1991
ELECTRICAL DIAGRAMS AND DIAGNOSIS MANUAL

R/V, P MODELS

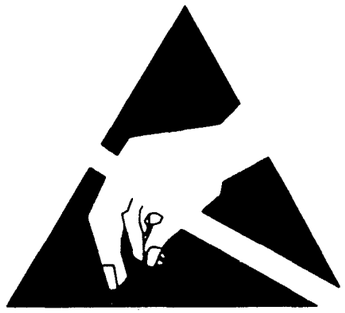
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X-9140
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NOTICE



CONTENTS SENSITIVE
TO
STATIC ELECTRICITY

F-05403

ELECTRONIC DISCHARGE WARNING

When handling an electronic part that has an ESD sensitive sticker, the service technician should follow these guidelines to reduce any possible electrostatic charge build-up on the service technician's body and the electronic part in the dealership.

1. **Do not open the package until it is time to install the part.**
2. **Avoid touching the electrical terminals of the part.**
3. **Before removing the part from its package, ground the package to a known good ground on the vehicle.**
4. **Always touch a known good ground before handling the part. This should be repeated while handling the part and more frequently after sliding across the seat, sitting down from a standing position or walking a distance.**

1991 R/V, P TRUCK MODELS

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HOW TO USE THIS MANUAL

The purpose of this manual is to provide:
- Clean and simple electrical circuit diagrams.
- Discussion of circuit electrical operation.
- Simplified diagnosis and testing procedures.
- Component location views.

Each electrical system or circuit will provide the following information:
- Circuit Operation.
- Circuit Diagrams.
- Component Location.
- Diagnosis Charts.

HANDLING ELECTROSTATIC DISCHARGE (ESD) SENSITIVE PARTS

When handling an electronic part that has an ESD sensitive sticker (Figure 1), the service technician should follow these guidelines to reduce any possible electrostatic charge build-up on the service technician's body and the electronic part in the dealership:

1. Do not open the package until it is time to install the part.
2. Avoid touching the electrical terminals of the part.
3. Before removing the part from its package, ground the package to a known good ground on the vehicle.
4. Always touch a known good ground before handling the part. This should be repeated while handling the part and more frequently after sliding across the seat, sitting down from a standing position or walking a distance.

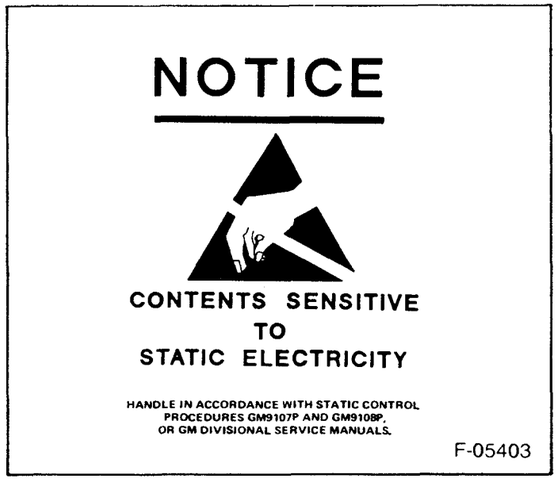


Figure 1 — Electronic Discharge Warning

CIRCUIT OPERATION

The description of circuit operation provides a simplified discussion of what is happening within each circuit. The discussion includes power application, ground paths and component operation. The explanation is tied to the circuit diagram, and in some cases, to specific switch movement or components in a circuit.

CIRCUIT DIAGRAMS

The circuit diagrams show the circuits and components that are covered in that particular system. By eliminating circuits and components not related to the systems being covered, the circuit diagrams are greatly simplified.

Circuit diagrams provide a schematic picture of how a circuit is provided voltage, what the current path is to the components, and how the circuit is grounded.

For ease of diagnosis, all connectors (C), splices (S), grounds (G) and grommets (GT) are identified by their own unique number. This number is used to reference component locations and also for identification in the diagnostic charts. The beginning digit designates the ZONE at which the connector, splice or ground can be found. For example: C302. The "C" is for connector, the "3" represents Zone 300 and 02 is the connector number.

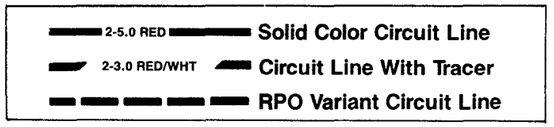
The following is a list of Zones for the vehicle:

ZONE	LOCATION
100	At and forward of bulkhead.
200	Within I/P.
300	From I/P to rear of cab.
400	Rearward of cab.
500	Within left door.
600	Within right door.
900	Within rear doors.

All connectors are shown with their part numbers and are viewed from the mating end. The part number is used to save time when ordering replacement parts. All components and switches are shown in their rest position, unless otherwise marked.

Each wiring circuit is identified by circuit number, size (in mm²) and color. Wire colors are shown in the abbreviated form. Figure 2 shows how the circuit numbers and color abbreviations are identified in this manual.

There are three types of lines used to depict circuits throughout the circuit diagrams. They are as shown:



COMPONENT LOCATIONS

When you are ready to locate the schematic components on the vehicle, use the Component Locations chart, see Figure 3.

Listed in the LH column are the components shown on the schematic. Next to the Fuse Block is the location, "Behind LH side of I/P." Reference to LH and RH is made as though the technician were sitting in the driver's seat. On the same line, in the far right column, is the page-figure reference. In this case, you are directed to Figure 37 in the Component Locator Views.

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 vehicle. Only in-line connector locations are given.

Grounds are listed next in the table. The location description for ground G302 reads, "Behind LH side of I/P, on ALDL bracket." You are directed to Figure 32.

Nearly every component, connector, ground or splice shown on a schematic can be pinpointed visually by using the Component Location Views in the back of this manual.

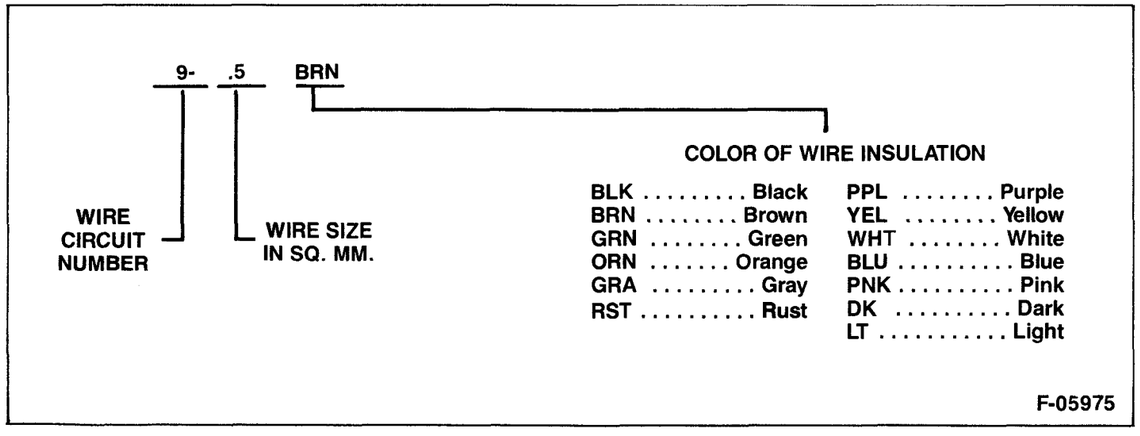


Figure 2 — Wire Coding

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Low Beam Headlamp Relay	LH side of dash panel ... 171-57
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C100 (36 Cavities) (Gasoline)	Engine compartment, on LH front of dash ... 156-19
G104	Behind LH headlamp, on radiator support ... 149-5
G105	Behind RH headlamp, on fender ... 166-47
G302	Behind LH side of I/P, on ALDL bracket ... 161-32
S101	Front lights harness, LH side of engine compartment ... 166-47
S102	Front lights harness, behind LH headlamp ... 166-47
S103	Front lights harness, behind RH headlamp ... 166-47
S104	Front lights harness, behind LH headlamp ... 166-47
S307	I/P harness, behind LH side of I/P, above steering column ... 167-37
Grommet 100	At LH side of dash panel (engine compartment) ... 159-29

Figure 3 — Component Location Chart

DIAGNOSIS

Before beginning any diagnosis, there are several important steps that should be taken:

Verify the problem

Operate the system and list symptoms in order to:

- Check the accuracy and completeness of the complaint.
- Learn more that might give a clue to the nature and location of the problem.
- Analyze what parts of the system are working.

Check the circuit diagram

Refer to the Circuit Diagram for clues to the problem. Location and identification of circuit components may give some idea of where the problem is.

The circuit diagrams 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 voltage or ground connection. If part of a circuit fails, check the connections between the part that works and the part that does not work.

For example, if the low beam headlamps work, but the high beams and the indicator lamp do not, then voltage and ground paths are good. Since the dimmer switch is the component which switches this voltage, it is most likely the cause of failure.

Read "circuit operation"

Read the Circuit Operation for the problem circuit. By studying the circuit diagram and circuit operation, enough information should be learned to narrow the cause to one component or one portion of the circuit.

Check for the cause of the problem (Diagnosis Charts)

The Diagnosis Charts (Figure 4) are a step-by-step approach to diagnosis of the problem (or condition). Each chart covers one symptom. For example, "Horn(s) will not operate."

The charts are divided into three columns; Test, Result and Action.

The Test procedures are listed in numerical sequence and must be followed in that order. Each test step will describe what must be done to the circuit, what test equipment to use and where to connect the test equipment.

After the test procedure has been performed, refer to the Result column. This will list possible results of the test. Once the result has been found, follow it directly over to the Action column.

The Action column will instruct what must be done to correct the problem or will list the next test step to be performed.

It is important to remember that a problem in one system could result in a symptom in another system.

Make the repair

Repair the problem circuit as directed in the diagnosis charts.

Verify that the repair is complete

Operate the system and check that the repair has removed all symptoms, and also has not caused any new symptoms.

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Check condition of PARK LP fuse.	Fuse is not blown.	GO to step 2.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
2. With the light switch ON, connect a test lamp from ORN (240) wire at light switch connector C304 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire from light switch to fuse block.
3. Connect a test lamp from YEL (10) wire at light switch connector C304 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE light switch.
4. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C305 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from dimmer switch to lights.
	Test lamp does not light.	REPLACE dimmer switch.

Figure 4 — Typical Diagnosis Chart

BASIC ELECTRICITY

Ohm's Law states that voltage (E) is equal to resistance (R) (ohms) time current (I) (amperes) in a circuit ($E = R \times I$). The equation can also be shown as $I = E/R$ or $R = E/I$.

If any two of the values are known for a given circuit, the missing one can be found by substituting the values in amperes, volts or ohms and solving for the missing value.

In a typical simple circuit, battery voltage is applied to a bulb through a 10-amp fuse and a switch. Closing the switch turns on the bulb.

To find the circuit current flow, use the equation:

$I = E/R$. Filling in the numbers for the equation:

I = 12 volts (E)/2 ohms (R), or I = 6 amps.

The bulb in this circuit operates at 6 amps and is rated to operate at this level. With 12 volts applied to the bulb, it will glow at the rated level.

CIRCUIT MALFUNCTIONS

There are three electrical conditions that can cause a non-working circuit; an "Open Circuit," a "Short Circuit," or a "Ground Circuit."

Open Circuit (Figure 5)

An open circuit occurs whenever there is a break in the circuit. The break can be corrosion at the connector, a wire broken off in a component, a wire that burned open from too much current, or a component not operating as it should.

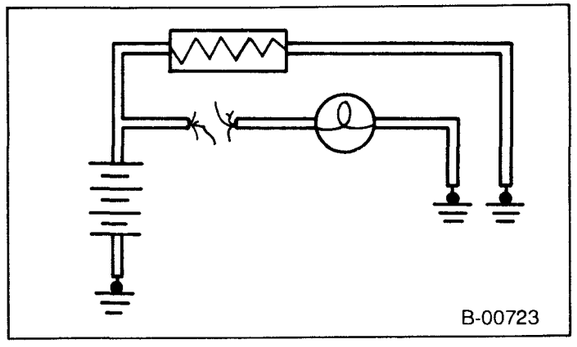


Figure 5 — Open Circuit

Short Circuit (Figure 6)

A short circuit happens when the current bypasses part of the normal circuit. This bypassing is usually caused by wires touching, salt water in or on a component such as a switch or a connector, or solder melting and bridging conductors in a component.

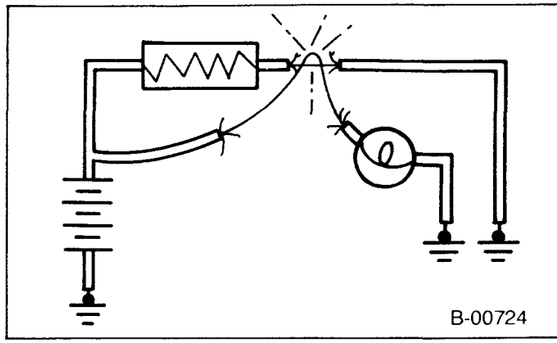


Figure 6 — Short Circuit

Grounded Circuit (Figure 7)

A grounded circuit is like a short circuit but the current flows directly into a ground circuit that is not part of the original circuit. This may be caused by a wire rubbing against the frame or body. Sometimes a wire will break and fall against metal that is connected electrically to the ground side of the voltage supply. A grounded circuit may also be caused by deposits of oil, dirt or moisture around connections or terminals, which provide a good path to ground.

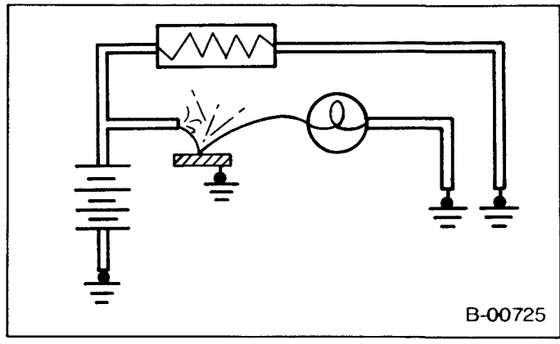


Figure 7 — Grounded Circuit

ELECTRICAL TEST EQUIPMENT

Various electrical testers have been developed over the years. A few of these are basic but are required to perform a thorough electrical diagnosis. These include:

- Jumper wires
- Test lamps
- Self-powered test lamps
- Voltmeter
- Ohmmeter
- Ammeter

All of these testers come in a variety of models and any working model will be adequate for simple tests. However, accuracy becomes important when the value of a reading obtained using a meter is critical to the diagnosis procedure. Make sure any electrical test meter used is of sufficient quality and accuracy to make the measurements required in the electrical testing.

Jumper Wires

Jumper wires allow "jumping" across a suspected open or break in a circuit.

- If the circuit works properly with the jumper wire in place, but does not work when the jumper wire is removed, the circuit has an open spot.
- A circuit without any opens or breaks has continuity and needs no further testing.

The jumper is usually a long wire with alligator clamps. A version of the jumper has a fuse holder in it with a 10-amp fuse. This will prevent damaging the circuit if the jumper is connected in the wrong way.

The jumper is used to locate opens in a circuit. One end of the jumper is attached to a voltage source and the other end is attached to the load in the circuit, i.e., lamps motor. If the load works, try "jumping" to circuit points that are progressively closer to the voltage supply. When the circuit load stops working, the open has been located.

The jumper is also used to test components in the circuit such as connectors, switches, and suspected high resistance points.

Unpowered Test Lamp

This tool consists of a 12-volt lamp with leads. The ends of the leads usually have alligator clamps, but various kinds of probes, terminal spades, and special connectors also are used.

The 12-volt test lamp continuity tester uses the vehicle's battery to provide voltage to the circuit under test. 12-volt testers are manufactured with a variety of tips, to permit touching them to connectors, bare wires, insulated wires or even wires within wiring harnesses. To check the tester before use, briefly touch the clip to one side of the battery and the probe to the other. 12-volt testers are NOT sensitive to polarity in a circuit, and can be connected either way.

The 12-volt test lamp generally has a sharp probe tip so it can be inserted into connector terminals or through the wire insulation for testing. It is important to keep the probe tip sharp to minimize the damage to wire insulation. When the test is complete at a particular point, be sure to tape any holes made in wire insulation.

The unpowered test lamp is used on an open circuit. One lead of the test lamp is grounded and the other lead is moved around the circuit to find the open. Depending on the physical layout of the circuit, sometimes it will be easier to start at the voltage supply and other times it is easier to start at the circuit load or ground circuit.

NOTICE: Test lamps are to be used only on circuits that do not contain solid state devices. If a test lamp is used in a circuit containing a solid state device, the current that the test lamp draws is above the current that the solid state device is able to handle. Using a test lamp on a solid state device may destroy the device.

Once one becomes familiar with the test lamp and the brilliance of the bulb in a normal circuit, high-resistance circuits can be recognized by the effect they have on the bulb. As the current drops in a high-resistance circuit, the bulb in the test lamp will glow less brightly. Although the 12-volt test lamp cannot be used as a foolproof test for high resistance, a less than normal brilliance of the lamp is an indication of circuit high resistance. Further testing will verify the condition and locate the cause.

Powered Test Lamp

This lamp is a pencil shaped unit with a self-contained battery, a 1.5 volt lamp bulb, a sharp probe and a ground lead fitted with an alligator clip.

This test lamp is used mainly for testing components that are disconnected from the vehicle voltage supply. The powered test lamp is also useful for testing suspected high resistance points in a circuit such as connectors and ground circuits that are corroded or loose.

NOTICE: The following instruments: Ammeter, Voltmeter, and Ohmmeter, each have a particular application for diagnosing electrical circuits.

When using an ammeter or voltmeter, and the value being tested is unknown, always use the highest scale first and work downward to a midscale reading whenever possible. This will avoid damage to the instrument.

Never use an ohmmeter in a voltage circuit, or as a substitute for a voltmeter or ammeter as damage to the instrument will result.

Meters

Three types of meters are generally used for diagnosis. They are:

1. The Ammeter.
2. The Ohmmeter.
3. The Voltmeter.

These meters are available in two designs. They are:

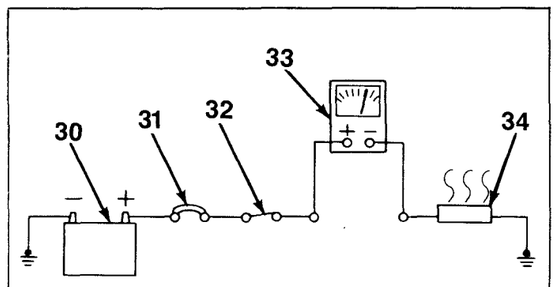
1. Analog (Needle-Type).
2. Digital (Electronic Display-Type).

CAUTION: The correct type of meter must be used when diagnosing circuits containing solid state devices. Incorrect use of the meters will result in damage to the solid state devices.

Analog meters may be used for any circuit not containing a solid state device, while a digital meter MUST be used to diagnose any circuit with a solid state device. Circuits which contain a solid state device, such as the Electronic Control Module, should be tested only with a 10-megaohm or higher impedance digital multimeter (J 29125 or equivalent).

Ammeter (Figures 8 and 11)

An ammeter is used to measure current flow (amperage) in a circuit. Amperes are units of electron flow which indicate how many electrons are passing through the circuit. Ohm's Law indicates that current flow in a circuit is equal to the circuit voltage divided by total circuit resistance.



30. Power Source
31. Circuit Breaker
32. Switch (Closed)
33. Ammeter
34. Load

B-06086

Figure 8 — Ammeter

At normal operating voltage, most circuits have a characteristic amount of current flow, referred to as normal current draw. Current draw is measured in amperes (amps) with an ammeter. Comparing measured current draw with the specified current draw rating provides useful diagnostic information.

Disconnect the circuit from the voltage source before connecting the ammeter. The ammeter (Figure 8) must be placed in series with the circuit being tested. Be sure that the ammeter's positive terminal is connected to the positive (battery) side of the circuit and its negative terminal to the negative (ground) side of the circuit.

CAUTION: Never connect an ammeter across a circuit like a voltmeter. The ammeter could be damaged by the vehicle electrical system.

Excessive current draw is responsible for blowing fuses and, in some cases, draining the battery. An ammeter will help diagnose these conditions by locating the cause of the excessive current draw. On the other hand, there are times when a reduced current draw at a component (a power window motor for example) causes unsatisfactory performance of an electrical system.

Ohmmeter (Figures 9 and 11)

The ohmmeter is used to read resistance (ohms) or to check for opens or shorts in a circuit or component. There are both analog-type and digital-type ohmmeters.

- An analog-type meter shows the actual resistance on a scale by the movement of a needle.
- On a digital-type meter, the resistance measured is converted inside the meter to a numerical output which is shown on a display panel.

Ohmeters use a small battery to supply the voltage and current which flows through the circuit being tested. The current flows through the circuit, positions the needle on analog-type meters, or converts to a digital readout on digital-type meters. This is done in terms of resistance as shown in Ohm's Law - R = E/I.

Although there are several different styles of analog ohmmeters, all will usually have the following features in addition to the meter movement:

- A range selector switch which permits the selection of different ranges of resistance.
- A set adjust control which allows the meter to be set at zero for accurate measurements.
- Some model ohmmeters also have a built-in feature that allows the ohmmeter to be used as a self-powered test lamp.

Digital meters do not have to be zeroed. They have various ranges just like the analog meters.

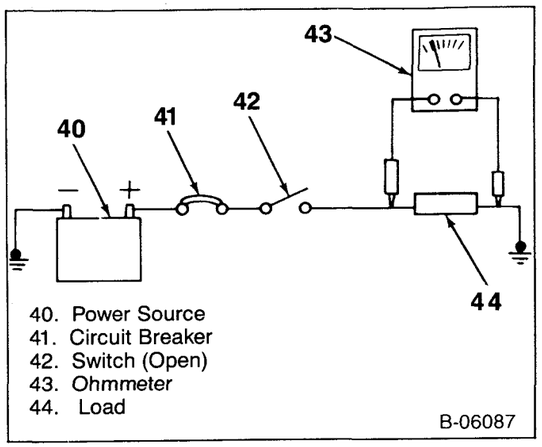


Figure 9 — Ohmmeter

CAUTION: Like a self-powered test lamp, the ohmmeter can only be used on circuits where voltage has been removed (Figure 9). It is designed to be operated on its own voltage supply. This voltage supply provides low voltage and current levels for the meter to make resistance measurements. The 12-volt electrical system voltage in the automotive circuits could damage the meter.

Electrical circuits can be checked for opens using basically the same procedure as previously described for the self-powered test lamp. The circuit must be separated from all voltage sources. The ohmmeter is connected across the two open ends of the circuit to be checked. A high reading (infinity) is an indication of an open circuit. A low reading (near zero) is an indication of a continuous circuit.

Checks for short circuits are made in a similar manner to that used for open circuits, except that the circuit being checked must be isolated from both voltage and normal ground.

Connecting the ohmmeter between an isolated circuit and a good ground point will allow checking the circuit for shorts to ground.

A short to ground in the circuit will be indicated on the meter by a near zero reading. A good circuit (no short to ground) will show up as infinity (very high resistance) indicated on the meter.

To measure the resistance of a component or a circuit, the component or circuit must be isolated from all other components (or circuits). The ohmmeter leads are then placed across the component or circuit and the resistance is read on the ohmmeter.

Voltmeter (Figures 10 and 11)

The voltmeter (properly observed) will give the technician more information than the ammeter, ohmmeter and test lamp combined. Its application for diagnosis here is to measure the electrical pressure (voltage) drop in a resistance circuit (Figure 10). Voltage drop is a reduction or "using up" of the voltage to push electricity through a resistance. It can be compared to the pressure of water flowing through a metering valve.

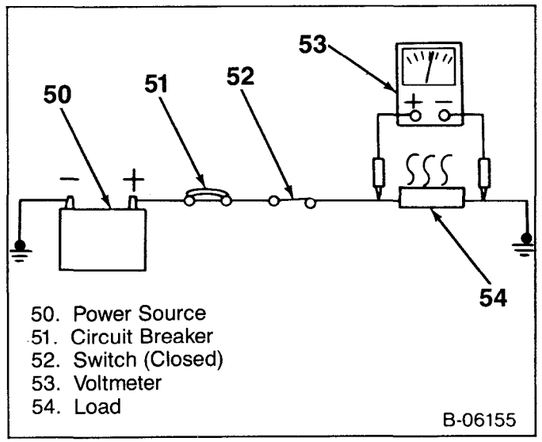


Figure 10 — Voltmeter

Low voltage to a lamp will make the lamp glow dimly. This can be caused by low source voltage (battery discharge or low alternator output), or by high resistance in the circuit due to a poor connection. Before making any meter measurements, it is important to review the relationship between current, voltage and resistance (Ohm's Law).

Being able to determine voltage drop is important because it provides the following information:

- Too high of a voltage drop indicates excessive resistance. If, for instance, a blower motor runs too slowly or a lamp glows too dimly, one can be sure there is excessive resistance in the circuit. By taking voltage drop readings in various parts of the circuit, the problem (corroded terminals) for example can be isolated.
- Too low of a voltage drop, likewise, indicates low resistance. If, for instance, a blower motor runs too fast, the problem could be isolated to a low resistance in a resistor pack by taking voltage drop readings.
- Maximum allowable voltage drop under a load is critical, especially if there is more than one high resistance problem in a circuit. It is important because like all resistances, all voltage drops are cumulative. Corroded terminals, loose connections or other similar problems reduce the voltage available across the key circuit components. The current flow is reduced in the circuit and all of the affected components operate at less than peak efficiency. A small drop across wires (conductors), switches, connectors, etc., is normal. (This is due to the resistance of the conductors but should be less than 10 percent of the total drop.)

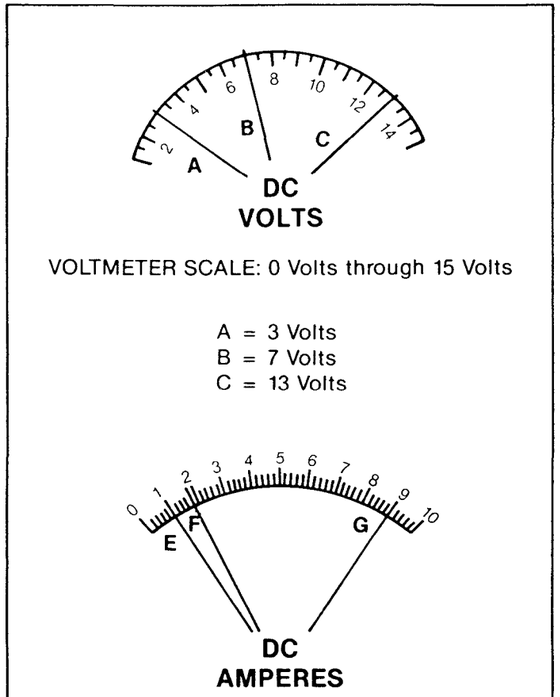


Figure 11 — Meter Scales

When using a voltmeter:

- Be sure to connect the positive lead to the battery side and the negative lead to the ground side of the component being checked.
- Voltage drop occurs when electricity (current) flows through a resistance. Make sure the voltage drop being measured is only through the component being checked, not through the component and a poor connection.
- The circuit must be operating (lamp ON or motor running, for example) to measure voltage drop.

The instrument panel voltmeter (in the vehicle) should also be observed for monitoring proper operation of the generator, battery, cranking motor, and cranking circuit. In this application, battery voltage drop can be monitored while the engine is cranking; and after the engine is running, generator output voltage can be monitored. This can be a valuable first step before diagnosing other electrical problems.

CIRCUIT WIRING REPAIR PROCEDURES

Maintenance and Repair

All electrical connections must be kept clean and tight. Loose or corroded connections may cause a discharged battery, difficult starting, dim lamps, and possible damage to the generator and regulator. Wires must be replaced if insulation becomes burned, cracked, or deteriorated.

Always use rosin flux solder to splice a wire or repair one that is frayed or broken and use insulating tape to cover all splices or bare wires.

When replacing wire, it is important that the correct size wire be used as shown on applicable wiring diagrams or parts book. Each harness or wire must be held securely in place to prevent chafing or damage to the insulation due to vibration.

Wire size in a circuit is determined by the amount of current, the length of the circuit and the voltage drop allowed. Wire size is specified using the metric gage. The metric gage describes the wire size directly in cross section area measured in square millimeters.

CAUTION: Never replace a wire with one of a smaller size or replace a fusible link with a wire of a larger size.

WIRE SIZE CONVERSION TABLE

METRIC SIZE $(mm)^2$	AWG SIZE
0.22	24
0.35	22
0.5	20
0.8	18
1.0	16
2.0	14
3.0	12
5.0	10
8.0	8
13.0	6
19.0	4
32.0	2
40.0	1
50.0	0
62.0	00

Wire Repair

The wire repair is very important for the continued reliable operation of the vehicle. This repair must be done as described in the following procedures.

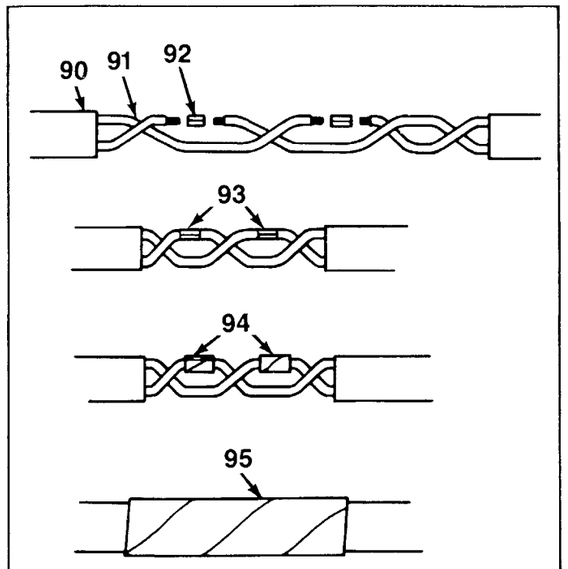
Twisted Wires (Figure 12)

Remove or Disconnect

1. Jacket (90).
2. Twisted wires (91).
3. Insulation from the wire.

Install or Connect

1. Splice clip (92).
2. Crimp and solder the splice clips (93).
3. Electrical tape wrap (94) on the splices.
4. Outer jacket electrical tape wrap (95).



90. Jacket
91. Twisted Wires
92. Splice Clip
93. Crimp and Solder
94. Electrical Tape Wrap
95. Outer Electrical Tape Wrap

B-06230

Figure 12 — Twisted Wire Repair

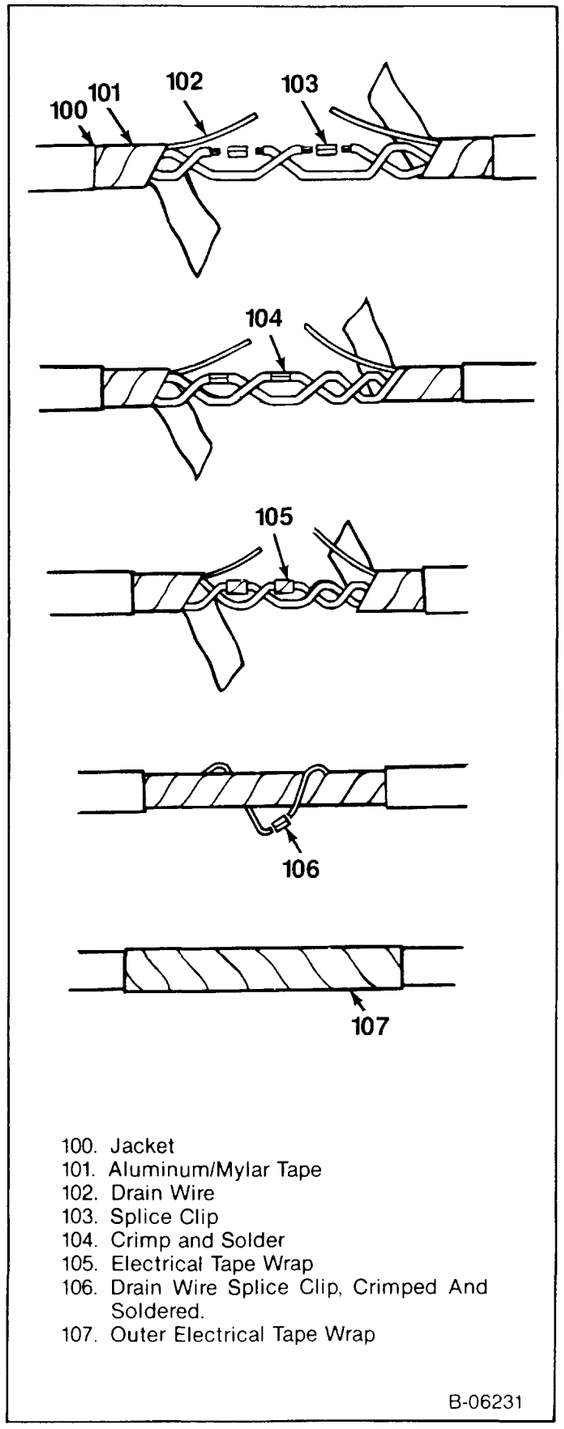
Twisted Wires/Shielded Cable (Figure 13)

Remove or Disconnect

1. Jacket (100).
2. Unwrap aluminum/myiar tape (101).
3. Drain wire (102).
4. Leads.
5. Insulation on the leads.

Install or Connect

1. Splice clips (103).
2. Crimp and solder the splice clips (104).
3. Electrical tape wrap (105) on the splices.
4. Aluminum/mylar tape by wrapping and taping.
5. Drain wire with a splice clip (106). Crimp and solder the splice clip.
6. Outer jacket electrical tape wrap (107).



100. Jacket
101. Aluminum/Mylar Tape
102. Drain Wire
103. Splice Clip
104. Crimp and Solder
105. Electrical Tape Wrap
106. Drain Wire Splice Clip, Crimped And Soldered.
107. Outer Electrical Tape Wrap

B-06231

Figure 13 — Twisted/Shielded Wire Repair

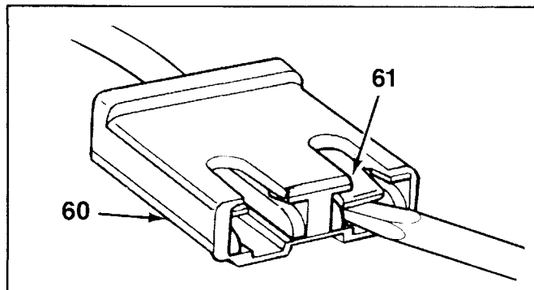
Wiring Connector Terminal Replacement (Blade-Type)

Remove or Disconnect (Figure 14)

1. Terminal lock tang.
2. Terminal (61).

Install or Connect (Figure 15)

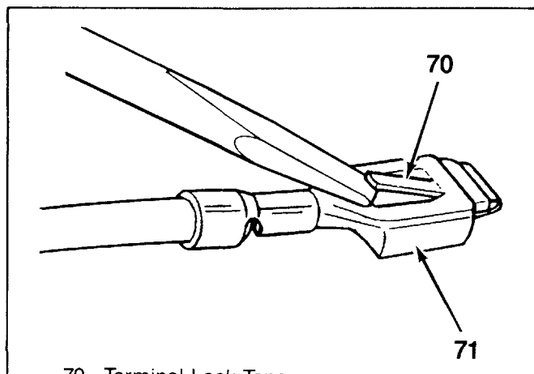
1. Pry up on the tang (70).
2. Terminal into the connector.



60. Connector
61. Terminal

B-06156

Figure 14 — Removing the Terminals from the Connector



70. Terminal Lock Tang
71. Terminal

B-06227

Figure 15 — Resetting the Lock Tang

Wiring Connector Terminal Replacement (Twin Lock-Type)

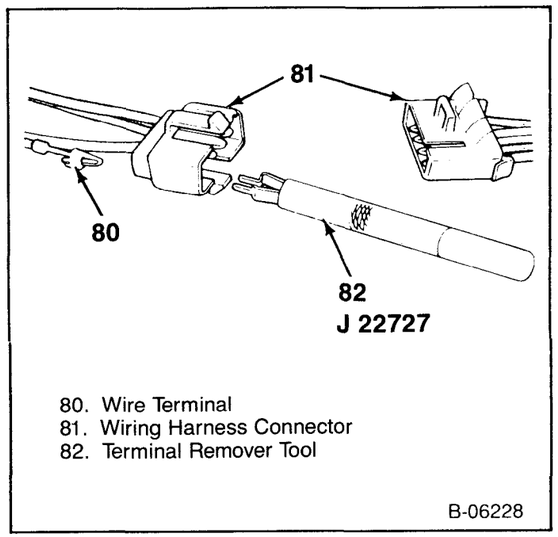
Remove or Disconnect (Figure 16)

Tool Required:
J 22727 Terminal Remover

1. Connector lock tangs (81).
2. Terminal locks using J 22727 (82).
3. Terminal (80).

Install or Connect

1. Pry out the tangs.
2. Terminal (80) into the connector (81).



80. Wire Terminal
81. Wiring Harness Connector
82. Terminal Remover Tool

B-06228

Figure 16 — Twin Lock Connector Terminal

WEATHER-PACK CONNECTORS

Special connectors known as Weather-Pack connectors (Figure 17) require a special tool J 28742-A (Figure 18) for servicing. This special tool is required to remove the pin and sleeve terminals. If removal is attempted with an ordinary pick, there is a good chance that the terminal will be bent or deformed. Unlike standard blade-type terminals, these terminals cannot be straightened once they are bent.

Make sure that the connectors are properly seated and all of the sealing rings (120) are in place when connecting the leads. The hinge-type flap (123) provides a back-up, or secondary locking feature for terminals. They are used to improve the connector reliability by retaining the terminals if the small terminal lock tangs (138) are not positioned properly.

Molded-on connectors require complete replacement of the connection. This means splicing a new connector assembly into the harness. Environmental connections cannot be replaced with standard connections. Instructions are provided with the Weather-Pack connector and terminal packages.

With the low current and voltage levels found in some circuits, it is important that the best possible bond at all wire splices be made by soldering the splices.

Use care when probing the connections or replacing terminals in them. It is possible to short between two terminals. If this happens, it is possible that damage may be done to certain components. Always use jumper wires between connectors for circuit checking. Never probe through the Weather-Pack seals.

When diagnosing for possible open circuits, it is often difficult to locate them by sight because oxidation or terminal misalignment is hidden by the connectors. Merely wiggling a connector on a sensor or in the wiring harness may pinpoint the open circuit condition. This should always be considered when an open circuit is indicated while diagnosing. Intermittent problems may also be caused by oxidized or loose connections.

METRI-PACK CONNECTORS

The Metri-Pack connectors use a pull-to-seat type terminal, as shown in Figure 17. The special tool required to remove the terminal is J 35689-A terminal remover. If removal is attempted with an ordinary pick, there is a good chance that the terminal will be bent or deformed. Refer to Figure 17.

Weather-Pack Connector Replacement

Remove or Disconnect (Figure 17)

Tool Required:
J 28742-A Terminal Remover (Figure 18)

1. Primary lock (121) by lifting.
2. Connector sections.
3. Secondary lock (125) by spreading the sides of the hasp, thus clearing the staples and rotating the hasp (127).
4. Terminal (136) by using J 287842-A (128, 139).
   - Snip off the old terminal assembly.
5. 5 mm of the wire insulation (130).

Clean
- Terminal Barrel (124).

Install or Connect (Figure 17)

1. Terminal insulator (134) on the wire. Slide the insulator back on the wire about 8 cm (3 inches).
2. Terminal (131) on the wire.
   - Roll crimp (132) and solder the terminal.
3. Terminal insulator (134) and the roll crimp (133).
4. Terminal into the connector.
5. Secondary lock (125).
6. Connector sections until the primary lock (121) engages.

Metri-Pack Connector Replacement

Remove or Disconnect (Figure 17)

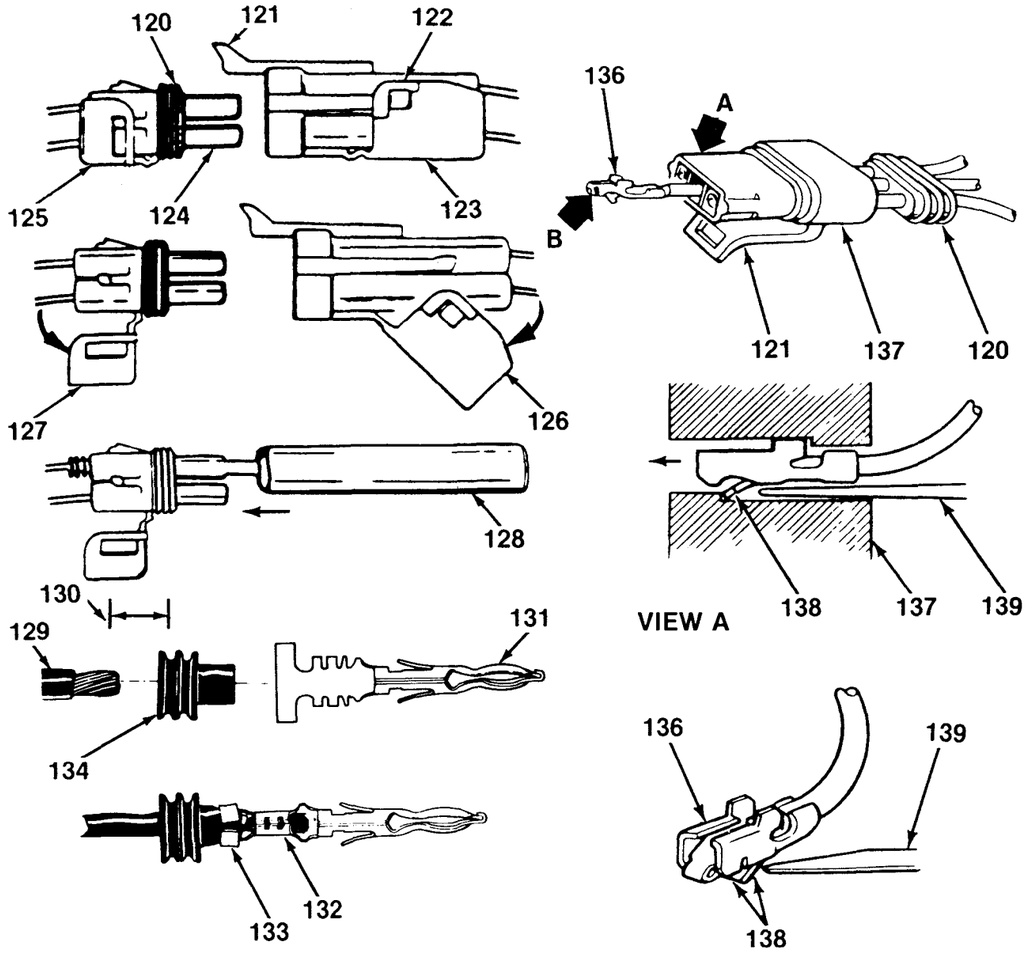
Tool Required:
J 35689-A Terminal Remover

1. Primary lock (121) by lifting.
2. Connector body (137).
3. Connector seal (120) by pulling the seal back onto the wires away from the connector body (137).
4. Terminal (136) by inserting J 35689-A (139) into the connector body (137) to depress the locking tang (138), then push the wire and terminal through the connector body (Figure 17).
   - Snip off the old terminal unless the terminal is to be reused, reshape the locking tang.
5. 5 mm (0.2 inch) of the wire insulation (130).

Clean
- Terminal cavity of the connector body.

Install or Connect (Figure 17)

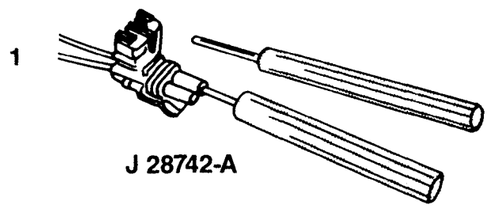
1. Terminal (136) on the wire.
   - Crimp and solder the terminal.
2. Terminal (136) into the connector cavity by pulling the wire on the seal side of the connector until the locking tang (138) is fully seated.
3. Seal (120) by pressing the seal into the connector body (137) until it is fully seated.
4. Connector sections until the primary lock (121) engages.



120. Connector Seal
121. Primary Lock
122. Secondary Lock Staple
123. Secondary Lock
124. Terminal Barrel
125. Secondary Lock
126. Lock Opened
127. Lock Opened
128. J 28742-A Terminal Remover
129. Wire
130. 5 mm (0.2 inch)
131. Terminal
132. Roll Crimp
133. Roll Crimp
134. Terminal Insulator
136. Metri-Pack Series 150 Female Terminal
137. Connector Body
138. Locking Tang
139. J 35689-A Terminal Remover

F-02349

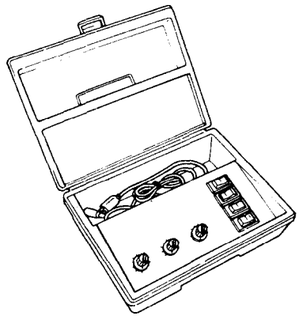
Figure 17 — Weather-Pack and Metri-Pack Connectors



1 J 28742-A



2 J 22727



3 J 33431-B

1. Weather-Pack II Terminal Remover
2. Electrical Terminal Remover
3. Signal Generator and Instrument Panel Tester

F-02438

Figure 18 — Special Tools

REGULAR PRODUCTION OPTION (RPO) LIST

AU3 -- Power Side Door Locks
A31 -- Power Side Windows
B3D -- School Bus Equipment
C36 -- Auxiliary Heater
C60 -- Air Conditioning
C65 -- Auxiliary Air Conditioning
C69 -- Roof Mounted Air Conditioner
C7P -- 16,000LB GVW Rating
D48 -- Electric Remote Control Outside Mirror
E63 -- Fleetside Body
K34 -- Cruise Control
K68 -- Generator-105 AMP
LB4 -- Engine, 4.3L (262 CID) V6 Gasoline Engine, VIN Z
LH6 -- Engine, 6.2L (378 CID) V8 Diesel Engine, VIN C
LL4 -- Engine, 6.2L (378 CID) V8 HD Diesel Engine, VIN J
LO5 -- Engine, 5.7L (350 CID) V8 Gasoline Engine, VIN K
L19 -- Engine, 7.4L (454 CID) V8 Gasoline Engine, VIN N
M20 -- Man Trans, 4-Spd.
MD8 -- Auto Trans, 4-Spd., With Overdrive
MT1 -- Auto Tans, 5 Spd., With Overdrive
MT8 -- Man Trans, 5-Spd.. With Overdrive
MY6 -- Man Trans, 4-Spd.
NA1 -- Emission System, Less Than 8500 GVW
NA4 -- Emission System, Above 8500 GVW
RO5 -- Dual Rear Wheels
TP2 -- Auxiliary Battery
TR9 -- Auxiliary Lighting Package
TVR -- Rear Dome and Reading Lamp
T61 -- Canadian Daytime Running Lamps
UJ1 -- Brake Warning Indicator System
UM6 -- Radio, ETR AM/FM Stereo, Cassette
UM7 -- Radio, ETR AM/FM Stereo, W/O Cassette
UY1 -- Wiring Harness, Camper
UY7 -- Truck Trailer Wiring Harness, HD
U89 -- Trailer Wiring Harness
V22 -- Quad Halogen Headlamps

ABBREVIATION LIST

The following is a list of abbreviations used in the wiring diagrams. The abbreviations have been developed in such a way that their meaning should be clear.

Use this page as a reference to determine the meaning of an abbreviation if necessary.

A -- Ampere
A/C -- Air Conditioner
AC -- Alternating Current
ACC -- Accessory
AIR -- Air Injection Reaction
AIR/COND -- Air Conditioner
ALDL -- Assembly Line Diagnostic Link
ALT -- Alternator
AMP -- Ampere
ANTI -- Anticipate
ASM -- Assembly
ASSY -- Assembly
AUD -- Audio
AUTO -- Automatic
AUX -- Auxiliary

BAT -- Battery
BATT -- Battery
BI-LEV -- Bi-Level
BLK -- Black
BLT -- Belt
BLU -- Blue
BOT -- Bottom
BRK -- Brake
BRN -- Brown
BU -- Backup
BUZZ -- Buzzer

CID -- Cubic Inch Displacement
CIR/BRK -- Circuit Breaker
CIRC -- Circuit
CLSTR -- Cluster
CNTRL -- Control
COMP -- Compartment
COMP -- Compressor
CONN -- Connector
CONV -- Convenience
CTSY -- Courtesy
CYL -- Cylinder

DC -- Direct Current
DEF -- Defrost
DK -- Dark
DIAG -- Diagnostic
DIM -- Dimmer
DIR -- Directional
DISC -- Discrete
DIST -- Distributor
DIV -- Diverter
DM -- Dome
DR -- Door
DRAC -- Digital Ratio Adapter Controller
DRL -- Daytime Running Lamps

ECM -- Electronic Control Module
EFE -- Early Fuel Evaporation
EGR -- Exhaust Gas Recirculation
ELEC -- Electric
ENG -- Engine
EPR -- Exhaust Pressure Regulator
ESC -- Electronic Spark Control
EST -- Electronic Spark Timing
ETR -- Electronically Tuned Radio
EVRV -- Electronic Vacuum Regulator Valve
EXC -- Except

F-PUMP -- Fuel Pump
FLASH -- Flasher
FRT -- Front
4WD -- Four-Wheel Drive

GEN -- Generator
GRA -- Gray
GRD -- Ground
GRN -- Green

HAND -- Handling
HZ -- Hazard
HD -- Heavy Duty
HD LP -- Headlamp
HEI -- High Energy Ignition
HI -- High
HTR -- Heater

IAC -- Idle Air Control
IGN -- Ignition
ILLUM -- Illumination
I/P -- Instrument Panel
INC -- Increased
IND -- Indicator
INJ -- Injector
INST -- Instrument
INTER -- Interior

LD -- Light Duty
LH -- Left Hand
LO -- Low
LP -- Lamp
LPS -- Lamps
LT -- Light
LTR -- Lighter

M -- Motor
MAN -- Manual
MAP -- Manifold Absolute Pressure
MAX -- Maximum
MED -- Medium
MRKR -- Marker
MULT -- Multiple

NAT -- Natural
NEU -- Neutral
NO -- Normally Open
NC -- Normally Closed

ORN -- Orange

PK -- Park
PLR -- Puller
PNK -- Pink
PNL -- Panel
PPL -- Purple
PRESS -- Pressure
PWR -- Power

RCVR -- Receiver
REF -- Reference
RESIST -- Resistance
RH -- Right Hand
RPO -- Regular Production Option
RST -- Rust
RWAL -- Real Wheel Antilock

SEN -- Sensor
SEND -- Sender
SIG -- Signal
SIL -- Silver
SKT -- Socket
SOL -- Solenoid
SPEEDO -- Speedometer
STR -- Stripe
SW -- Switch

TACH -- Tachometer
TBI -- Throttle Body Injection
TCC -- Torque Converter Clutch

TEMP -- Temperature
TP -- Throttle Position
T/L -- Tail Lamp
TRANS -- Transmission
TYP -- Typical

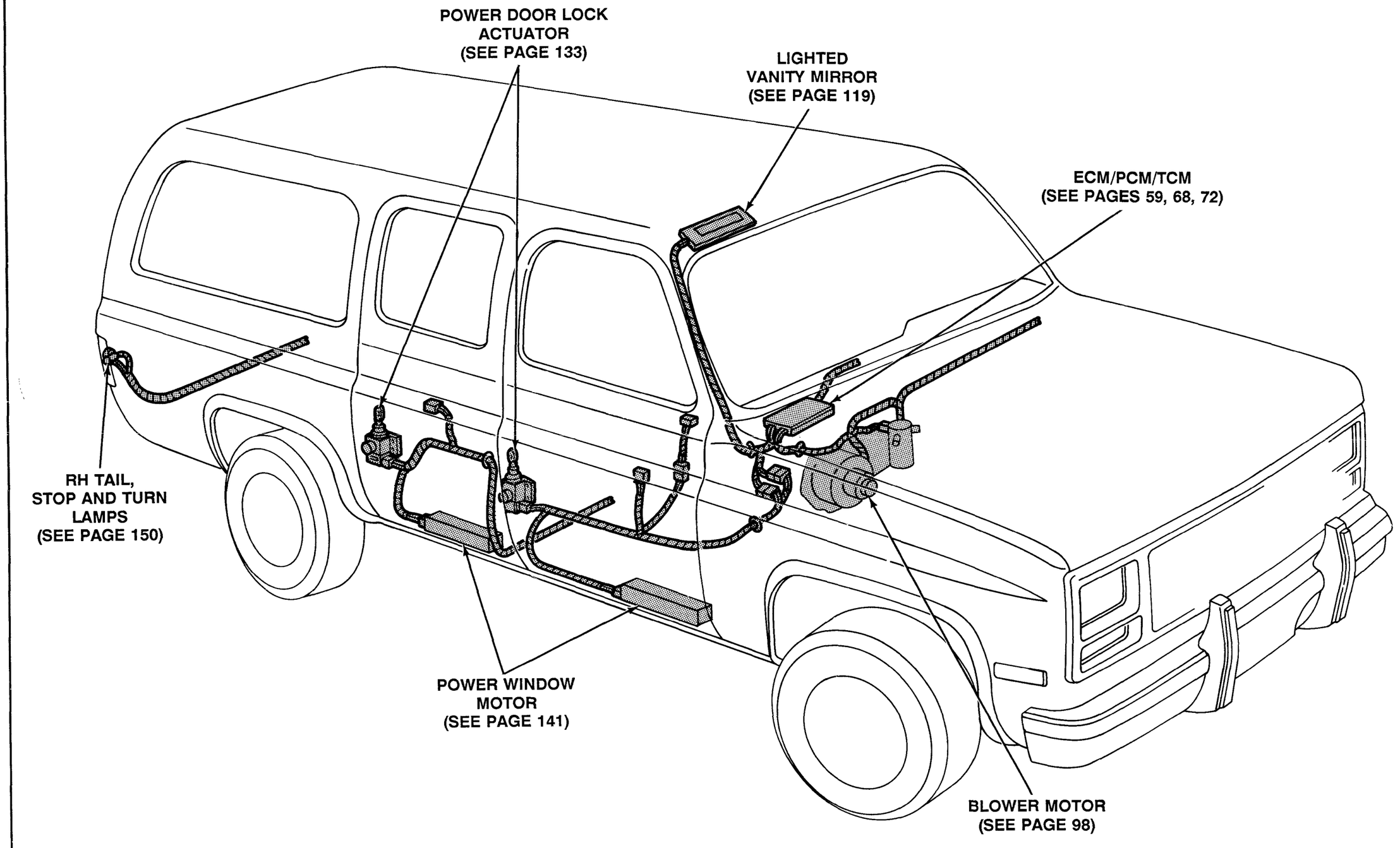
V -- Volt
VAC -- Vacuum
VLV -- Valve
VSS -- Vehicle Speed Sensor

W/ -- With
W/O -- Without
W/S -- Windshield
W WASHER -- Window Washer
WDO -- Window
WHT -- White
WGR -- Wiring

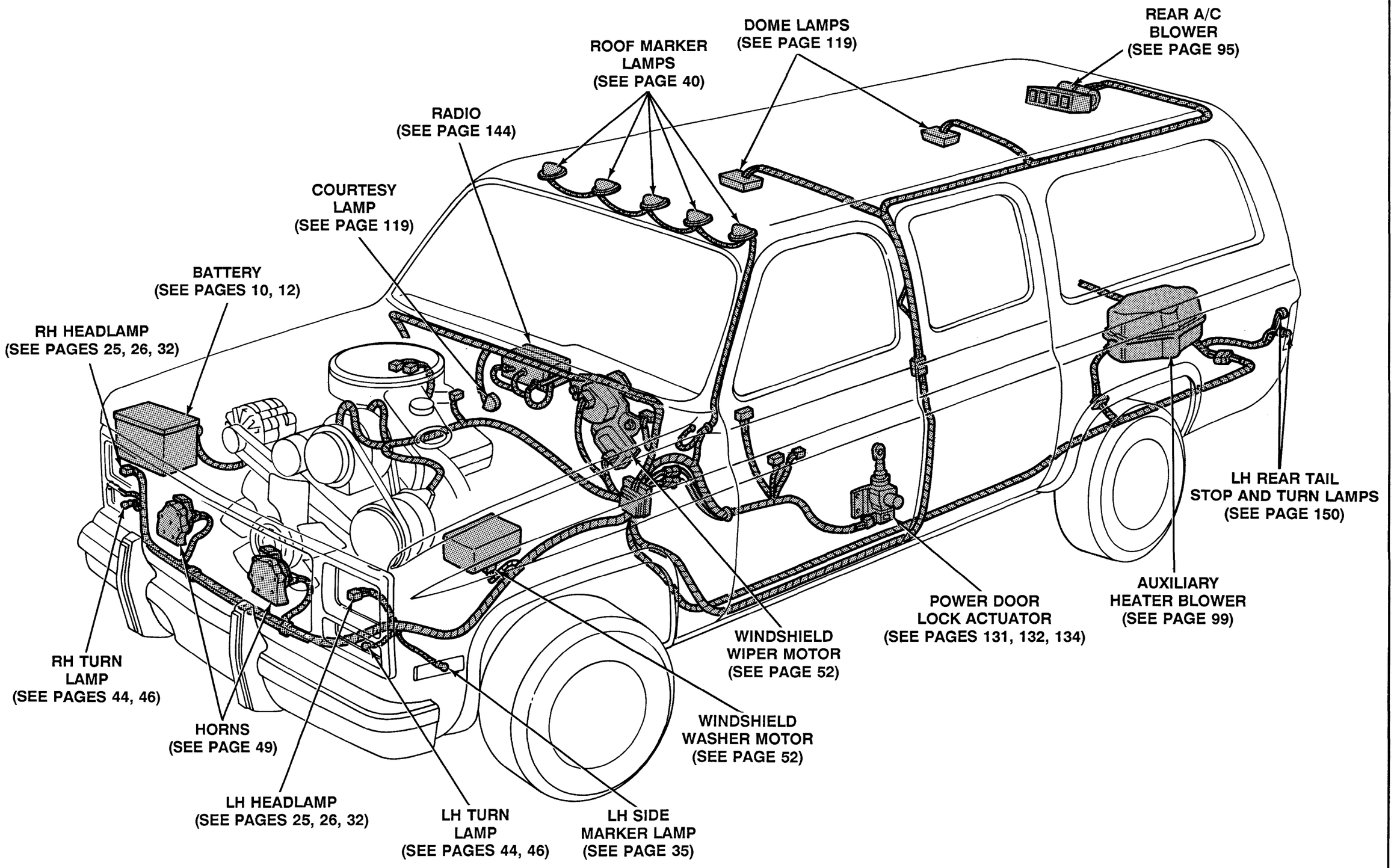
YEL -- Yellow

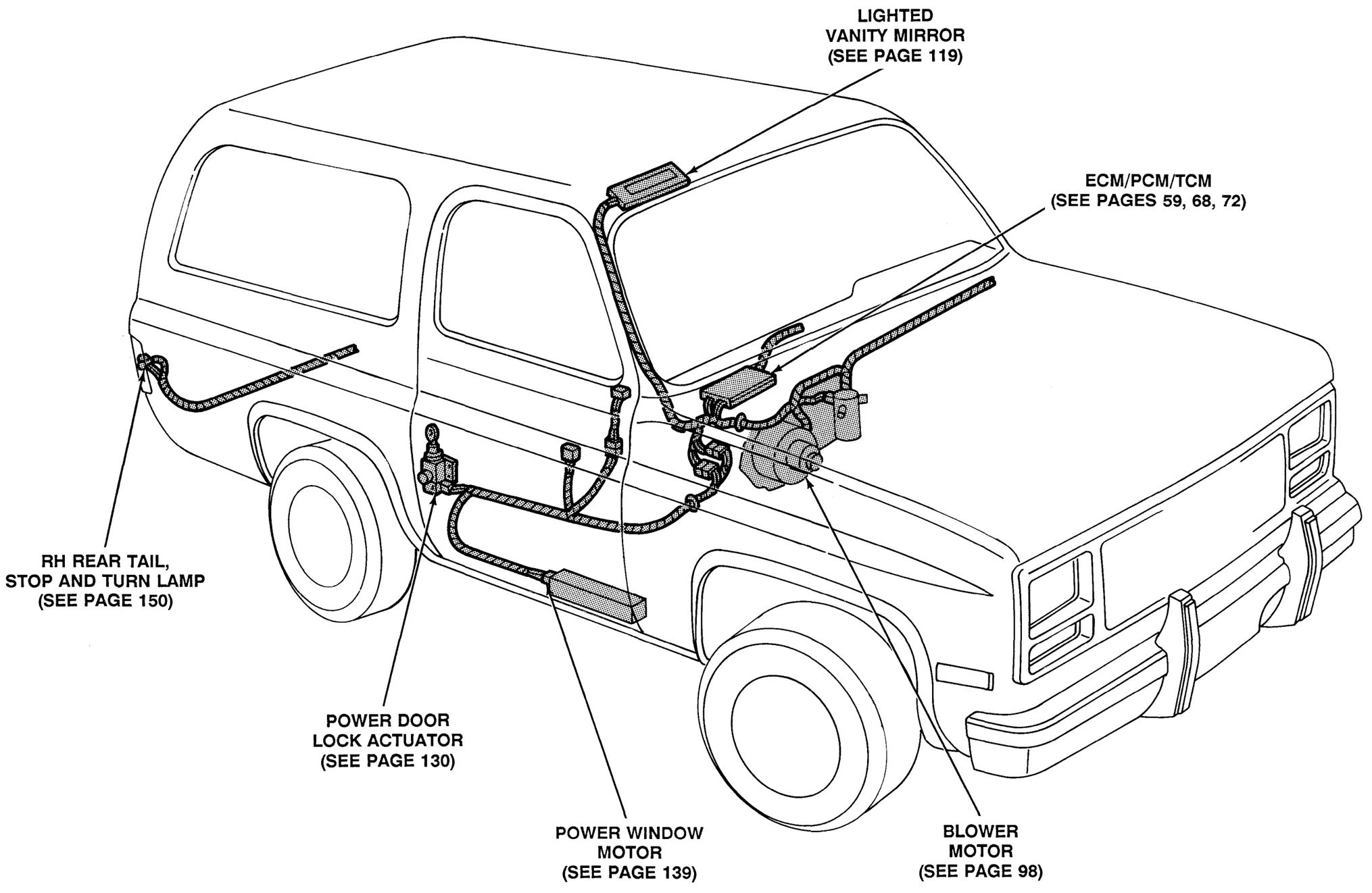
SECTION A

R/V MODELS

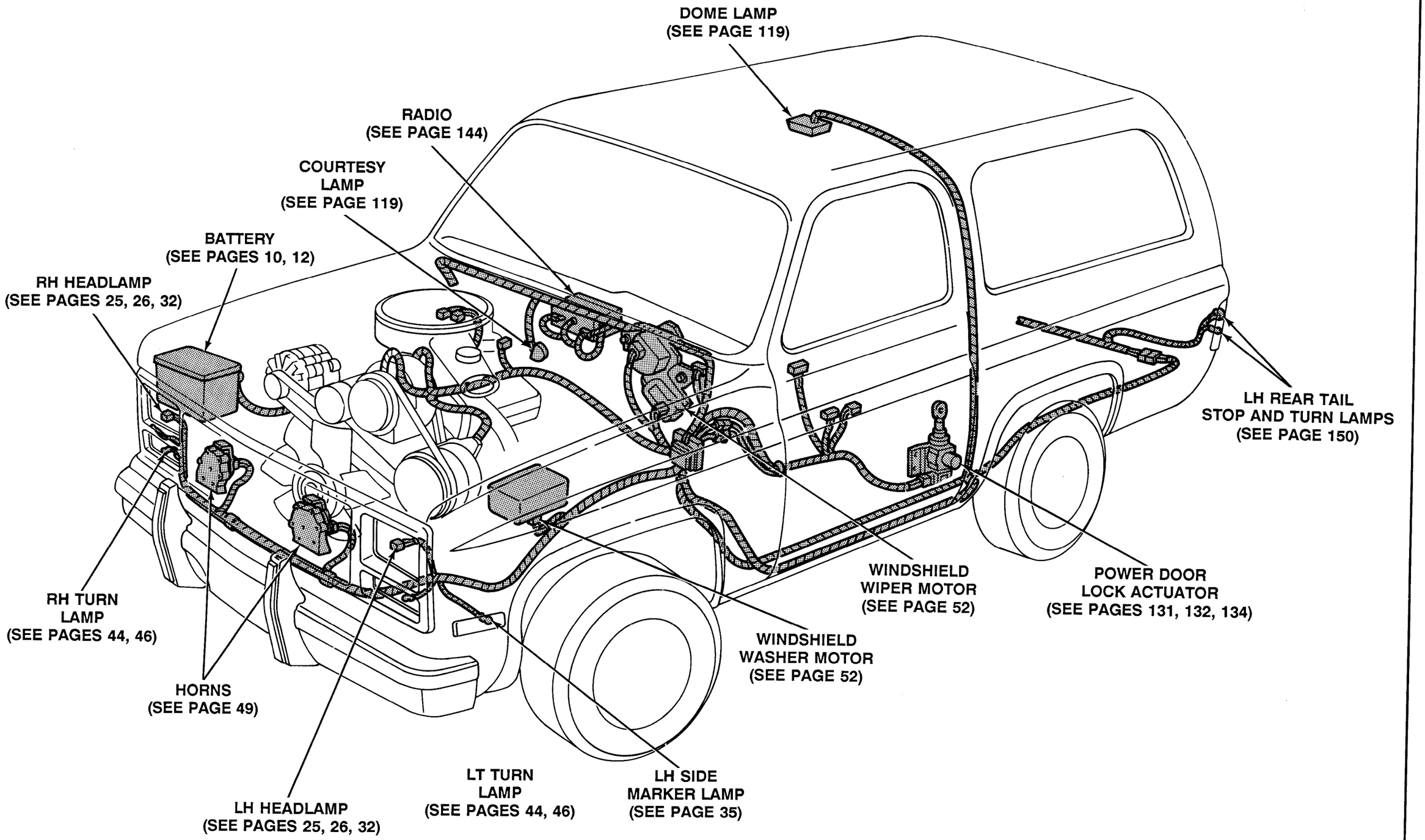


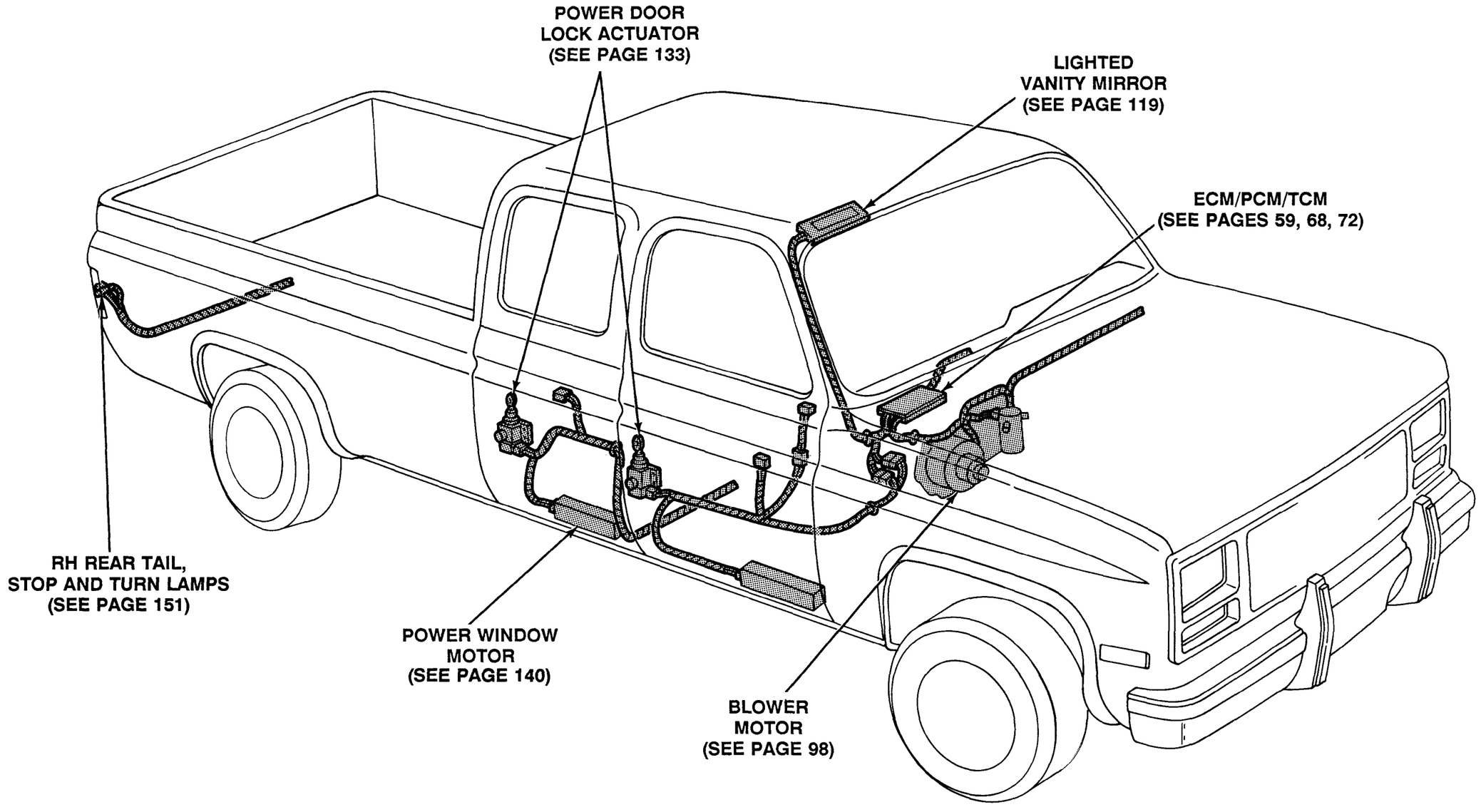
A-2 PHANTOM VIEW


ROOF MARKER LAMPS (SEE PAGE 40)
DOME LAMPS (SEE PAGE 119)
REAR A/C BLOWER (SEE PAGE 95)
RADIO (SEE PAGE 144)
COURTESY LAMP (SEE PAGE 119)
BATTERY (SEE PAGES 10, 12)
RH HEADLAMP (SEE PAGES 25, 26, 32)
LH REAR TAIL STOP AND TURN LAMPS (SEE PAGE 150)
AUXILIARY HEATER BLOWER (SEE PAGE 99)
POWER DOOR LOCK ACTUATOR (SEE PAGES 131, 132, 134)
WINDSHIELD WIPER MOTOR (SEE PAGE 52)
WINDSHIELD WASHER MOTOR (SEE PAGE 52)
RH TURN LAMP (SEE PAGES 44, 46)
HORNS (SEE PAGE 49)
LH HEADLAMP (SEE PAGES 25, 26, 32)
LH TURN LAMP (SEE PAGES 44, 46)
LH SIDE MARKER LAMP (SEE PAGE 35)

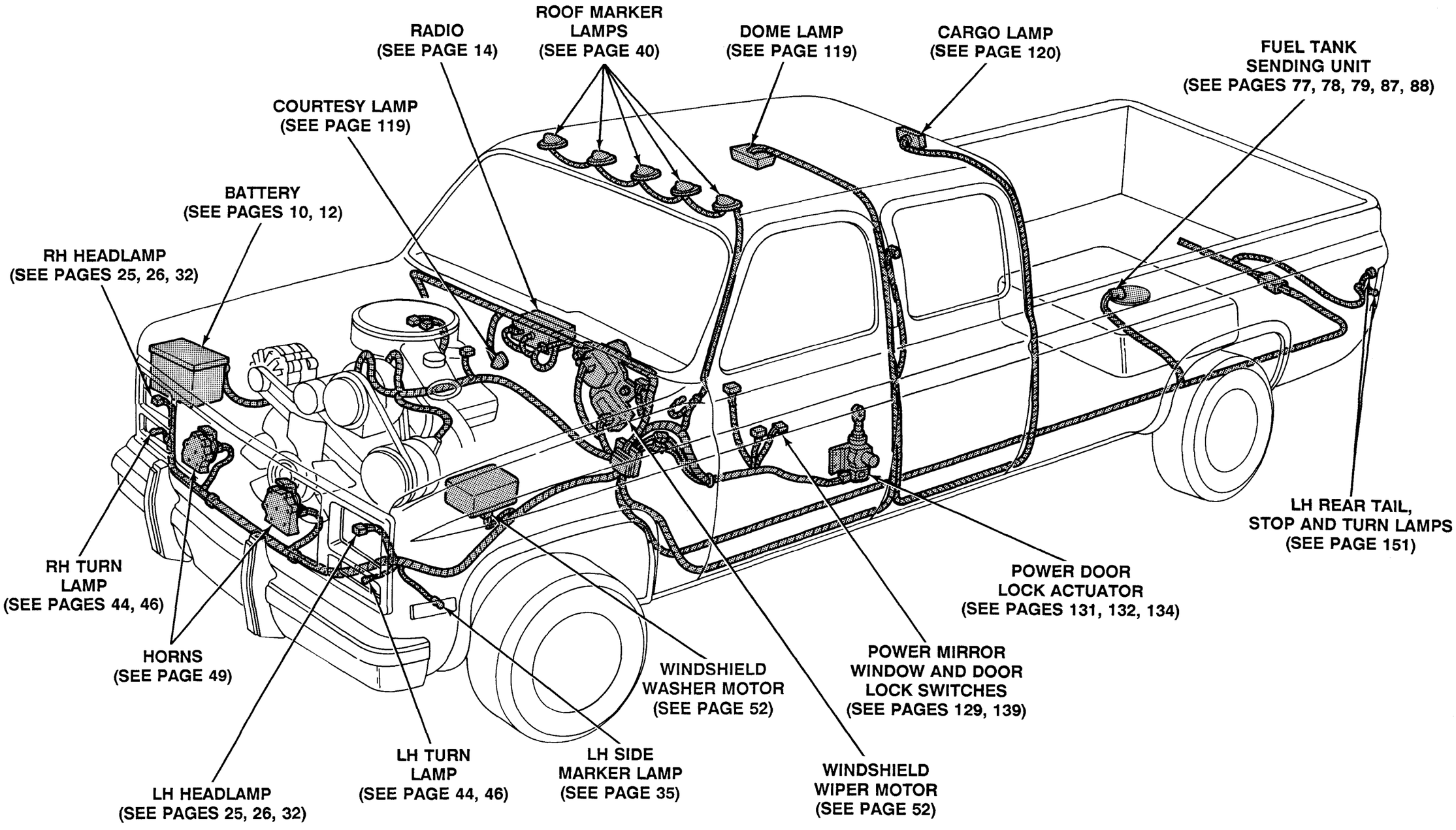


A-4 PHANTOM VIEW


DOME LAMP
(SEE PAGE 119)
RADIO
(SEE PAGE 144)
COURTESY
LAMP
(SEE PAGE 119)
BATTERY
(SEE PAGES 10, 12)
RH HEADLAMP
(SEE PAGES 25, 26, 32)
LH REAR TAIL
STOP AND TURN LAMPS
(SEE PAGE 150)
WINDSHIELD
WIPER MOTOR
(SEE PAGE 52)
POWER DOOR
LOCK ACTUATOR
(SEE PAGES 131, 132, 134)
WINDSHIELD
WASHER MOTOR
(SEE PAGE 52)
RH TURN
LAMP
(SEE PAGES 44, 46)
HORNS
(SEE PAGE 49)
LT TURN
LAMP
(SEE PAGES 44, 46)
LH SIDE
MARKER LAMP
(SEE PAGE 35)
LH HEADLAMP
(SEE PAGES 25, 26, 32)



A-6 PHANTOM VIEW



PHANTOM VIEW A-7

SYMPTOMS INDEX

SYMPTOM — **PAGE**

AIR CONDITIONING
- A/C compressor does not engage ... A-91
- Blower motor does not operate in any mode ... A-92
- Blower motor does not operate in HI ... A-92
- Blower motor does not operate in MED ... A-92
- Blower motor does not operate in LO ... A-92

AIR CONDITIONING, REAR
- Blower motor does not operate at all ... A-93
- Blower motor does not operate in HI but only in LO ... A-93
- Blower motor does not operate in LO but only in HI ... A-93

AUDIO ALARMS
- Key-in warning alarm does not operate ... A-111
- The safety belt warning buzzer does not operate ... A-111
- The safety belt warning buzzer operates when safety belt is buckled ... A-111
- Lamps-on warning alarm does not operate ... A-111

AUXILIARY COOLING FAN
- Cooling fan does not run ... A-89
- Cooling fan runs continuously ... A-89

BRAKE SYSTEMS
- Brake indicator remains on with ignition switch in run and park brake off ... A-114
- Brake indicator does not light during a warning condition or during the antilock system check ... A-114

CRUISE CONTROL
- Cruise control does not disengage when clutch or brake pedal is depressed ... A-122
- Cruise control does not operate ... A-122

DIESEL ENGINE FUEL CONTROL
- Fuel heater does not operate ... A-86
- Service fuel filter indicator lights with no water in fuel ... A-86
- Service fuel filter indicator does not light briefly with ignition switch turned to run ... A-86

TURN SIGNAL LAMPS
- Turn signals do not work on one side ... A-42
- Turn signals do not operate ... A-43
- Turn signal lamps flash rapidly ... A-43

FRONT PARK, MARKER, ROOF AND HAZARD LAMPS
- Front park and side marker lamps do not operate ... A-33
- Roof marker lamps do not operate ... A-33
- Hazard warning lamps do ont operate ... A-33

FOUR-WHEEL DRIVE INDICATOR LAMPS
- Four-wheel drive indicator lamp will not turn off ... A-125
- Four-wheel drive engages but 4WD indicator lamp does not light (V100, V200) ... A-125
- Four-wheel drive engages but 4WD indicator lamp does not light (V300) ... A-125

HEADLAMPS
- Headlamps do not illuminate high or low beams -- both sides ... A-23
- Low beam lamp(s) do not operate ... A-23
- High beam lamps(s) do not operate ... A-24
- Daytime running lamps do not operate (Canada only) ... A-24
- Daytime running lamps stay on (Canada only) ... A-24

HEATER, FRONT
- Blower motor does not operate at all ... A-96
- Blower motor does not operate in HI but only in LO and/or MED ... A-96
- Blower motor does not operate in LO and/or MED but only in HI ... A-96

HEATER, AUXILIARY
- Auxiliary heater blower motor does not operate at all ... A-96
- Auxiliary heater blower motor does not operate in LO ... A-96

HORNS
- Horn(s) will not operate ... A-48
- Horn sounds continuously without depressing horn switch ... A-48
- Cigarette lighter does not operate ... A-48

INSTRUMENT PANEL: GAGES AND INDICATORS
- Fuel gage indicates full or beyond at all times ... A-100
- Fuel gage indicates empty when there is fuel in the tank ... A-100
- Fuel gage is inaccurate ... A-100
- Temperature gage indicates hot with engine coolant below operating temperature and ignition switch in RUN ... A-101
- Temperature gage indicates cold all the time ... A-101
- Temperature gage is not accurate ... A-101
- Oil pressure gage indicates low pressure when oil pressure is good ... A-101
- Oil pressure gage indicates high pressure at all times ... A-101
- Oil pressure gage is not accurate ... A-101
- Voltmeter is not accurate ... A-101
- Speedometer is inoperative or inaccurate ... A-102
- Low coolant indicator does not light with coolant level low (diesel only) ... A-102
- Low coolant indicator is lit when coolant level is good ... A-102

COURTESY LAMPS,CARGO LAMPS AND UNDERHOOD LAMP
- Courtesy lamps do not operate ... A-118
- Dome lamp does not work or stays on all the time ... A-118
- Cargo lamp does not work ... A-118
- I/P compartment box lamp does not work ... A-118
- UnderhOod lamp does not work ... A-118

POWER DOOR LOCKS (WITH SWING OUT SIDE DOOR)
- *None of the door lock motors lock or unlock* ... A-128
- One door lock motor does not lock or unlock from a particular switch ... A-128
- One door lock motor does not operate from any switch ... A-128
- No door lock motors lock or unlock from any switches ... A-128

POWER WINDOWS
- Power windows does not operate or only go in one direction ... A-136
- Power windows only operate from driver's side window switch ... A-137
- Power windows do not operate from driver's side window switch ... A-137
- Tailgate window does not operate from tailgate window switch ... A-137
- Tailgate window does not operate from key operated tailgate window switch ... A-138

GLOW PLUGS
Wait indicator does not flash or flashes for the incorrect amount of time when engine is below normal operating temperature ... A-82
Wait indicator stays on or flashes when engine is at normal operating temperature and ignition switch in run position (6.2L diesel engine) ... A-83

HEADLAMPS
Headlamps do not illuminate high or low beams -- both sides ... A-23
Low beam lamp(s) do not operate ... A-23
High beam lamps(s) do not operate ... A-24
Daytime running lamps do not operate (Canada only) ... A-24
Daytime running lamps stay on (Canada only) ... A-24

HEATER, FRONT
Blower motor does not operate at all ... A-96
Blower motor does not operate in HI but only in LO and/or MED ... A-96
Blower motor does not operate in LO and/or MED but only in HI ... A-96

HEATER, AUXILIARY
Auxiliary heater blower motor does not operate at all ... A-96
Auxiliary heater blower motor does not operate in LO ... A-96

HORNS
Horn(s) will not operate ... A-48
Horn sounds continuously without depressing horn switch ... A-48
Cigarette lighter does not operate ... A-48

INSTRUMENT PANEL: GAGES AND INDICATORS
Fuel gage indicates full or beyond at all times ... A-100
Fuel gage indicates empty when there is fuel in the tank ... A-100
Fuel gage is inaccurate ... A-100
Temperature gage indicates hot with engine coolant below operating temperature and ignition switch in RUN ... A-101
Temperature gage indicates cold all the time ... A-101
Temperature gage is not accurate ... A-101
Oil pressure gage indicates low pressure when oil pressure is good ... A-101
Oil pressure gage indicates high pressure at all times ... A-101
Oil pressure gage is not accurate ... A-101
Voltmeter is not accurate ... A-101
Speedometer is inoperative or inaccurate ... A-102
Low coolant indicator does not light with coolant level low (diesel only) ... A-102
Low coolant indicator is lit when coolant level is good ... A-102

COURTESY LAMPS,CARGO LAMPS AND UNDERHOOD LAMP
Courtesy lamps do not operate ... A-118
Dome lamp does not work or stays on all the time ... A-118
Cargo lamp does not work ... A-118
I/P compartment box lamp does not work ... A-118
UnderhOod lamp does not work ... A-118

POWER DOOR LOCKS (WITH SWING OUT SIDE DOOR)
None of the door lock motors lock or unlock ... A-128
One door lock motor does not lock or unlock from a particular switch ... A-128
One door lock motor does not operate from any switch ... A-128
No door lock motors lock or unlock from any switches ... A-128

POWER WINDOWS
Power windows do not operate or only go in one direction ... A-136
Power windows only operate from driver's side window switch ... A-137
Power windows do not operate from driver's side window switch ... A-137
Tailgate window does not operate from tailgate window switch ... A-137
Tailgate window does not operate from key operated tailgate window switch ... A-138

POWER MIRRORS
Neither mirror is operational ... A-127
LH mirror will not adjust UP and DOWN ... A-127
LH mirror will not adjust LEFT and RIGHT ... A-127
RH mirror will not adjust UP and DOWN ... A-128
RH mirror will not adjust LEFT and RIGHT ... A-128

SYMPTOM **PAGE**

AM RADIO
Radio does not appear to work (no display lights, no sound) ... A-143
Clock does not operate ... A-143
Panel lamp does not come on ... A-143
Display dimming function will not operate ... A-143
No sound or distorted sound from a speaker ... A-143

REAR DEFOGGER
Rear window defogger does not work and on indicator does not light ... A-146
On indicator works but rear window defogger does not defrost ... A-146
Rear defogger panel lamp does not work ... A-146

REAR EXTERIOR LAMPS
Backup lamps do not operate ... A-149
Rear park, marker and license lamps do not operate ... A-149

START AND CHARGE
Engine does not crank and starter solenoid does not click ... A-53
Starter solenoid clicks, engine does not crank or cranks slowly ... A-54
Battery is undercharged or overcharged ... A-54

VACUUM SYSTEMS
Little or no heat from auxiliary heater ... A-161
Improper air distribution from outlets ... A-161
Cruise control does not operate ... A-161

WINDSHIELD WIPERS AND WASHERS (PULSE)
Wipers do not operate in any mode ... A-50
Wipers do not operate in HI ... A-50
Wipers do not operate in LO or delay ... A-50
Washer motor does not operate ... A-51
Washer motor does not shut off ... A-51

RPO CODES

C60 - AIR CONDITIONING
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
K68 - GENERATOR-105 AMP
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE
M20 - MAN TRANS, 4-SPD
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE
TP2 - AUXILIARY BATTERY
UY1 - WIRING HARNESS, CAMPER
UY7 - TRUCK TRAILER WIRING HARNESS, HD

2-8.0 BLK/RED
1-32.0 BLK
2-8.0 BLK
150-8.0 BLK
BATTERY
AUXILIARY BATTERY
LTP2
2-3.0 RST (FUSIBLE LINK)
2-1.0 RST (FUSIBLE LINK)
IGNITION COIL
(SEE PAGE 76)
AUXILIARY COOLING FAN RELAY (L19 AND C60)
(SEE PAGE 90)
2-1.0 RST (FUSIBLE LINK)
2-5.0 RED
BATTERY JUNCTION BLOCK
S105
AUXILIARY BATTERY JUNCTION BLOCK (TP2)
S118
2-8.0 RED
2-8.0 BLK/RED
3-3.0 PNK
39-.8 PNK/BLK
S102
6-3.0 PPL
C100
12020183
ENGINE
2 440 420
39 806 439
120 140
3 31
436 50
2 35
422 97 93
6 92 91
H G F E D C B A
2 3
6-3.0 PPL
422
1223
1222
1228
1229
1227
455
1224
1225
1226
439
S101
2-3.0 RED
39-.8 PNK/BLK
2-1.0 RST (FUSIBLE LINK)
TRANSMISSION CONNECTOR
C172
12084690
IN-LINE FUSE 30 AMP
S103
2-5.0 RED
2-5.0 RED
A/C
(SEE PAGE 94)
CAMPER AND TRAILER WIRING (SEE PAGE 160)
2-3.0 RST (FUSIBLE LINK)
2-8.0 RED
S104
2-8.0 RED
AUXILIARY BATTERY RELAY (TP2)
1-32.0 BLK
6-3.0 PPL
GENERATOR
C106
12045896
P L T S
P L S 39
STARTER MOTOR
SHEET METAL GROUND G111
ENGINE GROUND G112
SHEET METAL GROUND G109

A-10 POWER DISTRIBUTION
GASOLINE ENGINE

RPO CODES

C60 - FRONT MANUAL AIR CONDITIONING
L05 - 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 - 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
MD8 - AUTOMATIC 4-SPEED TRANSMISSION
M20 - MANUAL 4-SPEED TRANSMISSION
MT1 - AUTOMATIC 3-SPEED TRANSMISSION
TP2 - AUXILIARY CAMPER BATTERY
UY1 - CAMPER WIRING HARNESS
UY7 - HEAVY DUTY TRUCK TRAILER WIRING HARNESS

COWL

C100
12020184

S208

2-3.0 RED
2-3.0 RED
2-3.0 RED
6-3.0 PPL
2-3.0 RED
3-3.0 PNK
2-3.0 RED
2-3.0 RED
2-3.0 RED

COURTESY AND DOME LAMPS (SEE PAGE 119) — 40-.8 ORN
EXTERIOR LAMPS (SEE PAGE 149) — 9-.8 BRN
HEADLAMP DIMMER SWITCH (SEE PAGE 25) — 10-1.0 YEL

C202
12004628

2-3.0 RED
6-3.0 PPL
2-3.0 RED
2-3.0 RED
3-3.0 PNK

S206
S207

AUX HTR A/C 25 AMP
2-3.0 RED
2-3.0 RED

PWR ACC 30 AMP
INSTR LPS 5 AMP
HTR A/C 25 AMP
STOP-HZ 15 AMP
RADIO 15 AMP
WIPER 25 AMP
IGN 20 AMP
HORN/DM 20 AMP
T/L CTSY 20 AMP
ECM B 10 AMP
GAGE/IDLE 20 AMP
TURN/BU 15 AMP
PWR WDO 30 AMP
DRL 15 AMP
CRANK 3 AMP
ECM 1 10 AMP
REAR

44-1.0 DK GRN
40-.8 ORN
300-3.0 ORN
4-3.0 BRN
3-3.0 PNK
300-3.0 ORN
4-3.0 BRN

LIGHT SWITCH

150
2
CIRCUIT BREAKER 25 AMP
40
44
DOME
156
OFF
PARK
HEAD
10
9

40-.8 ORN
156-.8 WHT
6-3.0 PPL
2-3.0 RED
6-3.0 PPL (AUTO TRANS ONLY)

CLUTCH START SWITCH (MAN TRANS ONLY) (SEE PAGE 56)

C237
8917948

(M20 ONLY)

5-3.0 YEL
6-3.0 PPL

300-3.0 ORN
COURTESY AND DOME LAMPS (SEE PAGE 119)

C210
06294641

300-3.0 ORN
2-3.0 RED

C209
12020966

2-3.0 RED
5-3.0 PPL
6-3.0 PPL

3-3.0 PNK
4-3.0 BRN

IGNITION SWITCH

3
4
33
2
36
6/5
300
START
RUN
OFF
LOCK
ACC

FUSE BLOCK
12103404

REAR HTR F
REAR A/C F
C C A W B D E BAT
C C A W B D E WDO
C C A A B D E IGN ACC LPS PWR
SHUNT SHUNT 5A 30 A
INSTR LPS PWR ACC
20A 20A 25A 15A
HORN/DM IGN AUX HTR A/C STOP HAZ
20A 20A 25A 15A
T/L CTSY GAGE/IDLE HTR A/C RADIO
10A 15A 30 A 25A
ECM B TURN B/U PWR WDO WIPER
10A 15A
ECM 1 DRL
3A
CRANK
FRONT

RPO CODES
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
M20 - MAN TRANS, 4-SPD
MT1 - AUTO TRANS, HD, 4-SPD. WITH OVERDRIVE
UY7 - TRUCK TRAILER WIRING HARNESS, HD

2-.8 BLK/RED
1-32.0 BLK
1-32.0 BLK
2-3.0 BLK
1-32.0 BLK
RH BATTERY
LH BATTERY
1-32.0 BLK
2-.8 BLK/RED
906-.5 GRA (FUSIBLE LINK)
2-2.0 GRA (FUSIBLE LINK)
6-3.0 PPL
STARTER MOTOR
S103
2-1.0 RST (FUSIBLE LINK)
S100
2-5.0 RED
BATTERY JUNCTION BLOCK
S108
906-1.0 PPL
2-1.0 RST (FUSIBLE LINK)
S106
2-3.0 RED
2-8.0 BLK/RED
S107
2-5.0 RED
A/C
(SEE PAGE 94)
2-5.0 DK BLU/WHT
TRAILER WIRING
(SEE PAGE 160)
IN-LINE FUSE 30 AMP
LEFT BANK GLOW PLUGS GROUND G113
RIGHT BANK GLOW PLUGS GROUND G114
SHEET METAL GROUND G111
C119
GLOW PLUG CONTROLLER
A
B
C
D
E
906
503
150
3/531
C168
12015982
906-1.0 PPL
2-3.0 BLK (FUSIBLE LINK)
2-3.0 RED
6-3.0 PPL
GENERATOR
P
L
I
S
C106
12045896
25
39
39-.8 PNK/BLK
25-1.0 BRN
2-3.0 RED
S109
COLD ADVANCE TIMER RELAY (LH6 ONLY) (SEE PAGE 64)
COLD ADVANCE FAST IDLE TEMPERATURE SWITCH (SEE PAGE 87)
39-.8 PNK/BLK
FUEL HEATER (SEE PAGE 87)
39-.8 PNK/BLK
WATER IN FUEL SENSOR (SEE PAGE 87)
39-.8 PNK/BLK
EGR DUMP (LH6 ONLY) (SEE PAGE 64)
EPR SOLENOID (LH6 ONLY) (SEE PAGE 64)
EGR SOLENOID PULSE WITH MODULATION (LH6 ONLY) (SEE PAGE 64)
FUEL SHUTOFF SOLENOID (SEE PAGES 87, 88)
LH6 ONLY)
3-3.0 PNK
ENGINE
2
503
31
39
H
G
F
508
30/420
420/520
3
D
C
2
35
25/130
150
97
93
B
6
92
91
A
1
2
3
C100
12020183
3-3.0 PNK (LL4 ONLY)
S121 (LH6 ONLY)
S130 (LL4 ONLY)
531-.8 LT GRN/BLK
COLD ADVANCE TIMER RELAY (LH6 ONLY) (SEE PAGE)
531-.8 LT GRN/BLK (LH6 ONLY)
3-3.0 PNK (LL4 ONLY)
531-.8 LT GRN/BLK
COLD ADVANCE CONTROL (LH6 ONLY) (SEE PAGE 64)
3-3.0 PNK
FUEL SOLENOID (LL4 ONLY) (SEE PAGES 87, 88)

A-12 POWER DISTRIBUTION

DIESEL ENGINES

RPO CODES
LH6 - 6.2L (378 CU. IN.) V8 DIESEL ENGINE
LL4 - 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
M20 - MANUAL 4-SPEED TRANSMISSION
MT1 - AUTOMATIC 3-SPEED TRANSMISSION

LIGHT SWITCH

CIRCUIT BREAKER 25 AMP

I/P CLUSTER CONNECTOR (SEE PAGE 103)

C202 12004628

HEADLAMP DIMMER SWITCH (SEE PAGE 25)

EXTERIOR LAMPS (SEE PAGE 149)

COURTESY AND DOME LAMPS (SEE PAGE 119)

C209 6294641

C210 12010966

C237 8917548

CLUTCH START SWITCH (MAN TRANS ONLY)

BRAKE WARNING SYSTEM (SEE PAGE 115)

COWL

I/P

12020184 C100

FUSE BLOCK 12103404

FRONT

REAR

IGNITION SWITCH

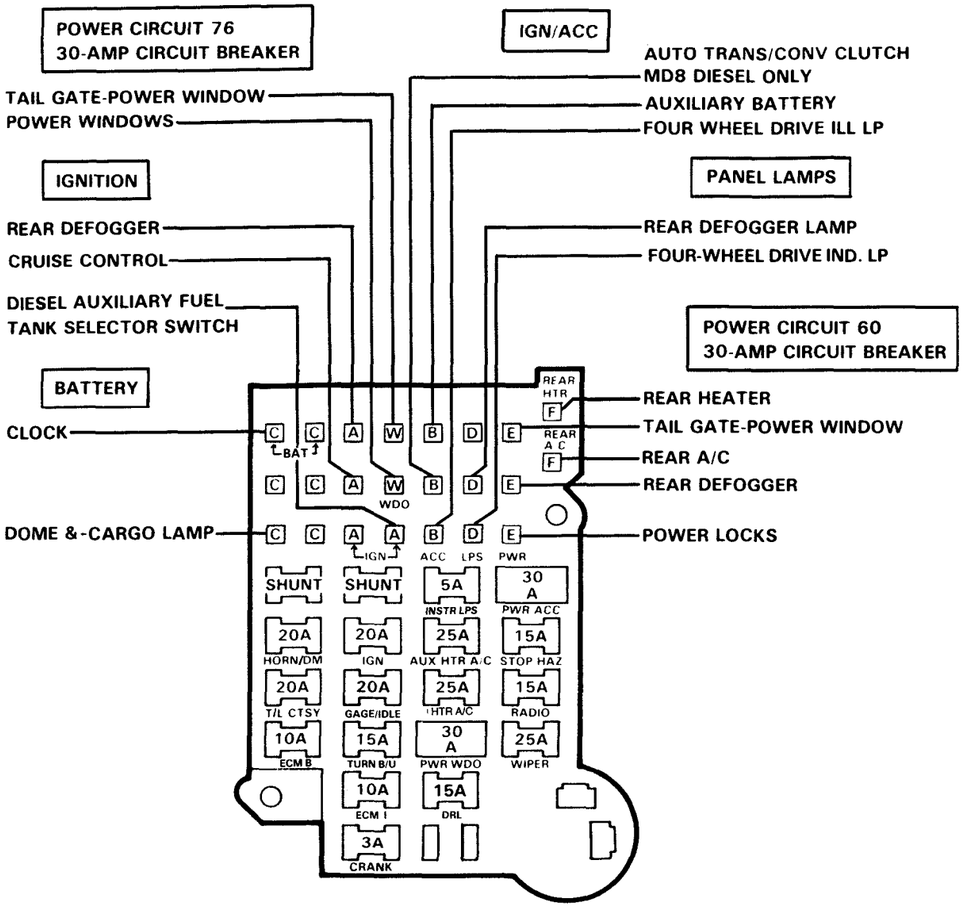
START
RUN
OFF
LOCK
ACC

RPO CODES

LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE

NOTE: LL4 ENGINES DO NOT USE THE CRANK, ECM I OR ECM B FUSES. LH6 ENGINES DO NOT USE THE CRANK FUSE.

NOTE: DRL ARE ONLY ON VEHICLES FOR SALE IN CANADA WITH T61.

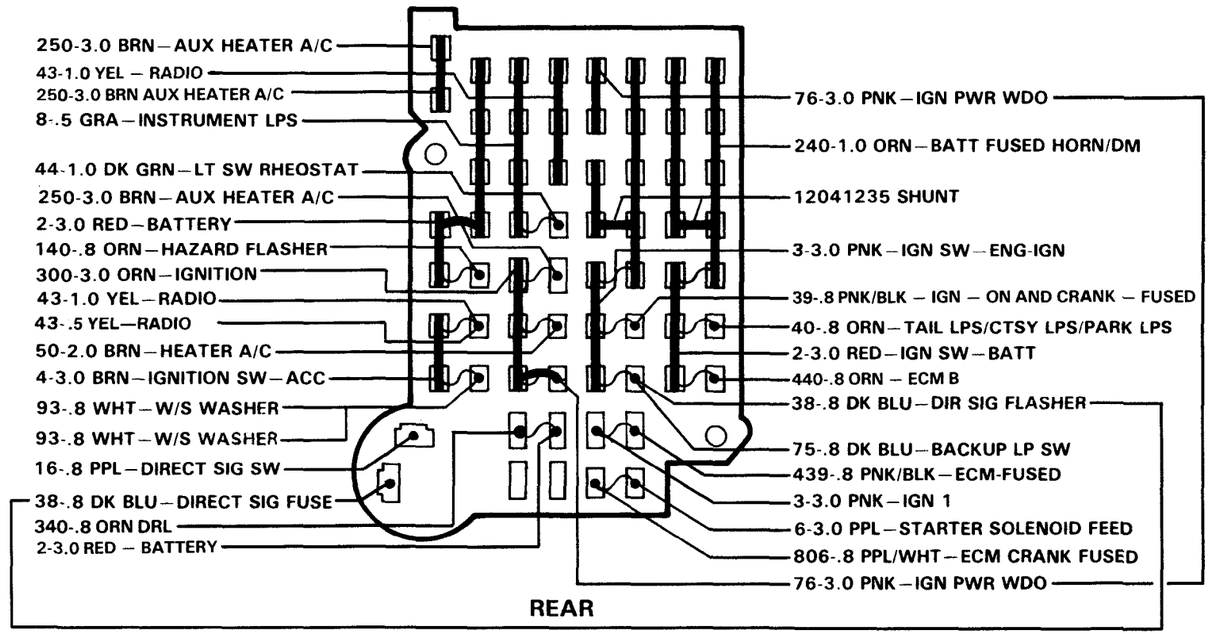


FRONT

12034359 BLOCK-MOLD
12059452 PRINTED BLOCK

CAUTION: Determine if non-cycling circuit breakers are hot before removing them. Hot non-cycling circuit breakers can cause personal injury.

	COLOR	MALE CONN
A	NAT	12004888
B	BRN	12004887
C	BLK	12004886
D	GRN	12004885
E	RED	12004883
W	BLU	12004884
F	DK GRA	12004740



REAR

A-14 FUSE BLOCK

FUSE AND CIRCUIT BREAKER IDENTIFICATION

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
AUX HTR A/C	12004010	WHITE 25 AMP	HOT IN RUN	AUXILIARY HEATER AND AIR CONDITIONING
CRANK	12004003	VIOLET 3 AMP	HOT IN START	ECM CRANK CIRCUIT
DRL	12004008	LT BLU 15 AMP	HOT AT ALL TIMES	DRL
ECM 1	12004007	RED 10 AMP	HOT IN RUN OR START	ECM 1
ECM B	12004007	RED 10 AMP	HOT AT ALL TIMES	ECM
GAGE/IDLE	12004009	YELLOW 20 AMP	HOT IN RUN OR START	IGNITION CRANK
HORN/DM	12004009	YEL 20 AMP	HOT AT ALL TIMES	HORN DOME AND CARGO LAMPS CLOCK
HTR A/C	12004010	WHITE 20 AMP	HOT IN RUN	HEATER AND AIR CONDITIONING
IGN	12004009	YELLOW 20 AMP	HOT IN RUN OR START	REAR DEFOGGER CRUISE CONTROL DIESEL AUXILIARY FUEL TANK SELECTOR SWITCH
INST LPS	12004005	TAN 5 AMP	HOT W/LIGHT SWITCH IN HEAD OR PARK	INSTRUMENT PANEL LAMPS
PWR ACC	(CIRCUIT BREAKER)	30 AMP	HOT AT ALL TIMES	TAIL GATE POWER WINDOW REAR DEFOGGER POWER LOCKS
PWR WDO	(CIRCUIT BREAKER)	30 AMP	HOT IN FUN	POWER WINDOWS
RADIO	12004008	LT BLUE 15 AMP	HOT IN ACC OR RUN	RADIO AUXILIARY BATTERY RELAY FOUR-WHEEL DRIVE INDICATOR LAMP AUTOMATIC TRANSMISSION CONVERTER CLUTCH (MD8 ONLY)
STOP HAZ	12004008	LT BLU 15 AMP	HOT AT ALL TIMES	HAZARD FLASHER
T/L CTSY	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAILLAMPS COURTESY LAMPS PARKING LAMPS
TURN/BU	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACKUP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS

LAMP BULB DATA

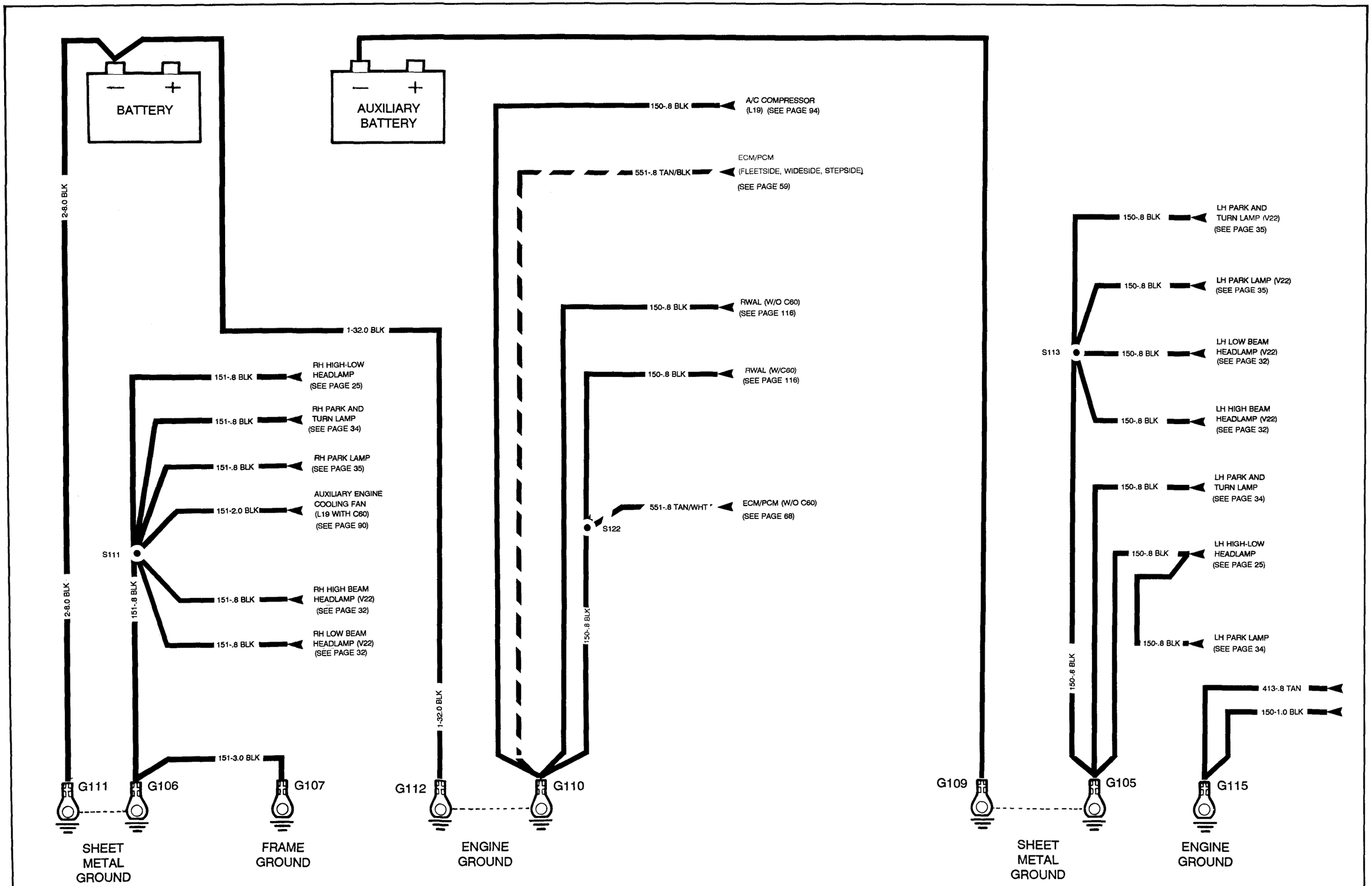
AC Type Guide Lamps are recommended when replacement becomes necessary.

Lamp Usage	Quantity	Trade No.	Power Rating at 12V, Watts
Headlamps (2) Headlamp System	2 2	6025 H6054 (Opt.)	66/65 35/65
(4) Headlamp System - Lo - HI	2 2	H4703 H4701	55 65
	2	H4651 (Opt.)	50
			Candle Power
Dome Lamps	2	211-2	12
Instrument Cluster Lamps	5	168	3
Headlamp Beam Indicator Lamp	1	168	3
Taillamp and Stoplamp[1]	2	2057	2-32
License Lamp	1	67	4
Turn Signal (Front Park Lamps)[1]	4**	3057NA	1.5-24
Turn Signal Indicator Lamp	2	168	3
Park Lamps (W/4 Headlamps)	2	194NA	1.5
Front Side Marker Lamps	2	194	2
Rear Side Marker Lamps	2	168	3
Roof Marker Lamps	5	194	2
Brake Warning Indicator	1	168	3
Backup Lamp	2	1156	32
Heater or A/C Control	1	194	2
Cargo Lamp*	1	1142	21
Fender Clearance Lamp*	4	168	3
Rear Identification*	5	Part of Lens	3
Radio Dial Lamp	1	1893	2
Four-Wheel Drive Indicator	1	161	1
Courtesy Lamp	1	1003	15
Low Coolant Lamp[2]	1	194	2
Clock	1	168	3
Safety Belt Warning	1	168	3
Glow Plugs Indicator[2]	1	194	2
Four-Wheel Drive Shift Lever	1	194	2
Water In Fuel[2]	1	194	2
"SERVICE ENGINE SOON" Lamp (W/Gasoline Engine) (W/LH6 Diesel)	1 1	194 1893	2 2
Underhood Lamp	1	19/10	9.9
Reading Lamp	2	906	6

1. Double filament bulb.
2. Diesel only.

* Not used on Suburban and Utility.

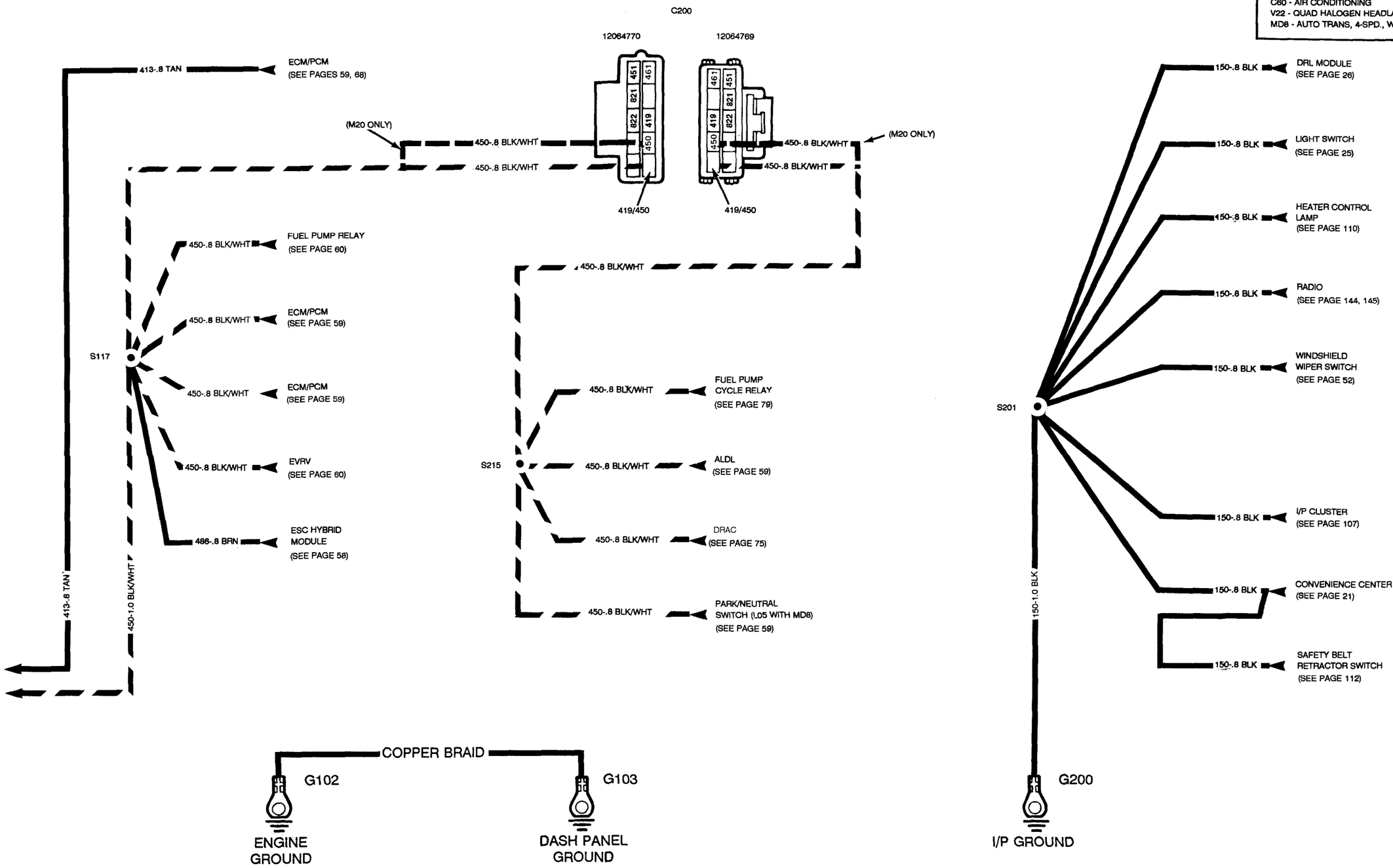
** 2 Required with 4 headlamp system.

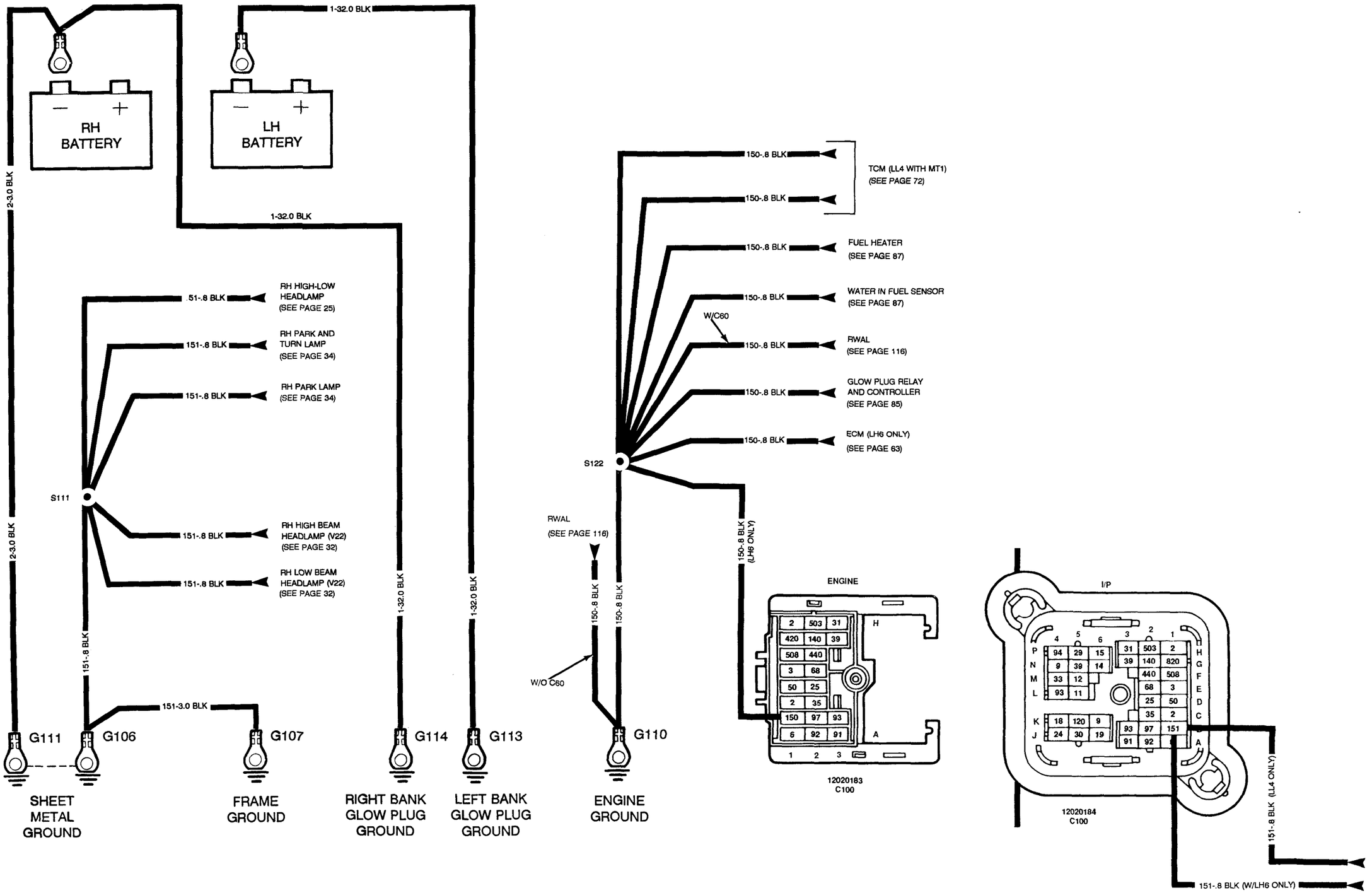


A-16 GROUND DISTRIBUTION

GASOLINE ENGINE

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N M20 - MAN TRANS, 4-SPD. C60 - AIR CONDITIONING V22 - QUAD HALOGEN HEADLAMPS MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE

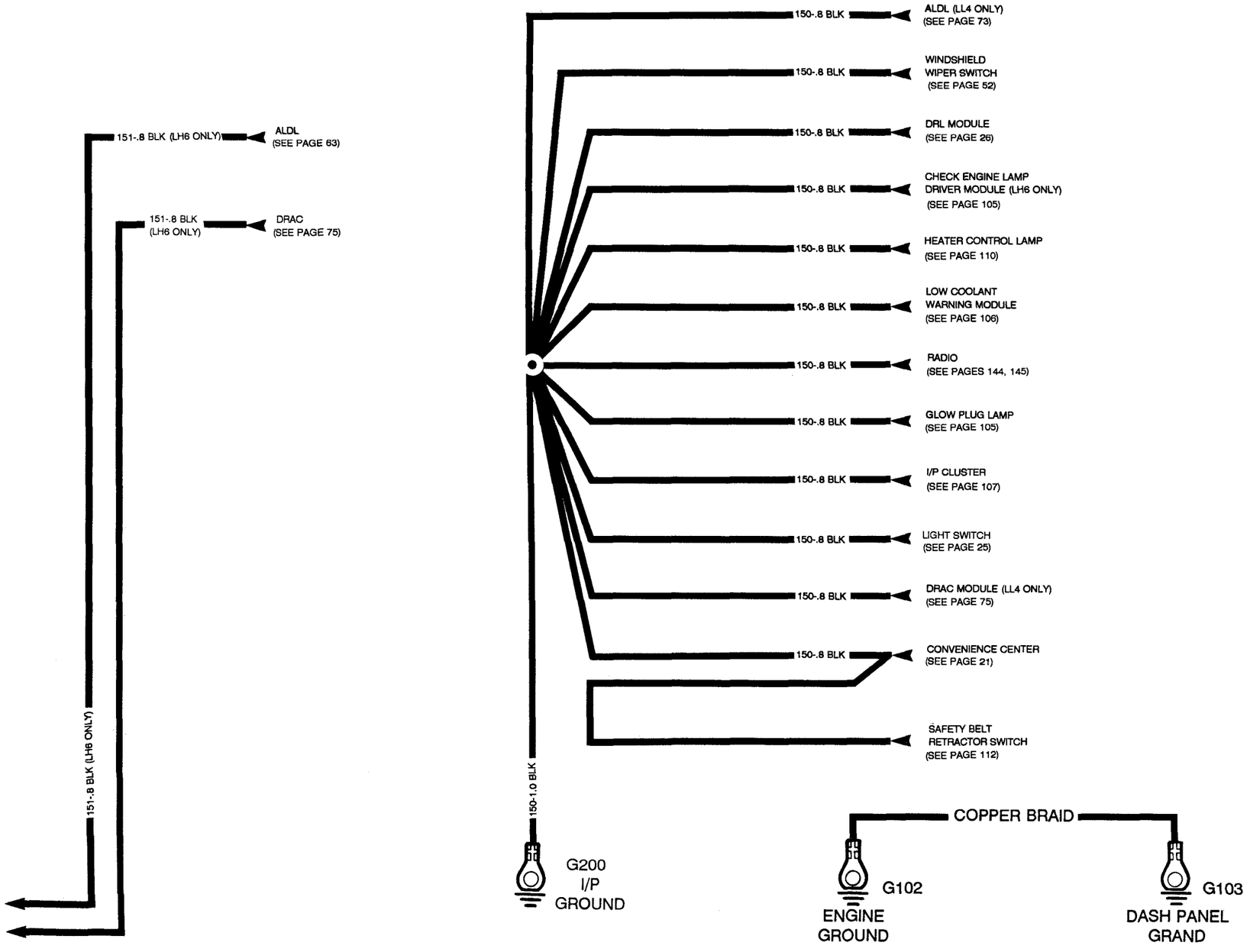




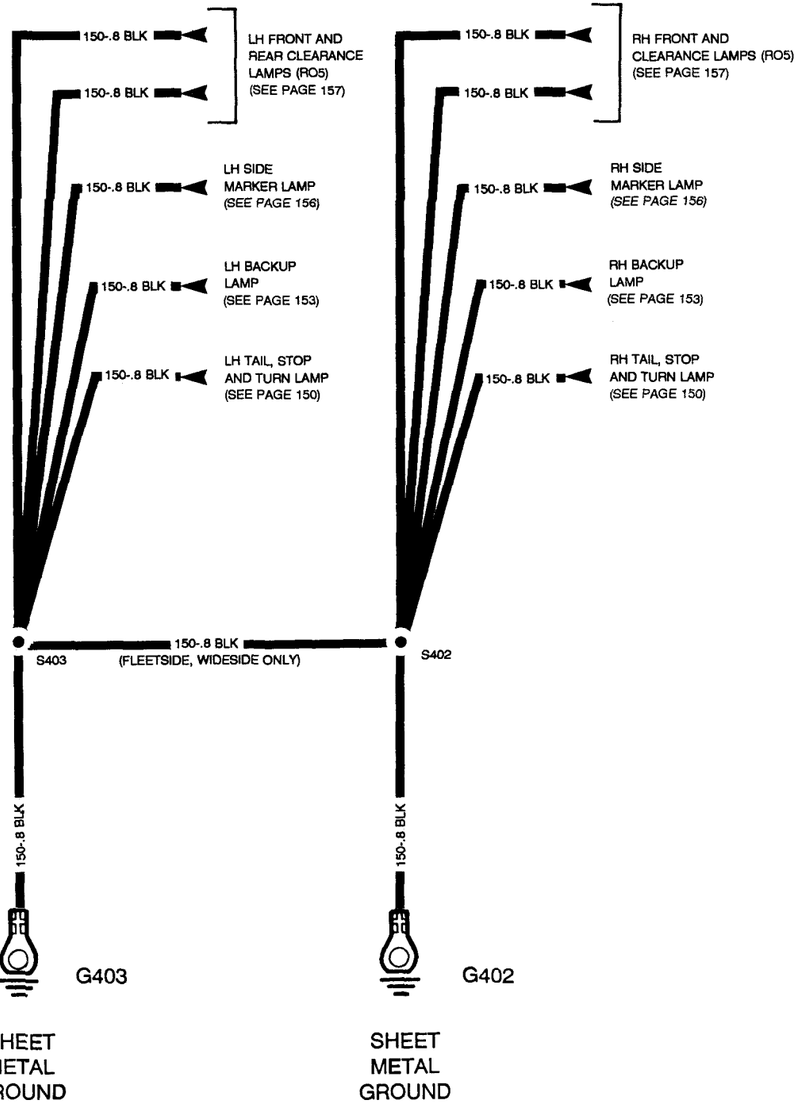
A-18 GROUND DISTRIBUTION

DIESEL ENGINES

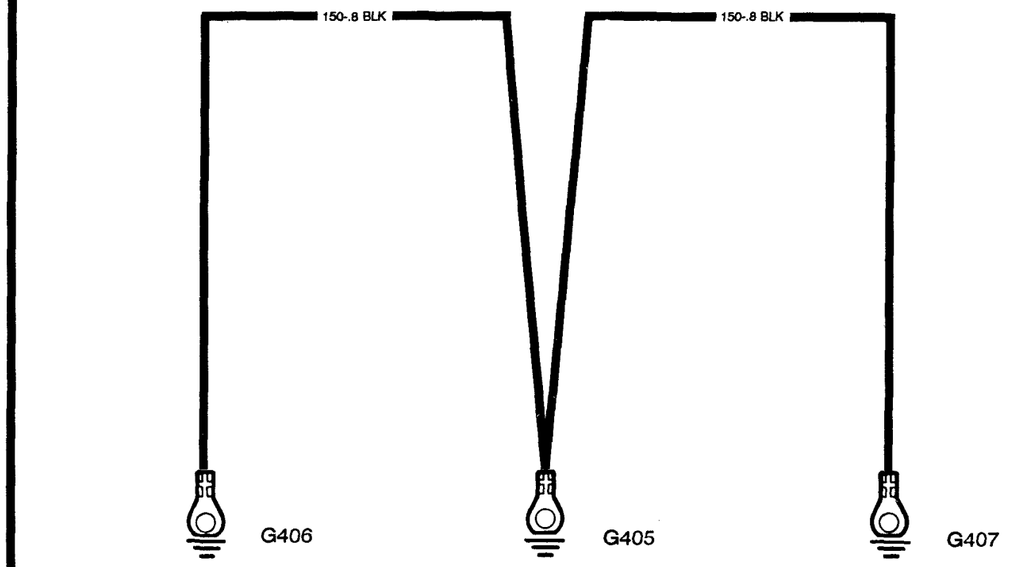
RPO CODES
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE V22 - QUAD HALOGEN HEADLAMPS



RPO CODES
RO5 - DUAL REAR WHEELS



FLEETSIDE, WIDESIDE, SUBURBAN AND UTILITY

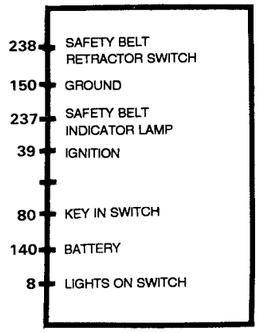


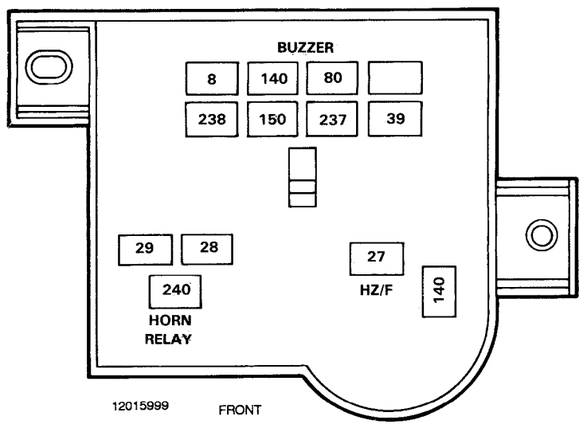
STEPSIDE

A-20 GROUND DISTRIBUTION

REAR LAMPS

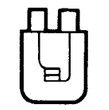
AUDIO ALARM



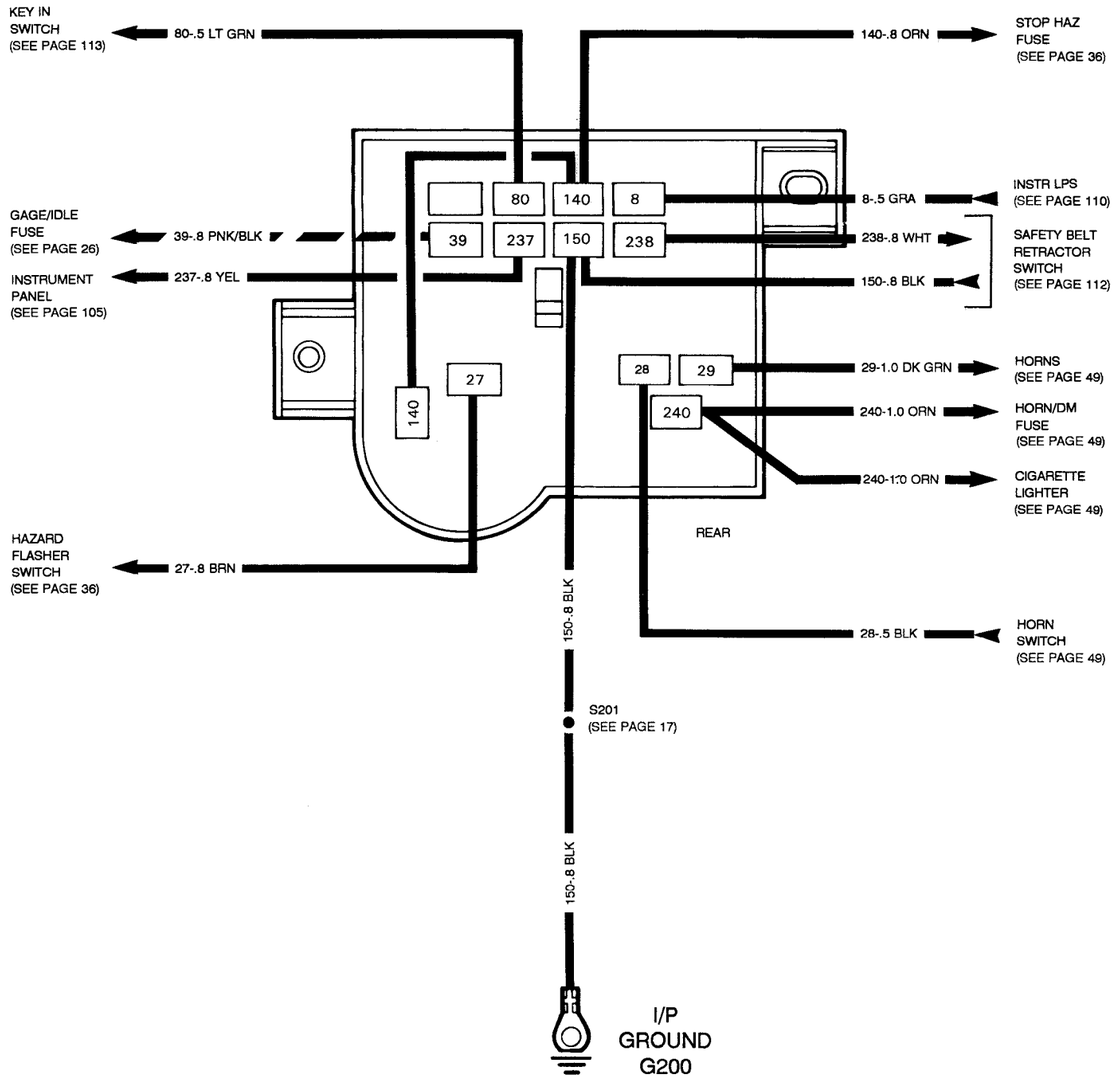


HORN RELAY

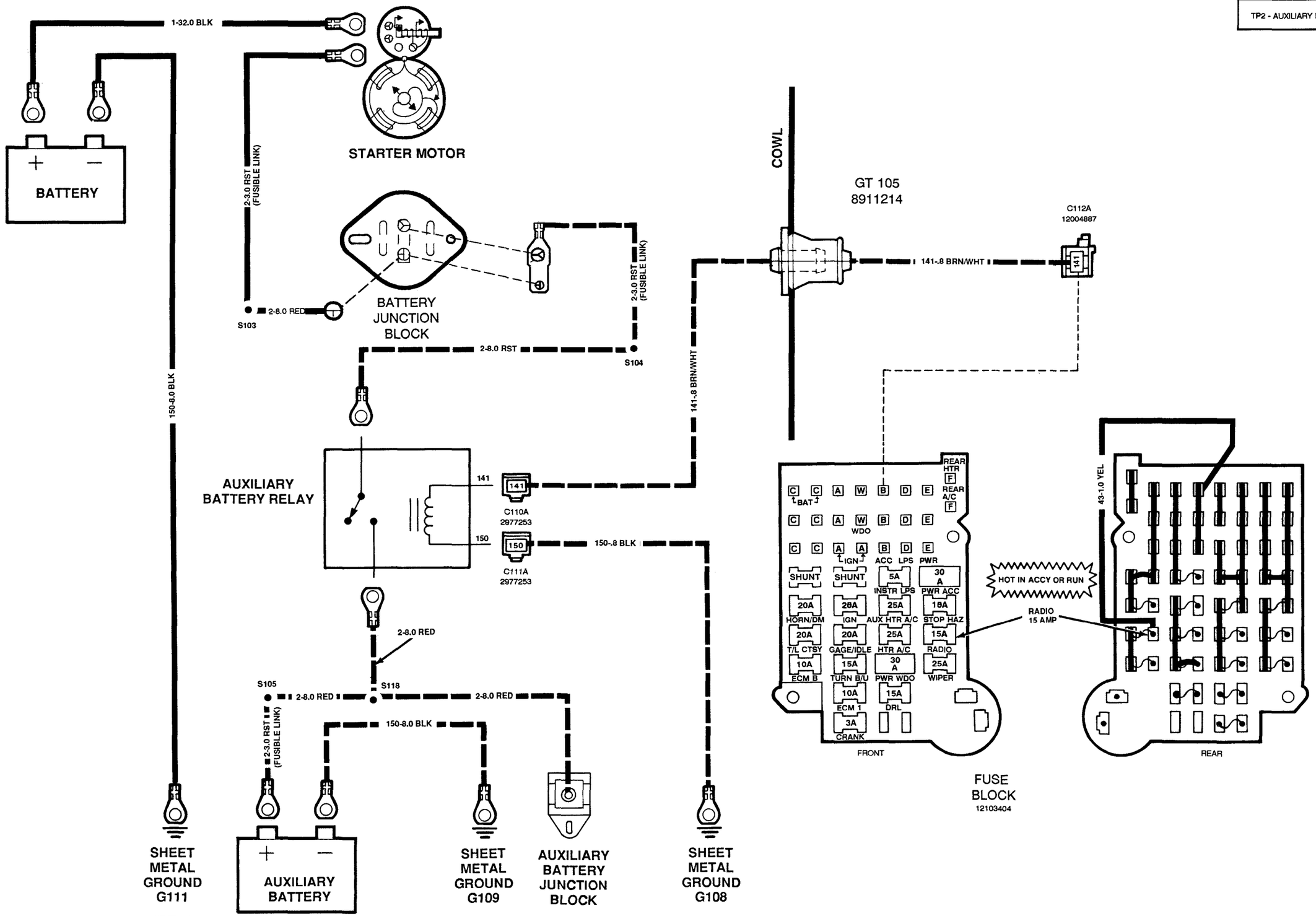
CONVENIENCE CENTER



HAZARD FLASHER



RPO CODES
TP2 - AUXILIARY BATTERY



A-22 AUXILIARY BATTERY

CIRCUIT OPERATION

HEADLAMPS

Voltage is applied to the Light Switch at all times. The Light Switch includes a Self-Resetting Circuit Breaker. The Circuit Breaker opens when the Headlamp circuit draws too much current. When the Circuit Breaker opens, it interrupts the current flow. With no current flow the Circuit Breaker cools off and resets automatically. When the Light Switch is in HEAD, the Dimmer Switch directs voltage to either the Low Beams or the High Beams. The High Beam Indicator also receives voltage along with the High Beams. When the Light Switch is in PARK or HEAD, voltage is directed to parklamps.

CANADIAN DAYTIME RUNNING LAMPS

Voltage is applied to the Daytime Running Lamp (DRL) relay at all times through the ORN (240) wire from the DRL Fuse and when the Ignition Switch is in RUN through the PNK/BLK (39) wire from the GAGE/IDLE Fuse. The DRL Relay provides voltage to the LH High Beam through the DK BLU/ORN (593) wire. This wire also becomes the ground wire when the Headlamps are operated normally. Voltage is applied to the DRL Module when the Ignition Switch is in RUN through the PNK/BLK (39) wire from the GAGE/IDLE Fuse.

When the Ignition Switch is placed in RUN the DRL Module energizes the DRL Relay connecting the ORN (240) circuit (hot at all times) with the DK BLU/ORN (593) circuit, turning on the Headlamps.

When the Headlamps are turned on manually, or the Ignition Switch is turned OFF, the DRL Module de-energizes the DRL Relay connecting the DK BLU/ORN (593) circuit to the BLK (150) ground circuit. This allows normal operation of the Headlamps.

If the dimmer switch is put into the High Beam Position, the DRL Module will supply voltage through the WHT (629) wire, to the Instrument Panel Cluster to turn on the High Beam Indicator bulb.

DIAGNOSIS -- HEADLAMPS

PRELIMINARY CHECKS:

Check condition of T/L CTSY fuse. If fuse is blown, LOCATE and REPAIR source of overload, then REPLACE fuse. If fuse is in good condition, use the following diagnostic procedures.

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from light switch to junction block.
2. With the light switch on and the headlamp dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C201 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from headlamp dimmer switch to headlamps.
	Test lamp does not light.	REPLACE headlamp dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn light switch ON and headlamp dimmer switch to LOW BEAM position. Connect a test lamp from TAN (12) wire at inoperative lamp(s) to ground.	Test lamp does not light.	GO to step 5.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from TAN (12) to BLK (150 or 151) wire(s) at headlamp connectors C138 or C144 (Base), C149 or C154 (Quad Halogen) to ground. (For Canadian vehicle w/o quad, DK BLU/ORN (593) is used in place of BLK (150) wire at connector C138).	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) from headlamp connector(s) C138 or C144 (Base), C149 or C154 (Quad Halogen) to ground terminal(s) G105, G106 or G107. (For Canadian vehicles w/o Quad Halogen, GO to step 3.)
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from BLK (150) wire at DRL relay connector C126 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from DRL relay to ground G105.
4. Connect a self powered test lamp from DK BLU/ORN (593) at DRL relay connector C126 to ground.	Test lamp lights.	LOCATE and REPAIR open in DK BLU/ORN (593) wire from headlamp connector C138 to DRL relay C126.
	Test lamp does not light.	REPLACE DRL relay.
5. Connect a test lamp from TAN (12) wire at headlamp dimmer switch connector C201 to ground.	Test lamp does not light.	GO to step 6.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch to headlamp.
6. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C201 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch to light switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch to ON and dimmer switch to HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at inoperative lamp(s) to ground.	Test lamp does not light.	GO to step 5.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from LT GRN (11) wire to BLK (150 or 151) wire(s) at headlamp connectors C138 or C144 (Base), C150 or C155 (Quad Halogen). (For Canadian vehicles, DK BLU/ORN (593) wire is used in place of BLK (150) wire at connector C138 or C155).	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) at headlamp connector(s) C138 or C144 (Base), C150 or C155 (Quad Halogen) to ground connection(s) G105, G106 or G107. (For Canadian vehicles: GO to step 3).
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from BLK (150) wire at DRL relay connector C126 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from DRL relay connector to ground G105.
4. Connect a self powered test lamp from DK BLU/ORN (593) wire to ground to DRL relay connector C126 to ground.	Test lamp lights.	LOCATE and REPAIR open in DK BLU/ORN (593) wire at headlamp connector C138 or C150 to DRL relay C126.
	Test lamp does not light.	REPLACE DRL relay.
5. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C201 to ground.	Test lamp does not light.	GO to step 6.
	Test lamp lights.	LOCATE and REPAIR open in LT GRN (11) wire from headlamps to headlamp dimmer switch.
6. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C201 to ground.	Test iamp does not light.	LOCATE and REPAIR open in YEL (10) wire headlamp dimmer switch to light switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

PRELIMINARY CHECKS:

Before checking the DAYTIME RUNNING LAMPS system, do the following:

1. Place Park Brake in the OFF position.
2. Place Light Switch to ON and Headlamp Dimmer Switch to HIGH BEAM position. If the High Beam Lamp(s) are inoperative, refer to the HIGH BEAM LAMP(S) DO NOT OPERATE test procedures. If the High Beam Lamp(s) are operative, use the following diagnostic procedures, after placing the Light Switch to OFF position.

DRL STAY ON

TEST	RESULT	ACTION
1. Disconnect DRL module connector C211. Place ignition switch to RUN and light switch to ON position. Connect a J 34209-A multimeter (or equivalent) to YEL (10) wire from module connector to ground. Measure voltage.	Battery voltage.	REPLACE DRL module.
	No voltage.	LOCATE and REPAIR open in YEL (10) wire from DRL module to light switch.

DRL DOES NOT OPERATE

TEST	RESULT	ACTION
1. Check condition of DRL fuse.	Fuse is not blown.	GO to step 2.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
2. Connect a test lamp from ORN (240) wire at DRL relay connector C126 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire from DRL relay connector C126 to C125 and/or ORN (340) wire between C125 to fuse block.
3. Check condition of GAGE/IDLE fuse.	Fuse is not blown.	GO to step 4.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
4. Place ignition switch to run. Connect a test lamp from PNK/BLK (39) wire at DRL relay connector C126 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire between DRL relay and fuse block.
5. Connect a test lamp from PNK/BLK (39) wire at DRL module connector C221 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire between DRL module and fuse block.
6. Using a jumper wire, apply ground to LT GRN/BLK (592) wire at DRL module connector C211.	Daytime Running lamps light.	GO to step 7.
	Daytime Running Lamps do not light.	GO to step 9.
7. Connect a self-powered test lamp from LT GRN/BLK (592) wire to BLK (150) wire at DRL module connector C211.	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between DRL module connector C211 and ground G200.
8. Connect a self-powered test lamp from LT GRN/BLK (592) wire at DRL relay connector C126 to ground.	Test lamp lights.	REPLACE DRL relay.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between DRL relay connector C126 and DRL module connector C211.
9. Connect a test lamp from DK BLU/ORN (593) wire at DRL relay connector C126 to ground.	Test lamp lights.	LOCATE and REPAIR open in DK BLU/ORN (593) wire between DRL relay connector C126 and LH headlamp connector C138 or C150.
	Test lamp does not light.	REPLACE DRL module.

RPO CODES
C60 - FRONT MANUAL AIR CONDITIONING L05 - 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K L19 - 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N LH6 - 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C LL4 - 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J M20 - MANUAL 4-SPEED TRANSMISSION

(SEE POWER DISTRIBUTION)

BATTERY

2-8.0 BLK/RED

GENERATOR
(SEE PAGE 10)

(SEE POWER DISTRIBUTION)

BATTERY JUNCTION BLOCK

2-1.0 RST
(FUSIBLE LINK)

2-1.0 RST
(FUSIBLE LINK)

S100 (LH6, LL4)
S101 (L05, L19)

2-3.0 RED

C100
12020183

AUXILIARY ENGINE COOLING FAN
(L19 AND C60)
(SEE PAGE 90)

151-2.0 BLK

PARK AND TURN LAMPS
(SEE PAGE 34)

151-.8 BLK

11-1.0 LT GRN

12-.8 TAN

C102
12020100

11-1.0 LT GRN

12-.8 TAN

151-.8 BLK

S111

151-.8 BLK

151-3.0 BLK

150-.8 BLK

C144
12034372

RH HIGH-LOW HEADLAMP

SHEET METAL GROUND G106

FRAME GROUND G107

C138
12034372

LH HIGH-LOW HEADLAMP

SHEET METAL GROUND G105

C203
12066261

I/P CLUSTER CONNECTOR
(SEE PAGE 103)

11-.8 LT GRN

COWL

S200

12-.8 TAN

12-.8 TAN

11-1.0 LT GRN

S208
(M20 ONLY)

2-3.0 RED (M20 ONLY)

2-3.0 RED

C100
12020184

I/P

C201
8917693

2-3.0 RED

10-1.0 YEL

DIMMER SWITCH

C202
12004628

LIGHT SWITCH

CIRCUIT BREAKER 25 AMP

DOME

OFF

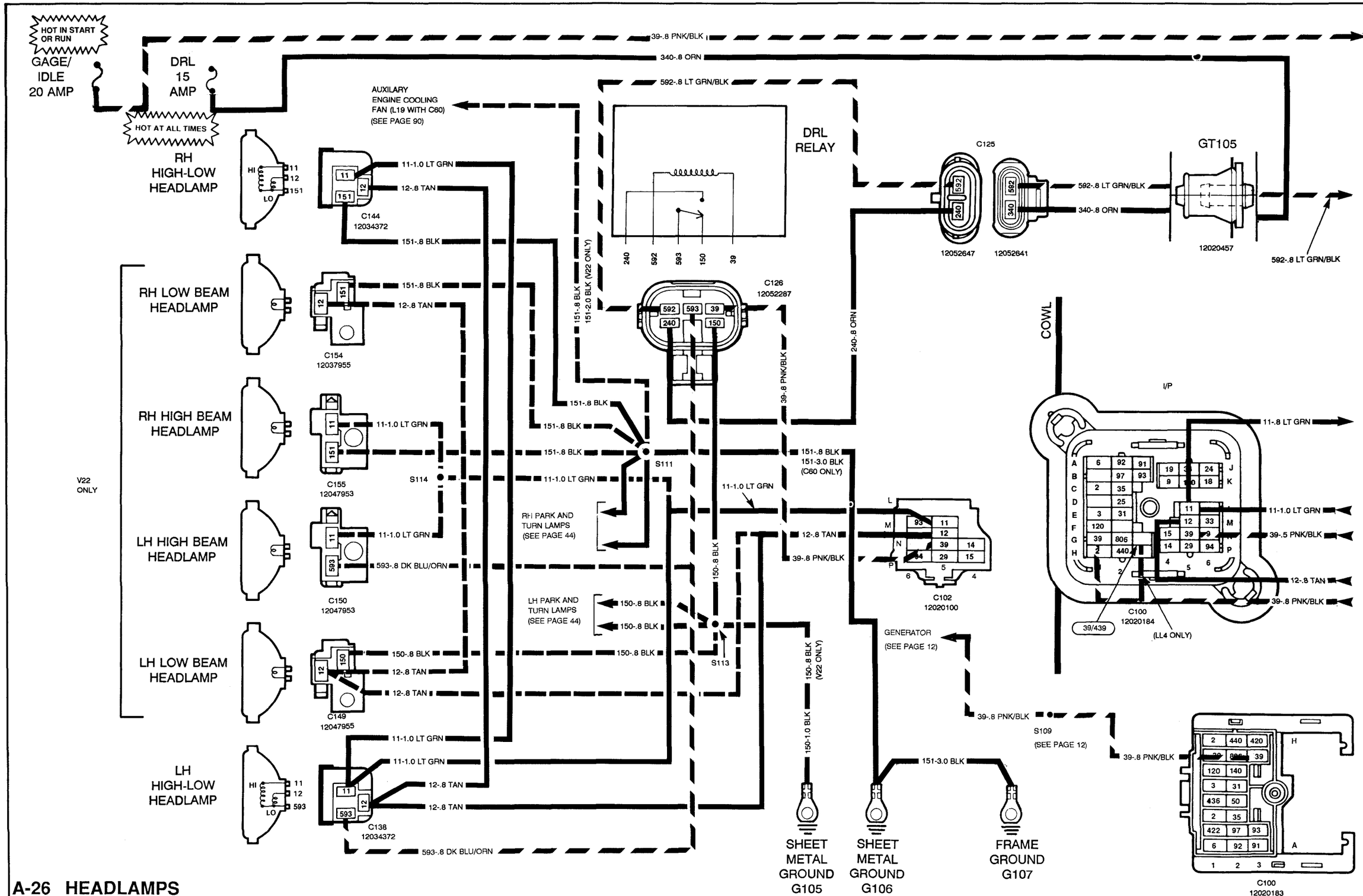
PARK

HEAD

OFF

PARK

HEAD



A-26 HEADLAMPS

W/DRL 5.7L, 7.4L V8 GASOLINE ENGINE, 6.2L HEAVY DUTY DIESEL W/MAN TRANS
FLEETSIDE, WIDESIDE, CREW-BONUS CAB

RPO CODES

C60 - AIR CONDITIONING
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN E
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
LL4 - ENGINE, 6.2L (378 CID) V8, HD DIESEL ENGINE, VIN J
V22 - QUAD HALOGEN HEADLAMPS

DRL MODULE
PARKING BRAKE INPUT
IGNITION
HEADLAMP SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRL OUTPUT AND RELAY
CONNECTOR
GROUND
33 39 10 11 629 592 150
C211
12015308

DIODE ASSEMBLY
(FLEETSIDE, WIDESIDE CREW/BONUS CAB)
C290
2977647
C213
12006377

DIODE ASSEMBLY
C291
12040549
(UTILITY ONLY)
420 420 820 33 33 33
RWAL
(UTILITY ONLY)
(SEE PAGE 116)
33-.5 TAN/WHT

PARK BRAKE WARNING SWITCH
(CLOSED WITH PARK BRAKE APPLIED)

C293
12004267

592-.8 LT GRN/BLK
39-.8 PNK/BLK
11-.8 LT GRN
33-.5 TAN/WHT
39-.5 PNK/BLK
11-.8 LT GRN
10-1.0 YEL
150-.8 BLK
33-.8 PNK/BLK (LL4 ONLY)
33-.5 TAN/WHT
629-.8 WHT
150-.8 BLK
592-.8 LT GRN/BLK
39-.5 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.5 PNK/BLK
12-.8 TAN
11-1.0 LT GRN
10-1.0 YEL
S219
S202
(UTILITY ONLY)

CONVENIENCE CENTER
(SEE PAGE 21)
FUEL PUMP CYCLE RELAY
(SEE PAGE 78)
WATER IN FUEL LAMP
(SEE PAGE 105)
LOW COOLANT WARNING MODULE
(SEE PAGE 104)
(LL4 ONLY)

I/P CLUSTER CONNECTOR
(SEE PAGE)
629 824 18
150 39 17
3 31 419 16
4 39 33 15
5 25 30 14
6 SPD 237 13
7 12
8 35 15 11
9 8 14 10
C203
12066261
39-.8 PNK/BLK (LL4 ONLY)

S201
(SEE PAGES 17, 19)
150-1.0 BLK
150-.8 BLK
12-.8 TAN
11-1.0 LT GRN
10-1.0 YEL

IGNITION SWITCH
3 4 33
2 2 36
6/5 300
START
RUN
OFF
LOCK
ACC

C209
12010966
C210
6294641

LIGHT SWITCH
44
150
DOME
156
2
OFF
PARK
CIRCUIT BREAKER 25 AMP
HEAD
10
40
OFF
PARK
9
HEAD

C202
12004628
H 150
F E D
9
G 10 44 C
J A 2 B
156

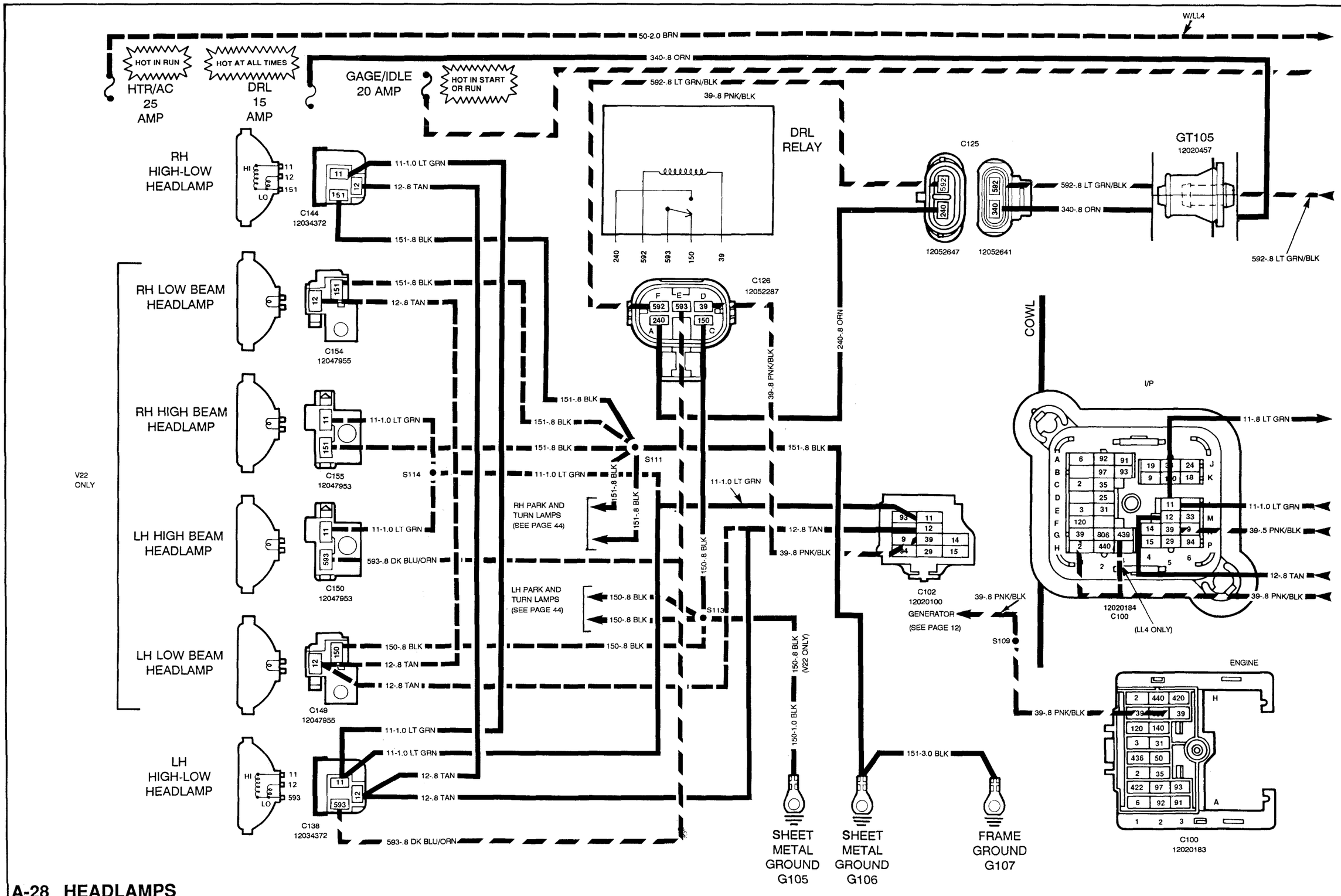
C201
8917693
B 11 12
10 D

DIMMER SWITCH
11 HI
12 10

G200
I/P GROUND

HEADLAMPS A-27

W/DRL 5.7L, 7.4L V8 GASOLINE ENGINE, 6.2L HEAVY DUTY DIESEL W/MAN TRANS
FLEETSIDE, WIDESIDE, CREW-BONUS CAB



A-28 HEADLAMPS

W/DRL 5.7L DIESEL ENGINES AND 4-SPD., AUTO TRANS SUBURBAN/UTILITY

RPO CODES
LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
LL4 - ENGINE, 6.2L (378 CID) V8, HD DIESEL ENGINE, VIN J
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
MD8 - AUTO TRANS, 4 SPD., WITH OVERDRIVE
V22 - QUAD HALOGEN HEADLAMPS
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE

S203
W/LL4
50-2.0 BRN
DRAC
(SEE PAGE 75)
50-1.0 BRN
HTR SW
(SEE PAGE 96)
50-2.0 BRN
50-2.0 BRN
50-2.0 BRN
592-.8 LT GRN/BLK
RWAL
(SEE PAGE 116)
39-.8 PNK/BLK
33-.5 TAN/WHT
39-.5 PNK/BLK
11-.8 LT GRN
11-.8 LT GRN
39-.8 PNK/BLK
11-1.0 LT GRN
12-.8 TAN
39-.8 PNK/BLK
10-1.0 YEL
S202

PARKING BRAKE INPUT
IGNITION
HEADLAMP SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRL OUTPUT AND RELAY CONNECTOR
GROUND
33
39/50
10
11
629
592
150

C211
12015308
39/50
A B C D E F G H
33 39 10 11 629 592 150

150-.8 BLK

DRL MODULE
RWAL
(SEE PAGE 116)
33-.5 TAN/WHT

DIODE ASSEMBLY
(W/LL4)
33 33 33 820 420 420
C291
12040549

DIODE ASSEMBLY
(EXCEPT LL4)
RWAL
(L05/L19)
(SEE PAGE 116)
33-.5 TAN/BLK
W/MT1 ONLY
33 33 33 820 420 420
A B C D E F
33 33 33 820 420 420

RWAL
(SEE PAGE 116)
33-.5 TAN/WHT
W/MD8

PARK BRAKE WARNING SWITCH
(CLOSED WITH PARK BRAKE APPLIED)

C293
12004267
33

33-.5 TAN/WHT
33-.8 TAN/WHT
629-.8 WHT
150-.8 BLK
592-.8 LT GRN/BLK
39-.5 PNK/BLK
39-.8 PNK/BLK
CONVENIENCE CENTER
(SEE PAGE 21)
WATER IN FUEL
LAMP (SEE PAGE 105)
LOW COOLANT WARNING MODULE
(SEE PAGE 104)
(LH6 ONLY)

I/P CLUSTER CONNECTOR
(SEE PAGE 103)
629 824 18
150 39 17
3 31 419 16
39 33 15
5 25 30 14
592 237 13
7 12
8 35 15 11
9 8 14 10
C203
12066261

150-.8 BLK
150-.8 BLK
39-.5 PNK/BLK

S201
(SEE PAGES 17, 19)
150-1.0 BLK
150-.8 BLK
12-.8 TAN
11-1.0 LT GRN
10-1.0 YEL
10-1.0 YEL

3 2 6/5 4 2 2 33 36 300
START
RUN
OFF
LOCK
ACC
IGNITION SWITCH

C209
12010966
6/5 A B 2 D C 3 4 E

C210
6294641
B 300 A 2 36 C D 33

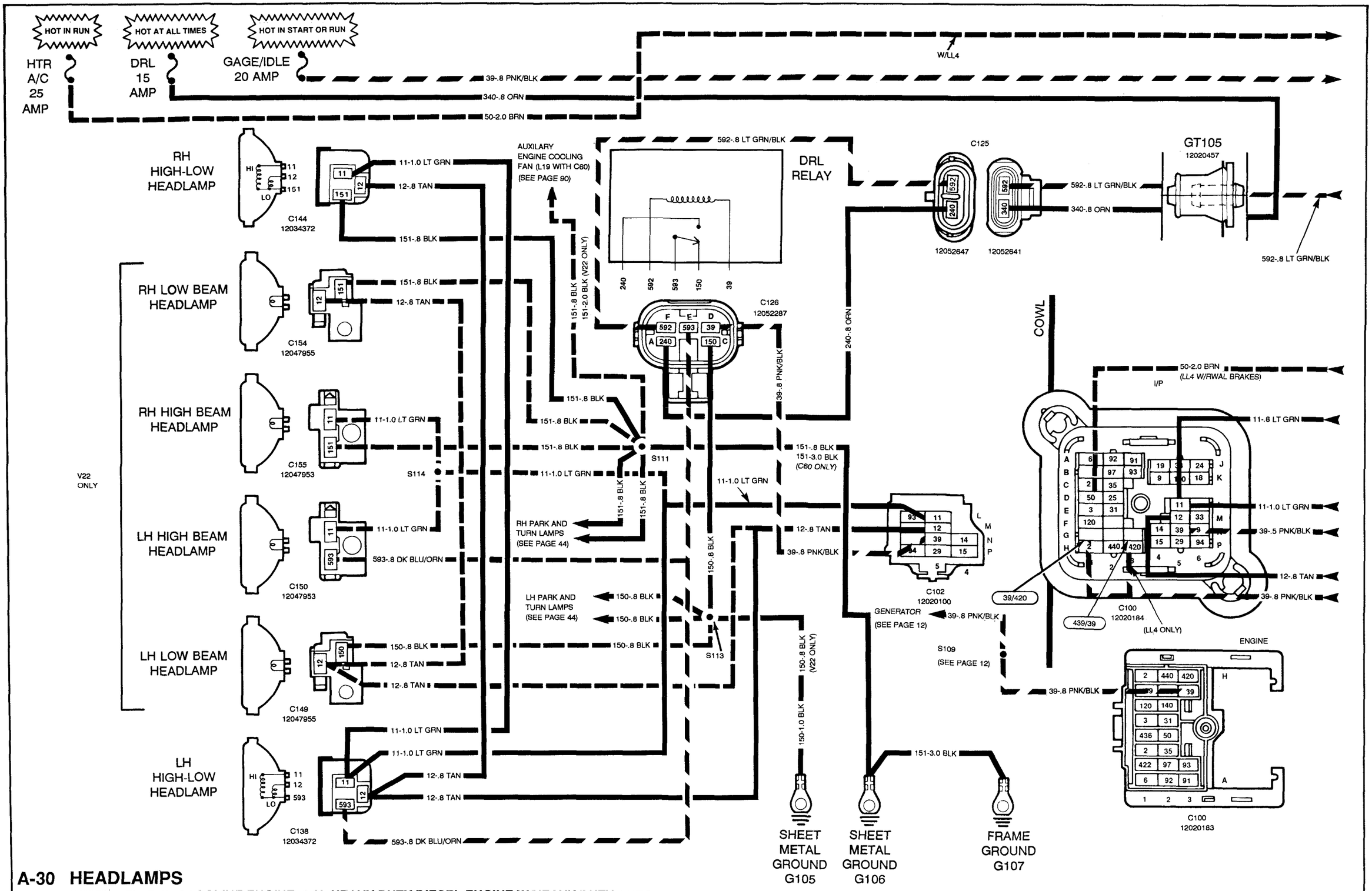
44
150 DOME 156
2
CIRCUIT BREAKER 25 AMP
OFF PARK
HEAD 10
OFF PARK
40 HEAD 9
LIGHT SWITCH

C202
12004628
150 9 D G 10 44 C J A 2 166 B

C201
8917693
B C 11 12 A 10 D

DIMMER SWITCH
11 HI LO 12 10

G200
I/P GROUND



A-30 HEADLAMPS

W/DRL 5.7L, 7.4L GASOLINE ENGINE, 6.2L HEAVY DUTY DIESEL ENGINE W/HEAVY DUTY AUTO TRANS, SUBURBAN, FLEETSIDE, WIDESIDE, CREW- BONUS CAB

RPO CODES

C60 - AIR CONDITIONING
L05 - ENGINE, 5.7L (350 CID) V8 ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
LL4 - ENGINE, 6.2L (378 CID) V8, HD DIESEL ENGINE, VIN J
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
MT1 - AUTO TRANS, HD, 4 SPD., WITH OVERDRIVE
V22 - QUAD HALOGEN HEADLAMPS

W/LL4
S203
W/LL4
50-2.0 BRN
DRAC (SEE PAGE 75)
50-.8 BRN
HTR SW (SEE PAGE 96)
50-2.0 BRN
RWAL (SEE PAGE 116)
50-1.0 BRN (LL4 ONLY)
592-.8 LT GRN/BLK
(LL4 W/ RWAL BRAKES)
50-2.0 BRN
11-.8 LT GRN
39-.8 PNK/BLK
11-1.0 LT GRN
39-.8 PNK/BLK
12-.8 TAN
39-.8 PNK/BLK
50-2.0 BRN

DRL MODULE
PARKING BRAKE INPUT
IGNITION
HEADLAMP SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRL OUTPUT AND RELAY
CONNECTOR
GROUND
33
39/50
10
11
629
592
150

C211
12015308
A B C D E F GH
33 50 10 11 629 592 150

RWAL (SEE PAGE 116)
33-.5 TAN/BLK
DIODE ASSEMBLY
C291
12040549
D C B A
33 33 33 820 420 420

PARK BRAKE WARNING SWITCH
(CLOSED WITH PARK BRAKE APPLIED)

C293
12004267
33

33-.5 TAN/WHT
33-.5 TAN/WHT
(LL4 W/MT I)
33-.8 TAN/WHT
629-.8 WHT
150-.8 BLK
592-.8 LT GRN/BLK
39-.5 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.5 PNK/BLK
12-.8 TAN
11-1.0 LT GRN
10-1.0 YEL

150-.8 BLK
33-.5 TAN/WHT
39-.5 PNK/BLK
10-1.0 YEL
11-.8 LT GRN

CONVENIENCE CENTER (SEE PAGE 21)
FUEL PUMP CYCLE RELAY (SEE PAGE 78)
LOW COOLANT WARNING MODULE (SEE PAGE 104) (LL4 ONLY)

I/P CLUSTER CONNECTOR
(SEE PAGE 103)
629 824 18
150 39 17
3 31 419 16
4 39 33 15
5 25 30 14
6 592 237 13
7 12
8 35 15 11
9 8 14 10

C203
12066261

39-.5 PNK/BLK
39-.8 PNK/BLK
(LL4 ONLY)

150-.8 BLK
150-.8 BLK

S201
(SEE PAGES 17, 19)
150-1.0 BLK

150-.8 BLK
12-.8 TAN
11-1.0 LT GRN
10-1.0 YEL
10-1.0 YEL

DIMMER SWITCH
B
C 11 12 A
10 D
11 HI LO
12 10

G200
I/P GROUND

C201
8917693

C202
12004628
H 150
F E 9 D
G J C 44
10
A 2 156 B

(LO5/L19 W/O RWAL BRAKES)

C209
12010966
5/6 A
B 2 D
C 3 4 E

C210
6294641
B 300 C
A 2 36
D 33

LIGHT SWITCH
44
150
DOME
156
2
OFF
PARK
CIRCUIT BREAKER 25 AMP
HEAD
10
OFF
PARK
40
9
HEAD

IGNITION SWITCH
3 4 33
2 2 36
6/5 300
START
RUN
OFF
LOCK
ACC

HEADLAMPS A-31

W/DRL 5.7L, 7.4L GASOLINE ENGINE, 6.2L HEAVY DUTY DIESEL ENGINE W/HEAVY DUTY AUTO TRANS, SUBURBAN, FLEETSIDE, WIDESIDE, CREW- BONUS CAB

(SEE POWER DISTRIBUTION)

BATTERY JUNCTION BLOCK

BATTERY

2-8.0 BLK/RED

2-1.0 RST (FUSIBLE LINK)

2-1.0 RST (FUSIBLE LINK)

S100 (LH6, LL4)
S101 (L05, L19)

2-3.0 RED

C100
12020183
ENGINE

C102
12020100

AUXILIARY ENGINE COOLING FAN (L19 AND C60) (SEE PAGE 90)

151-2.0 BLK

GENERATOR (SEE PAGE 10)

RH LOW BEAM HEADLAMP

RH HIGH BEAM HEADLAMP

LH HIGH BEAM HEADLAMP

LH LOW BEAM HEADLAMP

C154
12047955

C155
12047953

C150
12047953

C149
12047955

151-.8 BLK

12-.8 TAN

11-1.0 LT GRN

150-.8 BLK

S111

S114

S113

151-3.0 BLK (C60 ONLY)

151-.8 BLK

RH PARK AND DIRECTIONAL LAMPS (SEE PAGE 44)

RH PARK AND TURN LAMPS (SEE PAGE 44)

SHEET METAL GROUND G105

SHEET METAL GROUND G106

GRAME GROUND G107

12020184
C100
I/P

C203
12066261
I/P CLUSTER CONNECTOR
(SEE PAGE 103)

11-.8 LT GRN

COWL

S200

12-.8 TAN

11-1.0 LT GRN

S208
(M20 ONLY)

2-3.0 RED (M20 ONLY)

2-3.0 RED

C201
8917693

DIMMER SWITCH

10-1.0 YEL

12004628
C202

CIRCUIT BREAKER 25 AMP

DOME

OFF

PARK

HEAD

LIGHT SWITCH

RPO CODES
C60 - AIR CONDITIONING
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
M20 - MAN TRANS, 4-SPD.

A-32 QUAD HALOGEN HEADLAMPS

CIRCUIT OPERATION

HAZARD LAMPS

Voltage is applied at all times, through the STOP/HAZ Fuse and the Hazard Flasher to the normally open contact of the Hazard Switch in the Turn Signal Switch Assembly. With the Hazard Switch in HAZARD FLASH, voltage is applied to both Front and Rear Turn Lamps. All of the Turn Lamps and both Turn Indicators flash on and off.

The Front Marker Lamps flash in HAZARD FLASH just as they do in RIGHT TURN and LEFT TURN. If the Lamp Switch is in OFF, they flash on when the Hazard Lamps are on. If the Light Switch is in either PARK or HEAD, they flash on when the Hazard Lamps are off and off when the Hazard Lamps are on.

In Hazard, this circuit is always open, and the Hazard Flasher control the Lamps.

PARK AND MARKER LAMPS

Voltage is applied through the T/L CTSY Fuse to the Light Switch at all times. With the Light Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, License Lamp and Roof Marker Lamps (if so equipped).

DIAGNOSIS -- FRONT PARK, MARKER ROOF AND HAZARD LAMPS

FRONT PARK AND SIDE MARKER LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch in PARK position. Connect a test lamp from ORN (40) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between light switch and fuse block or REPLACE T/L CTSY fuse.
2. Connect test lamp from BRN (9) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp at BRN (9) wire at LH park lamp connector C140 to ground.	Test lamp lights.	CHECK conditions of bulb sockets and BLK (150 and 151) wires from park lamps to ground terminals G106 and G107.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from park lamps to light switch.

ROOF MARKER LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between light switch and fuse block or REPLACE (T/L CTSY) fuse.
2. Connect test lamp from BRN (9) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect test lamp at WHT (45) wire at LH marker lamp terminal to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (45) and BRN (9) wires from marker lamp to light switch.
4. Connect test lamp from WHT (45) wire to BLK (150) wire at LH marker lamp.	Test lamp lights.	CHECK condition of light socket.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from marker lamps to bus bar ground.

HAZARD WARNING LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in RUN and position turn signal lamps as if making a turn.	Turn signal lights operate.	GO to step 2.
	Turn signal lights do not operate.	GO to step 3.
2. Turn off turn signal lamps and put hazard warning lamps on. Connect a test lamp from BRN (27) wire at turn signal switch connector C205 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	CHECK condition of fuse (STOP/HAZ) and an open in ORN (140) wire and BRN (27) wire. If fuse and wiring are good, REPLACE hazard flasher.
3. Place hazard lamps on. Connect test lamp from LT BLU (14) wire at turn signal switch connector C205 to ground.	Test lamp flashes.	LOCATE and REPAIR open in wires from turn signal switch to convenience center.
	Test lamp does not light.	REPLACE turn signal switch.

RPO CODES
C60 - AIR CONDITIONING L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N T61 - CANADIAN DAYTIME RUNNING LAMPS

HOT AT ALL TIMES

T/L CTSY 20 AMP

40-.8 ORN

RH SIDE MARKER LAMP

C145 12077765

RH PARK AND TURN LAMP

C147 12092379

151-.8 BLK

AUXILIARY ENGINE COOLING FAN (L19 WITH C60) (SEE PAGE 90)

151-2.0 BLK

RH HIGH-LOW HEADLAMP (SEE PAGE 25)

S111

15-.8 DK BLU

9-.8 BRN

RH PARK AND TURN LAMP

C146 12092379

S115

S112

LH PARK AND TURN LAMP

C140 12092379

S110

14-.8 LT BLU

S113

LH HIGH-LOW HEADLAMP (SEE PAGE 25)

150-.8 BLK

150-.8 BLK (T61 ONLY)

LH PARK AND TURN LAMP

C139 12092379

C137 12077765

LH SIDE MARKER LAMP

SHEET METAL GROUND G105

SHEET METAL GROUND G106

FRAME GROUND G107

S204

RADIO/CLOCK (SEE PAGES 144, 145)

I/P CTSY LPS

C202 12004628

LIGHT SWITCH

DOME

OFF

PARK

HEAD

CIRCUIT BREAKER 25 AMP

S212

RADIO/CLOCK (SEE PAGES 144, 145)

TURN LAMPS SWITCH (SEE PAGE 45)

COWL

C102 12020100

TAILLAMPS ONLY

C100 1202184

I/P

151-.8 BLK

151-3.0 BLK

A-34 FRONT, PARK AND MARKER LAMPS

BASE

RPO CODES
C60 - AIR CONDITIONING L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

HOT AT ALL TIMES

T/L CTSY 20 AMP

40-.8 ORN

S204

40-.8 ORN → RADIO/CLOCK (SEE PAGE)

40-.8 ORN → I/P CTSY LPS (SEE PAGE)

40-.8 ORN

RH SIDE MARKER

C157 12077765

15-.8 DK BLU

RH PARK AND TURN LAMP

C156 12092379

151-.8 BLK

9-.8 BRN

15-.8 DK BLU

RH PARK LAMP

C158 12077766

151-.8 BLK

9-.8 BRN

9-.8 BRN

S111

RH LOW BEAM HEADLAMP (SEE PAGE 32)

151-.8 BLK

RH HIGH BEAM HEADLAMP (SEE PAGE 32)

151-.8 BLK

9-.8 BRN

S112

151-2.0 BLK

LH HIGH BEAM HEADLAMP (SEE PAGE 32)

150-.8 BLK

9-.8 BRN

AUXILIARY ENGINE COOLING FAN (L19 WITH C60) (SEE PAGE 90)

LH LOW BEAM HEADLAMP (SEE PAGE 32)

150-.8 BLK

S113

150-.8 BLK

LH PARK LAMP

C152 12077766

150-.8 BLK

9-.8 BRN

150-.8 BLK

150-.8 BLK

151-.8 BLK

15-.8 DK BLU

15-.8 DK BLU

9-.8 BRN

C202 12004628

LH PARK AND TURN LAMP

C151 12092379

150-.8 BLK

14-.8 LT BLU

14-.8 LT BLU

9-.8 BRN

14-.8 LT BLU

9-.8 BRN

151-3.0 BLK

LH SIDE MARKER

C153 12077765

14-.8 LT BLU

SHEET METAL GROUND G105

SHEET METAL GROUND G106

FRAME GROUND G107

C102 12020100

S212

9-.8 BRN → RADIO/CLOCK (SEE PAGES 144, 145)

15-.8 DK BLU → TURN LAMPS SWITCH

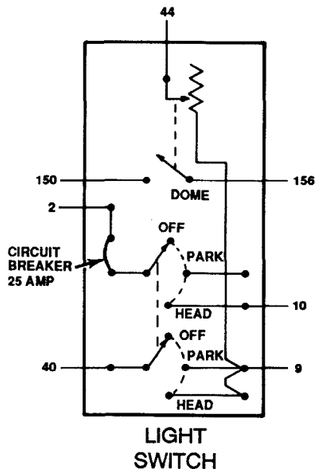
14-.8 LT BLU → (SEE PAGE 44)

9-.8 BRN

TAILLAMPS ONLY

C100 1202184

I/P



LIGHT SWITCH

FRONT, PARK AND MARKER LAMPS A-35

W/QUAD HALOGEN HEADLAMPS

HOT AT ALL TIMES

STOP HAZ
15 AMP

140-.8 ORN

140-.8 ORN

(L05/L19 WITH M20 FLEETSIDE, WIDESIDE, CREW/BONUS CAB)

140-.8 ORN

S210

140-.8 ORN

CONVENIENCE CENTER

HORN RELAY
28
240
29

SAFETY BELT SW 238
GROUND 150
FASTEN BELTS 237
IGNITION 39
IGN KEY SW 80
BATTERY 140
LIGHTS ON SW 8

27
140
HAZARD FLASHER

140-.8 ORN

BUZZER
8 140 80
238 150 237 39

HORN
29 28
240

HZ/F
27
140

P.E.D.

12015999

FRONT

140-.8 ORN

(SUBURBAN/UTILITY DIESEL)

(SUBURBAN/UTILITY GASOLINE)

140-.8 ORN

RH PARK AND TURN LAMP

151-.8 BLK

C147
12092379

C145
12077765

RH SIDE MARKER LAMP

15-.8 DK BLU

RH PARK AND TURN LAMP

C146
12092370

15-.8 DK BLU

15-.8 DK BLU

S115

15-.8 DK BLU

151-.8 BLK

151-.8 BLK

AUXILIARY ENGINE COOLING FAN (L19 WITH C60)
(SEE PAGE 90)

151-2.0 BLK

151-.8 BLK

LH HIGH/LOW HEADLAMP
(SEE PAGE 25)

151-.8 BLK

S111

151-.8 BLK

RH HIGH/LOW HEADLAMP
(SEE PAGE 25)

150-.8 BLK

150-.8 BLK

150-.8 BLK

S113

150-.8 BLK
(T61 ONLY)

150-.8 BLK
(T61 ONLY)

150-.8 BLK
(T61 ONLY)

150-.8 BLK

14-.8 LT BLU

6 5 4
15 29 94
14 39 6
12 33
11 93
P N M L

C102
12020100

27-.8 BRN

14-.8 LT BLU

15-.8 DK BLU

15-.8 DK BLU

14-.8 LT BLU

LH PARK AND TURN LAMP

14-.8 LT BLU

S110

14-.8 LT BLU

C140
12092379

150-.8 BLK

150-.8 BLK

14-.8 LT BLU

151-.8 BLK

151-3.0 BLK

LH PARK AND TURN LAMP

14-.8 LT BLU

C139
12092379

C137
12077765

LH SIDE MARKER LAMP

SHEET METAL GROUND G105

SHEET METAL GROUND G106

FRAME GROUND G107

P 94 29 15
N 9 39 14
M 33 12
L 93 11

4 5 6 3 2 1
420 44 2
439 39
140
31 3
50 436
35 2
93 97 422
91 92 6
H G F E D C B A

K 18 120 9
J 24 30 19

C100
12020184

I/P

19-.8 DK GRN

18-.8 YEL

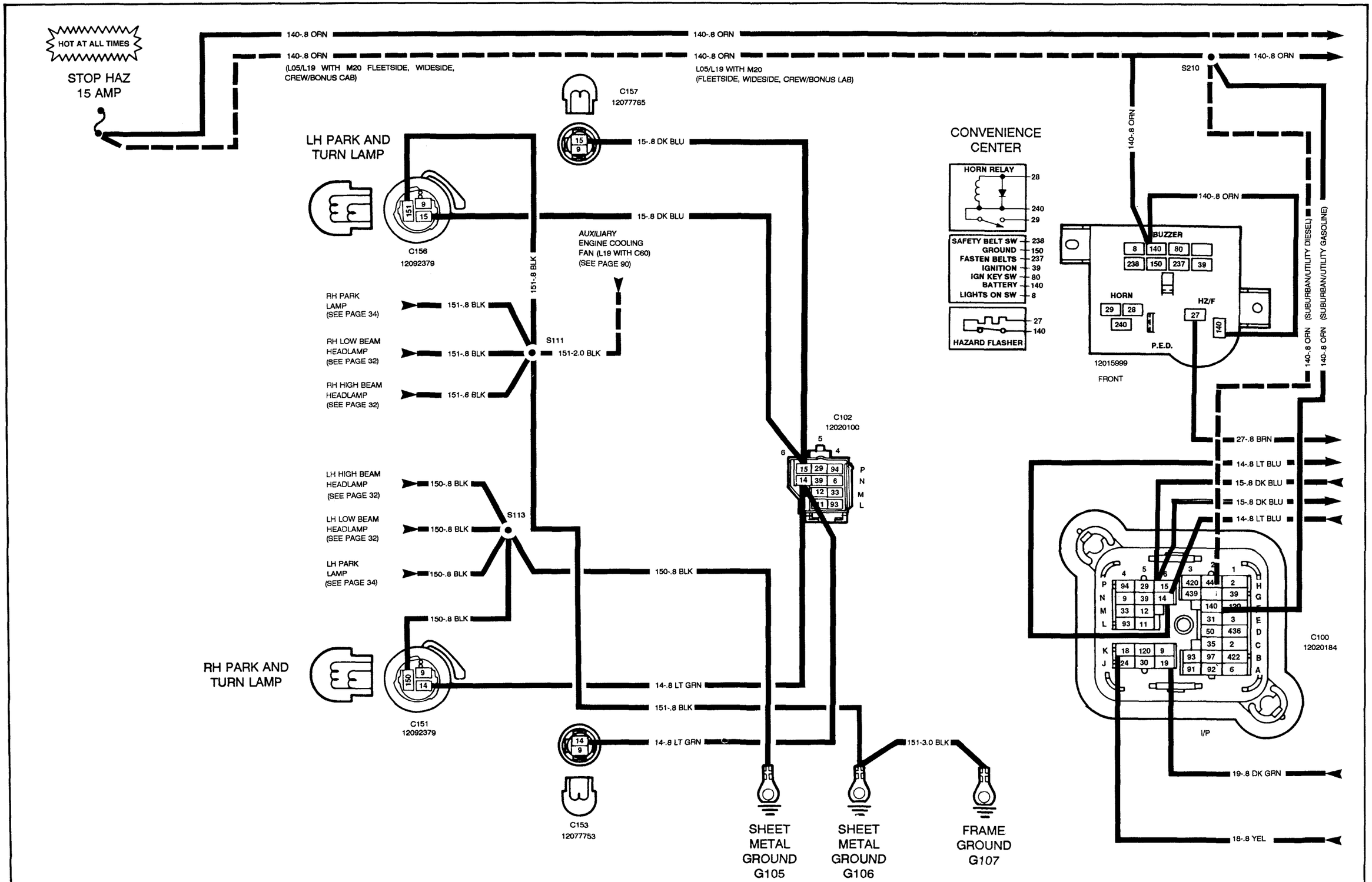
A-36 HAZARD LAMPS

BASE

RPO CODES
C60 - AIR CONDITIONING
E63 - FLEETSIDE BODY
L05 - HEATER, ENGINE BLOCK
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
M20 - MAN TRANS, 4-SPD.
R05 - DUAL REAR WHEELS
T61 - CANADIAN DAYTIME RUNNING LAMPS

140-.8 ORN
L05/L19 WITH M20
(FLEETSIDE, WIDESIDE, CREW/BONUS LAB)
140-.8 ORN
I/P CLUSTER CONNECTOR
(SEE PAGE 103)
C203
12026261
14-.8 LT BLU
15-.8 DK BLU
140-.8 ORN
17-.8 WHT
C244
12033699
STOPLAMP SWITCH
(CLOSES WHEN BRAKES ARE APPLIED)
(STEERING COLUMN SWITCHES)
TURN SIGNAL SWITCH
LEFT TURN SIGNAL
RIGHT TURN SIGNAL
HAZARD
HORN
KEY
NORMALLY OPEN SWITCHES
17-.8 WHT
19-.8 DK GRN
18-.8 YEL
16-.8 PPL
27-.8 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
80-.5 LT GRN
159-.8 TAN
C205
12004147
12004148
27-.8 BRN
14-.8 LT BLU
15-.5 DK BLU
15-.8 DK BLU
14-.5 LT BLU
19-.8 DK GRN
18-.8 YEL
C101
12020099
19-.8 DK GRN
18-.8 YEL
SHEET METAL GROUND G403
PLUGGED CAVITY
(SUBURBAN/UTILITY ONLY)
PLUGGED CAVITY
C301
12015024
19-.8 DK GRN
S302
C300
12015024
12015798
18-.8 YEL
S301
GT 401
(SURBURBAN ONLY)
RH TAIL, STOP AND TURN LAMP
C411
8911035
(SUBURBAN ONLY)
C411
8911029
(UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))
19-.8 YEL
(UTILITY ONLY)
19-.8 DK GRN
C424
2962509
6288712
(E63 ONLY)
S402
(FLEEDSIDE WIDESIDE, STEPSIDE ONLY)
150-.8 BLK
RH FRONT AND REAR CLEARANCE LAMPS
(SEE PAGE 156)
RH SIDE MARKER LAMPS
(SEE PAGE 156)
RH BACKUP LAMP
(SEE PAGE 153)
C423
2962509
6288712
(E63 ONLY)
(UTILITY ONLY)
S403
LH TAIL STOP AND TURN LAMP
C412
8911029 (UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))
C412
8911035 (SUBURBAN)
LH FRONT AND REAR CLEARANCE LAMPS
(SEE PAGE 156)
LH SIDE MARKER LAMP
(SEE PAGE 156)
LH BACKUP LAMP
(SEE PAGE 153)
SHEET METAL GROUND G402
(SURBURBAN/UTILITY ONLY)
GT 400
(SURBURBAN ONLY)

HAZARD LAMPS A-37
BASE



A-38 HAZARD LAMPS

W/QUAD HALOGEN HEADLAMPS

RPO CODES

C60 - AIR CONDITIONING
E63 - FLEETSIDE BODY
L05 - HEATER, ENGINE BLOCK
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
M20 - MAN TRANS, 4-SPD.
R05 - DUAL REAR WHEELS
T61 - CANADIAN DAYTIME RUNNING LAMPS

140-.8 ORN
140-.8 ORN
L05/L19 WITH M20
(FLEETSIDE, WIDESIDE, CREW/BONUS LAB)

I/P CLUSTER CONNECTOR
(SEE PAGE 103)

C203
12026261

C244
12033699

14-.8 LT BLU
15-.8 DK BLU
140-.8 ORN
17-.8 WHT

STOPLAMP SWITCH
(CLOSED WHEN BRAKE PEDAL IS DEPRESSED)

(CLOSES WHEN BRAKES ARE APPLIED)

GT 401
(SURBURBAN ONLY)

19-.8 YEL

RH TAIL, STOP AND TURN LAMP

C411
8911035
(SUBURBAN ONLY)

C411
8911029
(UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))

PLUGGED CAVITY
(SUBURBAN/UTILITY ONLY)

PLUGGED CAVITY

C301

12015024

19-.8 DK GRN

19-.8 YEL
(UTILITY ONLY)

19-.8 DK GRN

C424
2962509
6288712
(E63 ONLY)

(STEERING COLUMN SWITCHES)

TURN SIGNAL SWITCH

LEFT TURN SIGNAL
RIGHT

S302

S402

(FLEETSIDE WIDESIDE, STEPSIDE ONLY)

150-.8 BLK

RH FRONT AND REAR CLEARANCE LAMPS
(SEE PAGE 156)

RH SIDE MARKER LAMPS
(SEE PAGE 156)

RH BACKUP LAMP
(SEE PAGE 153)

27-.8 BRN
14-.8 LT BLU
15-.8 DK BLU
15-.5 DK BLU
14-.5 LT BLU

C205
12004147

17-.8 WHT
19-.8 DK GRN
18-.8 YEL
16-.8 PPL
27-.8 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
80-.5 LT GRN
159-.8 TAN

HORN
KEY
HAZARD

NORMALLY OPEN SWITCHES

12004148

C300

12015024

12015798

18-.8 YEL

S301

18-.8 YEL

(UTILITY ONLY)

C423
2962509
6288712
(E63 ONLY)

18-.8 YEL

S403

150-.8 BLK

LH TAIL STOP AND TURN LAMP

C412
8911029 (UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))

C101
12020099

19-.8 DK GRN

18-.8 YEL

LH FRONT AND REAR CLEARANCE LAMPS
(SEE PAGE 156)

LH SIDE MARKER LAMP
(SEE PAGE 156)

LH BACKUP LAMP
(SEE PAGE 153)

SHEET METAL GROUND G403

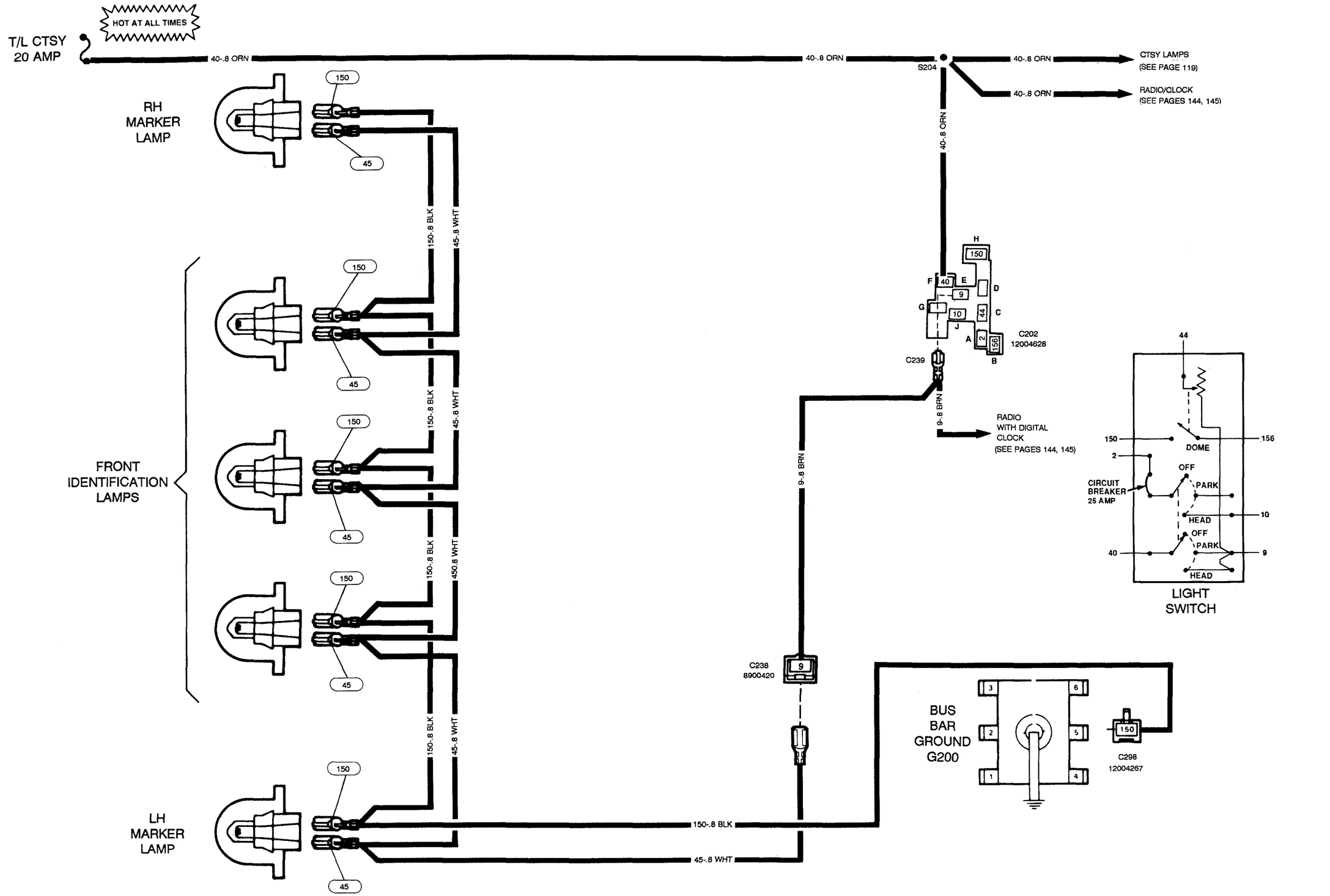
SHEET METAL GROUND G402
(SURBURBAN/UTILITY ONLY)

GT 400
(SURBURBAN ONLY)

8911035 (SUBURBAN)

HAZARD LAMPS A-39

W/QUAD HALOGEN HEADLAMPS



A-40 ROOF MARKER LAMPS

BLANK

CIRCUIT OPERATION

TURN SIGNAL LAMPS

With the Ignition Switch in RUN or START, voltage is applied through the TURN/BU Fuse and Turn Signal Flasher to the normally closed contact of the Hazard Flasher Switch in the Turn Signal Switch Assembly.

With the Turn Signal Switch in LH Turn position, voltage is applied to both the LH Turn Indicator and the LH Front Park/Turn Lamp (LT BLU wires). Voltage is applied to the LH Rear Turn Lamp (YEL wire).

The Lamps go on immediately. They begin to flash when the current flow heats up the timing element in the flasher and it repeatedly opens and closes the circuit.

The voltage applied to the LH Front Park and Turn Lamp will also be applied to the LH Front Marker Lamp. If the Light Switch is in the OFF position, the LH Front Marker Lamp will find a path to ground through splice S112 and the many Lamps connected in parallel to ground. These Lamps provide low resistance paths to ground. The Marker Lamp will flash with the Turn Lamps. The Lamps used for the ground path will not flash, however, since the voltage drop across the Marker Lamp is much higher than that across the other Lamps.

When the Light Switch is in either PARK or HEAD, voltage is applied through the T/L CTSY Fuse, Lamp Switch and splice S112 to the Marker and Park Lamps. If the Turn Signal Switch is in LEFT TURN, the LH Front Marker Lamp will have voltage at both connections and will go out. When the flasher removes voltage to the Turn Lamp, the Marker Lamp will be grounded through the Turn Lamp and will go on. In this way, the LH Front Marker Lamp will flash on when the LH Front Park and Turn Lamp goes off, and off when the Turn Lamp goes on.

With the Turn Signal Switch Assembly in RIGHT TURN, voltage will be applied to the RH Lamps in a similar manner.

DIAGNOSIS — TURN SIGNAL LAMPS

PRELIMINARY CHECKS:

1. Check condition of TURN/BU fuse. If fuse is blown, LOCATE and REPAIR source of overload, then REPLACE fuse.
2. Place Headlamp Switch in PARK position. If any park or marker lamps do not operate, refer to FRONT PARK AND SIDE MARKER LAMPS DO NOT OPERATE diagnostic procedure in this manual. If the park or marker lamps are operative, use the following diagnostic procedure.

TURN SIGNALS DO NOT WORK ON ONE SIDE

TEST	RESULT	ACTION
1. Turn hazard warning system ON. Observe lights on side of turn signals that did not work.	Lights flash.	CHECK for improper bulb. REPLACE if necessary.
	Lights do not come on.	GO to step 2.
2. Turn hazard warning system off. Place ignition switch to RUN and turn signal to side that does not work. Connect test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side does not work) at turn signal switch connector C205 to ground.	Test lamp lights.	GO to step 4.
	lamp does not light.	GO to step 3.
3. Connect a test lamp from PPL (16) at turn signal switch connector C205 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	REPLACE turn signal flasher.
4. Connect a test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side did not work) at park and turn lamp connector C137, C140, C145, C146, C147 (Base) or C151, C152, C153, C156, C157, C158 (Quad Halogen) to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in either LT BLU (14) or DK BLU (15) wires.
5. Connect a test lamp from LT BLU (14) or DK BLU (15) wire to BLK (150 or 151) wire at park and turn lamp connector C139, C140, C146, C147 (Base) or C151, C156 (Quad Halogen).	Test lamp lights.	CHECK condition of bulb sockets.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire.

TURN SIGNALS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place hazard warning lamps to ON position.	Hazard lamps operate.	GO to step 2.
	Hazard lamps do not operate.	GO to step 3.
2. Connect a test lamp from PPL (16) wire are turn signal switch connector C205 to ground.	Test lamp flashes.	REPLACE turn signal switch.
	Test lamp does not light.	CHECK condition of fuse (TURN/BU) and an open in PPL (16) wire, DK BLU (38) wire, or BLK (150) wire. If fuse and wiring are good, REPLACE turn signal flasher.
3. Place ignition switch in RUN position and put turn signal switch as if making a LH turn. Connect a test lamp from LT BLU (14) wire at turn signal switch connector C205 to ground.	Test lamp flashes.	LOCATE and REPAIR open in wires from turn signal switch to convenience center.
	Test lamp does not light.	REPLACE turn signal switch.

TURN SIGNAL LAMPS FLASH RAPIDLY

TEST	RESULT	ACTION
Turn hazard lamp switch ON. Check front signal lamps and rear taillamps.	One side of turn signal lamps flash rapidly.	REPLACE inoperative turn signal bulb.
	Only one side of turn signals light but do not flash rapidly.	REFER to "Turn Signals Do Not Operate On One Side" symptom.

FUSE BLOCK

12103404

REAR HTR F

REAR A/C F

C BAT

C C A W B D E

C C A W B D E WDO

C C A A B D E IGN ACC LPS PWR

SHUNT SHUNT 5A 30 A

INSTR LPS PWR ACC

20A 20A 25A 15A

HORN/DM IGN AUX HTR A/C STOP HAZ

20A 20A 25A 15A

T/L CTSY GAGE/IDLE HTR A/C RADIO

10A 15A 30 A 25A

ECM B TURN B/U PWR WDO WIPER

10A 15A

ECM 1 DRL

3A

CRANK

FRONT

HOT IN START OR RUN

TURN/BU 15 AMP

TURN SIGNAL FLASHER

16

38

REAR

16-.8 PPL

I/P CLUSTER CONNECTOR

(SEE PAGE 103)

C203

12026261

COWL

C100

12020184

I/P

140/806

15-.8 DK BLU

14-.8 LT BLU

19-.8 DK GRN

18-.8 YEL

38-.8 DK BLU

RH SIDE MARKER LAMP

C145

12077765

151-.8 BLK

RH PARK AND TURN LAMP

C147

12092379

15-.8 DK BLU

S115

RH PARK AND TURN LAMP

C146

12092379

151-.8 BLK

AUXILIARY ENGINE COOLING FAN (L19 WITH C60)

(SEE PAGE 90)

151-2.0 BLK

S111

RH HIGH/LOW HEADLAMP

(SEE PAGE 25)

LH HIGH/LOW HEADLAMP

(SEE PAGE 25)

150-.8 BLK

150-.8 BLK (T61 ONLY)

S113

LH PARK AND TURN LAMP

C140

12092379

S110

14-.8 LT BLU

C102

12020100

151-3.0 BLK

LH PARK AND TURN LAMP

C139

12092379

C137

12077765

LH SIDE MARKER LAMP

SHEET METAL GROUND G105

SHEET METAL GROUND G106

FRAME GROUND G107

A-44 TURN SIGNAL LAMPS

BASE

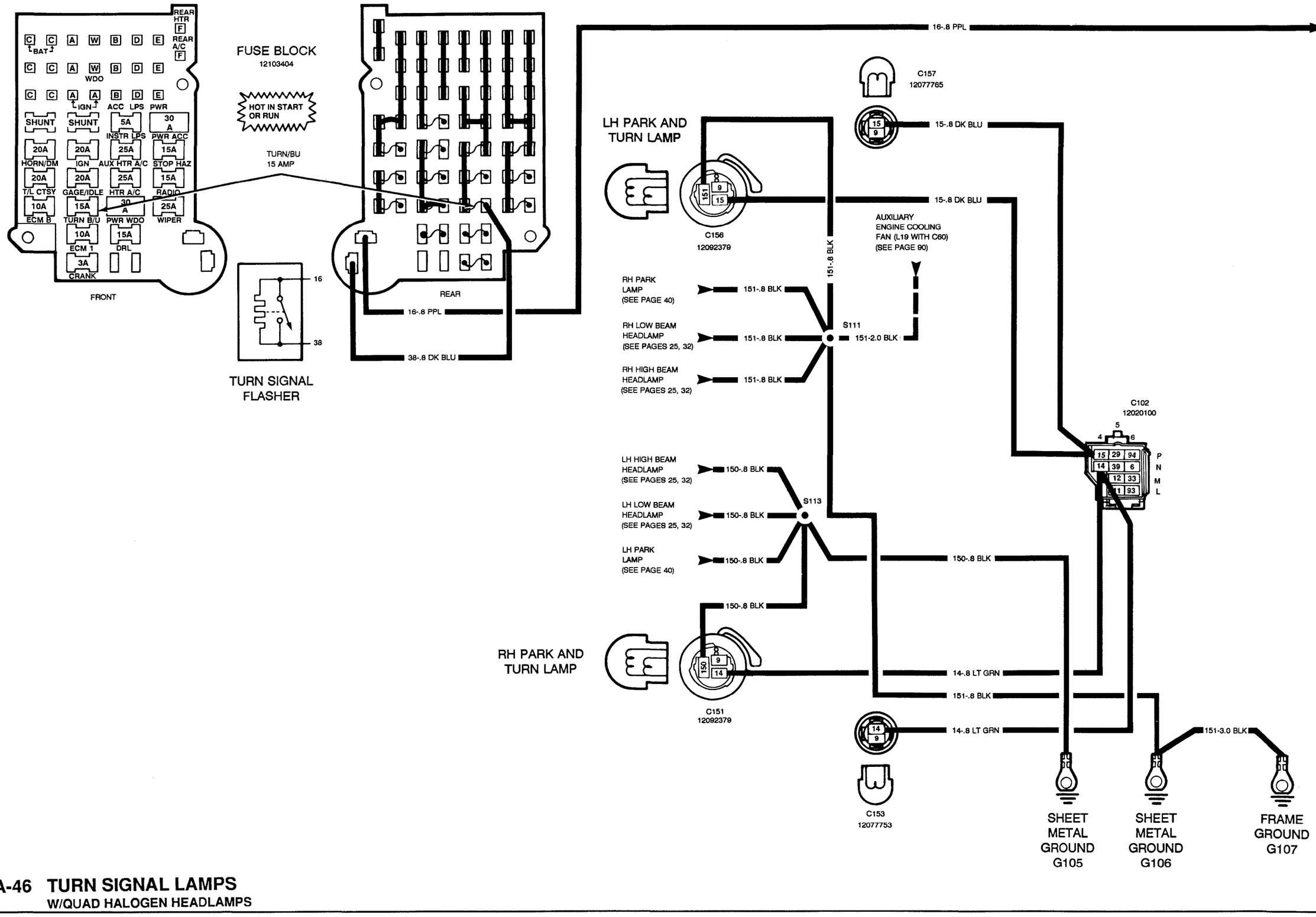
RPO CODES

E63 - FLEETSIDE BODY
R05 - DUAL REAR WHEELS
T61 - CANADIAN DAYTIME RUNNING LAMPS
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
C60 - AIR CONDITIONING

16-.8 PPL
15-.5 DK BLU
14-.5 LT BLU
18-.8 YEL
19-.8 DK GRN
C205
12004147
12004148
(STEERING COLUMN SWITCHES)
17-.8 WHT
19-.8 DK GRN
18-.8 YEL
16-.8 PPL
27-.8 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
80-.5 LT GRN
159-.8 TAN
LEFT TURN SIGNAL
RIGHT
HAZARD
HORN
KEY
NORMALLY OPEN SWITCHES
TURN SIGNAL SWITCH
C101
12020099
S301
S302
S403
PLUGGED CAVITY
(SUBURBAN/UTILITY ONLY)
C301
12015024
C300
12015798
GT 401
(SURBURBAN ONLY)
RH TAIL, STOP AND TURN LAMP
C411
8911035
(SURBURBAN ONLY)
C411
8911029
(UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))
19-.8 YEL (UTILITY ONLY)
C424
2962509
6288712
(E63 ONLY)
S402
FLEETSIDE, WIDESIDE, STEPSIDE ONLY)
150-.8 BLK
RH FRONT AND REAR CLEARANCE LAMPS (SEE PAGE 156)
RH SIDE MARKER LAMPS (SEE PAGE 156)
BACKUP LAMP (SEE PAGE 153)
C423
2962509
6288712
(E63 ONLY)
(UTILITY ONLY)
LH TAIL, STOP AND TURN LAMP
C412
8911029 (UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))
C412
8911035 (SUBURBAN)
LH FRONT AND REAR CLEARANCE LAMPS (SEE PAGE 156)
LH SIDE MARKER LAMP (SEE PAGE 156)
LH BACKUP LAMP (SEE PAGE 153)
SHEET METAL GROUND G403
SHEET METAL GROUND G402
(SURBURBAN/UTILITY ONLY)
GT 400
(SURBURBAN ONLY)

TURN SIGNAL LAMPS A-45

BASE



A-46 TURN SIGNAL LAMPS

W/QUAD HALOGEN HEADLAMPS

RPO CODES

C60 - AIR CONDITIONING
E63 - FLEETSIDE BODY
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
R05 - DUAL REAR WHEELS
T61 - CANADIAN DAYTIME RUNNING LAMPS

16-.8 PPL

I/P

15-.8 DK BLU

140/808

I/P

C100
12020184

I/P CLUSTER CONNECTOR
(SEE PAGE 103)
C203
12026261

14-.8 LT BLU

TURN SIGNAL SWITCH

(STEERING COLUMN SWITCHES)

LEFT TURN SIGNAL

RIGHT

HAZARD

HORN

KEY

NORMALLY OPEN SWITCHES

17-.8 WHT
19-.8 DK GRN
18-.8 YEL
16-.8 PPL
27-.8 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
80-.5 LT GRN
159-.8 TAN

C205
12004147

12004148

19-.8 DK GRN

18-.8 YEL

16-.8 PPL

15-.5 DK BLU

14-.5 LT BLU

19-.8 DK GRN

18-.8 YEL

S301

S302

PLUGGED CAVITY

(SUBURBAN/UTILITY ONLY)

C301

12015024

12015798

C300

12015024

12015798

GT 401
(SURBURBAN ONLY)

RH TAIL, STOP AND TURN LAMP

C411
8911035

(SURBURBAN ONLY)

150-.8 BLK

C411
8911029

(UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))

19-.8YEL

19-.8 YEL
(UTILITY ONLY)

19-.8 DK GRN

C424
2962509 6288712
(E63 ONLY)

S402

(FLEEDSIDE WIDESIDE, STEPSIDE ONLY)

150-.8 BLK

RH FRONT AND REAR CLEARANCE LAMPS
(SEE PAGE 156)

RH SIDE MARKER LAMPS
(SEE PAGE 156)

RH BACKUP LAMP
(SEE PAGE 153)

18-.8 YEL

C423
2962509 6288712
(E63 ONLY)

(UTILITY ONLY)

18-.8 YEL

S403

150-.8 BLK

LH TAIL STOP AND TURN LAMP

C412
8911029 (UTILITY, FLEETSIDE (E63) AND WIDESIDE (R05))

150-.8 BLK

LH FRONT AND REAR CLEARANCE LAMPS
(SEE PAGE 156)

RH SIDE MARKER LAMP
(SEE PAGE 156)

RH BACK UP LAMP
(SEE PAGE 153)

SHEET METAL GROUND G403

SHEET METAL GROUND G402
(SURBURBAN/UTILITY ONLY)

GT 400
(SURBURBAN ONLY)

C412
8911035 (SUBURBAN)

C101
12020099

19-.8 DK GRN

18-.8 YEL

TURN SIGNAL LAMPS A-47

W/QUAD HALOGEN HEADLAMPS

CIRCUIT OPERATION

When the Horn Switch is depressed, one side of the coil of the Horn Relay is grounded. The relay is energized. The relay contacts close and battery voltage is applied to the horns.

DIAGNOSIS -- HORNS

PRELIMINARY CHECKS:

Check condition of HORN/DM fuse. If fuse is blown, LOCATE and REPAIR source of overload, then REPLACE fuse. If fuse is in good condition, use the following diagnostic procedure.

HORN(S) WILL NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from BLK/LT GRN (29) wire at horn connector (C142, C143) to ground. Press horn switch.	Test lamp lights.	REPLACE horn.
	Test lamp does not light.	GO to step 3.
2. Remove horn relay. Connect a test lamp from ORN (240) wire at convenience center to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire between convenience center and fuse block.
3. Disconnect turn signal switch connector C205. Use a jumper wire to ground BLK (28) wire at turn signal switch connector C205.	Horn does not sound.	GO to step 4.
	Horn sounds.	REPLACE turn signal switch.
4. Disconnect horn relay. Install a jumper wire from ORN (240) terminal to DK GRN (29) terminal at convenience center.	Horn sounds.	REPLACE horn relay.
	Horn does not sound.	LOCATE and REPAIR open in DK GRN (29) wire from convenience center to C100 and/or LT GRN/BLK (29) wire between C100 and horn(s).

HORN SOUNDS CONTINUOUSLY WITHOUT DEPRESSING HORN SWITCH

TEST	RESULT	ACTION
1. Disconnect turn signal switch connector C205.	Horn stops.	REPLACE turn signal switch.
	Horn continues to sound.	GO to step 2.
2. Disconnect horn relay. Check for a short to ground in DK GRN (29) and BLK (29) wires.	No shorts found.	REPLACE relay.
	Short(s) found.	REPAIR or REPLACE as required.

CIGARETTE LIGHTER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp at cigarette lighter connector C299 from ORN (240) wire to ground.	Test lamp lights.	REPLACE cigarette lighter.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire between fuse block and cigarette lighter connector C299.

HOT AT ALL TIMES

HORN/DM
20 AMP

240-1.0 ORN

HORN RELAY
28
240
29

SAFETY BELT SW 238
GROUND 150
FASTEN BELTS 237
IGNITION 39
IGN KEY SW 80
BATTERY 140
LIGHTS ON SW 8

27
140
HAZARD FLASHER

CONVENIENCE
CENTER

BUZZER
8 140 80
238 150 237 39

HORN
29 28
240

HZ/F
140
27

P.E.D.

12015999
FRONT

RH
HORN
29
C143
12004267

29-1.0 LT GRN/BLK

29-1.0 DK GRN
240-1.0 ORN
240-1.0 ORN

28-.5 BLK

C299
2962793

C205
12004147

P 17 17-.8 WHT
N 19 19-.8 DK GRN
M 18 18-.8 YEL
L 16 16-.8 PPL
K 27 27-.8 BRN
J 15 15-.5 DK BLU
H 14 14-.5 LT BLU
G 28 28-.5 BLK
F 80 80-.5 LT GRN
E 159 159-.8 TAN
D
C
B
A

C205
12004148

(STEERING COL. SWITCHES)
LEFT
RIGHT
TURN SIGNAL
HORN
KEY
HAZARD
NORMALLY
OPEN
SWITCHES

TURN
SIGNAL SWITCH

LH
HORN
29
C142
12004267

29-1.0 LT GRN/BLK

C102
12020100
6 5 4
15 29 94
14 39 9
12 33
11 93
P
N
M
L

COWL

I/P

C100
12020184
4 6 3 2 1
P 94 29 15 420 440 2 H
N 9 39 14 439 806 39 G
M 33 12 140 120 F
L 93 11 31 3 E
50 436 D
35 2 C
K 18 120 9 93 97 422 B
J 24 30 19 91 92 6 A

C299
2962793
240

CIGARETTE
LIGHTER

CIRCUIT OPERATION

PULSE WIPERS

In addition to MIST, LO and HI speed operation the pulse-type Wiper/Washer System includes an operating mode in which the wipers make single strokes with an adjustable time interval between strokes. The time interval is controlled by a Solid-State Pulse/Speed/Wash Control in the Wiper Motor Module. The duration of the relay interval is determined by the Pulse Delay Resistance in the Wiper/Washer Switch.

LOW SPEED

In the LO position, the Wiper/Washer Switch supplies voltage in the GRA (91) wire and the Pulse/Speed/Wash Control. The Pulse/Speed/Wash Control provides ground to the Park/Run Relay which is energized and supplies voltage to the brushes of the Wiper Motor. The wipers run at low speed until they are turned off.

HIGH SPEED

With the Wiper/Washer Switch in the HI position, battery voltage is supplied from the PPL (92) wire directly to a second armature terminal of the Wiper Motor. The wipers run at high speed. When the Wiper/Washer Switch is turned to OFF, the wipers complete the last sweep at low speed and park.

PARK

When the wipers are turned off, the Wiper Motor runs at low speed until the wiper blades reach the PARK position. At that time the Park/Run Relay opens and shuts the Wiper Motor to stop it immediately. The wiper blades remain in the PARK position.

MIST

When the control is moved to MIST and released, the wipers make one sweep at low speed and return to PARK. The circuit operation is the same as low speed.

PULSE

With the Wiper/Washer Switch in PULSE (Delay), voltage is applied to the GRA (91) wire, the Wiper Motor Module, and the Solid-State Control Board. Voltage is applied to Park/Run Relay coil which is momentarily grounded by the Pulse/Speed/Wash Control circuit and the relay closes. Battery voltage is supplied through the closed contacts of the relay to the run Wiper Motor. The relay remains energized as long as the contacts of the Park/Run Switch remain closed. When the wiper blades have reached PARK, the Park/Run Switch opens, de-energizing the Park/Run Relay. The wiper blades remain in PARK until the Control Board grounds the Park/Relay coil to start another sweep. The delay time between sweeps is controlled by the pulse delay resistors. The delay can be adjusted from 0 to 43 seconds.

WASHER

When the Washer Switch is depressed, voltage is applied to the Solid-State Control Board. The Control Board supplies a ground to the washer motor through the PNK (94) wire. It also starts the wiper cycle through the low speed brushes of the Wiper Motor. The washer continues to run as long as the switch is held down. The Solid-State Control Board keeps the wipers on for approximately six seconds after the washer goes off. If the washer is switched on during the PULSE operation, the wipers run in low speed for six seconds. The wash cycle is completed before the wipers return to the delayed pulse operation.

The Wiper Motor is equipped with a circuit breaker which protects the motor when the wipers are blocked. The resulting high current will open the circuit breaker which will reset upon cooling.

DIAGNOSIS — WINDSHIELD WIPERS AND WASHERS (PULSE)

PRELIMINARY CHECKS:

CHECK condition of WIPER fuse. If fuse is in good condition, use the following diagnostic procedure.

WIPERS DO NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Place ignition in RUN or ACC and turn wipers to HI. Connect a test lamp from WHT (93) wire at wiper motor connector C188 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between wiper motor connector C188 and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect a fused jumper from BLK (150) wire at pulse wiper module connector C207 to ground.	Wiper motor runs.	LOCATE and REPAIR open in BLK (150) wire between pulse wiper module connector C207 and ground G200.
	Wiper motor does not run.	REPLACE wiper motor.

WIPERS DO NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition in RUN or ACC and wipers to HI. Connect a fused jumper from PPL (92) wire at pulse wiper module connector C207 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire between wiper motor connector C188 and pulse wiper module connector C207. If no open is found, REPLACE wiper motor.
	Wiper motor runs.	GO to step 2.
2. Connect a fused jumper from PPL (92) wire at pulse wiper switch connector C204 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire between pulse wiper switch connector C204 and pulse wiper module connector C207. If no open is found, REPLACE pulse wiper control module.
	Wiper motor runs.	REPLACE wiper, washer switch.

WIPERS DO NOT OPERATE IN LO OR DELAY

TEST	RESULT	ACTION
1. Place ignition in RUN or ACC and wipers to LO. Connect a fused jumper from GRA (91) wire at pulse wiper module connector C207 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRA (91) wire between wiper motor connector C188 and pulse wiper module connector C207. If no open is found, REPLACE wiper motor.
	Wiper motor runs.	GO to step 2.
2. Connect a fused jumper from GRA (91) wire at wiper switch connector C204 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRA (91) wire between pulse wiper switch connector C204 and pulse wiper module connector C207. If no open is found, REPLACE pulse wiper control module.
	Wiper motor runs.	REPLACE pulse wiper/washer switch.

WASHER MOTOR DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition to RUN or ACC and pulse wiper/washer switch to WASH. Connect a test lamp from WHT (93) wire at washer pump connector C187 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between washer pump connector C187 and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect a test lamp from WHT (93) wire to PNK (94) wire at washer pump connector C187.	Test lamp lights.	REPLACE washer pump.
	Test lamp does not light.	GO to step 3.
3. Connect a fused jumper from PNK (94) wire at pulse wiper control module connector C207 to ground.	Washer motor does not pump.	LOCATE and REPAIR open in PNK (94) wire between washer pump connector C187 and pulse wiper control module connector C207.
	Washer motor pumps.	GO to step 4.
4. Connect fusible jumper from PNK (94) wire at wiper switch connector C204 to ground.	Washer motor does not pump.	LOCATE and REPAIR open in PNK (94) wire between pulse wiper control module connector C207 and pulse wiper switch connector C204.
	Washer motor pumps.	GO to step 5.
5. Connect a fusible jumper from BLK (150) wire at wiper switch connector C204 to ground.	Washer motor does not pump.	REPLACE wiper switch.
	Washer motor pumps.	LOCATE and REPAIR open in BLK (150) wire between wiper switch connector switch and ground G200.

WASHER MOTOR DOES NOT SHUT OFF

TEST	RESULT	ACTION
1. Place ignition in RUN or ACC and wiper switch to WASH. Disconnect wiper switch connector C204.	Washer motor stops pumping.	REPLACE wiper switch.
	Washer motor pumps.	GO to step 2.
2. Disconnect wiper control module connector C207.	Washer motor stops pumping.	REPLACE pulse wiper control module.
	Washer motor pumps.	LOCATE and REPAIR short to ground in PNK (94) wire between pulse wiper control module connector C207 and washer pump connector C187.

HOT IN ACCY OR RUN

WIPER
25 AMP

93-.8 WHT

93-.8 WHT

WINDSHIELD
WIPER
MOTOR

M
HI
LO
C8
PARK SW.
92
91
93
91
97

C188
8917544

B
A C
92 91 93

C189
8917548

B A
91 97

WINDSHIELD
WASHER
PUMP

M
94
93

92-.8 PPL
91-.8 GRA
93-.8 WHT
91-.8 GRA
97-.8 BLK/LT BLU

94-.8 PNK

C187
2973781
94 93

FRONT
BODY
CONNECTOR

C102
12020100
5 4 6
15 29 94
14 39 9
12 33
11 93
P N M L

93-.8 WHT

1 2 3
2 440 420
39 806 439
120 140
3 31
436 50
2 35
422 97 93
6 92 91
H G F E D C B A
ENGINE

C100
12020183

93-.8 WHT

94-.8 PNK

C207
12020492
G F E D C B A
97 91 150 92 94

97-.8 BLK/LT BLU
91-.8 GRA
92-.8 PPL
150-.8 BLK

PULSE WIPER
CONTROL MODULE

C204
G F E D C B A
96 97 91 150 92 94 96

PULSE WIPER,
WASHER SWITCH
(COLUMN MOUNTED)

HI LO DELAY OFF MIST
DELAY
94

COWL

93-.8 WHT

93-.8 WHT

I/P

C100
12020184
5 6 3 2 1
94 29 15
9 39 14
33 12
93 11
18 120 9
24 30 19
420 440 2
439 806 39
140 120
31 3
50 436
35 2
93 97 422
91 92 6
H G F E D C B A

97-.8 BLK/LT BLU
91-.8 GRA
92-.8 PPL
150-.8 BLK

S201
(SEE PAGE 17)

150-1.0 BLK

I/P
GROUND
G200

A-52 WINDSHIELD WIPERS AND WASHERS
PULSE

CIRCUIT OPERATION

START

When the Ignition Switch is moved to the START position, battery voltage is applied to the Starter Solenoid. Both solenoid windings are energized. The circuit through the Pull-In Winding is completed to ground through the Starter Motor. The windings work together magnetically to pull in and hold in the Plunger. The Plunger moves the Shift Lever. This action causes the Starter Drive Assembly to rotate as it engages the Flywheel ring gear on the engine. At the same time, the Plunger also closes the solenoid switch contacts in the Starter Solenoid. Full battery voltage is applied directly to the Starter Motor and it cranks the engine.

As soon as the Solenoid Switch contacts close, voltage is no longer applied through the Pull-In Winding, since battery voltage is applied to both ends of the windings. The Hold-In Winding remains energized, and its magnetic field is strong enough to hold the Plunger, Shift Lever, and Drive Assembly Solenoid Switch contacts in place to continue cranking the engine.

When the Ignition Switch is released from the START position, battery voltage is removed from the PPL (6) wire and the junction of the two windings. Voltage is applied from the Motor contacts through both windings to ground at the end of the Hold-In Winding. However, the voltage applied to the Pull-In Windings is now opposing the voltage applied when the winding was first energized. The magnetic fields of the Pull-In and Hold-In Windings now oppose one another. This action of the windings, with the help of the Return Spring, causes the Starter Drive Assembly to disengage and Solenoid Switch contacts to open simultaneously. As soon as the contacts open, the starter circuit is turned off.

CHARGE

The Generator provides voltage to operate the vehicle's electrical system and to charge its Battery. A magnetic field is created when current flows through the Rotor. This field rotates as the Rotor is driven by the engine, creating an AC voltage in the Stator windings. The AC voltage is converted to DC by the rectified bridge and is supplied to the electrical system at the Battery terminal.

This Generator's regulator uses digital techniques to supply the Rotor current and thereby control the output voltage. The Rotor current is proportional to the width of the electrical pulses supplied to it by the Regulator. When the Ignition Switch is placed in RUN, narrow width pulses are supplied to the Rotor, creating a weak magnetic field. When the engine is started, the Regulator senses Generator rotation by detecting AC voltage at the Stator through an internal wire. Once the engine is running the Regulator varies the field current by controlling the pulse width. This regulates the Generator output voltage for proper battery charging and electrical system operation.

DIAGNOSIS -- START AND CHARGE

PRELIMINARY CHECKS:

Turn headlamps and dome lamps ON and place ignition in START. If lamps go dim or go out, check battery for correct charge. If battery charge is insufficient, refer to Section 6D of the 1991 R/V,P Light Truck Service Manual. If battery has sufficient charge, use the following procedures.

ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK

TEST	RESULT	ACTION
1. Place transmission in PARK (auto) or depress clutch pedal for man. trans. Connect a voltmeter from PPL (6) wire at starter solenoid to ground. Turn ignition switch to START position.	Battery voltage.	GO to step 2.
	No voltage.	GO to step 3 for man. trans. GO to step 5 for auto. trans.
2. Connect a voltmeter from PPL (6) wire to starter mounting bolts.	Battery voltage.	REPLACE starter solenoid
	Less than battery voltage.	CLEAN starter motor mounting bolts, starter motor, and mounting surface.
3. Disconnect clutch start switch connector C237. Connect voltmeter from YEL (5) wire at clutch start switch connector C237 to ground. Ignition switch must be in START position.	Battery voltage.	GO to step 4.
	No voltage.	LOCATE and REPAIR open in YEL (5) wire between the clutch start switch and the ignition switch. If wire is in good condition, GO to step 5.
4. Depress clutch and put transmission in neutral. Apply parking brake. Connect a fused jumper from YEL (5) to PPL (6) at clutch start switch connector C237. Turn ignition switch to START position.	Engine cranks.	REPLACE clutch start switch.
	Engine does not crank.	LOCATE and REPAIR open in PPL (6) wire from clutch start switch to starter solenoid.
5. With ignition switch OFF, connect a voltmeter from RED (2) wire at ignition switch connector C209 to ground. Repeat step except connect from RED (3) wire at ignition switch connector C210 to ground.	Battery voltage.	REPLACE ignition switch.
	No voltage.	REPLACE and REPAIR open in RED (2) wires and fusible link at junction block.

STARTER SOLENOID CLICKS, ENGINE DOES NOT CRANK OR CRANKS SLOWLY

TEST	RESULT	ACTION
1. Remove CRANK and ECM 1 fuses. Connect a voltmeter to positive and negative battery terminals. Turn ignition switch to START.	Voltage reading greater than 9.6 volts after 15 seconds cranking.	GO to step 2.
	Voltage less than 9.6 volts after 15 seconds cranking.	PERFORM a Battery Load Test. Refer to Section 6D in 1991 R/V, P Light Truck Service Manual.
2. Connect a voltmeter from negative battery terminal to engine block.	Less than .5 volts.	GO to step 3.
	More than .5 volts.	REPLACE negative battery cable.
3. Connect a voltmeter from positive battery terminal to starter solenoid terminal at BLK (2) wire.	Less than .5 volts.	REPAIR starter motor.
	More than .5 volts.	REPLACE positive battery cable.

BATTERY IS UNDERCHARGED OR OVERCHARGED

TEST	RESULT	ACTION
1. Connect voltmeter from RED (2) wire at generator to ground.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in RED (2) wire and fusible link from generator to junction block.
2. Reconnect generator connector C106 and terminal. Have all accessories turned off and engine running at fast idle. Connect voltmeter from battery terminal on generator to ground.	Reading of 13-16 volts.	PERFORM Generator Bench Test. Refer to Section 6D in the 1991 R/V, P Light Truck Service Manual.
	Reading of less than or greater than 13-16 volts.	REPAIR generator.

RPO CODES

LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE
M20 - MAN TRANS, 4-SPD
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE

1-32.0 BLK
BATTERY
STARTER MOTOR
2-3.0 RST (FUSIBLE LINK)
2-1.0 RST (FUSIBLE LINK)
BATTERY JUNCTION BLOCK
S103
2-8 RED
S100
2-8.0 BLK/RED
2-8.0 BLK
150-8.0 BLK
2-3.0 RED
6-3.0 PPL
25-1.0 BRN (MD8 ONLY)
COWL
GT101
12064740
25-1.0 BRN (MD8 ONLY)
C217
12047663
12047662
25-.8 BRN (MD8 ONLY)
25-.8 BRN
C203
12066261
I/P CLUSTER CONNECTOR
(SEE PAGE 103)
25-.8 BRN
25-.8 BRN
(LO5 AND M20 UTILITY ONLY)
S206
2-3.0 RED
2-3.0 RED
2-3.0 RED
I/P
C100
12020183
25-1.0 BRN
25-1.0 BRN (LO5 AND M20 UTILITY ONLY)
ENGINE
S101
25-1.0 BRN
C100
12020184
S207
3-3.0 PNK (MT1 ONLY)
3-3.0 PNK (MT1 ONLY)
(MT1 AND MD8 ONLY)
6-3.0 PPL
(M20 ONLY)
C210
6294641
C209
12010966
IGNITION SWITCH
6-3.0 PPL
5-3.0 YEL
3-3.0 PNK
C237
8917548
GENERATOR
C106
12045896
IN-LINE FUSE
CRANK
3 AMP
(MT1 ONLY)
439-1.0 PNK/BLK
TO ECM
(SEE PAGE 59)
806-.8 PPL/WHT
TO ECM
(SEE PAGE 59)
2-1.0 RST (FUSIBLE LINK)
SHEET METAL GROUND G111
ENGINE GROUND G112
2-8.0 BLK/RED
START
RUN
OFF
LOCK
ACC

RPO CODES
LH6 - 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C LL4 - 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN J M20 - MANUAL 4-SPEED TRANSMISSION MT1 - AUTOMATIC 3-SPEED TRANSMISSION

1-32.0 BLK
1-32.0 BLK
1-32.0 BLK
RH BATTERY
LH BATTERY
STARTER MOTOR
1-32.0 BLK
2-.8 BLK/RED
1-32 BLK
2-3.0 BLK
1-32 BLK
2-2.0 GRA (FUSIBLE LINK)
BATTERY JUNCTION BLOCK
S103
2-5.0 RED
2-1.0 RST (FUSIBLE LINK)
S106
2-1.0 RST (FUSIBLE LINK)
S100
2-3.0 RED
6-3.0 PPL
ENGINE
2 503 31
420 140 39
508 440
3 68
50 25
2
439 93
6 91
H
A
1 3
12020183 C100
COWL
I/P
4 5 6 3 1
P 94 29 15 31 2
N 9 39 14 39 820
M 33 12 508
L 93 11 3
25 50
35 2
K 18 120 9 93 97 439
J 24 30 19 91 92 6
H G F E C A
12020184 C100
25-.8 BRN
25-1.0 BRN
1 11 824 18
2 150 39 17
3 31 419 16
4 39 33 15
5 25 30 14
6 237 13
7 12
8 35 15 11
9 8 14 10
C203 12066261
I/P CLUSTER CONNECTOR
(SEE PAGE 103)
S206
2-3.0 RED
2-3.0 RED
2-3.0 RED
6-3.0 PPL
(MT1 ONLY)
6-3.0 PPL
12010966 C209
6/5 A
B 2 D
C 3 4 E
6294641 C210
B 300 A
2 36 C
D 33
(M20 ONLY)
IGNITION SWITCH
6-3.0 PPL
5-3.0 YEL
3 4 33
6/5 2 2 36
300
START
RUN
OFF
LOCK
ACC
C237 8917548
6 5
GLOW PLUGS CONTROLLER (SEE PAGE 84)
CLUTCH START SWITCH (MAN TRANS ONLY)
GENERATOR
P L I S
12045896 C106
P 25 39 S
S107
2-3.0 BLU (FUSIBLE LINK)
2-.8 RED
SHEET METAL GROUND G111
RIGHT BANK GLOW PLUGS GROUND G114
LEFT BANK GLOW PLUGS GROUND G113
2-.8 BLK/RED

RPO CODES

LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN N
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE
NA4 - EMISSION SYSTEM, ABOVE 8500 GVW

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
			A2	NOT USED
			A3	NOT USED
435	.8	GRA	A4	EGR SOLENOID (LO5) EVRV (LO5 WITH NA4, LO5 CANADIAN AND L19)
419	.8	BRN/WHT	A5	SYSTEM CHECK LAMP
439	.8	PNK/BLK	A6	12V IGNITION FUSED
*422	.8	TAN/BLK	A7	TORQUE CONVERTER CLUTCH (MD8)
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASSEMBLY LINE DIAGNOSTIC LINK
437	.8	BRN	A10	SPEED SENSOR (LO5, L19 WITHOUT RWAL) DRAC MODULE (LO5, L19 WITH RWAL)
452	.8	BLK	A11	5V RETURN B
450	.8	BLK/WHT	A12	SYSTEM RETURN
440	.8	ORN	B1	12V BATTERY FUSED
120	.8	TAN/WHT	B2	ELEC FUEL PUMP FUSED FEED
453	.8	BLK/RED	B3	DISTRIBUTOR REF LOW
			B4	NOT USED
430	.8	PPL/WHT	B5	DISTRIBUTOR REF HIGH
			B6	NOT USED
485	.8	BLK	B7	SPARK RETARD CONTROL
59	.8	DK GRN	B8	AIR CONDITION
			B9	NOT USED
*434	.5	ORN/BLK	B10	PARK/NEUTRAL SWITCH
			B11	NOT USED
			B12	NOT USED

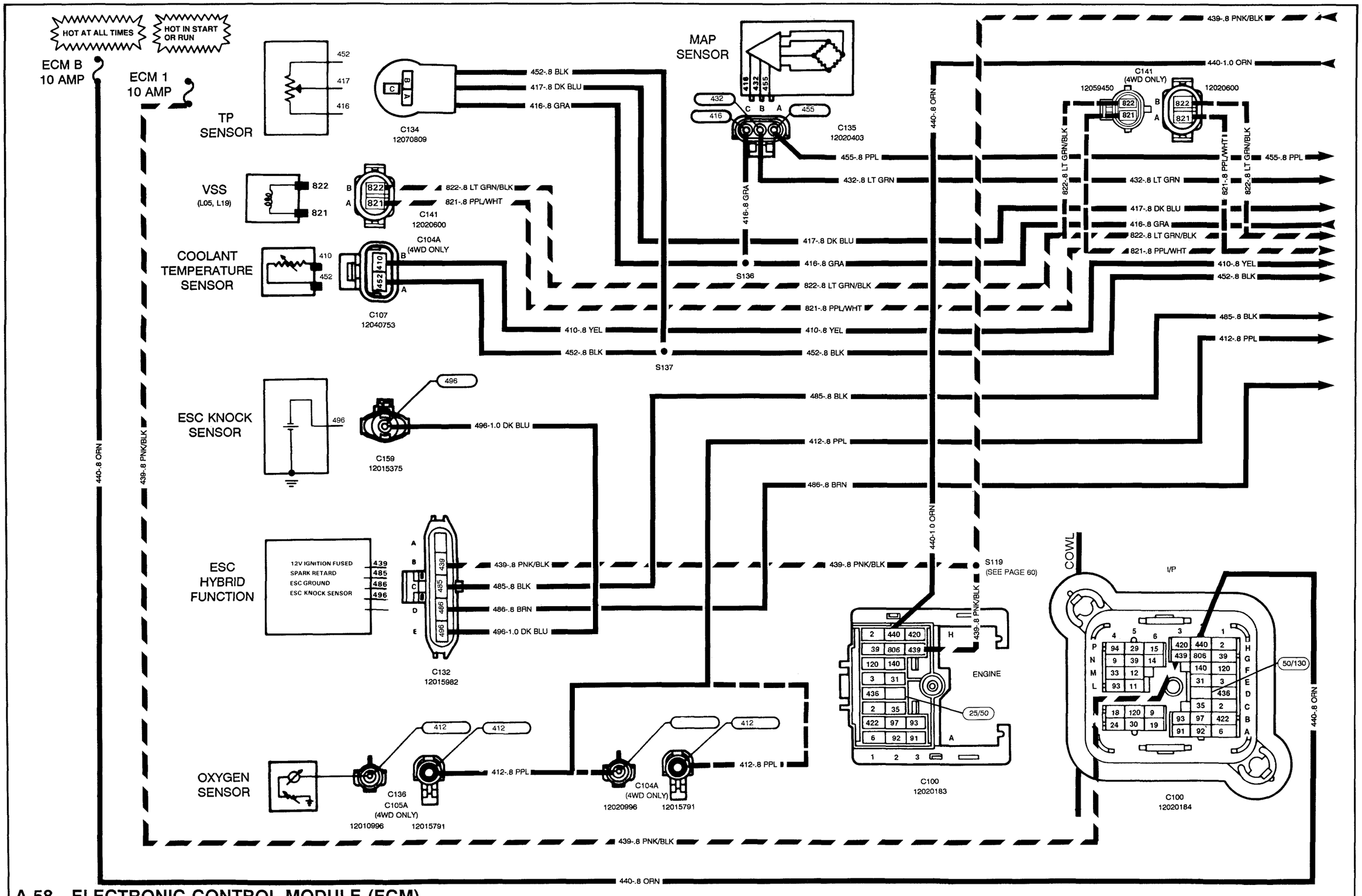
*AUTO TRANS ONLY

ELECTRONIC CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			C1	NOT USED
			C2	NOT USED
444	.8	LT GRN/BLK	C3	STEPPER COIL B LOW
443	.8	LT GRN/WHT	C4	STEPPER COIL B HIGH
441	.8	LT BLU/WHT	C5	STEPPER COIL A HIGH
442	.8	LT BLU/BLK	C6	STEPPER COIL A LOW
*446	.8	LT BLU	C7	A/C CONTROL (4TH GEAR DISCRETE (L05 WITH MD8)
			C8	NOT USED
806	.8	PPL/WHT	C9	CRANK SIGNAL (FUSED)
410	.8	YEL	C10	COOLANT TEMPERATURE
432	.8	LT GRN	C11	MAP SENSOR
			C12	NOT USED
417	.8	DK BLU	C13	TP SENSOR
416	.8	GRA	C14	5V SENSOR REFERENCE
			C15	NOT USED
440	.8	ORN	C16	12V BATTERY FUSED
551	.8	TAN/WHT	D1	SYSTEM GROUND
455	.8	PPL	D2	5V RETURN A
			D3	NOT USED
423	.8	WHT	D4	HEI SPARK TIMING
424	.8	TAN/BLK	D5	HEI BYPASS
413	.8	TAN	D6	OXYGEN SENSOR LOW (GROUND)
412	.8	PPL	D7	OXYGEN SENSOR HIGH
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
			D13	NOT USED
468	.8	DK GRN	D14	INJECTOR B (2) DRIVE
			D15	NOT USED
467	.8	DK BLU	D16	INJECTOR A (1) DRIVE

*AUTO TRANS ONLY

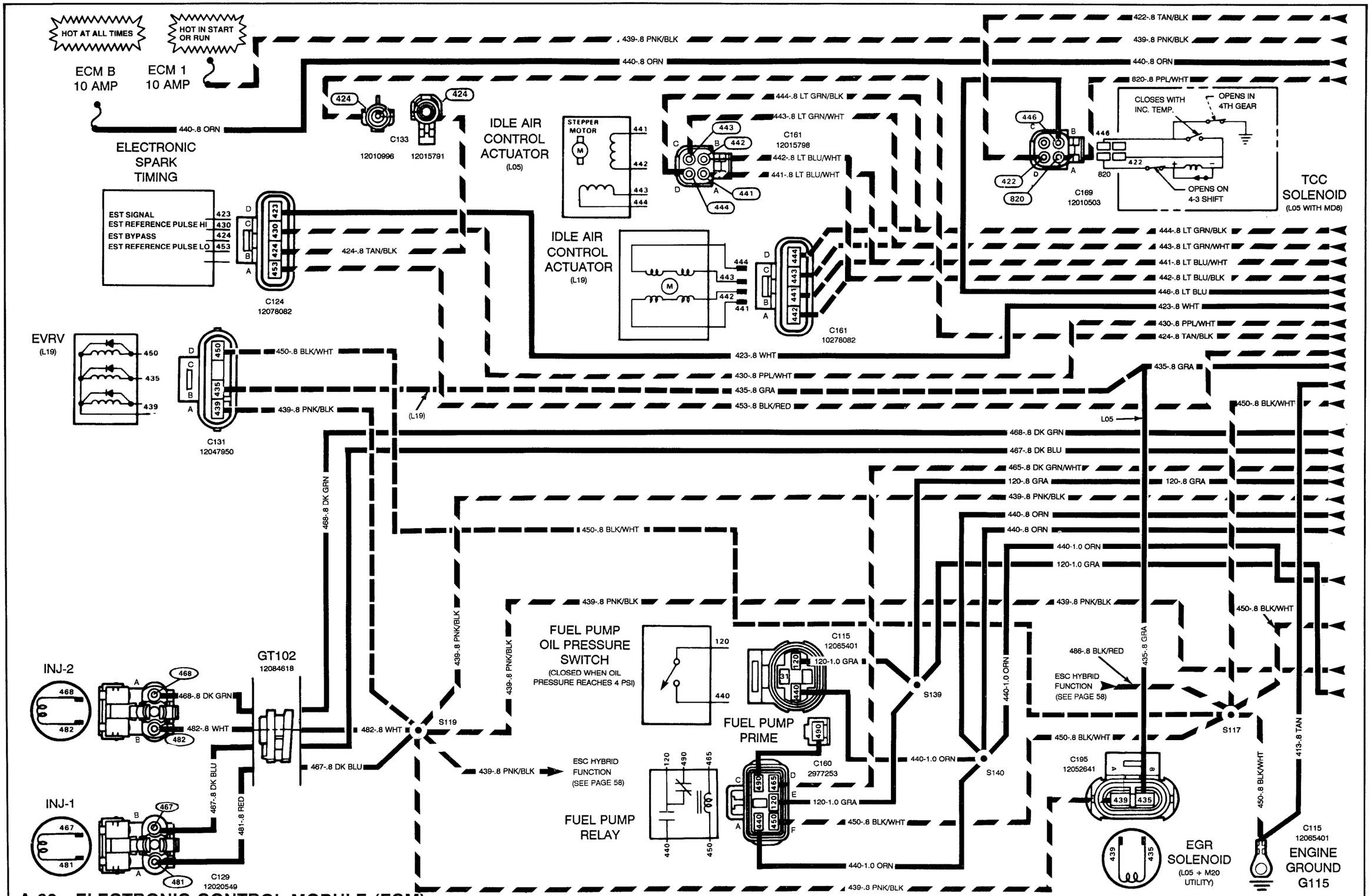
ELECTRONIC CONTROL MODULE CONNECTOR


HOT AT ALL TIMES
HOT IN START OR RUN
ECM B 10 AMP
ECM 1 10 AMP
TP SENSOR
452
417
416
C134
12070809
452-.8 BLK
417-.8 DK BLU
416-.8 GRA
MAP SENSOR
C135
12020403
455-.8 PPL
432-.8 LT GRN
VSS
(L05, L19)
822
821
C141
12020600
822-.8 LT GRN/BLK
821-.8 PPL/WHT
COOLANT TEMPERATURE SENSOR
410
452
C107
12040753
C104A
(4WD ONLY)
410-.8 YEL
452-.8 BLK
S136
S137
ESC KNOCK SENSOR
496
C159
12015375
496-1.0 DK BLU
485-.8 BLK
412-.8 PPL
486-.8 BRN
ESC HYBRID FUNCTION
12V IGNITION FUSED
SPARK RETARD
ESC GROUND
ESC KNOCK SENSOR
439
485
486
496
C132
12015982
439-.8 PNK/BLK
440-1.0 ORN
440-.8 ORN
440-1 0 ORN
C141
(4WD ONLY)
12059450
12020600
455-.8 PPL
432-.8 LT GRN
417-.8 DK BLU
416-.8 GRA
822-.8 LT GRN/BLK
821-.8 PPL/WHT
410-.8 YEL
452-.8 BLK
485-.8 BLK
412-.8 PPL
S119
(SEE PAGE 60)
ENGINE
25/50
C100
12020183
COWL
I/P
50/130
C100
12020184
OXYGEN SENSOR
412
C136
C105A
(4WD ONLY)
12010996
12015791
C104A
(4WD ONLY)
12020996
12015791

RPO CODES

LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE 7.4L (454 CID) V8 GAS ENGINE, VIN N
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE

439-.8 PNK/BLK
FUEL PUMP RELAY (SEE PAGE 78)
440-1.0 ORN
440-.8 ORN
440-1.0 ORN
440-.8 ORN
S140
OIL PRESSURE SWITCH (SEE PAGE 78)
440-1.0 ORN
GT101
12064740
455-.8 PPL
432-.8 LT GRN
417-.8 DK BLU
416-.8 GRA
822-.8 LT GRN/BLK
821-.8 PPL/WHT
410-.8 YEL
452-.8 BLK
450-.8 BLK/WHT
485-.8 BLK
412-.8 PPL
S117
488-.8 BRN
450-.8 BLK/WHT
EVRV (SEE PAGE 60)
450-.8 BLK/WHT
450-.8 BLK/WHT
FUEL PUMP RELAY (SEE PAGE 78)
450-.8 BLK/WHT
413-.8 TAN
439-.8 PNK/BLK
440-.8 ORN
440-.8 ORN
A/C (SEE PAGE 94)
59-.8 DK GRN
455-.8 PPL
432-.8 LT GRN
417-.8 DK BLU
416-.8 GRA
822-.8 LT GRN/BLK
821-.8 PPL/WHT
410-.8 YEL
452-.8 BLK
450-.8 BLK/WHT
551-.8 TAN/WHT
485-.8 BLK
412-.8 PPL
413-.8 TAN
450-.8 BLK/WHT
PARK/NEUTRAL SWITCH
(CLOSES WITH TRANSMISSION IN PARK OR NEUTRAL)
450
434
821-.8 PPL/WHT
822-.8 LT GRN/BLK
461-.8 ORN
451-.8 WHT/BLK
551-.8 TAN/WHT
C216
12047946
B A
440 1 465
120 2
453 3
4 435
430 5 419
6 439
485 7 422
59 8 461
9 451
434 10 437
11 452
12 450
485-.8 BLK
419-.8 BRN/WHT
SERVICE ENGINE SOON LAMP (SEE PAGE 104)
450-.8 BLK/WHT
452-.8 BLK
461-.8 ORN
437-.8 BRN
451-.8 WHT/BLK
551-.8 TAN/WHT
455-.8 PPL
412-.8 PPL
413-.8 TAN
D C
551 1
455 2 436
3 444
423 4 443
424 5 441
413 6 442
412 7 446
8
9 806
10 410
11 432
12
13 417
468 14 416
15
467 16 440
ECM CONNECTORS
C215
12045575
CRANK SIGNAL (FUSED) (SEE PAGE 55)
806-.8 PPL/WHT
440-.8 ORN
416-.8 GRA
417-.8 DK BLU
432-.8 LT GRN
410-.8 YEL
B A
450
434
C265
12015034
450-.8 PNK/BLK
434-.8 ORN/BLK
F G H J K
434 822 821 696 33
419 450 451 437 461
12064770
450-.8 BLK/WHT
E D C B A
C200
12064769
419 450 451 437 461
434 822 821 696 33
F K
ALDL
G H J K L M
F E D C B
422
461
436
451
450
461-.5 ORN
451-.8 WHT/BLK
450-.8 BLK/WHT
S215
450-.8 BLK/WHT
450-.8 BLK/WHT
437-.8 BRN
821-.8 PPL/WHT
822-.8 LT GRN/BLK
DRAC MODULE (SEE PAGE 75)
C206
12020043
ENGINE GROUND G115
RWAL (SEE PAGE 116)
150-.8 BLK
ENGINE GROUND G110



A-60 ELECTRONIC CONTROL MODULE (ECM)

OUTPUTS - GASOLINE ENGINE

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K M20 - MAN TRANS, 4-SPD. L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

422-.8 TAN/BLK
439-.8 PNK/BLK
440-.8 ORN
820-.8 PPL/WHT
440-.8 ORN
440-.8 ORN
444-.8 LT GRN/BLK
443-.8 LT GRN/WHT
442-.8 LT BLU/BLK
446-.8 LT BLU
423-.8 WHT
441-.8 LT BLU/WHT
424-.8 TAN/BLK
453-.8 BLK/RED
435-.8 GRA
430-.8 PPL/WHT
424-.8 TAN/BLK
453-.8 BLK/RED
435-.8 GRA
413-.8 TAN
450-.8 BLK/WHT
468-.8 DK GRN
467-.8 DK BLU
465-.8 DK GRN/WHT
120-.8 GRA
439-.8 PNK/BLK
440-.8 ORN
440-.8 ORN
422-.8 TAN/BLK
441-.8 LT BLU/WHT
430-.8 PPL/WHT
413-.8 TAN
450-.8 BLK/WHT
468-.8 DK GRN
467-.8 DK BLU
465-.8 DK GRN/WHT
120-.8 GRA
439-.8 PNK/BLK
440-.8 ORN
440-.8 ORN
GT101
12064740
COWL
444-.8 LT GRN/BLK
443-.8 LT GRN/WHT
820-.8 PPL/WHT
441-.8 LT BLU/WHT
422-.8 LT BLU/BLK
446-.8 LT BLU
423-.8 WHT
430-.8 PPL/WHT
424-.8 TAN/BLK
453-.8 BLK/RED
450-.8 BLK/WHT
820-.8 PPL/WHT
468-.8 DK GRN
467-.8 DK BLU
120-.8 GRA
413-.8 TAN
440-.8 ORN
441-.8 LT BLU/WHT
435-.8 GRA
422-.8 TAN/BLK
465-.8 DK GRN/WHT
440-.8 ORN
453-.8 BLK/RED
A/C
(SEE PAGE 94)
59-.8 DK GRN
C216
12047946
439-.8 PNK/BLK
442-.8 LT BLU/BLK
446-.8 LT BLU
551-.8 TAN/WHT
441-.8 LT BLU/WHT
443-.8 LT GRN/WHT
444-.8 LT GRN BLK
215
12045575
806-.8 PPL/WHT
419-.8 BRN/WHT
CRANK
SIGNAL
(SEE PAGE 55)
440-.8 ORN
434-.5 ORN/BLK
450-.8 BLK/WHT
450-.8 BLK/WHT
12064770
(L05 WITH MD8)
440-1.0 ORN
450-.8 BLK/WHT
551-.8 TAN/WHT
450-.8 BLK/WHT
12047663
C117
12047662
820-.8 PPL/WHT
RWAL DIODE
ARRAY MODULE
(SEE PAGE 116)
439-.8 PNK/BLK
ENG
120-1.0 GRA
120-1.0 GRA
422-.8 TAN/BLK
422-.8 TAN/BLK
C100
12020183
I/P
440-.8 ORN
120-.8 TAN/WHT
120-.8 GRA
(SUBURBAN ONLY)
FUEL PUMP
CYCLE RELAY
(SEE PAGE 78)
4551-.8 TAN/WHT
150-.8 BLK
REAR WHEEL
ANTILOCK BRAKES
(SEE PAGE 116)
450-.8 BLK/WHT
DRAC
450-.8 BLK/WHT
HOT FUEL
HANDLING MODULE
450-.8 BLK/WHT
S215
(SEE PAGE 17)
450-.8 BLK/WHT
419-.8 BRN/WHT
C200
120-1.0 TAN/WHT
120-1.0 GRA (SUBURBAN ONLY)
COWL
C100
12020184
422-.8 TAN/BLK
120-1.0 TAN/WHT
ENGINE
GROUND
G110
S215
ALDL
C203
12020043
SERVICE ENGINE
SOON LAMP
(SEE PAGE 105)
12064769
422-.8 TAN/BLK

ELECTRONIC CONTROL MODULE (ECM) A-61

OUTPUTS - GASOLINE ENGINE

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
432	.8	LT GRN	A1	MAP SENSOR
417	.8	DK BLU	A2	TP SENSOR
410	.8	YEL	A3	COOLANT TEMPERATURE SWITCH
			A4	NOT USED
			A5	NOT USED
451	.8	WHT/BLK	A6	ASSEMBLY LINE DIAGNOSTIC LINK CONNECTOR
			A7	NOT USED
121	.8	WHT	A8	ENGINE SPEED SENSOR
437	.8	BRN	A9	VSS FROM DRAC MODULE
488	.8	LT GRN	A10	ASSEMBLY LINE DIAGNOSTIC LINK CONNECTOR
			A11	NOT USED
416	.8	GRA	A12	TP SENSOR AND MAP SNESOR 5V REFERENCE
			B1	NOT USED
			B2	NOT USED
			B3	NOT USED
			B4	NOT USED
			B5	NOT USED
			B6	NOT USED
			B7	NOT USED
			B8	NOT USED
			B9	NOT USED
			B10	NOT USED
			B11	NOT USED
			B12	NOT USED

ELECTRONIC CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
452	.8	BLK	C1	SYSTEM GROUND
150	.8	BLK	C2	SYSTEM GROUND
			C3	NOT USED
			C4	NOT USED
*422	.8	TAN/BLK	C5	TORQUE CONVERTER CLUTCH
421	.8	DK BLU/WHT	C6	COLD ADVANCE/GLOW PLUG TIMER INHIBIT RELAY
			C7	NOT USED
			C8	NOT USED
			C9	NOT USED
435	.5	GRA	C10	EGR DIAGNOSTIC CONNECTOR
697	.8	LT BLU	C11	EGR DUMP SOLENOID
538	.8	DK GRN	C12	EPR VALVE SOLENOID
			C13	NOT USED
439	.8	PNK/BLK	C14	12V IGNITION FUSED
			C15	NOT USED
440	.8	ORN	C16	12V BATTERY FUSED
			D1	NOT USED
			D2	NOT USED
			D3	NOT USED
			D4	NOT USED
			D5	NOT USED
			D6	NOT USED
			D7	NOT USED
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
			D13	NOT USED
			D14	NOT USED
			D15	NOT USED
			D16	NOT USED

*AUTO TRANS ONLY

ELECTRONIC CONTROL MODULE CONNECTOR

RPO CODES
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C

HOT IN START OR RUN

HOT AT ALL TIMES

ECM 1 10 AMP

ECM B 10 AMP

439-.8 PNK/BLK

440-.8 ORN

ENGINE SPEED SENSOR

121 452

C175 12015792

A B

121 452

COOLANT TEMPERATURE SWITCH

CLOSES WHEN COOLANT REACHES 107°C(225°F)

452 410

C107 12078084

452-.8 BLK

121-.8 WHT

452-.8 BLK

410-.8 YEL

TP SENSOR

452 417 416

A B C

C134 12015793

452 417 416

MAP SENSOR

432 416 452

C135 12020403

A B C

432-.8 LT GRN

416-.8 GRA

S136

416-.8 GRA

410-.8 YEL

S137

452-.8 BLK

416-.8 GRA

452-.8 BLK

417-.8 DK BLU

416-.8 GRA

VSS

C141 12020600

822 821

A B

822-.8 LT GRN/BLK

821-.8 PPL/WHT

410-.8 YEL

452-.8 BLK

150-.8 BLK

S122 (SEE PAGE 18)

150-.8 BLK

440-.8 ORN

439-.8 PNK/BLK

150-.8 BLK

COWL

GT101 12064740

432-.8 LT GRN

416-.8 GRA

121-.8 WHT

417-.8 DK BLU

410-.8 YEL

821-.8 PPL/WHT

822-.8 LT GRN/BLK

452-.8 BLK

150-.8 BLK

416-.8 GRA

488-.8 LT GRN

437-.8 BRN

121-.8 WHT

451-.8 WHT/BLK

417-.8 DK BLU

432-.8 LT GRN

410-.8 YEL

C216 12047946

ECM CONNECTOR

C D

440-.8 ORN

439-.8 PNK/BLK

C215 12045575

488-.8 LT GRN

451-.8 WHT/BLK

822-.8 LT GRN/BLK

439-.8 PNK/BLK

821-.8 PPL/WHT

437-.8 BRN

440-.8 ORN

452-.8 BLK

150-.8 BLK

ENGINE

C100 12020183

I/P

C100 12020184

COWL

I/P CLUSTER CONNECTOR (SEE PAGE 103)

150-1.0 BLK

151-.8 BLK

ENGINE GROUND G110

488-.8 LT GRN

489-.8 YEL

439-.8 PNK/BLK

C226 12010488

CHECK ENGINE LAMP DRIVER CONNECTOR

151-.8 BLK

439-.8 PNK/BLK

12064770

C200

12064769

440-.8 ORN

ALDL C171 12020043

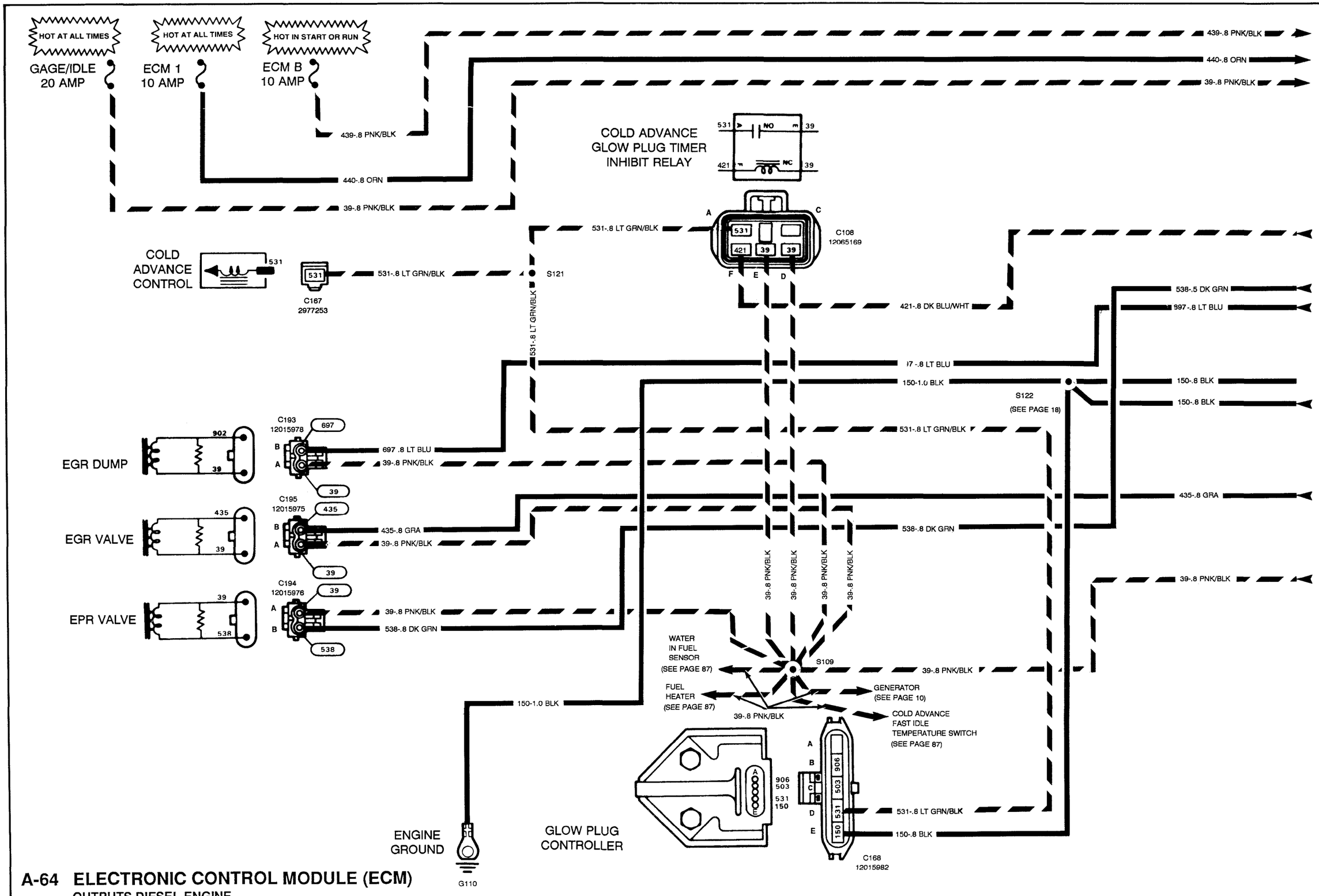
451-.8 WHT/BLK

437-.8 BRN

821-.8 PPL/WHT

822-.8 LT GRN/BLK

DRAC MODULE (SEE PAGE 75)



A-64 ELECTRONIC CONTROL MODULE (ECM)

OUTPUTS DIESEL ENGINE

439-.8 PNK/BLK
440-.8 ORN
39-.8 PNK/BLK
422-.8 TAN/BLK
820-.8 PPL/WHT
421-.8 DK BLU/WHT
538-.8 DK GRN
697-.8 LT BLU
435-.8 GRA
150-.8 BLK
150-.8 BLK
435-.8 GRA
39-.8 PNK/BLK
820-.8 PPL/WHT
150-.8 BLK
422-.8 TAN/BLK
151-.8 BLK
151-.8 BLK
422-.8 TAN/BLK
439-.8 PNK/BLK
440-.8 ORN
440-.8 ORN
439-.8 PNK/BLK
538-.8 DK GRN
697-.8 LT BLU
435-.8 GRA
421-.8 DK BLU/WHT
422-.8 TAN/BLK
150-.8 BLK
440-.8 ORN

TCC SOLENOID
(AUTO TRANS)

C169
12015390

S138

DIAGNOSTIC CONNECTOR
C176
12015256

COWL
GT101
12064760

C215
12045575

S202
(SEE PAGE 27)

12064770
C200
12064769

RWAL DIODE ARRAY MODULE
(SEE PAGE 116)

I/P

ENGINE

C100
12020183

C100
12020184

DRAC MODULE
(SEE PAGE 75)

ALDL
C206
12020043

C225
12010488

CHECK ENGINE LAMP DRIVER CONNECTOR

COWL

ELECTRONIC CONTROL MODULE (ECM) A-65

OUTPUTS DIESEL ENGINES

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
1223	.8	YEL/BLK	A2	SOLENOID B DRIVER
1222	.8	LT GRN	A3	SOLENOID A DRIVER
422	.8	TAN/BLK	A4	TCC DRIVER
			A5	NOT USED
			A6	NOT USED
419	.8	BRN/WHT	A7	SYSTEM CHECK LAMP
			A8	NOT USED
			A9	NOT USED
			A10	NOT USED
435	.8	GRA	A11	EVRV SOLENOID
420	.8	PPL	A12	BRAKE SIGNAL
			B1	NOT USED
1226	.8	RED	B2	PRESSURE SWITCH MANIFOLD C
1225	.8	DK BLU	B3	PRESSURE SWITCH MANIFOLD B
1224	.8	PNK	B4	PRESSURE SWITCH MANIFOLD A
1232	.8	LT BLU	B5	OUTPUT SPEED HIGH
1233	.8	DK GRN/YEL	B6	OUTPUT SPEED LOW
1229	.8	LT BLU/WHT	B7	FORCE MOTOR LOW
1228	.8	BLK/RED	B8	FORCE MOTOR HIGH
1230	.8	DK BLU/WHT	B9	INPUT SPEED HIGH
1231	.8	GRA/RED	B10	INPUT SPEED LOW
437	.8	BRN	B11	VSS (W/O RWAL) DRAC (W/ RWAL)
59	.8	DK GRN	B12	AIR CONDITIONING

POWERTRAIN CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
439	.8	PNK/BLK	C1	12V IGNITION FUSED
450	.8	BLK/WHT	C2	SYSTEM GROUND
551	.8	TAN/WHT	C3	SYSTEM GROUND
416	.8	GRA	C4	5V SENSOR REFERENCE
417	.8	DK BLU	C5	TPS
441	.8	LT BLU/WHT	C6	STEPPER COIL A HIGH
442	.8	LT BLU/BLK	C7	STEPPER COIL A LOW
444	.8	LT GRN/BLK	C8	STEPPER COIL B LOW
443	.8	LT GRN/WHT	C9	STEPPER COIL B HIGH
432	.8	LT GRN	C10	MAP
461	.8	ORN	C11	SERIAL DATA
			C12	NOT USED
413	.8	TAN	C13	OXYGEN SENSOR GROUND
412	.8	PPL	C14	OXYGEN SENSOR
468	.8	DK GRN	C15	INJECTOR B DRIVER
467	.8	DK BLU	C16	INJECTOR A DRIVER
440	.8	ORN	D1	12V BATTERY FUSED
455	.8	PPL	D2	SENSOR GROUND
452	.8	BLK	D3	SENSOR GROUND
474	.8	GRA	D4	5V SENSOR REFERENCE
496	.8	DK BLU	D5	KNOCK SIGNAL
451	.8	WHT/BLK	D6	ALDL
120	.8	TAN/WHT	D7	ELECTRIC FUEL PUMP FEED FUSED
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
423	.8	WHT	D11	HEI SPARK TIMING
424	.8	TAN/BLK	D12	HEI BYPASS
453	.8	BLK/RED	D13	DISTRIBUTOR REFERENCE LOW
430	.8	PPL/WHT	D14	DISTRIBUTOR REFERENCE HIGH
1227	.8	BLK/YEL	D15	TRANSMISSION TEMPERATURE
410	.8	YEL	D16	COOLANT TEMPERATURE

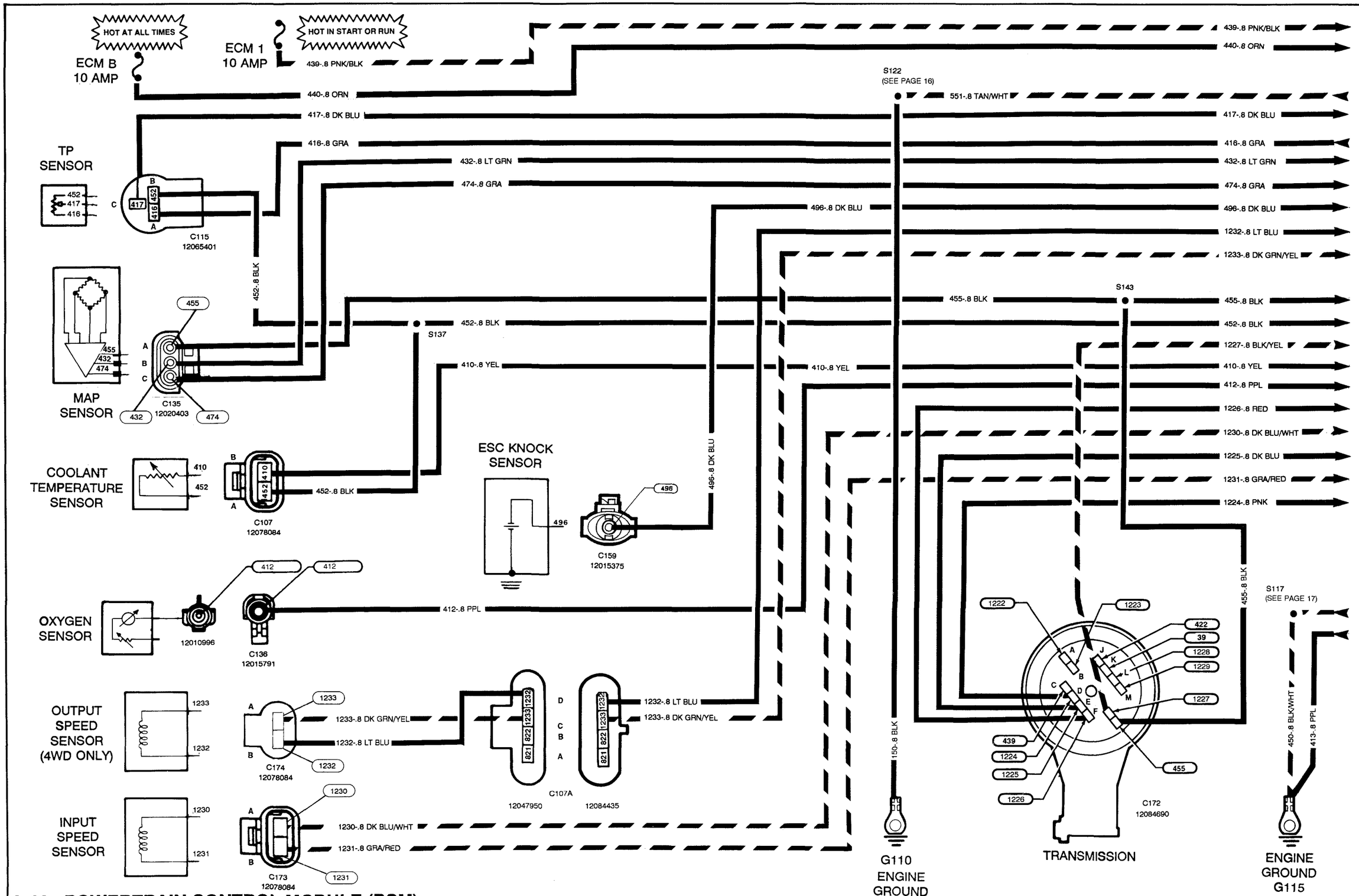
POWERTRAIN CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			A1	NOT USED
			A2	NOT USED
1224	.8	PNK	A3	PRESSURE SWITCH MANIFOLD A
1225	.8	DK BLU	A4	PRESSURE SWITCH MANIFOLD B
1226	.8	RED	A5	PRESSURE SWITCH MANIFOLD C
1223	.8	YEL/BLK	A6	SOLENOID B DRIVER
1222	.8	LT GRN	A7	SOLENOID A DRIVER
451	.8	WHT/BLK	A8	ALDL
			A9	NOT USED
			A10	NOT USED
			A11	NOT USED
440	.8	ORN	A12	12V BATTERY FUSED
			B1	NOT USED
			B2	NOT USED
59	.8	DK GRN	B3	AIR CONDITIONING
420	.8	PPL/BLK	B4	BRAKE SIGNAL
422	.8	TAN/BLK	B5	TCC
			B6	NOT USED
			B7	NOT USED
			B8	NOT USED
			B9	NOT USED
488	.8	LT GRN	B10	SERIAL DATA
1233	.8	DK GRN/YEL	B11	OUTPUT SPEED SENSOR LOW
1232	.8	LT BLU	B12	OUTPUT SPEED SENSOR HIGH

TRANSMISSION CONTROL MODULE CONNECTOR

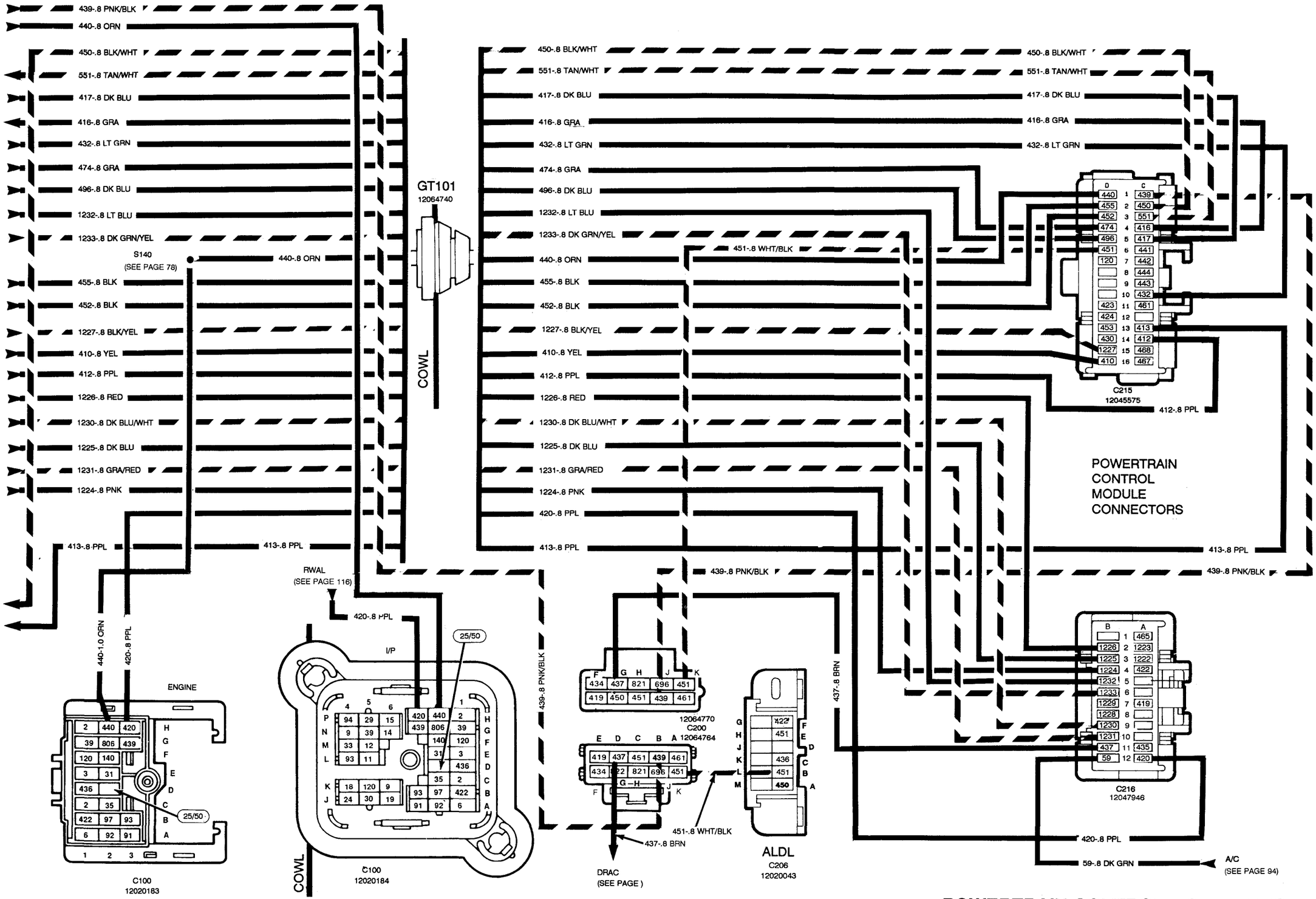
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
150	.8	BLK	C1	SYSTEM GROUND
150	.8	BLK	C2	SYSTEM GROUND
452	.8	BLK	C3	SENSOR GROUND
416	.8	GRA	C4	5V SENSOR REFERENCE
			C5	NOT USED
			C6	NOT USED
			C7	NOT USED
			C8	NOT USED
			C9	NOT USED
			C10	NOT USED
			C11	NOT USED
			C12	NOT USED
			C13	NOT USED
			C14	NOT USED
1228	.8	RED/BLK	C15	FORCE MOTOR HIGH
439	.8	PNK/BLK	C16	12V IGNITION FUSED
			D1	NOT USED
437	.8	BRN	D2	VSS
1231	.8	DK BLU/WHT	D3	INPUT SPEED LOW
1232	.8	LT BLU	D4	INPUT SPEED HIGH
			D5	NOT USED
121	.8	WHT	D6	ENGINE SPEED
452	.8	BLK	D7	SENSOR GROUND
417	.8	DK BLU	D8	TP SENSOR
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
1227	.8	BLK/YEL	D12	TRANSMISSION TEMPERATURE
432	.8	LT GRN	D13	MAP SENSOR
			D14	NOT USED
			D15	NOT USED
1229	.8	LT BLU/WHT	D16	FORCE MOTOR HIGH

TRANSMISSION CONTROL MODULE CONNECTOR



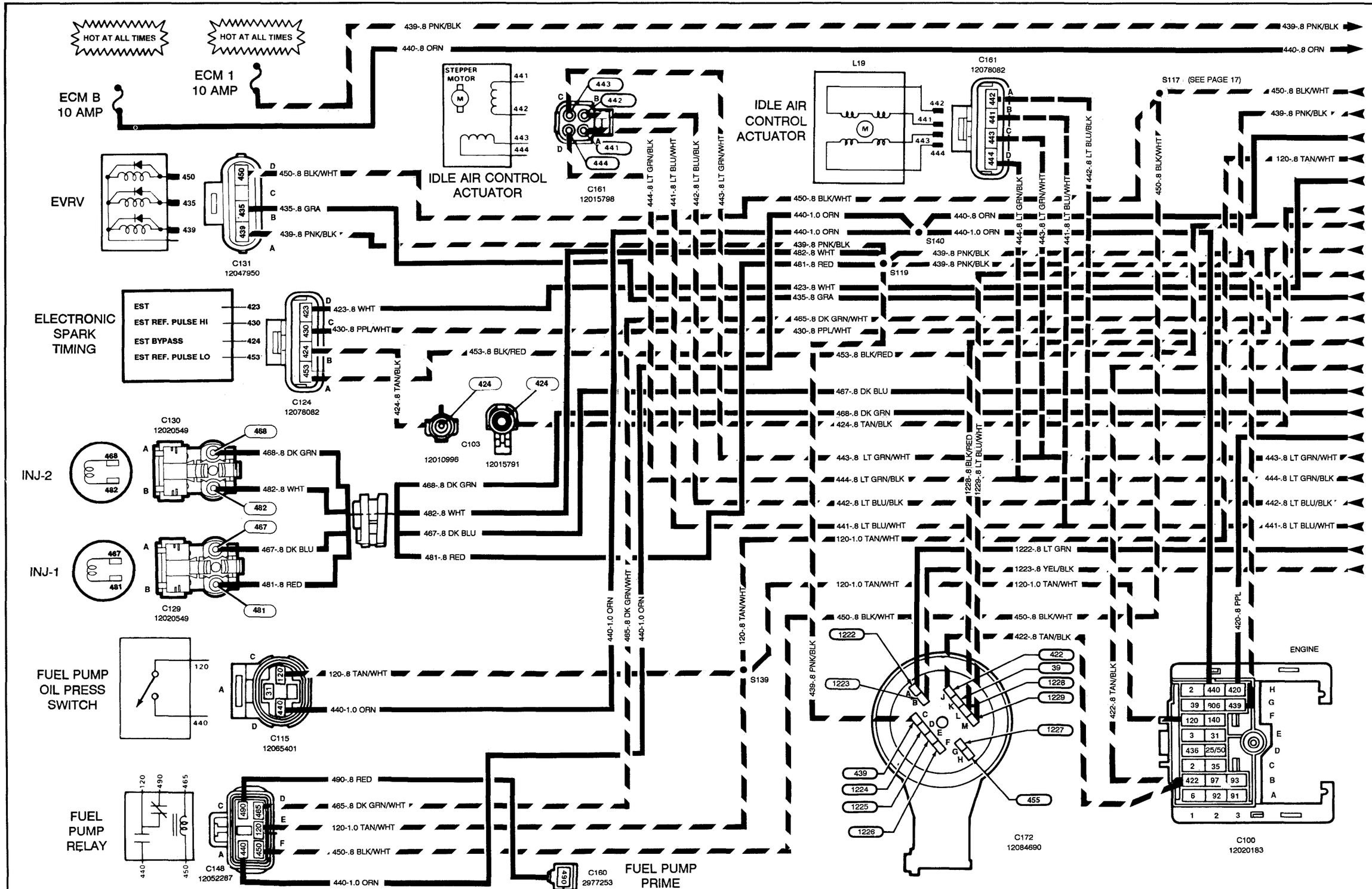
A-68 POWERTRAIN CONTROL MODULE (PCM)

INPUTS - GASOLINE ENGINE W/HD 4-SPD., AUTO TRANS W/OVERDRIVE



POWERTRAIN CONTROL MODULE (PCM) A-69

INPUTS - GASOLINE ENGINE W/HD 4-SPD., AUTO TRANS W/OVERDRIVE



A-70 POWERTRAIN CONTROL MODULE (PCM)

OUTPUTS - GASOLINE ENGINE W/HD 4-SPD., AUTO TRANS W/OVERDRIVE

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

439-.8 PNK/BLK
440-.8 ORN
S122
(SEE PAGE)
450-.8 BLK/WHT
439-.8 PNK/LK
440-.8 ORN
120-.8 TAN/WHT
423-.8 WHT
424-.8 TAN/BLK
453-.8 BLK/RED
430-.8 PPL/WHT
1229-.8 LT BLU/WHT
435-.8 GRA
465-.8 DK GRN/WHT
1228-.8 BLK/RED
422-.8 TAN/BLK
467-.8 DK BLU
468-.8 DK GRN
420-.8 PPL
443-.8 LT GRN/WHT
444-.8 LT GRN/BLK
442-.8 LT BLU/BLK
441-.8 LT BLU/WHT
1222-.8 LT GRN
1223-.8 YEL/BLK
150-.8 BLK

GT 101
12064740
COWL

551.8 TAN/WHT
450-.8 BLK/WHT
439-.8 PNK/BLK
440-.8 ORN
120-.8 TAN/WHT
423-.8 WHT
424-.8 TAN/BLK
453-.8 BLK/RED
430-.8 PPL/WHT
1229-.8 LT BLU/WHT
435-.8 GRA
1228-.8 BLK/RED
422-.8 TAN/BLK
467-.8 DK BLU
468-.8 DK GRN
420-.8 PPL
451-.8 WHT/BLK
443-.8 LT GRN/WHT
461-.8 ORN
444-.8 LT GRN/BLK
442-.8 LT BLU/BLK
441-.8 LT BLU/WHT
419-.8 BRN/WHT
1222-.8 LT GRN
1223-.8 YEL/BLK

C215
12045575
D: 440 455 452 474 496 451 120 — C: 439 450 444 416 417 441 442 444 443 432 461 — 423 424 453 430 1227 467 — 413 412 468 467

467-.8 DK BLU
468-.8 DK GRN
443-.8 LT GRN/WHT
461-.8 ORN
444-.8 LT GRN/BLK
442-.8 LT BLU/BLK
441-.8 LT BLU/WHT
419-.8 BRN/WHT
1222-.8 LT GRN
1233-.8 YEL/BLK
465-.8 DK GRN/WHT

POWERTRAIN CONTROL MODULE CONNECTORS

C216
12047946
B: 1226 1225 1224 1232 1233 1228 1228 1230 1231 437 59 — A: 465 1223 1222 422 419 435 420

420-.8 PPL
435-.8 GRA
422-.8 TAN/BLK

420-.8 PPL → RWAL (SEE PAGE 116)

CHECK ENGINE LAMP (SEE PAGE 104)

461-.5 ORN
419-.8 BRN/WHT

I/P
C100
12020184
P: 94 29 15 / N: 9 39 14 / M: 33 12 / L: 93 11
4 5 6 / 1
420 440 2 / 439 [illegible] [illegible] / 140 120 / 31 3 / 50 436 / 35 2 / 93 97 422 / 91 92 6
K: 18 120 9 / J: 24 30 19
H G F E D C A

12064770
C200
12064764
F G I: 696 437 822 821 451 / 450 33 419 439 461
E D C B A: 450 33 419 439 461 / 696 437 822 821 451
F G H I J

C206
12020043
G H J K L M: 422 / 461 / 436 / 451 / 450
D C B A

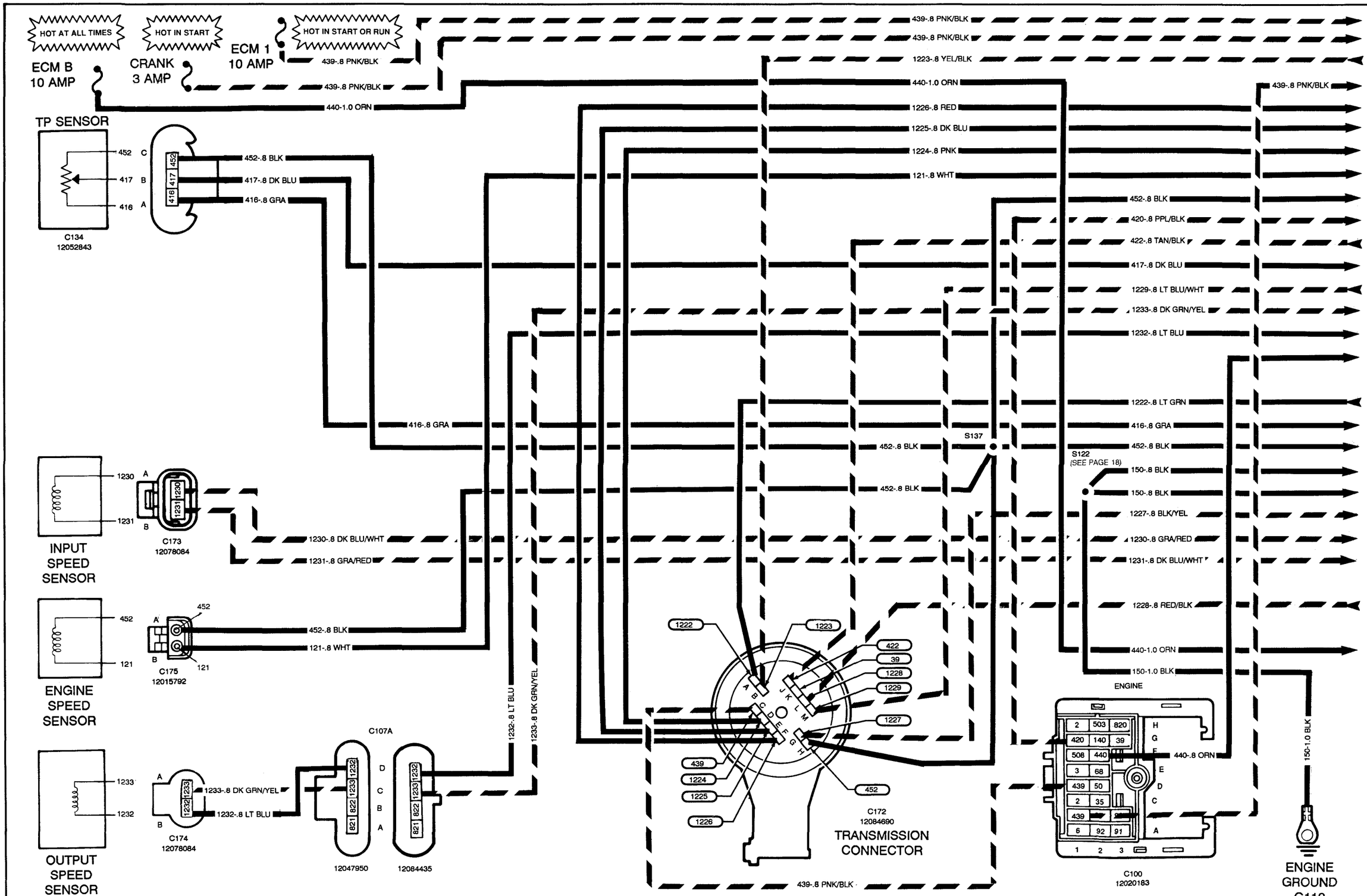
451-.8 WHT/BLK

ENGINE GROUND G110

COWL

POWERTRAIN CONTROL MODULE (PCM) A-71

OUTPUTS - GASOLINE ENGINE W/ HD 4-SPD., AUTO TRANS W/OVERDRIVE



A-72 TRANSMISSION CONTROL MODULE (TCM)

DIESEL ENGINE

RPO CODES
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J

439-.8 PNK/BLK
439-.8 PNK/BLK
1223-.8 YEL/BLK
439-.8 PNK/BLK
1226-.8 RED
1225-.8 DK BLU
1224-.8 PNK
121-.8 WHT
452-.8 BLK
420-.8 PPL/BLK
422-.8 TAN/BLK
417-.8 DK BLU
1229-.8 LT BLU/WHT
1233-.8 DK GRN/YEL
1232-.8 LT BLU
440-.8 ORN

1222-.8 LT GRN
416-.8 GRA
452-.8 BLK
150-.8 BLK
150-.8 BLK
1227-.8 BLK/YEL
1231-.8 DK BLU/WHT
1230-.8 GRA/RED
1228-.8 RED/BLK

GT101
12064740

1223-.8 YEL/BLK
439-.8 PNK/BLK
1226-.8 RED
1225-.8 DK BLU
1224-.8 PNK
121-.8 WHT
452-.8 BLK
420-.8 PPL/BLK
S214
422-.8 TAN/BLK
422-.8 TAN/BLK
417-.8 DK BLU
1229-.8 LT BLU/WHT
1233-.8 DK GRN/YEL
1232-.8 LT BLU
440-.8 ORN

1222-.8 LT GRN
416-.8 GRA
452-.8 BLK
150-.8 BLK
150-.8 BLK
1227-.8 BLK/YEL
1231-.8 DK BLU/WHT
1230-.8 GRA/RED
422-.8 TAN/BLK
1226-.8 RED/BLK

59-.8 DK GRN
A/C
(SEE PAGE 94)
1234-.5 GRA/RED
488-.8 LT GRA

C216
12059125

TCM
CONNECTORS

C215
12059126

ALDL

C206
12020043

437-.8 BRN
451-.8 WHT/BLK

SUBURBAN ONLY
12047663
C295
12047662
SUBURBAN ONLY
1234-.5 GRA/RED
SERVICE
TRANSMISSION
LAMP
(SEE PAGE 105)

12064770
C200
12064769
437-.8 BRN
DRAC
(SEE PAGE 75)

451-.8 WHT/BLK
422-.8 TAN/BLK
488-.8 LT GRN

150-1.0 BLK
150-.8 BLK
S201
(SEE PAGE 17)
I/P GROUND
G200

I/P
440-1.0 ORN
439-.8 PNK/BLK
439-.8 PNK/BLK
COWL
C100
12020184

TRANSMISSION CONTROL MODULE (TCM) A-73

DIESEL ENGINE

RPO CODES
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE

HOT IN START OR RUN

GAGE/IDLE
20 AMP

39-.8 PNK/BLK

GT101
12064740

422-.8 TAN/BLK

446-.8 LT BLU

820-.8 PPL/WHT

COWL

TCC
SOLENOID

CLOSES WITH
INCREASED
TEMPERATURE

(OPENS IN
4TH GEAR)

OPENS ON
4-3 SHIFT

C169
12010503

446
C
B
422
D
A
820

446
422
820

422-.8 TAN/BLK

820-.8 PPL/WHT

422-.8 TAN/BLK

446-.8 LT BLU

C216
12047946

ECM
CONNECTORS

B
440 1
120 2
453 3
4 435
430 5 419
6 439
485 7 422
59 8 461
9 451
434 10 437
11 452
12 450
A
465

422-.8 TAN/BLK

39-.8 PNK/BLK

BRAKE
SWITCH
(MD8 ONLY)

(CLOSES WHEN
BRAKES ARE APPLIED)

39

420

C292
12004267

B
A
39
420

420-.8 PPL

RWAL
MODULE
(SEE PAGE 116)

39-.8 PNK/BLK

S202
(SEE PAGE 27)

25 820

12047663

C217

A B
25 820

12047662

820-.8 PPL/WHT

RWAL
DIODE ARRAY
MODULE
(SEE PAGE 116)

D C
450 1
455 2 436
3 444
423 4 443
424 5 441
413 6 442
412 7 446
8
9 806
10 410
11 432
12
13 417
468 14 416
15
467 16 440

446-.8 LT BLU

C215
12045575

E D C B A
422
461
436
451
450
G H J K L M

C203
12020043

ALDL

422-.8 TAN/BLK

ENGINE

2 440 420
39 806 439
120 140
3 31
436 50
2 35
422 97 93
6 92 91
H
G
F
E
D
C
B
A
1 2 3

C100
12020183

I/P

4 5 6 3 2 1
P 94 29 15 420 440 2 H
N 9 39 14 439 806 39 G
M 33 12 140 120 F
L 93 11 31 3 E
50 436 D
35 2 C
K 18 120 9 93 97 422 B
J 24 30 19 91 92 6 A

C100
12020184

422-.8 TAN/BLK

COWL

A-74 TRANSMISSION CONVERTER CLUTCH (TCC) DETENT SOLENOID

5.7L V8 GASOLINE ENGINE

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C M20 - MAN TRANS, 4-SPD.

HOT IN RUN

HTR A/C
25 AMP

50-2.0 BRN

50-2.0 BRN → HTR A/C SELECTOR CONTROL SWITCH (SEE PAGE 94)

50-2.0 BRN → RWAL MODULE (SEE PAGE 116)

50-1.0 BRN

S211

ECM CONNECTOR

C216
12047946

B: 440 120 453 430 485 59 434
A: 465 435 419 439 422 461 451 437 452 450

I/P CLUSTER CONNECTOR
(SEE PAGE 103)

11/629

C203
12066261

1: 150 31 39 25 592 69 35 8
18: 824 39 419 33 30 237 15 14
9 10

419/488/1234

824-.8 LT BLU/BLK

DRAC

VEHICLE SPEED — 824
VEHICLE SPEED SENSOR INPUT — 821
VEHICLE SPEED TO ECM SIGNAL — 437
VEHICLE SPEED SIGNAL TO RWAL — 696
12 VOLT (IGNITION) — 50
GROUND — 150
VEHICLE SPEED SENSOR INPUT — 822
VEHICLE SPEED SIGNAL TO CRUISE CONTROL — 437

C289
12066130

824 821 437 696 50 150 822

C256
12066189

437

VSS

821
822

C141
12020600

822-.8 LT GRN/BLK
821-.8 PPL/WHT

GT101
12064740

822-.8 LT GRN/BLK
696-.8 WHT

437-.8 BRN

50-1.0 BRN

RWAL CONTROLLER
(SEE PAGE 116)

696-.8 WHT

(L05 WITH M20)

822-.8 LT GRN/BLK
821-.8 PPL/WHT

821-.8 PPL/WHT

K: 337 696 821 822 434
A: 461 437 451 450 419
F m

C200
12064770

(L05 WITH M20)

822-.8 LT GRN/BLK

I/P

S117
(SEE PAGE 17)

450-.8 BLK/WHT

450-1.0 BLK/WHT

A: 461 437 451 450 419
K: 337 696 821 822 434
E F

C200
12064764

S213

696-.8 WHT
696-.8 WHT
821-.8 PPL/WHT
822-.8 LT GRN/BLK

696-.8 WHT

450-.8 BLK/WHT

437-.8 BRN

CRUISE CONTROL
(SEE PAGE 124)

151-.8 BLK (LH6 ONLY)
150-.8 BLK (LL4 ONLY)

S215 (SEE PAGE 17)

ENG

C100
12020183

H: 2 140 420
G: 822 812 439
F: 120 140
E: 3 31
D: 436 50
C: 2 35
B: 422 97 93
A: 6 92 91
1 2 3

S122
(SEE PAGE 116)

150-.8 BLK

150-.8 BLK

ENGINE GROUND G110

C100
12020184

P: 94 29 15
N: 9 39 14
M: 33 12
L: 93 11
K: 18 120 9
J: 24 30 19
4 5 6 3 2 1
120 440 2
439 821 822
140 120
31 3
50 436
35 2
93 97 422
91 92 6
H G F E D C A

150-.8 BLK (LH6 ONLY)

151-.8 BLK (LH6 ONLY)

COWL

450-1.0 BLK/WHT

ENGINE GROUND G115

G: 422
F: 696 461
E
D
J
K: 436
L: 451
C
M B A

450/151

450-.8 BLK/WHT

ALDL CONNECTOR
C206
12020043

450-.8 BLK/WHT

FUEL PUMP CYCLE RELAY
(SEE PAGE 79)

DIGITAL RATIO ADAPTER CONTROLLER (DRAC) MODULE A-75

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

GAGE/IDLE 20 AMP

HOT IN START OR RUN

ECM 1 10 AMP

HOT IN START OR RUN

439-.8 PNK/BLK

39-.8 PNK/BLK

439-.8 PNK/BLK

IGNITION MODULE

PICKUP COIL

DISTRIBUTOR REFERENCE HI 423

EST 430

BYPASS 424

DISTRIBUTOR REFERENCE LO 453

D

A

C124
12078082

423-.8 WHT

430-.8 PPL/WHT

424-.8 TAN/WHT

453-.8 PPL/WHT

COWL

GT101
12064740

439-.8 PNK/BLK

453-.8 BLK/RED

430-.8 PPL/WHT

423-.8 WHT

424-.8 TAN/WHT

C216
12047946

ECM CONNECTORS

C215
12045575

424-.8 TAN/WHT

424

C133

424

12015791

12010996

121

3

IGNITION COIL

B

121

3

C109
12040705

121-.8 WHT

3-3.0 PNK

TACHOMETER

121-.8 WHT

3-3.0 PNK

DISTRIBUTOR

481-.8 RED

INJECTOR #1
(SEE PAGE 60)

482-.8 WHT

INJECTOR #2
(SEE PAGE 60)

C114
02977253

GENERATOR
(SEE PAGE 10)

39-.8 PNK/BLK

ENGINE

439-.8 PNK/BLK

EVRV SOLENOID (L19)
(SEE PAGE 60)

439-.8 PNK/BLK

AIR SWITCH SOLENOID
(UTILITY ONLY)
(SEE PAGE 60)

439-.8 PNK/BLK

EGR SOLENOID
(L05 ONLY)
(SEE PAGE 60)

439-.8 PNK/BLK

HYBRID FUNCTION ESC
(SEE PAGE 58)

S119

C100
12020183

439-.8 PNK/BLK

39-.8 PNK/BLK

39-.8 PNK/BLK

I/P

COWL

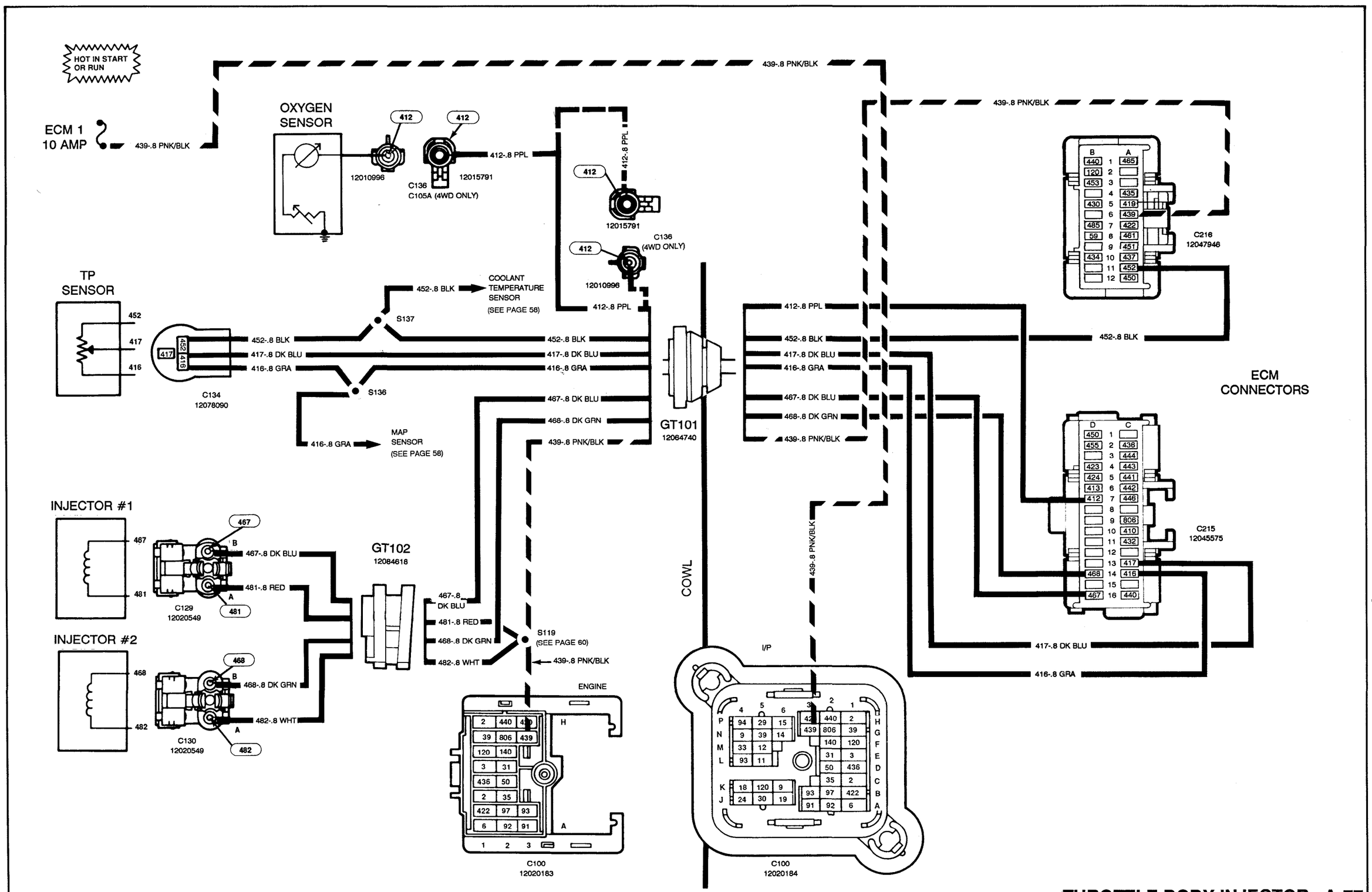
S202
(SEE PAGE 27)

39-.8 PNK/BLK

3-3.0 PNK

IGNITION SWITCH
(SEE PAGE 11)

C100
12020184


HOT IN START OR RUN
ECM 1
10 AMP
439-.8 PNK/BLK
OXYGEN SENSOR
412
412
12010996
C136
C105A (4WD ONLY)
12015791
412-.8 PPL
412-.8 PPL
412
12015791
412
C136
(4WD ONLY)
12010996
TP SENSOR
452
417
416
452-.8 BLK
COOLANT TEMPERATURE SENSOR
(SEE PAGE 58)
S137
417-.8 DK BLU
416-.8 GRA
C134
12078090
S136
416-.8 GRA
MAP SENSOR
(SEE PAGE 58)
467-.8 DK BLU
468-.8 DK GRN
439-.8 PNK/BLK
GT101
12064740
412-.8 PPL
452-.8 BLK
417-.8 DK BLU
416-.8 GRA
467-.8 DK BLU
468-.8 DK GRN
439-.8 PNK/BLK
439-.8 PNK/BLK
C216
12047946
452-.8 BLK
ECM CONNECTORS
C215
12045575
417-.8 DK BLU
416-.8 GRA
INJECTOR #1
467
481
467-.8 DK BLU
481-.8 RED
C129
12020549
INJECTOR #2
468
482
468-.8 DK GRN
482-.8 WHT
C130
12020549
GT102
12084618
467-.8 DK BLU
481-.8 RED
468-.8 DK GRN
482-.8 WHT
S119
(SEE PAGE 60)
439-.8 PNK/BLK
ENGINE
C100
12020183
COWL
439-.8 PNK/BLK
I/P
C100
12020184

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

HOT AT ALL TIMES

HOT IN START OR RUN

ECM B 10 AMP

GAGE/IDLE 20 AMP

440-1.0 ORN

39-.8 PNK/BLK

S202 (SEE PAGE 27)

ECM CONNECTOR

C216 12047946

440-.8 ORN

120-.8 GRA

465-.8 DK GRN/WHT

441-.8 LT BLU/WHT

443-.8 LT GRN/WHT

442-.8 LT BLU/BLK

444-.8 LT GRN/BLK

FUEL PUMP CYCLE RELAY (HOT FUEL HANDLING MODULE)

IGNITION SW FUEL PUMP FUSED GROUND

39

120

450

12045688

C194

12047886

39-.8 PNK/BLK

120-.8 GRA (SUBURBAN ONLY)

120-1.0 TAN/WHT

450-.8 BLK/WHT

ALDL (SEE PAGE 59)

450-.8 BLK/WHT

S215 (SEE PAGE 79)

440-1.0 ORN

DRAC (SEE PAGE 75)

450-.8 BLK/WHT

IDLER AIR CONTROL FRAME (L19)

C161 12078082

IDLE AIR CONTROL ACTUATOR (L05)

STEPPER MOTOR

C161 12015796

GT100 12064740

551-.8 TAN/WHT

413-.8 TAN

C215 12045575

COWL

ENGINE

C100 12020183

I/P

C100 12020184

120-1.0 TAN/WHT

30-.5 PNK

FUEL GAGE (SEE PAGE 108)

120-1.0 TAN/WHT

FUEL PUMP OIL PRESSURE SWITCH

C115 12065401

120-1.0 GRA

S139

465-.8 DK GRN/WHT

120-.8 GRA

551-.8 TAN/WHT

413-.8 TAN

440-.8 ORN

ECM CONNECTOR

120-1.0 GRA

440-1.0 ORN

450-.8 BLK/WHT

FUEL PUMP PRIME

C160 2977253

490-.8 RED

S140

S117

RWAL (SEE PAGE 116)

450-.8 BLK/WHT

FUEL PUMP RELAY

C148 12052287

450-.8 BLK/WHT

ENGINE GROUND G110

150-.8 BLK

ENGINE GROUND G115

ELECTRIC FUEL PUMP FUEL GAGE SENDING UNIT

C409 12059473

120-1.0 TAN/WHT

30-.8 PNK

C101 12020099

BLU OR PPL OR LT GRN

FRAME GROUND G409

A-78 FUEL CONTROL AND IDLE AIR CONTROL

GASOLINE ENGINE

HOT IN START OR RUN

GAGE/IDLE 20 AMP

39-.8 PNK/BLK

(FUEL PUMP CYCLE RELAY HOT FUEL HANDLING MODULE)

GROUND — 450
IGNITION SWITCH — 39
FUEL PUMP FUSED — 120

39 / 450 / 120

12045688

C294

12047886

S117
(SEE PAGE 17)

GT
101
12064740

COWL

450-.8 BLK/WHT

120-.8 GRA

450-.8 BLK/WHT

S139

120-1.0 GRA → FUEL PUMP OIL PRESS SWITCH (SEE PAGE 60)

120-1.0 GRA → FUEL PUMP RELAY (SEE PAGE 60)

GENERATOR (SEE PAGE 10)

450-.8 BLK/WHT

120-.8 GRA

39-.8 PNK/BLK

C200

12064770

12064769

ECM CONNECTOR
C216

12047946

S215

450-.8 BLK/WHT → ALDL (SEE PAGE 59)

450-.8 BLK/WHT → DRAC (SEE PAGE 75)

450-.8 BLK/WHT → PARK/NEUTRAL SWITCH (SEE PAGE 59)

120-.8 TAN/WHT (120-.8 GRA SUBURBAN ONLY)

S202
(SEE PAGE 27)

ELECTRIC FUEL PUMP FUEL GAGE SENDING UNIT

FRAME GROUND G409

12015792

C409
12059473

WIRE COLOR CAN BE BLU, PPL OR LT GRN

ENGINE

C100
12020183

I/P

C100
12020184

50/130

50/25

120-.8 TAN/WHT

120-.8 GRA (SUBURBAN ONLY)

120-1.0 TAN/WHT

30-.8 PNK

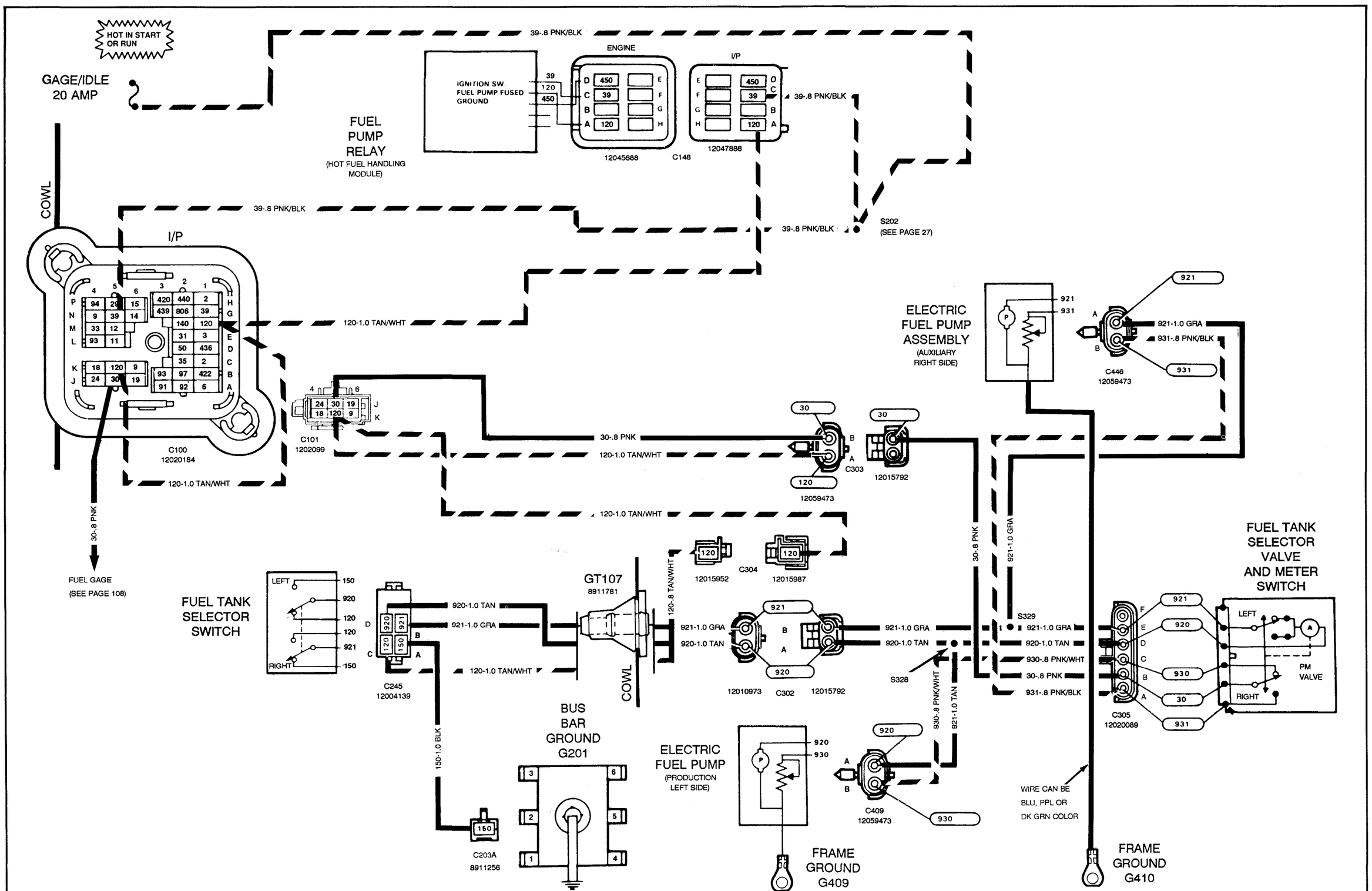
30-.5 PNK → FUEL GAGE (SEE PAGE 108)

G110
ENGINE GROUND

C101
12020094

HOT FUEL HANDLING A-79

GASOLINE ENGINES



A-80 AUXILIARY FUEL TANK AND FUEL TANK SELECTOR SWITCH

GASOLINE ENGINE

HOT IN START OR RUN

C231
12004888

139

IGN
20 AMP

IGN
20 AMP

FUSE BLOCK
12103404

FRONT

REAR

139-.8 PNK

30-.8 PNK

ENGINE

C100
12020183

I/P

C100
12020184

COWL

30-.5 PNK

FUEL GAGE
(SEE PAGE 108)

C102A
6288440
8911220

30-.8 PNK

C305
12020089

RIGHT TANK
AUXILIARY

C446
6288440

FUEL TANK
SELECTOR VALVE
AND METER SWITCH

S326

54-.8 DK GRN

53-.8 LT GRN

S327

GT107
08911781

C106A
6288424
2984855

COWL

C232
12004101

FUEL TANK
SELECTOR SWITCH

931-.8 PNK/BLK

930-.8 PNK/WHT

LEFT TANK
(PRODUCTION)

C409
6288440

BLU OR PPL OR LT GRN

150-.8 BLK

G201
BUS
BAR
GROUND

C297
12004267

G410
FRAME
GROUND

G409
FRAME
GROUND

AUXILIARY FUEL TANK AND FUEL TANK SELECTOR SWITCH A-81

DIESEL ENGINE

CIRCUIT OPERATION

The heating of the Glow Plugs is controlled by the Glow Plug Relay in the Glow Plug Controller. Battery voltage is applied to the relay contacts through the RED wire from the Junction Block. The relay is operated by a Solid-State Controller. The Controller responds to engine temperature and also to an Ignition Switch Start input.

When the Ignition Switch is turned to RUN, battery voltage is applied to the Enable Input of the Controller. The Glow Plug Relay within the Controller will be energized for approximately five seconds during which it applies voltage to the Glow Plugs and WAIT Indicator. After the initial time period the relay will de-energized for five seconds then will cycle ON/OFF for approximately 10 seconds.

When the Glow Plug Controller receives the Start Input, the Glow Plugs and WAIT Indicator will cycle ON/OFF after the Ignition Switch is returned to RUN.

After approximately 25 seconds the Controller will open the Glow Plug Relay and the heating of the plugs stops. If the engine is restarted while the engine is at normal operating temperature, the ECM will keep the relay contacts open so that no plug heating takes place.

DIAGNOSIS -- GLOW PLUGS

PRELIMINARY CHECKS:

A check of the glow plug system should be performed before diagnostic procedures.

With engine below normal operating temperature, turn ignition switch to RUN. The WAIT indicator should light. After approximately 10 seconds, the WAIT indicator must begin to flash for an additional 10 seconds and then go out.

Turn ignition switch to OFF and then momentarily to START and return to RUN position. The WAIT indicator should flash for approximately 25 seconds and then go out.

With engine at normal temperature, turn ignition switch to RUN. The WAIT indicator should not flash for an 6.2L engine, but should flash for an 6.2L HD engine.

WAIT INDICATOR DOES NOT FLASH OR FLASHES FOR THE INCORRECT AMOUNT OF TIME WHEN ENGINE IS BELOW NORMAL OPERATING TEMPERATURE

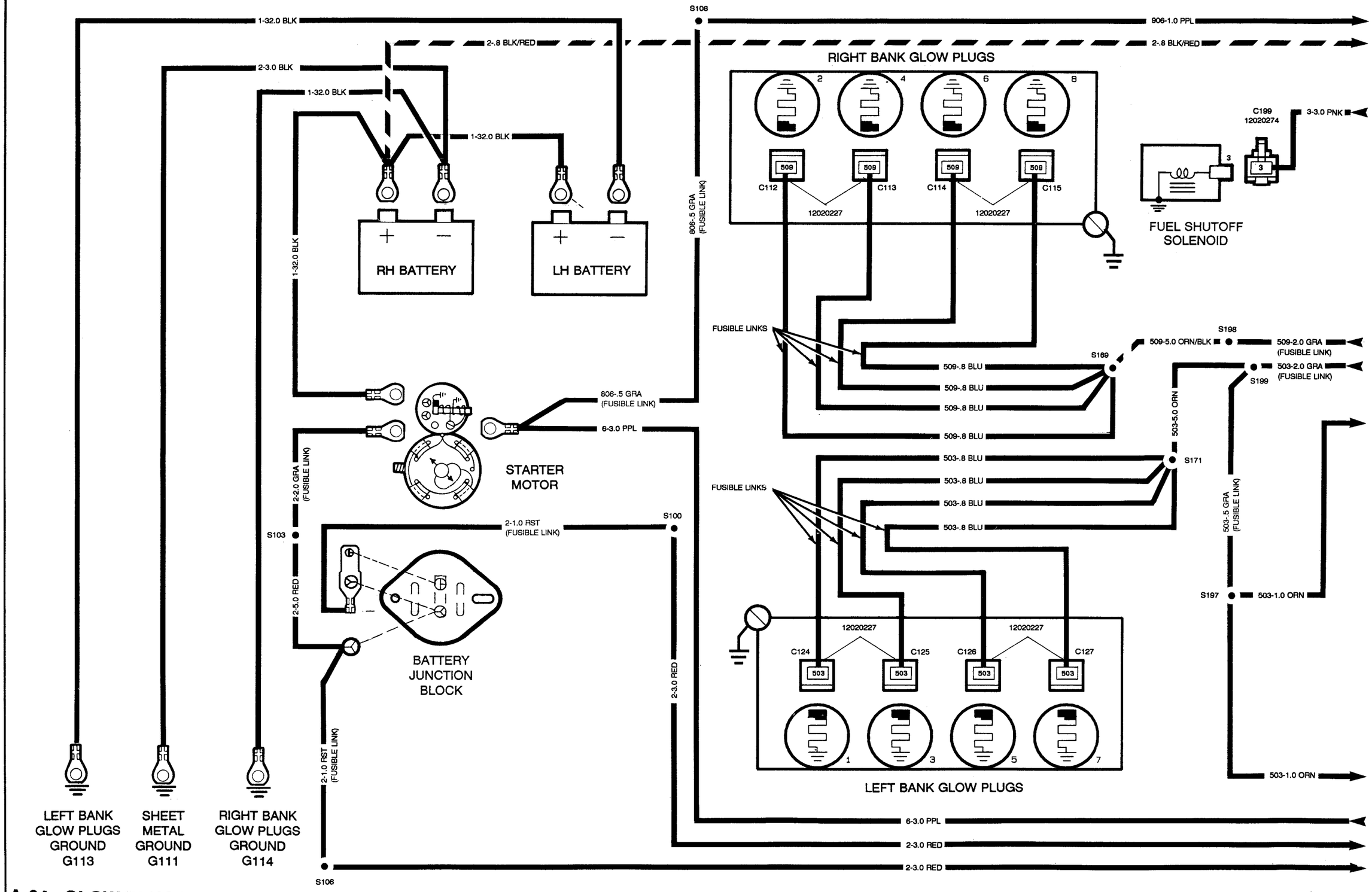
TEST	RESULT	ACTION
NOTE: For 6.2L V8 diesel engines, ground DK BLU/WHT (421) wire at cold advance glow plug inhibit relay connector C108. 1. Place ignition switch in RUN position. Connect test lamp from RED (2) wire at glow plug controller to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire and fusible link from glow plug controller to junction block.
2. Connect a test lamp from LT GRN/BLK (531) wire for 6.2L or PNK (3) wire for 6.2L HD engines at glow plug controller connector C168 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 3 for 6.2L engines. For 6.2L HD engines, LOCATE and REPAIR open in PNK (3) wire from glow plug controller to ignition switch.
3. Connect a test lamp from each PNK/BLK (39) wire at cold advance glow plug inhibit relay connector C108 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	CHECK condition of GAGE/IDLE fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from inhibit relay to fuse block.
4. Connect a 10 amp fused jumper from DK BLU/WHT (421) wire at cold advance glow plug inhibit relay connector C167 to ground. Connect test lamp from LT GRN/BLK (531) wire at inhibit relay connector C108 to ground.	Test lamp lights.	CHECK for open in DK BLU/WHT (421) wire from inhibit relay to ECM. If wire is good, problem is with ECM. Refer to Section 6E in the 1991 R/V, P Light Truck Service Manual.
	Test lamp does not light.	CHECK for open in LT GRN/BLK (531) wire. If good, REPLACE cold advance glow plug inhibit relay.
5. Connect a test lamp from LT GRN/BLK (531) wire for 6.2L engines or PNK (3) wire for 6.2L HD engines to BLK (150) wire at glow plug controller connector C168.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from glow plug controller to ground terminal G110.

WAIT INDICATOR DOES NOT FLASH OR FLASHES FOR THE INCORRECT AMOUNT OF TIME WHEN ENGINE IS BELOW NORMAL OPERATING TEMPERATURE

TEST	RESULT	ACTION
6. Connect test lamp from PPL/WHT (806) wire at glow plug controller connector C168 to ground. Move ignition switch to START position.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in PPL/WHT (806) wire from glow plug controller to starter motor.
7. Place ignition switch to OFF position. Connect test lamp from ORN (503) wires at glow plug controller to ground.	Test lamp lights.	REPLACE glow plug controller.
	Test lamp does not light.	GO to step 8.
8. Disconnect glow plug controller connector C168. Using a positive polarity ohmmeter, check continuity between ORN (503) or (509) wires and BLK (150) wires.	Reading of 2 ohms or less.	GO step 9.
	Reading greater than 2 ohms.	LOCATE and REPAIR open in GRA (503)and (509) wires from glow plug controller connector C117 to glow plug harness splices S198 and S199.
9. Connect glow plug controller connector. Connect test lamp from ORN (503) wires at glow plug controller to connector C168 to ground. Turn ignition switch momentarily to START and then release to RUN position.	Test lamp cycles on and off for approximately 25 seconds then goes off.	GO to step 11.
	Test lamp does not light or cycles for the incorrect time.	REPLACE glow plug controller.
10. Remove all connectors from glow plugs. Connect one lead of test lamp to battery voltage and other lead to each glow plug.	Test lamp lights for all glow plugs.	LOCATE and REPAIR open in ORN (503) or ORN/BLK (509) wires and fusible links from glow plug to controller.
	Test lamp does not light for one or more glow plugs.	REPLACE glow plug(s) where test lamp did not light.

WAIT INDICATOR STAYS ON OR FLASHES WHEN ENGINE IS AT NORMAL OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN POSITION (6.2L DIESEL ENGINE ONLY)

TEST	RESULT	ACTION
1. Connect test lamp from each PNK/BLK (39) wire at cold advance glow plug inhibit relay connector C108 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of GAGE/IDLE fuse. If fuse is good, LOCATE and REPAIR open from inhibit relay to fuse block.
2. Connect a fused jumper from DK BLU/WHT (421) wire at cold advance glow plug inhibit relay connector C108 to ground. Connect test lamp from LT GRN/BLK (531) wire at inhibit relay connector C108 to ground.	Test lamp lights.	CHECK for open in DK BLU/WHT (421) wire from inhibit relay to ECM. If wire is good, problem is with ECM. Refer to Section 6E in 1991 R/V, P Light Truck Service Manual.
	Test lamp does not light.	REPLACE cold advance glow plug inhibit relay.


S108
1-32.0 BLK
2-.8 BLK/RED
906-1.0 PPL
2-.8 BLK/RED
RIGHT BANK GLOW PLUGS
2
4
6
8
C199
12020274
3-3.0 PNK
3
3
509
509
509
509
C112
C113
C114
C115
12020227
12020227
FUEL SHUTOFF
SOLENOID
2-3.0 BLK
1-32.0 BLK
1-32.0 BLK
1-32.0 BLK
RH BATTERY
LH BATTERY
806-.5 GRA
(FUSIBLE LINK)
FUSIBLE LINKS
S198
509-5.0 ORN/BLK
509-2.0 GRA
(FUSIBLE LINK)
S169
509-.8 BLU
509-.8 BLU
509-.8 BLU
509-.8 BLU
S199
503-2.0 GRA
(FUSIBLE LINK)
503-5.0 ORN
806-.5 GRA
(FUSIBLE LINK)
6-3.0 PPL
503-.8 BLU
S171
503-.8 BLU
503-.8 BLU
503-.8 BLU
503-.8 BLU
FUSIBLE LINKS
2-2.0 GRA
(FUSIBLE LINK)
STARTER
MOTOR
S103
2-1.0 RST
(FUSIBLE LINK)
S100
503-.5 GRA
(FUSIBLE LINK)
S197
503-1.0 ORN
2-5.0 RED
BATTERY
JUNCTION
BLOCK
12020227
12020227
C124
C125
C126
C127
503
503
503
503
1
3
5
7
LEFT BANK GLOW PLUGS
2-3.0 RED
503-1.0 ORN
2-1.0 RST
(FUSIBLE LINK)
6-3.0 PPL
2-3.0 RED
2-3.0 RED
S106
LEFT BANK
GLOW PLUGS
GROUND
G113
SHEET
METAL
GROUND
G111
RIGHT BANK
GLOW PLUGS
GROUND
G114

RPO CODES
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C M20 - MAN TRANS, 4 SPD.

806-1.0 PPL/WHT

2-.8 BLK/RED

GENERATOR (SEE PAGE 12)

S107

2-3.0 BLU (FUSIBLE LINK)

3-3.0 PNK

2-8.0 RED

C119

GLOW PLUG CONTROLLER

509-2.0 GRA (FUSIBLE LINK)

503-2.0 GRA (FUSIBLE LINK)

C117
2965931

503-1.0 ORN

S121 (LH6)

531-.8 LT GRN/BLK → COLD ADVANCE GLOW PLUG TIMER INHIBIT RELAY (LH6) (SEE PAGE 64)

531-.8 LT GRN/BLK → COLD ADVANCE CONTROL (LH6) (SEE PAGE 64)

531-.8 LT ORN/BLK

3-3.0 PNK

A
B
C
D
E
806
503
150
3/531

C168
12015982

S130 (LL4)

3-3.0 PNK (LL4 ONLY)

150-.8 BLK

S122 (SEE PAGE 18)

GLOW PLUG WAIT LAMP

C222
8905381

503-1.0 BRN

150-.8 BLK

S201 (SEE PAGE 19)

6-3.0 PPL → CLUTCH START SWITCH (M20 ONLY) (SEE PAGE 56)

2-3.0 RED

C209
6294641

A 300 C
2 36
B D 33

C210
12010966

6 5 A
B 2 D
3 4 E
C

6-3.0 PPL

S207

3-3.0 PNK

2-3.0 RED

2-3.0 RED

S206

2-3.0 RED

150-1.0 BRN

IGNITION SWITCH

3 4 33
2 2 36
6 5 300

START
RUN
OFF
LOCK
ACC

ENGINE

2	503	31	H
420	140	39	
508	440		
3	68		
50	25		
2	35		
439	97	93	
6	92	91	A

2 3

12020183
C100

503-1.0 ORN

2-3.0 RED

2-3.0 RED

6-3.0 PPL

3-3.0 PNK

150-1.0 BLK

I/P

	4	5	6	3	2	1	
P	94	29	15	31	503	2	H
N	9	39	14	39	140	820	G
M	33	12			440	508	F
L	93	11			68	3	E
					25	50	D
K	18	120	9		35	2	C
J	24	30	19	93	97	439	B
				91	92	6	A

12020184
C100

COWL

3-3.0 PNK

6-3.0 PPL

2-3.0 RED

3-3.0 PNK

3-3.0 PNK

2-3.0 RED

S208

2-3.0 RED

2-3.0 RED

FUSE BLOCK (SEE PAGE 12)

ENGINE GROUND
G110

I/P GROUND
G200

CIRCUIT OPERATION

The Diesel Fuel Filter System combines five functions into a single package:

1. Heats diesel fuel to prevent wax-plugging of the filter.
2. Combines very small droplets of water in the fuel into larger drops and separates the water from the fuel.
3. Filters the diesel fuel.
4. Detects the presence of excess water in the fuel and
5. Provides a means to drain the water it has separated.

The Fuel Filter Assembly consists of the Fuel Heater, the Water In Fuel Sensor and a Filter. The Filter contains the "coalescer" (the device that combines small droplets of water into larger ones) and the filter/separator.

An electric fuel pump delivers diesel fuel from the tank to the fuel filter. As fuel enters the filter, it passes first through the Fuel Heater. The heater contains a thermostatic switch. The switch opens or closes, to turn the heater off or on, depending on the temperature of the fuel. When the switch is closed, battery voltage is applied to the heater form the GAGE/IDLE Fuse.

The fuel then passes through the Primary and Secondary filters. Next the fuel flows through the water coalescer. Here the droplets of water in the fuel are combined into larger drops, the drops fall to the water reservoir in the filter. When the fuel flows from the Fuel Filter Assembly to the injection pump, it is clean and free of water.

The Solid-State Water In Fuel Sensor applies voltage to a Probe. When the Probe touches water, the Module closes a switch. This completes a circuit to ground to light the SERVICE FUEL FILTER indicator.

A time delay circuit in the Water In Fuel Module grounds the indicator bulb briefly to test the bulb each time the system is turned on.

DIAGNOSIS —DIESEL ENGINE FUEL CONTROLS

PRELIMINARY CHECKS:

CHECK condition of GAGE/IDLE fuse. If fuse is blown, LOCATE and REPAIR source of overload, then REPLACE fuse. If fuse is in good condition, use the following diagnostic procedures.

FUEL HEATER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect fuel heater connector C196. Place ignition switch to RUN position. Connect a voltmeter from PNK/BLK (39) wire at fuel heater connector C196 to ground.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in PNK/BLK (39) wire from fuel heater to fuse block.
2. Connect a voltmeter from PNK/BLK (39) wire to BLK (150) wire at fuel heater connector C196.	Battery voltage.	REPLACE fuel filter.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from fuel sensor to ground terminal G110.

SERVICE FUEL FILTER INDICATOR DOES NOT LIGHT BRIEFLY WITH IGNITION SWITCH TURNED TO RUN

TEST	RESULT	ACTION
1. Disconnect water in fuel sensor connector C197 and place ignition switch in RUN. Connect a voltmeter from PNK/BLK (39) wire at fuel sensor connector C197 to ground.	Battery voltage.	GO to step 2.
	No voltage reading.	LOCATE and REPAIR open in PNK/BLK (39) wire from fuel sensor to fuse block.
2. Connect a voltmeter from PNK/BLK (39) to BLK (150) wire at water in fuel sensor connector C197.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from fuel sensor to ground terminal G110.
3. Connect a voltmeter from YEL (508) wire at water in fuel sensor connector C197 to ground.	Battery voltage.	REPLACE fuel filter.
	No voltage.	CHECK Service Fuel Filter lamp. If lamp is good, LOCATE and REPAIR open in YEL (508) wire.

SERVICE FUEL FILTER INDICATOR LIGHTS WITH NO WATER IN FUEL

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Disconnect water in fuel sensor connector C197.	SERVICE FUEL FILTER indicator stays on.	LOCATE and REPAIR short to ground in YEL (508) wire.
	SERVICE FUEL FILTER indicator goes out.	REPLACE fuel filter.

HOT IN START OR RUN

GAGE/IDLE
20 AMP

COLD
ADVANCE
FAST IDLE
TEMPERATURE
SWITCH

39
534
A
B
C102A
2977373

534
FAST IDLE
SOLENOID
C100A

534
12004267

534-.8 DK GRN

39-.8 PNK/BLK
EGR DUMP VALVE
(SEE PAGE 64)

EGR VALVE
(SEE PAGE 64)
39-.8 PNK/BLK

EPR VALVE
(SEE PAGE 64)
39-.8 PNK/BLK

39-.8 PNK/BLK

COLD ADVANCE TIMER
RELAY (SEE PAGE 64)

39-.8 PNK/BLK
GENERATOR
(SEE PAGE 12)

S122
(SEE PAGE 18)

150-1.0 BLK

39-.8 PNK/BLK

39-.8 PNK/BLK

S202
(SEE PAGE 27)

39-.8 PNK/BLK

WATER
IN FUEL
SENSOR

39
508
150
SOLID STATE

508
39
A
B
C
150
C103A
12015793

39-.8 PNK/BLK
508-.8 YEL
150-.8 BLK

150
39
FUEL
HEATER

A
150
B
39
C
C104A
12015793

150-.8 BLK
39-.8 PNK/BLK

508-.8 YEL

3
FUEL SHUTOFF
SOLENOID

3
C199
12020274

3-3.0 PNK

ENGINE
GROUND
G110

ENGINE

2	503	3
820	140	39
508	140	
3	31	
50	25	
2	35	
150	97	93
6	92	91

H G F E D C B A
1 2 3
C100
12020183

I/P

	4	5	6	3	2	1	
P	94	29	15	31	503	2	H
N	9	39	14	39			
M	33	12		420	508		
L	93	11		31	3		
				25	50		D
K	18	120	9	35	2		C
J	24	30	19	93	97	150	B
				91	92	6	A

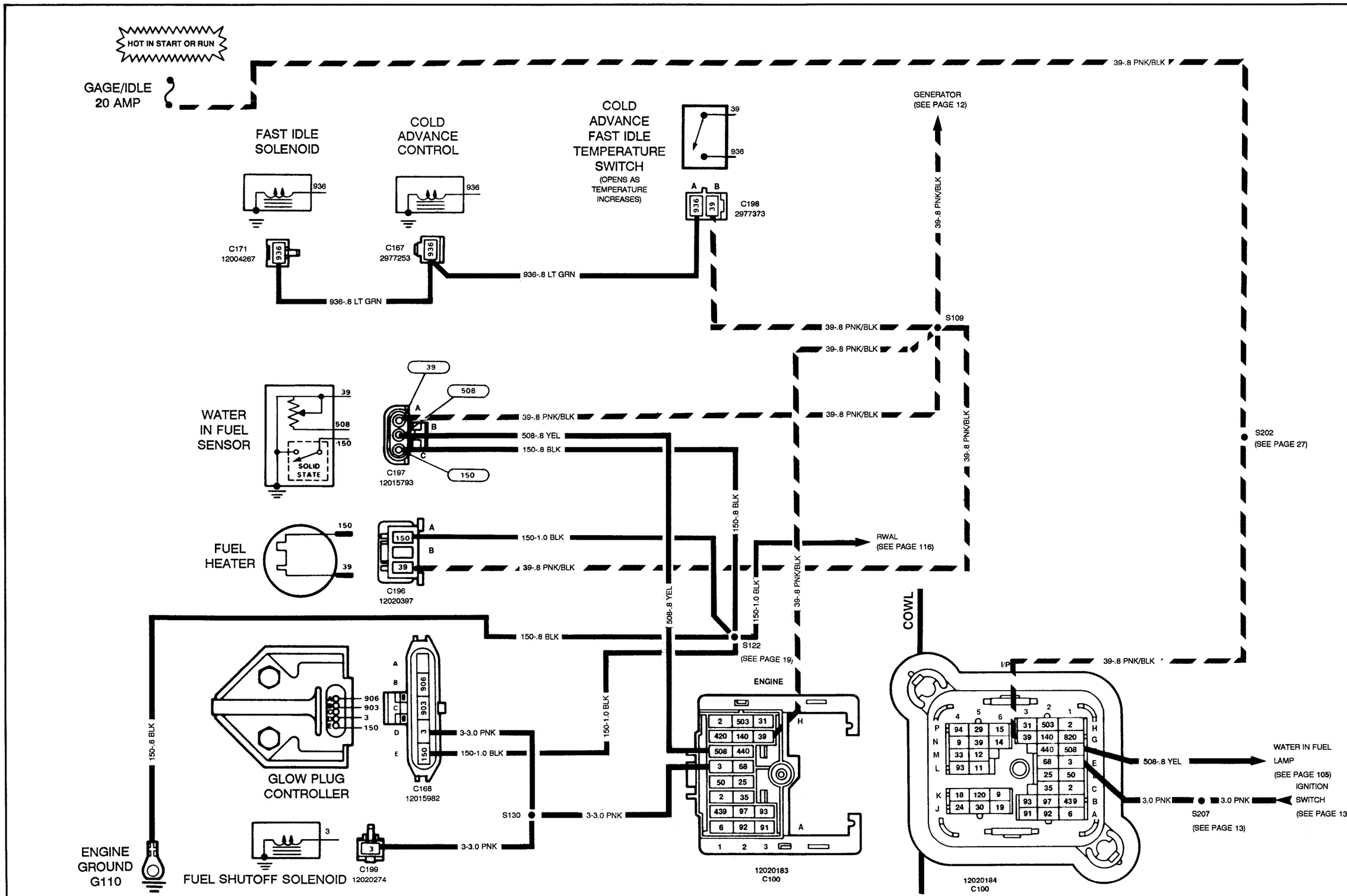
C100
12020184

508-.8 YEL

WATER IN FUEL
LAMP (SEE PAGE 105)

DIESEL ENGINE FUEL CONTROLS A-87

6.2L V8 DIESEL ENGINE



A-88 DIESEL ENGINE FUEL CONTROLS

6.2L HD V8 DIESEL ENGINE

CIRCUIT OPERATION

Battery voltage is applied to the Auxiliary Cooling Fan Relay at all times by the RED (2) wire and by the PNK/BLK (39) wire through the GAGE/IDLE fuse, when the Ignition Switch is in RUN or START. When the Auxiliary Cooling Fan Temperature Switch closes at 107°C (225°F), the DK GRN (935) wire is grounded and the Auxiliary Cooling Fan Relay energizes. Battery voltage is applied across the Auxiliary Cooling Fan Motor and the Auxiliary Cooling Fan runs.

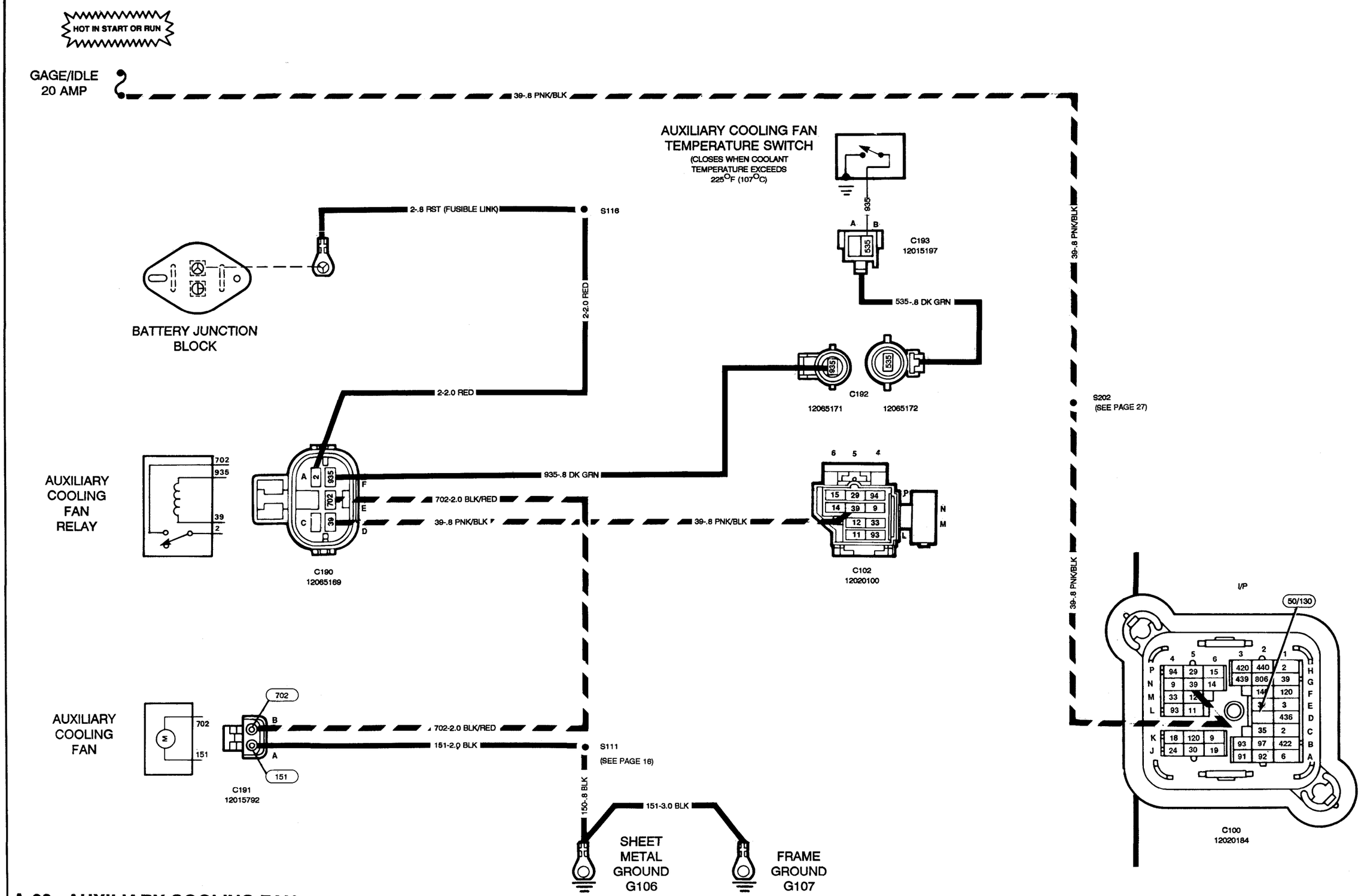
DIAGNOSIS -- AUXILIARY COOLING FAN

COOLING FAN DOES NOT RUN

TEST	RESULT	ACTION
1. Disconnect auxiliary cooling fan temperature switch connector C170. Connect a fused jumper from DK GRN (535) wire at auxiliary cooling fan temperature switch connector C170 to ground.	Auxiliary cooling fan does not run.	GO to step 2.
	Auxiliary cooling fan runs.	REPLACE auxiliary cooling fan temperature switch.
2. Disconnect auxiliary cooling fan relay connector C190. Connect test lamp from PNK/BLK (39) wire at auxiliary cooling fan relay connector C190 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of fuse (GAGE/IDLE) and/or LOCATE and REPAIR open in PNK/BLK (39) wire from auxiliary cooling fan relay to fuse block.
3. Connect fused jumper from DK GRN (535) wire at auxiliary cooling fan temperature switch connector C170 to ground. Connect a test lamp from PNK/BLK (39) wire to DK GRN (935) wire at auxiliary cooling fan relay connector C190.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (535) wire.
4. Connect a test lamp from RED (2) wire at auxiliary cooling fan relay connector C190 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire and fusible link.
5. Connect a 30 amp fused jumper from RED (2) wire to BLK/RED (702) wire at auxiliary cooling fan relay connector C190.	Auxiliary cooling fan does not run.	GO to step 6.
	Auxiliary cooling fan runs.	REPLACE auxiliary cooling fan relay.
6. Leave 30 amp fused jumper connector. Disconnect auxiliary cooling fan connector C191. Connect a test lamp from BLK/RED (702) at auxiliary cooling fan connector C191 to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/RED (702) wires from auxiliary cooling fan to auxiliary cooling fan relay.
7. Connect a test lamp from BLK/RED (702) to BLK (151) wires at auxiliary cooling fan connector C191.	Test lamp lights.	REPLACE auxiliary cooling fan.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (151) wire from auxiliary cooling fan to ground terminal G106.

COOLING FAN RUNS CONTINUOUSLY

TEST	RESULT	ACTION
1. Place ignition switch in RUN position and with engine coolant temperature below 107°C (225°F), disconnect auxiliary cooling fan temperature switch connector C170.	Auxiliary cooling fan runs.	GO to step 2.
	Auxiliary cooling fan does no run.	REPLACE auxiliary cooling fan temperature switch.
2. Disconnect auxiliary cooling fan relay connector C190. Connect a test lamp from PNK/BLK (39) to DK GRN (535) wires at auxiliary cooling fan relay connector C190.	Test lamp lights.	CHECK for short in DK GRN (535) wire from fan relay to auxiliary cooling fan temperature switch.
	Test lamp does not light.	REPLACE auxiliary cooling fan relay.



A-90 AUXILIARY COOLING FAN

7.4L V8 GASOLINE ENGINE

CIRCUIT OPERATION

BLOWER CONTROLS

Battery voltage is applied at all times to the HI Blower Relay, through the RED (2) wire. When the Blower Switch is in the OFF, LO or MED positions, the HI Blower Relay is de-energized.

With the Ignition Switch is in the RUN and ACC position, voltage is supplied to the Selector Control by way of the BRN (50) wire through the HTR A/C Fuse. This voltage is supplied, through the Selector Control, and then through the BRN/WHT (64) wire to the Blower Switch and Resistor Block. At the Resistor Block, voltage is dropped through three resistors. This reduced voltage flows through the DK BLU (101) wire to the de-energized, HI blower relay. Since the Hi blower relay is de-energized, circuits 101 and 65 are connected through the relay. This reduced voltage flows through the PPL (65) wire to the Blower Motor and the Blower Motor will run at a slow speed.

When the Blower Switch is turned to LO, voltage flows through the Blower Switch, to the Resistor Block, through the TAN (63) wire. Voltage flows through two resistors, through the DK BLU (101) wire, through the contacts of the de-energized HI Blower Relay to the Blower Motor by way of the PPL (65) wire.

When the Blower Switch is turned to MED, voltage flows through the Blower Switch, to the Resistor Block, through the LT BLU (72) wire. Voltage flows through one resistor, through the DK BLU (101) wire, through the contacts of the de-energized HI Blower Relay to the Blower Motor by way of the PPL (65) wire.

When the Blower is turn to HI, voltage flows through the Blower Switch, to the HI Blower Relay, through the ORN (52) wire. This voltage flows through the coil of the HI Blower Relay. With the HI Blower Relay energized, battery voltage flows through the RED (2) wire, through the contacts of the energized HI Blower Relay to the Blower Motor by way of the PPL (65) wire. This allows battery voltage to power the Blower Motor.

COMPRESSOR CONTROLS

The Compressor for the A/C System is driven by the engine by means of a belt drive and the A/C Compressor Clutch. The Clutch allows the Compressor to be disengaged when the A/C is not required.

Operation of the Compressor depends on the particular A/C Mode selected at the Heater and A/C Controller. With A/C ON selected, battery voltage flows through the Selector Control to the Evaporator Pressure Control Switch by way of the LT GRN (66) wire. Voltage flows through the normally closed contacts of the Evaporator Pressure Control Switch to the A/C Compressor Clutch. The coil is energized and the A/C Compressor Clutch engages.

If the refrigerant pressure drops to a point which may cause icing of the evaporator, the Evaporator Pressure Control Switch opens, de-energizing the A/C Compressor Clutch. When the refrigerant pressure rises to a point where cooling is required again, the Evaporator Pressure Control Switch closes to re-energize the A/C Compressor Clutch.

The A/C Compressor Clutch Diode is connected across the terminals of the A/C Compressor Clutch. Whenever the clutch is de-energized, the magnetic field around it collapses, generating an induced voltage in the clutch coil. The Diode provides a path for the current resulting from the induced voltage so that other circuit components are not damaged by it.

REAR BLOWER CONTROL

Battery voltage is supplied to the Blower Switch through the AUX HTR A/C Fuse and the BRN (50) wire. When the Blower Switch is turned to LO, voltage flows through the Blower Switch to the Resistors by way of the YEL (51) wire. Voltage flows through two resistors, through the ORN (52) wire to the Rear Blower Motor.

When the Blower Switch is turned to HI, voltage flows through the Blower Switch directly to the Rear Blower Motor through the ORN (52) wire.

DIAGNOSIS -- AIR CONDITIONING

PRELIMINARY CHECKS:

Outside temperature must be above 16°C (60°F) in order to properly diagnose system.

A/C COMPRESSOR CLUTCH DOES NOT ENGAGE

TEST	RESULT	ACTION
1. Place ignition switch in RUN, selector control in MAX. Connect voltmeter from BRN (50) wire at selector control connector C233 to ground.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in BRN (50) wire from selector control to fuse block. CHECK HTR/AC fuse.
2. Disconnect A/C compressor control switch connector C178 and place selector control to MAX. Connect a fused jumper between LT GRN (66) wire and DK GRN (59) wire at A/C compressor control switch connector C178.	A/C clutch engages.	GO to step 4.
	A/C clutch does not engage.	CHECK for open A/C compressor control switch. If A/C compressor control switch is open and refrigerant pressure is normal, REPLACE A/C compressor control switch.
3. Connect voltmeter from DK GRN (59) wire at compressor clutch connector C165 to ground.	Battery voltage.	GO to step 5.
	No voltage.	LOCATE and REPAIR open in DK GRN (59) wire from A/C compressor clutch to A/C compressor control switch.
4. Connect voltmeter from DK GRN (59) wire to BLK (150) wire at A/C compressor clutch connector C165.	Battery voltage.	REPLACE A/C compressor clutch.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from A/C compressor clutch to ground terminal G110.

BLOWER MOTOR DOES NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Place ignition switch to RUN, selector control to VENT and blower switch to HI. Disconnect blower motor connector C180. Connect voltmeter from PPL (65) wire at blower connector C180 to ground terminal G117.	Battery voltage.	REPLACE blower motor.
	No voltage.	GO to step 2.
2. Connect voltmeter from BRN (50) wire at selector control connector C233 to ground.	Battery voltage.	GO to step 3.
	No voltage.	CHECK condition of HTR/AC fuse. If fuse is good, LOCATE and REPAIR open in BRN (50) wire from selector control connector C233 to fuse block.
3. Connect voltmeter from BRN/WHT (64) wire at blower switch connector C234 to ground.	Battery voltage.	GO to step 4.
	No voltage.	LOCATE and REPAIR open in BRN/WHT (64) wire between blower switch connector C234 and selector switch connector C233. If no open is found, REPLACE selector control.
4. Connect voltmeter from ORN (52) wire at HI blower relay connector C177 to ground.	Battery voltage.	GO to step 5.
	No voltage.	LOCATE and REPAIR open in ORN (52) wire between HI blower relay connector C177 and blower switch connector C234. If no open is found, REPLACE blower switch.
5. Disconnect HI blower relay connector C177. Connect voltmeter from ORN (52) wire at HI blower relay connector C177 to BLK (150) wire.	Battery voltage.	GO to step 6.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire between HI blower relay connector C177 and ground terminal G115.
6. Connect HI blower relay connector C177. Connect voltmeter from PPL (65) wire at HI blower relay connector to ground.	Battery voltage.	LOCATE and REPAIR open in PPL (65) wire between HI blower relay connector C177 and blower motor connector C180.
	No voltage.	REPLACE HI blower relay.

BLOWER MOTOR DOES NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition switch to RUN, selector control to VENT and blower switch to HI. Connect voltmeter from ORN (52) wire at HI blower relay connector C177 to ground.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in ORN (52) wire from HI blower relay to blower switch.
2. Connect voltmeter to RED (2) wire at HI blower relay connector C177 to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in RED (2) wire or fusible link.
3. Connect voltmeter to RED (2) wire at HI blower relay connector C177 to BLK (150) wire.	Battery voltage.	REPLACE HI blower relay.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire to ground G115.

BLOWER MOTOR DOES NOT OPERATE IN MED

TEST	RESULT	ACTION
1. Place blower switch to MED. Connect voltmeter to LT BLU (72) wire at blower switch connector C234 to ground.	Battery voltage.	GO to step 2.
	No voltage.	REPLACE blower switch.
2. Connect voltmeter to LT BLU (72) wire at blower resistor connector C179 to ground.	Battery voltage.	REPLACE blower resistor.
	No voltage.	LOCATE and REPAIR open in LT BLU (72) wire between blower resistor and blower switch.

BLOWER MOTOR DOES NOT OPERATE IN LO

TEST	RESULT	ACTION
1. Place blower switch to LO. Connect voltmeter to TAN (63) wire at blower switch connector C234 to ground.	Battery voltage.	GO to step 2.
	No voltage.	REPLACE blower switch.
2. Connect voltmeter to TAN (63) wire at blower resistor connector C179 to ground.	Battery voltage.	REPLACE blower resistor.
	No voltage.	LOCATE and REPAIR open in TAN (63) wire between blower resistor and blower switch.

DIAGNOSIS CHART -- AIR CONDITIONING, REAR

PRELIMINARY CHECKS:

CHECK condition of AUX HTR A/C fuse. If fuse is blown, LOCATE and REPAIR source of overload, then REPLACE fuse. If fuse is in good condition, use following diagnostic procedures.

BLOWER MOTOR DOES NOT OPERATE AT ALL

TEST	RESULT	ACTION
1. Disconnect blower motor connector C410. Place ignition switch in RUN position. Connect a test lamp from PPL (52) wire at blower motor connector C410 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect a test lamp from PPL (52) wire to BLK (2) wire at blower motor connector C410.	Test lamp lights.	REPLACE blower motor.
	Test lamp does not light.	LOCATE and REPAIR open in ground BLK (2) wire between blower motor and ground terminal G411.
3. Connect a test lamp from BRN (50) wire at blower switch connector C281 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire between blower switch connector C281 and fuse block connector C283. If no open is found, CHECK AUX HTR A/C fuse.
4. Place blower switch in LO or HI. Connect a test lamp from blower switch connector C281 at wire that applies to position of switch to ground. LO is YEL (51) wire and HI is ORN (52) wire.	Test lamp does not light.	REPLACE blower switch.
	Test lamp lights.	LOCATE and REPAIR open in wires to blower motor.

BLOWER MOTOR DOES NOT OPERATE IN HI BUT ONLY IN LO

TEST	RESULT	ACTION
1. Connect a test lamp from ORN (52) wire at blower switch connector C281 to ground.	Test lamp lights.	LOCATE and REPAIR open in ORN (52) wire between blower switch connector C281 and splice S220.
	Test lamp does not light.	REPLACE blower switch.

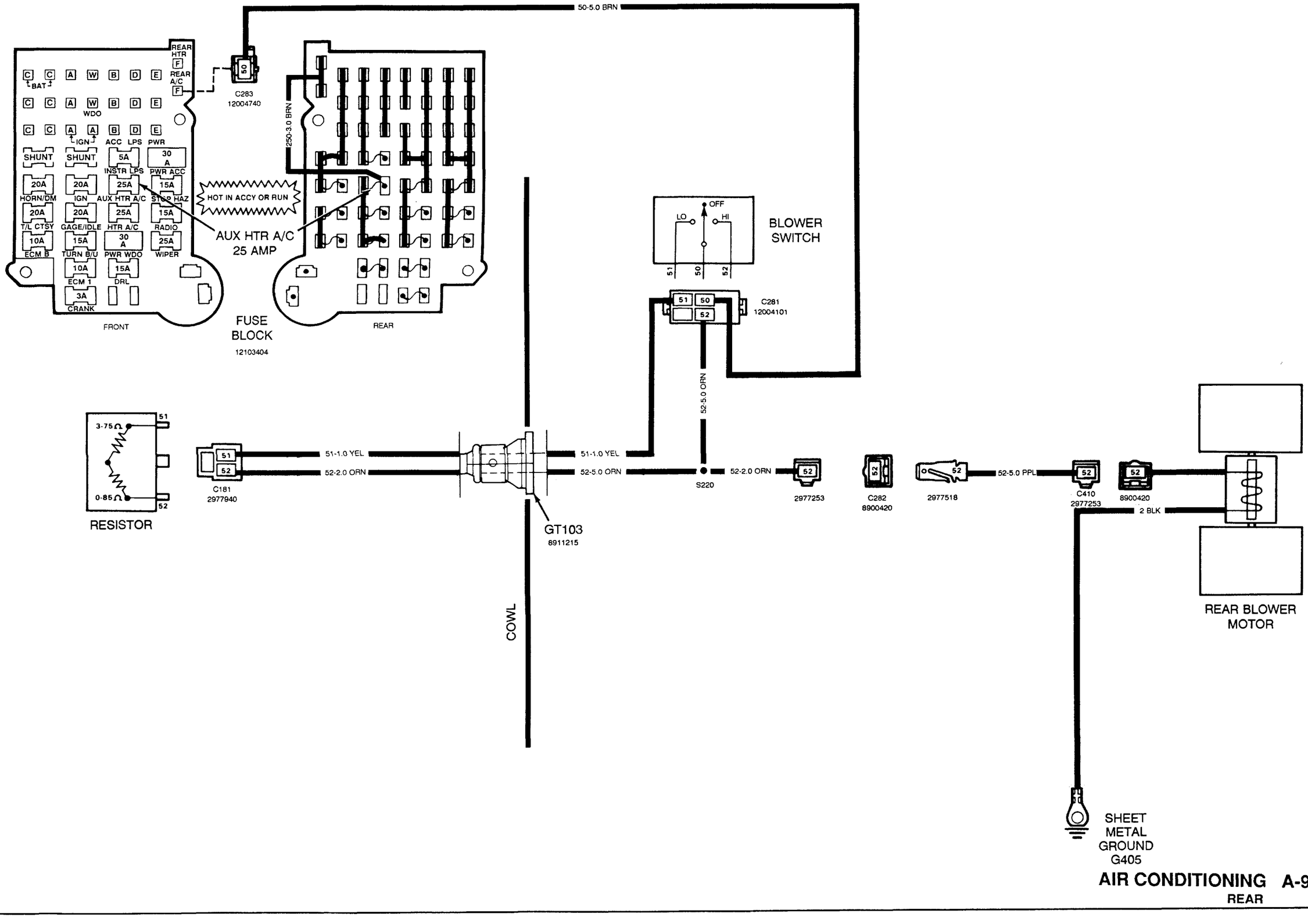
BLOWER MOTOR DOES NOT OPERATE IN LO BUT ONLY IN HI

TEST	RESULT	ACTION
1. Place blower switch in LO position. Connect a test lamp from YEL (51) LO wire at blower motor switch connector C281 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect a test lamp from YEL (51) LO wire at blower resistor connector C181 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (51) wire from blower resistor to blower switch.
3. Connect a test lamp from ORN (52) wire at blower resistor connector C181 to ground.	Test lamp lights.	LOCATE and REPAIR open in ORN (52) wire between blower resistor connector C181 and splice S220. If no open is found, REPLACE resistor.

RPO CODES

LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE

HOT IN RUN
HTR A/C
25 AMP
HOT AT ALL TIMES
BATTERY
JUNCTION
BLOCK
2-5.0 RED
BLK
BLOWER
MOTOR
C180
2977976
COWL
52-.8 ORN
65-5.0 PPL
150-.8 BLK
101-1.0 DK BLU
HI BLOWER
RELAY
C177
2984911
C179
2984570
RESISTOR
64-1.0 BRN/WHT
63-1.0 TAN
72-1.0 LT BLU
52-.8 ORN
GT103
8911212
63-1.0 TAN
52-.8 ORN
72-1.0 LT BLU
64-1.0 BRN/WHT
66-.8 LT GRN
50-2.0 BRN
BLOWER
SWITCH
C234
12004067
OFF
LO
MED
HI
M1
M2
64-1.0 BRN/WHT
C233
8917372
OFF
MAX
NORM
BILEV
VENT
HEAT
DEFROST
SELECTOR CONTROL
50-1.0 BRN
12025952
C235
12015987
DRAC
MODULE
(SEE PAGE 75)
RWAL BRAKES
(SEE PAGE 116)
S211
50-2.0 BRN
50-1.0 BRN
ECM
CONNECTOR
C216
12047948
66-1.0 LT GRN
59-1.0 DK GRN
A/C COMPRESSOR
CONTROL SWITCH
(CLOSED WHEN
PRESSURE EXCEEDS
41 PSI)
C178
12004827
12015987
C162
12015952
59-1.0 DK GRN
(LL4 WITH
MT1 ONLY)
S120
59-1.0 DK GRN
50-1.0 DK GRN
59-.8 DK GRN
COMPRESSOR
C165
150-1.0 BLK
2973407
899
12034599
DIODE
(LL4 WITH MT1
ONLY)
C182
12015952
12015987
MOUNTING
BRACKET
GROUND
G116
GROUND
G115
SHEET
METAL
GROUND
G117


50-5.0 BRN
REAR HTR
REAR A/C
C283
12004740
250-3.0 BRN
BAT
WDO
IGN
ACC
LPS
PWR
SHUNT
SHUNT
5A
INSTR LPS
30 A
PWR ACC
20A
HORN/DM
20A
IGN
25A
AUX HTR A/C
15A
STOP HAZ
20A
T/L CTSY
20A
GAGE/IDLE
25A
HTR A/C
15A
RADIO
10A
ECM B
15A
TURN B/U
30 A
PWR WDO
25A
WIPER
10A
ECM 1
15A
DRL
3A
CRANK
HOT IN ACCY OR RUN
AUX HTR A/C
25 AMP
FRONT
REAR
FUSE
BLOCK
12103404
OFF
LO
HI
BLOWER
SWITCH
51
50
52
C281
12004101
52-5.0 ORN
3-75Ω
0-85Ω
RESISTOR
C181
2977940
51-1.0 YEL
52-2.0 ORN
GT103
8911215
COWL
S220
2977253
C282
8900420
2977518
52-5.0 PPL
C410
2977253
8900420
2 BLK
REAR BLOWER
MOTOR
SHEET
METAL
GROUND
G405

CIRCUIT OPERATION

FRONT HEATER

The blower motor delivers air to the interior of the vehicle. Its speed is controlled by the Blower Switch and Blower Resistors. When the Ignition Switch is placed in RUN, battery voltage is applied to the Blower Switch through the HTR A/C Fuse. With the Blower Switch in LO, voltage is applied across both resistors to the Blower Motor. With the Blower Switch in MED, voltage is applied across one resistor to the Blower Motor, and the Blower runs faster. When the Blower Switch is in HI, battery voltage is applied directly to the Blower Motor and Blower operates at its fastest speed.

AUXILIARY HEATER

The Auxiliary Blower Motor delivers heated air to the rear of the vehicle. Its speed is controlled by a rear Blower Switch and Blower Resistors. When the Ignition Switch is placed in RUN, battery voltage is applied to the rear Blower Motor through the AUX HTR A/C Fuse. With the rear Blower Switch in LO, a ground path through two resistors allows the voltage at the rear Blower Switch Motor to flow to ground. With the rear Blower in HI, a ground path allows full voltage at the rear Blower Motor to flow to ground.

DIAGNOSIS -- FRONT HEATER

BLOWER MOTOR DOES NOT OPERATE AT ALL

TEST	RESULT	ACTION
1. Check condition of HTR A/C fuse.	Fuse is not blown.	GO to step 2.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
2. Place ignition switch in RUN and blower switch in HI. Disconnect blower motor connector C180. Connect a test lamp from ORN (52) wire at blower motor connector C180 to ground.	Test lamp lights.	CHECK blower motor screws for a good ground. If ok, REPLACE blower motor.
	Test lamp does not light.	GO to step 3.
3. Connect a test lamp from BRN (50) wire at heater blower switch connector C234 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire between heater blower switch connector C234 and fuse block.
4. Place blower switch to LO, MED, or HI. Connect a test lamp from heater blower switch connector C234 at wire that applies to position of switch to ground. LO is YEL (51) wire, MED is LT BLU (72) wire, and HI is ORN (52) wire.	Test lamp does not light.	REPLACE blower switch.
	Test lamp lights.	LOCATE and REPAIR open in wires to blower motor between heater blower switch connector C234 and blower resistor connector C183.

BLOWER MOTOR DOES NOT OPERATE IN HI BUT ONLY IN LO AND/OR MED

TEST	RESULT	ACTION
1. Connect a test lamp from ORN (52) wire at blower switch connector C234 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect a test lamp from ORN (52) wire at resistor connector C183 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (52) wire from blower resistor connector C183 to blower switch connector C234.

BLOWER MOTOR DOES NOT OPERATE IN LO AND/OR MED BUT ONLY IN HI

TEST	RESULT	ACTION
1. Place blower switch in position where blower motor does not work. Connect a test lamp from either YEL (51) LO wire or LT BLU (72) MED wire (depending on switch position) at blower motor switch connector C234 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect a test lamp from either YEL (51) LO wire or LT BLU (72) MED wire (depending on switch position) at resistor blower connector C183 to ground.	Test lamp lights.	REPLACE blower resistor.
	Test lamp does not light.	LOCATE and REPAIR open in wire(s) (51 or 72) from blower resistor connector C183 to blower switch connector C234.

DIAGNOSIS -- AUXILIARY HEATER

AUXILIARY HEATER BLOWER MOTOR DOES NOT OPERATE AT ALL

TEST	RESULT	ACTION
1. Check condition of AUX HTR A/C fuse.	Fuse is not blown.	GO to step 2.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
2. Place ignition switch in RUN and blower switch in HI. Disconnect blower motor connector C425. Connect a test lamp from BRN (50) wire to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire between blower motor connector C425 and fuse block connector C285.
3. Connect blower motor connector C425. Connect a test lamp from BRN (50) wire at blower motor to DK GRN (952) wire.	Test lamp lights.	REPLACE blower motor.
	Test lamp does not light.	GO to step 4.
4. Connect a self-powered test lamp from DK GRN (952) wire at blower switch connector C234 to BLK (150) wire.	Test lamp lights.	LOCATE and REPAIR open in DK GRN (952) wire between blower switch connector C284 and blower motor connector C425.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between blower switch connector C284 and bus bar ground connector C296. If no open is found, REPLACE blower switch.

AUXILIARY HEATER BLOWER MOTOR DOES NOT OPERATE IN LO

TEST	RESULT	ACTION
1. Connect a self-powered test lamp from YEL (51) wire at blower resistor connector C426 to ground.	Test lamp lights.	REPLACE blower resistor.
	Test lamp does not light.	GO to step 2.
2. Connect a self-powered test lamp from YEL (51) wire at blower resistor connector C426 to BLK (150) wire.	Test lamp lights.	LOCATE and REPAIR open in YEL (51) wire between blower resistor connector C426 and blower switch connector C284.
	Test lamp does not light.	REPLACE blower switch.

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

HOT IN RUN

HTR A/C
25 AMP

50-2.0 BRN

50-2.0 BRN

S203

50-1.0 BRN
(L05/L19 WITH RWAL)

50-1.0 BRN

DRAC
(SEE PAGE 75)

50-2.0 BRN

50-2.0 BRN
(L05/L19 WITH RWAL)

50-2.0 BRN

RESISTOR

R2 R1
52 72 51

C183
296501A

72 51
52

BLOWER
MOTOR

52

C180
2977976

GT104
8911217

52-2.0 ORN
51-2.0 YEL
52-2.0 ORN
72-2.0 LT BLU

51-2.0 YEL
52-2.0 ORN
72-2.0 LT BLU

51
52
72
50

C205
12004067

HEATER
BLOWER
SWITCH

HI
MED
OFF
LO

51
72
52
50

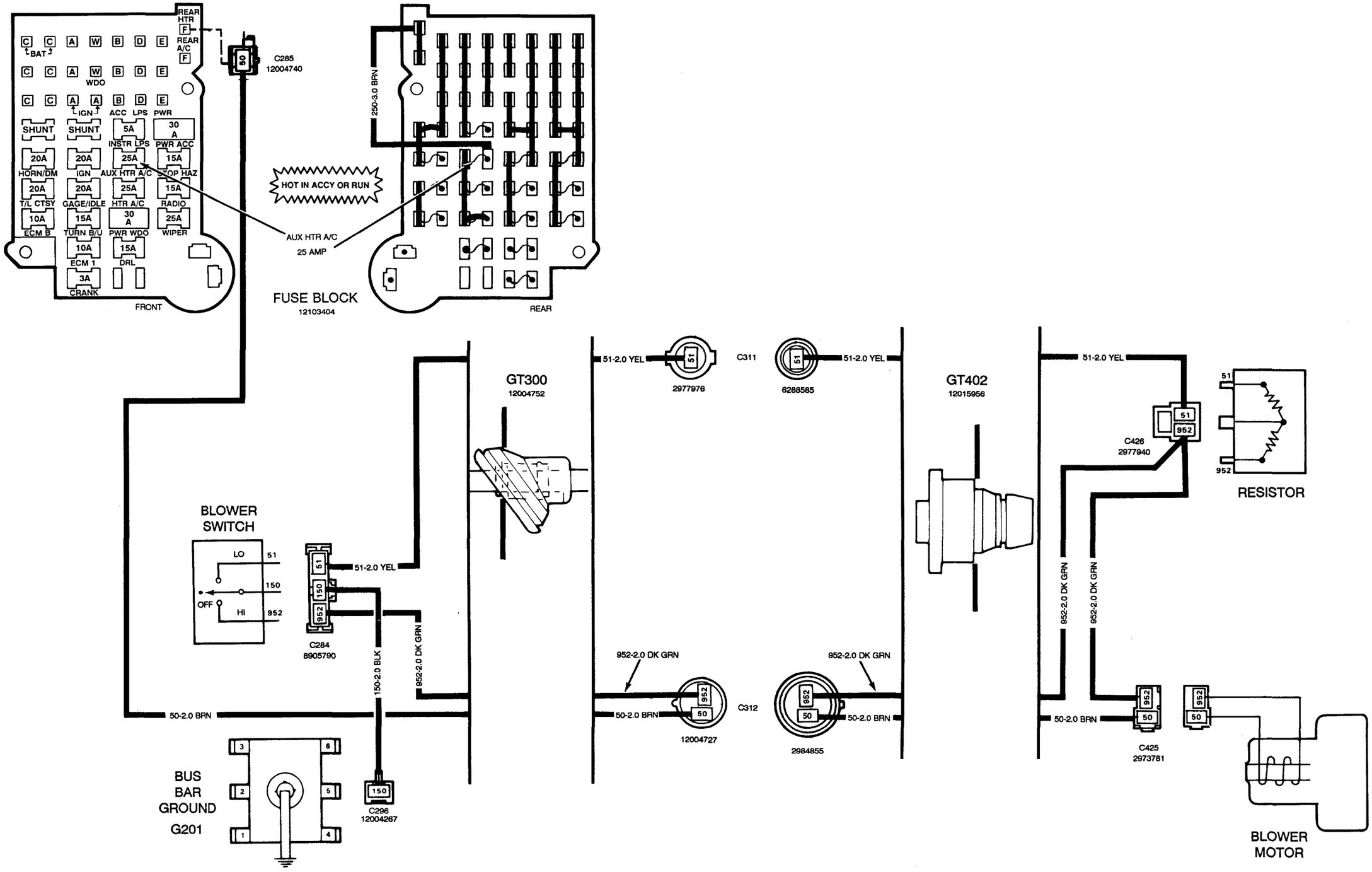
50-2.0 BRN

50 50

C235
12015952 12015987

50-2.0 BRN

A-98 HEATER
FRONT


REAR HTR
REAR A/C
C285
12004740
50
C BAT
C C A W B D E
C C A W B D E
WDO
C C A A B D E
IGN
ACC LPS PWR
SHUNT
SHUNT
5A
INSTR LPS
30 A
PWR ACC
20A
HORN/DM
20A
IGN
25A
AUX HTR A/C
15A
STOP HAZ
20A
T/L CTSY
20A
GAGE/IDLE
25A
HTR A/C
15A
RADIO
10A
ECM B
15A
TURN B/U
30 A
PWR WDO
25A
WIPER
10A
ECM 1
15A
DRL
3A
CRANK
FRONT
HOT IN ACCY OR RUN
AUX HTR A/C
25 AMP
250-3.0 BRN
FUSE BLOCK
12103404
REAR
GT300
12004752
GT402
12015956
51-2.0 YEL
51
2977976
C311
6288585
51-2.0 YEL
51-2.0 YEL
51
952
C426
2977940
RESISTOR
BLOWER SWITCH
LO
OFF
HI
51
150
952
C284
8905790
51-2.0 YEL
150-2.0 BLK
952-2.0 DK GRN
952-2.0 DK GRN
952-2.0 DK GRN
952-2.0 DK GRN
50-2.0 BRN
50-2.0 BRN
C312
12004727
2984855
50-2.0 BRN
C425
2973781
BUS BAR GROUND
G201
C296
12004267
BLOWER MOTOR

CIRCUIT OPERATION

FUEL GAGE

The pointer of the Fuel Gage is moved by the magnetic fields of two coils. The coils are at right angles to each other. Battery voltage is applied to the E-coil and the circuit divides at the opposite end of the coil. One path continues to ground through the F-coil. Another goes to ground through the variable resistor of the Fuel Gage Sender.

When the tank is low, the resistance of the Sender is low. A large flow of current passes through the E-coil and the Fuel Gage Sender resistor. This moves the pointer toward E on the scale. When the tank is full, the Sender resistance is high. More current now flows through the F-coil, moving the pointer toward F on the scale.

With two coils operating the pointer, the Gage is not affected by changes in the system's battery voltage.

OIL PRESSURE GAGE

The engine oil pressure is displayed by the Oil Pressure Gage. The pointer of the Gage is moved by two coils, and its operation is similar to that of the Fuel Gage.

The Oil Pressure Sender is connected to the junction of the two coils. It has low resistance when the oil pressure is low, and 90 ohms resistance when the oil pressure is high. This changing resistance changes the current flow through the coils. The magnetic fields of the coils move the pointer from low to high.

TEMPERATURE GAGE

The Temperature Gage is also operated by two coils. Battery voltage is applied to both coils. One is grounded directly and the other is grounded through the Temperature Sender. This has 55 ohms resistance at 128°C (260°F) (hot coolant) and its resistance becomes greater at low temperatures. It is approximately 1400 ohms at 38°C (100°F). This causes the current through the Sender and one coil to increase as the coolant temperature increases. This moves the pointer.

VOLTMETER

The Voltmeter measures the electrical system's voltage with the Ignition Switch in RUN or START. With the engine stopped, the Voltmeter indicates Battery condition. With the engine running, the Voltmeter indicates Charging System operation.

LOW COOLANT INDICATOR

The Low Coolant Indicator comes on to warn the driver when a low level of coolant exists in the radiator. Battery voltage is applied to the Low Coolant Module. When a low coolant condition exists, a signal is sent to the Low Coolant Module from the Low Coolant Sensor. The Low Coolant Module will provide a ground to the Low Coolant Indicator.

The Low Coolant Sensor is not a switch that opens and closes. It has a very high resistance to ground, more than 50,000 ohms, when the engine coolant level is low. This causes the Low Coolant Module to light the Low Coolant Indicator. With more of the Sensor covered by coolant, its resistance decreases. When the fluid level is good, the resistance will be less than 10,000 ohms. With the Sensor resistance between 10,000 and 50,000 ohms, the Sensor is partly covered and the fluid is not low enough to cause the warning to be displayed.

DIAGNOSIS -- INSTRUMENT PANEL: GAGES AND INDICATORS

PRELIMINARY CHECKS

Check condition of GAGE/IDLE fuse. If fuse is blown, locate and repair source of overload, then replace fuse. If fuse is in good condition, use the following diagnostic procedures.

FUEL GAGE INDICATES FULL OR BEYOND AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect fuel sender connector C409 and place ignition switch to RUN. Connect a fused jumper from PNK (30) wire at fuel tank sender connector C409 to ground.	Fuel gage indicates full.	LOCATE and REPAIR a short in PNK (30) wire. If no short is found, REPLACE fuel gage.
	Fuel gage indicates empty.	CHECK fuel gage ground. If ground is good, REPAIR/REPLACE fuel gage sender.

FUEL GAGE INDICATES EMPTY WHEN THERE IS FUEL IN THE TANK

TEST	RESULT	ACTION
1. Disconnect fuel tank sender connector C409 and place ignition switch to RUN.	Fuel gage indicates full.	CHECK fuse gage ground. If ground is good, REPAIR/REPLACE fuel gage sender.
	Fuel gage indicates empty.	LOCATE and REPAIR a short in PNK (30) wire. If no short is found, REPLACE fuel gage.

FUEL GAGE IS INACCURATE

TEST	RESULT	ACTION
1. Disconnect fuel tank sender connector C409. Connect one RED lead of Tester J 33431-B to PNK (30) wire and other to ground. Set resistance dials to 0 ohms and then to 90 ohms. Fuel gage should indicate empty and then full. (Allow time for gage to reach full due to anti-slosh device.)	Gage responds correctly.	CHECK fuel tank ground wire for high resistance. If ground is good, REPAIR/REPLACE fuel gage sender.
	Gage does not respond correctly.	CHECK for high resistance in PNK (30) wire. If wire is good, REPLACE fuel gage.

TEMPERATURE GAGE INDICATES HOT WITH ENGINE COOLANT BELOW OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
Disconnect temperature sender connector C107 and place ignition switch to RUN.	Temperature gage indicates cold.	REPLACE temperature sender.
	Temperature gage does not indicate cold.	LOCATE and REPAIR a short in DK GRN (35) wire. If no short is found, PERFORM diagnostic procedures under symptom "Temperature Gage Is Not Accurate."

TEMPERATURE GAGE INDICATES COLD ALL THE TIME

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C107. Ground the DK GRN (35) wire at temperature sender connector C107.	Temperature gage indicates hot.	REPLACE temperature sender.
	Temperature gage does not indicate hot.	LOCATE and REPAIR open in DK GRN (35) wire. If wire is good, REPLACE temperature gage.

TEMPERATURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
Disconnect temperature sender connector C107. Connect red lead from J 33431-B tester to DK GRN (35) wire and other lead to ground. Adjust resistance dials to 1400 ohms and then to 55 ohms. Temperature gage should indicate cold then hot.	Gage indicates correctly.	REPLACE temperature sender.
	Gage is not correct.	LOCATE and REPAIR open in DK GRN (35) wire. If wire is good, REPLACE temperature gage.

OIL PRESSURE GAGE INDICATES LOW PRESSURE WHEN OIL PRESSURE IS GOOD

TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C115 (Gasoline) or C116 (Diesel) and place ignition switch to RUN.	Oil pressure gage indicates high pressure.	REPLACE oil pressure sender.
	Oil pressure gage indicates no or low pressure.	LOCATE and REPAIR short TAN (31) wire. If wire is good, REPLACE oil pressure gage.

OIL PRESSURE GAGE INDICATES HIGH PRESSURE AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C115 (Gasoline) or C116 (Diesel) and place ignition switch to RUN. Connect a fused jumper from TAN (31) wire at oil pressure sender connector C115 (Gasoline) or C116 (Diesel) to ground.	Oil pressure gage indicates low pressure.	REPLACE oil pressure sender.
	Oil pressure gage indicates high pressure.	LOCATE and REPAIR open in TAN (31) wire. If wire is good, REPLACE oil pressure gage.

OIL PRESSURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C115 (Gasoline) or C116 (Diesel). Connect one RED lead of J33431-B tester to TAN (31) wire at oil pressure sender connector C115 (Gasoline) or C116 (Diesel) and other lead to ground. Set resistance dials to 0 ohms and then to 90 ohms. The oil pressure gage should indicate low pressure and then high pressure.	Oil pressure gage indicates correctly.	REPLACE oil pressure sender.
	Oil pressure gage does not indicate correctly.	LOCATE and REPAIR open in TAN (31) wire. If wire is good, REPLACE oil pressure gage.

VOLTMETER IS NOT ACCURATE

TEST	RESULT	ACTION
Place ignition switch to RUN position. Connect a voltmeter between positive and negative terminals of the battery.	Voltage reading is same as vehicle's voltmeter.	Voltmeter is good.
	Voltage reading is different from vehicle's voltmeter.	LOCATE and REPAIR open in PNK/BLK (39) wire and BLK (150) wire at instrument cluster. If wires are good, REPLACE voltmeter.

SPEEDOMETER IS INOPERATIVE OR INACCURATE

TEST	RESULT	ACTION
1. Disconnect instrument cluster connector C203 and place ignition switch to RUN. Connect voltmeter from LT BLU/BLK (824) wire at instrument cluster connector C203 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of HTR A/C fuse. If fuse is good, LOCATE and REPAIR open in LT BLU/BLK (824) wire.
2. Connect voltmeter from LT BLU/BLK (824) wire to BLK (150) wire at instrument cluster connector C203.	Battery voltage.	REFER to speed sensor in Emissions Manual (Gasoline) or Service Manual (Diesel) for further diagnosing.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from instrument cluster to ground.

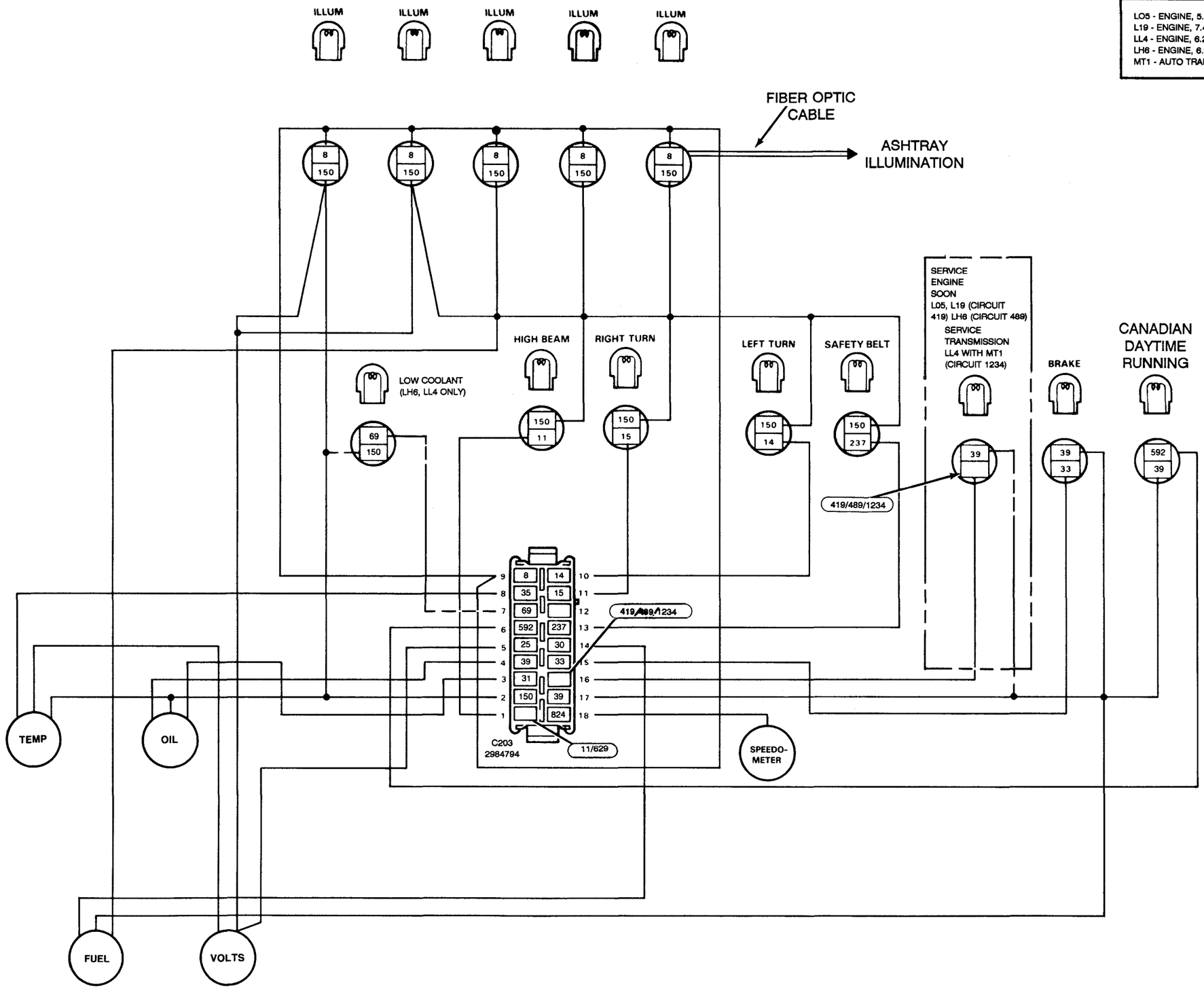
LOW COOLANT INDICATOR DOES NOT LIGHT WITH COOLANT LEVEL LOW (DIESEL ONLY)

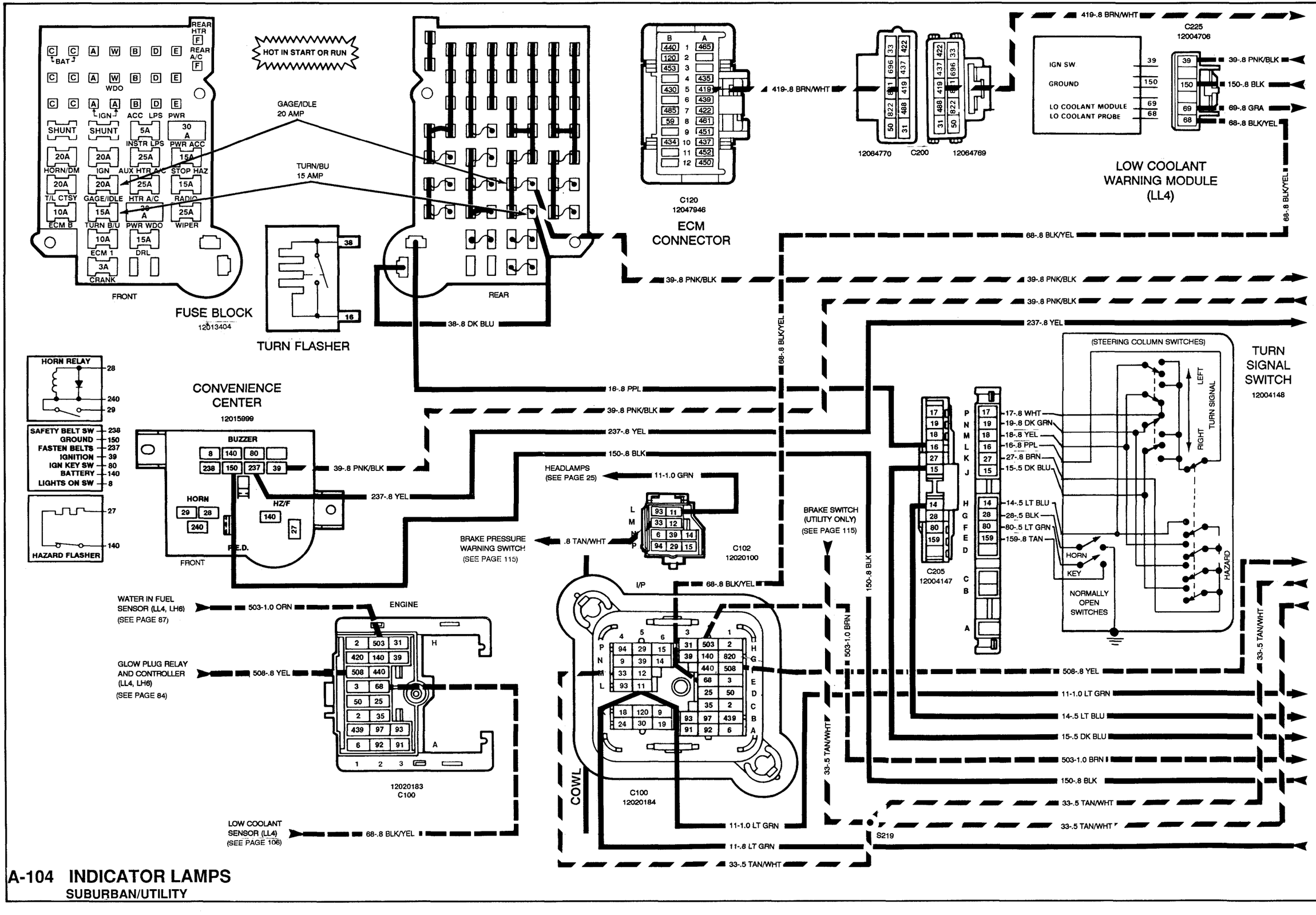
TEST	RESULT	ACTION
1. Disconnect low coolant probe connector C186 and place ignition switch to RUN. Observe low coolant indicator light.	Low coolant indicator lights.	REPLACE low coolant probe.
	Low coolant indicator does not light.	GO to step 2.
2. Disconnect low coolant module connector C225. Connect voltmeter from PNK/BLK (39) wire at low coolant module connector C225 to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in PNK/BLK (39) wire.
3. Connect voltmeter from PNK/BLK (39) wire to BLK (150) wire at low coolant module connector C225.	Battery voltage.	GO to step 4.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire.
4. Connect voltmeter from GRA (69) wire at low coolant module connector C225 to ground.	Battery voltage.	GO to step 5.
	No voltage.	LOCATE and REPAIR open or short to ground in GRA (69) wire going from low coolant module to low coolant indicator lamp.
5. Connect voltmeter from PNK/BLK (39) wire to YEL/BLK (68) wire at low coolant module connector C225.	Battery voltage.	LOCATE and REPAIR short to ground in YEL/BLK (68) wire from low coolant module to low coolant probe.
	No voltage.	REPLACE low coolant module.

LOW COOLANT INDICATOR IS LIT WHEN COOLANT LEVEL IS GOOD

TEST	RESULT	ACTION
Connect a fused jumper from low coolant probe connector C186 to ground. Place ignition switch to RUN and observe low coolant indicator light.	Low coolant indicator goes out.	REPLACE low coolant probe.
	Low coolant indicator stays lit.	LOCATE and REPAIR open in YEL/BLK (68) wire. If wire is good, follow diagnostic procedures listed under symptom "Low Coolant Indicator Does Not Light With Coolant Level Low."

LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE





A-104 INDICATOR LAMPS

SUBURBAN/UTILITY

RPO CODES
LL4 - ENGINE, 6.2L (376 CID) V8 HD DIESEL ENGINE, VIN J LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C

419-.8 BRN/WHT
489-.8 YEL (LH6 ONLY)
150-.8 BLK
39-.8 PNK/BLK
69-.8 GRA
C226
12010488
439 488 150 489
CHECK ENGINE LAMP DRIVER MODULE
(LH6)
WATER IN FUEL LAMP
GLOW PLUGS WAIT LAMP
(LL4, LH6)
C223
12004215
39 508
C222
8905381
150 503
DRL MODULE
(SEE PAGE 27)
TCM
(LL4 WITH MT1)
(SEE PAGE 73)
I/P CLUSTER CONNECTOR
(SEE PAGE 103)
C203
12026261
11/629
592-.8 LT GRN/BLK
629-.8 WHT
1234-.5 GRA/RED
824 18
150 39
31 419
39 33
25 30 14
592 237
69
35 15
8 14
419/489/1234
237-.8 YEL
33-.5 TAN/WHT
39-.5 PNK/BLK
237-.8 YEL
S201
(SEE PAGES 17, 19)
S202
(SEE PAGE 27)
11-1.0 LT GRN
14-.5 LT BLU
15-.5 DK BLU
503-1.0 BRN
508-.8 YEL
C210
6294641
C209
12010966
6 A 2 D 3 C 4 E
300 A 2 B 35 C 33 D
3 4 2 33 36 5/6 300
START
RUN
OFF
LOCK
ACC
IGNITION SWITCH
C201
8917693
B C 11 12 A 10 D
DIMMER SWITCH
HI 11 10 12
BUS BAR GROUND G200

A-106 INDICATOR LAMPS

FLEETSIDE, WIDESIDE, CREW-BONUS CAB

FUSE BLOCK
120103404

TURN FLASHER

HOT IN START OR RUN

GAGE/IDLE
20 AMP

TURN/BU
15 AMP

ECM CONNECTOR

C120
12047946

419-.8 BRN/WHT

C200
12064770
12064769

C225
12004706

LOW COOLANT WARNING MODULE
(LL4)

IGN SW
GROUND
LO COOLANT MODULE
LO COOLANT PROBE

39-.8 PNK/BLK
150-.8 BLK
69-.8 GRA
68-.8 BLK/YEL

REAR

38-.8 DK BLU

39-.8 PNK/BLK
237-.8 YEL
16-.8 PPL
150-.8 BLK

TURN SIGNAL SWITCH
12004148

(STEERING COLUMN SWITCHES)

17-.8 WHT
19-.8 DK GRN
18-.8 YEL
16-.8 PPL
27-.8 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
80-.5 LT GRN
159-.8 TAN

LEFT TURN SIGNAL
RIGHT
HORN
KEY
HAZARD
NORMALLY OPEN SWITCHES

C205
12004147

CONVENIENCE CENTER
12015999

BUZZER
HORN
HZ/F
P.E.D.
FRONT

HORN RELAY

SAFETY BELT SW
GROUND
FASTEN BELTS
IGNITION
IGN KEY SW
BATTERY
LIGHTS ON SW

HAZARD FLASHER

HEADLAMPS
(SEE PAGE 25)

11-1.0 GRN

BRAKE PRESSURE WARNING SWITCH
(SEE PAGE 115)

33-.8 TAN/WHT

C102
12020100

I/P

68-.8 BLK/YEL

503-1.0 BRN

150-.8 BLK

C100
12020184

COWL

S219

11-1.0 LT GRN

11-.8 LT GRN

33-.5 TAN/WHT

TO GLOW PLUG RELAY AND CONTROLLER
(SEE PAGE 87)

503-1.0 ORN

ENGINE

TO WATER IN FUEL SENSOR
(SEE PAGE 84)

508-.8 YEL

12020183
C100

LOW COOLANT SENSOR

C186
2977253

68-.8 BLK/YEL

508-.8 YEL

11-1.0 LT GRN

14-.5 LT BLU

15-.5 DK BLU

503-1.0 BRN

150-.8 BLK

33-.5 TAN/WHT

RPO CODES
LL4 - ENGINE, 6.2L (376 CID) V8 HD DIESEL ENGINE, VIN J LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C

419-.8 BRN/WHT

39-.8 PNK/BLK

150-.8 BLK

69-.8 GRA

WATER IN FUEL LAMP

GLOW PLUGS WAIT LAMP

(LL4 ONLY)

C223
12004215

C222
8905381

DRL MODULE
(SEE PAGE 26)

I/P CLUSTER CONNECTOR
(SEE PAGE 103)

C203
12026261

S201
(SEE PAGES 17, 19)

592-.8 LT GRN/BLK

629-.8 WHT

11/629

419/489

TCM
(LL4 WITH MT1)
(SEE PAGE 73)

39-.5 PNK/BLK

33-.5 TAN/WHT

237-.8 YEL

1234-.5 GRA/RED

S202
(SEE PAGE 27)

11-1.0 LT GRN

14-.5 LT BLU

15-.5 DK BLU

503-1.0 BRN

508-.8 YEL

C201
8917693

DIMMER SWITCH

BUS BAR
GROUND
G200

C209
12010966

C210
6294641

START
RUN
OFF
LOCK
ACC

INDICATOR LAMPS A-107

FLEETSIDE, WIDESIDE, CREW-BONUS CAB

RPO CODES

L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE
MT1 - AUTO TRANS, HD 4-SPD., WITH OVERDRIVE

HOT IN START OR RUN

GAGE/IDLE 20 AMP

39-.8 PNK/BLK

COOLANT TEMPERATURE SENDER

35-.8 DK GRN

C107 12015306

GT101 12064740

C200 12064770 12064769

31-.5 TAN (LL4 WITH MT1)

(LL4 WITH MT1)

FUEL PUMP CYCLE RELAY (SEE PAGE 78)

S202 (SEE PAGE 27)

39-.5 PNK/BLK

DRAC (SEE PAGE 75)

I/P CLUSTER CONNECTOR (SEE PAGE 103)

11/629

824-.8 LT BLU/BLK

419/489

C203 12026261

FUEL PUMP OIL PRESSURE SWITCH (L05, L19)

31-.8 TAN

C115 12065401

C100

ENGINE 12020183

I/P 12020184

120-1.0 TAN/WHT 120-1.0 GRA (SUBURBAN ONLY)

31-.5 TAN (LL4 WITH MT1)

35-.8 DK GRN

120-1.0 TAN/WHT

OIL PRESSURE SENDER (LH6, LL4)

31-.8 TAN 31-.5 TAN (LL4 WITH MT1)

C116 2977935

S139 (SEE PAGE 60)

120-.8 gra → ECM (SEE PAGE 60)

FUEL TANK SENDER (LH6, LL4)

C409 6288440

30-.8 PNK

30-.5 PNK

C101 12020199

120-1.0 TAN/WHT

30-.8 PNK

C409 12059473

ELECTRIC FUEL PUMP FUEL GAGE SENDING UNIT (L05, L19)

COWL

120-1.0 TAN/WHT 120-1.0 GRA (SUBURBAN ONLY)

35-.5 DK GRN

150-.8 BLK

S201 (SEE PAGES 17, 19)

FRAME GROUND G409

BUS BAR GROUND G200

A-108 INSTRUMENT PANEL GAGES

SUBURBAN/UTILITY

RPO CODES

L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K
L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C

HOT IN START OR RUN

GAGE/IDLE 20 AMP

39-.8 PNK/BLK

39-.8 PNK/BLK

S202 (SEE PAGE 27)

39-.5 PNK/BLK

FUEL PUMP CYCLE RELAY (SEE PAGE 78)

DRAC (SEE PAGE 75)

COOLANT TEMPERATURE SENDER

35

35-.8 DK GRN

C163 12052644

FUEL PUMP OIL PRESSURE SWITCH (L05, L19)

120 31 440

31-.8 TAN

C115 12065401

31-.8 TAN

ENGINE

12020183

C100

12020184

I/P

31-.8 TAN

120-1.0 TAN/WHT 120-1.0 GRA (SUBURBAN ONLY)

31-.5 TAN

39-.5 PNK/BLK

11/629

824-.8 LT BLU/BLK

I/P CLUSTER CONNECTOR (SEE PAGE 103)

419/489

C203 12026261

150-.8 BLK

S201 (SEE PAGES 17, 19)

150-1.0 BLK

30-.5 PNK

OIL PRESSURE SENDER (LH6, LL4)

31

31-.8 TAN
31-.5 TAN (LL4 WITH MT1)

C185 2977935

35-.8 DK GRN

120-1.0 TAN/WHT

31-.8 TAN

35-.8 DK GRN

120-1.0 TAN/WHT
120-1.0 GRA (SUBURBAN ONLY)

COWL

30-.5 PNK

35-.5 DK GRN

FUEL TANK SENDER (LH6, LL4)

30

ECM/PCM (SEE PAGE 60)

120-1.0 TAN/WHT

S139 (SEE PAGE 60)

C409 6288440

C101 12020199

120-1.0 TAN/WHT

30-.8 PNK

C409 12059473

ELECTRIC FUEL PUMP FUEL GAGE SENDING UNIT (L05, L19)

30-.8 PNK

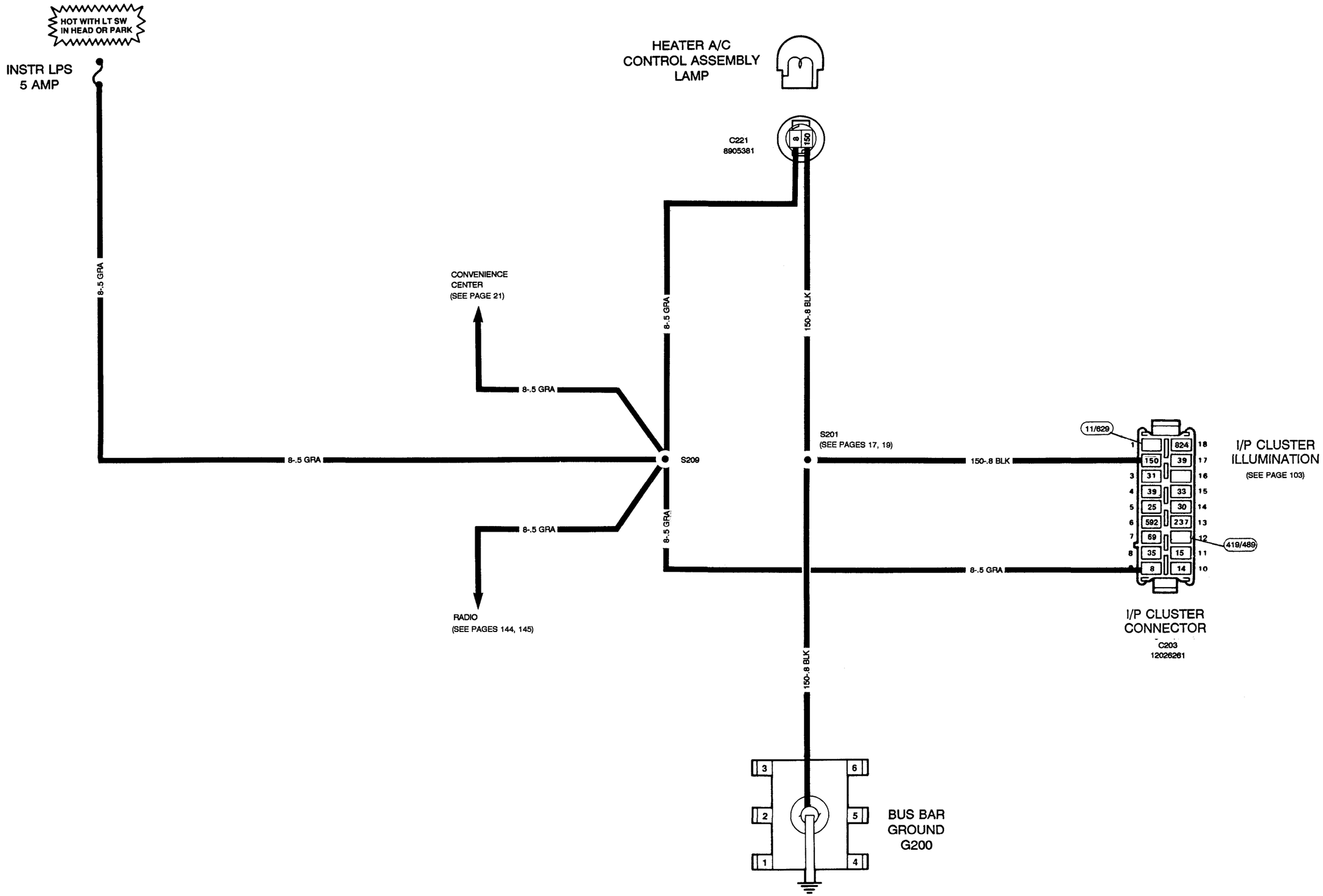
30-.8 PNK

30-.8 PNK

30-.5 PNK

FRAME GROUND G409

BUS BAR GROUND G200



A-110 INSTRUMENT PANEL LAMPS

CIRCUIT OPERATION

SAFETY BELT WARNING BUZZER

With the Ignition Switch in RUN or START, voltage is applied through the GAGE/IDLE Fuse to the Audio Alarm at the Convenience Center. With the driver's safety belt not buckled, terminal 39 of the Audio Alarm is grounded through the Safety Belt Switch. The Fasten Belts Indicators always goes on for about five seconds when the Ignition Switch is turned to RUN or START.

IGNITION KEY WARNING BUZZER

Whenever the key is in the ignition switch, the ignition switch is in LOCK, OFF, or ACC and the driver's door is open, terminal 80 or the audio alarm is grounded. This sounds the buzzer.

LAMPS-ON WARNING BUZZER

When the light switch is in HEAD or PARK and the panel dimmer switch is not in the dimmest setting, voltage is applied through the INSTR LPS fuse to the audio alarm module through the GRA (8) wire. With the panel dimmer switch at its dimmest setting the voltage may not be enough to activate the alarm. When the ignition switch is in RUN or START, voltage is applied through the GAGE/IDLE fuse and the PNK/BLK (39) wire. These two voltage are sensed and the alarm is not sounded.

The alarm is activated when the ignition switch is turned to LOCK, OFF, or ACC, the GAGE/IDLE fuse loses voltage. The audio alarm module senses this loss of voltage and activates the alarm. If voltage is still available from the INSTR LPS fuse. Voltage from the STOP HAZ fuse is applied to sound the alarm. The alarm can be turned off by turning off the light switch.

DIAGNOSIS -- AUDIO ALARMS

KEY-IN WARNING ALARM DOES NOT OPERATE

TEST	RESULT	ACTION
1. Turn ignition switch OFF. Leave key in ignition switch. Open left door. Remove audio alarm module. Connect a voltmeter from ORN (140) wire at convenience center to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK STOP/HAZ fuse. If fuse is good, REPAIR open in ORN (140) wire. Install audio alarm module.
2. Connect a self-powered test lamp form LT GRN (80) at convenience center to ground.	Test lamp lights.	REPLACE audio alarm module.
	Test lamp does not light.	GO to step 3.
3. Connect a self-powered test lamp from LT GRN (80) wire at turn signal switch connector C205 to ground.	Test lamp lights.	LOCATE and REPAIR open in LT GRN (80) wire from turn signal switch connector C205 to convenience center. Install audio alarm module.
	Test lamp does not light.	GO to step 4.
4. Connect a self-powered test lamp from TAN (159) wire at turn signal switch connector C205 to ground.	Test lamp lights.	REPLACE turn signal switch, INSTALL audio alarm module.
	Test does not light	GO to step 5.
5. Connect a self-powered test lamp from TAN (159) wire at LH jamb switch connector C208 to ground.	Test lamp lights.	LOCATE and REPAIR open in TAN (159) wire between LH door jamb switch connector C208 and turn signal switch connector C205. INSTALL audio alarm module.
	Test lamp does not light.	REPLACE LH door jamb switch. INSTALL audio alarm module.

THE SAFETY BELT WARNING BUZZER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from PNK/BLK (39) wire at convenience center to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of the GAGE/IDLE fuse. If fuse is not blown, LOCATE and REPAIR open in PNK/BLK (39) wire from convenience center to fuse block.
2. Connect test lamp from WHT (238) wire and BLK (150) wire at convenience center.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from convenience center to bus bar ground.
3. Connect test lamp from WHT (238) wire at safety belt retractor switch connector C306 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (238) wire from safety belt retractor switch to convenience center.
4. Buckle safety belt. Connect test lamp from BLK (150) wire at safety belt retractor switch connector C306 to ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from safety belt retractor switch to bus bar ground.
	Test lamp does not light.	REPLACE safety belt retractor switch.

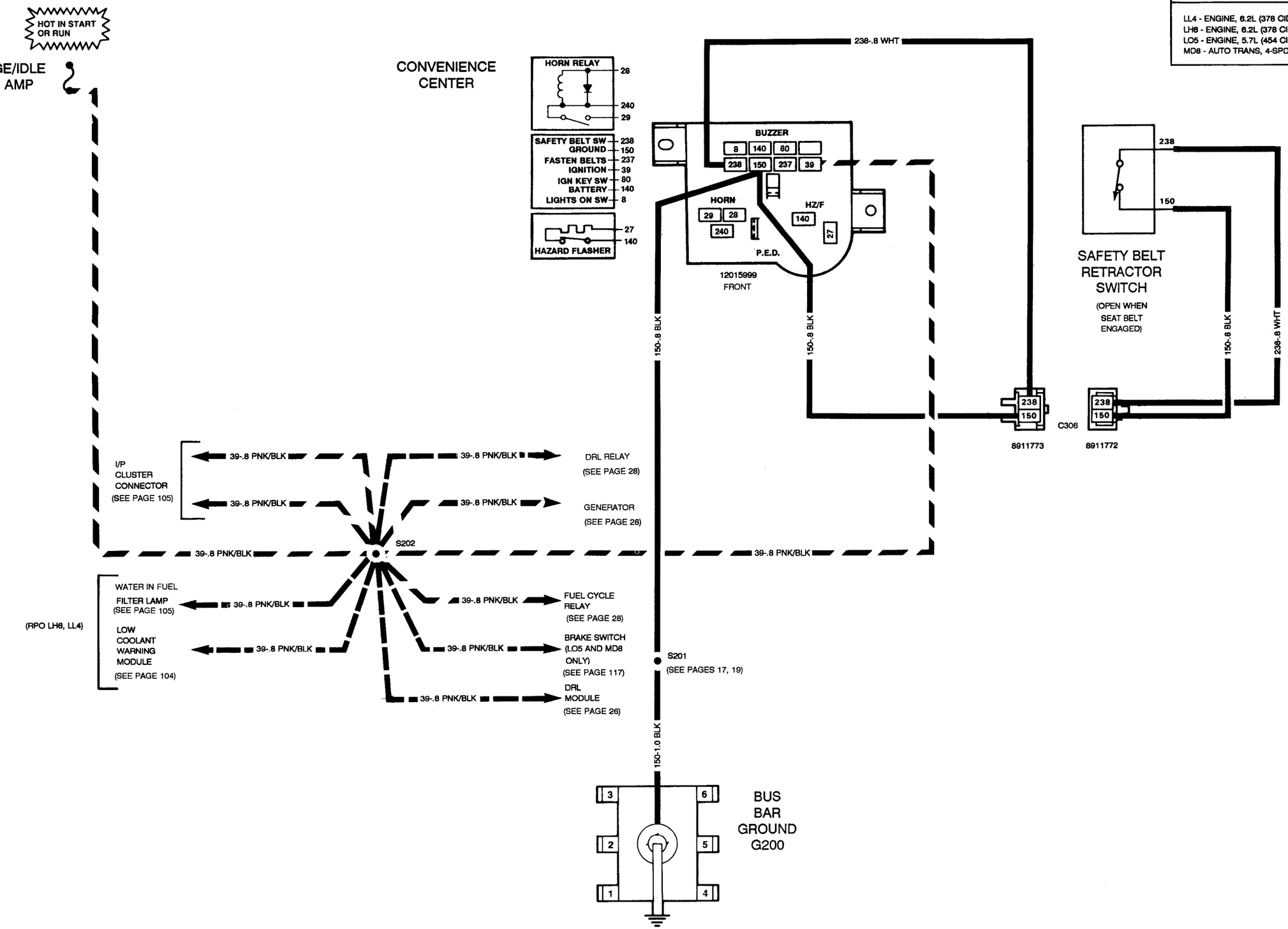
THE SAFETY BELT WARNING BUZZER OPERATES WHEN SAFETY BELT IS BUCKLED

TEST	RESULT	ACTION
Disconnect safety belt retractor switch connector C306.	Safety belt buzzer stops.	REPLACE safety belt retractor switch.
	Safety belt buzzer continues.	CHECK for a short from WHT (238) wire to ground. REPAIR as required.

LAMPS-ON WARNING ALARM DOES NOT OPERATE

TEST	RESULT	ACTION
1. Remove audio alarm module. Turn ignition switch to RUN. Turn lamps switch ON. Connect voltmeter from PNK/BLK (39) wire at convenience center to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK GAGE/IDLE fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (29) wire.
2. Connect voltmeter from GRA (8) wire at convenience center to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in GRA (8) wire.
3. Connect ohmmeter from BLK (150) wire at convenience center to ground.	Low resistance.	REPLACE audio alarm module.
	High resistance.	LOCATE and REPAIR cause of high resistance in BLK (150) wire.

RPO CODES
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C LO5 - ENGINE, 5.7L (454 CID) V8 GAS ENGINE, VIN K MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE



A-112 SAFETY BELT WARNING BUZZER

RPO CODES

LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE

HOT WITH LT SW IN HEAD OR PARK
HOT AT ALL TIMES
HOT IN START OR RUN
HOT AT ALL TIMES

INSTR LPS 5 AMP
STOP HAZ 15 AMP
GAGE/IDLE 20 AMP
HORN/DM 20 AMP

240-1.0 ORN
39-.8 PNK/BLK
140-.8 ORN
140-.8 ORN
140-.8 ORN
140-.8 ORN
80-.5 LT GRN
39-.8 PNK/BLK
237-.8 YEL
240-1.0 ORN
8-.5 GRA
150-.8 BLK
150-1.0 BLK
8-.5 GRA
8-.5 GRA
8-.5 GRA
8-.5 GRA
80-.5 LT GRN
159-.8 TAN

S210
S202 (SEE PAGE 27)
S201 (SEE PAGES 17, 19)
S209

140-.8 ORN → RWAL MODULE (SEE PAGE 116)

HORN RELAY
240
29
28
SAFETY BELT SW 238
GROUND 150
FASTEN BELTS 237
IGNITION 39
IGN KEY SW 80
BATTERY 140
LIGHTS ON SW 8
27
140
HAZARD FLASH

AUDIO ALARM

CONVENIENCE CENTER
BUZZER
8 140 80
238 150 237 39
29 28
240
HORN RELAY
FRONT
27
HZ/F
140

I/P CLUSTER CONNECTOR (SEE PAGE 105)

RADIO (SEE PAGES 144, 145)
I/P CLUSTER CONNECTOR (SEE PAGE 105)
HEATER, A/C CONTROL ASSEMBLY LAMPS (SEE PAGE 110)

BUS BAR GROUND G200

LH DOOR JAMB SWITCH (SEE PAGE 118)

C205 12004147
12004148

(STEERING COLUMN SWITCHES)
LEFT TURN SIGNAL
RIGHT
HORN
KEY
HAZARD
NORMALLY OPEN SWITCHES
TURN SIGNAL SWITCH

P	17	.8 WHT
N	19	.8 DK GRN
M	18	.8 YEL
L	16	.8 PPL
K	27	.8 BRN
J	15	.8 DK BLU
H	14	.8 LT BLU
G	28	.8 BLK
F	80	.8 LT GRN
E	159	.8 TAN
D		
C		
B		
A		

KEY-IN AND LIGHTS-ON WARNING BUZZER A-113

CIRCUIT OPERATION

Battery voltage is applied to the Brake Indicator when the Ignition Switch is in RUN or START. Two switches are connected to the Brake Indicator. When either of these two switches close, ground is provided and the indicator lights. The Brake Indicator is also connected to the Electronic Rear Wheel Brake Control Module.

The Park Brake Warning Switch provides a ground when the Parking Brake is applied. The Park Brake Indicator lights to alert the driver.

The Brake Pressure Switch closes to light the Brake Indicator when there is low brake fluid pressure in one of the two hydraulic brake systems. This could be caused by a leak in one of the brake lines. Refer to Section 5 in the 1991 R/V,P Light Truck Service Manual for Switch reset procedures. This can only be accomplished after the faulty system has been repaired.

The Electronic Rear Wheel Brake Control Module grounds the Brake Indicator when the module senses a fault in the Antilock Brake System. For Electronic Rear Wheel Brake Control Diagnosis, refer to Section 5A in the 1991 R/V,P Light Truck Service Manual.

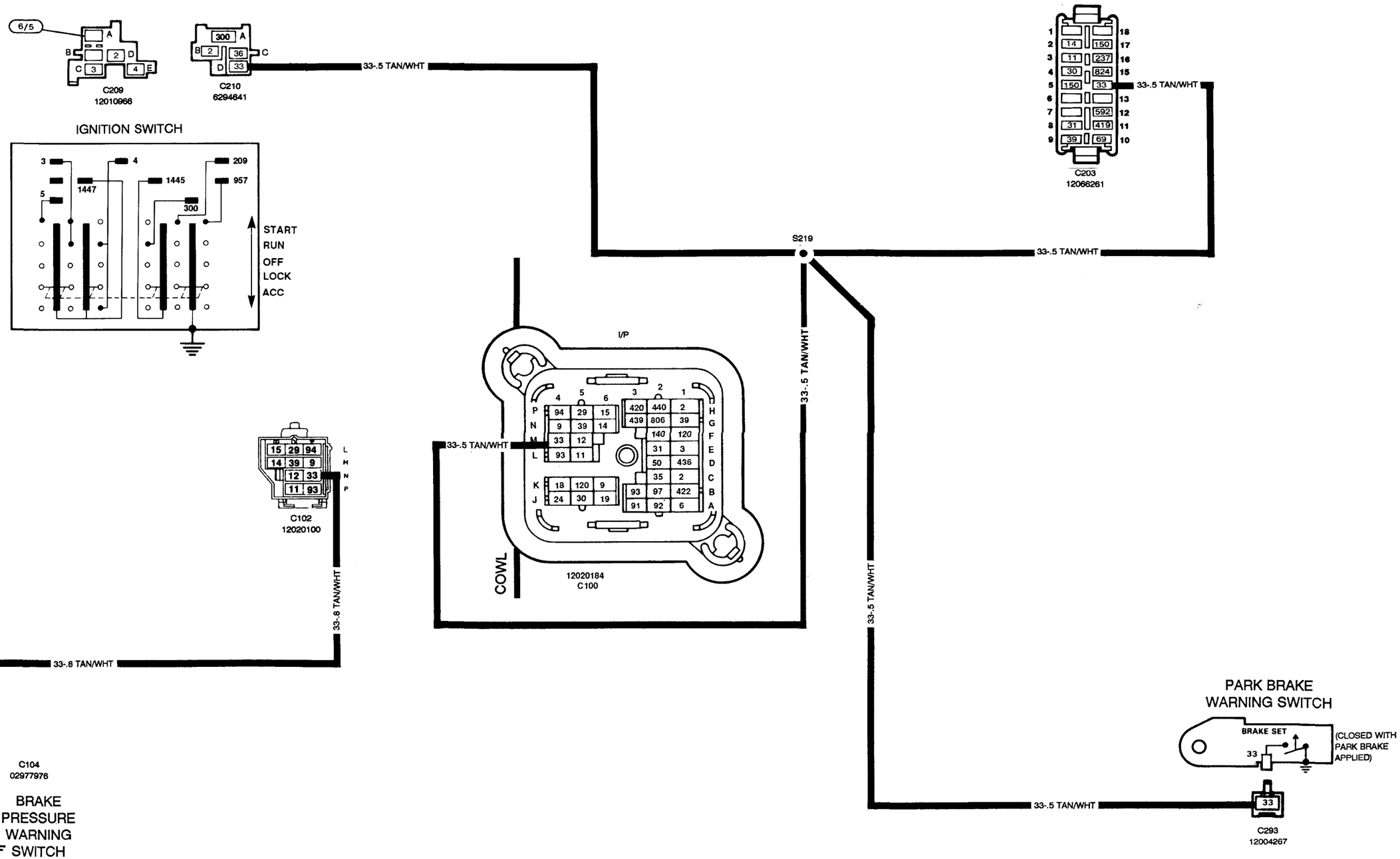
DIAGNOSIS -- BRAKE SYSTEMS

BRAKE INDICATOR REMAINS ON WITH IGNITION SWITCH IN RUN AND PARK BRAKE OFF

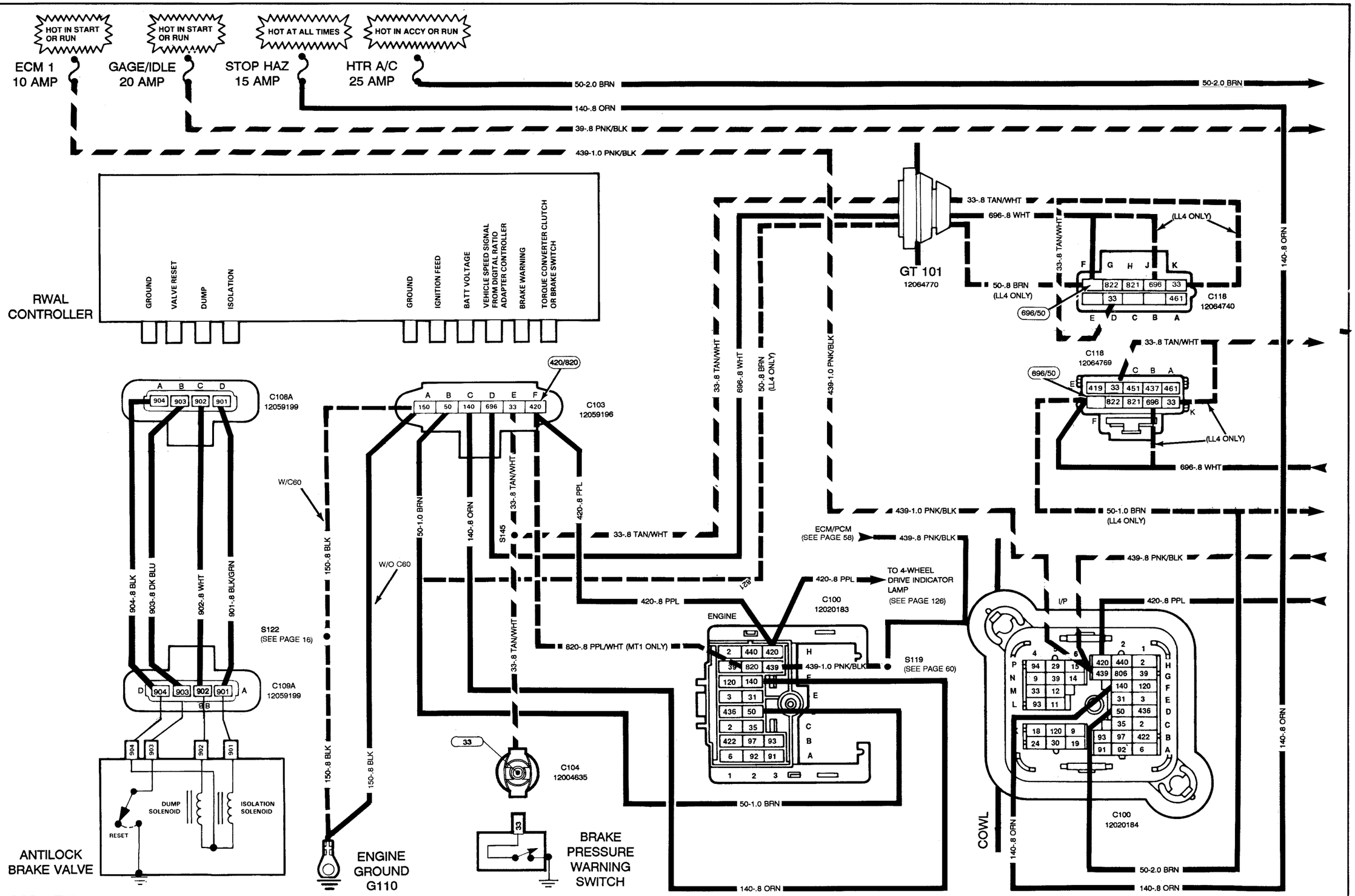
TEST	RESULT	ACTION
1. Disconnect park brake switch connector C293.	Brake indictor lamp does not go out.	GO to step 2.
	Brake indicator lamp goes out.	CHECK adjustment of park brake switch. If adjustment cannot be corrected, REPLACE brake switch.
2. Disconnect brake pressure warning switch connector C104.	Brake indicator lamp does not go out.	GO to step 3 if not equipped with Electronic Rear Wheel Brake Control. GO to step 4 is equipped with Electronic Rear Wheel Brake Control.
	Brake indictor lamp goes out.	CHECK for a possible leak or loss of fluid in the brake system.
3. Connect a self-powered test lamp from TAN/WHT (33) wire at park brake warning switch C293 to ground.	Test lamp lights.	LOCATE and REPAIR short in TAN/WHT (33) wire.
	Test lamp does not light.	CHECK instrument cluster and indicator lamp.
4. Disconnect Electronic Rear Wheel Brake Control module connector C103.	Brake indicator lamp does not go out.	CHECK wiring between instrument cluster and each switch and module for a short to ground. If wiring is good, the problem is in the instrument cluster.
	Brake indicator lamp goes out.	CHECK for an inoperative antilock brake system. Refer to Section 5A of the 1991 R/V, P Light Truck Service Manual for a diagnostic circuit check.

BRAKE INDICATOR DOES NOT LIGHT DURING A WARNING CONDITION OR DURING THE ANTILOCK SYSTEM CHECK

TEST	RESULT	ACTION
1. Disconnect park brake switch connector C293. Connect a fused jumper from park brake switch connector C293 to ground.	Brake indicator lamp does light. Brake indicator lamp lights.	GO to step 2. CHECK adjustment of park brake switch. If adjustment cannot be corrected, REPLACE brake switch.
2. Disconnect brake pressure warning switch connector C104. Connect a fused jumper from TAN/WHT (33) wire at brake pressure warning switch connector C104 to ground.	Brake indicator lamp does not light.	GO to step 3.
	Brake indicator lamp lights.	REPLACE brake pressure warning switch.
3. Disconnect electronic rear wheel brake control module connector C103. Connect a fused jumper from TAN/WHT (33) wire at antilock module connector C103 to ground.	Brake indicator lamp does not light.	CHECK wiring and in-line diode (if equipped) between instrument cluster and each switch and module for an open. If wiring is good, the problem is in the instrument cluster.
	Brake indicator lamp lights.	CHECK for an inoperative antilock brake system. Refer to Section 5A of the 1991 R/V, P Light Truck Service Manual for a diagnostic circuit check.



BRAKE WARNING SYSTEM A-115
WITH RWAL



A-116 REAR WHEEL ANTILOCK BRAKES

RPO CODES
C60 - AIR CONDITIONING
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE
MD8 - AUTO TRANS, 4-SPD., WITH OVERDRIVE

DIODE ASSEMBLY

50-2.0 BRN

39-.8 PNK/BLK

2977647

C290

12006377

33 33

PARK BRAKE WARNING SWITCH

(CLOSES WITH PARKING BRAKE APPLIED)

BRAKE SET

33

C293
12004267

33-.5 TAN/WHT

33 33 33 820 420 420

DIODE ASSEMBLY

F E D C B A

C291
12020486

420-.8 PPL

S219

33-.5 TAN/WHT

33-.8 TAN/WHT

33-.5 TAN/BLK

820-.8 YEL

420-.8 PPL

DRL
(SEE PAGE 26)

S202
(SEE PAGE 27)

39-.8 PNK/BLK (MD8 ONLY)

TCC SOLENOID
(SEE PAGE 74)

696-.8 WHT

39-.5 PNK/BLK

S203
(SEE PAGE 29)

50-1.0 BRN

439-1.0 PNK/BLK

420-.8 PPL

C292
12004267

420

A
B

39/439

BRAKE SWITCH
(CLOSES WHEN BRAKES ARE APPLIED)

S213

696-.8 WHT

C206
12020043

G H J K L M

422
696
436
451
450

F E D C B A

ALDL CONNECTOR

DRAC

15 14 13 12 11 10 9 8 7

824 821 437 696 50 450 822

C289
12066130

824	VEHICLE SPEED
821	VEHICLE SPEED SENSOR INPUT
437	VEHICLE SPEED TO ECM SIGNAL
696	VEHICLE SPEED SIGNAL TO RWAL
50	12 VOLT (IGNITION)
450	GROUND
822	VEHICLE SPEED SENSOR INPUT

C203
12066261

1	11	824	18
2	150	39	17
3	31	419	16
4	39	33	15
5	25	30	14
6		237	13
7			12
8	35	15	11
9	88	14	10

I/P CLUSTER CONNECTOR

CIRCUIT OPERATION

COURTESY DOME, VANITY, I/P COMPARTMENT BOX, CARGO AND UNDERHOOD LAMPS

Voltage is applied at all times from the T/L CTSY Fuse to the Courtesy Lamp, Dome Lamp, I/P Compartment Box Lamp and Vanity Lamps. The Courtesy and Dome Lamps turn on when a ground path is provided by the Panel Dimmer Switch or one of the Door Jamb Switches.

The I/P Compartment Box and Vanity Lamps have their own switches that provide ground paths when their switches close.

CARGO LAMP

Voltage is applied at all times through the HORN/DM Fuse to the Cargo Lamp Switch. When the Cargo Lamp Switch is turned on, voltage flows through the switch to the Lamp. On models with a tailgate, a ground path is provided when the tailgate is opened.

UNDERHOOD LAMP

Voltage is applied at all times to the Underhood Lamp from the Junction Block, through an in-line fuse. When the switch is closed a ground path is provided.

DIAGNOSIS -- INTERIOR LAMPS

PRELIMINARY CHECKS:

Checks condition of T/L CTSY fuse. If fuse is good, refer to appropriate diagnostic procedure.

COURTESY LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at courtesy lamp connector C218 to ground. Check at each courtesy lamp.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire.
2. Open right door. Connect test lamp from ORN (40) wire to WHT (156) wire at courtesy lamp connector C218.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	CHECK to make sure jamb switch is closing. If switch closes, LOCATE and REPAIR open in WHT (156) wire and BLK (150) wire.

CARGO LAMP DOES NOT WORK

TEST	RESULT	ACTION
1. Turn cargo switch on. Connect a test lamp from ORN (140) wire at cargo lamp connector C436 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect a test lamp from ORN (140) wire to WHT (156) wire at cargo lamp connector C436.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (156) wire from cargo lamp to light switch.
3. Connect a test lamp from ORN (40) wire at cargo lamp switch connector C431 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire.
4. Connect a test lamp from ORN (140) wire at cargo lamp switch connector C430 to ground.	Test lamp lights.	LOCATE and REPAIR open in ORN/WHT (140) wire from cargo lamp switch to cargo lamp.
	Test lamp does not light.	REPLACE cargo lamp switch.

DOME LAMP DOES NOT WORK OR STAYS ON ALL THE TIME

TEST	RESULT	ACTION
1. Connect a test lamp from ORN (40) wire at both dome lamps to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire.
2. Open both doors and turn panel lamp switch to ON. Connect a test lamp from ORN (40) wire to WHT (156) wire at dome lamp.	Test lamp lights.	REPLACE bulb if dome lamp did not work. If dome lamp stayed ON all the time, GO to step 3.
	Test lamp does not light	GO to step 3.
3. Disconnect jamb switch connectors. Connect an ohmmeter from WHT (156) terminal to BLK (150) terminal at jamb switch. Take a reading with door open and a reading with door closed. With door open reading must be 0 ohms and door closed, infinite ohms.	Correct readings.	GO to step 4.
	Incorrect readings.	REPLACE jamb switch(es) that have incorrect reading.
4. Disconnect light switch connector C202. Connect an ohmmeter from WHT (156) terminal to BLK (150) terminal at light switch. Turn light switch to ON and the OFF and take a reading in each position. When ON, reading must be 0 ohms and when OFF, reading must be infinite ohms.	Correct readings.	LOCATE and REPAIR open or short in WHT (156) wire and BLK (150) wire.
	Incorrect readings.	REPLACE light switch.

I/P COMPARTMENT BOX LAMP DOES NOT WORK

TEST	RESULT	ACTION
1. Open I/P compartment box door. Connect test lamp from ORN (40) wire I/P compartment box lamp connector C230 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire.
2. Connect test lamp from ORN (40) wire to BLK (150) wire at I/P compartment box lamp connector C230.	Test lamp lights.	REPLACE I/P compartment box lamp assembly.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from I/P compartment box lamp to ground terminal G202.

UNDERHOOD LAMP DOES NOT WORK

TEST	RESULT	ACTION
1. Connect a test lamp from ORN (40) wire to BLK (150) wire at underhood lamp connector C101A.	Test lamp lights.	REPLACE underhood lamp bulb.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp to RED (2) wire at in-line fuse connector C100A to ground.	Test lamp lights.	REPLACE in-line fuse.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire or fusible link.

C219
12004886

FUSE BLOCK
12103404

FRONT

REAR

HOT AT ALL TIMES

T/L CTSY
20 AMP

2-3.0 RED

ENGINE

C100
12020183

GENERATOR
AND BATTERY
(SEE PAGE 10)

I/P

C100
12020184

C202
12004628

LIGHT SWITCH

CIRCUIT
BREAKER
25 AMP

DOME

OFF

PARK

HEAD

RH DOOR
JAMB SWITCH

(CLOSED WITH
DOOR OPEN)

GT602
8911287

I/P
COMPARTMENT
BOX LAMP
AND SWITCH

C230
12010118

150-.8 BLK

40-.8 ORN

40-.1 ORN

156-.8 WHT

C218

S204
(SEE PAGE 34)

COURTESY
LAMP

C218
8905988

C220
8911221

S217

40-.8 BRN

C227
2984369

C228
6288872

GT502
12015958

159-.8 TAN

LH DOOR
JAMB SWITCH
(CLOSED WITH
DOOR OPEN)

SHEET
METAL
GROUND
G200

RH REAR
DOOR JAMB
SWITCH

(CLOSED WITH
DOOR OPEN)

(SUBURBAN ONLY)

C438
6288872

156-1.0 WHT

FRONT DOME LAMP
(SUBURBAN/UTILITY)

2973324

REAR DOME LAMP
(SUBURBAN/UTILITY)

2973324

240-1.0 ORN

S413

C435
06288219

C434
6288544 (UTILITY ONLY)
12004333

S412

REAR PANEL
DOOR/END GATE
HARNESS EXTENSION
(SUBURBAN ONLY)
(SEE PAGE)

C323
12047682

C324
12047683

LIGHTED
VANITY
MIRROR

CARGO LAMPS
(SUBURBAN ONLY)
(SEE PAGE 120)

C437
6288872

C208
12047682

C208
12047683

KEY-IN
WARNING
BUZZER
(SEE PAGE 113)

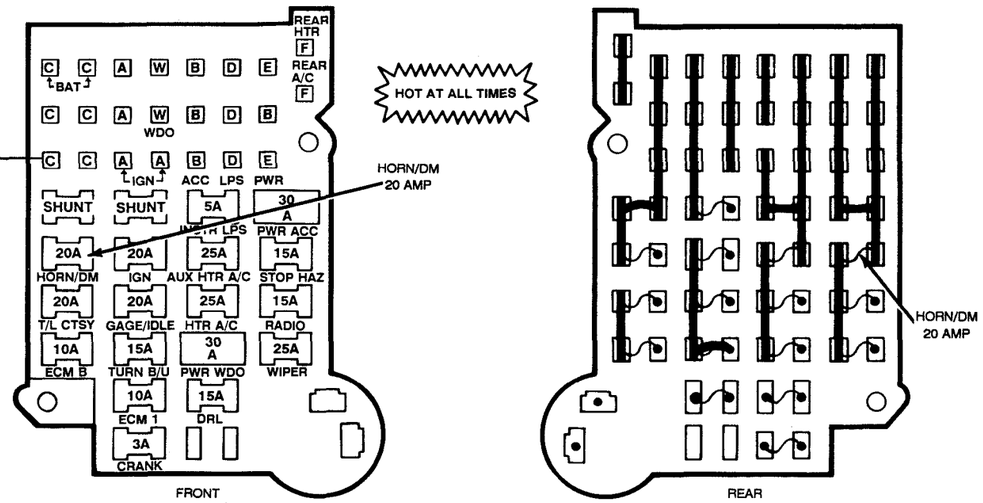
LEFT REAR
DOOR JAMB
SWITCH

(CLOSED WITH
DOOR OPEN)

DOME LAMPS, I/P COMPARTMENT LAMP, AND LIGHTED VANITY MIRROR A-119

RPO CODES

E63 - FLEETSIDE BODY



FUSE BLOCK
12103404

CARGO LAMP SWITCH
FLEETSIDE MODELS (E63)

C431
2962793

40
140

C430
2962793

40-.8 ORN

140-.8 ORN

156-.8 WHT

C436
8911223

CARGO LAMP
FLEETSIDE MODELS (E63)

COURTESY LAMP AND FRONT DOOR JAMB SWITCHES (SEE PAGE 119)

C219
12004886

40-.8 ORN

156-.8 WHT

C455
2977253

156-.8 WHT

156-.8 WHT

40-.8 ORN

40-.8 ORN

C454
8911353

6288544

6288545

C433
12015987

C456
12004333
6288544 (UTILITY ONLY)

156-.8 WHT

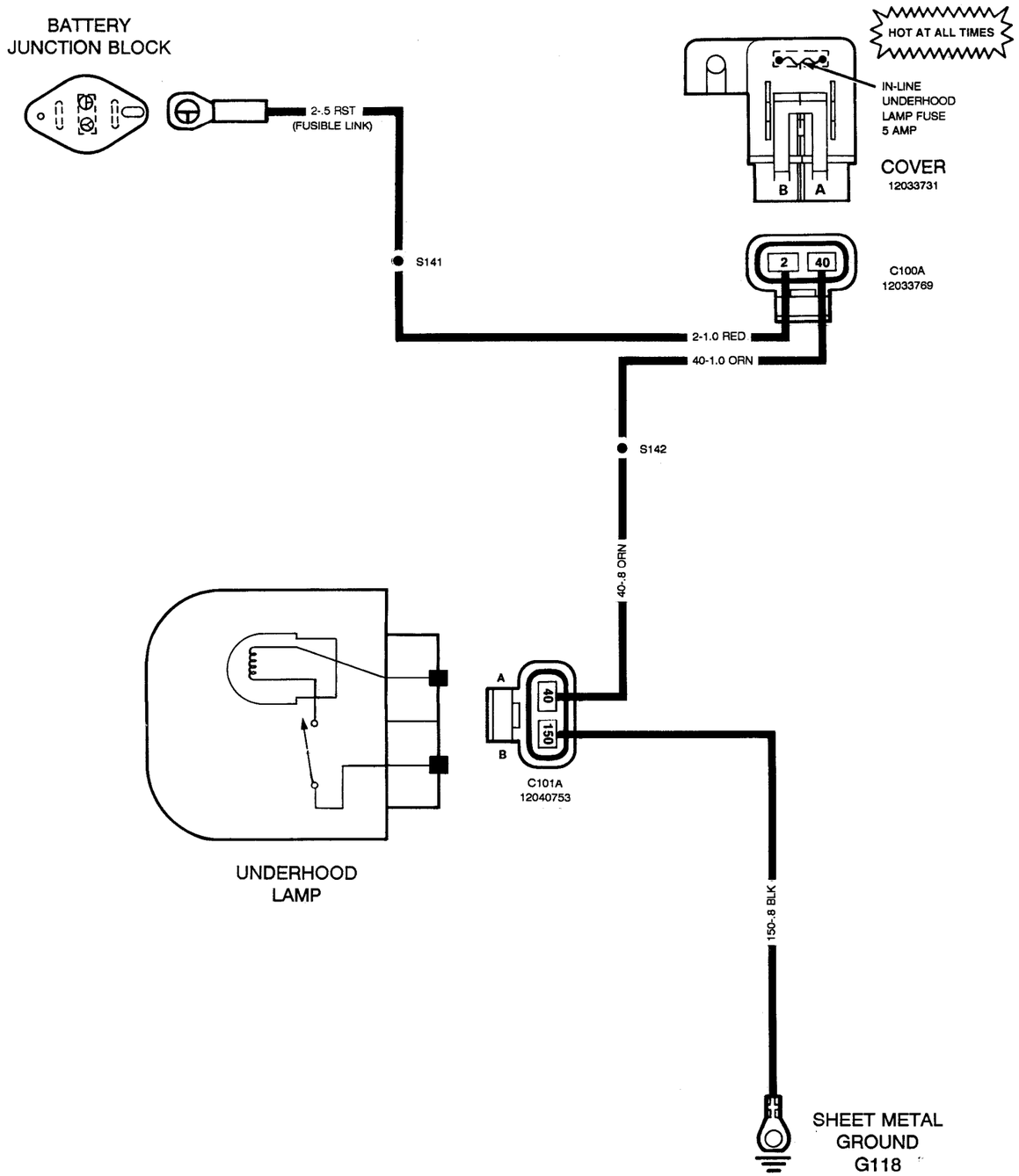
40-.8 ORN

C442
12015952

REAR GATE SWITCH

DOME LAMPS
(SEE PAGE 112)

A-120 CARGO LAMP


BATTERY
JUNCTION BLOCK
2-.5 RST
(FUSIBLE LINK)
S141
HOT AT ALL TIMES
IN-LINE
UNDERHOOD
LAMP FUSE
5 AMP
COVER
12033731
B
A
2
40
C100A
12033769
2-1.0 RED
40-1.0 ORN
S142
40-.8 ORN
A
B
40
150
C101A
12040753
150-.8 BLK
UNDERHOOD
LAMP
SHEET METAL
GROUND
G118

CIRCUIT OPERATION

The Cruise Control System operates a mechanical linkage to the throttle by means of a Vacuum Motor. This is a diaphragm moved by a vacuum applied to one side. A solenoid operated valve connects the Vacuum Motor to a Vacuum Tank. Another solenoid valve vents the vacuum to reduce the suction. The Cruise Control Module controls the vacuum motor and the throttle by pulsing these solenoid valves on and off.

One input to the module is the vehicle speed. This input comes from the DRAC. If the actual speed signal is different from the speed that was sent into and remembered by the module, the module generates pulses to change the vacuum and return the vehicle to the set speed. Other inputs to the module are from the Cruise Switch and the Set Switch. A disconnect input to the module comes from a switch on the brake pedal and on vehicles equipped with a manual transmission, from the Clutch Switch. A separate vacuum shut-down of the Cruise Control comes from the Brake/Clutch Cruise Release Valve on the brake pedal.

The two outputs of the Cruise Control Module operate the coils of the Vacuum Valve and the Vent Valve. Both valves are located in the Cruise Control Servo. These valves move the throttle by means of the Vacuum Motor. The Servo Position Sensor coil senses the position and motion of the Vacuum Motor. It feeds this information back to the module to provide smooth acceleration while the vehicle is in Cruise Control.

DIAGNOSIS -- CRUISE CONTROL

CRUISE CONTROL DOES NOT DISENGAGE WHEN CLUTCH OR BRAKE PEDAL IS DEPRESSED

TEST	RESULT	ACTION
1. Place ignition switch in RUN and cruise control switch to ON. Connect a test lamp from GRA (397) wire at brake switch connector C253 to ground.	Test lamp lights.	GO to step 2, (man trans). GO to step 5 (auto trans).
	Test lamp does not light.	LOCATE and REPAIR open in GRA (397) wire between brake switch and cruise control switch.
2. Connect a test lamp from BRN (86) wire at brake switch connector C253 to ground. Do not depress brake pedal.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK adjustment of brake switch. If brake switch cannot be adjusted, REPLACE brake switch.
3. Connect a test lamp from BRN (86) wire at clutch switch connector C254 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (86) wire between brake switch and clutch switch.
4. Connect a test lamp from GRA/BLK (87) wire at clutch switch connector C254 to ground. Do not depress clutch pedal.	Test lamp lights.	REFER to "Cruise Control Does Not Operate" procedure.
	Test lamp does not light.	CHECK adjustment of clutch switch. If adjustment cannot be corrected, REPLACE clutch switch.
5. Connect a test lamp from GRA/BLK (87) wire at brake switch connector C253 to ground. Do not depress brake pedal.	Test lamp lights.	REFER to "Cruise Control Does Not Operate" symptom.
	Test lamp does not light.	CHECK adjustment of brake switch. If adjustment cannot be made, REPLACE brake switch.

CRUISE CONTROL DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in RUN and cruise control switch to ON. Connect a test lamp from GRA (397) wire at cruise control switch connector C252 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (139) wire between cruise control switch and fuse block. If wire is in good condition, REPLACE cruise control switch.
2. Connect a test lamp from DK BLU (84) wire at cruise control switch connector C252 to ground.	Test lamp lights.	REPLACE cruise control switch.
	Test lamp does not light.	GO to step 3.
3. Depress SET/COAST switch. Connect a test lamp from DK BLU (84) wire at cruise control module connector C252 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (84) wire between cruise control switch and cruise control module. If wire is in good condition, REPLACE cruise control switch.
4. Depress and hold RESUME/ ACCELERATE switch. Connect a test lamp from DK GRN (83) wire at cruise control module connector C252 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (83) wire. If wire is in good condition, REPLACE cruise control switch.
5. Connect a test lamp from GRA (397) wire at cruise control module connector C252 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in GRA (397) wire between cruise control module and brake switch and/or brake switch and cruise control switch.
6. Connect a test lamp from BLK (150) wire to GRA (397) wire at cruise control module connector C252.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between cruise control module and bus bar ground.
7. Place ignition switch to OFF. Disconnect cruise control servo connector C184. Using four jumper leads, connect cavities A, B, D and E to ground. Using a digital ohmmeter, check for continuity in DK BLU/WHT (403), TAN (398), LT BLU/BLK (399) and LT GRN (402) wires at cruise control module connector C252 to ground.	No continuity in any or all wires.	LOCATE and REPAIR open in wire(s) that show no continuity.
	Continuity.	GO to step 8.

CRUISE CONTROL DOES NOT OPERATE (CONTINUED)

TEST	RESULT	ACTION
8. Connect a digital ohmmeter at BLK (150) cavity in cruise control servo connector C184 and check for continuity to ground.	No continuity.	LOCATE and REPAIR open in BLK (150) wire between cruise control servo and bus bar ground.
	Continuity.	Problem is not related to the cruise control system wiring or switches, replace cruise control module and test drive. If still inoperative, replace cruise control servo.

RPO CODES
LH6 - ENGINE, 6.2L (378 CID) V8 DIESEL ENGINE, VIN C LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE, VIN J

FUSE BLOCK
12103404

FRONT

REAR

HOT IN START OR RUN

IGN 20 AMP

IGN 20 AMP

C251
12004888

(LH6, LL4 ONLY)

139-.8 PNK/BLK

139-.8 PNK/BLK

GT106
12034336

COWL

W/O RWAL

W/ RWAL

C252
12034125

402-.8 LT GRN

397-.8 GRA

399-.8 LT BLU/BLK

403-.8 DK BLU/WHT

398-.8 TAN

437-.8 BRN

400-.8 YEL

150-.8 BLK

84-.8 DK BLU

63-.8 DK GRN

CRUISE CONTROL MODULE

403	CRUISE VENT VALVE
402	CRUISE CONTROL VACUUM
400	SPEED SENSOR - INPUT
437	SPEED SIGNAL - INPUT
399	CRUISE SERVO
398	CRUISE SERVO
150	GROUND
87	BRAKE SWITCH
84	CRUISE ENGAGER SWITCH
83	CRUISE ENGAGER SWITCH
397	ELECTRONIC CRUISE

CRUISE SERVO

VENT VALVE

VAC VALVE

C184
12052664

C185

12015345

12015344

C250
12033739

CRUISE CONTROL SWITCH

SET/COAST

RESUME/ACCEL

ON/OFF

S205 (LH6, LL4 ONLY)

S211

BUS BAR GROUND G201

C200A
8911256

MAN TRANS ONLY

OPENS WHEN PEDAL IS DEPRESSED

CLUTCH SWITCH

BRAKE SWITCH

AUTO TRANS ONLY

BRAKE SWITCH

C254
12052351

C253
12015197

C253
12015197

87-.8 GRA/BLK

86-.8 BRN

86-.8 BRN

397-.8 GRA

397-.8 GRA

87-.8 GRA/BLK

397-.8 GRA

397-.8 GRA

WITH RWAL

C256
12066189

437

SPEED SIGNAL

DRAC MODULE

VSS

(LH6, LL4 ONLY)

C221
12015686

C255
12034117

W/O RWAL

2K

2K

A-124 CRUISE CONTROL

CIRCUIT OPERATION

When the Ignition Switch is in RUN and the Four-Wheel Drive Control (4WD) Lever is engaged, the Transfer Case Switch closes and battery voltage is applied across the Front Axle Actuator. The Front Axle Actuator energizes and the four-wheel drive gears are meshed. This meshing action of the four-wheel drive gears closes the Front Axle Switch, and battery voltage is applied through the WHT (156) wire across the four-wheel drive indicator lighting the bulb in Utility and Suburban models. On Fleetside, Wideside and Crew/Bonus Cab models, the closing of the switch provides a ground for the indicator lamp. Battery voltage is also applied through the front axle switch contacts and the PPL (420) wires to the Electronic Rear Wheel Brake Control Module in the Utility and Suburban models. This will keep the antilock braking system disabled in 4WD mode. The In-Line Resistor (automatic transmission only) prevents the TCC Solenoid from engaging when the Front Axle Switch is closed.

DIAGNOSIS -- FOUR-WHEEL DRIVE INDICATOR LAMP

PRELIMINARY CHECKS:

Make sure all mechanical components are operative before diagnosing the electrical portion of the four-wheel drive system.

To determine whether the vehicle is in Two-Wheel Drive or Four-Wheel Drive, it must be lifted up so the wheels can spin freely.

While performing the following diagnostic procedures, the Ignition Switch must be in RUN, and the 4WD Control Lever must be in the 4WD ENGAGED position.

FOUR-WHEEL DRIVE INDICATOR LAMP WILL NOT TURN OFF

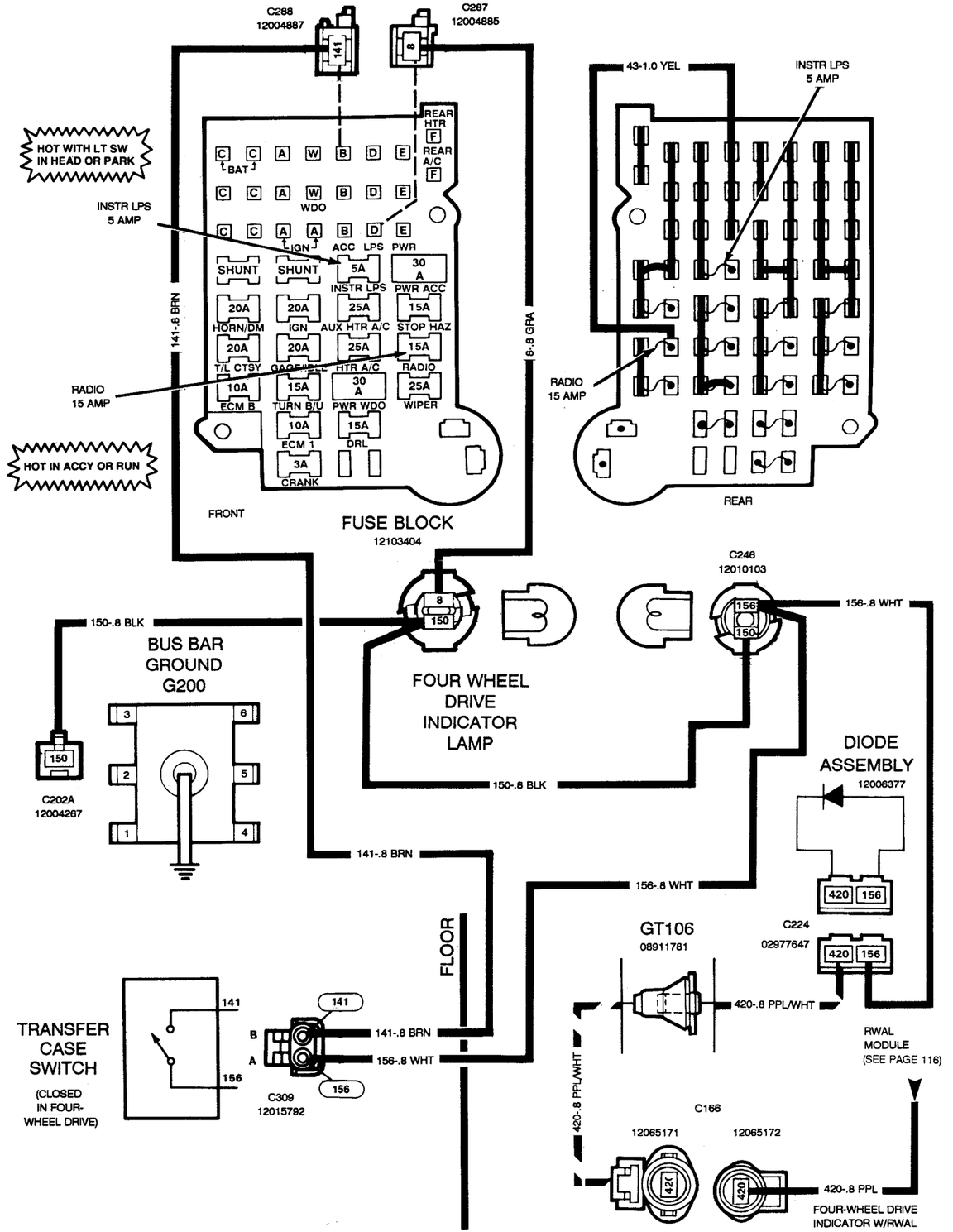
TEST	RESULT	ACTION
Disconnect transfer case switch connector C309.	4WD indicator lamp goes off.	REPLACE transfer case switch.

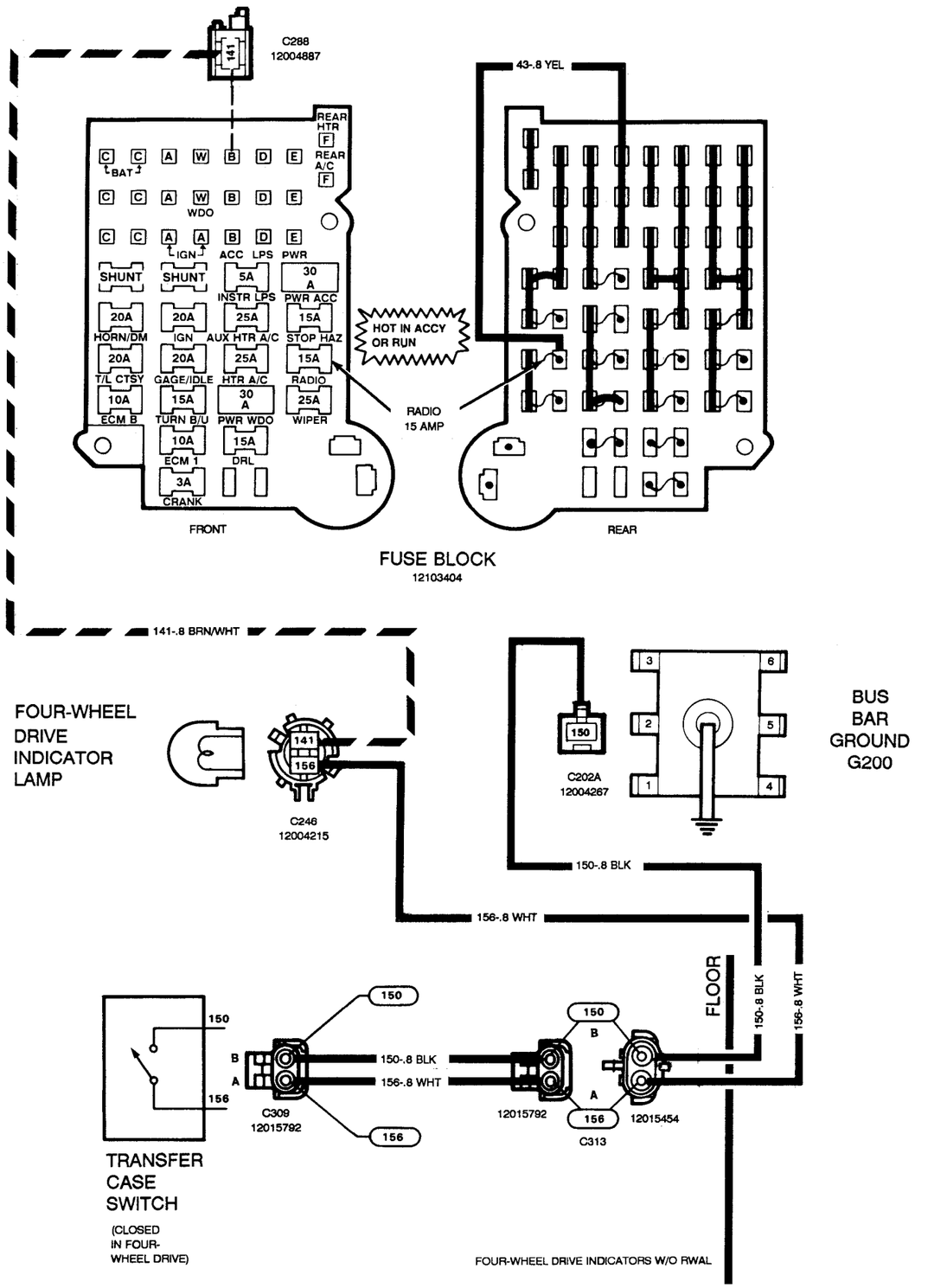
FOUR-WHEEL DRIVE ENGAGES BUT 4WD INDICATOR LAMP DOES NOT LIGHT (V100, V200)

TEST	RESULT	ACTION
1. Place ignition switch in RUN. Remove transfer case connector C309. Connect a test lamp from BRN (141) wire to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK RADIO fuse. If fuse is good, LOCATE and REPAIR open in BRN (141) wire between transfer case switch connector C309 and fuse block connector C288.
2. Connect transfer case connector C309. Connect a test lamp to the WHT (156) wire at the back of the transfer case connector C309 to ground. Place the transfer case in four-wheel drive.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE transfer case switch.
3. With ignition switch in RUN and transfer case in four-wheel drive, disconnect 4WD indictor lamp connector C246. Connect a test lamp between WHT (156) wire and ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (156) wire between transfer case switch connector C309 and four-wheel drive indicator lamp connector C246.
4. Connect a test lamp between WHT (156) wire and BLK (150) wire at four-wheel drive indicator lamp connector C246.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire to ground.

FOUR-WHEEL DRIVE ENGAGES BUT 4WD INDICATOR LAMP DOES NOT LIGHT (V300)

TEST	RESULT	ACTION
1. Disconnect 4WD indicator lamp connector C246. Connect test lamp to BRN/WHT (141) wire to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK RADIO fuse, if fuse is good, LOCATE and REPAIR open in BRN/WHT (141) wire.
2. Connect test lamp to connector C246 to BRN/WHT (141) to WHT (156) wire. Engage four-wheel drive.	Test lamp lights.	REPLACE 4WD indicator lamp.
	Test lamp does not light.	GO to step 3.
3. Connect a self-powered test lamp to WHT (156) wire at transfer case connector C309 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (156) wire.
	Test lamp lights.	GO to step 4.
4. Connect a self-powered test lamp between WHT (156) wire and BLK (150) wire at transfer case switch connector C246. Make sure four-wheel drive is engaged.	Test lamp lights.	REPLACE transfer case switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire to ground.


C288
12004887
C287
12004885
HOT WITH LT SW IN HEAD OR PARK
INSTR LPS 5 AMP
RADIO 15 AMP
HOT IN ACCY OR RUN
141-.8 BRN
8-.8 GRA
REAR HTR
REAR A/C
WDO
BAT
IGN
ACC
LPS
PWR
SHUNT
INSTR LPS
PWR ACC
HORN/DM
AUX HTR A/C
STOP HAZ
T/L CTSY
GAGE/IDLE
HTR A/C
RADIO
ECM B
TURN B/U
PWR WDO
WIPER
ECM 1
DRL
CRANK
FRONT
FUSE BLOCK
12103404
43-1.0 YEL
INSTR LPS 5 AMP
RADIO 15 AMP
REAR
C246
12010103
150-.8 BLK
BUS BAR GROUND G200
C202A
12004267
FOUR WHEEL DRIVE INDICATOR LAMP
150-.8 BLK
156-.8 WHT
DIODE ASSEMBLY
12006377
420
156
141-.8 BRN
156-.8 WHT
FLOOR
GT106
08911781
C224
02977647
420-.8 PPL/WHT
RWAL MODULE
(SEE PAGE 116)
TRANSFER CASE SWITCH
(CLOSED IN FOUR-WHEEL DRIVE)
141
156
B
A
C309
12015792
C166
12065171
12065172
420-.8 PPL
FOUR-WHEEL DRIVE INDICATOR W/RWAL


C288
12004887
43-.8 YEL
HOT IN ACCY OR RUN
RADIO 15 AMP
FRONT
REAR
FUSE BLOCK
12103404
141-.8 BRN/WHT
FOUR-WHEEL DRIVE INDICATOR LAMP
C246
12004215
C202A
12004267
BUS BAR GROUND G200
150-.8 BLK
156-.8 WHT
FLOOR
TRANSFER CASE SWITCH
(CLOSED IN FOUR-WHEEL DRIVE)
C309
12015792
C313
12015454
FOUR-WHEEL DRIVE INDICATORS W/O RWAL

CIRCUIT OPERATION

POWER MIRRORS

Voltage is applied at all times to the Power Outside Rearview Mirror Switch, through the HORN/DM Fuse and an In-Line Auto Fuse.

The mirror assemblies contain two motors. One motor positions the mirror up and down, the other motor positions the mirror to the left or right. By reversing the polarity of the motors, the motors will move the mirrors either up/down or left/right.

POWER DOOR LOCKS

When a Door Lock Switch is operated, all of the doors will unlock or lock. Each lock can also be operated manually. The locks are operated by reversible motors that receive voltage from the PWR/ACC Circuit Breaker. The Door Lock Switches operate to turn the Motors on by applying battery voltage to one of the terminals and ground to the other terminal.

When either Door Lock Switch is moved to the LOCK position, it completes the circuit to the Motors. Voltage is applied to the GRA (295) wire and to the Door Lock Motors, which are grounded by the TAN (294) wire from the other terminal of the Motor through the other switch contact to ground. The Motor in each door runs to operate the Door Locks. When the Door Lock Switch is released, the circuit is opened and the Motors turn off.

A similar action occurs with either of the Door Lock Switches closing to the UNLOCK position. Now the TAN (294) wires to the Motors supply battery voltage and the GRA (295) wires are grounded. The polarity of the voltage to the Motors has reversed. The Motors run in the opposite direction to unlock the doors.

The Door Lock Switches are usually closed for just a moment. If the Door Lock Switches are held closed, a circuit breaker in each Motor will open to protect against damage. The circuit breakers close automatically when they cool off.

DIAGNOSIS — POWER MIRRORS

PRELIMINARY CHECKS:

1. Check to see that the HORN/DM, PWR ACC and in-line (C266) fuses are not blown. If blown, locate and repair source of the overload, then replace fuse.
2. Refer to Section 8 of the 1991 R/V,P Light Truck Service Manual for diagnosis and repair of all non-electrical system components.

NEITHER MIRROR IS OPERATIONAL

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at mirror switch connector C505 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between mirror switch connector C505 and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from ORN (40) wire to BLK (150) wire at mirror switch connector C505.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between mirror switch connector C505 and bus bar ground.
	Test lamp lights.	REPLACE mirror switch.

LH MIRROR WILL NOT ADJUST UP AND DOWN

TEST	RESULT	ACTION
Disconnect in-line fuse connector C266 and connector C504 at LH mirror motor. Place ohmmeter on Rx1 scale and connect leads to YEL (88) and LT BLU (82) wires at LH mirror motor connector C504. While holding mirror adjustment switch in the UP and DOWN positions, measure for continuity.	Continuity.	REPLACE LH mirror motor.
	No continuity.	LOCATE and REPAIR open in YEL (88) or LT BLU (82) wires between mirror switch connector C505 and LH mirror motor connector C504. If none if found, REPLACE switch.

LH MIRROR WILL NOT ADJUST LEFT AND RIGHT

TEST	RESULT	ACTION
Disconnect in-line fuse connector C266 and connector C504 at LH mirror motor. Place ohmmeter on Rx1 scale and connect leads to WHT (81) and LT BLU (82) wires at LH mirror motor connector C504. While holding mirror adjustment switch in the LEFT and RIGHT positions, measure for continuity.	Continuity.	REPLACE LH mirror motor.
	No continuity.	LOCATE and REPAIR open in WHT (81) or LT BLU (82) wires between mirror switch connector C505 and LH mirror motor connector C504. If none is found, REPLACE switch.

RH MIRROR WILL NOT ADJUST UP AND DOWN

TEST	RESULT	ACTION
Disconnect in-line fuse connector C266 and connector C600 at RH mirror motor. Place ohmmeter on Rx1 scale and connect leads to YEL/BLK (888) and LT BLU/BLK (82) wires at RH mirror motor connector C600. While holding mirror adjustment switch in the UP and DOWN positions, measure for continuity.	Continuity.	REPLACE RH mirror motor.
	No continuity.	LOCATE and REPAIR open in YEL/BLK (888) and LT BLU (82) wires between mirror switch connector C505 and RH mirror motor connector C600. If none is found, REPLACE switch.

RH MIRROR WILL NOT ADJUST LEFT AND RIGHT

TEST	RESULT	ACTION
Disconnect in-line fuse connector C266 and C600 at RH mirror motor. Place ohmmeter on Rx1 scale and connect leads to WHT/BLK (881) and LT BLU/BLK (82) wires at RH mirror motor connector C600. While holding mirror adjustment switch in the LEFT and RIGHT positions, measure for continuity.	Continuity.	REPLACE RH mirror motor.
	No continuity.	LOCATE and REPAIR open in WHT/BLK (881) and LT BLU/BLK (82) wires between mirror switch connector C505 and RH mirror motor connector C600. If none is found, REPLACE switch.

DIAGNOSIS — POWER DOOR LOCKS

NONE OF THE DOOR LOCK MOTORS LOCK OR UNLOCK

TEST	RESULT	ACTION
Connect test lamp from ORN/BLK (60) wire at door lock relay connector C264 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN/BLK (60) wire between door lock relay connector C264 and fuse block. Inspect splice S259 for open wire. If no open is found, REPLACE PWR ACC circuit breaker.
	Test lamp lights.	INSPECT door lock relay for poor ground condition or REPLACE door lock relay.

ONE DOOR LOCK MOTOR DOES NOT LOCK OR UNLOCK FROM A PARTICULAR SWITCH

TEST	RESULT	ACTION
1. Connect a test lamp from ORN/BLK (60) wire at inoperative switch connector to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN/BLK (60) wire between switch and splice S259.
	Test lamp lights.	If door lock will not lock, go to step 2. If door lock will not unlock, go to step 3.
2. Connect a fused jumper from ORN/BLK (60) wire to LT BLU (195) wire at inoperative switch connector.	Door lock motor runs.	REPLACE door lock switch.
	Door lock motor does not run.	LOCATE and REPAIR open in LT BLU (195) wire between inoperative switch connector and door lock relay connector C264.
3. Connect a fused jumper from ORN/BLK (60) wire to BLK/WHT (194) wire at inoperative switch connector.	Door lock motor runs.	REPLACE door lock switch.
	Door lock motor does not run.	LOCATE and REPAIR open in BLK/WHT (194) wire between inoperative switch connector and door lock relay connector C264.

ONE DOOR LOCK MOTOR DOES NOT OPERATE FROM ANY SWITCH

TEST	RESULT	ACTION
1. Connect test lamp from TAN (294) wire to GRA (295) wire at inoperative motor and momentarily place door lock switch in lock or unlock position while observing test lamp.	Test lamp lights.	REPLACE door lock motor.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp from TAN (294) wire at inoperative motor to ground and momentarily place door lock switch to unlock position while observing test lamp.	Test lamp lights.	LOCATE and REPAIR open in GRA (295) wire between inoperative motor connector and splice S258.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (294) wire between inoperative motor connector and splice S257.

HOT AT ALL TIMES

640-1.0 ORN

640

C258
12004886

REAR HTR F
REAR A/C F
C C A W B D E BAT
C C A W B D E WDO
C C A A B D E IGN
ACC LPS PWR

SHUNT SHUNT 5A 30 A
INST LPS PWR ACC
20A 20A 25A 15A
HORN/DM IGN AUX HTR A/C STOP HAZ
20A 20A 25A 15A
T/L CTSY GAGE/IDLE HTR A/C RADIO
10A 15A 30 A 25A
ECM B TURN B/U PWR WDO WIPER
10A 15A
ECM 1 DRL
3A
CRANK

FRONT

HORN/DM
20 AMP

REAR

FUSE BLOCK
12103404

640-1.0 ORN

40-.5 ORN

150-.5 BLK

150-3.0 BLK

S261

150-3.0 BLK → POWER WINDOWS (SEE PAGE 139)

40 B
640 A
C266
12010105

IN-LINE
3 AMP
AUTO FUSE

C257
12004267

BUS BAR GROUND

G201

C268
12015345
12015344

888-.5 YEL/BLK
82-.5 LT BLU/BLK
881-.5 WHT/BLK

GT600
8911670

GT601
12010247

82-.5 LT BLU/BLK
S600

C600
12047785

RH POWER OUTSIDE REARVIEW MIRROR

82 888 881 82
UP/DOWN
LEFT/RIGHT

POWER OUTSIDE REARVIEW MIRROR SWITCH

150 40 888 881 81 88 82 82

LH POWER OUTSIDE REARVIEW MIRROR

UP/DOWN 82 88 81 82 LEFT/RIGHT

C267
12064763
12064762

150 40
82 888 881
A B C
F E D

150-.5 BLK
82-.5 LT BLU/BLK
881-.5 WHT/BLK
40-.5 ORN
888-.5 YEL/BLK

GT500
8911670

GT501
12010247

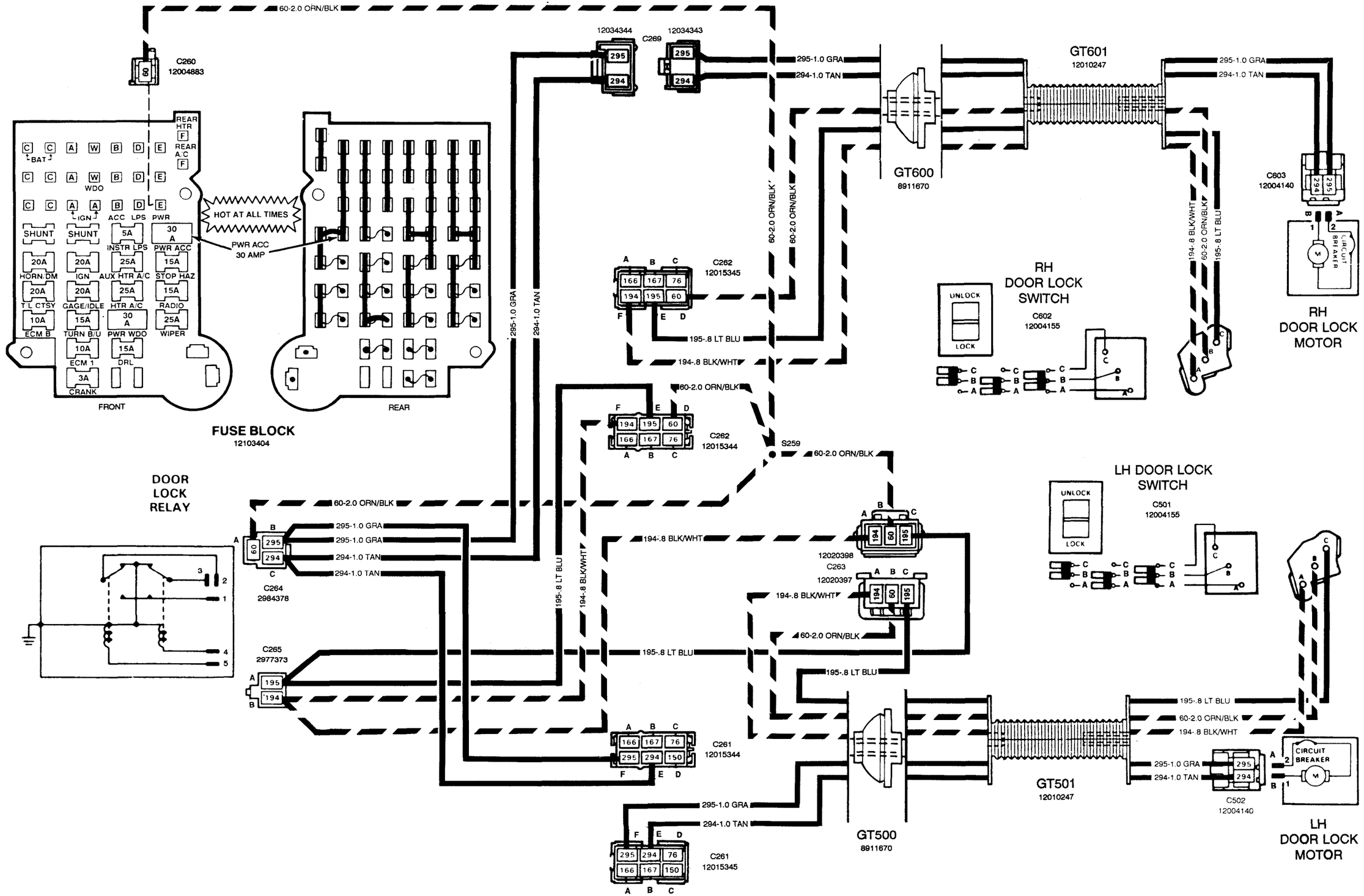
88-.5 YEL
81-.5 WHT
C504
12047785

C505
12045688
40 81 82 88
150 881 82 888
H G F E

82-.5 LT BLU

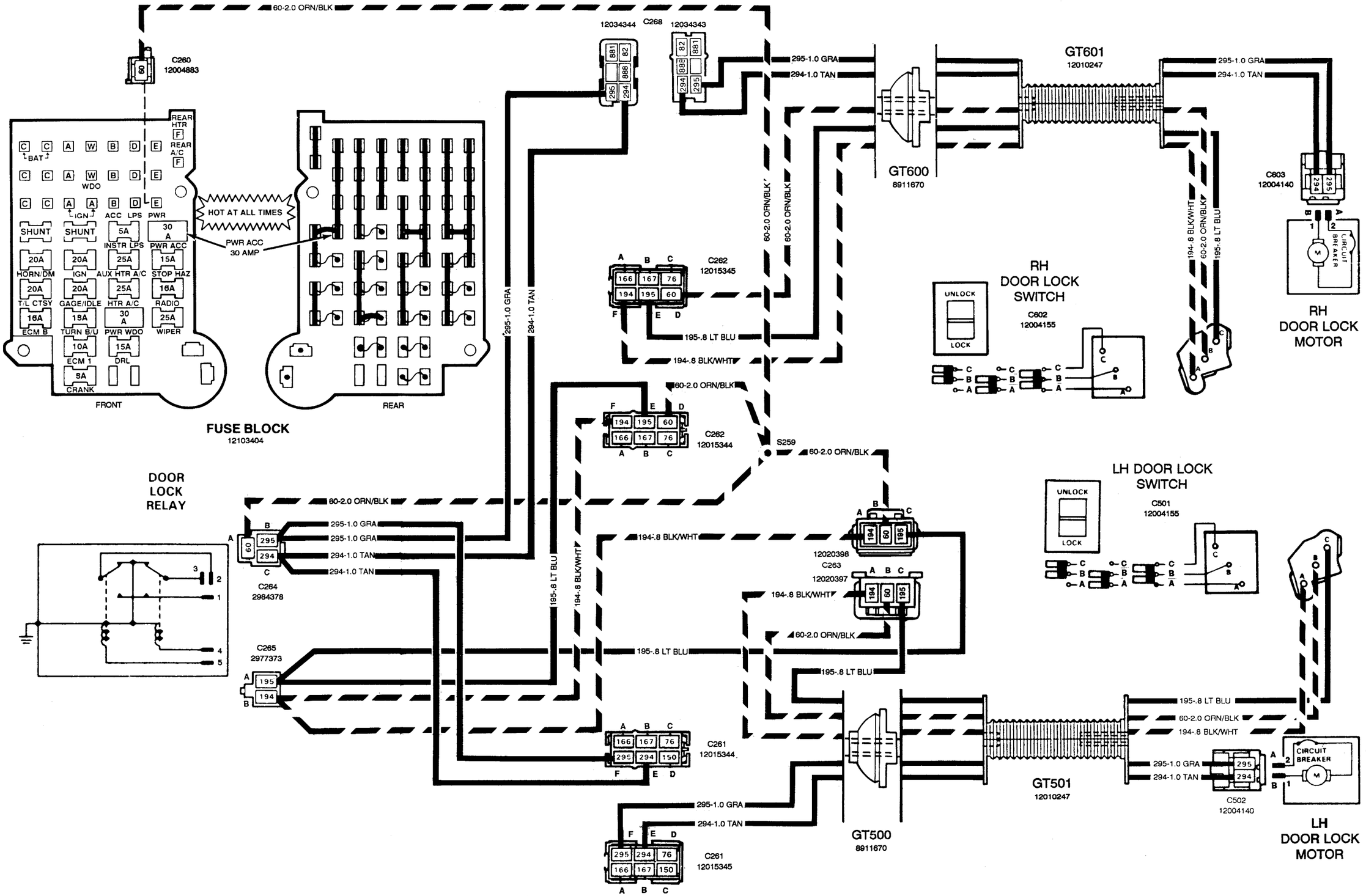
S500

POWER OUTSIDE REARVIEW MIRRORS A-129



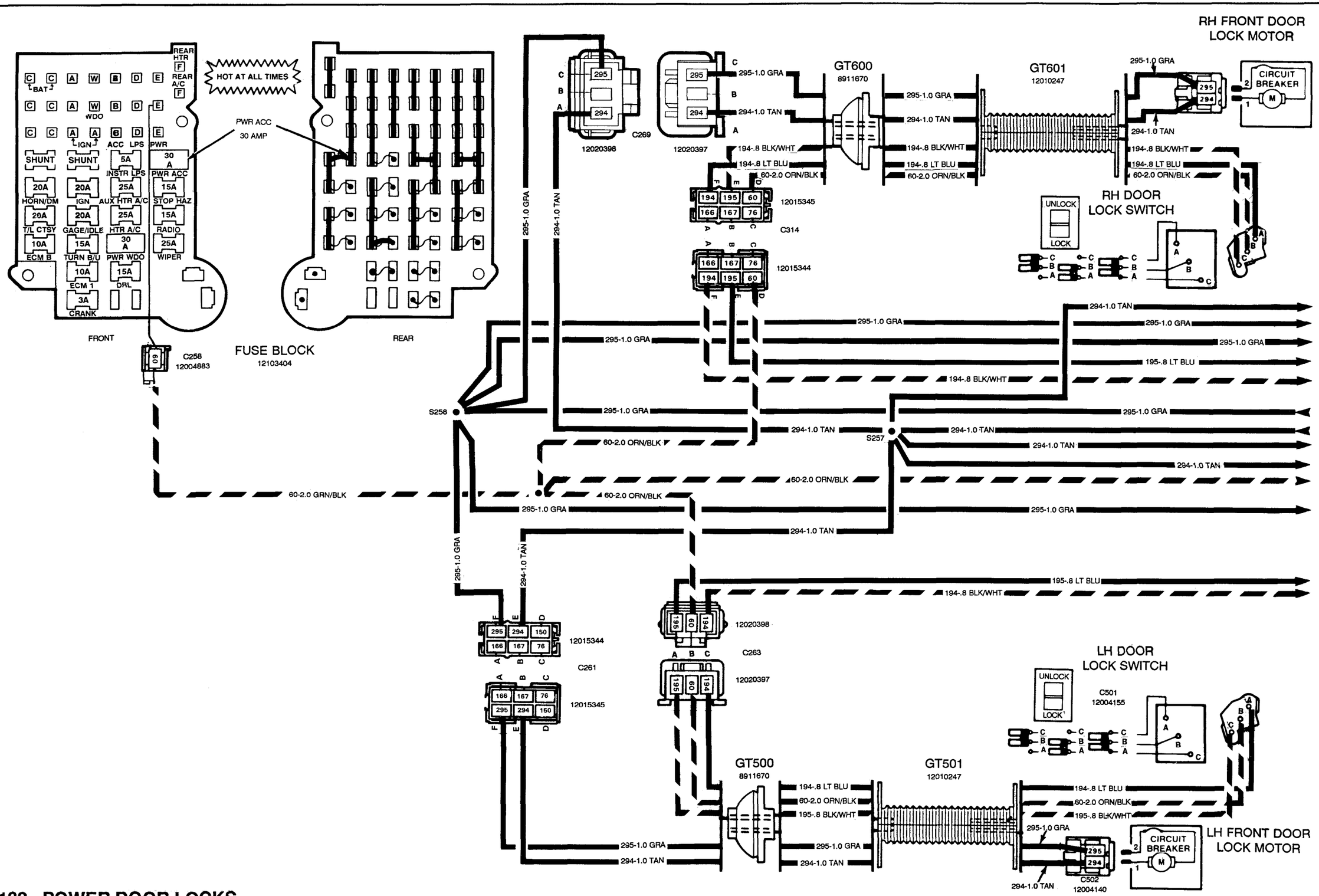
A-130 POWER DOOR LOCKS

2-DOOR (WITHOUT POWER OUTSIDE REARVIEW MIRRORS)



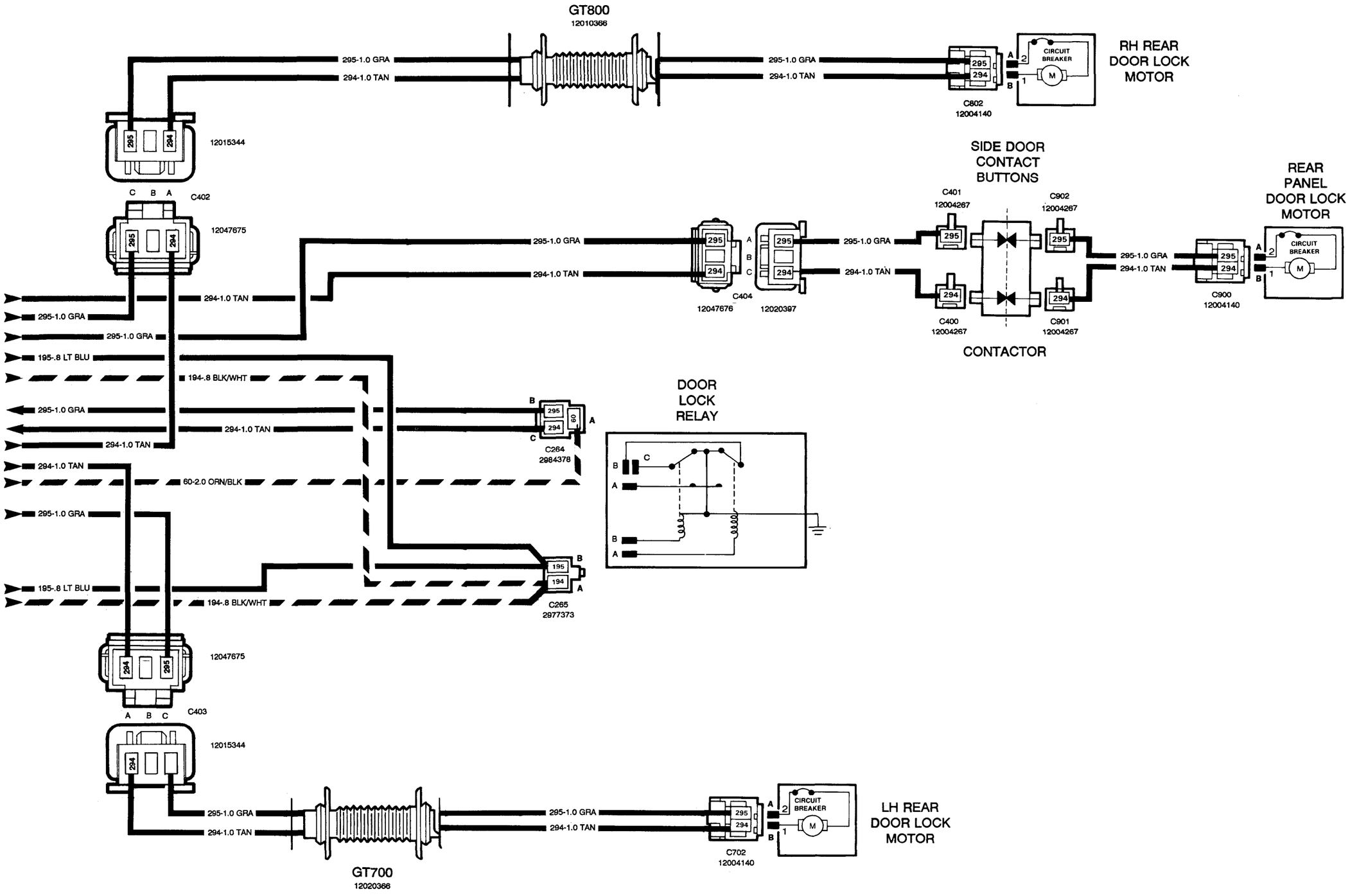
POWER DOOR LOCKS A-131

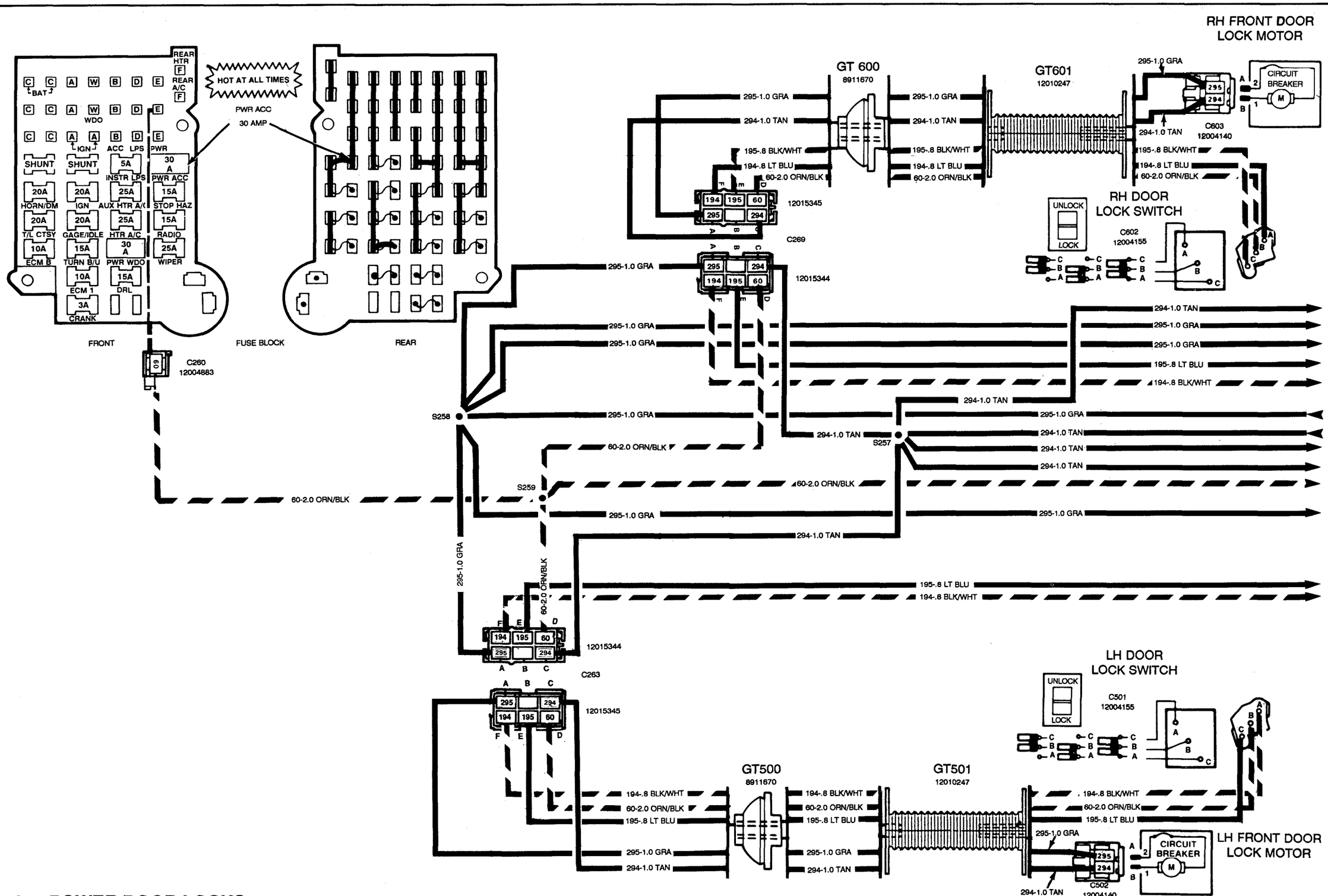
2-DOOR (WITH POWER OUTSIDE REARVIEW MIRRORS)



A-132 POWER DOOR LOCKS

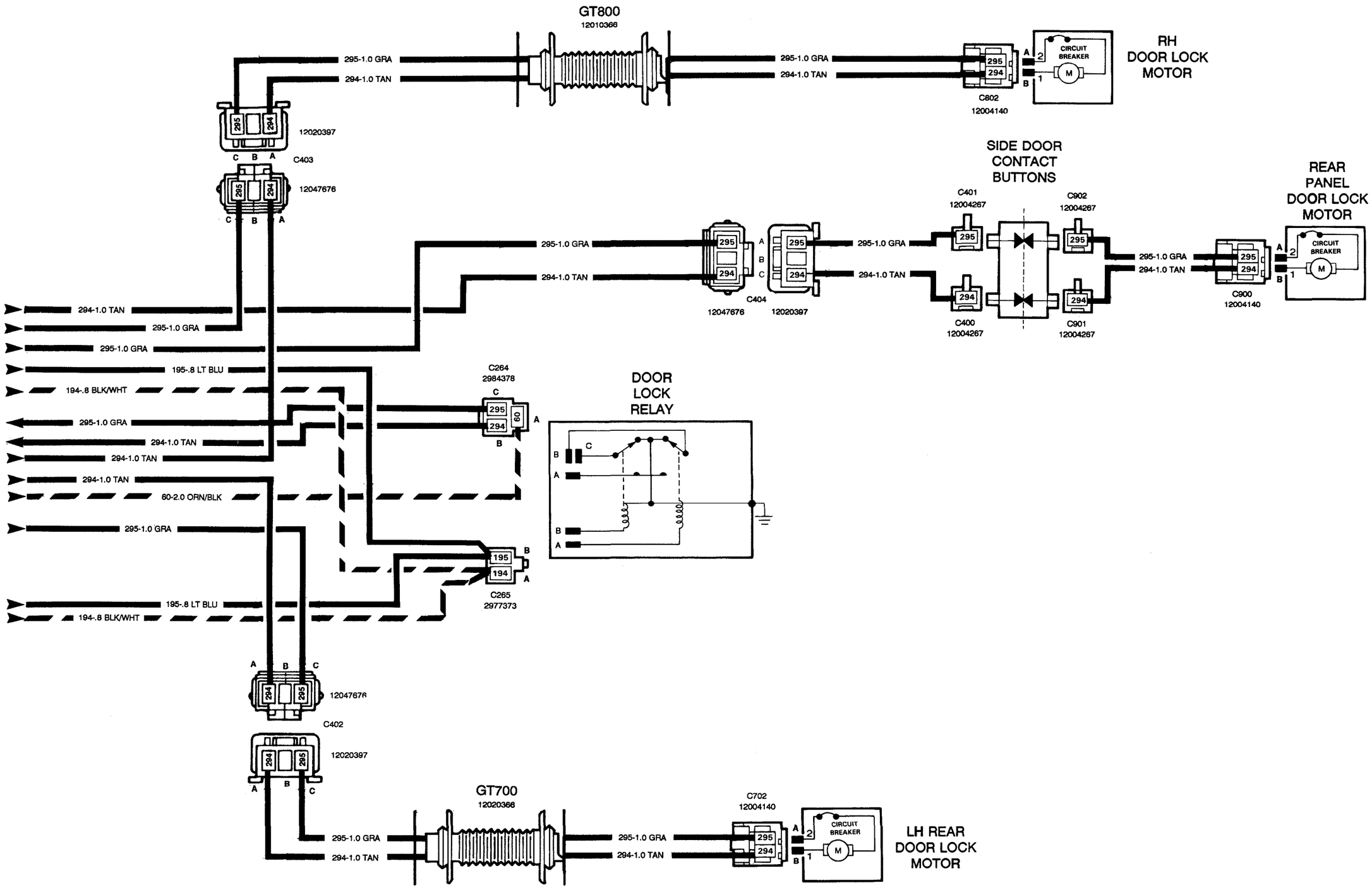
4-DOOR (WITH POWER OUTSIDE REARVIEW MIRRORS)


GT800
12010366
295-1.0 GRA
294-1.0 TAN
C802
12004140
CIRCUIT BREAKER
RH REAR DOOR LOCK MOTOR
12015344
C402
12047675
SIDE DOOR CONTACT BUTTONS
C401
12004267
C902
12004267
C404
12047676
12020397
C400
12004267
C901
12004267
CONTACTOR
C900
12004140
REAR PANEL DOOR LOCK MOTOR
195-.8 LT BLU
194-.8 BLK/WHT
60-2.0 ORN/BLK
C264
2984378
DOOR LOCK RELAY
C265
2977373
12047675
C403
12015344
GT700
12020366
C702
12004140
LH REAR DOOR LOCK MOTOR



A-134 POWER DOOR LOCKS

4-DOOR (WITHOUT POWER OUTSIDE REARVIEW MIRRORS)


GT800
12010366
295-1.0 GRA
294-1.0 TAN
C802
12004140
CIRCUIT BREAKER
RH DOOR LOCK MOTOR
12020397
C403
12047676
SIDE DOOR CONTACT BUTTONS
C401
12004267
C902
12004267
C400
12004267
C901
12004267
REAR PANEL DOOR LOCK MOTOR
C900
12004140
C404
12047676
12020397
294-1.0 TAN
295-1.0 GRA
195-.8 LT BLU
194-.8 BLK/WHT
60-2.0 ORN/BLK
C264
2984378
DOOR LOCK RELAY
C265
2977373
C402
12047676
12020397
GT700
12020366
C702
12004140
LH REAR DOOR LOCK MOTOR

CIRCUIT OPERATION

A permanent magnet (PM) motor operates each of the Power Windows. Each Motor raises or lowers the window when voltage is supplied to it. The direction the Motor turns depends on the polarity of the supply voltage. The Switches control the supply voltage polarity.

The Master Door Lock/Power Window Switch Assembly controls all of the Window Motors. Each window also has its own control switch.

Each Motor is protected by a built-in circuit breaker. If a Window Switch is held too long with the window obstructed or after the window is fully up or down, the circuit breaker opens the circuit. The circuit breaker resets automatically.

When the Ignition Switch is in RUN or ACC, battery voltage is applied to the Master Door Lock/Power Window Switch Assembly, the PWR WDO Circuit Breaker, and the PNK (76) wires.

When any of the UP Switches are operated, battery voltage is applied to the Window Motor through the DK BLU/WHT (166) wire. The Window Motor is grounded through the DN contact. The Motor runs to drive the window up. When any of the DN Switches are operated, battery voltage is applied to the Window Motor in the opposite direction through the BRN (65) wire. The Window Motor is grounded through the UP contact. The Motor runs to drive the window down.

Battery voltage is supplied to the key-operated tailgate window switch at all times through the PWR ACC circuit breaker and the ORN/BLK (60) wire. When the ignition switch is in RUN or ACC, battery voltage is applied to the PWR WDO circuit breaker and the PNK (76) wire to the front tailgate window switch.

WINDOW SWITCH OPERATION

When the Ignition Switch is in RUN or ACC, battery voltage is applied to the Window Switch through the PWR WDO Circuit Breaker and the PNK wires to terminal 76. When the UP Switch in the Window Switch is operated, battery voltage is applied to the Window Motor through the DK BLU/WHT (166) wire. The Motor is grounded through the BRN (165) wire, the DN contact in the Window Switch, the TAN (167) wire and the DN contact in the Master Door Lock/Power Window Switch Assembly. The Motor runs to drive the window up. When the DN switch in the Window Switch is operated, battery voltage is applied to the Window Motor in the opposite direction through the BRN (165) wire. The Motor is grounded through the DK BLU (164) wire, the UP contact in the Window Switch, the DK BLU/WHT (166) wire and the UP contact in the Master Door Lock/Power Window Switch Assembly. The Motor runs to drive the window down.

The tailgate window motor receives voltage from either the front or key-operated tailgate switches through the LT BLU (183) wire for down or the TAN/WHT (184) for up operation. The tailgate window motor is grounded at the tailgate.

DIAGNOSIS — POWER WINDOWS

PRELIMINARY CHECKS:

Check condition of PWR WDO circuit breaker. If circuit breaker is in good condition, use the following diagnostic procedures.

POWER WINDOWS DO NOT OPERATE OR ONLY GO IN ONE DIRECTION

TEST	RESULT	ACTION
1. Place ignition switch in RUN or ACC position. Connect a test lamp from PNK (76) wire at affected window switch connector C500, C601, C700 or C800 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from affected window switch to fuse block.
2. Connect a test lamp from PNK (76) wire to BLK (150) wire at affected window switch connector C500, C601, C700 or C800.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from affected window switch to bus bar ground.
3. Move and hold affected window switch to UP position. Connect a test lamp from BRN (165, 667, or 669) wire at affected window switch connector C500, C601, C700 or C800 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE affected window switch.
4. Connect a test lamp from BRN (165, 667, or 669) wire to DK BLU (164, 666, or 669) wire at affected window switch connector C500, C601, C700 or C800.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPLACE affected window switch.
5. Connect a test lamp from BRN (165, 667, or 669) wire at affected window motor connector C503, C604, C701 or C801 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (165, 667 or 669) wire from affected window motor to window switch.
6. Connect a test lamp from BRN (165, 667, or 669) wire to DK BLU (164, 666, or 668) wire at affected window motor connector C503, C604, C701 or C801.	Test lamp lights.	REPLACE affected window motor.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (164, 666 or 668) wire between affected window motor and window switch.

POWER WINDOWS ONLY OPERATE FROM DRIVER'S SIDE WINDOW SWITCH

TEST	RESULT	ACTION
1. Place ignition switch in ACC position. Connect test lamp from PNK (76) wire at affected window switch connector C601, C700 or C800 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from affected window switch to fuse block.
2. Move affected window switch to UP position. Connect test lamp from BRN (667 or 669) wire at affected window switch connector C601, C700 or C800 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE affected window switch.
3. Move affected window switch to DOWN position. Connect test lamp from DK BLU (666 or 668) wire at affected window switch connector C601, C700 or C800 to ground.	Test lamp does not light.	REPLACE affected window switch.

POWER WINDOWS DO NOT OPERATE FROM DRIVER'S SIDE WINDOW SWITCH

TEST	RESULT	ACTION
1. Place ignition switch in ACC position. Position and hold affected window switch to UP position. Connect test lamp from BRN (667 or 669) wire at affected window motor connector C604, C701 or C801 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect test lamp from BRN (667 or 669) wire to DK BLU (666 or 668) wire at affected window motor connector C604, C701 or C801.	Test lamp lights.	REPLACE affected window motor.
	Test lamp does not light.	GO to step 3.
3. Connect a test lamp from PNK (76) wire at affected window switch connector C506 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from affected window switch to fuse block.
4. Connect test lamp from PNK (76) wire to DK BLU/WHT (166), DK GRN (168) or LT GRN (170) wires at affected window switch connector C506.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	GO to step 5.
5. Connect test lamp from PNK (76) wire to BLK (150) wire at affected window switch connector C506.	Test lamp lights.	REPLACE affected window switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from affected window switch to bus bar ground.
6. Connect test lamp from PNK (76) wire to TAN (167), PPL (169) or PPL/WHT (171) wire at affected window switch connector C506.	Test lamp lights.	GO to step 8.
	Test lamp does not light.	GO to step 7.
7. Connect test lamp from PNK (76) wire to BLK (150) wire at affected window switch connector C506.	Test lamp lights.	REPLACE affected window switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from affected window switch to bus bar ground.
8. Connect test lamp from PNK (76) wire to DK BLU/WHT (166), DK GRN (168) or LT GRN (170) wire and then to TAN (167), PPL (169) or PPL/WHT (171) wire at affected window switch connector C601, C700 or C800.	Test lamp lights at all wires.	REPLACE affected window switch.
	Test lamp lights at only one wire or not at all.	LOCATE and REPAIR open in wires (166, 168, 170, 167, 169 or 171) from affected window switch to left window switch.

PRELIMINARY CHECKS:

1. Tailgate should remain closed throughout the diagnosis of the POWER REAR WINDOW circuit.
2. CHECK condition of PWR WDO and PWR ACC circuit breakers. If circuit breakers are in good condition, use the following diagnostic procedures.

TAILGATE WINDOW DOES NOT OPERATE FROM FRONT TAILGATE WINDOW SWITCH

TEST	RESULT	ACTION
1. Place ignition switch in RUN or ACC position. Connect a test lamp from PNK (76) wire at front tailgate window switch connector C274 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from front tailgate window switch connector C274 to fuse block.
2. Position and hold tailgate window switch in the UP position. Connect a test lamp from TAN/WHT (184) wire at front tailgate window switch connector C274 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE front tailgate window switch.
3. Position and hold front tailgate window switch in the DOWN position. Connect a test lamp from LT BLU (183) wire at front tailgate window switch connector C274 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE front tailgate window switch.
4. Connect a fused jumper from PNK (76) wire at the front tailgate window switch connector C274 to TAN/WHT (184) wire. Then connect a test lamp from TAN/WHT (184) wire at tailgate window motor connector C905 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in TAN/WHT (184) wire between tailgate window motor connector C905 and front tailgate window switch.
5. Connect a fused jumper from PNK (76) wire at the front tailgate window switch connector C274 to LT BLU (183) wire. Then connect a test lamp from one LT BLU (183) wire at cutout switch connector C904 to ground. REPEAT for the other LT BLU (183) wire.	Test lamp lights at both wires.	GO to step 6.
	Test lamp does not light at one or both wires.	LOCATE and REPAIR open in LT BLU (183) wire from cutout switch connector C904 to front tailgate window switch connector C274. If wire is in good condition, REPLACE cutout switch.
6. Connect a test lamp from LT BLU (183) wire at tailgate window motor connector C905 to ground.	Test lamp lights.	REPLACE tailgate window motor.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (183) wire between tailgate motor connector C905 and cutout switch. If wire is in good condition, REPLACE tailgate window motor.

TAILGATE WINDOW DOES NOT OPERATE FROM KEY-OPERATED TAILGATE WINDOW SWITCH

TEST	RESULT	ACTION
1. Connect a test lamp from ORN (60) wire at key-operated tailgate window switch connector C906 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (60) wire from key-operated tailgate window switch connector C906 to fuse block.
2. Position and hold key-operated tailgate window switch in UP position. Connect a test lamp from TAN/WHT (184) wire at key-operated tailgate window switch connector C906 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE key-operated tailgate window switch.
3. Connect a test lamp from TAN/WHT (184) wire at key-operated tailgate window motor connector C905 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in TAN/WHT (184) wire from key-operated tailgate window motor connector C905 to key-operated tailgate window switch connector C906.
4. Position and hold key-operated tailgate window switch in DOWN position. Connect a test lamp from LT BLU (183) wire at cutout switch connector C904 to ground. REPEAT at other LT BLU (183) wire.	Test lamp lights at both wires.	GO to step 5.
	Test lamp does not light at first wire only.	LOCATE and REPAIR open in LT BLU (183) wire form cutout switch connector C904 to key-operated tailgate window switch connector C906. If wire is in good condition, REPLACE key-operated tailgate window switch.
	Test lamp does not light at second wire only.	REPLACE cutout switch.
5. Connect a test lamp from LT BLU (183) wire at key-operated tailgate window motor connector C905 to ground.	Test lamp lights.	REPLACE tailgate window motor.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (183) wire from tailgate window motor connector C905 to cutout switch connector C904. If wire is in good condition, REPLACE tailgate window motor.

RPO CODES

D48 - ELECTRIC REMOTE CONTROL OUTSIDE MIRROR

HOT IN ACCY OR RUN

C259
12004884

76-2.0 PNK

REAR HTR F
REAR A/C F
BAT
WDO
IGN
ACC LPS PWR
INSTR LPS PWR ACC
HORN/DM IGN AUX HTR A/C STOP HAZ
T/L CTSY GAGE/IDLE HTR A/C RADIO
ECM B TURN B/U PWR WDO WIPER
ECM 1 DRL
CRANK

SHUNT 5A 30 A
20A 20A 25A 15A
20A 20A 25A 15A
16A 16A 30 A 25A
20A 15A
3A

FRONT

PWR WDO
30 AMP

FUSE BLOCK
12103404

PWR WDO
30 AMP

REAR

76-3.0 PNK

PWR WDO
30 AMP

168-2.0 DK BLU/WHT
167-2.0 TAN
76-2.0 PNK

12015345
C262

12015344

167-2.0 TAN
166-2.0 DK BLU/WHT
76-2.0 PNK

76-2.0 PNK
S260

150-3.0 BLK
S261 (WITH D48 ONLY)
150-3.0 BLK

12015344
C261

12015345

150-2.0 BLK

POWER OUTSIDE
REARVIEW MIRRORS
(SEE PAGE 127)

167-2.0 TAN
166-2.0 DK BLU/WHT
150-2.0 BLK

GT600
8911670

GT601
12010247

167-2.0 TAN
166-2.0 DK BLU/WHT
76-2.0 PNK

C601
12034136

666-2.0 DK BLU
667-2.0 BRN

C604
12004140

CIRCUIT BREAKER

RH WINDOW MOTOR

DWN
UP

RH WINDOW SWITCH

GT500
8911670

GT501
12010247

76-3.0 PNK
167-2.0 TAN
166-2.0 DK BLU/WHT
150-2.0 BLK

165-2.0 BRN
164-2.0 DK BLU

LH WINDOW MOTOR

LH WINDOW SWITCH
C500
12010121

DOWN UP LH
DOWN UP RH

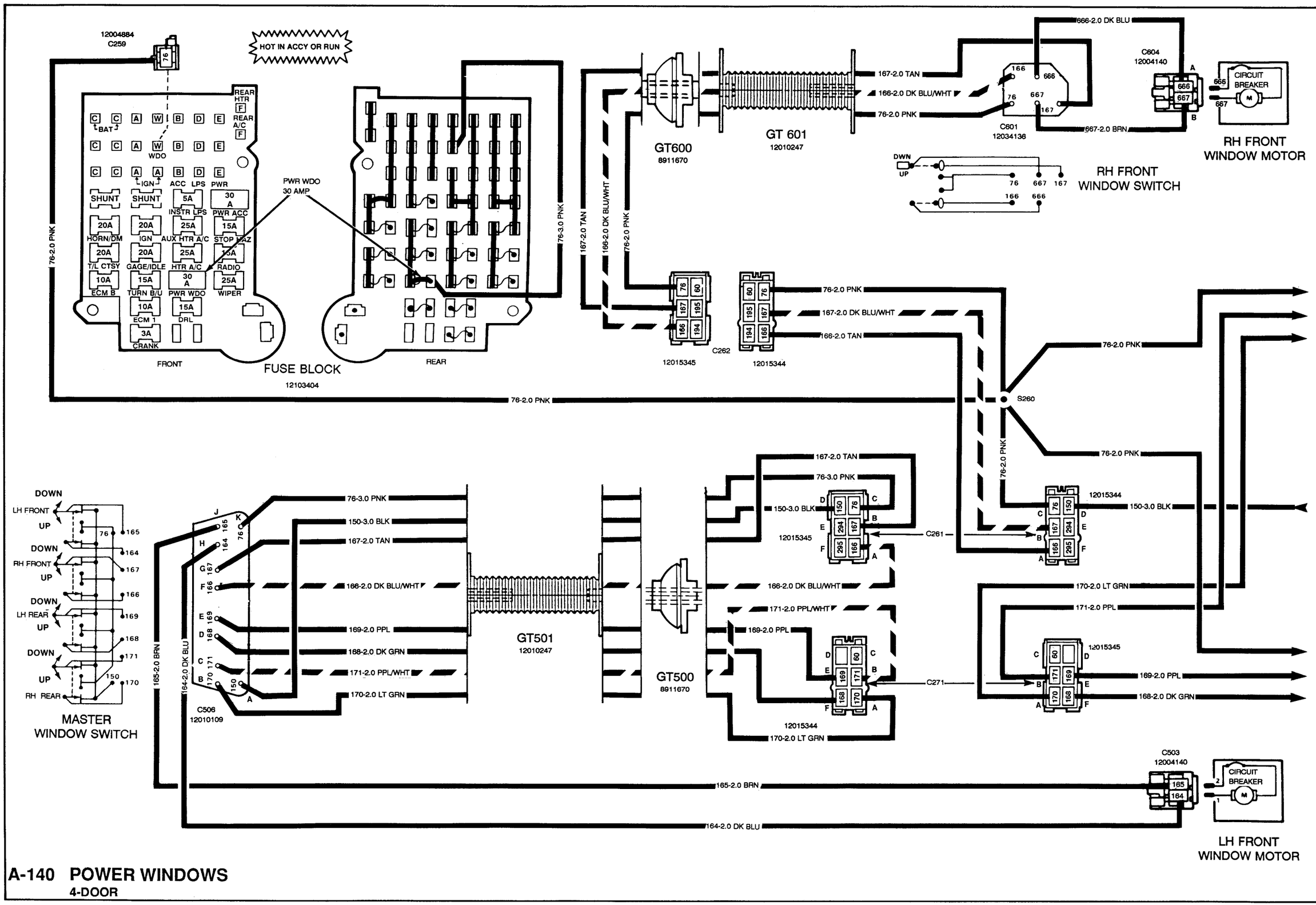
BUS BAR GROUND

150
12004267

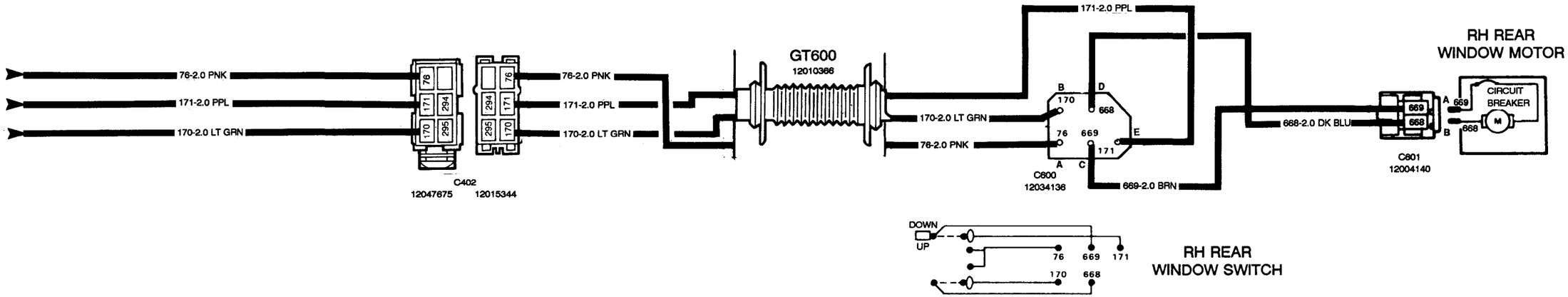
G200

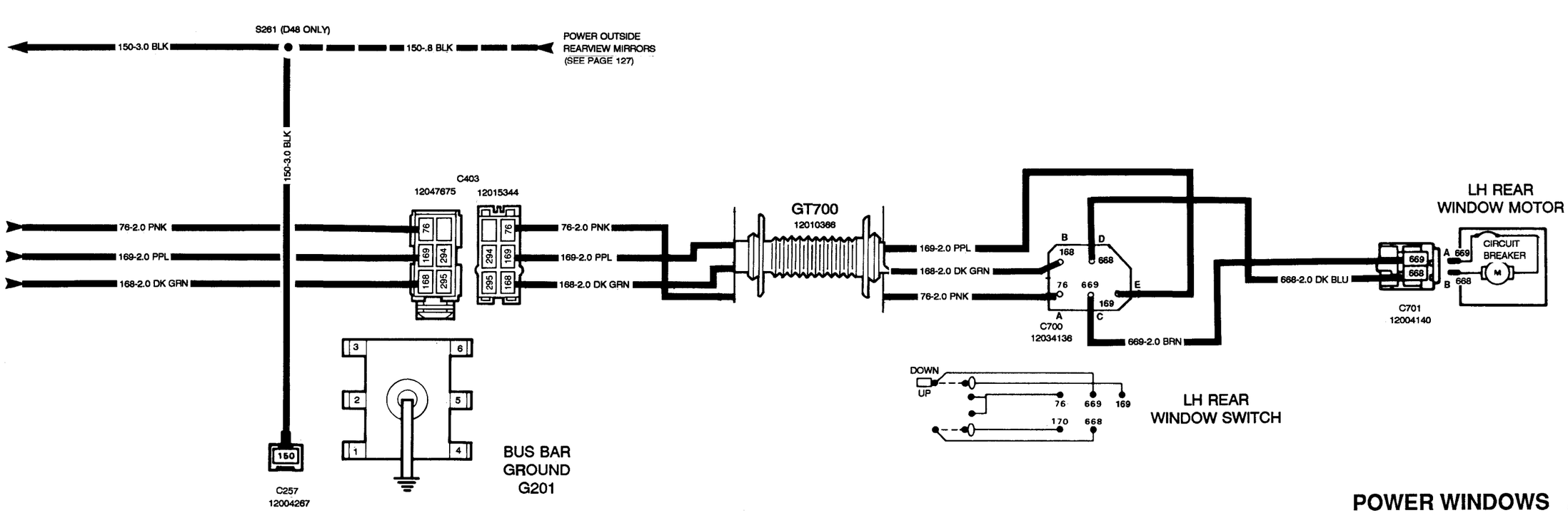
A-140 POWER WINDOWS

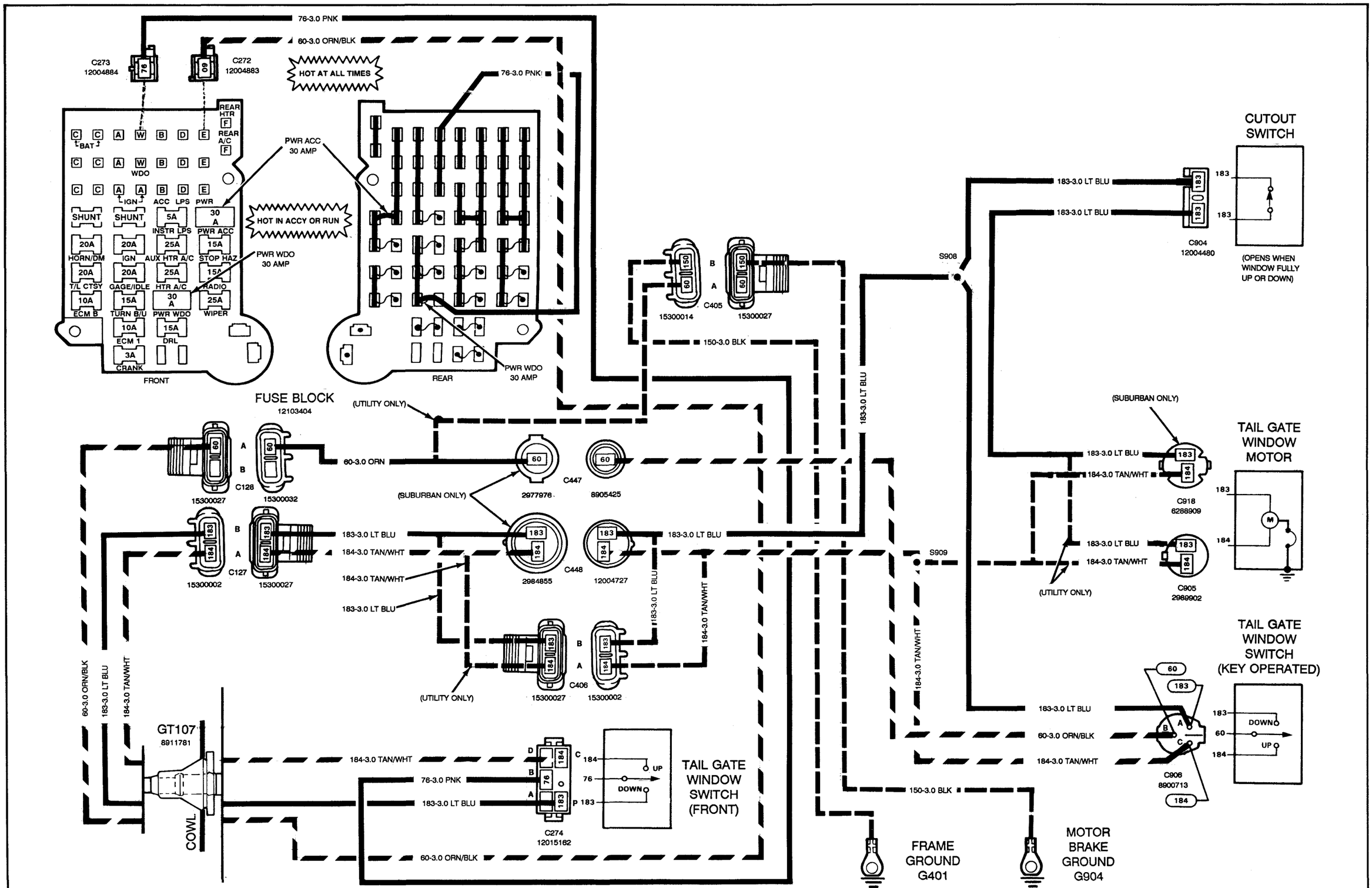
4-DOOR



RPO CODES
D48 - ELECTRIC REMOTE CONTROL OUTSIDE MIRROR







A-142 POWER REAR WINDOW

CIRCUIT OPERATION

The RADIO Fuse provides main power to the Radio. With Ignition Switch in ACC or RUN, voltage is applied through the RADIO Fuse and the YEL wire to the On/Off Switch in the Radio. The On/Off Switch is located in the Radio. The circuit is grounded at Bus Bar Ground. With the On/Off Switch closed, voltage is applied to the Solid-State Radio circuits to ground. Two wires connect each speaker to the Radio. The ETR Radio has two inputs that other models do not have: Display Dim Signal and Clock Power.

The ETR model is an AM/FM Radio that changes stations electronically. The frequency of preselected stations can be stored in the electronic memory. The ETR model also provides a digital display of time or station frequency. As in other models, the Panel Lamp Switch controls panel lamp dimming. In the ETR model, dimming is also controlled by the Radio itself by means of the DIM Display Input Signal.

The ETR model's Clock memory and Radio and memory functions are supplied voltage at all times through the HORN/DM Fuse. If voltage to the ETR model is cut off -- by disconnecting the Battery, for example -- the operator must reset the memory functions when voltage is restored.

DIAGNOSIS -- RADIO

RADIO DOES NOT APPEAR TO WORK (NO DISPLAY LIGHTS, NO SOUND)

TEST	RESULT	ACTION
1. Disconnect radio connector C241 and place ignition switch to RUN or ACC. Connect a voltmeter from YEL (43) wire at radio connector C241 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of RADIO fuse. If fuse is good, LOCATE and REPAIR open in YEL (43) wire.
2. Connect a voltmeter from YEL (43) wire to BLK (150) wire at radio connector C241.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from radio to bus bar ground.

CLOCK DOES NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect radio connector C204. Connect a voltmeter form ORN (40) wire at radio connector C204 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	CHECK condition of HORN/DM fuse. If fuse is good, LOCATE and REPAIR open in ORN (40) wire.

PANEL LAMP DOES NOT COME ON

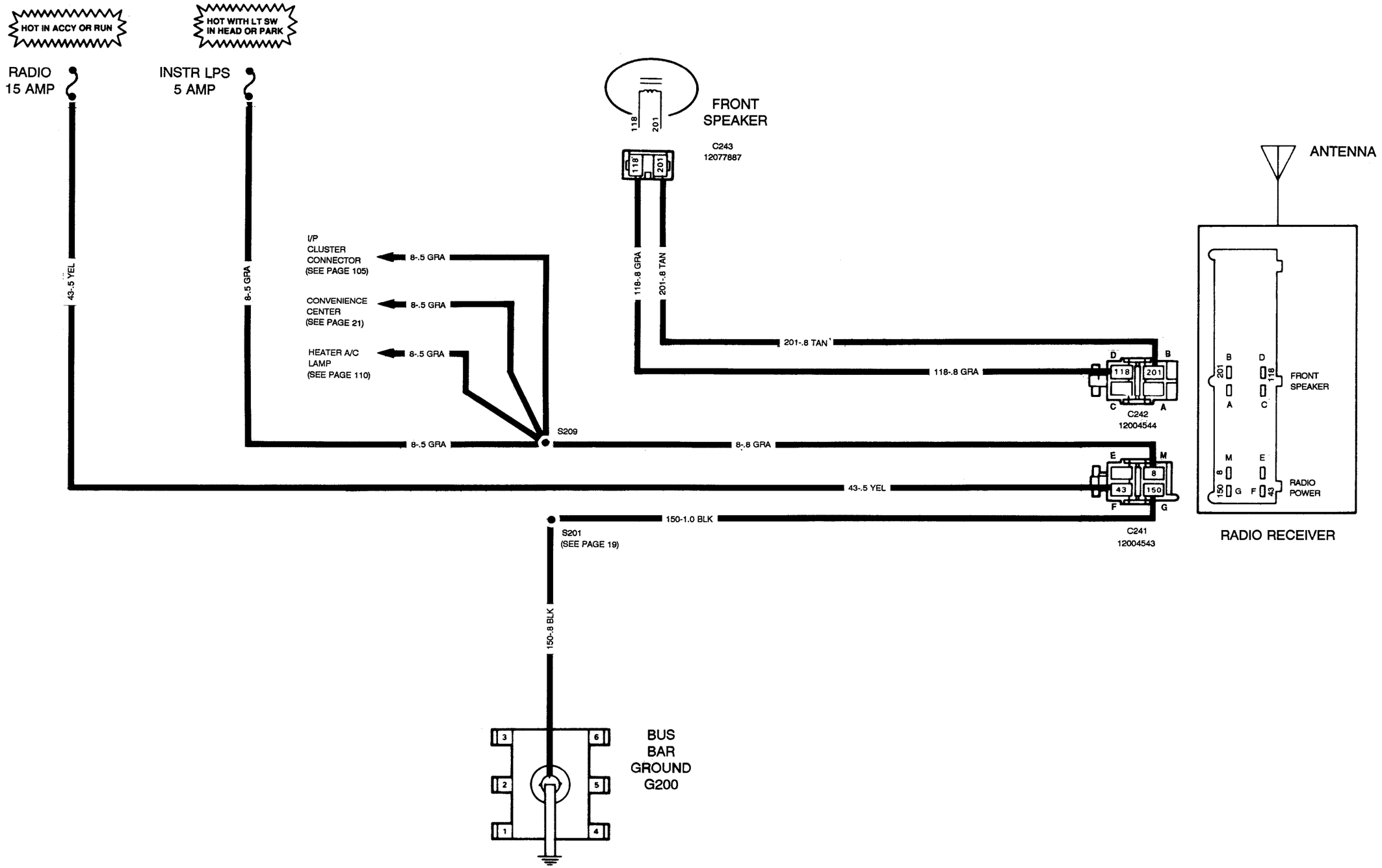
TEST	RESULT	ACTION
1. Disconnect radio connector C241. Place light switch to PARK and panel dimmer switch to HIGH. Connect a voltmeter from GRA (8) wire at radio connector C241 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	CHECK condition of INST LPS fuse. If fuse is good, LOCATE and REPAIR open in GRA (8) wire from radio to fuse block.

DISPLAY DIMMING FUNCTION WILL NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect radio connector C204. Place light switch to PARK. Connect voltmeter from BRN (9) wire at radio connector C204 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	LOCATE and REPAIR open in BRN (9) wire from radio at light switch.

NO SOUND OR DISTORTED SOUND FROM A SPEAKER

TEST	RESULT	ACTION
1. Disconnect suspected speaker connector. Set analog ohmmeter on RX1 scale. Connect an ohmmeter across speaker terminals.	Speaker pops.	GO to step 2.
	No noise.	REPLACE speaker.
2. Place ignition switch to RUN or ACC and turn radio ON. Tune radio to a strong signal. Connect a voltmeter across outputs for suspect speaker.	Varying around 1 volt AC.	REPLACE speaker.
	No voltage or greater than 1 volt AC.	LOCATE and REPAIR speaker wires between radio and speaker. If wires are good, REMOVE radio and send in for repairs.



A-144 AM RADIO
MONAURAL

RPO CODES
UM6 - RADIO, ETR AM/FM STEREO, CASSETTE

HOT AT ALL TIMES

HOT IN ACCY OR RUN

40-.8 ORN
UM6 ONLY

C249
12004886

RADIO
15 AMP

8-.5 GRA

43-1.0 YEL

REAR HTR F
REAR A/C F
C C A W B D E BAT
C C A W B D E WDO
C C A A B D E IGN ACC LPS PWR

SHUNT	SHUNT	5A INSTR LPS	30 A PWR ACC
20A HORN/DM	20A IGN	25A AUX HTR A/C	15A STOP HAZ
20A T/L CTSY	20A GAGE/IDLE	25A HTR A/C	15A RADIO
10A ECM B	15A TURN B/U	30 A PWR WDO	25A WIPER
	10A ECM 1	15A DRL	
	3A CRANK		

FRONT

RADIO
15 AMP

HORN/DM
20 AMP

REAR

FUSE BLOCK
12103404

40-.8 ORN

9-.8 BRN

9-.8 BRN
UM6 ONLY

9-.8 BRN

ROOF MARKER LAMPS
(SEE PAGE 156)

9-.8 BRN

S212
(SEE PAGE 34)

43-.5 YEL

9-.8 BRN

S209

I/P CLUSTER CONNECTOR
(SEE PAGE 105)

8-.5 GRA

CONVENIENCE CENTER
(SEE PAGE 21)

8-.5 GRA

HEATER/A/C LAMP
(SEE PAGE 110)

8-.5 GRA

H 150 F 40 E 9 D G 10 44 C J A X2 156 B

C202
12004628

8-.8 GRA

43-.5 YEL

C241
12004543

150-.8 BLK

S201
(SEE PAGE 17)

150-1.0 BLK

RH FRONT SPEAKER

C248
2973384

200 117

200-.8 LT GRN

117-.8 DK GRN

201-.8 TAN

118-.8 GRA

201 118

247
2973384

LH FRONT SPEAKER

40-.8 ORN

S204
(SEE PAGE 34)

115-.8 LT BLU

46-.8 DK BLU

199-.8 BRN

116-.8 YEL

C240
12004545

L J 115 46 116 199 K H

C242
12004544

D B 118 201 117 200 C A

RH REAR SPEAKER

C440
12077787

A B 115 46

ANTENNA

DIGITAL CLOCK CONNECTOR

C204
8911772

40 9

REAR SPEAKERS

FRONT SPEAKERS

RADIO POWER

RADIO RECEIVER

116-.8 YEL

199-.8 BRN

B A 199 116

C439
12077787

LH REAR SPEAKER

BUS BAR GROUND G200

3 6 2 5 1 4

44 150 DOME 156 2 OFF PARK HEAD 10 40 OFF PARK HEAD 9

LIGHT SWITCH

RADIO A-145

AM/FM STEREO

CIRCUIT OPERATION

With the Ignition Switch in RUN, voltage is applied to the Rear Defogger Switch. When the Rear Defogger Switch is moved to the ON position, voltage is then applied to the Rear Defogger Timer-Relay. The contact closes, which provides voltage to the ON Indicator and the Rear Defogger. The rear window will become warm to remove fog from the surface of the window.

The contact in the Rear Defogger Control will stay closed until the Rear Defogger Control Switch is turned off, or the timer cycle is complete.

The first time the Rear Defogger Switch is activated, the Timer-Relay will allow the Rear Defogger to operate for 10 minutes. Each time after the Rear Defogger Switch is activated, the Timer-Relay will allow the Rear Defogger to operate for a maximum of five minutes. The Timer-Relay will reset to 10 minutes when the Ignition Switch is turned OFF and then back to the RUN position.

The Timer also shuts off at any time the Rear Defogger Control On-Off Switch is depressed to OFF.

DIAGNOSIS — REAR DEFOGGER

REAR WINDOW DEFOGGER DOES NOT WORK AND ON INDICATOR DOES NOT LIGHT

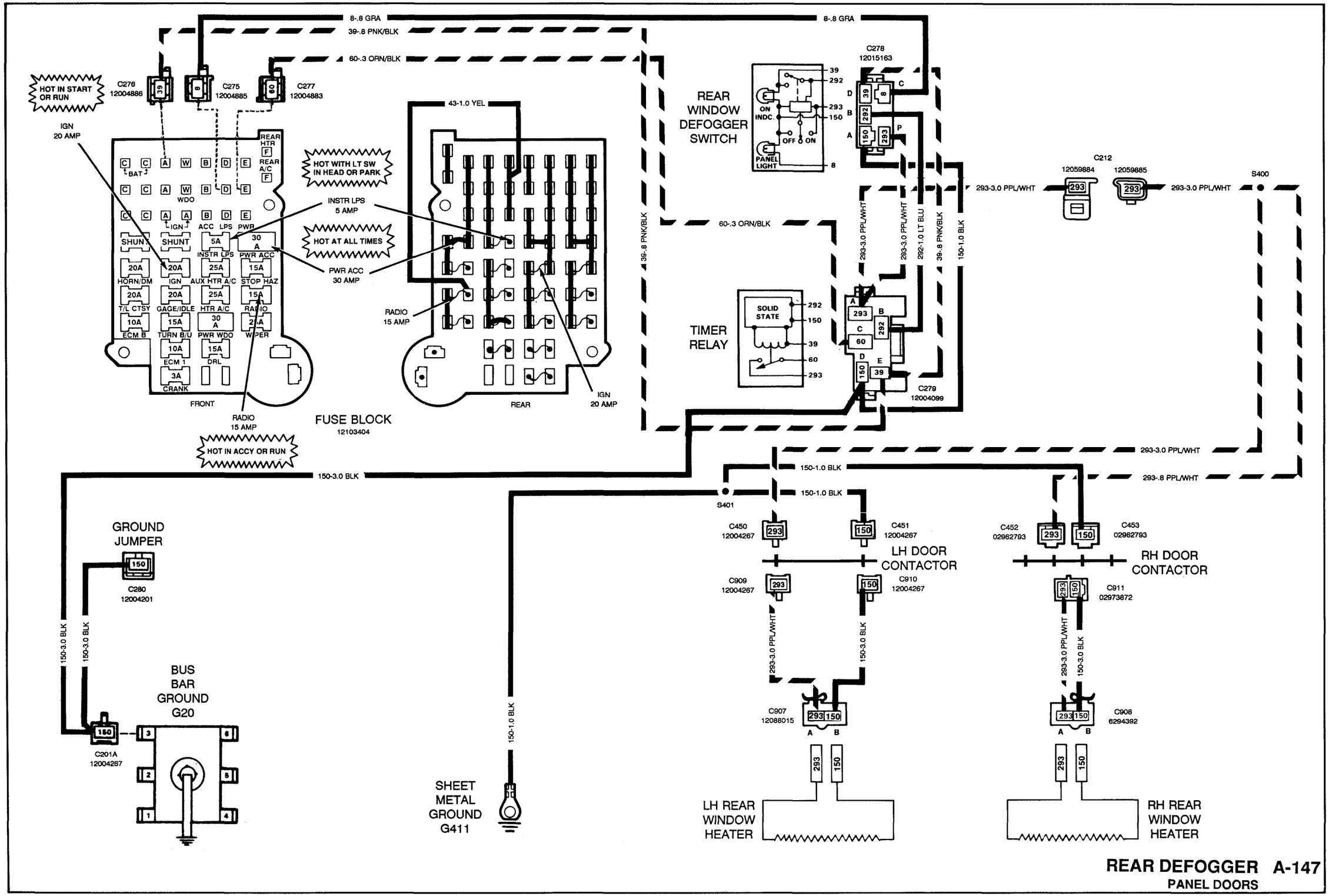
TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect a test lamp from ORN/BLK (60) at timer relay connector C279 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of PWR ACC circuit breaker. If circuit breaker is good, LOCATE and REPAIR open in ORN/BLK (60) wire.
2. Connect a test lamp from PNK/BLK (39) wire at rear window defogger switch connector C278 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of IGN fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire.
3. Connect a test lamp from PNK/BLK (39) and BLK (150) wires at rear window defogger switch connector C278 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire.
4. Place rear window defogger switch on and hold. Connect a test lamp from LT BLU (292) wire at rear window defogger switch connector C278 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPLACE rear window defogger switch.
5. Place rear window defogger switch ON and hold. Connect a test lamp from PPL/WHT (293) connector at timer relay to ground.	Test lamp does not light.	REPLACE timer relay.

ON INDICATOR WORKS BUT REAR WINDOW DEFOGGER DOES NOT DEFROST

TEST	RESULT	ACTION
1. Place ignition switch in RUN and rear defogger switch ON. Connect a test lamp from PPL (293) wire to ground (tailgate models) or PPL/WHT (293) wire at rear window defogger to ground (panel door models).	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PPL or PPL/WHT (293) wires.
2. Connect a test lamp from PPL (293) to ground wires at rear window defogger (tailgate models) or PPL/WHT (293) (panel door models) to BLK (150) wires at rear window defogger, ground G411.	Test lamp lights.	REPAIR rear defogger as required.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire.

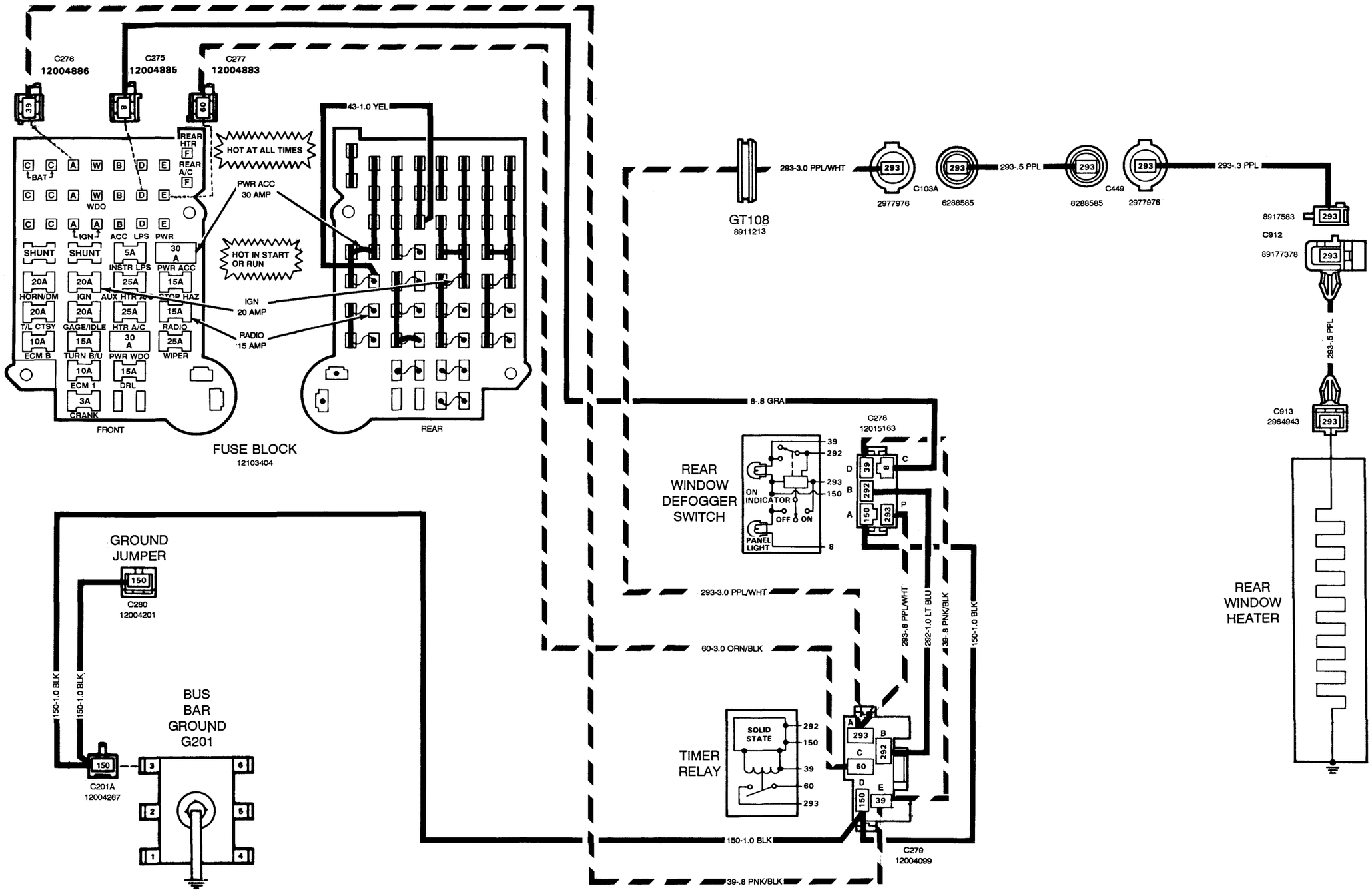
REAR DEFOGGER PANEL LAMP DOES NOT WORK

TEST	RESULT	ACTION
Turn headlamps ON and position dimmer control to BRIGHT. Connect test lamp from GRA (8) wire at rear window defogger switch connector C278 to ground.	Test lamp lights.	REPLACE panel light bulb.
	Test lamp does not light.	LOCATE and REPAIR open in GRA (8) wire.



REAR DEFOGGER A-147

PANEL DOORS



A-148 REAR DEFOGGER
TAILGATE

CIRCUIT OPERATION

BACKUP LAMPS

With the Ignition Switch in RUN, or START, voltage is applied through the TURN/BU Fuse to the Transmission Position Switch or the Backup Lamp Switch. Whenever the gear selector lever is shifted to REVERSE the Transmission Position Switch or the Backup Lamp Switch closes and voltage is applied to the Backup Lamps and the Lamps turn on.

PARK, TAIL, MARKER AND LICENSE LAMPS

Voltage is applied through the T/L CTSY Fuse to the Light Switch at all times. With the Light Switch in the PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps.

TRAILER WIRING

Trailer wiring is a modification of the existing rear body harness. The trailer lamps operate in the same manner as the vehicle lamps. The trailer lamps are grounded to the vehicle lamps.

DIAGNOSIS — REAR EXTERIOR LAMPS

PRELIMINARY CHECKS:

The rear lamp systems (taillamps, clearance lamps, end gate lamps, and license plate lamps) all receive voltage from same wire circuit BRN (9) and share same ground terminals G402 and G403. If only one system is not working, LOCATE and REPAIR an open in the wiring and/or bulbs that pertain to that system.

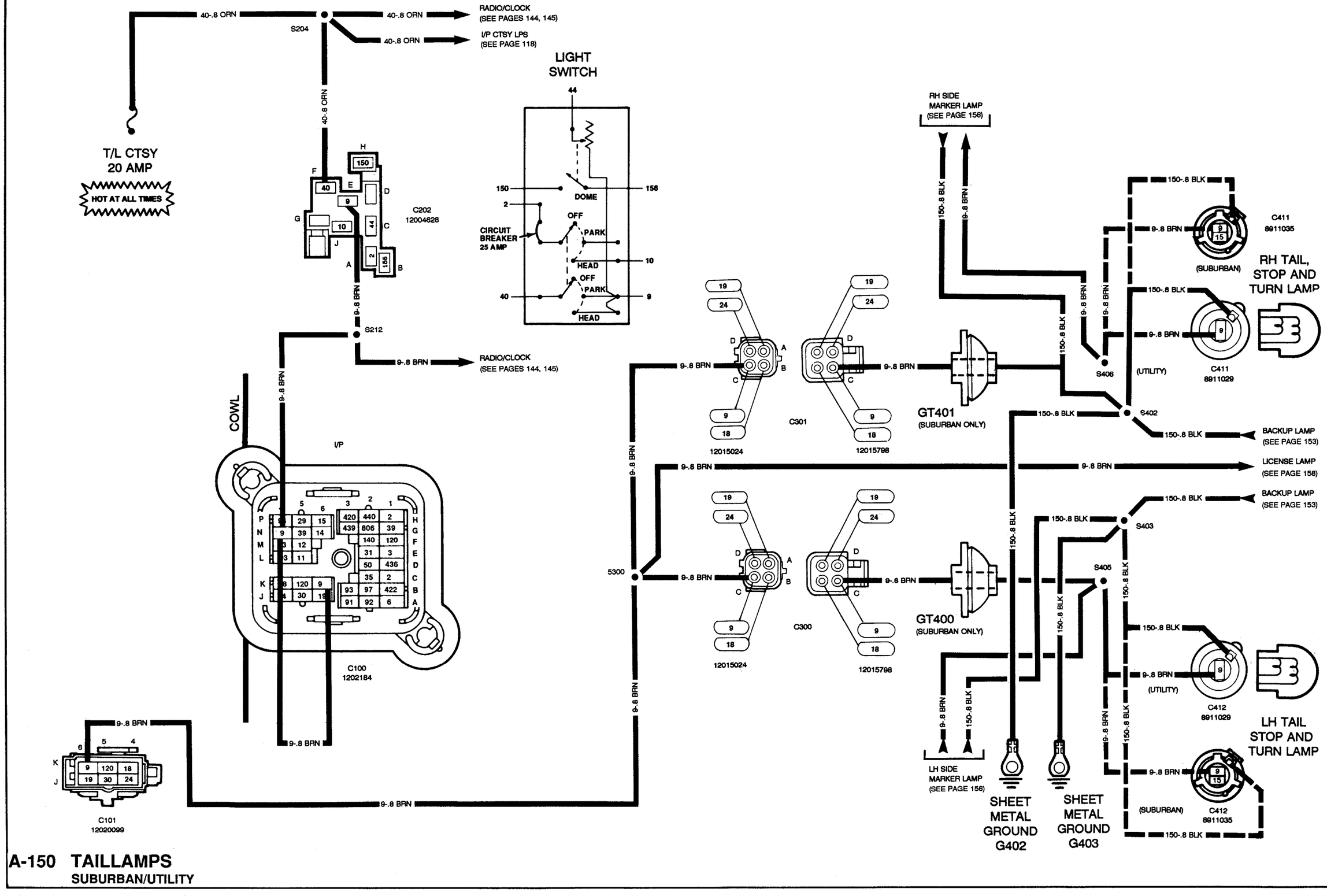
BACKUP LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch to RUN and transmission in reverse. Connect a test lamp from LT GRN (24) wire at backup lamp connector C428 or C429 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect a test lamp from LT GRN (24) wire to BLK (150) wire at backup lamp connector C428 or C429.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from backup lamp to ground terminal G403.
3. Connect a test lamp from DK BLU (75) wire at backup lamp switch connector C286 or C118 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	CHECK condition of TURN/BU fuse. If fuse is good LOCATE and REPAIR open in DK BLU (75) wire from backup lamp switch connector C286 or C118 to backup lamps.
4. Connect a test lamp from LT GRN (24) wire at backup lamp switch connector C286 or C118 to ground.	Test lamp lights.	LOCATE and REPAIR open in LT GRN (24) wire from backup lamp switch connector C286 or C118 to fuse block.
	Test lamp does not light.	Adjust backup lamp switch. If backup lamp switch will not adjust properly, REPLACE backup lamp switch.

REAR TAIL, MARKER AND LICENSE LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch in HEAD or PARK position. If only license lamp does not operate, GO to step 5. Connect a test lamp from BRN (9) wire at connector C300 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between light switch connector C202 and connector C300.
	Test lamp lights.	If only RH rear Tail/Marker lamps and license lamps do not operate, GO to step 2. If only LH rear Tail/Marker lamps do not operate, GO to step 3.
2. Connect a test lamp from BRN (9) wire at RH tail or marker lamp connector C411 or C414 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between connector C300 and RH tail or marker lamp connector C411 or C414.
	Test lamp lights.	GO to step 4.
3. Connect a test lamp from BRN (9) wire at inoperative LH tail or marker lamp connector C412 or C413 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) between LH tail or marker lamp connector C412 or C413 and connector C300.
	Test lamp lights.	Go go step 5.
4. Connect a test lamp from BRN (9) wire and BLK (150) wire at inoperative tail or marker lamp connector C411, C412, C413 or C414.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) between tail or marker lamp connector C411, C412, C413 or C414 and G403.
	Test lamp lights.	If rear tail or marker lamp is inoperative, REPLACE bulb. For inoperative license lamps, GO to step 6.
5. Connect a test lamp from BRN (9) wire at license lamp connector C419, C420 or C421 to ground.	Test lamp does not light.	LOCATE and REPAIR open BRN (9) wire between license lamp connector and S300 and S404.
	Test lamp lights.	Inspect ground connection at license lamp socket. If satisfactory REPLACE bulb.

A-150 TAILLAMPS
SUBURBAN/UTILITY



RPO CODES
RO5 - DUAL REAR WHEELS

HOT AT ALL TIMES

T/L CTSY 20 AMP

40-.8 ORN

S204

40-.8 ORN → RADIO/CLOCK (SEE PAGES 144, 145)

40-.8 ORN → I/P CTSY LPS (SEE PAGE 118)

40-.8 ORN

H, F, E, D, G, C, J, A, B

150, 40, 9, 10, 44, 2, 156

C202
12004628

9-.8 BRN

S212

CIRCUIT BREAKER 25 AMP

44

150 — DOME — 156

2 — OFF / PARK / HEAD — 10

40 — OFF / PARK / HEAD — 9

9-.8 BRN → RADIO/CLOCK (SEE PAGES 144, 145)

9-.8 BRN

COWL

C100
1202184
I/P

P: 94 29 15 / 9 39 14
M: 33 12
L: 93 11
K: 18 120 9
J: 24 30 19
420 440 2 / 439 806 39 / 140 120 / 31 3 / 50 436 / 35 2 / 93 97 422 / 91 92 6

9-.8 BRN

C101
12020099

K: 9 120 18
J: 19 30 24

9-.8 BRN

C300

19, 24, D, A, B, C, 9, 18

12015024

12015798

LIGHT SWITCH

RH SIDE MARKER LAMP (SEE PAGE 156)

9-.8 BRN

150-.8 BLK

9-.8 BRN

RH CLEARANCE LAMPS (RO5) (SEE PAGE 156)

150-.8 BLK

150-.8 BLK

9-.8 BRN

9-.8 BRN

S402

RH TAIL, STOP AND TURN LAMP

150-.8 BLK

9-.8 BRN

C411
8911029

150-.8 BLK → BACKUP LAMP (SEE PAGE 154)

LICENSE LAMP (SEE PAGE 159)

9-.8 BRN

9-.8 BRN

9-.8 BRN

9-.8 BRN

9-.8 BRN

150-.8 BLK

ENDGATE MARKER LAMPS

9-.8 BRN

9-.8 BRN

S404

9-.8 BRN

150

C427
02984092 08905426

150

9-.8 BRN

9-.8 BRN

9-.8 BRN

9-.8 BRN

9-.8 BRN

S403

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

LH TAIL, STOP AND TURN LAMP

150-.8 BLK

150-.8 BLK

C412
8911029

LH CLEARANCE LAMPS (RO5) (SEE PAGE 156)

9-.8 BRN

9-.8 BRN

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

BACKUP LAMP (SEE PAGE 154)

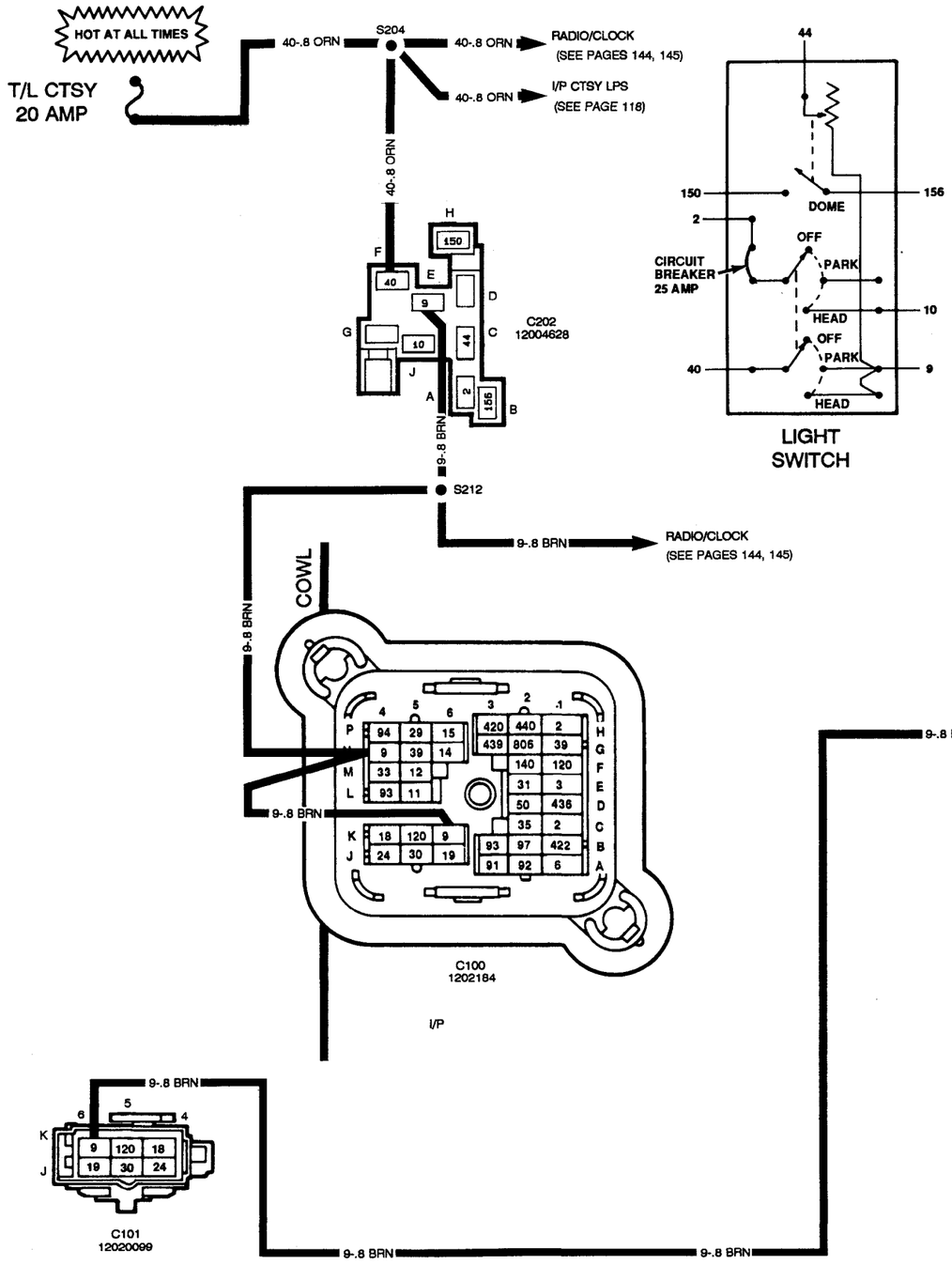
LH SIDE MARKER LAMP (SEE PAGE 156)

SHEET METAL GROUND G403

SHEET METAL GROUND G404

TAILLAMPS A-151

FLEETSIDE AND WIDESIDE



A-152 TAILLAMPS
STEPSIDE

HOT IN RUN

TURN/BU
15 AMP

75-.8 DK BLU

24-.8 LT GRN

C286
2973407

BACKUP
LAMP SWITCH
(AUTO TRANS ONLY)
CLOSED WHEN TRANS
IN REVERSE

12047662

C236
12047663

COWL

24-.8 LT GRN

75-.8 DK BLU

C118
12015792

GT101
12064740

BACKUP
LAMP SWITCH
(MAN TRANS ONLY)
CLOSED WHEN TRANS
IN REVERSE

NEUT FWD REV

S402

150-.8 BLK

RH TAIL, STOP,
TURN AND SIDE
MARKER LAMPS
(SEE PAGE 150)

C301

12015024

12015768

GT401
(SUBURBAN ONLY)

C429

8911027 (UTILITY)
8911028 (SUBURBAN)

RH BACKUP
LAMP

S308

C100
1202184

I/P

C428

LH BACKUP
LAMP

S403

LH TAIL, STOP,
TURN AND SIDE
MARKER LAMPS
(SEE PAGE 150)

C300

12015024

12015798

GT400
(SUBURBAN ONLY)

C101
12020099

SHEET
METAL
GROUND
G402

SHEET
METAL
GROUND
G403

BACKUP LAMPS A-153

SUBURBAN/UTILITY

RPO CODES
LL4 - ENGINE, 6.2L (378 CID) V8 HD DIESEL ENGINE VIN J

HOT IN START

TURN/BU
15 AMP

75-.8 DK BLU

BACKUP
LAMP SWITCH
(MAN TRANS ONLY)
CLOSED WHEN TRANS
IN REVERSE

NEUT FWD REV

24

75

C118
12015792

24-.8 LT GRN

COWL

GT101
12064740

C200
12064769

12064770

(LL4 ONLY)

24-.8 LT GRN

C286
2973407

BACKUP
LAMP SWITCH
(AUTO TRANS ONLY)
CLOSED WHEN TRANS
IN REVERSE

S402

150-.8 BLK

RH TAIL, STOP,
TURN AND SIDE
MARKER LAMPS
(SEE PAGE 151)

RH BACKUP
LAMP

C429

8911027

ENGINE

C100
12020183

I/P

C100
12020184

C300

12015024

12015798

S410

LH BACKUP
LAMP

C428

8911027

S403

LH TAIL, STOP,
TURN AND SIDE
MARKER LAMPS
(SEE PAGE 151)

SHEET
METAL
GROUND
G403

C101
12020099

A-154 BACKUP LAMPS

FLEETSIDE AND WIDESIDE

HOT IN RUN

TURN/BU
15 AMP

75-.8 DK BLU

24-.8 LT GRN

75-.8 DK BLU

24-.8 LT GRN

C286
2973407

BACKUP
LAMP SWITCH
(AUTO TRANS ONLY)
CLOSED WHEN TRANS
IN REVERSE

COWL

12047662

C236
12047663

24-.8 LT GRN

24-.8 LT GRN

75-.8 DK BLU

75-.8 DK BLU

GT101
12064740

C118
12015792

NEUT FWD REV

BACKUP
LAMP SWITCH
(MAN TRANS ONLY)
CLOSED WHEN TRANS
IN REVERSE

PART OF
LAMP ASSEMBLY

24-.8 LT GRN

C426
6288585

RH BACKUP
LAMP

24-.8 LT GRN

COWL

C100
1202184

I/P

12015024

C300

12015798

24-.8 LT GRN

S410

24-.8 LT GRN

C427
6288585

PART OF
LAMP ASSEMBLY

24-.8 LT GRN

LH BACKUP
LAMP

C101
12020099

24-.8 LT GRN

150-.8 BLK

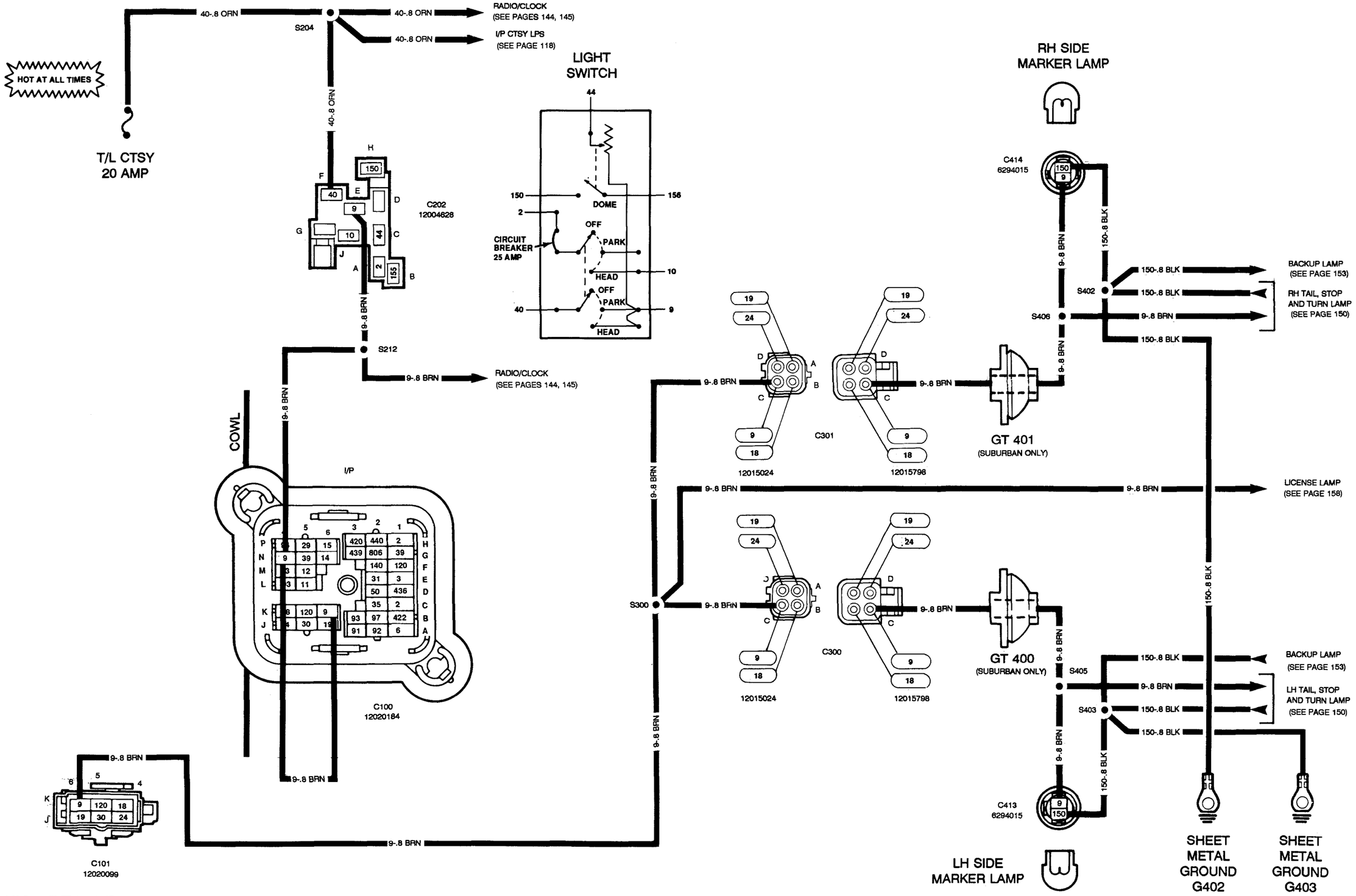
150-.8 BLK

LH TAIL, STOP,
AND TURN
LAMP GROUND
G406

FRAME
GROUND
G405

RH TAIL, STOP,
AND TURN
LAMP GROUND
G407

BACKUP LAMPS A-155
STEPSIDE



A-156 REAR PARK AND MARKER LAMPS

SUBURABN/UTILITY

RPO CODES

R05 - DUAL REAR WHEELS

HOT AT ALL TIMES

T/L CTSY 20 AMP

40-.8 ORN

S204

40-.8 ORN → RADIO/CLOCK (SEE PAGES 144, 145)

40-.8 ORN → I/P CTSY LPS (SEE PAGE 118)

40-.8 ORN

C202 12004628

9-.8 BRN

S212

9-.8 BRN → RADIO/CLOCK (SEE PAGES 144, 145)

LIGHT SWITCH

CIRCUIT BREAKER 25 AMP

DOME

OFF

PARK

HEAD

COWL

C100 1202184

I/P

C101 12020099

9-.8 BRN

WIDESIDE PICK-UP (R05 ONLY)

RH FRONT CLEARANCE LAMP

RH REAR CLEARANCE LAMP

RH SIDE MARKER LAMP

C415 6294015

C416 6294015

C414 6294015

150-.8 BLK

S402

BACKUP LAMP (SEE PAGE 154)

RH TAIL STOP AND TURN LAMP (SEE PAGE 151)

LICENSE LAMP (SEE PAGE 158)

S404

C300

12015024

12015798

END GATE IDENTIFICATION LAMPS (SEE PAGE 151)

LH TAIL, STOP AND TURN LAMP (SEE PAGE 151)

S403

BACKUP LAMP (SEE PAGE 154)

C417 6294015

C418 6294015

C413 62294015

LH FRONT CLEARANCE LAMP

LH REAR CLEARANCE LAMP

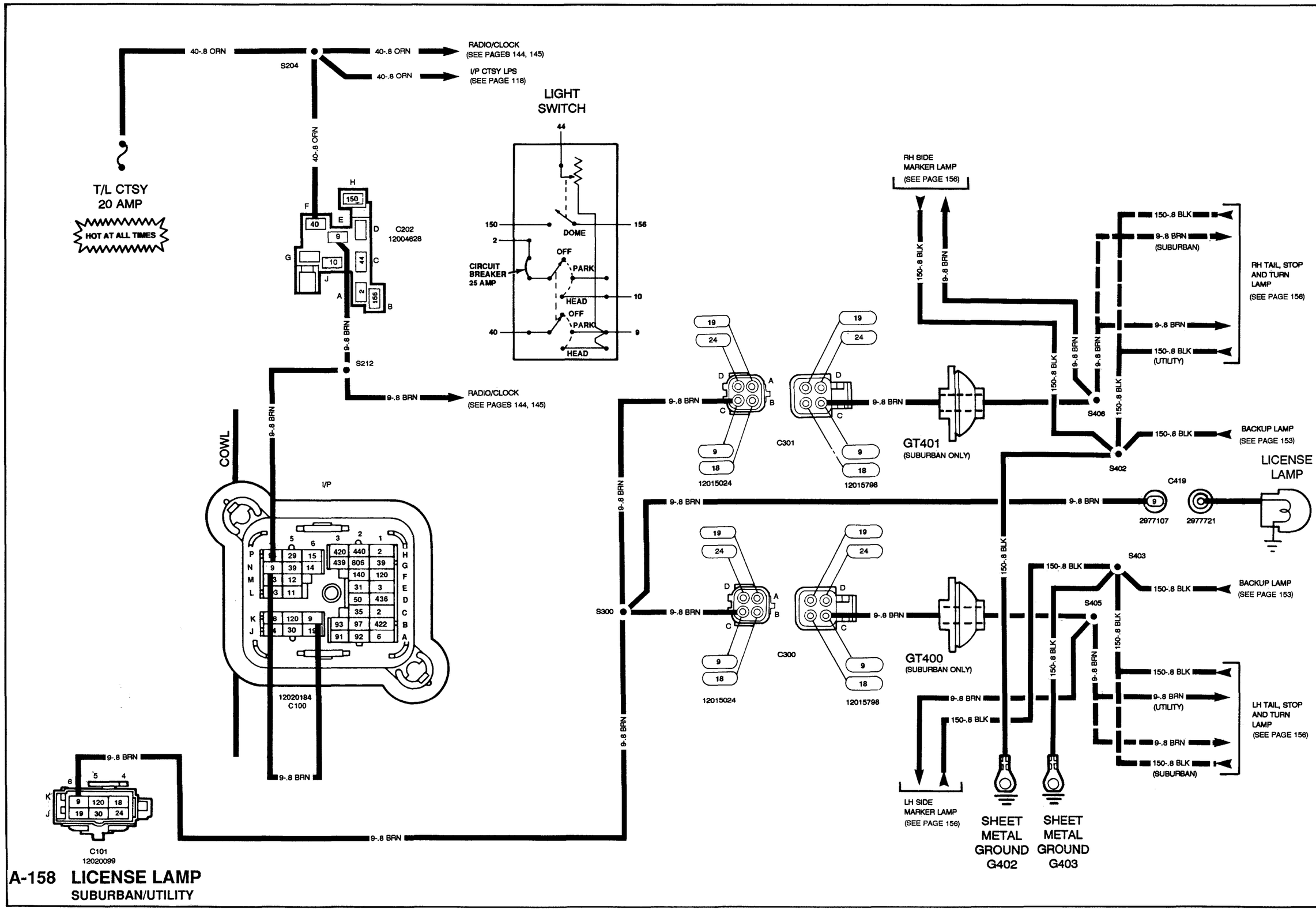
LH SIDE MARKER LAMP

SHEET METAL GROUND G403

WIDESIDE PICK-UP (R05 ONLY)

REAR PARK AND MARKER LAMPS A-157

FLEETSIDE AND WIDESIDE



A-158 LICENSE LAMP
SUBURBAN/UTILITY

RPO CODES

RO5 - DUAL REAR WHEELS

HOT AT ALL TIMES

40-.8 ORN

S204

40-.8 ORN → RADIO/CLOCK (SEE PAGES 144, 145)

40-.8 ORN → I/P CTSY LPS (SEE PAGE 118)

T/L CTSY 20 AMP

40-.8 ORN

C202
12004628

9-.8 BRN

S212

9-.8 BRN → RADIO/CLOCK (SEE PAGES 144, 145)

LIGHT SWITCH

CIRCUIT BREAKER 25 AMP

DOME

OFF

PARK

HEAD

COWL

C100
1202184

I/P

9-.8 BRN

C101
12020099

C300

12015024

12015798

RH SIDE MARKER LAMP (SEE PAGE 156)

150-.8 BLK

BACKUP LAMP (SEE PAGE 154)

S402

RH CLEARANCE LAMPS (RO5) (SEE PAGE 156)

RH TAIL, STOP AND TURN LAMP (SEE PAGE 151)

LICENSE LAMP

C420
2977107 2977721

S404

C422
2977107 2977159

S411

C421
2977107 2977721

LICENSE LAMP

END GATE IDENTIFICATION LAMPS (SEE PAGE 151)

LH CLEARANCE LAMPS (RO5) (SEE PAGE 156)

S403

LH TAIL, STOP AND TURN LAMP (SEE PAGE 151)

LH SIDE MARKER LAMP (SEE PAGE 156)

G403 SHEET METAL GROUND

LICENSE LAMP A-159

FLEETSIDE AND WIDESIDE

RPO CODES
TP2 - AUXILIARY BATTERY

BATTERY JUNCTION BLOCK (W/O TP2)

2-5.0 RED

IN-LINE FUSE 30 AMP

CAP 5290791

BODY 5291294

COWL

2-5.0 RED- POWER FEED

CAMPER

24-.8 LT GRN- BACKUP LAMP

9-.8 BRN- TAIL AND LICENSE LAMP

18-.8 YEL- LH STOP AND TURN S/G LAMP

19-.8 DK GRN- RH STOP AND TURN S/G LAMP

22-.5 WHT

FRAME GROUND G403

TAIL, STOP TURN SIG, MARKER AND BACKUP LAMPS

19-.8 DK GRN

24-.8 LT GRN

9-.8 BRN

18-.8 YEL

C300 12015798

C300B 12015024

S304

S305

S306

S307

C300A 12015798

C300 12015024

REAR LAMP CONNECTOR C101 12020099

CAMPER EQUIPMENT

BATTERY JUNCTION BLOCK (W/O TP2)

2-5.0 RED

IN-LINE FUSE (30 AMP)

CAP 5290791

BODY 5291294

COWL

47-3.0 DK BLU- AUX

2-5.0 RED- POWER FEED

24-.8 LT GRN- BACKUP LAMP

9-.8 BRN- TAIL AND LICENSE LAMP

TRAILER

18-.8 YEL- LH STOP AND TURN SIG LAMP

19-.8 DK GRN- RH STOP AND TURN SIG LAMP

22-5.0 WHT- GROUND

22-.5 WHT

FRAME GROUND G403

TAIL, STOP TURN SIG, MARKER AND BACKUP LAMPS

19-.8 DK GRN

24-.8 LT GRN

19-.8 DK GRN

18-.8 YEL

C300 12015798

C300B 12015024

S304

S305

S306

S307

C300A 12015798

C300 12015024

REAR LAMP CONNECTOR C101 12020099

HEAVY DUTY TRAILER

BATTERY JUNCTION BLOCK (W/ TP2)

IN-LINE FUSE 30 AMP

CAP 5290791

BODY 5291294

BATTERY JUNCTION BLOCK (W/ TP2)

IN-LINE FUSE (30 AMP)

CAP 5290791

BODY 5291294

A-160 CAMPER AND TRAILER WIRING

DIAGNOSIS

Conditions most likely to cause vacuum system problems include hoses that leak or become disconnected. With the engine running, either condition is easily detected from the hiss of air at the opening. Other common vacuum problems are kinked or obstructed hoses, hoses connected incorrectly or binding components.

A vacuum pump can be used as a vacuum source to operate components and test the system. The built-in vacuum gage of the pump provides a means of checking for a vacuum leak as well. Once vacuum is applied to operate the component, the gage should hold steady until the vacuum is purposely released.

On vacuum system that are controlled by electrical or electronic switches, check for a blown fuse, wiring that is cracked, frayed or burned, and high resistance in connectors of the control circuit(s) before checking for a suspected vacuum system problem.

DIAGNOSIS - AUXILIARY HEATER VACUUM CONTROL

PRELIMINARY CHECKS:

With the engine warmed up and running, verify that the front heater can deliver a strong flow of heated air from the floor outlets with the blower switch on "HI," the mode selector set for heater operation and the temperature lever in the full "HOT" position. If the front heater or A/C heating system is functioning correctly but the auxiliary heater does not, the problem is in the auxiliary heater system. The following procedure will isolate the cause.

LITTLE OR NO HEAT FROM AUXILIARY HEATER

TEST	RESULT	ACTION
1. With the engine running and the auxiliary heater "OFF," move the auxiliary heater control rocker switch to "LO" and then to "HI," pausing to listen for a change in the force of the airflow from the heater outlet with the change.	No airflow (or improper airflow).	REFER to Auxiliary Heater Diagnosis in this manaul.
	Proper airflow in both control switch positions.	GO to step 2.
2. With the engine running and the auxiliary heater switch in "LO," disconnect the vacuum hose at the hot water valve and feel for vacuum at the hose end.	No vacuum.	GO to step 3.
	Vacuum.	GO to step 4.
3. Disconnect the hot water valve vacuum hose at the auxiliary heater control switch and feel for vacuum at the open port of the switch.	No vacuum.	REPAIR vacuum source line or REPLACE auxiliary heater control switch, as necessary.
	Vacuum.	REPAIR or REPLACE faulty hot water valve vacuum hose.
4. Connect all vacuum hoses. With the engine warmed up and running, place the auxiliary heater control switch in "HI." After at least a minute of operation in this mode, carefully feel the temperature of the heater inlet pipe downstream from the hot water valve.	Little or no heat.	REPAIR or REPLACE the hot water valve, heater core or heater hoses and pipes as necessary.
	Adequate heat.	VERIFY complaint. Vacuum system is OK.

DIAGNOSIS - FRONT MANUAL AIR CONDITIONING VACUUM CONTROL

PRELIMINARY CHECKS:

Use the charts in this section to verify that air is either begin delivered from an outlet when it should not be, or that air is not being delivered when it should be, during operation in one or more modes.

After making checks of the vacuum system (listening for the hiss of a vacuum leak, checking for proper vacuum hose connections and kinked, pinched or misrouted hoses), be sure the complaint is not caused by a mechanical problem before making additional vacuum system checks.

IMPROPER AIR DISTRIBUTION FROM OUTLETS

TEST	RESULT	ACTION
1. Disconnect the vacuum hose at the actuator for the inoperative air valve ("door"). With the engine idling and the mode lever set in a position that will apply vacuum to the actuator, check for vacuum at the disconnected hose.	Vacuum at or near engine vacuum at idle.	REPAIR binding condition in air valve or linkage. (If no binding is found, REPLACE actuator.)
	Little or no vacuum.	GO to step 2.
2. Disconnect the vacuum hose harness at the rotary selector valve on the A/C control assembly. With the same test conditions as in step 1, check for vacuum at the rotary selector valve port that feeds the suspected vacuum hose.	Vacuum at or near engine vacuum at idle.	REPAIR obstruction or vacuum leak in hose to the affected actuator.
	Little or no vacuum.	GO to step 3.
3. With the vacuum supply hose disconnected from the rotary selector valve and with the same test conditions as in step 2, check for vacuum at the open end of the tan vacuum supply hose.	Vacuum at or near engine vacuum.	REPLACE rotary selector valve.
	Little or no vacuum.	REPAIR obstruction or vacuum leak in vacuum supply hose.

DIAGNOSIS - CRUISE CONTROL VACUUM HARNESS

CRUISE CONTROL DOES NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect vacuum hose (smaller hose) at vacuum valve inlet of servo unit. Connect a vacuum gage to the disconnected hose. Start engine and allow it to idle. Measure vacuum at vacuum hose.	Vacuum is less than normal engine vacuum at idle.	REPAIR vacuum pump (diesel engine) or air leak in hose or connections between cruise control servo and vacuum source (inlet manifold vacuum fitting or vacuum pump).
	Vacuum is same as normal engine vacuum at idle.	GO to step 2 (gas engine). Verify complaint (diesel engine).
2. Momentarily accelerate engine sharply while watching vacuum gage.	Vacuum reduces noticeably as engine accelerates.	REPLACE check valve in line from vacuum source.
	Vacuum does not change.	GO to step 3.
3. Stop engine. Disconnect vacuum gage and connect vacuum hose to servo unit. Disconnect vent hose (larger hose) from servo unit and connect a vacuum pump with built-in vacuum gage to the disconnected hose. Operate vacuum pump to obtain the same vacuum as observed in step 1. Stop pumping and observe the vacuum reading.	Vacuum drops.	REPAIR air leak in hose or connections, or ADJUST or REPLACE vacuum release valve on brake pedal bracket.
	Vacuum does not change.	REFER to Cruise Control Diagnosis in this manaul.

CIRCUIT OPERATION

VACUUM SYSTEMS

A vacuum-operated component uses the force of normal air pressure working against the lower air pressure of a partial vacuum to provide voltage that operates the component. With a gasoline engine, the vacuum created in the inlet manifold when the engine is running is stored in a ball-shaped vacuum tank suspended from the center of the hood inner panel. A check valve in the line feeding vacuum to the tank keeps the stored vacuum from weakening when inlet manifold vacuum drops during high speed or high voltage operation.

An engine-driven mechanical vacuum pump serves as the source of vacuum with a diesel engine. A vacuum tank is not required with a vacuum pump.

Vacuum is routed through hoses to a mechanical or electric valve that provides a means of controlling the vacuum-operated component. When the valve is open, it allows vacuum to go to an actuator that actually operates the component. When the component is to be returned to its original position, the valve cuts off the vacuum to the actuator hose and vents the hose to normal air pressure.

A typical actuator is a metal shell with a movable shaft that retracts and extends to mechanically operate the component. A flexible diaphragm separates the interior of the shell into two chambers - a sealed chamber to which vacuum can be admitted, and an open chamber exposed to normal air pressure. The movable shaft is attached to the center of the diaphragm and extends from the open chamber.

When vacuum is directed to the sealed chamber, normal air pressure presses on the other side of the diaphragm and causes it to retract the shaft. When the vacuum is cut off, the sealed chamber is vented to outside air to balance the air pressure on both sides of the diaphragm and eliminate the force that retracted the shaft. A coiled spring within the sealed chamber expands to push the diaphragm back to its original position. This extends the shaft.

In addition to the two-position actuator described above, a three-position actuator may be used for certain applications. The three-position actuator has a vacuum hose at each end of the shell. When vacuum is applied to either end of the actuator and the opposite end is vented, the shaft will move in the direction of the end having the vacuum. When both ends of the actuator are vented to normal air pressure, internal springs center the shaft. This provides a center position as well as both extremes for an actuator application that requires three operating positions. The heater and air conditioning actuator of the R/V truck front manual air conditioning system is a three-position actuator.

The servo unit of the cruise control is a special type of vacuum actuator with an internal control valve that can apply varying amounts of vacuum to the diaphragm. The varying vacuum provides a calibrated range of throttle positions that can accurately control vehicle speed. The function of the servo is explained more fully under "CRUISE CONTROL VACUUM CONTROL" in this section.

AUXILIARY HEATER VACUUM SYSTEM

The auxiliary heater control switch in the instrument panel routes battery voltage to the auxiliary heater blower motor when the auxiliary heater control switch is "ON" and the ignition switch is in RUN.

In addition, the switch routes vacuum from the vacuum tank to the vacuum actuator that opens the auxiliary heater hot water valve. When open, the hot water valve admits heated coolant to the auxiliary heater inlet pipe and auxiliary heater core.

When the auxiliary heater control switch is turned "OFF," electric voltage to the blower motor is cut off and the hot water valve vacuum actuator is vented to atmospheric air to close the valve. This stops the flow of coolant to prevent unwanted heat.

FRONT MANUAL AIR CONDITIONING VACUUM SYSTEM

The front manual air conditioning system uses vacuum to operate the air valves ("doors") that control airflow through the air conditioning module.

Vacuum is supplied from the vacuum tank on the cowl panel in the left corner of the engine compartment. The vacuum supply line brings vacuum to the rotary selectors valve that is operated by the mode lever of the air conditioning control assembly in the instrument panel. A vacuum hose harness brings vacuum from the ports in the rotary selector valve to the vacuum actuators for the air valves of the air conditioning system. All actuators except the heater and air conditioning actuator are two-position actuators controlled by one vacuum hose. The heater and air conditioning actuator is a three-position actuator with two vacuum hoses. Application of vacuum or vented air to each actuator is determined by the operating mode selected by setting the mode lever in the control assembly. The following charts indicate the air outlets that operate in each mode selection and the response of the rotary selector valve to each mode lever position.

AIR DISTRIBUTION

MODE SELECTION	UPPER (I/P) A/C OUTLETS	LOWER (FLOOR) HEATER OUTLETS	DEFROSTER OUTLETS	REMARKS
OFF	NONE	NONE	NONE	
MAX A/C	HIGH	NONE	NONE	a, b
NORM A/C	HIGH	NONE	NONE	a
BI-LEVEL	MEDIUM	MEDIUM	NONE	a
VENT	HIGH	NONE	NONE	c
HEAT	NONE	HIGH	LOW	c
DEF	NONE	LOW	HIGH	a

REMARKS:
a — Refrigeration system operates. b — Inside air recirculated. c — Refrigeration system off; no air cooling available.

ROTARY SELECTOR VALVE OPERATING CHART

CONNECTIONS		HOSE COLOR	MODE SELECTION						
VALVE PORT NO.	TERMINAL		OFF	MAX A/C	NORM A/C	BI-LEVEL	VENT	HEAT	DEF
1	SOURCE	GRA	VAC	VAC	VAC	VAC	VAC	VAC	VAC
2	A/C MODE	TAN	VENT	VAC	VAC	VENT	VAC	VENT	VENT
3	HEAT MODE	BLUE	VAC	VENT	VENT	VENT	VENT	VAC	VAC
4	RECIRC & PLENUM	ORN	VENT	VAC	VENT	VENT	VENT	VENT	VENT
5	DEFROST MODE	BLK	VENT	VENT	VENT	VENT	VENT	VENT	VAC

CRUISE CONTROL VACUUM SYSTEM

The cruise control system uses vacuum to operate a servo unit that adjusts throttle position to maintain a desired vehicle speed. The electronic control module of the cruise control system operates a vacuum valve and a vent valve in the servo to trap enough vacuum in the servo to hold the required throttle setting. A vacuum release valve on the brake pedal bracket vents the trapped vacuum to atmosphere when the brake pedal is depressed, allowing the servo to quickly return the throttle to idle.

Control Module Functions

The cruise control module continually interprets the setting of the mode control switches, the position of the servo linkage to the throttle and the output of the vehicle speed sensor. In response to these inputs, the cruise control module electrically signals the momentary opening or closing of the vacuum and vent solenoid valves in the servo unit.

Servo Unit Functions

The cruise control servo consists of a vacuum-operated diaphragm, a normally closed solenoid valve to admit vacuum to the servo diaphragm chamber, a normally open solenoid valve to vent the diaphragm chamber to atmosphere, and a variable inductance position sensor that signals the position of the servo linkage - and accordingly, the throttle setting - to the cruise control module.

When the system is engaged and operating, the servo operates the throttle as follows:

Steady Cruise: Both the vacuum valve and the vent valve are closed, trapping vacuum in the diaphragm chamber to hold a steady throttle setting.

Vehicle Losing Speed: The cruise control module opens the vacuum valve to increase the strength of the vacuum in the diaphgram chamber. The vent valve remains closed.

Vehicle Gaining Speed: The cruise control module opens the vent valve to the atmosphere to reduce the vacuum in the diaphragm chamber so the throttle return spring can take over and reduce the throttle opening. The vacuum valve remains closed.

The cruise control module pulses the opening of the vacuum valve or the vent valve for minor speed corrections until the vehicle reaches the set speed. Under normal road load conditions, the vacuum valve will remain completely open, instead of pulsing, when vehicle speed drops 5 mph below the set speed. When the vehicle speed exceeds 3 mph over the set speed, the vent valve will remain completely open, instead of pulsing.

The servo will go into a completely open vent valve position, returning the throttle to idle, when the brake or clutch pedal is depressed, when electrical voltage to the system is lost (such as when the cruise control switch or the ignition switch is turned off) or when there is an open in the variable inductance position sensor coil in the servo.

CIRCUIT OPERATION

POWER BRAKE BOOSTER VACUUM SYSTEM

The power brake booster is a tandem diaphragm vacuum-suspended unit. When the engine is running, inlet manifold vacuum is transmitted to the booster unit through a vacuum hose. A check valve at the power brake booster end of the hose keeps air from flowing from the hose into the booster unit and weakening the power brake operating force when inlet manifold vacuum is low.

With the service brakes released, vacuum is supplied equally to both sides of the two diaphragms in the booster unit. Because pressure on both sides of the diaphragms are balanced, no boost is provided to the braking system and the brakes are not applied.

When the driver presses down on the brake pedal, the pedal pushrod depresses a spring-loaded air valve within the power brake booster. The air valve opens to admit air at atmospheric pressure to the back side of both diaphragms. This forces the diaphragms forward and causes a piston rod in the booster unit to push the brake master cylinder pistons and apply the service brakes.

The amount of atmospheric air admitted to the back side of both diaphragms depends upon the force the driver applies to the brake pedal. The greater the pedal pressure, the more the valve opens. This provides a power boost that multiplies the force applied to the master cylinder pistons in proportion to the pressure on the brake pedal.

When the brake pedal is released, the flow of atmospheric air is cut off and inlet manifold vacuum draws off the air behind the diaphgrams. As a result, air pressures within the diaphgram chambers are once again balanced so no power boost is developed.

EGR VALVE VACUUM SYSTEM

The exhaust gas recirculation (EGR) system allows a small amount of exhaust gas to flow from the exhaust manifold into the inlet manifold when the throttle is opened beyond idle and inlet manifold vacuum is normal. This reduces combustion temperatures in the engine to control oxides of nitrogen emissions.

The EGR valve is operated by an integral vacuum actuator that controls a pintle within the valve. The pintle remains closed to prevent exhaust gas recirculation until vacuum is applied to the actuator. The vacuum causes the pintle to open, allowing the measured flow of exhaust gas to enter the inlet manifold.

The EGR system used with gasoline engines remains closed during periods of engine idle and deceleration to prevent rough idle from excessive dilution of the air/fuel mixture. It also remains closed at wide-open throttle to prevent power loss. At other times, it rapidly cycles open and closed to modulate the flow of exhaust gas as required. Under certain circumstances, it may remain fully open to provide the maximum EGR.

In gasoline engines, the manifold absolute pressure (MAP) sensor measures the strength of inlet manifold vacuum in the EGR vacuum circuit and sends a signal back to the electronic control module (ECM). The ECM uses the signal from the MAP sensor to control fuel delivery and ignition timing. In addition, the ECM will adjust the on-off intervals of the EGR valve to correct the flow of exhaust gas into the cylinders if actual vacuum differs from the preferred vacuum as calculated by the ECM. This provides the required control of oxides of nitrogen emissions while retaining engine performance under all operating conditions.

Vacuum for the EGR system of gasoline engines is taken from the throttle body and routed through a hose to the electronic vacuum regulator valve (EVRV). This valve is controlled by the 435 circuit from the ECM. When the EVRV solenoid is energized, the valve routes vacuum to the EGR actuator. The actuator opens the EGR pintle valve to allow exhaust gas to flow into the inlet manifold. When the EVRV solenoid is released, the valve vents the EGR actuator to outside air to close the EGR pintle valve.

In the LH6 diesel engine, the operation of the EGR valve is assisted by the exhaust pressure regulator (EPR) valve. At idle, the EPR valve increases exhaust back pressure to force more exhaust through the EGR valve and reduce combustion temperatures. The vacuum which operates the EGR valve and the EPR valve is supplied by an engine-driven vacuum pump.

The electronic control module (ECM) controls the EGR valve solenoid to regulate the vacuum to the EGR valve in the same way as with a gasoline engine. The ECM calculates the amount of exhaust gas recirculation based on inputs from the engine speed sensor and the throttle position sensor, and pulses the EGR valve solenoid to control EGR. The manifold absolute pressure (MAP) sensor monitors the control of exhaust gas recirculation as indicated by the air pressure in the EPR vacuum line. If actual vacuum differs from the preferred vacuum as calculated by the ECM, the ECM will adjust the on-off intervals of the EGR valve to correct the flow of exhaust gas into the cylinders.

When the ECM recognizes the operating range in which no exhaust gas recirculation is needed, the EGR vent solenoid opens to vent the vacuum at the EGR valve.

At idle, the ECM energizes the EPR valve solenoid to send vacuum to close the EPR valve. This increases exhaust back pressure to force more exhaust gas through the EGR system and lower combustion temperatures to reduce oxides of nitrogen emissions.

PRELIMINARY CHECKS:

POWER BRAKE BOOSTER VACUUM SYSTEM

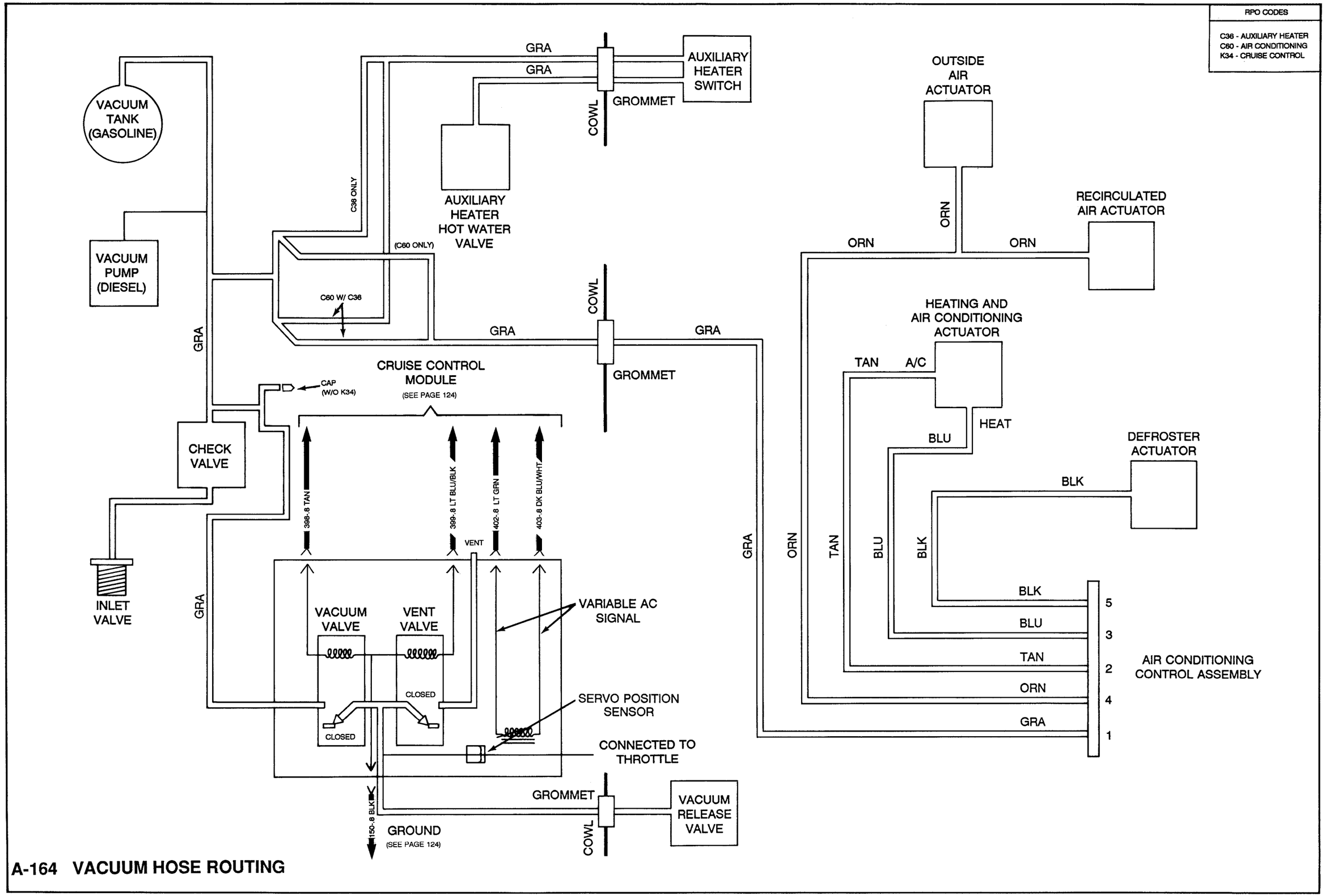
Little or no power assist upon brake application can be caused by a faulty power brake booster vacuum system. A simple two-step procedure can be used to check out the vacuum system if a visual inspection fails to uncover the cause.

- With the engine off, apply and release the brake a number of times to exhaust all vacuum from the power brake booster. As many as 8 to 10 strokes may be required. Then hold your foot on the brake pedal with a firm pressure (comparable to the pressure required to bring the vehicle to a normal gradual stop). While maintaining a steady pressure, start the engine. If the vacuum system is working properly, you should feel the brake pedal "fall away" slightly under your foot as the engine starts. If there is no power assist, refer to the R/V, G and P Truck Service Manual, Section 5A-1.
- With no pressure applied to the brake pedal, shut off the engine and allow the vehicle to stand undisturbed for 3-5 minutes. Then depress and release the brake pedal a number of times until firm resistance is met with very little brake pedal travel. A vacuum leak or a faulty check valve at the booster unit end of the vacuum hose is indicated if firm resistance is encountered with very little brake pedal travel on the first few strokes.

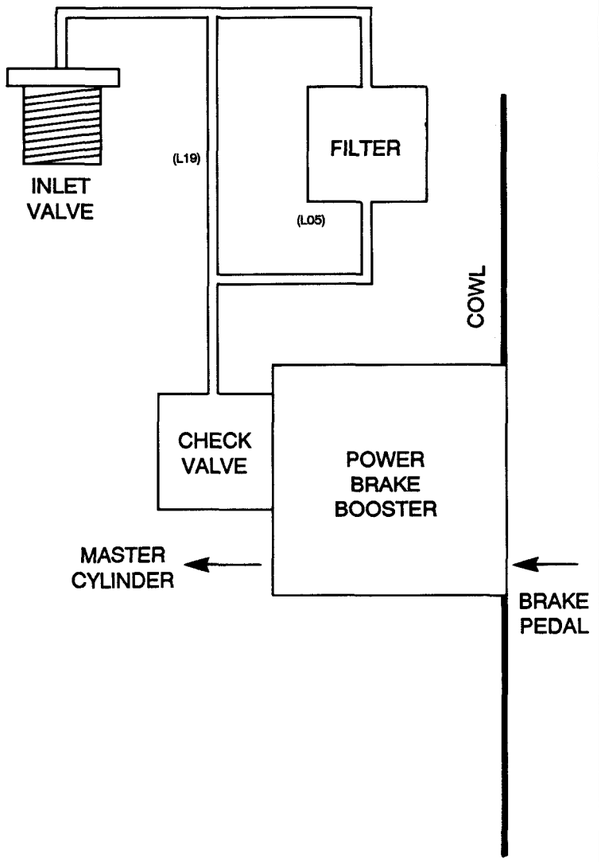
EGR VALVE VACUUM SYSTEM

A leak in the EGR (exhaust gas recirculation) vacuum system can upset the ECM's programmed control of exhaust gas recirculation and adversely affect engine operation. Too much exhaust gas recirculation at idle or cruise with a gasoline engine can result in the engine stalling after closed throttle deceleration, surging during steady throttle cruising, or a rough idle. Too little exhaust gas flow allows combustion temperatures to become too high and bring about detonation ("spark knock") or an overheated engine. In addition, nitrous oxide emissions may be high enough to cause the vehicle to fail an emissions test.

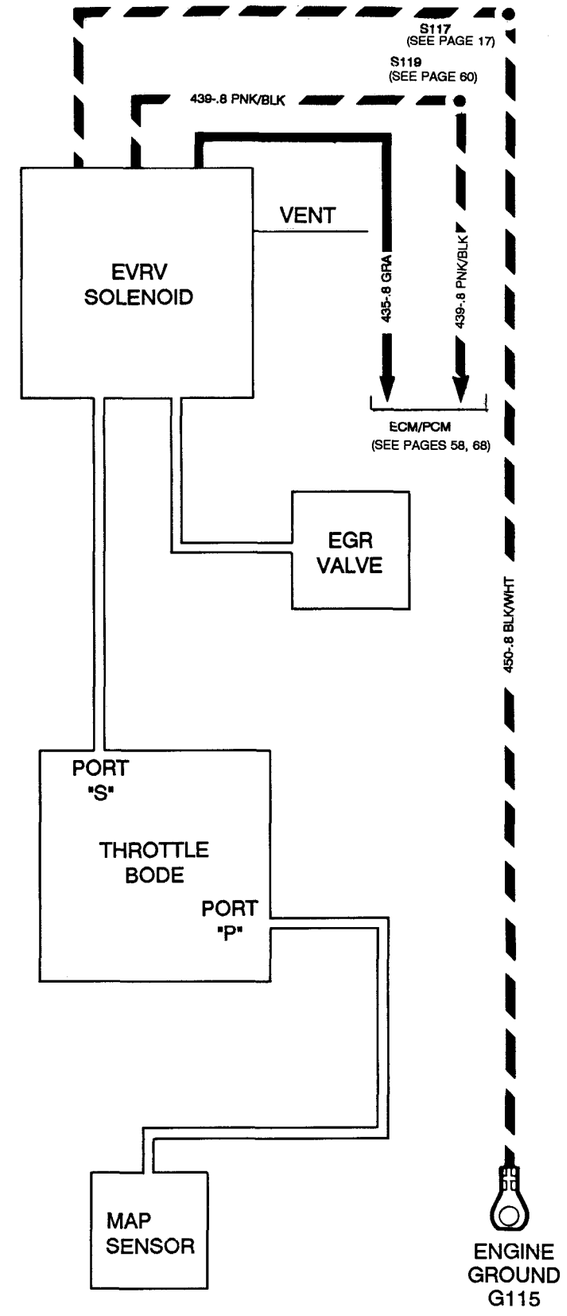
Because the source of an EGR system symptom might be traced to a mechanical or electrical condition as well as a faulty vacuum system, an effective systematic diagnosis procedure should examine all three categories of components - not just the vacuum system alone. Therefore, no exclusive vacuum system diagnosis procedures are provided here. For more information on the EGR system, refer to the "Fuel and Emissions Service Manual."



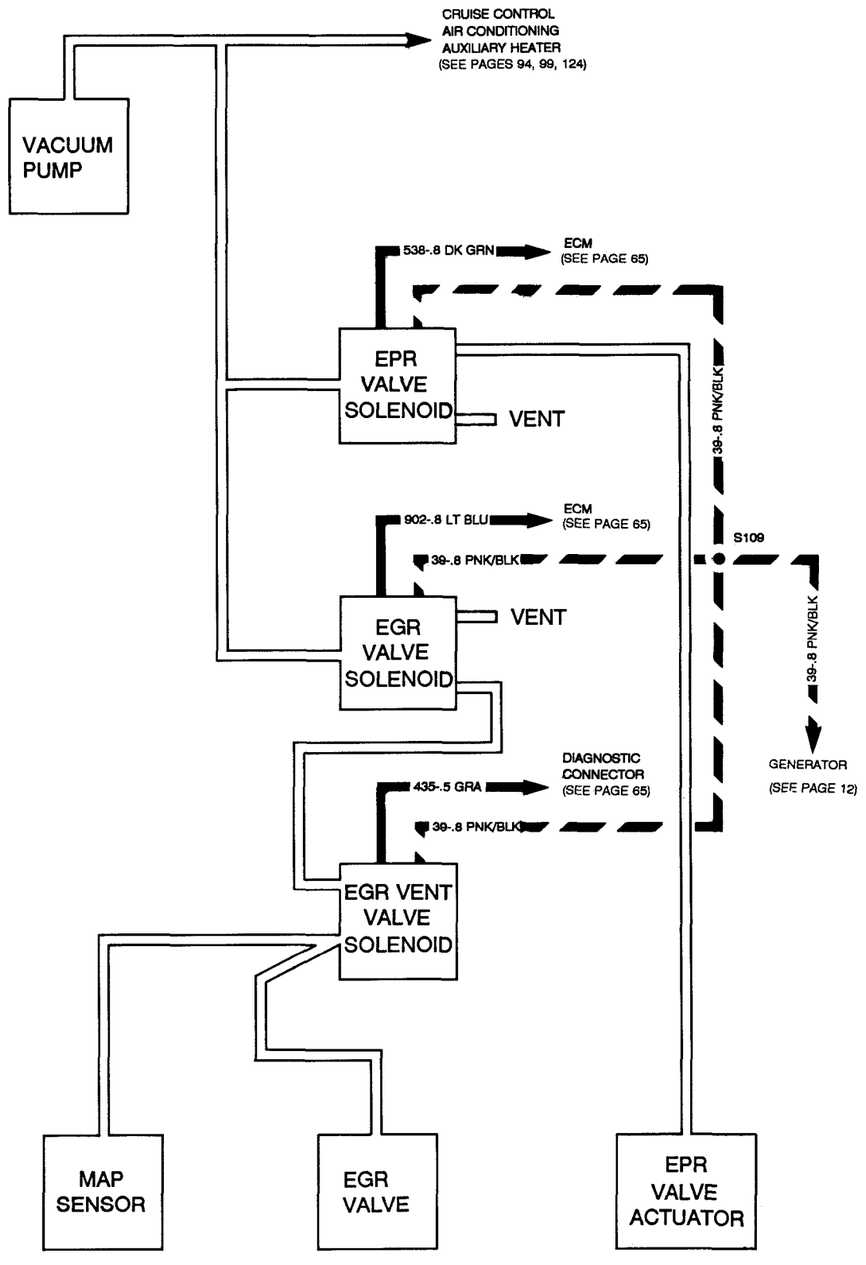
A-164 VACUUM HOSE ROUTING



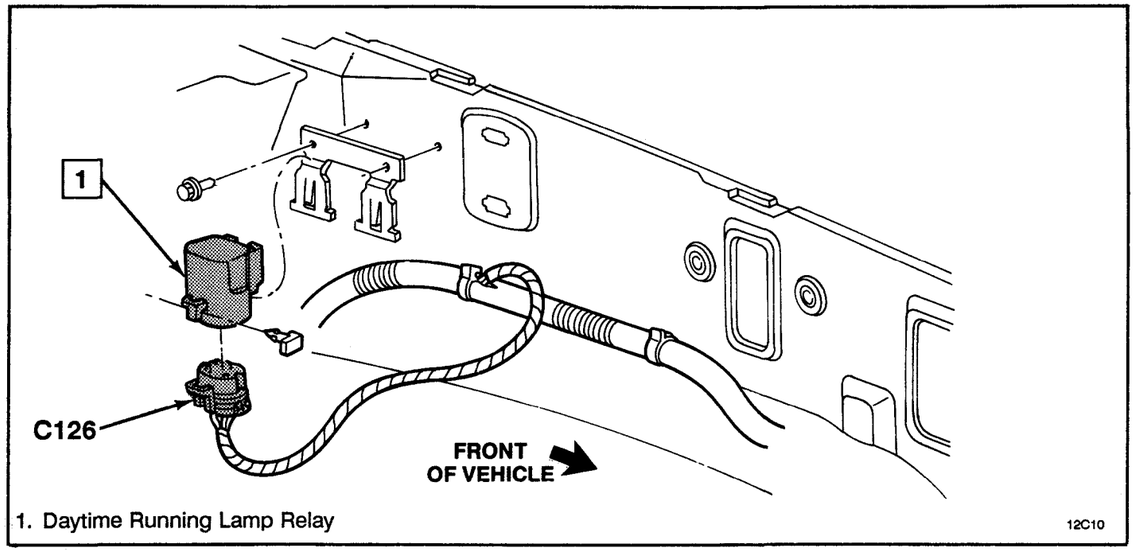
POWER BRAKE BOOSTER VACUUM SYSTEM



EGR VALVE VACUUM SYSTEM (GASOLINE ENGINE)

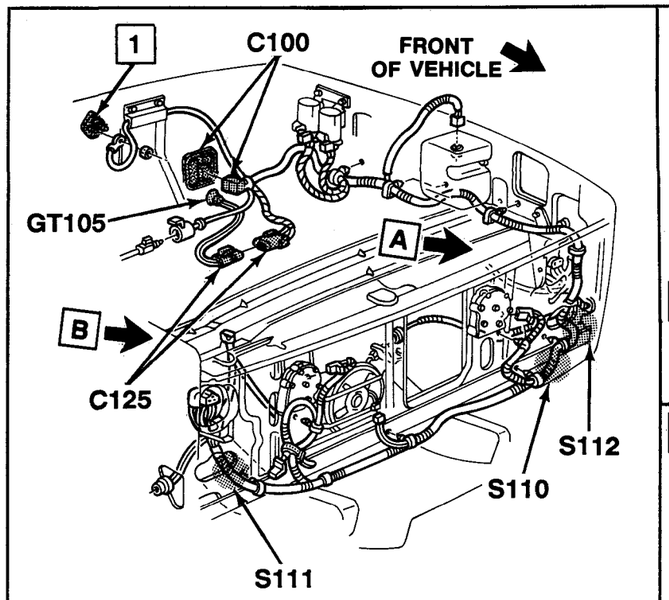


EGR/EPR VACUUM SYSTEM (DIESEL ENGINE)

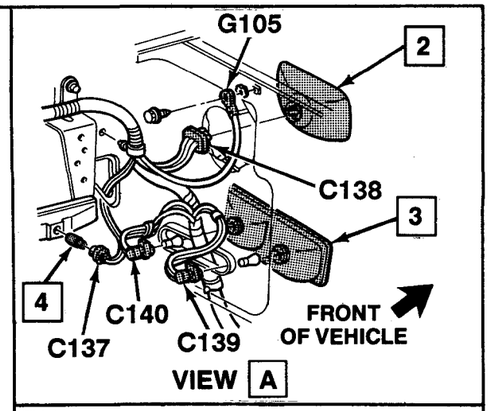


1. Daytime Running Lamp Relay

Figure 1 - Daytime Running Lamps Relay



1. Battery Junction Block
2. LH High-Low Headlamp
3. LH Park and Turn Lamp
4. LH Front Side Marker Lamp
5. RH High-Low Headlamp
6. RH Front Side Marker Lamp
7. RH Park and Turn Lamp



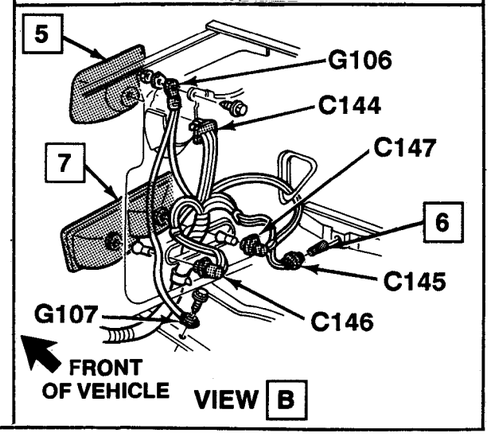
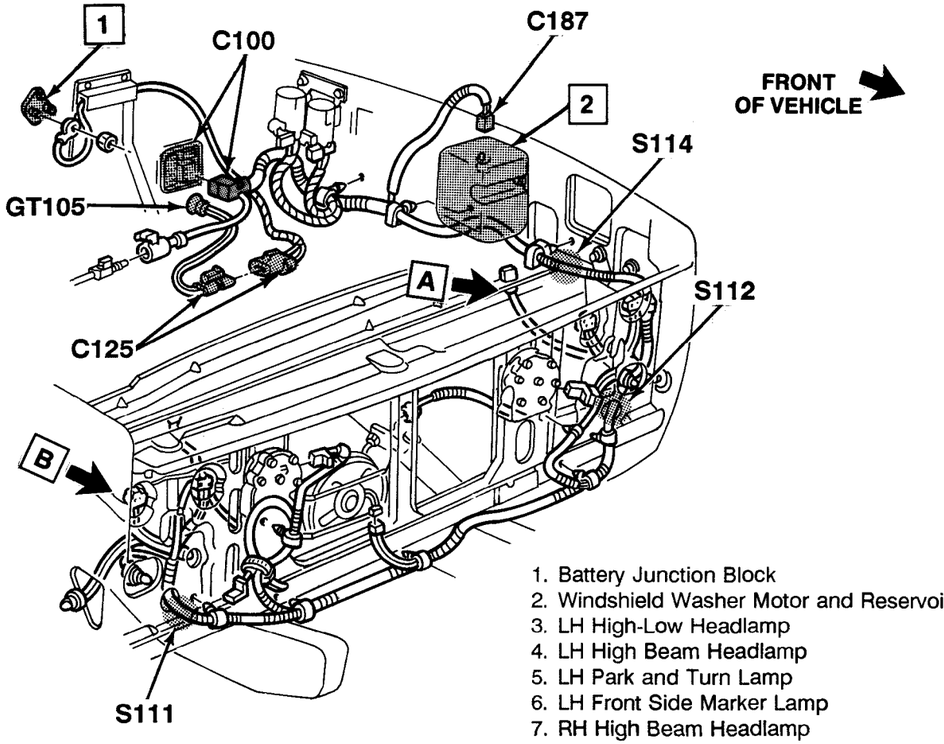
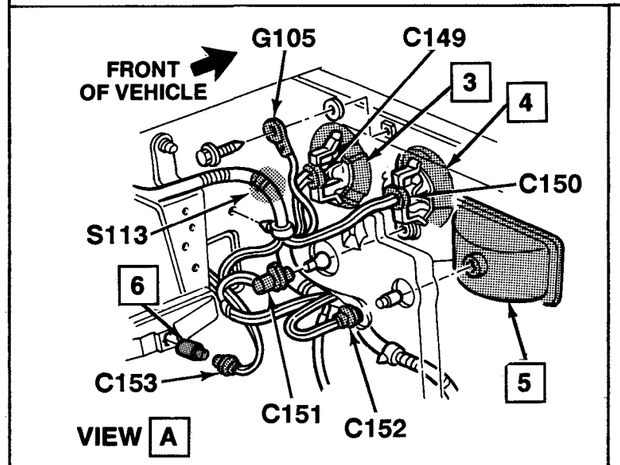


Figure 2 - Front Headlamps-Base



1. Battery Junction Block
2. Windshield Washer Motor and Reservoir
3. LH High-Low Headlamp
4. LH High Beam Headlamp
5. LH Park and Turn Lamp
6. LH Front Side Marker Lamp
7. RH High Beam Headlamp
8. RH High-low Headlamp
9. RH Front Side Marker Lamp
10. RH Park and Turn Lamp



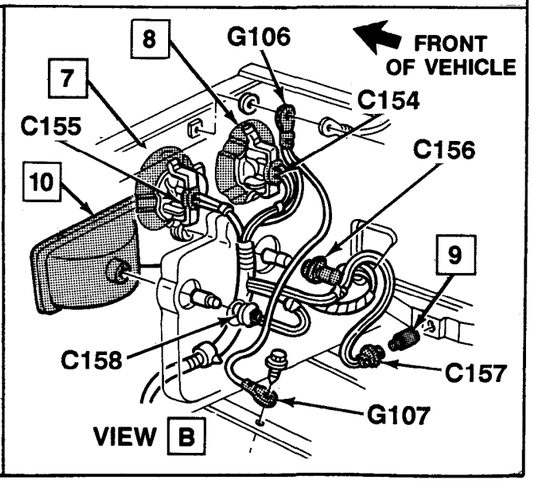


Figure 3 - Front Headlamps-Dual Headlamps-Quad Halogen

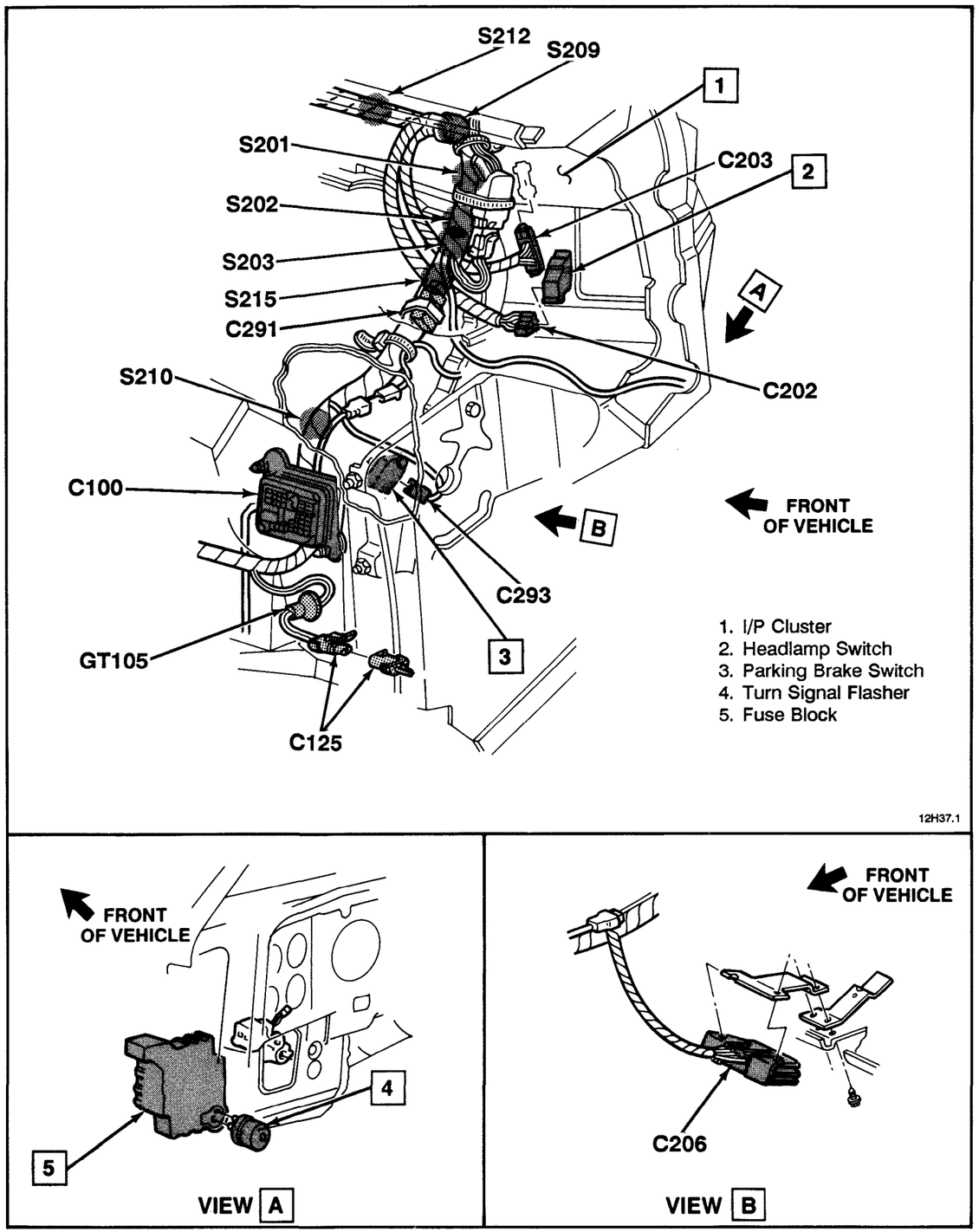


Figure 4 - Headlamp Switch and Fuse Block

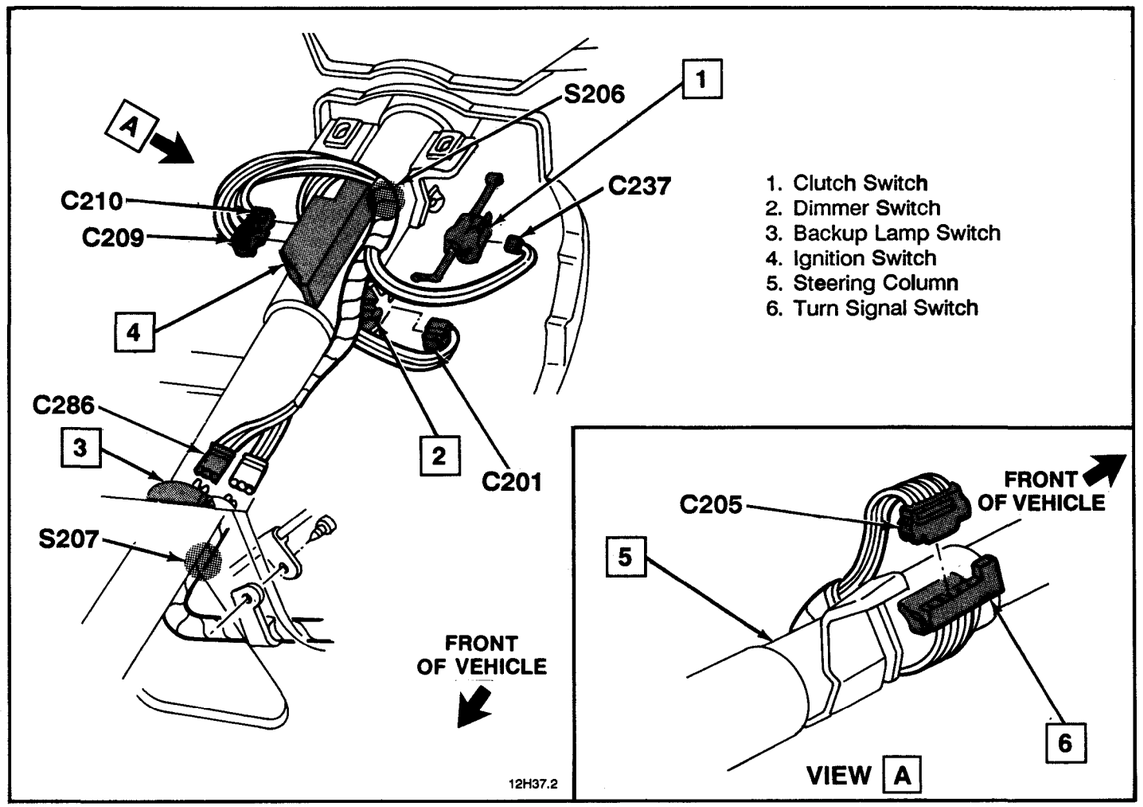


Figure 5 - Dimmer Switch

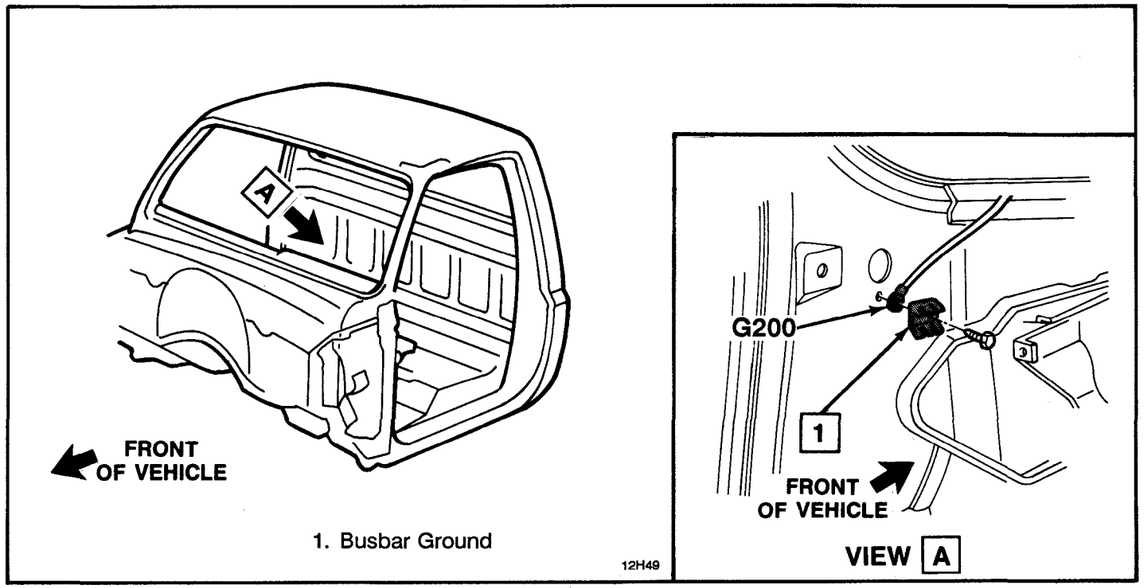


Figure 6 - I/P Ground

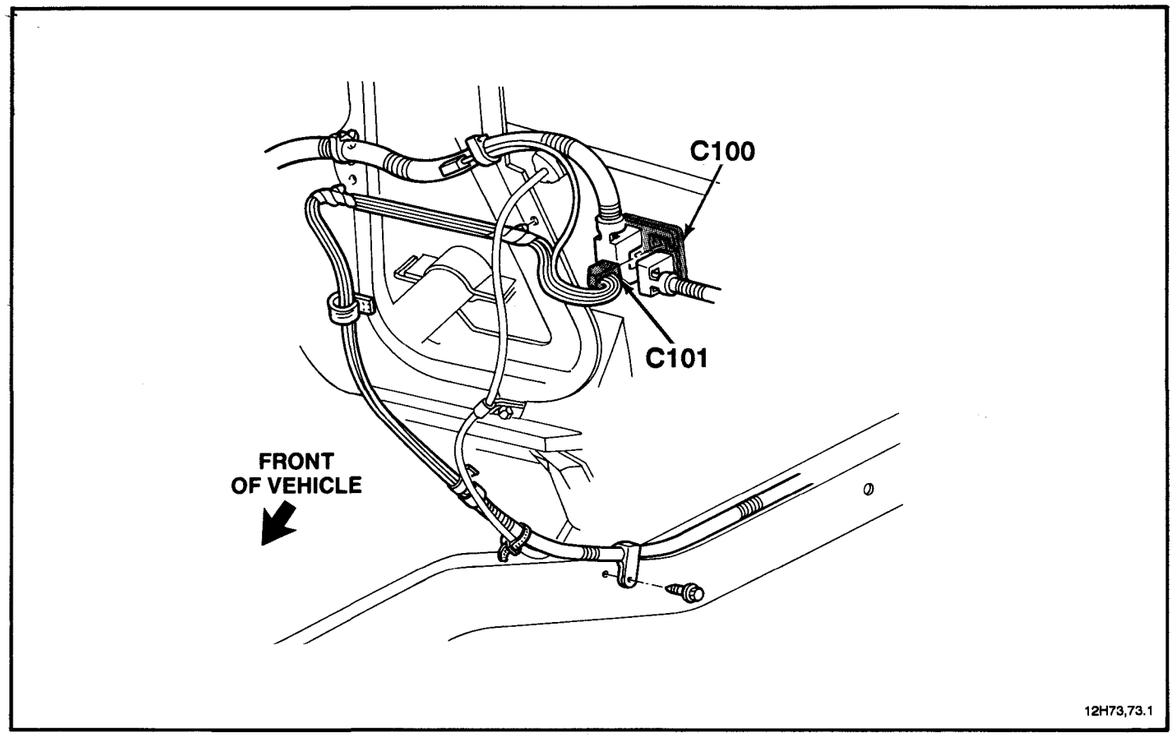


Figure 7 - Rear Lamps Wiring Extension Harness

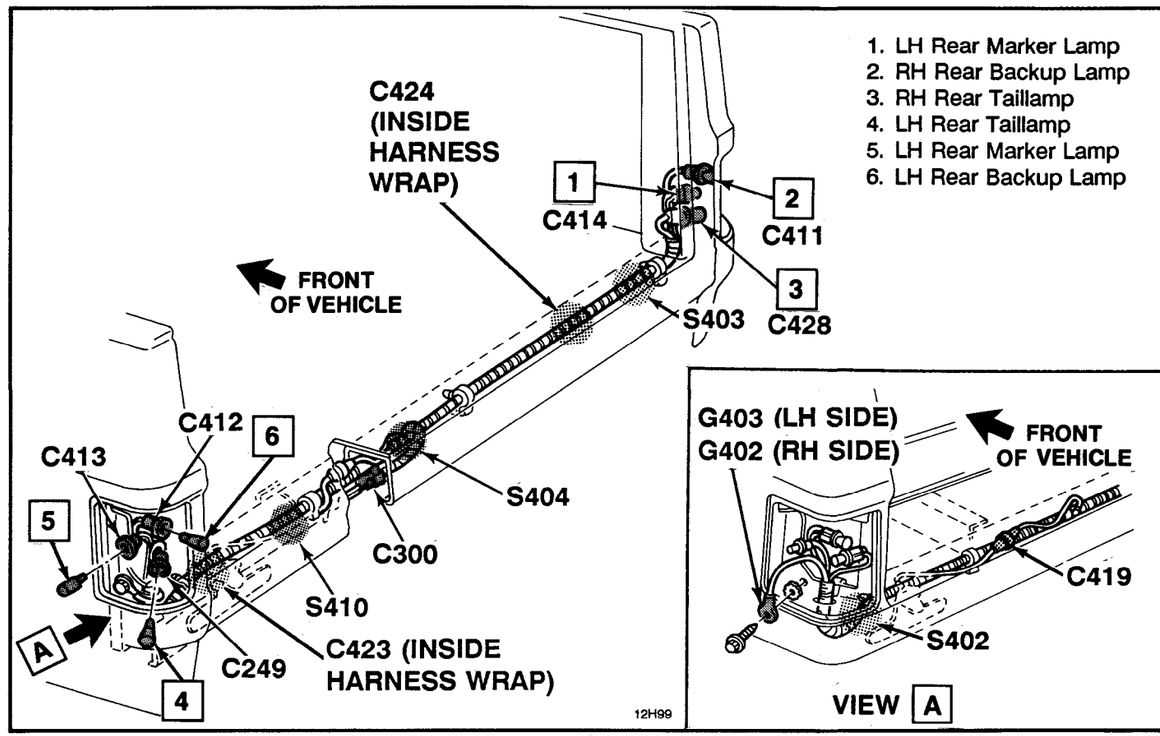


Figure 9 - Rear Lamps-Fleetside

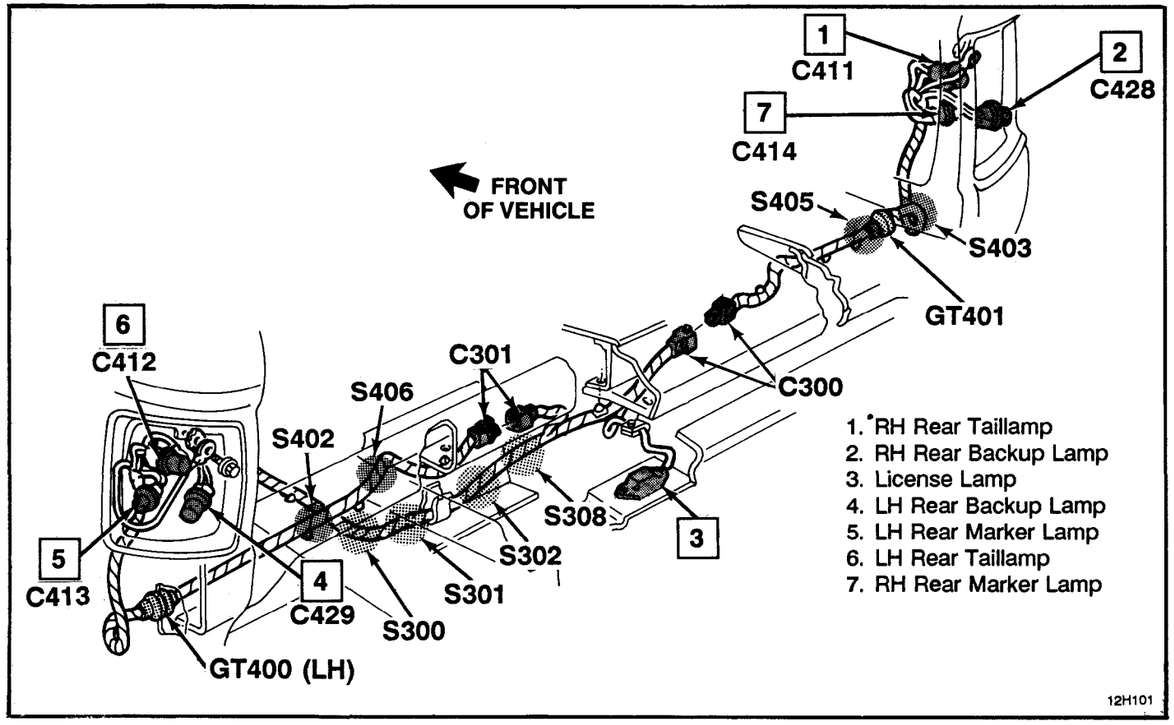


Figure 8 - Rear Lamps-Suburban and Utility

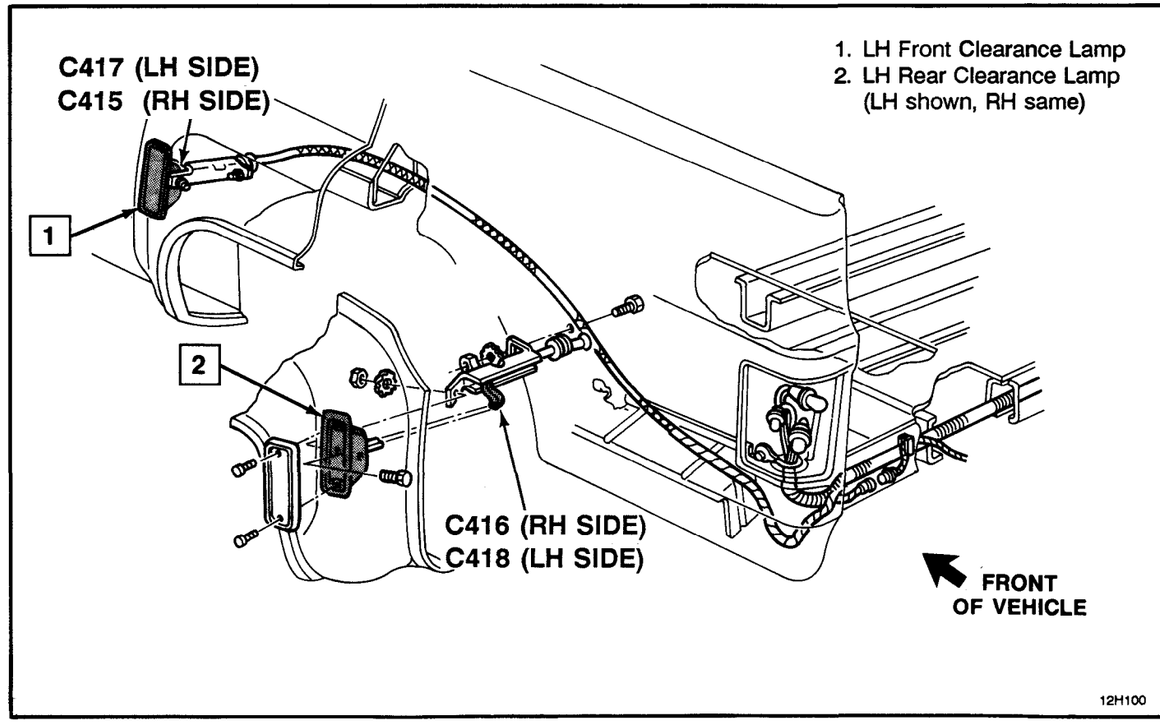
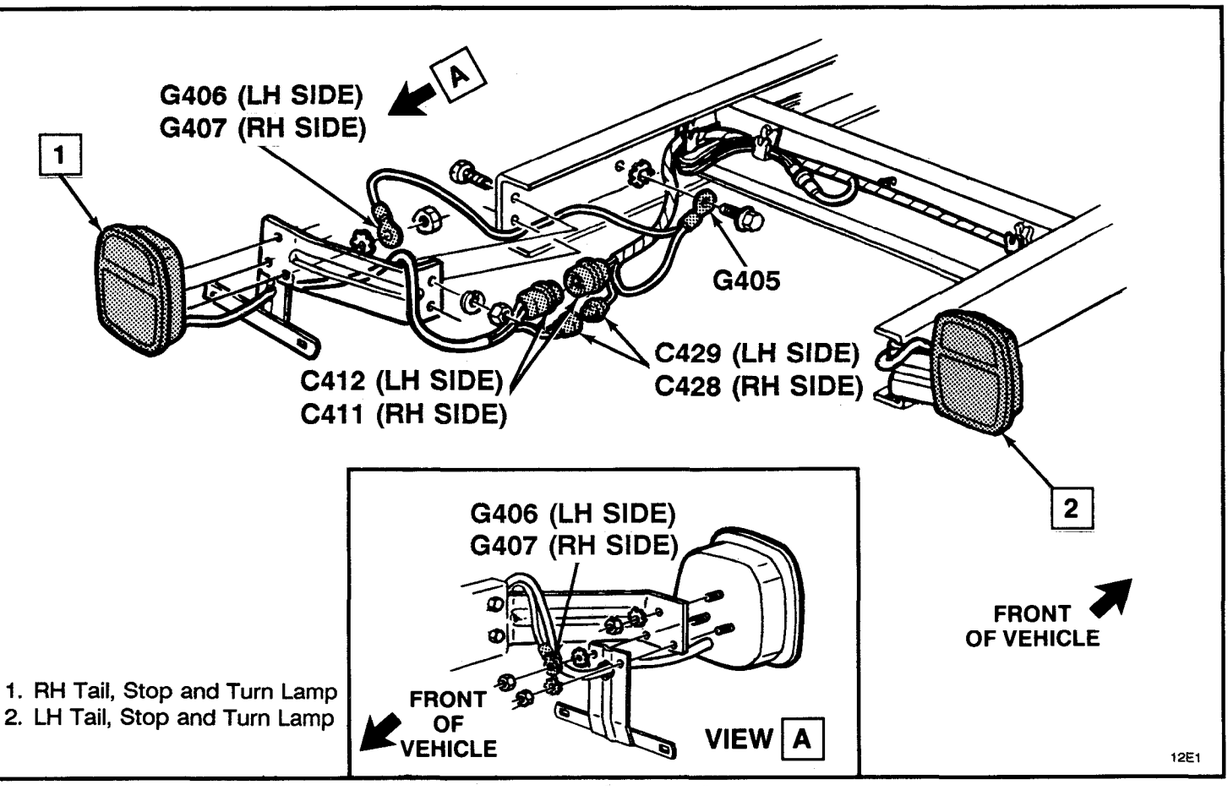
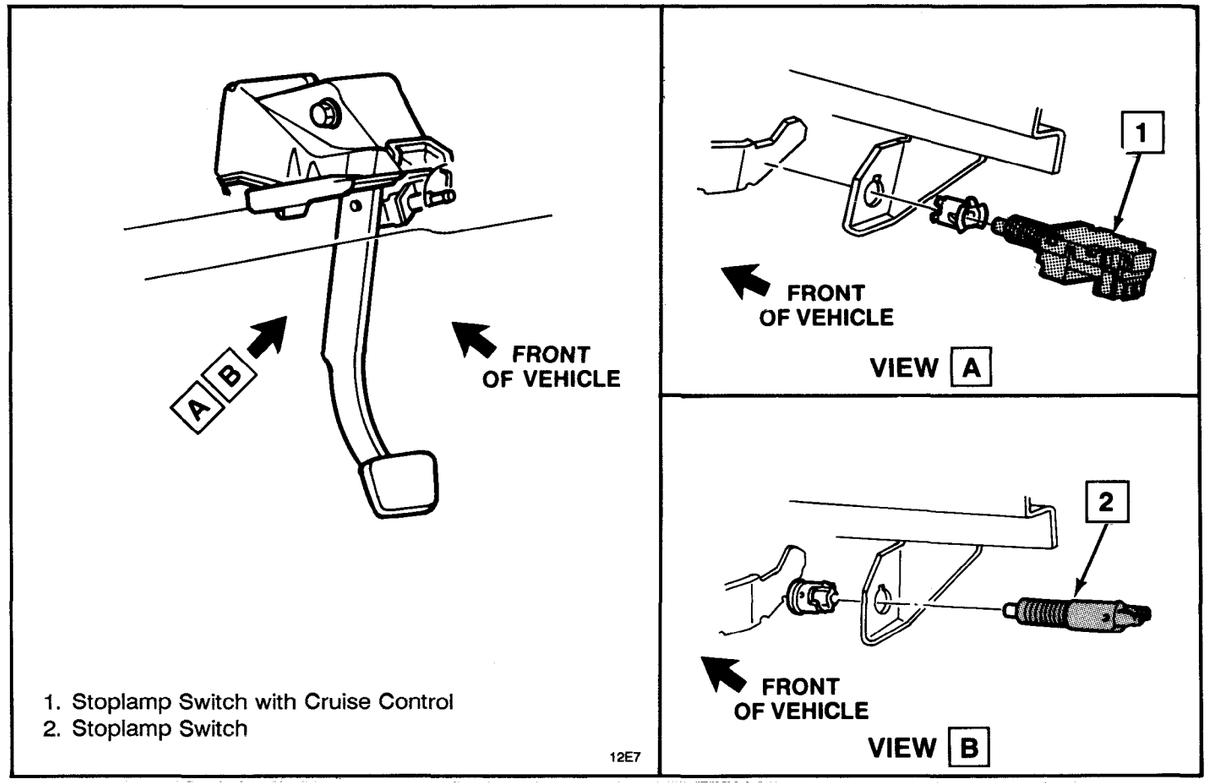


Figure 10 - Side Clearance Lamps-Dual Rear Wheels



1. RH Tail, Stop and Turn Lamp
2. LH Tail, Stop and Turn Lamp

Figure 11 - Rear Lamps - Stepside



1. Stoplamp Switch with Cruise Control
2. Stoplamp Switch

Figure 13 - Stop Lamp Switch

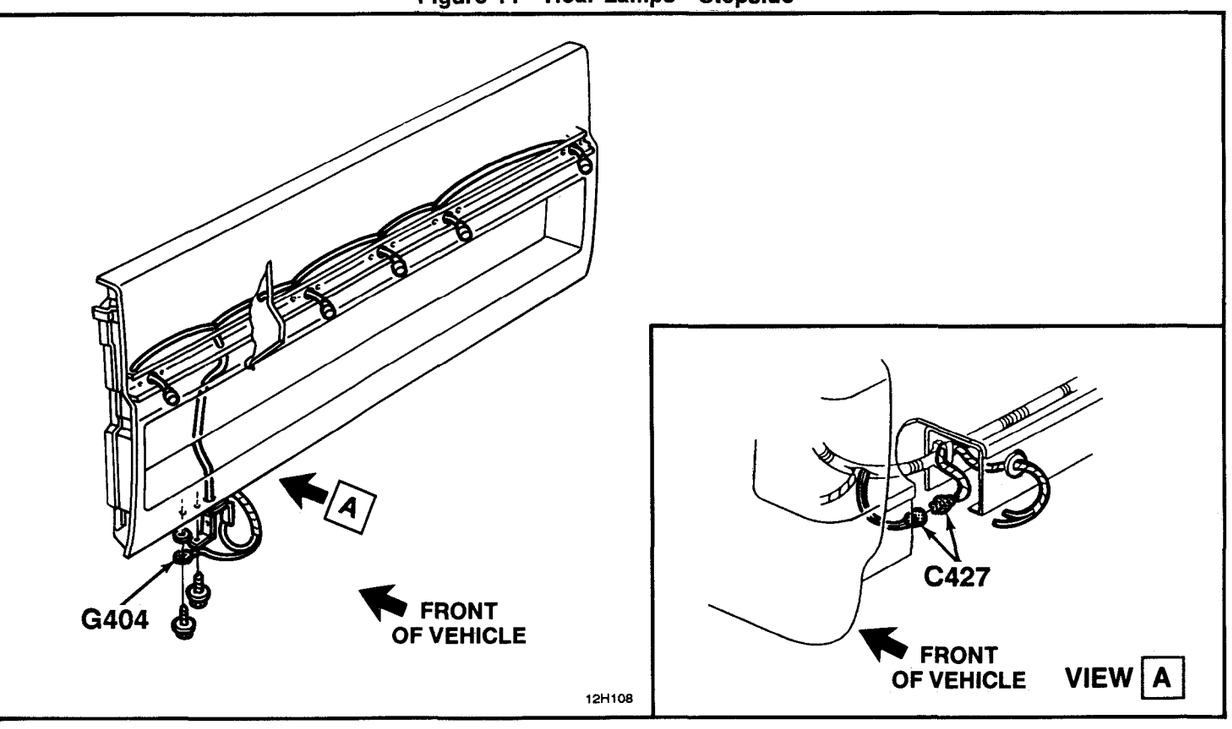


Figure 12 - Endgate Identification Lamps

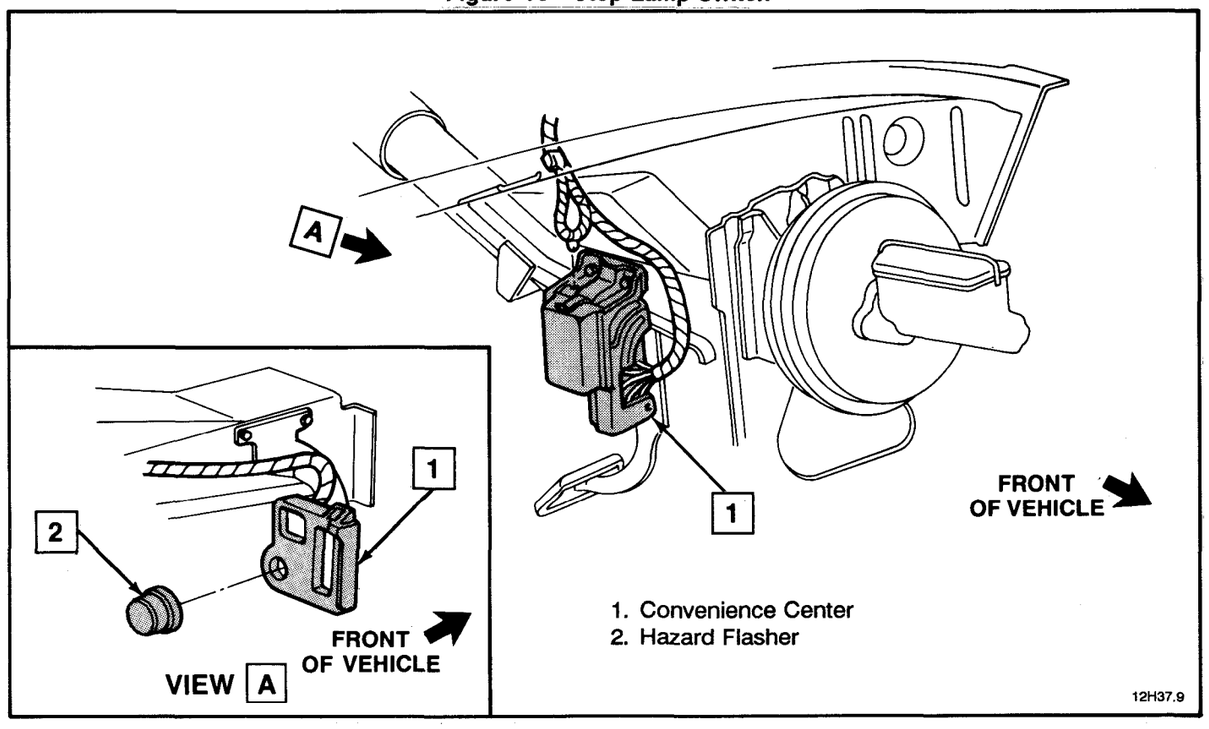


Figure 14 - Convenience Center

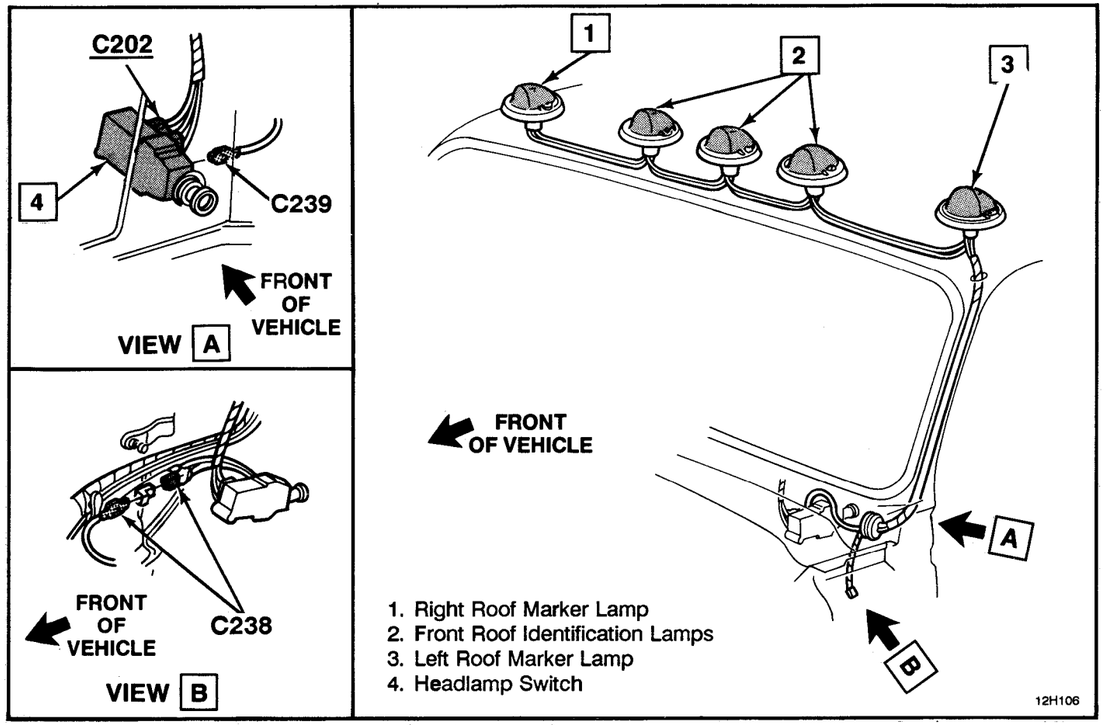


Figure 15 - Roof Marker Lamps

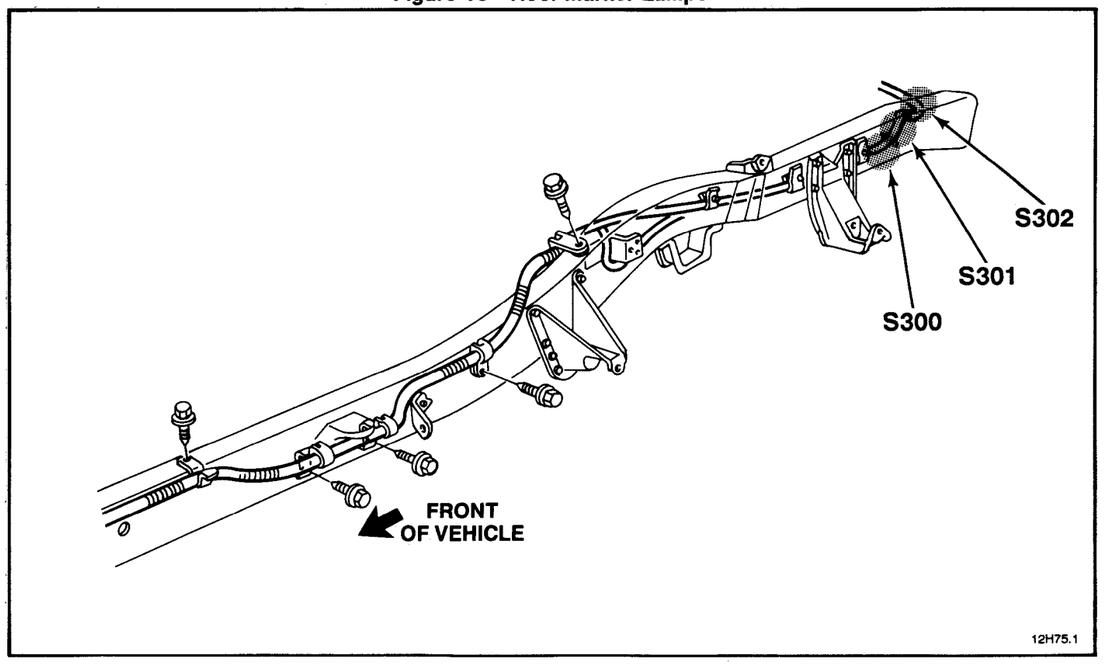


Figure 16 - Rear Lamps Extension Harness

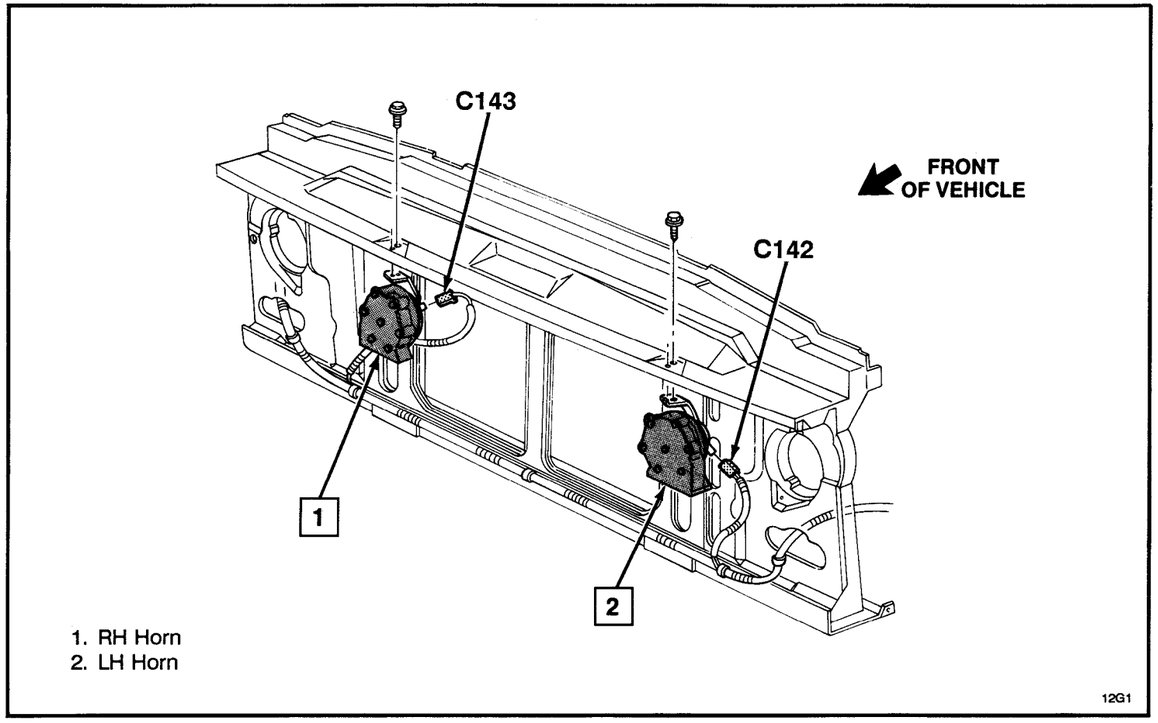


Figure 17 - Horn Assemblies

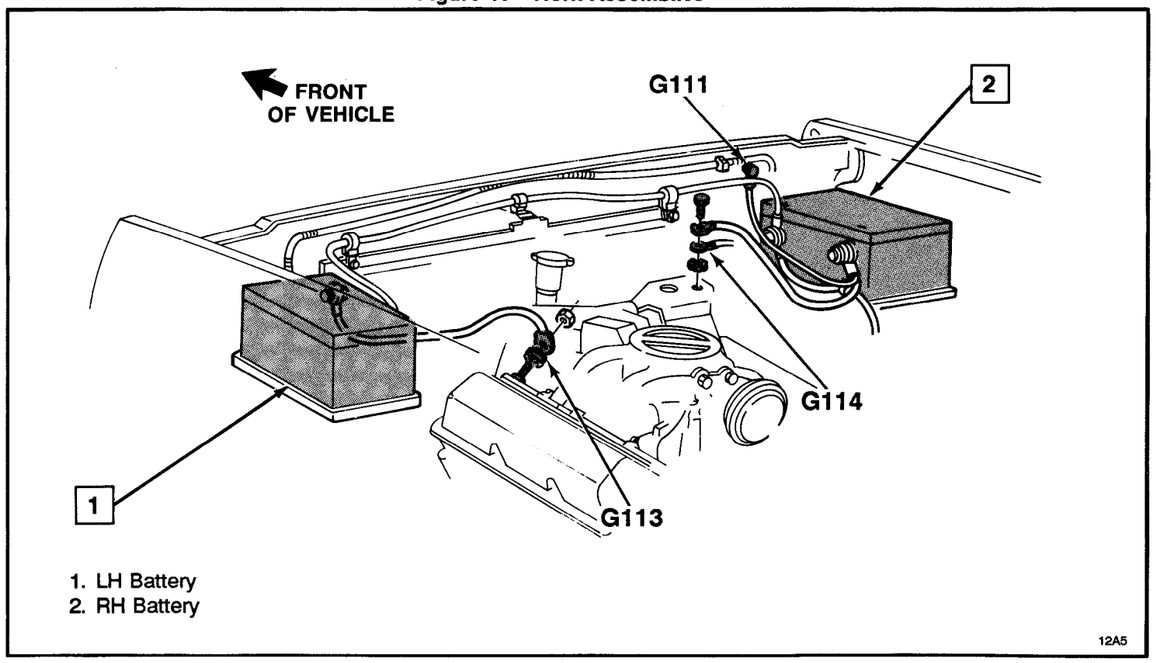
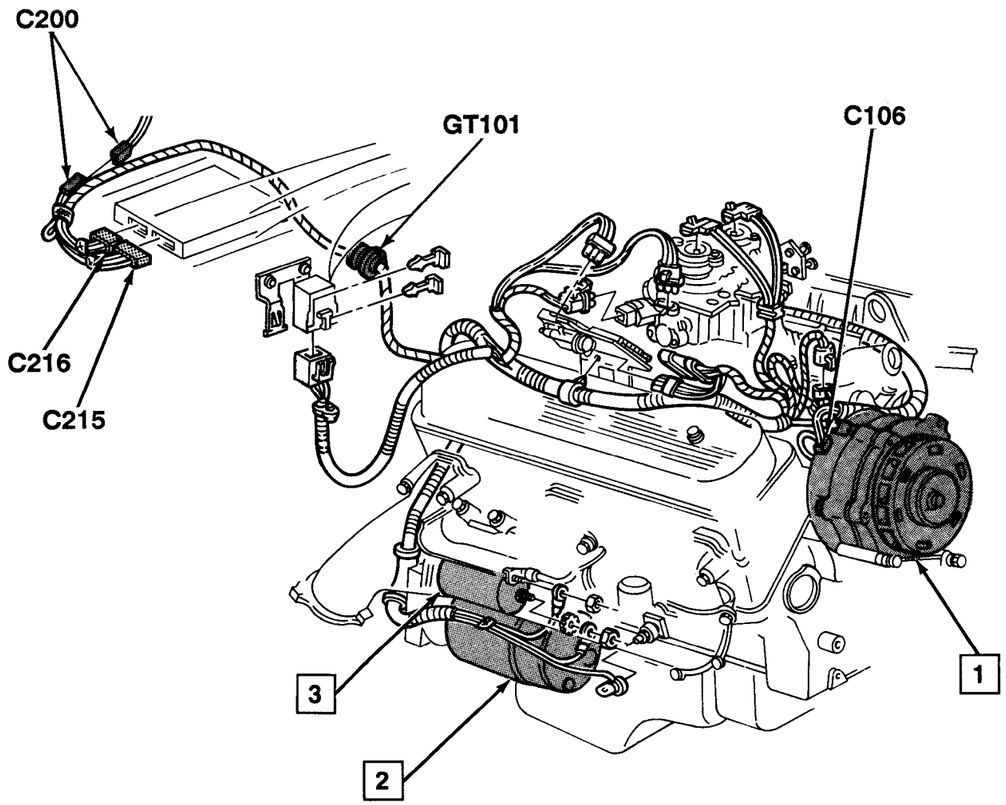


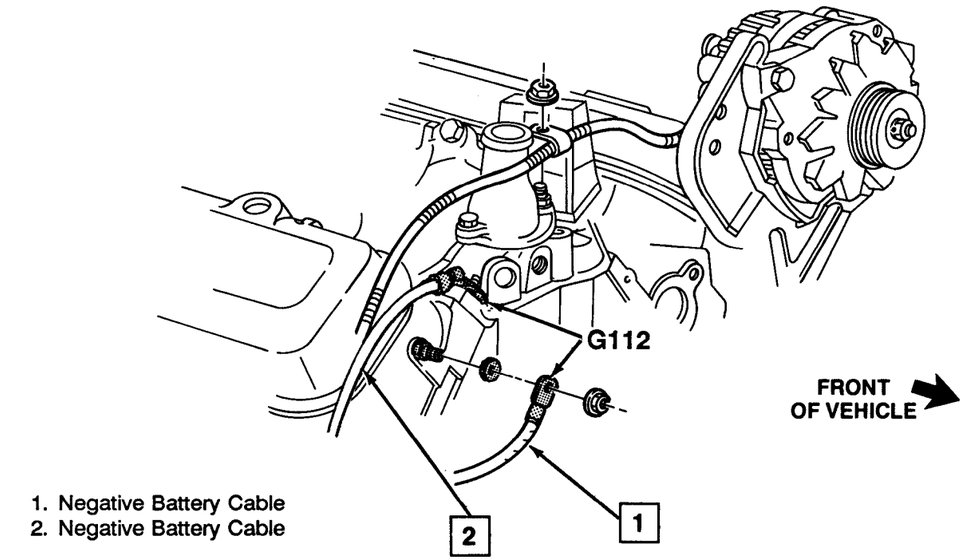
Figure 18 - Batteries - 6.2L V8 and 6.2L V8 HD Engines



1. Generator
2. Starter Motor
3. Starter Motor Solenoid

12H12

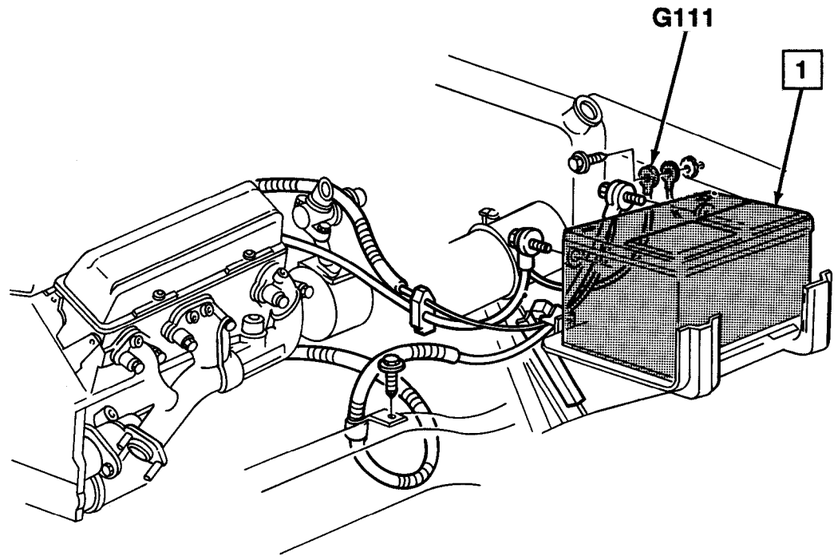
Figure 19 - Generator and Starter Motor - 5.7L and 7.4L Engines



1. Negative Battery Cable
2. Negative Battery Cable

12A2.3,3.3

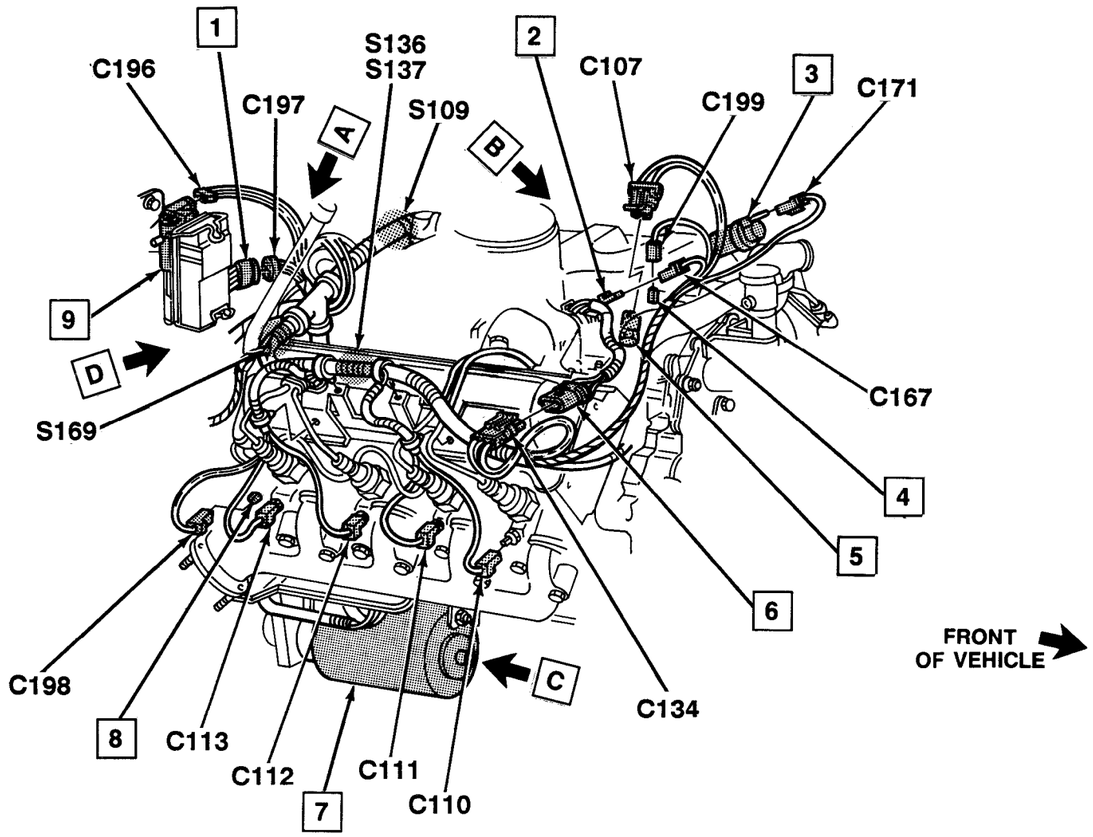
Figure 20 - Battery to Engine Ground - 5.7L and 7.4L Engines



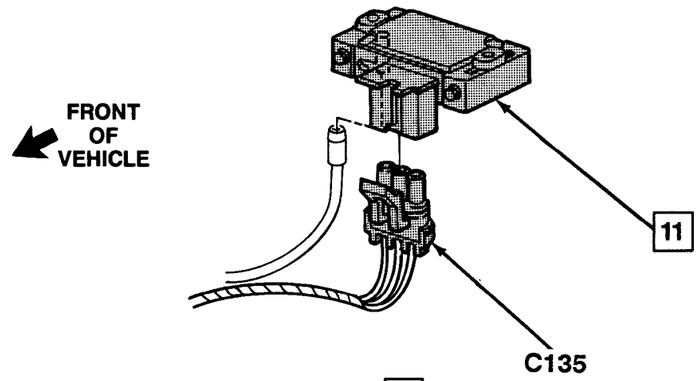
1. Battery

12A2.2,3.2

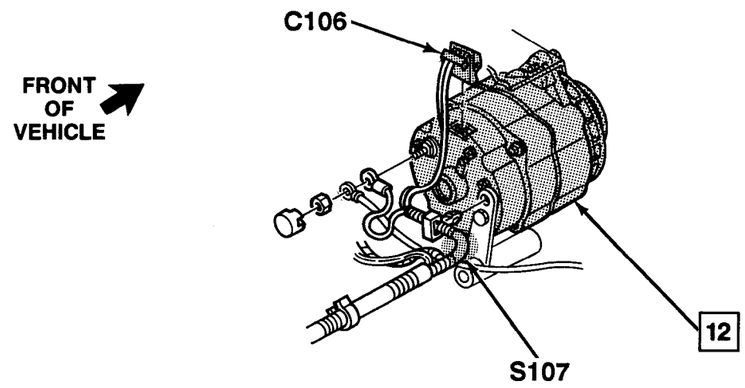
Figure 21 - Battery - 5.7L and 7.4L Engines



12H19

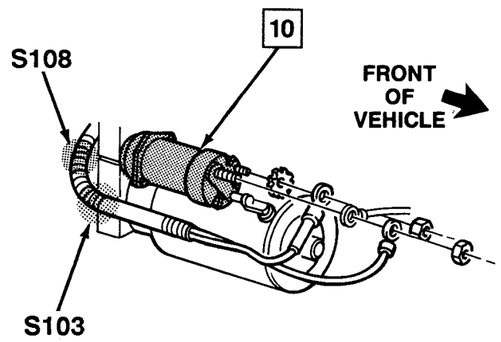


VIEW A

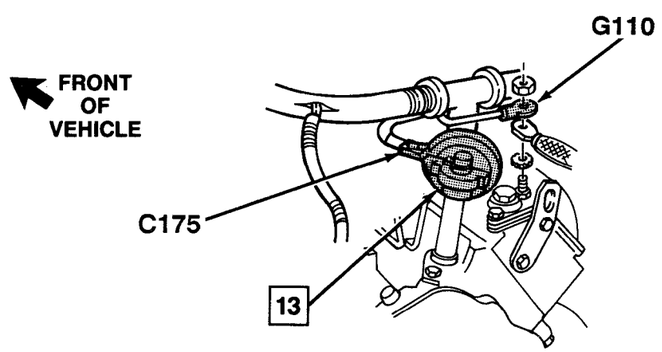


VIEW B

1. Water in Fuel Sensor
2. Cold Advance Control Solenoid
3. Fast Idle Solenoid
4. Fuel Shut Off Solenoid
5. Coolant Temperature Switch
6. Throttle Position Sensor
7. Starter Motor
8. Cold Advance/Fast Idle Temperature Switch
9. Fuel Heater
10. Starter Motor Solenoid
11. Manifold Absolute Pressure Sensor
12. Generator

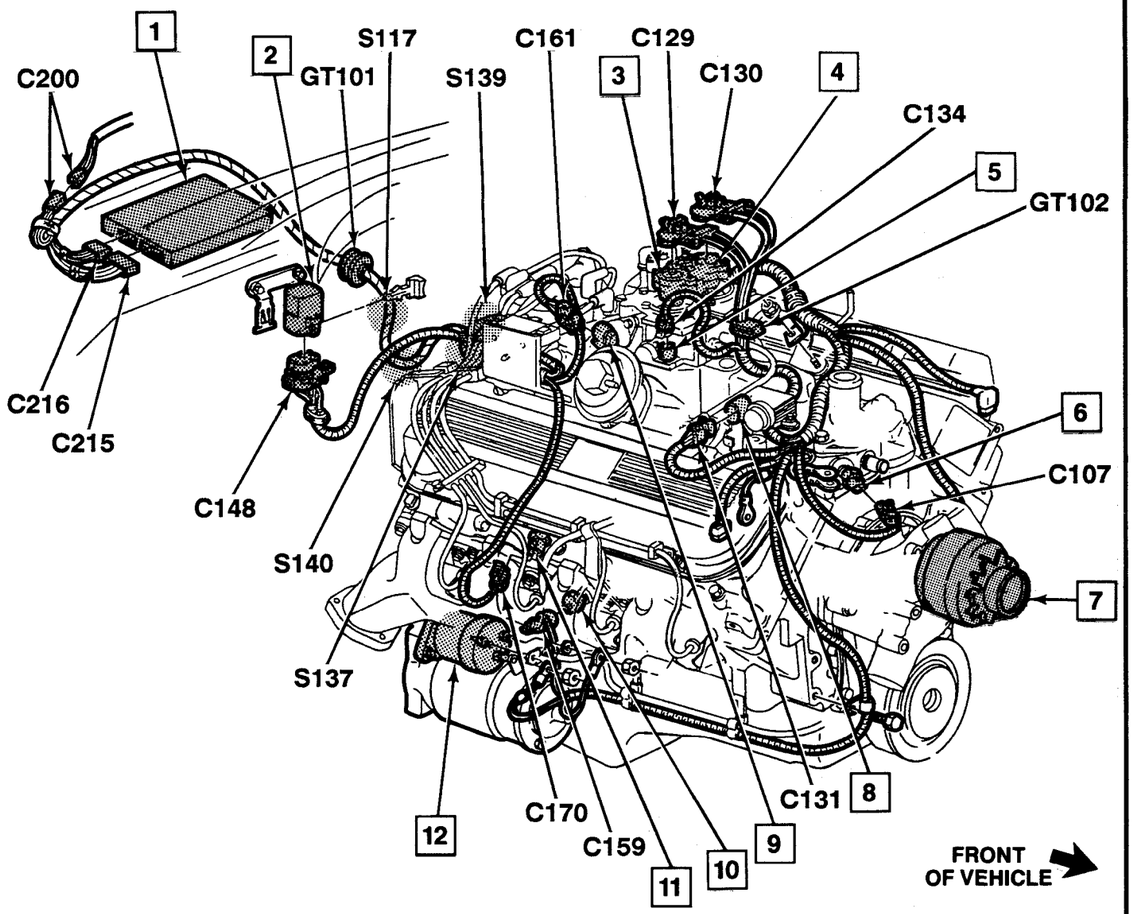


VIEW C



VIEW D

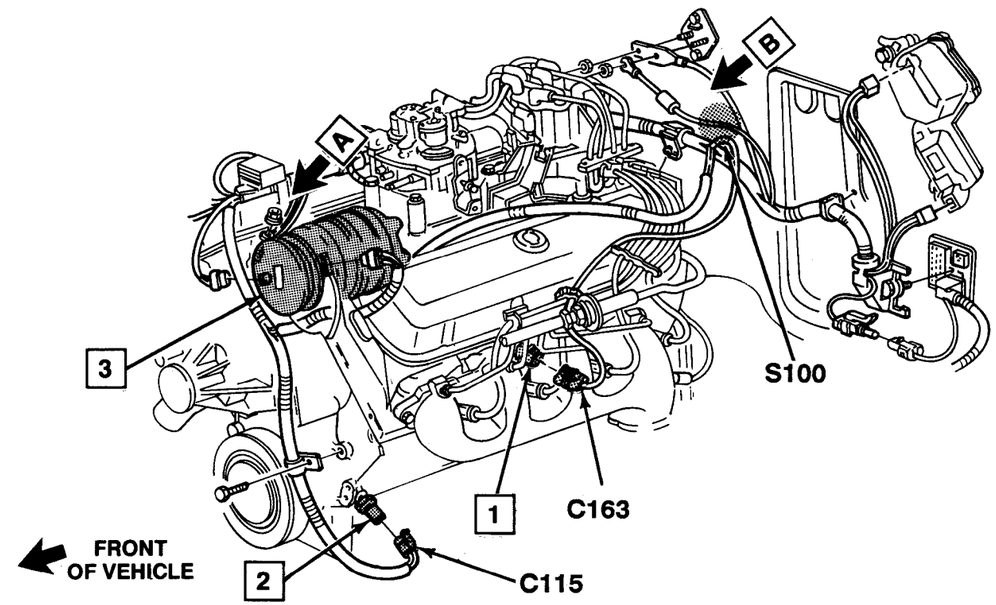
Figure 22 - Engine Wiring, Right Side - 6.2L and 6.2L HD V8 Engines

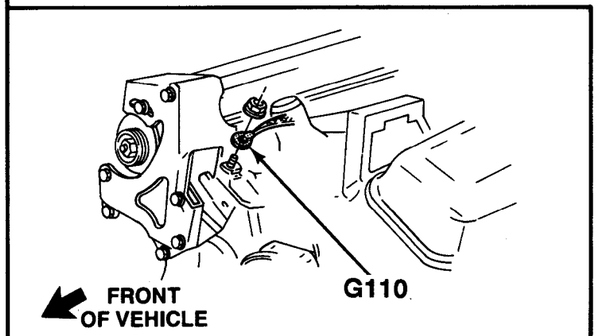


1. Electronic Control Module
2. Idle Air Control Actuator
3. Fuel Injector 2
4. Fuel Injector 1
5. Throttle Position Sensor
6. Coolant Temperature Sensor
7. Generator
8. EVRV Solenoid
9. Idle Air Control Actuator
10. Knock Sensor
11. Auxiliary Cooling Fan Temperature Switch
12. Starter Motor Solenoid

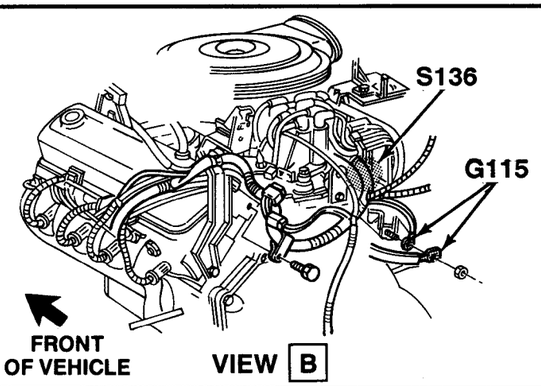
12H16.4

Figure 23 - Engine Wiring, Right Side - 7.4L Engine





VIEW A

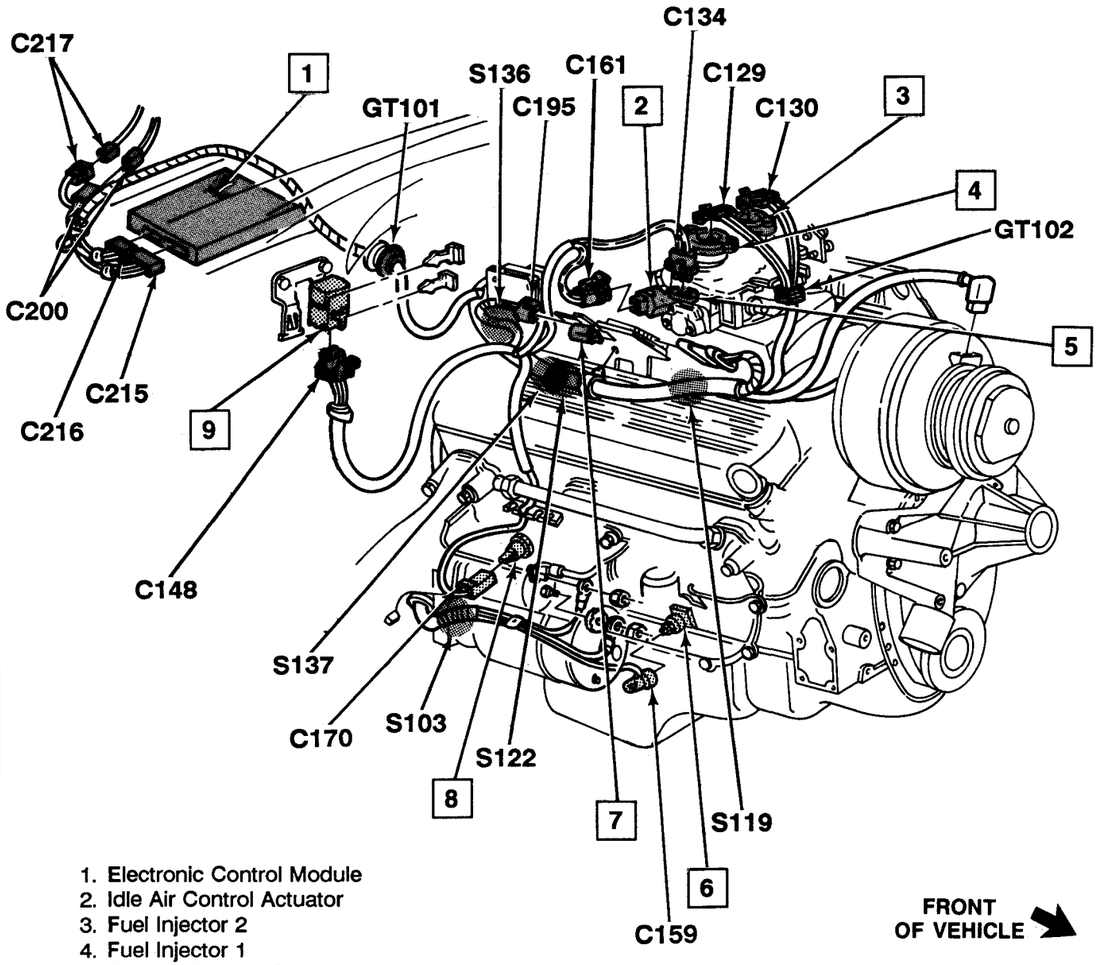


VIEW B

1. Engine Temperature Sender
2. Fuel Pump Oil Pressure Switch
3. Generator

12H15

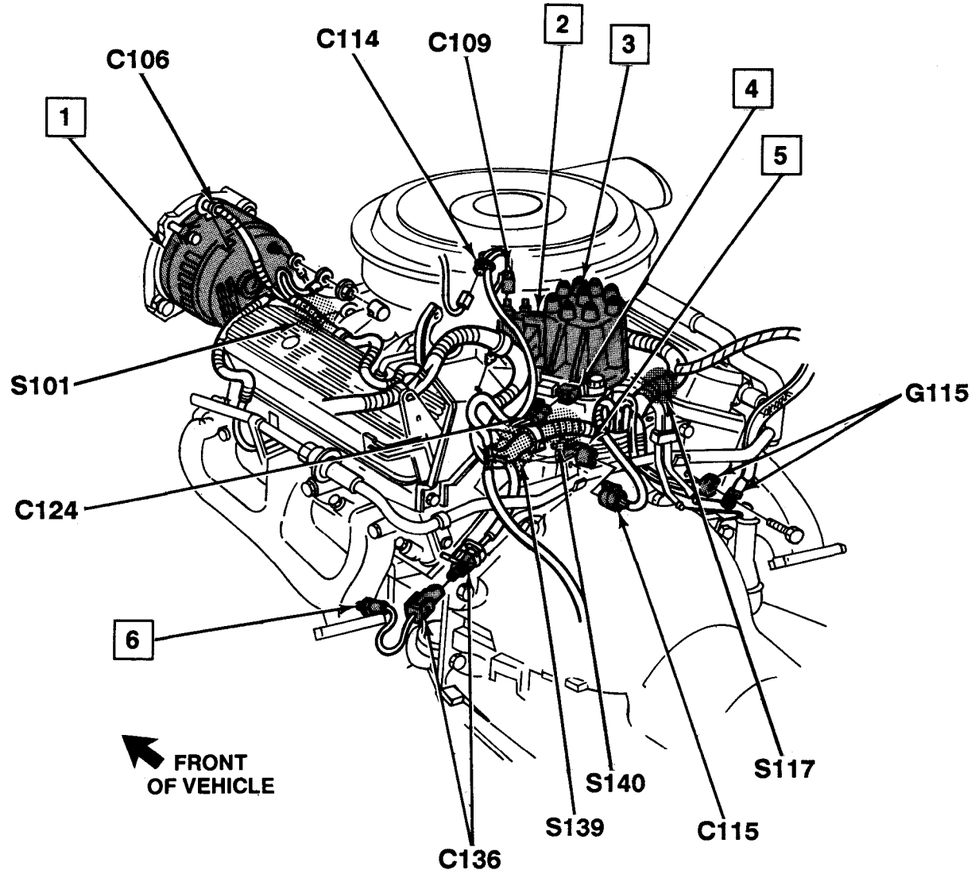
Figure 24 - Engine Wiring, Left Side - 7.4L Engine (Fleetside)



1. Electronic Control Module
2. Idle Air Control Actuator
3. Fuel Injector 2
4. Fuel Injector 1
5. Throttle Position Sensor
6. Knock Sensor
7. EGR Solenoid
8. Auxiliary Cooling Fan Temperature Switch
9. Fuel Pump Relay

12H14.2

Figure 25 - Engine Wiring, Right Side - 5.7L Engine



1. Generator
2. Coil
3. Distributor
4. Electronic Spark Timing Module
5. Fuel Pump Oil Pressure Switch
6. Oxygen Sensor

12H14

Figure 26 - Engine Wiring, Rear Left Side - 5.7L Engine (Suburban Utility)

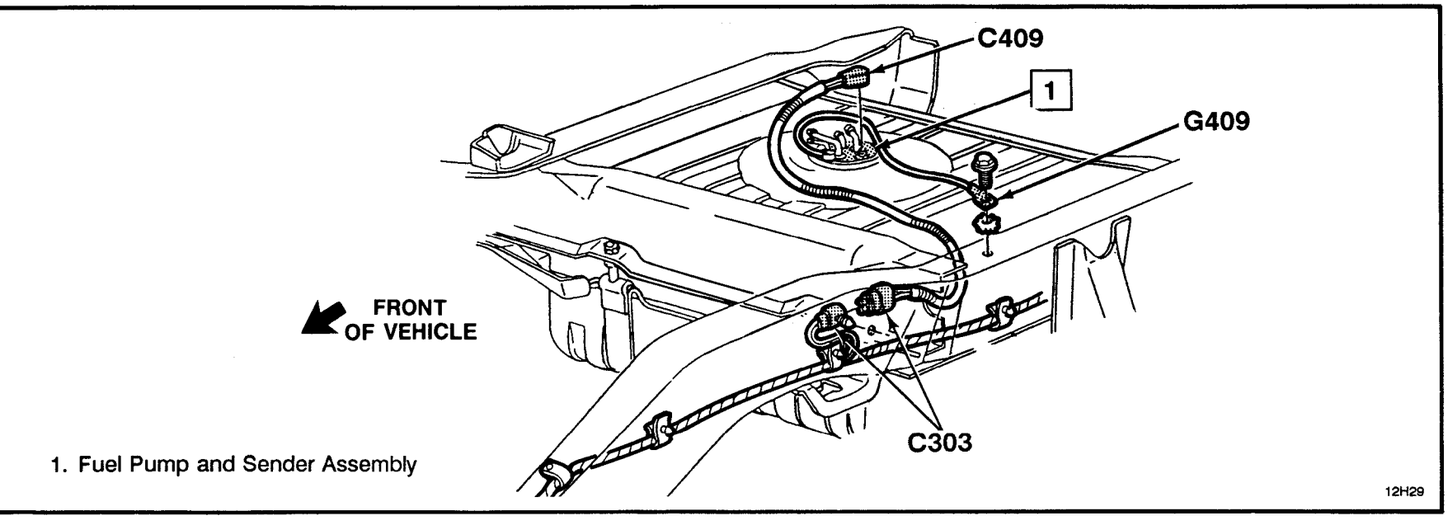


Figure 27 - Fuel Pump and Sender Assembly

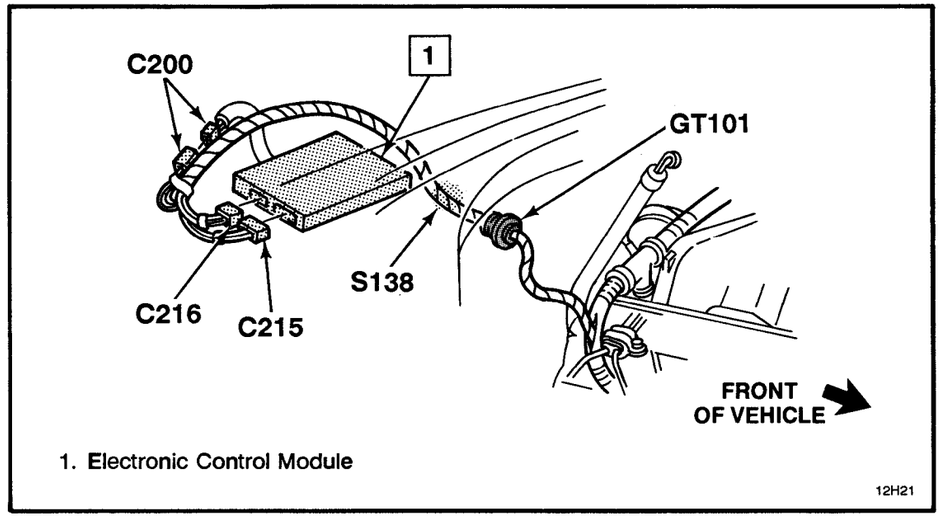


Figure 29 - Electronic Control Module - LH6

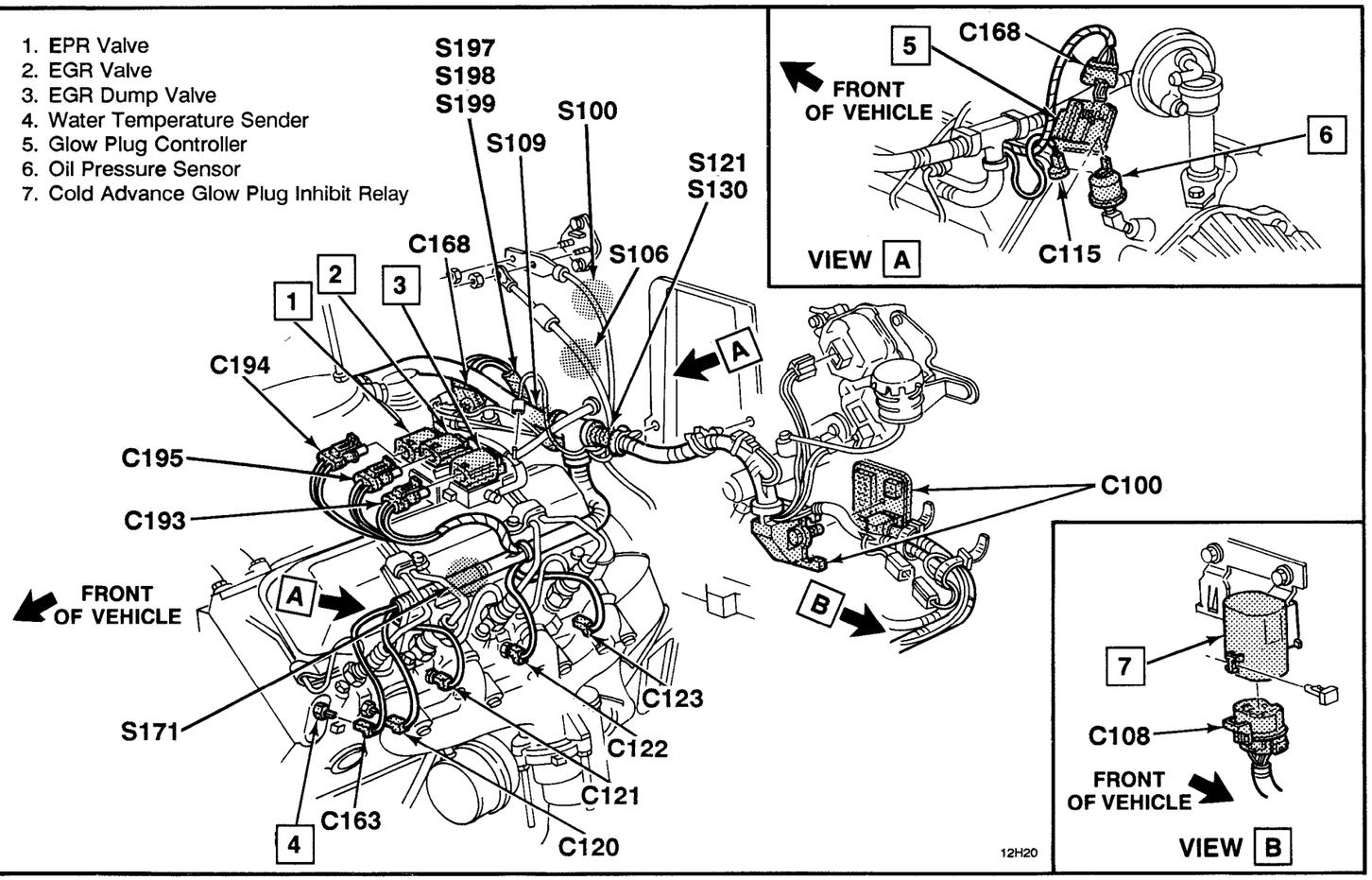


Figure 28 - Diesel Engine Harness - LH Side

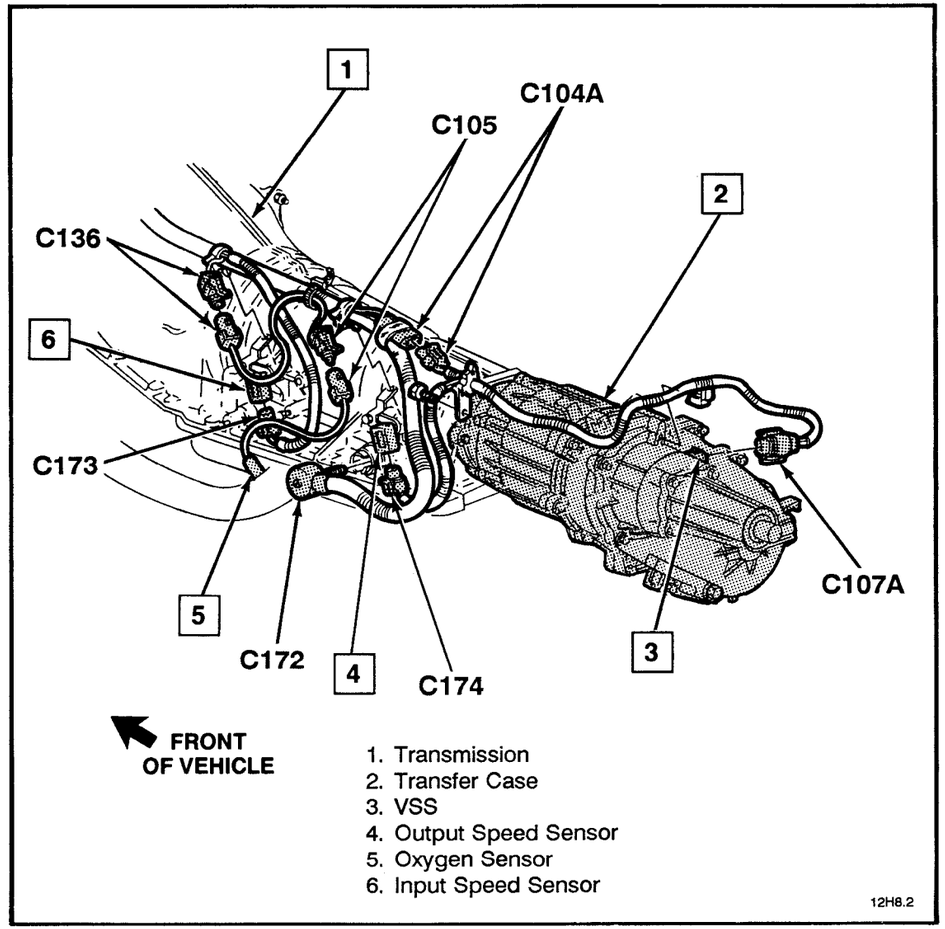
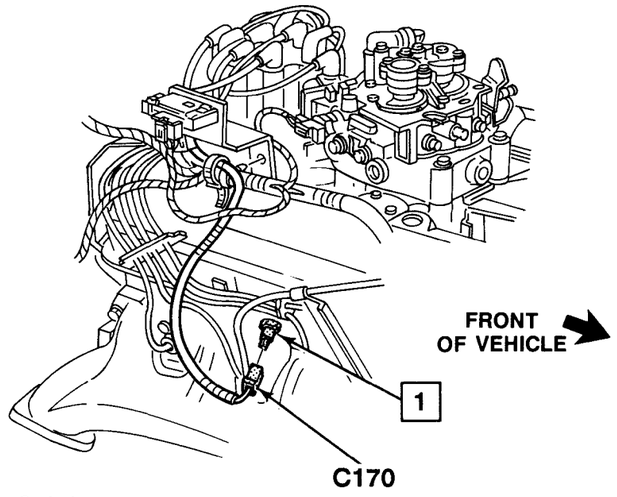


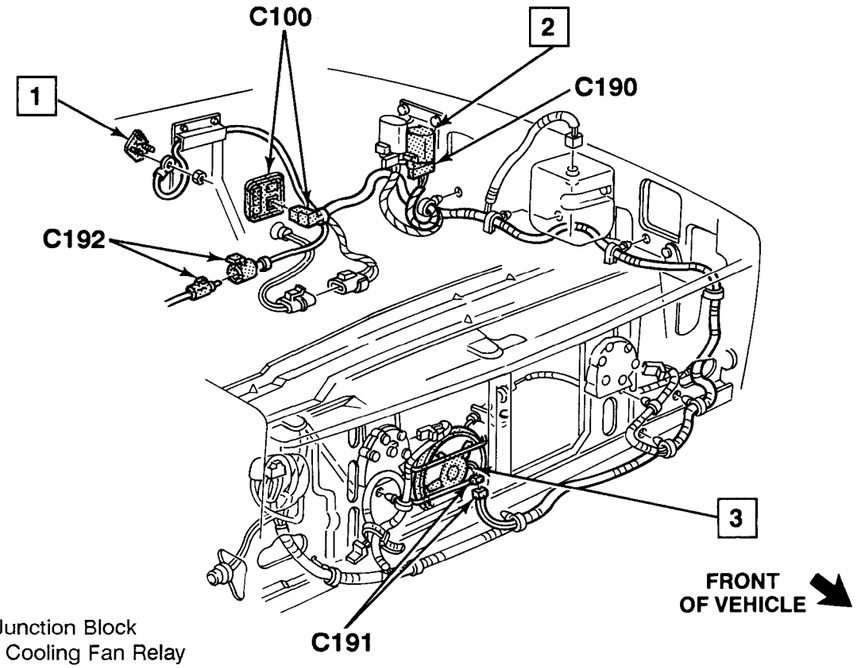
Figure 30 - MT1 Electronically Controlled Transmission



1. Auxiliary Fan Temperature Switch

12H9

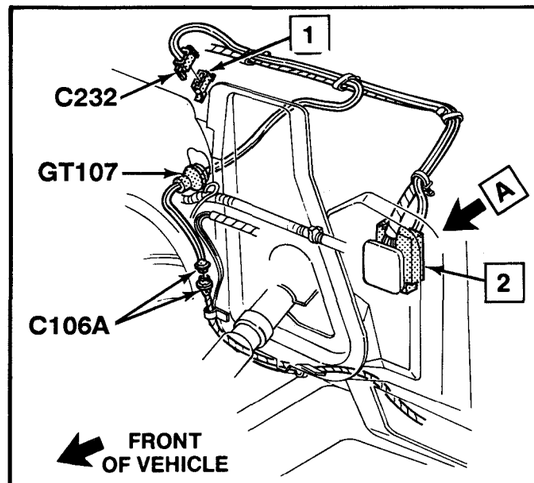
Figure 31 - Auxiliary Cooling Fan Wiring Harness

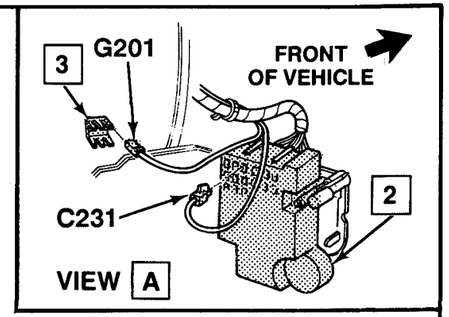


1. Battery Junction Block
2. Auxiliary Cooling Fan Relay
3. Auxiliary Cooling Fan

12H1.1

Figure 32 - Auxiliary Cooling Fan

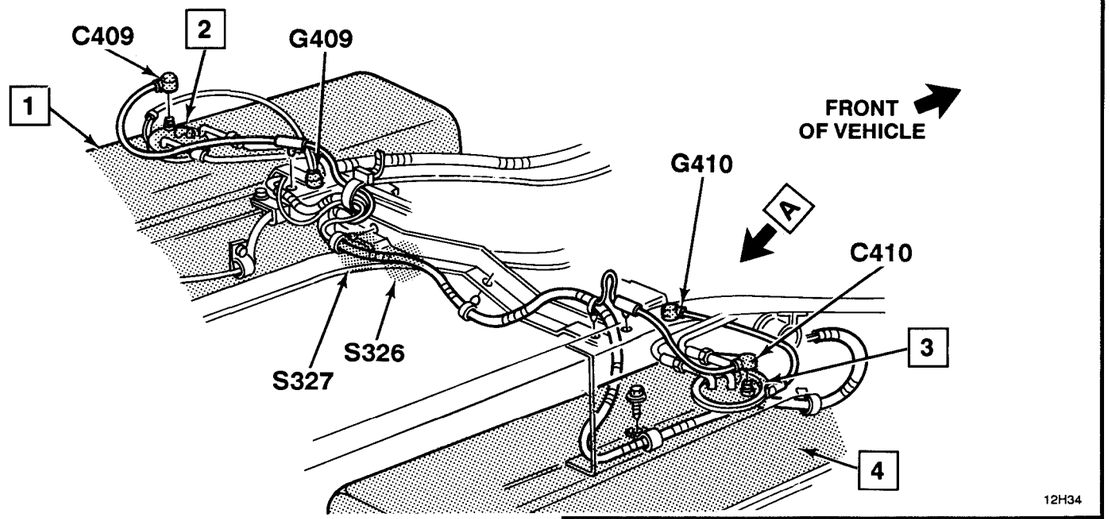


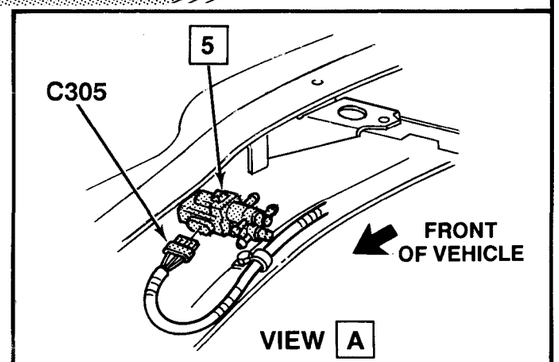


1. Auxiliary Fuel Tank Selector Switch
2. Fuse Block
3. Bus Bar Ground
4. Grommet 105

12H30

Figure 33 - Auxiliary Fuel Tank Selector Switch





1. LH Fuel Tank (Production)
2. LH Fuel Sender Assembly
3. RH Fuel Sender Assembly
4. RH Fuel Tank (Auxiliary)
5. Fuel Tank Selector Valve and Motor Switch

Figure 34 - Auxiliary Fuel Tanks - Diesel

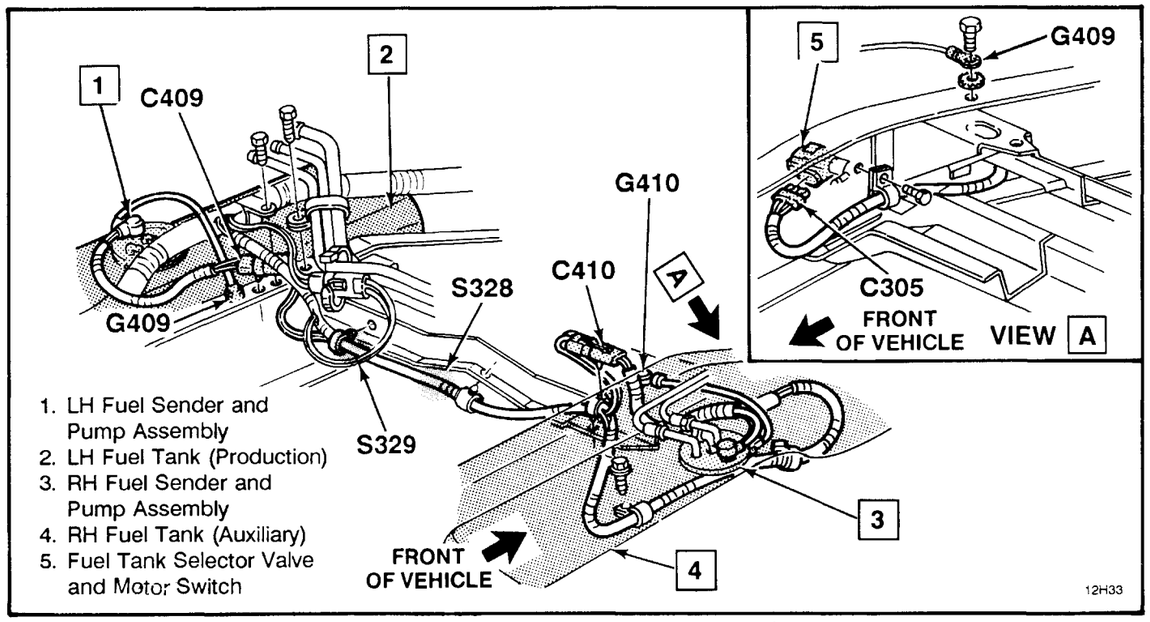


Figure 35 - Auxiliary Fuel Tanks - Gasoline

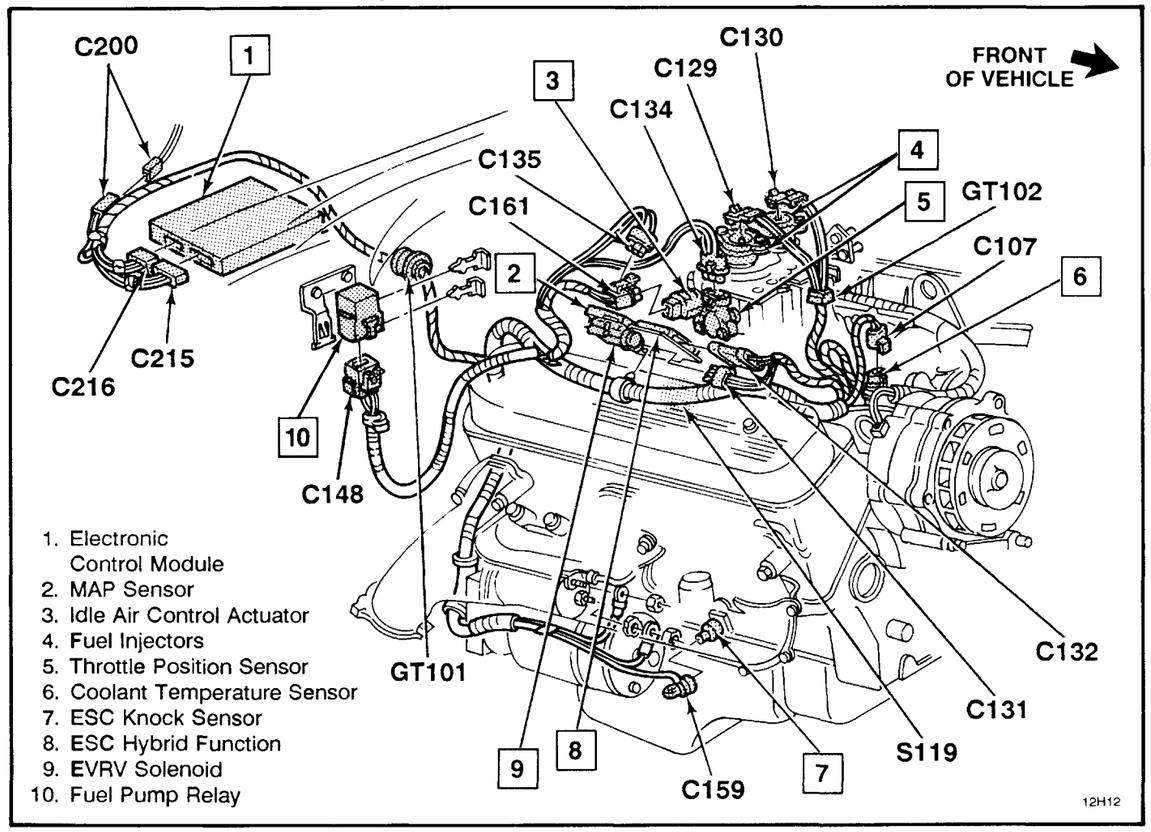


Figure 36 - Electronic Engine Controls, RH Side - 5.7L Engine

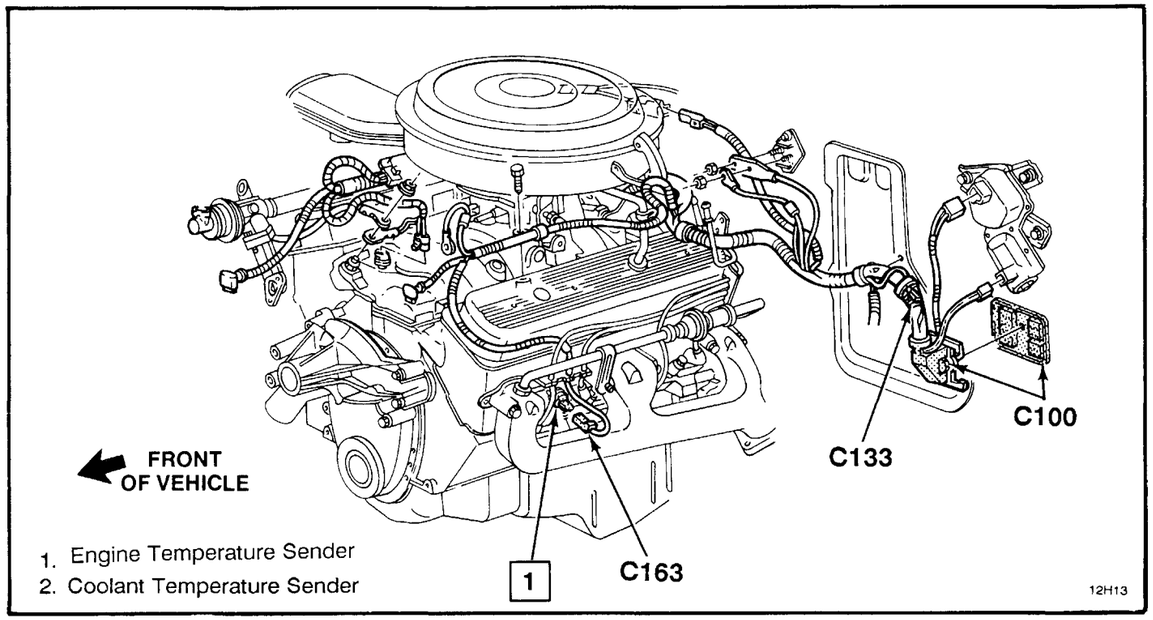


Figure 37 - Electronic Engine Controls, RH Side - 5.7L Engine

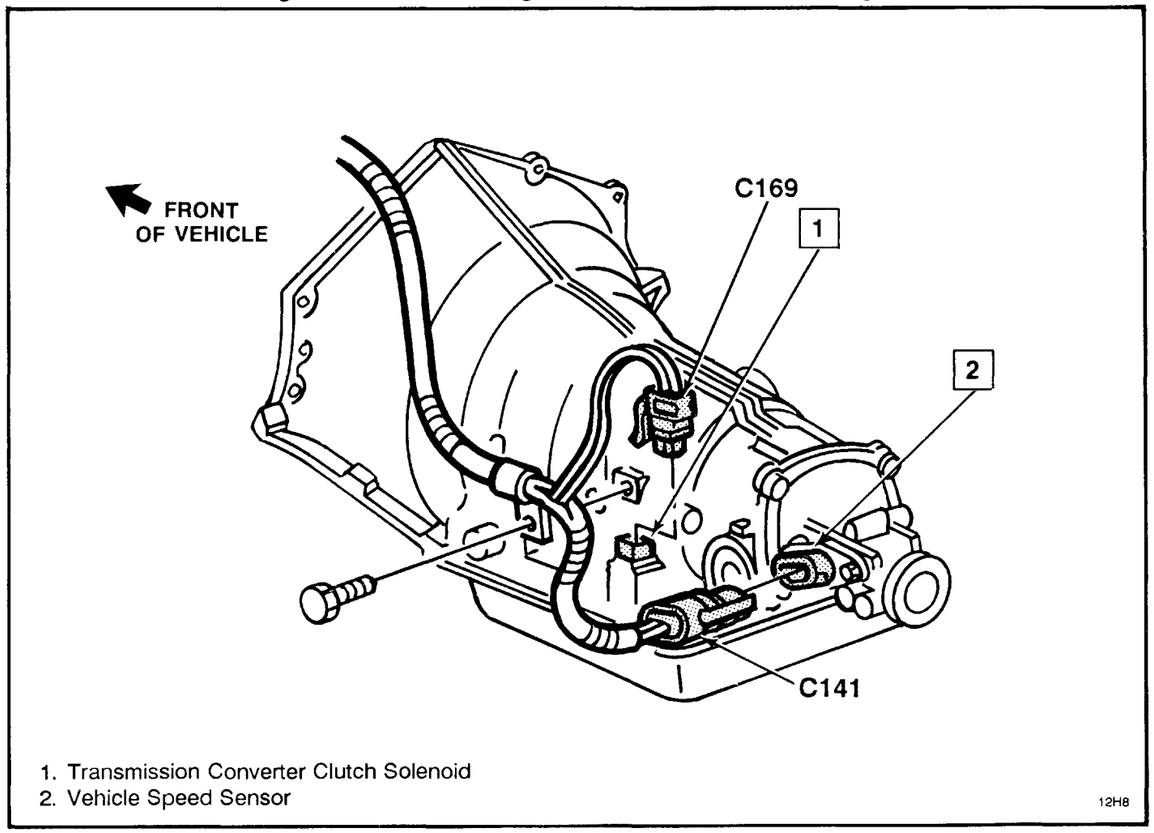
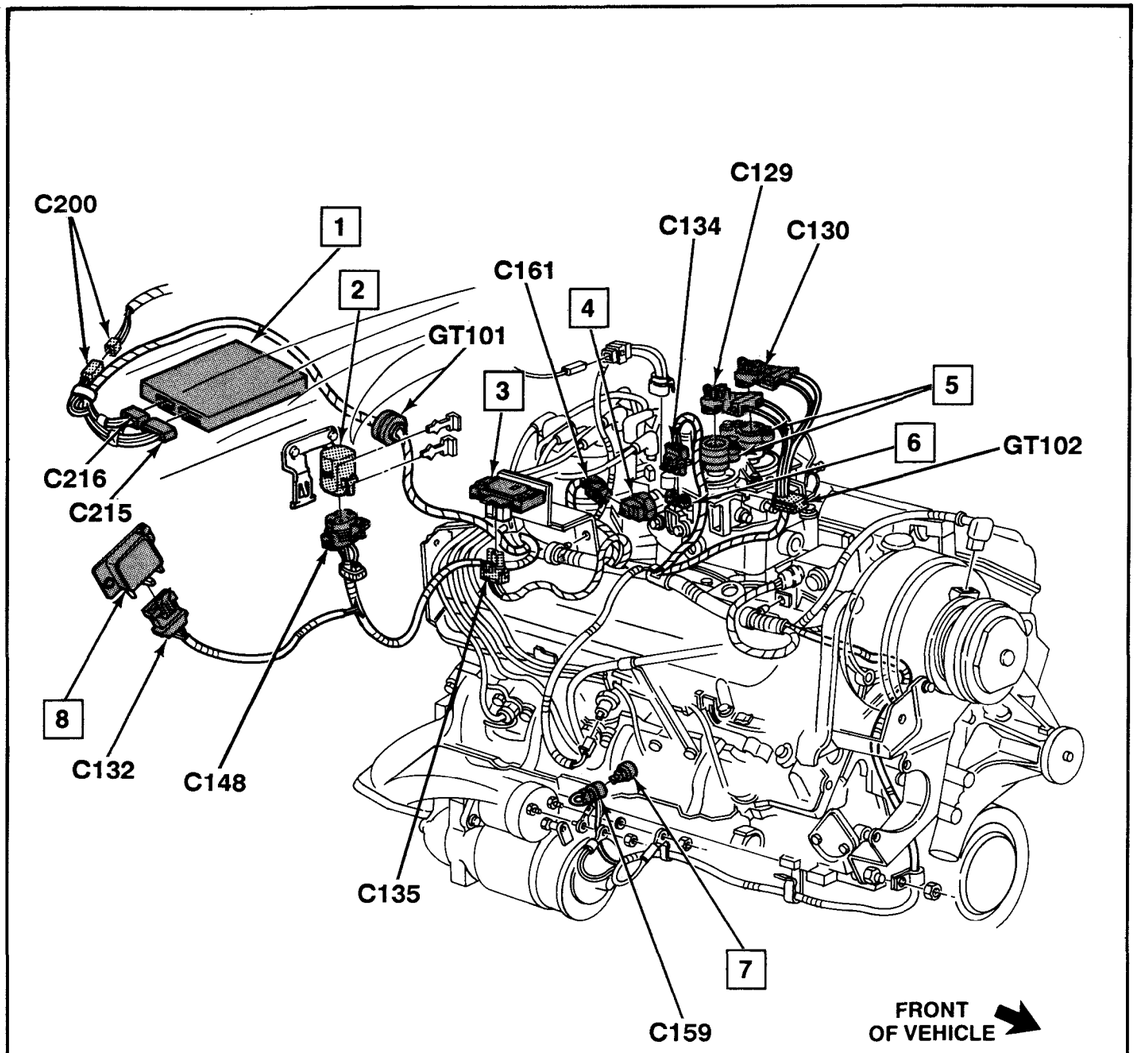


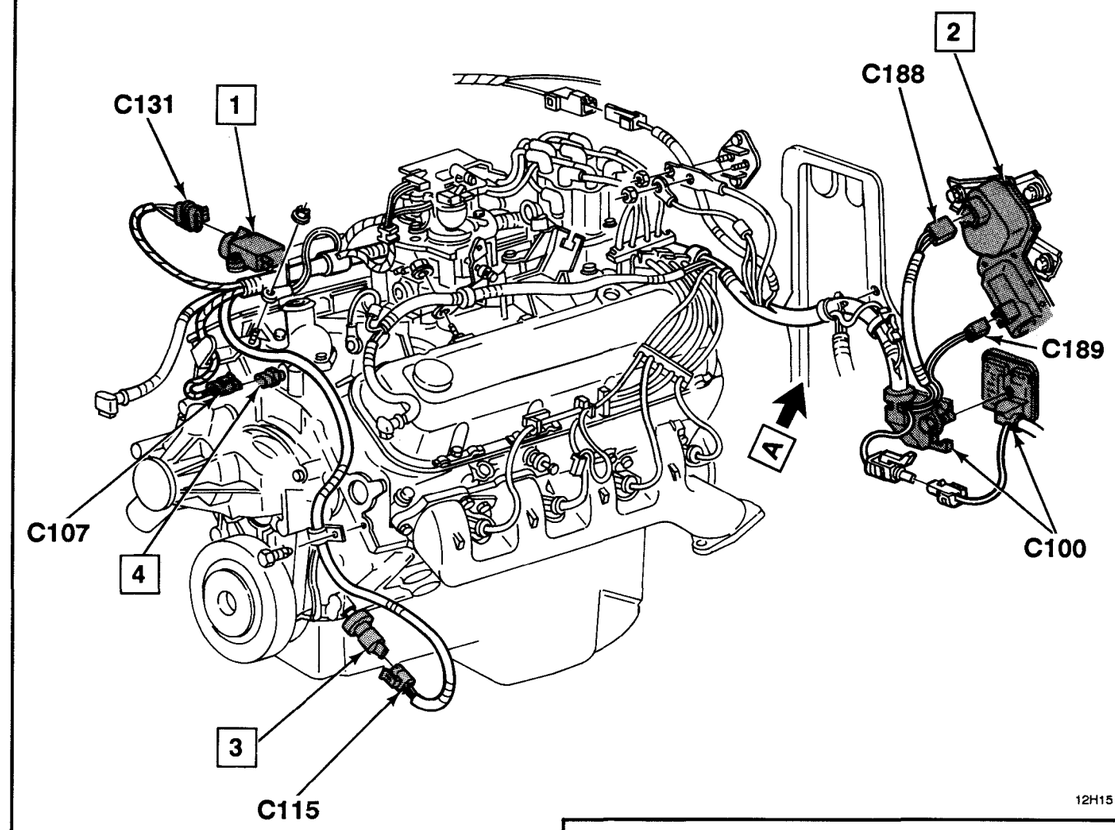
Figure 38 - Automatic 4-Speed Transmission Wiring



1. Electronic Control Module
2. Fuel Pump Relay
3. Manifold Absolute Pressure Sensor
4. Idle Air Control Actuator
5. Fuel Injectors
6. Throttle Position Sensor
7. ESC Knock Sensor
8. ESC Hybrid Function

12H14.2

Figure 39 - Electronic Engine Controls, RH Side - 7.4L Engine



12H15

1. EVRV Solenoid
2. Windshield Wiper Motor
3. Fuel Pump Oil Pressure Switch
4. Coolant Temperature Sensor
5. Rear Wheel Antilock Controller Module
6. Brake Pressure Warning Switch

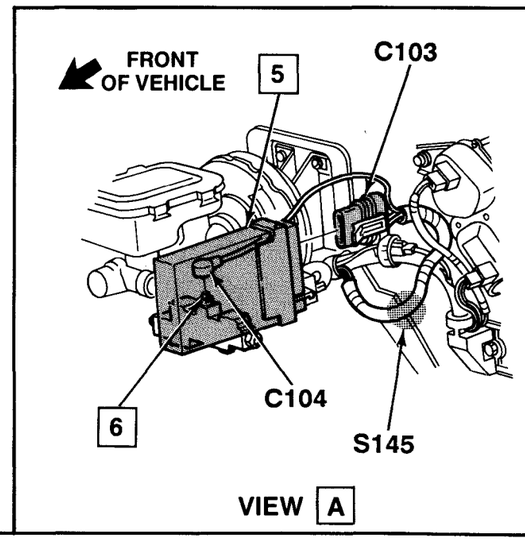
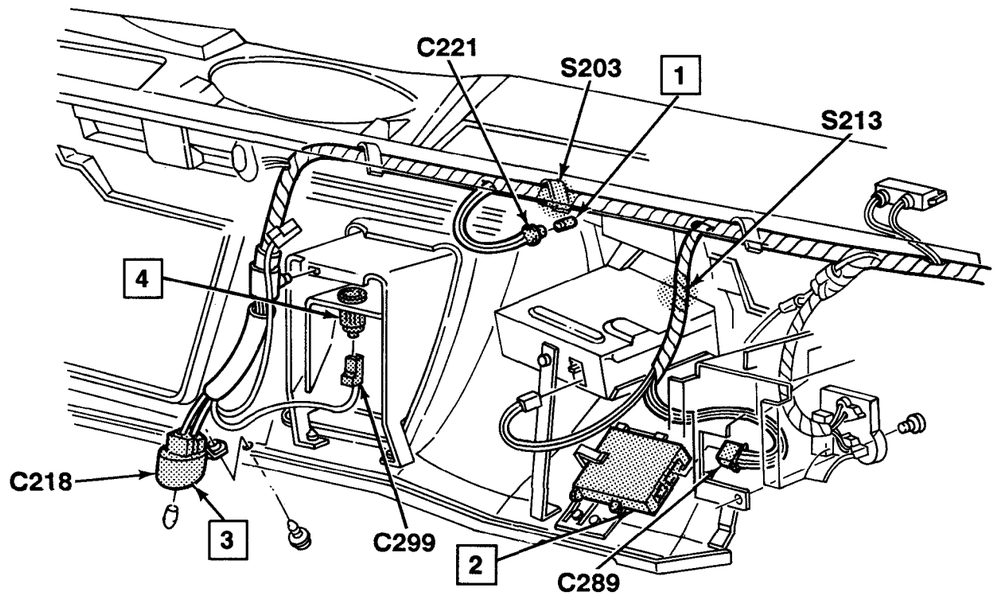


Figure 40 - Electronic Engine Controls, LH Side - 7.4L



1. Heater A/C Control Assembly Lamp
2. Digital Ratio Adapter Controller Module
3. Courtesy Lamp
4. Cigarette Lighter

12H37

Figure 41 - Digital Ratio Adapter Controller Module

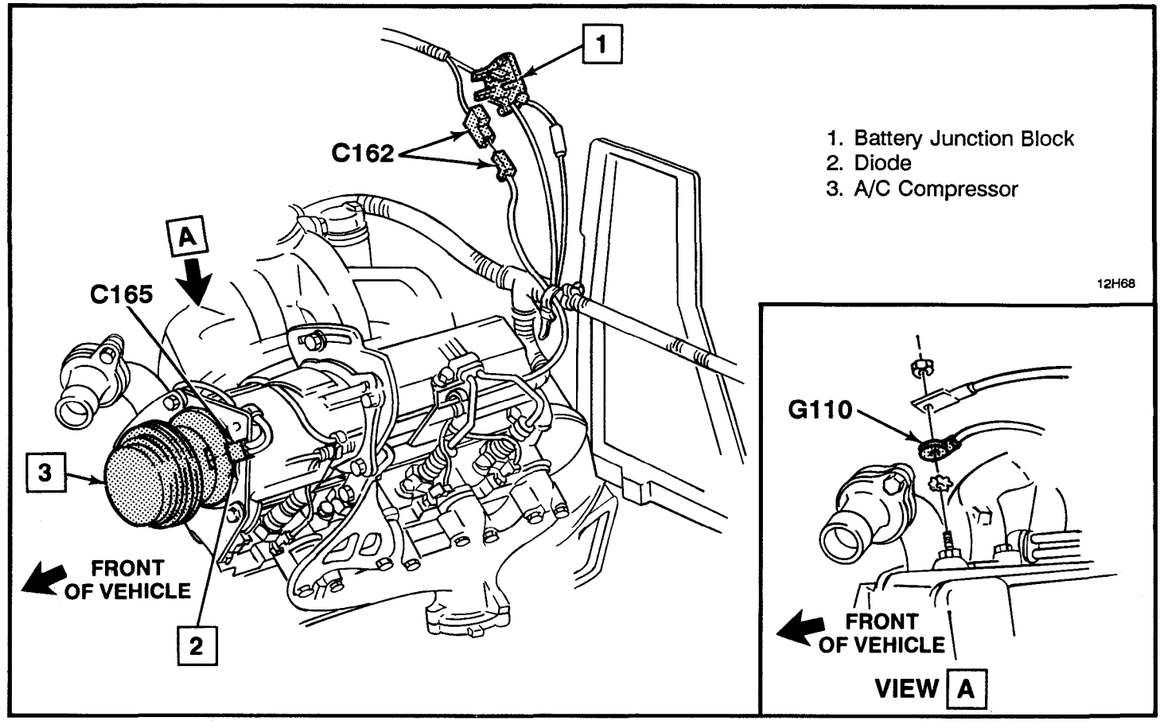


Figure 42 - A/C Compressor

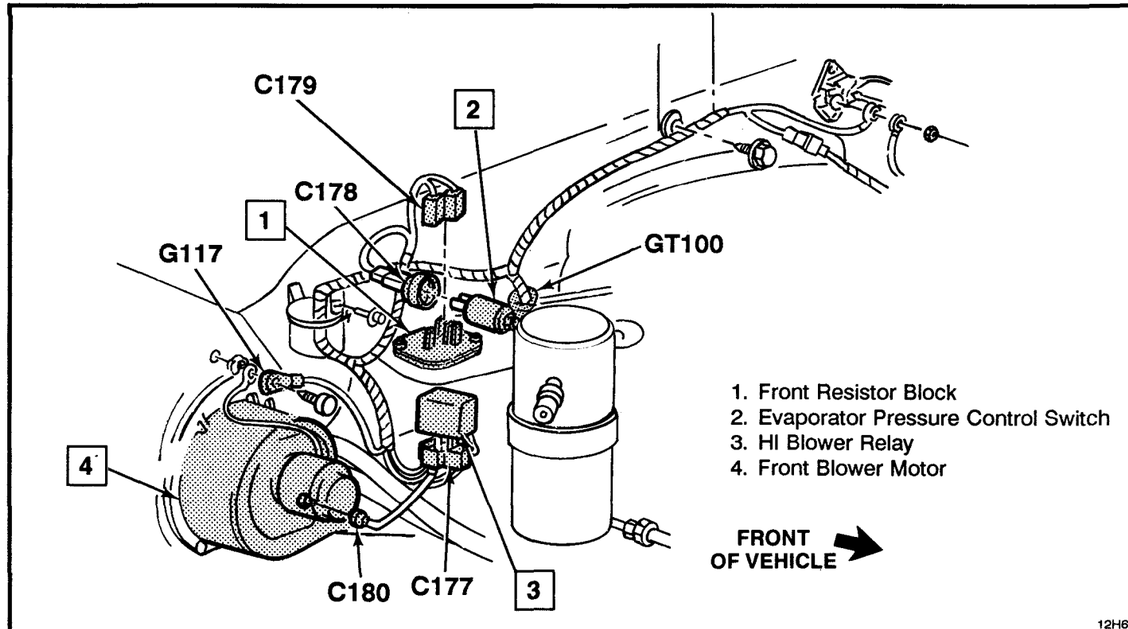
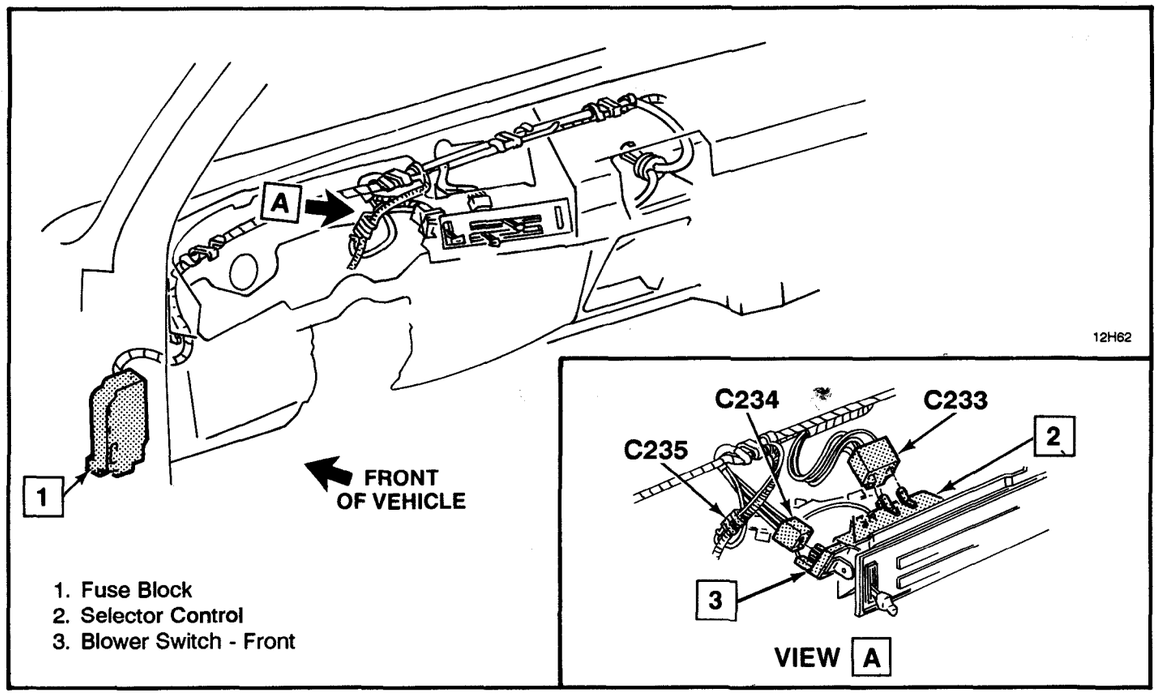
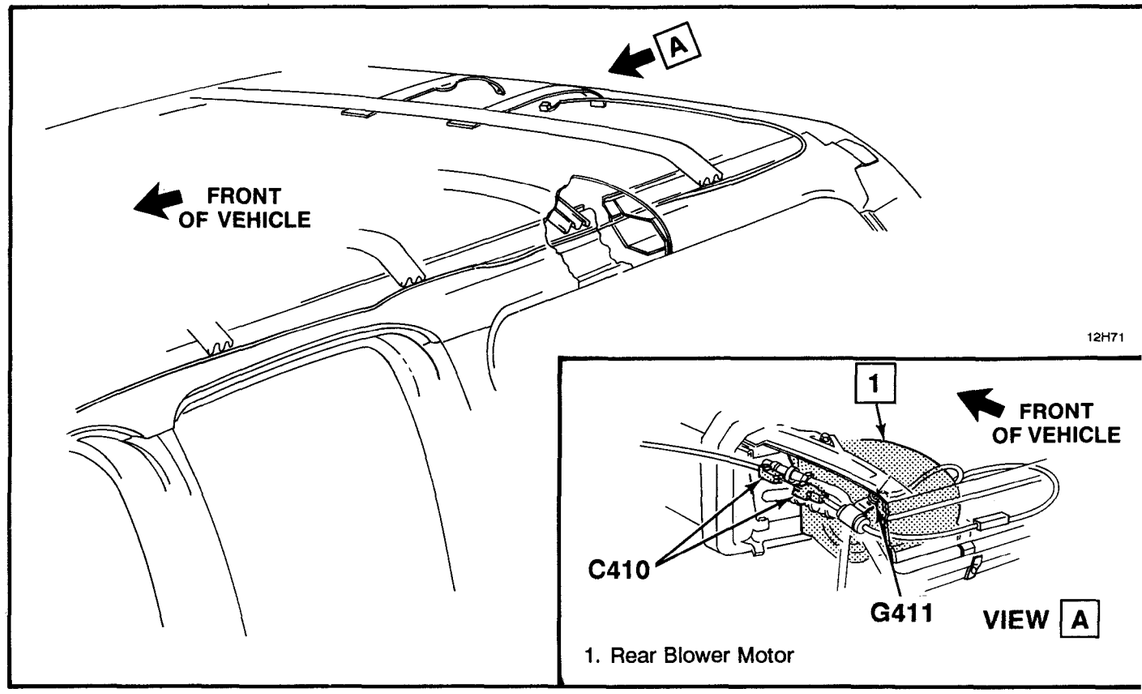


Figure 43 - A/C System Wiring



1. Fuse Block
2. Selector Control
3. Blower Switch - Front

Figure 44 - A/C and Heater Control Wiring - Front



1. Rear Blower Motor

Figure 46 - Rear A/C Blower Motor

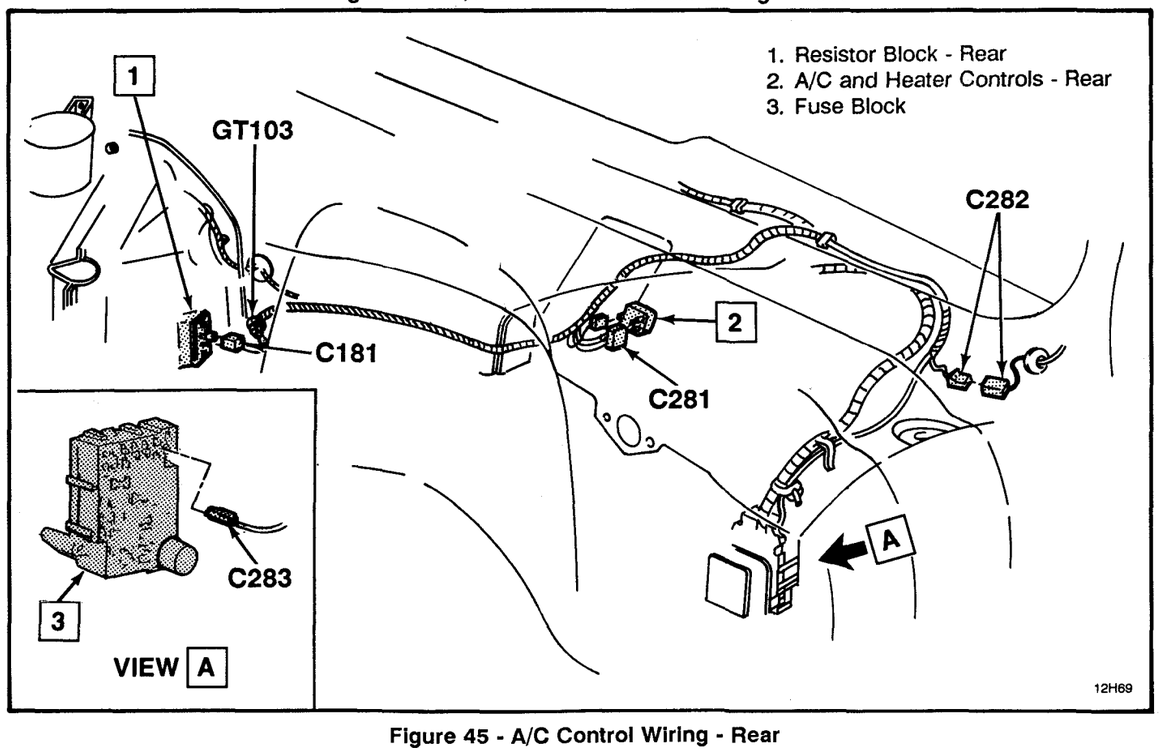


Figure 45 - A/C Control Wiring - Rear

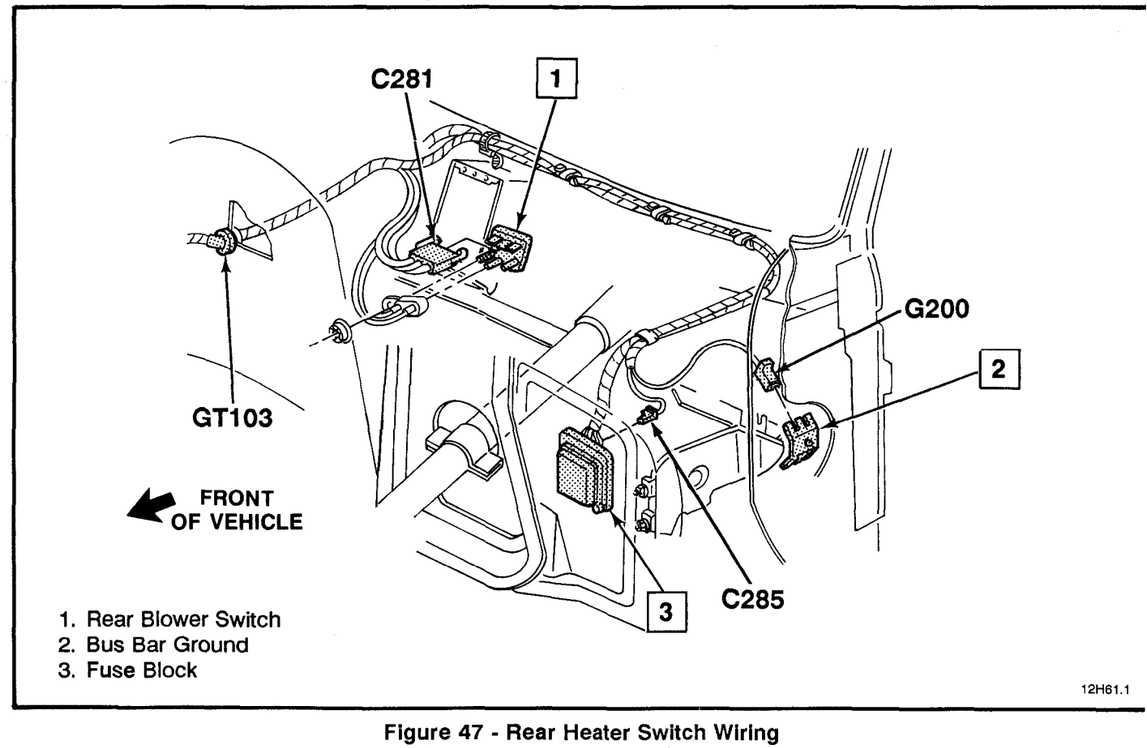


Figure 47 - Rear Heater Switch Wiring

A-180 COMPONENT LOCATOR VIEWS

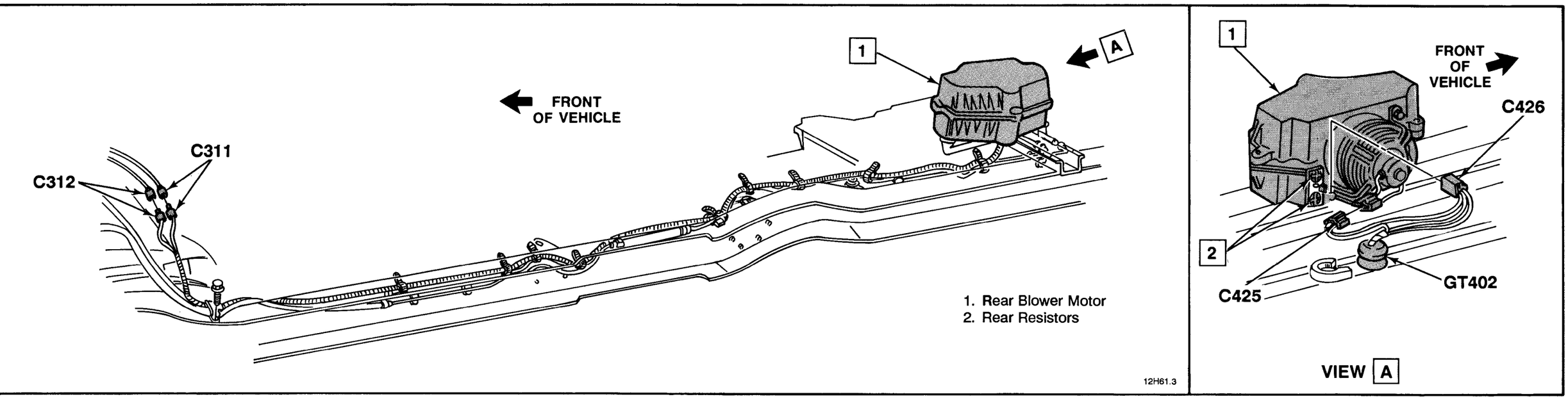


Figure 48 - Rear Heater Blower Wiring

1. Glow Plugs Wait Lamp
2. Water in Fuel Indicator
3. Check Engine Lamp Driver Module
4. Low Coolant Warning Module
5. Instrument Center

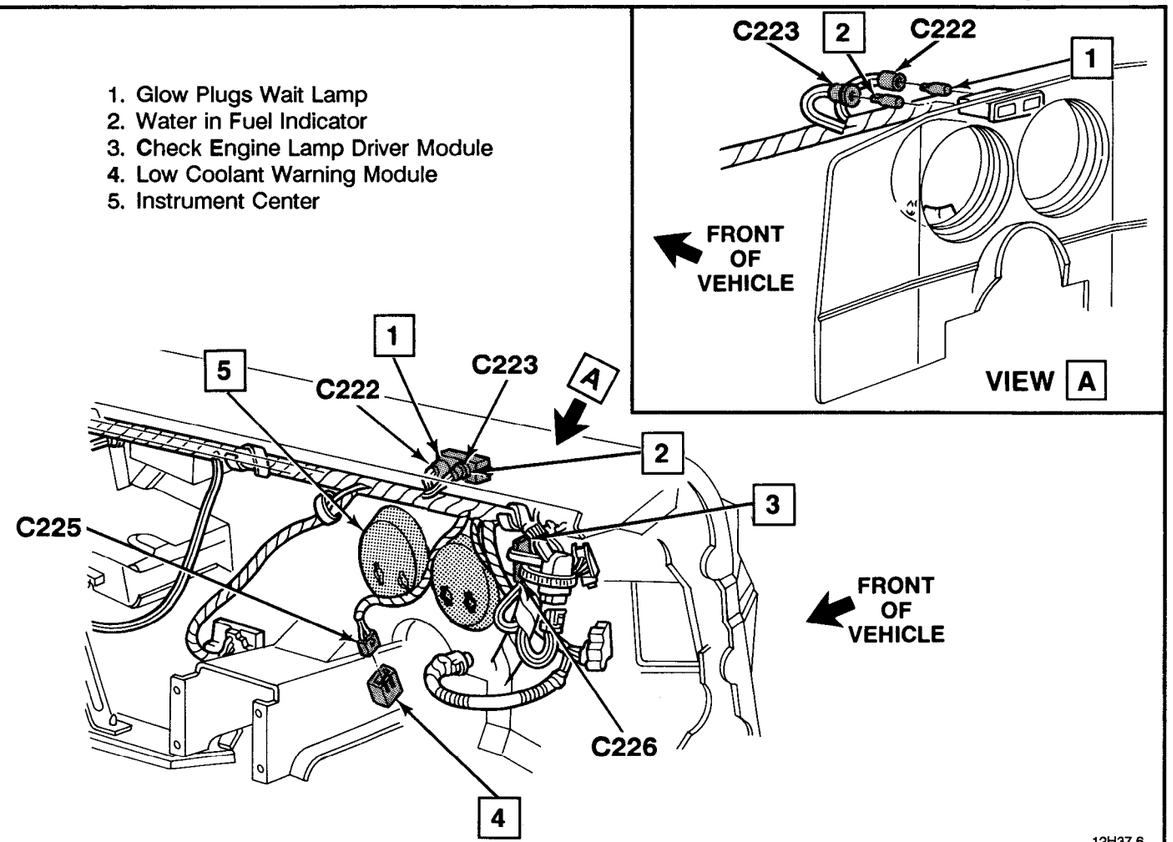
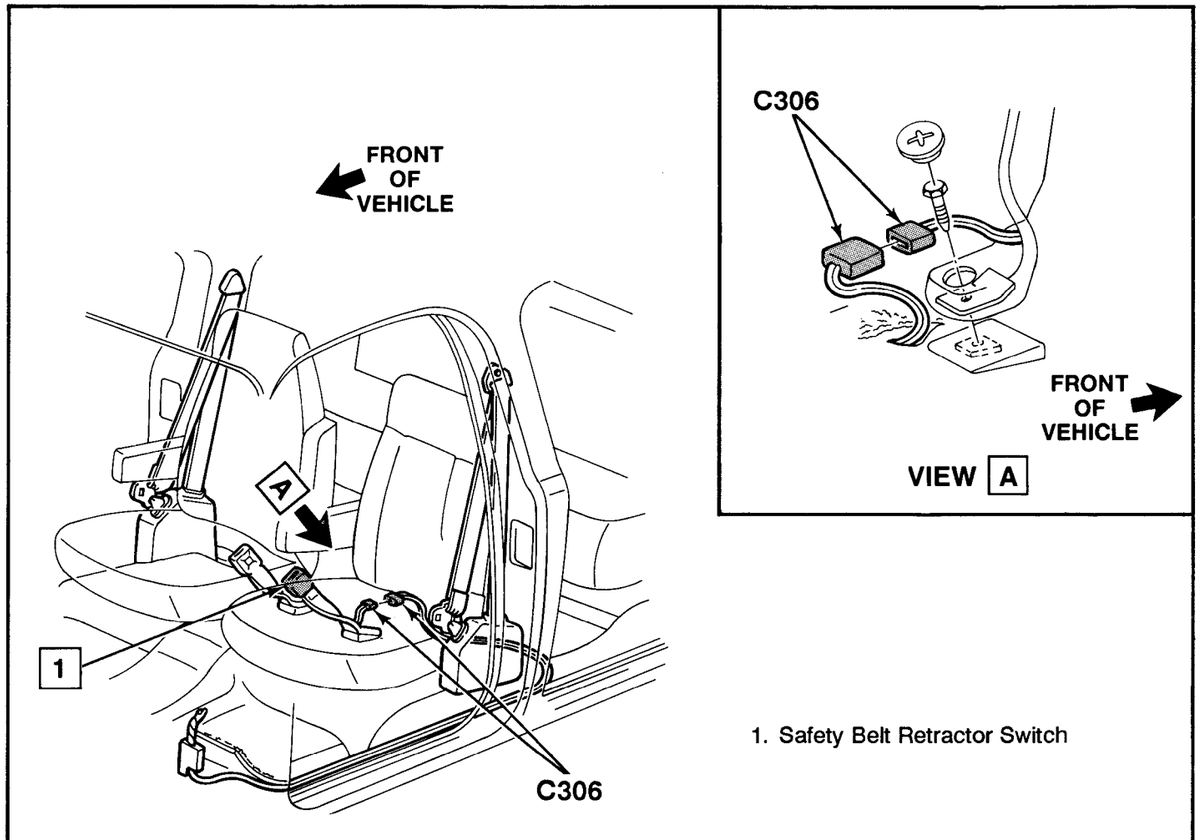


Figure 49 - I/P Wiring - 6.2L V8 and 6.2L V8 HD Engine



1. Safety Belt Retractor Switch

Figure 50 - Safety Belt Retractor Switch Wiring

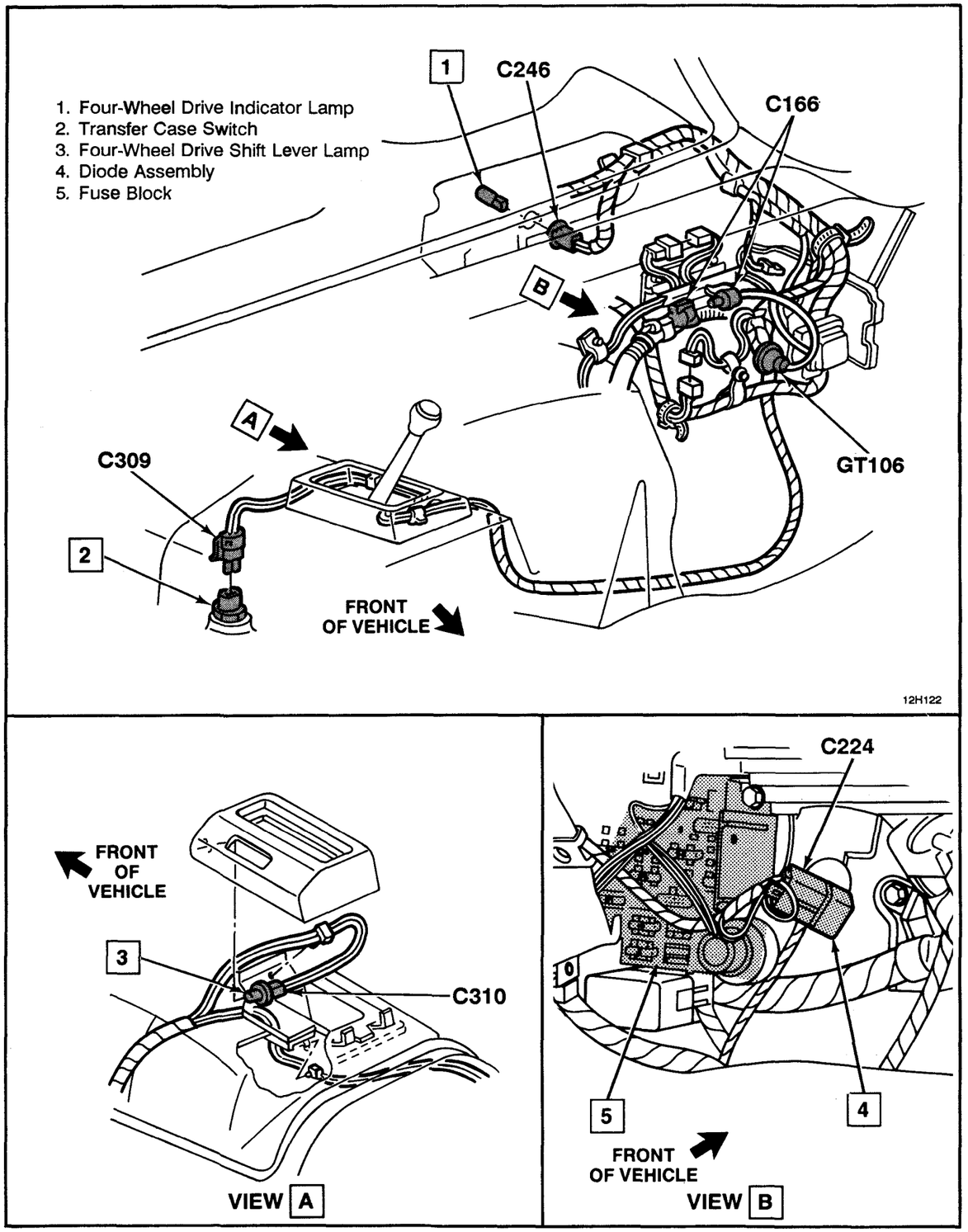


Figure 51 - Transfer Case Wiring - V100, V200

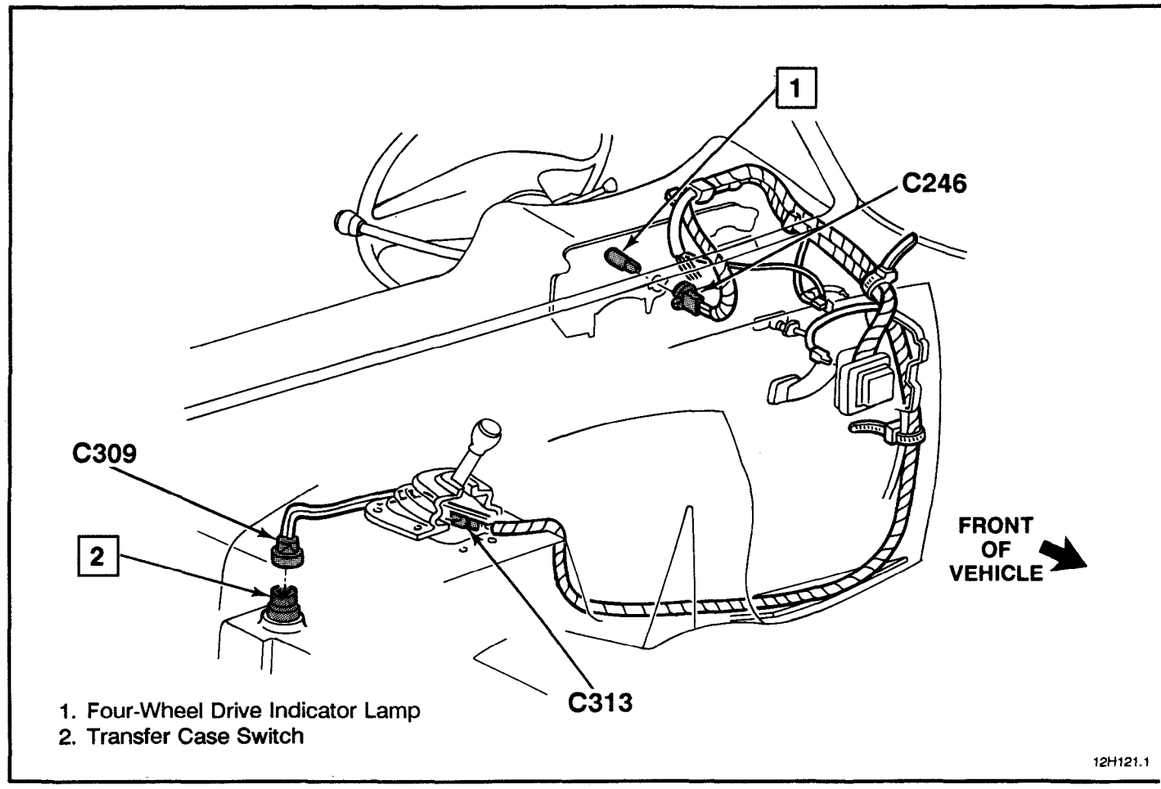


Figure 52 - Transfer Case Wiring - V300

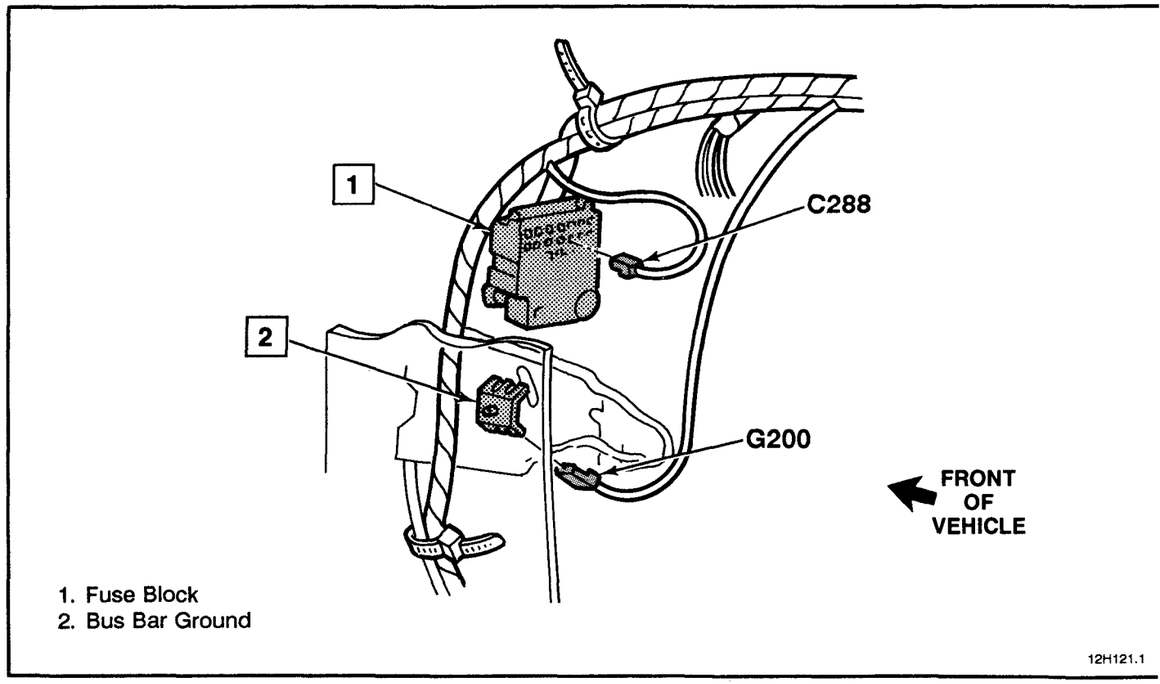


Figure 53 - Transfer Case - Power and Ground Connections

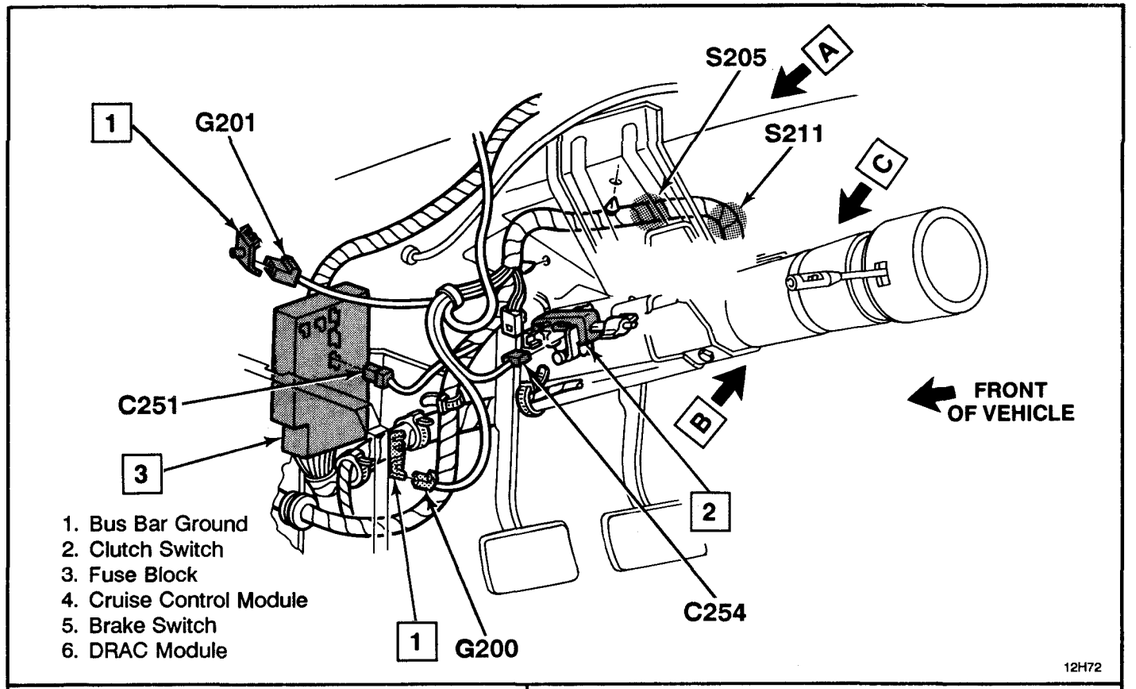


Figure 54 - Cruise Control Wiring - Manual Transmission

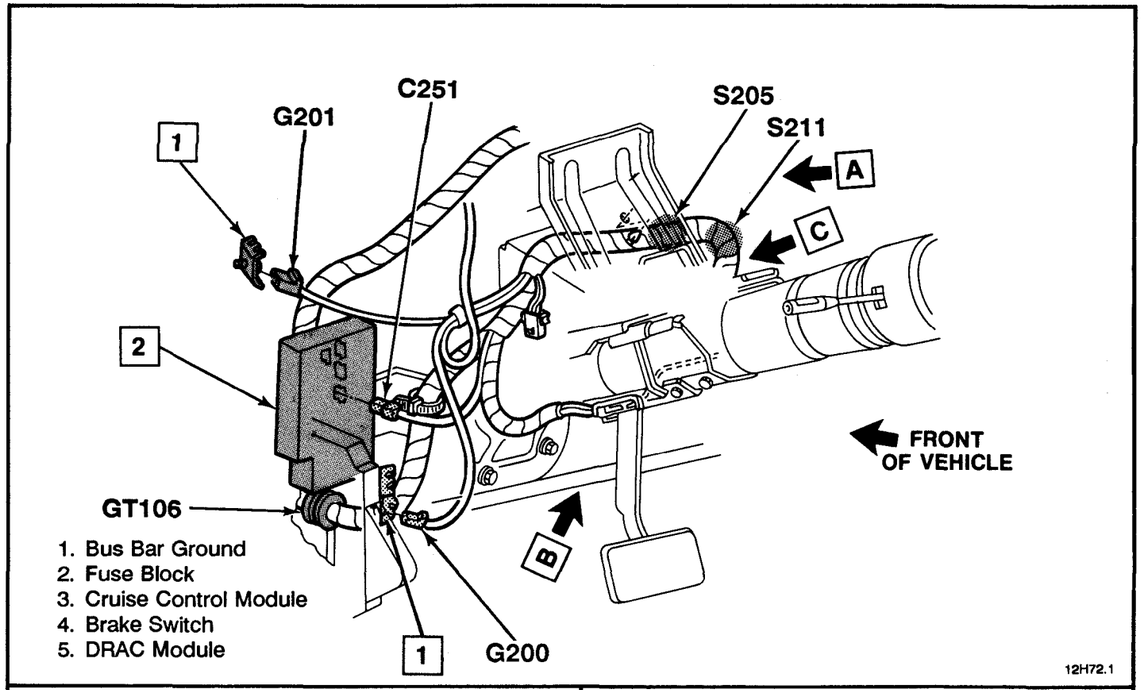
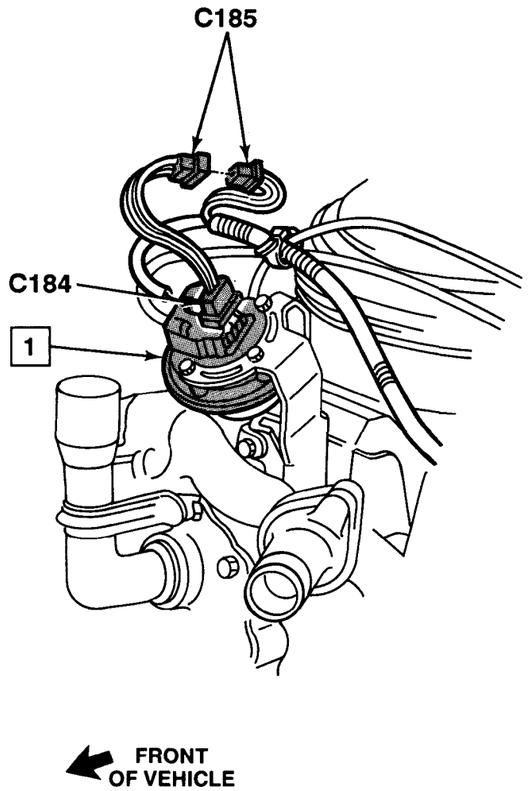


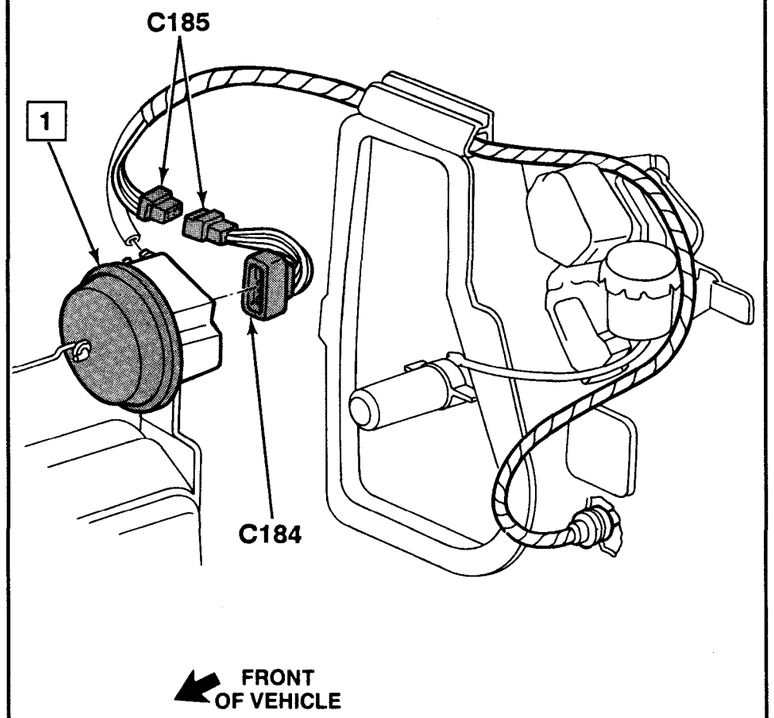
Figure 55 - Cruise Control Wiring - Automatic Transmission



1. Cruise Control Servo

12H72.3

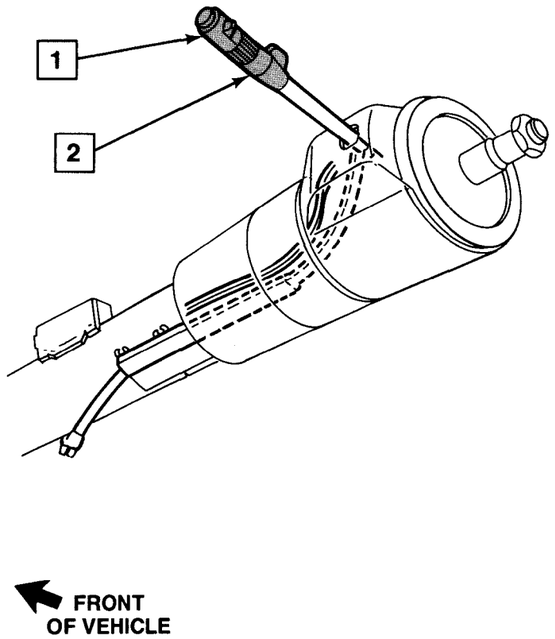
Figure 56 - Cruise Control Servo - 6.2L and 6.2L V8 HD Engines



1. Cruise Control Servo

12H72.4

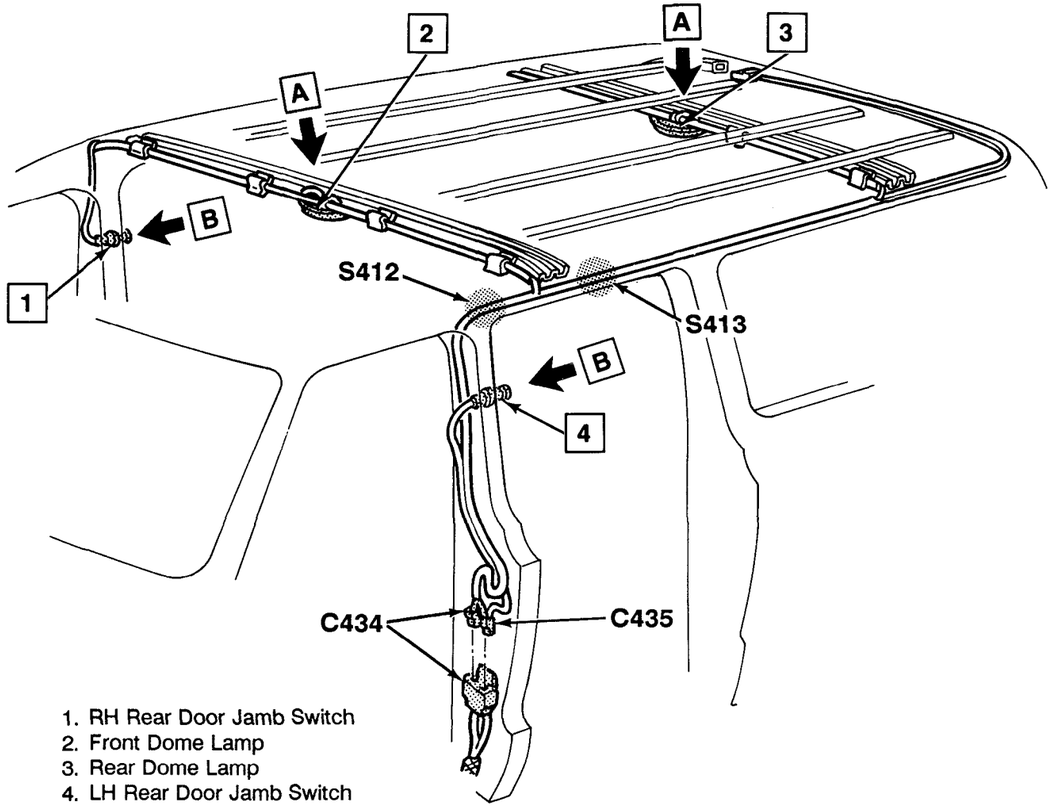
Figure 57 - Cruise Control Servo - 5.7L and 7.4L Engines



1. Cruise Control Actuator
2. Multifunctional Switch

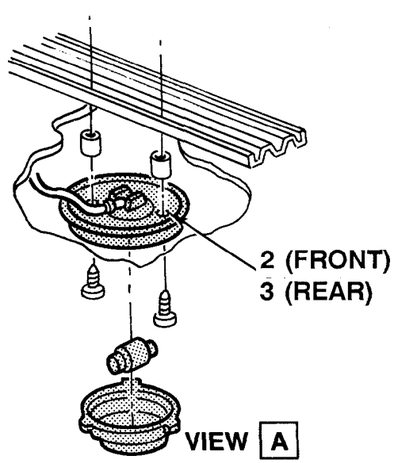
12H72.5

Figure 58 - Cruise Control Actuator

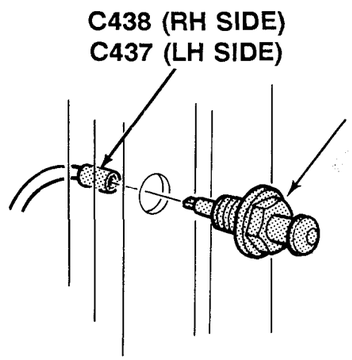


1. RH Rear Door Jamb Switch
2. Front Dome Lamp
3. Rear Dome Lamp
4. LH Rear Door Jamb Switch

12H127

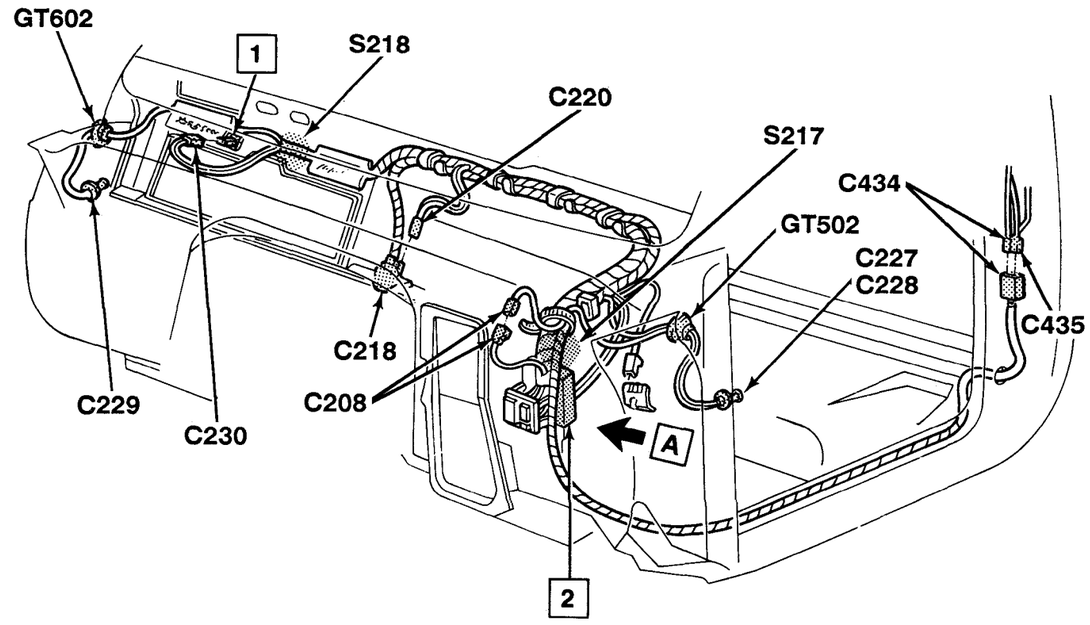


VIEW A



VIEW B

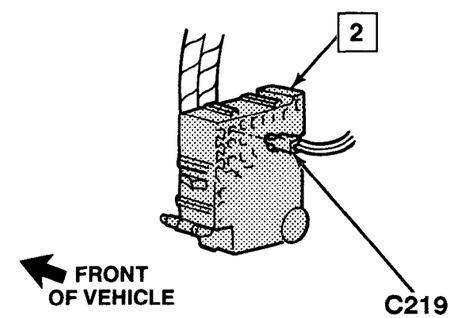
Figure 59 - Dome Lamp Wiring



1. Glove Box Lamp Switch
2. Fuse Panel

FRONT OF VEHICLE

12H123



VIEW A

Figure 60 - Front Door Jamb Switch Wiring

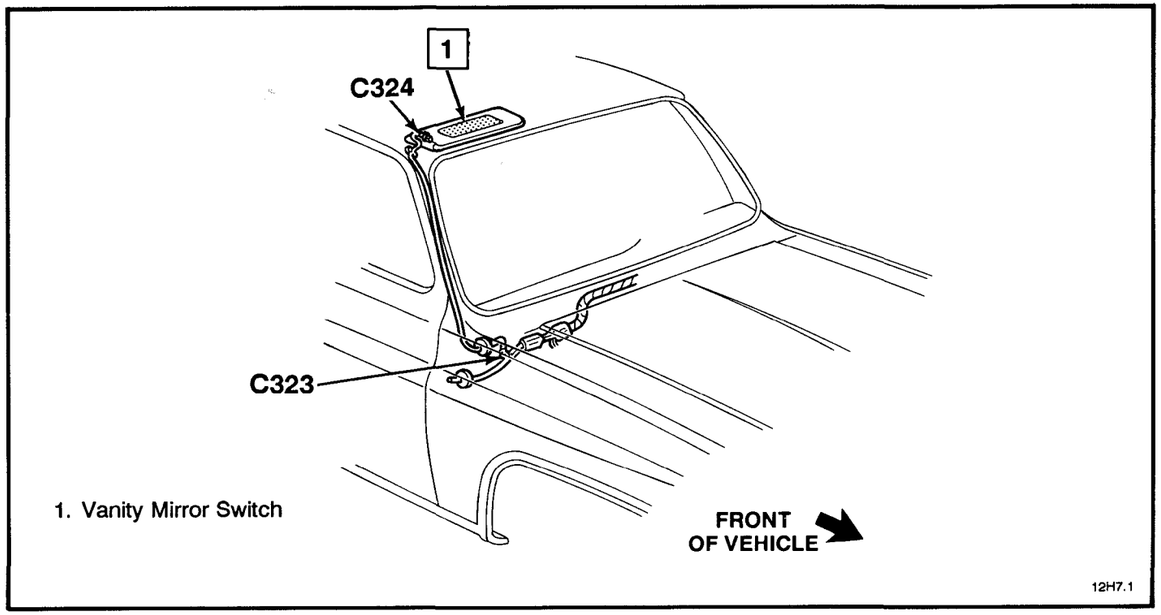


Figure 61 - Vanity Mirror Switch Wiring

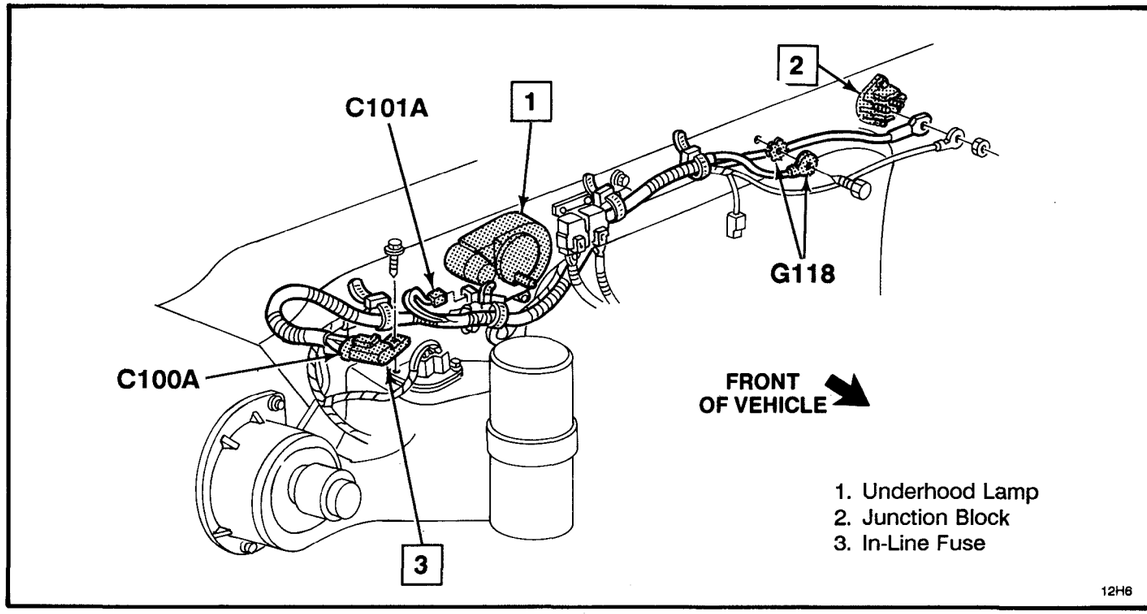


Figure 63 - Underhood Lamp Wiring - 5.7L and 7.4L Engines

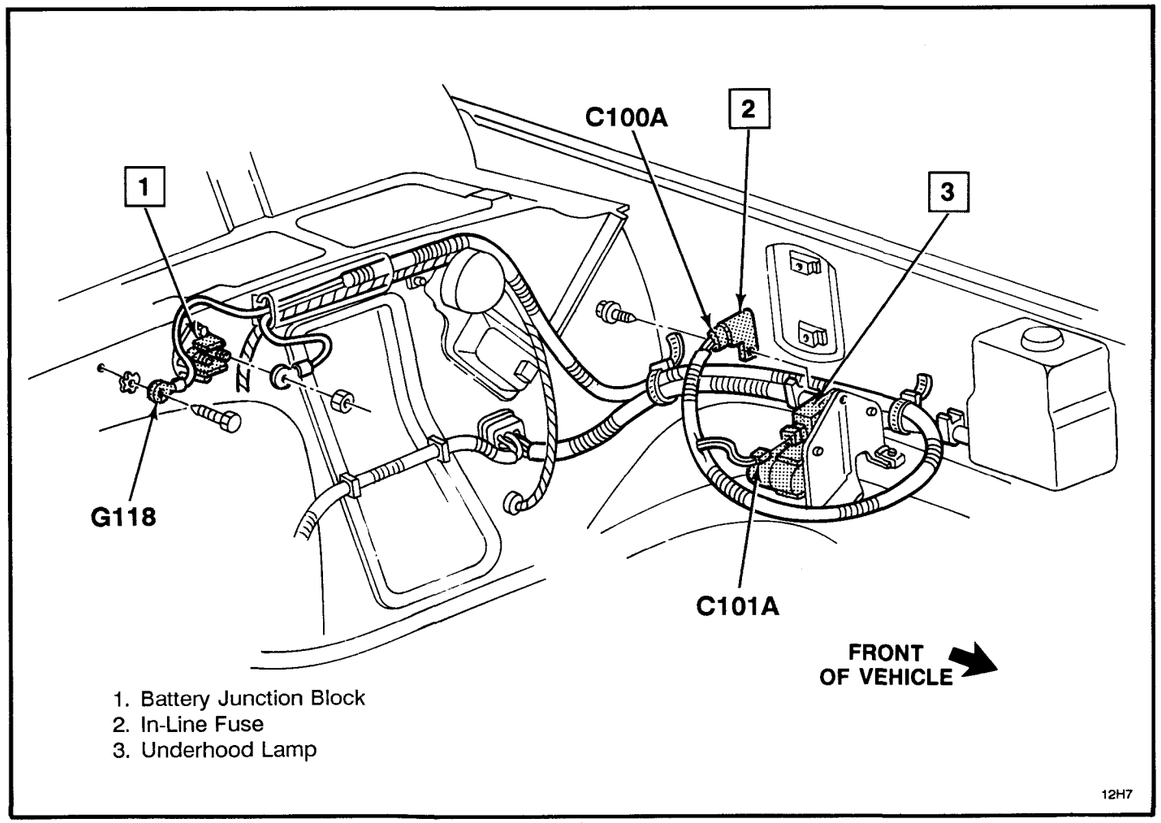


Figure 62 - Underhood Lamp Wiring - 6.2L V8 and 6.2L V8 HD Engines

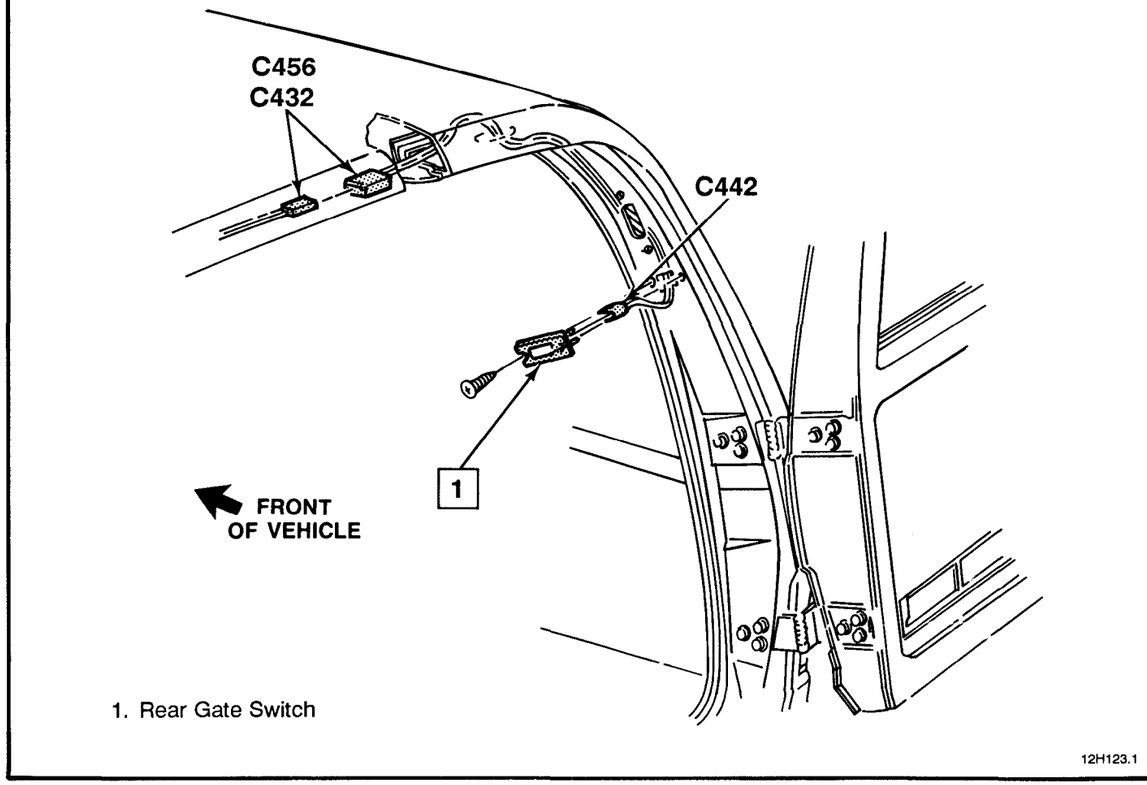


Figure 64 - Rear Gate Switch Wiring

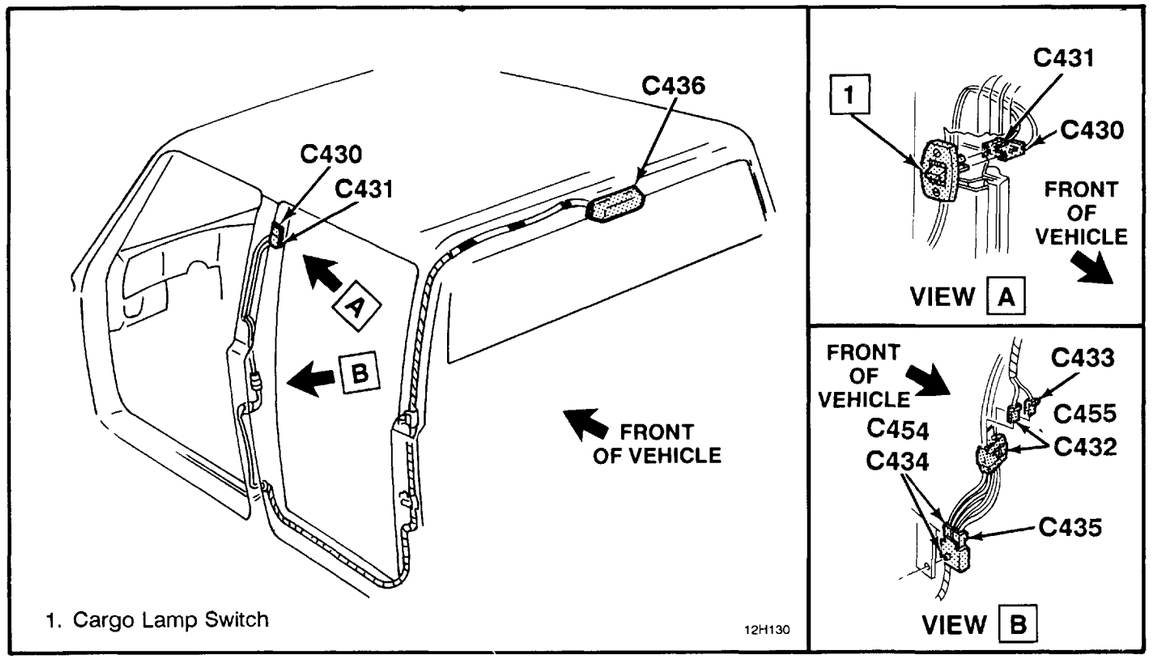


Figure 65 - Cargo Lamp Wiring

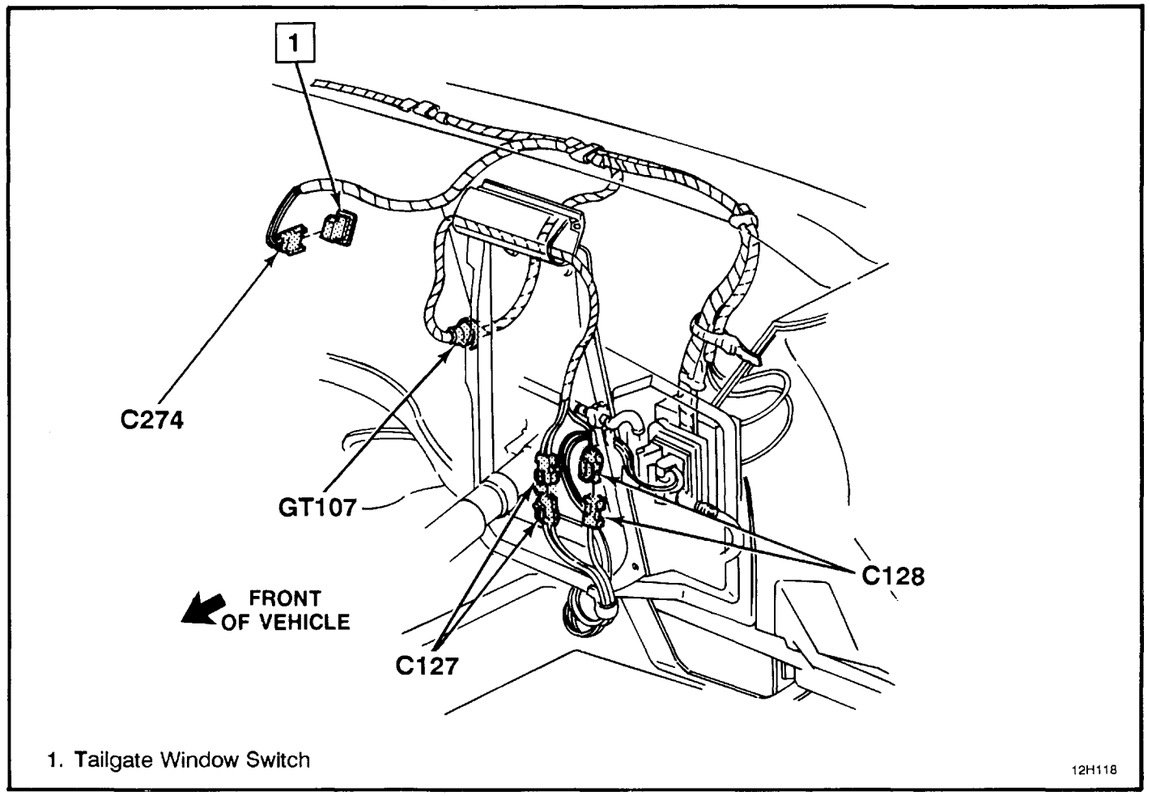


Figure 66 - Tailgate Window Front Wiring

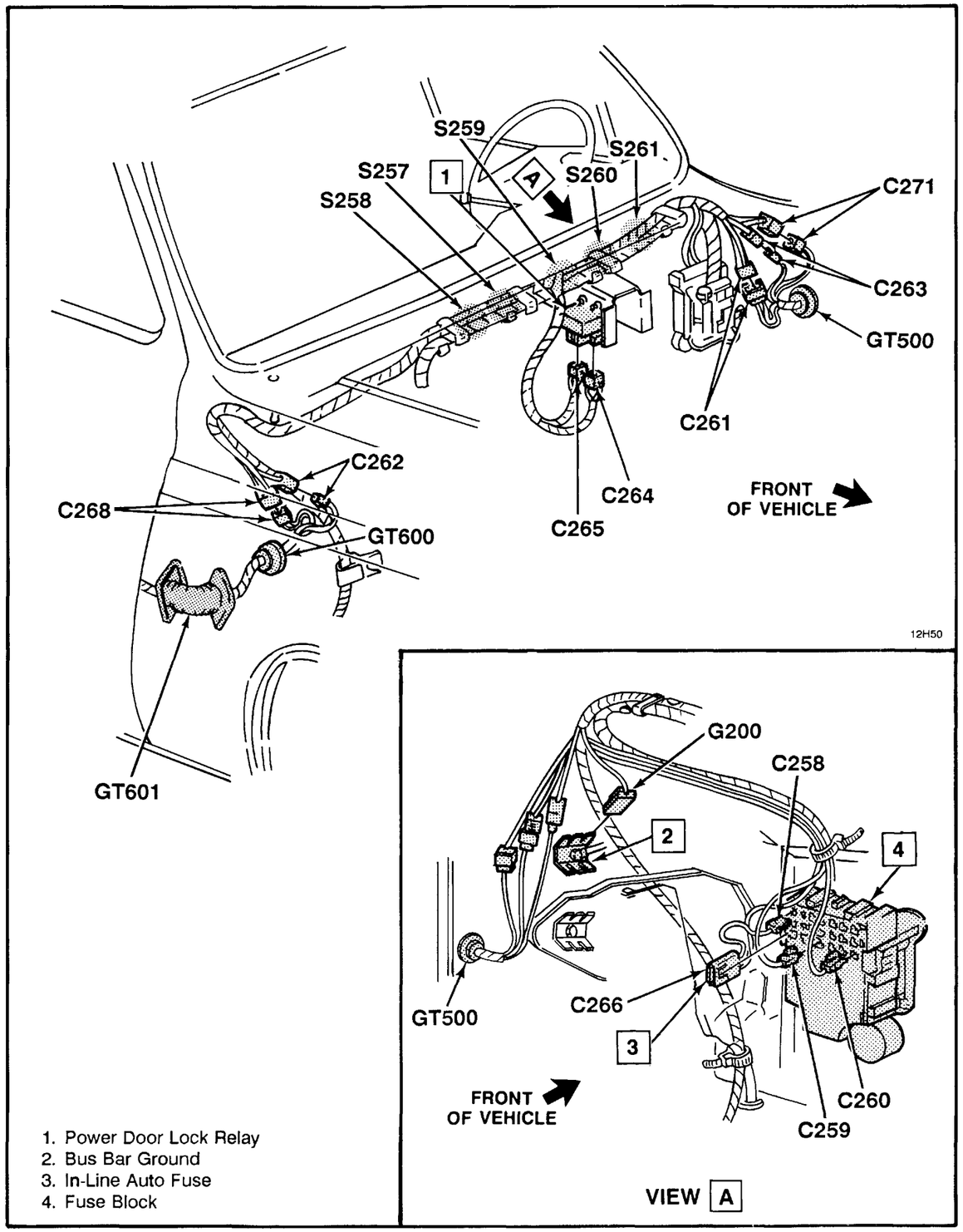


Figure 67 - Power Window, Locks, and Mirror Wiring

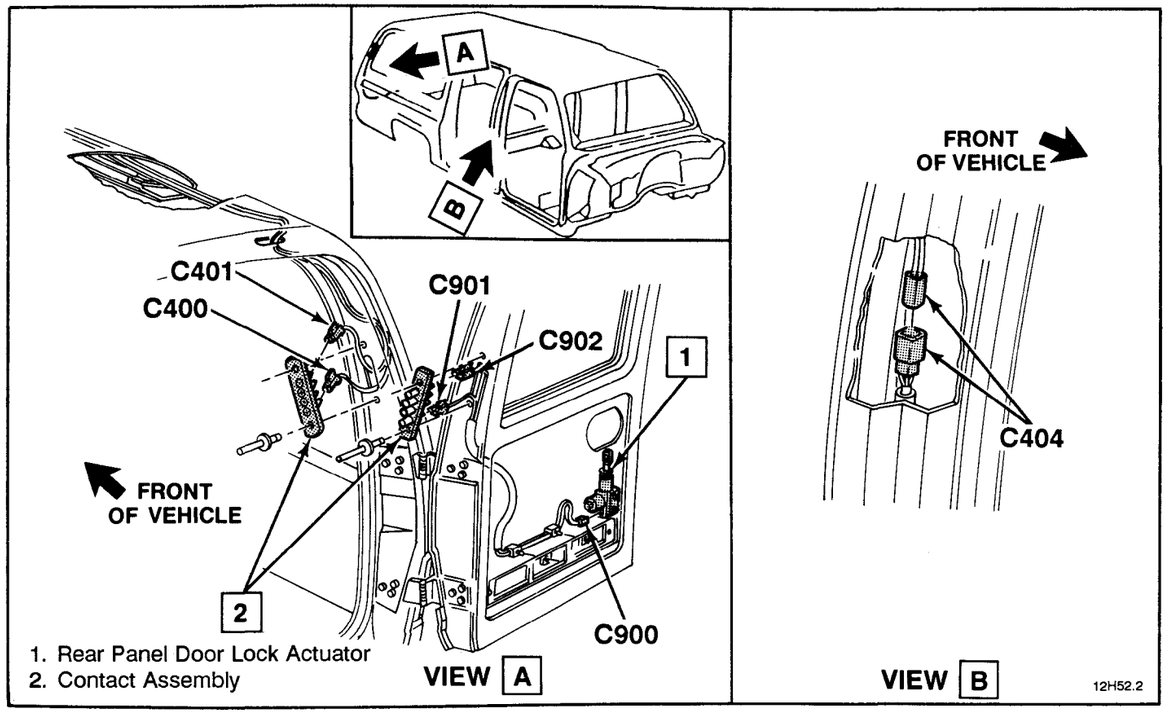


Figure 68 - Rear Panel Door Lock Wiring

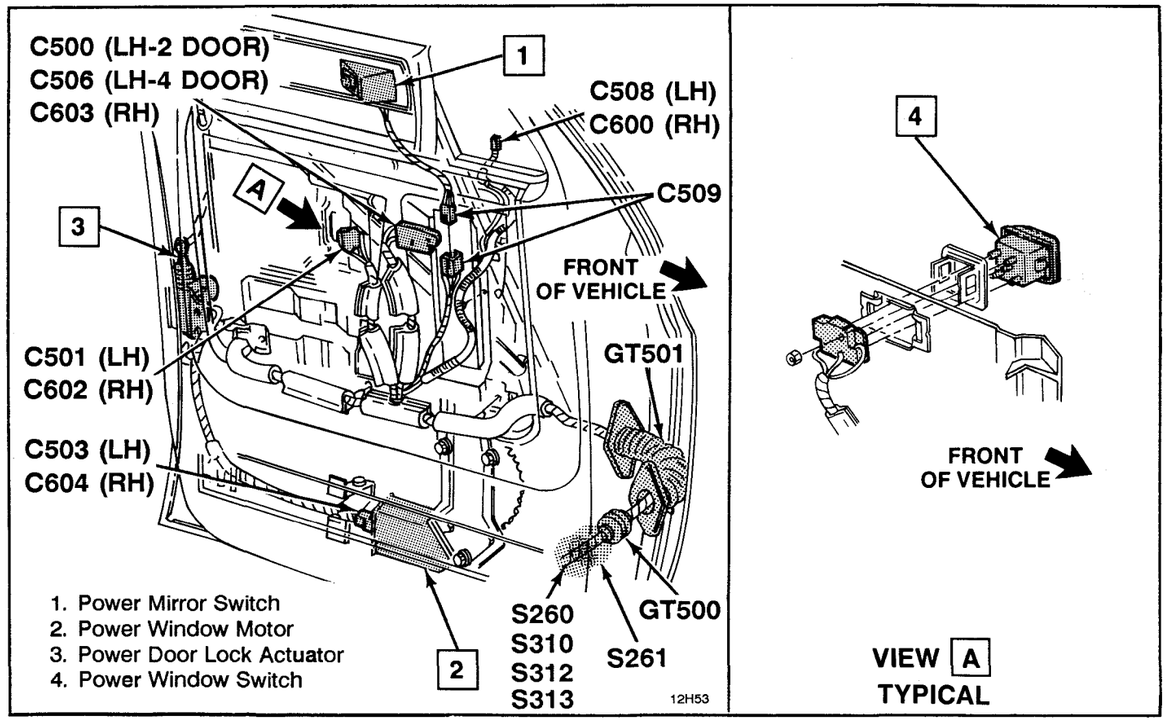
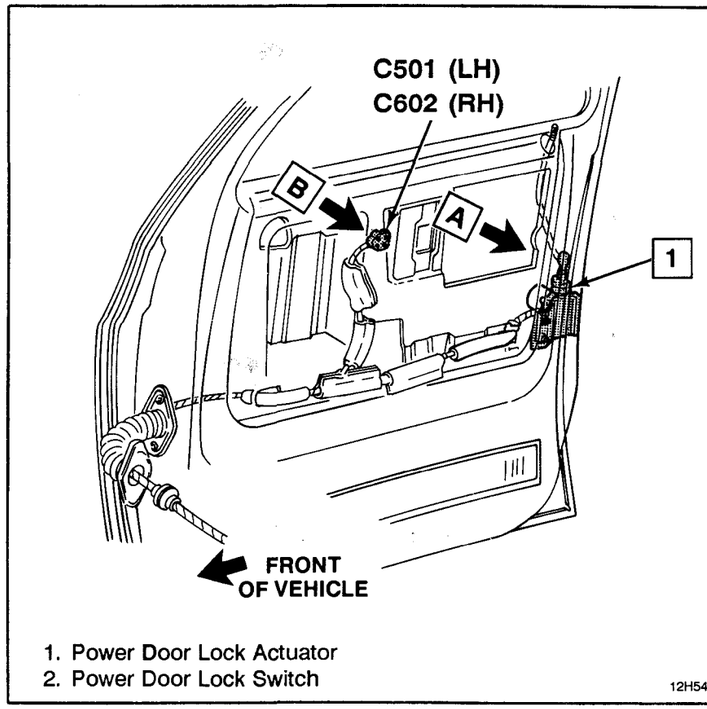


Figure 69 - Front Door Wiring with Power Door Locks, Windows and Mirrors



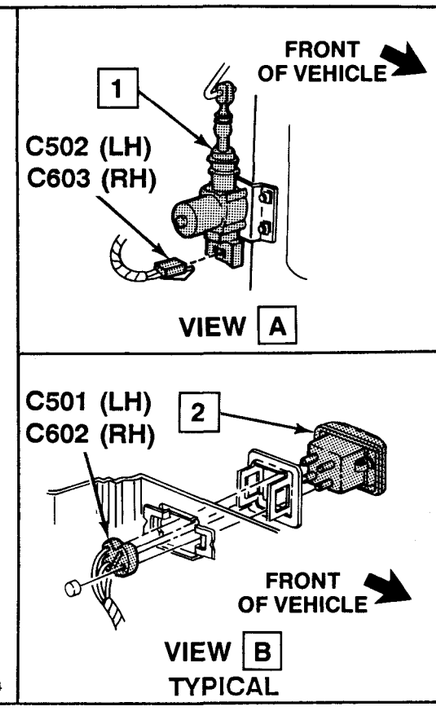


Figure 70 - Power Door Lock Wiring

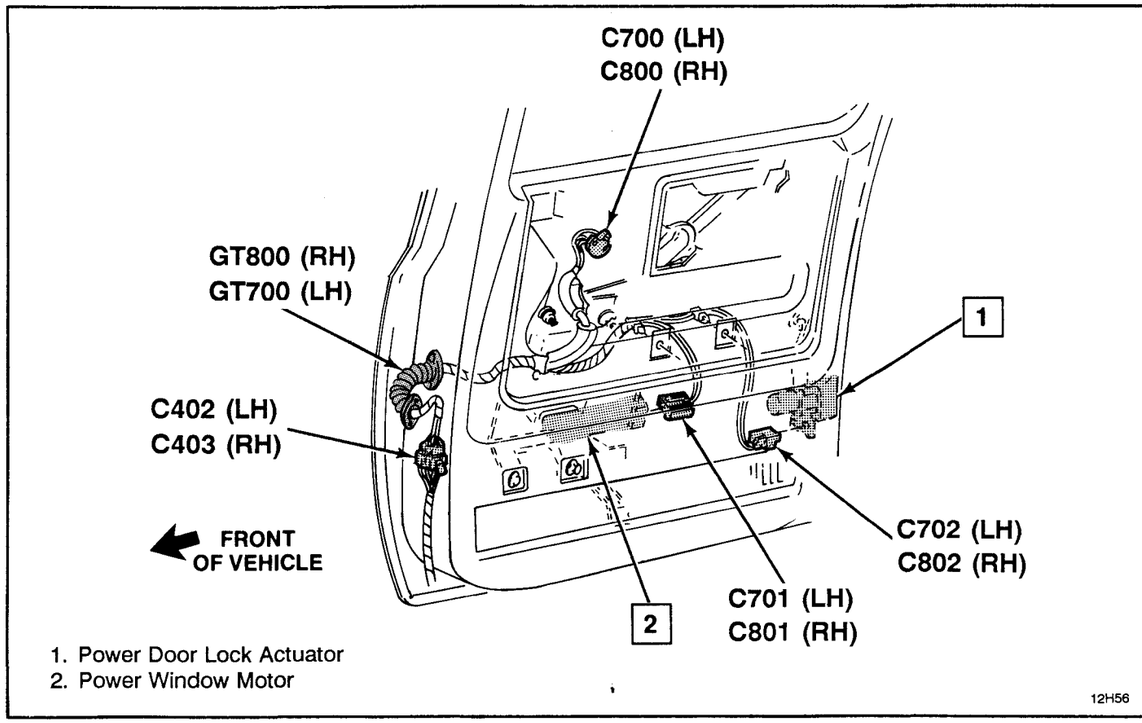
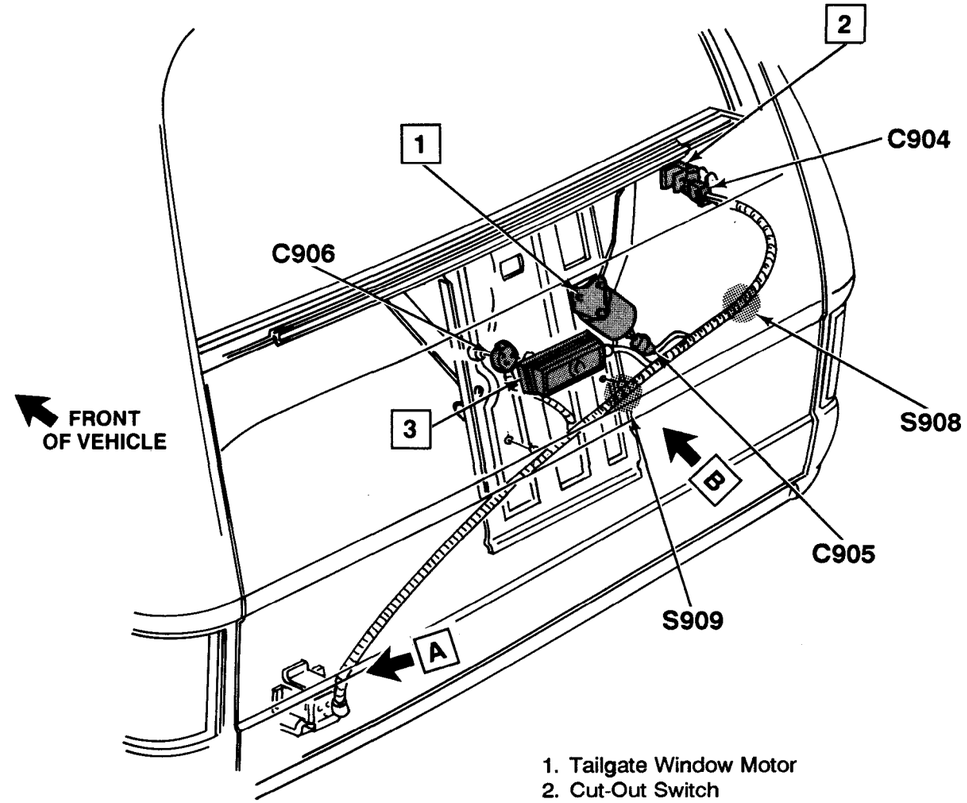
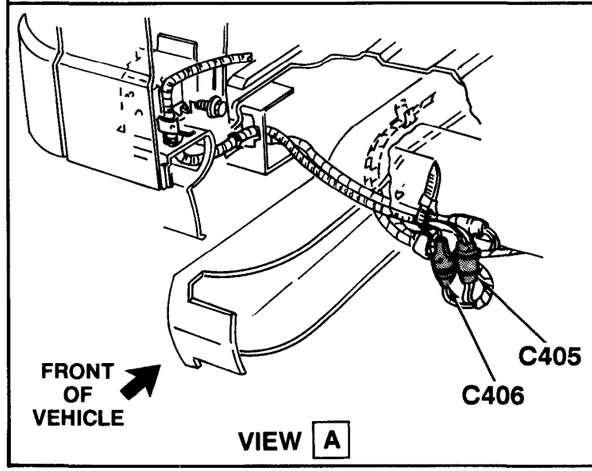


Figure 71 - Rear Door Power Windows and Locks

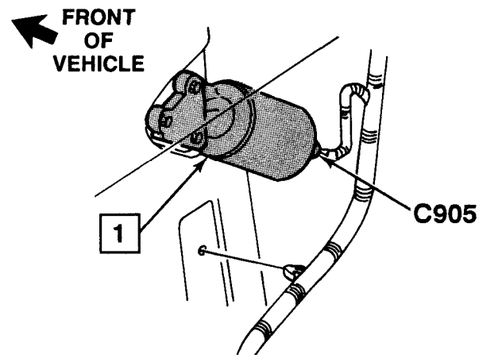


1. Tailgate Window Motor
2. Cut-Out Switch
3. Tailgate Window Switch, Key Operated

12H120

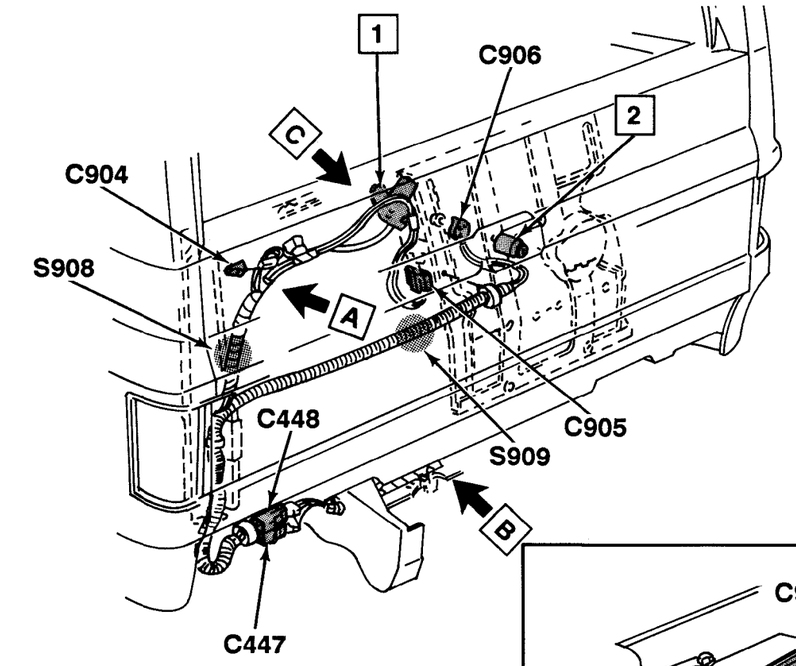


VIEW A



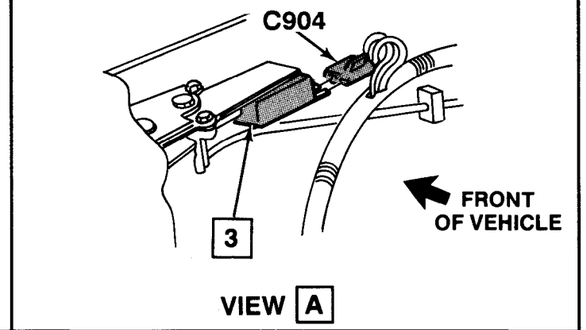
VIEW B

Figure 72 - Tailgate Rear Window Wiring - Utility

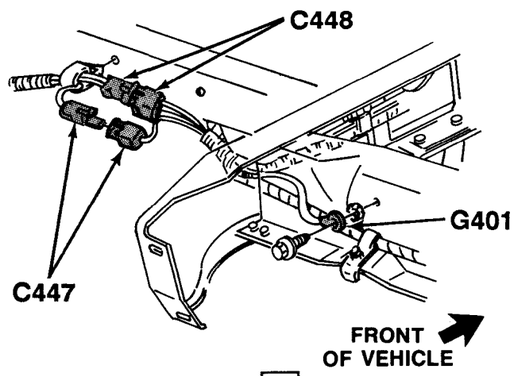


12H121

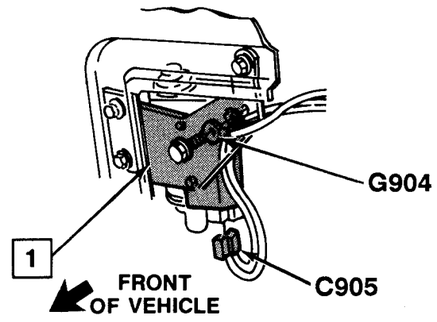
1. Rear Tailgate Window Motor
2. Tailgate Window Switch, Key Operated
3. Cut-Out Switch



VIEW A



VIEW B



VIEW C

Figure 73 - Tailgate Rear Window Wiring - Suburban

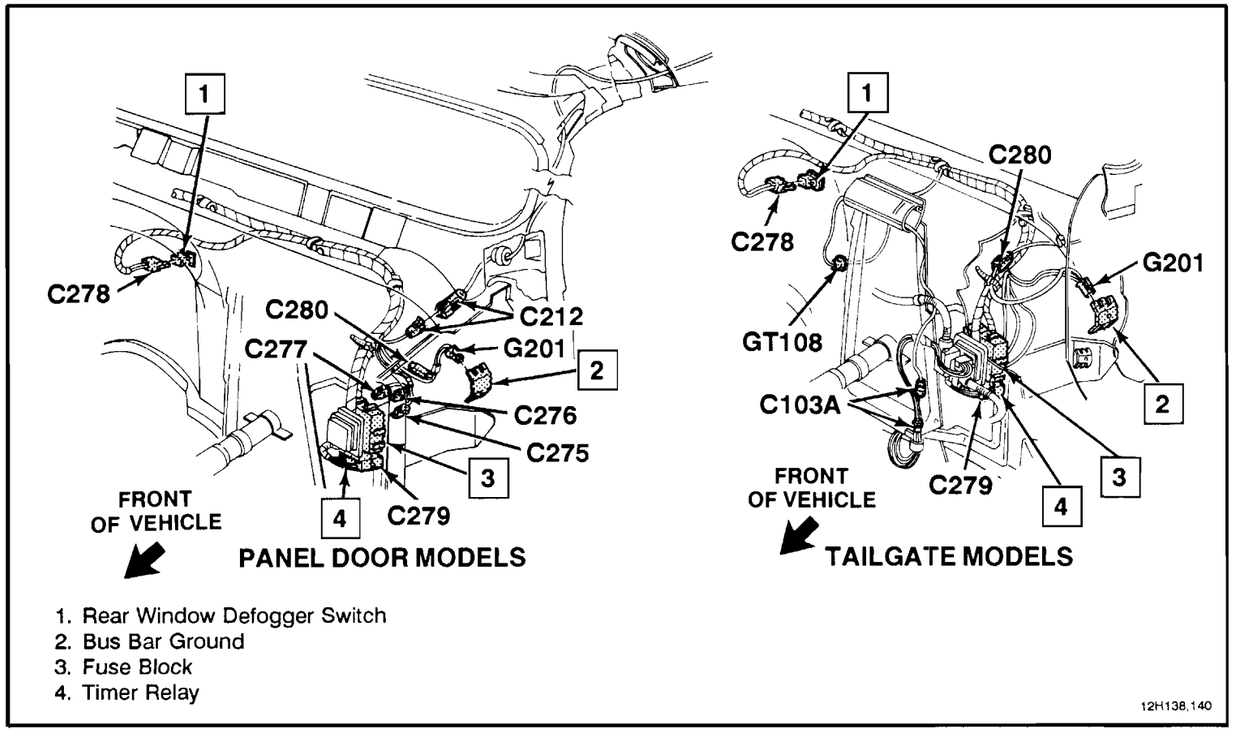


Figure 74 - Rear Defogger I/P Wiring - All Models

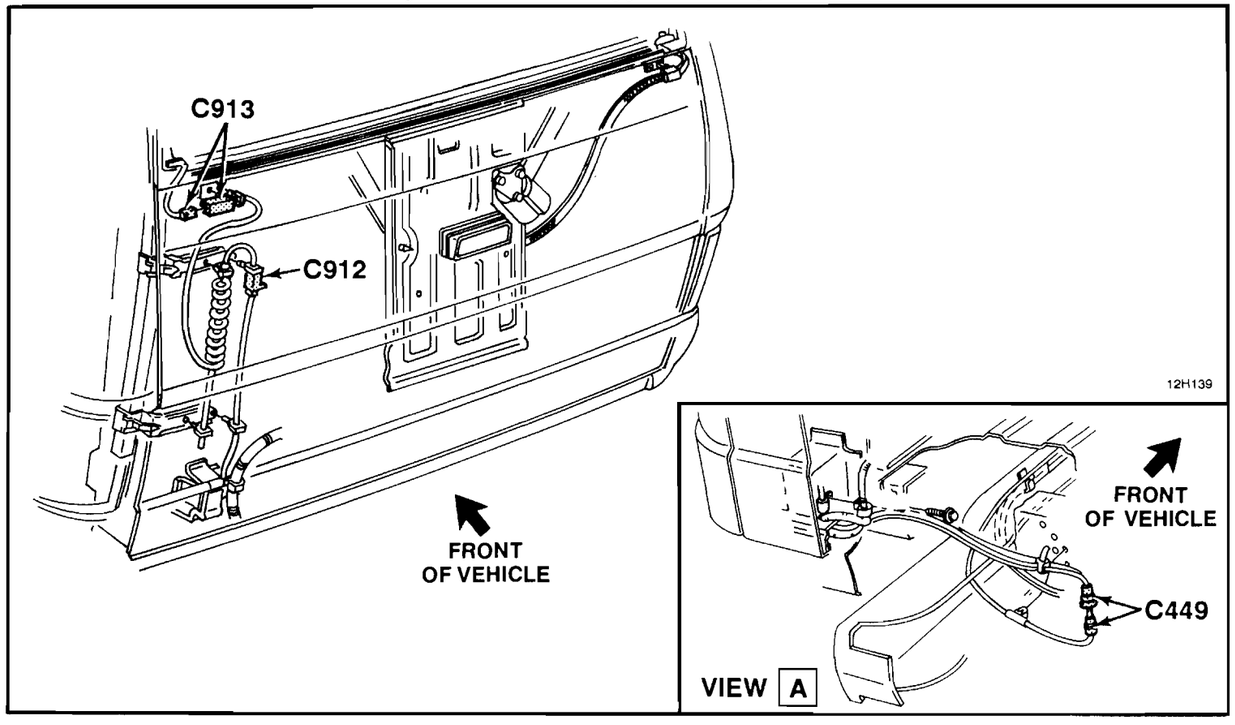


Figure 75 - Rear Window Defogger Wiring - Tailgate Model

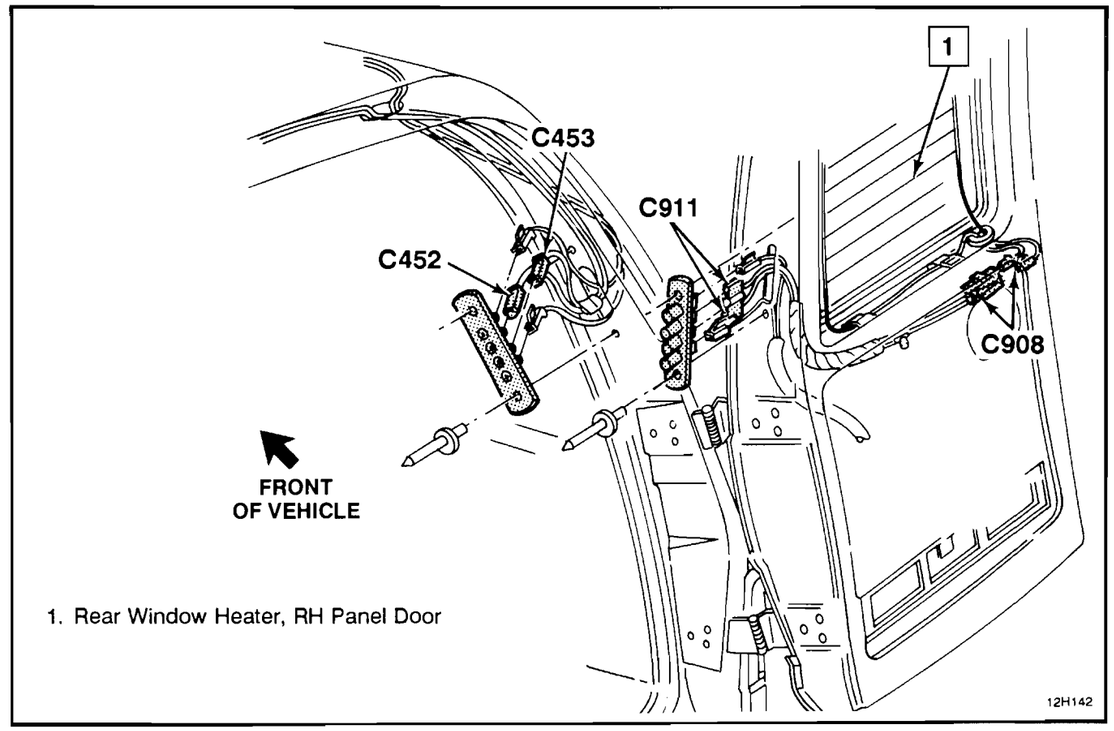


Figure 76 - Rear Window Defogger Wiring - Panel Door Model

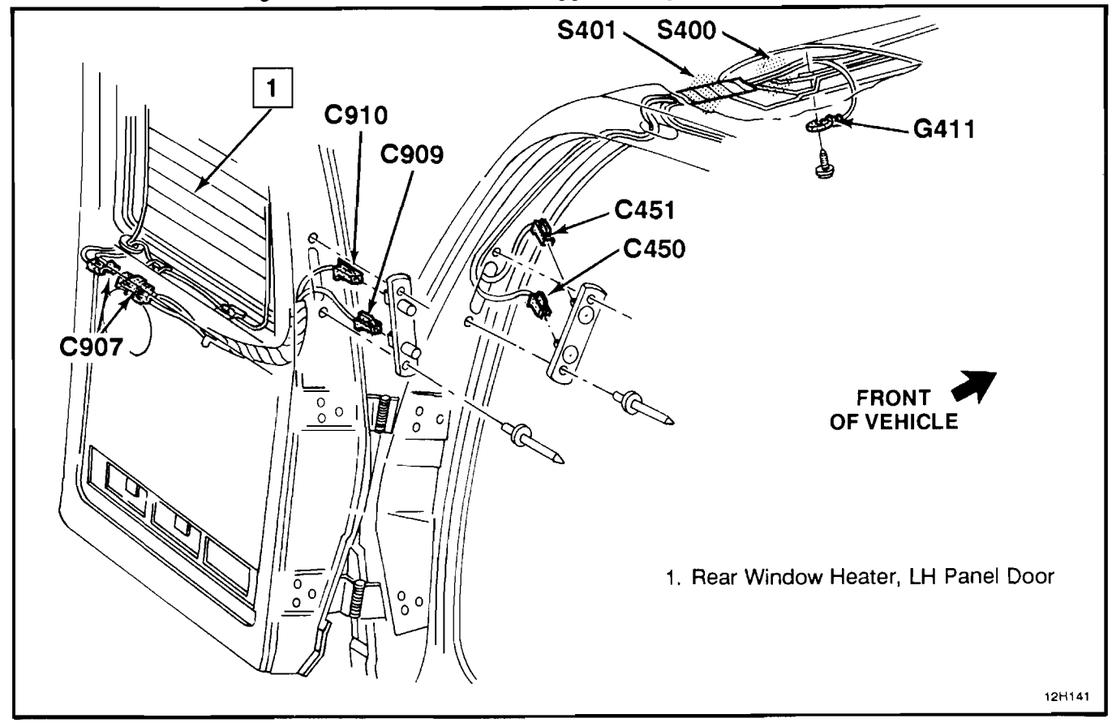


Figure 77 - Rear Window Defogger Wiring - Panel Door Model - LH Side

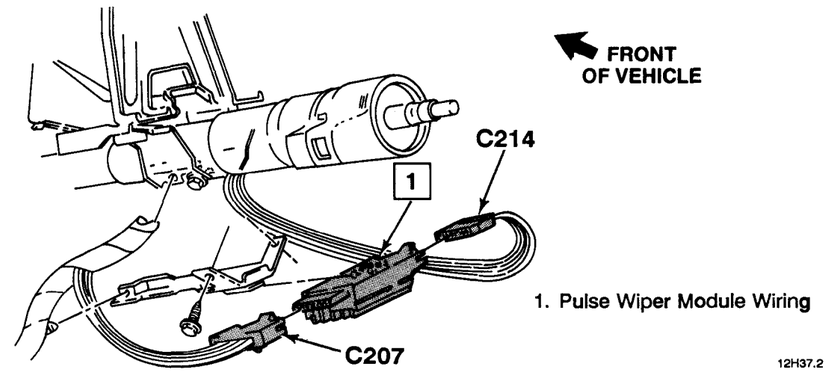


Figure - 78 Pulse Wiper Module Wiring

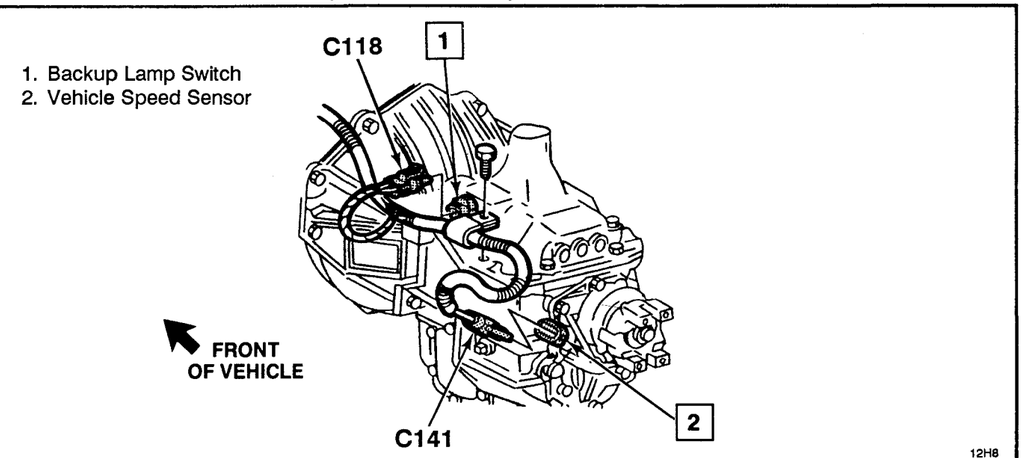


Figure 79 - Backup Lamp Switch - Manual Transmission

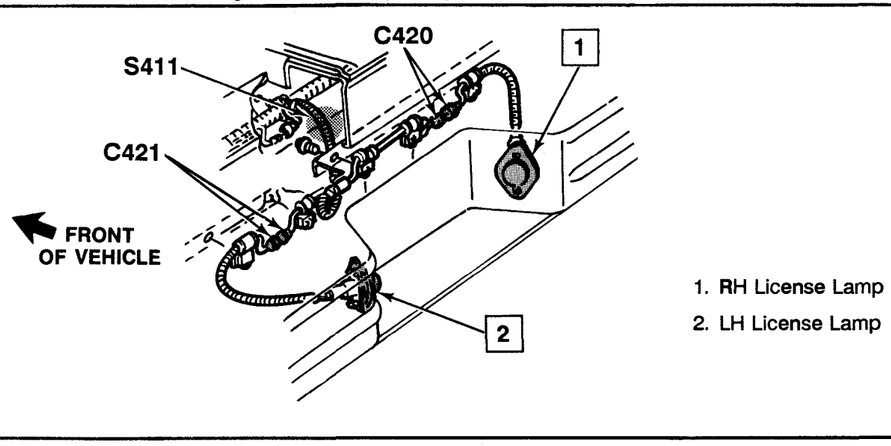


Figure 80 - License Lamps Wiring - Fleetside

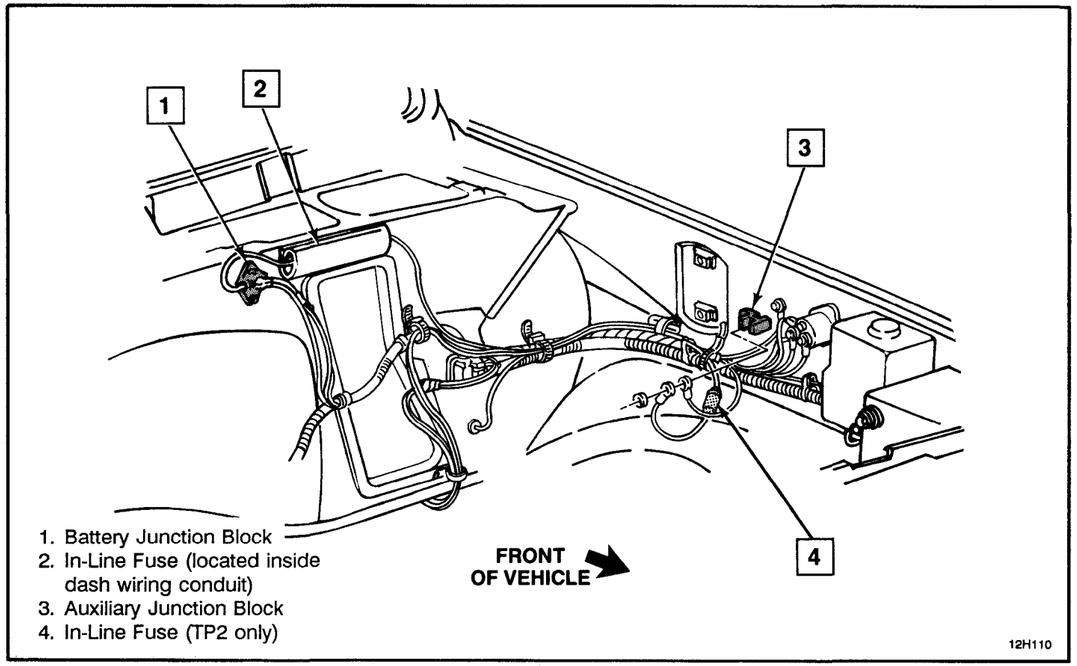


Figure 81 - Camper and Trailer Equipment Harness - Engine Compartment

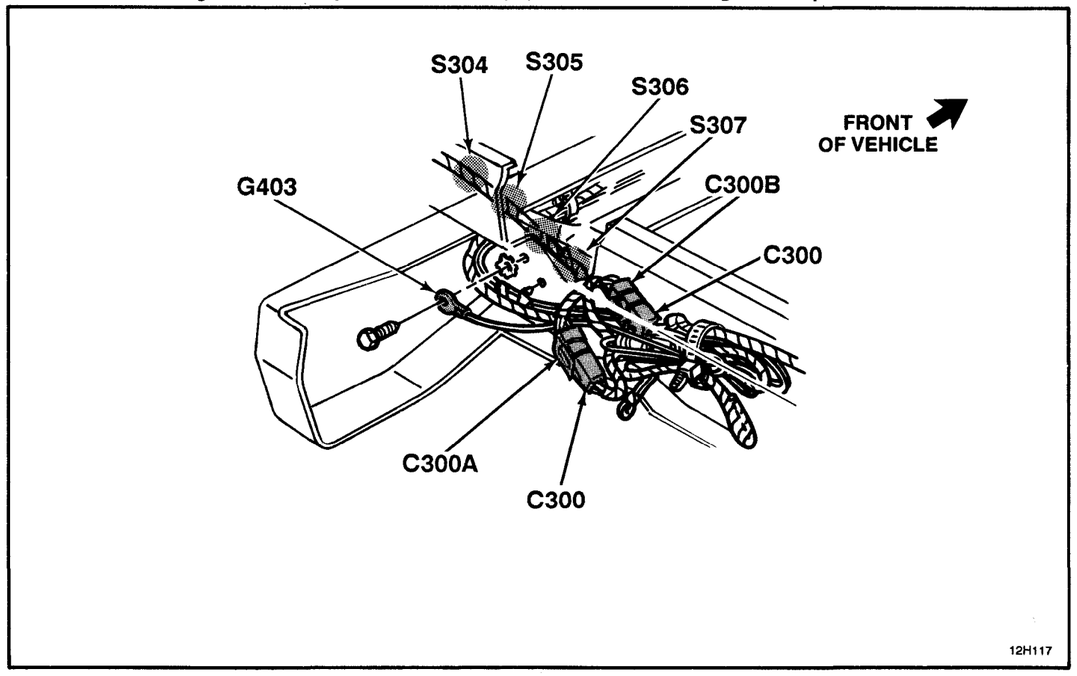


Figure 82 - Camper and Trailer Equipment Wiring - Suburban

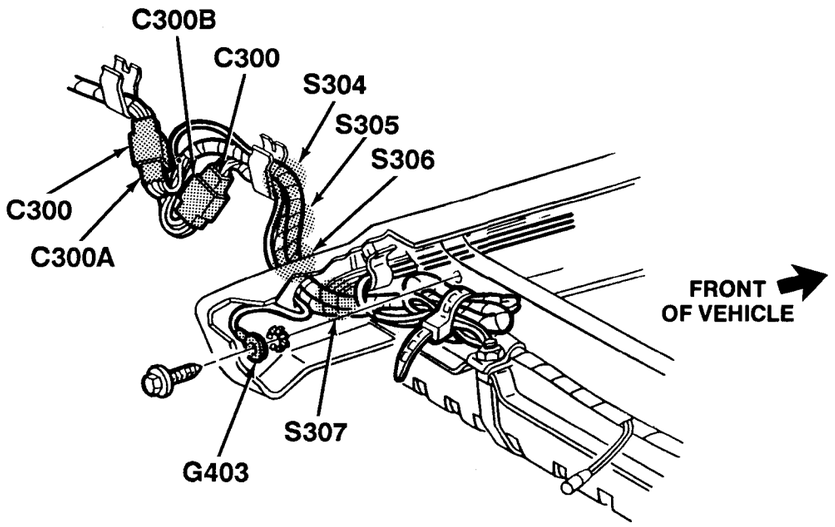


Figure 83 - Camper and Trailer Wiring - Utility

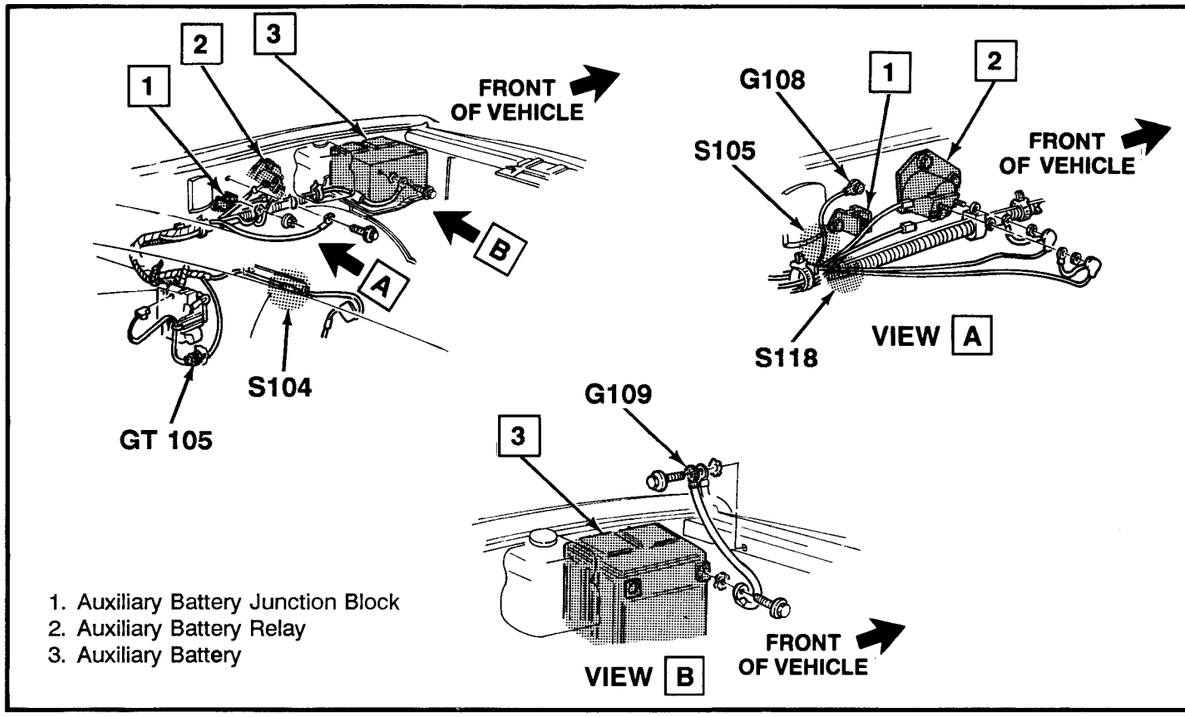


Figure 85 - Auxiliary Battery

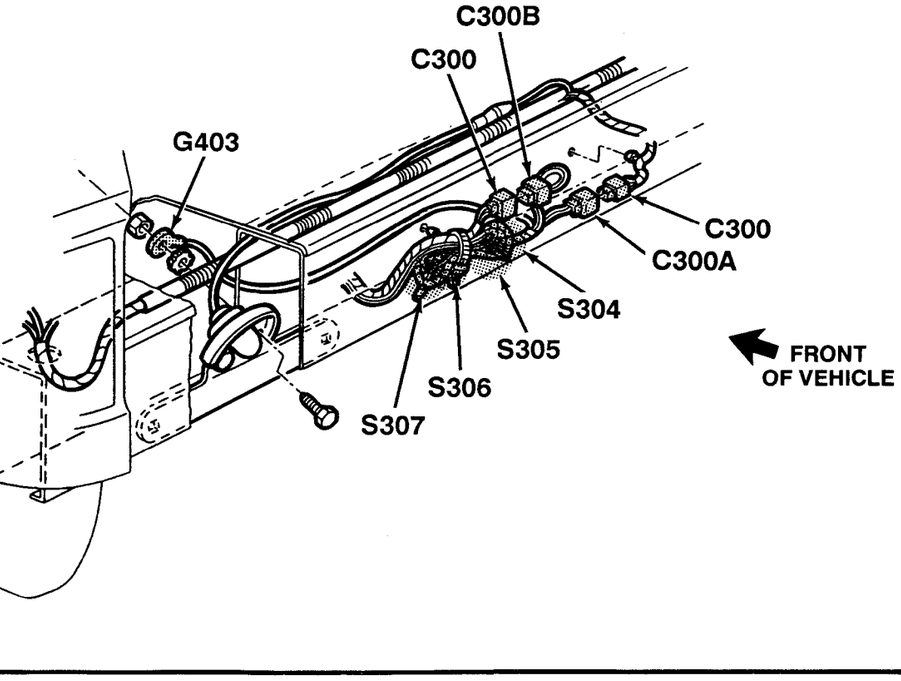


Figure 84 - Camper and Trailer Wiring - Fleetside

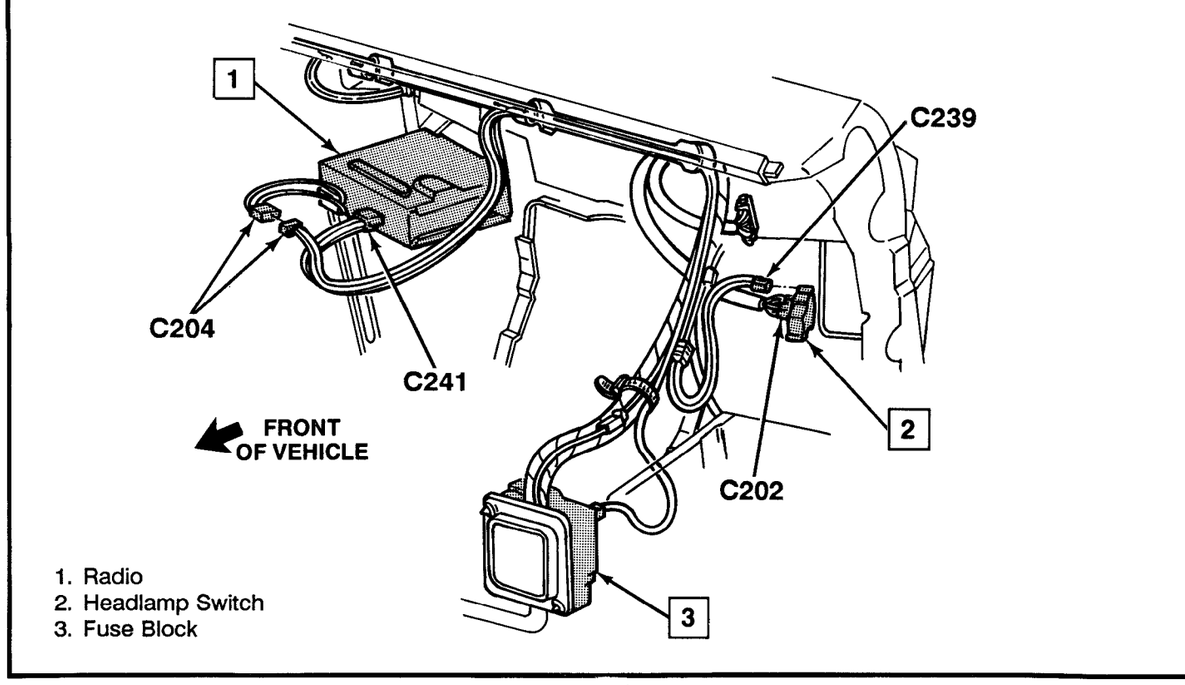


Figure 86 - Radio Wiring, Front Harness

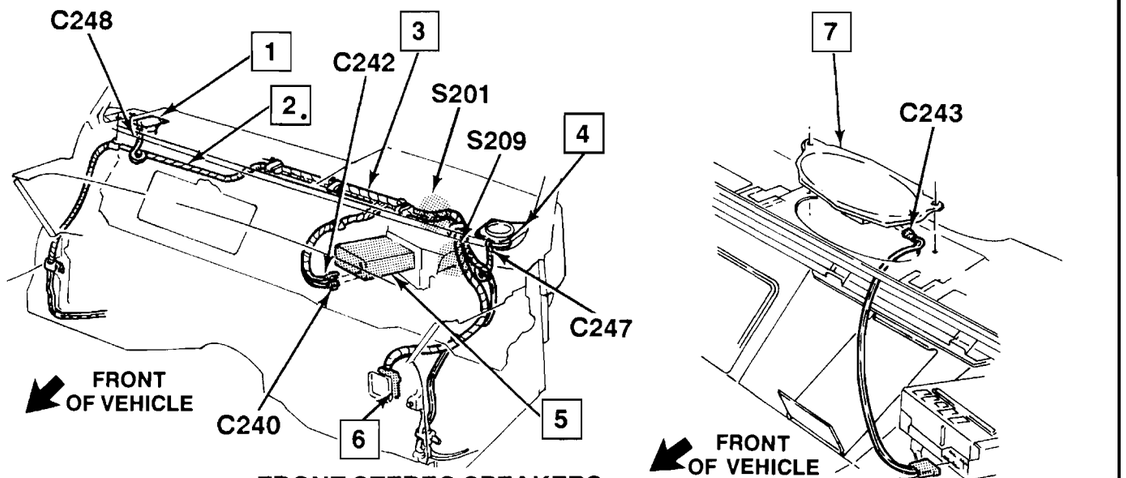


Figure 87 - Radio and Front Speaker Wiring Harness

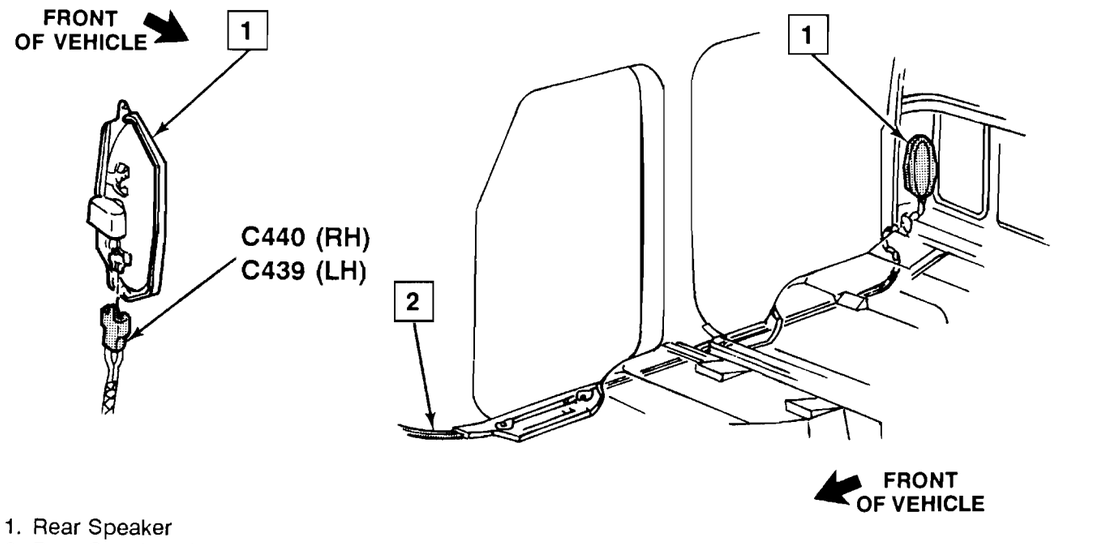


Figure 88 - Rear Speaker Wiring Harness

COMPONENT LOCATION		Page	Figure
A/C Compressor	Front of engine	179	42
A/C Diode	At A/C compressor	179	42
Automatic Transmission Backup Lamp Switch	Bottom of steering column	167	5
Auxiliary Battery	LH side of vehicle behind headlamp	192	85
Auxiliary Battery Relay, LH side	On inner fender well	192	85
Auxiliary Cooling Fan Temperature Switch	Lower RH side of engine	173	23
		174	25
		176	31
Auxiliary Cooling Fan	Below radiator support	176	32
Auxiliary Cooling Fan Relay	LH inner fender well	176	32
Auxiliary Fuel Tank Selector Switch	RH side of dash	176	33
Auxiliary Junction Block, LH side	On inner fender well	191	81
		192	85
Backup Lamp Switch	At top of transmission	191	79
Backup Lamp, LH	LH rear of vehicle	168	8
		168	9
Backup Lamp, RH	RH rear of vehicle	168	8
		168	9
Battery Junction Block	Engine compartment, LH Cowl	166	2
		166	3
		176	32
		179	42
		186	62
		186	63
Blower Motor	RH side of cowl	179	43
Brake Pressure Warning Switch	Below master cylinder	178	40
Brake Switch	On top of brake pedal assembly	183	54
		183	55
Bus Bar Ground	LH side of I/P	167	6
		176	33
		180	47
		182	53
		183	54
		183	55
		187	67
		190	74
		191	81
Cargo Lamp Switch Upper	LH B-Pillar	187	65
Check Engine Lamp Driver Module	Under I/P	181	49
Cigarette Lighter	In ash receptacle	179	41
Clutch Start Switch	LH side of steering column	167	5
Clutch Switch	On top of clutch pedal assembly	183	54
Coil	Top rear of engine	174	26
Cold Advance Control Solenoid	Front LH side of engine	172	22
Cold Advance Glow Plug Inhibit Relay	Engine compartment, LH rear side	175	28
Cold Advance/Fast Idle Temp Switch	Lower RH rear of engine	172	22
Combination Lamp, LH Rear	LH rear of vehicle	169	11
Combination Lamp, RH Rear	RH rear of vehicle	169	11
Convenience Center	LH side of I/P	169	11
Coolant Temperature Sender (7.4L Gasoline)	Lower LH side of engine	173	24
		177	37
		178	40
Coolant Temperature Sensor (5.7L and 7.4L Gasoline)	Top center of engine	173	23
		177	36
		178	40
Coolant Temperature Switch (Diesel)	Front of engine	172	22
		173	23
Courtesy Lamp	Below I/P	179	41
Cruise Control Actuator	Part of multi function switch	184	58
Cruise Control Module	Behind I/P, on LH side of steering column	183	54
		183	55
Cruise Control Servo (5.7L and 7.4L Gasoline)	Rear of engine	184	57
Cruise Control Servo (6.2L Diesel)	Front of engine	184	56
Cut-Out Switch	Upper RH side of tailgate (Utility)	189	72
Cut-Out Switch	Upper LH side of tailgate (Suburban)	189	73
DRAC Module	I/P near steering column	179	41
		183	54
		183	55
DRL Relay	LH front inner fender	166	1
Distributor	Top rear of engine	174	26
Dome Lamp, Front	Above passenger seats on roof	185	59
Dome Lamp, Rear	Above rear cargo area on roof	185	59
ECM	Under LH side of I/P	173	23
		174	25
		175	29
		177	36
		178	39
EGR Dump Valve	Top LH side of engine	175	28
EGR Solenoid	Top RH side of engine	174	25
EGR Valve	Top LH side of engine	175	28
EPR Valve	Top LH side of engine	175	28
ESC Hybrid Function (5.7L Gasoline)	Top RH side of engine	177	36
ESC Hybrid Function (7.4L Gasoline)	On RH side of cowl panel	178	39
EVRV Solenoid	Top front of engine	173	23
		177	36
		178	40
Electronic Spark Timing Module	Top rear of engine	174	26
Engine Speed Sensor	Top RH side of engine	172	22
Evaporator Pressure Control Switch	RH side of cowl	179	43
Fast Idle Solenoid	On top of engine	172	22
Four-Wheel Drive Indicator Lamp	In I/P cluster	182	51
Four-Wheel Drive Shift Level Lamp	At transfer case shift lever	182	51
Front Blower Switch	Center of I/P	180	44
Front Resistor Block	RH side of cowl panel	179	43
Fuel Heater	Engine compartment, on cowl behind engine	172	22

COMPONENT LOCATION		Page	Figure
Fuel Injector	Top center of engine	173	23
		173	24
		174	25
		177	36
		178	39
Fuel Pump Oil Pressure Switch (5.7L Gasoline)	Top rear of engine	174	26
Fuel Pump Oil Pressure Switch (7.4L Gasoline)	Lower LH side of engine	173	24
		178	40
Fuel Pump Relay	Engine compartment on cowl behind engine	173	23
		174	25
		177	36
		178	39
Fuel Pump and Sender Assembly	In fuel tank	175	27
		176	33
		177	35
Fuel Shut Off Solenoid	Front LH side of engine	172	22
Fuel Tank Selector Valve and Motor Switch	RH frame rail near auxiliary fuel tank	176	34
		177	35
Fuse Block	LH side of I/P	167	4
		176	33
		180	44
		180	45
		180	47
		182	51
		182	53
		183	54
		183	55
		185	60
		187	67
		186	64
Generator	Front of engine	171	19
		172	22
		173	23
		173	24
		174	26
Glove Box Lamp Switch	In glove box on RH side of I/P	185	60
Glow Plug Controller	Top rear of engine	175	28
Glow Plugs Wait Lamp	In instrument cluster	181	49
Hazard Flasher	LH side of I/P on convenience center	169	14
Headlamp Dimmer Switch	LH side of steering column	167	5
Headlamp, LH High Beam (Quad)	LH front of vehicle	166	3
Headlamp, LH Low Beam (Quad)	LH Front of vehicle	166	3
Headlamp, Low Beam (Quad)	RH front of vehicle	166	3
Headlamp, RH High Beam (Quad)	RH Front of vehicle	166	3
Headlamp, RH High-Low (Base)	RH front of vehicle	166	2
Heater A/C Control Assembly Lamp	Front center of I/P	179	41
High Blower Relay	Engine compartment near blower motor	179	43
I/P Cluster	LH side of I/P	167	4

COMPONENT LOCATION		Page	Figure
Idle Air Control Actuator	Top RH side of engine	173	23
		174	25
		176	31
Ignition Switch	RH side of steering column	167	5
In-Line Diode (4WD)	In 4WD harness at RH side of fuse block	182	51
In-Line Fuse (Camper/Trailer Wiring)	Center of cowl panel in dash conduct	191	81
In-Line Fuse (Underhood lamp) (Diesel)	LH inner fender well	186	62
In-Line Fuse (Underhood lamp) (Gasoline)	RH side of cowl	186	63
In-line Fuse (TP2 Only)	LH side on inner fender well	191	81
Input Speed Sensor	LH side of transmission	175	30
Instrument cluster	LH side of I/P	181	49
Knock Sensor	Lower RH side of engine	173	23
		174	25
		178	39
		184	56
LH Battery	Engine Compartment, front LH side	170	18
LH Horn	LH front of vehicle	170	17
LH License Lamp	Rear center of vehicle	191	80
LH Rear Door Jamb Switch	On LH B-pillar	185	59
LH Rear Side Marker Lamp	LH rear of vehicle	168	8
		168	9
License Lamp	Rear center of vehicle	168	8
Light Switch	LH side of I/P	167	4
		170	15
Low Coolant Warning Module	Behind LH side of I/P	181	49
MAP Sensor	Top RH rear of engine	172	22
		177	36
		178	39
Multi Function Switch	On steering column	184	58
Oil Pressure Sensor (Diesel)	LH rear of engine	175	28
Output Speed Sensor	LH side of transmission	175	30
Oxygen Sensor	LH exhaust manifold	174	26
		175	30
Powertrain Control Module (PCM)	Under LH side of I/P	173	23
Panel Door Contractor	At rear door	188	68
Park Brake Warning Switch	Under LH side of I/P	167	4
Park and Turn Lamp, LH (Base)	LH front of vehicle	166	2
Park and Turn Lamp, LH (Quad)	LH front of vehicle	166	3
Park and Turn Lamp, RH (Base)	RH front of vehicle	166	2
Park and Turn Lamp, RH (Quad)	RH front of vehicle	166	3
Power Door Lock Actuator	LH front door	188	69
Power Door Lock Actuator	RH front door	188	70
Power Door Lock Actuator	Rear side doors	188	71
Power Door Lock Relay	At RH side of steering column support	187	67
Power Door Lock Switch	Upper RH front door	188	70
Power Mirror Switch	Upper LH front door	188	69
Power Window Motor	Lower LH front door	188	69
Power Window Motor	Rear side doors	188	71
Power Window Switch	At LH front door	188	69
Power Window Motor	Lower LH front door	188	69

COMPONENT LOCATION		Page	Figure
Pulse Wiper Module	Under LH side of I/P	191	78
RH Battery	Engine compartment, front LH side	170	18
		171	21
RH Fuel Sender Assembly	RH Fuel Tank	176	34
		177	35
RH Horn	RH front of vehicle	170	17
RH License Lamp	Rear center of vehicle	191	80
RH Rear Door Jamb Switch	On RH B-pillar	185	59
RH Rear Side Marker Lamp	RH rear of vehicle	168	8
		168	9
Radio Receiver	Center of I/P	192	86
		193	87
Rear A/C Blower Motor	Top rear of vehicle	180	46
Rear A/C Blower Switch	Center of I/P	180	47
Rear A/C and Heater Controls	Center of I/P	180	45
Rear Gate Switch	RH rear of vehicle	186	64
Rear Heater Blower Motor	Rear LH side of vehicle	181	48
Rear Heater Blower Resistors	At rear heater blower motor	181	48
Rear Panel Door Lock Actuator	At rear door	188	68
Rear Resistor Block	RH side of engine compartment	180	45
Rear Wheel Antilock Controller Module	LH side of master cylinder	178	40
Rear Window Defogger Switch	Center of I/P	190	74
Roof Identification Lamps	Front top of roof	170	15
Roof Marker Lamp, LH	Front top LH side of roof	170	15
Roof Marker Lamp, RH	Front top RH side of roof	170	15
Safety Belt Retractor Switch	At safety belt assembly	181	50
Selector Control	Center of I/P	180	44
Side Marker Lamp, LH Front (Base)	Front LH side of vehicle	166	2
Side Marker Lamp, LH Front (Base)	Front RH side of vehicle	166	2
Side Marker Lamp, LH Front (Quad)	Front LH side of vehicle	166	3
Side Marker Lamp, RH Front (Quad)	Front RH side of vehicle	166	3
Speaker, Front	Top center of I/P	193	87
Speaker, Left Front	LH side of I/P	193	87
Speaker, Left Rear	LH rear side of vehicle	193	87
Speaker, Right Front	RH side of I/P	193	87
Speaker, Right Rear	RH side of vehicle	193	87
Starter Motor Under	RH side of engine	171	19
Starter Motor Lower	RH side of engine	172	22
Starter Motor Solenoid	Under RH side of engine	171	19
Starter Motor Solenoid	Lower RH side of engine	173	23
Stop Lamp Switch	Above brake pedal	169	13
Tailgate Window Motor (Utility)	RH center of tailgate	189	72
Tailgate Window Motor (Suburban)	LH center of tailgate	189	73
Tailgate Window Switch (Key Operated)	Center of tailgate	189	72
		189	73

COMPONENT LOCATION		Page	Figure
Taillamp, LH	Rear LH side of vehicle	168	8
		168	9
Taillamp, RH	Rear RH side of vehicle	168	8
		168	9
Throttle Position Sensor (Diesel)	Front RH side of engine	171	22
Timer Relay	Below fuse block	190	74
Transfer Case Switch	Top of transfer case	182	51
Transmission Converter Clutch Solenoid	LH rear of transmission	177	38
Turn Signal Flasher	LH side of I/P, on fuse block	167	4
Turn Signal Switch	LH side of steering column	167	5
Underhood Lamp (Gasoline)	RH side of cowl	186	63
Underhood Lamp (Diesel)	LH inner fender well	186	62
Vehicle Speed Sensor	Rear of transfer case (4WD)	175	30
Vehicle Speed Sensor	Rear of transmission (2WD)	177	38
		191	79
Washer Motor	Engine compartment, LH fender	166	3
Water Temperature Sender	Front LH side of engine	175	28
Water in Fuel Indicator	In instrument cluster	181	49
Water in Fuel Sensor	Engine compartment on cowl behind engine	172	22
Windshield Wiper Motor	Top LH side of cowl	178	40
Connectors:			
C100	Engine compartment, LH cowl	162	2
		166	3
		186	63
		167	4
		168	7
		175	28
		176	31
C100A	In engine compartment at LH inner fender well	186	62
		186	63
C101A	At underhood lamp	186	62
C103	At rear wheel anti-lock controller module	178	40
C103A	In lower LH side of engine compartment near cowl	190	74
C104	At brake pressure warning switch	178	40
C104A	At top center of transmission	175	30
C105	At output speed sensor	175	30
C106	Front of engine at generator	171	19
		172	22
		174	26
C106A	At cowl, above steering column	176	33
C107	At coolant temperature sensor	172	22
		173	23
		177	36
		177	37
		178	40
C107	At coolant temperature switch	172	22
C108	At cold advance glow plug inhibit relay	175	28
C109	At coil	174	26
C110	At glow plug #2	172	22
C111	At glow plug #4	172	22
C112	At glow plug #6	172	22

COMPONENT LOCATION		Page	Figure
C113	At glow plug #8	172	22
C114	Top of engine near coil	174	26
C115	At fuel pump oil pressure switch	173	24
		174	26
		175	28
		178	40
C118	At backup lamp switch	191	79
C120	At glow plug #1	175	28
C121	At glow plug #3	175	28
C122	At glow plug #5	175	28
C123	At glow plug #7	175	28
C124	At electronic spark timing module	174	26
C125	Engine compartment, near LH front of cowl	166	2
		166	3
		167	4
C126	LH inner fender, at daytime running lamp relay	166	1
C127	In engine compartment at LH side of cowl	187	66
C128	In engine compartment at LH side of cowl	187	66
C129	At fuel injector 1	173	23
		174	25
		177	36
		178	39
C130	At fuel injector 2	173	23
		174	25
		177	36
		178	39
C131	At EVRV solenoid	169	13
		177	36
		178	40
C132	At ESC hybrid function	177	36
		178	39
C133	At LH side of cowl panel	177	37
C134	At TP sensor	172	22
C134	At throttle position sensor	173	23
		174	25
		177	36
		178	39
C135	At map sensor	172	22
		177	36
		178	39
C136	At top center of transmission	174	26
		175	30
C137	Front LH side marker lamp	166	2
C138	Front LH high-low headlamp	166	2
C139	Front LH park lamp	166	2
C140	Front LH turn lamp	166	2
C141	At vehicle speed sensor	191	79
C142	At LH horn	170	17
C143	At RH horn	170	17
C144	Front RH high-low headlamp	166	2
C145	Front RH side marker lamp	166	2
C146	Front park lamp	166	2

COMPONENT LOCATION		Page	Figure
C147	Front RH turn lamp	166	2
C148	At fuel pump relay	173	23
		174	25
		177	36
		178	39
C149 (Quad)	Front LH low beam headlamp	166	3
C150 (Quad)	Front LH high beam headlamp	166	3
C151 (Quad)	Front LH turn lamp	166	3
C152 (Quad)	Front LH park lamp	166	3
C153 (Quad)	Front LH side marker lamp	166	3
	relay	167	4
C154 (Quad)	Front RH low beam headlamp	166	3
C155 (Quad)	Front RH high beam headlamp	166	3
C156 (Quad)	Front RH turn lamp	166	3
C157 (Quad)	Front RH park lamp	166	3
C159	At knock sensor	173	23
		174	25
		177	36
		178	39
C161	At idle air control actuator	173	23
		174	25
		177	36
		178	39
C162	Engine compartment, near battery junction block	179	42
C163	At engine temperature sender	173	24
		175	28
C165	At A/C compressor	179	42
C166	At clutch switch	183	54
C166	Near steering column	183	55
C167	At cold advance control solenoid	172	22
C168	At glow plug controller	175	28
C169	At transmission converter clutch solenoid	177	38
C170	At auxiliary cooling fan temperature switch	173	23
		174	25
		176	31
C171	At fast idle solenoid	172	22
C172	At rear LH side of transmission	175	30
C173	At input speed sensor	175	30
C174	At EGR valve	175	28
C175	At engine speed sensor	172	22
C177	At high blower relay	179	43
C178	At evaporator pressure control switch	179	43
C179	At front resistor block	179	43
C180	At front blower motor	179	43
C181	At rear resistor block	180	45
C184	At cruise control servo	184	56
		184	57
C185	In cruise harness near servo	184	56
		184	57
C187	At windshield washer bottle	184	3
C188	At windshield wiper motor	178	40
C189	At windshield wiper motor	178	40

		Page	Figure
C190	At auxiliary cooling fan relay	176	32
C191	At auxiliary cooling fan	176	32
C192	Engine compartment, LH side near cowl	176	32
C193	At EGR dump valve	175	28
C194	At EPR valve	175	28
C195	At EGR solenoid	174	25
C196	At fuel heater	172	22
C197	At water in fuel sensor	172	22
C198	At cold advance/fast idle temperature switch	172	22
C199	At fuel shut off solenoid	172	22
C200	Under I/P near ECM/PCM/TCM	171	19
		173	23
		174	25
		175	29
		177	36
		178	39
C202	At light switch	167	4
		170	15
		192	86
C203	LH side of I/P	167	4
C204	At radio	192	86
C207	At pulse wiper module	191	78
C208	Near fuse block	185	60
C212	Under LH side of I/P near fuse block	190	74
C214	At pulse wiper module	191	78
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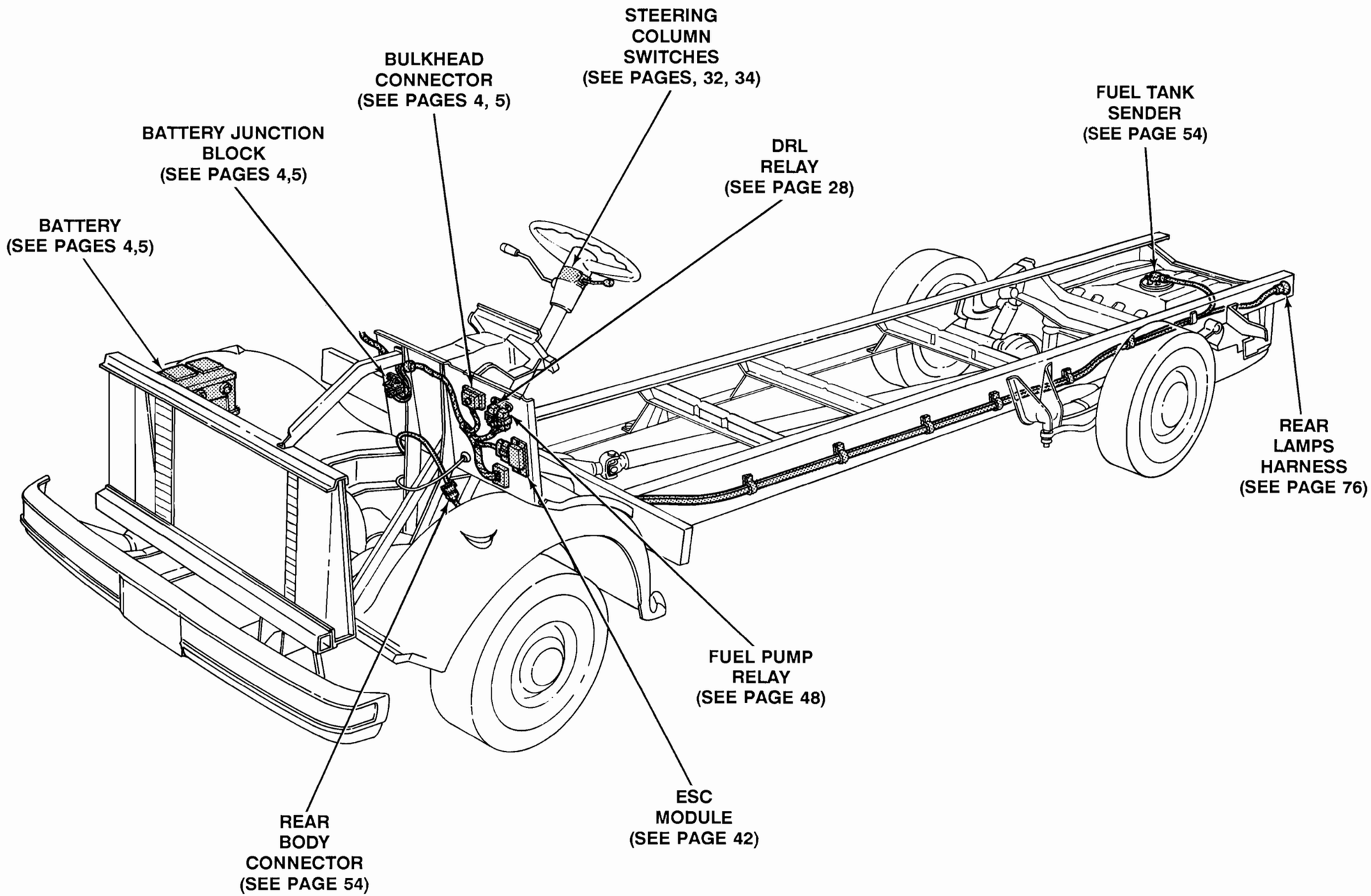
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SECTION B

P MODEL (COMMERCIAL)



B-2 PHANTOM VIEW

SYMPTOMS INDEX

SYMPTOM — **PAGE**

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- Alarm will not sound B-73
- Alarm will not shut off B-73

DIESEL ENGINE FUEL CONTROLS
- Fuel heater does not operate B-62
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GAGES AND INDICATORS
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- Fuel gage is inaccurate B-66
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GLOW PLUGS
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HEADLAMPS
- Headlamps do not illuminate high or low beams - both sides B-22
- Low beam lamp(s) do not operate B-22
- High beam lamp(s) do not operate B-22

HEADLAMPS (WITH DRL)
- Headlamps do not illuminate high or low beams - both sides B-25
- Low beam lamp(s) do not operate B-25
- High beam lamp(s) do not operate B-26
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PARK, MARKER AND HAZARD LAMPS
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- Hazard warning lamps do not operate B-30
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- Rear marker lamp(s) do not operate B-30

REAR EXTERIOR LAMPS
- None of the rear lamps operate B-75
- Backup lamps do not operate B-75

START AND CHARGE
- Starter solenoid clicks, engine does not crank or cranks slowly B-39
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- Battery is undercharged or overcharged B-39

TURN LAMPS
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- Turn signals do not operate on one side B-33
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WIPER/WASHER
- Wipers do not operate in any mode B-37
- Wipers do not operate in HI B-37
- Wipers do not operate in LO B-37
- Washer motor does not operate B-37
- Washer motor does not shut off B-37

RPO CODES

B3D - SCHOOL BUS EQUIPMENT

BATTERY

2-32.0 BLK

1-19.0 BLK

1-19.0 BLK

1-32.0 BLK (B3D ONLY)

STARTER MOTOR

6-5.0 PPL

2-3.0 RST (FUSIBLE LINK)

2-13.0 RED (B3D ONLY)

S192

S198

2-8.0 RED

2-1.0 RST (FUSIBLE LINK)

S199

BATTERY JUNCTION BLOCK

2-5.0 RST (FUSIBLE LINK) (B3D ONLY)

2-2.0 RST (FUSIBLE LINK)

S197

2-5.0 RED

GT104
8917053

2-13.0 RED (B3D)

BODY BUILDER 100 AMP JUNCTION BLOCK (B3D ONLY)

COWL

S207

6-3.0 PPL

3-5.0 PNK

I/P

C100
12020184

2-3.0 RED

2-5.0 RED

S208
(SEE PAGE 70)

39-.8 PNK/BLK

C100
12020183

3-5.0 PNK

S111
(SEE PAGE 46)

GENERATOR

C106
12045896

2-8.0 RED

ENGINE GROUND G111

1-19.0 BLK

SHEET METAL GROUND G110

6-5.0 PPL

2-32.0 BLK

IGNITION COIL
(SEE PAGE 42)

ENGINE

39-.8 PNK/BLK

3-5.0 PNK

I/P CLUSTER
(SEE PAGE 70)

6-3.0 PPL

5-3.0 YEL

CLUTCH START SWITCH

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

2-5.0 RED

C298
1201966

C299
6294641

4-5.0 BRN

300-5.0 ORN

2-3.0 RED

HEADLAMP SWITCH

PANEL DIMMER SWITCH

C297
12020030

C209
12020029

S205

9-1.0 BRN

300-5.0 ORN

2-5.0 RED

6-3.0 PPL

3-5.0 PNK

2-5.0 RED

S206

4-5.0 BRN

44

DOME

OFF

PARK

HEAD

CIRCUIT BREAKER 25 AMP

LIGHT SWITCH

HTR 25 AMP

INSTR-LPS 5 AMP

44-1.0 DK GRN

4-5.0 BRN

300-5.0 ORN

2-5.0 RED

2-5.0 RED

ECM-BAT 10 AMP

ACC-RADIO 10 AMP

TAIL LPS 20 AMP

STOP-HAZ 15 AMP

INJ 7.5 AMP

ECM-CRNK 10 AMP

ALT 20 AMP

WIPER 25 AMP

CRNK 10 AMP

TURN-B/U 15 AMP

REAR

FRONT

FUSE BLOCK
12089776

SHUNT
15A HORN/DM
20A TAIL LPS
15A STOP-HAZ
5A INSTR-LPS
7.5A INJ
10A ECM-CRNK
20A ALT
15A TURN-B/U
20A GAUGES
25A HTR
10A AUX
15A FUS/PLR
10A TRANS
10A ACC-RADIO
25A WIPER
10A ECM-BAT
PWR

B-4 POWER DISTRIBUTION

GASOLINE ENGINES W/MAN TRANS

RPO CODES

B3D - SCHOOL BUS EQUIPMENT

POWER DISTRIBUTION B-5

GASOLINE ENGINE W/AUTO TRANS

RPO CODES

B3D - SCHOOL BUS EQUIPMENT

RH BATTERY

LH BATTERY

2-8.0 RED

1-50.0 BLK

1-32.0 BLK (B3D ONLY)

1-32.0 BLK

1-50.0 BLK (B3D ONLY)

2-3.0 BLK

2-13.0 RED (B3D ONLY)

GT104
8917053

2-13.0 RED (B3DONLY)

BODY BUILDER
100 AMP JUNCTION
BLOCK (B3D ONLY)

COWL

STARTER MOTOR

BATTERY JUNCTION BLOCK

2-1.0 RST (FUSIBLE LINK)

(B3D)

S192

S196

2-3.0 RST (FUSIBLE LINK)

S197

2-13.0 RED

2-3.0 RED

GLOW PLUG CONTROLLER

S195

C191

2-8.0 RED

906-1.0 PPL

C128
12015982

3-3.0 PNK

2-13.0 RED

2-3.0 RED

6-5.0 PPL

1-32.0 BLK

1-32.0 BLK (B3D ONLY)

1-50.0 BLK (B3D ONLY)

2-3.0 BLK

2-3.0 RED

6-3.0 PPL

3-5.0 PNK

C100
12020184

39-.8 PNK/BLK

2-5.0 RED

S208
(SEE PAGE 70)

39-.8 PNK/BLK

I/P CLUSTER
(SEE PAGE 70)

S206

3-5.0 PNK

2-5.0 RED

S205

6-3.0 PPL

5-3.0 YEL

CLUTCH START SWITCH

C219
8911921

C298
1201966

C299
6294641

4-5.0 BRN

300-5.0 ORN

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

PANEL DIMMER SWITCH

C297
12020030

HEADLAMP SWITCH

2-3.0 RED

C209
12020029

9-1.0 BRN

300-5.0 ORN

4-5.0 BRN

44

DOME

OFF

PARK

HEAD

CIRCUIT BREAKER 25 AMP

LIGHT SWITCH

ENGINE GROUND LH CYLINDER HEAD G113

S115

39-.8 PNK/BLK

C107
12045896

GENERATOR

2-13.0 RED

ENGINE GROUND RH CYLINDER HEAD G113

SHEET METAL GROUND G110

S113

3-3.0 PNK

FUEL SHUT OFF VALVE
(SEE PAGE 63)

BAT

ACC

IGN

HTR

PWR

SHUNT

20A GAUGES

15A HORN/DM

5A INSTR-LPS

TRANS

ECM-BAT

20A TAIL LPS

7.5A INJ

25A HTR

10A ACC-RADIO

15A STOP-HAZ

10A ECM-CRNK

AUX

25A WIPER

20A ALT

10A CRNK

15A TURN-B/U

FUS/PLR

FRONT

FUSE BLOCK
12089776

HTR
25 AMP

INSTR-LPS
5 AMP

GAUGES
20 AMP

ECM-BAT
10 AMP

ACC-RADIO
10 AMP

HORN/DM
15 AMP

TAIL LPS
20 AMP

STOP-HAZ
15 AMP

WIPER
25 AMP

CRNK
10 AMP

INJ
7.5 AMP

TURN-B/U
15 AMP

ALT
20 AMP

ECM-CRNK
10 AMP

REAR

4-5.0 BRN

300-5.0 ORN

2-3.0 RED

B-6 POWER DISTRIBUTION

DIESEL ENGINE W/MAN TRANS

RPO CODES

B3D - SCHOOL BUS EQUIPMENT

RH BATTERY

LH BATTERY

2-8.0 RED

1-50.0 BLK

1-32.0 BLK (B3D)

1-32.0 BLK

1-50.0 BLK (B3D ONLY)

2-3.0 BLK

BATTERY JUNCTION BLOCK

STARTER MOTOR

2-1.0 RST (FUSIBLE LINK)

2-1.0 RST (FUSIBLE LINK)

2-13.0 RED

2-1.0 RST (FUSIBLE LINK)

2-3.0 RED

2-3.0 RST (FUSIBLE LINK)

S195

GLOW PLUG CONTROLLER

C191

2-8.0 RED

906-1.0 PPL

C128 12015982

3-3.0 PNK

2-13.0 RED

2-3.0 RED

6-5.0 PPL

1-32.0 BLK

1-32.0 BLK (B3D ONLY)

1-50.0 BLK

2-3.0 BLK

2-3.0 RED

S192

S196

S197

2-13.0 RED (B3D)

COWL

GT104 8917053

2-13.0 RED (B3D)

BODY BUILDER 100 AMP JUNCTION BLOCK (B3D ONLY)

6-3.0 PPL

3-5.0 PNK

C100 12020184

39-.8 PNK/BLK

2-5.0 RED

S208 (SEE PAGE 70)

39-.8 PNK/BLK

I/P CLUSTER (SEE PAGE 70)

3-5.0 PNK

2-5.0 RED

S206

S205

C298 1201966

C299 6294641

4-5.0 BRN

300-5.0 ORN

2-3.0 RED

PANEL DIMMER SWITCH

C297 12020030

HEADLAMP SWITCH

C209 12020029

9-1.0 BRN

300-5.0 ORN

S299

4-5.0 BRN

IGNITION SWITCH

START

RUN

OFF

LOCK

ACC

LIGHT SWITCH

DOME

CIRCUIT BREAKER 25 AMP

OFF

PARK

HEAD

OFF

PARK

HEAD

ENGINE GROUND LH CYLINDER HEAD G113

S115

39-.8 PNK/BLK

C107 12045896

GENERATOR

2-13.0 RED

ENGINE GROUND RH CYLINDER HEAD G113

SHEET METAL GROUND G110

S113

3-3.0 PNK

FUEL SHUT OFF VALVE (SEE PAGE 63)

FRONT

FUSE BLOCK 12089776

ECM-BAT 10 AMP

ACC-RADIO 10 AMP

WIPER 25 AMP

GAUGES 20 AMP

INJ 7.5 AMP

TURN-B/U 15 AMP

ALT 20 AMP

ECM-CRNK 10 AMP

INJ 7.5 AMP

HTR 25 AMP

INSTR-LPS 5 AMP

HORN/DM 15 AMP

TAIL LPS 20 AMP

STOP-HAZ 15 AMP

REAR

POWER DISTRIBUTION B-7

DIESEL ENGINE W/AUTO TRANS

RPO CODES
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE MT8 - MAN TRANS, 5-SPD., WITH OVERDRIVE

RH BATTERY

LH BATTERY

2-8.0 RED

1-50.0 BLK

1-32.0 BLK (B3D)

BATTERY JUNCTION BLOCK

STARTER MOTOR

(B3D) 2-1.0 RST (FUSIBLE LINK)

2-1.0 RST (FUSIBLE LINK)

2-13.0 RED

2-1.0 RST (FUSIBLE LINK)

2-3.0 RED

S197

2-3.0 RST (FUSIBLE LINK)

S195

2-8.0 RED

GLOW PLUG CONTROLLER

906-1.0 PPL

2-3.0 RED

2-13.0 RED

C128
12015982

3-3.0 PNK

S115

39-.8 PNK/BLK

2-13.0 RED

GENERATOR

C107
12045896

1-32.0 BLK

1-32.0 BLK

1-50.0 BLK (B3D)

2-3.0 BLK

6-5.0 PPL

1-32.0 BLK

1-32.0 BLK (B3D)

2-3.0 BLK

S192

S196

2-13.0 RED (B3D)

2-3.0 RED

ENGINE GROUND LH CYLINDER HEAD G113

ENGINE GROUND RH CYLINDER HEAD G112

SHEET METAL GROUND G110

BODY BUILDER 100 AMP JUNCTION BLOCK
(B3D)

2-13.0 RED

GT104
8917053

6-3.0 PPL

3-3.0 PNK

COWL

1/P

C100
12020184

39-.8 PNK/BLK

S208
(SEE PAGE 70)

39-.8 PNK/BLK

I/P CLUSTER
(SEE PAGE 70)

2-3.0 RED

S206

3-3.0 PNK

S205

2-3.0 RED

3-3.0 PNK

C299
12010966

S113

3-3.0 PNK

39-.8 PNK/BLK

ENGINE

C100
12020183

FUEL SHUT OFF VALVE
(SEE PAGE 63)

3-3.0 PNK

IGN
20 AMP

20 A

39

3

FUSE HOLDER
12010105

FUSE BLOCK
12052472

FRONT

INJECTION 7.5 AMP

ECM 10 AMP

IGN 20 AMP

ECM/FUEL PUMP 20 AMP

REAR

TOP

BOT

(MT1)

3-3.0 PNK

3-3.0 PNK

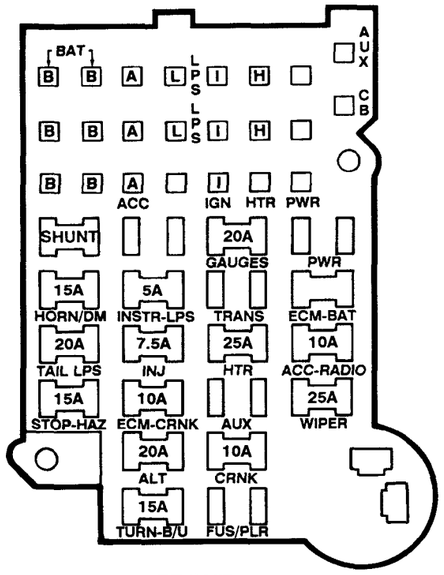
2-3.0 RED

B-8 POWER DISTRIBUTION

DIESEL ENGINE (DRIVEAWAY)

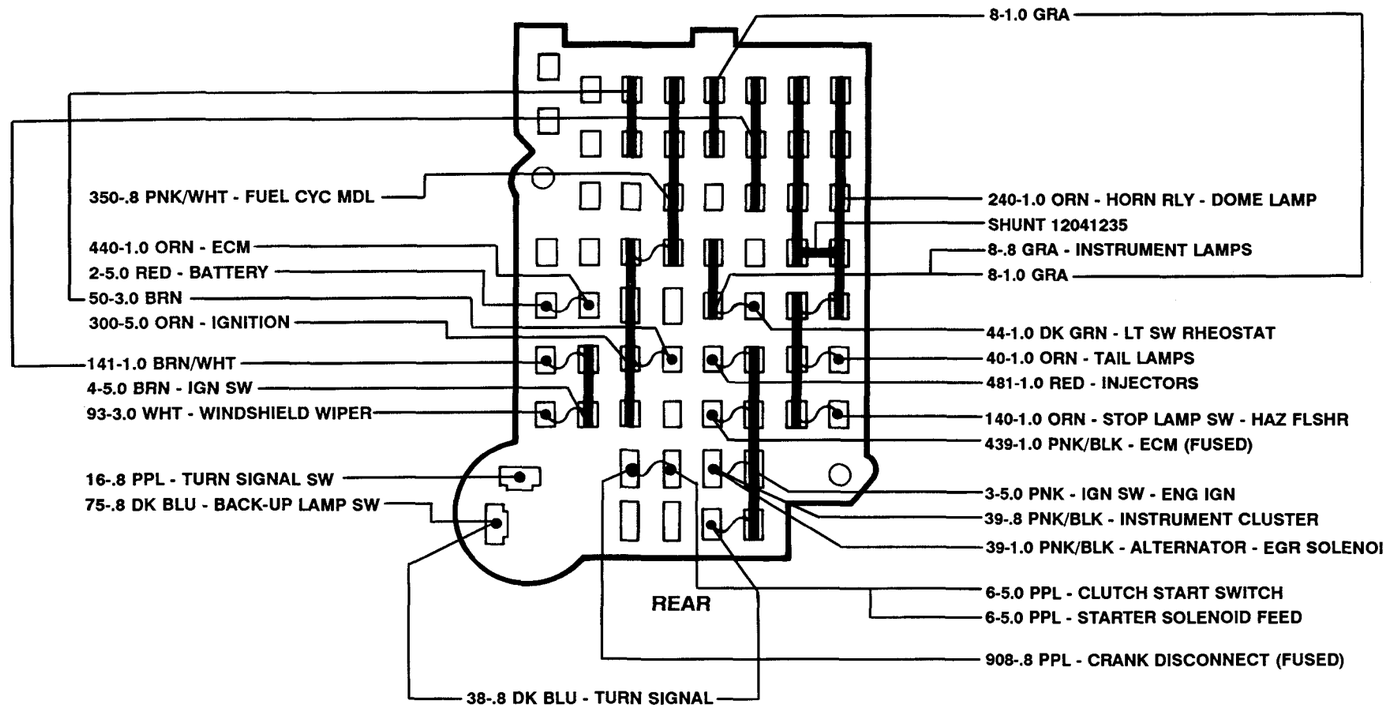
RPO CODES
B3D - SCHOOL BUS EQUIPMENT

2-32.0 BLK
1-19.0 BLK
BATTERY
1-19.0 BLK
1-32.0 BLK (B3D)
2-13.0 RED (B3D)
GT104
8917053
BODY BUILDER
100 AMP JUNCTION
BLOCK (B3D ONLY)
COWL
TEMPORARY RUN
IGNITION SWITCH
6-3.0 PPL
3-3.0 PNK
I/P
C298
12010966
3-3.0 PNK
6-5.0 PPL
2-3.0 RST
(FUSIBLE LINK)
2-13.0 RED
(B3D ONLY)
STARTER
MOTOR
S192
S198
S205
3-3.0 PNK
2-5.0 RST
(FUSIBLE LINK)
(B3D ONLY)
S199
2-1.0 RST
(FUSIBLE LINK)
BATTERY
JUNCTION
BLOCK
C100
12020184
39-.8 PNK/BLK
2-3.0 RED
2-3.0 RED
2-3.0 RED
S206
S208
(SEE PAGE 70)
39-.8 PNK/BLK
I/P CLUSTER
(SEE PAGE 70)
2-3.0 RED
1-19.0 BLK
6-5.0 PPL
2-32.0 BLK
ENGINE
2-2.0 RST
(FUSIBLE LINK)
2-5.0 RED
S197
S111
(SEE PAGE 46)
C100
12020183
39-.8 PNK/BLK
3-3.0 PNK
3-3.0 PNK
3-3.0 PNK
3-3.0 PNK
2-3.0 RED
GENERATOR
C106
12045896
2-8.0 RED
39-.8 PNK/BLK
ECM
10 AMP
INJECTORS
7.5 AMP
IGN
20 AMP
ECM/FUEL
PUMP
20 AMP
FRONT
FUSE BLOCK
12052472
REAR
TOP
BOT
ENGINE
GROUND
G111
SHEET
METAL
GROUND
G110
IGNITION COIL
(SEE PAGE 42)



FRONT

12034359 - BLOCK MOLD
12089776 - PRINTED BLOCK



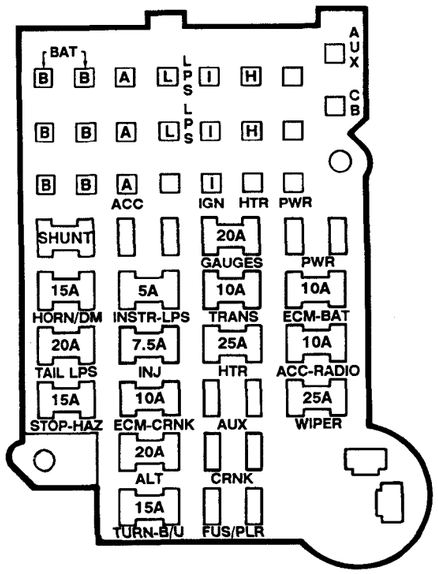
	COLOR	MALE CONN
A	BRN	12004887
B	BLK	12004886
H	GRN	12004885
I	NAT	12004888
L	BLU	12004884

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
ACC-RADIO	12004007	RED 10 AMP	HOT IN ACC OR RUN	RADIO ACCESSORIES
ALT	12004009	YELLOW 20 AMP	HOT IN RUN OR START	ALTERNATOR
CRNK	12004007	RED 10 AMP	HOT IN START	ELECTRONIC CONTROL MODULE CRANK CIRCUIT
ECM-BAT	12004007	RED 10 AMP	HOT AT ALL TIMES	ELECTRONIC CONTROL MODULE
ECM-CRNK	12004007	RED 10 AMP	HOT IN RUN OR START	ELECTRONIC CONTROL MODULE IGNITION 1
GAUGES	12004009	YELLOW 20 AMP	HOT IN RUN	PROVISIONS FOR GAGES
HORN-DM	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	PROVISIONS FOR HORN AND DOME LAMPS

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
HTR	12004010	WHITE 25 AMP	HOT IN RUN	HEATER
INJ	12004006	BRN 7.5 AMP	HOT IN RUN OR START	INJECTORS
INSTR-LPS	12004005	TAN 5 AMP	HOT W/ HEADLAMP IN PARK OR HEAD	INSTRUMENT PANEL LAMPS
STOP-HAZ	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	STOP LAMPS HAZARD FLASHER
TAIL LPS	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAIL LAMPS
TURN-B/U	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACK-UP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS

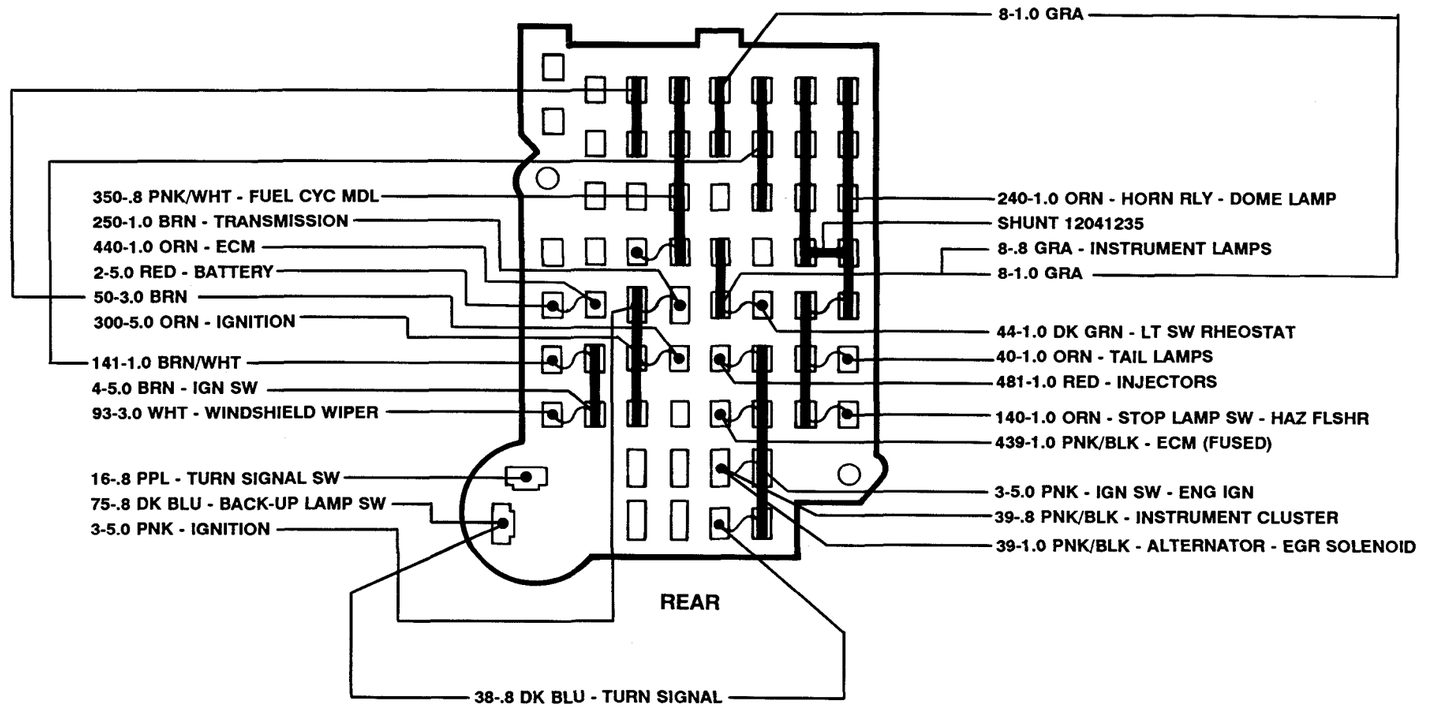
B-10 FUSE BLOCK

GASOLINE ENGINE W/MAN TRANS



FRONT

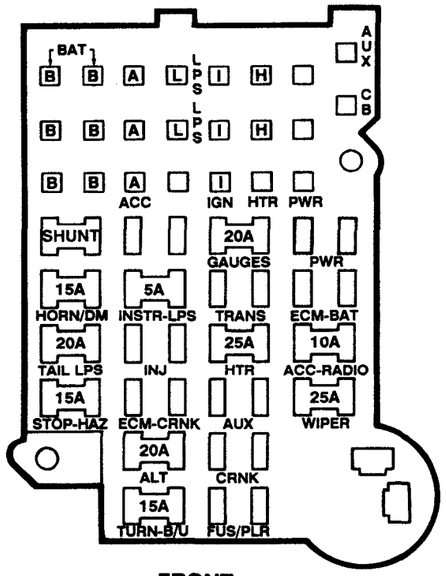
12034359 - BLOCK MOLD
12089776 - PRINTED BLOCK



	COLOR	MALE CONN
A	BRN	12004887
B	BLK	12004886
H	GRN	12004885
I	NAT	12004888
L	BLU	12004884

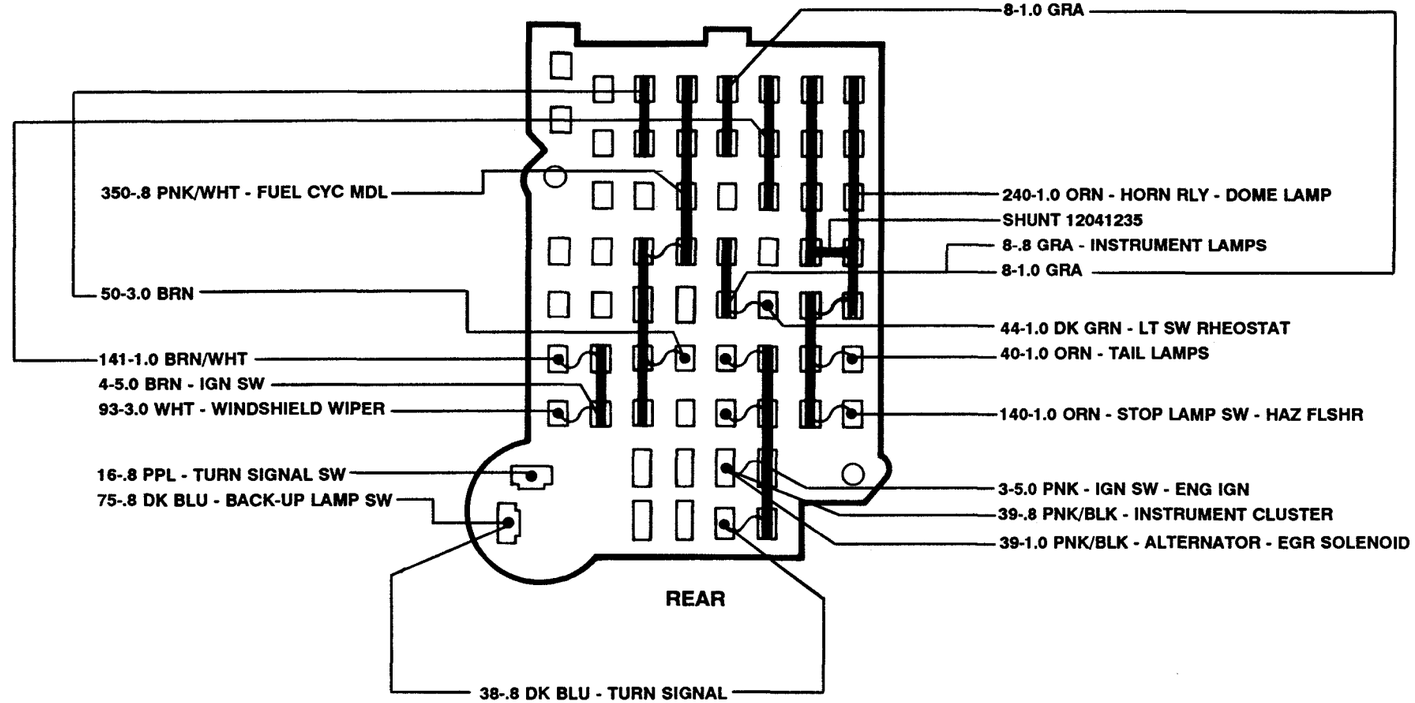
FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
ACC-RADIO	12004007	RED 10 AMP	HOT IN ACC OR RUN	RADIO ACCESSORIES
ALT	12004009	YELLOW 20 AMP	HOT IN RUN OR START	ALTERNATOR
ECM-BAT	12004007	RED 10 AMP	HOT AT ALL TIMES	ELECTRONIC CONTROL MODULE
ECM-CRNK	12004007	RED 10 AMP	HOT IN RUN OR START	ELECTRONIC CONTROL MODULE IGNITION 1
GAUGES	12004009	YELLOW 20 AMP	HOT IN RUN	PROVISIONS FOR GAGES
HORN-DM	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	PROVISIONS FOR HORN AND DOME LAMPS
HTR	12004010	WHITE 25 AMP	HOT IN RUN	HEATER

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
INJ	12004006	BRN 7.5 AMP	HOT IN RUN OR START	INJECTORS
INSTR-LPS	12004005	TAN 5 AMP	HOT W/ HEADLAMP IN PARK OR HEAD	INSTRUMENT PANEL LAMPS
STOP-HAZ	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	STOP LAMPS HAZARD FLASHER
TAIL LPS	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAIL LAMPS
TRANS	12004007	RED 10 AMP	HOT IN RUN OR START	TRANSMISSION
TURN-B/U	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACK-UP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS



FRONT

12034359 - BLOCK MOLD
12089774 - PRINTED BLOCK



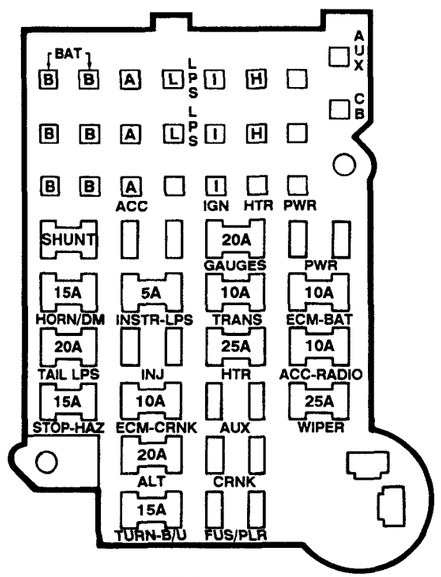
	COLOR	MALE CONN
A	BRN	12004887
B	BLK	12004886
H	GRN	12004885
I	NAT	12004888
L	BLU	12004884

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
ACC-RADIO	12004007	RED 10 AMP	HOT IN ACC OR RUN	RADIO ACCESSORIES
ALT	12004009	YELLOW 20 AMP	HOT IN RUN OR START	ALTERNATOR
GAUGES	12004009	YELLOW 20 AMP	HOT IN RUN	PROVISIONS FOR GAGES
HORN-DM	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	PROVISIONS FOR HORN AND DOME LAMPS
HTR	12004010	WHITE 25 AMP	HOT IN RUN	HEATER

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
INSTR-LPS	12004005	TAN 5 AMP	HOT W/ HEADLAMP IN PARK OR HEAD	INSTRUMENT PANEL LAMPS
STOP-HAZ	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	STOP LAMPS HAZARD FLASHER
TAIL LPS	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAIL LAMPS
TURN-B/U	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACK-UP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS

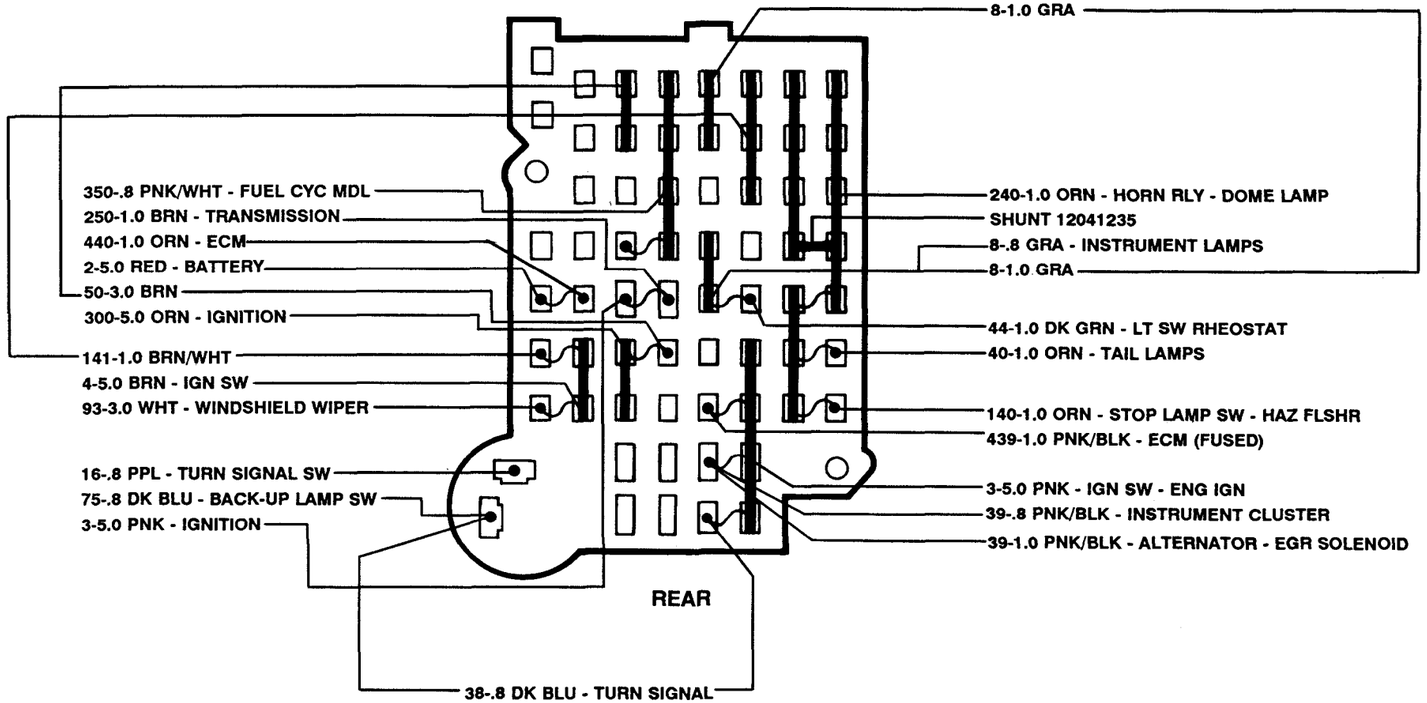
B-12 FUSE BLOCK

DIESEL ENGINE W/MAN TRANS



FRONT

12034359 - BLOCK MOLD
12089776 - PRINTED BLOCK



REAR

	COLOR	MALE CONN
A	BRN	12004887
B	BLK	12004886
H	GRN	12004885
I	NAT	12004888
L	BLU	12004884

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
ACC-RADIO	12004007	RED 10 AMP	HOT IN ACC OR RUN	RADIO ACCESSORIES
ALT	12004009	YELLOW 20 AMP	HOT IN RUN OR START	ALTERNATOR
ECM-BAT	12004007	RED 10 AMP	HOT AT ALL TIMES	ELECTRONIC CONTROL MODULE
ECM-CRNK	12004007	RED 10 AMP	HOT IN RUN OR START	ELECTRONIC CONTROL MODULE IGNITION 1
GAUGES	12004009	YELLOW 20 AMP	HOT IN RUN	PROVISIONS FOR GAGES
HORN-DM	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	PROVISIONS FOR HORN AND DOME LAMPS

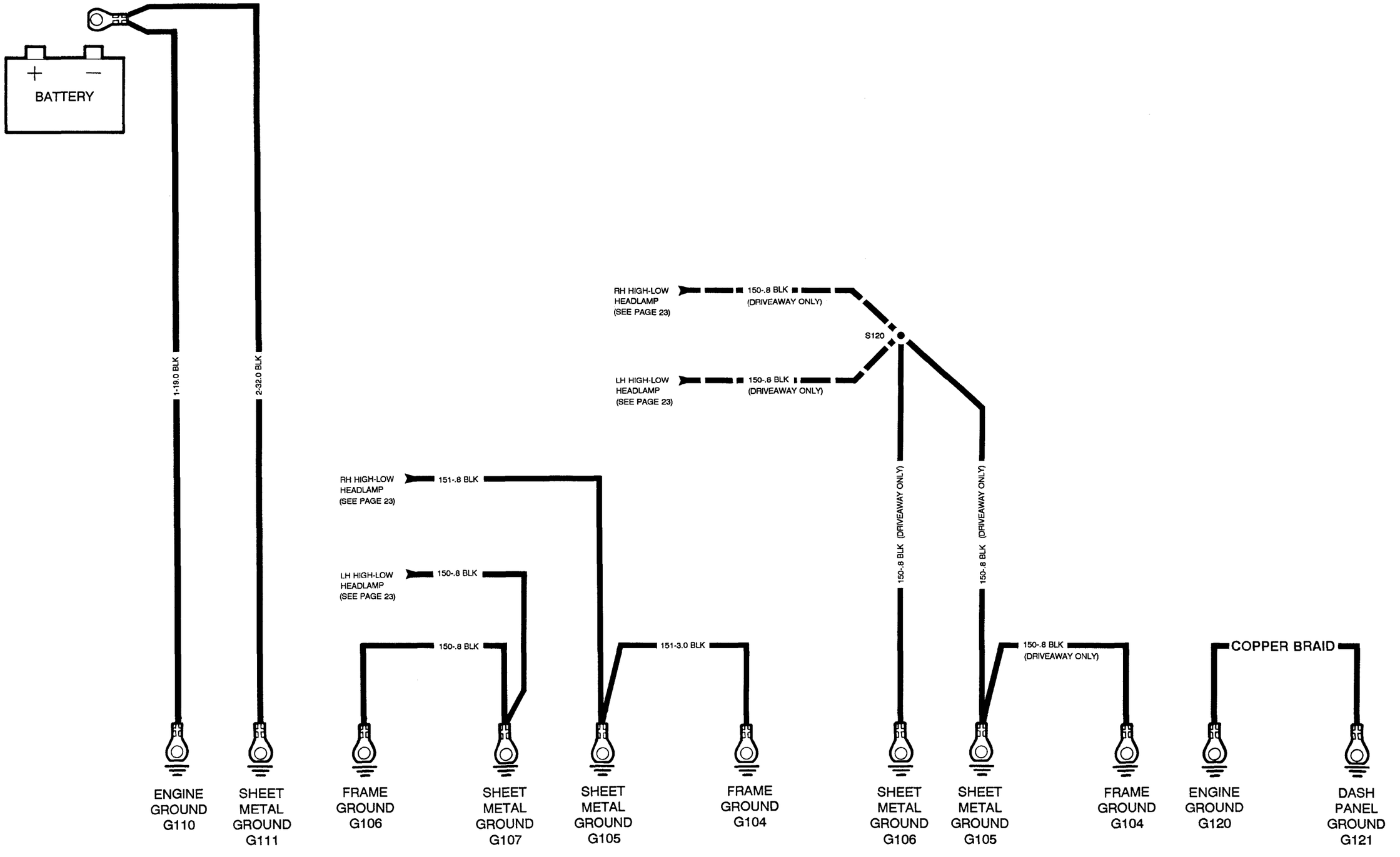
FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
HTR	12004010	WHITE 25 AMP	HOT IN RUN	HEATER
INSTR-LPS	12004005	TAN 5 AMP	HOT W/ HEADLAMP IN PARK OR HEAD	INSTRUMENT PANEL LAMPS
STOP-HAZ	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	STOP LAMPS HAZARD FLASHER
TRANS	142004007	RED 10 AMP	HOT IN RUN OR START	TRANSMISSION
TAIL LPS	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAIL LAMPS
TURN-B/U	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACK-UP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS

LAMP BULB DATA

AC Type Guide Lamps are recommended when replacement becomes necessary.

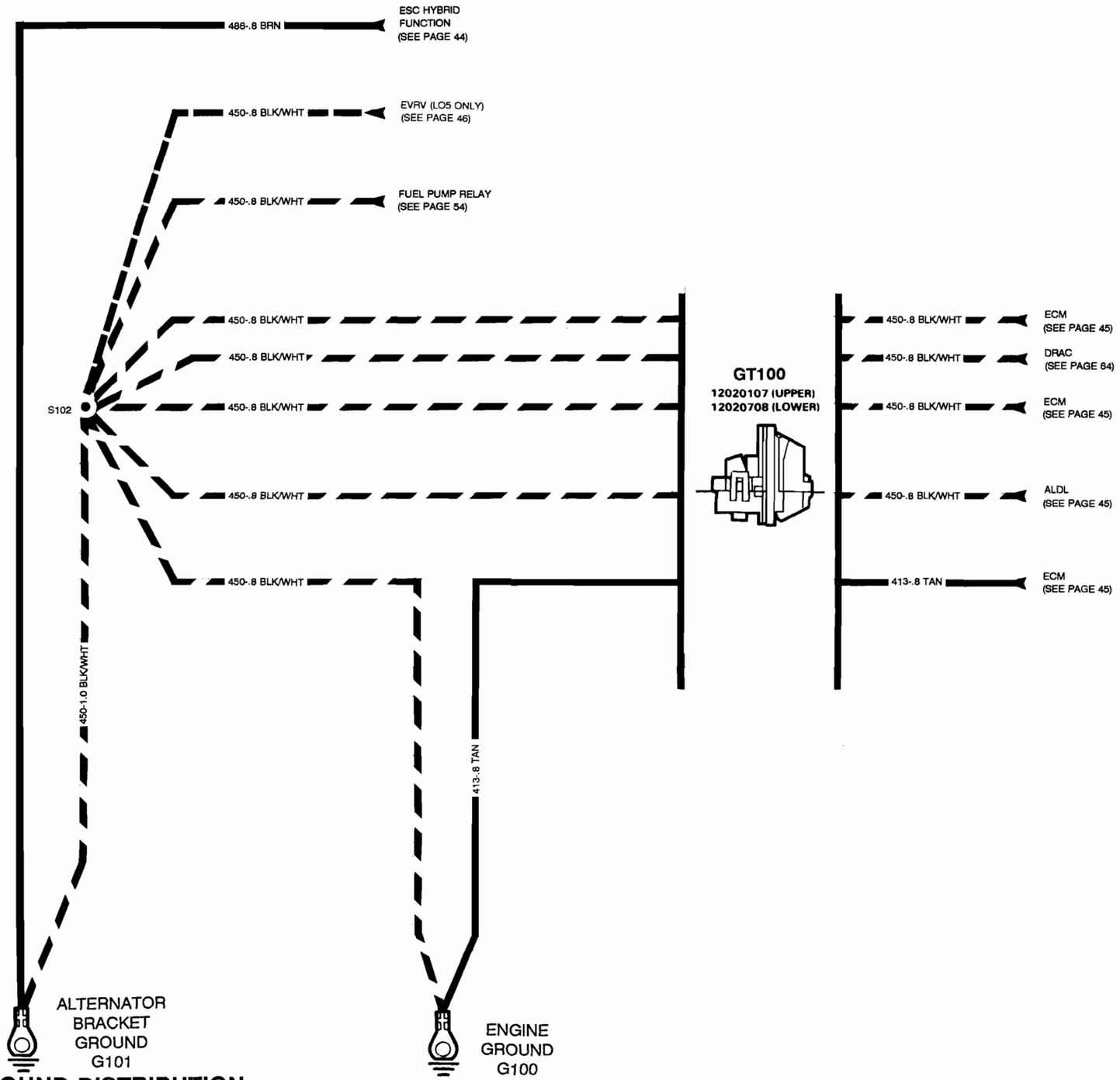
Lamp Usage	Quantity	Trade No.	Power Rating at 12V, Watts
Headlamp[1]	2	6014	50/60 W
			Candle Power
Park and Signal Lamp[2]	2	2057	32-2
Tail and Stoplamp[3] (Union City Body Co.)	2	1157	32-3
Tail and Stoplamp[2] (Except Union City Body Co.)	2	2057	32-2
Front Side Marker Lamp	2	194	2
Rear Side Marker Lamp	2	194	2
License Lamp	2	67	4
Backup Lamp[4]	--	--	--
Instrument Cluster Illumination Lamp	6	PC194	2
Turn Signal Indicator Lamp	2	PC194	2
Headlamp High Beam Indicator Lamp	1	PC74	.7
Service Brake Warning Indicator Lamp	1	PC74	.7
Park Brake Warning Indicator Lamp	1	PC74	.7
Transmission Control Illumination Lamp	1	73	.3
Low Coolant Indicator Lamp[5]	1	PC74	.7
Glow Plug Indicator Lamp[5]	1	PC74	.7
Water in Fuel Indicator Lamp[5]	1	PC74	.7
Service Engine Soon Indicator Lamp	1	PC74	.7
Trans Indicator Lamp[5]	1	PC74	.7
Fasten Safety Belts Indicator Lamp[6]	1	PC74	.7
Door Ajar Indicator Lamp	1	PC74	.7
Daytime Running Lights Indicator Lamp[7]	1	PC118	.7

1. Double filament sealed beam: 50W low beam, 60W high beam.
2. Double filament lamp: 32 CP high, 2 CP low.
3. Double filament lamp: 32 CP high, 3 CP low.
4. Refer to body manufacturer's specifications.
5. Diesel only.
6. When used by body manufacturer.
7. Canada only.

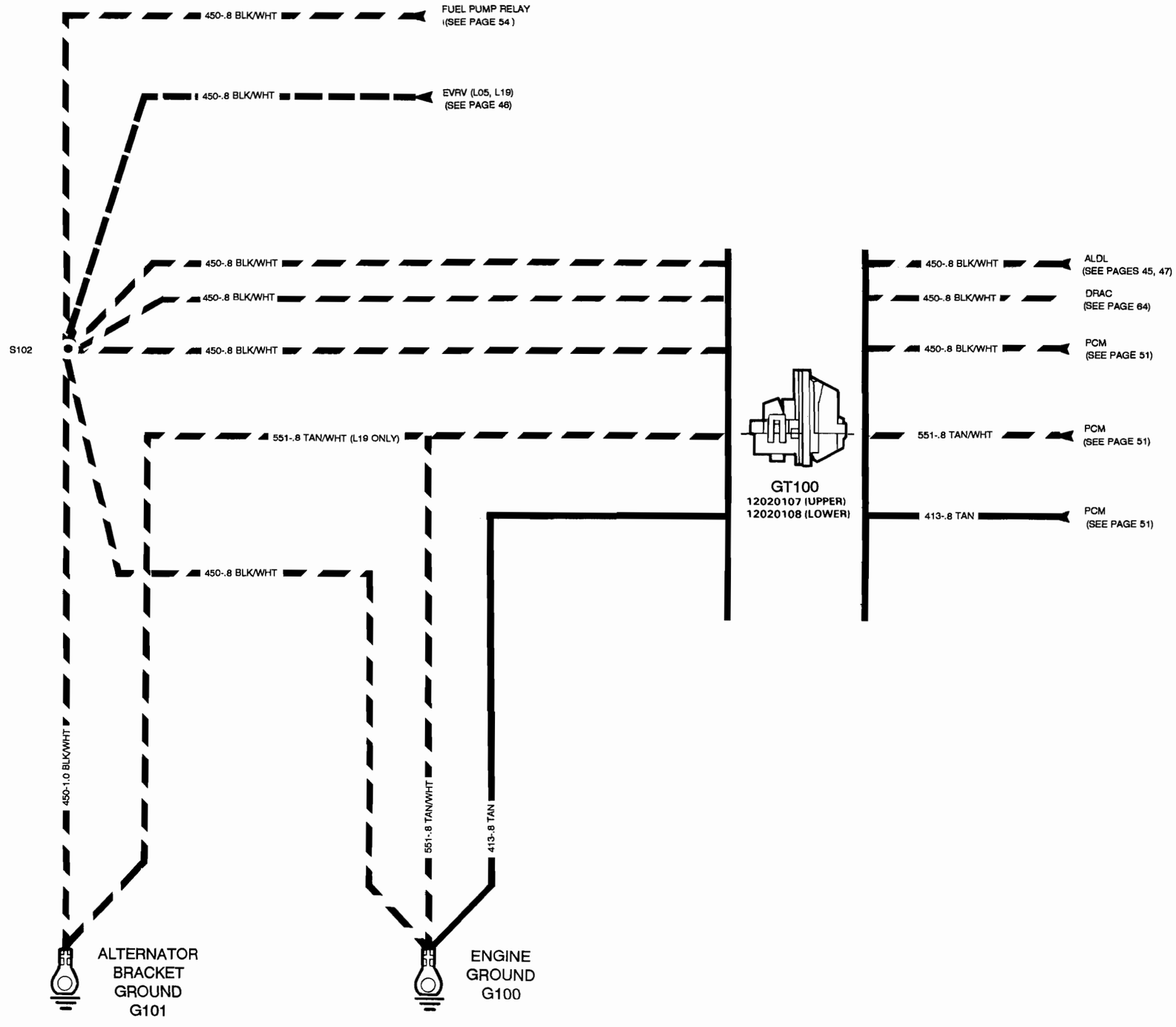


GROUND DISTRIBUTION B-15

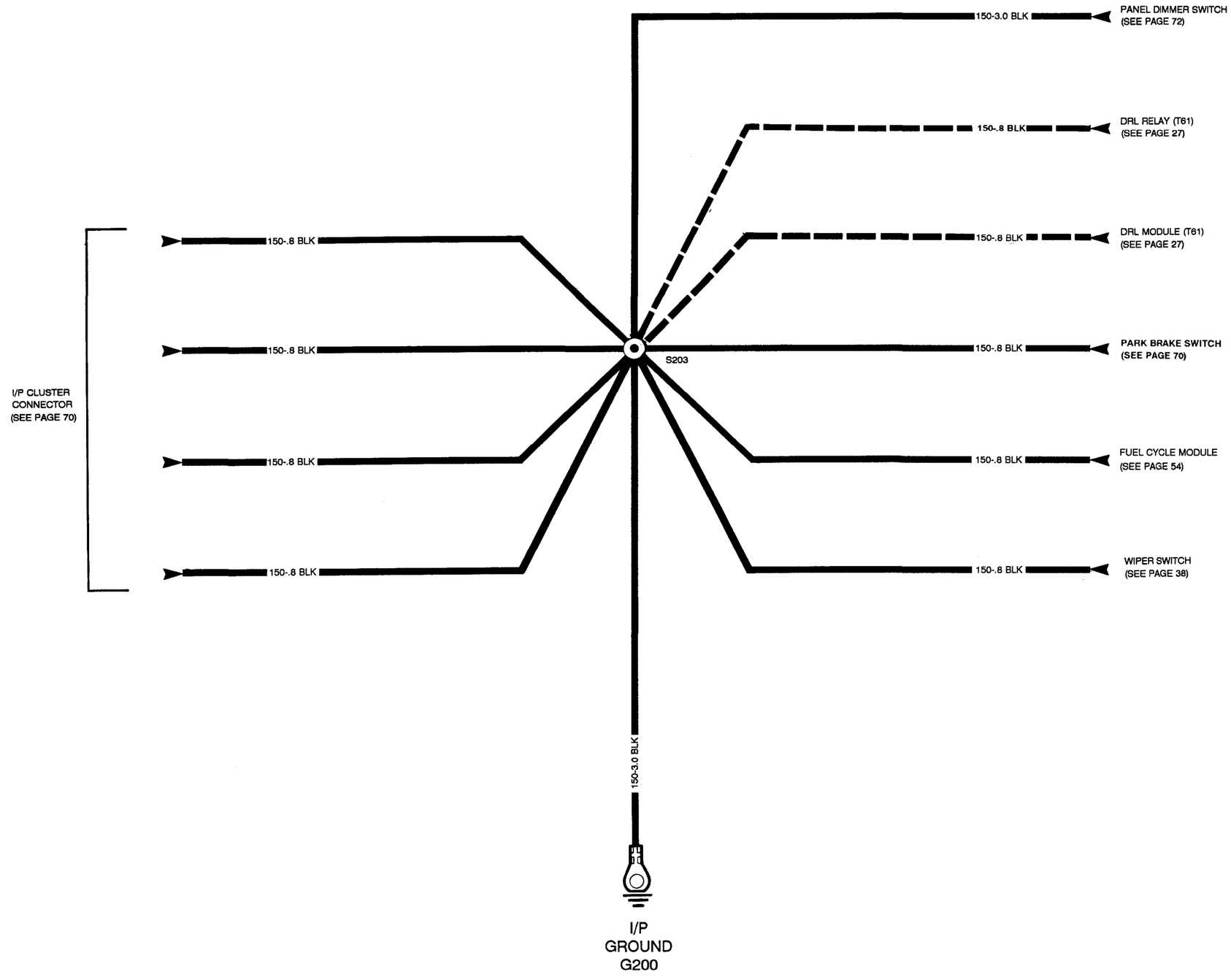
FORWARD LAMPS



B-16 GROUND DISTRIBUTION
GASOLINE ENGINE W/MAN TRANS


450-.8 BLK/WHT
FUEL PUMP RELAY
(SEE PAGE 54)
450-.8 BLK/WHT
EVRV (L05, L19)
(SEE PAGE 46)
S102
450-.8 BLK/WHT
450-.8 BLK/WHT
450-.8 BLK/WHT
551-.8 TAN/WHT (L19 ONLY)
450-.8 BLK/WHT
450-1.0 BLK/WHT
551-.8 TAN/WHT
413-.8 TAN
GT100
12020107 (UPPER)
12020108 (LOWER)
450-.8 BLK/WHT
ALDL
(SEE PAGES 45, 47)
450-.8 BLK/WHT
DRAC
(SEE PAGE 64)
450-.8 BLK/WHT
PCM
(SEE PAGE 51)
551-.8 TAN/WHT
PCM
(SEE PAGE 51)
413-.8 TAN
PCM
(SEE PAGE 51)
ALTERNATOR
BRACKET
GROUND
G101
ENGINE
GROUND
G100

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K T61 - CANADIAN DAYTIME RUNNING LAMPS

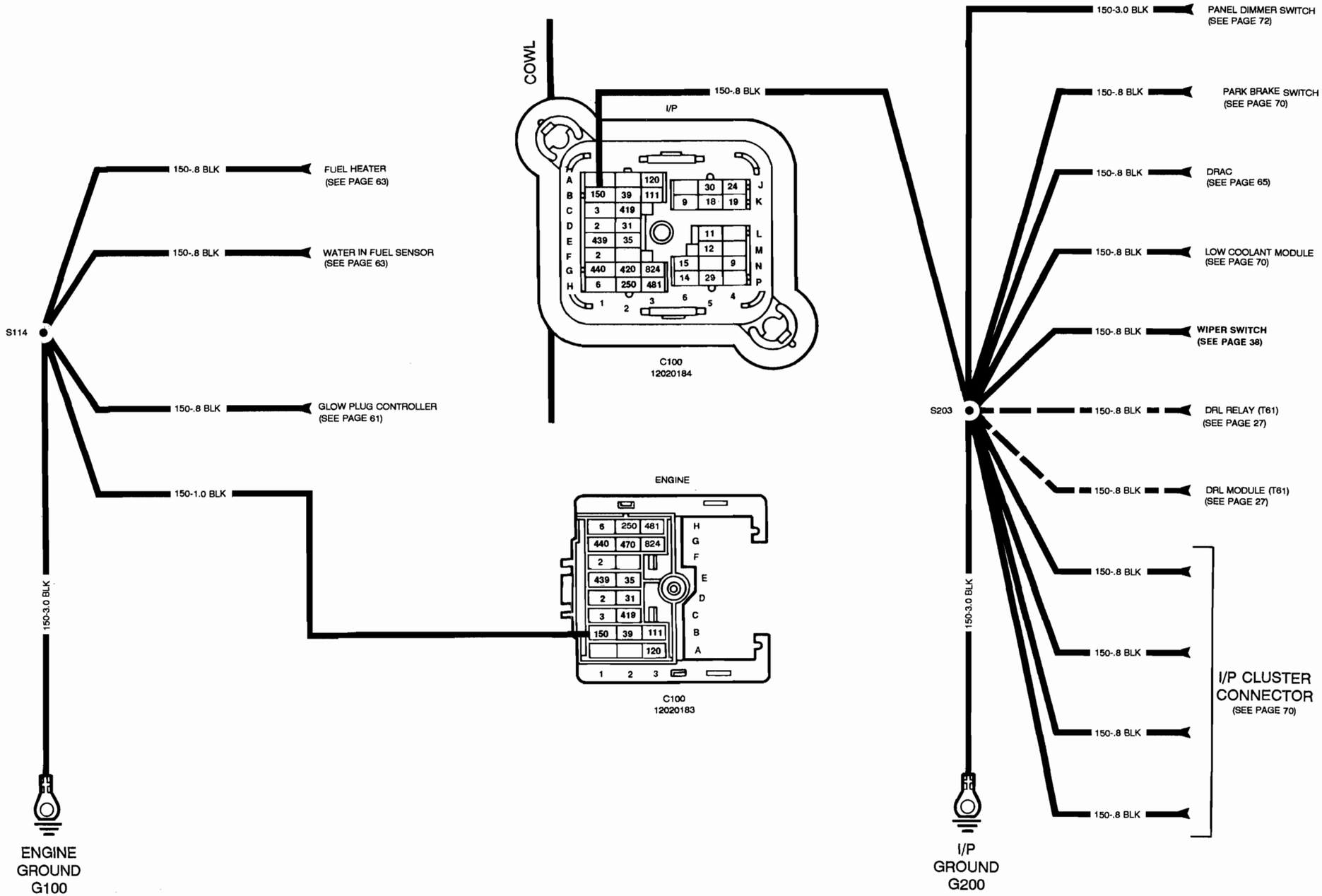


B-18 GROUND DISTRIBUTION

GASOLINE ENGINE

RPO CODES

T61 - CANADIAN DAYTIME RUNNING LAMPS



GROUND DISTRIBUTION B-19

DIESEL W/MAN TRANS

RPO CODES

T61 - CANADIAN DAYTIME RUNNING LAMPS

551-.8 TAN/WHT

450-.8 BLK/WHT

150-.8 BLK

150-.8 BLK

GT100
12020107 (UPPER)
12020108 (LOWER)

551-.8 TAN/WHT — TCM (SEE PAGE 56)

450-.8 BLK/WHT — TCM (SEE PAGE 56)

150-.8 BLK — ALDL (SEE PAGE 57)

150-.8 BLK — DRAC (SEE PAGE 65)

150-.6 BLK — FUEL HEATER (SEE PAGE 63)

150-.8 BLK — WATER IN FUEL SENSOR (SEE PAGE 63)

S114

150-.8 BLK — GLOW PLUG CONTROLLER (SEE PAGE 61)

150-.8 BLK

150-3.0 BLK

C100
12020183

	3	2	1
A	120		
B	111	39	150
C		419	3
D		31	2
E		35	439
F			2
G		420	440
H	481	250	6

ENGINE

ENGINE GROUND G102

ENGINE GROUND G100

COWL

150-.8 BLK

C100
12010184

I/P

	1	2	3	6	5	4		
A							120	J
B	150	39	111				30 24	
C	3	419					9 18 19	K
D	2	31						
E	439	35					11	L
F	2						12	M
G	440	420					15 9	N
H	6	250	481				14 29	P

150-3.0 BLK — PANEL DIMMER SWITCH (SEE PAGE 72)

150-.8 BLK — PARK BRAKE SWITCH (SEE PAGE 70)

150-.8 BLK — LOW COOLANT WARNING MODULE (SEE PAGE 70)

150-.8 BLK — WIPER SWITCH (SEE PAGE 38)

150-.8 BLK — DRL RELAY (T61) (SEE PAGE 27)

S203

150-.8 BLK — DRL MODULE (T61) (SEE PAGE 27)

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

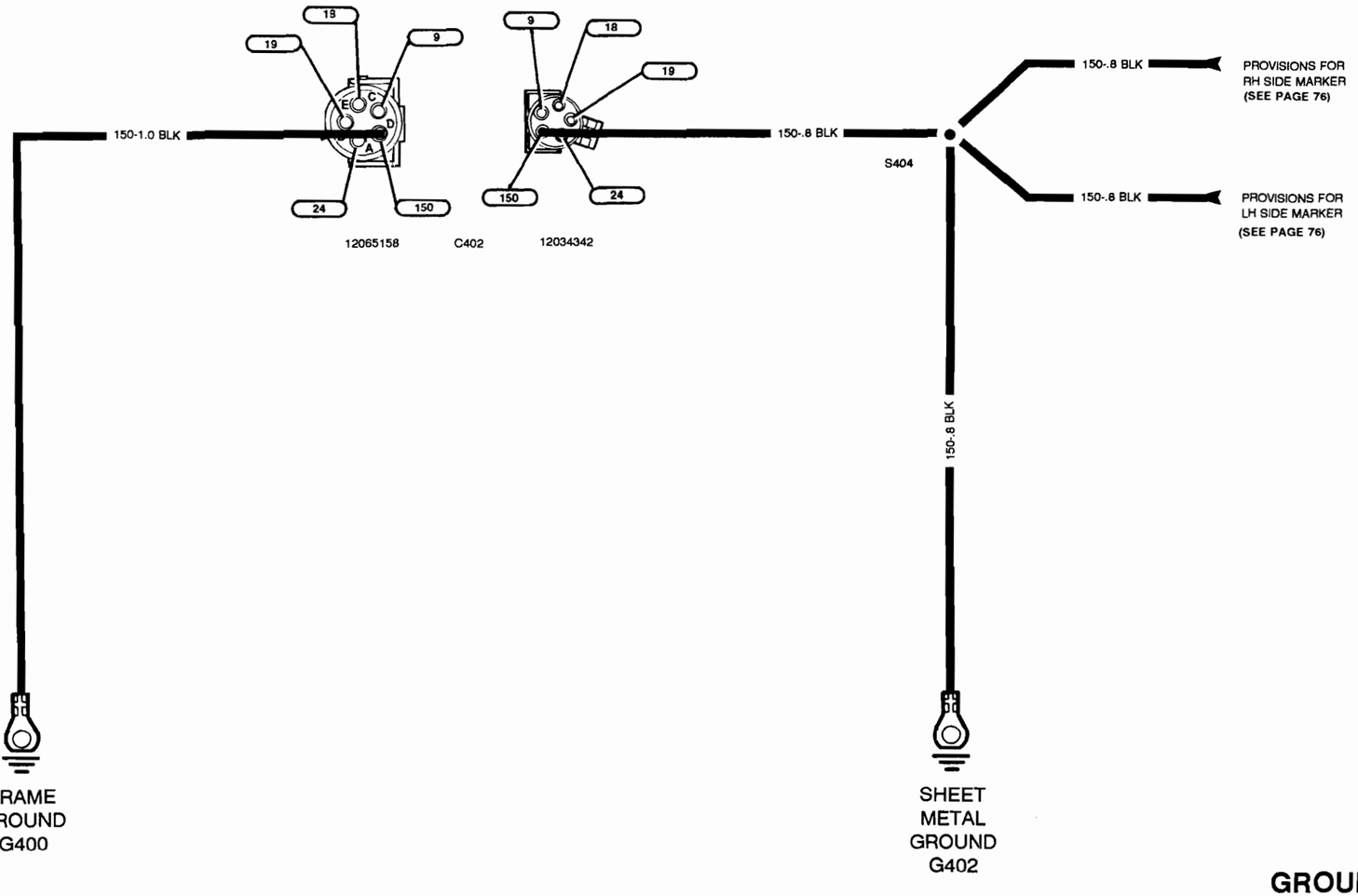
I/P CLUSTER CONNECTOR (SEE PAGE 70)

150-3.0 BLK

I/P GROUND G200

B-20 GROUND DISTRIBUTION

DIESEL W/AUTO TRANS


19
18
9
F
E
C
D
A
24
150
12065158
C402
12034342
9
18
19
150
24
150-1.0 BLK
150-.8 BLK
S404
150-.8 BLK
PROVISIONS FOR
RH SIDE MARKER
(SEE PAGE 76)
150-.8 BLK
PROVISIONS FOR
LH SIDE MARKER
(SEE PAGE 76)
150-.8 BLK
FRAME
GROUND
G400
SHEET
METAL
GROUND
G402

CIRCUIT OPERATION

Voltage is applied to the Light Switch at all times. The Light Switch includes a Self-Resetting Circuit Breaker. The Circuit Breaker opens when the Light Switch circuit draws too much current. When the Circuit Breaker opens, it interrupts the current flow. With no current flow, the Circuit Breaker cools off and resets automatically. When the Light Switch is in HEAD, the Dimmer Switch directs voltage to either the Low Beams or the High Beams. The HI Beam Indicator also receives voltage along with the High Beams.

DIAGNOSIS -- HEADLAMPS

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS -: BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from light switch connector C209 to battery junction block.
2. With the light switch on and the dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C210 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from headlamp dimmer switch connector C210 to connector C100.
	Test lamp does not light.	REPLACE headlamp dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn light switch ON and headlamp dimmer switch to LOW BEAM position. Connect a test lamp from TAN (12) wire at connector C100 to ground.	Test lamp does not light.	GO to step 2.
	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
2. Connect test lamp from TAN (12) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 3.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch connector C210 to connector C101.
3. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch connector C210 to light switch connector C209.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch to ON and dimmer switch to HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at connector C100 to ground.	Test lamp does not light.	GO to step 2.
	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
2. Place headlamp dimmer switch in HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 3.
	Test lamp lights.	LOCATE and REPAIR open in YEL (10) wire at headlamp dimmer switch connector C210 to light switch connector C209.
3. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire at headlamp dimmer switch connector C210 to light switch connector C209.
	Test lamp lights.	REPLACE headlamp dimmer switch.

JUNCTION BLOCK

2-1.0 RST (FUSIBLE LINK)

S197

2-5.0 RED

C100
12020183

I/P CLUSTER CONNECTOR

C205
12040744

C297
12020030

PANEL DIMMER SWITCH

9-.8 BRN

2-3.0 RED

C209
12020029

LIGHT SWITCH

CIRCUIT BREAKER 25 AMP

DOME

OFF

PARK

HEAD

LIGHT SWITCH

COWL

I/P

12-.8 TAN

11-1.0 LT GRN

C100
12020184

2-3.0 RED

10-1.0 YEL

11-1.0 LT GRN

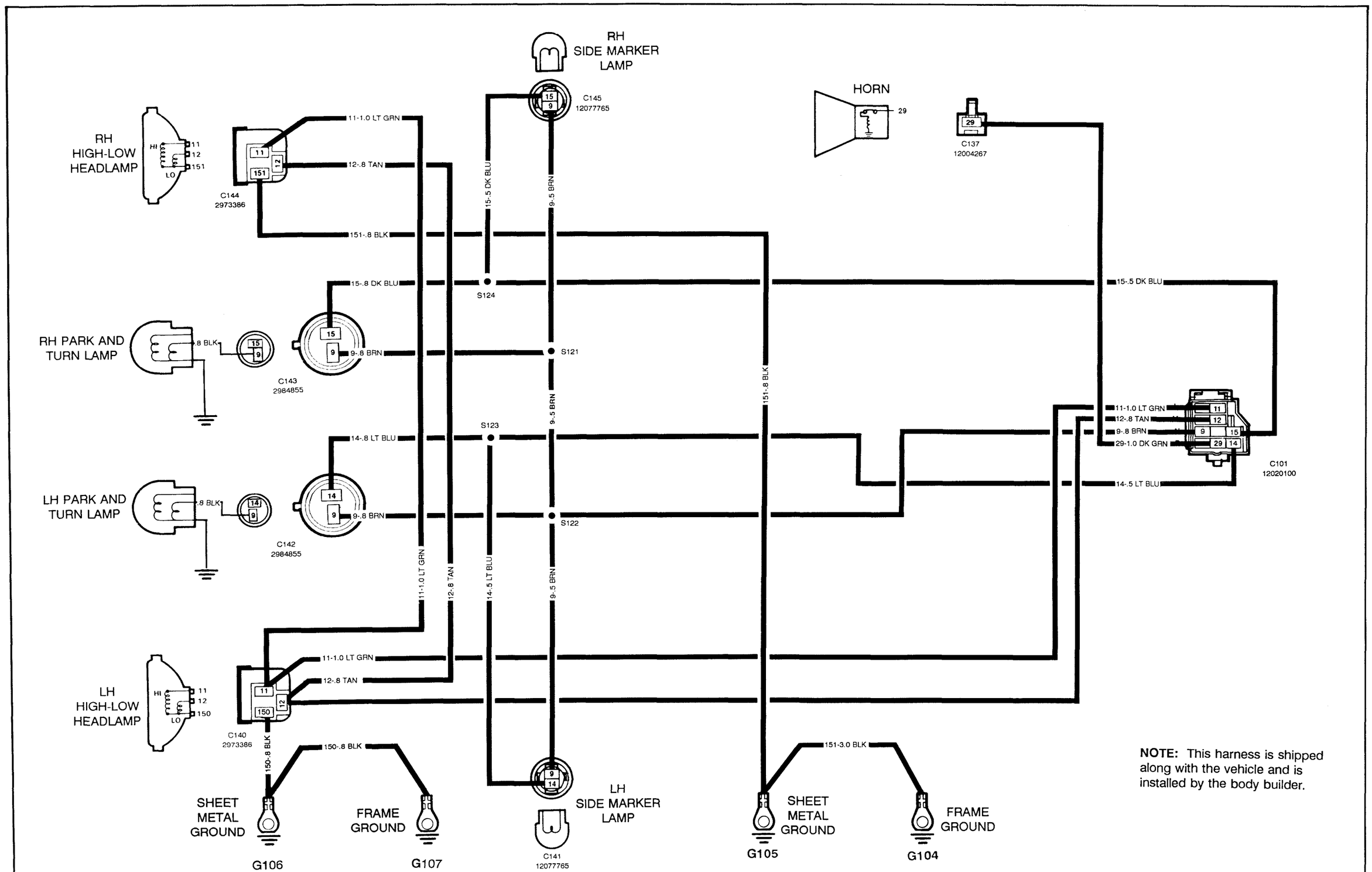
12-.8 TAN

HEADLAMP DIMMER SWITCH

HI

LO

C210
8917693



NOTE: This harness is shipped along with the vehicle and is installed by the body builder.

B-24 FORWARD LAMP HARNESS

CIRCUIT OPERATION

CANADIAN DAYTIME RUNNING LAMPS

Battery voltage is applied to the Daytime Running Lamps (DRL) Module from the BRN (50) wire and the HTR fuse.

With the Headlamps on, the DRL Relay is not energized and the LT BLU/ORN (593) wire is grounded to BLK (150) wire inside of the relay. This serves as ground for the LH Headlamp.

With Ignition in RUN, headlamps off and Parking Brake released, the DRL Module applied battery voltage to the LT GRN/BLK (592) wire. This action illuminates the DRL Indicator in the Instrument Panel and energizes the DRL Relay. When energized, the DRL Relay disconnects the LT BLU/ORN (593) wire from ground and internally connects it to the LT GRN/BLK (592) wire causing it to be 12 volts.

The LT BLU/ORN (593) wire feeds the LH High beam which is connected in series to the RH Headlamp through the LT GRN (11) wire. Grounding of the entire DRL circuit is accomplished through the BLK (151) wire at the RH Headlamp. This results in High beam headlamps that are less intense for daytime driving and should provide longer service.

DIAGNOSIS -- HEADLAMPS (WITH DRL)

PRELIMINARY CHECKS:

Before checking the DAYTIME RUNNING LAMPS system, do the following:

1. Place Park Brake in the OFF position.
2. Place Light Switch to ON and Headlamp Dimmer Switch to HIGH BEAM position. If the High Beam Lamp(s) are inoperative, refer to the HIGH BEAM LAMP(S) DO NOT OPERATE test procedures. If the High Beam Lamp(s) are operative, use the following diagnostic procedures, after placing the Light Switch to OFF position.

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS -- BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from light switch connector C209 to fuse block.
2. Connect a test lamp from YEL (10) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C210 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from headlamp dimmer switch connector C210 to connector C100.
	Test lamp does light.	REPLACE headlamp dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

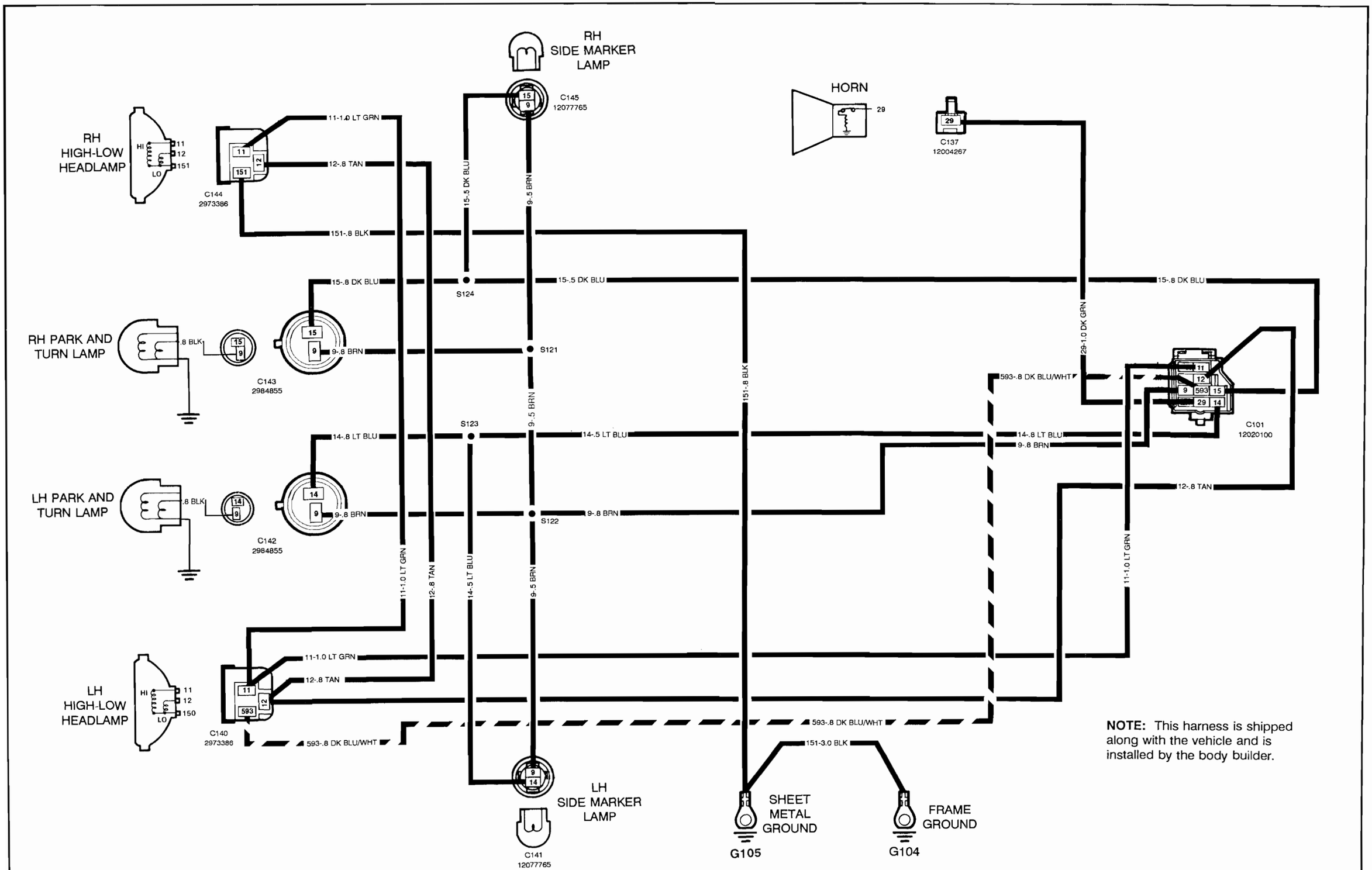
TEST	RESULT	ACTION
1. Turn light switch ON and dimmer switch to LOW BEAM position. Connect a test lamp from TAN (12) wire at connector C100 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	GO to step 2.
2. Connect a test lamp from LT BLU/ORN (593) wire at DRL relay connector C243 to ground.	Test lamp does not light.	LOCATE and REPAIR open in LT BLU/ORN (593) wire from light connector C100 to DRL relay connector C243.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from BLK (150) wire at the DRL relay connector C243 to ground.	Test lamp does not light.	REPLACE DRL relay.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from DRL relay connector C243 to ground G200. If not open is found, ISOLATE problem in body builder's installed wiring.
4. Connect a test lamp from TAN (12) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 5.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from connector C100 to headlamp dimmer switch connector C209.
5. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch connector C210 to light switch connector C209.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from LT GRN (11) wire at connector C100 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	GO to step 2.
2. Connect a test lamp from LT BLU/ORN (593) wire to ground at DRL relay connector C243.	Test lamp does not light.	LOCATE and REPAIR open in LT BLU/ORN (593) wire between connector C100 and DRL relay connector C243.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from BLK (150) wire at DRL relay connector C243 to ground.	Test lamp does not light.	REPLACE DRL relay.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from DRL relay connector C243 to ground G200.
4. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 5.
	Test lamp lights.	LOCATE and REPAIR open in LT GRN (11) wire from connector C100 to headlamp dimmer switch connector C210.
5. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open inYEL (10) wire at headlamp dimmer switch connector C210 to light switch connector C209.
	Test lamp lights.	REPLACE headlamp dimmer switch.

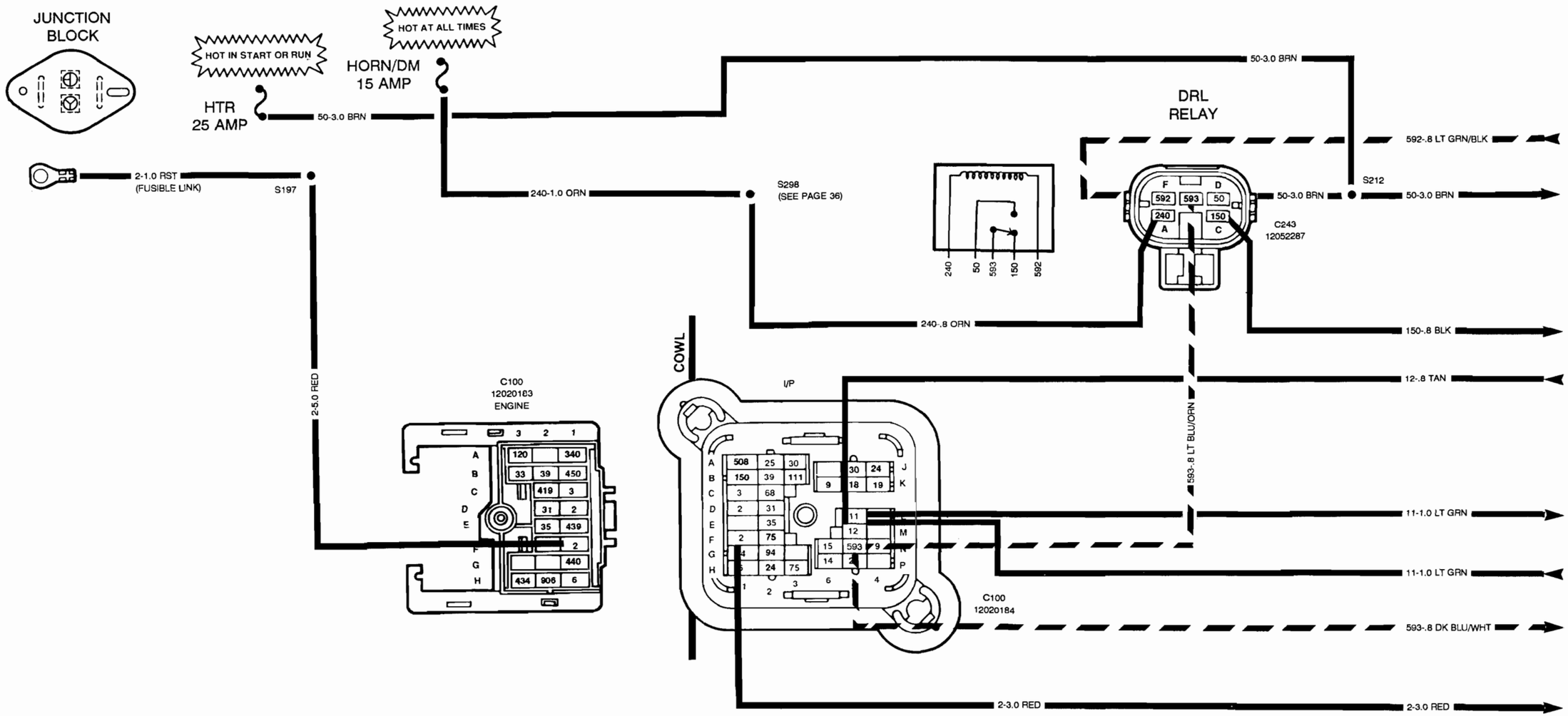
CANADIAN DAYTIME RUNNING LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. With ignition in RUN, headlamps off and park brake released, connect a testlamp from ORN (240) wire at DRL relay connector C242 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire between DRL relay connector C242 and fuse block. If no open is found REPLACE DRL fuse.
	Test lamp lights.	GO to step 2.
2. Connect J 34029-A Multimeter from BRN (50) wire at DRL module connector C243 and DRL relay connector C242 to ground. Measure voltage.	Battery voltage at only one connector.	LOCATE and REPAIR open in BRN (50) wire between splice S212 and connector with missing voltage.
	No battery voltage at either connector.	LOCATE and REPAIR open in BRN (50) wire between splice S212 and fuse block. If no open is found, REPLACE HTR fuse.
	Battery voltage at both connectors.	GO to step 3.
3. Connect J 34029-A Multimeter from BRN (50) wire at DRL module connector C243 and DRL relay connector C242 to BLK (150) wire at each component connector. Measure voltage.	No voltage.	LOCATE and REPAIR open in BLK (150) wire between suspect connector and ground G200.
	Battery voltage.	GO to step 4.
4. Connect J 34029-A Multimeter from LT GRN/BLK (592) wire at DRL relay connector C242 to ground. Measure voltage.	No voltage.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between the DRL relay and the DRL module. If no open is found, REPLACE DRL module.
	Battery voltage.	GO to step 5.
5. Connect a test lamp from LT BLU/ORN (593) wire at connector C101.	Test lamp does not light.	LOCATE and REPAIR open in LT BLU/ORN (593) wire between DRL relay connector C242 and connector C100. If no open is found, ISOLATE problem in body builder's installed wiring.
	Test lamp lights.	Daytime running lamps are operational.



NOTE: This harness is shipped along with the vehicle and is installed by the body builder.

FORWARD LAMP HARNESS B-27
W/DRL



B-28 HEADLAMPS WIRING

W/DRL

DRL MODULE
C243
12015308

PARKING BRAKE INPUT
IGNITION
LIGHT SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRIVING LAMP OUTPUT TO RELAY
GROUND

33 50 10 11 629 592 150

I/P CLUSTER CONNECTOR
(SEE PAGE 69)
C205
12040744

592-.8 LT GRN/BLK
50-3.0 BRN
150-.8 BLK
12-.8 TAN
11-1.0 LT GRN
11-1.0 LT GRN
593-.8 DK BLU/WHT
12-.8 TAN
2-3.0 RED
50-3.0 BRN
592-.8 LT GRN/BLK
150-.8 BLK
33-.5 TAN/WHT
S202
33-.5 TAN/WHT
150-.8 BLK
33-.5 TAN/WHT
593-.8 DK BLU/WHT
150-.8 BLK
629-.8 WHT
S203
(SEE PAGE 18)
150-.8 BLK
150-.8 BLK
PARK BRAKE SWITCH
(SEE PAGE 70)
9-.8 BRN
2-3.0 RED
10-1.0 YEL
10-1.0 YEL
11-1.0 LT GRN
150-3.0 BLK
11/629

HEADLAMP DIMMER SWITCH
HI 11
10
LO 12

C210
8917693

I/P GROUND G200

C297
12020030
PANEL DIMMER SWITCH

C209
12020029
LIGHT SWITCH

LIGHT SWITCH
44
150
DOME
156
2
OFF
PARK
CIRCUIT BREAKER 25 AMP
HEAD
10
OFF
PARK
40
9
HEAD

HEADLAMPS WIRING B-29
W/DRL

CIRCUIT OPERATION

PARK AND MARKER LAMPS

Voltage is applied through the TAIL LPS Fuse to the Light Switch at all times. With the Light Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps. The Front Marker Lamps are grounded through the LH and RH Park and Turn Lamps.

HAZARD SIGNAL LAMPS

Voltage is applied at all times, through the STOP-HAZ Fuse and the Hazard Flasher to the normally open contact of the Hazard Switch in the Turn Signal Switch. With the Hazard Switch in HAZARD FLASH, voltage is applied to both Front and Rear Turn Lamps. All of the Turn Lamps and both Turn Indicators flash on and off.

The Front Marker Lamps flash in HAZARD FLASH just as they did in TURN RIGHT and TURN LEFT, if the Lamp Switch is in OFF, they flash on when the Hazard Lamps are on. If the Lamp Switch is in either PARK or HEAD, they flash on when the Hazard Lamps are off and off when the Hazard Lamps are on.

In HAZARD, the circuit is always open, and the Hazard Flasher Control the Lamps.

DIAGNOSIS -- PARK, MARKER AND HAZARD LAMPS

PRELIMINARY CHECKS:

If only one lamp is inoperative, inspect wire(s) to affected lamp socket, check bulb-to-socket fit or replace bulb.

PARK LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch in PARK position. Connect a test lamp from ORN (40) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Connect a test lamp form RED (2) wire at fuse block to ground.	Test lamp lights.	CHECK condition of TAIL LPS fuse. If fuse is good, LOCATE and REPAIR open in ORN (40) wire.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from fuse block to battery junction block.
3. Connect a test lamp from BRN (9) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE light switch.
4. Connect a test lamp at BRN (9) wire connector C100 to ground.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from connector C100 to light switch connector C209.

HAZARD WARNING LAMPS DO NOT OPERATE

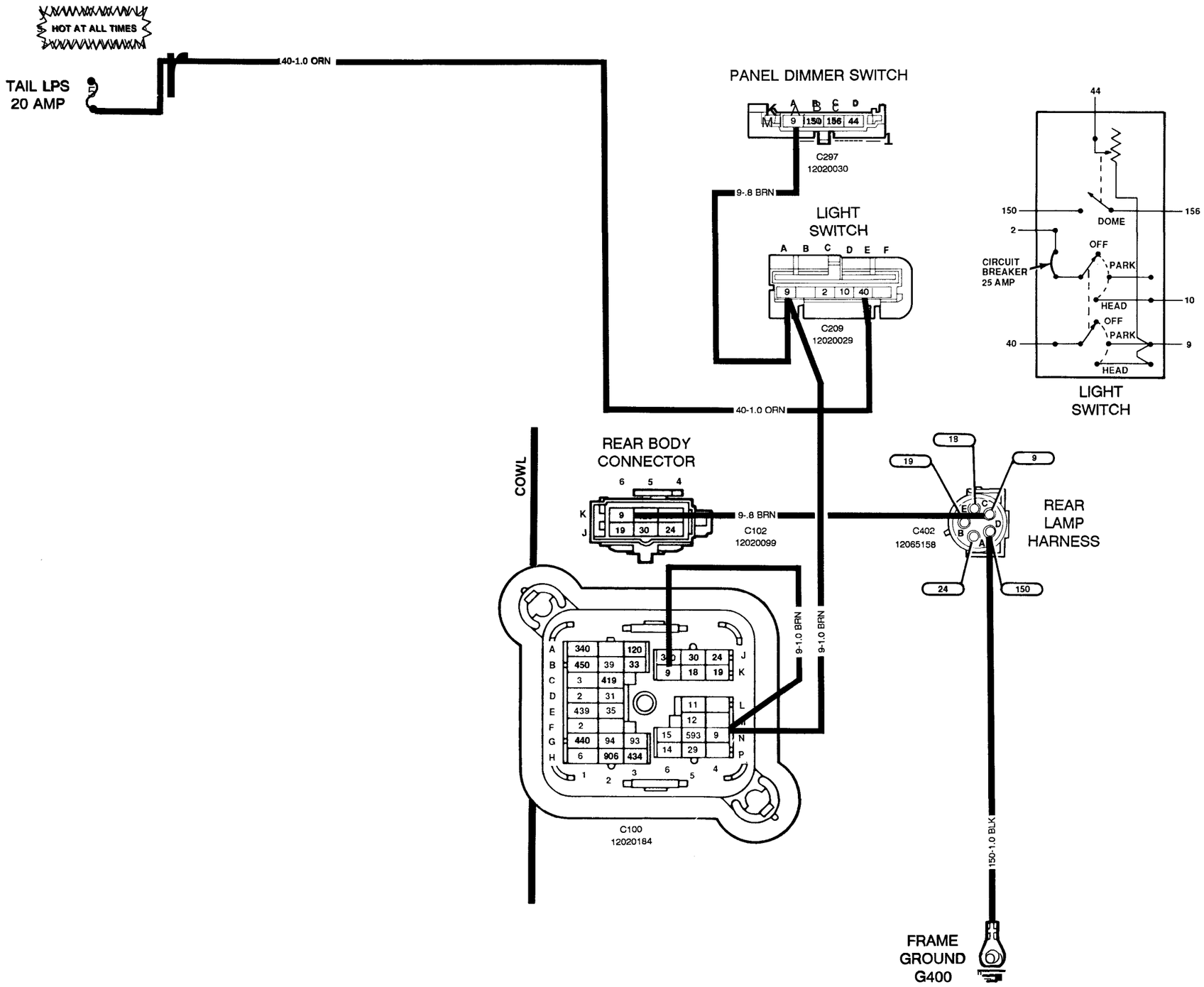
TEST	RESULT	ACTION
1. Place ignition switch in RUN and position turn signal lamps as if making a turn.	Turn signal lights operate.	GO to step 2.
	Turn signal lights do not operate.	Refer to "Turn Signals Do Not Work On One Side" symptom.
2. Turn off turn signal lamps and put hazard warning lamps ON. Connect a test lamp from BRN (27) wire at turn signal switch connector C206 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	CHECK condition of STOP/HAZ fuse. If fuse is good, LOCATE and REPAIR open in ORN (140) wire and BRN (27) wire. If fuse and wiring are good, REPLACE hazard flasher.

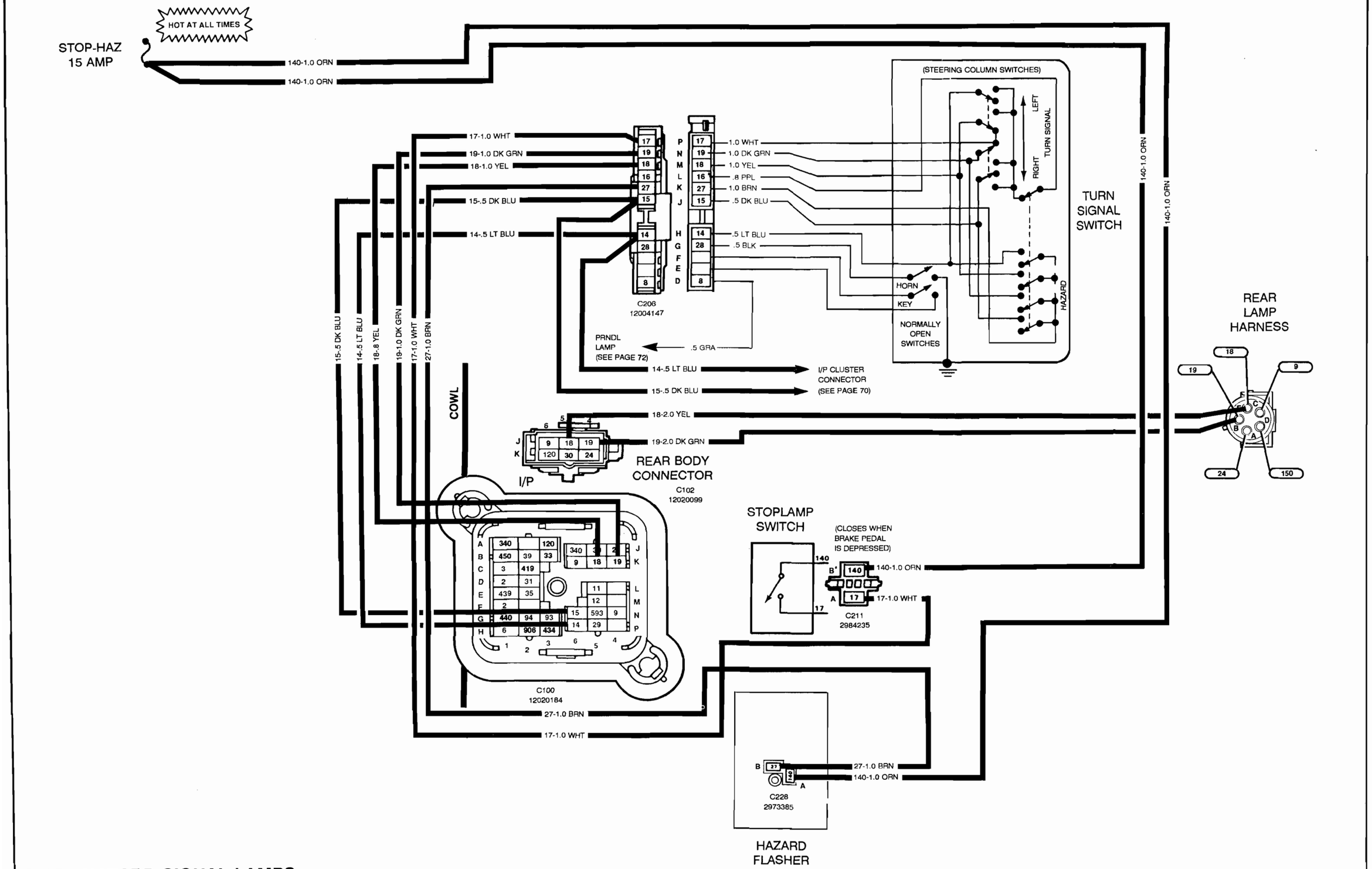
SIDE MARKER LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch in PARK position. Connect a test lamp from BRN (9) wire at connector C100 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from connector C100 to light switch connector C209.
2. Remove bulb from socket, then connect a test lamp between BRN (9) wire and LT BLU (14) or DK BLU (15) wire(s) at connector C100.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (14) or DK BLU (15) wire(s) from connector C100 to turn signal switch connector C206.

REAR MARKER LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light in PARK position. Connect a test lamp from BRN (9) wire at LH rear lamp harness connector C402.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire(s) from rear lamp harness connector C402.
2. Connect a test lamp between BRN (9) wire and BLK (150) wire(s) at rear lamp harness connector C402.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from rear lamp harness connector C402 to ground G400.


HOT AT ALL TIMES
TAIL LPS
20 AMP
40-1.0 ORN
PANEL DIMMER SWITCH
K M A B C D
9 150 156 44
C297
12020030
9-.8 BRN
LIGHT
SWITCH
A B C D E F
9 2 10 40
C209
12020029
40-1.0 ORN
44
150
156
DOME
2
OFF
PARK
CIRCUIT
BREAKER
25 AMP
HEAD
10
OFF
PARK
40
9
HEAD
LIGHT
SWITCH
COWL
REAR BODY
CONNECTOR
6 5 4
K
J
9
19 30 24
9-.8 BRN
C102
12020099
19
19
9
C402
12065158
REAR
LAMP
HARNESS
24
150
9-1.0 BRN
9-1.0 BRN
A 340 120
B 450 39 33
C 3 419
D 2 31
E 439 35
F 2
G 440 94 93
H 6 906 434
1 2 3 6 5 4
J
K
L
M
N
P
C100
12020184
150-1.0 BLK
FRAME
GROUND
G400



B-32 HAZARD SIGNAL LAMPS

CIRCUIT OPERATION

TURN SIGNAL LAMPS

With the Ignition Switch in RUN or START, voltage is applied through the TURN/BU Fuse and Turn Flasher to the normally closed contact of the Hazard Flasher Switch in the Turn Signal Switch.

With the Turn Signal Switch in LH Turn position, voltage is applied to both the LH Turn Indicator and the LH Front Park and Turn Lamp LT BLU (14) wires. Voltage is applied to the LH Tail, Stop and Turn Lamp YEL (18) wire.

The Lamps go on immediately. They begin to flash when the current flow heats up the Timing Element in the Flasher and it repeatedly opens and closes the circuit.

The voltage applied to the LH Park and Turn Lamp will also be applied to the LH Side Marker Lamp. If the Lamp Switch is in the OFF position, the LH Side Marker Lamp will find a path to ground through Splice S123 and the Park and Turn Lamp to ground. This Lamp provides low resistance paths to ground. The Marker Lamps will flash with the Turn Lamps.

When the Light Switch is in either PARK or HEAD, voltage is applied through the TAIL LPS Fuse, Lamp Switch, and Splice S122 to the Marker and Park Lamps. If the Turn Signal Switch is in TURN LEFT, the LH Side Marker Lamp will have voltage at both connections and will go out. When the Flasher removes voltage to the Turn Lamp, the Marker Lamp will be grounded through the Turn Lamp and will go on. In this way, the LH Side Marker Lamp will flash on when the LH Park and Turn Lamp goes off, and off when the Turn Lamp goes on.

With the Turn Signal Switch in TURN RIGHT, voltage will be applied to the RH Lamps in the same way.

DIAGNOSIS -- TURN LAMPS

TURN SIGNALS DO NOT OPERATE

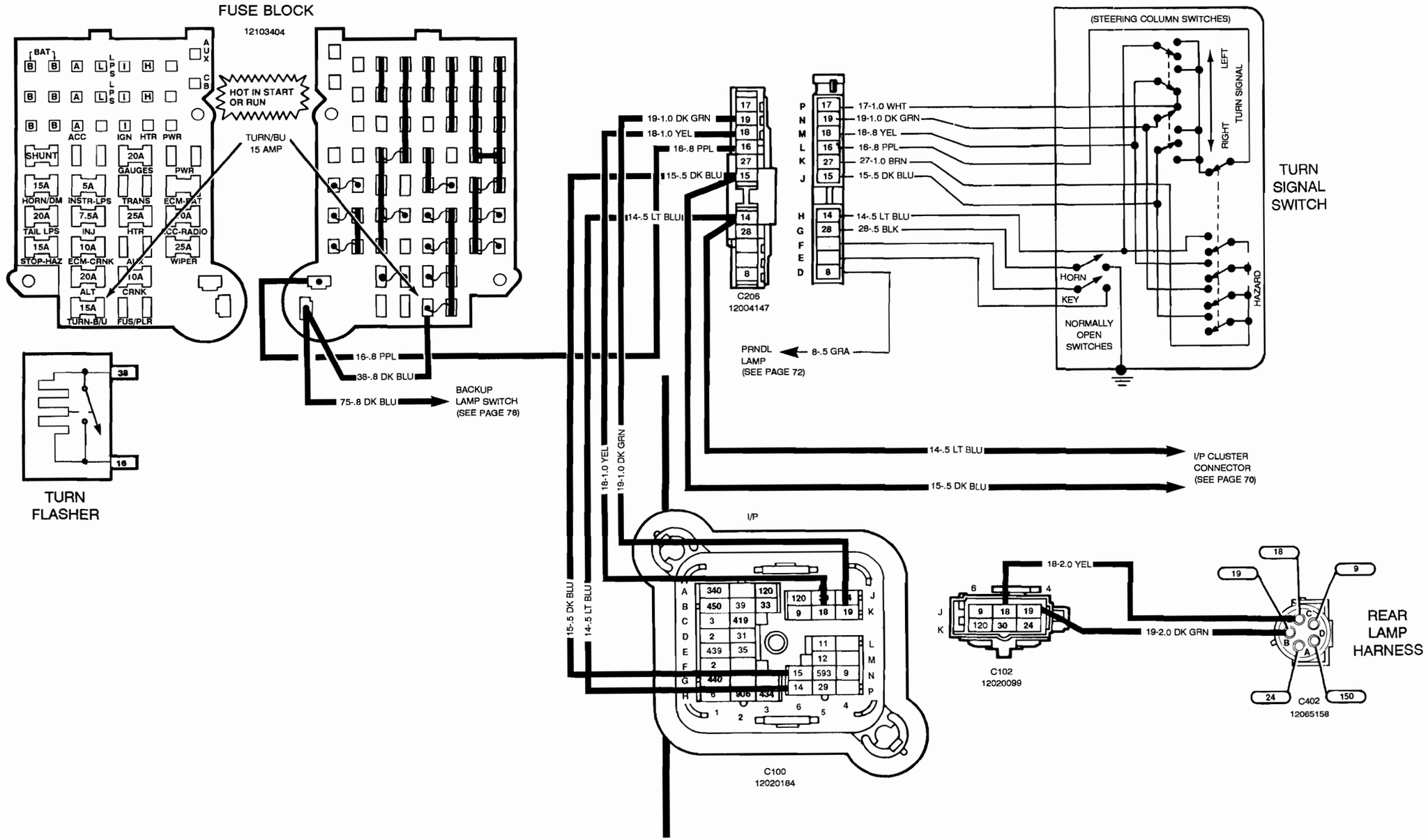
TEST	RESULT	ACTION
1. Place hazard warning lamps to on position.	Hazard lamps operate.	GO to step 2.
	Hazard lamps do not operate.	REFER to "Hazard Lamps Do Not Operate" symptom.
2. Connect a test lamp from PPL (16) wire at turn signal switch connector C206 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	CHECK condition of TURN/BU fuse and an open in PPL (16) wire or DK BLU (38) wire. If fuse and wiring are good, REPLACE turn signal flasher.

TURN SIGNALS DO NOT WORK ON ONE SIDE

TEST	RESULT	ACTION
1. Turn hazard warning system on. Observe lights on side of turn signals that did not work.	Lights flash.	CHECK for improper bulb. REPLACE if necessary.
	Lights do not come on.	GO to step 2.
2. Turn hazard warning system off. Place ignition switch to RUN and turn signal to side that does not work. Connect test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side does not work) at turn signal switch connector C206 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	GO to step 3.
3. Connect test lamp from PPL (16) at turn signal switch connector C206 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	REPLACE turn signal flasher.
4. Connect test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side did not work) at park and turn lamp connector C142 or C143 to ground.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in either LT BLU (14) or DK BLU (15) wires between turn signal switch connector C206 and connector C100.

TURN SIGNAL LAMPS FLASH RAPIDLY

TEST	RESULT	ACTION
Turn hazard lamp switch ON. Check front signal lamps and rear taillamps.	One side of turn signal lamps flash rapidly.	REPLACE inoperative turn signal bulb.
	Only one side of turn signals light but do not flash rapidly.	REFER to "Turn Signals Do Not Work On One Side" symptom.


FUSE BLOCK
12103404
BAT
AUX
CB
HOT IN START OR RUN
TURN/BU 15 AMP
ACC
IGN
HTR
PWR
SHUNT
20A GAUGES
PWR
15A HORN/DM
5A INSTR-LPS
TRANS
ECM-BAT
20A TAIL LPS
7.5A INJ
25A HTR
10A CC-RADIO
15A STOP-HAZ
10A ECM-CRNK
AUX
25A WIPER
20A ALT
10A CRNK
15A TURN-B/U
FUS/PLR
TURN FLASHER
38
16
16-.8 PPL
38-.8 DK BLU
75-.8 DK BLU
BACKUP LAMP SWITCH (SEE PAGE 78)
19-1.0 DK GRN
18-1.0 YEL
16-.8 PPL
15-.5 DK BLU
14-.5 LT BLU
C206
12004147
P N M L K J H G F E D
17-1.0 WHT
19-1.0 DK GRN
18-.8 YEL
16-.8 PPL
27-1.0 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
8-.5 GRA
PRNDL LAMP (SEE PAGE 72)
(STEERING COLUMN SWITCHES)
LEFT TURN SIGNAL
RIGHT
TURN SIGNAL SWITCH
HORN
KEY
NORMALLY OPEN SWITCHES
HAZARD
14-.5 LT BLU
15-.5 DK BLU
I/P CLUSTER CONNECTOR (SEE PAGE 70)
18-1.0 YEL
19-1.0 DK GRN
15-.5 DK BLU
14-.5 LT BLU
I/P
C100
12020184
18-2.0 YEL
19-2.0 DK GRN
C102
12020099
REAR LAMP HARNESS
C402
12065158

CIRCUIT OPERATION

When the Horn Switch is depressed, one side of the coil of the Horn Relay is grounded. The relay is energized. Its contacts close and battery voltage is applied to the Horn.

DIAGNOSIS -- HORNS

PRELIMINARY CHECKS:

Check to see that the HORN D/M fuse is not blown. REPLACE if blown.

HORN(S) WILL NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from DK GRN (29) wire at connector C100 to ground. Press horn switch.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	GO to step 2.
2. Remove horn relay. Connect a test lamp from ORN (240) wire at horn relay connector C207 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire between horn relay connector C207 and fuse block.
3. Install horn relay. Disconnect turn signal switch connector C206. Use a jumper wire to ground BLK (28) wire at turn signal switch connector C206.	Horn does not sound.	GO to step 4.
	Horn sounds.	REPLACE horn switch.
4. Disconnect horn relay. Install a jumper wire from ORN (240) terminal to DK GRN (29) terminal at horn relay connector C207.	Horn sounds.	REPLACE horn relay.
	Horn does not sound.	LOCATE and REPAIR open in DK GRN (29) wire from horn relay connector C207 connector C100.

HORN SOUNDS CONTINUOUSLY WITHOUT DEPRESSING HORN SWITCH

TEST	RESULT	ACTION
1. Disconnect turn signal switch connector C206.	Horn stops.	REPLACE horn switch.
	Horn continues to sound.	GO to step 2.
2. Disconnect horn relay connector C207.	Horn stops.	REPLACE horn relay.
	Horn continues to sound.	LOCATE and REPAIR open in BLK (28) wire between horn relay connector C207 and horn switch.

HOT AT ALL TIMES

HORN/DM
15 AMP

240-1.0 ORN

HORN
RELAY

240
29
240
28

C207
12065169

240
240
29
28

28-.5 BLK

240-.8 ORN

29-1.0 DK GRN

240-.8 ORN

C206
12004147 12004148

17	P	17	17-1.0 WHT
19	N	19	19-1.0 DK GRN
18	M	18	18-1.0 YEL
16	L	16	16-.8 PPL
27	K	27	27-1.0 BRN
15	J	15	15-.5 DK BLU
14	H	14	.8 LT BLU
28	G	28	28-.5 BLK
	F		
	E		
8	D	8	

8-.5 GRA

PRNDL
LAMP
(SEE PAGE 72)

(STEERING COLUMN SWITCHES)

LEFT TURN SIGNAL
RIGHT

HORN
KEY
HAZARD

NORMALLY
OPEN
SWITCHES

TURN
SIGNAL
SWITCH

240-1.0 ORN

S298

240-.8 ORN

PROVISIONS FOR
DOME LAMPS
(SEE PAGE 38)

240-.8 ORN

OOWL

I/P

A	340		120		340	30	24	J		
B	450	39	33		9	18	19	K		
C	3	419		120						
D	2	31					11	L		
E	439	35					12	M		
F	2					15	593	9	N	
G	440					14	29		P	
H	6	906	434							
	1	2	3	6	5	4				

C100
12020184

CIRCUIT OPERATION

WIPER

The Wiper Motor is supplied battery voltage with the Ignition Switch in START or RUN, with ground supplied by the Wiper/Washer Switch.

When the Wiper Motors is in LO, Battery voltage is supplied to the motor through the WHT wire and the ground circuit is through the GRA wire, the Wiper/Washer Switch and the BLK wire to ground.

When the wiper is in HI, battery voltage is supplied to the motor through the WHT wire and the ground circuit is through the PPL wire, the Wiper/Washer Switch and the BLK wire to ground.

WASHER

Battery voltage is applied to the washer pump through the WHT wire, to the switch and to ground through the BLK wire. The washers are operational as long as the paddle switch on the Wiper Switch arm is on.

DIAGNOSIS -- WIPER/WASHER

PRELIMINARY CHECKS:

Check condition of WIPER fuse. If fuse is in good condition, use the following diagnostic procedures.

WIPERS DO NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Place ignition in RUN and turn wipers to HI. Connect a test lamp from WHT (93) wire at wiper motor connector C187 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between wiper motor connector C189 and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect a fused jumper from BLK (150) wire at wiper switch connector C221 to ground.	Wiper motor runs.	LOCATE and REPAIR open in BLK (150) wire between wiper switch connector C221 and ground G200.
	Wiper motor does not run.	REPLACE wiper motor.

WIPERS DO NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition in RUN and wipers to HI. Connect a fused jumper from PPL (92) wire at wiper switch connector C221 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire between wiper motor connector C189 and wiper switch connector C221. If no open is found, REPLACE wiper motor.
	Wiper motor runs.	REPLACE wiper washer switch.

WASHER MOTOR DOES NOT SHUT OFF

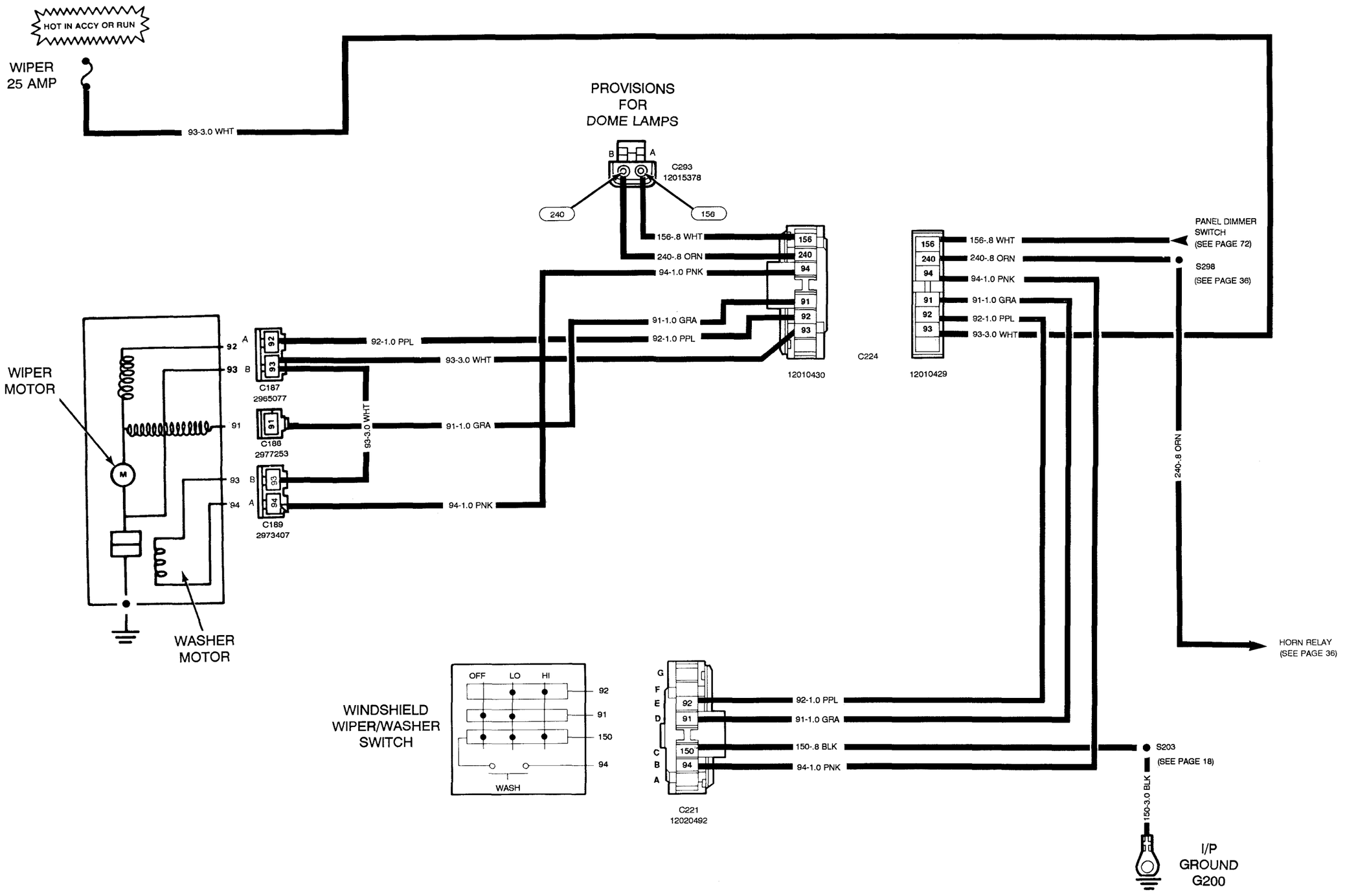
TEST	RESULT	ACTION
1. Place ignition switch in RUN and wiper switch to WASH. Disconnect wiper switch connector C221.	Washer motor stops pumping.	REPLACE wiper washer switch.
	Washer motor pumps.	LOCATE and REPAIR short to ground in PNK (94) wire between wiper switch connector C221 and washer motor connector C187.

WIPERS DO NOT OPERATE IN LO

TEST	RESULT	ACTION
1. Place ignition in RUN and wipers to LO. Connect a fused jumper from GRA (91) wire at wiper switch connector C221 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRA (91) wire between wiper motor connector C188 and wiper switch connector C221. If no open is found, REPLACE wiper motor.
	Wiper motor runs.	REPLACE wiper washer switch.

WASHER MOTOR DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in ACC or RUN. Connect a test lamp from WHT (93) wire at connector C224 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between connector C224 and fuse block.
2. Connect a test lamp from WHT (93) wire at washer pump connector C187 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between washer motor connector C187 and connector C224.
3. Connect test jumper from PNK (94) wire at washer motor connector C187 to ground.	Washer motor runs.	GO to step 4.
	Washer motor does not run.	REPLACE washer motor.
4. Connect test jumper from PNK (94) wire at connector C224 to ground.	Washer motor runs.	GO to step 5.
	Washer motor does not run.	LOCATE and REPAIR open in PNK (94) wire between washer motor connector C187 and connector C224.
5. Connect test jumper from PNK (94) wire at windshield wiper washer switch connector C221.	Washer motor runs.	GO to step 6.
	Washer motor does not run.	LOCATE and REPAIR open in PNK (94) wire between connector C224 and windshield wiper washer switch connector C221.
6. Connect test jumper from BLK (150) wire at windshield wiper washer switch connector C221 to ground. Press wash switch.	Washer motor runs.	LOCATE and REPAIR open in BLK (150) wire between windshield wiper washer switch connector C221 and ground G200.
	Washer motor does not run.	REPLACE windshield wiper washer switch.



B-38 WINDSHIELD WIPERS/WASHERS

CIRCUIT OPERATION

START

When the Ignition Switch is moved to the START position, battery is applied to the Starter Solenoid. Both solenoid windings are energized. The circuit through the Pull-In Winding is completed to ground through the Starter Motor. The windings work together magnetically to pull in and hold in the Plunger. The Plunger moves the Shift Lever. This action causes the Starter Drive Assembly to rotate as it engages the Flywheel ring gear on the engine. At the same time, the Plunger also closes the solenoid switch contacts in the Starter Solenoid. Full battery voltage is applied directly to the Starter Motor and it cranks the engine.

As soon as the Solenoid Switch contacts close, voltage is no longer applied through the Pull-In Winding, since battery voltage is applied to both ends of the windings. The Hold-In Winding remains energized, and its magnetic field is strong enough to hold the Plunger, Shift Lever, and Drive Assembly Solenoid Switch contacts cranking the engine.

When the Ignition Switch is released from the START position, battery voltage is removed from the PPL (6) wire and the junction of the two windings. Voltage is applied from the Motor contacts through both windings to ground at the end of the Hold-In Winding. However, the voltage applied to the Pull-In Winding is now opposing the voltage applied when the winding was first energized. The magnetic fields of the Pull-In and Hold-In Windings now oppose one another. This action of the windings, with the help of the Return Spring, causes the Starter Drive Assembly to disengage and Solenoid Switch contacts to open simultaneously. As soon as the contacts open, the starter circuit is turned off.

CHARGE

The Generator provides voltage to operate the vehicle's electrical system and to charge its Battery. A magnetic field is created when current flows through the Rotor. This field rotates as the Rotor is driven by the engine, creating an AC voltage in the Stator windings. The AC voltage is converted to DC by the rectifier bridge and is supplied to the electrical system at the Battery terminal.

This Generator's regulator uses digital techniques to supply the Rotor current and thereby control the output voltage. The Rotor current is proportional to the width of the electrical pulses supplied to it by the Regulator. When the Ignition Switch is placed in RUN, narrow width pulses are supplied to the Rotor, creating a weak magnetic field. When the engine is started, the Regulator sensor Generator rotation by detecting AC voltage at the Stator through an internal wire. Once the engine is running the Regulator varies the field current by controlling the pulse width. This regulates the Generator output voltage for proper battery charging and electrical system operation.

The digital regulator controls the VOLTS Indicator light with a solid-state light driver. The light driver turns on the light whenever undervoltage, overvoltage or a stopped Generator is detected.

DIAGNOSIS -- START AND CHARGE

STARTER SOLENOID CLICKS, ENGINE DOES NOT CRANK OR CRANKS SLOWLY

TEST	RESULT	ACTION
1. Remove CRNK fuse. Connect a voltmeter to positive and negative battery terminals. Turn ignition switch to START.	Voltage reading greater than 9.5 volts after 15 seconds cranking.	GO to step 2.
	Voltage less than 9.5 volts after 15 seconds cranking.	PERFORM a Battery Load Test. Refer to Section 6D in Service Manual.
2. Connect a voltmeter from negative battery terminal to engine block.	Less than .5 volts.	GO to step 3.
	More than .5 volts.	REPLACE negative battery cable.
3. Connect voltmeter from positive battery terminal to starter solenoid terminal at BLK (2) wire.	Less than .5 volts.	REPAIR starter motor.
	More than .5 volts.	REPLACE positive battery cable.

ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK

TEST	RESULT	ACTION
1. Place transmission in PARK (auto) and depress clutch pedal (man). Connect a voltmeter from PPL (6) wire at starter solenoid to ground. Turn ignition switch to START position.	Battery voltage.	GO to step 2.
	No voltage.	GO to step 3 (man trans). GO to step 5 (auto trans).
2. Connect voltmeter from PPL (6) wire to starter mounting bolts.	Battery voltage.	REPLACE starter solenoid.
	Less than battery voltage.	CLEAN starter motor mounting bolts, starter motor, and mounting surface.
3. Disconnect clutch start switch connector C219. Connect voltmeter from YEL (5) wire at clutch start switch connector C219 to ground. Ignition switch must be in START position.	Battery voltage.	GO to step 4.
	No voltage.	GO to step 5.
4. Depress clutch and put transmission in neutral. Apply parking brake. Connect a fused jumper from YEL (5) to PPL (6) at clutch start switch connector C219. Turn ignition switch to START position.	Engine cranks.	REPLACE clutch start switch.
	Engine does not crank.	CHECK condition of CRNK fuse. If fuse is good, LOCATE and REPAIR open in PPL (6) wire from clutch start switch connector C219 to starter solenoid.
5. With ignition switch OFF, connect a voltmeter from cavity B terminal at ignition switch connector C298 to ground.	Battery voltage.	REPLACE ignition switch.
	No voltage.	LOCATE and REPAIR open in RED (2) wires and fusible link from battery junction block to ignition switch connector C298.

BATTERY IS UNDERCHARGED OR OVERCHARGED

TEST	RESULT	ACTION
1. Connect voltmeter from RED (2) wire at generator connector C107.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in RED (2) wire and fusible link from generator connector C107 to battery junction block.
2. Connect generator connector C109 and terminal. Have all accessories turned off and engine running at fast idle. Connect voltmeter from battery terminal on generator to ground.	Reading of 13-16 volts.	PERFORM Generator Bench Test. Refer to Section 6D in Service Manual.
	Reading of less than or greater than 13-16 volts.	REPAIR generator.

RPO CODES

MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE
MT8 - MAN TRANS, 5-SPD., WITH OVERDRIVE

BATTERY

2-32.0 BLK

1-19.0 BLK

1-9.0 BLK (1-32.0 BLK B3M ONLY)

2-3.0 RST (FUSIBLE LINK)

2-1.0 RST (FUSIBLE LINK)

2-8.0 RED

S198

S199

2-3.0 RED

STARTER MOTOR

6-5.0 PPL

IGNITION COIL (SEE PAGE 42)

S111 (SEE PAGE 46)

39-.8 PNK/BLK

ENGINE

C100 12020183

3-5.0 PNK

6-5.0 PPL

BATTERY JUNCTION BLOCK

S197

2-1.0 RST (FUSIBLE LINK)

2-5.0 RED

GENERATOR

C107 12045896

P
L
F
S

39

2-8.0 RED

1-19.0 BLK

2-32.0 BLK

ENGINE GROUND

G111

SHEET METAL GROUND

G110

6-5.0 PPL

5-5.0 YEL

CLUTCH START SWITCH

C219 8911921

6-5.0 PPL (MT1)
5-5.0 YEL (MT8)

2-5.0 RED

6/5 SOL
BAT 1
BAT 2
IGN 1
ACC

C298 12010966

300 IGN 3
BAT 3
GRD 1 111
GRD 2 33

C299 6294641

S206 (SEE PAGE 4)

3-5.0 PNK

S207

6-5.0 PPL

2-5.0 RED

3-5.0 PNK

S205

I/P

C100 12020184

39-.8 PNK/BLK

S208 (SEE PAGE 70)

6-5.0 PPL (MT8 ONLY)

3-5.0 PNK

CRNK 10 AMP

ALT 20 AMP

906-.8 PPL (MT8 ONLY)

ECM (SEE PAGE 45)

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

RPO CODES

B3D - SCHOOL BUS EQUIPMENT
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE
MT8 - MAN TRANS, 5-SPD., WITH OVERDRIVE

RH BATTERY

LH BATTERY

2-8.0 RED

1-50.0 BLK
1-32.0 BLK (B3D ONLY)

BATTERY JUNCTION BLOCK

STARTER MOTOR

1-32.0 BLK

1-32.0 BLK
1-50.0 BLK (B3D ONLY)

2-3.0 BLK

6-5.0 PPL

S196

2-1.0 RST
(FUSIBLE LINK)

2-13.0 RED

2-1.0 RST
(FUSIBLE LINK)

S197

2-3.0 RED

2-3.0 RST
(FUSIBLE LINK)

S195

2-8.0 RED

GLOW PLUG CONTROLLER

C128
12015982

906-1.0 PPL

2-3.0 RED

2-13.0 RED

6-5.0 PPL

2-3.0 RED

2-3.0 RED

3-3.0 PNK

S115

S113

3-3.0 PNK

39-.8 PNK/BLK

39-.8 PNK/BLK

GENERATOR

C107
12045896

1-32.0 BLK

1-32.0 BLK (B3M ONLY)

1-50.0 BLK (B3M ONLY)

2-3.0 BLK

2-13.0 RED

ENGINE GROUND LH CYLINDER HEAD G113

ENGINE GROUND RH CYLINDER HEAD G112

SHEET METAL GROUND G110

6-3.0 PPL

5-3.0 YEL

CLUTCH START SWITCH
(MT8)

C219
8911921

6-3.0 PPL

3-5.0 PNK

COWL

C100
1/P
12020184

6-3.0 PPL

3-5.0 PNK

6-3.0 PPL (MT1 ONLY)
5-3.0 YEL (MT8 ONLY)

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

ALT
20 AMP

39-.8 PNK/BLK

3-5.0 PNK

S205

2-5.0 RED

2-5.0 RED

S206
(SEE PAGE 4)

3-5.0 PNK

C298
12010966

C299
6294641

ENGINE

C100
12020183

3-3.0 PNK

FUEL SHUT OFF VALVE
(SEE PAGE 63)

RPO CODES
L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K

HOT IN START OR RUN

ECM-CRNK 10 AMP

ALT 20 AMP

439-.8 PNK/BLK

39-.8 PNK/BLK

439-.8 PNK/BLK

IGNITION MODULE

EST — 423 — D

DISTRIBUTOR REFERENCE HI — 430 — C

BYPASS — 424 — B

DISTRIBUTOR REFERENCE LO — 453 — A

PICK-UP COIL

IGNITION MODULE

C120
12078082

423-.8 WHT

430-.8 PPL/WHT

424-.8 TAN/BLK

453-.8 BLK/RED

439-.8 PNK/BLK

453-.8 BLK/RED

430-.8 PPL/WHT

423-.8 WHT

424

424-.8 TAN/WHT

C199

12015791

12010996

GT100
12020107 (UPPER)
12020108 (LOWER)

439-.8 PPL/WHT

453-.8 BLK/RED

430-.8 PPL/WHT

423-.8 WHT

424-.8 TAN/WHT

439-.8 PNK/BLK

C251
12047946

ELECTRONIC CONTROL MODULE CONNECTORS

424-.8 TAN/BLK

C250
12045575

2

1

121

3

COIL ASM

IGNITION COIL

A

B

121

3

121-.8 WHT

3-3.0 PNK

C121
12040705

TACHOMETER

121

C122
02977253

121-.8 WHT

3-3.0 PNK

GENERATOR
(SEE PAGE 40)

39-.8 PNK/BLK

ENGINE

C100
12020183

DISTRIBUTOR

S112

439-.8 PNK/BLK

DRAC
(SEE PAGE 64)

ESC MODULE
(SEE PAGE 42)

I/P

C100
12020184

S208
(SEE PAGE 70)

3-5.0 PNK

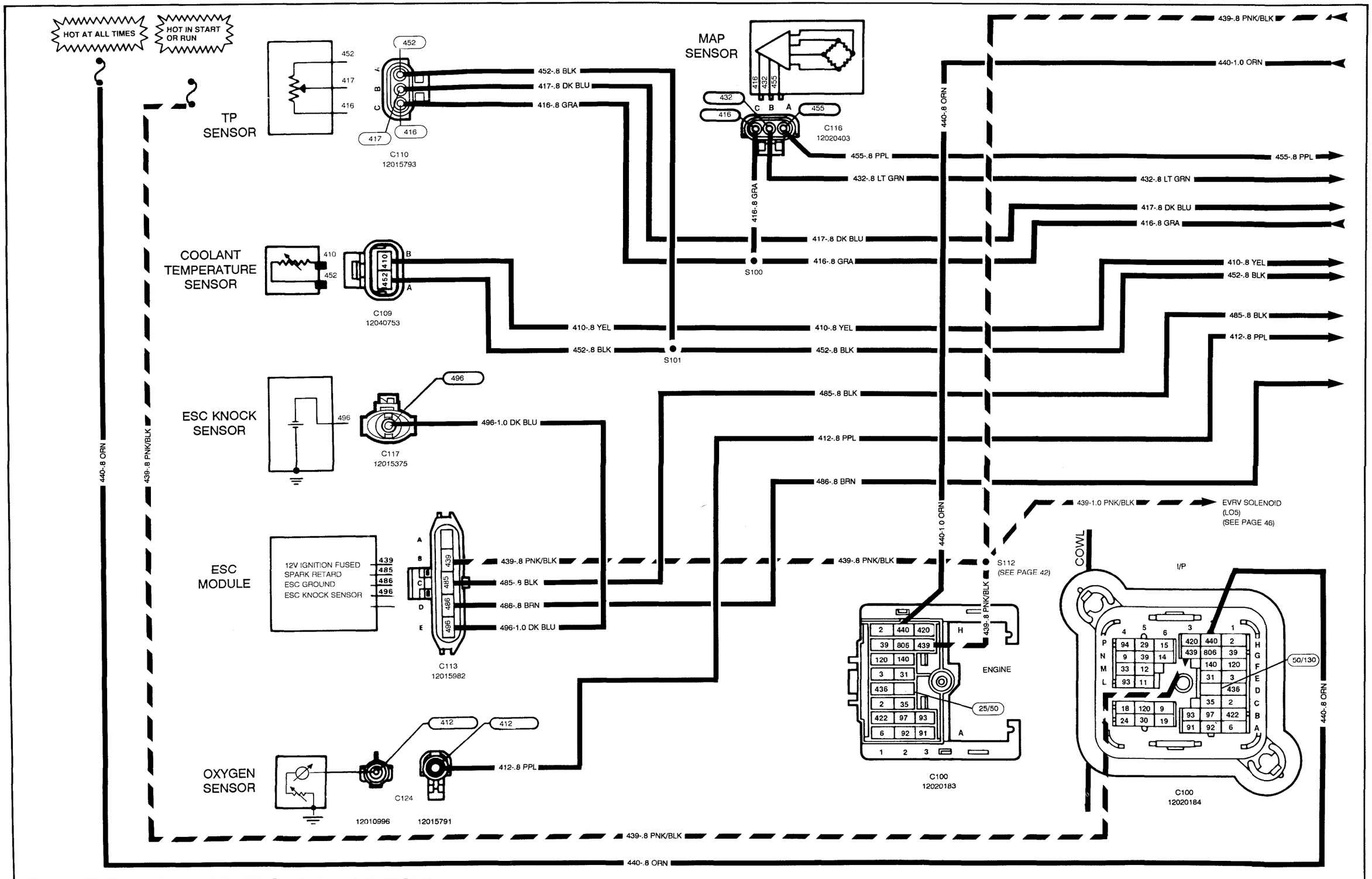
IGNITION SWITCH
(SEE PAGES 4, 5)

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
			A2	NOT USED
			A3	NOT USED
435	.8	GRA	A4	EGR SOLENOID (LB4) EVRV (L05)
419	.8	BRN/WHT	A5	CHECK ENGINE LAMP
439	.8	PNK/BLK	A6	12V IGNITION FUSED
			A7	NOT USED
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASSEMBLY LINE DIAGNOSTIC LINK
437	.8	BRN	A10	DRAC MODULE
452	.8	BLK	A11	5V RETURN B
450	.8	BLK/WHT	A12	SYSTEM RETURN
440	.8	ORN	B1	12V BATTERY FUSED
120	.8	TAN/WHT	B2	ELEC FUEL PUMP FUSED FEED
453	.8	BLK/RED	B3	DISTRIBUTOR REF LOW
			B4	NOT USED
430	.8	PPL/WHT	B5	DISTRIBUTOR REF HIGH
			B6	NOT USED
485	.8	BLK	B7	SPARK RETARD CONTROL
			B8	NOT USED
			B9	NOT USED
			B10	NOT USED
			B11	NOT USED
			B12	NOT USED

ELECTRONIC CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			C1	NOT USED
			C2	NOT USED
444	.8	LT GRN/BLK	C3	STEPPER COIL B LOW
443	.8	LT GRN/WHT	C4	STEPPER COIL B HIGH
441	.8	LT BLU/WHT	C5	STEPPER COIL A HIGH
442	.8	LT BLU/BLK	C6	STEPPER COIL A LOW
			C7	NOT USED
			C8	NOT USED
906	.8	PPL/WHT	C9	CRANK SIGNAL (FUSED)
410	.8	YEL	C10	COOLANT TEMPERATURE
432	.8	LT GRN	C11	MANIFOLD ABSOLUTE PRESS.
			C12	NOT USED
417	.8	DK BLU	C13	THROTTLE POSITION SENSOR
416	.8	GRA	C14	5V SENSOR REFERENCE
468	.8	DK GRN	C15	INJECTOR B (2) DRIVE
440	.8	ORN	C16	12V BATTERY FUSED
450	.8	BLK/WHT	D1	SYSTEM GROUND
455	.8	PPL	D2	5V RETURN A
			D3	NOT USED
423	.8	WHT	D4	HEI SPARK TIMING
424	.8	TAN/BLK	D5	HEI BYPASS
413	.8	TAN	D6	OXYGEN SENSOR LOW
412	.8	PPL	D7	OXYGEN SENSOR HIGH
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
			D13	NOT USED
468	.8	DK GRN	D14	INJECTOR B (2) DRIVE
467	.8	DK BLU	D15	INJECTOR A (1) DRIVE
467	.8	DK BLU	D16	INJECTOR A (1) DRIVE

ELECTRONIC CONTROL MODULE - GASOLINE ENGINES



B-44 ELECTRONIC CONTROL MODULE (ECM)

INPUTS - GASOLINE ENGINE W/MAN TRANS

RPO CODES

LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K

439-.8 PNK/BLK

440-1.0 ORN

440-.8 ORN

440-.8 ORN

S104
(SEE PAGE 47)

455-.8 PPL

432-.8 LT GRN

417-.8 DK BLU

416-.8 GRA

410-.8 YEL

452-.8 BLK

485-.8 BLK

412-.8 PPL

450-.8 BLK/WHT

450-.8 BLK/WHT

450-.8 BLK/WHT

450-.8 BLK/WHT

S102
(SEE PAGE 16)

437-.8 BRN

DRAC MODULE
(SEE PAGE 64)

413-.8 TAN

551-.8 TAN/WHT

486-.8 BRN

ENGINE
GROUND
G100

GENERATOR
BRACKET
GROUND
G101

GT100
12020197 (UPPER)
12020708 (LOWER)

439-.8 PNK/BLK

440-.8 ORN

440-.8 ORN

455-.8 PPL

432-.8 LT GRN

417-.8 DK BLU

416-.8 GRA

437-.8 BRN

410-.8 YEL

452-.8 BLK

450-.8 BLK/WHT

485-.8 BLK

412-.8 PPL

413-.8 TAN

450-.8 BLK/WHT

450-.8 BLK/WHT

461-.8 ORN

451-.8 WHT/BLK

C251
12047946

B		A
440	1	465
120	2	
453	3	
	4	435
430	5	419
	6	439
485	7	422
59	8	461
	9	451
434	10	437
	11	452
	12	450

485-.8 BLK

419-.8 BRN/WHT

SERVICE
ENGINE
SOON
LAMP
(SEE PAGE 70)

450-.8 BLK/WHT

452-.8 BLK

461-.8 ORN

437-.8 BRN

451-.8 WHT/BLK

455-.8 PPL

412-.8 PPL

413-.8 TAN

ECM
CONNECTORS

C250
12045575

D		C
450	1	
455	2	436
	3	444
423	4	443
424	5	441
413	6	442
412	7	446
	8	
	9	806
	10	410
	11	432
	12	
	13	417
468	14	416
	15	
467	16	440

CRANK SIGNAL
(FUSED)
(SEE PAGE 40)

806-.8 PPL/WHT

440-.8 ORN

416-.8 GRA

417-.8 DK BLU

432-.8 LT GRN

410-.8 YEL

450-.8 BLK/WHT

461-.8 ORN

451-.8 WHT/BLK

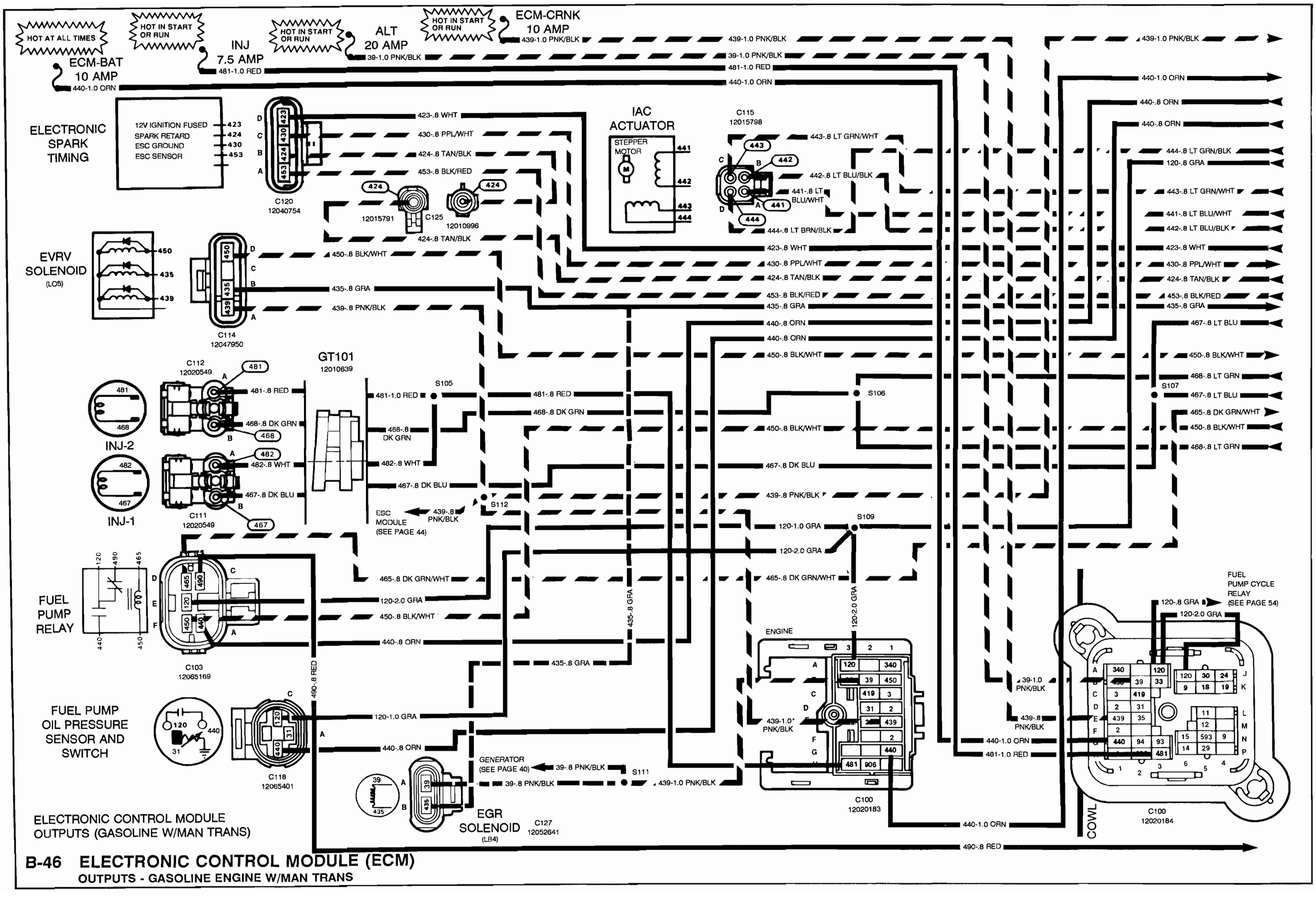
ALDL

G	422	F
H	461	E
J		D
K	436	C
L	451	
M	450	A

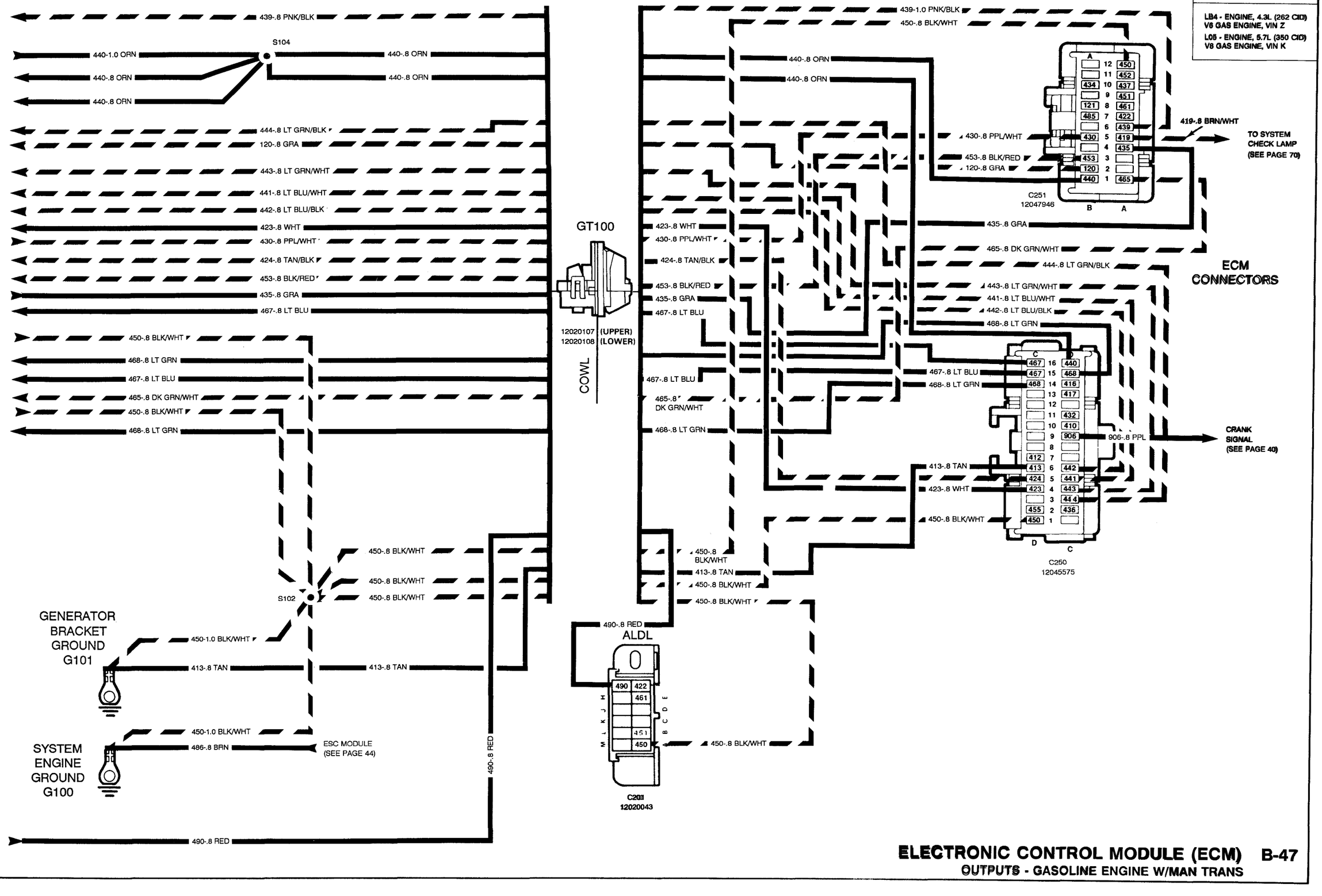
C201
12020043

ELECTRONIC CONTROL MODULE (ECM) B-45

INPUTS - GASOLINE ENGINE W/MAN TRANS

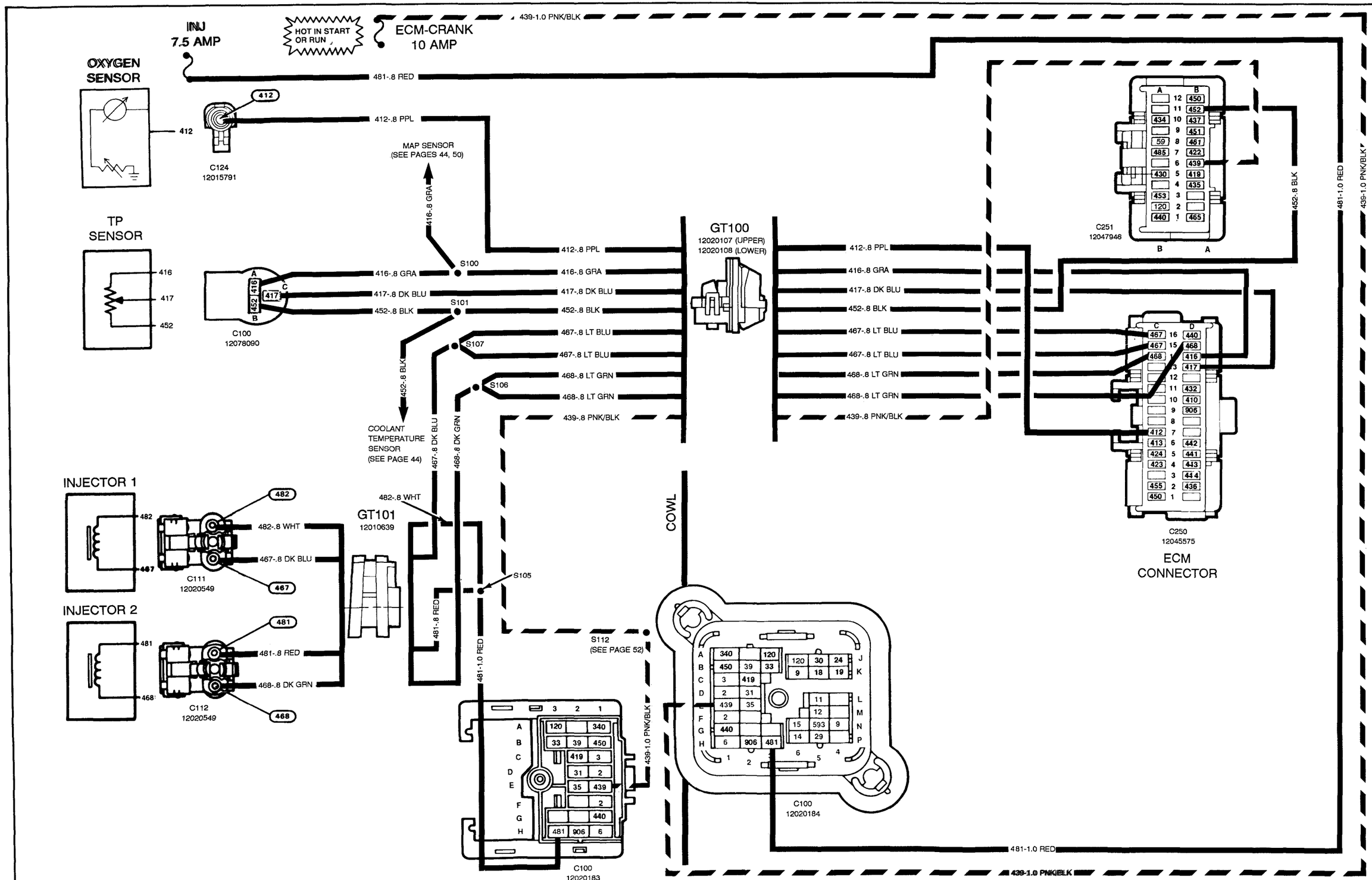


B-46 ELECTRONIC CONTROL MODULE (ECM)
OUTPUTS - GASOLINE ENGINE W/MAN TRANS



ELECTRONIC CONTROL MODULE (ECM) B-47

OUTPUTS - GASOLINE ENGINE W/MAN TRANS

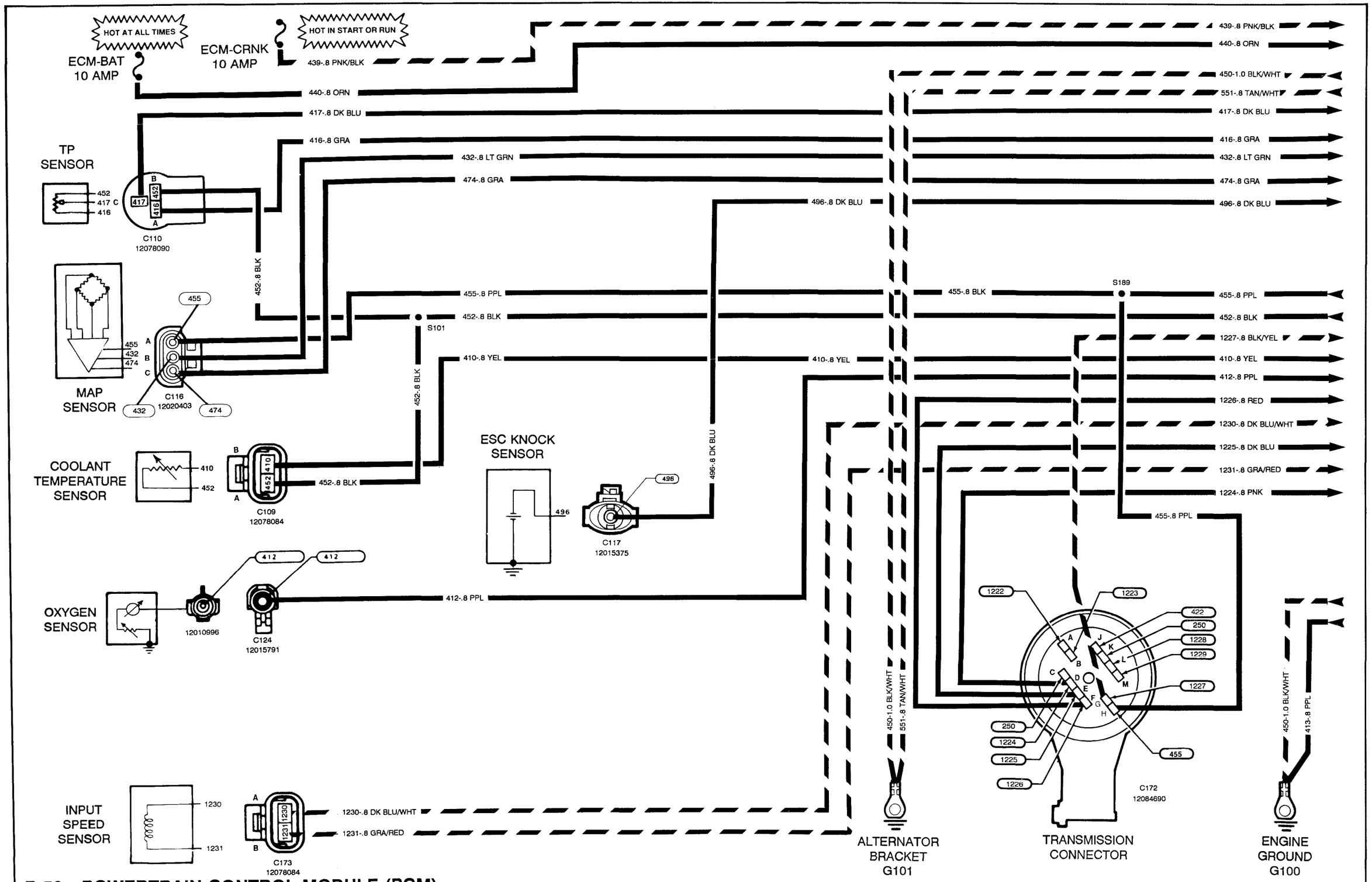

INJ
7.5 AMP
HOT IN START OR RUN
ECM-CRANK
10 AMP
439-1.0 PNK/BLK
OXYGEN SENSOR
412
481-.8 RED
412-.8 PPL
C124
12015791
MAP SENSOR
(SEE PAGES 44, 50)
416-.8 GRA
TP SENSOR
416
417
452
S100
S101
416-.8 GRA
417-.8 DK BLU
452-.8 BLK
C100
12078090
GT100
12020107 (UPPER)
12020108 (LOWER)
412-.8 PPL
416-.8 GRA
417-.8 DK BLU
452-.8 BLK
467-.8 LT BLU
468-.8 LT GRN
439-.8 PNK/BLK
C251
12047946
452-.8 BLK
481-1.0 RED
439-1.0 PNK/BLK
S107
S106
467-.8 LT BLU
468-.8 LT GRN
439-.8 PNK/BLK
452-.8 BLK
COOLANT TEMPERATURE SENSOR
(SEE PAGE 44)
467-.8 DK BLU
468-.8 DK GRN
INJECTOR 1
482
482-.8 WHT
467-.8 DK BLU
467
C111
12020549
INJECTOR 2
481
481-.8 RED
468-.8 DK GRN
468
C112
12020549
482-.8 WHT
GT101
12010639
481-.8 RED
S105
481-1.0 RED
439-1.0 PNK/BLK
S112
(SEE PAGE 52)
C100
12020183
COWL
C100
12020184
481-1.0 RED
439-1.0 PNK/BLK
C250
12045575
ECM
CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
1223	.8	YEL/BLK	A2	SOLENOID B DRIVER
1222	.8	LT GRN	A3	SOLENOID A DRIVER
422	.8	TAN/BLK	A4	TCC DRIVER
			A5	NOT USED
			A6	NOT USED
419	.8	BRN/WHT	A7	SYSTEM CHECK LAMP
			A8	NOT USED
			A9	NOT USED
			A10	NOT USED
435	.8	GRA	A11	EVRV SOLENOID
420	.8	PPL	A12	BRAKE SIGNAL
			B1	NOT USED
1226	.8	RED	B2	PRESSURE SWITCH MANIFOLD C
1225	.8	DK BLU	B3	PRESSURE SWITCH MANIFOLD B
1224	.8	PNK	B4	PRESSURE SWITCH MANIFOLD A
			B5	NOT USED
			B6	NOT USED
1229	.8	LT BLU/WHT	B7	FORCE MOTOR LOW
1228	.8	BLK/RED	B8	FORCE MOTOR HIGH
1230	.8	DK BLU/WHT	B9	INPUT SPEED HIGH
1231	.8	GRA/RED	B10	INPUT SPEED LOW
437	.8	BRN	B11	DRAC MODULE
59	.8	DK GRN	B12	AIR CONDITIONING (L05)

POWERTRAIN CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
439	.8	PNK/BLK	C1	12V IGNITION FUSED
450	.8	BLK/WHT	C2	SYSTEM GROUND
551	.8	TAN/WHT	C3	SYSTEM GROUND
416	.8	GRA	C4	5V SENSOR REFERENCE
417	.8	DK BLU	C5	TPS
441	.8	LT BLU/WHT	C6	STEPPER COIL A HIGH
442	.8	LT BLU/BLK	C7	STEPPER COIL A LOW
444	.8	LT GRN/BLK	C8	STEPPER COIL B LOW
443	.8	LT GRN/WHT	C9	STEPPER COIL B HIGH
432	.8	LT GRN	C10	MAP
1061	.8	ORN/BLK	C11	SERIAL DATA
			C12	NOT USED
413	.8	TAN	C13	OXYGEN SENSOR GROUND
412	.8	PPL	C14	OXYGEN SENSOR
468	.8	DK GRN	C15	INJECTOR B (2) DRIVER
467	.8	DK BLU	C16	INJECTOR A (1) DRIVER
440	.8	ORN	D1	12V BATTERY FUSED
455	.8	PPL	D2	SENSOR GROUND
452	.8	BLK	D3	SENSOR GROUND
474	.8	GRA	D4	5V SENSOR REFERENCE
496	.8	DK BLU	D5	KNOCK SIGNAL
451	.8	WHT/BLK	D6	ALDL
120	.8	TAN/WHT	D7	ELECTRIC FUEL PUMP FEED FUSED
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
423	.8	WHT	D11	HEI SPARK TIMING
424	.8	TAN/BLK	D12	HEI BYPASS
453	.8	BLK/RED	D13	DISTRIBUTOR REFERENCE LOW
430	.8	PPL/WHT	D14	DISTRIBUTOR REFERENCE HIGH
1227	.8	BLK/YEL	D15	TRANSMISSION TEMPERATURE
410	.8	YEL	D16	COOLANT TEMPERATURE

POWERTRAIN CONTROL MODULE CONNECTOR



B-50 POWERTRAIN CONTROL MODULE (PCM)

INPUTS - GASOLINE ENGINE W/AUTO TRANS

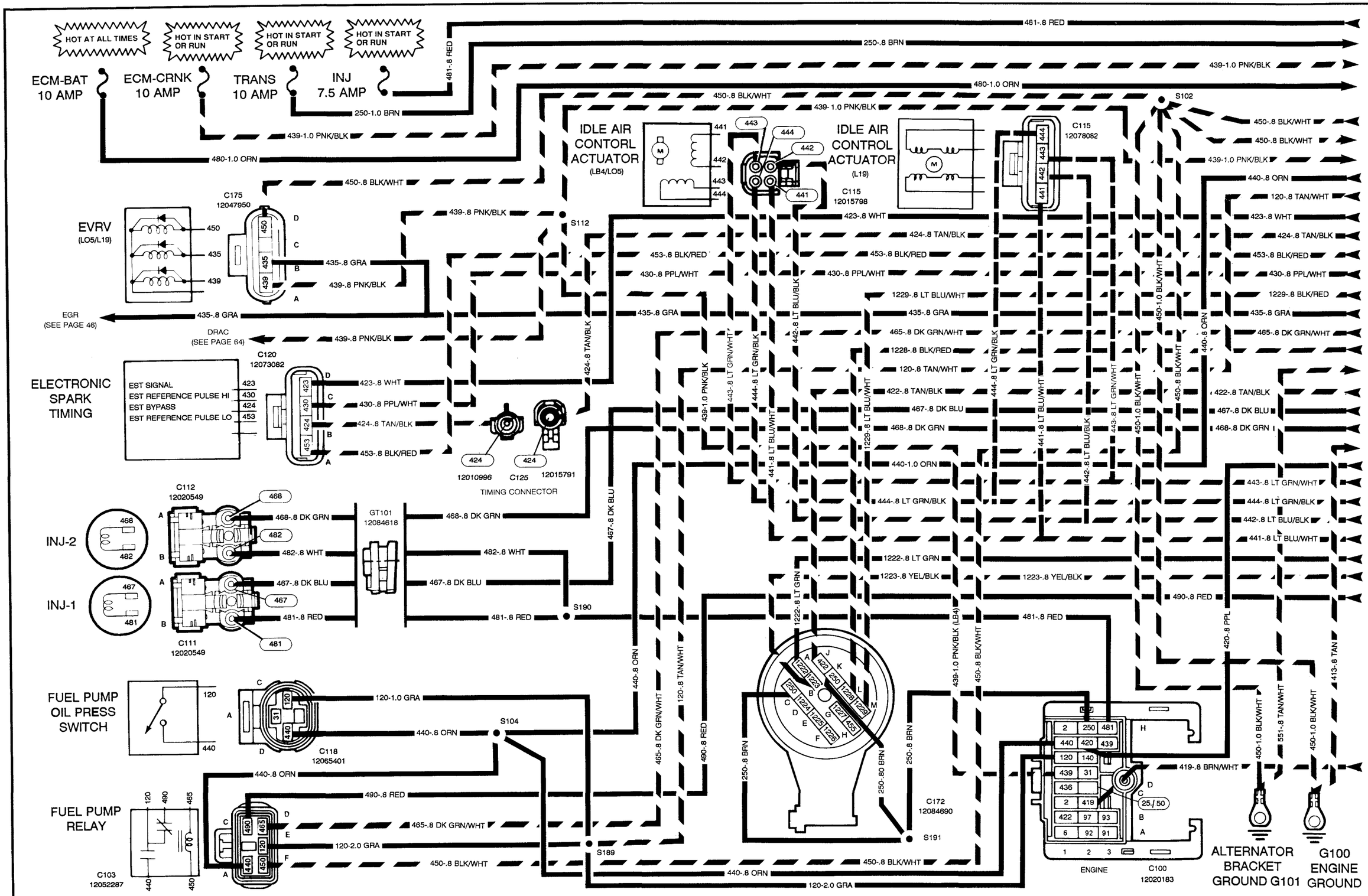
RPO CODES

L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN E

439-.8 PNK/BLK
440-.8 ORN
S102
(SEE PAGE 17)
450-1.0 BLK/WHT
450-.8 BLK/WHT
551-.8 TAN/WHT
417-.8 DK BLU
416-.8 GRA
432-.8 LT GRN
474-.8 GRA
496-.8 DK BLU
S104
(SEE PAGE 52)
440-.8 ORN
455-.8 PPL
452-.8 BLK
1227-.8 BLK/YEL
410-.8 YEL
412-.8 PPL
1226-.8 RED
1230-.8 DK BLU/WHT
1225-.8 DK BLU
1231-.8 GRA/RED
1224-.8 PNK
450-1.0 BLK/WHT
413-.8 PPL
413-.8 PPL
440-1.0 ORN
ENGINE
C100
12020183
COWL
GT100
12020107
(UPPER)
12020108
(LOWER)
I/P
25/50
C100
12020184
COWL
450-.8 BLK/WHT
551-.8 TAN/WHT
417-.8 DK BLU
416-.8 GRA
432-.8 LT GRN
474-.8 GRA
496-.8 DK BLU
440-.8 ORN
455-.8 PPL
452-.8 BLK
1227-.8 BLK/YEL
410-.8 YEL
412-.8 PPL
1226-.8 RED
1230-.8 DK BLU/WHT
1225-.8 DK BLU
1231-.8 GRA/RED
1224-.8 PNK
413-.8 PPL
437-.8 BRN
DRAC
(SEE PAGE 64)
451-.8 WHT/BLK
437-.8 BRN
ALDL
C201
12020043
417-.8 DK BLU
416-.8 GRA
C250
12052177
412-.8 PPL
PCM
CONNECTORS
413-.8 PPL
439-.8 PNK/BLK
437-.8 BRN
C251
12052175
59-.8 DK GRN
LO5 ONLY
PROVISIONS FOR
AIR CONDITIONING

POWERTRAIN CONTROL MODULE (PCM) B-51

INPUTS - GASOLINE ENGINE W/AUTO TRANS



B-52 POWERTRAIN CONTROL MODULE (PCM)

OUTPUTS - GASOLINE ENGINE W/AUTO TRANS

RPO CODES
LB4 - ENGINE, 4.3L (262 CID) V6 GAS ENGINE, VIN Z L05 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

481-1.0 RED
250-1.0 BRN
439-1.0 PNK/BLK
440-1.0 ORN
450-.8 BLK/WHT
450-.8 BLK/WHT
439-.8 PNK/BLK
439-1.0 PNK/BLK (LB4)
440-.8 ORN
120-.8 TAN/WHT
423-.8 WHT
424-.8 BLK/RED
453-.8 BLK/RED
430-.8 PPL/WHT
1229-.8 LT BLU/WHT
435-.8 GRA
465-.8 DK GRN/WHT
1228-.8 BLK/RED
551-.8 TAN/WHT
422-.8 TAN/BLK
467-.8 DK BLU
468-.8 DK GRN
413-.8 TAN
420-.8 PPL
443-.8 LT GRN/WHT
444-.8 LT GRN/BLK
442-.8 LT BLU/BLK
441-.8 LT BLU/WHT
1222-.8 LT GRN
1223-.8 YEL/BLK

GT100
12020107
(UPPER)
12020108
(LOWER)

COWL

TCC SWITCH
A 250
B 420
250-1.0 BRN

C296
12010649

I/P

420-.8 PPL

C100
12020184

COWL

419-.8 BRN/WHT

SERVICE
ENGINE
SOON
LAMP
(SEE PAGE 69)

419-.8 BRN/WHT

250-1.0 BRN
440-1.0 ORN
439-1.0 PNK/BLK

490-.8 RED

ALDL
G H J K L M
490 422
1061
436
451
450
C B

C204
12020043

450-.8 BLK/WHT
422-.8 TAN/BLK
422-.8 TAN/BLK

435-.8 GRA
1229-.8 LT BLU/WHT
451-.8 WHT/BLK

D
440 1 439
455 2 450
452 3 551
474 4 416
496 5 417
451 6 441
120 7 442
8 444
9 443
10 432
423 11 1061
424 12
453 13 413
430 14 412
1227 15 468
410 16 467

C250
12052177

465-.8 DK GRN/WHT
441-.8 LT BLU/WHT
444-.8 LT GRN/BLK
1061-.8 ORN/BLK

B
1 465
1226 2 1223
1225 3 1222
1224 4 422
5
6
1229 7 419
1228 8
1230 9
1231 10
437 11 435
59 12 420

C251
12052175

1223-.8 YEL/BLK
1222-.8 LT GRN
422-.8 TAN/BLK
419-.8 BRN/WHT

PCM
CONNECTORS

420-.8 PPL
435-.8 GRA
1061-.8 ORN/BLK

POWERTRAIN CONTROL MODULE (PCM) B-53

OUTPUTS - GASOLINE ENGINE W/AUTO TRANS

RPO CODES
LB4 - ENGINE, 4.3L (262 CID) V6 GAS ENGINE, VIN Z LO5 - ENGINE, 5.7L (350 CID) V8 GAS ENGINE, VIN K L19 - ENGINE, 7.4L (454 CID) V8 GAS ENGINE, VIN N

HOT AT ALL TIMES
GAUGES 25 AMP
HOT IN RUN
ECM-BAT 10 AMP
350-1.0 PNK/WHT
440-1.0 ORN
490-.8 RED → ALDL (SEE PAGE 47)
FUEL PUMP RELAY
C103 12065169
465-.8 DK GRN/WHT
120-2.0 GRA
450-.8 BLK/WHT
440-.8 ORN
120-.8 GRA
440-.8 ORN
450-.8 BLK/WHT
C251 12047946
465-.8 DK GRN/WHT
ELECTRONIC CONTROL MODULE
IGNTION ELEC. FUEL PUMP
GROUND
FUEL CYCLE MODULE
C202 12047886
150-.8 BLK
S203 (SEE PAGE 18)
COWL
150-3.0 BLK
440-1.0 ORN
120-.8 GRA
120-2.0 GRA
I/P
441-.8 LT BLU/WHT
442-.8 LT BLU/BLK
443-.8 LT GRN/WHT
444-.8 LT BRN/BLK
IDLE AIR CONTROL ACTUATOR (L19)
C115 12078082
S104
440-.8 ORN
440-1.0 ORN
450-.8 BLK/WHT
GT100
12020107 (UPPER)
12020108 (LOWER)
413-.8 TAN
450-1.0 BLK/WHT
C250 12045575
443-.8 LT GRN/WHT
442-.8 LT BLU/BLK
441-.8 LT BLU/WHT
444-.8 LT GRN/BLK
31-.5 TAN
450-1.0 BLK/WHT
120-2.0 GRA
ENG
C100 12020183
C100 12020184
31-.5 TAN → TO OIL PRESSURE GAGE (SEE PAGE 71)
STEPPER MOTOR
IDLE AIR CONTROL ACTUATOR (LB4, LO5)
444-.8 LT BRN/BLK
413-.8 TAN
ESC MODULE (SEE PAGE 44)
S109
450-1.0 BLK/WHT
450-.8 BLK/WHT
S102
450-1.0 BLK/WHT
450-1.0 BLK/WHT
120-1.0 GRA
ALDL (SEE PAGE 45) ← 450-.8 BLK/WHT
120-2.0 GRA
31-.5 TAN
440-.8 ORN
C102 12020099
REAR BODY CONNECTOR
C118 12065401
FUEL PUMP OIL PRESSURE SENSOR AND SWITCH
ELECTRIC FUEL PUMP
12020829
12020827
C400
120-2.0 TAN/WHT
30-.8 PNK
150-2.0 BLK
SYSTEM GROUND
413-.8 TAN
G100
BRACKET GROUND
486-.8 BRN
G101
I/P GROUND G200
FRAME GROUND
G400

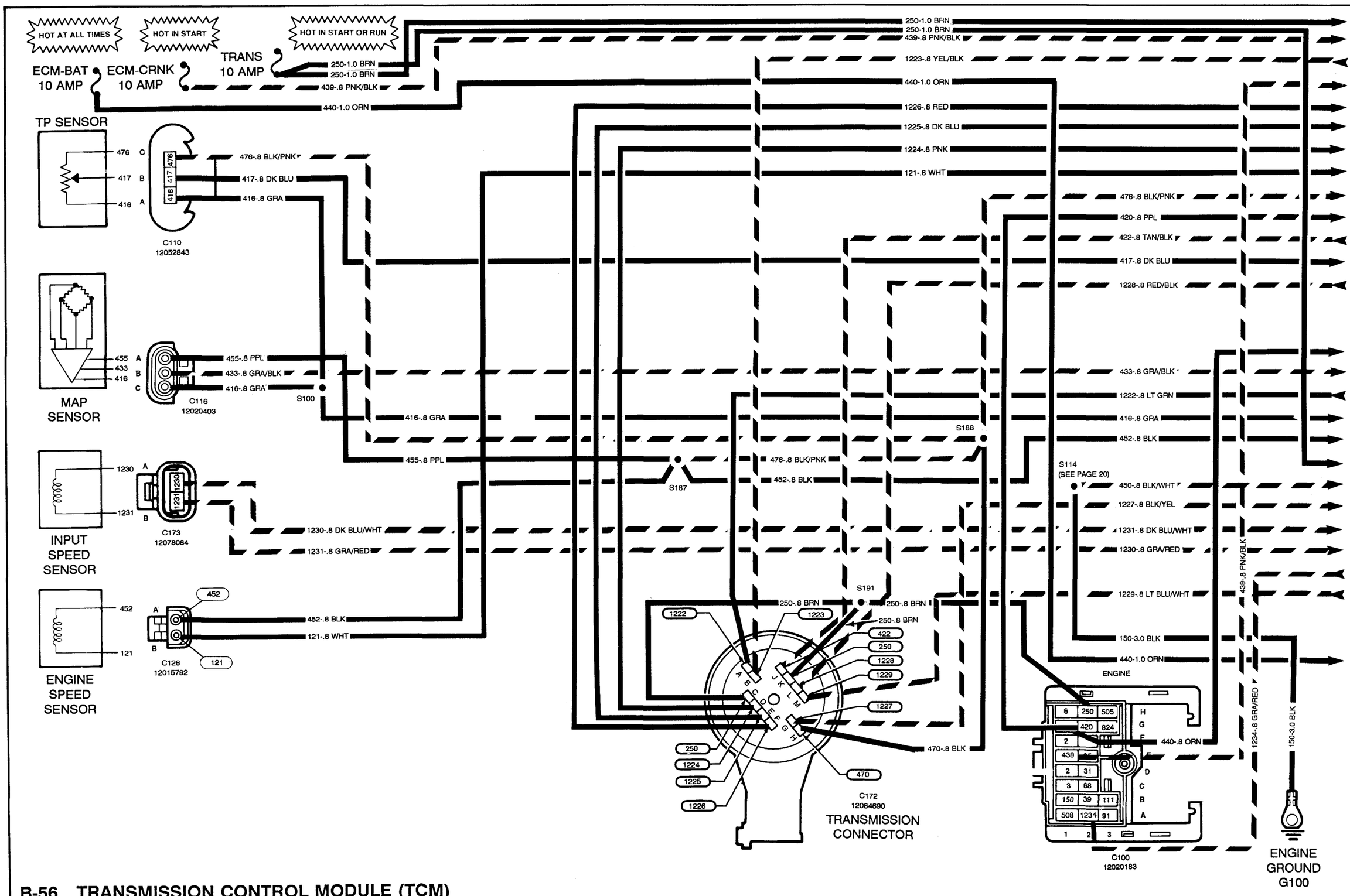
B-54 FUEL CONTROL AND IDLE AIR CONTROL

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			A1	NOT USED
			A2	NOT USED
1224	.8	PNK	A3	PRESSURE SWITCH MANIFOLD A
1225	.8	DK BLU	A4	PRESSURE SWITCH MANIFOLD B
1226	.8	RED	A5	PRESSURE SWITCH MANIFOLD C
1223	.8	YEL/BLK	A6	SOLENOID B DRIVER
1222	.8	LT GRN	A7	SOLENOID A DRIVER
451	.8	WHT/BLK	A8	ALDL
			A9	NOT USED
			A10	NOT USED
			A11	NOT USED
440	.8	ORN	A12	12V BATTERY FUSED
			B1	NOT USED
			B2	NOT USED
			B3	NOT USED
420	.8	PPL/BLK	B4	BRAKE SIGNAL
422	.8	TAN/BLK	B5	TCC
			B6	NOT USED
			B7	NOT USED
			B8	NOT USED
1234	.8	GRA/RED	B9	SYSTEM CHECK LAMP
1061	.8	ORN/BLK	B10	SERIAL DATA
1233	.8	DK GRN/YEL	B11	OUTPUT SPEED SENSOR LOW
1232	.8	LT BLU	B12	OUTPUT SPEED SENSOR HIGH

TRANSMISSION CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
450	.8	BLK/WHT	C1	SYSTEM GROUND
551	.8	TAN/WHT	C2	SYSTEM GROUND
452	.8	BLK	C3	SENSOR GROUND
416	.8	GRA	C4	5V SENSOR REFERENCE
			C5	NOT USED
			C6	NOT USED
			C7	NOT USED
			C8	NOT USED
			C9	NOT USED
			C10	NOT USED
			C11	NOT USED
			C12	NOT USED
			C13	NOT USED
			C14	NOT USED
1229	.8	LT BLU/WHT	C15	FORCE MOTOR HIGH
439	.8	PNK/BLK	C16	12V IGNITION FUSED
			D1	NOT USED
437	.8	BRN	D2	DRAC MODULE
1231	.8	DK BLU/WHT	D3	INPUT SPEED LOW
1230	.8	GRA/RED	D4	INPUT SPEED HIGH
			D5	NOT USED
121	.8	WHT	D6	ENGINE SPEED
476	.8	BLK/PNK	D7	SENSOR GROUND
417	.8	DK BLU	D8	TPS
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
1227	.8	BLK/YEL	D13	TRANSMISSION TEMPERATURE
433	.8	GRA/BLK	D14	MAP
			D15	NOT USED
1229	.8	LT BLU/WHT	D16	FORCE MOTOR HIGH

TRANSMISSION CONTROL MODULE CONNECTOR



B-56 TRANSMISSION CONTROL MODULE (TCM)

DIESEL ENGINE W/AUTO TRANS

250-1.0 BRN
439-.8 PNK/BLK
1223-.8 YEL/BLK
439-.8 PNK/BLK
1226-.8 RED
1225-.8 DK BLU
1224-.8 PNK
121-.8 WHT
476-.8 BLK/PNK
420-.8 PPL
S119
422-.8 TAN/BLK
417-.8 DK BLU
1228-.8 RED/BLK

440-.8 ORN
433-.8 GRA/BLK
1222-.8 LT GRN
416-.8 GRA
452-.8 BLK
250-1.0 BRN
450-.8 BLK/WHT
1227-.8 BLK/YEL
1231-.8 DK BLU/WHT
1230-.8 GRA/RED
1234-.8 GRA/RED
1229-.8 LT BLU/WHT

COWL

GT100
12020107
(UPPER)
12020108
(LOWER)

1223-.8 YEL/BLK
439-.8 PNK/BLK
1226-.8 RED
1225-.8 DK BLU
1224-.8 PNK
121-.8 WHT
476-.8 BLK/PNK
420-.8 PPL
422-.5 TAN/BLK
422-.5 TAN/BLK
417-.8 DK BLU
1228-.8 RED/BLK
422-.5 TAN/BLK
1234-.5 GRA/RED

440-.8 ORN
433-.8 GRA/BLK
1222-.8 LT GRN
416-.8 GRA
452-.8 BLK
551-.8 TAN/WHT
450-.8 BLK/WHT
1227-.8 BLK/YEL
1231-.8 DK BLU/WHT
1230-.8 GRA/RED
1234-.8 GRA/RED
1229-.8 LT BLU/WHT
1061-.8 ORN/BLK
437-.8 BRN

C253
12059125

B		A
	1	
	2	
59	3	1224
420	4	1225
422	5	1226
	6	1223
	7	1222
	8	451
1234	9	
1061	10	
1233	11	
1232	12	440

TCM
CONNECTORS

D		C
	1	450
437	2	551
1231	3	452
1230	4	416
	5	
121	6	
476	7	
417	8	
	9	
	10	
	11	
	12	
1227	13	
433	14	
1229	15	
1228	16	439

C252
12059126

ALDL

G	422	F
H	1061	
J		D
K	451	C
L		B
M	450	A

C201
12020043

I/P

P	4	5	6	3	2	1		H
N	9	29	14	505	250	6		G
M		15		824	420	440		F
L		12				2		E
		11		35	439			
				31	2			
K	18	19	9	68	3			C
J	24	30		111	39	150		B
					1234	508		A

C100
12020184

420-.8 PPL
439-.8 PNK/BLK
440-1.0 ORN
551-.8 TAN/WHT
422-.5 TAN/BLK

TCC
SWITCH

250	
420	

C296
12010649

ENGINE
GROUND
G102

DRAC
(SEE PAGE 65)

CHECK
ENGINE
LAMP
(SEE PAGE 70)

1234-.8 GRA/RED

451-.8 WHT/BLK
422-.5 TAN/BLK
1061-.8 ORN/BLK

TRANSMISSION CONTROL MODULE (TCM) B-57

DIESEL ENGINE W/AUTO TRANS

B-58 BLANK

CIRCUIT OPERATION

The heating of the Glow Plugs is controlled by the Glow Plug Relay in the Glow Plug Controller. Battery voltage is applied to the relay contacts through the RED wire from Junction Block. The relay is operated by a Solid-State Controller. The Controller responds to engine temperature and also to an Ignition Switch Start Input.

When the Ignition Switch is turned to RUN, battery voltage is applied to the Enable Input of the Controller. The Glow Plug Relay within the Controller will be energized for approximately five seconds during which it applies voltage to the Glow Plugs and WAIT Indicator. After the initial time period the relay will be de-energized for five seconds then will cycle ON/OFF for approximately 10 seconds.

When the Glow Plug Controller receives the Start Input, the Glow Plugs and WAIT Indicator will cycle ON/OFF after the Ignition Switch is returned to RUN.

After approximately 25 seconds the Controller will open the Glow Plug Relay and the heating of the plugs stops.

DIAGNOSIS -- GLOW PLUGS

PRELIMINARY CHECKS:

A check of the glow plug system should be performed before doing diagnostic procedures.

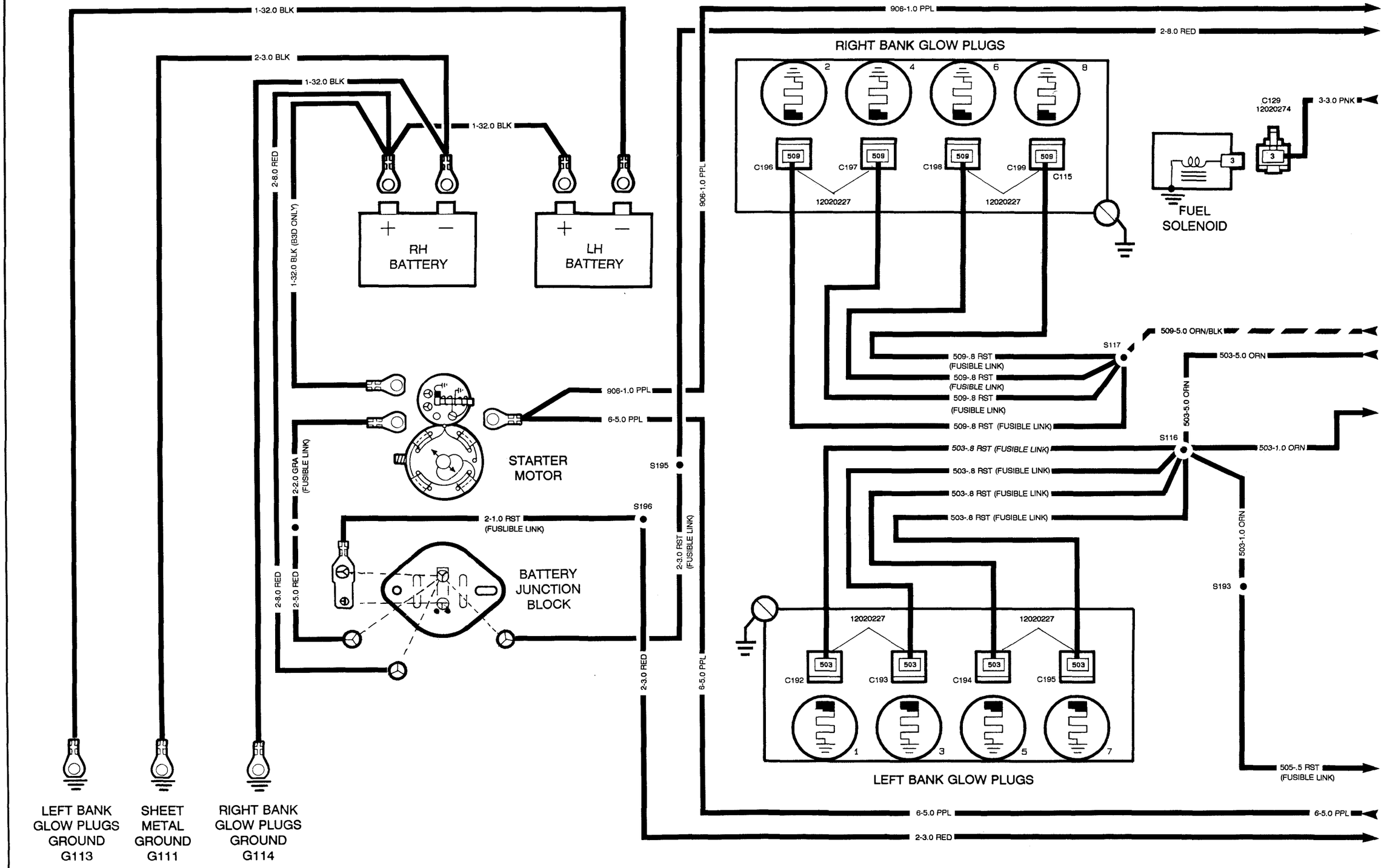
With engine below normal operating temperature, turn ignition switch to RUN. The WAIT indicator should light. After approximately 10 seconds, the WAIT indicator must begin to flash for an additional 10 seconds and then go out.

Turn ignition switch to OFF and then momentarily to START and return to RUN position. The WAIT indicator should flash for approximately 25 seconds and then go out.

With engine at normal operating temperature, turn ignition switch to RUN. The WAIT indicator should flash.

WAIT INDICATOR DOES NOT FLASH OR FLASHES FOR THE INCORRECT AMOUNT OF TIME WHEN ENGINE IS BELOW NORMAL OPERATING TEMPERATURE

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect test lamp from RED (2) wire at glow plug controller connector C190 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire and fusible link from glow plug controller connector C190 to battery junction block.
2. Connect test lamp from PNK (3) wire at glow plug controller connector C128 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (3) wire from glow plug controller connector C128 to ground terminal G102.
3. Connect test lamp from PNK (3) wire to BLK (150) wire at glow plug controller connector C128.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from glow plug controller connector C128 to ground terminal G102.
4. Connect test lamp from PPL (906) wire at glow plug controller connector C128 to ground. Move ignition switch to START position.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in PPL (906) wire from glow plug controller connector C128 to starter motor.
5. Place ignition switch to OFF position. Connect test lamp from ORN (503) and ORN/BLK (509) wires at glow plug controller connector C191 to ground.	Test lamp lights.	REPLACE glow plug controller.
	Test lamp does not light.	GO to step 6.
6. Disconnect glow plug controller connector C128. Using a positive polarity ohmmeter, check continutity between ORN (503) and BLK (150) wires.	Reading of 2 ohms or less.	GO to step 7.
	Reading greater than 2 ohms.	LOCATE and REPAIR open in ORN (503) wires from glow plug controller connector C128 to splice S116.
7. Reconnect glow plug controller connector. Connect test lamp from ORN (503) and ORN/BLK (509) wires at glow plug controller connector C191 to ground. Turn ignition switch momentarily to START and then release to RUN position.	Test lamp cycles on and off for approximately 25 seconds then goes off.	GO to step 8.
	Test lamp does not light or cycles for the incorrect time.	REPLACE glow plug controller.
8. Remove all connectors from glow plugs. Connect one lead of test lamp to battery voltage and other lead to each glow plug.	Test lamp lights for all glow plugs.	LOCATE and REPAIR open in ORN (503) and ORN/BLK (509) wires from glow plug to glow plug controller connector C191.
	Test lamp does not light for one or more glow plugs.	REPLACE glow plug(s) where test lamp did not light.



B-60 GLOW PLUGS

RPO CODES
B3D - SCHOOL BUS EQUIPMENT
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE
MT8 - MAN TRANS, 5-SPD., WITH OVERDRIVE

906-1.0 PPL
2-8.0 RED
3-3.0 PNK
2-8.0 RED
3-3.0 PNK
C190
GLOW PLUG CONTROLLER
509-5.0 ORN/BLK
503-5.0 ORN
C191
C128
12015982
A
B
D
E
906
503
3
150
3-3.0 PNK
150-.8 BLK
S113
S114
(SEE PAGES 19, 20)
503-1.0 ORN
COWL
150-1.0 BLK
ENGINE
C100
12020183
3-3.0 PNK
505-.5 RST
(FUSIBLE LINK)
6-5.0 PPL
2-3.0 RED
ENGINE GROUND
G102
I/P
S205
3-5.0 PNK
C100
12020184
505-1.0 YEL
GLOW PLUG WAIT LAMP
(SEE PAGE 70)
6-5.0 PPL
2-5.0 RED
6-5.0 PPL
(MT1 ONLY)
6-5.0 PPL
5-3.0 PNK
2-5.0 RED
2-5.0 RED
S206
FUSE BLOCK
(SEE PAGES 12, 13)
6-5.0 PPL
CLUTCH START SW
(MT8 ONLY)
(SEE PAGE 41)
5-3.0 YEL
2-5.0 RED
C298
6294641
5-3.0 YEL (MT8)
6-5.0 PPL (MT1)
C299
12010966
2-5.0 RED
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC

CIRCUIT OPERATION

The Diesel Fuel Filter System combines six functions into a single package:

1. It heats diesel fuel to prevent wax-plugging of the filter;
2. It combines very small droplets of water in the fuel into larger drops and separates the water from the fuel;
3. It filters the diesel fuel;
4. It detects an excessive pressure drop indicating filter plugging; (Vacuum Switch)
5. It detects the presence of excess water in the fuel; and
6. It provides a means to drain the water it has separated.

The Fuel Filter Assembly consists of the following main parts: Fuel Heater, the Water In Fuel Sensor, the Fuel Pressure Switch, and a Filter. The Filter contains the "coalescer" (the device that combines small droplets of water into larger ones) and the filter/separator.

An electric fuel pump delivers diesel fuel from the tank to the fuel filter. As fuel enters the filter, it passes first through the Fuel Heater. The heater contains a thermostatic switch. The switch opens or closes, to turn the heater off or on, depending on the temperature of the fuel.

The fuel then passes through the Primary and Secondary filters. Next the fuel flows through the water coalescer. Here the droplets of water in the fuel are combined into larger drops, the drops fall to the water reservoir in the filter. When fuel flows from the Fuel Filter Assembly to the injection pump, it is clean and free of water.

The Solid-State Water In Fuel Sensor applies voltage to a Probe. When the Probe touches water, the Module closes a switch. This completes a circuit to ground to light the SERVICE FUEL FILTER Indicator.

A times delay circuit in the Water In Fuel Module grounds the Indicator bulb briefly to test the bulb each time the system is turned on.

The Fuel Heater is operated by a built-in thermostatic switch. When the switch is closed, battery voltage is applied to the heater from the ALT Fuse.

DIAGNOSIS -- DIESEL ENGINE FUEL CONTROLS

FUEL HEATER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect fuel heater connector C132. Place ignition switch to RUN position. Connect voltmeter from PNK/BLK (39) wire at fuel heater connector C132 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of ALT fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) from fuel heater connector C132 to fuse block.
2. Connect voltmeter from PNK/BLK (39) wire to BLK (150) wire at fuel heater connector C132.	Battery voltage.	REPLACE fuel heater.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from fuel heater connector to ground G102.

WATER IN FUEL INDICATOR LIGHTS WITH NO WATER IN FUEL

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Disconnect water in fuel sensor connector C130.	Water in fuel indicator stays on.	LOCATE and REPAIR open in YEL/BLK (508) wire between water in fuel sensor connector C130 and water in fuel indicator.
	Water in fuel indicator goes out.	REPLACE water in fuel sensor.

WATER IN FUEL INDICATOR DOES NOT LIGHT BRIEFLY WITH IGNITION SWITCH TURNED TO RUN

TEST	RESULT	ACTION
1. Disconnect water in fuel sensor connector C130 and place ignition switch in RUN. Connect a voltmeter from PNK/BLK (39) wire at water in fuel sensor connector C130 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of ALT fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from water in fuel sensor connector C130 to fuse block.
2. Connect voltmeter from PNK/BLK (39) to BLK (150) wire at water in fuel sensor connector C130.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from water in fuel sensor connector C130 to ground G102.
3. Connect voltmeter from YEL/BLK (508) wire at water in fuel sensor connector C130 to ground.	Battery voltage.	REPLACE water in fuel sensor.
	No voltage.	CHECK water in fuel lamp. If lamp is good, LOCATE and REPAIR open in YEL/BLK (508) wire between water in fuel sensor connector C130 and water in fuel indicator.

HOT IN START OR RUN

ALT 20 AMP

39-.8 PNK/BLK

FAST IDLE SOLENOID

531

COLD ADVANCE CONTROL

531

COLD ADVANCE AND FAST IDLE TEMPERATURE SWITCH

531 39

C131 2973872

C135 12004267

C134 2977253

531-.8 LT GRN/BLK

531-.8 LT GRN/BLK

39-.8 PNK/BLK → GENERATOR (SEE PAGE 41)

S115

39-.8 PNK/BLK

39-.8 PNK/BLK

39-.8 PNK/BLK

WATER IN FUEL SENSOR

39
508
150

SOLID STATE

C130 12015793

39-.8 PNK/BLK

508-.8 YEL/BLK

150-.8 BLK

508-.8 YEL/BLK

150-.8 BLK

39-.8 PNK/BLK

39-.8 PNK/BLK

FUEL HEATER

150
39

C132 12020397

150-.8 BLK

39-.8 PNK/BLK

S114 (SEE PAGES 19, 20)

COWL

GLOW PLUG CONTROLLER

906
903
3
150

C128 12015982

3-3.0 PNK

150-.8 BLK

150-1.0 BLK

S113

3-5.0 PNK

FUEL SHUT OFF VALVE

C129 12020274

3-3.0 PNK

ENGINE GROUND G102

12020183

508-.8 YEL → WATER IN FUEL LAMP (SEE PAGE 70)

12020184

S208 (SEE PAGE 70)

39-.8 PNK/BLK

39-.8 PNK/BLK → I/P CLUSTER (SEE PAGE 69)

C100

RPO CODES
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE MT8 - MAN TRANS, 5-SPD., WITH OVERDRIVE

HOT IN START OR RUN

ECM-CRNK
10 AMP

439-1.0 PNK/BLK

DRAC

VEHICLE SPEED SIGNAL CLUSTER
VEHICLE SPEED TO ECM/PCM SIGNAL
VEHICLE SPEED INPUT
12 VOLT (IGNITION)
GROUND
VEHICLE SPEED SENSOR INPUT

824 437 1232 439 150 1233

C292
12066130

437-.8 BRN

1233-.8 DK GRN/YEL

150-.8 BLK

439-.8 PNK/BLK

1232-.8 LT BLU

824-.8 LT BLU/BLK

ECM/PCM
CONNECTOR
C251
12052175

B: 1226 1223 1224 1229 1228 1230 1231 437
A: 485 1223 1222 422 419 435 420

COWL

GT100
12020107 (UPPER)
12020108 (LOWER)

VSS
(MT8)

1233
1232

A: 1233 1232
B

1233-.8 DK GRN/YEL

1232-.8 LT BLU

C185
12020600

OUTPUT
SPEED
SENSOR
(MT1)

1233
1232

A: 1233 1232
B

C174
12078084

1233-.8 DK GRN/YEL

1232-.8 LT BLU

S112
(SEE PAGE 52)

824-.8 LT BLU/BLK

439-.8 PNK/BLK

150-.8 BLK

ENGINE

3 2 1
A: 481 250 340
B: 824 420 440
C: 2
D: 439
E: 31 2
F: 419 3
G: 150
H: 120

C100
12020183

I/P

A: 120
B: 150 39 111
C: 3 419
D: 2 31
E: 439 35
F: 2
G: 440 420 824
H: 6 250 484

J: 30 24
K: 9 18 19
L: 11
M: 12
N: 15 9
P: 14 29 4

1 2 3 6 5 4

C100
12020184

150-.8 BLK

S203
(SEE PAGE 18)

824-.8 LT BLU/BLK

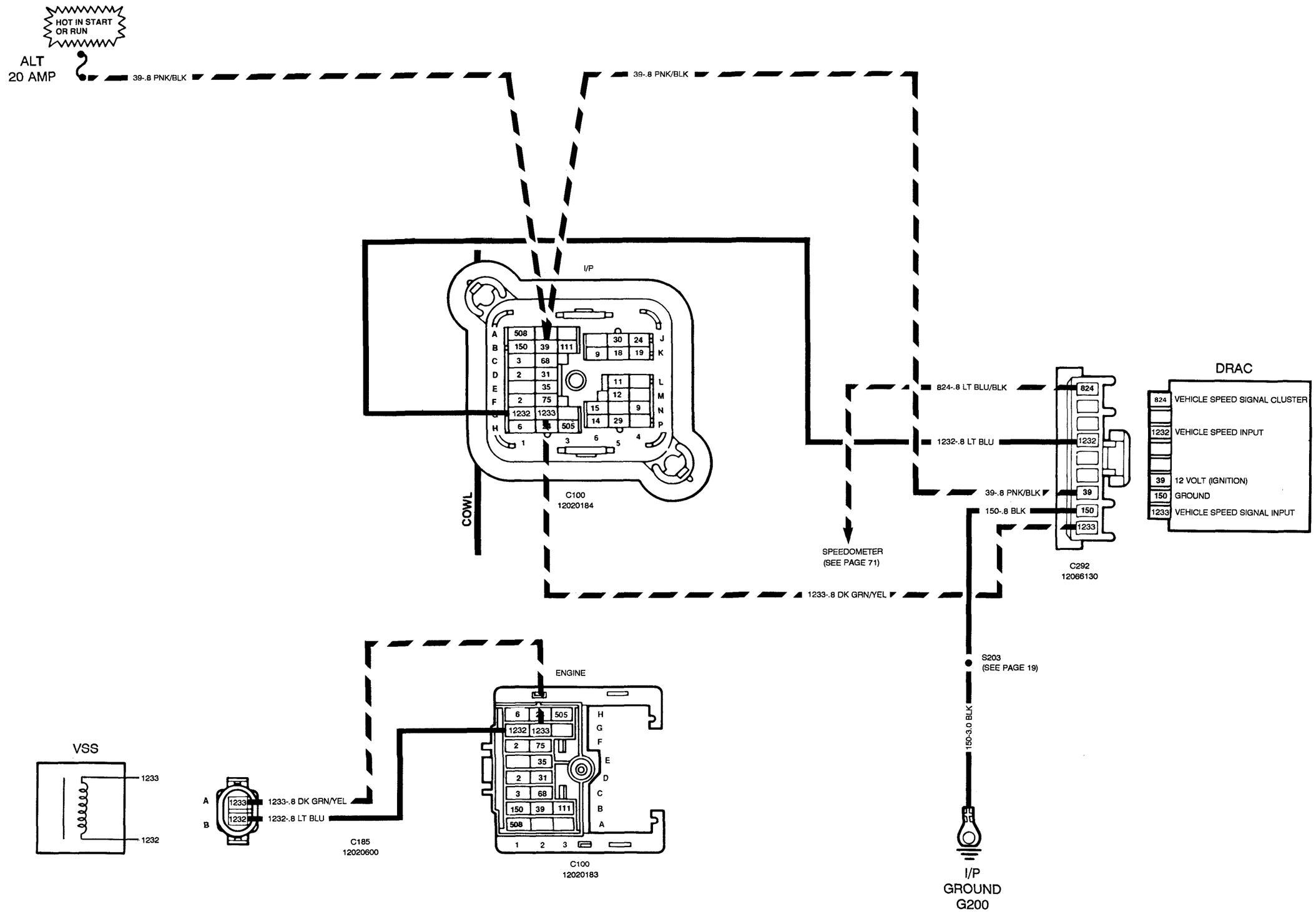
SPEEDOMETER
(SEE PAGE 71)

150-3.0 BLK

I/P
GROUND
G200

B-64 DIGITAL RATIO ADAPTER CONTROLLER (DRAC)

GASOLINE ENGINES W/MAN OR AUTO TRANS AND DIESEL ENGINES W/AUTO TRANS



DIGITAL RATIO ADAPTER CONTROLLER (DRAC) B-65

DIESEL ENGINE W/MAN TRANS

CIRCUIT OPERATION

The operation of an individual Indicator is described along with its circuit. Refer to the schematic and text for the circuit that is indicated below each of the Indicators.

PARK BRAKE WARNING LAMP

Battery voltage is applied to the Park Brake Warning Lamp when the Ignition Switch is in RUN or START. The Park Brake Switch provides a ground when the Park Brake is applied. The Park Brake Warning Lamp illuminates to alert the driver.

SERVICE BRAKES WARNING LAMP

Battery voltage is applied to the Service Brakes Warning Lamp when the Ignition Switch is in RUN or START. The Brake Pressure Switch closes to provide a ground and illuminate the lamp when there is a loss of brake fluid pressure in one of the two brake systems. This could be caused by a leak in one of the brake lines.

FUEL GAGE

The pointer of the Fuel Gage is moved by the magnetic fields of two coils. The coils are at right angles to each other. Battery voltage is applied to the E-coil and the circuit divides at the opposite end of the coil. One path continues to ground through the F-coil. Another goes to ground through the variable resistor of the Fuel Gage Sender.

When the tank is low, the resistance of the Sender is low. A large flow of current passes through the E-coil and the Fuel Gage Sender resistor. This moves the pointer toward E on the scale. When the tank is full, the Sender resistance is high. More current now flows through the F-coil, moving the pointer toward F on the scale.

With two coils operating the pointer, the Gage is not affected by changes in the system's battery voltage.

OIL PRESSURE GAGE

The engine oil pressure is displayed by the Oil Pressure Gage. The pointer of the Gage is moved by two coils, and its operation is similar to that of the Fuel Gage.

The Oil Pressure Sender is connected to the junction of the two coils. It has low resistance when the oil pressure is low, and 90 ohms resistance when the oil pressure is high. This changing resistance changes the current flow through coils. The magnetic fields of the coils move the pointer from low to high.

TEMPERATURE GAGE

The Temperature Gage is also operated by two coils. Battery voltage is applied to both coils. One is grounded directly and the other is grounded through the Temperature Sender. This has 55 ohms resistance at 127°c (260°F) (hot coolant) and its resistance becomes greater at lower temperatures. It is approximately 1400 ohms at 38°C (100°F). This causes the current through the Sender and one coil to increase as the coolant temperature increases. This moves the pointer.

LOW COOLANT INDICATOR (DIESEL)

The Low Coolant Indicator comes on to warn the driver when a low level of coolant exists in the radiator. Battery voltage is applied to the Low Coolant Module. When a low coolant condition exists, a signal is sent to the Low Coolant Module from the Low Coolant Sensor. The Low Coolant Module will provide a ground to the Low Coolant Indicator.

The Low Coolant Sensor is not a switch that opens and closes. It has a very high resistance to ground, more than 50,000 ohms, when the engine coolant level is low. This causes the Low Coolant Module to light the Low Coolant Indicator. With more of the Sensor covered by coolant, its resistance decreases. When the fluid level is good, the resistance will be less than 10,000 ohms. With the Sensor resistance between 10,000 and 50,000 ohms, the Sensor is partly covered and the fluid is not low enough to cause the warning to be displayed.

CHECK ENGINE (GASOLINE) INDICATOR

Refer to Light Duty Truck Fuel, Driveability and Emissions Service Manual, Section 3.

WATER IN FUEL WARNING INDICATOR

Refer to Fuel Controls (Diesel), Page 62

GLOW PLUG INDICATOR

Refer to Glow Plugs (Diesel), Page 59

RH/LH TURN SIGNAL INDICATORS

Refer to Front Exterior Lamps, Page 33

HIGH BEAM INDICATOR

Refer to Headlamps, Page 22

DRL INDICATOR

Refer to Headlamps with Canadian Daytime Running Lamps, Page 25

DIAGNOSIS -- INSTRUMENT PANEL: GAGES AND INDICATORS

PRELIMINARY CHECKS:

Check condition of GAUGES and INST LPS fuses. If fuses are in good condition use the following diagnostic procedures.

FUEL GAGE INDICATES FULL OR BEYOND AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect fuel pump connector C400 and place ignition switch to RUN. Connect a fused jumper from PNK (30) wire at fuel pump connector C400 to ground.	Fuel gage indicates full.	LOCATE and REPAIR open in PNK (30) wire between fuel pump connector C400 and fuel gage. If no open is found, REPLACE fuel gage.
	Fuel gage indicates empty.	GO to step 2.
2. Connect fused jumper form PNK (30) wire to BLK (150) wire at fuel pump connector C400.	Fuel gage indicates full.	LOCATE and REPAIR open in BLK (150) wire between fuel pump connector C400 and ground G400. If no open is found, REPLACE fuel pump.
	Fuel gage indicates empty.	REPAIR/REPLACE fuel pump.

FUEL GAGE INDICATES EMPTY WHEN THERE IS FUEL IN THE TANK

TEST	RESULT	ACTION
1. Disconnect fuel pump and place ignition switch to RUN.	Fuel gage indicates full.	REPAIR/REPLACE fuel pump.
	Fuel gage indicates empty.	LOCATE and REPAIR an open in PNK (30) wire between fuel pump connector C400 and fuel gage. If no open is found, REPLACE fuel gage.

FUEL GAUGE IS INACCURATE

TEST	RESULT	ACTION
1. Disconnect fuel pump connector C400. Connect one RED lead of J 34029-A Multimeter to PNK (30) wire and other to ground. Set resistance dials to 0 ohms and then to 90 ohms. Fuel gage should indicate empty and then full. (Allow time for gage to reach full due to anti-slosh device.)	Gage responds correctly.	CHECK BLK (150) wire for high resistance. If wire is good, REPAIR/REPLACE fuel pump.
	Gage does not respond correctly.	CHECK for high resistance in PNK (30) wire. If wire is good, REPLACE fuel gage.

TEMPERATURE INDICATOR STAYS ON AT ALL TIMES WITH IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C108 (Gasoline) or C106 (Diesel) and place ignition switch to RUN. Observe temperature indicator.	Indicator stays on.	LOCATE and REPAIR short in DK GRN (35) wire. If wire is good, REPLACE instrument cluster.
	Indicator goes off.	REPLACE temperature sender.

TEMPERATURE GAGE INDICATES COLD ALL THE TIME

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C108 (Gasoline) or C106 (Diesel). Ground the DK GRN (35) wire at temperature sender connector C108 (Gasoline) or C106 (Diesel).	Temperature gage indicates hot.	REPAIR/REPLACE temperature sender.
	Temperature gage does not indicate hot.	LOCATE and REPAIR open in DK GRN (35) wire between temperature sender connector C108 (Gasoline) or C106 (Diesel) and temperature gage. If wire is good, REPLACE temperature gage.

TEMPERATURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C108 (Gasoline) or C106 (Diesel). Connect RED lead from J 34029-A Multimeter to DK GRN (35) wire and other lead to ground. Adjust resistance dials to 1400 ohms and then to 55 ohms. Temperature gage should indicate cold then hot.	Gage indicate correctly.	REPLACE temperature sender.
	Gage is not correct.	LOCATE and REPAIR open in DK GRN (35) wire between temperature sender connector C108 (Gasoline) or C106 (Diesel) and temperature gage. If wire is good, REPLACE temperature gage.

TEMPERATURE GAGE INDICATES HOT WITH ENGINE COOLANT BELOW OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C108 (Gasoline) or C106 (Diesel) and place ignition switch to RUN.	Temperature gage indicates cold.	REPLACE temperature sender.
	Temperature gage does not indicate cold.	LOCATE and REPAIR an open in DK GRN (35) wire between temperature sender connector C108 (Gasoline) and 106 (Diesel) and temperature gage. If no open is found, PERFORM diagnostic procedures under symptom "Temperature Gage Is Not Accurate.

OIL PRESSURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C118. Connect one RED lead of J 34029-A Multimeter to TAN (31) wire at oil pressure sender connector C118 and other lead to ground. Set resistance dials to 0 ohms and then to 90 ohms. The oil pressure gage should indicate low pressure and then high pressure.	Oil pressure gage indicates correctly.	REPLACE oil pressure sender.
	Oil pressure gage does not indicate correctly.	LOCATE and REPAIR open in TAN (31) wire between oil pressure sender connector C118 and oil pressure gage. If wire is good, REPLACE oil pressure gage.

OIL PRESSURE GAGE INDICATES HIGH PRESSURE AT ALL TIMES

TEST	RESULT	ACTION
Disconnect oil pressure sender connector C118 and place ignition switch to RUN. Connect a fused jumper from TAN (31) wire at oil pressure sender connector C118 to ground.	Oil pressure gage indicates low pressure or indicator lights.	REPLACE oil pressure sender.
	Oil pressure gage indicates high pressure or indicator does not light.	LOCATE and REPAIR open in TAN (31) wire and bulb. If wire and bulb are good, REPLACE oil pressure gage.

OIL PRESSURE GAGE INDICATES LOW PRESSURE WHEN OIL PRESSURE IS GOOD

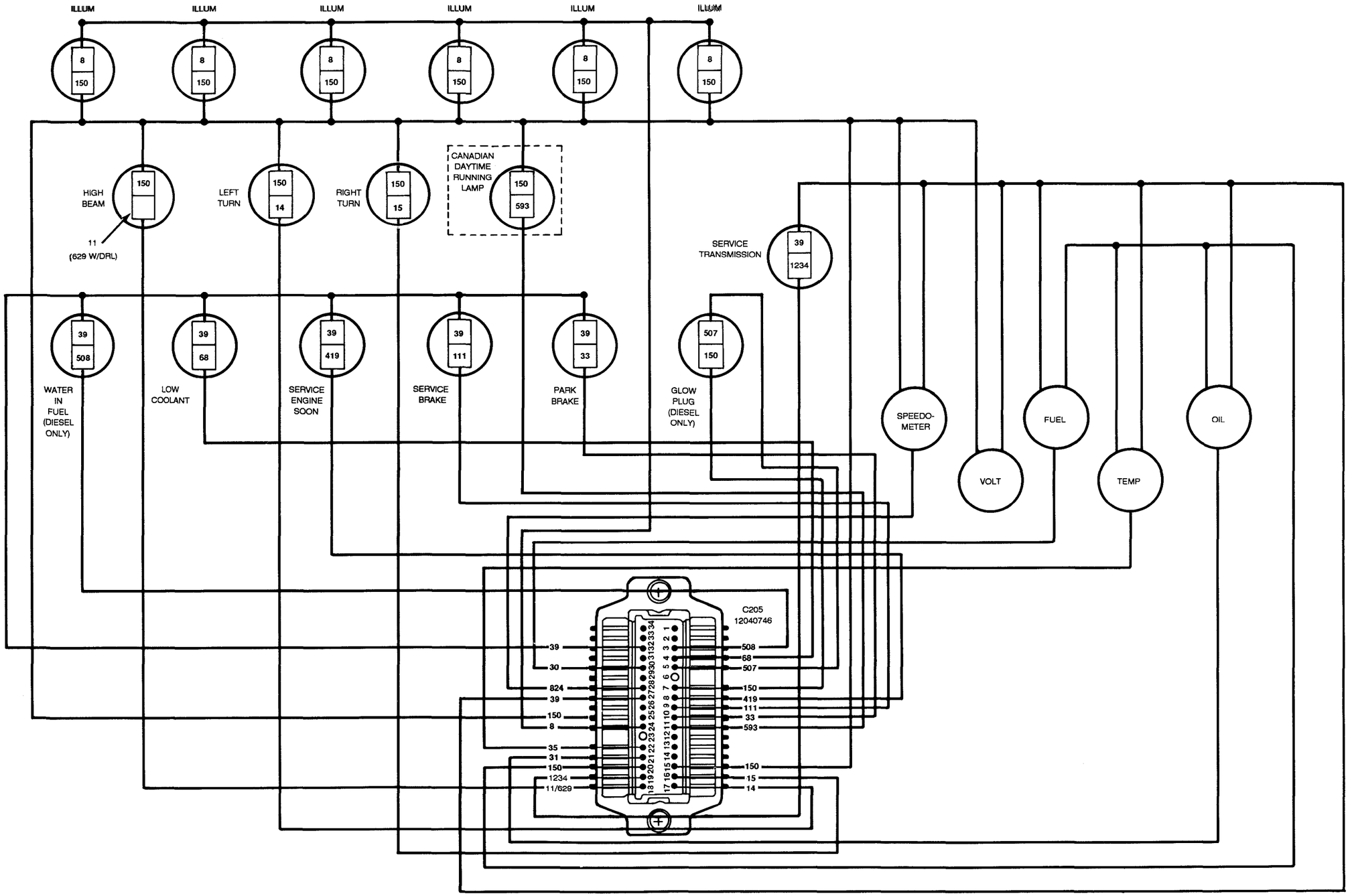
TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C118 and place ignition switch to RUN.	Oil pressure gage indicates high pressure or indicator light goes out.	REPLACE oil pressure sender.
	Oil pressure gage indicates no or low pressure or indicator light stays on.	LOCATE and REPAIR open in TAN (31) wire between oil pressure sender connector C118 and oil pressure gage. If wire is good, REPLACE oil pressure gage.

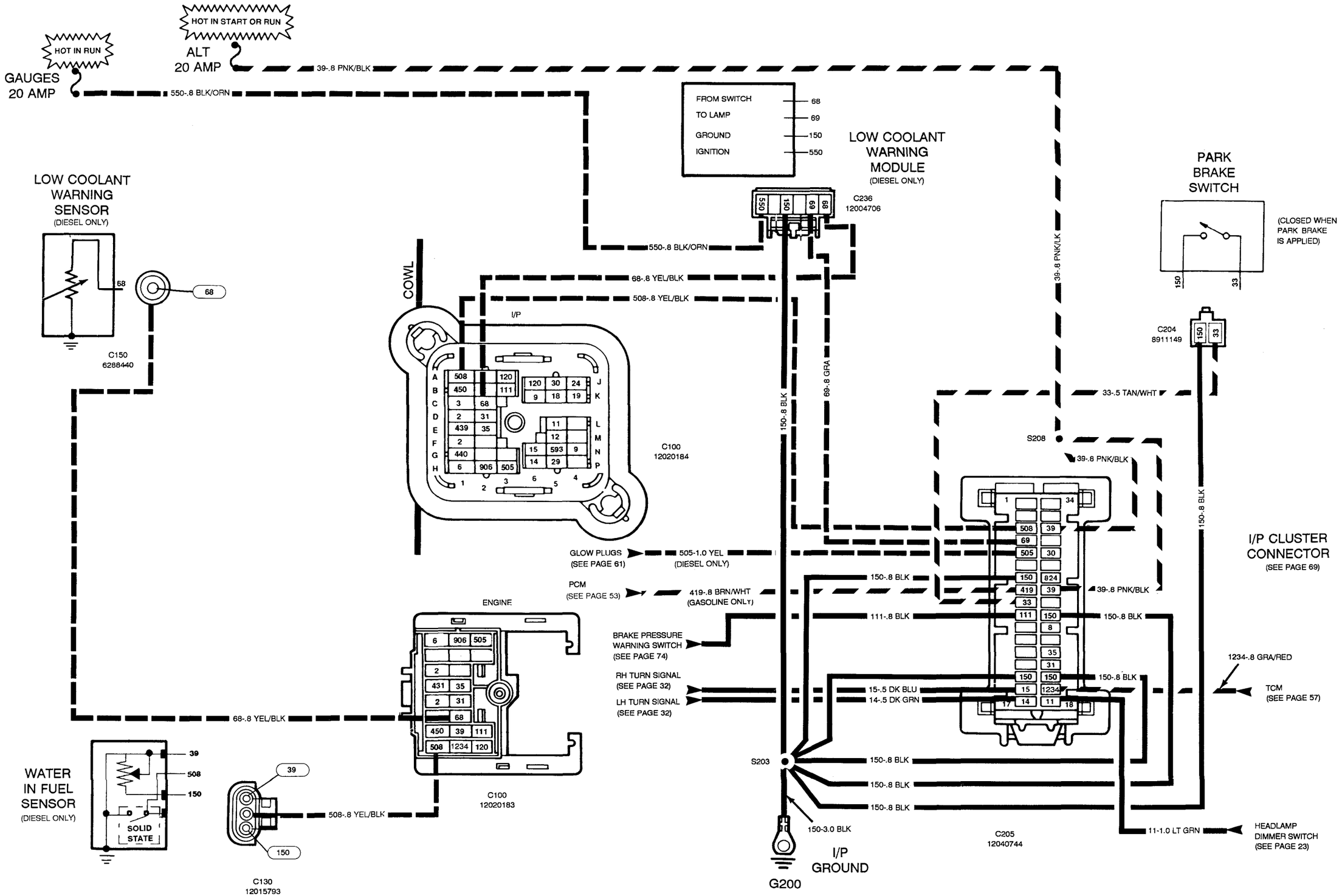
LOW COOLANT INDICATOR DOES NOT LIGHT WITH COOLANT LEVEL LOW (DIESEL ONLY)

TEST	RESULT	ACTION
1. Disconnect low coolant warning switch connector C150 and place ignition switch to RUN. Observe low coolant indicator light.	Low coolant indicator lights.	REPLACE low coolant warning switch.
	Low coolant indicator does not light.	GO to step 2.
2. Disconnect low coolant warning module connector C236. Connect voltmeter from PNK/BLK (39) wire at low coolant warning module connector C236 to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in BLK/ORN (550) wire. If no open is found, CHECK condition of GAUGES fuse.
3. Connect voltmeter from BLK/ORN (550) wire to BLK (150) wire at low coolant warning module connector C236.	Battery voltage.	GO to step 4.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire between low coolant warning module connector C236 and ground G200.
4. Connect voltmeter from GRA (69) wire at low coolant warning module connector C236 to ground.	Battery voltage.	GO to step 5.
	No voltage.	LOCATE and REPAIR open or short to ground in GRA (69) wire from low coolant warning module connector C236 to low coolant warning lamp.
5. Connect voltmeter from BLK/ORN (550) wire to YEL/BLK (68) at low coolant warning module connector C236.	Battery voltage.	LOCATE and REPAIR open in YEL/BLK (68) wire from low coolant warning module connector C236 to low coolant warning switch connector C150.
	No voltage.	REPLACE low coolant warning module.

LOW COOLANT INDICATOR IS LIT WHEN COOLANT LEVEL IS GOOD

TEST	RESULT	ACTION
Connect a fused jumper from low coolant warning switch connector C150 to ground. Place ignition switch to RUN and observe low coolant indicator light.	Low coolant indicator goes out.	REPLACE low coolant probe.
	Low coolant indicator stays lit.	LOCATE and REPAIR open in YEL/BLK (68) wire. If wire is good, follow diagnostic procedures listed under symptom "Low Coolant Indicator Does Not Light With Coolant Level Low."


ILLUM
ILLUM
ILLUM
ILLUM
ILLUM
ILLUM
8
150
HIGH BEAM
150
11
(629 W/DRL)
LEFT TURN
150
14
RIGHT TURN
150
15
CANADIAN DAYTIME RUNNING LAMP
150
593
SERVICE TRANSMISSION
39
1234
WATER IN FUEL (DIESEL ONLY)
39
508
LOW COOLANT
39
68
SERVICE ENGINE SOON
39
419
SERVICE BRAKE
39
111
PARK BRAKE
39
33
GLOW PLUG (DIESEL ONLY)
507
150
SPEEDO-METER
VOLT
FUEL
TEMP
OIL
C205
12040746
39
30
824
39
150
8
35
31
150
1234
11/629
508
68
507
150
419
111
33
593
150
15
14



B-70 INDICATOR LAMPS

HOT IN START OR RUN

ALT
20 AMP

39-.8 PNK/BLK

S208

39-.8 PNK/BLK

39-.8 PNK/BLK

ENGINE TEMPERATURE SWITCH
CLOSES WHEN ENGINE TEMPERATURE EXCEEDS 260°F

COOLANT TEMPERATURE SENDER

OIL PRESSURE SENSOR
(DIESEL)

FUEL PUMP OIL PRESSURE SENSOR & SWITCH

FUEL PUMP

C108
6288704

C106
2962965
(DIESEL)

C119
2977935

C118
12065401

35-.5 DK GRN

31-.5 TAN

31-.5 TAN

31-.5 TAN

30

150

120

12020829

12020827

C400

30-.8 PNK

150-.8 BLK

C102
12020099

K REAR BODY
J CONNECTOR

C205
12040744

DRAC
(SEE PAGES 64, 65)

824-.8 LT BLU/BLK

I/P CLUSTER CONNECTOR
(SEE PAGE 69)

ENGINE

C100
12020183

I/P

C100
12020184

COWL

30-.5 PPL

31-.5 TAN

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-3.0 BLK

S203
(SEE PAGE 18)

31-.5 TAN

35-.5 DK GRN

35-.5 DK GRN

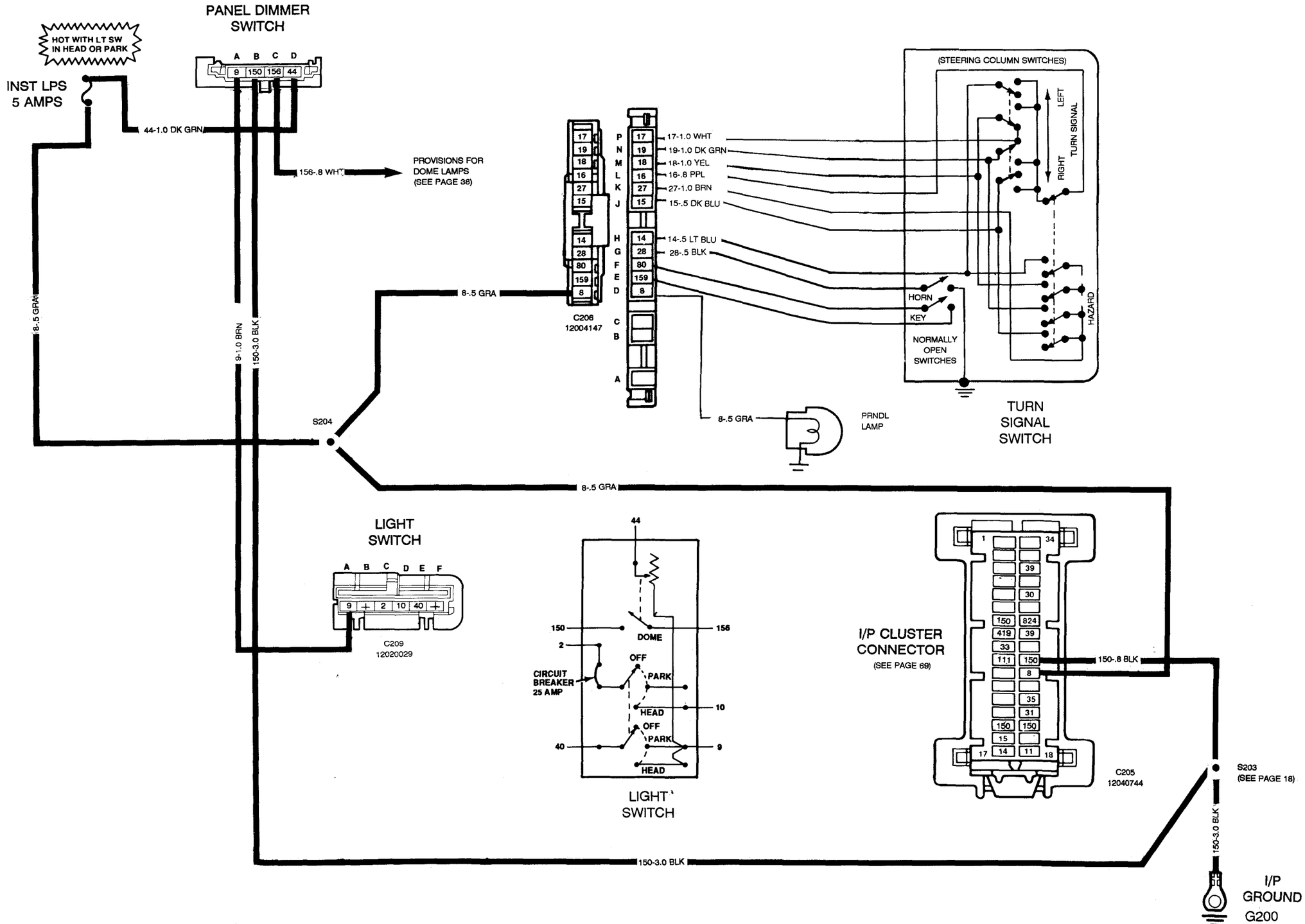
FRAME GROUND

G400

I/P GROUND

G200

INSTRUMENT PANEL GAGES B-71



B-72 INSTRUMENT PANEL LAMPS

CIRCUIT OPERATION

Vehicles equipped with the Hydro-Boost Brake system have an optional warning harness that plugs into the I/P harness. Refer to Section 5A1 of the 1991 R/V, P Light Truck Service Manual for further description and operation of the Hydro-Boost System.

DIAGNOSIS -- BRAKE WARNING SYSTEM

PRELIMINARY CHECKS:

1. Check condition of GAUGES fuse. Replace if needed.
2. Place Ignition Switch in RUN.
3. For vehicles equipped with Hydro-Boost Brake system, verify hydraulics as described in Section 5A1 of the 1991 R/V, P Light Truck Service Manual. If alarm continues to malfunction, use the following procedures.

BRAKE INDICATOR REMAINS ON WITH IGNITION SWITCH IN RUN AND PARK BRAKE OFF

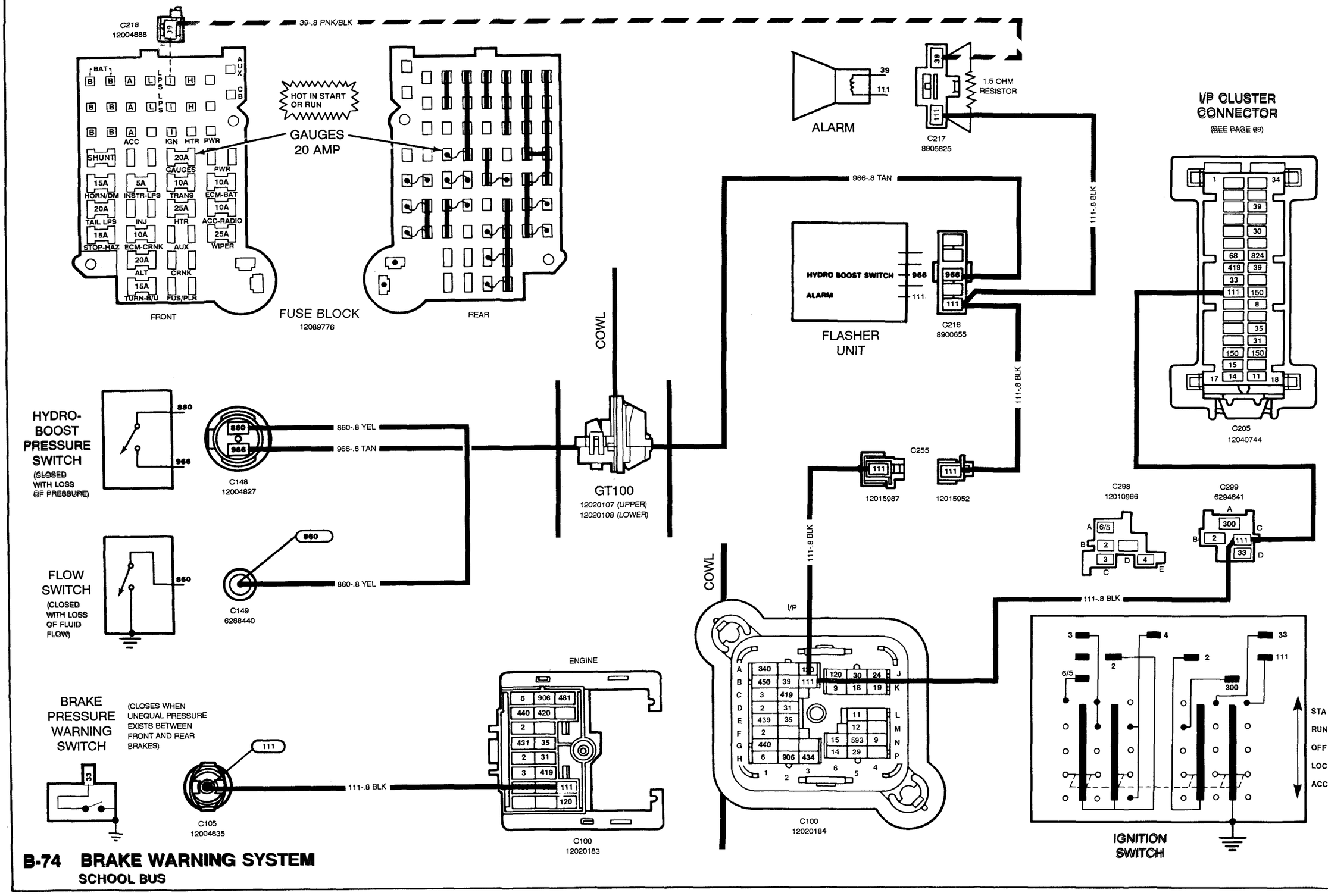
TEST	RESULT	ACTION
1. Disconnect park brake switch connector C204.	Brake indicator lamp does not go out.	GO to step 2.
	Brake indicator lamp goes out.	CHECK adjustment of park brake switch. If adjustment cannot be corrected, REPLACE park brake switch.
2. Disconnect brake pressure warning switch connector C105.	Brake indicator lamp does not go out.	LOCATE and REPAIR short to ground in BLK (111) wire between brake pressure switch connector C105 and indicator lamp.
	Brake indicator lamp goes out.	CHECK for a possible leak or loss of brake fluid.

ALARM WILL NOT SOUND

TEST	RESULT	ACTION
1. Connect a test lamp from PNK/BLK (39) wire at alarm connector C217 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire between alarm connector C217 and fuse block.
2. Connect test jumper from BLK (11) wire at alarm connector C217 to ground.	Alarm sounds.	GO to step 3.
	Alarm does not sound.	REPLACE alarm.
3. Connect test jumper from BLK (11) wire at delay module connector C116 to ground.	Alarm sounds.	GO to step 4.
	Alarm does not sound.	LOCATE and REPAIR open in BLK (11) wire between alarm connector C217 and delay module connector C216.
4. Connect test jumper from TAN (966) wire at hydro-boost pressure switch connector C148 to ground.	Alarm sounds.	REFER to Section 5A1 of the 1991 R/V, P Light Truck Service Manual.
	Alarm does not sound.	LOCATE and REPAIR open in TAN (966) wire between hydro-boost pressure switch connector C148 and delay module connector C216. If no open is found, REPLACE delay module.

ALARM WILL NOT SHUT OFF

TEST	RESULT	ACTION
1. Disconnect brake pressure warning switch connector C105.	Alarm stops.	GO to step 2.
	Alarm continues to sound.	CHECK for possible leak or loss of fluid in the brake system.
2. Disconnect delay module connector C216.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR short to ground in BLK (11) wire between delay module connector C216 and alarm connector C217.
3. Disconnect hydro-boost pressure switch connector C148. Connect a test lamp from TAN (996) wire at hydro-boost pressure switch connector C148 to positive battery terminal.	Alarm continues to sound.	LOCATE and REPAIR short to ground in TAN (996) wire between hydro-boost pressure switch connector C148 and delay module connector C216. If no short is found, REFER to Section 5A1 of the 1991 R/V, P Light Truck Service Manual.
	Alarm stops.	REPLACE delay module.



B-74 BRAKE WARNING SYSTEM
SCHOOL BUS

CIRCUIT OPERATION

BACKUP LAMPS

With the Ignition Switch in RUN or START, voltage is applied through the TURN/BU Fuse to the Transmission Position Switch or the Backup Lamp Switch. Whenever the gear selector lever is shifted to REVERSE the Transmission Position Switch or the Backup Lamp Switch closes and voltage is applied to the Backup Lamps and the lamps turn on.

PARK, TAIL, MARKER, AND LICENSE LAMPS

Voltage is applied through the PARK LP Fuse to the Light Switch at all times. With the Light Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps.

DIAGNOSIS -- REAR EXTERIOR LAMPS

PRELIMINARY CHECKS:

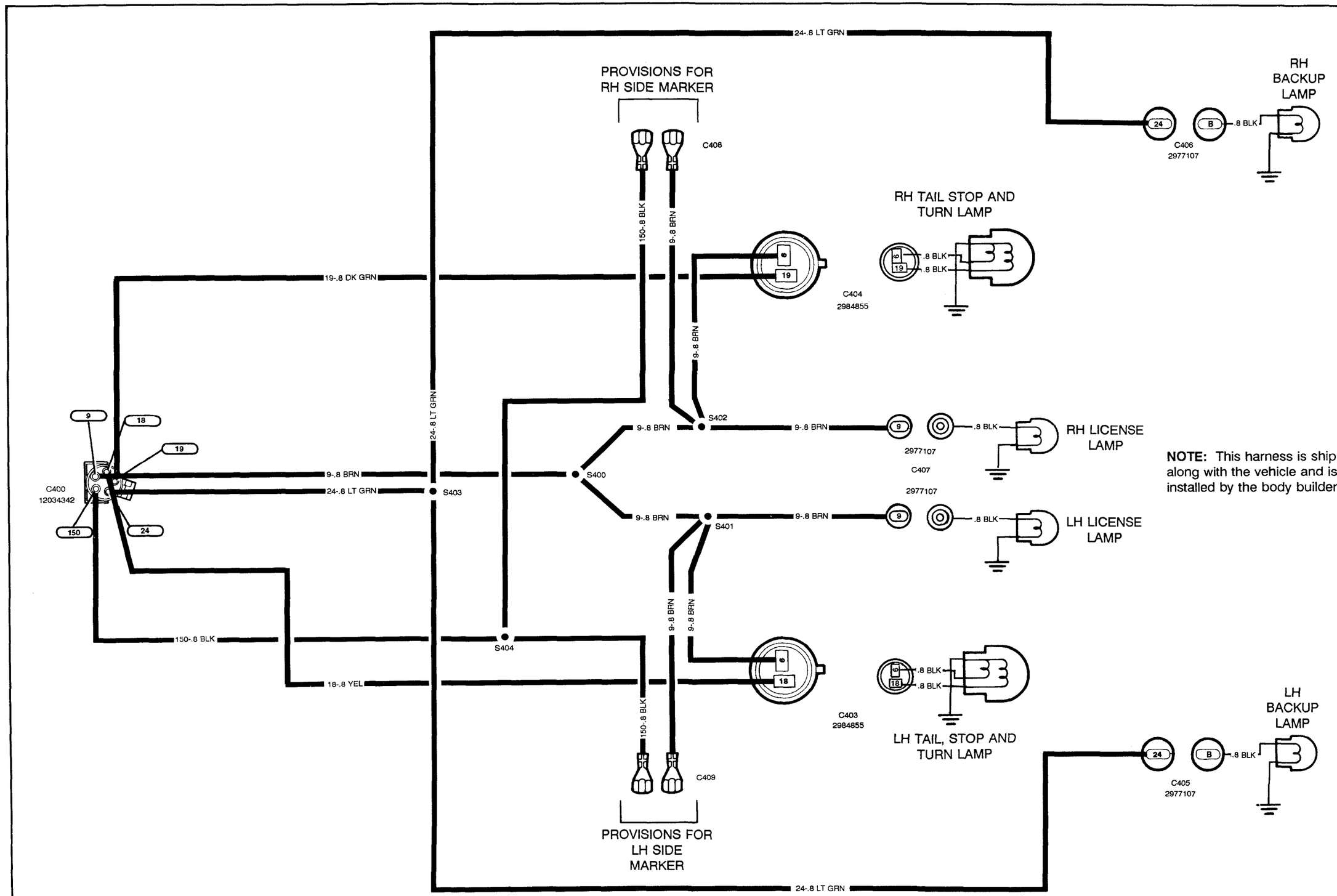
The rear lamp systems taillamps, backup lamps, and license plate lamp(s) all receive voltage from same wire circuit (BRN 9) and are grounded at the bulb socket(s). If only one system is not working, LOCATE and REPAIR an open in the wiring and/or bulbs that pertain to that system.

NONE OF THE REAR LAMP SYSTEMS OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of TAIL LPS fuse. If fuse is good, LOCATE and REPAIR open in RED (2) wire from light switch connector C209 to battery junction block and/or ORN (40) wire from light switch connector C209 to fuse block.
2. Place light switch to PARK position. Connect test lamp from BRN (9) wire at light switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect test lamp from BRN (9) wire at rear lamp harness connector C402 to ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from rear lamp harness connector C402 to light switch connector C209.

BACKUP LAMPS DO NOT OPERATE

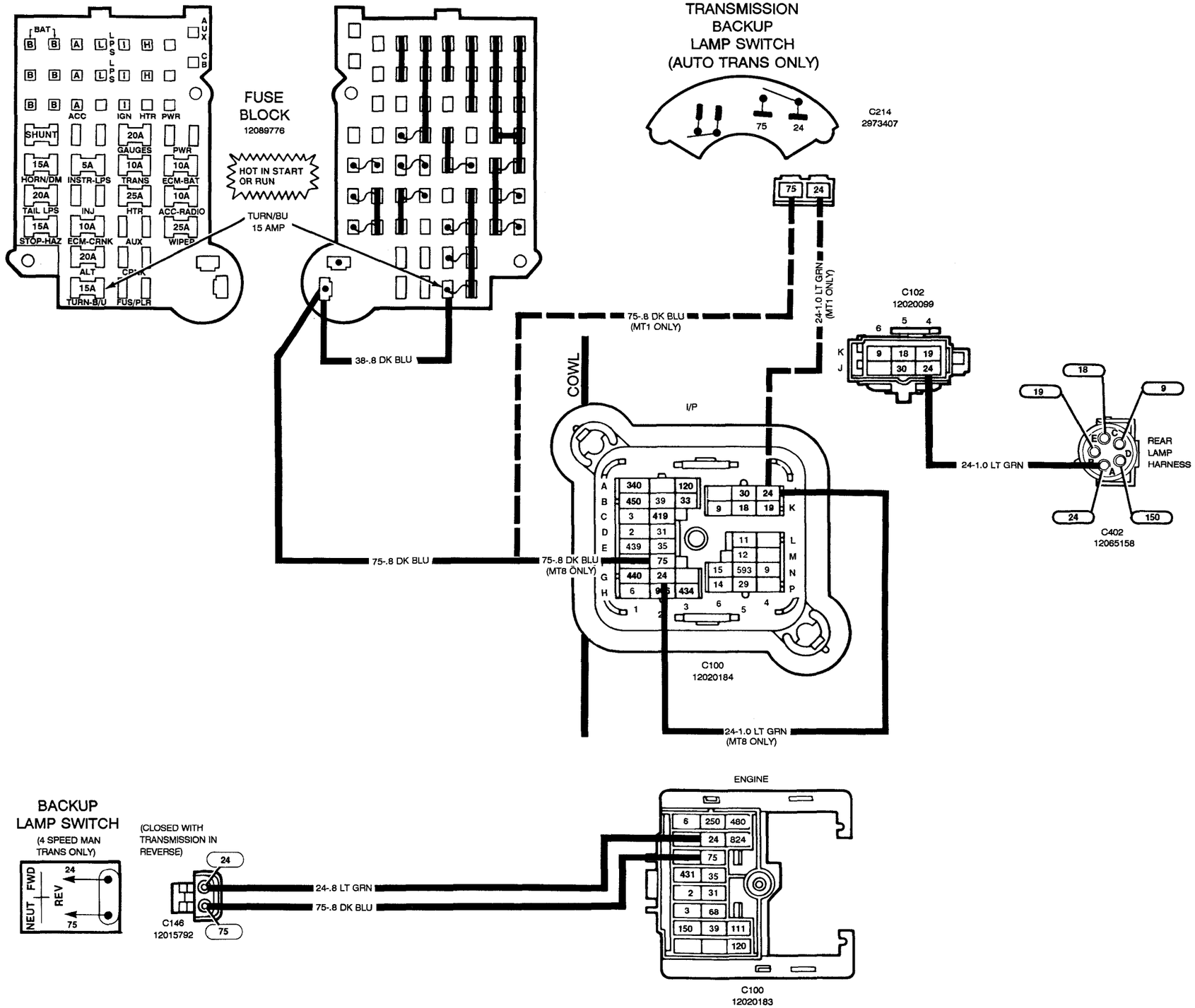
TEST	RESULT	ACTION
1. Place transmission in reverse. Connect test lamp from LT GRN (24) wire at rear lamp harness connector C402 to ground.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp from DK BLU (75) wire at backup lamp switch connector C214 (auto) or C146 (man) to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of TURN/BU fuse. If fuse is good, LOCATE and REPAIR open in DK BLU (75) wire from backup lamp switch connector C214 (auto) or C146 (man) to fuse block and DK BLU (38) wire.
3. Connect test lamp from LT GRN (24) wire at backup lamp switch connector C214 (auto) or C146 (man) to ground.	Test lamp lights.	LOCATE and REPAIR open in LT GRN (24) wire from backup lamp switch connector C214 (auto) or C146 (man) to connector C408.
	Test lamp does not light.	Adjust backup lamp switch. If backup lamp switch will not adjust properly, REPLACE backup lamp switch.

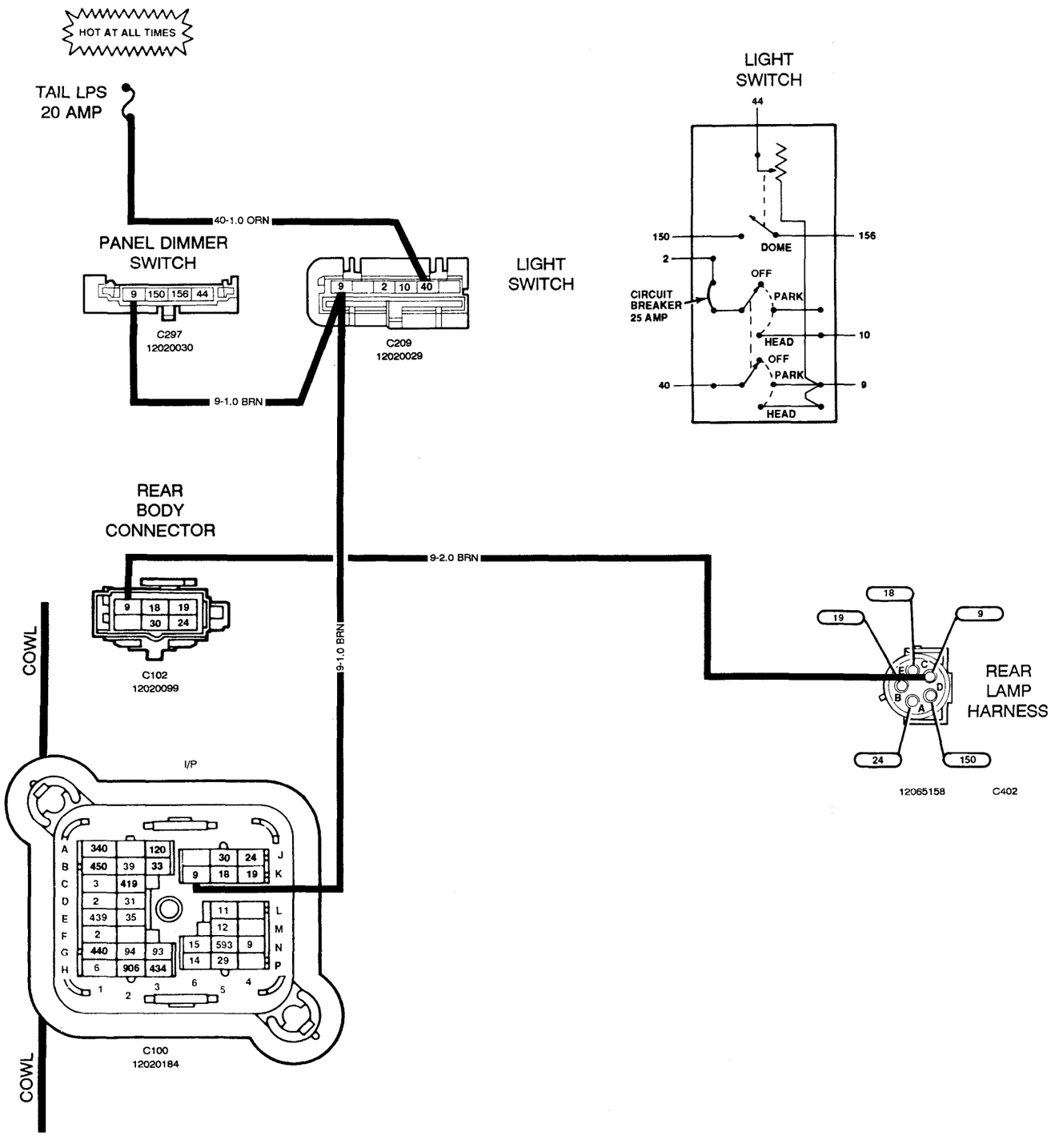


NOTE: This harness is shipped along with the vehicle and is installed by the body builder.

B-76 REAR LAMP HARNESS

RPO CODES
MT1 - AUTO TRANS, HD, 4-SPD., WITH OVERDRIVE MT8 - MAN TRANS, 5-SPD., WITH OVERDRIVE





B-78 TAILLAMPS, REAR MARKER AND LICENSE LAMPS

CIRCUIT OPERATION

VACUUM SYSTEMS

A vacuum-operated component uses the force of normal air pressure working against the lower air pressure of a partial vacuum to operate the component. The vacuum created within the inlet manifold when the engine is running is stored in a vacuum tank in the engine compartment. A check valve in the line feeding vacuum to the tank keeps the stored vacuum from weakening when inlet manifold vacuum drops during high speed or high power operation.

Vacuum is routed through hoses (and in some cases, tubing) to a mechanical or electric valve that provides a means of controlling the vacuum-operated component. When the valve is open, it allows vacuum to go to an actuator that actually operates the component. When the component is to be returned to its original position, the valve cuts off the vacuum to the actuator hose and vents the hose to normal air pressure.

A typical actuator is a metal shell with a movable shaft that retracts and extends to mechanically operate the component. A flexible diaphragm separates the interior of the shell into two chambers - a sealed chamber to which vacuum can be admitted, and an open chamber exposed to normal air pressure. The movable shaft is attached to the center of the diaphragm and extends from the open chamber.

When the vacuum is directed to the sealed chamber, normal air pressure presses on the other side of the diaphragm and causes it to retract the shaft. When the vacuum is cut off, the sealed chamber is vented to outside air to balance the air pressure on both sides of the diaphragm and eliminate the force that retracted the shaft. A coiled spring within the sealed chamber expands to push the diaphragm back to its original positions. This extends the shaft.

EXHAUST GAS RECIRCULATION VACUUM SYSTEM

All 1991 P-Truck gasoline engines are equipped with an exhaust gas recirculation (EGR) system. The EGR system allows a small amount of exhaust gas to flow from the exhaust manifold into the inlet manifold when the throttle is opened beyond idle and inlet manifold vacuum is normal. This reduces combustion temperatures in the engine to control oxides of nitrogen emissions.

The EGR valve is operated by an integral vacuum actuator that controls a pintle within the valve. The pintle remains closed to prevent exhaust gas recirculation until vacuum is applied to the actuator. The vacuum causes the pintle to open, allowing a measured flow of exhaust gas to enter the inlet manifold.

The EGR system remains closed during periods of engine idle and deceleration to prevent rough idle from excessive dilution of the fuel-air mixture. It also remains closed at wide-open throttle to prevent voltage loss. At other times, it rapidly cycles open and closed to modulate the flow of exhaust gas as required. Under certain circumstances, it may remain fully open to provide the maximum EGR.

A manifold absolute pressure (MAP) sensor measures the strength of the vacuum in the EGR vacuum circuit and sends a signal back to the electronic control module (ECM). If actual vacuum differs from the preferred vacuum as calculated by the ECM, the ECM will adjust the on-off intervals of the EGR valve to correct the flow of exhaust gas into the cylinders. This provides the required control of oxides of nitrogen emissions while retaining engine performance under all operating conditions. The ECM also uses the signal from the MAP sensor to control fuel delivery and ignition timing.

Vacuum for the EGR system is taken from the throttle body and routed through a hose to the electronic vacuum regulator valve (EVRV) solenoid (V8 engine) or to the EGR valve solenoid (V6 engine). The solenoid is controlled by the 435 circuit from the ECM. When the solenoid opens the electronic vacuum regulator valve or the EGR valve, vacuum reaches the EGR actuator through another vacuum hose and opens the EGR pintle valve to allow exhaust gas to flow into the inlet manifold. When the EVRV solenoid or the EGR valve solenoid is released, the valve vents the EGR actuator to outside air to close the EGR pintle valve.

EGR VALVE VACUUM SYSTEM

A leak in the EGR (exhaust gas recirculation) vacuum system can upset the ECM's programmed control of exhaust gas recirculation and adversely affect engine operation. Too much exhaust gas recirculation at idle or cruise can result in the engine stalling after closed throttle deceleration, surging during steady throttle cruising, or a rough idle. Too little exhaust gas flow allows combustion temperatures to become too high and bring about detonation ("spark knock") or an overheated engine. In addition, nitrous oxide emissions may be high enough to cause the vehicle to fail an emissions test.

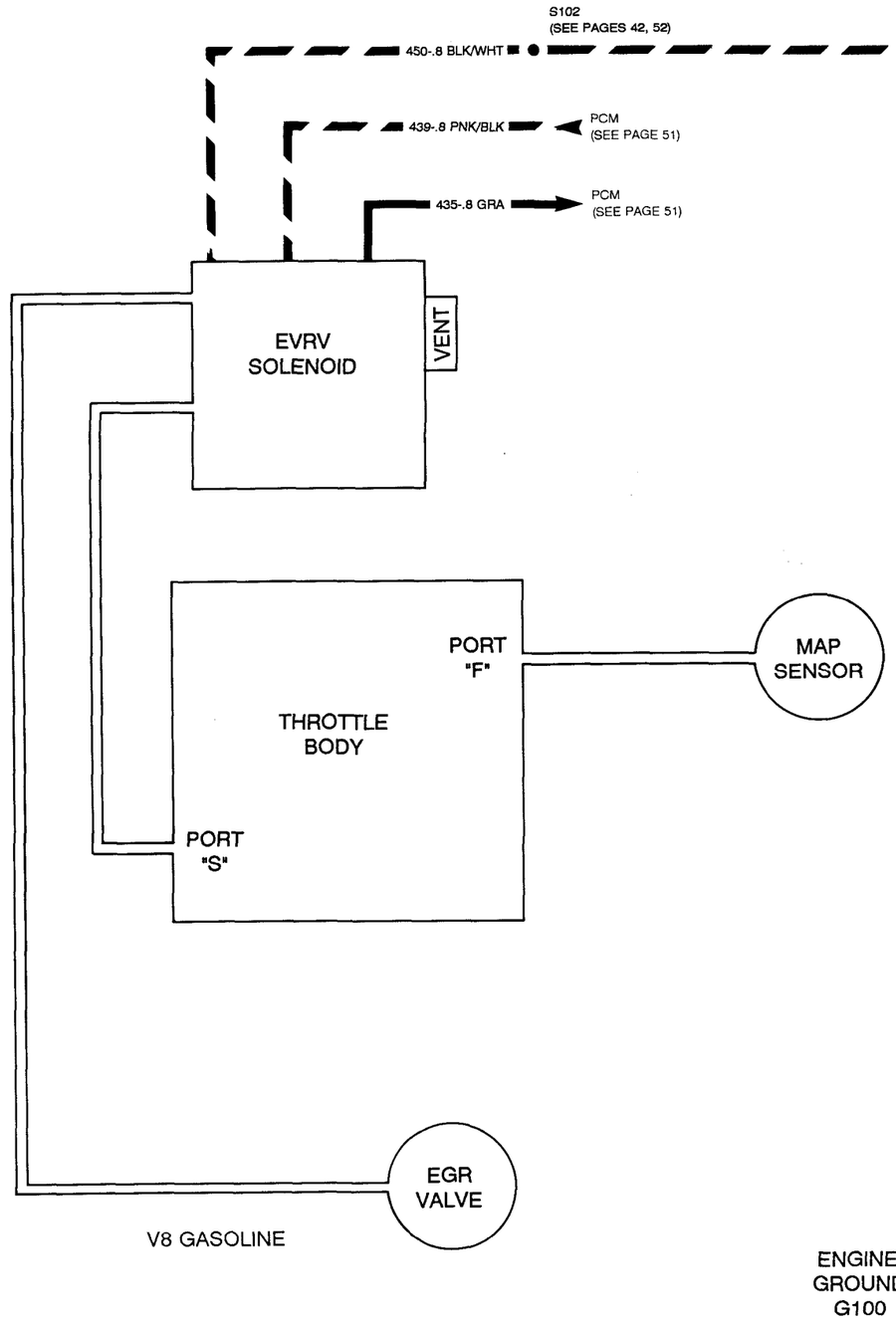
Because the source of an EGR system symptom might be traced to a mechanical or electrical condition as well as a faulty vacuum system, an effective systematic diagnosis procedure should examine all three categories of components -- not just the vacuum system alone. Therefore, no exclusive vacuum system diagnosis procedures are provided here. For more information on the EGR system, refer to the 1991 "Fuel and Emissions Service Manual."

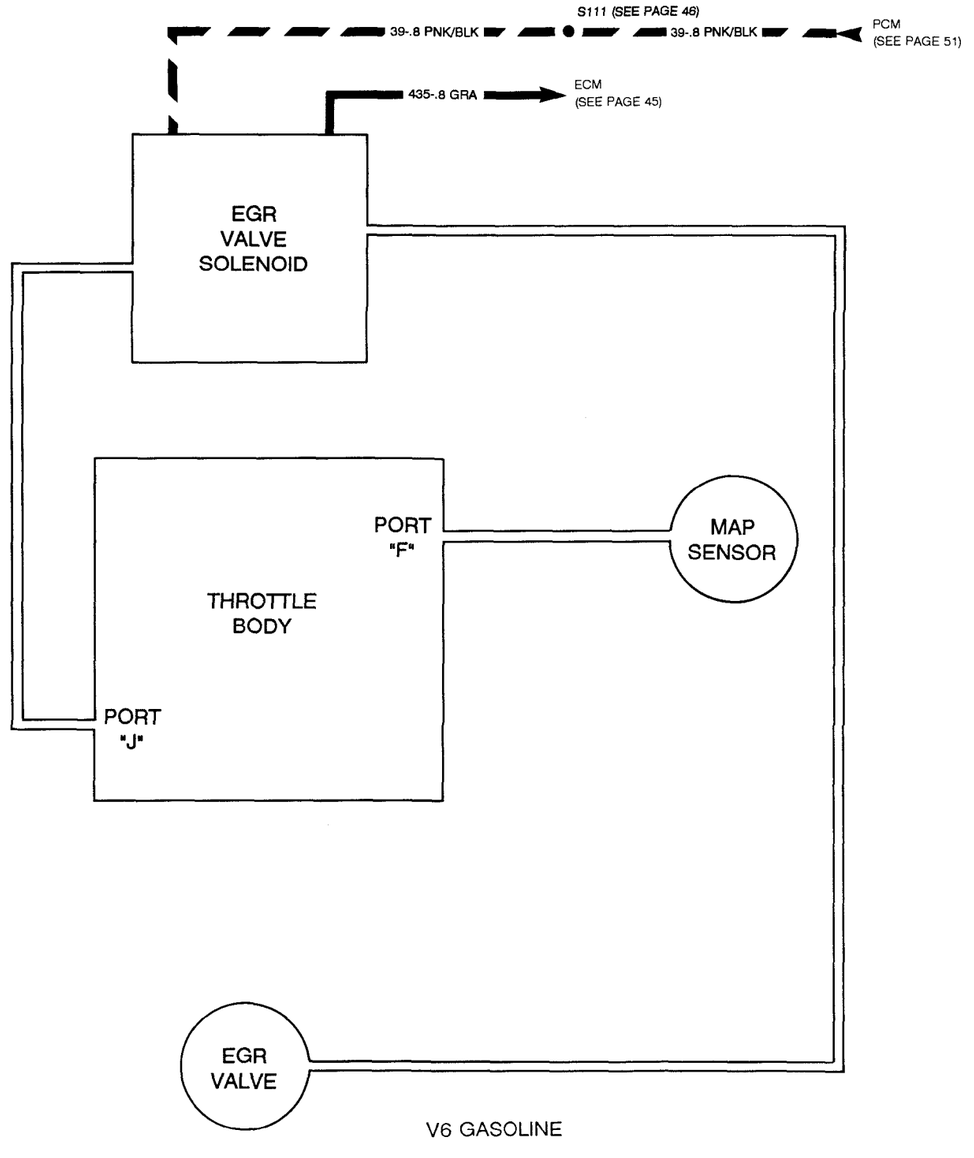
DIAGNOSIS

Condition most likely to cause vacuum system problems include hoses that leak or become disconnected. With the engine running, either condition is easily detected from the hiss of air at the opening. Other common vacuum problems are kinked or obstructed hoses, hoses connected incorrectly or binding components.

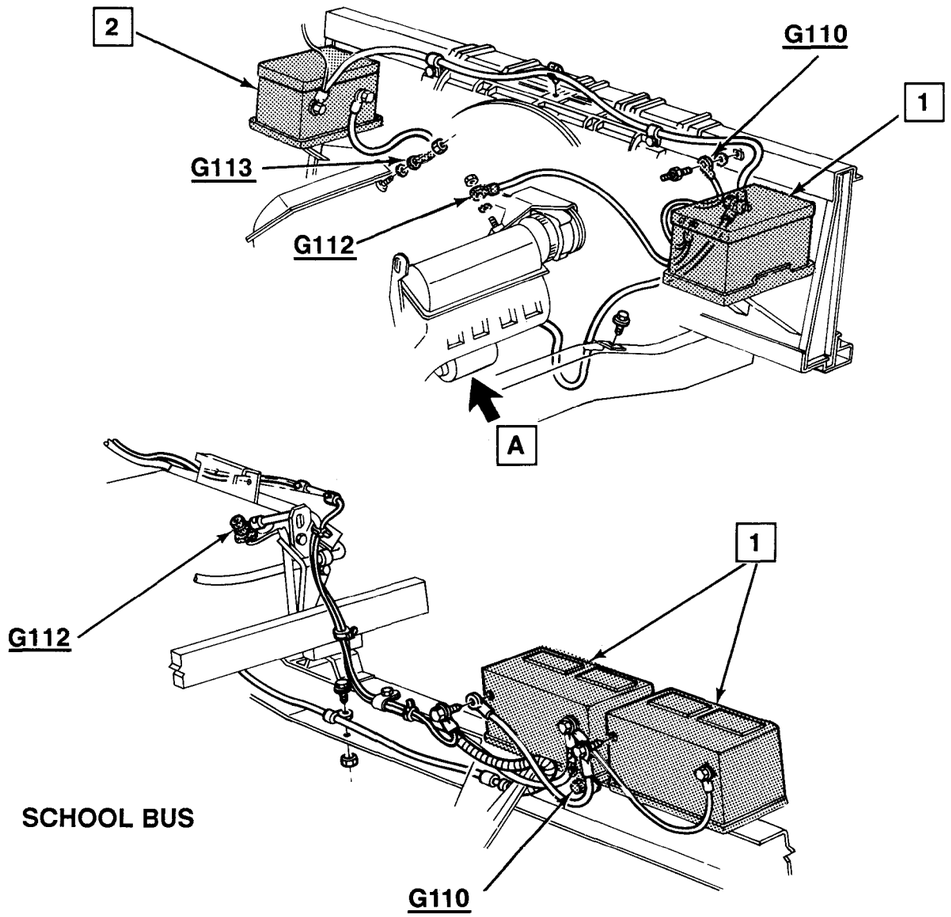
A vacuum pump can be used as a vacuum source to operate components and test the system. The built-in vacuum gage of the pump provides a means of checking for a vacuum leak as well. Once vacuum is applied to operate the component, the gage should hold steady until the vacuum is purposely released.

On vacuum systems that are controlled by electrical or electronic switches, check for a blown fuse, wiring that is cracked, frayed or burned, and high resistance in connectors of the control circuit(s) before checking for a suspected vacuum system problem.





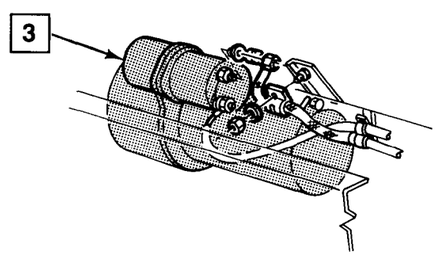
B-80 EXHAUST GAS RECIRCULATION (EGR)



SCHOOL BUS

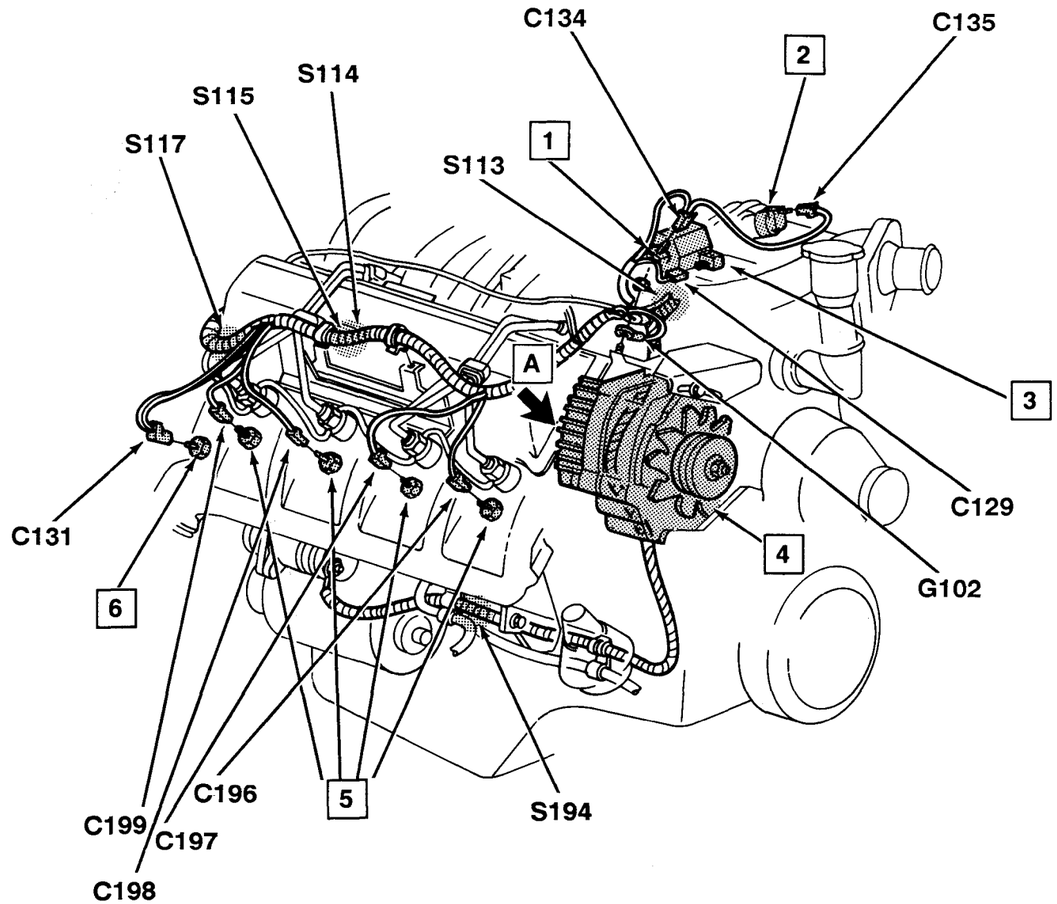
1. RH Batteries
2. LH Battery
3. Starter Motor

12A3
12A5



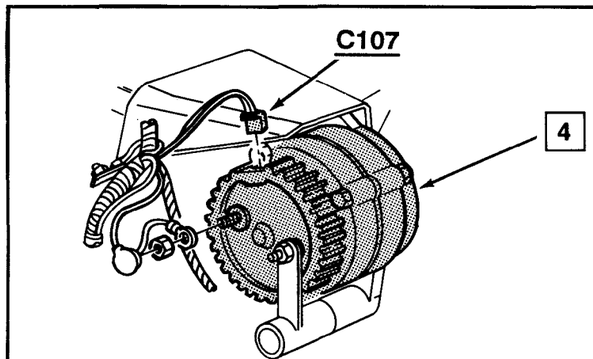
VIEW A

Figure 1 - Batteries and Cables (6.2L V8 HD Diesel Engine)



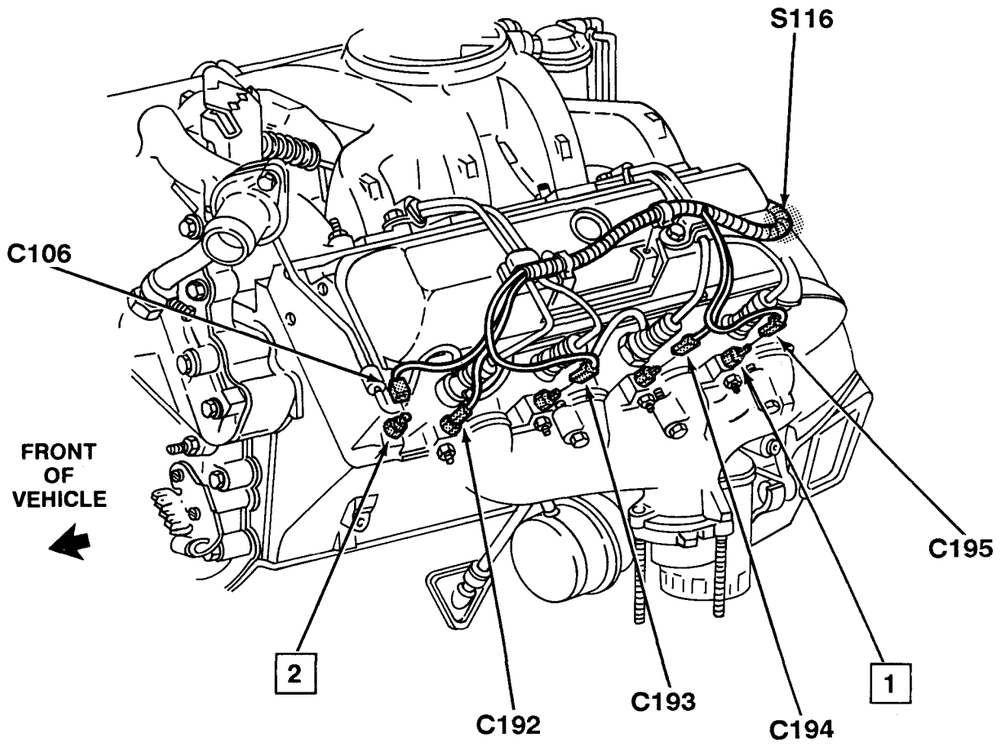
1. Cold Advance Control
2. Fast Idle Solenoid
3. Fuel Shut-Off Valve
4. Generator
5. Glow Plug (RH)
6. Cold Advance and Fast Idle Temperature Switch

12H-25



VIEW A

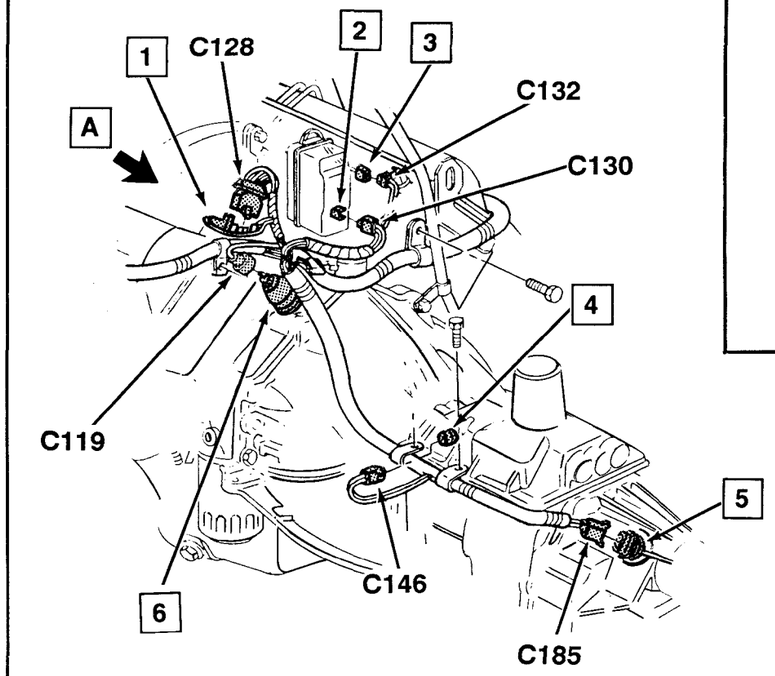
Figure 2 - Engine Wiring Harness - RH Side (6.2L V8 HD Engine)

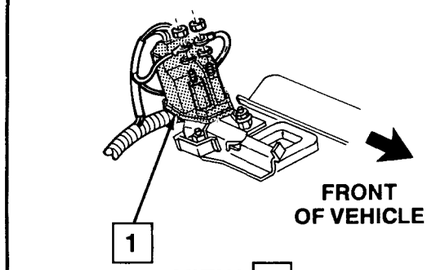


1. Glow Plug (LH)
2. Coolant Temperature Sender

12H24

Figure 3 - Engine Wiring Harness - LH Side (6.2L V8 HD Diesel Engine)

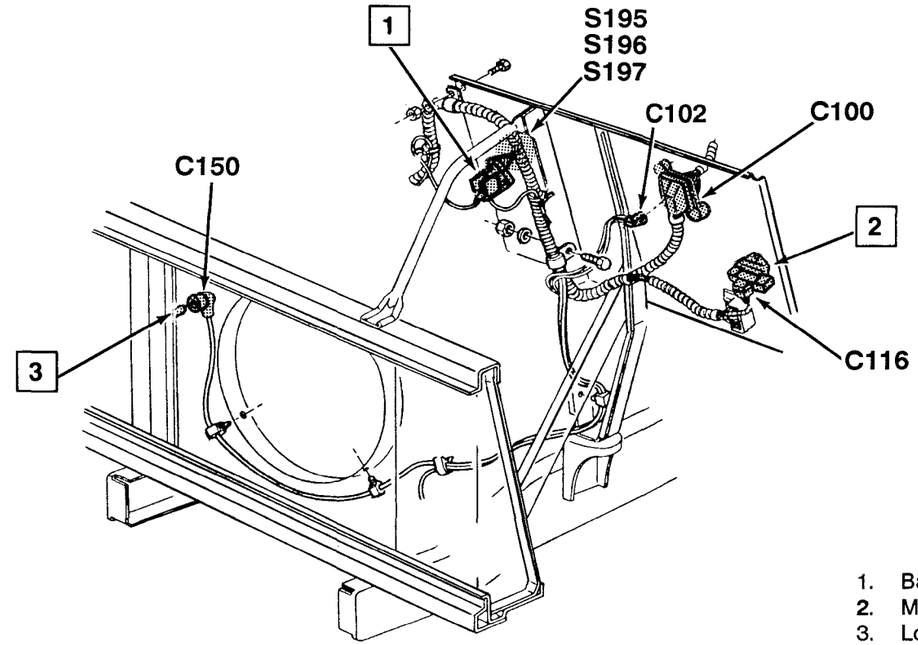




1. Glow Plug Controller
2. Water in Fuel Sensor
3. Fuel Heater
4. Back Up Lamp Switch
5. Speed Sensor
6. Oil Pressure Switch

12H26

Figure 4 - Engine Wiring Harness - Rear (6.2L V8 HD Diesel Engine)

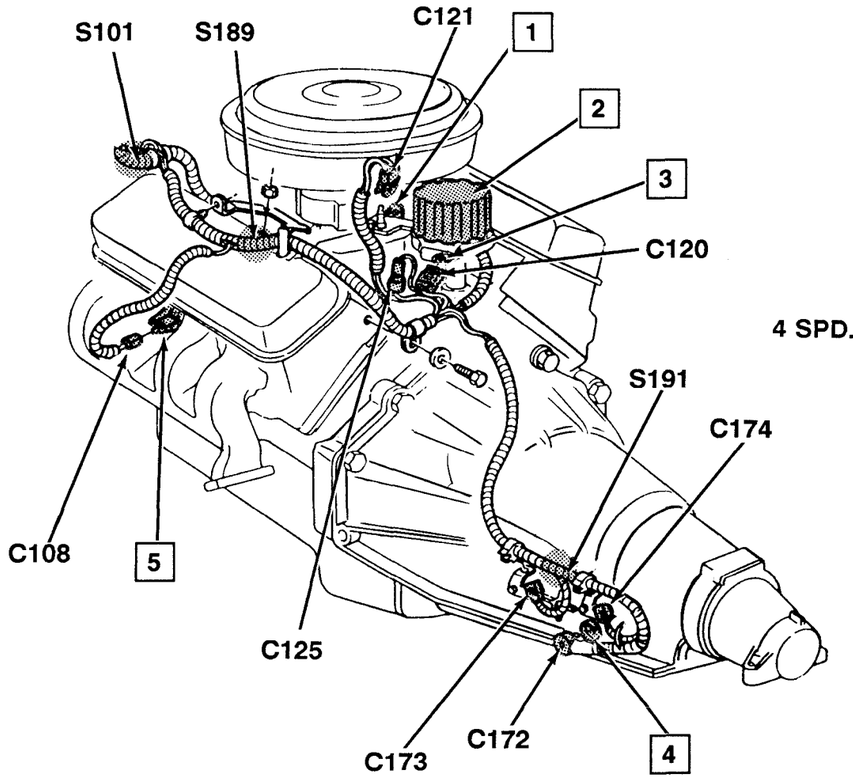


1. Battery Junction Block
2. Map Sensor
3. Low Coolant Sensor

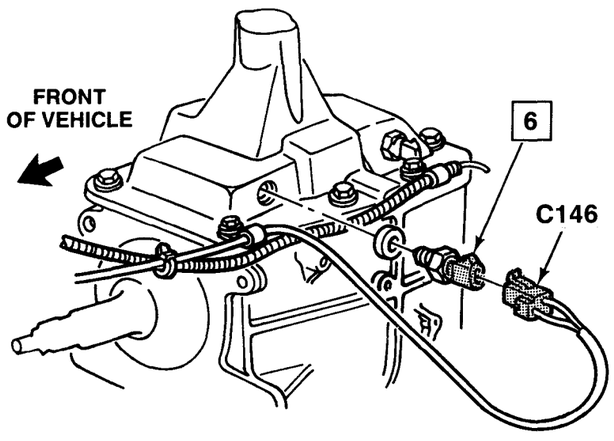
12H8

Figure 5 - Engine Wiring Harness to Cowl/Radiator (6.2L V8 HD Diesel Engine)

B-82 COMPONENT LOCATOR VIEWS



4 SPD., AUTO TRANS

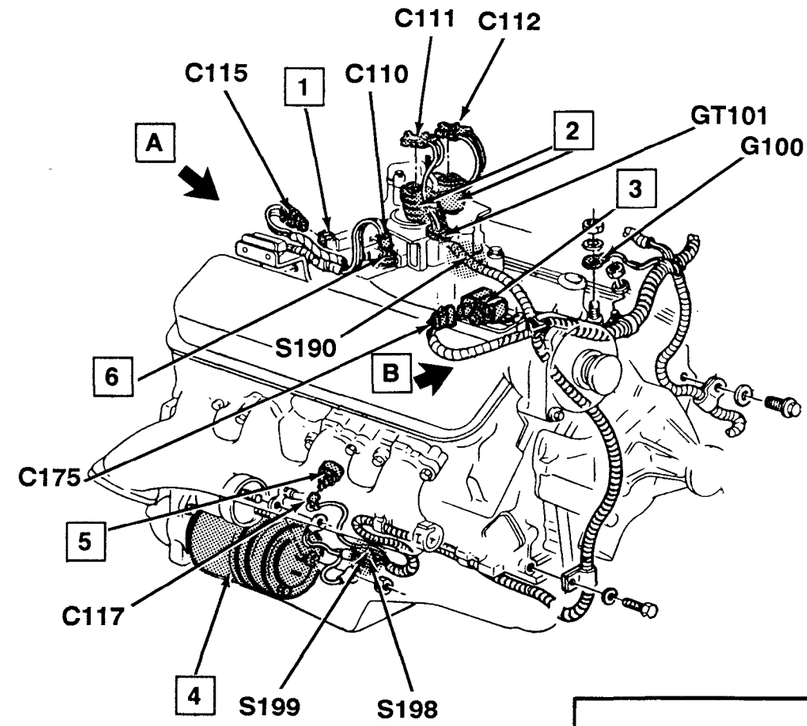


4 SPD., MAN TRANS

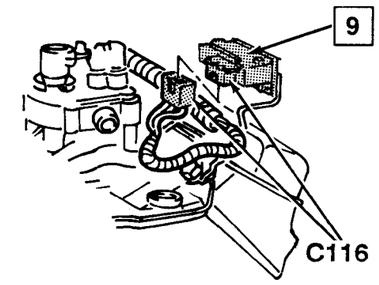
1. Ignition Coil
2. Distributor
3. Electronic Spark Module
4. Transmission
5. Engine Temperature Switch
6. Transmission Backup Lamp Switch

12H22

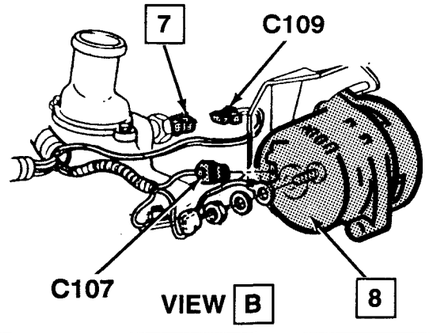
Figure 6 - Engine Wiring Harness, LH Side (7.4L V8 Gas Engine)



12H23



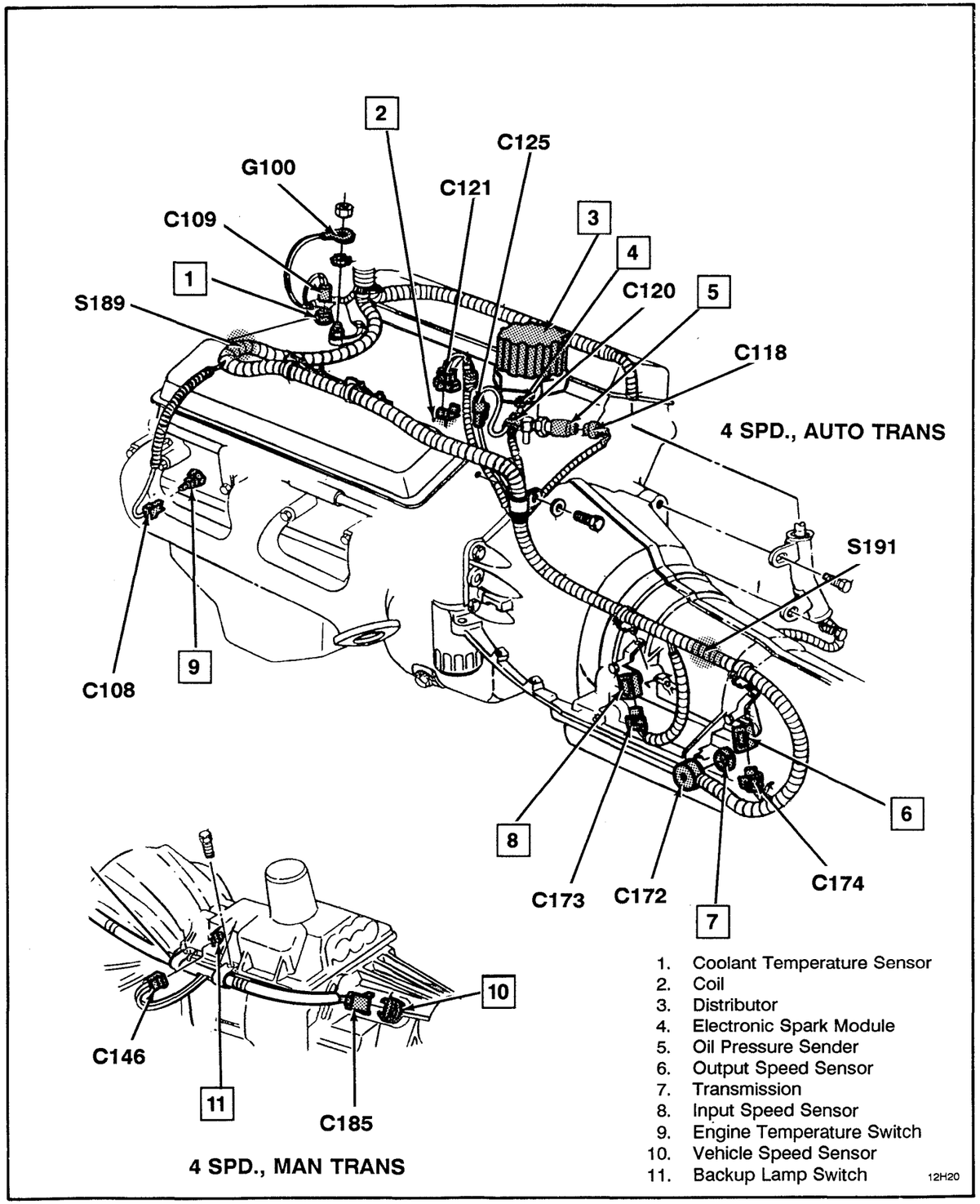
VIEW A



VIEW B

1. Idle Air Control Actuator
2. Injectors
3. EVRV
4. Starter Motor
5. Knock Sensor
6. TP Sensor
7. Coolant Temperature Sensor
8. Generator
9. Map Sensor

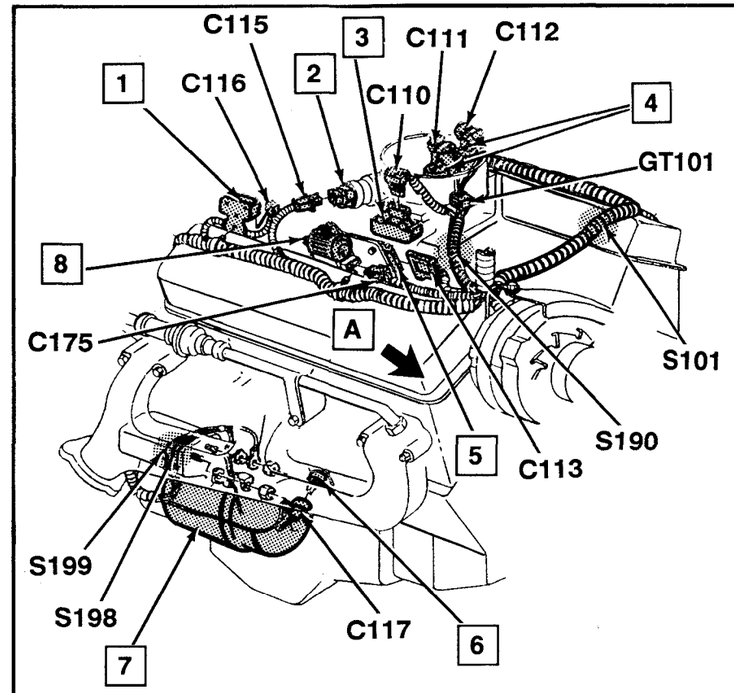
Figure 7 - Engine Wiring Harness, RH Side (7.4L V8 Gas Engine)



1. Coolant Temperature Sensor
2. Coil
3. Distributor
4. Electronic Spark Module
5. Oil Pressure Sender
6. Output Speed Sensor
7. Transmission
8. Input Speed Sensor
9. Engine Temperature Switch
10. Vehicle Speed Sensor
11. Backup Lamp Switch

12H20

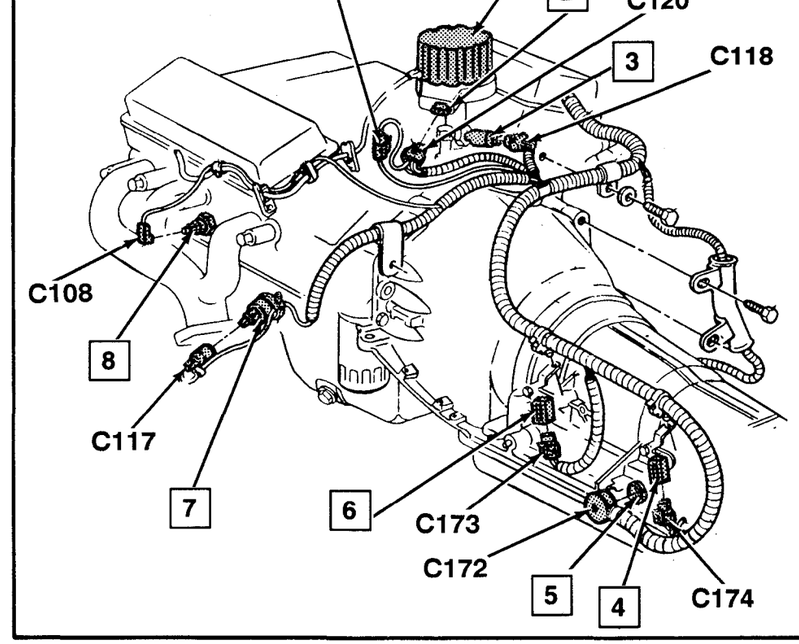
Figure 8 - Engine Wiring Harness, LH Side (5.7 V8 Gas Engine)



1. Map Sensor
2. Idle Air Controller
3. TP Sensor
4. Injectors
5. ESC Hybrid
6. Knock Sensor
7. Starter Motor
8. EVRV

12H21

Figure 9 - Engine Wiring Harness, RH Side (5.7L V8 Gas Engine)

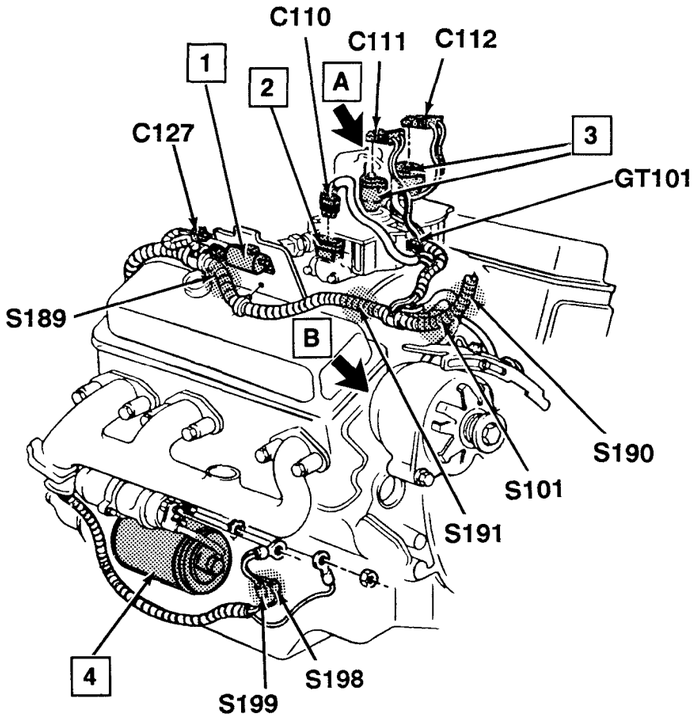


1. Distributor
2. Electronic Spark Module
3. Oil Pressure Sender
4. Output Speed Sensor
5. Transmission
6. Input Speed Sensor
7. Knock Sensor
8. Engine Temperature Switch

12H16

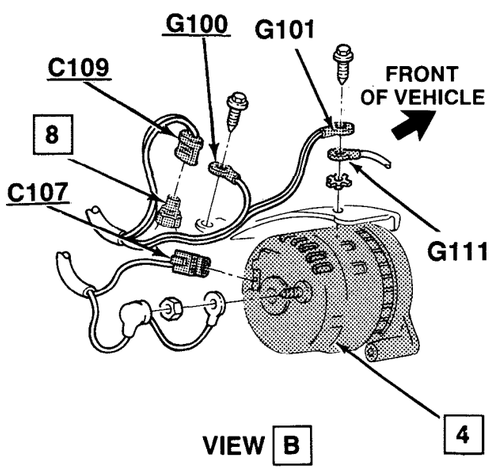
Figure 10 - Engine Wiring Harness to Cowl (7.4L V8 Gas Engine)

B-84 COMPONENT LOCATOR VIEWS



1. **EG**R Solenoid
2. TP Sensor
3. Injectors
4. Starter Motor
5. Map Sensor
6. Coil
7. Idle Air Control
8. Coolant Temperature Sensor

12H17



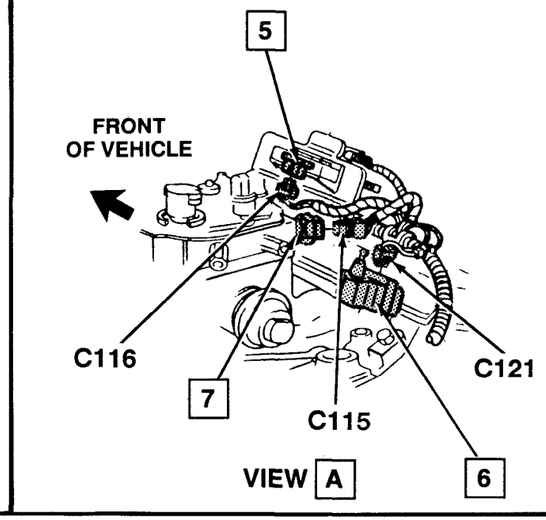
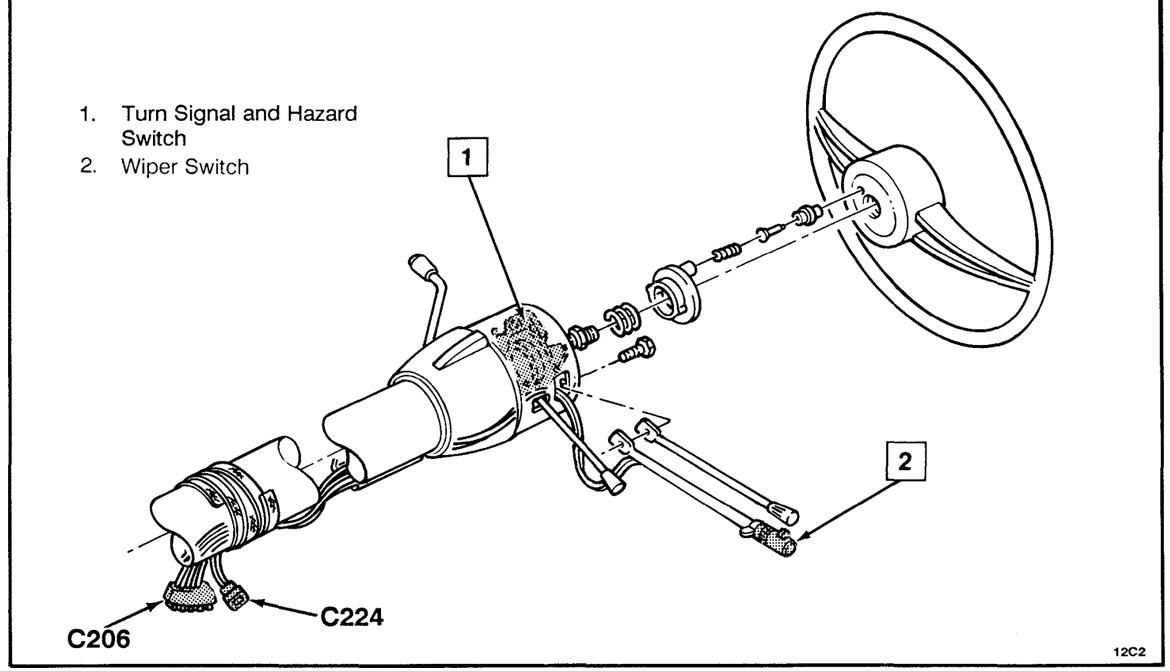


Figure 11 - Engine Wiring Harness, RH Side (4.3L V6 Gas Engine)

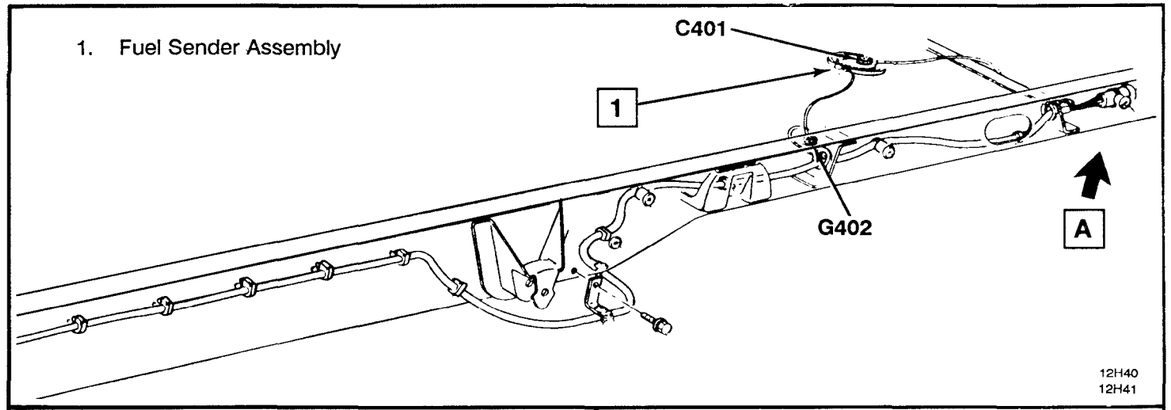
1. Turn Signal and Hazard Switch
2. Wiper Switch



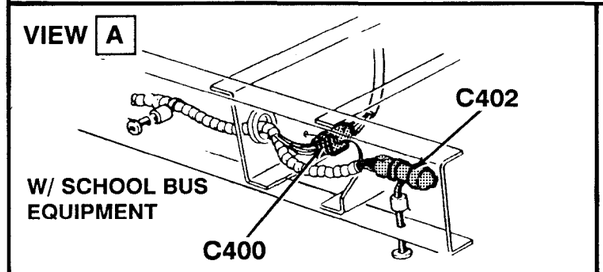
12C2

Figure 12 - Steering Column Switches

1. Fuel Sender Assembly



12H40
12H41



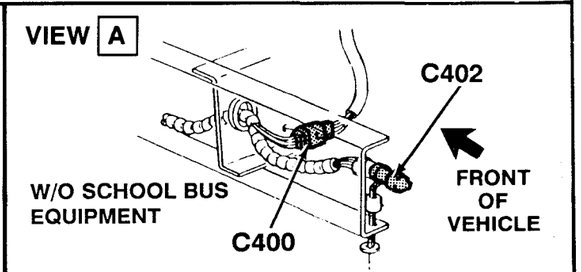


Figure 13 - Fuel Sender and Rear Lamp Wiring (Typical)

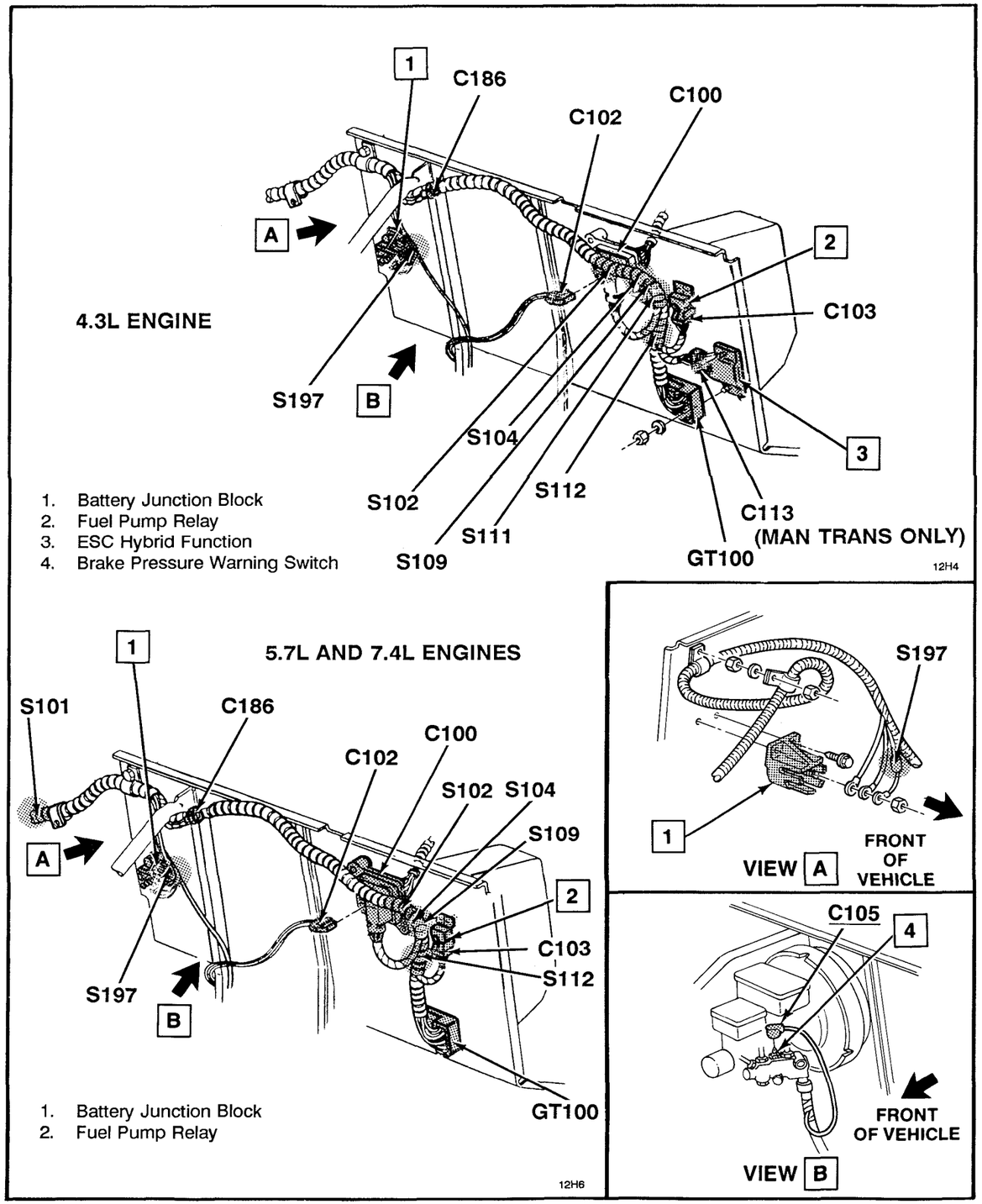


Figure 14 - Engine Wiring Harness to Cowl (4.3L V6, 5.7L and 7.4L V8 Gas Engines

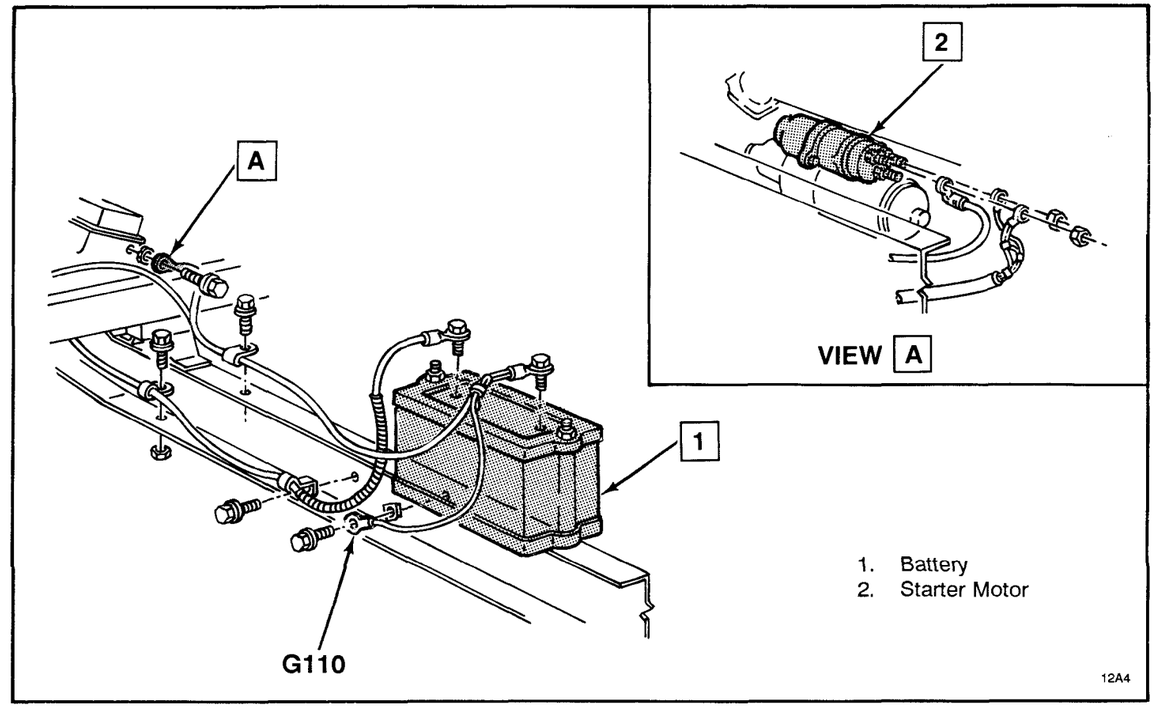


Figure 15 - Battery and Leads (4.3L V6 and 5.7L V8 Gas Engines W/ School Bus Equipment)

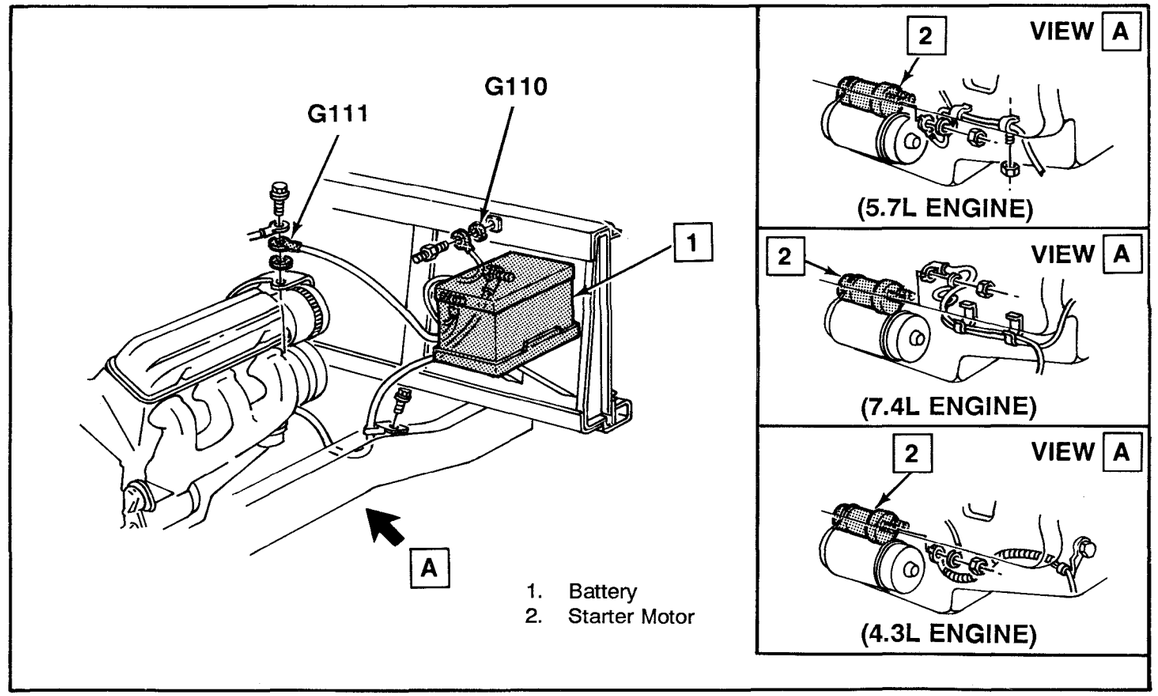


Figure 16 - Battery and Leads (4.3L V6, 5.7L and 7.4L V8 Gas Engines)

COMPONENT LOCATION		Page	Figure
Backup Lamp Switch	Top LH front of transmission	82	4
		83	6
		84	8
Battery, LH	LH front behind radiator support	81	1
Battery, RH	RH front behind radiator support	81	1
		86	15
		86	16
Battery Junction Block	RH side of shipping panel	82	5
		86	14
Brake Pressure Warning Switch	Near master cylinder	86	14
Cold Advance Control	Top front of engine	81	2
Cold Advance Fast Idle Temperature Switch	RH rear of engine	81	2
Coolant Temperature Sensor (Gasoline)	Top front of engine	83	7
Coolant Temperature Sensor (Diesel)	Top RH front of engine	84	8
Distributor	Top rear of engine	83	6
		84	8
		84	10
EGR Solenoid	Top RH side of engine	85	11
Engine Temperature Switch	LH side of engine	83	6
		84	8
		84	10
ESC Hybrid	Top RH side of engine	84	9
		86	14
ESC Module	Top of engine at distributor	83	6
		84	8
		84	10
EVRV	Top RH front of engine	83	7
		84	9
Fast Idle Solenoid	Top LH side of engine	81	2
Fuel Gage Sender	In fuel tank	85	13
Fuel Heater	Top rear of engine	82	4
Fuel Pump Relay	Top LH side of shipping panel	86	14
Fuel Shut Off Valve	Top front of engine	81	2
Generator (Diesel)	Front of engine	83	7
		84	9
		85	11
Generator (Gasoline)	Front of engine	81	2
Glow Plug #1	LH side of engine	81	3
Glow Plug #2	RH side of engine	81	2
Glow Plug #3	LH side of engine	81	3
Glow Plug #4	RH side of engine	81	2
Glow Plug #5	LH side of engine	81	3
Glow Plug #6	RH side of engine	81	2
Glow Plug #7	LH side of engine	81	3
Glow Plug #8	RH side of engine	81	2
Glow Plug Controller	Top LH rear of engine	82	4
Idle Air Control Actuator	Top rear of engine	83	7
		84	9

COMPONENT LOCATION		Page	Figure
Ignition Coil	Top of engine near distributor	83	6
		84	8
		85	11
Injector #1	Top center of engine	83	7
		84	9
		85	11
Injector #2	Top center of engine	83	7
		84	9
		85	11
Input Speed Sensor	LH side of transmission	84	8
		84	10
Knock Sensor	RH side of engine	83	7
		84	9
		85	11
Low Coolant Sensor (Diesel)	RH side of radiator	82	5
MAP Sensor (Diesel)	LH side of shipping panel	82	5
MAP Sensor (Gasoline)	Top rear of engine	83	7
		84	9
		85	11
Oil Pressure Sender (Diesel)	Top rear of engine	84	8
		84	10
Oil Pressure Switch (Gasoline)	Top LH side of transmission	82	4
		84	8
Output Speed Sensor	LH side of transmission	84	8
		84	10
Starter Motor	Lower RH side of engine	81	1
		83	7
		84	9
		85	11
		86	15
		86	16
TP Sensor	Top RH side of engine	83	7
		84	9
		85	11
Turn Signal Switch	LH side of steering column	85	12
VSS	Top LH side of transmission	82	4
		84	8
Water in Fuel Sensor	Top rear of engine	82	4
Wiper Switch	LH side of steering column	85	12
Connectors:			
C100	Top left side of left cowl	82	5
		86	14
C102	Top left side of left cowl	82	5
		86	14
C103	At fuel pump relay	86	14
C105	At brake pressure warning switch	86	14
C106	At coolant temperature sensor	81	3
C107	At generator	81	2
		83	7
		84	9
		85	11

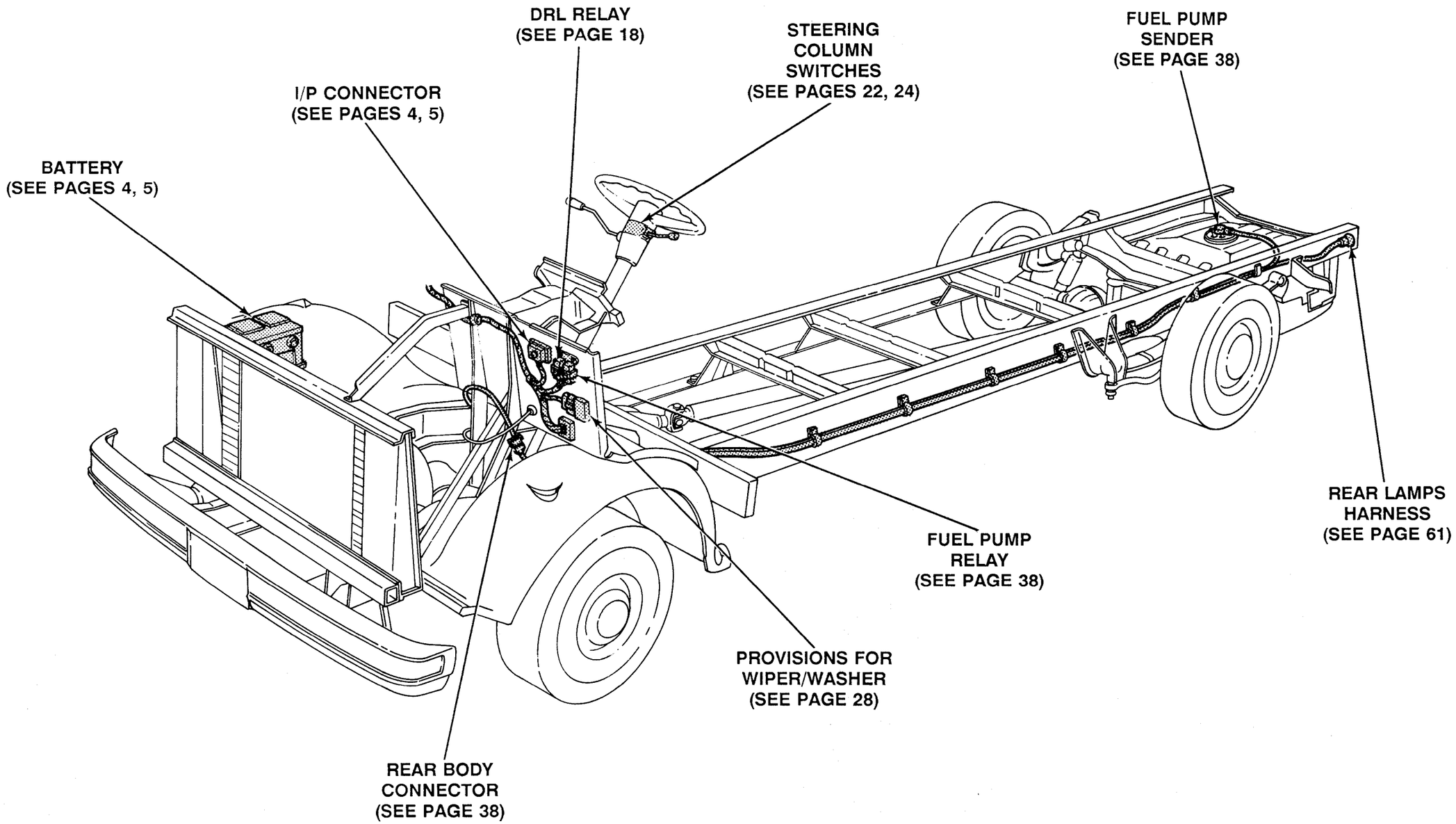
COMPONENT LOCATION		Page -- Figure
C108	At engine temperature switch	82 5
		83 6
		84 8
		84 10
C109	At coolant temperature sensor	83 7
		84 8
		84 10
C110	At throttle position sensor	83 7
		84 9
		85 11
C111	At RH injector	83 7
		84 9
		85 11
C112	At LH injector	83 7
		84 9
		85 11
C113	At ESC hybrid	84 9
		86 14
C115	At idle air control actuator	83 7
		84 9
		85 11
C116	At MAP sensor	82 5
		83 7
		84 9
		85 11
C117	At knock sensor	83 7
		84 9
		84 10
C118	At oil pressure sender (gasoline)	84 8
		84 10
C199	At oil pressure switch (diesel)	82 4
C120	At electronic spark module	83 6
		84 8
		84 10
C121	At ignition coil	83 6
		84 8
		85 11
C125	LH side of distributor	83 6
		84 8
		84 10
C127	At EGR Solenoid	85 11
C128	At glow plug controller	82 4
C129	Front of cold advance control	81 2
C130	At water in fuel sensor	82 4
C131	At cold advance fast idle temperature switch	81 2
C132	At fuel heater	82 4
C134	Top of cold advance control	82 4
C135	Fast idle solenoid	81 2
C146	At backup lamp switch	82 4
		83 6
		84 8
C150	At low coolant sensor	82 5

COMPONENT LOCATION		Page -- Figure
C172	LH center of transmission	83 6
		84 8
		84 10
C173	Input speed sensor	83 6
		84 8
		84 10
C174	Output speed sensor	83 6
		84 8
		84 10
C175	EVRV	83 7
		84 9
C185	At vehicle speed sensor	82 4
		84 8
C186	LH top of LH cowl (near support)	86 14
C192	#1 glow plug	81 3
C193	#3 glow plug	81 3
C194	#5 glow plug	81 3
C195	#7 glow plug	81 3
C196	#2 glow plug	81 2
C197	#4 glow plug	81 2
C198	#6 glow plug	81 2
C199	#8 glow plug	81 2
C206	Base of serving column	85 12
C224	Base of serving column	85 12
C400	At fuel tank	85 13
C401	At fuel level sender	85 13
C402	At rear lamp harness	85 13
Grommets:		
GT100	LH lower side of cowl	86 14
GT101	Center of injector body	83 7
		84 9
		85 11
Grounds:		
G100	Top LH rear of engine	83 7
		84 8
		85 11
G101	At alternator bracket	84 9
		85 11
G102	RH front top of engine	81 2
G110	RH side of radiator support above battery	81 1
		86 15
		86 16
G111	At alternator bracket	84 11
		86 16
G112	RH front of inlet manifold	81 1
G113	LH front of inlet manifold	81 1
G402	LH frame rail near fuel tank	85 13
Splices:		
S101	Front LH top of engine	84 9
		85 11
		86 14
S102	Top LH side of cowl	86 14

COMPONENT LOCATION

		Page	Figure
S104	Top LH side of cowl	86	14
S109	Top LH side of LH cowl	86	14
S111	Top LH side of LH cowl	86	14
S112	Top LH side of LH cowl	86	14
S113	Front RH top of engine	81	2
S114	RH top corner of engine	81	2
S115	RH top center of engine	81	2
S116	LH top rear of engine	81	3
S117	RH top rear of engine	81	2
S189	Top LH center of engine	83	6
		84	8
		84	9
		85	11
S190	Top LH side of engine	85	11
S191	LH side of transmission	83	6
		84	8
S195	LH side of cowl	82	5
		86	14
S196	LH side of cowl	82	5
		86	14
S197	LH side of cowl	82	5
		86	14
S198	Lower RH side of engine	83	7
		84	9
		85	11
S199	Lower RH side of engine	83	7
		84	9
		85	11

SECTION C
P MODEL
(MOTORHOME)



C-2 PHANTOM VIEW

SYMPTOMS INDEX

SYMPTOM — **PAGE**

AUXILIARY COOLING FAN
- Auxiliary cooling fan does not run C-48
- Auxiliary cooling fan runs continuously C-48

CRUISE CONTROL
- Cruise control does not disengage when brake pedal is depressed C-51
- Cruise control does not operate C-51

DIESEL ENGINE FUEL CONTROLS
- Service fuel filter indicator does not light briefly with ignition switch turned to RUN C-46
- Fuel heater does not operate C-46
- Water in fuel indicator lights with no water in fuel C-46

GAGES AND INDICATORS
- Fuel gage indicates full or beyond at all times C-53
- Fuel gage indicates empty when there is fuel in the tank C-53
- Fuel gage is inaccurate C-53
- Oil pressure gage indicates low pressure when oil pressure is good C-53
- Oil pressure gage indicates high pressure at all times C-54
- Temperature gage indicates hot with engine coolant below operating temperature and ignition switch in RUN C-54
- Temperature gage indicates cold all the time C-54
- Temperature gage is inaccurate C-54
- Low coolant indicator is lit when coolant level is good C-54
- Low coolant indicator does not light with coolant level low (diesel only) C-54

GLOW PLUGS
- Wait indicator does not flash or flashes for the incorrect amount of time when engine is below normal operating temperature C-43

HEADLAMPS
- Headlamps do not illuminate high or low beams - both sides C-13
- Low beam lamp(s) do not operate C-13
- High beam lamp(s) do not operate C-13

HEADLAMPS (WITH DRL)
- Headlamps do not illuminate high or low beams - both sides C-16
- Low beam lamp(s) do not operate C-16
- High beam lamp(s) do not operate C-17
- Canadian daytime running lamps do not operate C-17

HORNS
- Horn will not operate C-25
- Horn sounds continuously without depressing horn switch C-25

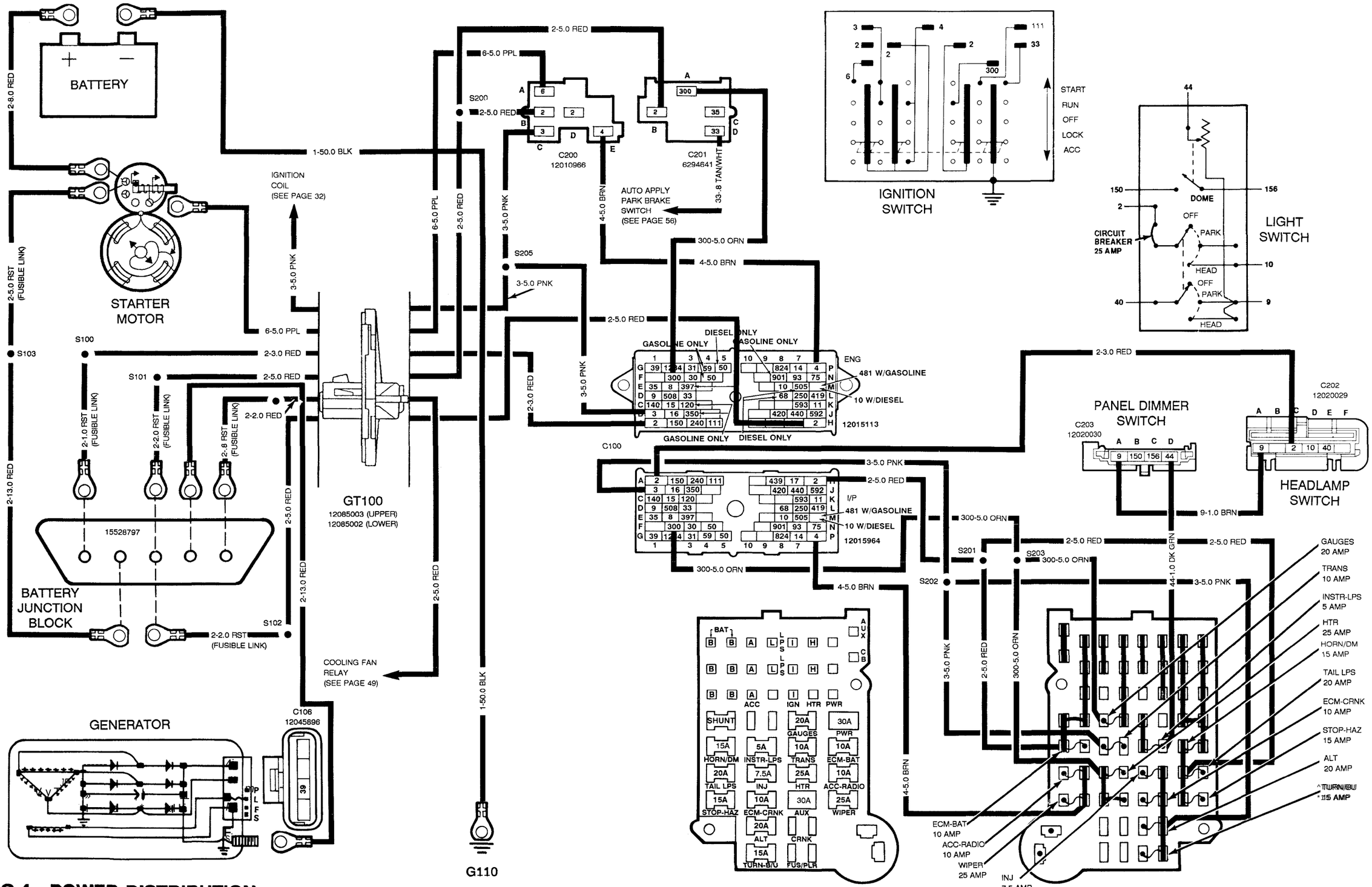
PARK, MARKER AND HAZARD LAMPS
- Park lamps do not operate C-21
- Side marker lamp(s) do not operate C-21
- Hazard warning lamps do not operate C-21

REAR EXTERIOR LAMPS
- None of the rear lamps operate C-60
- Backup lamps do not operate C-60

START AND CHARGE
- Battery is undercharged or overcharged C-29
- Engine does not crank and starter solenoid does not click C-29
- Starter solenoid clicks, engine does not crank or cranks slowly C-29

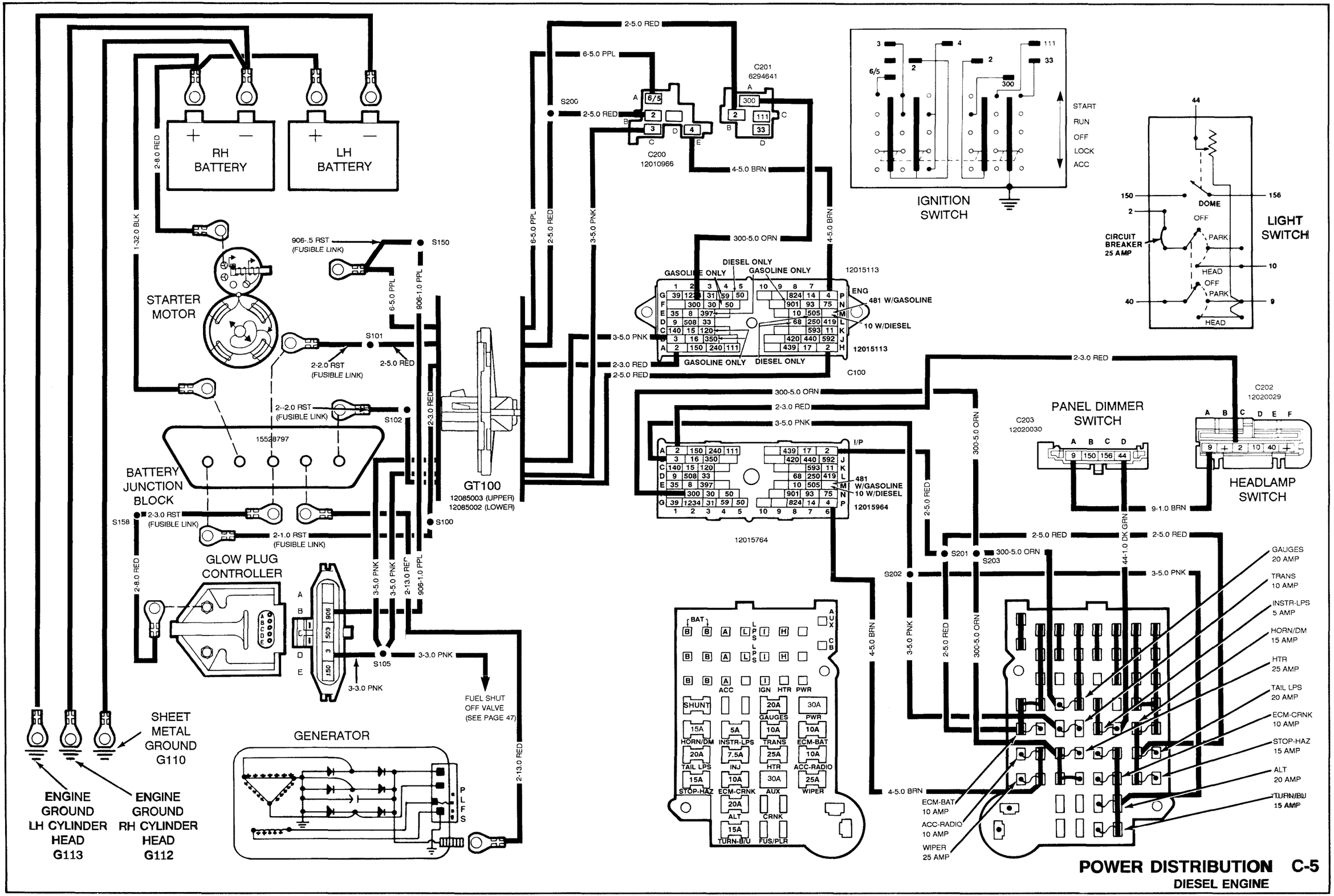
TURN LAMPS
- Turn signals do not work on one side C-23
- Turn signals do not operate C-23
- Turn signal lamps flash rapidly C-23

WIPER/WASHER
- Wipers do not operate in any mode C-27
- Wipers do not operate in HI C-27
- Wipers do not operate in LO C-27



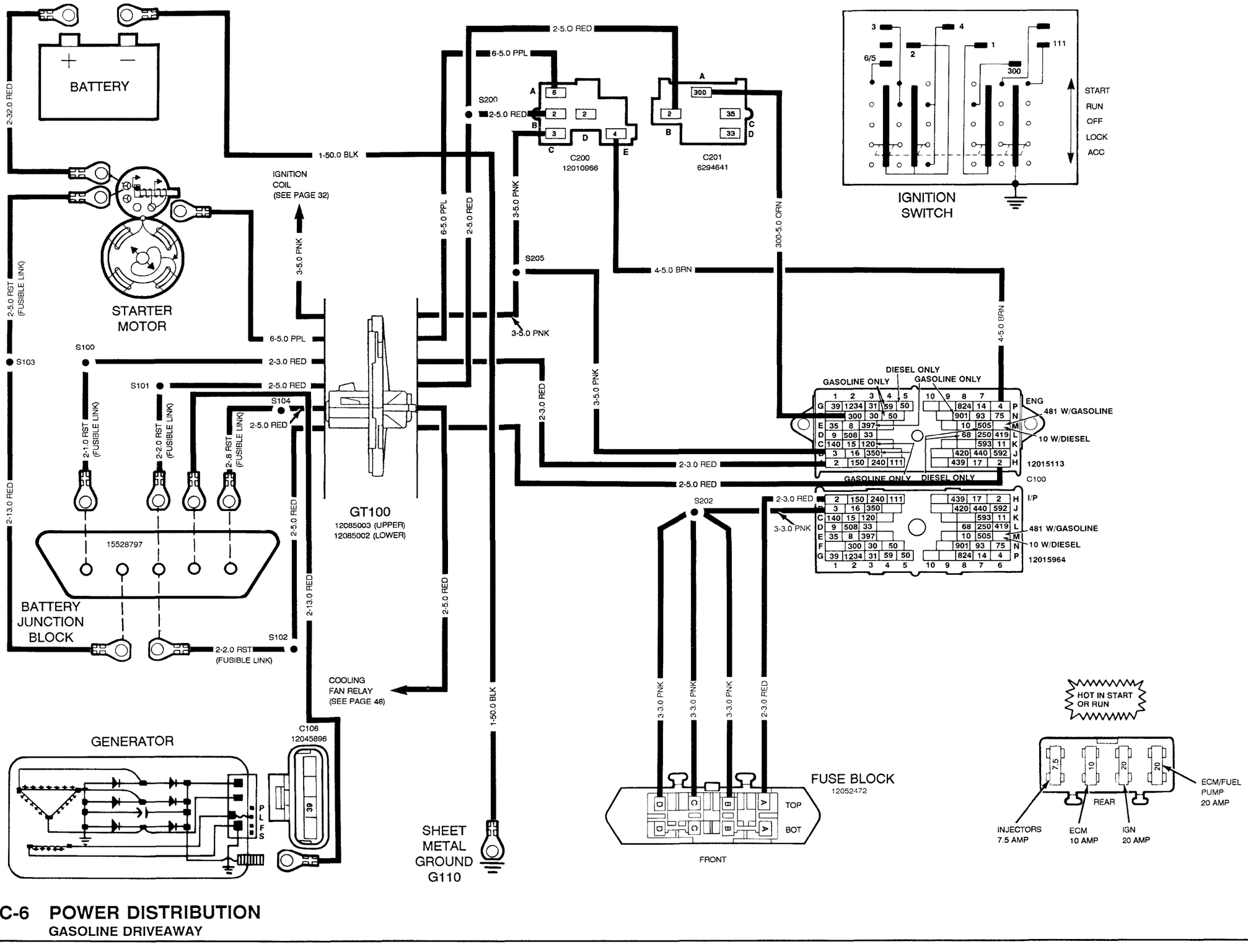
C-4 POWER DISTRIBUTION

GASOLINE ENGINE



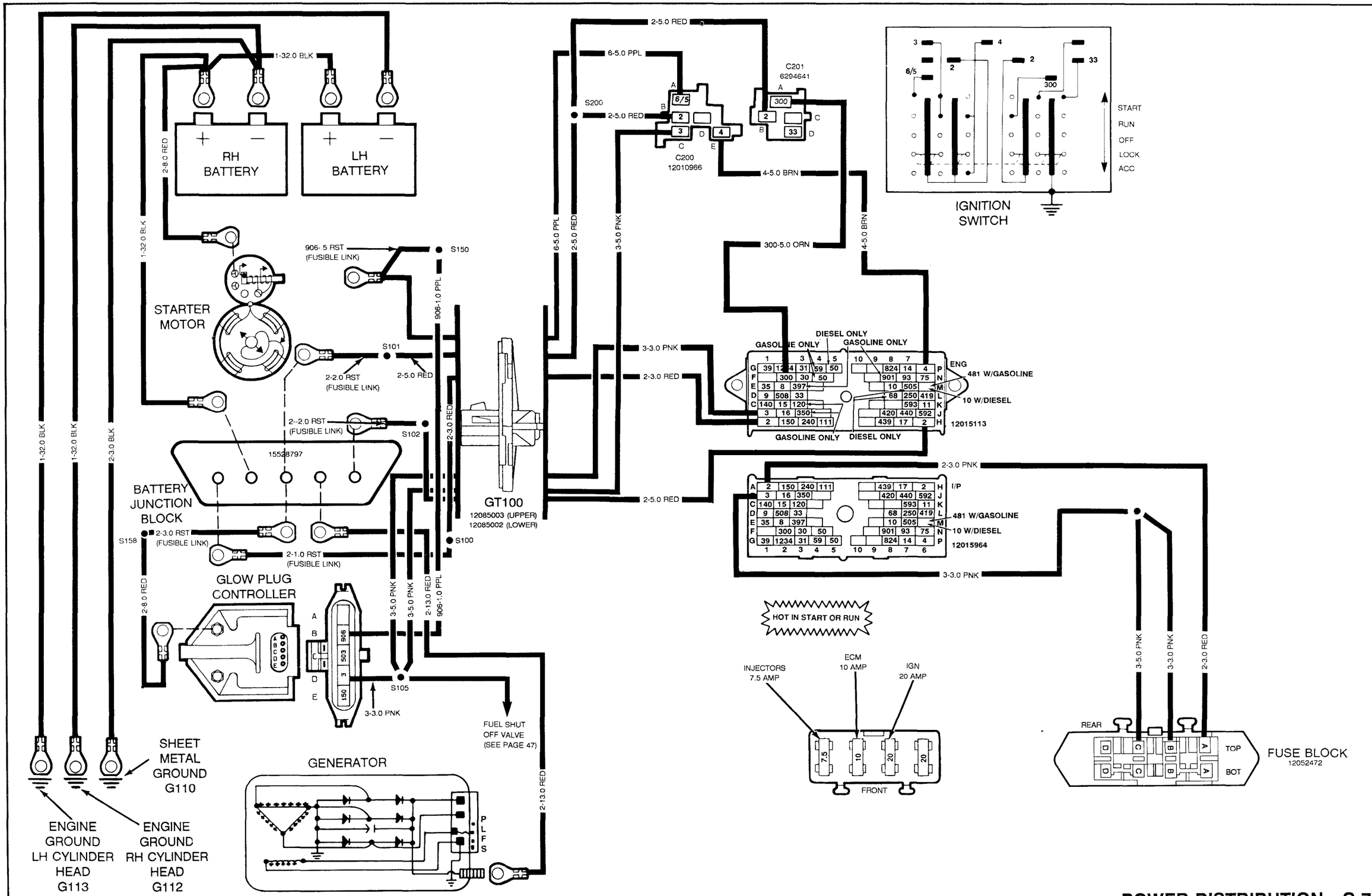
POWER DISTRIBUTION C-5

DIESEL ENGINE



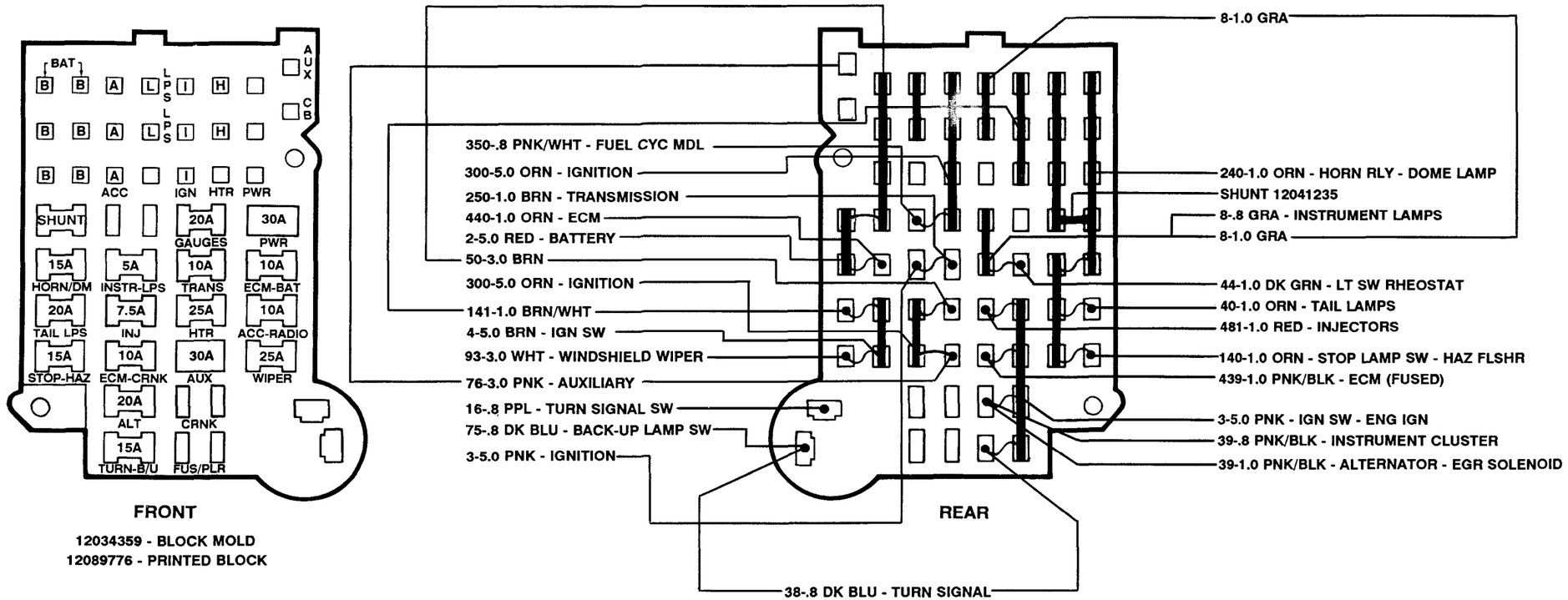
C-6 POWER DISTRIBUTION

GASOLINE DRIVEAWAY



POWER DISTRIBUTION C-7

DIESEL DRIVEAWAY

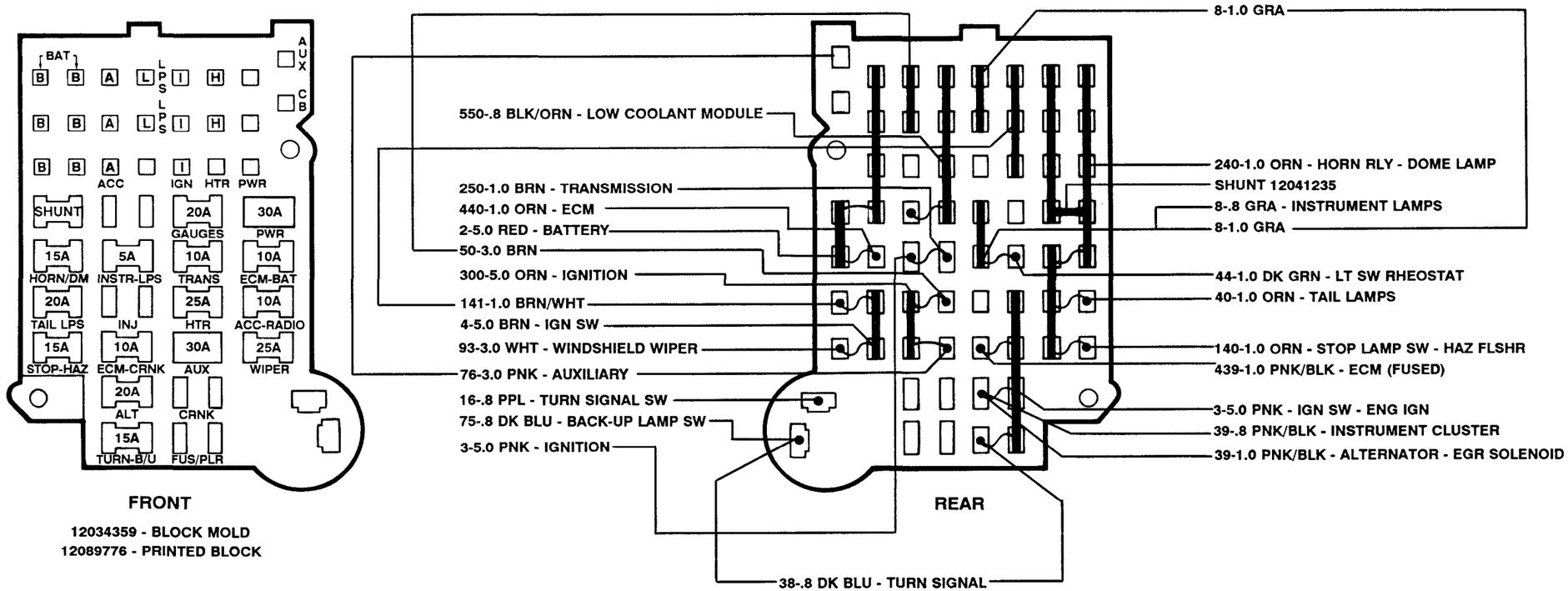


	COLOR	MALE CONN
A	BRN	12004887
B	BLK	12004886
H	GRN	12004885
I	NAT	12004888
L	BLU	12004884

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
ACC-RADIO	12004007	RED 10 AMP	HOT IN ACC OR RUN	RADIO ACCESSORIES
ALT	12004009	YELLOW 20 AMP	HOT IN RUN OR START	ALTERNATOR
AUX	CIRCUIT BREAKER	GRN 30 AMP	HOT IN RUN OR START	BODY BUILDER INSTALLED ACCESSORIES
ECM-BAT	12004007	RED 10 AMP	HOT AT ALL TIMES	ELECTRONIC CONTROL MODULE
ECM-CRNK	12004007	RED 10 AMP	HOT IN RUN OR START	ELECTRONIC CONTROL MODULE IGNITION 1
GAUGES	12004009	YELLOW 20 AMP	HOT IN RUN	PROVISIONS FOR GAGES
HORN-DM	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	PROVISIONS FOR HORN AND DOME LAMPS

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
HTR	12004010	WHITE 25 AMP	HOT IN RUN	HEATER
INJ	12004006	BRN 7.5 AMP	HOT IN RUN OR START	INJECTORS
INSTR-LPS	12004005	TAN 5 AMP	HOT W/ HEADLAMP IN PARK OR HEAD	INSTRUMENT PANEL LAMPS
STOP-HAZ	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	STOP LAMPS HAZARD FLASHER
PWR	CIRCUIT BREAKER	GRN 30 AMP	HOT AT ALL TIMES	BODY BUILDER INSTALLED ACCESSORIES
TAIL LPS	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAIL LAMPS
TRANS	12004007	RED 10 AMP	HOT IN RUN OR START	TRANSMISSION
TURN-B/U	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACK-UP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS

C-8 FUSE BLOCK
GASOLINE ENGINE



	COLOR	MALE CONN
A	BRN	12004887
B	BLK	12004886
H	GRN	12004885
I	NAT	12004888
L	BLU	12004884

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
ACC-RADIO	12004007	RED 10 AMP	HOT IN ACC OR RUN	RADIO ACCESSORIES
ALT	12004009	YELLOW 20 AMP	HOT IN RUN OR START	ALTERNATOR
AUX	CIRCUIT BREAKER	GRN 30 AMP	HOT IN RUN OR START	BODY BUILDER INSTALLED ACCESSORIES
ECM-BAT	12004007	RED 10 AMP	HOT AT ALL TIMES	ELECTRONIC CONTROL MODULE
ECM-CRNK	12004007	RED 10 AMP	HOT IN RUN OR START	ELECTRONIC CONTROL MODULE IGNITION 1
GAUGES	12004009	YELLOW 20 AMP	HOT IN RUN	PROVISIONS FOR GAGES
HORN-DM	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	PROVISIONS FOR HORN AND DOME LAMPS

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	HOT CONDITION	DESCRIPTION
HTR	12004010	WHITE 25 AMP	HOT IN RUN	HEATER
INSTR-LPS	12004005	TAN 5 AMP	HOT W/ HEADLAMP IN PARK OR HEAD	INSTRUMENT PANEL LAMPS
STOP-HAZ	12004008	LT BLUE 15 AMP	HOT AT ALL TIMES	STOP LAMPS HAZARD FLASHER
PWR	CIRCUIT BREAKER	GRN 30 AMP	HOT AT ALL TIMES	BODY BUILDER INSTALLED ACCESSORIES
TAIL LPS	12004009	YELLOW 20 AMP	HOT AT ALL TIMES	TAIL LAMPS
TRANS	12004007	RED 10 AMP	HOT IN RUN OR START	TRANSMISSION
TURN-B/U	12004008	LT BLUE 15 AMP	HOT IN RUN OR START	TURN SIGNALS BACK-UP LAMPS
WIPER	12004010	WHITE 25 AMP	HOT IN ACC OR RUN	WINDSHIELD WIPERS

LAMP BULB DATA

AC Type Guide Lamps are recommended when replacement becomes necessary.

Lamp Usage	Quantity	Trade No.	Power Rating at 12V, Watts
Headlamp[1]	2	6014	50/60 W
			Candle Power
Park and Signal Lamp[2]	2	2057	32-2
Tail and Stoplamp[3] (Union City Body Co.)	2	1157	32-3
Tail and Stoplamp[2] (Except Union City Body Co.)	2	2057	32-2
Front Side Marker Lamp	2	194	2
Rear Side Marker Lamp	2	194	2
License Lamp	2	67	4
Backup Lamp[4]	--	--	--
Instrument Cluster Illumination Lamp	6	PC194	2
Turn Signal Indicator Lamp	2	PC194	2
Headlamp High Beam Indicator Lamp	1	PC74	.7
Service Brake Warning Indicator Lamp	1	PC74	.7
Park Brake Warning Indicator Lamp	1	PC74	.7
Transmission Control Illumination Lamp	1	73	.3
Low Coolant Indicator Lamp[5]	1	PC74	.7
Glow Plug Indicator Lamp[5]	1	PC74	.7
Water in Fuel Indicator Lamp[5]	1	PC74	.7
Service Engine Soon Indicator Lamp	1	PC74	.7
Trans Indicator Lamp[5]	1	PC74	.7
Fasten Safety Belts Indicator Lamp[6]	1	PC74	.7
Door Ajar Indicator Lamp	1	PC74	.7
Daytime Running Lights Indicator Lamp[7]	1	PC118	.7

1. Double filament sealed beam: 50W low beam, 60W high beam.
2. Double filament lamp: 32 CP high, 2 CP low.
3. Double filament lamp: 32 CP high, 3 CP low.
4. Refer to body manufacturer's specifications.
5. Diesel only.
6. When used by body manufacturer.
7. Canada only.

RPO CODES
T61 - CANADIAN DAYTIME RUNNING LAMPS

S113

150-.8 BLK — A/C COMPRESSOR (SEE PAGE 50)

150-.8 BLK — COOLING FAN PRESSURE SWITCH (SEE PAGE 49)

150-.8 BLK — COOLING FAN (SEE PAGE 49)

150-.8 BLK — EVRV (SEE PAGE 36)

150-.8 BLK — CRUISE CONTROL MODULE (SEE PAGE 52)

150-.8 BLK

PCM (SEE PAGE 34) — 413-.8 TAN

PCM (SEE PAGE 34) — 454-.8 BLK/WHT

ALDL (SEE PAGES 35, 37) — 450-.8 BLK/WHT

PCM (SEE PAGE 34) — 450-.8 BLK/WHT

450-.8 BLK/WHT — AUTO APPLY PARK BRAKE (SEE PAGE 56)

450-.8 BLK/WHT

450-.8 BLK/WHT

S112 — 150-1.0 BLK

150-1.0 BLK

450-.8 BLK/WHT — S111

150-2.0 BLK

450-2.0 BLK/WHT

454-.8 BLK/WHT

413-.8 TAN

ENGINE GROUND G102

ENGINE GROUND G100

ALTERNATOR BRACKET GROUND G103

GT 100
12085003 (UPPER)
12085002 (LOWER)

150-1.0 BLK

150-1.0 BLK

S204

150-1.0 BLK

150-.8 BLK — WIPER SWITCH (SEE PAGE 28)

150-.8 BLK

150-.8 BLK — DRL RELAY (T61 ONLY) (SEE PAGE 18)

DRAC (SEE PAGE 42)

150-1.0 BLK

I/P

A	2	150	240	111			439	17	2	H
B	3	16	350				420	440	592	J
C	140	15	120					593	11	K
D	9	508	33				68	250	419	L
E	35	8	397				10	505		M
F		300	30	50			901	93	75	N
G	39	1234	31	59	50		824	14	4	P
	1	2	3	4	5		10	9	8	7	6	

481 W/GASOLINE

10 W/DIESEL

12015964

C100

DIESEL ONLY

GASOLINE ONLY

GASOLINE ONLY

ENG

G	39	1234	31	59	50		824	14	4	P
F		300	30	50			901	93	75	N
E	35	8	397				10	505		M
D	9	508	33				68	250	419	L
C	140	15	120					593	11	K
B	3	16	350				420	440	592	J
A	2	150	240	111			439	17	2	H
	1	2	3	4	5		10	9	8	7	6	

481 W/GASOLINE

10 W/DIESEL

12015113

GASOLINE ONLY

DIESEL ONLY

S206

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

I/P CLUSTER (SEE PAGE 56)

PANEL DIMMER SWITCH (SEE PAGE 58) — 150-3.0 BLK

DRL MODULE (T61 ONLY) (SEE PAGE 18) — 150-.8 BLK

150-.8 BLK — FUEL CYCLE MODULE (SEE PAGE 36)

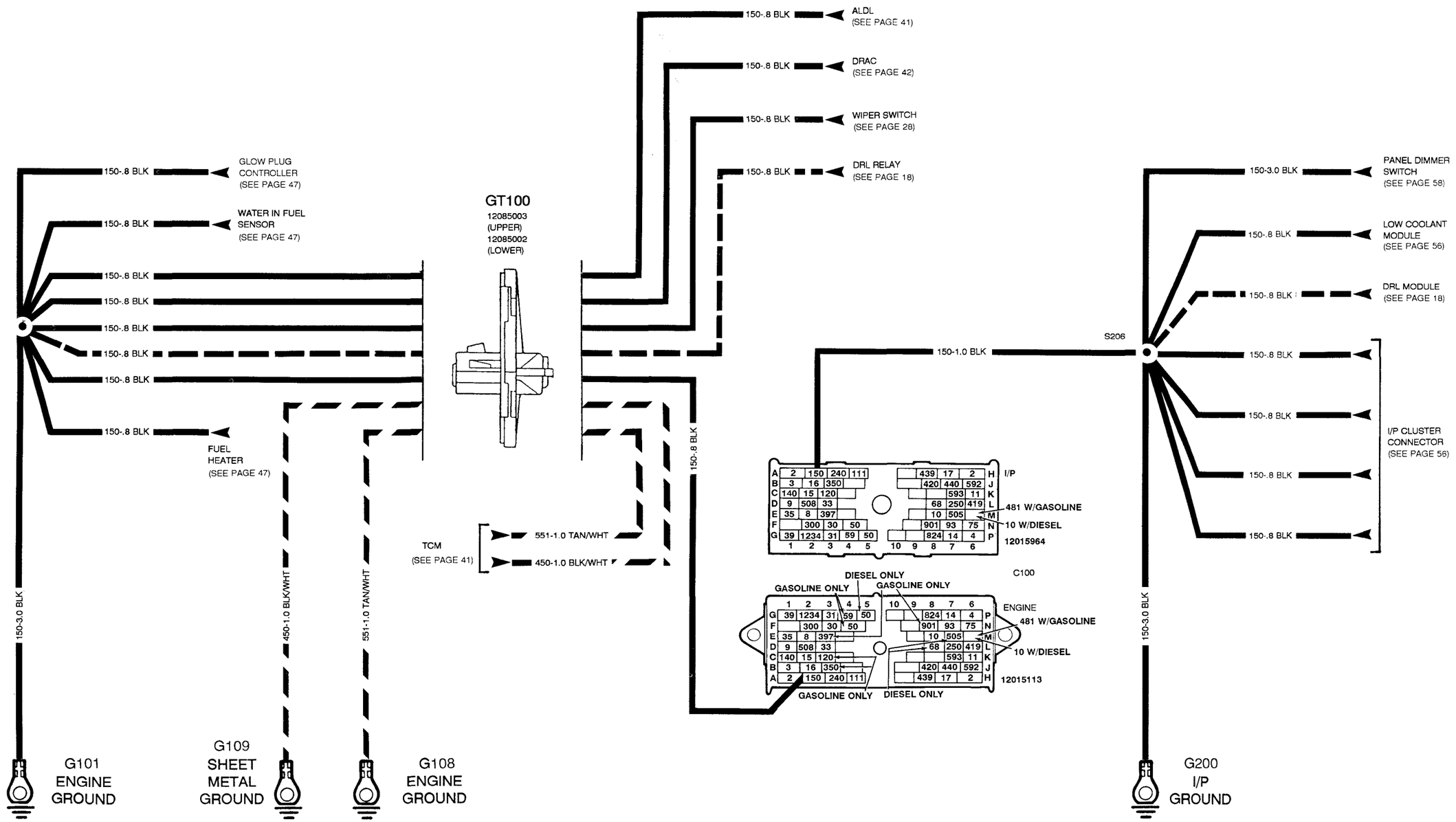
150-3.0 BLK

I/P GROUND G200

150-1.0 BLK

REAR LAMP HARNESS

						18								9	
19															



C-12 GROUND DISTRIBUTION

DIESEL ENGINE

CIRCUIT OPERATION

Voltage is applied to the Light Switch at all times. The Light Switch includes a Self-Resetting Circuit Breaker. The Circuit Breaker opens when the Headlamp circuit draws too much current. When the Circuit Breaker opens, it interrupts the current flow. With no current flow, the Circuit Breaker cools off and resets automatically. When the Light Switch is in HEAD, the Headlamp Dimmer Switch directs voltage to either the Low Beams or the High Beams. The Hi Beam Indicator also receives voltage along with the High Beams.

DIAGNOSIS -- HEADLAMPS

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS -- BOTH SIDES

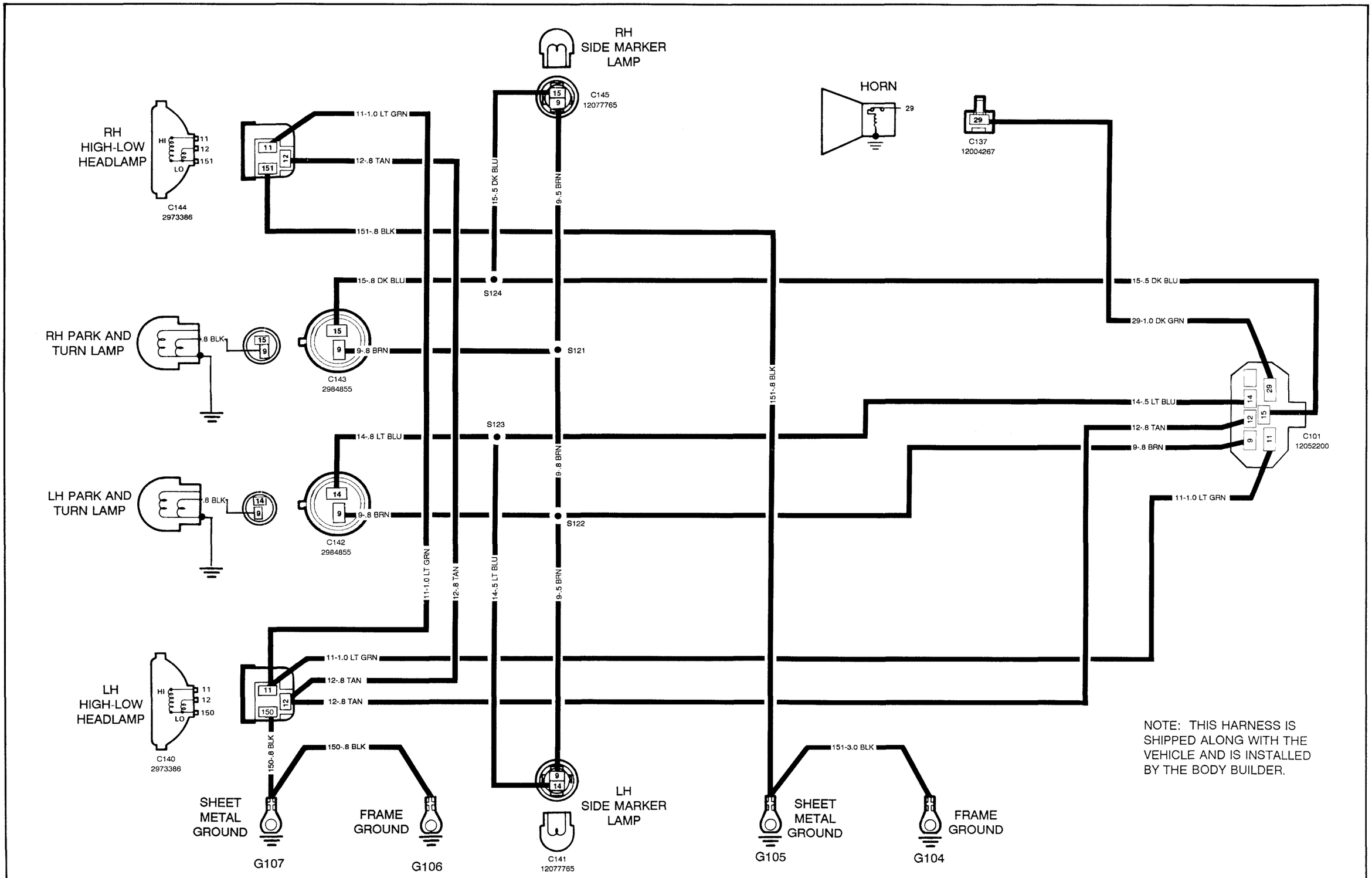
TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from light switch connector C202 to battery junction block.
2. With the light switch on and the headlamp dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C215 to ground.	Test lamp lights.	REPAIR open LT GRN (11) wire from headlamp dimmer switch connector C215 to connector C101.
	Test lamp does not light.	REPLACE headlamp dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn the light switch to ON and headlamp dimmer switch to LOW BEAM position. Connect a test lamp from TAN (12) wire at connector C101 to ground.	Test lamp does not light.	GO to step 2.
	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
2. Connect a test lamp from TAN (12) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	GO to step 3.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch connector C215 to connector C101.
3. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch connector C215 to light switch connector C202.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch to ON and headlamp dimmer switch to HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at connector C101 to ground.	Test lamp does not light.	GO to step 2.
	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
2. Place headlamp dimmer switch in HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	GO to step 3.
	Test lamp lights.	LOCATE and REPAIR open in LT GRN (11) wire from headlamp dimmer switch connector C215 to connector C101.
3. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire at headlamp dimmer switch connector C215 to light switch connector C202.
	Test lamp lights.	REPLACE headlamp dimmer switch.



C-14 FORWARD LAMP HARNESS

BATTERY JUNCTION BLOCK

HOT WITH LT SW IN HEAD OR PARK

TAIL LPS 20 AMP

2-1.0 RST (FUSIBLE LINK)

S100

2-3.0 RED

40-1.0 ORN

12-.8 TAN

C101
12059472
FORWARD LAMP HARNESS

9-1.0 BRN

11-1.0 LT GRN

GT100
12085003 (UPPER)
12085002 (LOWER)

REAR LAMP HARNESS (SEE PAGE 62)

9-.8 BRN

S115

S216

10-1.0 YEL

12-.8 TAN

9-.8 BRN

2-3.0 RED

I/P

481 W/GASOLINE

10 W/DIESEL

12015964

C100

DIESEL ONLY

GASOLINE ONLY

GASOLINE ONLY

ENGINE

481 W/GASOLINE

10 W/DIESEL

12015113

GASOLINE ONLY

DIESEL ONLY

HEADLAMP DIMMER SWITCH

HI

LO

C210
8917693

11-1.0 LT GRN

I/P CLUSTER
(SEE PAGE 56)

C203
12020030
PANEL DIMMER SWITCH

LIGHT SWITCH
C202
12020029

DOME

OFF

PARK

HEAD

CIRCUIT BREAKER 25 AMP

LIGHT SWITCH

HEADLAMPS C-15
BASE

CIRCUIT OPERATION

CANADIAN DAYTIME RUNNING LAMPS

Battery voltage is applied to the Daytime Running Lamps (DRL) Relay Switch at all times through the BRN (50) wire and the HTR fuse.

With the Headlamps on, the DRL Relay is not energized and the LT BLU/ORN (593) wire is grounded to BLK (150) wire inside of the relay. This serves as ground for the LH Headlamp.

With Ignition in RUN, headlamps off and Park Brake released, the DRL Module applies battery voltage to the LT GRN/BLK (592) wire. This action illuminates the DRL Indicator in the Instrument Panel and energizes the DRL Relay. When energized, the DRL Relay disconnects the DK BLU/WHT (593) wire from ground and internally connects it to the ORN (240) wire, causing it to be 12 volts.

The DK BLU/WHT (593) wire feeds the LH High Beams which are connected in series to the RH Headlamp through the LT GRN (11) wire. Grounding of the entire DRL circuit is accomplished through the BLK (151) wire at the RH Headlamp. This result in High Beam headlamps that are less intense for daytime driving and should provide longer service.

DIAGNOSIS -- HEADLAMPS (WITH DRL)

PRELIMINARY CHECKS:

Before checking the DRL system, do the following:

1. Place Park Brake in the OFF position.
2. Place Light Switch to ON and Headlamp Dimmer Switch to HIGH BEAM position.

If the High Beam Lamp(s) are inoperative, refer to the HIGH BEAM LAMP(S) DO NOT OPERATE test procedures.

If the High Beam Lamp(s) are operative, use the following diagnostic procedures, after placing the Light Switch to OFF position.

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS -- BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from light switch connector C202 to fuse block.
2. With the light switch on and the headlamp dimmer switch to HIGH BEAM. Connect a test lamp from YEL (10) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp from LT GRN (11) wire at headlamp dimmer switch connector C215 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from headlamp dimmer switch connector C215 to connector C101.
	Test lamp does not light.	REPLACE headlamp dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

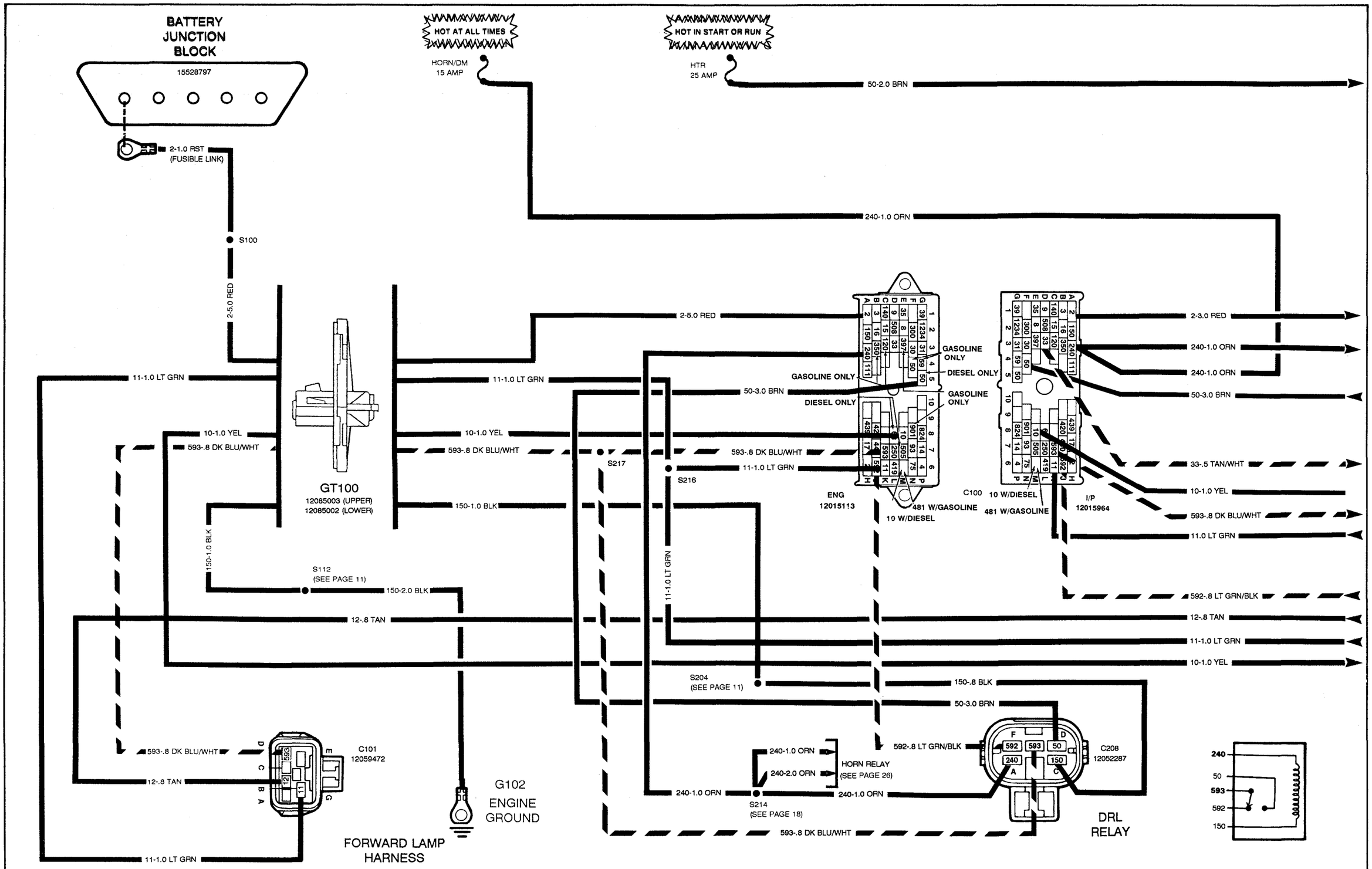
TEST	RESULT	ACTION
1. Turn light switch ON and headlamp dimmer switch to LOW BEAM position. Connect a test lamp from TAN (12) wire at connector C101 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	GO to step 2.
2. Connect a test lamp from DK BLK/WHT (593) wire at DRL relay connector C208 to ground.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/WHT (593) wire at connector C101 to DRL relay connector C208.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from BLK (150) wire at DRL relay connector C208 to ground.	Test lamp does not light.	REPLACE DRL relay.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from DRL relay connector C208 to ground G200.
4. Connect a test lamp from TAN (12) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	GO to step 5.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch connector C215 to connector C101. If no open is found, ISOLATE problem in body builder's installed wiring.
5. Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch connector C215 to light switch connector C202.
	Test lamp lights.	REPLACE headlamp dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
Turn light switch ON and headlamp dimmer switch to LOW BEAM position. Connect a test lamp from TAN (12) wire at connector C101 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	GO to step 2.
Connect a test lamp from DK BLK/WHT (593) wire at DRL relay connector C208 to ground.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/WHT (593) wire at connector C101 to DRL relay connector C208.
	Test lamp lights.	GO to step 3.
Connect a test lamp from BLK (150) wire at DRL relay connector C208 to ground.	Test lamp does not light.	REPLACE DRL relay.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from DRL relay connector C208 to ground G200.
Connect a test lamp from TAN (12) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	GO to step 5.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch connector C215 to connector C101. If no open is found, ISOLATE problem in body builder's installed wiring.
Connect a test lamp from YEL (10) wire at headlamp dimmer switch connector C215 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch connector C215 to light switch connector C202.
	Test lamp lights.	REPLACE headlamp dimmer switch.

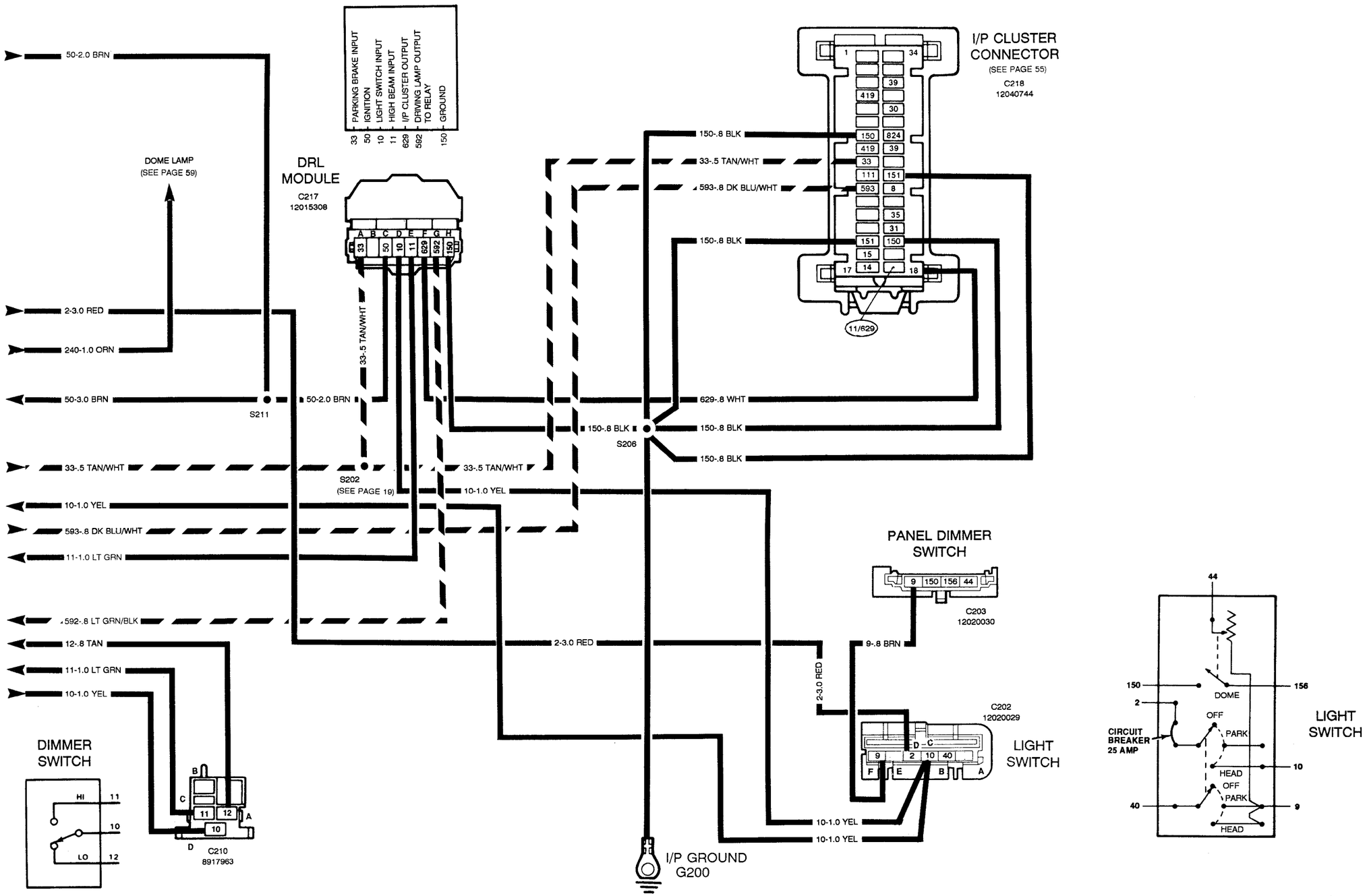
CANADIAN DAYTIME RUNNING LAMPS DO NOT OPERATE

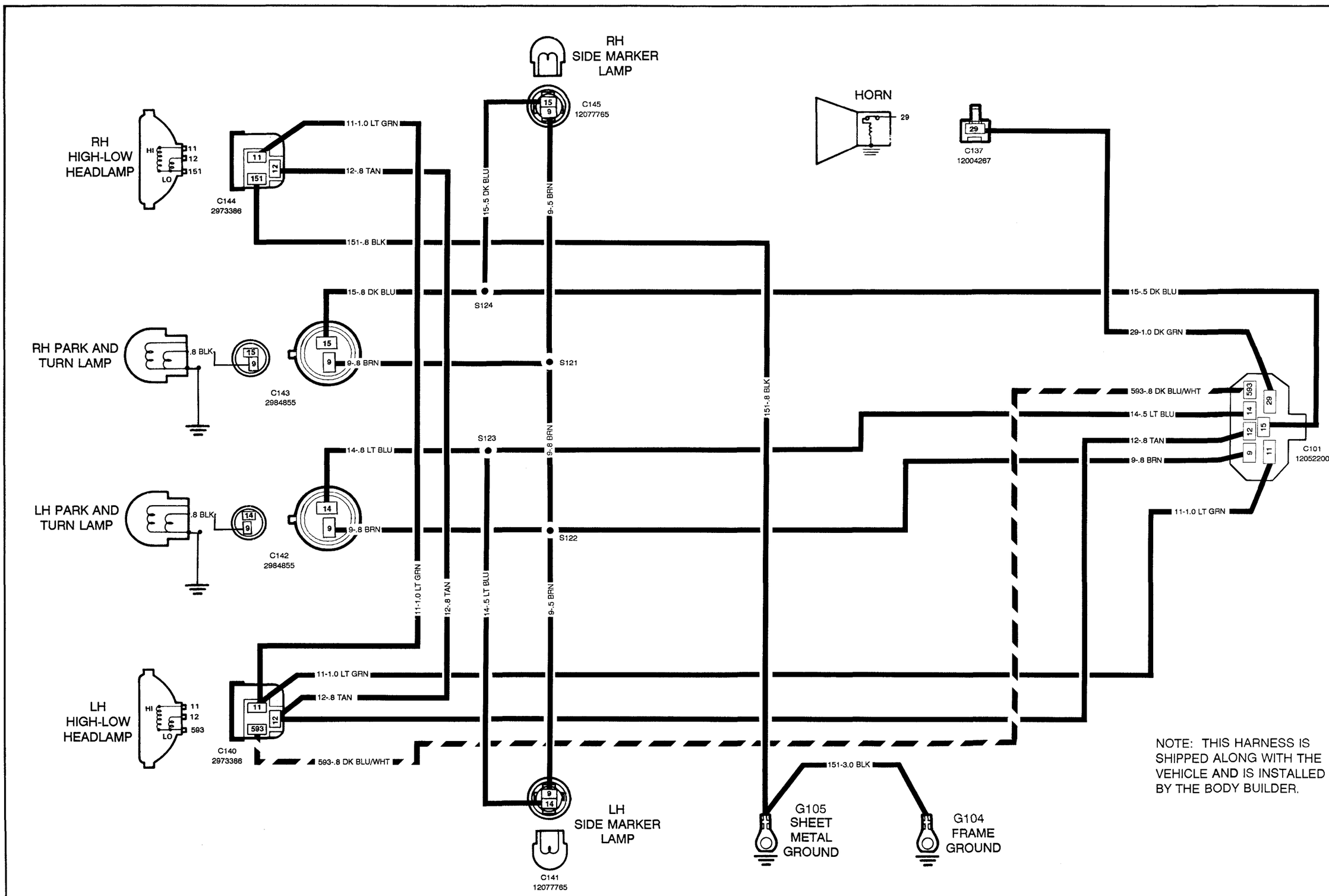
TEST	RESULT	ACTION
1. With ignition in RUN, headlamps off and park brake released, connect a test lamp from ORN (240) wire at DRL relay connector C208 to ground.	Test lamp does not light	LOCATE and REPAIR open in ORN (240) wire between DRL relay connector C208 and fuse block or REPLACE HORN/DM fuse.
	Test lamp lights.	GO to step 2.
2. Connect J 34029-A Multimeter from BRN (50) wire at DRL module connector C217 and DRL relay connector C208 to ground. Measure voltage.	Battery voltage at only one connector.	LOCATE and REPAIR open in BRN (50) wire between splice S211 and connector with missing voltage.
	No battery voltage at either connector.	LOCATE and REPAIR open in BRN (50) wire between splice S211 and fuse block or REPLACE HTR fuse.
	Battery voltage at both connectors.	GO to step 3.
3. Connect J 34029-A Multimeter from BRN (50) wire at DRL module connector C217 and DRL relay connector C208 to BLK (150) wire at each component connector. Measure voltage.	No voltage.	LOCATE and REPAIR open in BLK (150) wire between suspect connector and ground G102 or G200.
	Battery voltage.	GO to step 4.
4 Connect J 34029-A Multimeter from LT GRN/BLK (592) wire at DRL relay connector C208 to ground. Measure voltage.	No voltage.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between DRL relay connector C208 and DRL module connector C217. If no open is found, REPLACE DRL module.
	Battery voltage.	GO to step 5.
5. Connect a test lamp from DK BLU/WHT (593) wire at connector C101.	Test lamp does not light	LOCATE and REPAIR open in DK BLU/WHT (593) wire between DRL relay connector C208 and connector C101. If no open is found, ISOLATE problem in body builder's installed wiring.
	Test lamp lights.	DRL are operating.



C-18 HEADLAMPS

W/DRL


50-2.0 BRN
DOME LAMP
(SEE PAGE 59)
2-3.0 RED
240-1.0 ORN
50-3.0 BRN
S211
50-2.0 BRN
33-.5 TAN/WHT
S202
(SEE PAGE 19)
33-.5 TAN/WHT
10-1.0 YEL
593-.8 DK BLU/WHT
11-1.0 LT GRN
592-.8 LT GRN/BLK
12-.8 TAN
11-1.0 LT GRN
10-1.0 YEL
DIMMER SWITCH
HI
LO
11
10
12
C210
8917963
DRL MODULE
C217
12015308
PARKING BRAKE INPUT
IGNITION
LIGHT SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRIVING LAMP OUTPUT TO RELAY
GROUND
33
50
10
11
629
592
150
33-.5 TAN/WHT
10-1.0 YEL
I/P GROUND
G200
150-.8 BLK
33-.5 TAN/WHT
593-.8 DK BLU/WHT
150-.8 BLK
629-.8 WHT
150-.8 BLK
S206
150-.8 BLK
2-3.0 RED
10-1.0 YEL
10-1.0 YEL
I/P CLUSTER CONNECTOR
(SEE PAGE 55)
C218
12040744
11/629
PANEL DIMMER SWITCH
C203
12020030
9-.8 BRN
2-3.0 RED
C202
12020029
LIGHT SWITCH
LIGHT SWITCH
44
150
156
DOME
2
OFF
PARK
CIRCUIT BREAKER 25 AMP
10
HEAD
OFF
PARK
40
9
HEAD



C-20 FORWARD LAMP HARNESS
W/DRL

CIRCUIT OPERATION

PARK AND MARKER LAMPS

Voltage is applied through the TAIL LPS Fuse to the Light Switch at all times. With the Light Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps. The Front Marker Lamps are grounded through the LH and RH Park and Turn Lamps.

HAZARD LAMPS

Voltage is applied at all times through the STOP-HAZ Fuse and the Hazard Flasher to the normally open contact of the Hazard Switch in the Turn Signal Switch. With the Hazard Switch in HAZARD FLASH, voltage is applied to both Front and Rear Turn Lamps. All of the Turn Lamps and both Turn Indicators flash on and off.

The Front Marker Lamps flash in HAZARD FLASH just as they did in TURN RIGHT and TURN LEFT, if the Lamp switch is in OFF, they flash on when the Hazard Lamps are on. If the Lamp Switch is in either PARK or HEAD, they flash on when the Hazard Lamps are off, and off when the Hazard Lamps are on.

In HAZARD, the circuit is always open, and the Hazard Flasher Controls the Lamps.

DIAGNOSIS -- PARK, MARKER AND HAZARD LAMPS

PRELIMINARY CHECKS:

If only one lamp is inoperative, inspect wire(s) to affected lamp socket, check bulb-to-socket fit or replace bulb.

PARK LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch in PARK position. Connect a test lamp from ORN (40) wire at light switch connector C202 to ground. (See page 15 for wiring of park lamp circuit.)	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Connect a test lamp from RED (2) wire at fuse block to ground.	Test lamp lights.	CHECK condition of TAIL LPS fuse. If fuse is good, LOCATE and REPAIR open in ORN (40) wire.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from fuse block to battery junction block.
3. Connect a test lamp from BRN (9) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE light switch.
4. Connect a test lamp at BRN (9) wire at connector C101 to ground.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from connector C101 to light switch connector C202.

SIDE MARKER LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place light switch in PARK position. Connect a test lamp from BRN (9) wire at connector C101 to ground. (See page 15 for wiring of marker lamp circuit.)	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from connector C101 to light switch connector C202.

HAZARD SIGNAL LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in RUN and position turn signal lamps as if making a turn.	Turn signal lights operate.	GO to step 2.
	Turn signal lights do not operate.	REFER to "Turn Signals Do Not Work On One Side" symptom.
2. Turn off turn signal lamps and put hazard warning lamps ON. Connect a test lamp from BRN (27) wire at turn signal switch connector C211 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	CHECK condition of STOP/HAZ fuse and for an open in ORN (140) wire and BRN (27) wire. If fuse and wiring are good, REPLACE hazard flasher.

STOPLAMP SWITCH
(CLOSES WHEN BRAKE PEDAL IS DEPRESSED)

HOT AT ALL TIMES

STOP-HAZ 15 AMP

140-1.0 ORN

140-.10 ORN

S210

140-1.0 ORN

17-1.0 WHT

15-.5 DK BLU

14-.5 LT BLU

C216
2984235

I/P CLUSTER CONNECTOR
(SEE PAGE 55)
C218
12040744

HAZARD FLASHER
C212
2973385

27-1.0 BRN

140-1.0 ORN

17-1.0 WHT

19-1.0 DK GRN

18-1.0 YEL

16-.8 PPL

27-1.0 BRN

15-.5 DK BLU

15-.5 DK BLU

14-.5 LT BLU

14-.5 LT BLU

C211
12004147 12004148

(STEERING COL SWITCHES)
LEFT TURN SIGNAL
RIGHT TURN SIGNAL
HORN
KEY
NORMALLY OPEN SWITCHES
HAZARD

TURN SIGNAL SWITCH

PRNDL LAMP
(SEE PAGE 58)

8-.5 GRA

15-.5 DK BLU

14-.5 LT BLU

15-.5 DK BLU

14-.5 LT BLU

16-.8 PPL

19-1.0 DK GRN

18-1.0 YEL

140-1.0 ORN

17-1.0 WHT

I/P
481 W/GASOLINE
10 W/DIESEL
12015964

C100

DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
ENG
481 W/GASOLINE
10 W/DIESEL
12015113
12015113

GASOLINE ONLY
DIESEL ONLY

17-1.0 WHT

15-.5 DK BLU

140-1.0 ORN

16-.8 PPL

18-1.0 YEL

19-1.0 DK GRN

C102
12020926

12020786

REAR LAMP HARNESS
C400
12065158

14-.5 LT BLU

15-.5 DK BLU

FORWARD LAMP HARNESS

C101
12059472

GT100
12085003 (UPPER)
12085002 (LOWER)

C-22 HAZARD SIGNAL LAMPS

CIRCUIT OPERATION

TURN SIGNAL LAMPS

With the Ignition Switch in RUN or START, voltage is applied through the TURN/BU Fuse and Turn Flasher to the normally closed contact of the Hazard Flasher Switch in the Turn Signal Switch.

With the Turn Signal Switch in LH Turn position, voltage is applied to both the LH Turn Indicator and the LH Front Park and Turn Lamp LT BLU (14) wires. Voltage is applied to the LH Tail, Stop and Turn Lamp YEL (18) wire.

The Lamps go on immediately. They begin to flash when the current flow heats up the Timing Element in the Flasher and it repeatedly opens and closes the circuit.

The voltage applied to the LH Park and Turn Lamp will also be applied to the LH Side Marker Lamp. If the Lamp Switch is in the OFF position, the LH Side Marker Lamp will find a path to ground through Splice S123 and the Park and Turn Lamp to ground. This Lamp provides low resistance paths to ground. The Marker Lamps will flash with the Turn Lamps.

When the Light Switch is in either PARK or HEAD, voltage is applied through the TAIL LPS Fuse, Lamp Switch, and Splice S122 to the Marker and Park Lamps. If the Turn Signal Switch is in TURN LEFT, the LH Side Marker Lamp will have voltage at both connections and will go out. When the Flasher removes voltage to the Turn Lamp, the Marker Lamp will be grounded through the Turn Lamp and will go on. In this way, the LH Side Marker Lamp will flash on when the LH Park and Turn Lamp goes off, and off when the Turn Lamp goes on.

With the Turn Signal Switch in TURN RIGHT, voltage will be applied to the RH Lamps in the same way.

DIAGNOSIS -- TURN LAMPS

TURN SIGNALS DO NOT WORK ON ONE SIDE

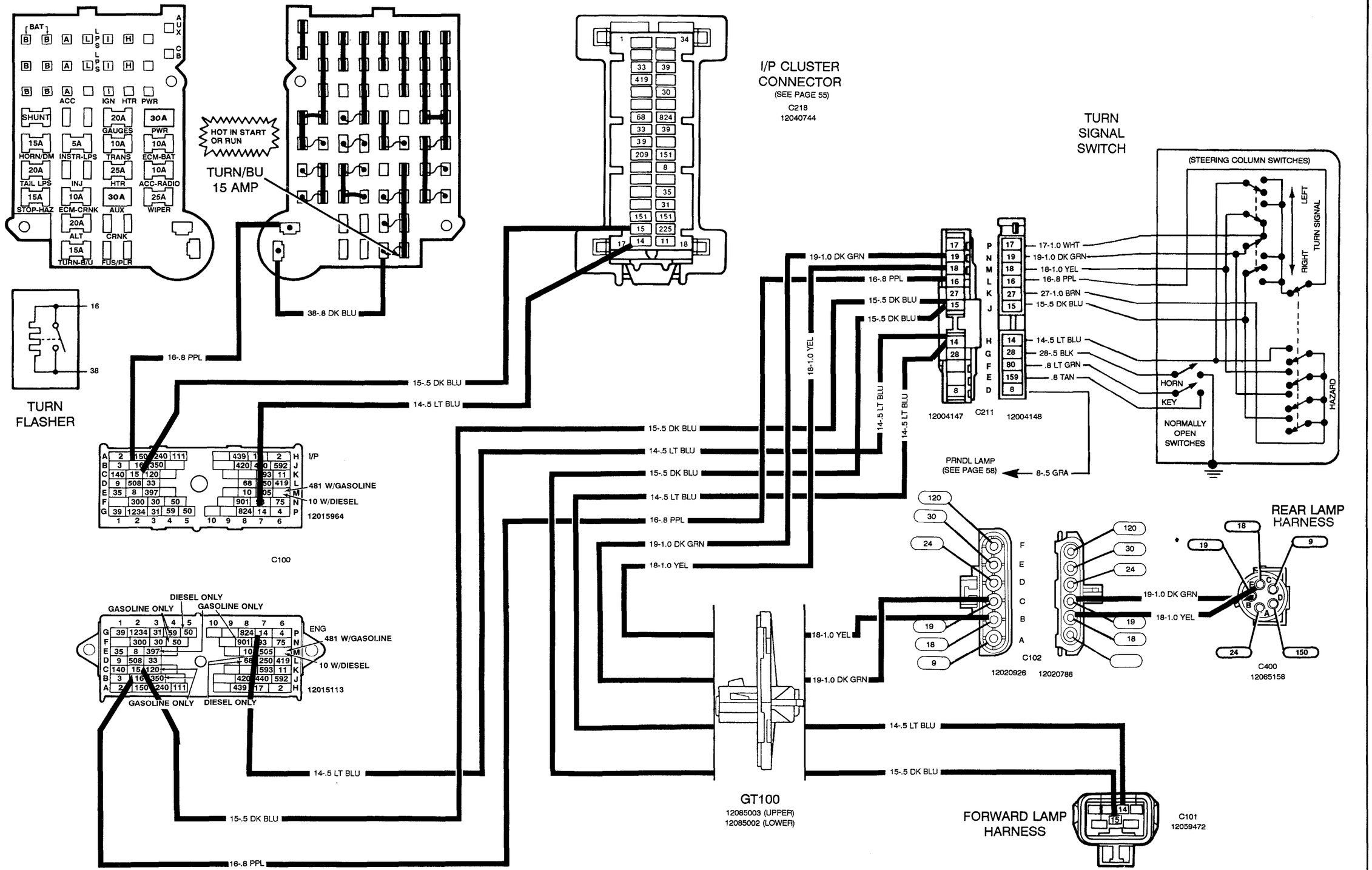
TEST	RESULT	ACTION
1. Turn hazard warning system on. Observe lights on side of turn signals that did not work.	Lights flash.	CHECK for improper bulb. REPLACE if necessary.
	Lights do not come on.	GO to step 2.
2. Turn hazard warning system off. Place ignition switch to RUN and turn signal to side that does not work. Connect a test lamp from LT BLU (14) or DK BLU (15) wire (depending upon which side does not work) at turn signal switch connector C211 to ground.	Test lamps lights.	GO to step 4.
	Test lamp does not light.	GO to step 3.
3. Connect a test lamp from PPL (16) wire at turn signal switch connector C211 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light	REPLACE turn signal flasher.
4. Connect a test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side did not work) at connector C101 to ground.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	LOCATE and REPAIR open in either LT BLU (14) or DK BLU (15) wire(s) between turn signal switch connector C211 and connector C101.

TURN SIGNALS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place hazard warning lamps to ON position.	Hazard lamps operate.	GO to step 2.
	Hazard lamps do not operate.	REFER to "Hazard Lamps Do No Operate" symptom.
2. Connect a test lamp from PPL (16) wire at turn signal switch connector C211 to ground.	Test lamp lights.	REPLACE turn signal switch.
	Test lamp does not light.	CHECK condition of TURN/BU fuse and for an open in PPL (16) wire or DK BLU (38) wire. If fuse and wiring are good, REPLACE turn signal flasher.

TURN SIGNAL LAMPS FLASH RAPIDLY

TEST	RESULT	ACTION
1. Turn hazard lamp switch to ON position. Check from turn signal lamps and rear taillamps.	One side of turn signal lamps flash rapidly.	REPLACE inoperative turn signal bulb.
	Only one side of turn signals light but do not flash rapidly.	REFER to "Turn Signals Do Not Work On One Side" symptom.



C-24 TURN SIGNAL LAMPS

CIRCUIT OPERATION

When the Horn Switch is depressed, one side of the Horn Relay coil is grounded. The relay is energized. Its contacts close and battery voltage is applied to the Horns.

DIAGNOSIS -- HORNS

PRELIMINARY CHECKS:

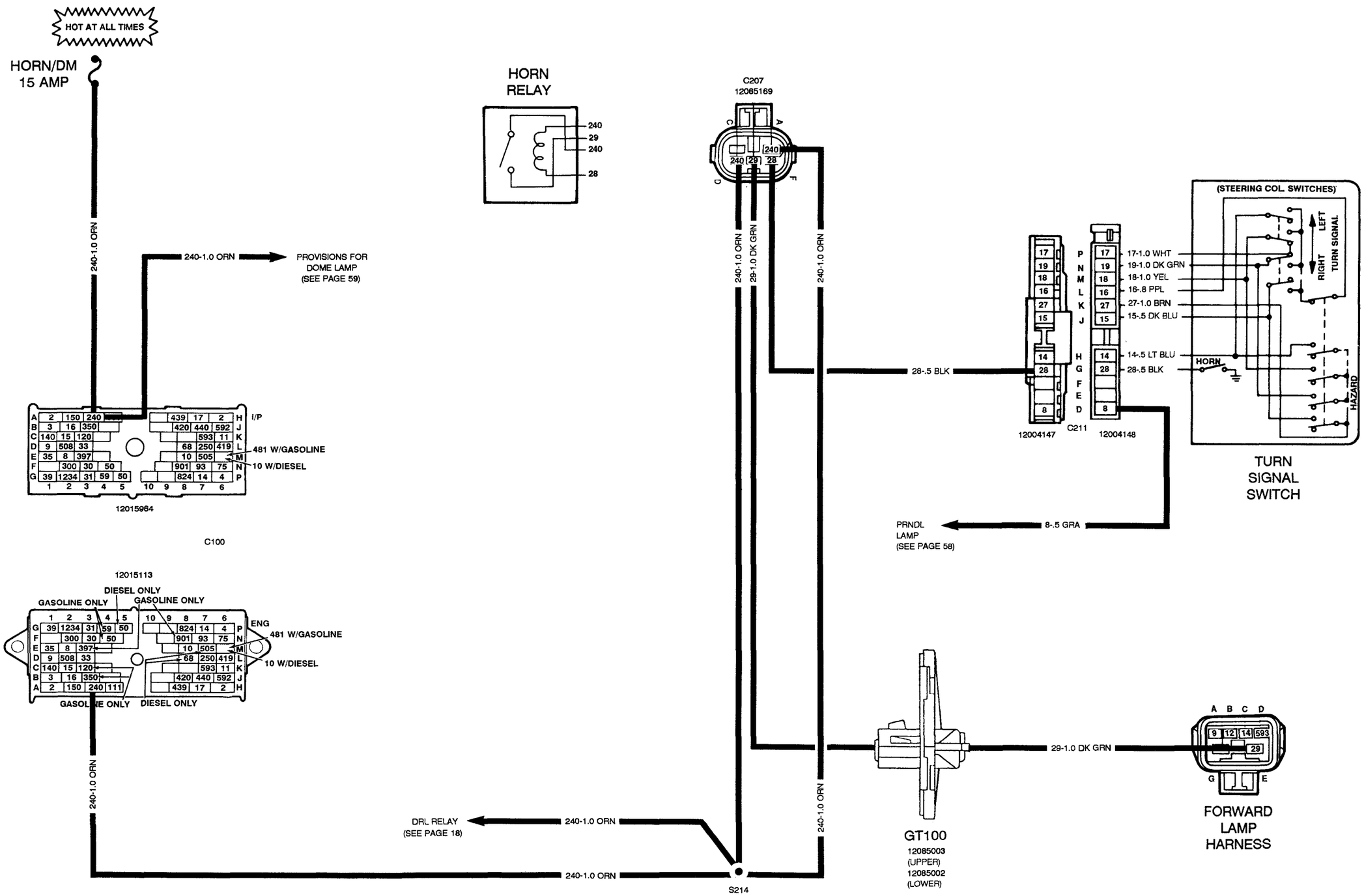
Check to see that the HORN/DM fuse is not blown. REPLACE if blown.

HORN WILL NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from DK GRN (29) wire at connector C101 to ground. Press horn switch.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	GO to step 2.
2. Remove horn relay. Connect a test lamp from ORN (240) wire at horn relay connector C207 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire between horn relay connector C207 and fuse block or REPLACE HORN/DM fuse
3. Reinsert horn relay. Disconnect turn signal switch connector C211. Connect a jumper wire to BLK (28) wire at turn signal switch connector C211 to ground.	Horn does not sound.	GO to step 4.
	Horn sounds.	REPLACE horn switch.
4. Disconnect horn relay. Install a jumper wire from ORN (240) terminal to DK GRN (29) terminal at horn relay connector C207.	Horn sounds.	REPLACE horn relay.
	Horn does not sound.	LOCATE and REPAIR open in DK GRN (29) wire from horn relay connector C207 to horn. If no open is found, ISOLATE problem in body builder's installed wiring.

HORN SOUNDS CONTINUOUSLY WITHOUT DEPRESSING HORN SWITCH

TEST	RESULT	ACTION
1. Disconnect turn signal switch connector C211.	Horn stops.	REPLACE horn switch.
	Horn continues to sound.	GO to step 2.
2. Disconnect horn relay connector C207. Check for a short to ground in BLK (28) wire.	No shorts found.	REPLACE relay.
	Short(s) found.	REPAIR or REPLACE as required.


HOT AT ALL TIMES
HORN/DM
15 AMP
240-1.0 ORN
240-1.0 ORN
PROVISIONS FOR
DOME LAMP
(SEE PAGE 59)
I/P
481 W/GASOLINE
10 W/DIESEL
12015964
C100
12015113
DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
ENG
481 W/GASOLINE
10 W/DIESEL
GASOLINE ONLY
DIESEL ONLY
HORN
RELAY
240
29
240
28
C207
12085169
240-1.0 ORN
29-1.0 DK GRN
240-1.0 ORN
28-.5 BLK
C211
12004147
12004148
(STEERING COL. SWITCHES)
17-1.0 WHT
19-1.0 DK GRN
18-1.0 YEL
16-.8 PPL
27-1.0 BRN
15-.5 DK BLU
14-.5 LT BLU
28-.5 BLK
HORN
LEFT
TURN SIGNAL
RIGHT
HAZARD
TURN
SIGNAL
SWITCH
8-.5 GRA
PRNDL
LAMP
(SEE PAGE 58)
240-1.0 ORN
DRL RELAY
(SEE PAGE 18)
240-1.0 ORN
240-1.0 ORN
S214
240-1.0 ORN
GT100
12085003
(UPPER)
12085002
(LOWER)
29-1.0 DK GRN
FORWARD
LAMP
HARNESS

C-26 HORN

CIRCUIT OPERATION

WIPER

The Wiper Motor is supplied battery voltage with the Ignition Switch in START or RUN, with ground supplied by the Wiper/Washer Switch.

When the Wiper Motor is in LO, battery voltage is supplied to the motor through the WHT (93) wire and the ground circuit is through the GRA (91) wire.

When the wiper is in HI, battery voltage is supplied to the motor through the WHT (93) wire and the ground circuit is through the PPL (92) wire, the Wiper/Washer Switch and the BLK (150) wire to ground.

WASHER

Battery voltage is applied to the washer pump through the WHT (93) wire, to the switch and to ground through the BLK (150) wire. The washers are operational as long as the paddle switch on the Wiper Switch arm is on.

DIAGNOSIS -- WIPER/WASHER

PRELIMINARY CHECKS:

Check condition of WIPER and INST LPS fuses. If fuses are in good condition, use the following diagnostic procedures.

WIPERS DO NOT OPERATE IN ANY MODE

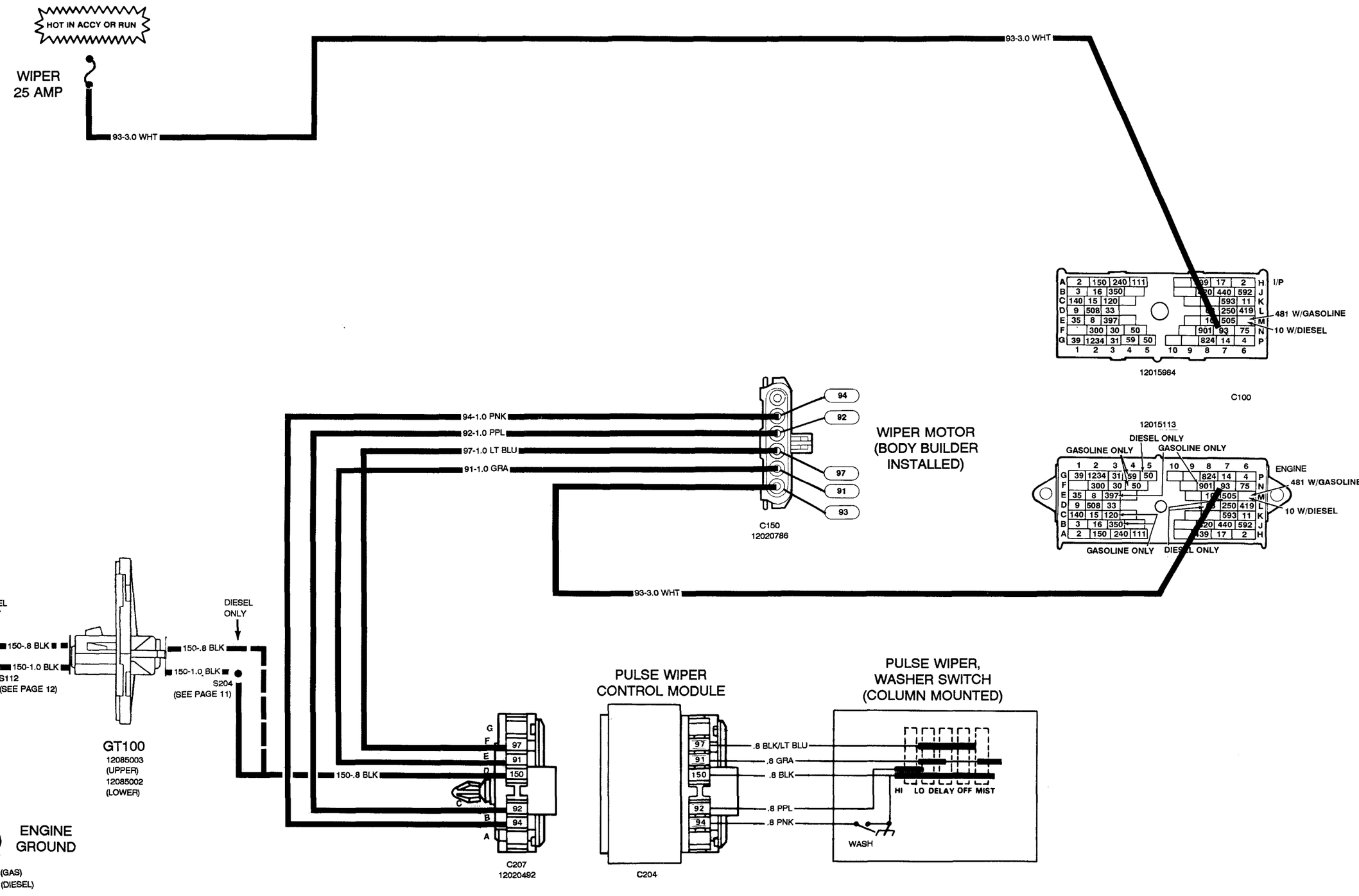
TEST	RESULT	ACTION
1. Place ignition in RUN and turn wipers to HI. Connect a test lamp from WHT (93) wire at wiper motor connector C150 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between wiper motor connector C150 and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect a fused jumper from BLK (150) wire at wiper switch connector C207 to ground.	Wiper motor runs.	LOCATE and REPAIR open in BLK (150) wire between wiper switch and ground G102 (Gasoline) or G101 (Diesel).
	Wiper motor does not run.	REPLACE wiper motor.

WIPERS DO NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition in RUN and wipers to HI. Connect a fused jumper from PPL (92) wire at wiper switch connector C207 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire between wiper motor connector C150 and wiper switch connector C207. If no open is found, REPLACE wiper motor.
	Wiper motor runs.	REPLACE wiper washer switch.

WIPERS DO NOT OPERATE IN LO

TEST	RESULT	ACTION
1. Place ignition in RUN and wipers to LO. Connect a fused jumper from GRA (91) wire at wiper switch connector C207 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRN (91) wire between wiper motor connector C150 and wiper switch connector C207. If no open is found, REPLACE wiper motor.
	Wiper motor runs.	REPLACE wiper washer switch.


HOT IN ACCY OR RUN
WIPER
25 AMP
93-3.0 WHT
93-3.0 WHT
I/P
481 W/GASOLINE
10 W/DIESEL
12015964
C100
94-1.0 PNK
92-1.0 PPL
97-1.0 LT BLU
91-1.0 GRA
94
92
97
91
93
C150
12020786
WIPER MOTOR
(BODY BUILDER
INSTALLED)
12015113
DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
ENGINE
481 W/GASOLINE
10 W/DIESEL
GASOLINE ONLY
DIESEL ONLY
93-3.0 WHT
DIESEL
ONLY
150-.8 BLK
150-1.0 BLK
S112
(SEE PAGE 12)
150-3.0 BLK
ENGINE
GROUND
G102 (GAS)
G101 (DIESEL)
GT100
12085003
(UPPER)
12085002
(LOWER)
DIESEL
ONLY
150-.8 BLK
150-1.0 BLK
S204
(SEE PAGE 11)
150-.8 BLK
G
F
E
D
C
B
A
97
91
150
92
94
C207
12020492
PULSE WIPER
CONTROL MODULE
.8 BLK/LT BLU
.8 GRA
.8 BLK
.8 PPL
.8 PNK
C204
PULSE WIPER,
WASHER SWITCH
(COLUMN MOUNTED)
HI LO DELAY OFF MIST
WASH

CIRCUIT OPERATION

START

When the Ignition Switch is moved to the START position, battery voltage is applied to the Starter Solenoid. Both solenoid windings are energized. The circuit through the Pull-In Winding is completed to ground through the Starter Motor. The windings work together magnetically to pull in and hold in the Plunger. The Plunger moves the Shift Lever. This action causes the Starter Drive Assembly to rotate as it engages the Flywheel ring gear on the engine. At the same time, the Plunger also closes the solenoid switch contacts in the Starter Solenoid. Full battery voltage is applied directly to the Starter Motor and it cranks the engine.

As soon as the Solenoid Switch contacts close, voltage is no longer applied through the Pull-In Winding, since battery voltage is applied to both ends of the windings. The Hold-In Winding remains energized, and its magnetic field is strong enough to hold the Plunger, Shift Lever, and Drive Assembly Solenoid Switch contacts in place to continue cranking the engine.

When the Ignition Switch is released from the START position, battery voltage is removed from the PPL (6) wire and the junction of the two windings. Voltage is applied from the Motor contacts through both windings to ground at the end of the Hold-In Winding. However, the voltage applied to the Pull-In Winding is now opposing the voltage applied when the winding was first energized. The magnetic fields of the Pull-In and Hold-In Windings now oppose one another. This action of the windings, with the help of the Return Spring, causes the Starter Drive Assembly to disengage and Solenoid Switch contacts to open simultaneously. As soon as the contacts open, the starter circuit is turned off.

CHARGE

The Generator provides voltage to operate the vehicle's electrical system and to charge its Battery. A magnetic field is created when current flows through the Rotor. This field rotates as the Rotor is driven by the engine, creating an AC voltage in the Stator windings. The AC voltage is converted to DC by the rectifier bridge and is supplied to the electrical system at the Battery terminal.

This Generator's regulator uses digital techniques to supply to Rotor current and thereby control the output voltage. The Rotor current is proportional to the width of the electrical pulses supplied to it by the Regulator. When the Ignition Switch is placed in RUN, narrow width pulses are supplied to the Rotor, creating a weak magnetic field. When the engine is started, the Regulator senses Generator rotation by detecting AC voltage at the Stator through an internal wire. Once the engine is running the Regulator varies the field current by controlling the pulse width. This regulates the Generator output voltage for proper battery charging and electrical system operation.

The digital regulator controls the VOLTS Indicator light with a solid-state light driver. The light driver turns on the light whenever undervoltage, overvoltage or a stopped Generator is detected.

DIAGNOSIS -- START AND CHARGE

BATTERY IS UNDERCHARGED OR OVERCHARGED

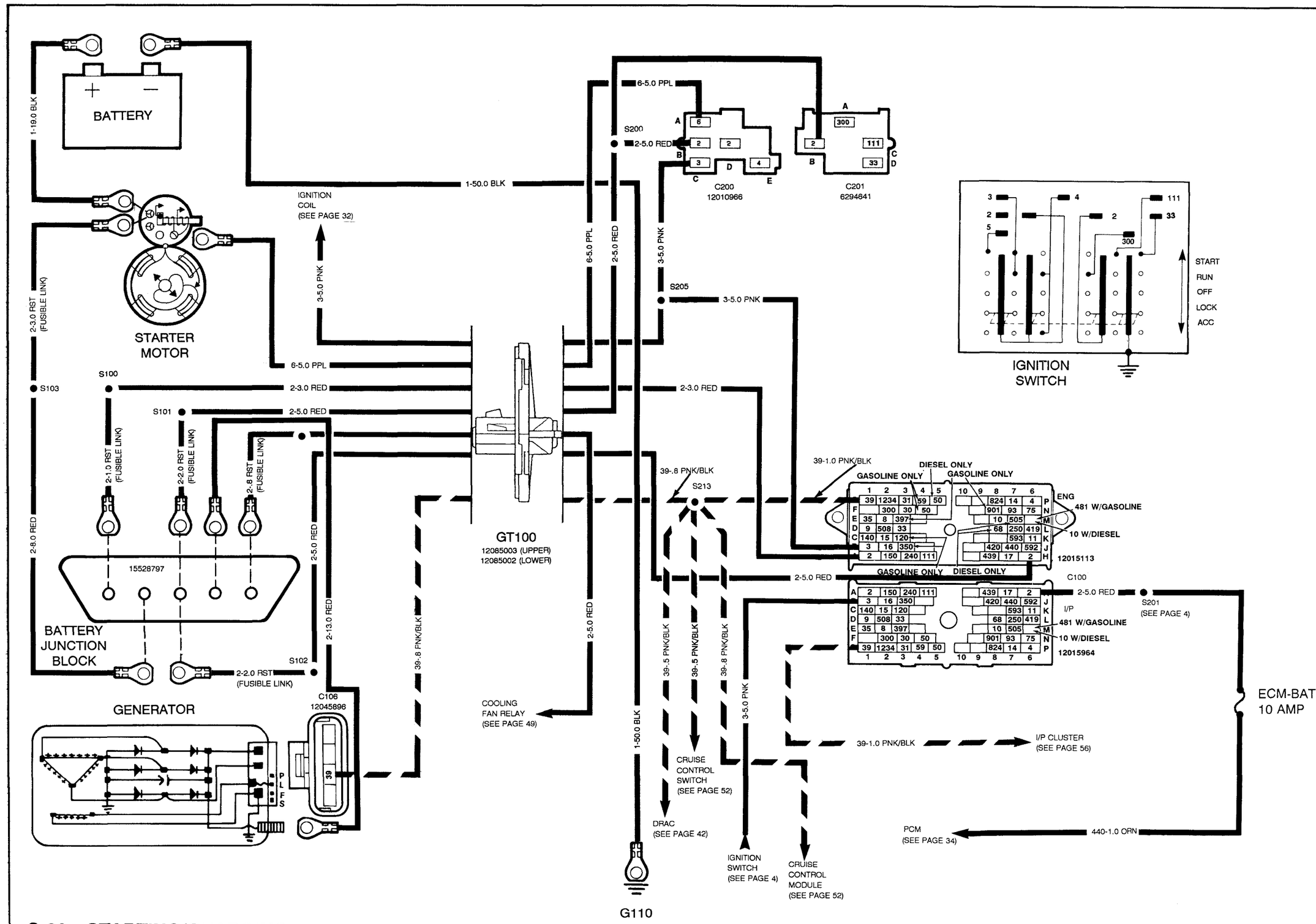
TEST	RESULT	ACTION
1. Connect a voltmeter from RED (2) wire at generator to ground.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in RED (2) wire and fusible link from generator to battery junction block.
2. Connect generator connector C105 and terminal. Have all accessories turned off and engine running at fast idle. Connect voltmeter from battery terminal on generator to ground.	Reading of 13-16 volts.	PERFORM Generator Bench Test. Refer to Section 6D in 1991 R/V, P Light Truck Service Manual.
	Reading of less than or greater than 13-16 volts.	REPAIR generator.

ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK

TEST	RESULT	ACTION
1. Place transmission in PARK. Connect a voltmeter from PPL (6) wire at starter solenoid to ground. Turn ignition switch to START position.	Battery voltage.	GO to step 2.
	No voltage.	GO to step 3.
2. Connect a voltmeter from PPL (6) wire to starter mounting bolts.	Battery voltage.	REPLACE starter solenoid.
	Less than battery voltage.	CLEAN starter motor mounting bolts, starter motor, and mounting surface.
3. With ignition switch in OFF position, connect a voltmeter from RED (2) wire at ignition switch connector C200 to ground.	Battery voltage.	REPLACE ignition switch.
	No voltage.	LOCATE and REPAIR open in RED (2) wires and fusible link between ignition switch connector C200 and battery junction block.

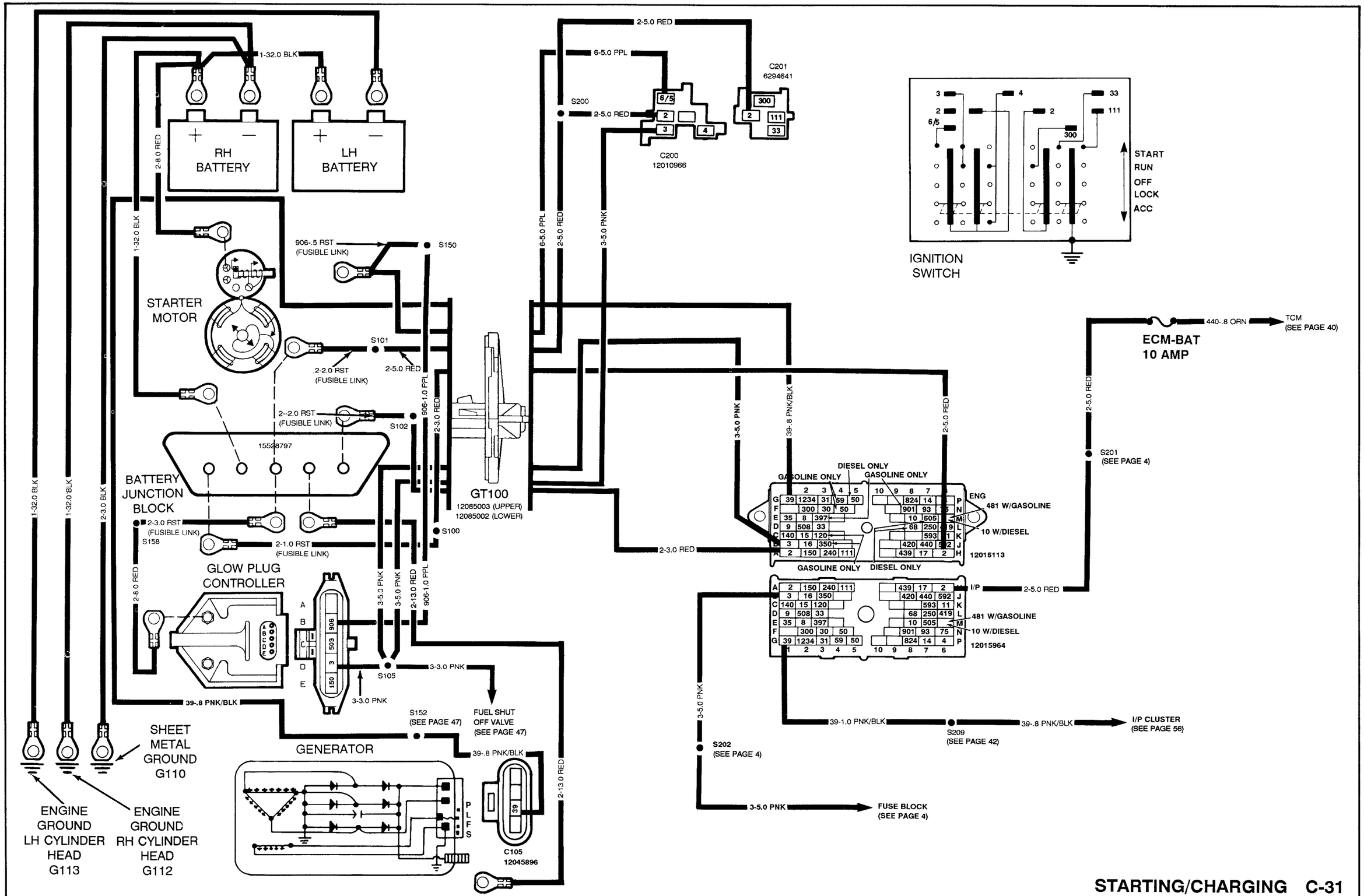
STARTER SOLENOID CLICKS, ENGINE DOES NOT CRANK OR CRANKS SLOWLY

TEST	RESULT	ACTION
1. Connect a voltmeter to positive and negative battery terminals. Turn ignition switch to START.	Voltage reading greater than 9.5 volts after 15 seconds cranking.	GO to step 2.
	Voltage less than 9.5 volts after 15 seconds cranking.	PERFORM a Battery Load Test. Refer to Section 6D in 1991 R/V, P Light Truck Service Manual.
2. Connect a voltmeter from negative battery terminal to engine block.	Less than .5 volts.	GO to step 3.
	More than .5 volts.	REPLACE negative battery cable.
3. Connect a voltmeter from positive battery terminal to starter solenoid terminal to BLK (2) wire.	Less than .5 volts.	REPAIR starter motor.
	More than .5 volts.	REPLACE positive battery cable.



C-30 STARTING/CHARGING

GASOLINE ENGINE


1-32.0 BLK
RH BATTERY
LH BATTERY
2-8.0 RED
1-32.0 BLK
2-5.0 RED
6-5.0 PPL
S200
C201
6294641
C200
12010966
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC
906-.5 RST (FUSIBLE LINK)
S150
STARTER MOTOR
S101
2-2.0 RST (FUSIBLE LINK)
2-5.0 RED
906-1.0 PPL
2-3.0 RED
2--2.0 RST (FUSIBLE LINK)
S102
15528797
BATTERY JUNCTION BLOCK
2-3.0 RST (FUSIBLE LINK)
S158
2-1.0 RST (FUSIBLE LINK)
S100
GT100
12085003 (UPPER)
12085002 (LOWER)
3-5.0 PNK
39-.8 PNK/BLK
2-5.0 RED
440-.8 ORN
TCM (SEE PAGE 40)
ECM-BAT 10 AMP
S201 (SEE PAGE 4)
DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
ENG
481 W/GASOLINE
10 W/DIESEL
12015113
GASOLINE ONLY
DIESEL ONLY
I/P
2-5.0 RED
481 W/GASOLINE
10 W/DIESEL
12015964
2-3.0 RED
2-8.0 RED
2-13.0 RED
906-1.0 PPL
3-5.0 PNK
3-5.0 PNK
S105
3-3.0 PNK
3-3.0 PNK
39-.8 PNK/BLK
S152 (SEE PAGE 47)
FUEL SHUT OFF VALVE (SEE PAGE 47)
39-.8 PNK/BLK
2-13.0 RED
39-1.0 PNK/BLK
S209 (SEE PAGE 42)
39-.8 PNK/BLK
I/P CLUSTER (SEE PAGE 56)
S202 (SEE PAGE 4)
3-5.0 PNK
FUSE BLOCK (SEE PAGE 4)
GENERATOR
C105
12045896
SHEET METAL GROUND G110
ENGINE GROUND LH CYLINDER HEAD G113
ENGINE GROUND RH CYLINDER HEAD G112

HOT IN START OR RUN

ECM-CRNK
10 AMP

439-1.0 PNK/BLK

439-1.0 PNK/BLK

REFERENCE LO — 423
BYPASS — 430
REFERENCE HI — 424
EST — 453
PICK-UP COIL
IGNITION MODULE

DISTRIBUTOR

COIL ASM
121
3
COIL

C120
12078082
423-.8 WHT
430-.8 PPL/WHT
424-.8 TAN/WHT
453-.8 BLK/RED

424
424
C125
12015791
12010996

424-.8 TAN/WHT

C121
12040705
121-.8 WHT

3-5.0 PNK

GT100
12085003
(UPPER)
12085002
(LOWER)

423-.8 WHT
424-.8 TAN/WHT
453-.8 BLK/RED
430-.8 PPL/WHT

3-5.0 PNK
S205
(SEE PAGE 4)

C250
12052177

121-.8 WHT

3-5.0 PNK

C100

12015113
12015964

439-.8 PNK/BLK

439-.8 PNK/BLK

3-5.0 PNK
3-5.0 PNK
IGNITION SWITCH
(SEE PAGE 4)
SPLICE S202
(SEE PAGE 19)

439-1.0 PNK/BLK

GASOLINE ONLY
DIESEL ONLY
GASOLINE ONLY
DIESEL ONLY
GASOLINE ONLY

ENG
I/P

10 W/DIESEL
481 W/GASOLINE
10 W/DIESEL
481 W/GASOLINE

121
C122
2977253
TACHOMETER

18436572

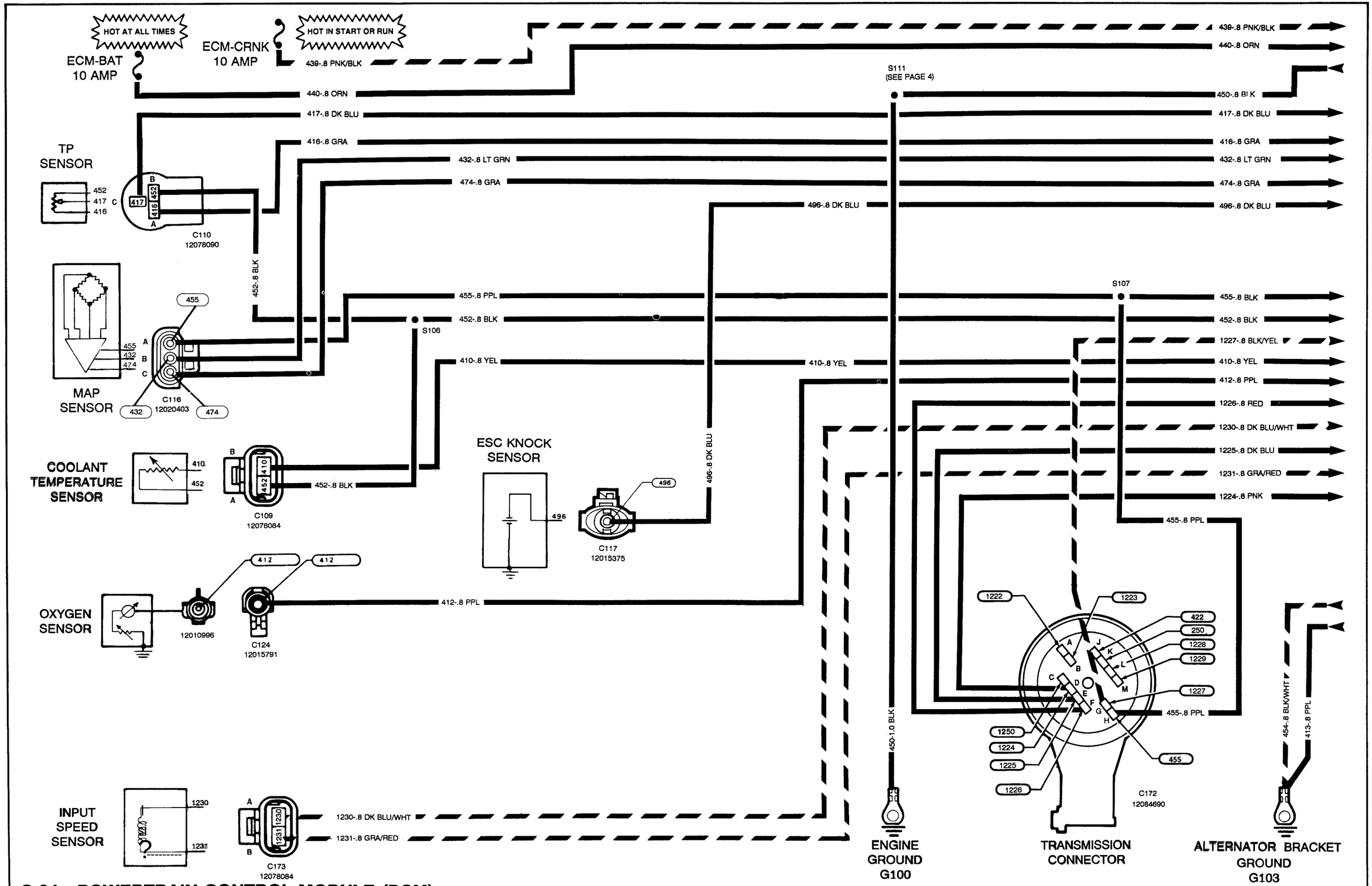
C-32 IGNITION

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
1223	.8	YEL/BLK	A2	SOLENOID B DRIVER
1222	.8	LT GRN	A3	SOLENOID A DRIVER
422	.8	TAN/BLK	A4	TCC DRIVER
			A5	NOT USED
			A6	NOT USED
419	.8	BRN/WHT	A7	SYSTEM CHECK LAMP
			A8	NOT USED
			A9	NOT USED
			A10	NOT USED
435	.8	GRA	A11	EVRV SOLENOID
420	.8	PPL	A12	BRAKE SIGNAL
			B1	NOT USED
1226	.8	RED	B2	PRESSURE SWITCH MANIFOLD C
1225	.8	DK BLU	B3	PRESSURE SWITCH MANIFOLD B
1224	.8	PNK	B4	PRESSURE SWITCH MANIFOLD A
			B5	NOT USED
			B6	NOT USED
1229	.8	LT BLU/WHT	B7	FORCE MOTOR LOW
1228	.8	BLK/RED	B8	FORCE MOTOR HIGH
1230	.8	DK BLU/WHT	B9	INPUT SPEED HIGH
1231	.8	GRA/RED	B10	INPUT SPEED LOW
437	.8	BRN	B11	DRAC MODULE
59	.8	DK GRN	B12	AIR CONDITIONING

POWERTRAIN CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
439	.8	PNK/BLK	C1	12V IGNITION FUSED
450	.8	BLK/WHT	C2	SYSTEM GROUND
551	.8	TAN/WHT	C3	SYSTEM GROUND
416	.8	GRA	C4	5V SENSOR REFERENCE
417	.8	DK BLU	C5	TPS
441	.8	LT BLU/WHT	C6	STEPPER COIL A HIGH
442	.8	LT BLU/BLK	C7	STEPPER COIL A LOW
444	.8	LT GRN/BLK	C8	STEPPER COIL B LOW
443	.8	LT GRN/WHT	C9	STEPPER COIL B HIGH
432	.8	LT GRN	C10	MAP
1061	.8	ORN/BLK	C11	SERIAL DATA
			C12	NOT USED
413	.8	TAN	C13	OXYGEN SENSOR GROUND
412	.8	PPL	C14	OXYGEN SENSOR
468	.8	DK GRN	C15	INJECTOR B (2) DRIVER
467	.8	DK BLU	C16	INJECTOR A (1) DRIVER
440	.8	ORN	D1	12V BATTERY FUSED
455	.8	PPL	D2	SENSOR GROUND
452	.8	BLK	D3	SENSOR GROUND
474	.8	GRA	D4	5V SENSOR REFERENCE
496	.8	DK BLU	D5	KNOCK SIGNAL
451	.8	WHT/BLK	D6	ALDL
120	.8	TAN/WHT	D7	ELECTRIC FUEL PUMP FEED FUSED
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
423	.8	WHT	D11	HEI SPARK TIMING
424	.8	TAN/BLK	D12	HEI BYPASS
453	.8	BLK/RED	D13	DISTRIBUTOR REFERENCE LOW
430	.8	PPL/WHT	D14	DISTRIBUTOR REFERENCE HIGH
1227	.8	BLK/YEL	D15	TRANSMISSION TEMPERATURE
410	.8	YEL	D16	COOLANT TEMPERATURE

POWERTRAIN CONTROL MODULE CONNECTOR



C-34 POWERTRAIN CONTROL MODULE (PCM)

INPUTS - GASOLINE ENGINE

439-.8 PNK/BLK
440-.8 ORN
450-.8 BLK/WHT
454-.8 BLK/WHT
417-.8 DK BLU
416-.8 GRA
432-.8 LT GRN
474-.8 GRA
496-.8 DK BLU
455-.8 PPL
452-.8 BLK
1227-.8 BLK/YEL
410-.8 YEL
412-.8 PPL
1226-.8 RED
1230-.8 DK BLU/WHT
1225-.8 DK BLU
1231-.8 GRA/RED
1224-.8 PNK
454-.8 BLK/WHT
413-.8 PPL
439-.8 PNK/BLK
440-.8 ORN

GT100
12085003
(UPPER)
12085002
(LOWER)

440-.8 ORN
413-.8 PPL
440-.8 ORN

450-.8 BLK/WHT
454-.8 BLK/WHT
417-.8 DK BLU
416-.8 GRA
432-.8 LT GRN
474-.8 GRA
496-.8 DK BLU
440-.8 ORN
455-.8 PPL
452-.8 BLK
1227-.8 BLK/YEL
410-.8 YEL
412-.8 PPL
1226-.8 RED
1230-.8 DK BLU/WHT
1225-.8 DK BLU
1231-.8 GRA/RED
1224-.8 PNK
413-.8 PPL
439-.8 PNK/BLK
451-.8 WHT/BLK
437-.8 BRN
439-.8 PNK/BLK
439-.8 PNK/BLK
437-.8 BRN

450-.8 BLK/WHT
454-.8 BLK/WHT
417-.8 DK BLU
416-.8 GRA
432-.8 LT GRN

D | C
440 1 439
455 2 450
452 3 454
474 4 416
496 5 417
451 6 441
120 7 442
8 444
9 443
10 432
423 11 461
424 12
453 13 413
430 14 412
1227 15 468
410 16 467

C250
12052177

412-.8 PPL
413-.8 PPL
439-.8 PNK/BLK

PCM
CONNECTORS

I/P
481 W/GASOLINE
10 W/DIESEL
12015964

ENG
481 W/GASOLINE
10 W/DIESEL
12015113

DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
DIESEL ONLY
GASOLINE ONLY

437-.8 BRN
DRAC
(SEE PAGE 42)
439-.8 PNK/BLK
439-.8 PNK/BLK

G 422
H 451
J
K 436
L 451
M 450
F E D C B A

ALDL
C204
12020043

437-.8 BRN

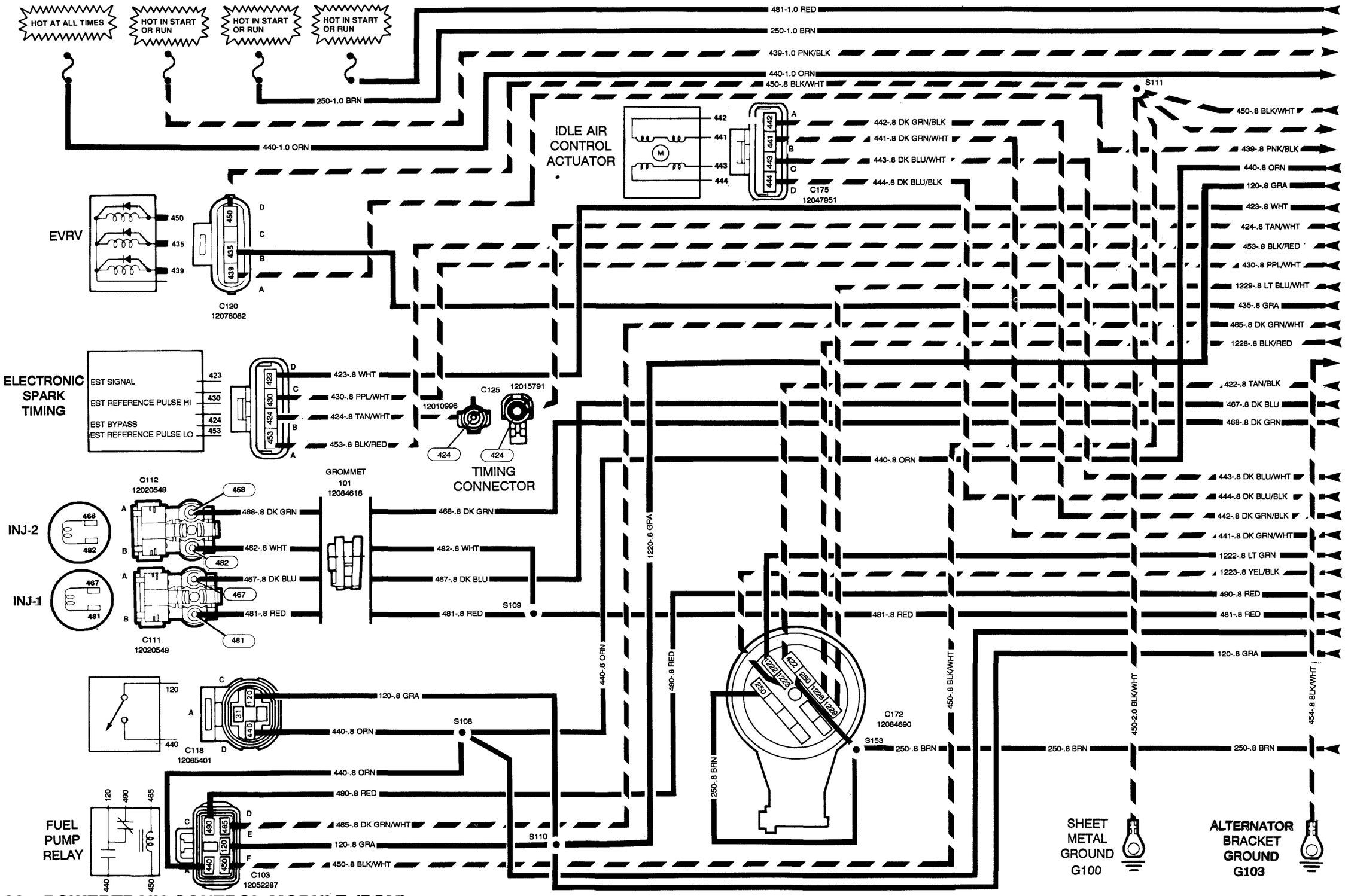
B | A
1 465
1226 2 1223
1225 3 1222
1224 4 422
430 5
6
1229 7 419
1228 8
1230 9
1231 10
437 11 435
59 12 420

C251
12052175

59-.8 DK GRN
AIR CONDITIONING
(SEE PAGE 50)

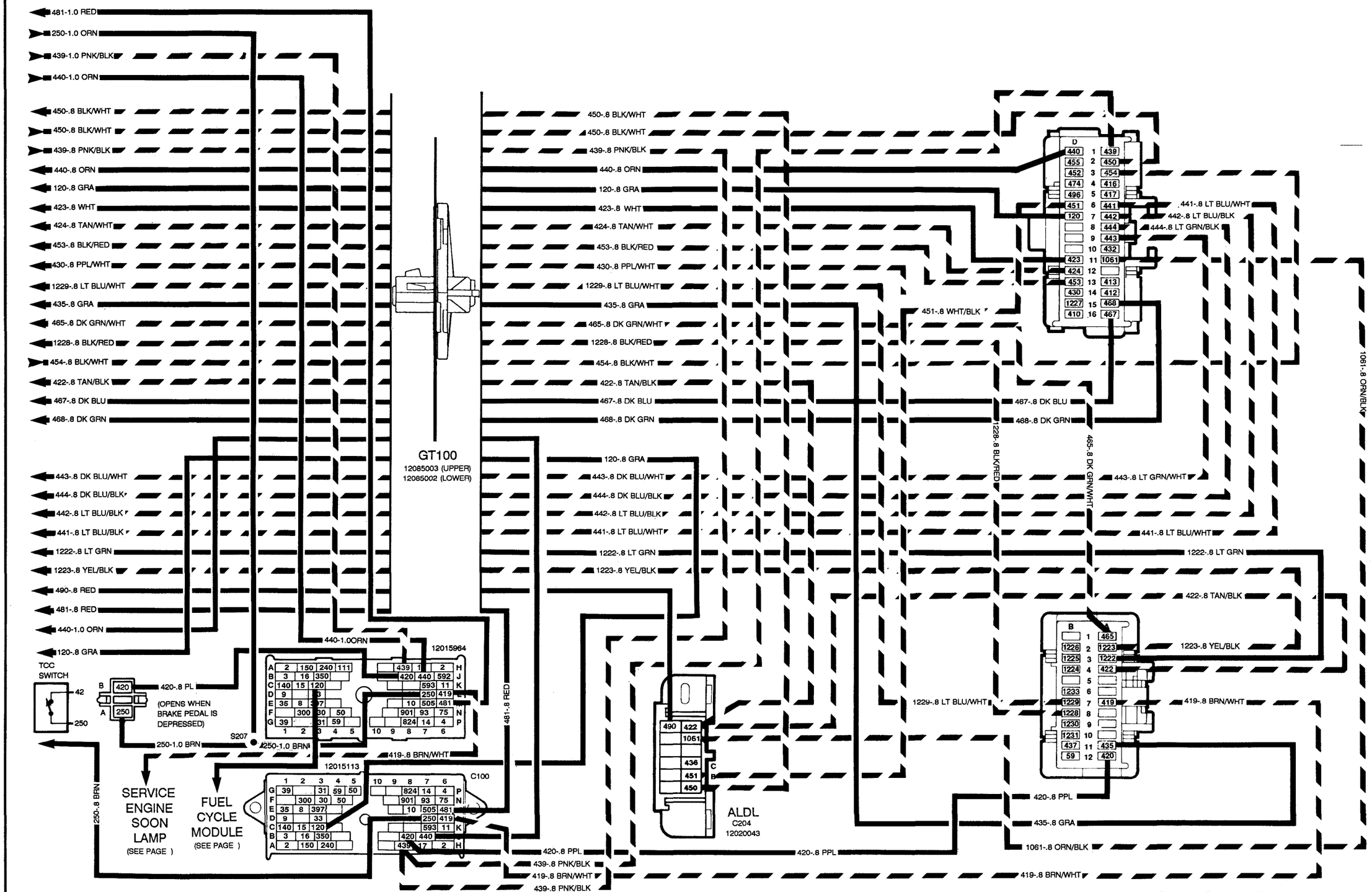
POWERTRAIN CONTROL MODULE (PCM) C-35

INPUTS - GASOLINE ENGINE



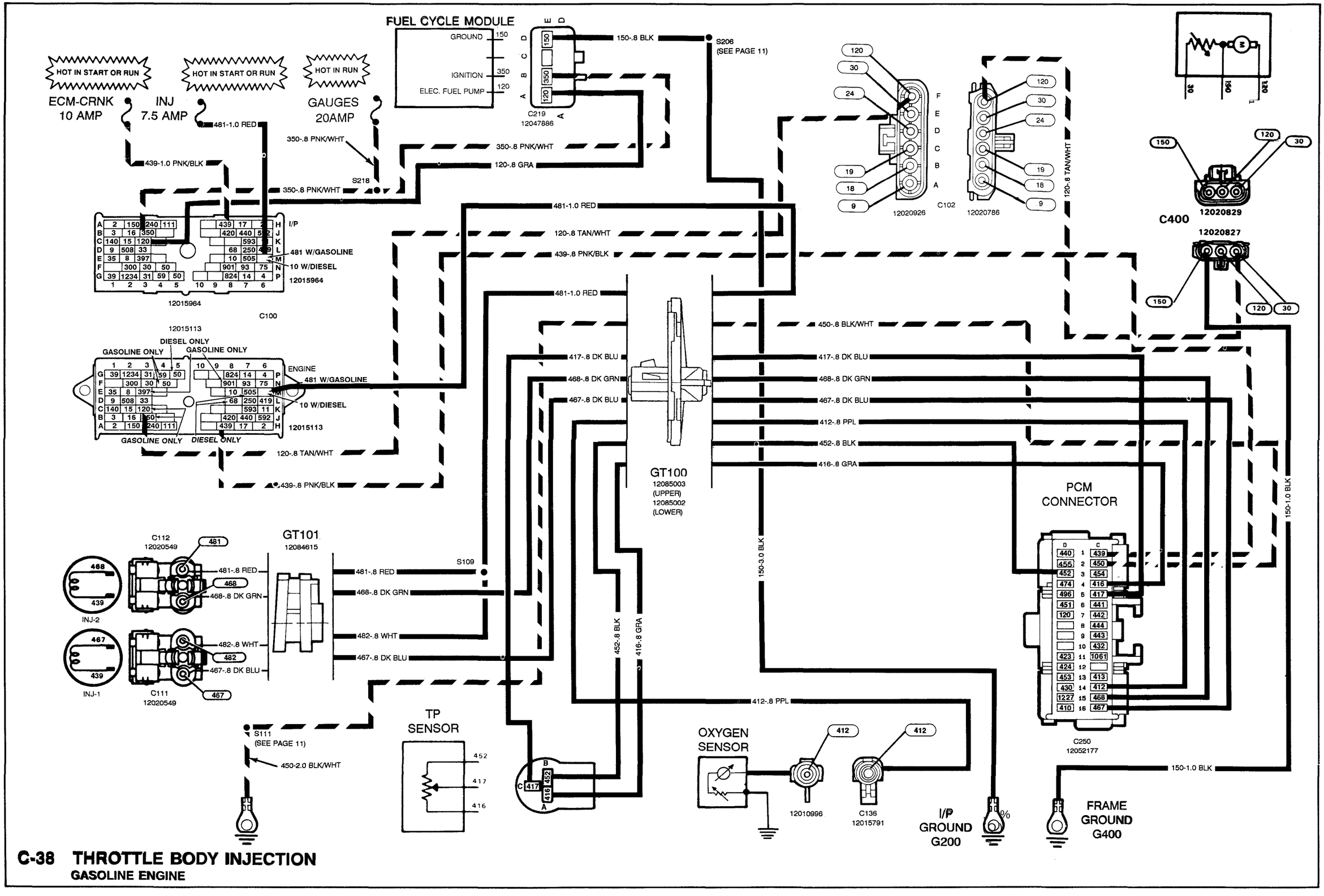
C-36 POWERTRAIN CONTROL MODULE (PCM)

OUTPUTS ■ GASOLINE ENGINE



POWERTRAIN CONTROL MODULE (PCM) C-37

OUTPUTS - GASOLINE ENGINE


FUEL CYCLE MODULE
GROUND 150
IGNITION 350
ELEC. FUEL PUMP 120
C219
12047886
150-.8 BLK
S206
(SEE PAGE 11)
HOT IN START OR RUN
HOT IN START OR RUN
HOT IN RUN
ECM-CRNK
10 AMP
INJ
7.5 AMP
GAUGES
20AMP
481-1.0 RED
350-.8 PNK/WHT
439-1.0 PNK/BLK
S218
350-.8 PNK/WHT
120-.8 GRA
481-1.0 RED
120-.8 TAN/WHT
439-.8 PNK/BLK
I/P
481 W/GASOLINE
10 W/DIESEL
12015964
C100
12015113
DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
ENGINE
481 W/GASOLINE
10 W/DIESEL
12015113
GASOLINE ONLY
DIESEL ONLY
120-.8 TAN/WHT
439-.8 PNK/BLK
481-1.0 RED
450-.8 BLK/WHT
417-.8 DK BLU
468-.8 DK GRN
467-.8 DK BLU
412-.8 PPL
452-.8 BLK
416-.8 GRA
GT100
12085003
(UPPER)
12085002
(LOWER)
150-3.0 BLK
452-.8 BLK
416-.8 GRA
C102
12020926
12020786
120-.8 TAN/WHT
C400
12020829
12020827
PCM
CONNECTOR
C250
12052177
150-1.0 BLK
C112
12020549
GT101
12084615
INJ-2
INJ-1
C111
12020549
481-.8 RED
468-.8 DK GRN
482-.8 WHT
467-.8 DK BLU
S109
S111
(SEE PAGE 11)
450-2.0 BLK/WHT
TP
SENSOR
OXYGEN
SENSOR
12010996
C136
12015791
I/P
GROUND
G200
FRAME
GROUND
G400

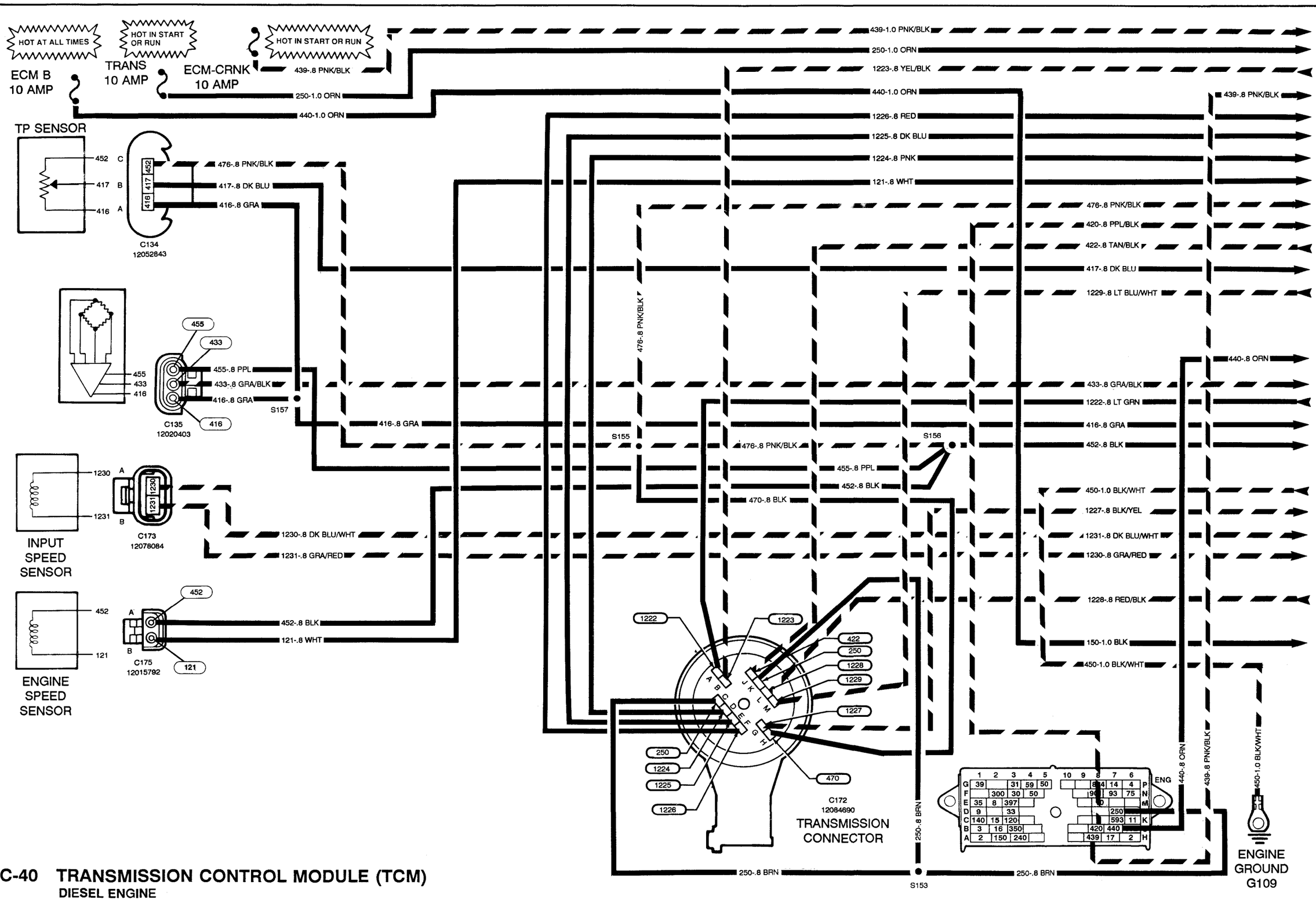
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			A1	NOT USED
			A2	NOT USED
1224	.8	PNK	A3	PRESSURE SWITCH MANIFOLD A
1225	.8	DK BLU	A4	PRESSURE SWITCH MANIFOLD B
1226	.8	RED	A5	PRESSURE SWITCH MANIFOLD C
1223	.8	YEL/BLK	A6	SOLENOID B DRIVER
1222	.8	LT GRN	A7	SOLENOID A DRIVER
451	.8	WHT/BLK	A8	ALDL
			A9	NOT USED
			A10	NOT USED
			A11	NOT USED
440	.8	ORN	A12	12V BATTERY FUSED
			B1	NOT USED
			B2	NOT USED
			B3	NOT USED
420	.8	PPL/BLK	B4	BRAKE SIGNAL
422	.8	TAN/BLK	B5	TCC
			B6	NOT USED
			B7	NOT USED
			B8	NOT USED
1234	.8	GRA/RED	B9	SYSTEM CHECK LAMP
1061	.8	ORN/BLK	B10	SERIAL DATA
1233	.8	DK GRN/YEL	B11	OUTPUT SPEED SENSOR LOW
1232	.8	LT BLU	B12	OUTPUT SPEED SENSOR HIGH

TRANSMISSION CONTROL MODULE CONNECTOR

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
450	.8	BLK/WHT	C1	SYSTEM GROUND
551	.8	TAN/WHT	C2	SYSTEM GROUND
452	.8	BLK	C3	SENSOR GROUND
416	.8	GRA	C4	5V SENSOR REFERENCE
			C5	NOT USED
			C6	NOT USED
			C7	NOT USED
			C8	NOT USED
			C9	NOT USED
			C10	NOT USED
			C11	NOT USED
			C12	NOT USED
			C13	NOT USED
			C14	NOT USED
1228	.8	RED/BLK	C15	FORCE MOTOR LOW
439	.8	PNK/BLK	C16	12V IGNITION FUSED
			D1	NOT USED
437	.8	BRN	D2	DRAC MODULE
1231	.8	DK BLU/WHT	D3	INPUT SPEED LOW
1230	.8	GRA/RED	D4	INPUT SPEED HIGH
			D5	NOT USED
121	.8	WHT	D6	ENGINE SPEED
476	.8	BLK/PNK	D7	SENSOR GROUND
417	.8	DK BLU	D8	TPS
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
1227	.8	BLK/YEL	D13	TRANSMISSION TEMPERATURE
433	.8	GRA/BLK	D14	MAP
			D15	NOT USED
1229	.8	LT BLU/WHT	D16	FORCE MOTOR HIGH

TRANSMISSION CONTROL MODULE CONNECTOR

C-40 TRANSMISSION CONTROL MODULE (TCM)
DIESEL ENGINE



439-1.0 PNK/BLK
250-1.0 ORN
1223-.8 YEL/BLK
439-.8 PNK/BLK
1226-.8 RED
1225-.8 DK BLU
1224-.8 PNK
121-.8 WHT
476-.8 PNK/BLK
420-.8 PPL/BLK
422-.8 TAN/BLK
417-.8 DK BLU
1229-.8 LT BLU/WHT
440-1.0 ORN
433-.8 GRA/BLK
1222-.8 LT GRN
416-.8 GRA
452-.8 BLK
551-1.0 TAN/WHT
450-1.0 BLK/WHT
1227-.8 BLK/YEL
1231-.8 DK BLU/WHT
1230-.8 GRA/RED
1228-.8 RED/BLK
440-1.0 ORN
250-1.0 ORN
551-1.0 TAN/WHT

GT100
12085003 (UPPER)
12085002 (LOWER)

439-1.0 PNK/BLK
1223-.8 YEL/BLK
1226-.8 RED
1225-.8 DK BLU
1224-.8 PNK
121-.8 WHT
476-.8 PNK/BLK
422-.8 TAN/BLK
417-.8 DK BLU
1229-.8 LT BLU/WHT
433-.8 GRA/BLK
1222-.8 LT GRN
416-.8 GRA
452-.8 BLK
551-1.0 TAN/WHT
450-1.0 BLK/WHT
1227-.8 BLK/YEL
1231-.8 DK BLU/WHT
1230-.8 GRA/RED
1228-.8 RED/BLK
440-1.0 ORN
422-.8 TAN/BLK

1234-.8 GRA/RED → I/P CLUSTER (SEE PAGE 56)
1223-.8 YEL/BLK

C216
12059125

B		A
	1	
	2	
59	3	1224
420	4	1225
422	5	1226
	6	1223
	7	1222
	8	451
1234	9	
1061	10	1061
1233	11	
1232	12	440

1061-.8 ORN/BLK
440-1.0 ORN
451-.8 WHT/BLK

TRANSMISSION CONTROL MODULE CONNECTORS

D		C
	1	450
437	2	551
1231	3	452
1230	4	416
	5	
121	6	
476	7	
417	8	
	9	
	10	
	11	
	12	
1227	13	
433	14	
	15	1228
229	16	439

439-.8 PNK/BLK

C215
12059126

ALDL

G	422	F
H	488	
J		D
K		C
L	451	
M	1061	50 A

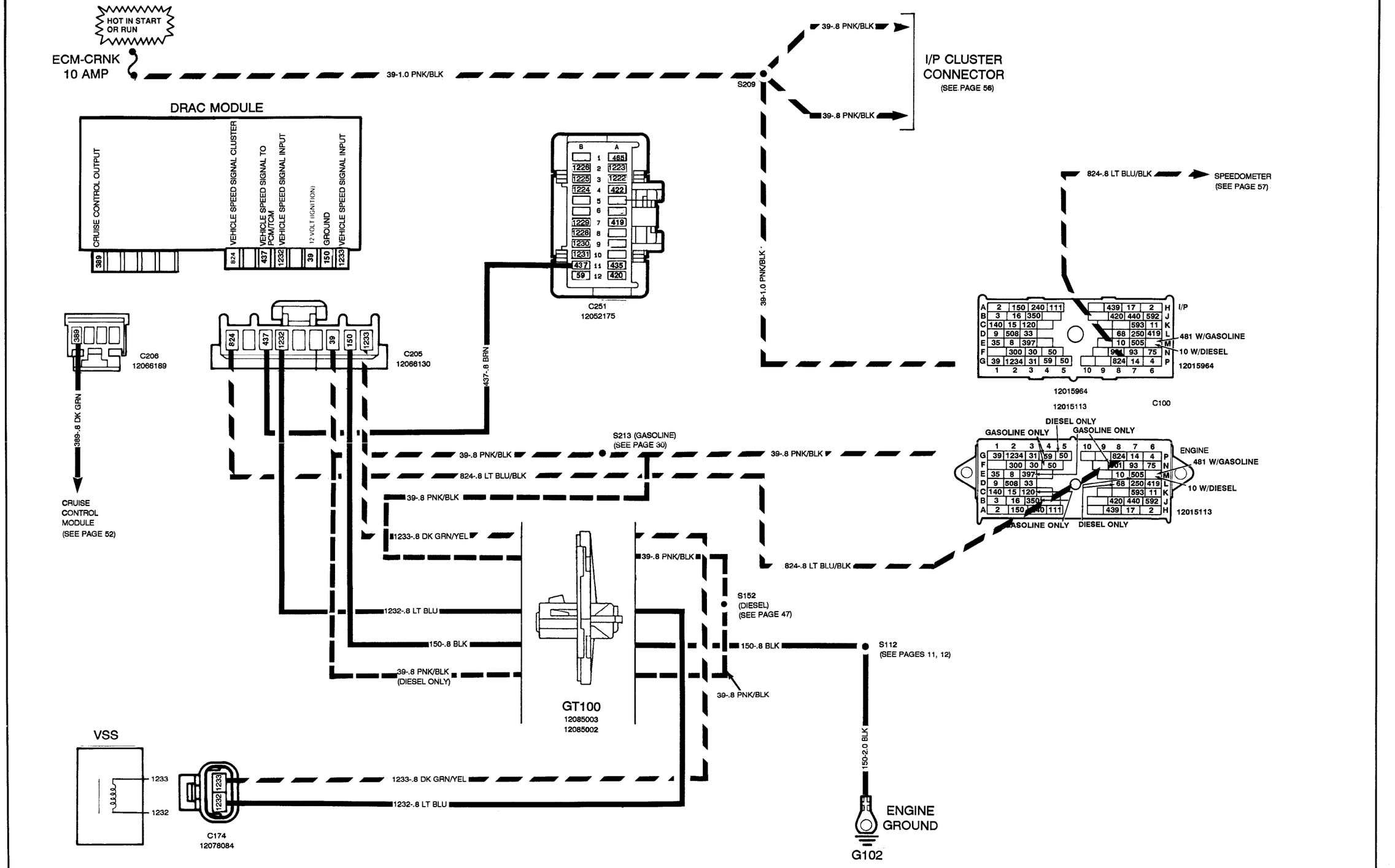
C206
12020043

1061-.8 ORN/BLK
422-.8 TAN/BLK
451-.8 WHT/BLK
422-.8 TAN/BLK

A	2	150	240	111		439	1	2	H
B	3	16	350			420	440	592	J
C	140	15	120				593	11	K
D	9	508	33					250	
E	35	8	397				10		M
F		300	30	50		901	93	75	N
G	39		31	59		824	14	4	P
	1	2	3	4	5	10	9	8	7	6

C100

ENGINE GROUND G108



C-42 DIGITAL RATIO ADAPTER CONTROLLER (DRAC)

CIRCUIT OPERATION

The heating of the Glow Plugs is controlled by the Glow Plug Relay in the Glow Plug Controller. Battery voltage is applied to the relay contacts through the RED (2) wire from Junction Block. The relay is operated by a Solid-State Controller. The Controller responds to engine temperature and also to an Ignition Switch Start Input.

When the Ignition Switch is turned to RUN, battery voltage is applied to the Enable Input of the Controller. The Glow Plug Relay within the Controller will be energized for approximately five seconds during which it applies voltage to the Glow Plugs and WAIT Indicator. After the initial time period the relay will be de-energized for five seconds then will cycle ON/OFF for approximately 10 seconds.

When the Glow Plug Controller receives the Start Input, the Glow Plugs and WAIT Indicator will cycle ON/OFF after the Ignition Switch is returned to RUN.

After approximately 25 seconds the Controller will open the Glow Plug Relay and the heating of the plugs stops.

DIAGNOSIS -- GLOW PLUGS

PRELIMINARY CHECKS:

A check of the glow plug system should be performed before doing diagnostic procedures.

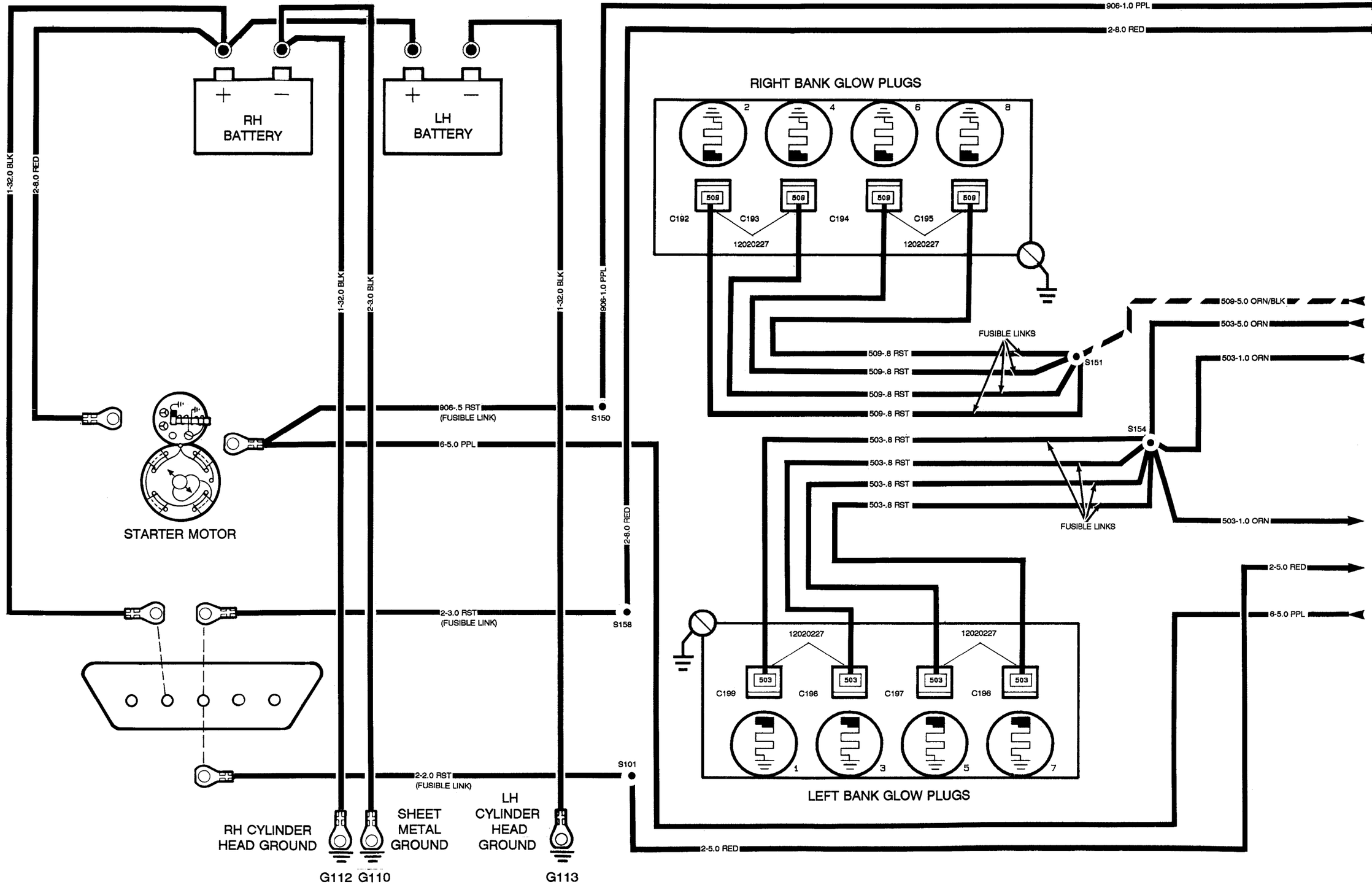
With engine below normal operating temperature, turn ignition switch to RUN. The WAIT Indicator should light. After approximately 10 seconds, the WAIT Indicator must begin to flash for an additional 10 seconds and then go out.

Turn ignition switch to OFF and then momentarily to START and return to RUN position. The WAIT Indicator should flash for approximately 25 seconds and then go out.

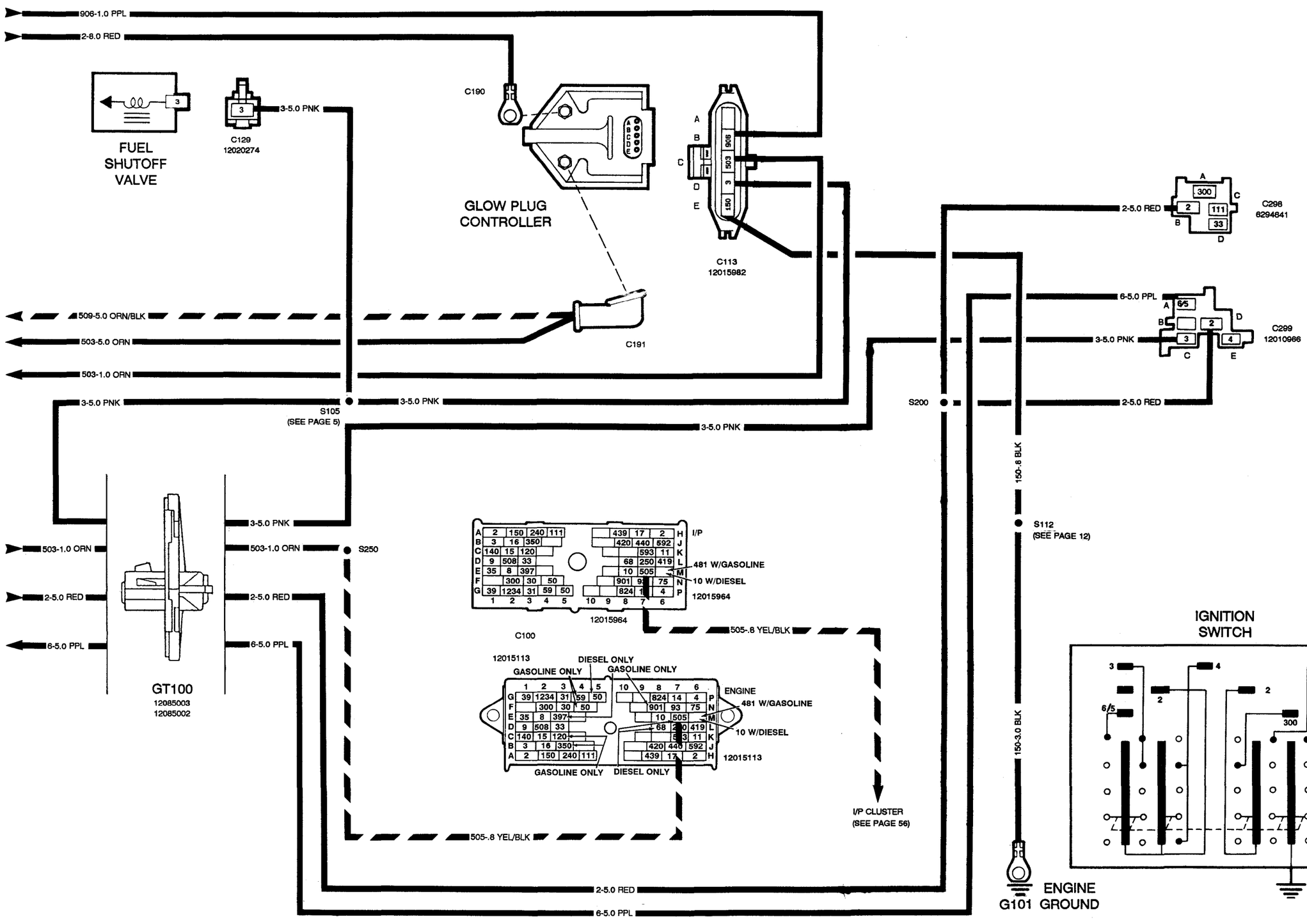
With engine at normal operating temperature, turn ignition switch to RUN. The WAIT Indicator should flash for a 6.2L engine.

WAIT INDICATOR DOES NOT FLASH OR FLASHES FOR THE INCORRECT AMOUNT OF TIME WHEN ENGINE IS BELOW NORMAL OPERATING TEMPERATURE

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect test lamp from RED (2) wire at glow plug controller connector C190 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire and fusible link from glow plug controller connector C190 to battery junction block.
2. Connect a test lamp from PNK (3) wire at glow plug controller connector C113 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (3) wire from glow plug controller connector C113 to fuel shutoff valve connector C129.
3. Connect a test lamp from PNK (3) wire to BLK (150) wire at glow plug controller connector C113.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from glow plug controller connector C113 to ground G101.
4. Connect a test lamp from PPL (906) wire at glow plug controller connector C113 to ground. Place ignition switch in START position.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in PPL or RST (906) wire from glow plug controller connector C113 to starter motor.
5. Place ignition in OFF position. Connect a test lamp from ORN (503) and ORN/BLK (509) wires at glow plug controller connector C191 to ground.	Test lamp lights.	REPLACE glow plug controller.
	Test lamp does not light.	GO to step 6.
6. Disconnect glow plug controller connector C113. Using a positive polarity ohmmeter. Check continuity between ORN (503) and BLK (150) wires.	Reading of 2 ohms or less.	GO to step 7.
	Reading greater than 2 ohms.	LOCATE and REPAIR open in ORN (503) wire from glow plug controller connector C113 to glow plug harness splice S154.
7. Connect glow plug controller connector. Connect a test lamp from ORN (503) and ORN/BLK (509) wires at glow plug controller connector C191 to ground. Turn ignition switch momentarily to START and then release to RUN position.	Test lamp cycles on and off for approximately 25 seconds then goes off.	GO to step 8.
	Test lamp does not light or cycles for the incorrect time.	REPLACE glow plug controller.
8. Remove all connectors from glow plugs. Connect one lead of test lamp to battery voltage and other lead to each glow plug.	Test lamp lights for all glow plugs.	LOCATE and REPAIR open in ORN (503) and ORN/BLK (509) wires and fusible links from glow plug to glow plug controller connector C190.
	Test lamp does not light for one or more glow plugs.	REPLACE glow plug(s) where test lamp did not light.



C-44 GLOW PLUGS


906-1.0 PPL
2-8.0 RED
FUEL SHUTOFF VALVE
C129
12020274
3-5.0 PNK
C190
GLOW PLUG CONTROLLER
C113
12015982
C298
6294841
2-5.0 RED
C299
12010966
6-5.0 PPL
3-5.0 PNK
2-5.0 RED
509-5.0 ORN/BLK
503-5.0 ORN
503-1.0 ORN
C191
S105
(SEE PAGE 5)
S200
150-.8 BLK
S112
(SEE PAGE 12)
150-3.0 BLK
GT100
12085003
12085002
S250
C100
12015964
I/P
481 W/GASOLINE
10 W/DIESEL
505-.8 YEL/BLK
12015113
DIESEL ONLY
GASOLINE ONLY
ENGINE
I/P CLUSTER
(SEE PAGE 56)
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC
ENGINE
G101 GROUND

CIRCUIT OPERATION

The Diesel Fuel Filter System combines six functions into a single package:

1. It heats diesel fuel to prevent wax-plugging of the filter;
2. It combines very small droplets of water in the fuel into larger drops and separates the water from the fuel;
3. It filters the diesel fuel;
4. It detects an excessive pressure drop indicating filter plugging; (Vacuum Switch)
5. It detects the presence of excess water in the fuel; and
6. It provides a means to drain the water it has separated.

The Fuel Filter Assembly consists of the following main parts: Fuel Heater, the Water In Fuel Sensor, the Fuel Pressure Switch, and a Filter. The Filter contains the coalescer (the device that combines small droplets of water into larger ones) and the filter/separator.

An electric fuel pump delivers diesel fuel from the tank to the fuel filter. As fuel enters the filter, it passes first through the Fuel Heater. The heater contains a thermostatic switch. The switch opens or closes, to turn the heater off or on, depending on the temperature of the fuel.

The fuel then passes through the Primary and Secondary filters. Next the fuel flows through the water coalescer. Here the droplets of water in the fuel are combined into larger drops, the drops fall to the water reservoir in the filter. When fuel flows from the Fuel Filter Assembly to the injection pump, it is clean and free of water.

The Solid-State Water In Fuel Sensor applies voltage to a Probe. When the Probe touches water, the Module closes a switch. This completes a circuit to ground to light the SERVICE FUEL FILTER Indicator.

A time delay circuit in the Water In Fuel Module grounds the Indicator bulb briefly to test the bulb each time the system is turned on.

The Fuel Heater is operated by a built-in thermostatic switch. When the switch is closed, battery voltage is applied to the heater from the GAGES Fuse.

DIAGNOSIS -- DIESEL ENGINE FUEL CONTROLS

SERVICE FUEL FILTER INDICATOR DOES NOT LIGHT BRIEFLY WITH IGNITION SWITCH TURNED TO RUN

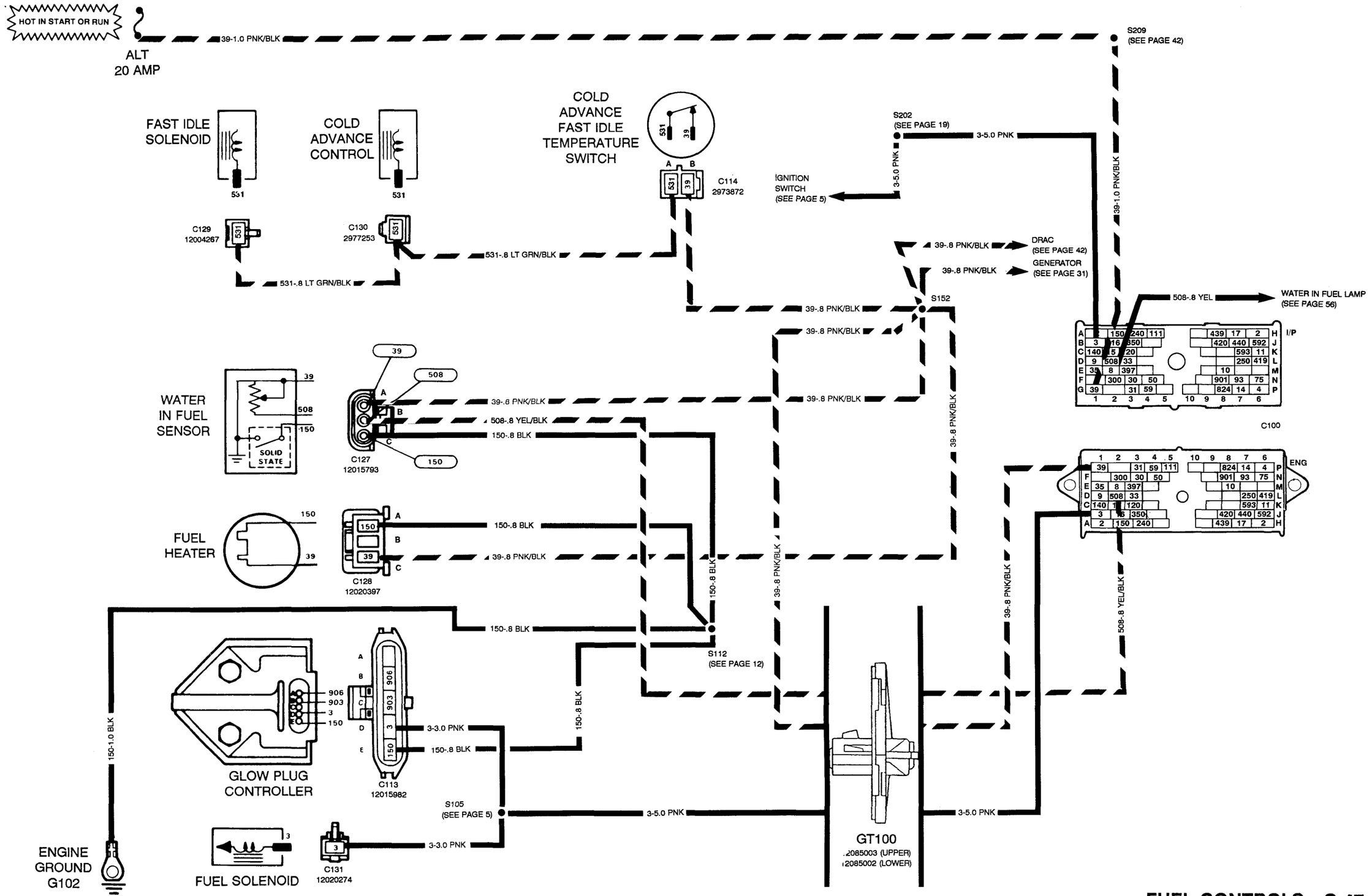
TEST	RESULT	ACTION
1. Disconnect water in fuel sensor connector C127 and place ignition switch in RUN position. Connect a voltmeter from PNK/BLK (39) wire at water in fuel sensor connector C127 to ground.	Battery voltage.	GO to step 2.
	No voltage reading.	CHECK condition of ALT fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from water in fuel sensor connector C127 to fuse block.
2. Connect a voltmeter from PNK/BLK (39) to BLK (150) wire at water in fuel sensor connector C127.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from water in fuel sensor connector C127 to ground G102.
3. Connect a voltmeter from YEL/BLK (508) wire at water in fuel sensor connector C127 to ground.	Battery voltage.	REPLACE water in fuel sensor.
	No voltage.	CHECK water in fuel lamp. If lamp is good, LOCATE and REPAIR open in YEL/BLK (508) wire.

FUEL HEATER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect fuel heater connector C128. Place ignition switch to RUN position. Connect a voltmeter from PNK/BLK (39) wire at fuel heater connector C128 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of ALT fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from fuel heater connector C128 to fuse block.
2. Connect a voltmeter from PNK/BLK (39) wire to BLK (150) wire at fuel heater connector C128.	Battery voltage.	REPLACE fuel heater.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from fuel heater connector C128 to ground G102.

WATER IN FUEL INDICATOR LIGHTS WITH NO WATER IN FUEL

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Disconnect water in fuel sensor connector C127.	Water in fuel indicator stays on.	LOCATE and REPAIR short to ground in YEL/BLK (508) wire.
	Water in fuel indicator goes out.	REPLACE water in fuel sensor.


HOT IN START OR RUN
ALT
20 AMP
39-1.0 PNK/BLK
S209
(SEE PAGE 42)
FAST IDLE
SOLENOID
COLD
ADVANCE
CONTROL
COLD
ADVANCE
FAST IDLE
TEMPERATURE
SWITCH
C114
2973872
S202
(SEE PAGE 19)
3-5.0 PNK
IGNITION
SWITCH
(SEE PAGE 5)
C129
12004267
C130
2977253
531-.8 LT GRN/BLK
39-.8 PNK/BLK
DRAC
(SEE PAGE 42)
GENERATOR
(SEE PAGE 31)
S152
508-.8 YEL
WATER IN FUEL LAMP
(SEE PAGE 56)
I/P
C100
WATER
IN FUEL
SENSOR
SOLID
STATE
C127
12015793
508-.8 YEL/BLK
150-.8 BLK
ENG
FUEL
HEATER
C128
12020397
S112
(SEE PAGE 12)
150-1.0 BLK
GLOW PLUG
CONTROLLER
C113
12015982
3-3.0 PNK
S105
(SEE PAGE 5)
3-5.0 PNK
GT100
12085003 (UPPER)
12085002 (LOWER)
ENGINE
GROUND
G102
FUEL SOLENOID
C131
12020274

CIRCUIT OPERATION

Battery voltage is applied to the Auxiliary Cooling Fan Relay at all times by the RED (2) wire and by the PNK/WHT (350) wire through the GAUGES fuse, when the Ignition Switch is in RUN or START. When the Auxiliary Cooling Fan Switch closes at 107°C (225°F), the DK GRN (935) wire is grounded and the Auxiliary Cooling Fan Relay energizes. Battery voltage is applied across the Auxiliary Cooling Fan Motor and the Cooling Fan runs.

DIAGNOSIS -- AUXILIARY COOLING FAN

AUXILIARY COOLING FAN RUNS CONTINUOUSLY

TEST	RESULT	ACTION
1. Place ignition switch in RUN position and with engine coolant temperature below 107°C (225°F), disconnect auxiliary cooling fan temperature switch connector C106.	Auxiliary cooling fan runs.	GO to step 2.
	Auxiliary cooling fan does not run.	REPLACE auxiliary cooling fan temperature switch.
2. Disconnect auxiliary fan relay connector C190. Connect a test lamp from PNK/WHT (350) to DK GRN (935) wires at auxiliary cooling fan relay connector C138.	Test lamp lights.	CHECK for short in DK GRN (935) wire from auxiliary cooling fan relay connector C138 to auxiliary cooling fan temperature switch connector C106.
	Test lamp does not light.	REPLACE auxiliary cooling fan relay.

AUXILIARY COOLING FAN DOES NOT RUN

TEST	RESULT	ACTION
1. Disconnect auxiliary cooling fan temperature switch connector C106. Connect a fused jumper from DK GRN (935) wire at auxiliary cooling fan temperature switch connector C106 to ground.	Auxiliary cooling fan does not run.	GO to step 2.
	Auxiliary cooling fan runs.	REPLACE auxiliary cooling fan temperature switch.
2. Disconnect auxiliary cooling fan relay connector C138. Connect a test lamp from PNK/WHT (350) wire at auxiliary cooling fan relay connector C138 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of GAUGES fuse and/or LOCATE and REPAIR open in PNK/WHT (350) wire from auxiliary cooling fan relay to fuse block.
3. Connect fused jumper from DK GRN (935) wire at auxiliary cooling fan temperature switch connector C106 to ground. Connect a test lamp from PNK/WHT (350) wire to DK GRN (935) at auxiliary cooling fan relay connector C138.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (935) wire between auxiliary cooling fan temperature switch connector C106 and auxiliary cooling fan relay connector C138.
4. Connect a test lamp from RED (2) wire at auxiliary cooling fan relay connector C138 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire and fusible link between auxiliary cooling fan relay connector C138 and battery junction block.
5. Connect 30 amp fused jumper from RED (2) wire to BLK/RED (702) wire at the auxiliary cooling fan relay connector C138.	Auxiliary cooling fan does not run.	GO to step 6.
	Auxiliary cooling fan runs.	REPLACE auxiliary cooling fan relay.
6. Leave 30 amp fused jumper connected. Disconnect auxiliary cooling fan connector C152. Connect a test lamp from BLK/RED (702) at auxiliary cooling fan connector C152 to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/RED (702) wires from auxiliary cooling fan connector C152 to auxiliary cooling fan relay connector C138.
7. Connect a test lamp from BLK/RED (702) to BLK (150) wires at auxiliary cooling fan connector C152.	Test lamp lights.	REPLACE auxiliary cooling fan.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from auxiliary cooling fan to ground G102.

HOT IN RUN

GAGES
20 AMP

350-.8 PNK/WHT

S218
(GASOLINE ONLY)
(SEE PAGE 38)

350-.8 PNK/WHT

BATTERY JUNCTION BLOCK

2-.8 RST
(FUSIBLE LINK)

S104

2-2.0 RED

935-.8 DK GRN

150-.8 BLK

150-.8 BLK

702-2.0 BLK/RED

2-2.0 RED

935-.8 DK GRN

2-2.0 RED

350-.8 PNK/WHT

150

M

702

AUXILIARY COOLING FAN

C152
12015792

150

150-.8 BLK

702-2.0 BLK/RED

702

150

935

AUXILIARY COOLING FAN PRESSURE SWITCH

C153
12015792

150-.8 BLK

935-.8 DK GRN

S114

935

134

AUXILIARY COOLING FAN TEMPERATURE SWITCH

(CLOSED WHEN COOLANT EXCEEDS 225°F)

C106
12052641

935-.8 DK GRN

GT100
12085003
(UPPER)
12085002
(LOWER)

S112
(SEE PAGE 11)

150-3.0 BLK

ENGINE GROUND

G102

I/P
481 W/GASOLINE
10 W/DIESEL
12015964

12015964

C100

12015113

DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY

ENGINE
481 W/GASOLINE
10 W/DIESEL

12015113

GASOLINE ONLY
DIESEL ONLY

935-.8 DK GRN

702-2.0 BLK/RED

2-2.0 RED

350-.8 PNK/WHT

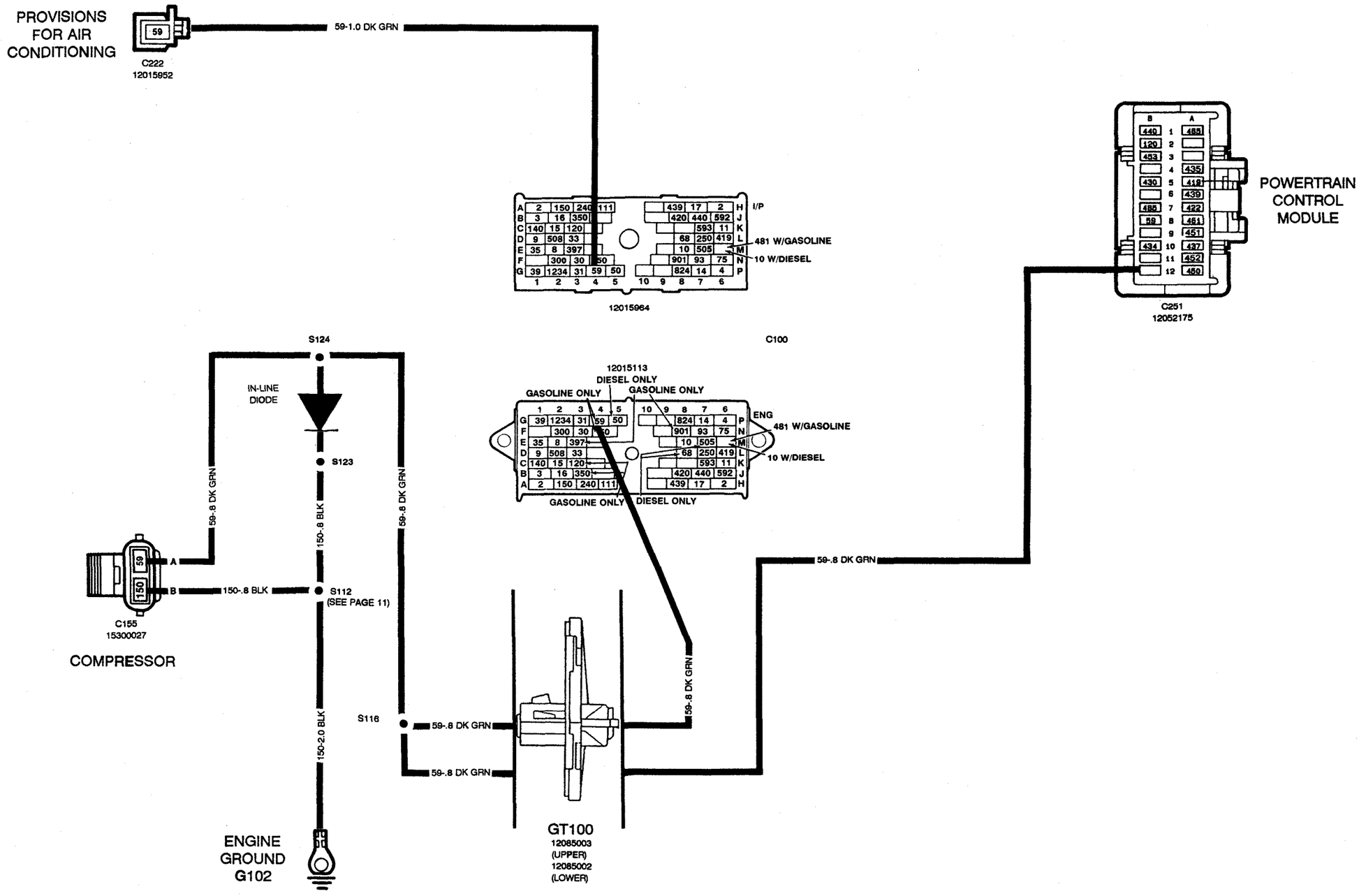
C138
12065169

935
2
702
350

COOLING FAN RELAY

AUXILIARY COOLING FAN C-49

GASOLINE ENGINE



C-50 PROVISIONS FOR AIR CONDITIONING

GASOLINE ENGINE

CIRCUIT OPERATION

The Cruise Control regulates the speed of the vehicle in response to driver commands.

The Cruise Control Module contains electronic circuitry and a stepper motor. The other system components are:

- Cruise Control Switch
- Brake Switch
- Vehicle Speed Sensor (VSS)

The Cruise Control Module receives voltage from the IGN Fuse in RUN or START. A speed signal is received from the VSS. The driver gives his input to the Cruise Control Module through the components listed above. The Cruise Control Module circuitry receives the driver's input and generates electrical pulses. These pulses cause the stepper motor and its output reel to rotate. The throttle is controlled by a cable wound on the output reel. The Cruise Control Module also contains a clutch which releases the cable when the Cruise Control System must be shut off. This clutch will operate when the Brake Pedal is depressed, the Cruise Control System is turned off, or the Cruise Control System detects a failure.

DIAGNOSIS -- CRUISE CONTROL

CRUISE CONTROL DOES NOT DISENGAGE WHEN BRAKE PEDAL IS DEPRESSED

TEST	RESULT	ACTION
1. Place ignition switch in RUN position and cruise control switch to ON. Depress brake pedal. Connect test lamp from BRN (86) wire at brake switch connectors C245 and C246 to ground.	Test lamp does not light.	REPLACE control module.
	Test lamp lights.	CHECK adjustment of brake switch. If adjustment cannot be corrected, REPLACE brake switch.

CRUISE CONTROL DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in RUN and cruise control switch to ON. Connect a test lamp from PNK/BLK (39) wire at cruise control switch connector C244 to ground and then cruise control module connector C248 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of IGN fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from cruise control switch connector C244 and cruise module connector C248 to fuse block.
2. Connect a test lamp from GRA (397) wire at cruise control switch connector C244 to ground.	Test lamp light.	GO to step 3.
	Test lamp does not light.	REPLACE cruise control switch.
3. Connect a test lamp from GRA (397) at cruise control module connector C248 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in GRA (397) wire from cruise control module connector C248 to cruise control switch connector C244.
4. Connect a test lamp from GRA (397) to BLK (150) wires at cruise control module connector C248.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from cruise control module connector C248 to ground G202.
5. Connect a test lamp from GRA (397) wire at brake switch connector C245 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in GRA (397) wire from brake switch connector C245 to splice S215.
6. Connect a test lamp from TAN (901) wire at brake switch connector C246 to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (901) wire from brake switch connector C246 to cruise control module connector C248.
7. Connect a test lamp from BRN (86) wire at brake switch connector C246 to ground.	Test lamp lights.	GO to step 8.
	Test lamp does not light.	CHECK adjustment of brake switch. If properly adjusted, REPLACE brake switch.
8. Connect a test lamp from BRN (86) wire at brake switch connector C245 to ground.	Test lamp lights.	GO to step 9.
	Test lamp does not light.	CHECK adjustment of brake switch. If properly adjusted, REPLACE brake switch.
9. Connect a test lamp from DK BLU (84) wire at cruise control switch connector C244 to ground.	Test lamp lights.	REPLACE cruise control switch.
	Test lamp does not light.	GO to step 10.
10. Depress SET switch. Connect a test lamp from DK BLU (84) wire at cruise control switch connector C244 to ground.	Test lamp lights.	GO to step 11.
	Test lamp does not light.	REPLACE cruise control switch.
11. Connect a test lamp from DK BLU (84) wire at cruise control module connector C248 to ground.	Test lamp lights.	GO to step 12.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (84) wire from cruise control module connector C248 to cruise control switch connector C244.
12. Depress and hold RESUME/ ACCEL switch. Connect test lamp from DK GRN (83) wire at cruise control switch connector C248 to ground.	Test lamp lights.	GO to step 13.
	Test lamp does not light.	REPLACE cruise control switch.
13. Connect a test lamp from DK GRN (83) wire at cruise control module connector C248 to ground.	Test lamp lights.	GO to step 14.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (83) wire from cruise control module connector C248 to cruise control switch connector C244.
14. Raise vehicle so drive wheels can be turned by hand. Connect voltmeter from PNK/WHT (39) wire to DK GRN (389) wire at cruise control module connector C248. Slowly turn drive wheels.	Pulses between 0 and battery voltage as wheels are turned.	REPLACE cruise control module.
	Does not pulse or no voltage reading.	CHECK speed sensor circuit. Refer to Fuel, Driveability and Emission Manual (Gasoline).

HOT IN START OR RUN

ALT
20 AMP

39-.8 PNK/BLK

S209
(SEE PAGE 42)

39-.8 PNK/BLK

I/P

A	2	150	40	111			4	17	2		H
B	3	16	30				20	440	592		J
C	140	15	12					593	11		K
D	9	508	3				68	250	419		L
E	35	8	397				10	505			M
F		300	30	50			901	93	75		N
G	39	1234	31	59	50		824	14	4		P
	1	2	3	4	5	10	9	8	7	6	

481 W/GASOLINE
10 W/DIESEL

12015964

C100

12015113

DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY

ENGINE

G	39	1234	31	59	50		824	14	4		P
F		300	30	50			901	93	75		N
E	35	8	397				10	505			M
D	9	508	3				68	250	419		L
C	140	15	12					593	11		K
B	3	16	30				20	440	592		J
A	2	150	40	111			4	17	2		H
	1	2	3	4	5	10	9	8	7	6	

ENG

481 W/GASOLINE
10 W/DIESEL

GASOLINE ONLY
DIESEL ONLY

901-.5 TAN
397-.5 GRA

BRAKE SWITCHES
(OPEN WHEN BRAKE PEDAL IS DEPRESSED)

901
86

B 901
A 86

C246
12015197

86-.5 BRN

86
397

A 86
B 397

C245
12010649

39-.8 PNK/BLK
397-.8 GRA
84-.8 DK BLU
83-.8 DK GRN
901-.5 TAN

S213 (SEE PAGE 30)

S215

39-.8 PNK/BLK
397-.8 GRA

C244
12020651

IGNITION	39
ACCEL/RESERVE SW	83
CRUISE ENGLARGER SWITCH	84
GROUND	150
VEHICLE SPEED INPUT	389
ELECTRONIC CRUISE	397
BRAKE SWITCH	901

CRUISE CONTROL MODULE

397-.8 GRA
389-.8 DK GRN
39-.8 PNK/BLK
901-.5 TAN
84-.8 DK BLU
83-.8 DK GRN

C248
12045810

150-.8 BLK

S112
(SEE PAGES 11, 12)

GT100
12085003
(UPPER)
12085002
(LOWER)

389-.8 DK GRN

DRAC
(SEE PAGE 42)

CRUISE CONTROL ACTIVATOR

84
83
397
39

SET/COAST
RESERVE/ ACCEL
ON/OFF

150-2.0 BLK

ENGINE GROUND G102

C-52 CRUISE CONTROL

CIRCUIT OPERATION

The operation of an individual Indicator is described along with its circuit. Refer to the schematic and text for the circuit that is indicated below each of the Indicators.

PARK BRAKE WARNING LAMP

Battery voltage is applied to the Brake Indicator when the Ignition Switch is in RUN, or START. Three Switches are connected to the Brake Indicator. When any one of these switches closes, a ground is provided and the indicator lights.

The Park Brake Switch provides a ground when the Park Brake is applied. The Brake Indicator lights to alert the driver.

The Brake Pressure Switch closes to light the Brake Indicator when there is low brake fluid pressure in one of the two hydraulic brake systems. This could be caused by a leak in one of the brake lines.

The Ignition Switch grounds the Brake Indicator when the Ignition Switch is turned to START to provide a quick check of the Brake Indicator Bulb and circuitry.

FUEL GAGE

The pointer of the Fuel Gage is moved by the magnetic fields of two coils. The coils are at right angles to each other. Battery voltage is applied to the E-coil and the circuit divides at the opposite end of the coil. One path continues to ground through the F-coil. Another goes to ground through the variable resistor of the Fuel Gage Sender.

When the tank is low, the resistance of the Sender is low. A large flow of current passes through the E-coil and the Fuel Gage Sender resistor. This moves the pointer toward E on the scale. When the tank is full, the Sender resistance is high. More current now flows through the F-coil, moving the pointer toward F on the scale.

With two coils operating the pointer, the Gage is not affected by changes in the system's battery voltage.

OIL PRESSURE GAGE

The engine oil pressure is displayed by the Oil Pressure Gage. The pointer of the Gage is moved by two coils, and its operation is similar to that of the Fuel Gage.

The Oil Pressure Sender is connected to the junction of the two coils. It has low resistance when the oil pressure is low, and 90 ohms resistance when the oil pressure is high. This changing resistance changes the current flow through the coils. The magnetic field of the coils move the pointer from low to high.

TEMPERATURE GAGE

The Temperature Gage is also operated by two coils. Battery voltage is applied to both coils. One is grounded directly and the other is grounded through the Temperature Sender. This has 55 ohms resistance at 127°C (260°F) (hot coolant) and its resistance becomes greater at lower temperatures. It is approximately 1400 ohms at 38°C (100°F). This causes the current through the Sender and one coil to increase as the coolant temperature increases. This moves the pointer.

LOW COOLANT INDICATOR (DIESEL)

The Low Coolant Indicator comes on to warn the driver when a low level of coolant exists in the radiator. Battery voltage is applied to the Low Coolant Module. When a low coolant condition exists, a signal is sent to the Low Coolant Module from the Low Coolant Sensor. The Low Coolant Module will provide a ground to the Low Coolant Indicator.

The Low Coolant Sensor is not a switch that opens and closes. It has a very high resistance to ground, more than 50,000 ohms, when the engine coolant level is low. This causes the Low Coolant Module to light the Low Coolant Indicator. With more of the Sensor covered by coolant, its resistance decreases. When the fluid level is good, the resistance between 10,000 and 50,000 ohms, the Sensor is partly covered and the fluid is not low enough to cause the warning to be displayed.

CHECK ENGINE (GASOLINE) INDICATOR

Refer to Light Duty Truck Fuel, Driveability and Emissions Service Manual, Section 3.

WATER IN FUEL WARNING INDICATOR

Refer to Fuel Controls (Diesel), Page B-38.

GLOW PLUG INDICATOR

Refer to Glow Plugs (Diesel), Page B-11.

RH/LH TURN SIGNAL INDICATORS

Refer to Front Exterior Lamps, Page B-24.

HIGH BEAM INDICATOR

Refer to Headlamps, Page

DRL INDICATOR

Refer to Headlamps with Canadian Daytime Running Lamps, Page

DIAGNOSIS -- INSTRUMENT PANEL: GAGES AND INDICATORS

PRELIMINARY CHECKS:

Check the condition of GAGES and INST LPS fuses. If fuses are in good condition, use the following diagnostic procedures.

FUEL GAGE INDICATES FULL OR BEYOND AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect fuel pump connector C401 and place ignition switch to RUN. Connect a fused jumper from PNK (30) wire at fuel pump connector C401 to ground.	Fuel gage indicates full.	LOCATE and REPAIR a short in PNK (30) wire. If not short is found, REPLACE fuel gage.
	Fuel gage indicates empty.	GO to step 2.
2. Connect a fused jumper from PNK (30) wire to BLK (150) wire at fuel pump connector C401.	Fuel gage indicates full.	LOCATE and REPAIR open in BLK (150) wire.
	Fuel gage indicates empty.	REPAIR/REPLACE fuel pump.

FUEL GAGE INDICATES EMPTY WHEN THERE IS FUEL IN THE TANK

TEST	RESULT	ACTION
1. Disconnect fuel pump connector C401 and place ignition switch to RUN.	Fuel gage indicates full.	REPAIR/REPLACE fuel pump.
	Fuel gage indicates empty.	LOCATE and REPAIR a short in PNK (30) wire. If no short is found, REPLACE fuel gage.

FUEL GAGE IS INACCURATE

TEST	RESULT	ACTION
1. Disconnect fuel pump connector C401. Connect one RED lead of J 34029-A Multimeter to PNK (30) wire and other to ground. Set resistance dials to 0 ohms and then to 90 ohms. Fuel gage should indicate empty and then full. (Allow time for gage to reach full due to anti-slosh device.)	Gage responds correctly.	CHECK BLK (150) wire for high resistance. If wire is good, REPAIR/REPLACE fuel pump.
	Gage does not respond correctly.	CHECK for high resistance in PNK (30) wire. If wire is good, REPLACE fuel gage.

OIL PRESSURE GAGE INDICATES LOW PRESSURE WHEN OIL PRESSURE IS GOOD

TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C118 (Gasoline) or C119 (Diesel) and place ignition switch to RUN.	Oil pressure gage indicates high pressure or indicator light goes out.	REPLACE oil pressure sender.
	Oil pressure gage indicates no or low pressure or indicator light stays on.	LOCATE and REPAIR short in TAN (31) wire. If wire is good, REPLACE oil pressure gage.

OIL PRESSURE GAGE INDICATES HIGH PRESSURE AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect oil pressure sender connector C118 (Gasoline) or C119 (Diesel) and place ignition switch to RUN. Connect a fused jumper from TAN (31) wire at oil pressure sender connector C118 (Gasoline) or C119 (Diesel) to ground.	Oil pressure gage indicates low pressure or indicator lights.	REPLACE oil pressure sender.
	Oil pressure indicates high pressure or indicator does not light.	LOCATE and REPAIR open in TAN (31) wire. If wire bulb is good, REPLACE oil pressure gage.

TEMPERATURE GAGE INDICATES HOT WITH ENGINE COOLANT BELOW OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C104 (Gasoline) or C108 (Diesel) and place ignition switch to RUN.	Temperature gage indicates cold.	REPLACE temperature sender.
	Temperature gage does not indicate cold.	LOCATE and REPAIR a short in DK GRN (35) wire. If no short is found, PERFORM diagnostic procedures under symptom "Temperature Gage Is Not Accurate."

TEMPERATURE GAGE INDICATES COLD ALL THE TIME

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C104 (Gasoline) or C108 (Diesel). Ground the DK GRN (35) wire at temperature sender connector C104 (Gasoline) or C108 (Diesel).	Temperature gage indicates hot.	REPAIR/REPLACE temperature sender.
	Temperature gage does not indicate hot.	LOCATE and REPAIR open in DK GRN (35) wire. If wire is good, REPLACE temperature gage.

TEMPERATURE GAGE IS NOT ACCURATE

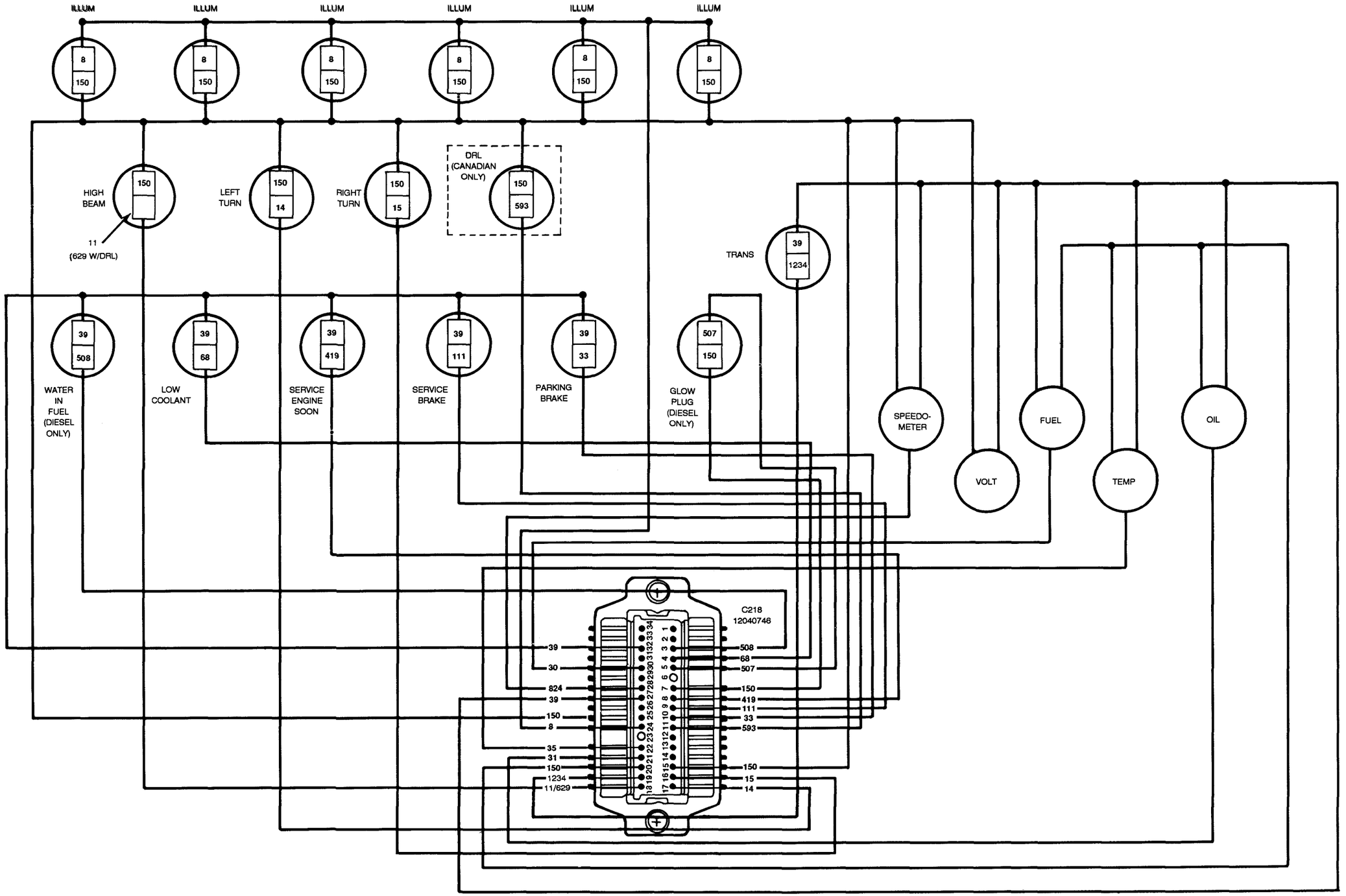
TEST	RESULT	ACTION
1. Disconnect temperature sender connector C104 (Gasoline) or C108 (Diesel). Connect RED lead from J 34029-A Multimeter to DK GRN (35) wire and other lead to ground. Adjust resistance dials to 1400 ohms and then to 55 ohms. Temperature gage should indicate cold then hot.	Gage indicates correctly.	REPLACE temperature sender.
	Gage is not correct.	LOCATE and REPAIR open in DK GRN (35) wire. If wire is good, REPLACE temperature gage.

LOW COOLANT INDICATOR IS LIT WHEN COOLANT LEVEL IS GOOD

TEST	RESULT	ACTION
1. Connect a fused jumper from low coolant warning switch connector C150 to ground. Place ignition switch to RUN and observe low coolant indicator light.	Low coolant indicator goes out.	REPLACE low coolant probe.
	Low coolant indicator stays lit.	LOCATE and REPAIR open in YEL/BLK (68) wire. If wire is good, follow diagnostic procedures listed under symptom "Low Coolant Indicator Does Not Light With Coolant Level Low."

LOW COOLANT INDICTOR DOES NOT LIGHT WITH COOLANT LEVEL LOW (DIESEL ONLY)

TEST	RESULT	ACTION
1. Disconnect low coolant warning switch connector C126 and place ignition switch to RUN. Observe low coolant indicator light.	Low coolant indicator lights.	REPLACE low coolant warning switch.
	Low coolant indicator does not light.	GO to step 2.
2. Disconnect low coolant warning module connector C223. Connect voltmeter from BLK/ORN (550) wire at low coolant warning module connector C223 to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in BLU/ORN (550) wire. If wire is good, REPLACE GAUGES fuse.
3. Connect a voltmeter from PNK/BLK (39) wire to BLK (150) wire at low coolant warning module connector C223.	Battery voltage.	GO to step 4.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire.
4. Connect a voltmeter from GRA (69) wire at low coolant warning module connector C223 to ground.	Battery voltage.	GO to step 5.
	No voltage.	LOCATE and REPAIR short to ground in GRA (69) wire from low coolant warning module connector C223 to low coolant warning lamp.
5. Connect a voltmeter from PNK/BLK (39) wire to YEL/BLK (68) at low coolant warning module connector C223.	Battery voltage.	LOCATE and REPAIR short to ground in YEL/BLK (68) wire from low coolant warning module connector C223 to low coolant warning switch connector C126.
	No voltage.	REPLACE low coolant module.


ILLUM
ILLUM
ILLUM
ILLUM
ILLUM
ILLUM
8
150
HIGH BEAM
150
11
(629 W/DRL)
LEFT TURN
150
14
RIGHT TURN
150
15
DRL (CANADIAN ONLY)
150
593
TRANS
39
1234
WATER IN FUEL (DIESEL ONLY)
39
508
LOW COOLANT
39
68
SERVICE ENGINE SOON
39
419
SERVICE BRAKE
39
111
PARKING BRAKE
39
33
GLOW PLUG (DIESEL ONLY)
507
150
SPEEDO-METER
VOLT
FUEL
TEMP
OIL
C218
12040746
39
30
824
39
150
8
35
31
150
1234
11/629
508
68
507
150
419
111
33
593
150
15
14

RPO CODES

C7P - 16,000 LBS GVW RATING

HOT IN START OR RUN

HOT IN RUN

ALT 20 AMP

GAUGES 20 AMP

39-.8 PNK/BLK

550-.8 BLK/ORN

LOW COOLANT WARNING SENSOR (DIESEL ONLY)

68

C126 6288440

68

550-.8 BLK/ORN

68-.8 YEL/BLK

508-.8 YEL/BLK

111-.8 BLK

IGNITION SWITCH (SEE PAGE 4)

33-.8 TAN/WHT

IGNITION

GROUND

TO LAMP

FROM SWITCH

550 150 69 68

LOW COOLANT WARNING MODULE (DIESEL ONLY)

F 550 150 69 68 A

C223 12004706

AUTO APPLY PARK BRAKE SWITCH

(GASOLINE W/C7P) CLOSED WHEN AUTO PARK BRAKE IS APPLIED)

33 450

B A

C189 12010973

33 450

39-.8 PNK/BLK

PARK BRAKE SWITCH

(CLOSED WHEN PARKING BRAKE IS APPLIED)

33

C220 12010651

33-.5 TAN/WHT

450-.8 BLK/WHT

S209 (SEE PAGE 42)

39-.8 PNK/BLK

150-.8 BLK

69-.8 GRA

A 2 50 240 111 439 17 2 H
B 3 16 350 42 440 592 J
C 140 6 120 593 11 K
D 9 508 33 68 250 419 L
E 35 8 397 10 505 M
F 300 30 50 901 93 75 N
G 39 1234 31 59 50 824 14 4 P
1 2 3 4 5 10 9 8 7 6

I/P

481 W/GASOLINE

10 W/DIESEL

12015964

I/P

C100

DIESEL ONLY

GASOLINE ONLY GASOLINE ONLY

G 39 1234 31 59 50 824 14 4 P ENG
F 300 30 50 901 93 75 N
E 35 8 397 10 505 M
D 9 508 33 68 250 419 L
C 140 6 120 593 11 K
B 3 16 350 42 440 592 J
A 2 50 240 111 439 17 2 H

481 W/GASOLINE

10 W/DIESEL

12015113

GASOLINE ONLY DIESEL ONLY

GLOW PLUGS (SEE PAGE 44)

505-1.0 YEL (DIESEL ONLY)

PCM (SEE PAGE 35)

419-.8 BRN/WHT (GASOLINE ONLY)

I/P CLUSTER CONNECTOR (SEE PAGE 55)

1 34

508 39
69
505 30
150 824
19 39
33
111 150
8
35
31
150 150
15 1234
14 11

C218 12040744

39-.8 PNK/BLK

150-.8 BLK

111-.8 BLK

S111 (SEE PAGE 11)

150-.8 BLK

150-.8 BLK

15-.5 DK BLU

1234-.8 GRA/RED

PCM/TCM (SEE PAGE 41)

RH TURN SIGNAL (SEE PAGE 24)

LH TURN SIGNAL (SEE PAGE 24)

14-.5 DK GRN

111-.8 BLK

508-.8 YEL/BLK

68-.8 YEL/BLK

68-.8 YEL/BLK

12085003 (UPPER)
12085002 (LOWER)

GT100

39

508

508-.8 YEL/BLK

150

C127 12015793

WATER IN FUEL SENSOR (DIESEL ONLY)

39

508

150

SOLID-STATE

BRAKE PRESSURE WARNING SWITCH

111

C154 12004635

111

(CLOSES WHEN UNEQUAL PRESSURE EXISTS BETWEEN FRONT AND REAR BRAKES)

111-.8 BLK

S206

150-.8 BLK

150-.8 BLK

150-3.0 BLK

G200 I/P GROUND

450 2.0 BLK/WHT

G100 SHEET METAL GROUND

11-1.0 LT GRN

DIMMER SWITCH (SEE PAGE 14)

C-56 INDICATOR LAMPS

HOT IN START OR RUN

ALT
20 AMP

39-.8 PNK/BLK

S209
(SEE PAGE 42)

39-.8 PNK/BLK

DRAC
(SEE PAGE 42)

ENGINE TEMPERATURE SWITCH

(CLOSES AT APPROXIMATELY 107°C (225°F)

COOLANT TEMPERATURE SENDER

OIL PRESSURE SWITCH
(DIESEL)

FUEL PUMP OIL PRESSURE SENSOR AND SWITCH

FUEL PUMP

C104
6288704

C108
2962965
(DIESEL)

C119
2977935

C118
12065401

C401
12020829
12020827

31-.5 TAN

31-.5 TAN

30-.5 PPL

824-.8 LT BLU/BLK

30-.8 PNK

35-.5 DK GRN

31-.5 TAN

30-.8 PNK

F
E
D
C
B
A

12020926

C102

12020786

I/P CLUSTER CONNECTOR
(SEE PAGE 55)

C218
12040744

35-.5 DK GRN

30-.8 PNK

31-.5 TAN

30-.5 PPL

I/P

481 W/GASOLINE

10 W/DIESEL

12015964

150-2.0 BLK

150-.8 BLK

150-.8 BLK

S206
(SEE PAGE 11)

150-.8 BLK

150-3.0 BLK

31-.5 TAN

31-.5 TAN

35-.5 DK GRN

35-.5 DK GRN

GT100
12085003 (UPPER)
12085002 (LOWER)

GASOLINE ONLY

DIESEL ONLY

GASOLINE ONLY

ENG

481 W/GASOLINE

10 W/DIESEL

12015113

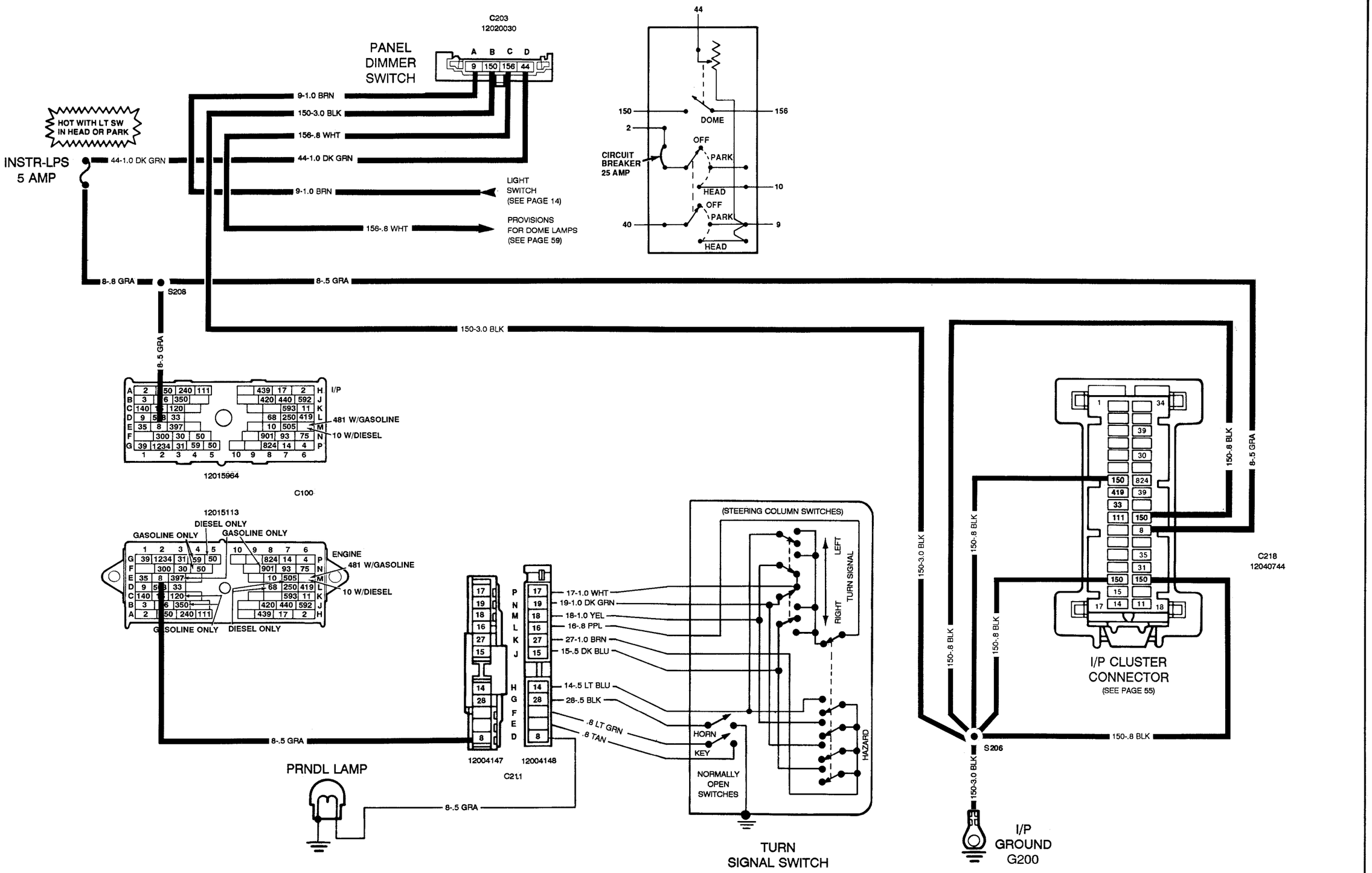
GASOLINE ONLY

DIESEL ONLY

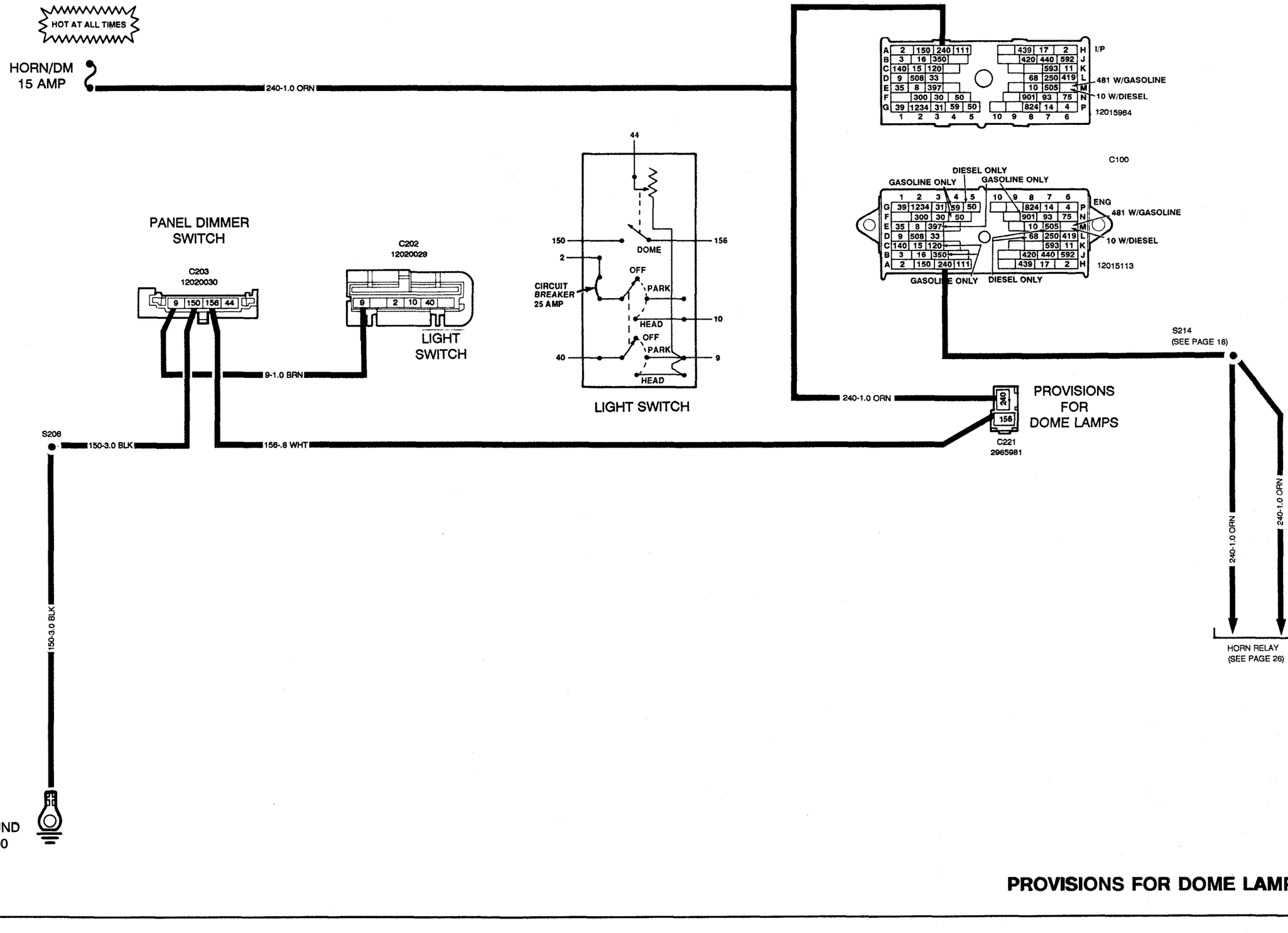
C100

FRAME GROUND G400

I/P GROUND G200



C-58 INSTRUMENT PANEL LAMPS


HOT AT ALL TIMES
HORN/DM
15 AMP
240-1.0 ORN
I/P
481 W/GASOLINE
10 W/DIESEL
12015964
C100
DIESEL ONLY
GASOLINE ONLY
GASOLINE ONLY
ENG
481 W/GASOLINE
10 W/DIESEL
12015113
GASOLINE ONLY
DIESEL ONLY
PANEL DIMMER
SWITCH
C203
12020030
C202
12020029
LIGHT
SWITCH
44
150
DOME
156
2
OFF
PARK
CIRCUIT
BREAKER
25 AMP
HEAD
10
OFF
PARK
40
9
HEAD
LIGHT SWITCH
9-1.0 BRN
240-1.0 ORN
PROVISIONS
FOR
DOME LAMPS
C221
2965981
S214
(SEE PAGE 18)
S206
150-3.0 BLK
156-.8 WHT
240-1.0 ORN
240-1.0 ORN
HORN RELAY
(SEE PAGE 26)
150-3.0 BLK
I/P
GROUND
G200

CIRCUIT OPERATION

BACKUP LAMPS

With the Ignition Switch in RUN or START, voltage is applied through the TURN/BU Fuse to the Transmission Position Switch or the Backup Lamp Switch. Whenever the gear selector lever is shifted to REVERSE, the Transmission Position Switch or the Backup Lamp Switch closes and voltage is applied to the Backup Lamps and the lamps turn on.

PARK, TAIL, MARKER, AND LICENSE LAMPS

Voltage is applied through the TAIL LPS Fuse to the Light Switch at all times. With the Light Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps.

DIAGNOSIS -- REAR EXTERIOR LAMPS

PRELIMINARY CHECKS:

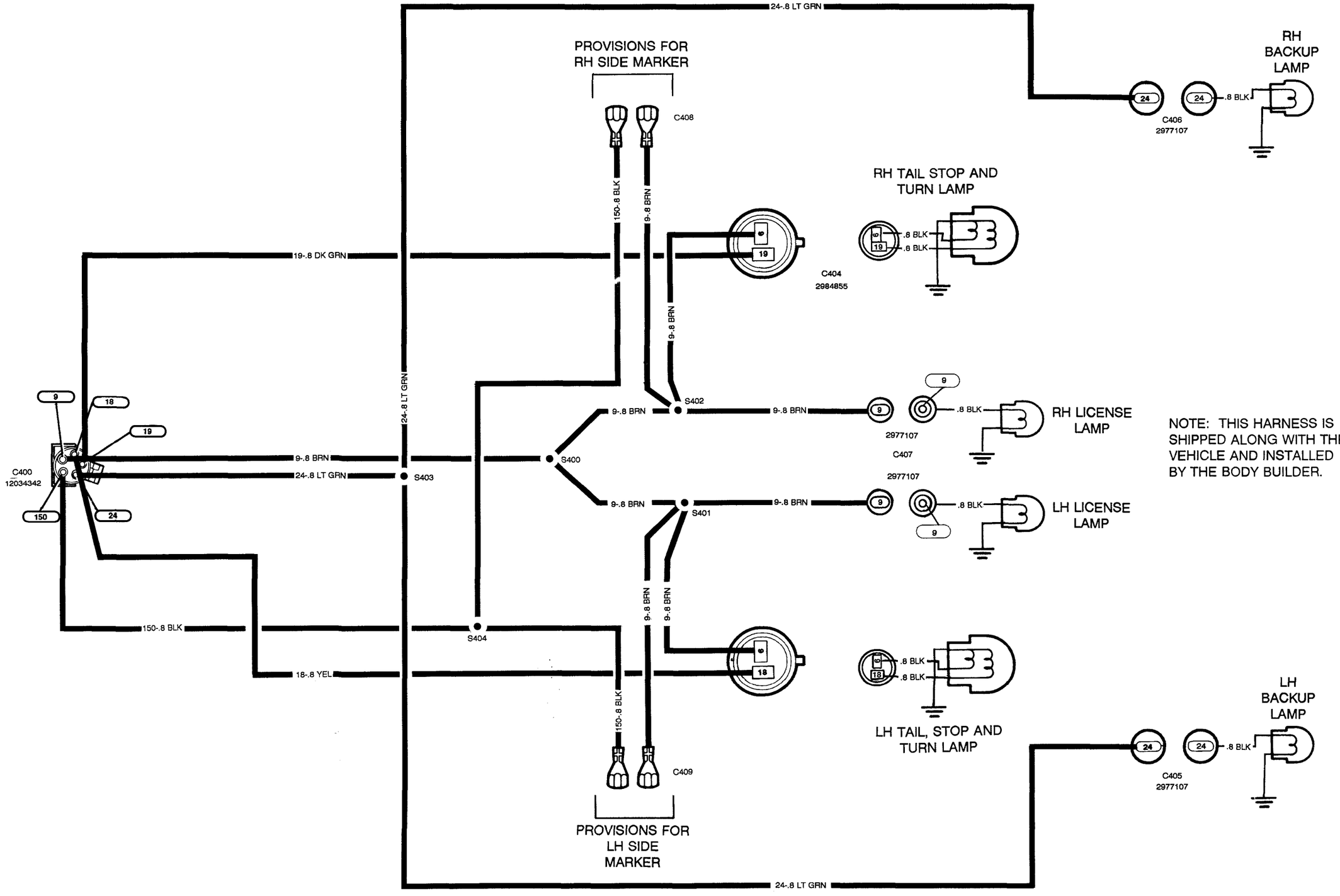
The rear lamp systems (taillamps, backup lamps, and license plate lamps) all receive voltage from the same wire circuit (BRN 9) and are grounded at the bulb socket(s). If only one system is not working, LOCATE and REPAIR an open in the wiring and/or bulbs that pertain to that system.

NONE OF THE REAR LAMP SYSTEMS OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from ORN (40) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of TAIL LPS fuse. If fuse is good, LOCATE and REPAIR open in RED (2) wire from light switch connector C202 to battery junction block and/or ORN (40) wire from light switch connector C202 to fuse block.
2. Place light switch to PARK position. Connect test lamp from BRN (9) wire at light switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE light switch.
3. Connect a test lamp from BRN (9) wire at rear lamp harness connector C400 to ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from rear lamp harness connector C400 to light switch connector C202.

BACKUP LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place transmission in reverse. Connect test lamp from LT GRN (24) wire at rear lamp harness connector C400 to ground.	Test lamp lights.	ISOLATE problem in body builder's installed wiring.
	Test lamp does not light.	GO to step 2.
2. Connect a test lamp from DK BLU (75) wire at backup lamp switch connector C214 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of TURN/BU fuse. If fuse is good, LOCATE and REPAIR open in DK BLU (75) wire from backup lamp switch connector C214 to fuse block and DK BLU (38) wire.
3. Connect a test lamp from LT GRN (24) wire at backup lamp switch connector C214 to ground.	Test lamp lights.	LOCATE and REPAIR open in LT GRN (24) wire from backup lamp switch connector C214 to rear lamp harness connector C400.
	Test lamp does not light.	Adjust backup lamp switch. If backup lamp switch will not adjust properly, REPLACE backup lamp switch.



NOTE: THIS HARNESS IS SHIPPED ALONG WITH THE VEHICLE AND INSTALLED BY THE BODY BUILDER.

REAR LAMPS HARNESS C-61

HOT AT ALL TIMES

TAIL LPS
20 AMP

40-1.0 ORN

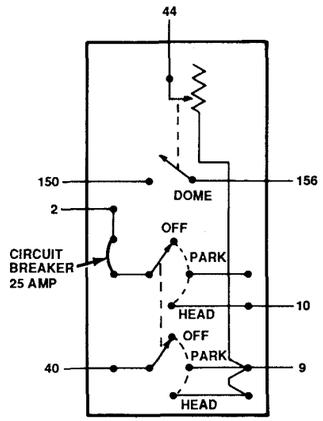
C247
12020030
PANEL DIMMER
SWITCH

9 44

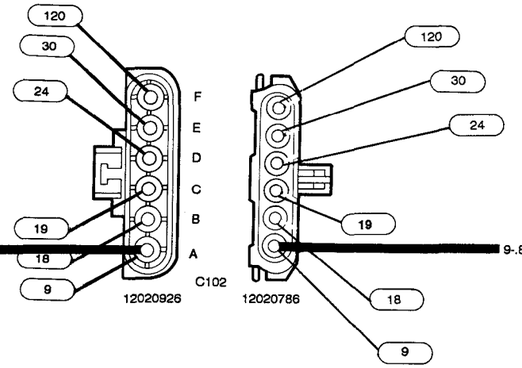
9 2 10 40

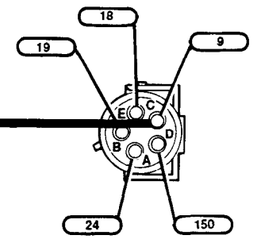
C202
12020029

9-1.0 BRN



LIGHT
SWITCH



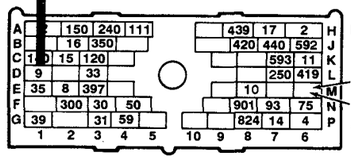


REAR
LAMP
HARNESS

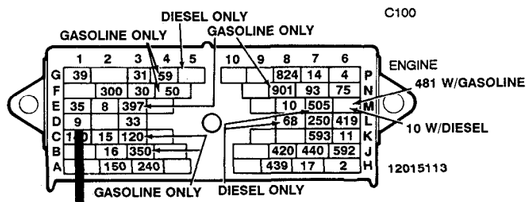
C400
12065158

9-.8 BRN

9-1.0 BRN



C100

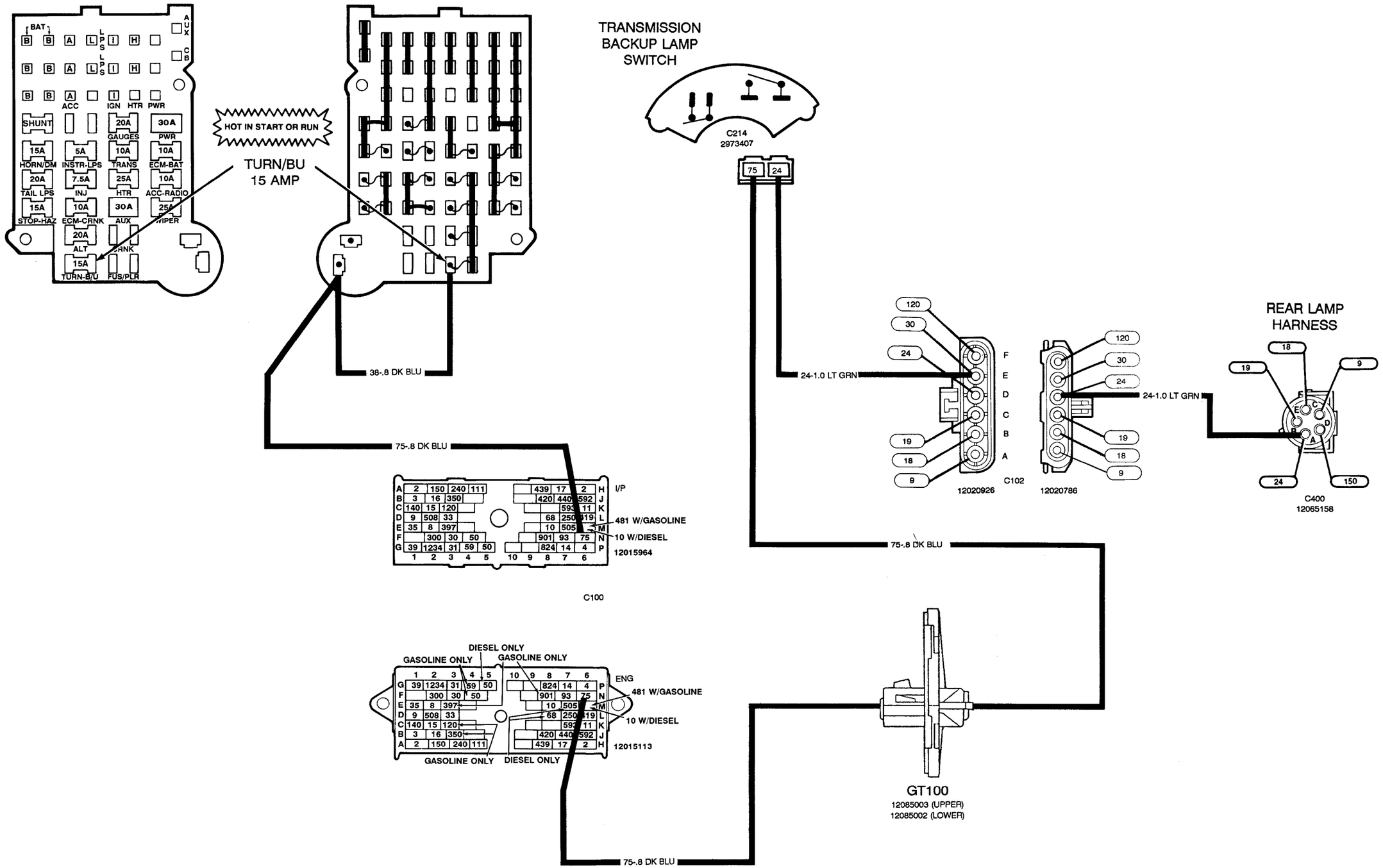


9-1.0 BRN

9-.8 BRN

S115
(SEE PAGE 15)

GT100
12085003
(UPPER)
12085002
(LOWER)


BAT
AUX
CB
ACC
IGN
HTR
PWR
SHUNT
20A
GAUGES
30A
PWR
15A
HORN/DM
5A
INSTR-LPS
10A
TRANS
10A
ECM-BAT
20A
TAIL LPS
7.5A
INJ
25A
HTR
10A
ACC-RADIO
15A
STOP-HAZ
10A
ECM-CRNK
30A
AUX
25A
WIPER
20A
ALT
CRNK
15A
TURN-B/U
FUS/PLR
HOT IN START OR RUN
TURN/BU
15 AMP
38-.8 DK BLU
75-.8 DK BLU
TRANSMISSION
BACKUP LAMP
SWITCH
C214
2973407
75
24
24-1.0 LT GRN
120
30
24
19
18
9
F
E
D
C
B
A
C102
12020926
12020786
REAR LAMP
HARNESS
18
19
9
24
150
C400
12065158
I/P
481 W/GASOLINE
10 W/DIESEL
12015964
C100
DIESEL ONLY
GASOLINE ONLY
ENG
12015113
GT100
12085003 (UPPER)
12085002 (LOWER)

CIRCUIT OPERATION

VACUUM SYSTEMS

A vacuum-operated component uses the force of normal air pressure working against the lower air pressure of a partial vacuum to operate the component. The vacuum created within the inlet manifold when the engine is running is stored in a vacuum tank in the engine compartment. A check valve in the line feeding vacuum to the tank keeps the stored vacuum from weakening when inlet manifold vacuum drops during high speed or high power operation.

Vacuum is routed through hoses (and in some cases, tubing) to a mechanical or electric valve that provides a means of controlling the vacuum-operated component. When the valve is open, it allows vacuum to go to an actuator that actually operates the component. When the component is to be returned to its original position, the valve cuts off the vacuum to the actuator hose and vents the hose to normal air pressure.

A typical actuator is a metal shell with a movable shaft that retracts and extends to mechanically operate the component. A flexible diaphragm separates the interior of the shell into two chambers - a sealed chamber to which vacuum can be admitted, and an open chamber exposed to normal air pressure. The movable shaft is attached to the center of the diaphragm and extends from the open chamber.

When the vacuum is directed to the sealed chamber, normal air pressure presses on the other side of the diaphragm and causes it to retract the shaft. When the vacuum is cut off, the sealed chamber is vented to outside air to balance the air pressure on both sides of the diaphragm and eliminate the force that retracted the shaft. A coiled spring within the sealed chamber expands to push the diaphragm back to its original positions. This extends the shaft.

EXHAUST GAS RECIRCULATION VACUUM SYSTEM

All 1991 P-Motorhome gasoline engines are equipped with an exhaust gas recirculation (EGR) system. The EGR system allows a small amount of exhaust gas to flow from the exhaust manifold into the inlet manifold when the throttle is opened beyond idle and inlet manifold vacuum is normal. This reduces combustion temperatures in the engine to control oxides of nitrogen emissions.

The EGR valve is operated by an integral vacuum actuator that controls a pintle within the valve. The pintle remains closed to prevent exhaust gas recirculation until vacuum is applied to the actuator. The vacuum causes the pintle to open, allowing a measured flow of exhaust gas to enter the inlet manifold.

The EGR system remains closed during periods of engine idle and deceleration to prevent rough idle from excessive dilution of the fuel-air mixture. It also remains closed at wide-open throttle to prevent power loss. At other times, it rapidly cycles open and closed to modulate the flow of exhaust gas as required. Under certain circumstances, it may remain fully open to provide the maximum EGR.

A manifold absolute pressure (MAP) sensor measures the strength of the vacuum in the EGR vacuum circuit and sends a signal back to the electronic control module (ECM). If actual vacuum differs from the preferred vacuum as calculated by the ECM, the ECM will adjust the on-off intervals of the EGR valve to correct the flow of exhaust gas into the cylinders. This provides the required control of oxides of nitrogen emissions while retaining engine performance under all operating conditions. The ECM also uses the signal from the MAP sensor to control fuel delivery and ignition timing.

Vacuum for the EGR system is taken from the throttle body and routed through a hose to the electronic vacuum regulator valve (EVRV) solenoid. The solenoid is controlled by the 435 circuit from the ECM. When the solenoid opens the electronic vacuum regulator valve vacuum reaches the EGR actuator through another vacuum hose and opens the EGR pintle valve to allow exhaust gas to flow into the inlet manifold. When the EVRV solenoid is released, the valve vents the EGR actuator to outside air to close the EGR pintle valve.

EGR VALVE VACUUM SYSTEM

A leak in the EGR (exhaust gas recirculation) vacuum system can upset the ECM's programmed control of exhaust gas recirculation and adversely affected engine operation. Too much exhaust gas recirculation at idle or cruise can result in the engine stalling after closed throttle deceleration, surging during steady throttle cruising, or a rough idle. Too little exhaust gas flow allows combustion temperatures to become too high and bring about detonation ("spark knock") or an overheated engine. In addition, nitrous oxide emissions may be high enough to cause the vehicle to fail an emissions test.

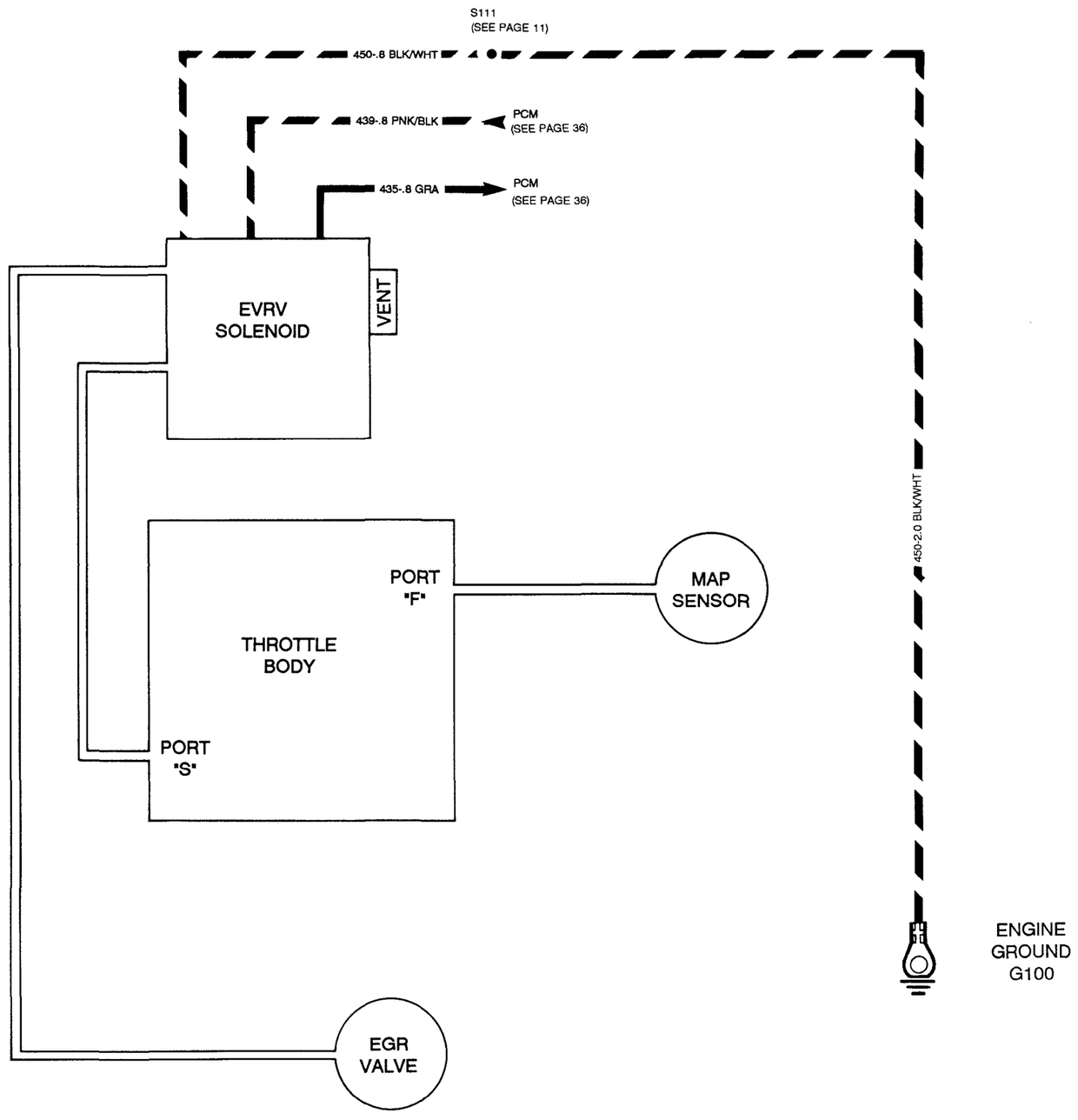
Because the source of a EGR system symptom might be traced to a mechanical or electrical condition as well as a faulty vacuum system, an effective systematic diagnosis procedure should examine all three categories of components -- not just the vacuum system alone. Therefore, no exclusive vacuum system diagnosis procedures are provided here. For more information on the EGR system, refer to the 1991 "Fuel and Emissions Service Manual."

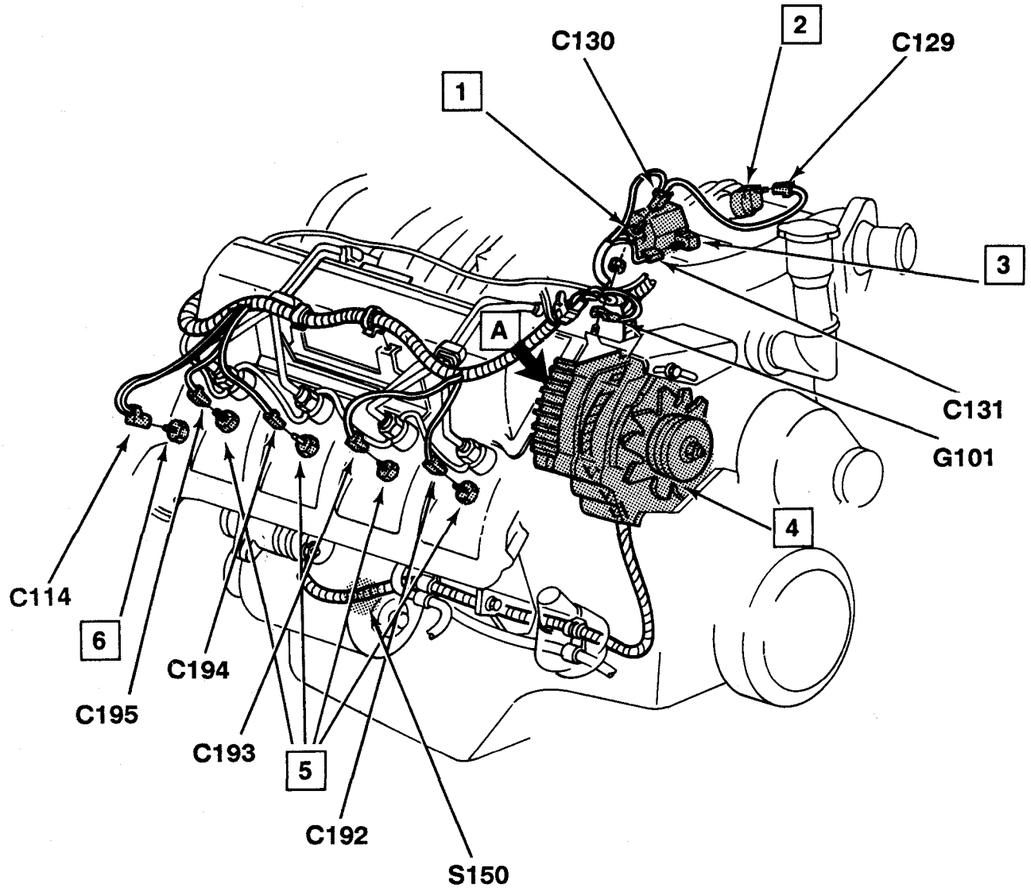
DIAGNOSIS

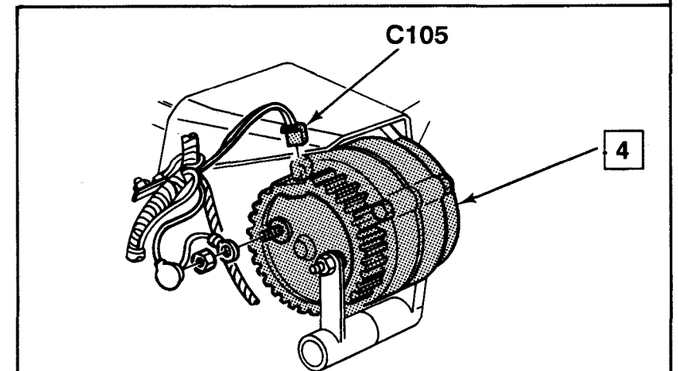
Conditions most likely to cause vacuum system problems include hoses that leak or become disconnected. With the engine running, either condition is easily detected from the hiss of air at the opening. Other common vacuum problems are kinked or obstructed hoses, hoses connected incorrectly or binding components.

A vacuum pump can be used as a vacuum source to operate components and test the system. The built-in vacuum gage of the pump provides a means of checking for a vacuum leak as well. Once vacuum is applied to operate the component, the gage should hold steady until the vacuum is purposely released.

On vacuum systems that are controlled by electrical or electronic switches, check for a blown fuse, wiring that is cracked, frayed or burned, and high resistance in connectors of the control circuit(s) before checking for a suspected vacuum system problem.

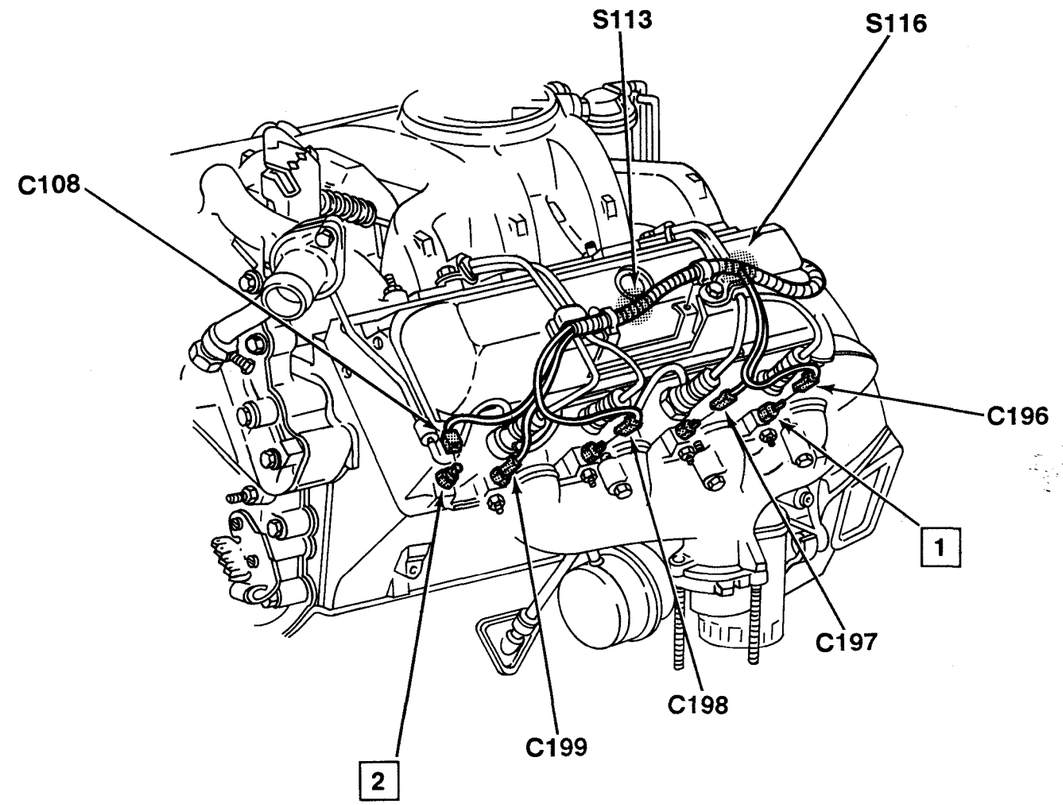

S111
(SEE PAGE 11)
450-.8 BLK/WHT
439-.8 PNK/BLK
PCM
(SEE PAGE 36)
435-.8 GRA
PCM
(SEE PAGE 36)
EVRV
SOLENOID
VENT
PORT
"F"
MAP
SENSOR
THROTTLE
BODY
PORT
"S"
EGR
VALVE
450-2.0 BLK/WHT
ENGINE
GROUND
G100





1. Cold Advance Control
2. Fast Idle Solenoid
3. Fuel Shut-Off Valve
4. Generator
5. Glow Plug (RH)
6. Cold Advance and Fast Idle Temperature Switch

Figure 1 - Engine Wiring Harenss -- RH Side (6.2L V8 HD Diesel Engine)



1. Glow Plug (LH)
2. Coolant Temperature Sender

Figure 2 - Engine Wiring Harness -- LH Side (6.2L V8 HD Diesel Engine)

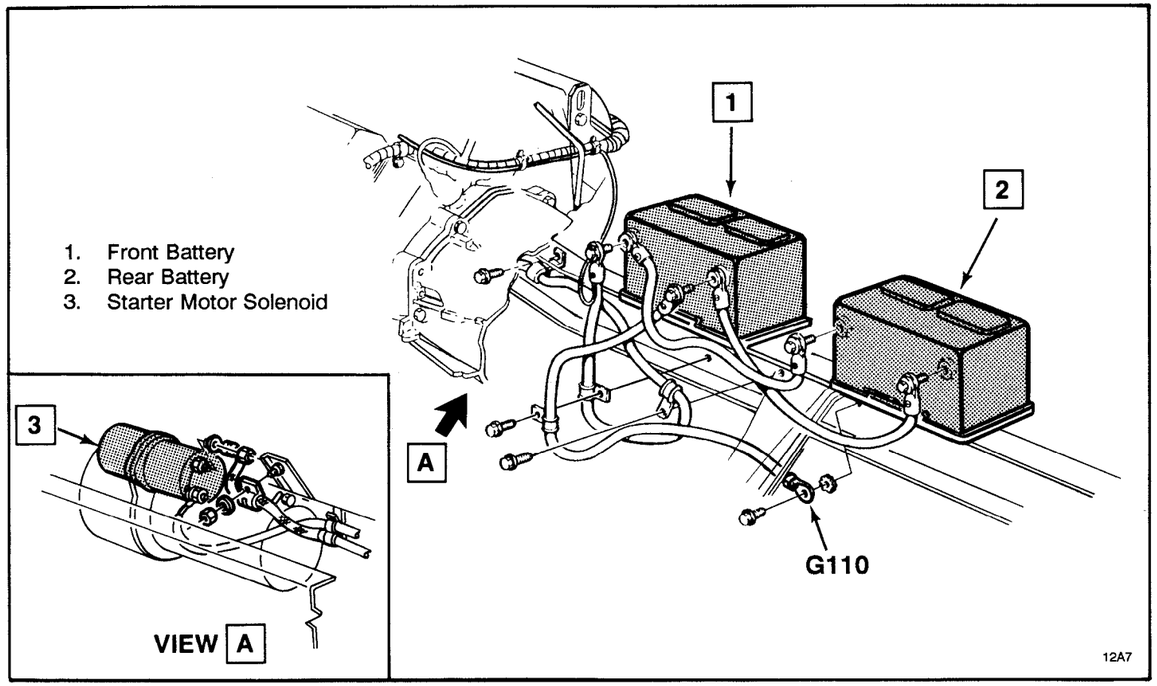


Figure 3 - Batteries and Cables (6.2L V8 HD Diesel Engine)

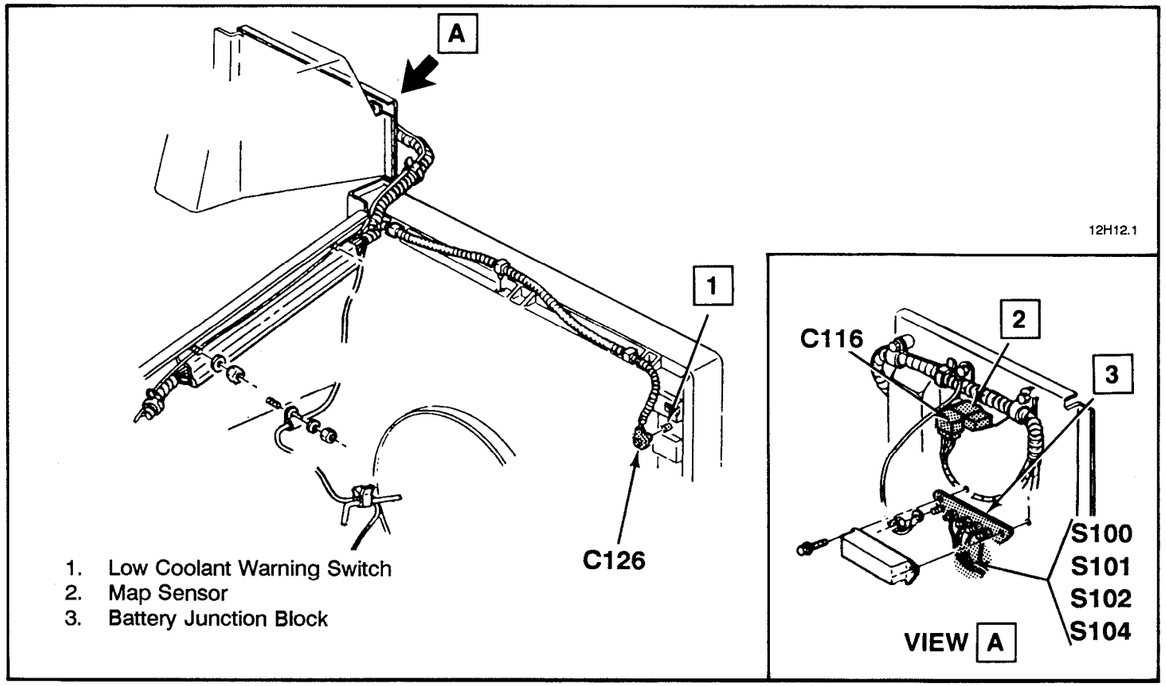


Figure 5 - Engine Wiring Harness to Cowl/Radiator (6.2L V8 HD Diesel Engine)

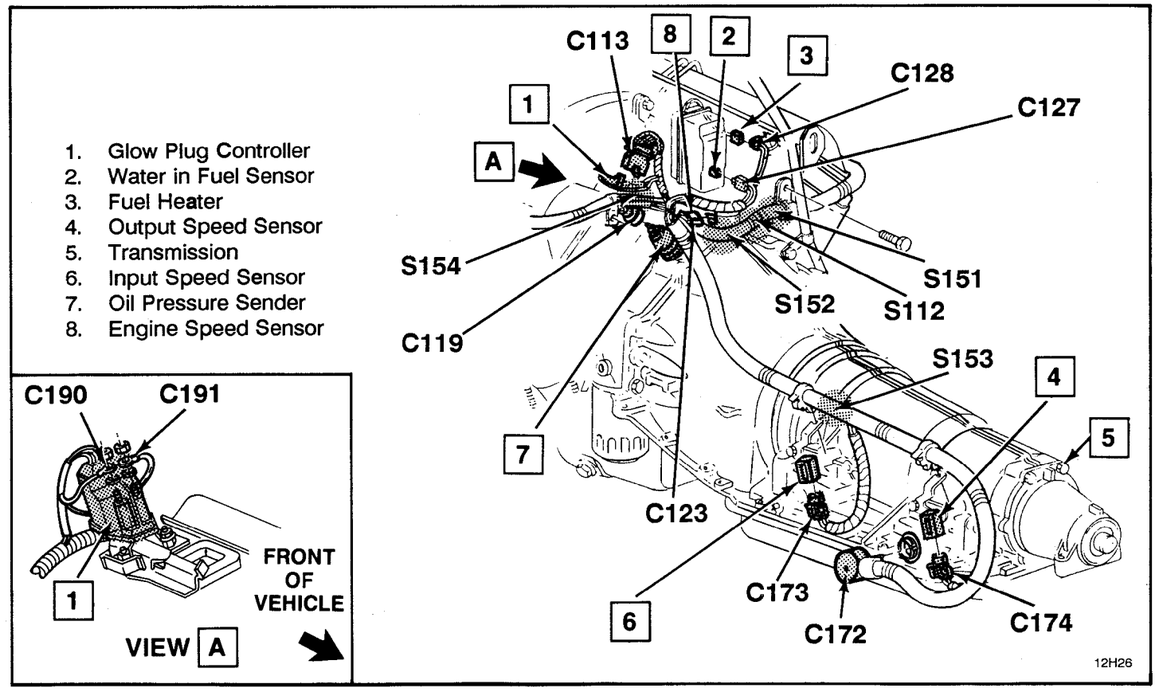


Figure 4 - Engine Wiring Harness -- Rear (6.2L V8 HD Diesel Engine)

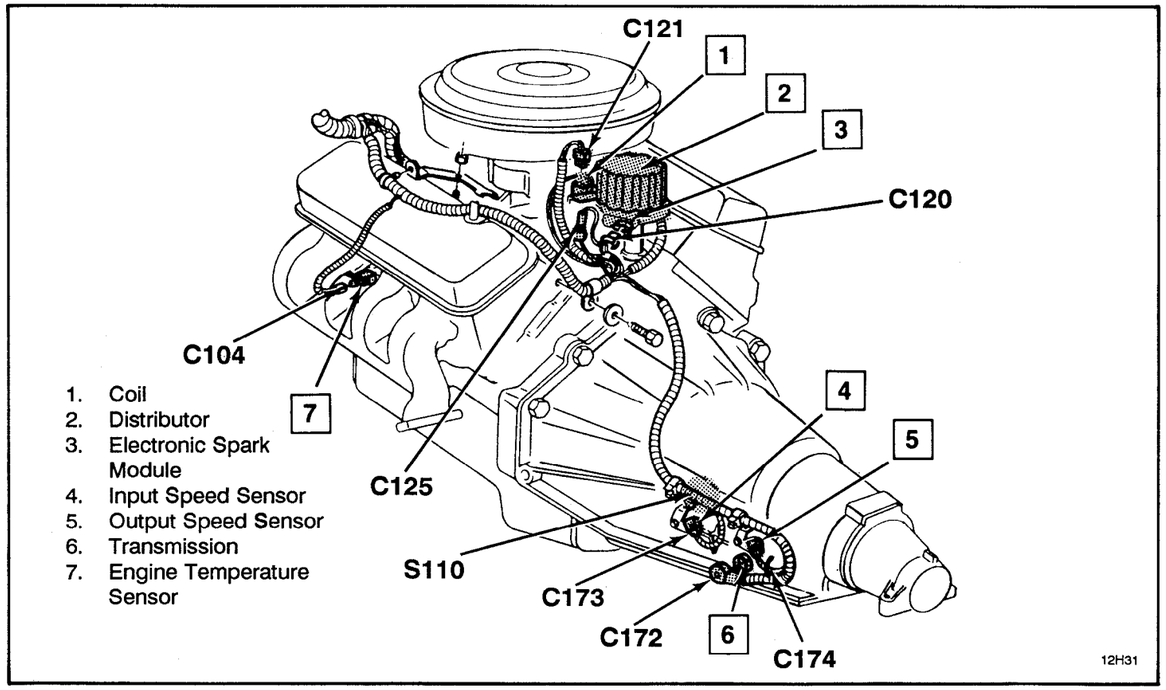
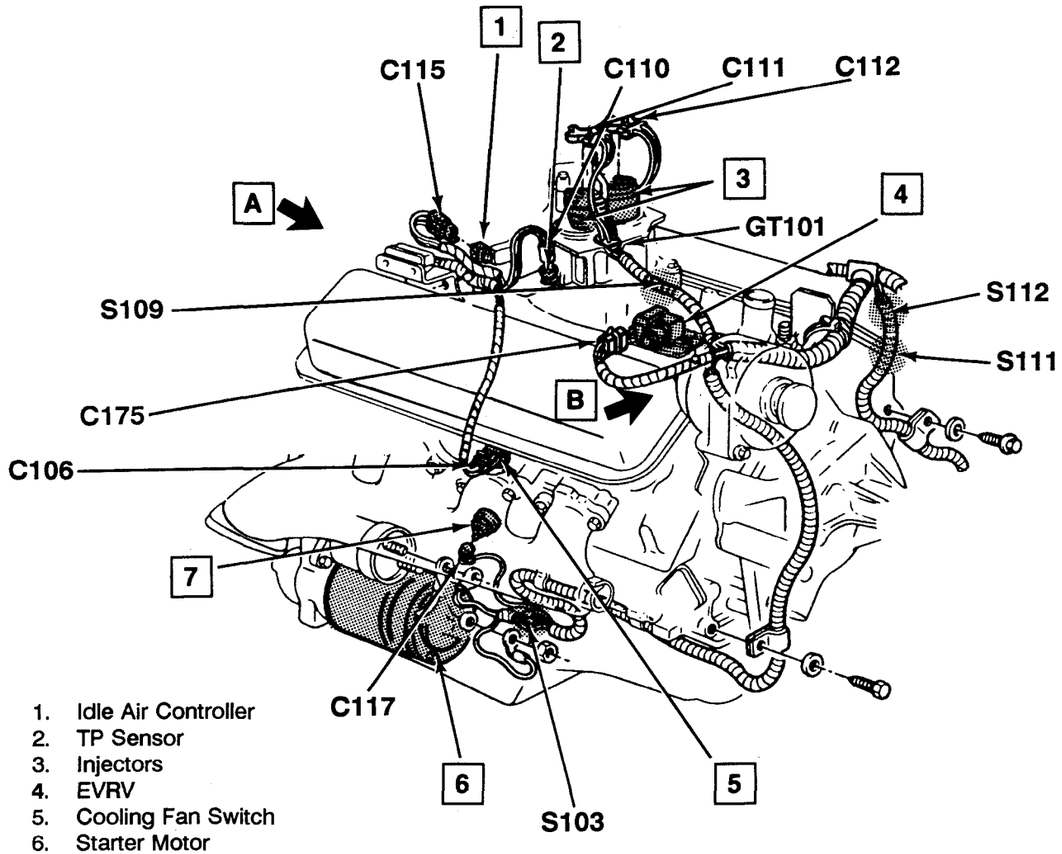
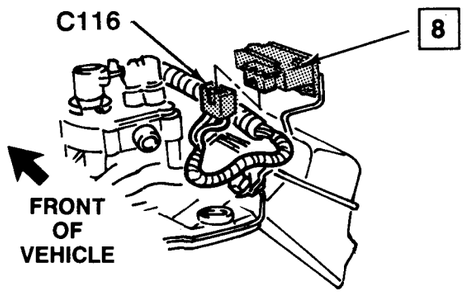


Figure 6 - Engine Wiring Harness -- LH Side (7.4L V8 Gasoline Engine)

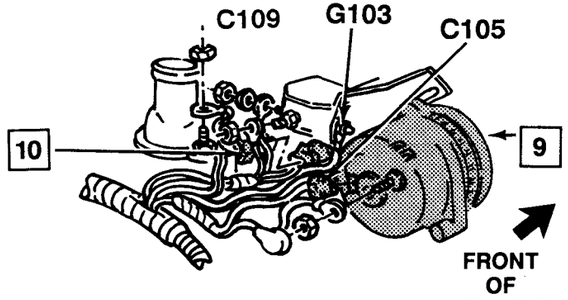


1. Idle Air Controller
2. TP Sensor
3. Injectors
4. EVRV
5. Cooling Fan Switch
6. Starter Motor
7. Knock Sensor
8. Map Sensor
9. Generator
10. Coolant Temperature Sensor

12H32

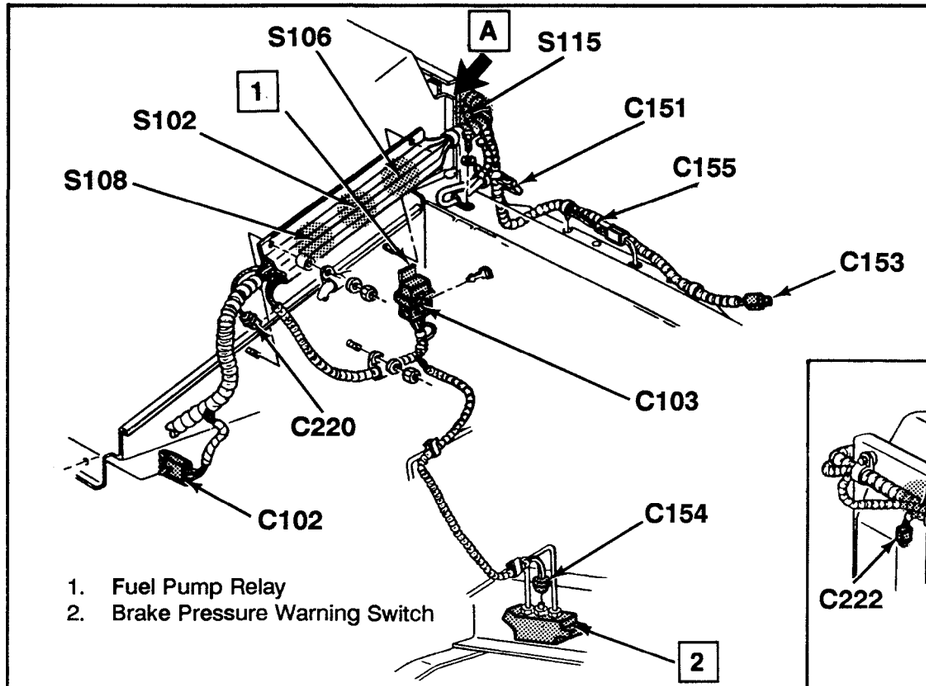


VIEW A

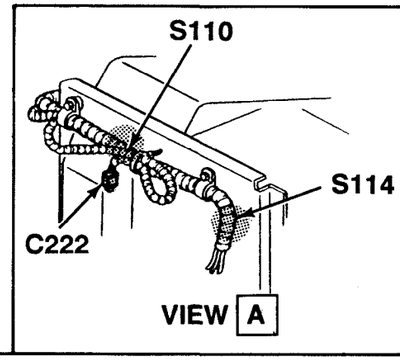


VIEW B

Figure 7 - Engine Wiring Harness, RH Side (7.4L V8 Gas Engine)

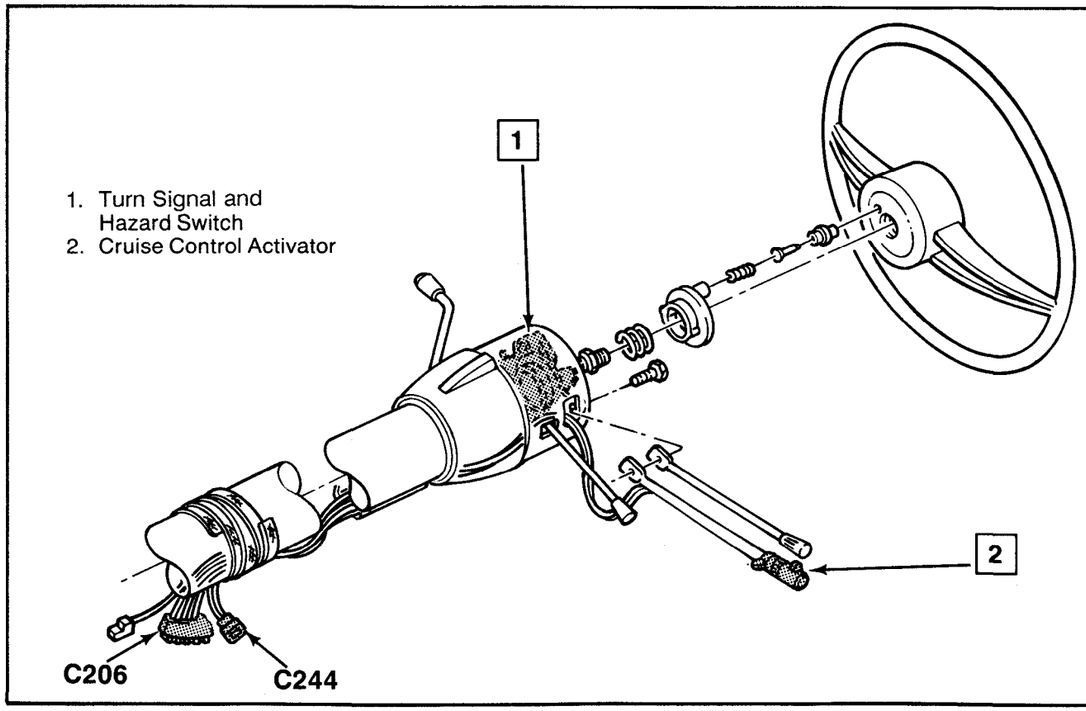


1. Fuel Pump Relay
2. Brake Pressure Warning Switch



12H11

Figure 8 - Engine Wiring Harness to Cowl (7.4L V8 Gasoline Engine)



1. Turn Signal and Hazard Switch
2. Cruise Control Activator

Figure 9 - Steering Column Switches

C-68 COMPONENT LOCATOR VIEWS

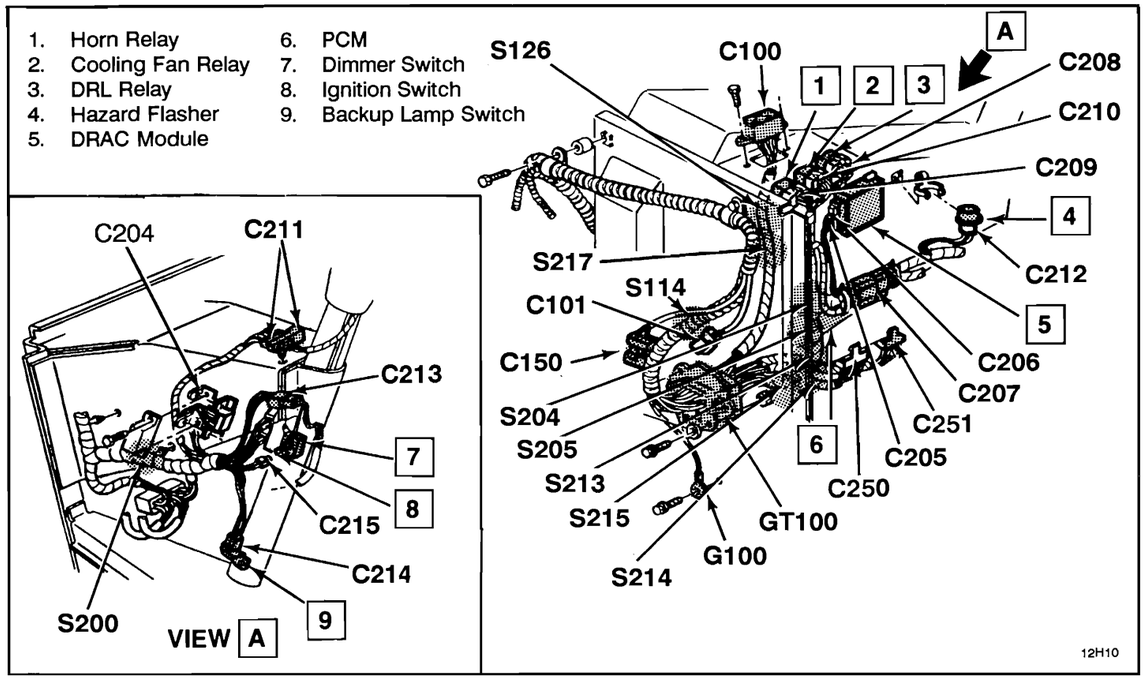


Figure 10 - Engine Wiring Harness to Cowl (7.4L V8 Gasoline Engine)

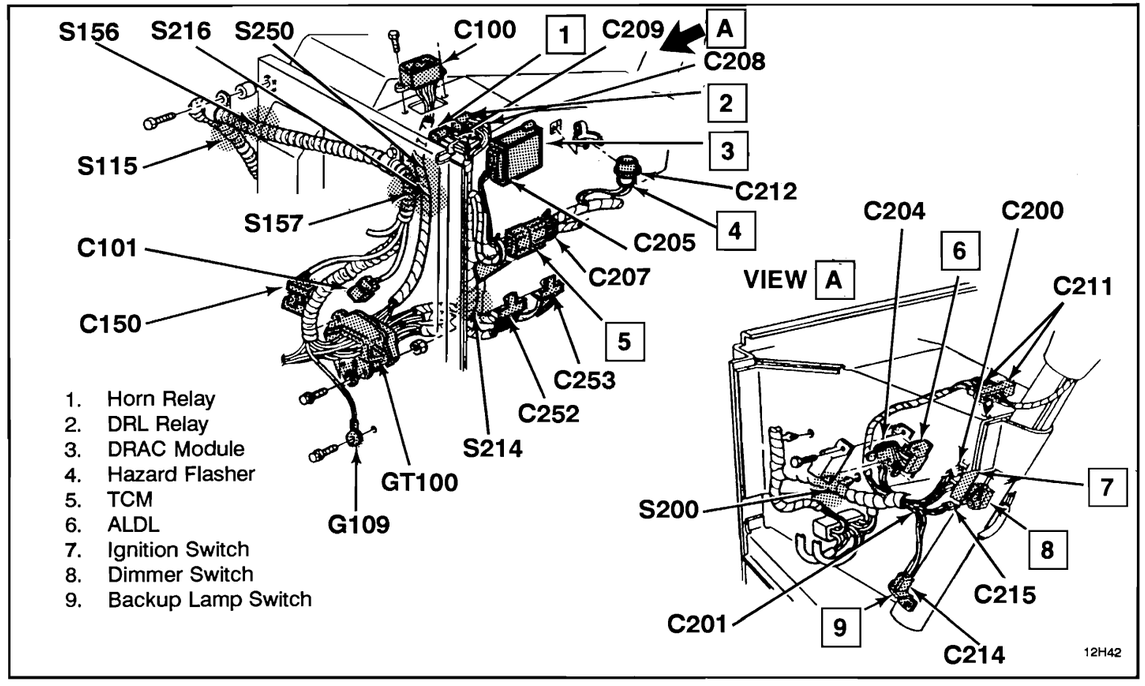


Figure 11 - Engine Wiring Harness to Cowl (6.2L V8 HD Diesel Engine)

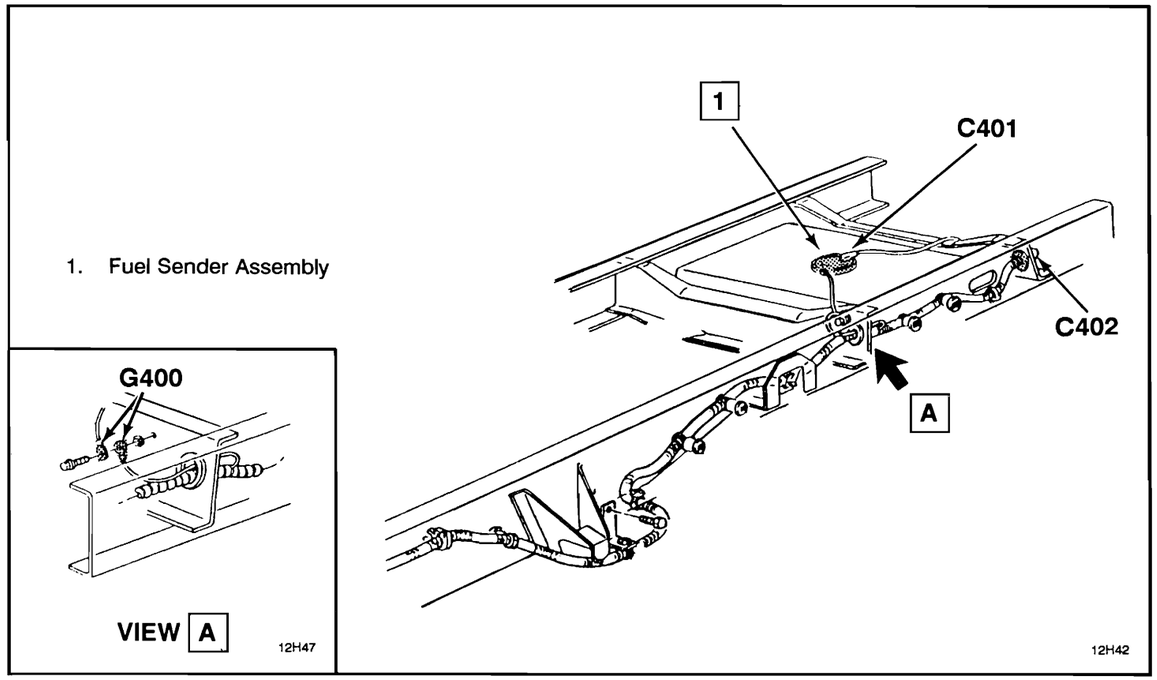


Figure 12 - Fuel Sender and Rear Lamp Wiring

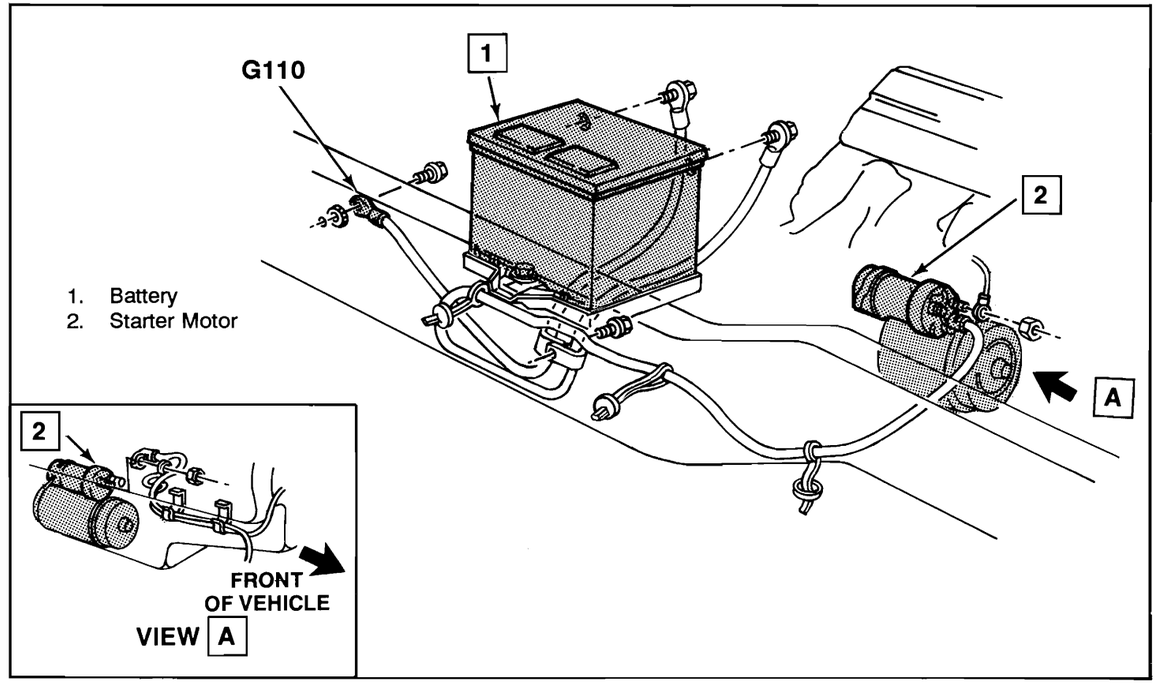


Figure 13 - Battery and Leads (7.4L V8 Gasoline Engine)

COMPONENT LOCATION

		Page	Figure
Auxiliary Cooling Fan Relay	Top LH side of shipping panel	69	10
Auxiliary Cooling Fan Switch	RH side of engine	68	7
Backup Lamp Switch	On steering column	69	10
		69	11
Battery, Front	RH frame rail behind engine	67	3
Battery, Rear	RH frame rail behind engine	67	3
		69	13
Battery Junction Block	LH side of shipping panel	67	5
Brake Pressure Warning Switch	Near master cylinder	68	8
Cold Advance Control	Top front of engine	66	1
Cold Advance Fast Idle Temperature Switch	RH rear of engine	66	1
Coolant Temperature Sender (Diesel)	LH front of engine	66	2
Coolant Temperature Sensor (Gasoline)	Top RH front of engine	68	7
Cruise Control Switch	LH side of steering column	68	9
Distributor	Top rear of engine	67	6
DRAC Module	Inside LH side of shipping panel	69	10
		69	11
DRL Relay	Top LH side of shipping panel	69	10
		69	11
Engine Speed Sensor	Rear of engine	67	4
Engine Temperature Sensor	LH side of engine	67	6
ESC Module	Top of engine near distributor	67	6
EVRV	RH front of engine	68	7
Fast Idle Solenoid	Top front of engine	66	1
Fuel Heater	Top rear of engine	67	4
Fuel Pump Relay	LH frame rail behind shipping panel	68	8
Fuel Sender	Inside fuel tank	69	12
Fuel Shutoff Valve	Top front of engine	66	1
Generator (Diesel)	Front of engine	66	1
Generator (Gasoline)	Front of engine	68	7
Glow Plug #1	LH side of engine	66	2
Glow Plug #2	RH side of engine	66	1
Glow Plug #3	LH side of engine	66	2
Glow Plug #4	RH side of engine	66	1
Glow Plug #5	LH side of engine	66	2
Glow Plug #6	RH side of engine	66	1
Glow Plug #7	LH side of engine	66	2
Glow Plug #8	RH side of engine	66	1
Glow Plug Controller	Top LH rear of engine	67	4
Hazard Flasher	Top LH side of shipping panel	69	10
		69	11
Headlamp Dimmer Switch	LH side of steering column	69	11
Horn Relay	Top LH side of shipping panel	69	10
		69	11
Idle Air Control Actuator	Top LH side of engine	68	7
Ignition Coil	Top rear of engine	67	6
Ignition Switch	On steering column	69	10
		69	11
Injector #1	Top of engine	68	7
Injector #2	Top of engine	68	7
Input Speed Sensor	LH side of transmission	67	4
		67	6
Knock Sensor	RH side of engine	68	7
Low Coolant Warning Switch	RH side of radiator	67	5
MAP Sensor (Diesel)	LH side of shipping panel	67	5
MAP Sensor (Gasoline)	RH rear of engine	68	7
Oil Pressure Sender	LH rear of engine	67	4
Output Speed Sensor	LH side of transmission	67	4
		67	6
PCM	LH side behind shipping panel	69	10
Starter Motor	RH side of engine	67	3
		68	7
		69	13
TCM	LH side behind shipping panel	69	11
TP Sensor	Top of engine	68	7
Turn Signal Switch	LH side of steering column	68	9
Water in Fuel Sensor	RH rear of engine	67	4
Connectors:			
C100	Top of LH cowl	69	10
		69	11
C101	Front of LH cowl	69	10
		69	11
C102	LH frame rail near front	68	8
C103	At fuel pump relay	68	8
C104	At engine temperature sensor	67	6
C105	At generator	66	1
		68	7
C106	At cooling fan switch	68	7
C108	At coolant temperature switch	66	2
C109	At coolant temperature sender	68	7
C110	At TP sensor	68	7
C111	At RH injector	68	7
C112	At LH injector	68	7
C113	At glow plug controller	67	4
C114	At cold advance/fast idle temperature switch	66	1
C115	At idle air controller	68	7
C116	At MAP sensor	67	5
		68	7
C117	At knock sensor	68	7
C119	At oil pressure sender	67	4
C120	At electronic spark control	67	6
C121	At ignition coil	67	6
C123	At engine speed sensor	67	4
C125	Left of distributor	67	6
C126	At low coolant warning switch	67	5
C127	At water in fuel sensor	67	4
C128	At fuel heater	67	4
C129	At fast idle solenoid	66	1
C130	At cold advance control	66	1
C131	At fuel shutoff valve	66	1

COMPONENT LOCATION

		Page	Figure
C150	LH side of front crossmember	69	10
		69	11
C151	LH side of front crossmember	68	8
C153	RH side of front crossmember	68	8
C154	At brake pressure warning switch	68	8
C155	Center of front crossmember	68	8
C172	At transmission electronic control	67	4
		67	6
C173	At output speed sensor	67	4
		67	6
C174	At input speed sensor	67	4
		67	6
C175	At EVRV	68	7
C190	At glow plug controller	67	4
C191	At glow plug controller	67	4
C192	At #2 glow plug	66	1
C193	At #4 glow plug	66	1
C194	At #6 glow plug	66	1
C195	At #8 glow plug	66	1
C196	At #7 glow plug	66	2
C197	At #5 glow plug	66	2
C198	At #3 glow plug	66	2
C199	At #1 glow plug	66	2
C200	At ignition switch	69	11
C201	At ignition switch	69	11
C204	At ALDL	69	11
C205	At DRAC module	69	10
		69	11
C206	Base of steering column	68	9
		69	10
C207	LH frame rail behind cowl	69	10
		69	11
C208	At DRL relay	69	10
		69	11
C209	At horn relay	69	10
		69	11
C210	At cooling fan relay	69	10
C211	Lower left of steering column	69	10
		69	11
C212	At hazard flasher	69	10
		69	11
C213	Lower left of steering column	69	10
C214	At backup lamp switch	69	10
		69	11
C215	At headlamp dimmer switch	69	10
		69	11
C220	LH frame rail near cowl	68	8
C222	LH cowl top center	68	8
C244	Base of steering column	68	8
C250	LH front frame rail	69	10
C251	LH front frame rail	69	10
C252	LH front frame rail	69	11
C253	LH front frame rail	69	11
C401	At fuel level sender	69	12
C402	LH side of rear crossmember	69	12
Grommets:			
GT100	LH side of cowl	69	10
		69	11
GT101	Injector body	68	7
Grounds:			
G100	Lower LH side of cowl	69	10
G101	Top front of engine	66	1
G103	At alternator bracket	68	7
G109	Lower LH side of cowl	69	11
G110	RH frame rail below rear battery	67	3
		69	13
G400	LH crossmember in front of fuel tank	69	12
Splices:			
S100	Battery junction block	67	5
S101	Battery junction block	67	5
S102	Battery junction block	67	5
S103	RH lower side of engine	68	7
S104	Battery junction block	67	5
S106	LH frame rail behind cowl	68	8
S108	LH frame rail behind cowl	68	8
S109	Front center of engine	68	7
S110	LH side of transmission (diesel)	67	6
	LH side of cowl (gasoline)	68	8
S111	Front RH side of engine	68	7
S112	Rear center top of engine	67	4
		68	7
S113	LH top of engine	66	2
S114	LH side of cowl	68	8
		69	10
S115	RH side of cowl	68	8
		69	11
S116	LH top rear of engine	66	2
S126	LH side of cowl	69	10
S150	RH lower side of engine	66	1
S151	Rear center of engine	67	4
S152	Rear center of engine	67	4
S153	LH side of transmission	67	4
S154	LH top rear of engine	67	4
S156	RH top side of cowl	69	11
S157	LH top side of cowl	69	11
S200	Cowl near steering column	69	10
		69	11
S204	Lower RH corner behind cowl	69	10
S205	Lower RH corner behind cowl	69	10
S213	Lower RH corner behind cowl	69	10
S214	Lower RH corner behind cowl	69	10
		69	11
S215	Lower RH corner behind cowl	69	10

		Page	Figure
S216 6	LH top of cowl	69	11
S217 7	Top LH corner of cowl	69	10
S250	Top LH corner of cowl	69	11

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Antilock Brakes, Rear Wheel, R/V A-116
Audio Alarm, R/V A-111
Auxiliary Battery, R/V A-22
Auxiliary Cooling Fan, R/V A-89
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Auxiliary Fuel Tank and Fuel Tank Selector Switch, Diesel, R/V A-81
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