1990 BRONCO / F150-F350 F-SUPER DUTY















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Electrical & Vacuum
TroubleShooting
Manual



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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 EVTM for the 1990 model year. The EVTM is directed to you--the technician. Our goal is to provide accurate and timely service information for product maintenance.

1990 EVTM 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 parts.
- Cellular pagination to assist in locating systems for easier referencing.
- Expanded Contents/Index to help with the EVTM 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

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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, 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, but because 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 trouble-shooting 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 trouble-shooting. 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.

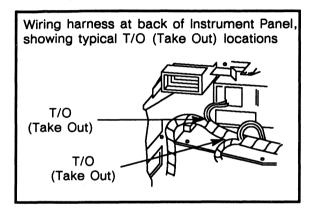
The wiring diagrams show the number of times the resistors and diodes are used. The wiring diagrams also show the distance from connector/length of wire in exact centimeters. Resistors and diodes are identified on the wiring diagrams by the following base part numbers:

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.

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

 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	0	Orange
BR	Brown	PK	Pink
DB	Dark Blue	P	Purple
DG	Dark Green	R	Red
GR	Green	Т	Tan
GY	Gray	W	White
LB	Light Blue	Υ	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.

 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.

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 temporarily installing a known good component and operating the circuit.

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

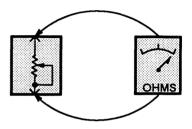


Figure 1-Resistance Check

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

TEST LAMP

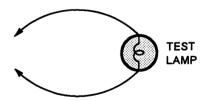


Figure 2-Test Lamp

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

Uses: Voltage Check, Short Check

SELF-POWERED TEST LAMP

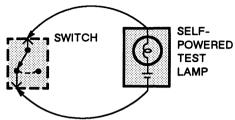


Figure 3-Continuity Check

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.

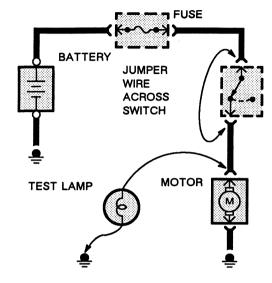


Figure 4-Switch Circuit Check and Voltage Check

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).

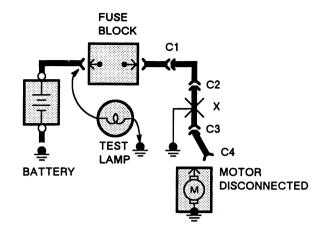


Figure 5-Short Check

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.)

4-3 HOW TO FIND THE ELECTRICAL PROBLEM

- 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.

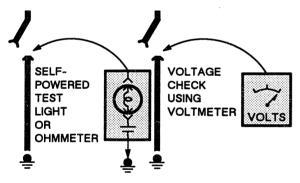


Figure 6—Ground Checks

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.

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 6).

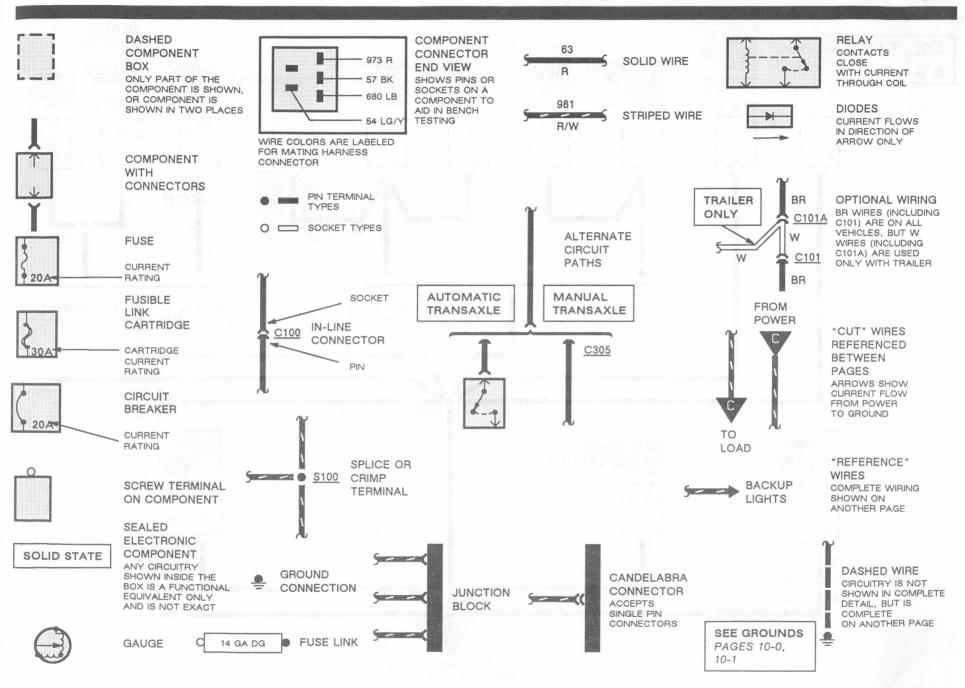
TROUBLESHOOTING HINTS

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.

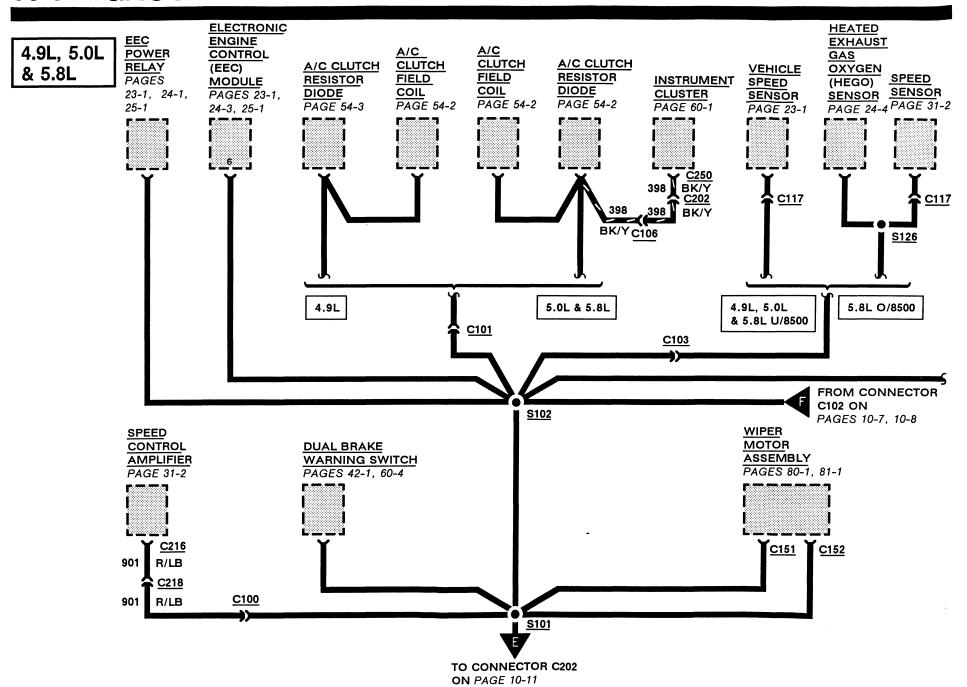
For example, if low beam headlamps work, but high beams and the indicator lamp don't work, then power and ground paths must be good. Since the dimmer switch is the component that switches this power to the high beam lights and indicator, it is most likely the cause of failure.

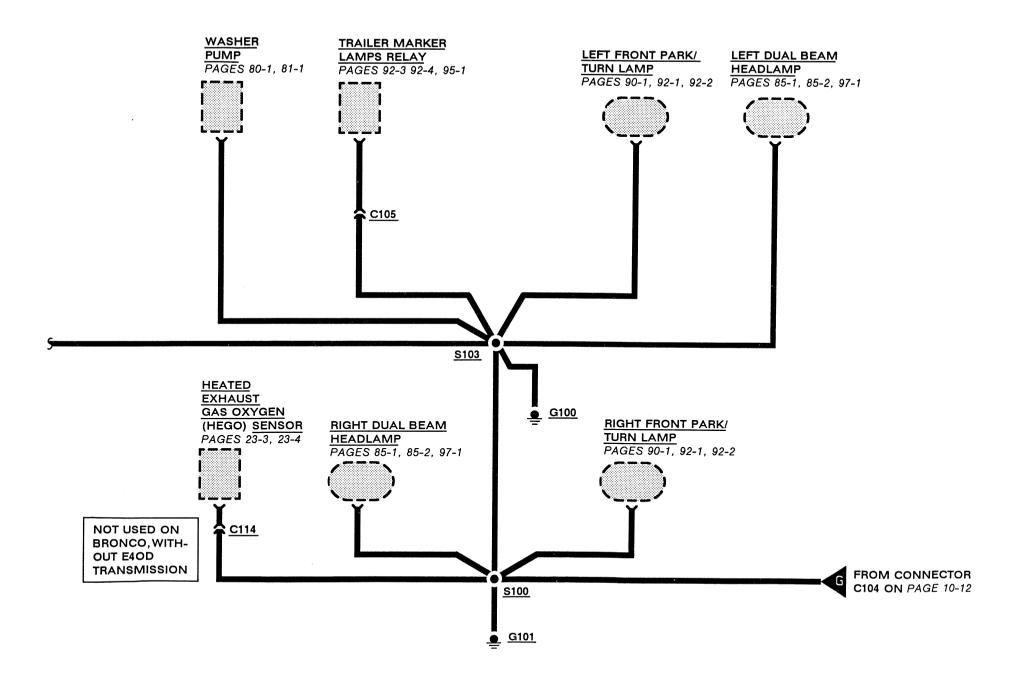
Troubleshooting Hints unique to a particular circuit are given in a new, three column format. Included in the charts are conditions that may develop, possible causes, and one or more tests that can be done quickly to determine the cause of the condition.

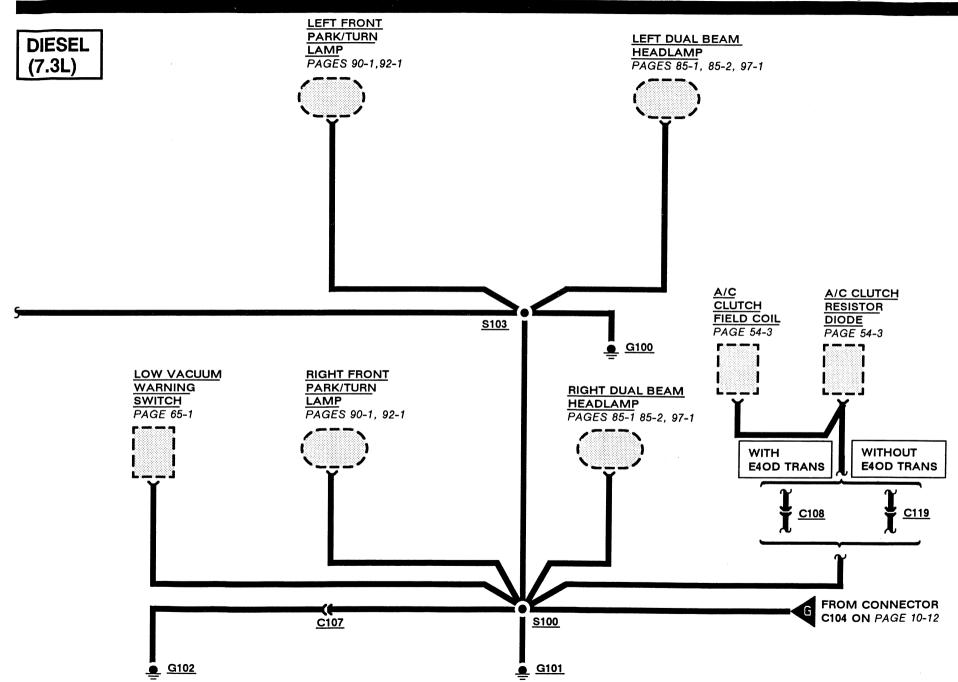
ELECTRICAL SYMBOLS 5-1

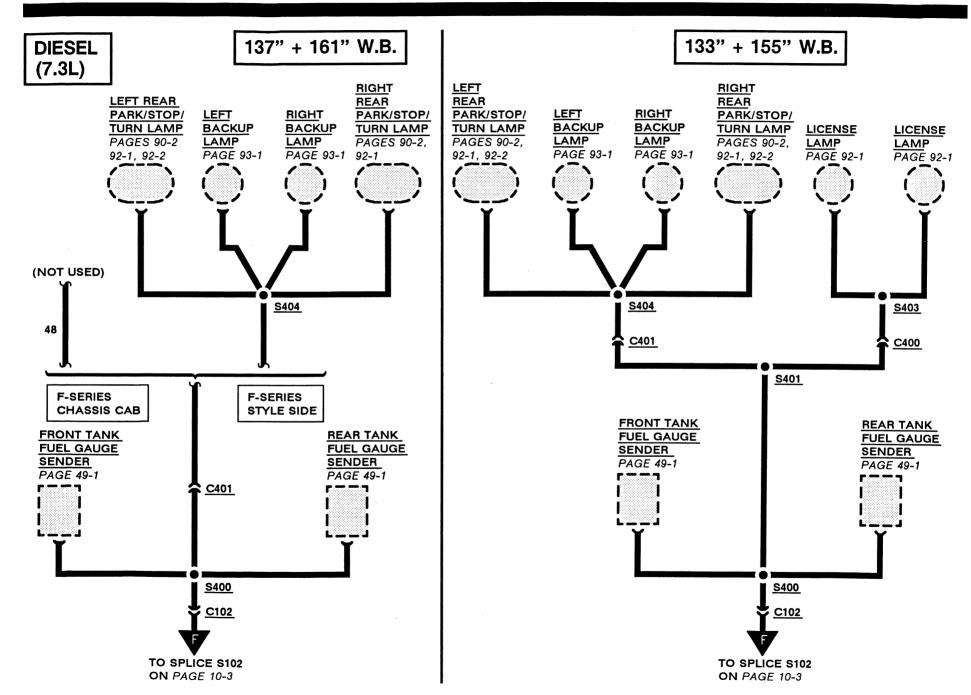


10-1 GROUNDS

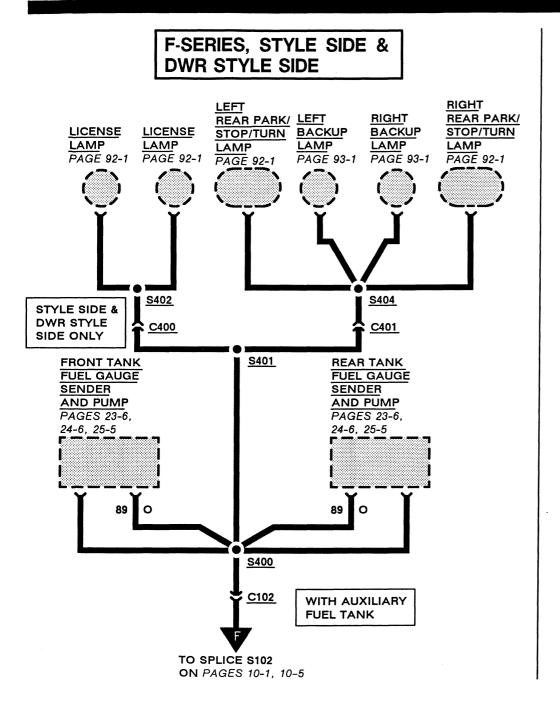




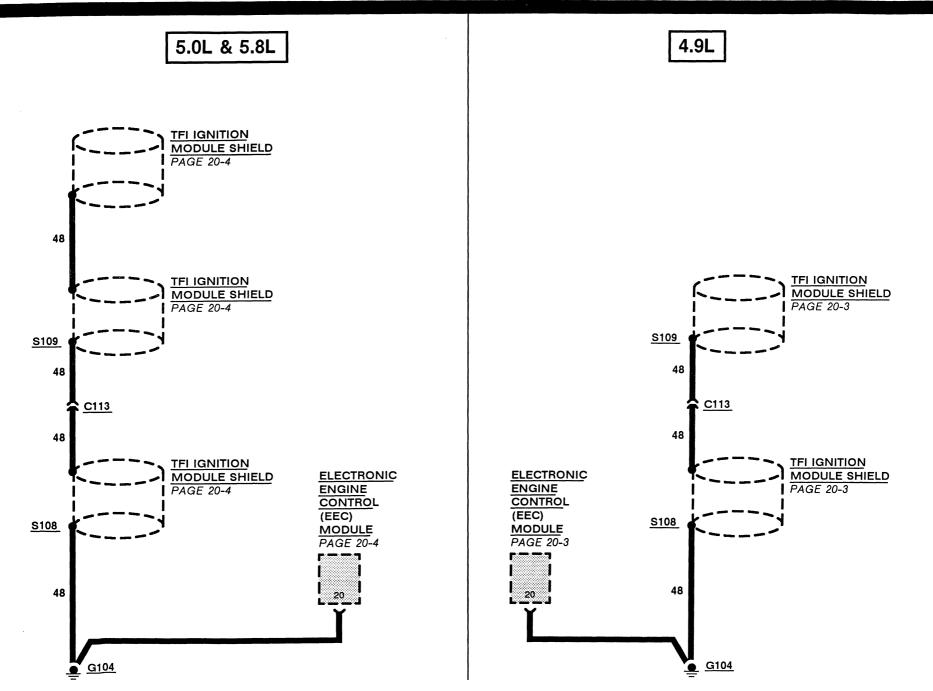




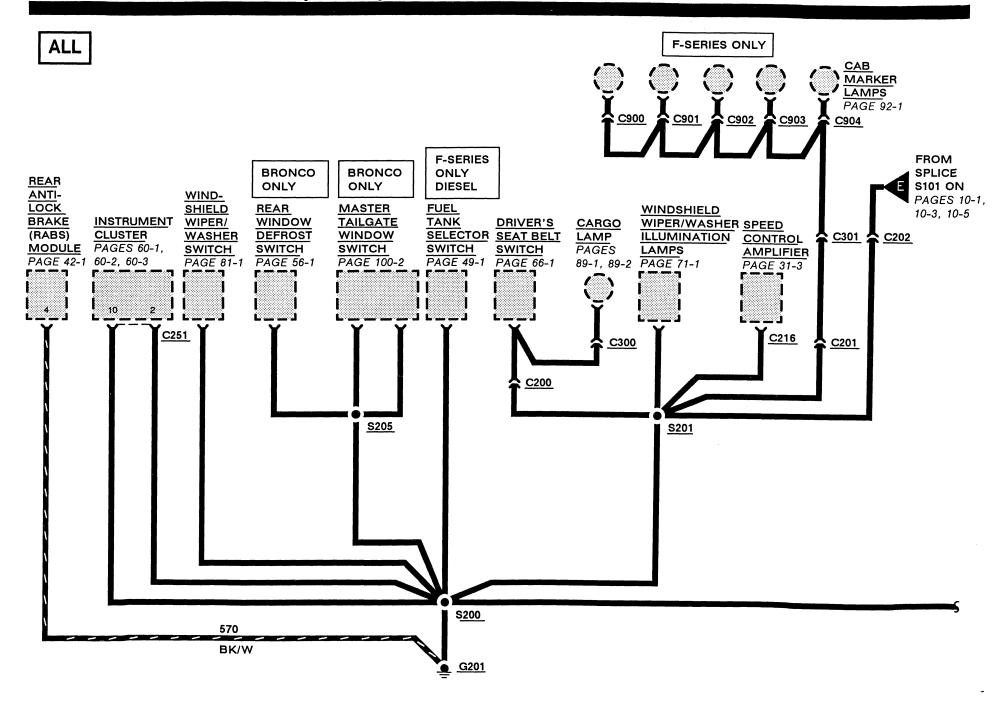
5.0L



ELECTRONIC HEATED EXHAUST ENGINE CONTROL GAS OXYGEN (EEC) MODULE (HEGO) SENSOR PAGE 24-4 PAGE 24-4 (NOT USED) C110 0 89 NOT USED ON C114 89 **BRONCO WITH-**89 lo **OUT E40D** 89 0 **TRANSMISSION** S107 89 0 C101 89 0 G103



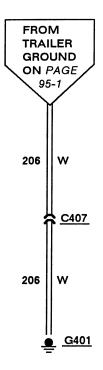
10-11 GROUNDS (G201)



10-13 GROUNDS (G401)

DRW STYLE SIDE **RIGHT RIGHT LEFT** LEFT FRONT REAR REAR FRONT SIDE SIDE SIDE SIDE **REAR BODY** MARKER **MARKER** MARKER MARKER MARKER LAMPS LAMP LAMP LAMP LAMP PAGE 92-3 PAGE 92-3 PAGE 92-3 PAGE 92-3 PAGE 92-3 206 W 206 206 | W W W 206 206 W 206 C410 C413 C420 C411 C412 206 W 206 W W 206 206 W S410 **S409** 206 W W 206 206 W C408 C407 W 206 w 206 S412 **FROM TRAILER GROUND** 206 W ON PAGE 95-1 206 W C401 C407 206 l w 206 W

TRAILER TOW LESS DRW STYLE SIDE



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.

11-1 FUSE PANEL/CIRCUIT PROTECTION

REPLACEMENT OF FUSES/CIRCUIT BREAKERS



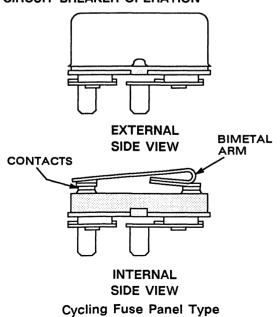


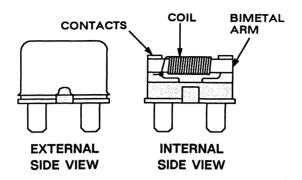
GOOD FUSE

BLOWN FUSE

Fuses are mounted in the Fuse Panel. They are identified by the number rating in amperes. Some positions may have either a fuse 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 to check them.

CIRCUIT BREAKER OPERATION





Non-Cycling Fuse Panel Type



Cycling In-Line Type

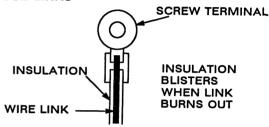
Some circuits are protected by circuit breakers (abbreviated "c.b." in fuse chart). They can be Fuse Panel mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal 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 cycle repeats as long as the overcurrent exists and power is 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 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.

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 usually color coded for wire size as follows:

COLOR CODE

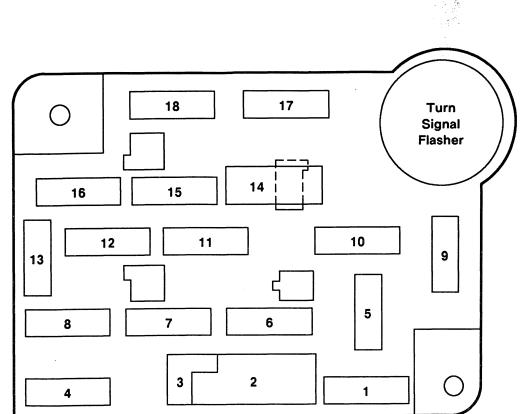
BLUE	20 GA
BROWN OR RED	18 GA
BLACK OR ORANGE	16 GA
GREEN	14 GA

When replacing fuse links, 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.



Fuse Value Amps	Color Code
4	Pink
5	Tan
10	Red
15	Light Blue
20	Yellow
25	Natural
30	Light Green
1	

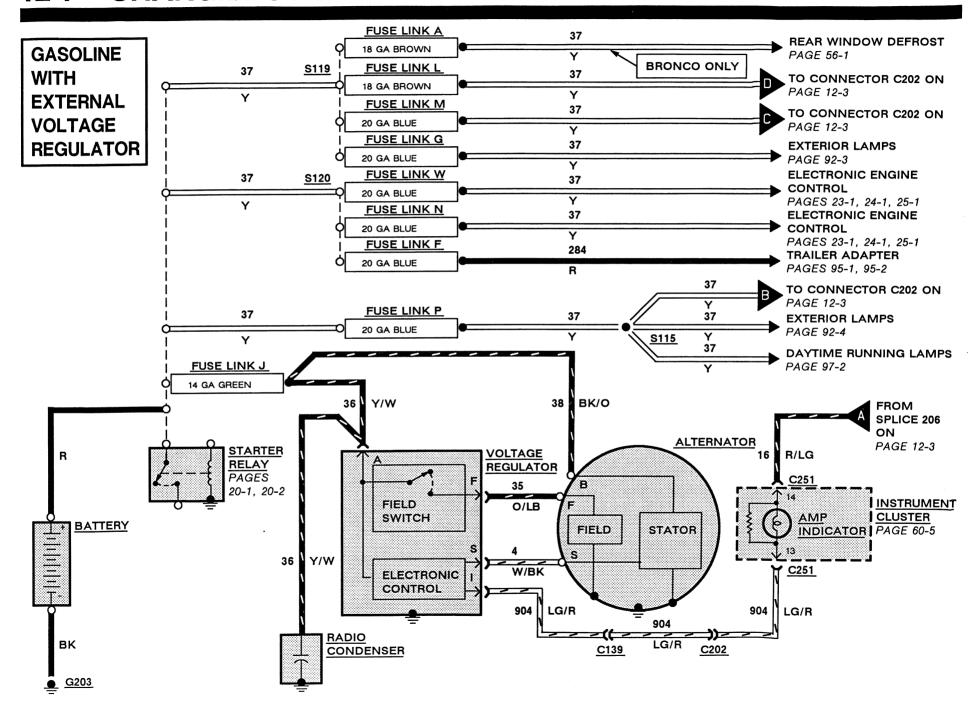
Power Distribution

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.

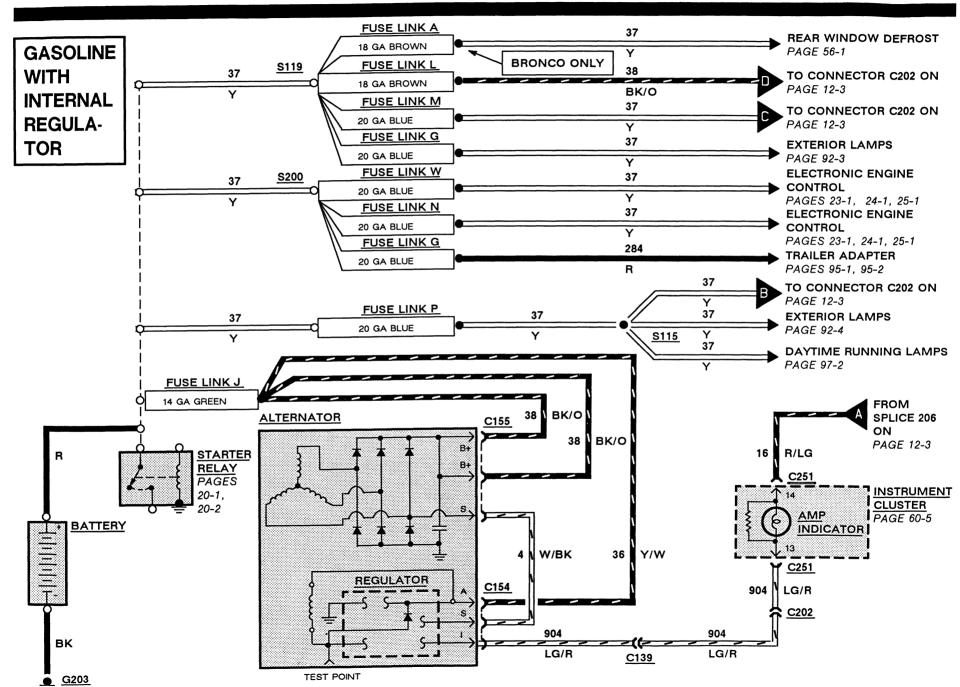
The Ignition Switch and Main Light Switch are powered at all times, as are fuses 1, 4, 8, 12 and 16. The other fuses are powered through the Ignition Switch or the Main Light Switch.

Fuse Position	Amps	Circuits Protected
1	15	Stop and Hazard Lamps, Anti-lock Brakes, Speed Control
2	_	(Not Used)
3	_	(Not Usad)
4	15	Exterior Illumination, Instrument Illumination, Radio Clock Illumination
5	15	Turn Lamps, Daytime Running Lamps, Overdrive Switch, Backup Lamps, HEGO Sen- sor 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

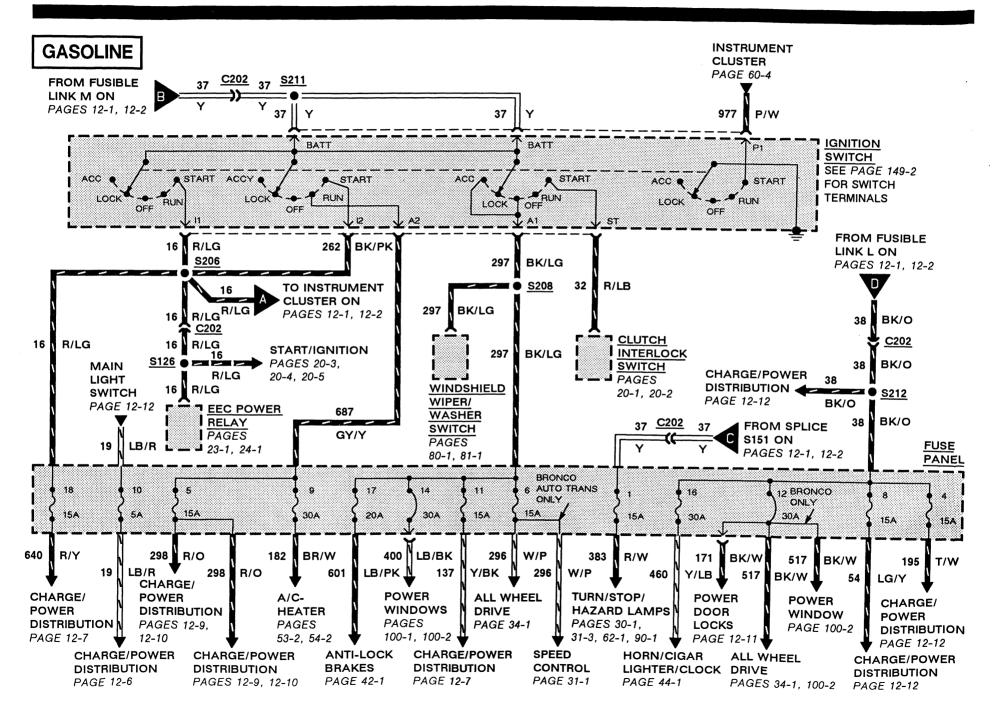
12-1 CHARGE/POWER DISTRIBUTION



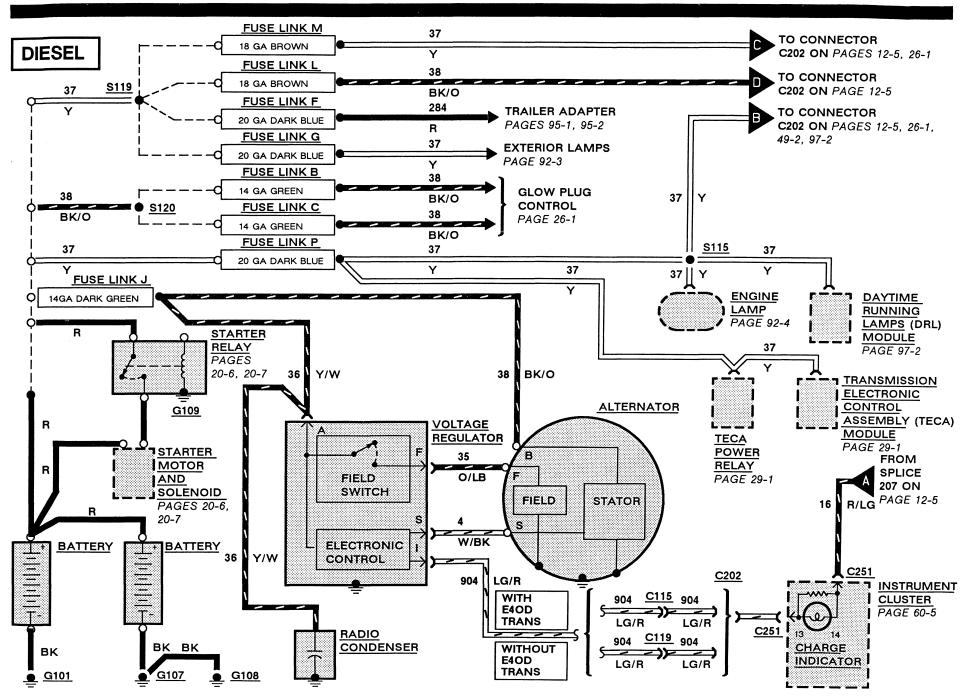
CHARGE/POWER DISTRIBUTION 12-2



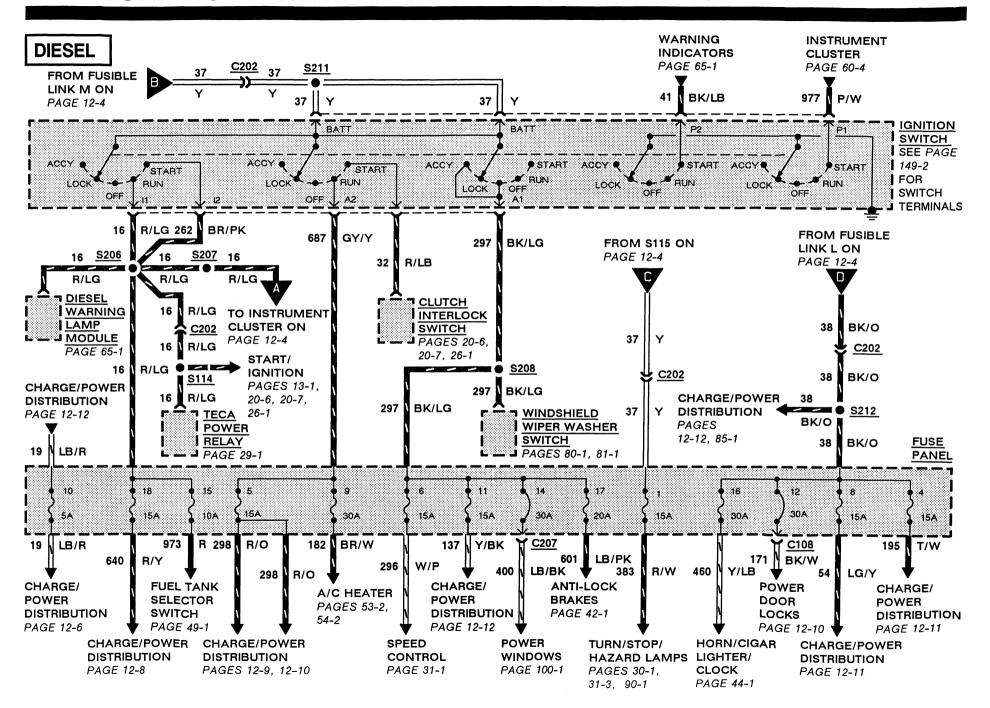
12-3 CHARGE/POWER DISTRIBUTION



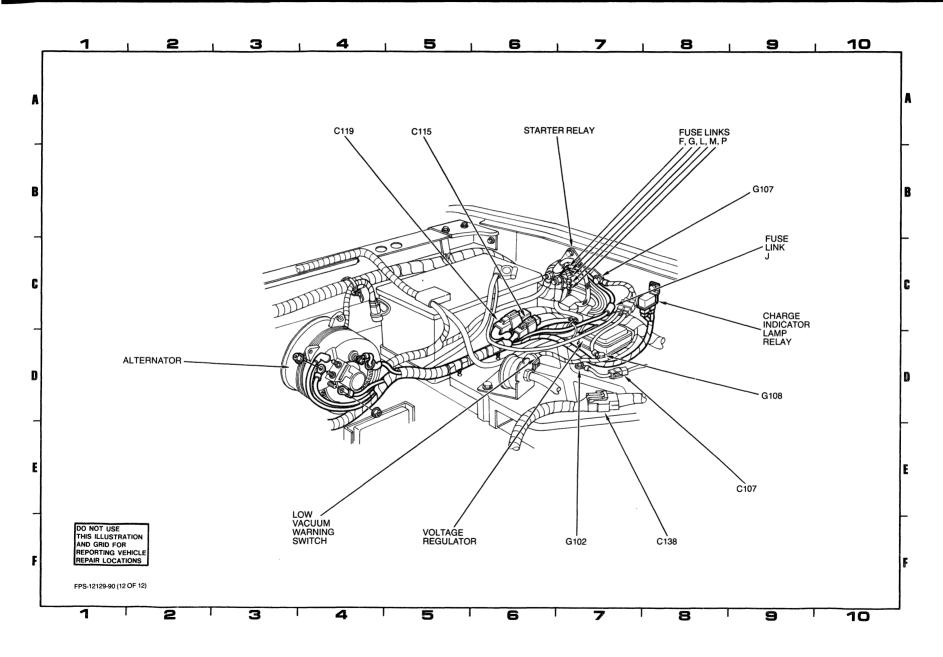
CHARGE/POWER DISTRIBUTION 12-4



12-5 CHARGE/POWER DISTRIBUTION



COMPONENT LOCATION VIEW 151-12



152-1 LOCATION INDEX

Base Harness Number	Harness Name	Major Systems
14401	Main	Anti-lock Brakes Courtesy Lamps Headlamps IMS/EUL Module Instrument Panel Speed Control Radio Turn/Stop/Hazard Lamps
14405	Rear Lamp	Warning Chime Anti-lock Brakes Auxiliary Fuel Tank Selector Fuel Tank Sender And Pump License Lamps Turn/Stop/Hazard Lamps Trailer Wiring
14406 14408	Fuel Tank Sender	Fuel Tank Sender
14630	Window Regulator Right Front Door	
14631	Window Regulator Left Front Door	Power Door Locks Power Window Radio
14K067 14086 14289	Warning Lamp Feed	Warning Indicators Tailgate Power Window
14303 14305	Engine Ground	Grounds
14334	Interior Lamp Feed	

LOCATION INDEX 152-2

Base Harness Number	Harness Name	Major Systems
11411120		<u> </u>
13A409	Rear Lamps	License Lamp
13A576 13A726	Trailer Lamp Feed	
13N850 13412 14A107 14A200	Diesel Starter Relay Ground	Ground License Lamp Anti-lock Brakes
14A303 14A346 14A348 14A504	Relay Feed Wiring Assembly	Power Windows Trailer Wiring Trailer Wiring Trailer Wiring
6B0108 7A786 9A124	Engine Block Heater Transfer Case Four Wheel Drive Control Fuel Tank Selector Switch	Seatbelt Retractor Engine Block Heater All Wheel Drive
9A840 9C887	Speed Control Wiring Assembly	
9D353 9D930 11A060 12A581	Fuel Pump Motor Jumper Fuel Charge	Engine Controls Engine Controls Grounds
12A690 15A411 15A416	Engine Control Sensor Extension	Start Ignition Windshield Wiper/Washer HEGO Sensor Lead Trailer Wiring

152-3 LOCATION INDEX

Base Harness Number	Harness Name	Major Systems
15A504	Marker Lamp To Switch	Exterior Lamps
15A702	Engine Compartment Lamp Feed	Exterior Lamps
15460	Marker Lamp Wiring Assembly	Exterior Lamps
15525	Backup Lamp Switch To Rear Lamp Feed	Backup Lamps
18A586	Heater Switch To Blower Motor	A/C Heater
19A123	Rear Speaker Extension	Radio

LOCATION INDEX 152-4

Component	Base Part No.	Location	Page Zone	Connector Page
Compension	rait No.	<u> </u>		Tugo
		On transfer case	*	
A/C Clutch Cycling Pressure Switch	19E561	RH rear of engine compartment, on A/C		
		accumulator		
		LH front of engine, on A/C compressor		
		LH fender apron, near relay assembly		
		Center of I/P	151- 8-B 4	
		Below rear of trunk, on differential	*	
Air Charge Temperature Sensor				
(4.9L)	12A697	Front RH side of engine, near intake		
		runner No.1	151- 1-F 4	
Air Charge Temperature Sensor				
(5.0L and 5.8L)	.12A697	Top front center of engine, near intake		
		runner No. 6	151- 4-C 1	
Air Charge Temperature Sensor				
		Top front center of engine		
		RH front of engine		
· · · · · · · · · · · · · · · · · · ·		RH rear of transmission		
		LH rear side of transmission		
		RH side of safety wall	151- 1-C 1	150- 1
Blower Resistors	. 18591	On heater housing assembly, near blower		
		motor		
		Center of I/P		150- 1
		Top of engine		
- · · · · · · · · · · · · · · · · · · ·		RH side of engine, near throttle body		
		RH side of engine		
- , , ,		Rear LH side of cargo area	151- 9-A 5	
Cargo Lamp Diode (F-Series)	14A604	Interior lamp feed harness, near T/O to cargo		
_		lamp, on rear of cab	151-10-A 5	
		RH fender apron, near starter relay	*	
		Mounted on clutch pedal support		150- 1
•		Mounted on clutch pedal support		
		Top center front of engine		
		Top LH side of engine		
Coolant Temperature Sender (4.9L) * No Figure Available	12A648	Front of engine, in thermostat housing	151- 2-B 1	

152-5 LOCATION INDEX

Component	Base Part No.	Location	Page Zone	Connector Page
Coolant Temperature Sender (5.0L, 5.8L, 7.3L, and 7.5L) Daytime Running Lamps (DRL)	12A648	Front LH side of engine	151- 3-D 9	
Diesel/Warning Lamp Module	10A936	LH front of engine compartment, near horns Behind LH side of I/P	151- 8-A 6	. 150- 2
Door Control Switch		Top front of engine	151- 9-E 1 . 151- 9-F 3	. 150- 2 . 150- 2
Driver's Seat Belt Switch Dual Brake Warning Diode/Resistor		Inside respective front door		
Dual Brake Warning Switch	. 2B264	Main harness, near anti-lock brake module LH rear of engine compartment, on brake fluid reservoir		
EGR Control Solenoid (4.9L)	. 9D460	cover bracket		. 150- 3
EGR Control Solenoid (5.0L and 5.8L) EGR Vacuum Regulator (EVR)	. 9D460	LH rear side of engine, on coil support bracket	151- 4-A 5	
		LH rear of engine LH side of engine		
EGR Valve Position Sensor (7.5L)	. 9G428	Front RH side of engine, on EGR valve LH rear of engine	151- 6-A 6	
	12A650	Lower LH side of safety wall		
Electronic Transfer Case Assembly Engine Coolant Temperature Sensor	7005	LH side of I/P	*	. 150-10 . 150- 9
⋆ No Figure Available				

Component	Base Part No.	Location	Page Zone	Connector Page
Engine RPM Sensor (with E4OD				
Transmission)	. 17630	. LH front of engine	151- 5-F 7	
Engine RPM Sensor (without				
E4OD Transmission)	. 17630	. Top front of engine	*	
		. Front LH side of engine		
Front Window Motor		. Inside respective front door	151- 9-F 1	
Fuel Gauge Sender/Electric Fuel Pump	. 9H307	. Mounted on top front of fuel tank	*	
Fuel Injection Pump Lever				
(FIPL) Sensor	. 9B989	. LH side of engine	151- 5-F 7	
Fuel Injectors (4.9L)	. 9E593	. RH side of engine, in lower intake manifold	151- 1-C 1	
Fuel Injectors (5.0L, 5.8L and 7.5L)	. 9F593	. Top of engine, in lower intake manifold	151- 3-A 5	
Fuel Line Heater	. 9C330	. Front RH side of engine, near fuel filter	151- 5-F 2	
Fuel Pump Relay	. 9C392	On LH fender apron	151- 2-D 9	150-10
Fuel Shutoff Solenoid	. 9D278	. Top of engine	151- 5-F 5	
Fuel Tank Selector Switch	. 9A050	. LH side of I/P	151- 8-A 9	150-10
Fuel Tank Selector Valve	9189	. LH side of main frame, rear of cab	*	150-11
Fuel Water Switch		. Front RH side of engine, near fuel filter	151- 5-B 1	
Fuse Link A	. 14526	. Front of RH fender apron, in engine control		
		harness	151- 1-D 1	
Fuse Link B	. 14526	Front of RH fender apron, in engine control		
		harness	151- 5-E 1	
Fuse Link C	. 14526	Front of RH fender apron, in engine control		
		harness	151- 5-E 1	
Fuse Link F	. 14526	Front of RH fender apron, in engine control		
		harness	151- 1-D 1	
Fuse Link G	. 14526	Front of RH fender apron, in engine control		
		harness	151- 1-D 1	
Fuse Link J	. 14526	RH fender apron, at starter relay	151- 1-D 1	
Fuse Link L	. 14526	Front of RH fender apron, in engine control		
		harness	151- 1-D 1	
Fuse Link M	. 14526	Front of RH fender apron, in engine control		
		harness	151- 1-D 1	

152-7 LOCATION INDEX

Component	Base Part No.	Location	Page Zone	Connector Page
Fuse Link N	. 14526	Front of RH fender apron, in engine control		
		harness	151- 1-D 1	
Fuse Link P	. 14526	Front of RH fender apron, in engine control		
		harness	151- 1-D 1	
Fuse Link W	. 14526	Front of RH fender apron, in engine control	151 1 D 1	
Eugo Link V	144526	harness	ו ט-ו -וכו	
ruse Link A	14A526	harness	*	
Fuse Link 7	144526	Rear of RH fender apron, in engine control	^	
7 000 Ellik 2	147.020	harness	*	
Fuse Panel	14A068	Behind LH side of I/P	*	
Glow Plug Controller	12B533	Top center rear of engine	151- 5-A 5	
Glow Plugs	12A342	On top of cylinder head	*	
Hazard Flasher	. 13350	Behind RH side of I/P	151- 8-D 1	
Heated Exhaust Gas Oxygen (HEGO)				
		In exhaust pipe, ahead of catalyst	*	
		Center of I/P	*	450.44
•		Behind RH side of I/P, near hazard flasher		150-11
· · · · · · · · · · · · · · · · · · ·		Behind RH side of I/P, near hazard flasher	*	
		Inside steering wheel		
Idle Air Bypass Valve	13032-3	rolward of LH radiator support	131- 1-1 6	
* *	12B526	Center front of engine, on throttle body	151- 3-F 6	
·		Top center of engine		
· · · · · · · · · · · · · · · · · · ·		LH side of engine		
•		LH side of engine		
		Lower LH side of engine		
		LH rear side of engine		
· · · · · · · · · · · · · · · · · · ·		LH side of engine		
		Inside steering column, part of ignition		
		switch assembly	*	
		LH side of engine, taped in harness		
-		RH side of steering column		150-11
Inertia Switch	9341	Behind LH cowl panel, near C202	151- 8-F 9	
⋆ No Figure Available				

LOCATION INDEX 152-8

Component	Base Part No.	Location	Page Zone	Connector Page
Instrument Cluster (Diesel)		LH side of I/P	*	150-13
Instrument Cluster (Gasoline)		LH side of I/P	*	150-12
		On rear of alternator		
		Behind LH side of I/P		
Knock Sensor	12A699	LH side of engine, near ignition coil	151- 2-F 6	
		RH fender apron		
		LH side of I/P		150-14
		RH side of safety wall		
		LH side of transmission		150-14
		LH side of I/P		
<u> </u>		On driver's door panel		
		Inside top of steering column		150-15
		LH side of engine		
· ·		LH side of engine, near oil filter		
•		Top rear of engine		
		Top RH rear of engine		
		LH center of I/P		150-16
		LH front of engine		
		Mounted on parking brake bracket		
		In fuel filter housing		
		LH fender apron		
		LH fender apron, near EEC power relay		
		Center of I/P		150-16
		Front LH side of engine, near ignition coil		
		Rear LH side of engine, near ignition coil		
•	•	Behind center of I/P, near radio		150-17
· · ·		On frame, near transmission		
•		LH side of I/P		150-17
		Inside RH front door		
-		Below RH side of driver's seat		
		Behind center of I/P, near radio		150-18
		LH rear of engine compartment, near brake		
		fluid reservoir	*	150-18
Starter Motor	11002	Lower RH front side of engine		-
Ale Fig Aveilette				

152-9 LOCATION INDEX

Component	Base Part No.	Location	Page Zone	Connector Page
Starter Motor And Solenoid	. 11450	Lower RH side of engine	*	
Starter Relay	. 11450	On RH fender apron	151- 1-D 1	
Stop Lamp Switch	. 13480	Mounted on brake pedal support	151- 8-B 7	
Tailgate Latch Switch		LH side of tailgate	*	
Tailgate Power Window Motor		Inside tailgate	151- 9-E10	
		LH side of tailgate		
Tailgate Window Switch	. 14259	RH side of tailgate	*	
TECA Power Relay	12A646	Front of LH fender apron	151- 5-C 9 .	. 150-19
		LH side of engine, on the distributor		
		Front of engine, below distributor		
TFI Ignition Module (7.5L)	12A199	LH rear of engine compartment	151- 6-B 8 .	. 150-19
Thermactor Air Bypass Solenoid				
(4.9L)	. 9B289			
		cover bracket	151- 2-A 5	
Thermactor Air Bypass Solenoid				
	. 9B289	LH rear side of engine, on coil support bracket .	151- 3-A 6	
Thermactor Air Bypass Solenoid				
	. 9B289	LH rear of engine	*	
Thermactor Air Diverter Solenoid	011405		454 4 4 0	
	. 9H465	LH side of engine	151- 1-A 8	
Thermactor Air Diverter Solenoid	011405		454 4 4 0	
		LH rear side of engine, on coil support bracket .		
	. 98989	LH side of engine, on throttle body shaft	151- 2-A 4	
Throttle Position Sensor	00000	La car Bill (and () and ()		
(5.UL and 5.8L)	. 98989	Lower RH front of engine, on throttle	454 0 5 5	
Throtale Decision Conner (7.51)	00000	body shaft		
	. 98989	Top LH side of engine	151- 6-A 5	
Timing Test Lead		III alda af a salaa	454 0 5 0	
		LH side of engine		
		Rear of LH fender apron		150.10
Transmission Electronic	13A435	LH fender apron	* .	. 150-19
	104650	I I also of cofety well below broke field		
Control Assembly (TECA)	12A00U	LH side of safety wall, below brake fluid	161 6 4 0	150.00
Ale Fleure Avellet I		reservoir	101- 5-A 9 .	. 150-20
⋆ No Figure Available				

Component	Base Part No.	Location	Page Zone	Connector Page
		Behind LH side of I/P, on fuse panel LH rear of engine compartment, on speed control servo		
VIP Self-test Connector C128		LH rear side of automatic transmission LH fender apron	* *	150-22
Warning Chime Module	10D840	Front of RH fender apron		150-22
•		reservoir	151- 8-B10	
-		Lower rear of engine		

Connector	Location	Page Zone	Connector Page	Color	Terminal
C100	LH side of safety wall, above brake fluid reservoir 151	- 2-A 8		GY	4
C101	Rear of LH fender apron	- 2-B10		GY	8
C102	Rear of LH fender apron 151	- 5-B 9		GY	4
C103	Rear of LH fender apron	- 1-B10		BK	8
C104	RH rear of engine compartment, near blower motor 151	- 2-B 1		BK	4
C105	LH fender apron 151	- 1-C10		BK	4
C106	Rear of LH fender apron 151	- 1-C10		BK	8
C107	Right fender apron, near voltage regulator 151	- 5-B 1		BK	1
C108	Right fender apron, near battery	- 5-D 1		GY	8
C110	Rear of LH fender apron 151	- 2-B 9		BK	8
C113	Rear of LH fender apron 151	- 1-C10		GY	8
C114	LH rear side of transmission	*		BK	4
C115	Right fender apron, near battery	- 5-D 1		GY	4
C117	LH rear side of transmission	*		GY	4
C118	LH side of engine 151	- 2-F 5		GY	2

* No Figure Available

152-11 LOCATION INDEX

Connector	Location	Page Zone	Connector Page	Color	Terminal
C119	RH fender apron, near battery	151- 5-D 1		GY	8
C121	Front of engine	*	150- 2	BK	8
C122	Rear of LH fender apron	151- 2-B 9		BK	8
C125	LH side of engine, near oil pressure sender	151- 1-A 5		BK	8
C127	LH rear side of transmission	*		GY	8
C128 VIP Self-test Connector	LH fender apron	151- 1-D10	150-22	BK	6
C129	Rear of LH fender apron	151- 2-B 9		GR	8
C130	Front of LH fender apron	*		GY	1
C133	Rear of LH fender apron	151- 2-B10		BK	8
C134	Rear of LH fender apron	151- 1-B10		BK	8
C138	RH fender apron	151- 5-D 3		GY	12
C139	Front of RH fender apron	151- 2-D 1		GY	1
C143 RABS Test Connector	LH fender apron, near EEC power relay	151- 2-C10		BK	2
C149	LH rear of engine compartment, near electronic engine				
	control (EEC) module	*		BL	4
C150	Behind LH corner of I/P	*			
C151	Center of safety wall, on wiper motor assembly	151- 2-A 7	150-24	BK	3
C152	Center of safety wall, on wiper motor assembly	151- 1-A 7	150-24	BK	3
C153	RH front of engine, on alternator	151- 2-F 4		BK	3
C154	RH front of engine, on alternator	151- 1-F 3		W	3
C157	Top LH side of engine	*		BK	4
C158	On frame, near transmission	*		BK	4
C159	Behind LH cowl panel, near C202	151- 8-F 8		GY	1
C200	Behind LH cowl panel	151- 8-E10		BK	6
C201	Behind LH cowl panel	151- 9-F 2			
C202	LH rear of engine compartment, in safety wall	151- 1-A 9		GY	53
C203	Behind RH cowl panel	151- 3-A 4		BR	6
C204	Behind center of I/P, near radio	151- 8-F 6			
C206	Behind LH side of I/P, near windshield wiper/washer switch	*		Υ	7
C207	Behind LH side of I/P, on fuse panel	*			
C208	Behind LH side of I/P, on fuse panel	*		BR	1
C209	Behind RH cowl Panel	151- 8-F 3		BK	8
C211	Behind LH cowl Panel	151- 8-E10		BK	2

^{*} No Figure Available

LOCATION INDEX 152-12

Connector	Location	Page Zone	Connector Page	Color	Terminal
C212	Behind LH cowl Panel	151-9-A 2		BK	8
C213	Behind RH cowl Panel	151-9-A 6		BK	8
C214	Rear of LH fender apron	151-1-B10		GY	4
C215	On base of steering column	*		BK	11
C216	Behind center of I/P, near radio	151-8-F 6	150-18	GY	6
C217	Behind center of I/P, near radio	151-8-F 5	150-18	GY	8
C218	Behind LH side of I/P, near C202	151-8-F 8		BK	8
C219	Top of steering column	151-8-F 8	150-15	BK	11
C220	On side of transfer case	151-8-F 7	150- 9	BK	9
C221	Behind RH cowl panel, on electronic shift control module	151-9-E 5	150- 8	W	8
C222	Behind RH cowl panel, on electronic shift control module	151-9-A 5	150- 8	GY	8
C223	Behind RH cowl panel, on electronic shift control module	151-9-A 5	150- 8	BR	8
C224	Behind RH cowl panel	151-9-C 5		GY	2
C226	Behind LH side of I/P	*		BK	3
C227	Behind LH side of I/P	151-8-D10		GY	2
C228	Behind LH side of I/P	151-8-F 2		GY	2
C229	Behind LH side of I/P	151-8-F 9		GY	4
C230	On RH side of driver's seat, near floor	151-9-E 5		GY	2
C250 (Diesel)	Behind LH side of I/P, on rear of instrument cluster	151-8-B 8	150-13	GY	14
C250 (Gasoline)	Behind LH side of I/P, on rear of instrument cluster	151-8-B 8	150-12	GY	14
C251 (Diesel)	Behind LH side of I/P, on rear of instrument cluster	151-8-B 7	150-13	BR	14
C251 (Gasoline)	Behind LH side of I/P, on rear of instrument cluster	151-8-B 7	150-12	BR	14
C257	Behind center of I/P, on radio	151-8-F 5	. 150-16		
C258	Behind center of I/P, on radio	151-8-F 4	150-16		
C300	On base of LH pillar, near door	151-9-E 4		GY	4
C301	On base of LH pillar, near door	151-9-F 4		GY	4
C400	Below LH side of cargo area, near rear crossmember	151-10-E10		BK	4
C401	Below LH side of cargo area, near rear crossmember	*		GY	8
C403	Below LH side of cargo area, near center crossmember	*		BL	4
C405	Below RH side of cargo area, near rear crossmember	151-9-E10		GY	4
C406	LH side of cargo area, near rear light assembly	151-9-F 6		GY	8
C407	Below LH side of cargo area, near crossmember	*		GY	4
C408	Below RH side of cargo area, near rear crossmember	151-10-E10		BK	4

^{*} No Figure Available

152-13 LOCATION INDEX

Connector	Location	Page Zone	Connector Page	Color	Terminal
C409	Below LH side of cargo area, near rear crossmember 15	1-10-F 7		BK	4
C410	Center of rear bumper	*		BK	4
C411	Inside LH rear quarter panel	1-10-F 6		BK	4
C412	Behind left front marker lamp	1-10-F 4		BK	4
C413	Behind right rear marker lamp	I-10-E10		BK	4
C414	Near LH rear shock absorber	*		BK	2
C415	LH side of cargo area, near rear light assembly 15	I- 9-F 6		BK	1
C416	LH side of cargo area, near rear light assembly 15	I- 9-F 7		BK	1
C417	Below LH side of cargo area, near crossmember	*		GY	4
C418	LH side of cargo area, near rear light assembly 15	I- 9-F 6		GY	3
C419	Below LH side of cargo area, near rear crossmember	*		BK	1
C420	Inside RH rear quarter panel	I-10-C 8		BK	4
C421	Inside center of tailgate	I- 9-F 9			
C500	Inside driver's door	I- 9-F 2			
C900	Above RH side of windshield header	I- 9-A 6		BK	2
C901	Above RH center of windshield header	I- 9-A 5		BK	2
C902	Above center of windshield header	I- 9-A 5		BK	2
C903	Above LH center of windshield header 15	I- 9-A 4		BK	2
C904	Above LH side of windshield header	I- 9-A 4		BK	2
* No Figure Available					

Location	Page Zone
LH side of radiator support	151-1-F 7
RH side of radiator support	151-2-F 3
RH side of radiator support	151-2-E 3
LH rear side of engine, near knock sensor	*
LH rear of engine compartment, near electronic engine	
control (EEC) module	151-2-B10
LH side of engine	151-2-A 7
RH fender apron, near voltage regulator	151-5-B 1
RH fender apron, at starter relay	151-5-C 1
RH fender apron, at voltage regulator	151-5-B 1
	LH side of radiator support RH side of radiator support RH side of radiator support LH rear side of engine, near knock sensor LH rear of engine compartment, near electronic engine control (EEC) module LH side of engine RH fender apron, near voltage regulator RH fender apron, at starter relay

LOCATION INDEX 152-14

Ground	Location	Page Zone
G109	RH fender apron	*
G201	. LH rear side of I/P	151-8-F 9
G202	Behind RH cowl panel	*
G203	RH rear side of radiator support	*
G204	On steering column	*
G205	Behind center of I/P, near speed control amplifier	151-8-F 4
G400	LH side of cargo area, near rear light assembly	*
G401	Below LH side of cargo area, near crossmember	*
G500	Inside driver's door, near left door speaker	151-9-A 2
⋆ No Figure Available		

Splice	Location
S100	. Engine control harness, near T/O to right headlamp
S101	. Engine control harness, near T/O to C202
S102	. Engine control harness, near T/O to C113
S103	. Engine control harness, near T/O to left headlamp
S106	. Engine control harness, near T/O to right headlamp
S107	. Engine control harness, near T/O to C110
S108	. Engine control harness, near T/O to C113
S109 (5.0L AND 5.8L)	. Dashed panel to engine gauge feed harness, near T/O to C113
S109 (7.5L)	. Fuel charge harness, near T/O to distributor
S110 (7.5L)	. Engine charge harness, near T/O to C113
S114	. Engine charge harness, near T/O to washer pump
S115	. Engine charge harness, near T/O to dual brake warning switch
S119	. Engine charge harness, near T/O to starter relay
S120	. Engine charge harness, near T/O to starter relay
S121	. Engine charge harness, near T/O to electronic engine control (EEC) module
S122	. Engine charge harness, near T/O to C106
S123 (4.9L)	. Dash panel to engine gauge feed harness, near T/O to TFI ignition module
S123 (5.0L, 5.8L)	. Fuel charge harness, near T/O to ignition coil
S123 (7.5L)	. Fuel charge harness, near T/O to distributor
S124	. Dash panel to engine gauge feed harness, near T/O to oil pressure sender

152-15 LOCATION INDEX

Splice	Location
S128 (5.0L)	. Fuel charge harness, near T/O to fuel injector NO.7
S128 (7.5L)	. Fuel charge harness, near T/O to fuel injector NO.6
S129	. Fuel charge harness, near T/O to fuel injector NO.2
S130	. Fuel charge harness, near T/O to fuel injector NO.4
S131 (4.9L)	. Fuel charge harness, near T/O to fuel injector NO.5
S131 (5.0L)	. Engine control harness, near T/O to G123
S131 (5.8L, 7.5L)	. Fuel charge harness, near T/O to fuel injector NO.4
•	. Fuel charge harness, near T/O to fuel injector NO.3
S132 (5.0L, 5.8L)	. Fuel charge harness, near T/O to fuel injector NO.8
· · · · · · · · · · · · · · · · · · ·	. Fuel charge harness, near T/O to fuel injector NO.4
	. Dash panel to engine gauge feed harness, near T/O to EGR control solenoid
	. Backup lamp harness, near T/O on RH side of transmission
	. Fuel charge harness, near T/O to ignition coil
	. Engine control harness, near T/O to C133
	. Engine control harness, near T/O to C128
	. Fuel charge harness, near T/O to engine coolant temperature sensor
	. Engine control harness, near T/O to C133
	. Rear lamp harness, near T/O to C102
	. Dash panel to engine gauge feed harness, near T/O to EGR valve position (EVP) sensor
	. Engine control harness, near T/O to EEC power relay
	. Rear lamp harness, near T/O to E4OD transmission
	. Engine control harness, near T/O to EEC power relay
	Engine control harness, near T/O to horns
	. Main harness, near T/O to stoplamp switch
	Engine control harness, near T/O to C134
	. Engine control harness, near T/O to C133
	. Heater switch to blower motor harness, near T/O to blower motor
	. Heater switch to blower motor harness, near T/O to blower motor
	. Engine control harness, near T/O to washer pump
	. Engine control harness, near T/O to washer pump
	Engine control harness, near T/O to horns
	. Engine control harness, near T/O to washer pump
	. Main harness, near T/O to horn relay
	. Main harness, near T/O to fuse panel
5101	. Engine control harness, near T/O to dual brake warning switch

LOCATION INDEX 152-16

Splice	Location
S163	Engine control harness, near T/O to C133
	Engine control harness, near T/O to washer pump
	Engine control harness, near T/O to C133
S166	Main harness, near T/o to ignition switch
	Engine control harness, near T/O to electronic engine control (EEC) module
	Alternator rectifier harness, near T/O to G109
S200	Main harness, near T/O to fuse panel
S201	Main harness, near T/O to overdrive switch
S202	Main harness, near T/O to overdrive switch
S203	Main harness, near T/O to hazard flasher
S204	Heater switch to blower harness, near T/O to blower resistors
S205	Main harness, near T/O to master tailgate window switch
S206	Main harness, near T/O to C250
S207	Main harness, near T/O to diesel/warning lamp module
S208	Main harness, near T/O to main light switch
S209	·
S210	
S211	
	Main harness, near T/O to parking brake switch
S213	·
	Main harness, near T/O to main light switch
	Main harness, near T/O to windshield wiper/washer switch
	Main harness, near T/O to warning chime module
	Main harness, near T/O to main light switch
S218	
S219	·
	Main harness, near T/O to rear anti-lock brake module
	Window regulator and relay switch harness, near T/o to C211
S224	
	Main harness, near T/O to windshield wiper/washer switch
	Main harness, near T/O to warning chime module
	Main harness, near T/O to rear anti-lock brake (ABS) module
	Main harness, near T/O to rear anti-lock brake (ABS) module
S229	
S230	Main harness, near T/O to fuse panel

152-17 LOCATION INDEX

Splice	Location
S231	. Window regulator and relay switch harness, near T/O to C211
S232	. Window regulator left front door harness, near T/O to master window control switch
S233	. Window regulator left front door harness, near T/O to left door speaker
S236	. Window regulator relay switch harness, near T/O to C211
S301	. Interior lamp feed harness, near T/O to C301
S303	. Interior lamp feed harness, near T/O to C301
S304	. Interior lamp feed harness, near T/O to C300
S305	. Interior lamp feed harness, near T/O to dome lamp
S306	. Interior lamp feed harness, near T/O to dome lamp
S400	. Rear lamp harness, near T/O to fuel gauge sender/electric fuel pump
S401	. Rear lamp harness, near T/O to fuel gauge sender/electric fuel pump
	. Rear license lamp harness, near T/O to C400
	. Backup lamp switch to rear feed harness, near T/O on right side of transmission
	. Rear lamp connector harness, near T/O to C419
S405	. Rear lamp connector harness, near T/O to right backup lamp
	. Right rear lamp extension harness, near T/O to C416
	. Right marker lamp harness, near T/O to C412
	. Right marker lamp harness, near T/O to C420
	. Rear lamp harness, near T/O to C401
	. Rear lamp harness, near T/O to fuel gauge sender and pump
	. Rear lamp harness, near T/O to C401
	. Rear lamp-connector harness, near T/O to C419
	. Rear license harness, near T/O to C400
	. Rear lamp harness, near T/O to C401
·	. Rear lamp connector harness, near T/O to C419
	. Right marker harness, near T/O to C411
	. Right marker lamp harness, near T/O to C413
	. Rear window regulator control harness, near T/O to master tailgate window switch
	. Rear lamp harness, near T/O to C406
S425	. Rear lamp harness, near T/O to C401

160-1 VEHICLE REPAIR LOCATION CODE



TO PINPOINT THE ACTUAL VEHICLE LOCATION OF A REPAIR. THE VEHICLE REPAIR LOCATION CODE IS REQUIRED.

FOR EXAMPLE, AN "X" HAS BEEN PLACED IN THE QUADRANT OF THE VEHICLE DIAGRAMS INDICATING THE LOCATION OF THE REPAIR. SEE DIAGRAMS.

LOCATION CODE, FOR THE EXAMPLE IS: A5/FU — (UNDER THE FLOOR OF DRIVER'S LEFT FOOT.)

FRONT/REAR DIRECTION FRONT

BCDE

ENGINE

REAR

2

3

4

5

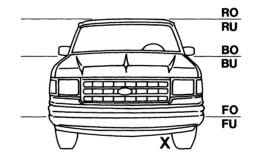
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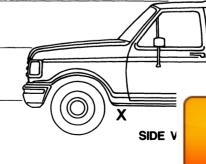
9

OVER/UNDER DIRECTION



- R = ROOF LINE
 - RO = ROOF OVER RU = ROOF UNDER
- B = BELT LINE
 - BO = BELT OVER BU = BELT UNDER
- F = FLOOR PAN
 - FO = FLOOR OVER
 - FU = FLOOR UNDER

+ CENTER OF VEHICLE



Buy Now

RO RU

BO BU









