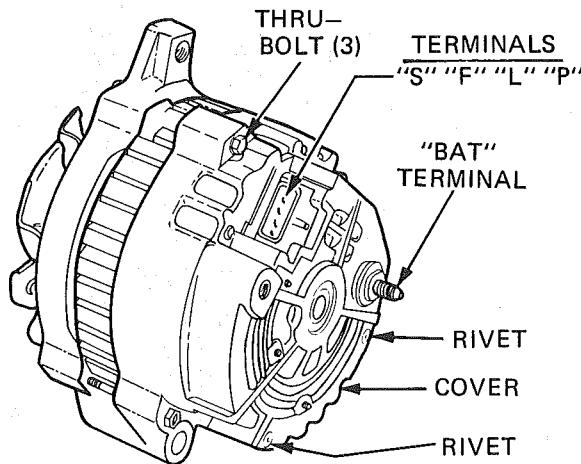


Fig. 601 Generator Mountings

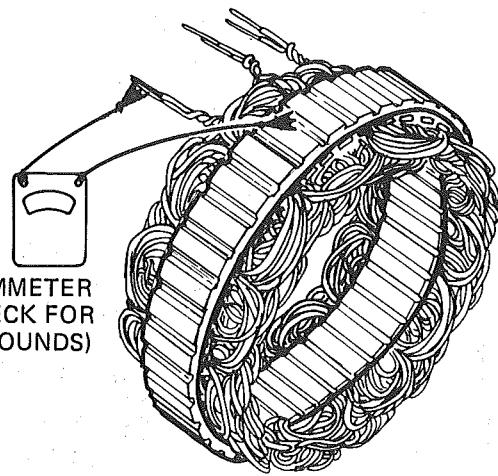
SPECIFICATIONS

ENGINE	EQUIPMENT	GEN/MOD	AMP
LB8	H-H/HBL	1101139/CS130	85A
	A-A/HBL	1101140/CS130	100A
LB9/L98	H-H/HBL-A-A/HBL	1101255/CS130	105A
LO3	H-H/HBL	1101253/CS130	85A
	A-A/HBL	1101254/CS130	100A

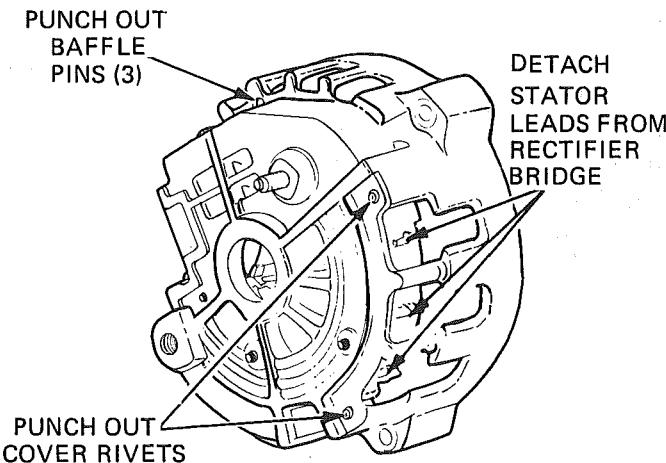
**CS130 GENERATOR DISASSEMBLY, TEST AND REASSEMBLY
(GENERATOR REMOVED FROM ENGINE)**

THRU-BOLT LOCATION

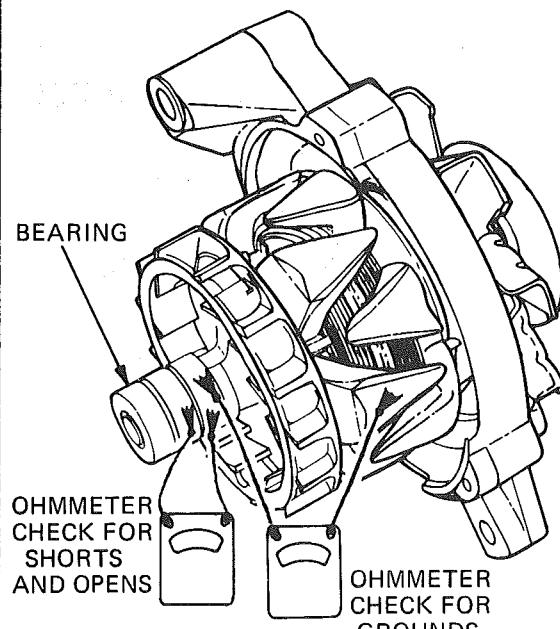
1. Make scribe marks on end frames to facilitate reassembly.
2. Remove thru-bolts and separate end frames.
3. Punch out cover rivets, or pins, and remove cover on slip ring end frame.

TESTING STATOR

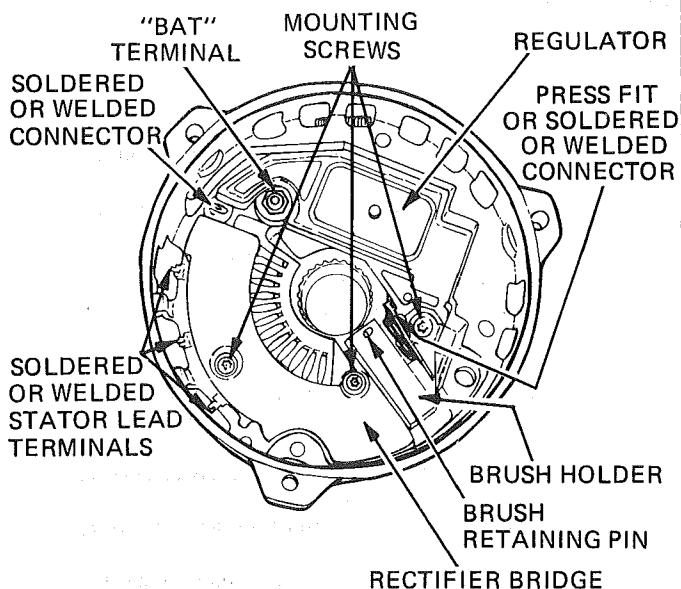
7. Check stator for grounds with ohmmeter. If reading is low, replace stator.

END FRAME VIEW

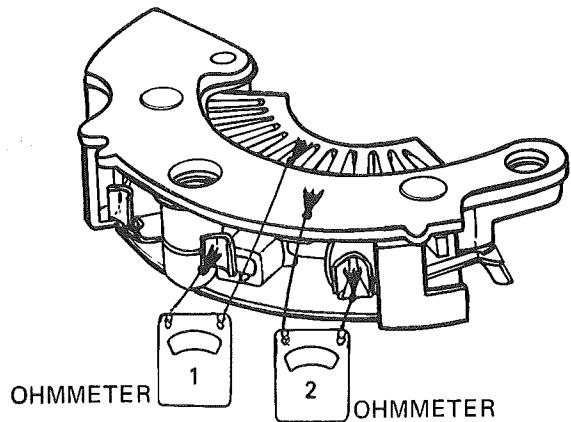
4. Unsolder stator leads at three terminals on rectifier bridge. Avoid excessive heat, which could damage diodes in rectifier bridge. NOTICE: If stator leads are welded, in place of soldered, cut stator leads about half way back on rectifier bridge terminals.
5. Remove stator.
6. Drive out three baffle pins and remove baffle from inside of slip ring end frame.

TESTING ROTOR

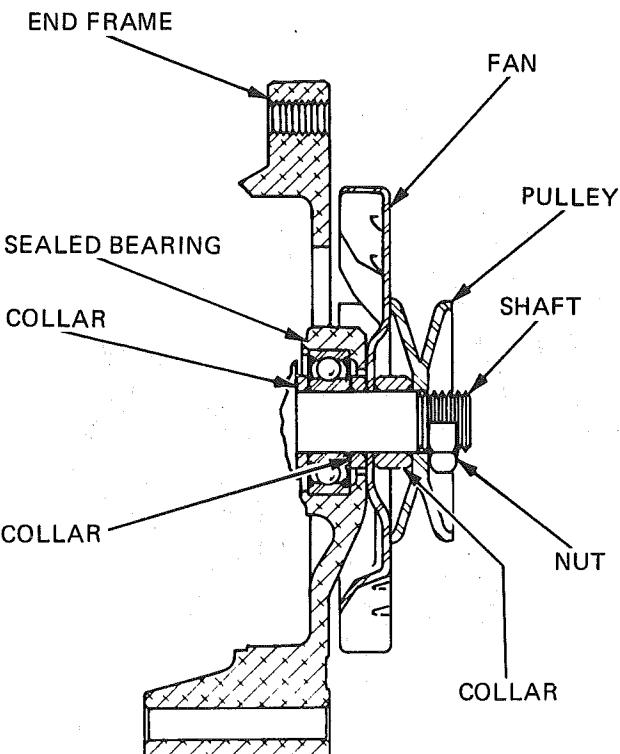
8. Check rotor for grounds with ohmmeter. Check can be made with drive end frame assembled. Reading should be very high. If not, replace rotor. Hold rotor with hex wrench in shaft when removing shaft nut.
9. Check rotor for opens and shorts. Should read 1.7-2.3 ohms. If not, replace rotor.

**REMOVE BRUSH HOLDER,
REGULATOR AND RECTIFIER**


10. Remove brush holder screw, disconnect terminal and remove brush holder assembly. If brushes are to be reused, clean with a soft dry cloth and use retaining pin to hold brushes in holder.
11. Unsolder and pry open terminal between regulator and rectifier bridge. Remove terminal and attaching screws to remove regulator and rectifier bridge from end frame.

TESTING RECTIFIER BRIDGE


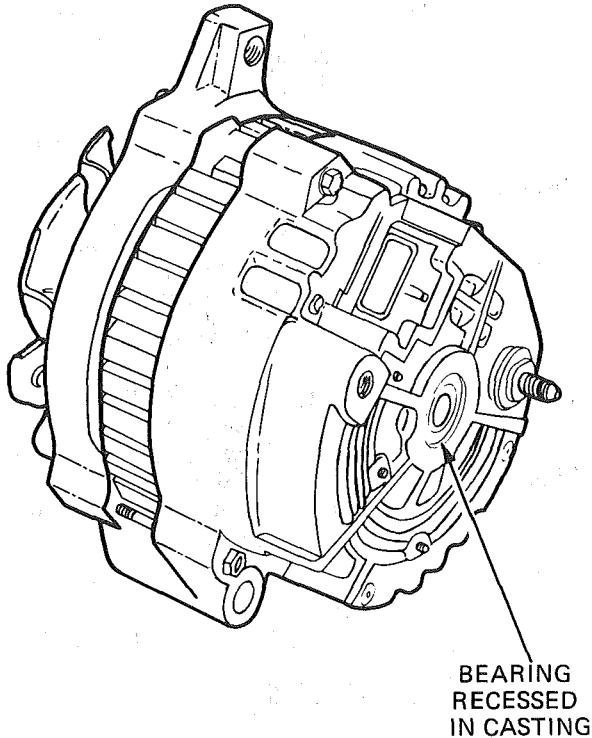
12. To check rectifier bridge, connect ohmmeter using low scale to one terminal and heat sink (step 1). Reverse leads. If both readings are the same, replace rectifier bridge. Check other two diodes in same manner as step 1. NOTICE: Some digital ohmmeters cannot be used to check diodes in bridge. Consult ohmmeter manufacturer to determine tester capabilities.
13. Check remaining three diodes in same manner by connecting ohmmeter from each terminal to base plate (step 2). If both readings are the same on any diode, replace rectifier bridge.

DRIVE END BEARING


CROSS SECTION
DE FRAME CS-130

14. Note stack up of parts for drive end bearing assembly. Hold rotor with hex wrench to remove, or tighten shaft nut. Torque to 54-108 N·m (40-80 lb.-ft.).

SLIP RING END FRAME BEARING



15. Install new tolerance ring inside of slip ring end frame.
16. Press outer race of new bearing against bottom of end frame casting.
17. Assemble brush holder using insulated screw to end frame; position holder so brushes will ride squarely on commutator. Use retainer pin to hold brushes in holder.
18. Assemble rectifier bridge to end frame using silicone cone grease (to dissipate heat) between bridge and end frame. Securely crimp the electrical connection between bridge and brush holder.
19. Install regulator, crimp and solder connection between regulator and bridge.
20. Install new baffle. Use punch to drive pins down flush with baffle.
21. Install stator, solder and crimp to three connectors on bridge. Avoid excessive heat which could damage diodes in rectifier bridge.
22. Install outside cover using punch to drive pins down flush with cover.
23. To assemble drive end frame and rotor assembly into end frame, push on both inner and outer race to push slip ring end assembly over shaft. Then push on both inner and outer race until outer race is recessed 1.9-2.2 mm inside end frame casting.
24. Assemble three bolts and remove brush retaining pin.

G20214-6D

Fig. 604 CS130 Generator Disassembly, Test and Reassembly 3 of 3

**CODE 51
CODE 52
CODE 53
CODE 55
2.8L (VIN S) "F" SERIES (PORT)**

CODE 51

**PROM ERROR
(FAULTY OR INCORRECT PROM)**

CHECK THAT ALL PINS ARE FULLY INSERTED IN THE SOCKET. IF OK , REPLACE PROM , CLEAR MEMORY, AND RECHECK. IF CODE 51 REAPPEARS, REPLACE ECM.

CLEAR CODES AND CONFIRM "CLOSED LOOP" OPERATION AND NO "SERVICE ENGINE SOON" LIGHT.

CODE 52
**CALPAK ERROR
(FAULTY OR INCORRECT CALPAK)**

CHECK THAT ALL PINS ARE FULLY INSERTED IN THE SOCKET. IF OK , REPLACE CALPAK , CLEAR MEMORY, AND RECHECK. IF CODE 52 REAPPEARS, REPLACE ECM.

CLEAR CODES AND CONFIRM "CLOSED LOOP" OPERATION AND NO "SERVICE ENGINE SOON" LIGHT.

CODE 53
SYSTEM OVER VOLTAGE

THIS CODE INDICATES THERE IS A BASIC GENERATOR PROBLEM .

- CODE 53 WILL SET IF VOLTAGE AT ECM TERMINAL "B2" IS GREATER THAN 17.1 VOLTS FOR 2 SECONDS.
- CHECK AND REPAIR CHARGING SYSTEM. SEE SECTION "6D".

CLEAR CODES AND CONFIRM "CLOSED LOOP" OPERATION AND NO "SERVICE ENGINE SOON" LIGHT.

CODE 55
ECM ERROR

BE SURE ECM GROUNDS ARE OK. IF OK
REPLACE ELECTRONIC CONTROL MODULE (ECM)

CLEAR CODES AND CONFIRM "CLOSED LOOP" OPERATION AND NO "SERVICE ENGINE SOON" LIGHT.

7-30-87
55 1516-6E

SECTION 8A

ELECTRICAL DIAGNOSIS

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3	Symbols	82	Instrument Panel: Digital Cluster
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5	Repair Procedures	90	Wiper/Washer
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40	Horns	134	Hatch Release
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64	Air Conditioning: Compressor Controls	151	Power Antenna
65	Air Conditioning: Air Delivery	201	Component Location Views
66	Air Conditioning: Blower Controls	202	Harness Connector Faces
67	Air Conditioning: Compressor Controls	203	Harness Routing Views
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INTRODUCTION

DIAGNOSTIC INFORMATION

This manual contains the following kinds of diagnostic information:

- Electrical Schematics
- Component Location Lists
- Harness Connector Faces
- Troubleshooting Hints
- System Checks
- System Diagnoses
- Circuit Operation Descriptions
- Harness Routing Views

Using these elements together will make electrical troubleshooting faster and easier. Each element is described below.

The **Electrical Schematic** should always be your starting point in using this Electrical Troubleshooting Manual. The schematic shows the electrical current paths when a circuit is operating properly. It is essential to understand how a circuit *should* work before trying to figure out why it doesn't.

The **Harness Connector Faces** show the cavity or terminal locations in all the multi-pin connectors shown in the schematic. Together with the wire colors and terminals given in the schematic, they help you locate test points. The drawings show the connector faces you see after the harness connector has been disconnected from a component. When more than one connector is connected to a component the connectors are all shown together.

The **Troubleshooting Hints** offer short-cuts or checks to help you determine the cause of a complaint. They are not intended to be a rigid

procedure for solving an electrical situation. Rather, Troubleshooting Hints represent a common-sense approach, based on an understanding of the circuit.

The **System Check** gives a summary of how the circuit should be operated and what should happen. This is especially important when you are working on a new system. The System Check will help you identify symptoms, lead you to diagnosis and confirm the system after repair.

The **System Diagnosis** provides a procedure to follow that will locate the condition in a circuit. If your own knowledge of the system and the Troubleshooting Hints have not produced a quick fix, follow the System Diagnosis. All procedures are based on symptoms to assist you in locating the condition as fast as possible.

The **Circuit Operation** will help you understand the circuit. It describes the components and how the circuit works.

The **Component Location List** helps you find where the parts of the circuit are in the vehicle. A brief statement of the location is given and also a reference to a drawing that shows the component and its connecting wires. These **Component Location Views** are in cell 201.

Harness Routing Views are found in cell 203. These views show the routing of the major wiring harnesses and the in-line connectors between the major harnesses. These views will make troubleshooting easier when you are not sure about harness routing.

PAGE NUMBER

This section is organized into cells with most cells containing a circuit schematic and the text for that circuit. This makes the section easy to use, since the page number for a schematic will normally stay the same year after year, and it will also be the same in all the GM publications about that circuit. For example, the Cruise Control schematics will always be the first pages of cell 34. The other information for Cruise Control follows them on pages 34-2, 34-3, etc.

Some cells may have more than one circuit schematic, such as Power Distribution, Interior Lights, and Air Conditioning. The circuit you want can either be located by using the index, or by a quick look through the related cell.

All the engine circuits for a particular engine VIN type are in the same cell. This makes that cell easy to use, since schematics for other cars are not in your way. The instrument panel schematics are organized similarly. If you are working on a car with a Digital Cluster, only the schematics that apply to that car's Digital Cluster will be in the cell you use. Information on the Indicators and Gages Clusters will be in other cells.

INTRODUCTION

SCHEMATICS

These schematics break the entire electrical system down into individual circuits. You are not distracted by wiring which is not part of the circuit you're working on.

It is important to realize that no attempt is made on the schematic to represent components and wiring as they physically appear on the car. For example, a 4-foot length of wire is treated no differently in a schematic from one which is only a few inches long. The number of cavities for each connector is listed in the Component Location List. Similarly, switches and other components are shown as simply as possible, with regard to function only.

The following example shows how to read a Horn schematic, see figure 1. Locate the Horn schematic using the Index. The circuit schematic will look somewhat like the one to the right. The schematic is read from top to bottom.

Voltage is applied to the Horn Relay at all times. When the relay coil is grounded by closing the Horn Switch, the relay contacts close. When the relay contacts are closed, both the LH and RH Horns are energized.

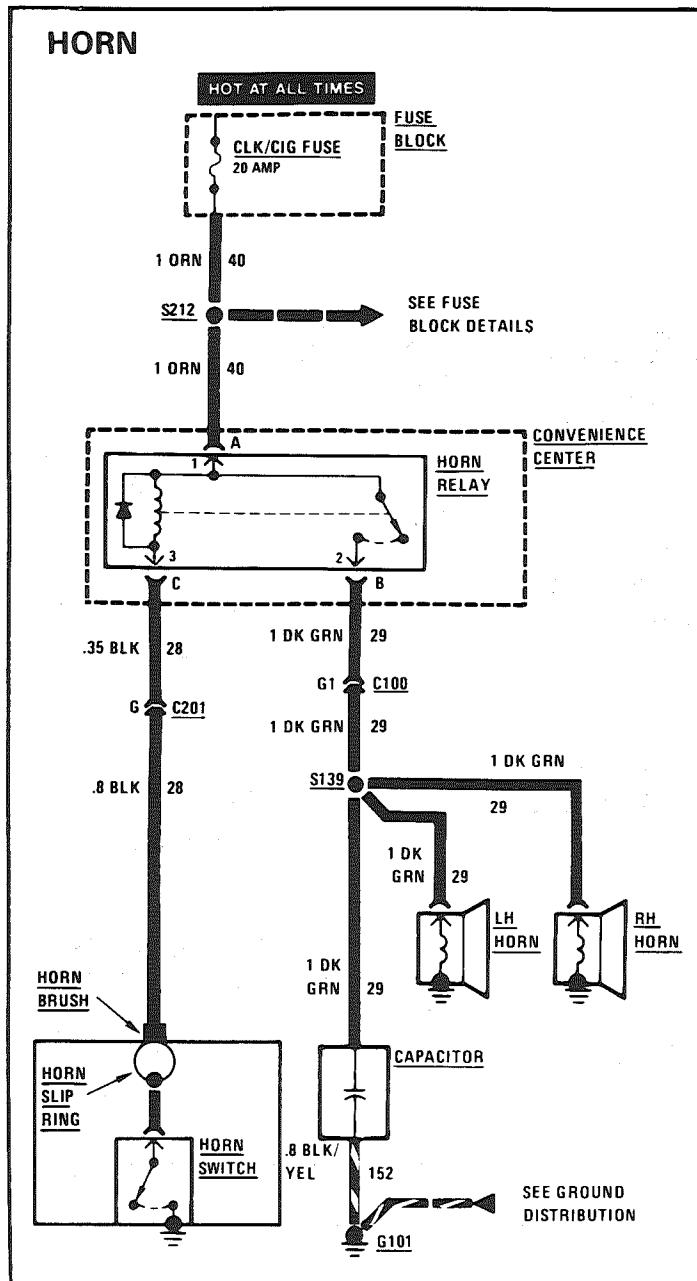


Figure 1 - Typical Horn Schematic

INTRODUCTION

COMPONENT LOCATIONS

When you are ready to locate the schematic components on the car, use the Component Locations List, see figure 2.

Listed in the left hand column are the components shown on the schematic. Next to the Convenience Center is the location, "Under LH side of I/P." Reference to LH and RH is made as though the troubleshooter was sitting in the driver's seat. On the same line, in the far right column, is a page-figure reference. In this case, you are directed to figure A on page 201-6.

Where connectors are listed, the number of cavities is provided. This represents the total number of cavities in the connector, regardless of how many are actually used. This information is provided to help you identify connectors on the car.

Grounds are listed next in the table. The location description for G101 reads, "LH front of engine compartment, behind headlights panel." You are directed to page 201-8, figure D.

Nearly every component, connector, ground or splice shown on a schematic can be pinpointed visually by using the Component Location Views' figures.

COMPONENT LOCATION	Page-Figure
COMPONENTS	
Convenience Center	Under LH side of I/P 201-6-A
Fuse Block	Under LH side of I/P 201-6-A
Horn Brush/Slip Ring	Under steering wheel 201-5-E
Horn Switch	Under steering wheel 201-5-E
CONNECTORS	
C100 (46 cavities)	LH side of dash 201-5-B
C201 (11 cavities)	Under LH side of I/P, near C100 201-5-F
GROUNDS	
G101	LH front of engine compartment, behind headlights panel 201-8-D
SPLICES	
S139.....	Front lights harness, behind LH front light panel 201-8-C
S212.....	I/P harness, behind I/P, above steering column... 201-6-B

Figure 2 - Typical Entries In The Component Location List

INTRODUCTION

HARNESS CONNECTOR FACES

The connectors, see figure 3, are labeled with the component they are connected to, or the connector number from the schematic where they appear, and their color. The identifying number is for reference only; it is not the connector part number. For in-line connectors, the half shown is usually the Socket half. If both views are shown, the other half is the Pin Half.

Only connectors that have two or more terminals are shown.

If you need to backprobe a connector while it is on the component, the order of the terminals must be mentally reversed. The wire color is a help in this situation. If there is more than one wire of the same color, you may need to locate a test point from its terminal number. A useful trick is to imagine that you are probing a terminal from behind the page you are looking at. Then mentally locate that terminal with respect to the keyway or other reference mark.

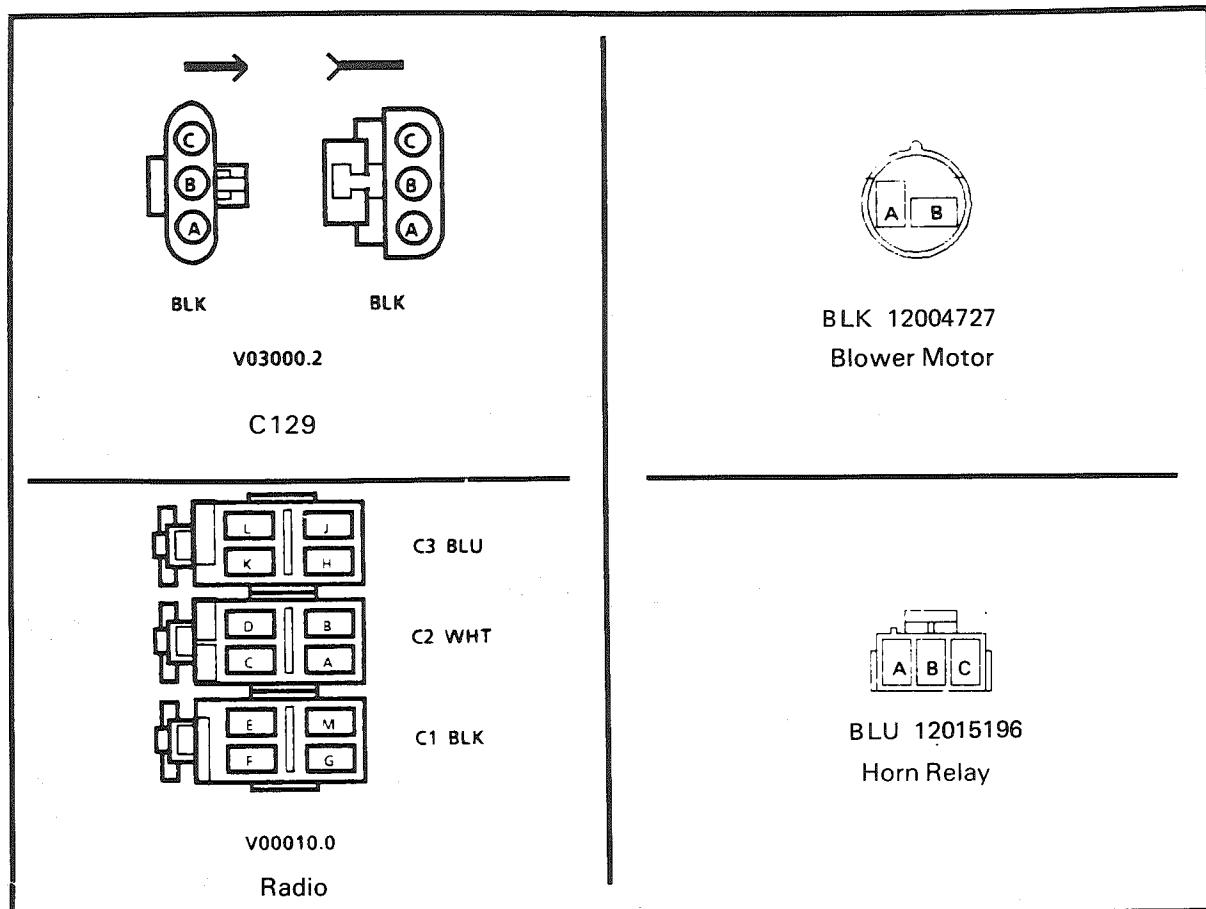


Figure 3 -Typical Harness Connector Faces

INTRODUCTION

OTHER INFORMATION

Body Part Names

Refer to figure 4 for the correct body part names.

VIN References

If schematics for more than one variation of an engine type—V6, for example—are shown, then the schematics will be labeled with VIN designations to distinguish the variations.

Service Parts Identification Label

To aid service and parts personnel in identifying options and parts originally installed, a Service Parts Identification Label has been placed in the car. See the General Information Section 0A of the Chassis Service Manual for the location of the label and the definition of the option codes.

Abbreviations

A/C — Air Conditioning

BCM — Body Computer Module

ECM — Electronic Control Module or Engine Control Module

I/P — Instrument Panel

RH — Right Hand, as seen from driver's seat

LH — Left Hand

Not Used — The connector cavity has no function.

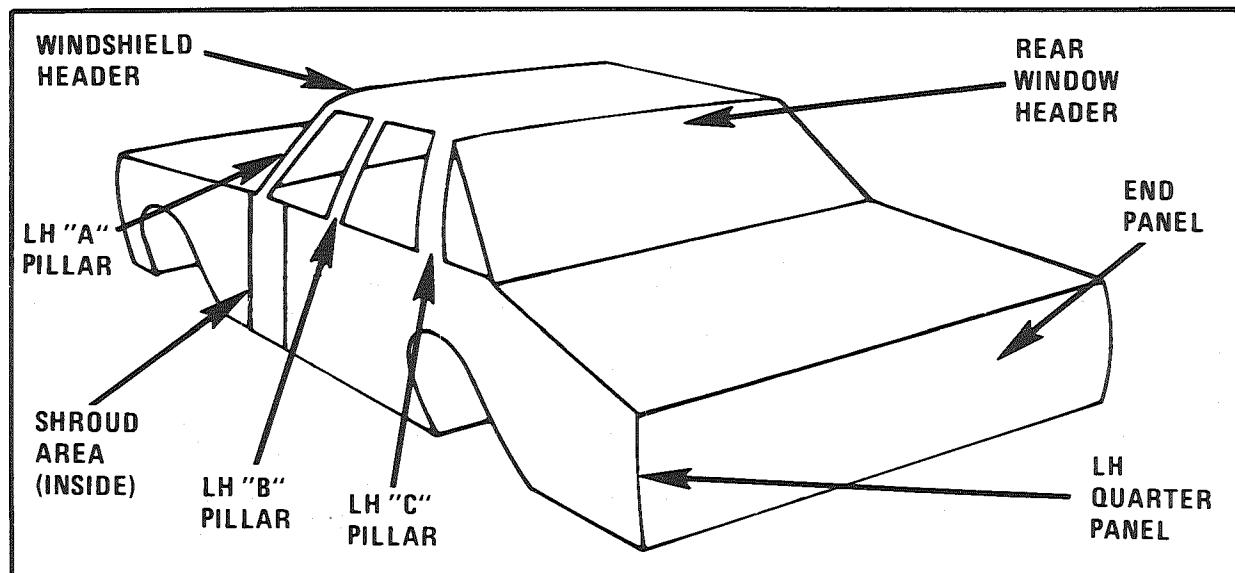
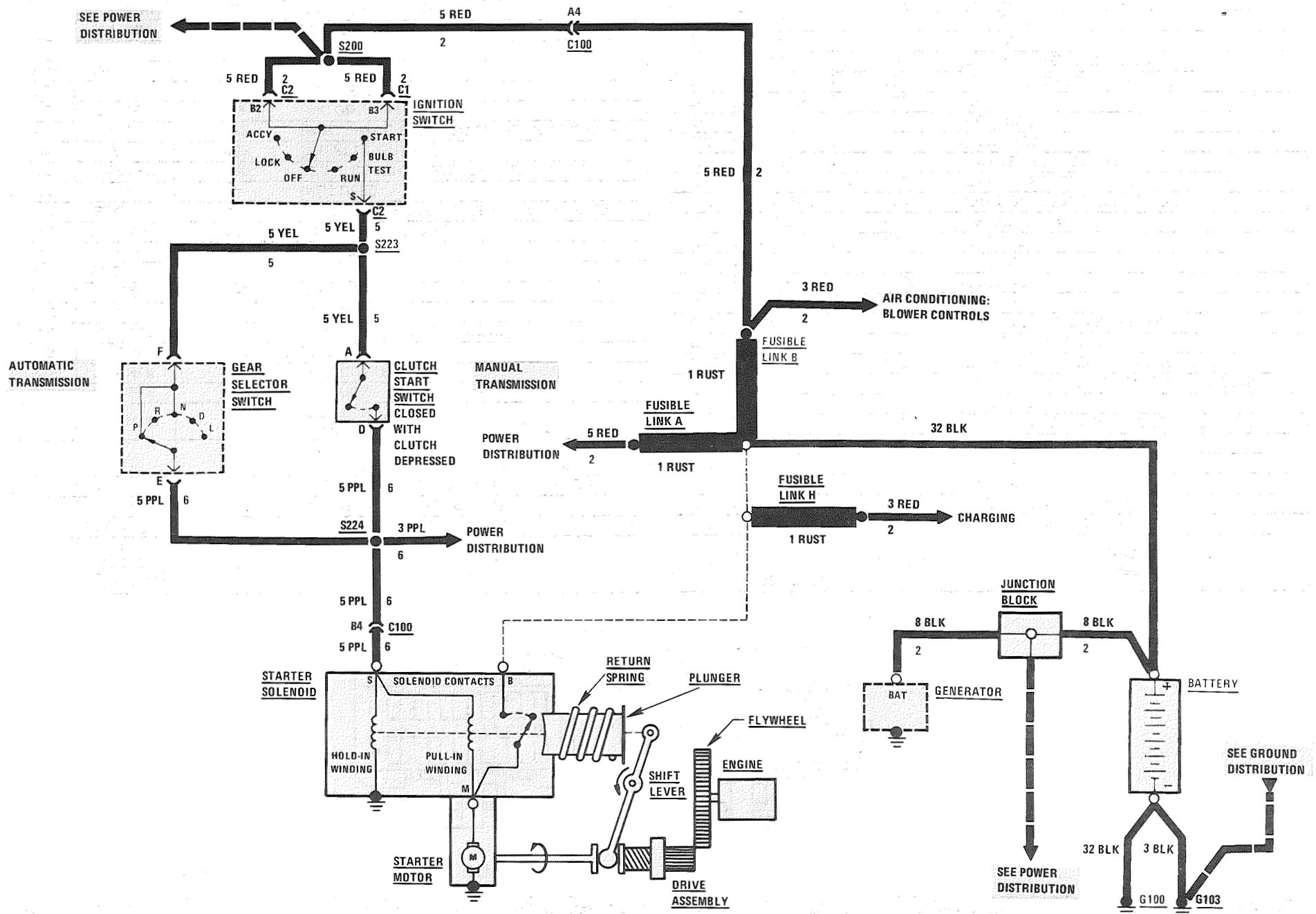


Figure 4 - Body Part Names

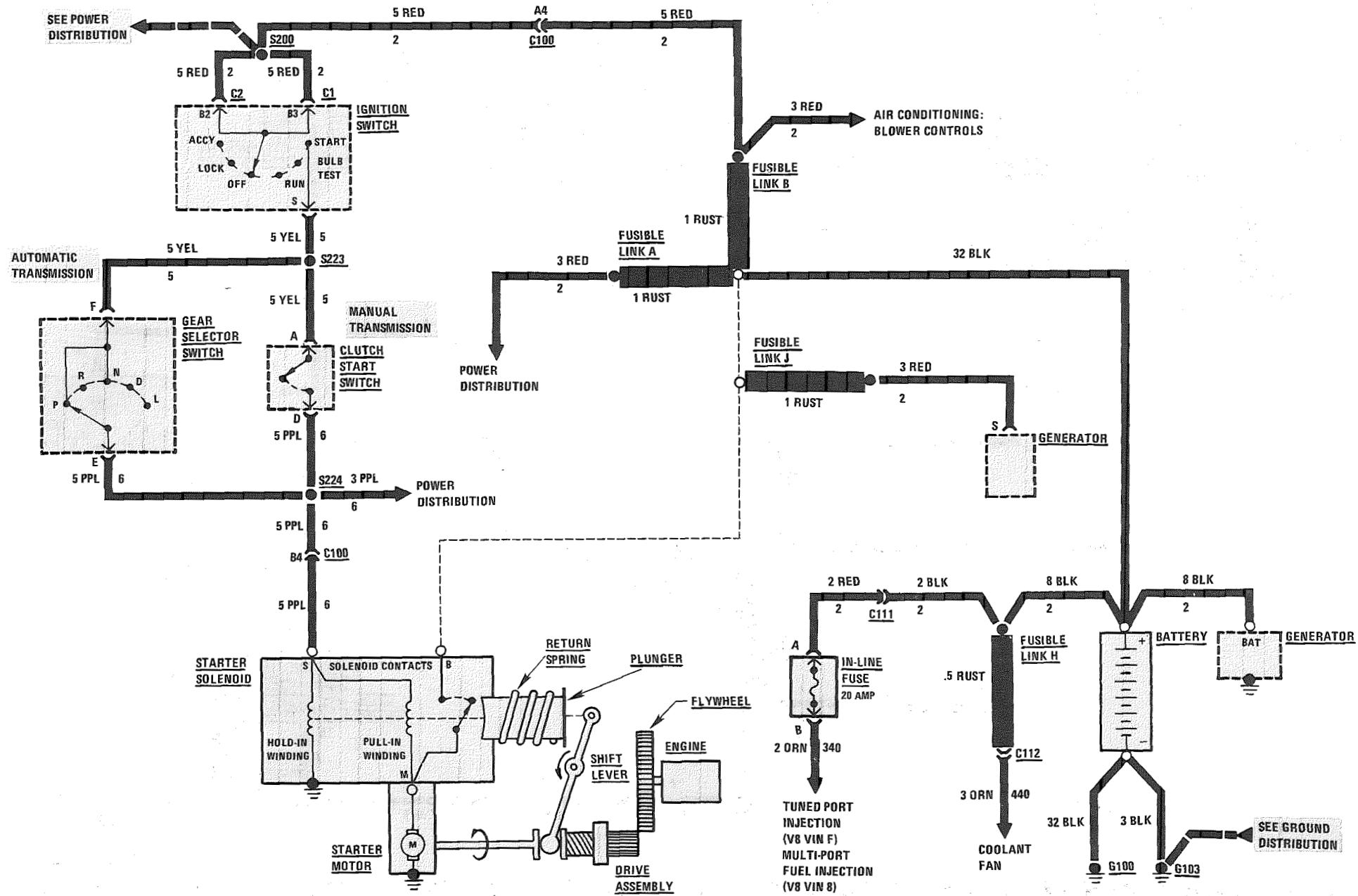
STARTER AND CHARGING SYSTEM: V6 VIN S

STARTER



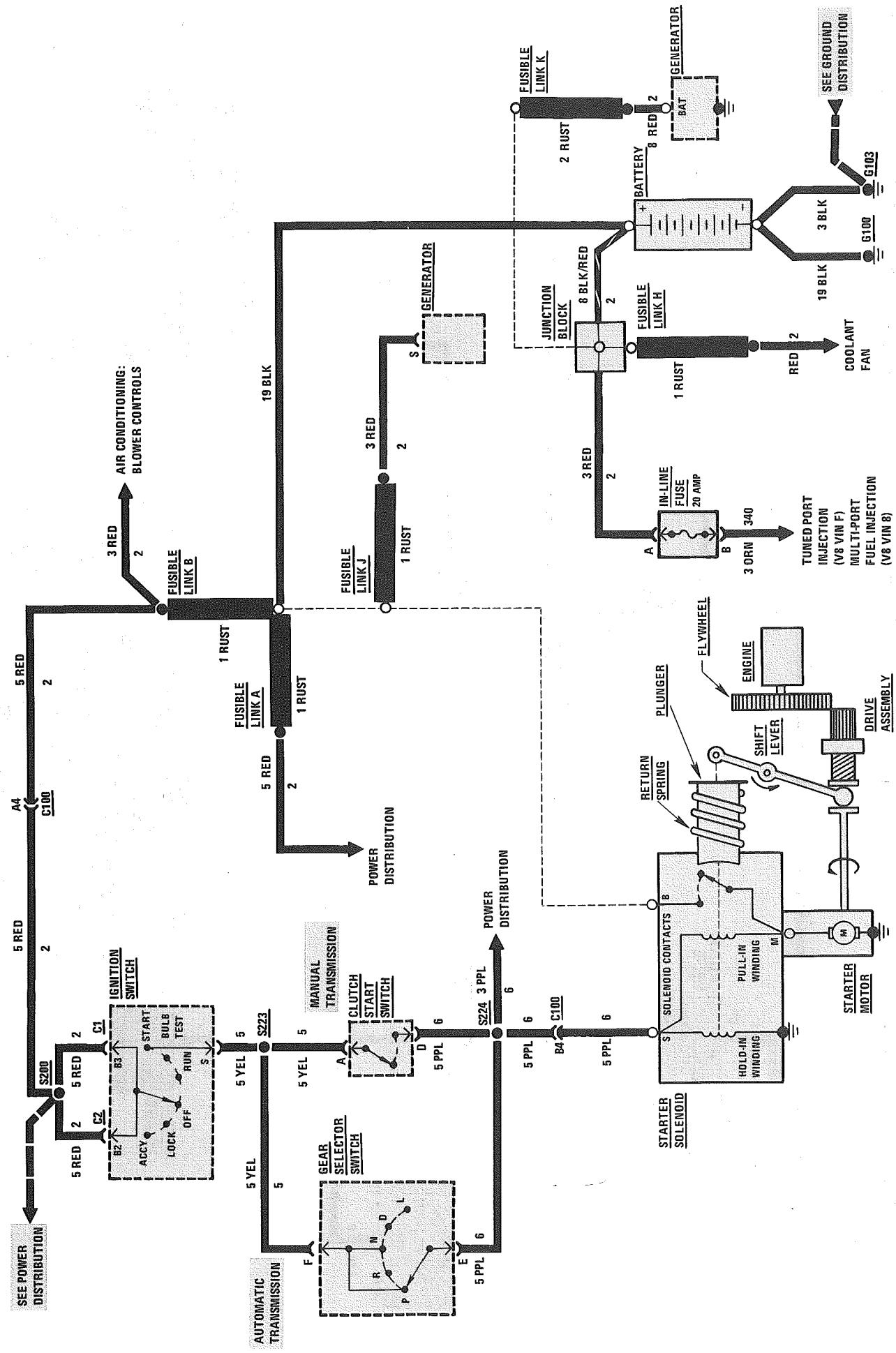
STARTER AND CHARGING SYSTEM: V8 VIN F, V8 VIN 8

STARTER



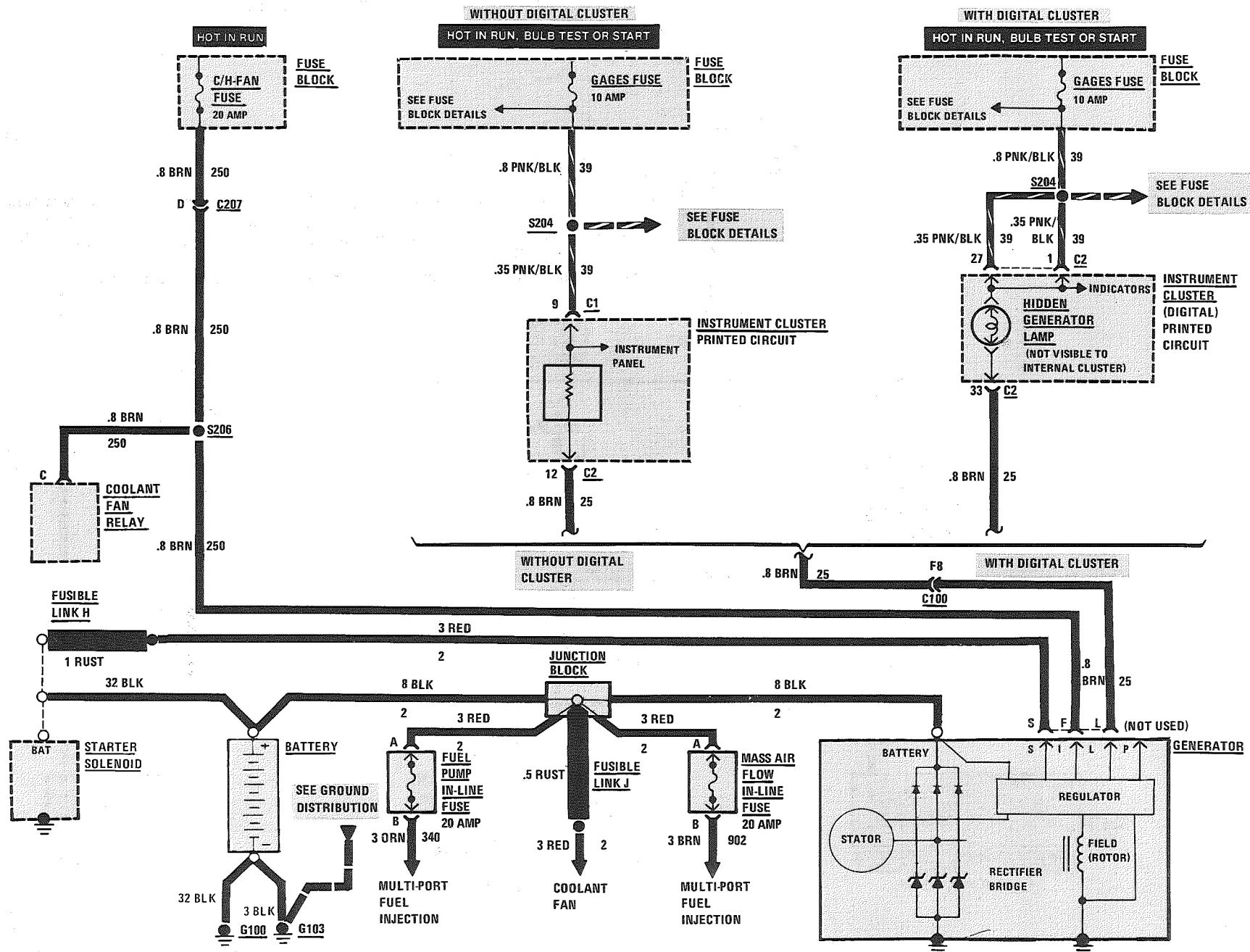
P STARTER AND CHARGING SYSTEM: V8 VINE

STARTER



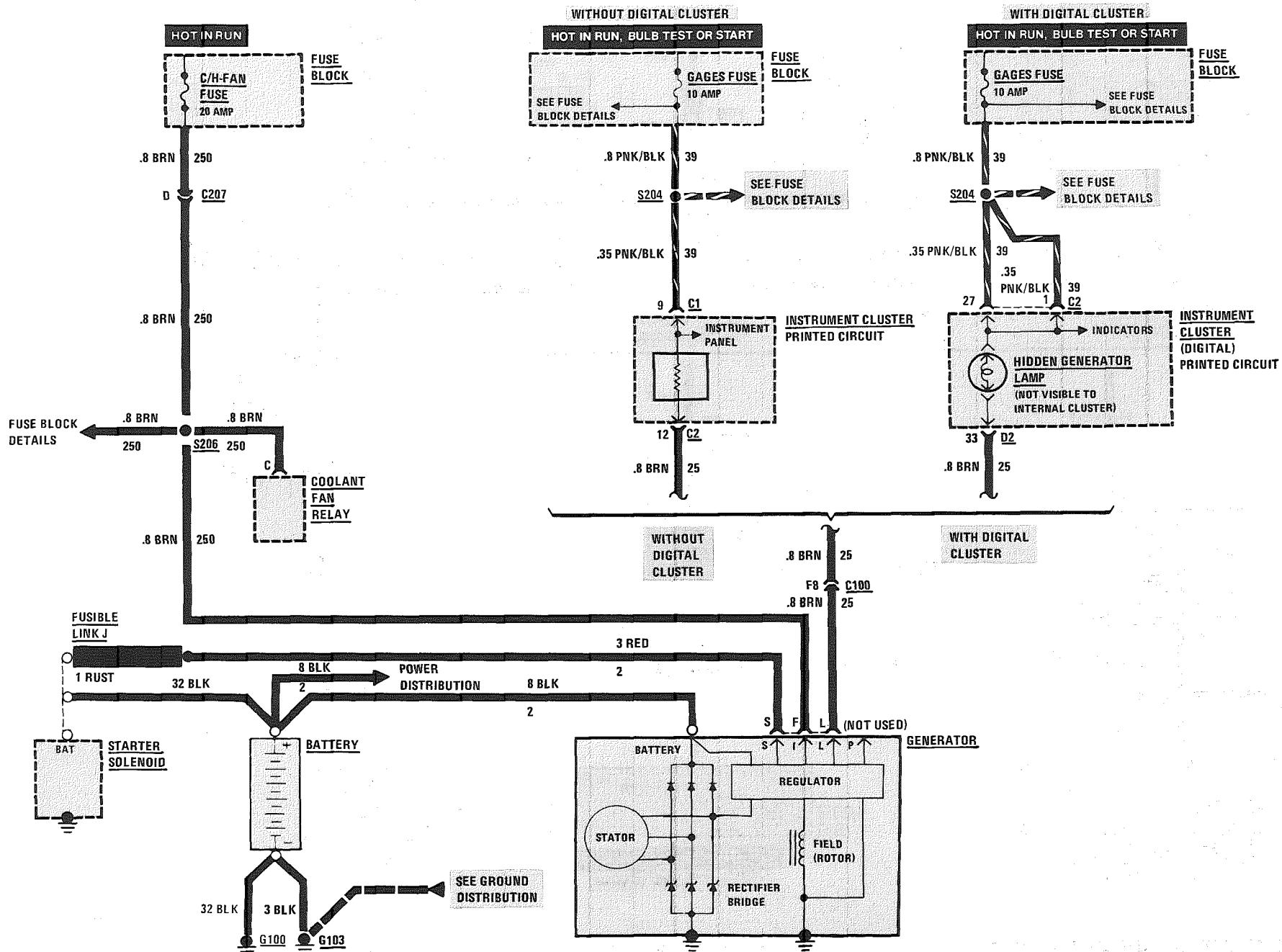
STARTER AND CHARGING SYSTEM: V6 VIN S

CHARGING



STARTER AND CHARGING SYSTEM: V8 VIN F, V8 VIN 8

CHARGING



STARTER AND CHARGING SYSTEM: V8 VIN E

CHARGING

