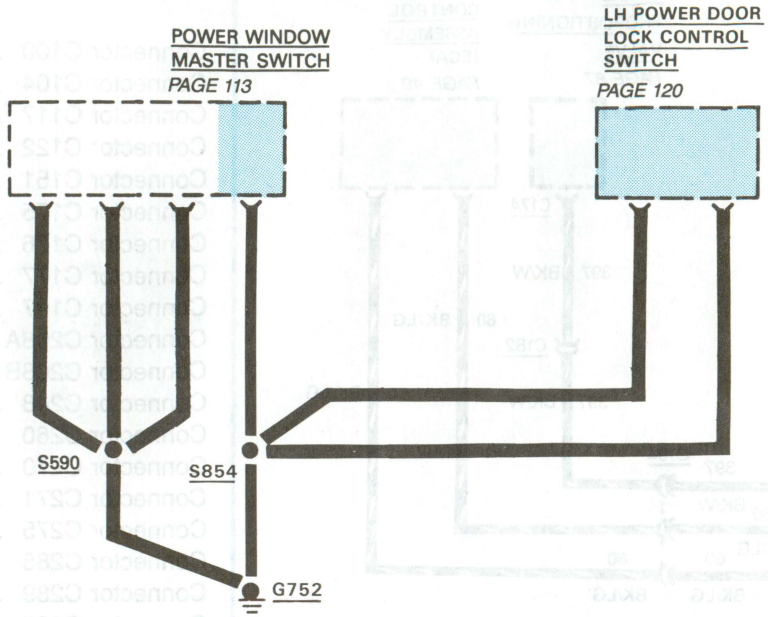
POWER WINDOW MASTER SWITCH
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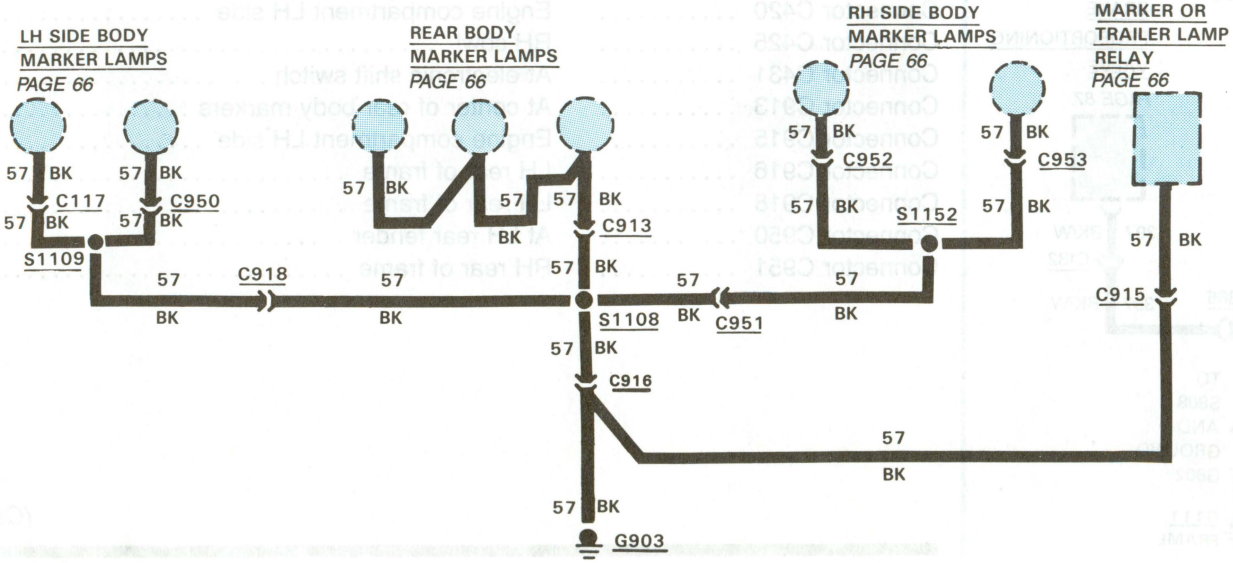
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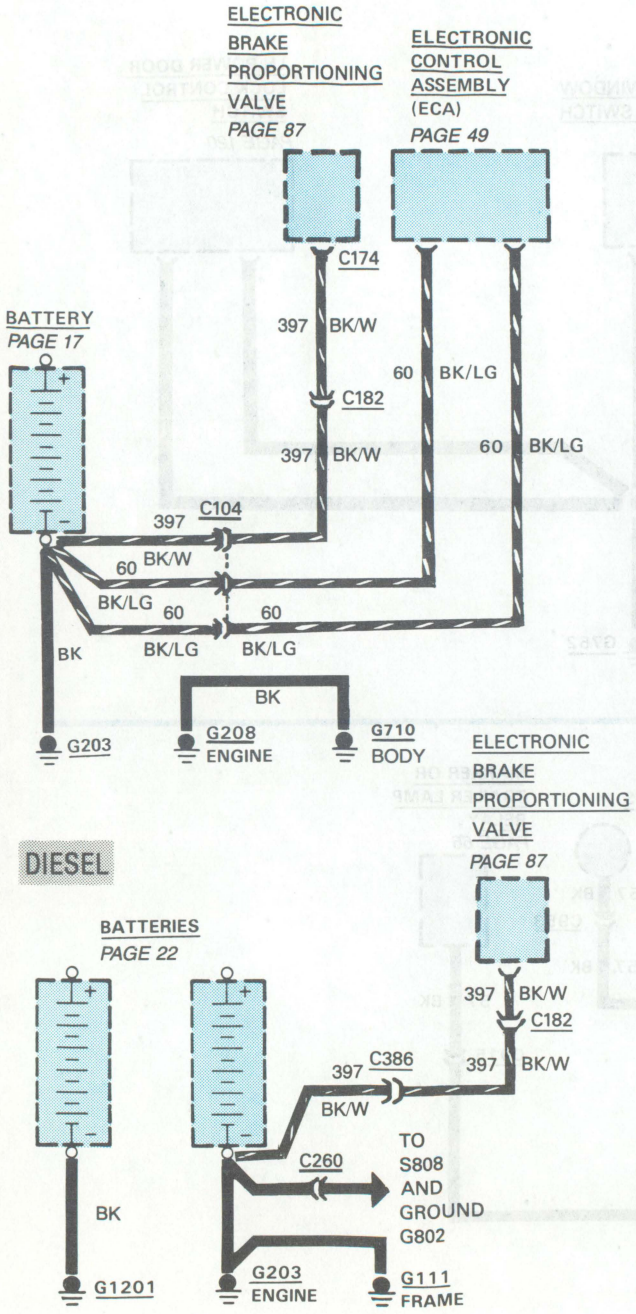
C950
S1109
C918
C913
C952
C953
S1152
C951
S1108
C916
C915
G903



COMPONENT 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

(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			

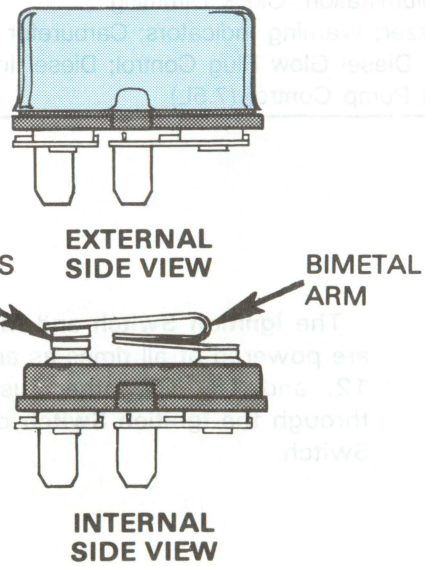
Splice S814	Near W/S wiper illumination lamp T/O
Splice S815	Near G701 T/O
Splice S818	Near RH courtesy lamp T/O
Splice S854	Near LH master window switch T/O
Splice S1108	Near rear marker lamp T/O
Splice S1109	Near LH front side marker lamp T/O
Splice S1152	Near RH front side marker lamp T/O

REPLACEMENT OF FUSES/ CIRCUIT BREAKERS

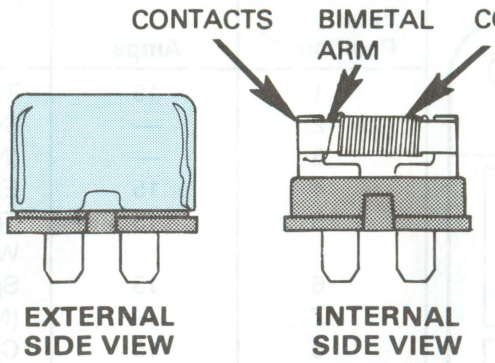
GOOD FUSE BLOWN FUSE

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.

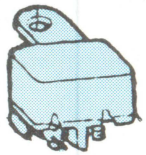
CIRCUIT BREAKER OPERATION



Cycling Fuse Block Type



Non-Cycling Fuse Block Type



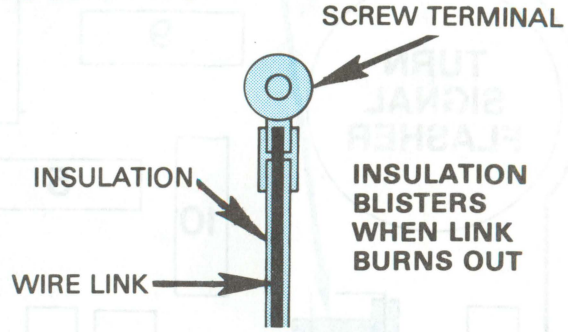
Cycling In-Line Type

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 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.

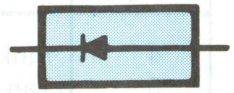
FUSE LINKS



The fuse link is a short length of wire smaller in 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.

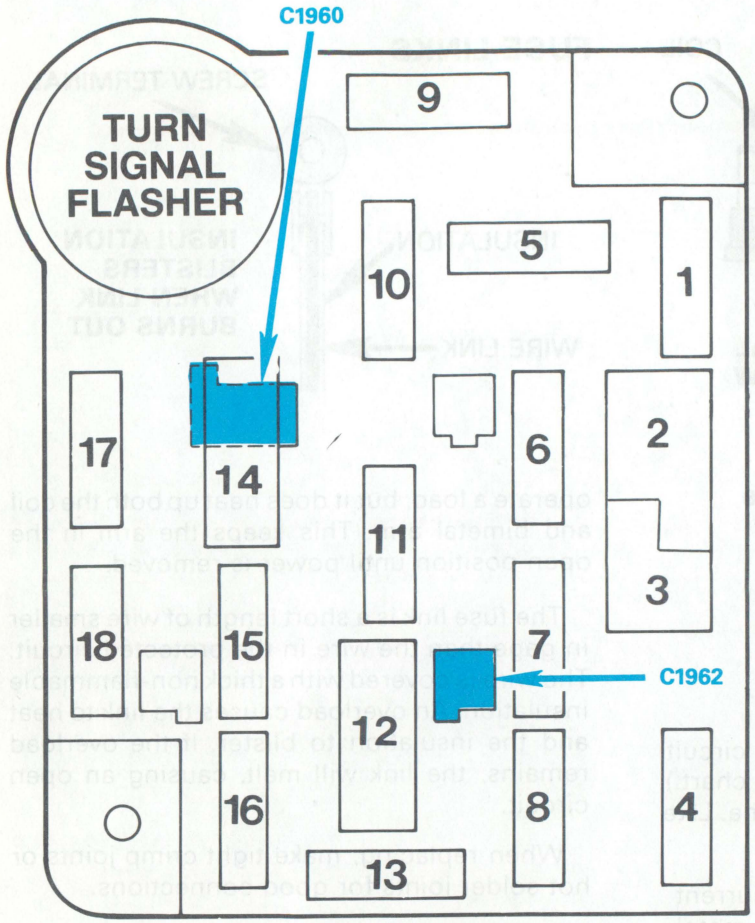


Figure 1 - Fuse Panel

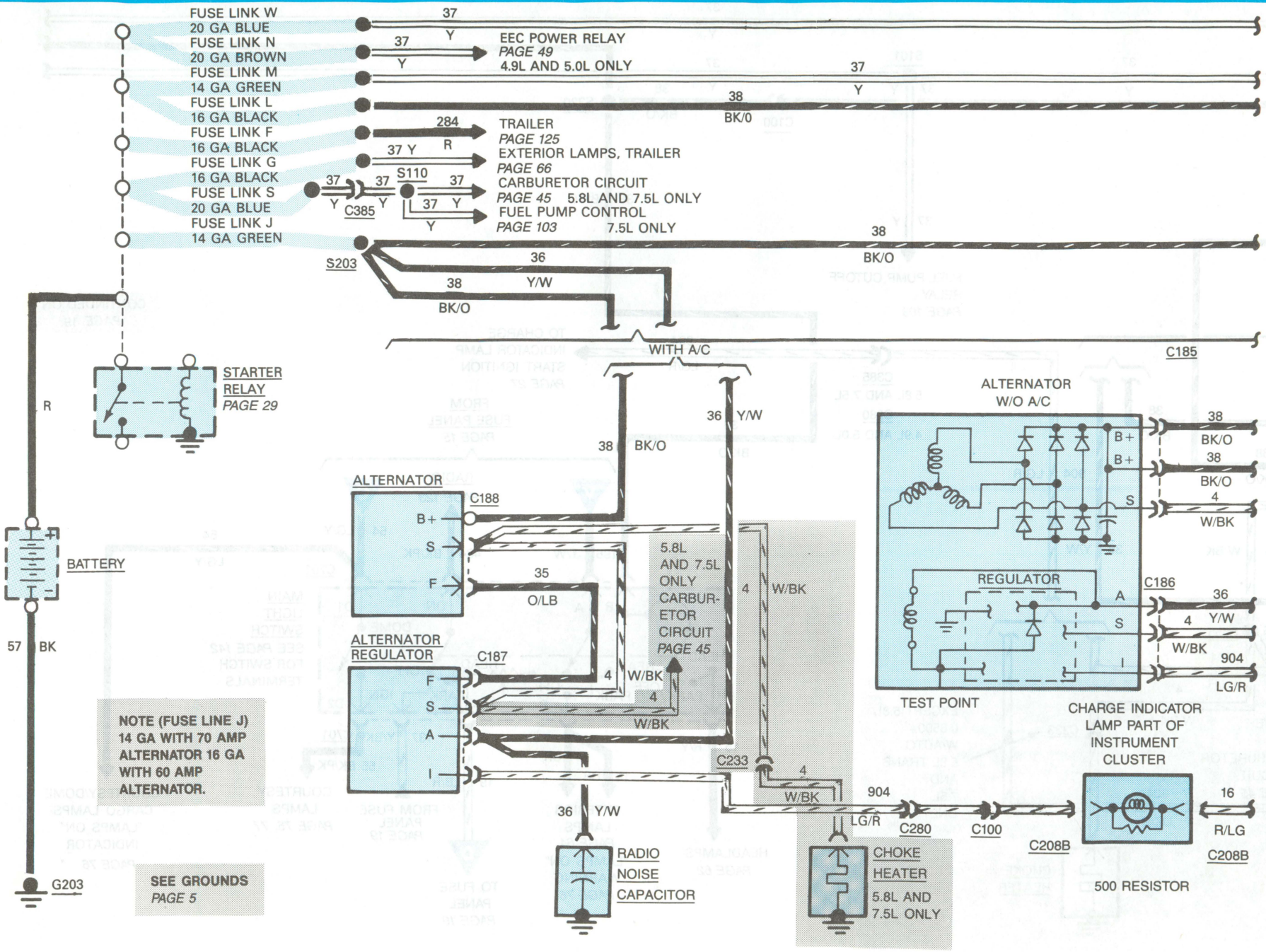
Fuse Position	Amps	Circuits Protection
1	15	Turn/Stop/Hazard Lamps; Speed Control
2	—	(Not used)
3	—	(Not used)
4	15	Exterior Lamps; Instrument Illumination
5	15	Turn Lamps; Backup Lamps; Rear Window Defrost
6	15	Speed Control; Electronic Shift-4 Wheel Drive
7	—	(Not Used)
8	15	Courtesy, Dome, Cargo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


FUSE LINK W
20 GA BLUE
FUSE LINK N
20 GA BROWN
FUSE LINK M
14 GA GREEN
FUSE LINK L
16 GA BLACK
FUSE LINK F
16 GA BLACK
FUSE LINK G
16 GA BLACK
FUSE LINK S
20 GA BLUE
FUSE LINK J
14 GA GREEN
37 Y
EEC POWER RELAY
PAGE 49
4.9L AND 5.0L ONLY
38 BK/O
284 R
TRAILER
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37 Y
EXTERIOR LAMPS, TRAILER
PAGE 66
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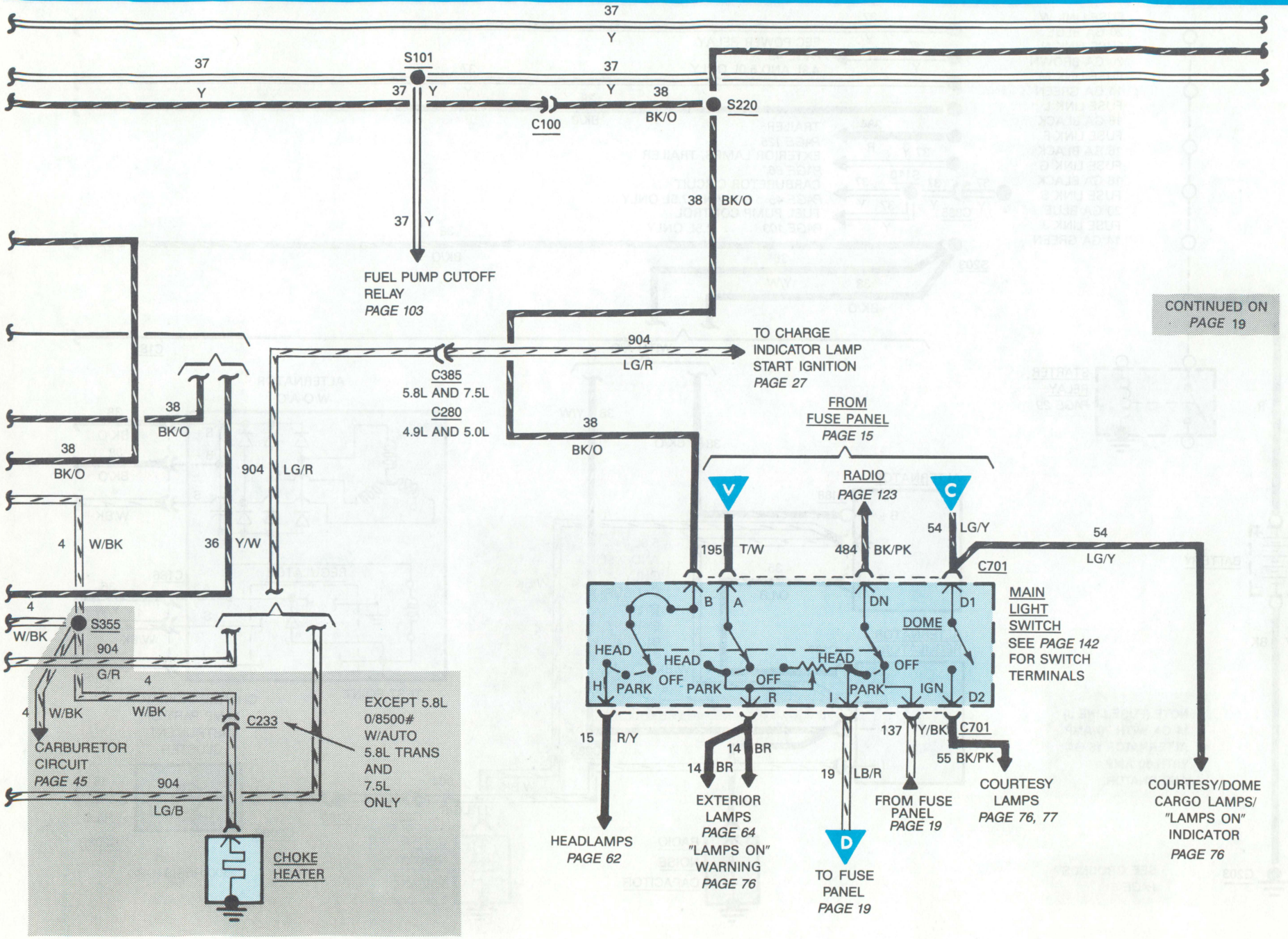
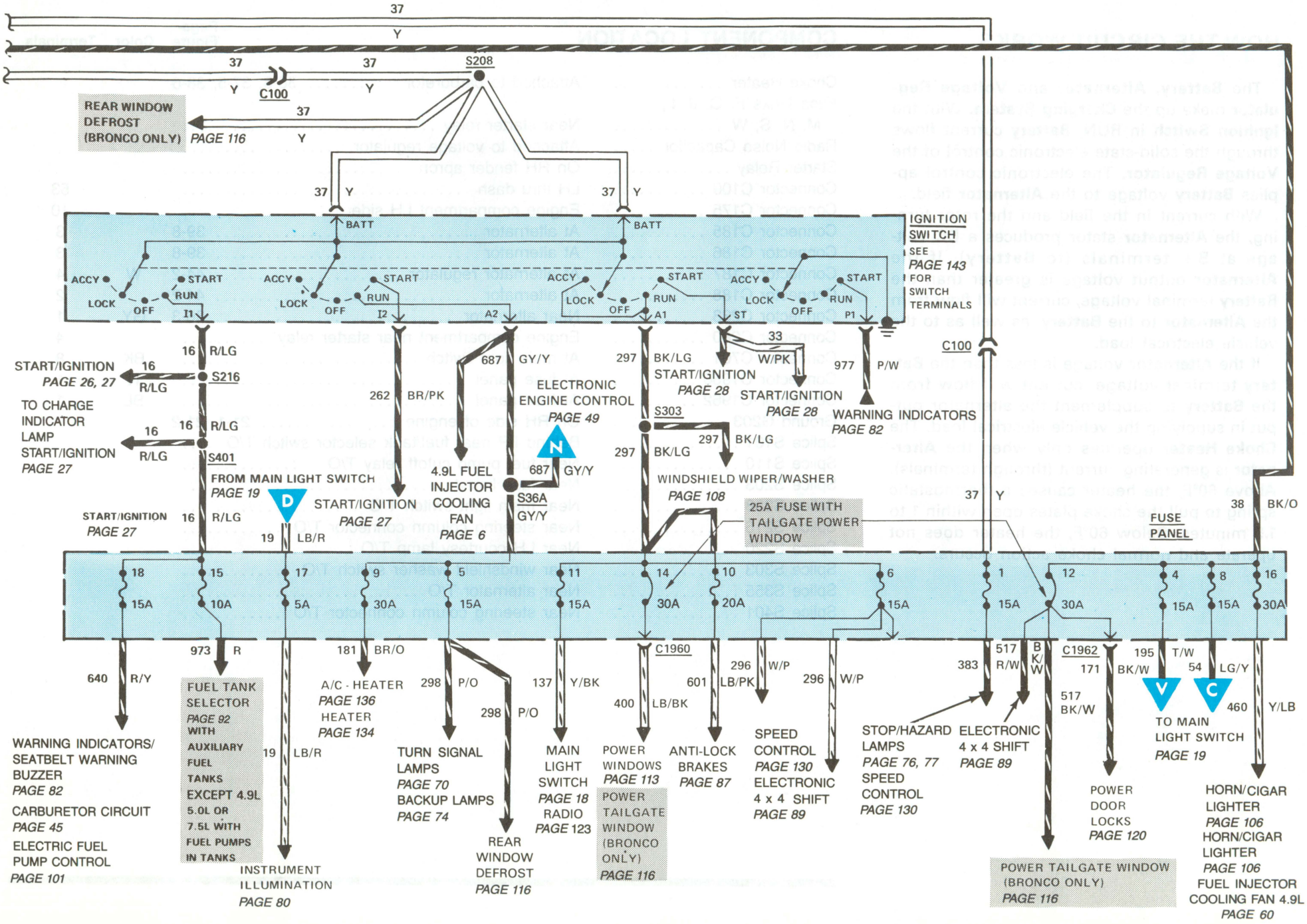
C385
CARBURETOR CIRCUIT
PAGE 45 5.8L AND 7.5L ONLY
FUEL PUMP CONTROL
PAGE 103 7.5L ONLY
S203
36 Y/W
WITH A/C
C185
STARTER RELAY
PAGE 29
R
BATTERY
57 BK
G203
SEE GROUNDS
PAGE 5
NOTE (FUSE LINE J)
14 GA WITH 70 AMP
ALTERNATOR 16 GA
WITH 60 AMP
ALTERNATOR.
ALTERNATOR
C188
B+
S
F
35 O/LB
ALTERNATOR REGULATOR
C187
F
S
A
I
4 W/BK
5.8L AND 7.5L ONLY CARBURETOR CIRCUIT
PAGE 45
C233
RADIO NOISE CAPACITOR
CHOKE HEATER
5.8L AND 7.5L ONLY
ALTERNATOR W/O A/C
B+
S
REGULATOR
A
S
I
C186
TEST POINT
CHARGE INDICATOR LAMP PART OF INSTRUMENT CLUSTER
904 LG/R
C280
C100
C208B
16 R/LG
500 RESISTOR

18 CHARGE/POWER DISTRIBUTION (GASOLINE)




37
Y
S208
C100
REAR WINDOW DEFROST (BRONCO ONLY) PAGE 116
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IGNITION SWITCH
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ACCY
START
RUN
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OFF
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I2
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A1
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TO CHARGE INDICATOR LAMP START/IGNITION PAGE 27
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FROM MAIN LIGHT SWITCH PAGE 19
START/IGNITION PAGE 27
START/IGNITION PAGE 27
4.9L FUEL INJECTOR COOLING FAN PAGE 6
ELECTRONIC ENGINE CONTROL PAGE 49
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FUEL TANK SELECTOR PAGE 92 WITH AUXILIARY FUEL TANKS EXCEPT 4.9L 5.0L OR 7.5L WITH FUEL PUMPS IN TANKS
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A/C - HEATER PAGE 136 HEATER PAGE 134
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TO MAIN LIGHT SWITCH PAGE 19
HORN/CIGAR LIGHTER PAGE 106
HORN/CIGAR LIGHTER PAGE 106
FUEL INJECTOR COOLING FAN 4.9L PAGE 60

HOW THE CIRCUIT WORKS

The **Battery, Alternator** and **Voltage Regulator** make up the **Charging System**. With the **Ignition Switch** in RUN, **Battery** current flows 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. The **Choke Heater** operates only when the **Alternator** is generating current (through terminals). Above 60°F, the heater causes a thermostatic spring to pull the choke plates open within 1 to 1.5 minutes. Below 60°F, the heater does not operate and normal choke action occurs.

COMPONENT LOCATION

		Page-Figure	Color	Terminals
Choke Heater	Attached to carburetor	36-3, 37-5, 38-6		
Fuse Links F, G, J, L, M, N, S, W	Near starter relay			
Radio Noise Capacitor	Attached to voltage regulator			
Starter Relay	On RH fender apron			
Connector C100	LH thru dash			53
Connector C175	Engine compartment LH side			10
Connector C185	At alternator	39-8		3
Connector C186	At alternator	39-8		3
Connector C187	At alternator regulator	44-2	W	4
Connector C188	At alternator	44-2		2
Connector C233	Near alternator	36-3	GY	1
Connector C280	Engine compartment near starter relay			4
Connector C701	At main light switch		BK	8
Connector C1960	At fuse panel		N	1
Connector C1962	At fuse panel		BL	1
Ground G203	On RH side of engine	21-1, 21-2		
Splice S101	Behind I/P near fuel/tank selector switch T/O			
Splice S110	Near fuel pump cutoff relay T/O			
Splice S203	Near fuse link J			
Splice S208	Near main light switch T/O			
Splice S216	Near steering column connector T/O			
Splice S220	Near LH courtesy lamp T/O			
Splice S303	Near windshield washer switch T/O			
Splice S355	Near alternator T/O			
Splice S401	Near steering column connector T/O			

TROUBLESHOOTING HINTS

The most common charge system complaints are dead **Battery** and charge indicator **On** at normal speed.

- Check **Fuse Link J** at **Starter Relay.**
- Check **Alternator** belt tension.
- Check **Battery** terminals and cable clamps.
- Check for clean and tight connections on **Alternator** and **Starter Relay.**
- Read ''Charging System Diagnosis'' in the Shop Manual.

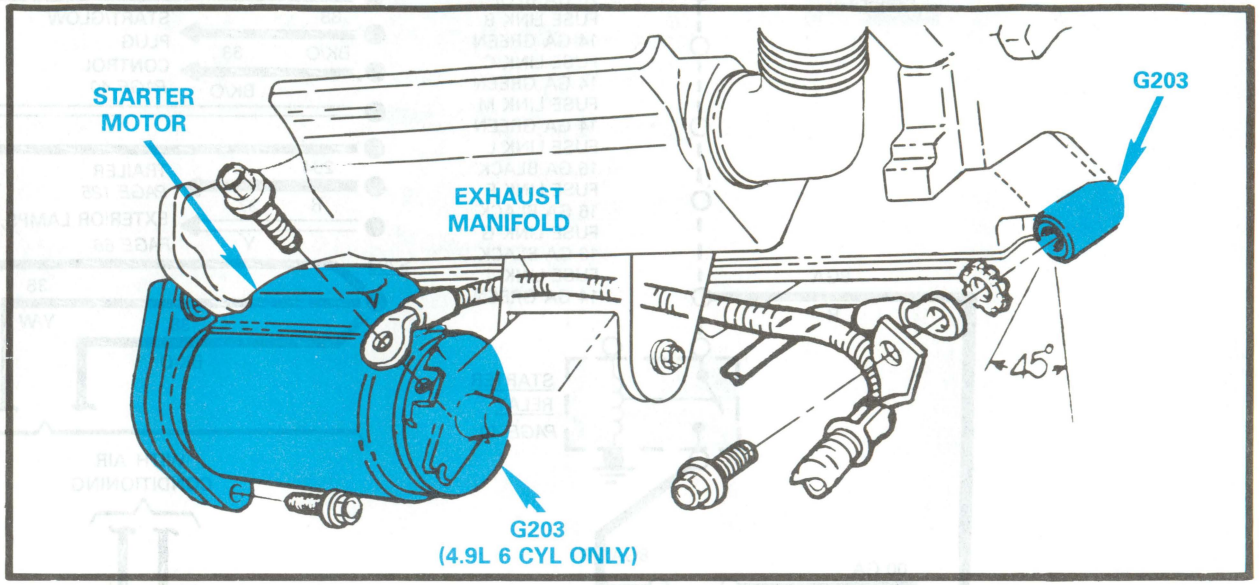


Figure 1 — Lower RH Side of Engine (5.0L, 5.8L, 7.5L, 8 Cyl.)

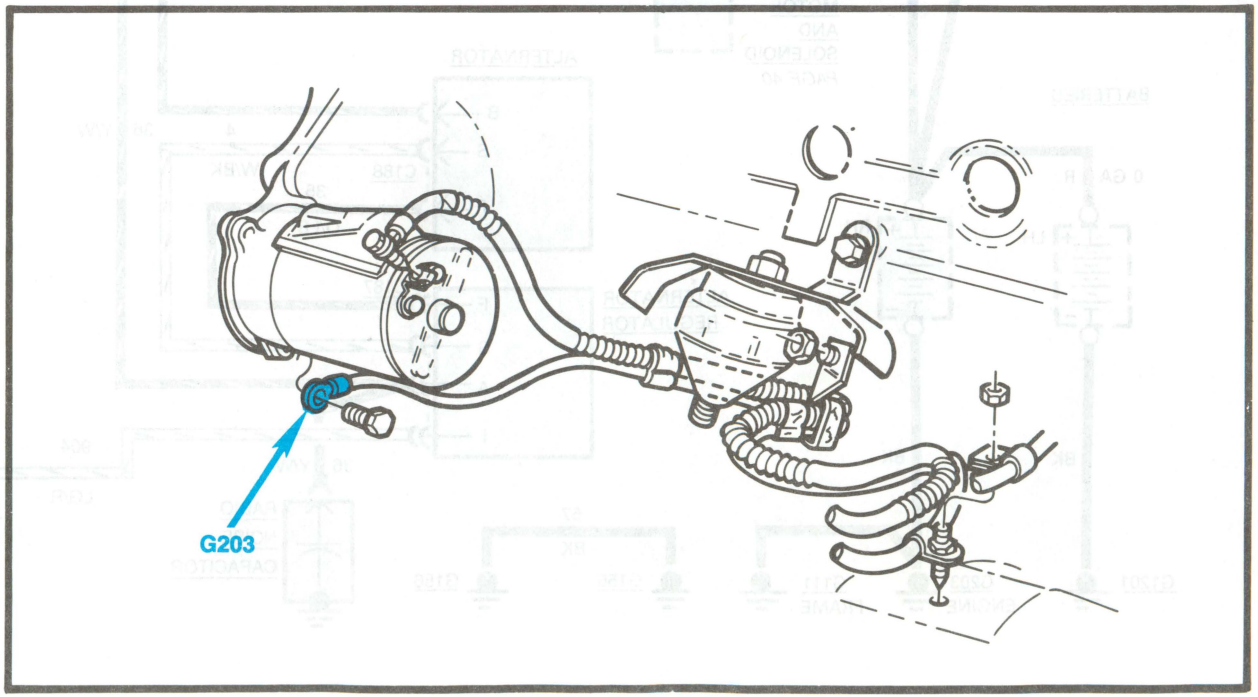
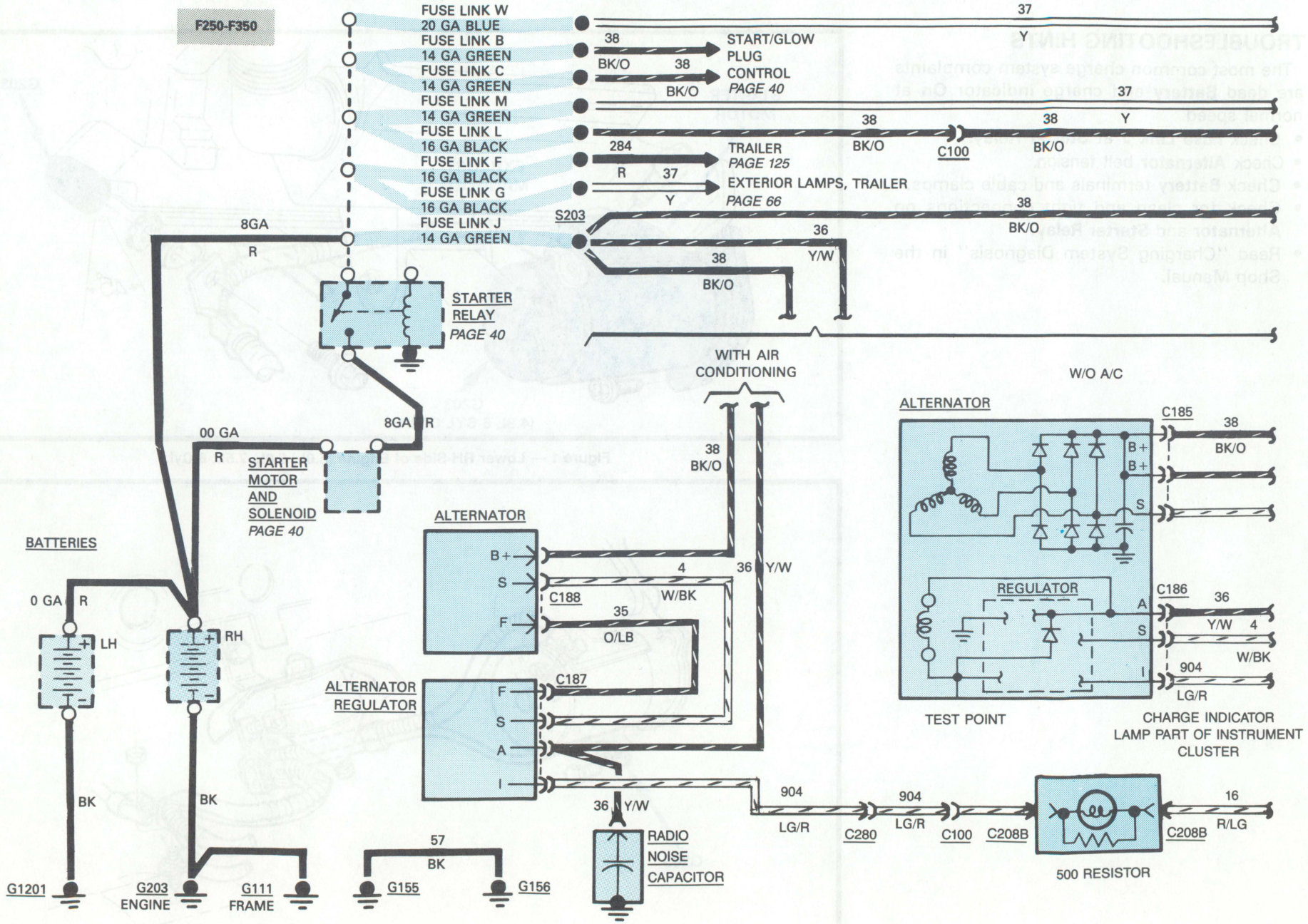
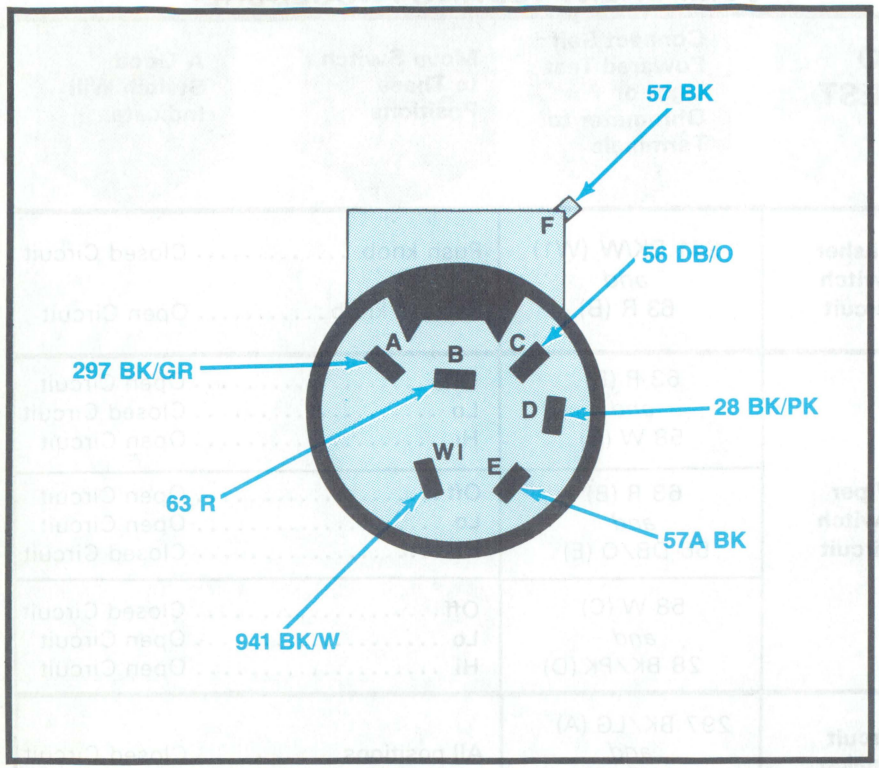


Figure 2 — Lower RH Side of Engine (4.9L 6 Cyl. ONLY)


F250-F350
FUSE LINK W
20 GA BLUE
FUSE LINK B
14 GA GREEN
FUSE LINK C
14 GA GREEN
FUSE LINK M
14 GA GREEN
FUSE LINK L
16 GA BLACK
FUSE LINK F
16 GA BLACK
FUSE LINK G
16 GA BLACK
FUSE LINK J
14 GA GREEN
37
Y
38
BK/O
START/GLOW PLUG CONTROL
PAGE 40
284
TRAILER
PAGE 125
R
37
Y
EXTERIOR LAMPS, TRAILER
PAGE 66
S203
C100
8GA
R
STARTER RELAY
PAGE 40
WITH AIR CONDITIONING
W/O A/C
00 GA
8GA
STARTER MOTOR AND SOLENOID
PAGE 40
ALTERNATOR
BATTERIES
0 GA
LH
RH
B+
S
F
C188
W/BK
O/LB
C187
ALTERNATOR REGULATOR
A
I
Y/W
LG/R
C280
C208B
C185
C186
REGULATOR
TEST POINT
CHARGE INDICATOR LAMP PART OF INSTRUMENT CLUSTER
500 RESISTOR
RADIO NOISE CAPACITOR
BK
57
G1201
G203
ENGINE
G111
FRAME
G155
G156

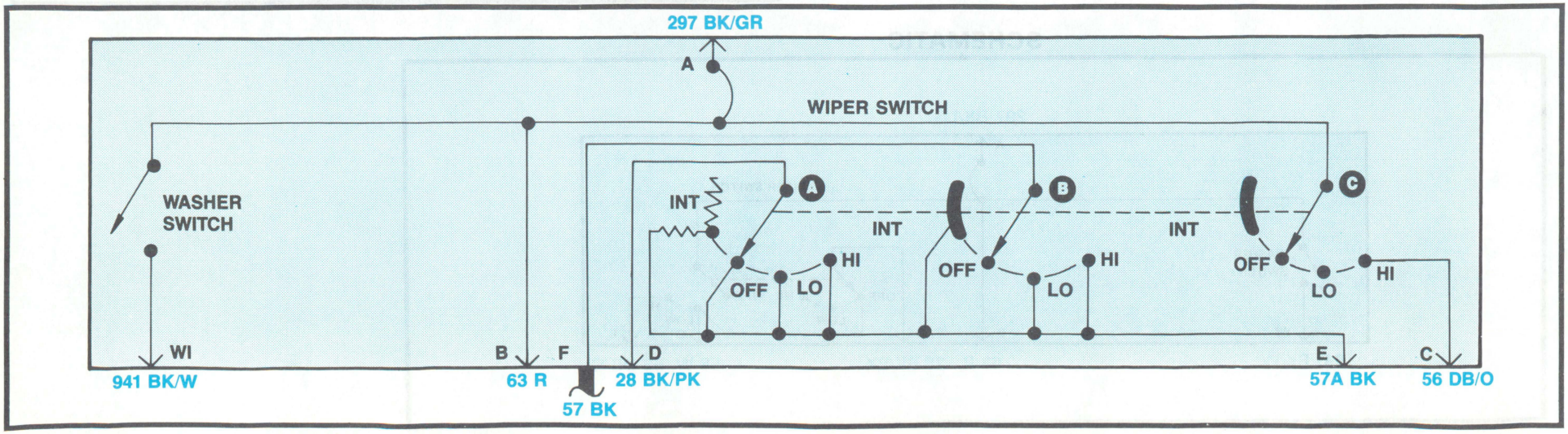
TERMINAL LOCATIONS ON SWITCH



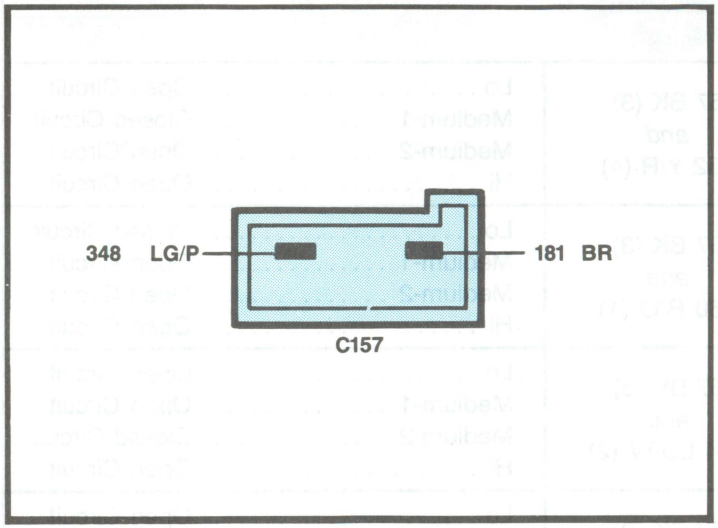
COMPONENT TESTING PROCEDURE

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 (E)	Off	Open Circuit
		All other positions	Closed Circuit
	63 R (B) *and* 56 DB/O (C)	Hi	Closed Circuit
		All other positions	Open Circuit
	28 BK/PK (D) *and* 57 BK (F)	Off	Open Circuit
		Rotate Control ..... Clockwise Into Position (as Viewed from Connector Side).	Ohmmeter will indicate smoothly increasing resistance from 200-1000 ohms minimum to 5600-8400 ohms maximum
		All other positions	Closed Circuit

SCHEMATIC



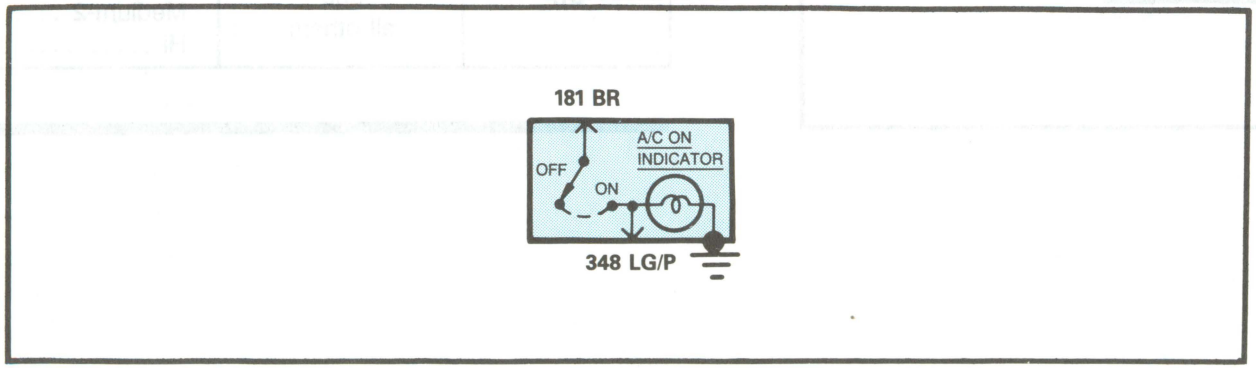
TERMINAL LOCATIONS ON SWITCH



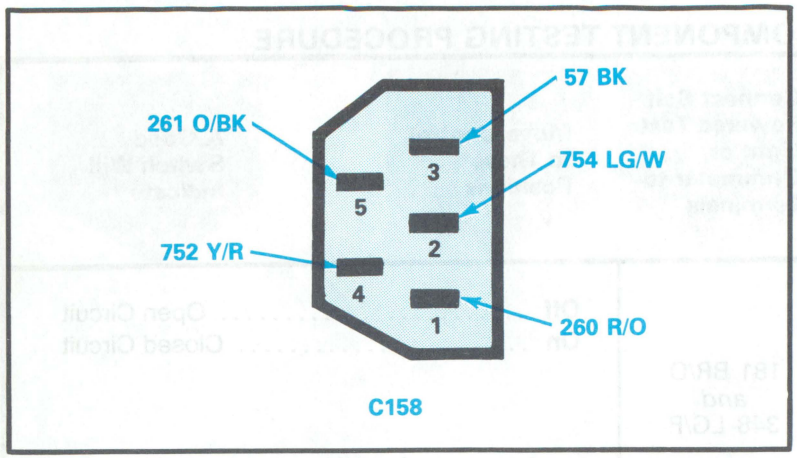
COMPONENT TESTING PROCEDURE

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 ..... Open Circuit On ..... Closed Circuit

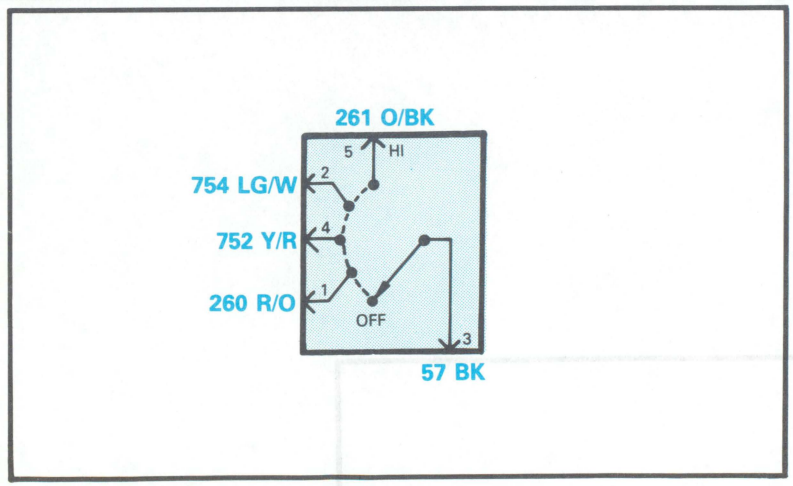
SCHEMATIC



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