1990
ELECTRICAL DIAGRAMS AND DIAGNOSIS MANUAL

R/V, P TRUCK MODELS

When reference is made in this manual to a brand name, number, or specific tool, an equivalent product may be used in place of the recommended item.

This manual should be kept in a handy place for ready reference. If properly used, it will enable the technician to better serve the owners of Chevrolet vehicles.

All information, illustrations, and specifications contained in this manual are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

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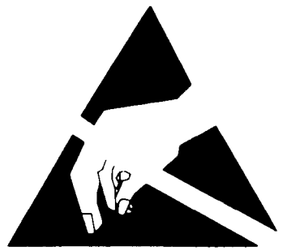
NOTICE



CONTENTS SENSITIVE
TO
STATIC ELECTRICITY

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HANDLING ELECTROSTATIC DISCHARGE SENSITIVE PARTS

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 electrical terminals of the part.
3. Before removing the part from its package, ground the package to a known good ground on the truck.
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.

1990 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.

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 powered, what the current path is to the components, and how the circuit is grounded.

For ease of diagnosis, all connectors (C), splices (S) and grounds (G) 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 R/V, P and P Cab Chassis truck:

ZONE	LOCATION
100	— At and forward of the cowl
200	— Within I/P
300	— From I/P to rear of front seats
400	— Rearward of front seats
500	— Within left doors
600	— Within right doors
900	— Within the rear doors/endgate

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. Splices that are marked with a number "S2" refers to a single wire that is spliced into a fusible link.

Each wiring circuit is identified by circuit number, size (in mm) and color. Wire colors are shown in the abbreviated form. Figure 1 shows how the circuit numbers are identified and color abbreviations used in this manual.

COMPONENT LOCATIONS

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

Listed in the left-hand 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 troubleshooter were sitting in the driver's seat. On the same line, in the far right column, are page and figure references. In this case, you are directed to page 132, Figure 37.

Grounds are listed next in the table. The location description for ground G202 reads, "Behind LH side of I/P, on ALDL bracket." You are directed to page 131, Figure 32.

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.

DIAGNOSIS CHARTS

The diagnostic charts (Figure 3) are a step-by-step approach of a symptom. 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 correct 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.

TROUBLESHOOTING

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

Verify the problem

Operate 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 power or ground connection. If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

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

Read "electrical operation"

Read the electrical operation for the problem circuit. By studying the circuit diagram and electrical 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 are provided for most of the common faults. Follow the procedures in the chart until the cause of the problem is located.

Make the repair

Repair the problem circuit as directed in the diagnosis charts.

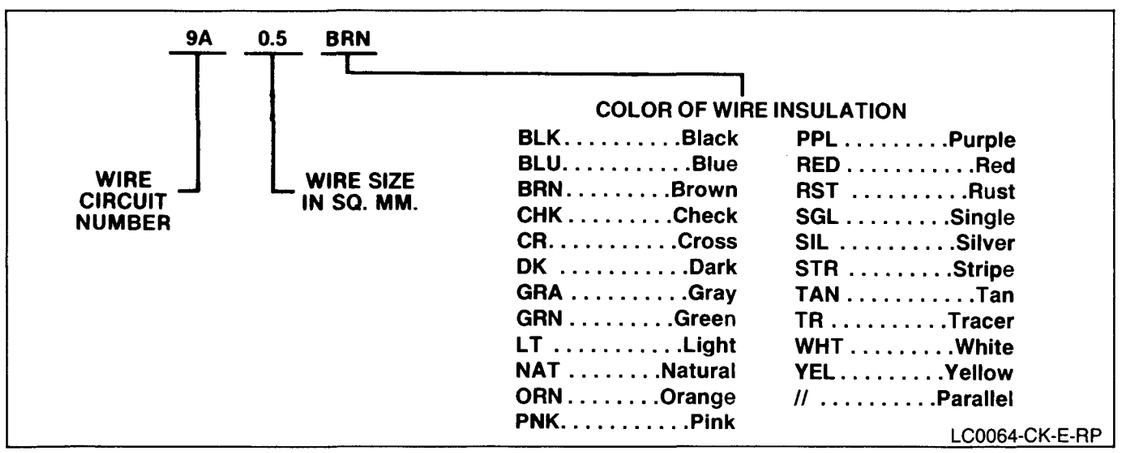

Figure 1—Wire Coding

COMPONENT LOCATION

		Page — Figure
Fuse Block	Behind LH side of I/P	132 — 37
Headlamp Dimmer Switch	Behind LH side of I/P, on steering column	131 — 36
C100 (Diesel)	Engine compartment, on LH front of cowl	130 — 28
C100 (Gasoline)	Engine compartment, on LH front of cowl	127 — 19
G104	Behind LH headlamp, on radiator support	122 — 5
G105	Behind RH headlamp, on fender	135 — 47
G202	Behind LH side of I/P, on ALDL bracket	131 — 32
S101	Harness, LH side of engine compartment	135 — 47
S102	Harness, behind LH headlamp	135 — 47
S103	Harness, behind RH headlamp	135 — 47
S104	Harness, behind LH headlamp	135 — 47
S207	I/P harness, behind LH side of I/P above steering column	132 — 37

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Figure 2—Component Location Chart

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.

BASIC ELECTRICITY

Ohm's Law states that voltage (E) is equal to resistance (R) times current (I) in a circuit (E = R x 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 "Grounded Circuit."

Open circuit (Figure 4)

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 device, or a wire that burned open from too much current.

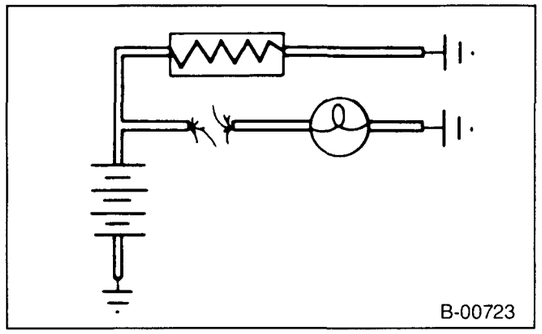

Figure 4—Open Circuit

Short circuit (Figure 5)

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 device such as a switch or a connector, or solder melting and bridging conductors in a device.

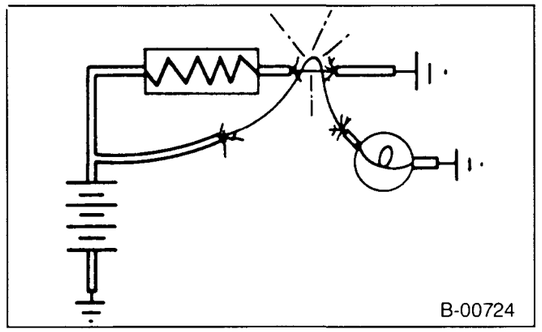

Figure 5—Short Circuit

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at headlamp switch connector C204 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from headlamp switch to junction block.
2. With the headlamp switch on and the dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at headlamp switch connector C204 to ground.	Test lamp lights.	Go to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C205 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.

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Figure 3—Typical Diagnosis Chart

Grounded circuit (Figure 6)

A ground 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 power supply. A grounded circuit may also be caused by deposits of oil, dirt and moisture around connections or terminals, which provide a good path to ground.

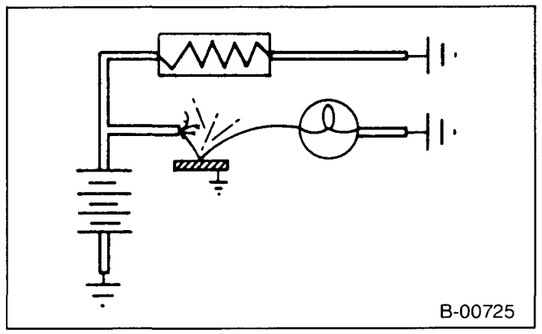


Figure 6—Grounded Circuit

ELECTRICAL TEST EQUIPMENT

Various electrical testers have been developed over the years. A few of these are basic but 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, when the value of a reading obtained using a meter is critical to the diagnostic procedure, accuracy becomes important. 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 (which means continuous) 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 power source and then the other end is attached to the load in the circuit, i.e., light, motor. If the load works, try "jumping" to circuit points that are progressively closer to the power 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 are used also.

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 power 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 would draw would be above the current that the solid state device would be 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 light is an indication of circuit high resistance. Further testing will verify the condition and locate the cause.

The 12-volt test lamp continuity tester depends on the vehicle's battery to power 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.

Powered test lamp

This lamp is a pencil shaped unit with a self-contained battery, a 1.5 volt light 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 power supply. The power 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 troubleshooting 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 power 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 Voltmeter.
2. The Ohmmeter.
3. The Ammeter.

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 34029-A or equivalent).

Ammeter (Figures 7 and 10)

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.

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. Referring to a specified current draw rating, measuring current draw and comparing the two provides much useful diagnostic information.

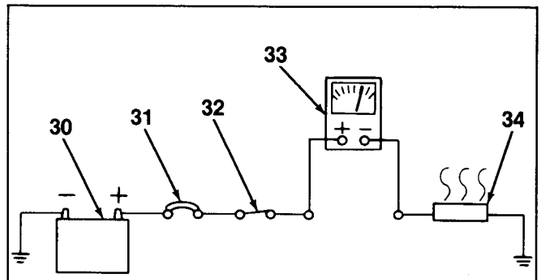


Figure 7—Ammeter

Disconnect the circuit from the power source before connecting the ammeter. The ammeter measures the amount of electrical current, amperes, moving through a conductor. The ammeter (Figure 7) 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 in the manner of 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 8 and 10)

The ohmmeter is used to read resistance (ohms) in a circuit. 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.

Ohmmeters 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.

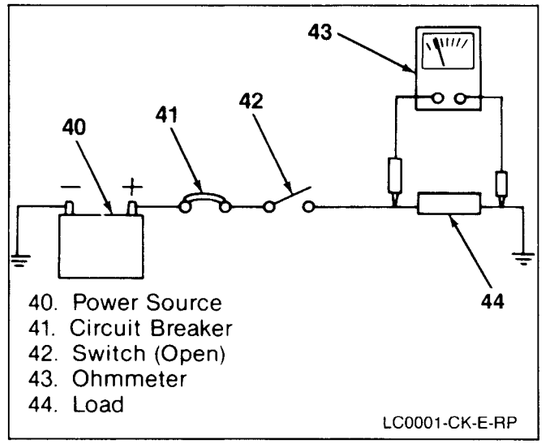


Figure 8—Ohmmeter

The ohmmeter can be used to perform tests for opens or shorts and to read actual resistance in a circuit or a component.

CAUTION: Like a self-powered test lamp, the ohmmeter can only be used on circuits where power has been removed (Figure 8). It is designed to be operated on its own power supply. This power supply provides low voltage and current levels for the meter to make resistance measurements. The 12-volt electrical system power 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 power 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 power 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 an 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 9 and 10)

The voltmeter (properly observed) will give the technician more information than the ammeter, ohmmeter and test lamp combined. Its application for troubleshooting here is to measure the electrical pressure (voltage) drop in a resistance circuit (Figure 9). Voltage drop is a reduction or "using up" of the voltage to push electricity through a resistance. It can be compared to the pressure water flowing through a metering valve makes.

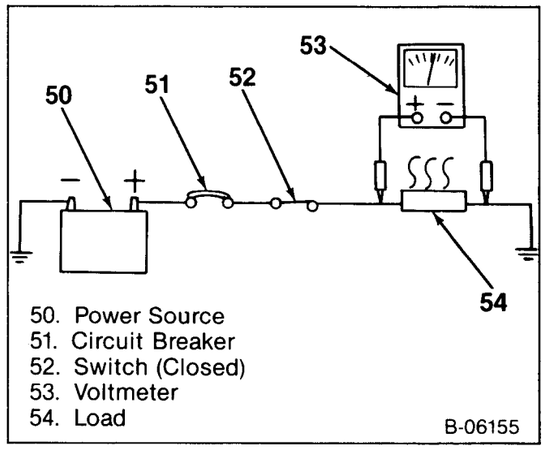
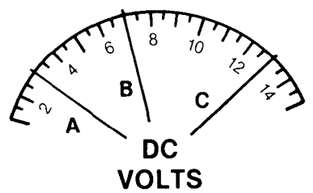


Figure 9—Voltmeter

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).

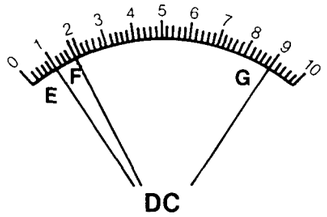
Being able to determine voltage drops is important because it provides the following information:

- Too high of a voltage drop indicates excessive resistance. If, for instance, a blower motor runs too slowly or a light



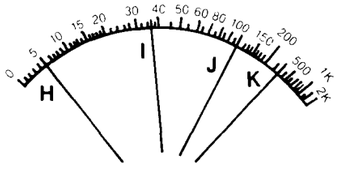
VOLTMETER SCALE: 0 Volts through 15 Volts

A = 3 Volts
B = 7 Volts
C = 13 Volts



AMMETER SCALE: 0 Amperes through 10 Amperes

E = 1 Ampere
F = 1.8 Amperes
G = 9 Amperes



OHMMETER SCALE: 0 Ohms through Infinity (∞)

H = 5 Ohms
I = 36 Ohms
J = 115 Ohms
K =350 Ohms

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Figure 10—Meter Scales

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 can be isolated (corroded terminals for example).

- Too low of a voltage drop, likewise, indicates low resistance. If, for instance, a blower motor ran 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.)

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 flows (current) 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 (light ON or motor running, for example) to measure voltage drop.

The dash mounted 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 prior to 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 lights, and possible damage to the generator and regulator. Wires must be replaced if insulation becomes burned, cracked, or deteriorated.

To splice a wire or repair one that is frayed or broken always use rosin flux solder to bond the splice and 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.

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.

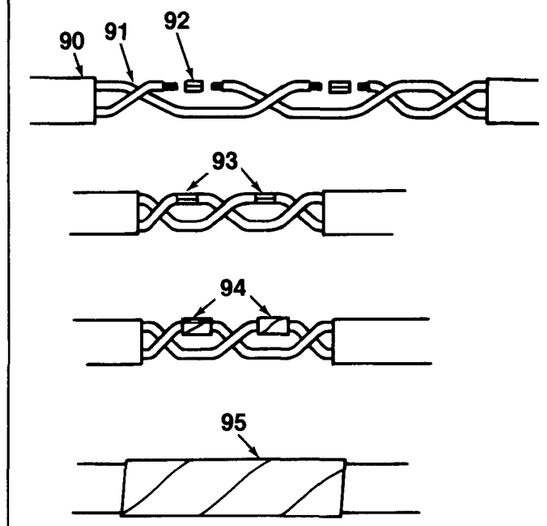
Twisted Wires (Figure 11)

Remove or Disconnect

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

Install or Connect

1. Splice clip (92).
   - Crimp (93).
   - Solder (93).
2. Electrical tape wrap (94) on wires.
3. Outer 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

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Figure 11—Twisted Wire Repair

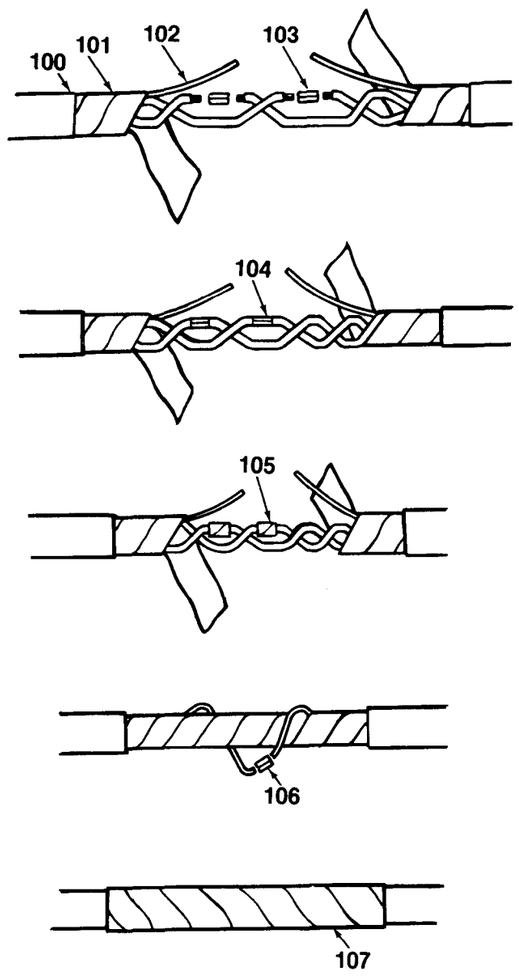
Twisted Wires/Shielded Cable (Figure 12)

Remove or Disconnect

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

Install or Connect

1. Splice clips (103).
2. Crimp and solder (104) the splice clips (103).
3. Electrical tape (105) on the splices.
4. Aluminum/mylar tape (101) 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 12—Twisted/Shielded Wire Repair

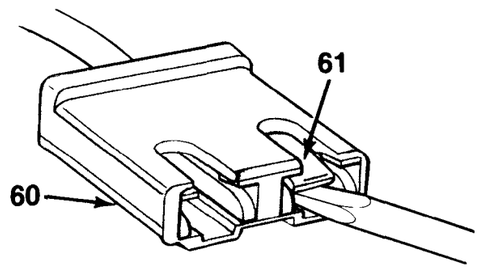
Wiring connector terminal replacement (Blade type)

Remove or Disconnect (Figure 13)

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

Install or Connect (Figure 14)

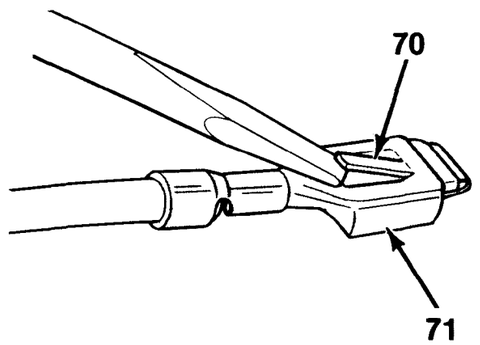
1. Pry up on the tang (70).
2. Terminal (71) into the connector.



60. Connector
61. Terminal

B-06156

Figure 13—Removing the Terminals from the Connector



70. Terminal Lock Tang
71. Terminal

B-06227

Figure 14—Resetting the Lock Tang

Wiring connector terminal replacement (Twin lock type)

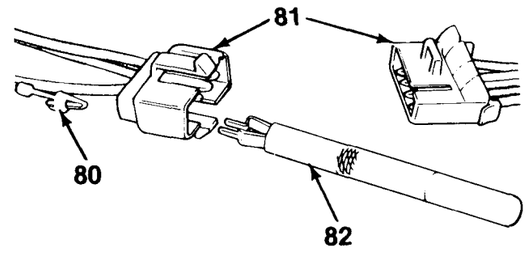
Remove or Disconnect (Figure 15)

Tool Required:
J 22727 Terminal Remover

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

Install or Connect

1. Pry out the tangs.
2. Terminal into the connector.



80. Wire Terminal
81. Wiring Harness Connector
82. Terminal Remover Tool J 22727

LC0002-CK-E-RP

Figure 15—Twin Lock Connector Terminal

WEATHER-PACK CONNECTORS

Special connectors known as Weather-Pack connectors (Figure 16) require a special tool J 28742-A 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 in place when connecting the leads. The hinge-type flap provides a backup, or secondary locking feature for terminals. They are used to improve the connector reliability by retaining the terminals if the small terminal lock tangs 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 opposite terminals. If this happens to the wrong terminal part, 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 are hidden by the connectors. Merely wiggling a connector on a sensor or in the wiring harness may correct the open circuit condition. This should always be considered when an open circuit is indicated while troubleshooting. 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 16. Special tools are required to remove the terminals. If removal is attempted with an ordinary pick, there is a good chance that the terminal will be bent or deformed. Refer to Figure 16.

Remove or Disconnect (Figure 16)

Tool Required:
J 28742-A Terminal Removal

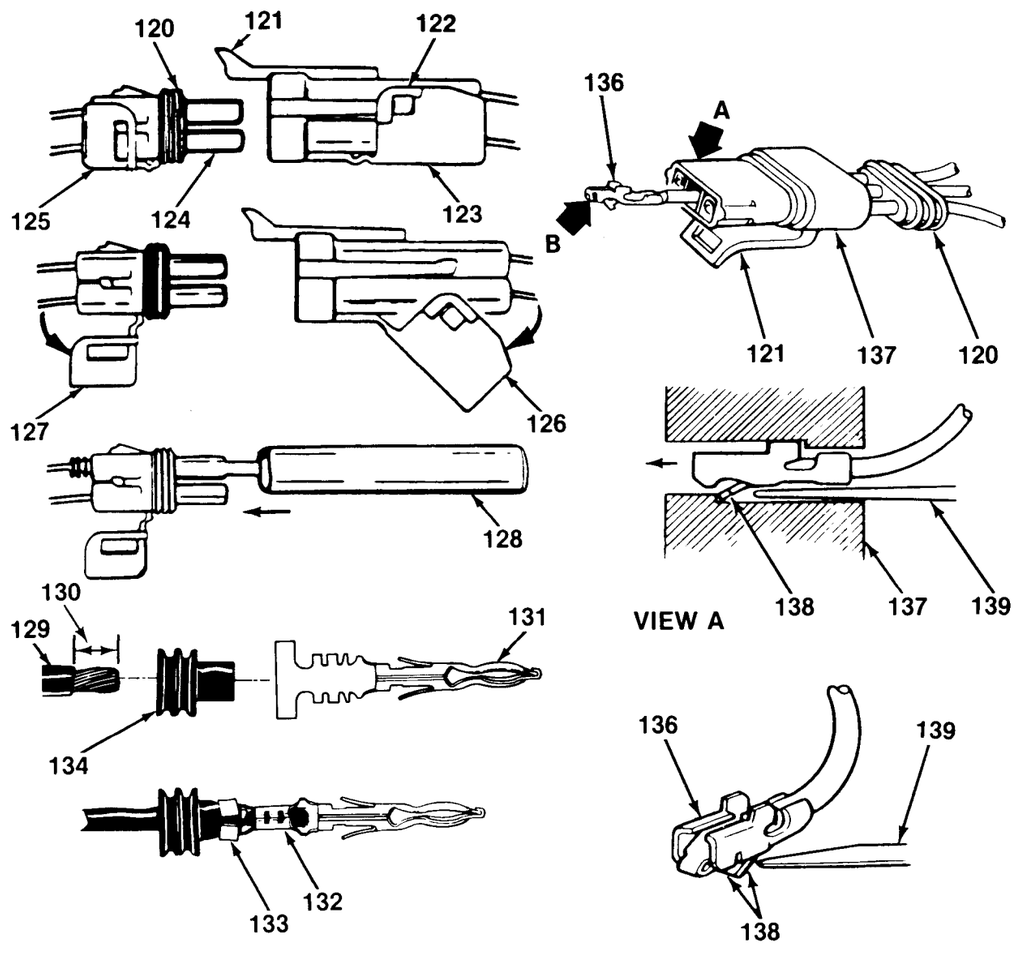
1. Primary lock (121) by lifting.
2. Connector sections.
3. Secondary lock (125) by spreading the sides of the hasp, thus clearing the staples and rotating the hasp (127).
4. Terminal (131) by using J 28742-A (128).
   - Snip off the old terminal assembly.
5. 5 mm of the wire insulation (130).

Clean

- Terminal barrel (124).

Install or Connect (Figure 16)

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.



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

LC0003-CK-E-RP

Figure 16—Weather-Pack and Metri-Pack Connectors

Metri-pack connector replacement

Remove or Disconnect (Figure 16)

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 16).
   - 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).

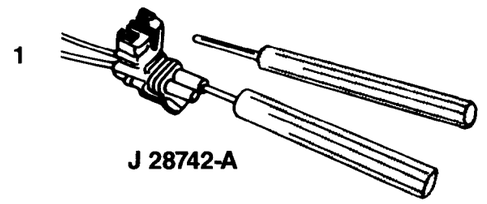
Clean

- Terminal cavity of the connector body.

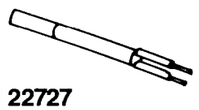
Install or Connect (Figure 16)

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 until the primary lock (121) engages.

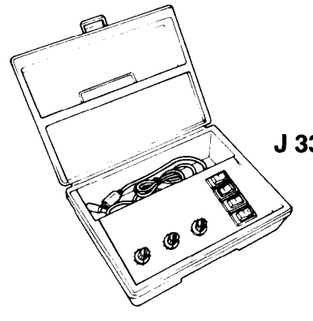
SPECIAL TOOLS



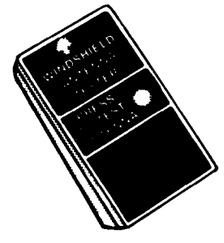
1 J 28742-A



2 J 22727



3 J 33431-B



4 J 23520-B

5 J 35689-A

1. Weather-Pack II Terminal Remover
2. Terminal Remover
3. Signal Generator and Instrument Panel Tester
4. Windshield Antenna Tester
5. Terminal Remover (Metri-Pack)

LC0004-CK-E-RP

REGULAR PRODUCTION OPTION (RPO) LIST

AU3 — Lock, Electric Side Door
A31 — Window, Power Operated Side
A33 — Window, Power Operated Tailgate or Back Door
B3D — Equipment, School Bus
CD4 — Windshield Wiper, Pulse
C36 — Heater, Auxiliary
C49 — Defogger, Electric Rear Window
C60 — Air Conditioner, Front Manual Controls
C69 — Air Conditioner, Roof Mounted
D48 — Mirror, Outside Electric Remote Control
E55 — End Gate, Suburban with Power Window
E63 — Body, Fleetside
K05 — Heater, Engine Block
K09 — Generator, 120 Amp
K34 — Cruise Control, Electronic
K60 — Generator, 100 Amp
K64 — Generator, 78 Amp
K68 — Generator, 105 Amp
K81 — Generator, 66 Amp
K99 — Generator, 85 Amp
LB4 — Engine, 4.3L V6 Gas
LH6 — Engine, 6.2L V8 Diesel
LL4 — Engine, 6.2L V8 Heavy Duty Diesel
L05 — Engine, 5.7L V8 Gas
L19 — Engine, 7.4L V8 Gas
MD8 — Transmission, Automatic 4-Speed, Hydra-Matic 4L60
M20 — Transmission, Manual 4-Speed, Hydra-Matic HM-117
M40 — Transmission, Automatic 3-Speed, Hydra-Matic 3L80
NA4 — Emission System, Above 8500 GVW
R05 — Wheels, Dual Rear
TP2 — Battery, Auxiliary
TR9 — Lamp Group
TT4 — Headlamps, Quad Halogen
UD4 — Alarm, Vehicle Speed
UF2 — Lamp, Cargo
UJ1 — Indicator, Brake Warning System
UM6 — Radio, ETR AM/FM Stereo, Seek and Scan, Auto Reverse Cassette, Clock
UM7 — Radio, ETR AM/FM Stereo, Seek and Scan, Clock
UT5 — Radio, ETR AM, Clock
UU9 — Radio, ETR AM/FM Stereo
UX1 — Radio, ETR AM/FM Stereo, Seek and Scan, Cassette with Auto Reverse and Repeat, Equalizer, Clock
UY1 — Wiring Harness, Camper
UY7 — Wiring Harness, Truck Trailer
U01 — Lamps, Roof Marker
U37 — Lighter, Cigarette
V22 — Grille, Chrome with Quad Halogen Headlamps
YE9 — Comfort, Convenience and Decor Package
ZW9 — Body, Chassis
Z62 — Comfort, Convenience and Decor Package

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
ACC—Accessory
ACCY—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

CIR/BRK—Circuit Breaker
CIRC—Circuit
CLSTR—Cluster
CNTL—Control
COMP—Compartment
COMP—Compressor
CONN—Connector
CONV—Convenience
CTSY—Courtesy
CYL—Cylinder

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
ELEC CNTRL MOD—Electronic Control Module
ENG—Engine
EPR—Exhaust Pressure Regulator
ESC—Electronic Spark Control
EST—Electronic Spark Timing
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
HAZ—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 PNL—Instrument Panel
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
NEUT—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

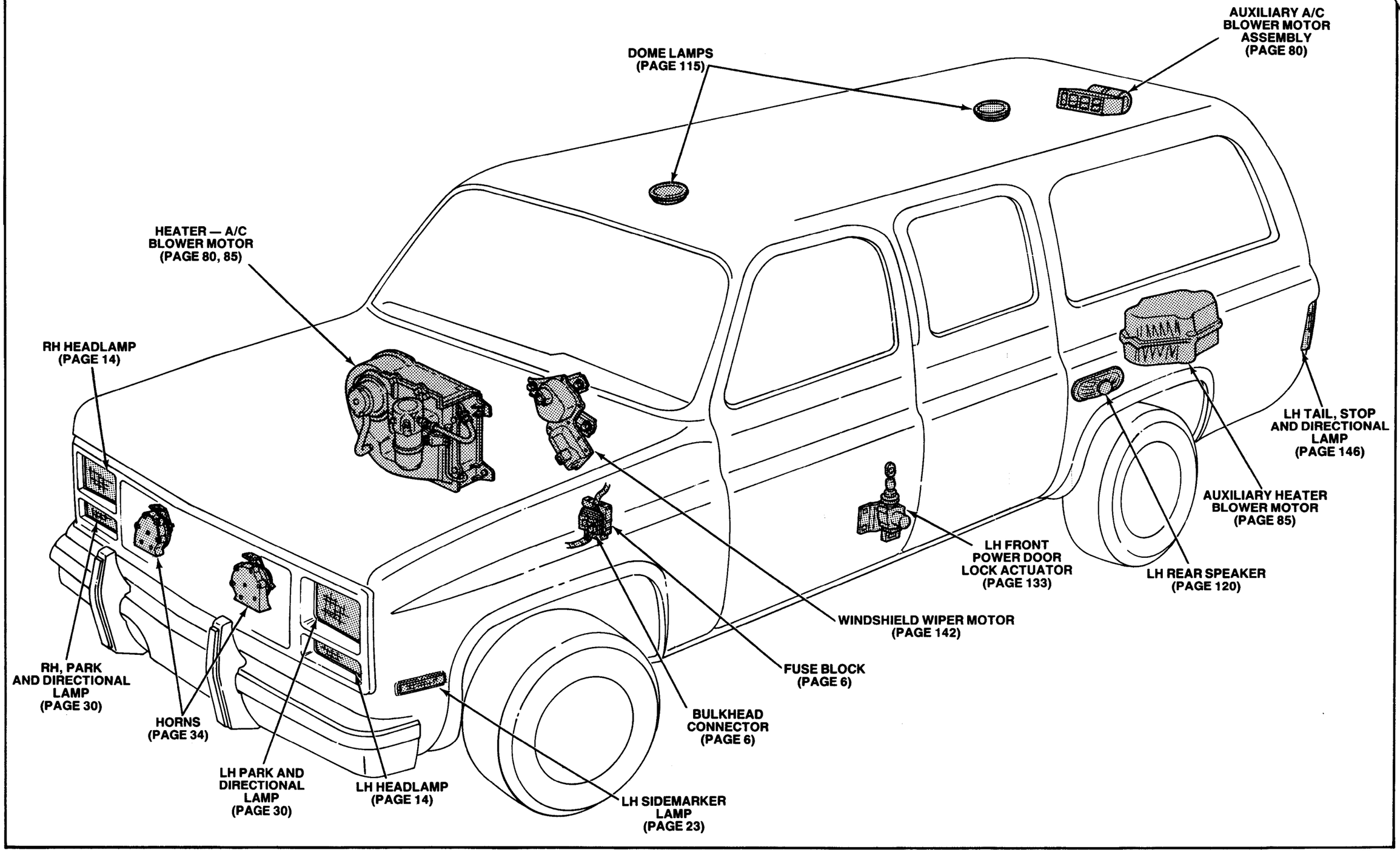
SEN—Sensor
SEND—Sender
SIG—Signal
SIL—Silver
SKT—Socket
SOL—Solenoid
SPEEDO—Speedometer
STR—Stripe
SW—Switch

TACH—Tachometer
TBI—Throttle Body Injection
TCC—Torque Converter Clutch
TEMP—Temperature
T/L—Taillamp
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
WRG—Wiring

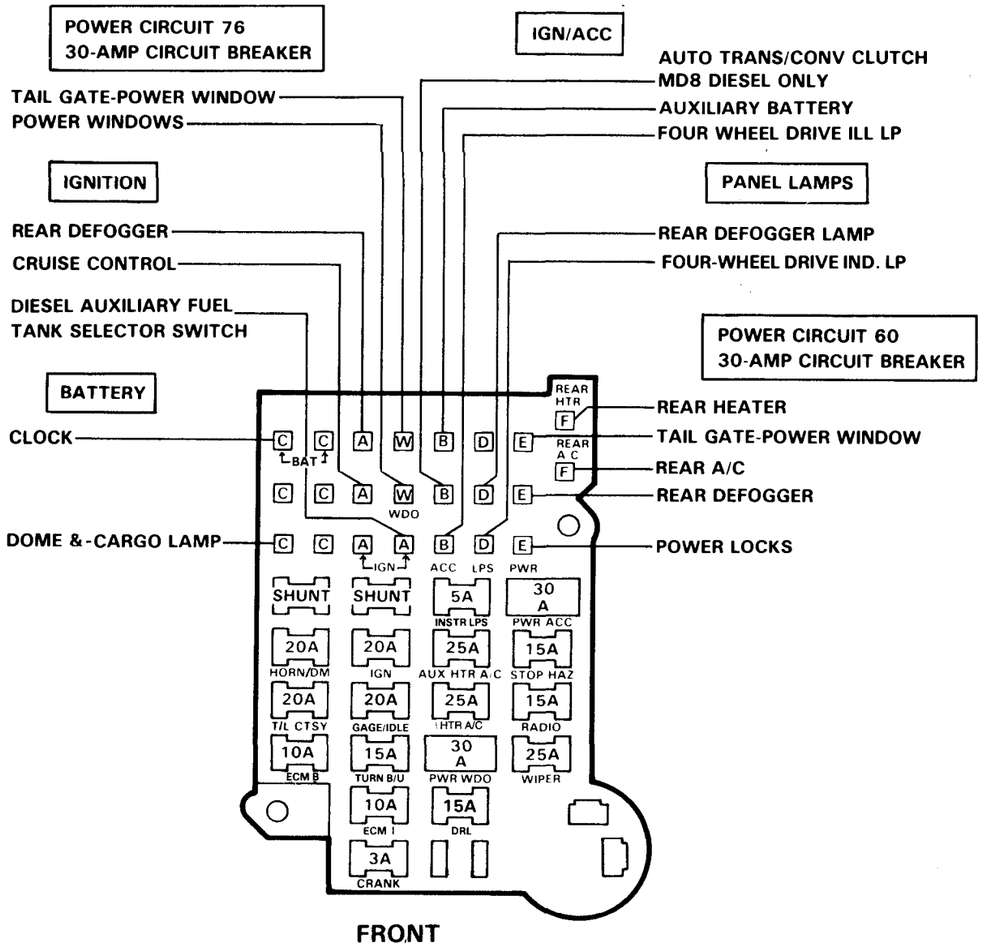
YEL—Yellow



PHANTOM VIEW

SYMPTOMS INDEX

SYMPTOMS INDEX



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

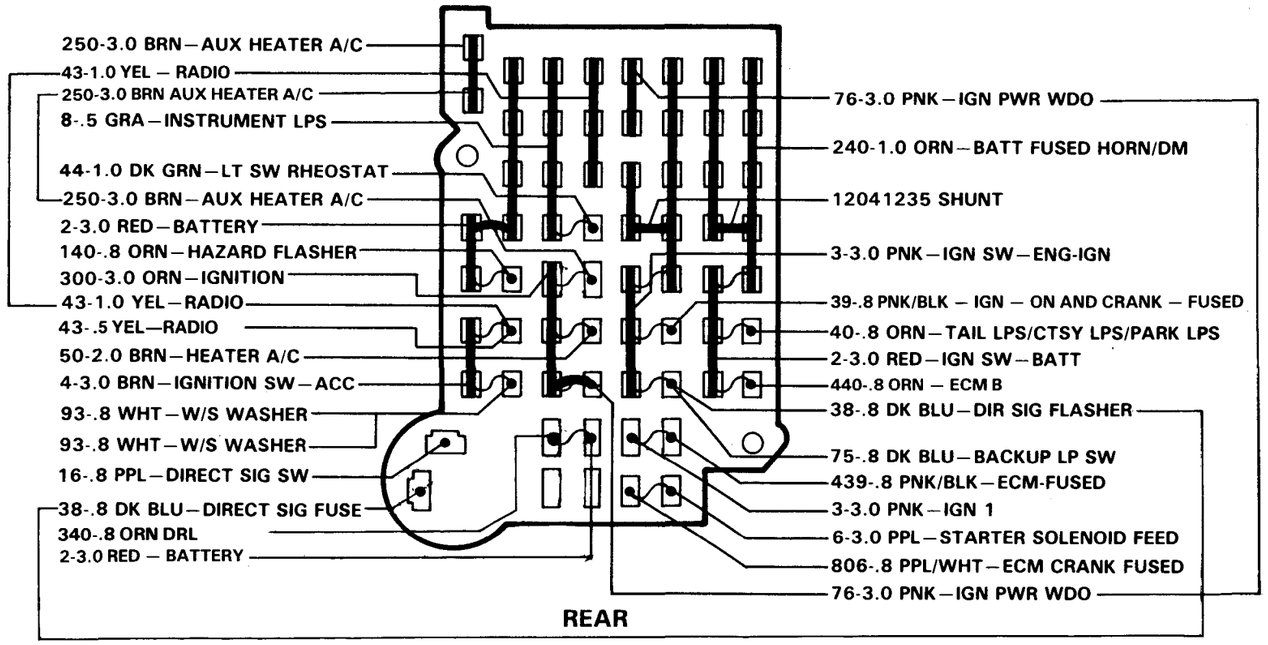
RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
MD8 — AUTOMATIC 4-SPEED TRANSMISSION

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

LH6 ENGINES DO NOT USE THE CRANK FUSE.

NOTE: DRL (DAYTIME RUNNING LAMPS) ARE ONLY ON VEHICLES FOR SALE IN CANADA WITH RPO Z49.



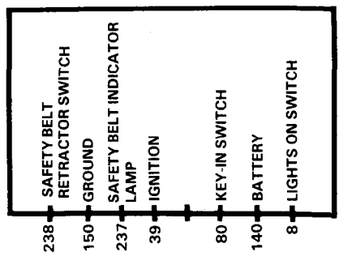
REAR

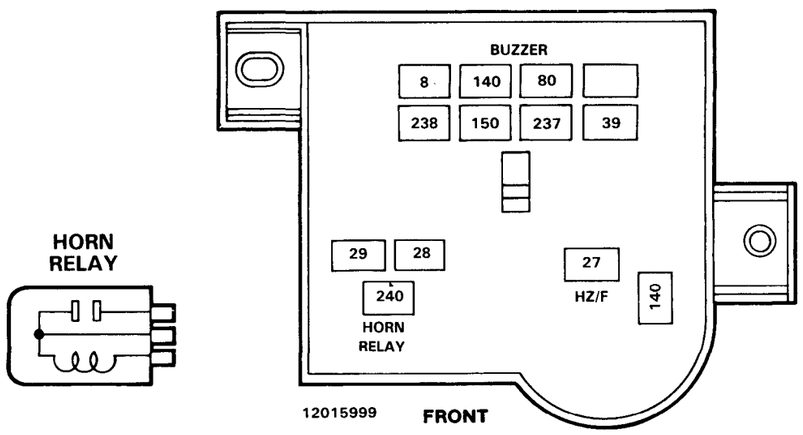
FUSE AND CIRCUIT BREAKER IDENTIFICATION

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	DESCRIPTION
AUX HTR A/C	12004010	WHITE 25 AMP	AUXILIARY HEATER AND AIR CONDITIONING
CRANK	12004003	VIOLET 3 AMP	ELECTRONIC CONTROL MODULE CRANK CIRCUIT
DRL	12004008	LT BLUE 15 AMP	DAYTIME RUNNING LAMPS
ECM 1	12004007	RED 10 AMP	ELECTRONIC CONTROL MODULE IGNITION 1
ECM B	12004007	RED 10 AMP	ELECTRONIC CONTROL MODULE
GAGE/IDLE	12004009	YELLOW 20 AMP	IGNITION CRANK
HORN/DM	12004009	YELLOW 20 AMP	HORN DOME AND CARGO LAMPS CLOCK
HTR AC	12004010	WHITE 25 AMP	HEATER AND AIR CONDITIONING
IGN	12004009	YELLOW 20 AMP	REAR DEFOGGER CRUISE CONTROL DIESEL AUXILIARY FUEL TANK SELECTOR SWITCH

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	DESCRIPTION
INSTR LPS	12004005	TAN 5 AMP	INSTRUMENT PANEL LAMPS
PWR ACC	(CIRCUIT BREAKER)	30 AMP	TAIL GATE-POWER WINDOW REAR DEFOGGER POWER LOCKS
PWR WDO	(CIRCUIT BREAKER)	30 AMP	POWER WINDOWS
RADIO	12004008	LT BLUE 15 AMP	RADIO AUXILIARY BATTERY RELAY FOUR-WHEEL DRIVE INDICATOR LAMP AUTOMATIC TRANSMISSION CONVERTER CLUTCH (RPO MD8 ONLY)
STOP HAZ	12004008	LT BLUE 15 AMP	HAZARD FLASHER
T/L CTSY	12004009	YELLOW 20 AMP	TAILLAMPS COURTESY LAMPS PARKING LAMPS
TURN B/U	12004008	LT BLUE 15 AMP	DIRECTIONAL SIGNALS BACKUP LAMPS
WIPER	12004010	WHITE 25 AMP	WINDSHIELD WIPERS

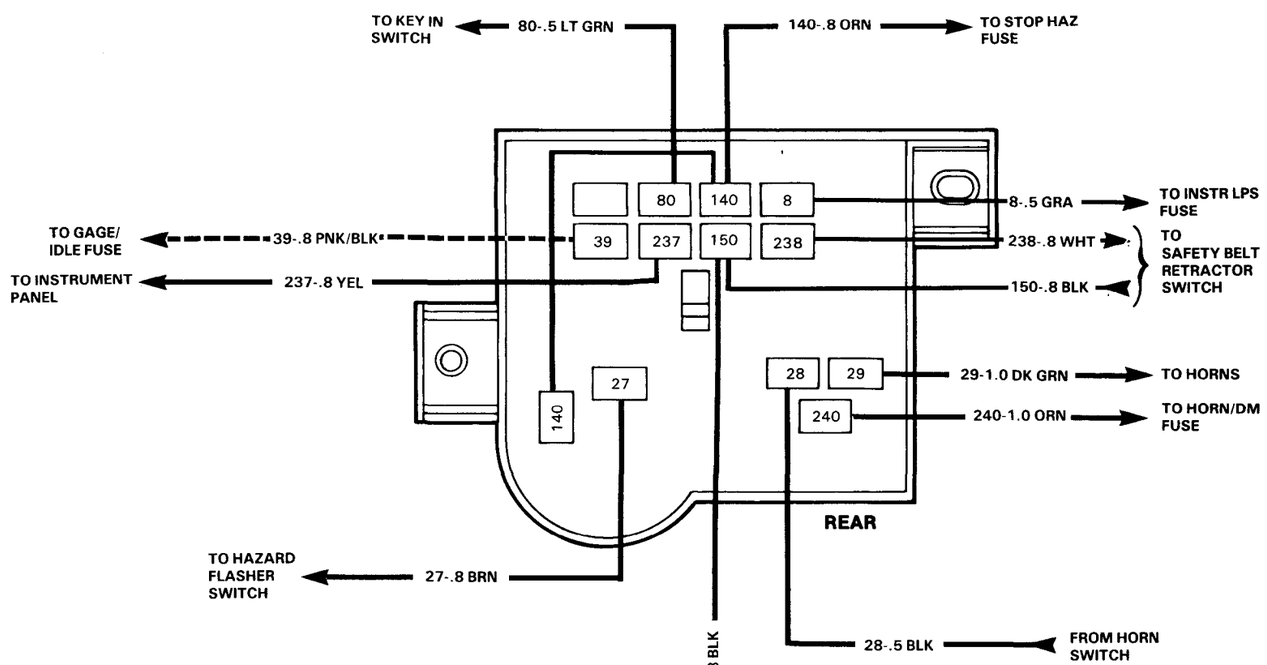
AUDIO ALARM

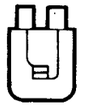




HORN RELAY

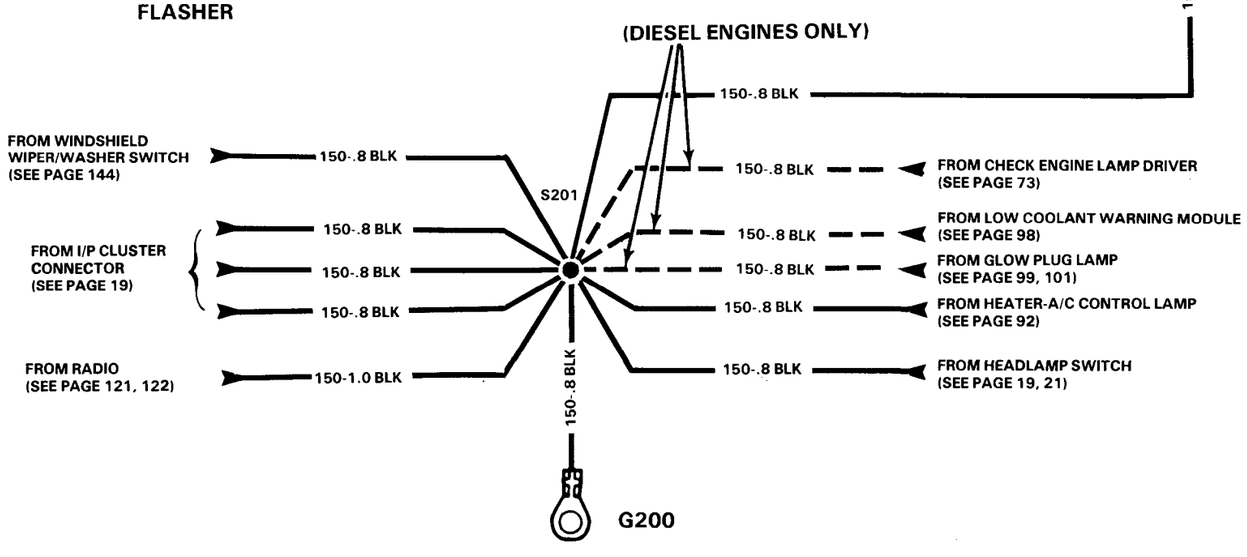
CONVENIENCE CENTER





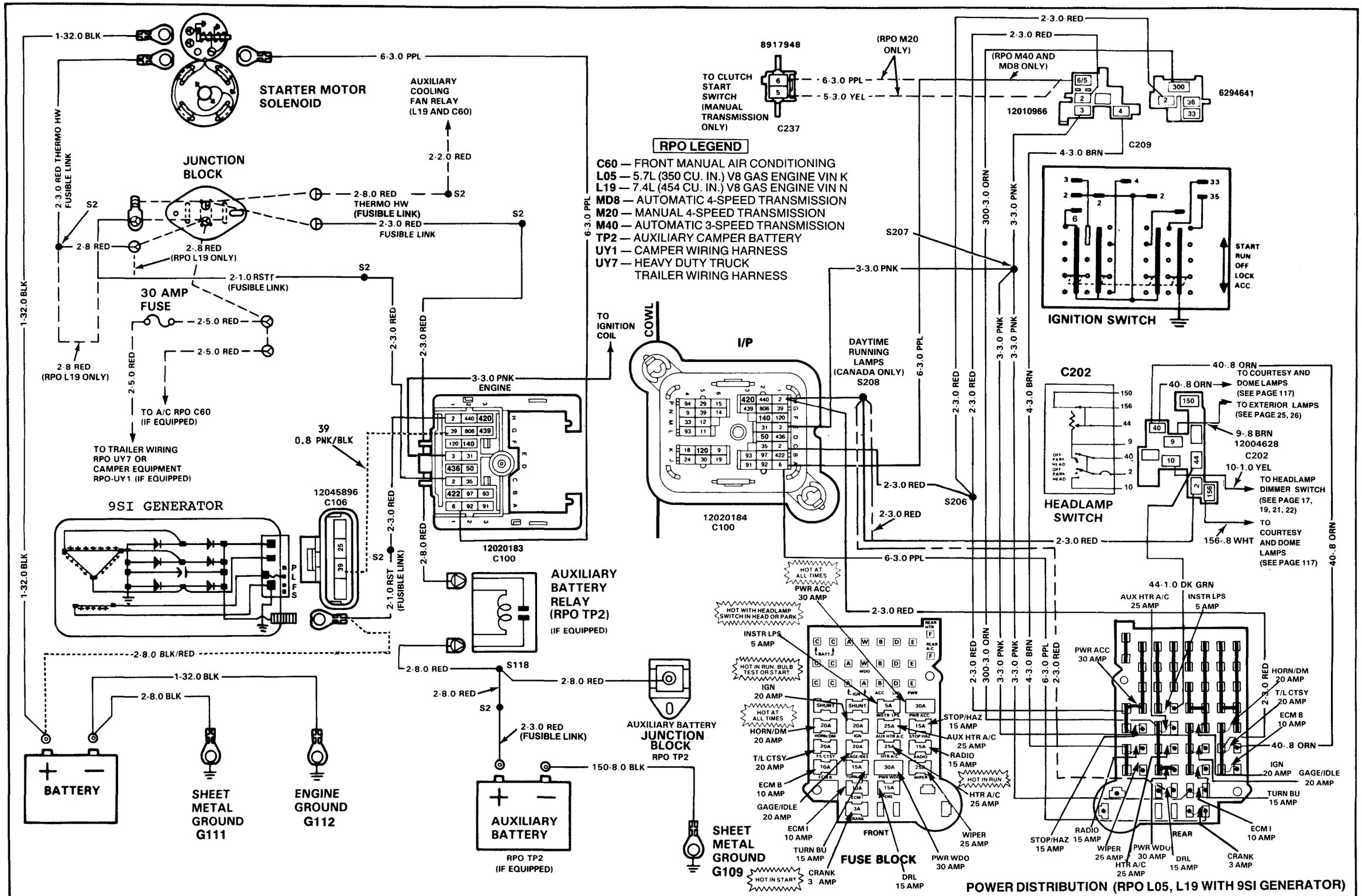
HAZARD FLASHER

(DIESEL ENGINES ONLY)

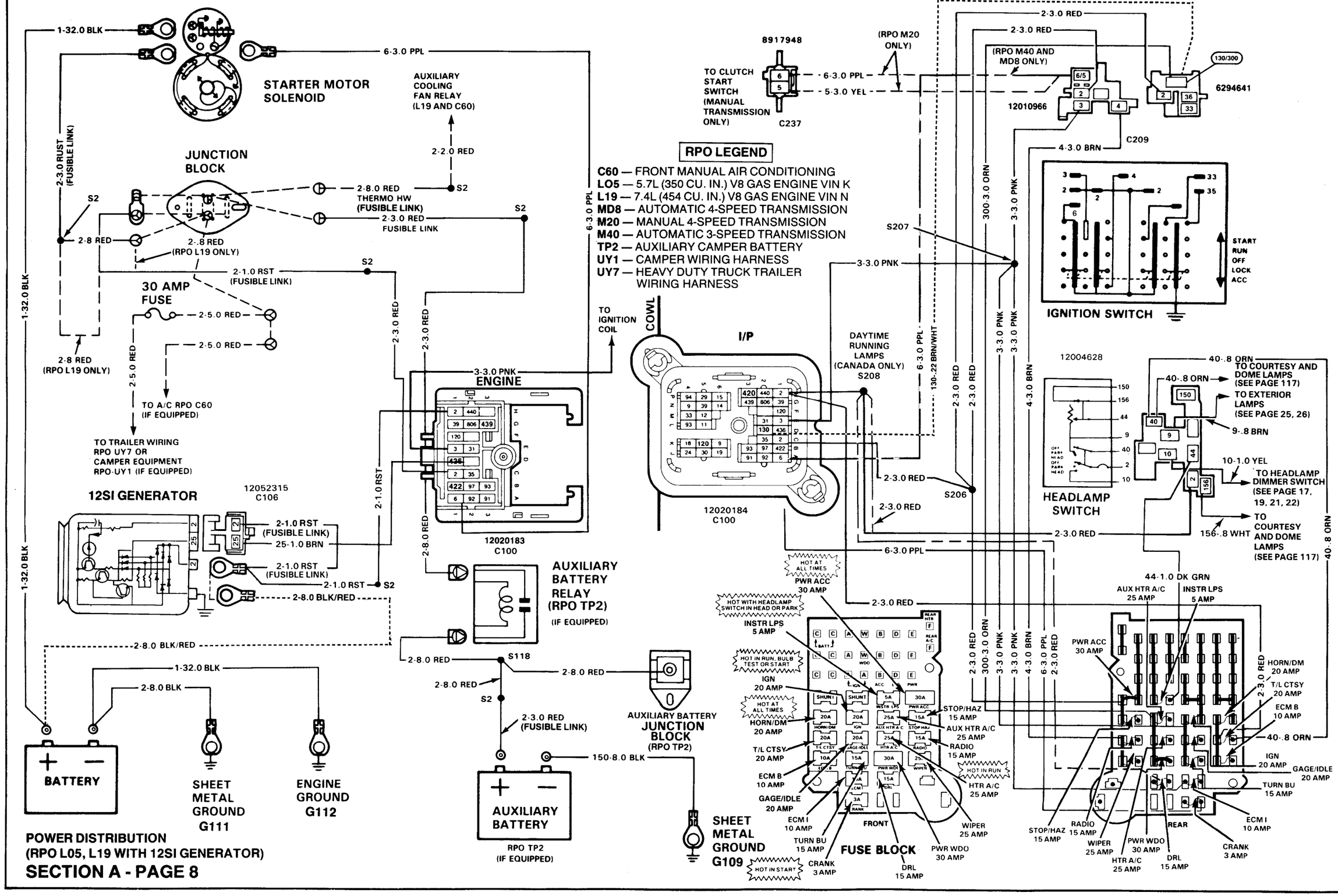


COMPONENT LOCATION

		Page — Figure
Auxiliary Battery	LH front of engine compartment	190 — 83
Auxiliary Battery Junction Block	LH side of engine compartment	190 — 83
Auxiliary Battery Relay	LH side of engine compartment	190 — 83
Battery	RH front of engine compartment	170 — 20
Fuse Block	Under LH side of I/P	166 — 4
Generator (RV100, 200(06), RPO L05)	LH front of engine	171 — 22
Generator (RV200(43), RV300, RPO L19)	RH front of engine	172 — 23
Generator (R200(43), RV300, RPO L05)	RH front of engine	169 — 17
Generator (R200(43), RV300, RPO L19)	LH front of engine	169 — 17
Headlamp Switch	LH side of I/P	166 — 4
Ignition Switch	LH side of steering column	166 — 5
Junction Block	Right front center of cowl	165 — 2
Starter Motor Solenoid (RPO L05)	Lower right rear of engine	169 — 17
Starter Motor Solenoid (RPO L19)	Lower right rear of engine	172 — 23
C100	Lower left front of cowl	166 — 4
C202	Behind LH side of I/P	165 — 2
C209	LH side of steering column	166 — 5
C237	At clutch switch	166 — 5
G109	RH side of engine compartment	190 — 83
G111	RH side of radiator support	170 — 20
G112	RH side of engine	170 — 19
S118	RH side of engine compartment	190 — 83
S206	I/P harness, LH side of steering column	166 — 5
S207	I/P harness, bottom of steering column	166 — 5
S208	I/P harness, near fuse block	166 — 4



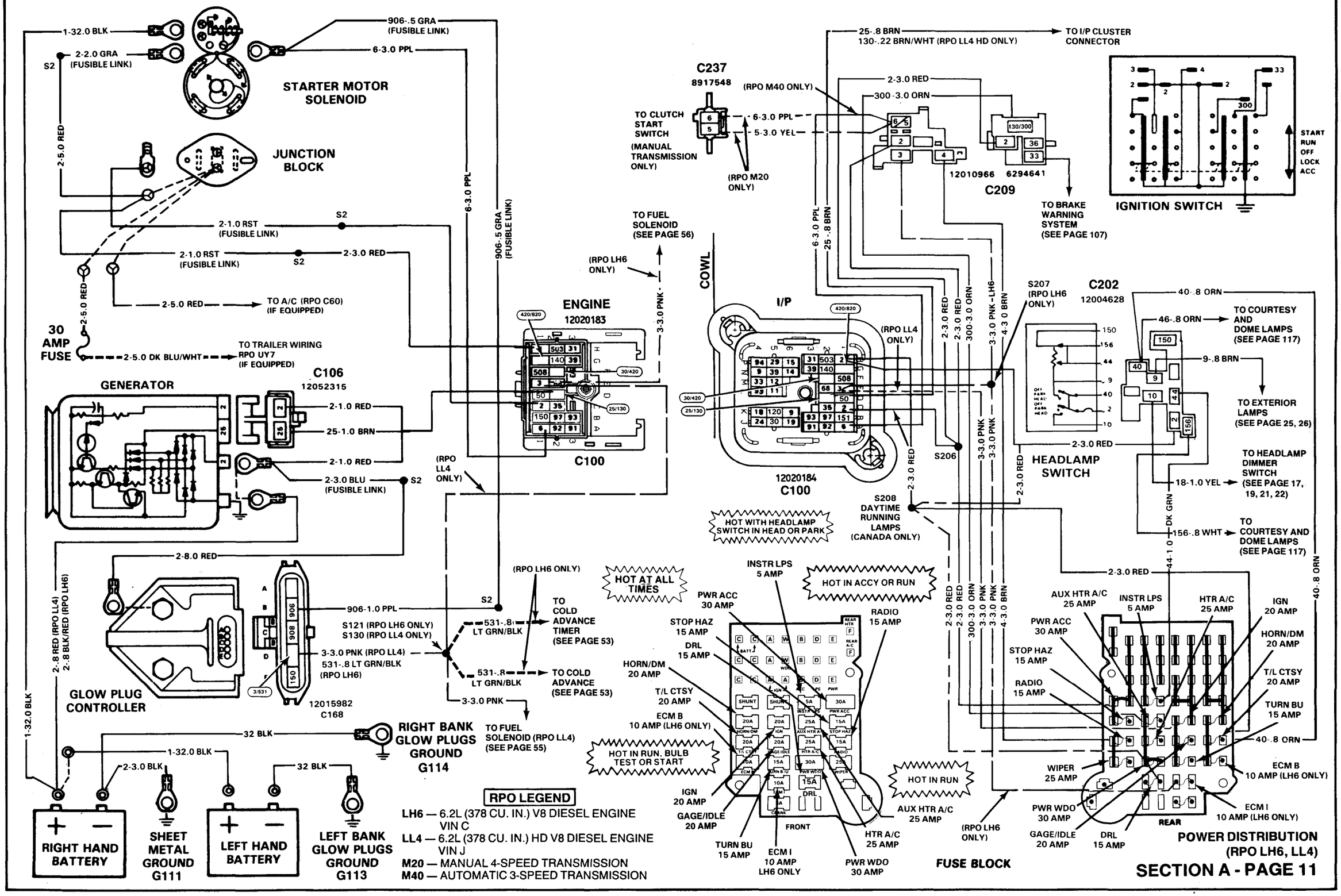
POWER DISTRIBUTION (RPO L05, L19 WITH 9SI GENERATOR)


STARTER MOTOR SOLENOID
1-32.0 BLK
6-3.0 PPL
AUXILIARY COOLING FAN RELAY (L19 AND C60)
2-2.0 RED
JUNCTION BLOCK
2-3.0 RUST (FUSIBLE LINK)
2-8.0 RED THERMO HW (FUSIBLE LINK)
2-3.0 RED FUSIBLE LINK
S2
2-8 RED
2-.8 RED (RPO L19 ONLY)
2-1.0 RST (FUSIBLE LINK)
30 AMP FUSE
2-5.0 RED
2-8 RED (RPO L19 ONLY)
TO A/C RPO C60 (IF EQUIPPED)
TO TRAILER WIRING RPO UY7 OR CAMPER EQUIPMENT RPO-UY1 (IF EQUIPPED)
12SI GENERATOR
12052315
C106
2-1.0 RST (FUSIBLE LINK)
25-1.0 BRN
2-8.0 BLK/RED
1-32.0 BLK
2-8.0 BLK
BATTERY
SHEET METAL GROUND G111
ENGINE GROUND G112
POWER DISTRIBUTION
(RPO L05, L19 WITH 12SI GENERATOR)
SECTION A - PAGE 8
3-3.0 PNK
ENGINE
12020183
C100
2-8.0 RED
S118
AUXILIARY BATTERY RELAY (RPO TP2)
(IF EQUIPPED)
AUXILIARY BATTERY JUNCTION BLOCK (RPO TP2)
150-8.0 BLK
AUXILIARY BATTERY
RPO TP2
(IF EQUIPPED)
SHEET METAL GROUND G109
8917948
TO CLUTCH START SWITCH (MANUAL TRANSMISSION ONLY)
C237
6-3.0 PPL
5-3.0 YEL
(RPO M20 ONLY)
RPO LEGEND
C60 — FRONT MANUAL AIR CONDITIONING
LO5 — 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
M40 — AUTOMATIC 3-SPEED TRANSMISSION
TP2 — AUXILIARY CAMPER BATTERY
UY1 — CAMPER WIRING HARNESS
UY7 — HEAVY DUTY TRUCK TRAILER WIRING HARNESS
TO IGNITION COIL
COWL
I/P
12020184
C100
DAYTIME RUNNING LAMPS (CANADA ONLY)
S208
S206
S207
2-3.0 RED
(RPO M40 AND MD8 ONLY)
12010966
6294641
130/300
C209
4-3.0 BRN
300-3.0 ORN
3-3.0 PNK
6-3.0 PPL
130-.22 BRN/WHT
4-3.0 BRN
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC
12004628
HEADLAMP SWITCH
40-.8 ORN
TO COURTESY AND DOME LAMPS (SEE PAGE 117)
TO EXTERIOR LAMPS (SEE PAGE 25, 26)
9-.8 BRN
10-1.0 YEL
TO HEADLAMP DIMMER SWITCH (SEE PAGE 17, 19, 21, 22)
156-.8 WHT
TO COURTESY AND DOME LAMPS (SEE PAGE 117)
HOT AT ALL TIMES
PWR ACC 30 AMP
HOT WITH HEADLAMP SWITCH IN HEAD OR PARK
INSTR LPS 5 AMP
HOT IN RUN, BULB TEST OR START
IGN 20 AMP
HOT AT ALL TIMES
HORN/DM 20 AMP
T/L CTSY 20 AMP
ECM B 10 AMP
GAGE/IDLE 20 AMP
ECM I 10 AMP
TURN BU 15 AMP
CRANK 3 AMP
HOT IN START
FUSE BLOCK
FRONT
DRL 15 AMP
PWR WDO 30 AMP
WIPER 25 AMP
HTR A/C 25 AMP
RADIO 15 AMP
AUX HTR A/C 25 AMP
STOP/HAZ 15 AMP
HOT IN RUN
44-1.0 DK GRN
AUX HTR A/C 25 AMP
INSTR LPS 5 AMP
REAR
HORN/DM 20 AMP
T/L CTSY 20 AMP
ECM B 10 AMP
40-.8 ORN
IGN 20 AMP
GAGE/IDLE 20 AMP
TURN BU 15 AMP
ECM I 10 AMP
CRANK 3 AMP
DRL 15 AMP
PWR WDO 30 AMP
HTR A/C 25 AMP
WIPER 25 AMP
RADIO 15 AMP
STOP/HAZ 15 AMP

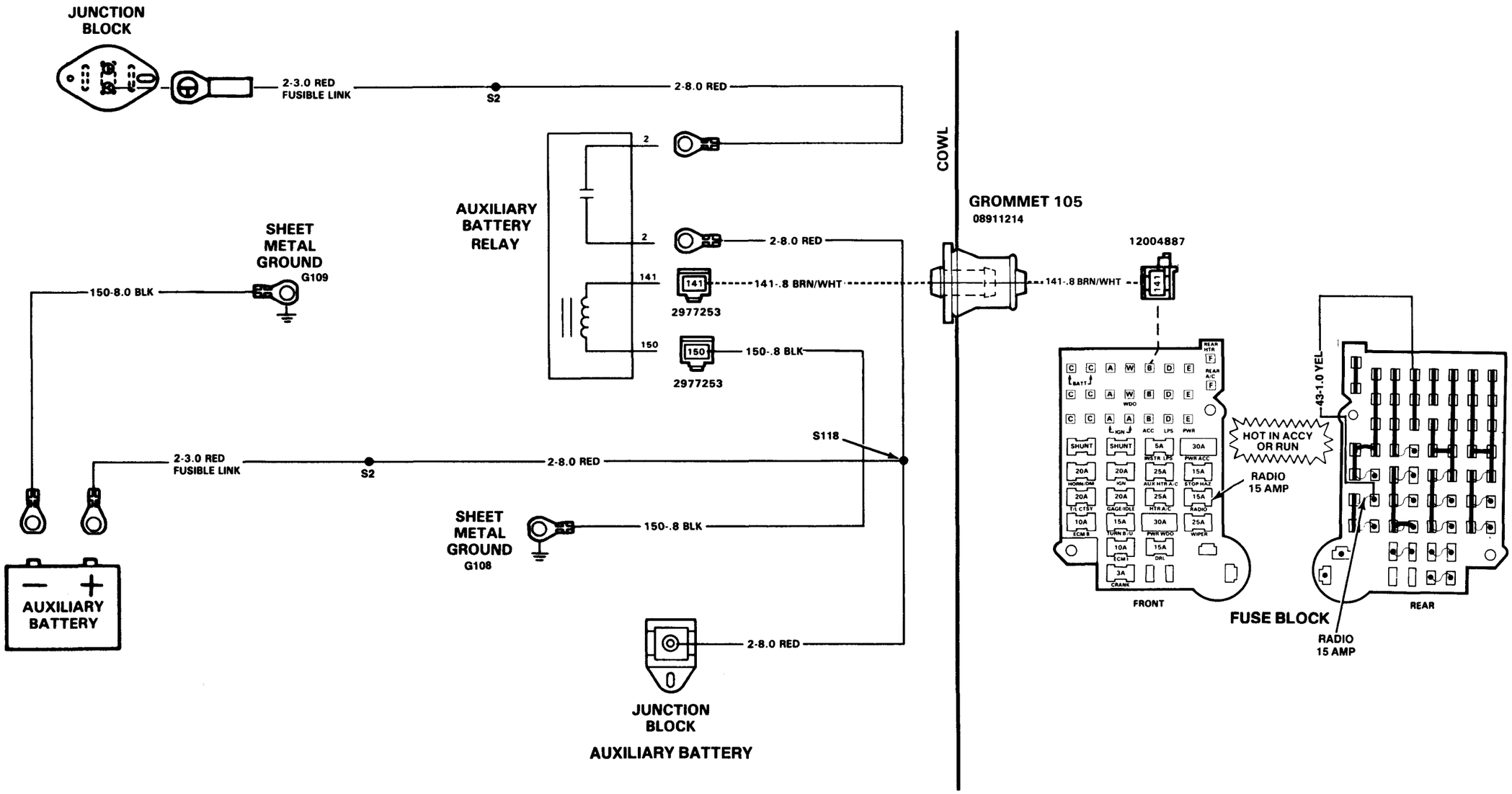
BLANK

COMPONENT LOCATION

		Page — Figure
Battery, LH	LH front of engine compartment	169 — 16
Battery, RH	RH front of engine compartment	169 — 16
Fuse Block	Behind LH side of I/P, above kick panel	166 — 4
Generator (RPO LH6, LL4)	Upper RH front of engine	170 — 18
Glow Plug Controller	Rear RH side of engine	173 — 26
Junction Block	Engine compartment, LH front of cowl	165 — 2
Starter Motor Solenoid	Lower RH side of engine	170 — 18
C100	Engine compartment, on RH front of cowl	165 — 2
C106 (RPO LH6, LL4)	At generator	170 — 18
C168 (RPO LH6, LL4)	At glow plug controller	173 — 26
C202	At headlamp switch	166 — 4
C209	At ignition switch	166 — 5
C237 (Manual Transmission)	At clutch start switch	166 — 5
G111 (Gasoline)	RH side of radiator support	169 — 16
G113 (Diesel)	LH side of engine	169 — 16
G114 (Diesel)	RH side of engine	169 — 16
S121 (RPO LH6)	Engine harness, LH front of engine	173 — 26
S130 (RPO LL4)	Engine harness, RH front of engine	170 — 18
S207 (RPO LH6)	In I/P harness, bottom of steering column	166 — 5
S208 (Daytime Running Lamps)	In I/P harness, above bulkhead	166 — 4


1-32.0 BLK
2-2.0 GRA (FUSIBLE LINK)
S2
906-.5 GRA (FUSIBLE LINK)
6-3.0 PPL
STARTER MOTOR SOLENOID
JUNCTION BLOCK
2-5.0 RED
2-1.0 RST (FUSIBLE LINK)
S2
2-3.0 RED
2-5.0 RED
TO A/C (RPO C60) (IF EQUIPPED)
30 AMP FUSE
2-5.0 DK BLU/WHT
TO TRAILER WIRING RPO UY7 (IF EQUIPPED)
GENERATOR
C106
12052315
2-1.0 RED
25-1.0 BRN
2-3.0 BLU (FUSIBLE LINK)
(RPO LL4 ONLY)
ENGINE
12020183
C100
3-3.0 PNK
(RPO LH6 ONLY)
TO FUEL SOLENOID (SEE PAGE 56)
C237
8917548
TO CLUTCH START SWITCH
(MANUAL TRANSMISSION ONLY)
6-3.0 PPL
5-3.0 YEL
(RPO M20 ONLY)
(RPO M40 ONLY)
2-3.0 RED
300-3.0 ORN
25-.8 BRN
130-.22 BRN/WHT (RPO LL4 HD ONLY)
TO I/P CLUSTER CONNECTOR
12010966
6294641
C209
TO BRAKE WARNING SYSTEM (SEE PAGE 107)
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC
COWL
I/P
12020184
C100
(RPO LL4 ONLY)
S206
S207 (RPO LH6 ONLY)
C202
12004628
40-.8 ORN
46-.8 ORN
TO COURTESY AND DOME LAMPS (SEE PAGE 117)
9-.8 BRN
TO EXTERIOR LAMPS (SEE PAGE 25, 26)
HEADLAMP SWITCH
TO HEADLAMP DIMMER SWITCH (SEE PAGE 17, 19, 21, 22)
18-1.0 YEL
DK GRN
156-.8 WHT
TO COURTESY AND DOME LAMPS (SEE PAGE 117)
44-1.0
S208 DAYTIME RUNNING LAMPS (CANADA ONLY)
HOT WITH HEADLAMP SWITCH IN HEAD OR PARK
2-8.0 RED
2-.8 RED (RPO LL4)
2-.8 BLK/RED (RPO LH6)
1-32.0 BLK
GLOW PLUG CONTROLLER
12015982
C168
906-1.0 PPL
S121 (RPO LH6 ONLY)
S130 (RPO LL4 ONLY)
3-3.0 PNK (RPO LL4)
531-.8 LT GRN/BLK (RPO LH6)
531-.8 LT GRN/BLK
TO COLD ADVANCE TIMER (SEE PAGE 53)
531-.8 LT GRN/BLK
TO COLD ADVANCE (SEE PAGE 53)
3-3.0 PNK
TO FUEL SOLENOID (RPO LL4) (SEE PAGE 55)
32 BLK
RIGHT BANK GLOW PLUGS GROUND G114
1-32.0 BLK
2-3.0 BLK
32 BLK
RIGHT HAND BATTERY
SHEET METAL GROUND G111
LEFT HAND BATTERY
LEFT BANK GLOW PLUGS GROUND G113
HOT AT ALL TIMES
HOT IN ACCY OR RUN
HOT IN RUN, BULB TEST OR START
HOT IN RUN
INSTR LPS 5 AMP
PWR ACC 30 AMP
STOP HAZ 15 AMP
DRL 15 AMP
HORN/DM 20 AMP
T/L CTSY 20 AMP
ECM B 10 AMP (LH6 ONLY)
RADIO 15 AMP
IGN 20 AMP
GAGE/IDLE 20 AMP
TURN BU 15 AMP
ECM I 10 AMP LH6 ONLY
PWR WDO 30 AMP
HTR A/C 25 AMP
AUX HTR A/C 25 AMP
(RPO LH6 ONLY)
FRONT
REAR
FUSE BLOCK
POWER DISTRIBUTION (RPO LH6, LL4)
RPO LEGEND
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
M40 — AUTOMATIC 3-SPEED TRANSMISSION

COMPONENT LOCATION



RPO LEGEND

TP2 — CAMPER AUXILIARY BATTERY

CIRCUIT OPERATION

HEADLAMPS

Voltage is applied to the Headlamps Switch at all times. The Headlamp 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 Headlamp 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 Headlamp Switch is in PARK or HEAD, voltage is directed to the parklamps.

DAYTIME RUNNING LAMPS (CANADA ONLY)

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 Switch provides voltage to the Left Hand High Beam through the DK BLU/ORN (593) wire and this wire also becomes the ground wire when the Headlamps are operated normally.

Voltage is applied to the Daytime Running Lamp 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 Daytime Running Lamp Module energizes the Daytime Running Lamp 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 Daytime Running Lamp Module de-energizes the Daytime Running Lamp 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 Daytime Running Lamp Module will supply voltage through the WHT (629) wire, to the Instrument Panel Cluster to turn on the High Beam Indicator bulb.

COMPONENT LOCATION

		Page	Figure
Daytime Running Lamp Module	Behind LH side of I/P		—
Daytime Running Lamp Relay	LH front inner fender	165	1
Fuse Block	Behind LH side of I/P, above kick panel	166	4
Grommet 105	Engine compartment, LH front of cowl	165	2
Headlamp, LH (Base)	LH front of vehicle	165	2
Headlamp, LH (RPO V22)	LH front of vehicle	165	3
Headlamp, RH (Base)	RH front of vehicle	165	2
Headlamp, RH (RPO V22)	RH front of vehicle	165	3
Headlamp Dimmer Switch	LH side of steering column	166	5
Headlamp Switch	LH side of I/P	166	4
I/P Cluster	LH side of I/P	166	4
Junction Block	Engine compartment, LH side of cowl	165	2
Parking Brake Switch	Below LH side of I/P, on parking brake assembly	166	4
Park and Directional Lamp, LH	LH front of vehicle	165	2
Park and Directional Lamp, RH	RH front of vehicle	165	2
Side Marker Lamp, LH Front	Front LH side of vehicle	165	2
Side Marker Lamp, RH Front	Front RH side of vehicle	165	2
C100	Engine compartment, on LH front of cowl	165	2
C125A	Engine compartment, near LH front of cowl	165	2
C126A	LH inner fender, at daytime running lamp relay	165	1
C137	Front LH side marker lamp	165	2
C138	Front LH headlamp	165	2
C139	Front LH park and directional lamp	165	2
C140	Front LH park and directional lamp	165	2
C144	Front RH high-low headlamp	165	2
C145	Front RH side marker lamp	165	2
C146	Front RH park and directional lamp	165	2
C147	Front RH park and directional lamp	165	2
C149 (RPO V22)	Front LH high-low headlamp	165	3
C150 (RPO V22)	Front LH high beam headlamp	165	3
C151 (RPO V22)	Front LH park and directional lamp	165	3
C152 (RPO V22)	Front LH park lamp	165	3
C153 (RPO V22)	Front LH side marker lamp	165	3
C154 (RPO V22)	Front RH high-low headlamp	165	3
C155 (RPO V22)	Front RH high beam headlamp	165	3
C156 (RPO V22)	Front RH park and directional lamp	165	3
C157 (RPO V22)	Front RH side marker lamp	165	3
C158 (RPO V22)	Front RH park lamp	165	3
C201	LH side of I/P, at dimmer switch	166	5
C202	LH side of I/P, at headlamp switch	166	4
C203	LH side of I/P	166	4
C211A	Behind LH side of I/P, at daytime running lamp module		—
C212A	At daytime running lamp indicator lamp		—
C213A	At diode assembly, behind I/P		—
C291	At diode assembly, behind I/P		—
C293	Below LH side of I/P, at parking brake switch	166	4
G105	LH front of vehicle, above LH headlamps	165	2
G106	RH front of vehicle, above RH headlamps	165	2
G107	RH front of vehicle on frame below RH headlamps	165	2
G200	LH side, behind I/P	166	6
S111	Forward lamps harness, in front of RH headlamps	165	2
S112	Forward lamps harness, in front of LH headlamps	165	2
S114 (RPO V22)	Forward lamps harness, LH side on front of washerbottle	165	3
S201	I/P harness, behind LH side of I/P	166	4
S202	I/P harness, behind LH side of I/P	166	4

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.

TROUBLESHOOTING CHART—HEADLAMPS

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at headlamp 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 headlamp switch to junction block.
2. With the headlamp switch on and the dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at headlamp switch connector C202 to ground.	Test lamp lights.	Go to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect a test lamp from LT GRN (11) wire at 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 headlamp switch ON and 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 (RPO V22) to ground. (For Canadian vehicles 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 (RPO V22) to ground terminal(s) G105, G106 or G107. (For Canadian vehicles w/o RPO V22, GO to step 3.)
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from DK BLU/ORN (593) at daytime running lamp relay connector C126A to ground.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/ORN (593) wire from headlamp connector C138 to daytime running lamp relay C126A.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from BLK (150) wire at the daytime running lamp relay connector C126A to ground.	Test lamp does not light.	REPLACE daytime running lamp relay.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from daytime running lamp relay to ground G105.
5. Connect a test lamp from TAN (12) wire at 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 dimmer switch connector C201 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp 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 (RPO V22). (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 (RPO V22) to ground connection(s) G105, G106 or G107. (For Canadian vehicles: GO to step 3).
	Test lamp lights.	REPLACE headlamps(s).
3. Connect a test lamp from DK BLU/ORN (593) wire to ground at daytime running lamp relay connector C201 to ground.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/ORN (593) wire at headlamp connector C138 or C150 to daytime running lamp relay C201.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from BLK (150) wire at daytime running lamp relay connector C201 to ground.	Test lamp does not light.	REPLACE daytime running lamp relay.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from daytime running lamp relay connector to ground G105.
5. Place dimmer switch in the HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at 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 dimmer switch connector C201 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire headlamp dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

PRELIMINARY CHECKS:

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

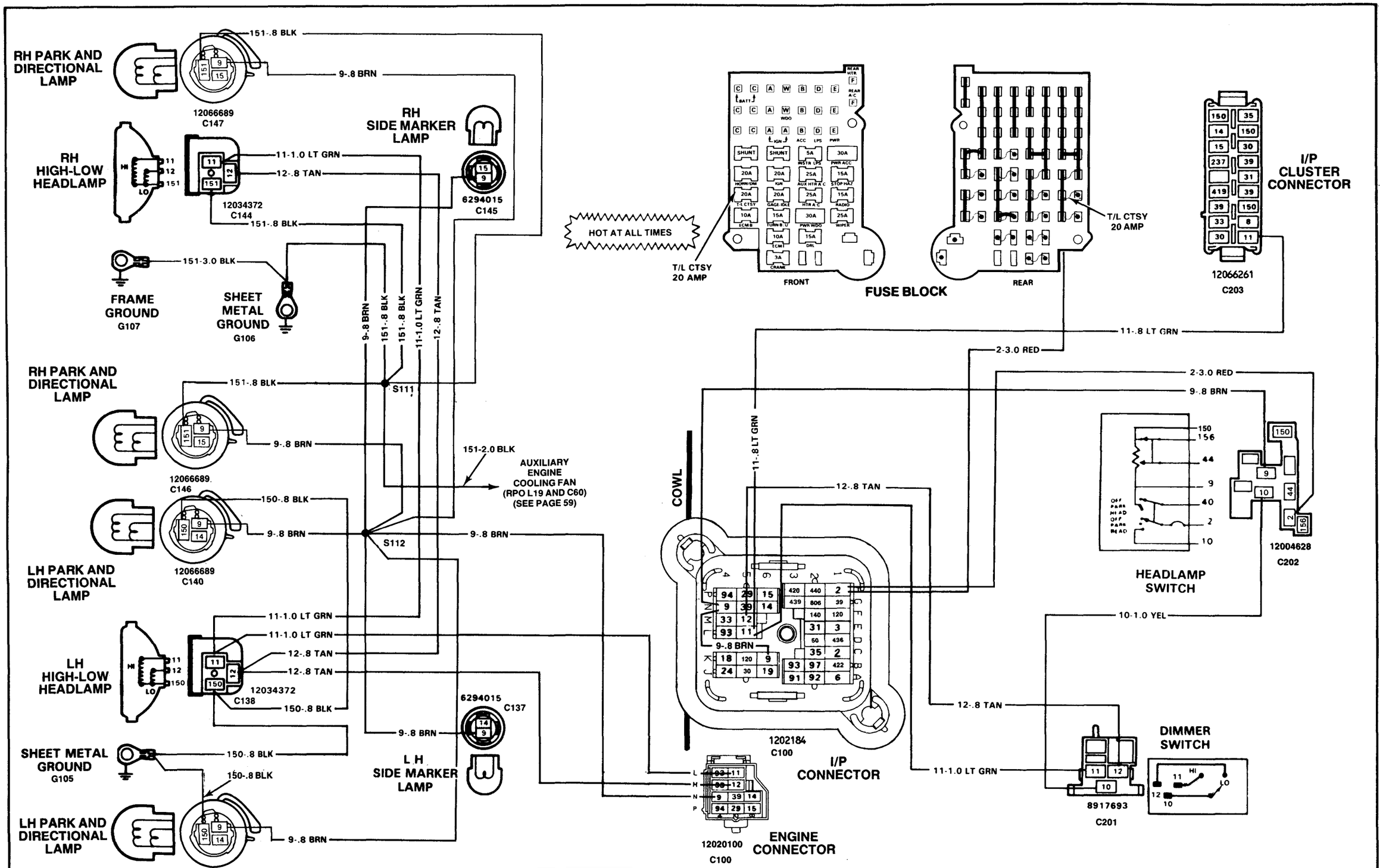
1. Place Park Brake in the OFF position.
2. Place Headlamp Switch to ON and Headlamp Dimmer Switch to HIGH BEAM position.
   If the High Beam Lamp(s) are inoperative, refer to the HIGH BEAM LAMP(S) DO NOT OPERATE test procedures.
   If the High Beam Lamp(s) are operative, use the following diagnostic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

DAYTIME RUNNING LAMPS DO NOT OPERATE (CANADA ONLY)

TEST	RESULT	ACTION
1. CHECK condition of DRL (daytime running lamp) 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 daytime running lamp relay connector C201 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire from relay connector C201 to C125A and/or ORN (340) wire between C125A 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. Disconnect the daytime running lamp module connector C211A and place the ignition switch to RUN. Connect a test lamp from PNK/BLK (39) wire at the daytime running lamp relay connector C201 to ground.	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire from relay connector to fuse block.
	Test lamp lights.	GO to step 5.
5. Connect a test lamp from LT GRN/BLK (592) wire at daytime running lamp relay connector C201 to ground.	Test lamp does not light.	REPLACE daytime running lamp relay switch.
	Test lamp lights.	GO to step 6.
6. Connect a J 34029-A multimeter from LT GRN/BLK (592) wire at daytime running lamp module connector C211A to ground. Measure voltage.	No voltage.	LOCATE and REPAIR open in LT GRN/BLK (592) wire from daytime running lamp module connector to daytime running lamp relay connector C201.
	Battery voltage.	GO to step 7.
7. Connect a J 34029-A multimeter (or equivalent) from PNK/BLK (39) wire at daytime running lamp module connector C211A to ground. Measure voltage.	No voltage.	LOCATE and REPAIR open in PNK/BLK (39) wire from module connector to fuse block.
	Battery voltage.	GO to step 9.
8. Connect J 34029-A multimeter from LT GRN/BLK (592) wire to BLK (150) wire at module connector C211A.	No voltage.	LOCATE and REPAIR open in BLK (150) wire from module connector to ground G200.
	Battery voltage.	REPLACE daytime running lamp module. If daytime running lamps still are inoperative, also REPLACE daytime running lamp relay switch.

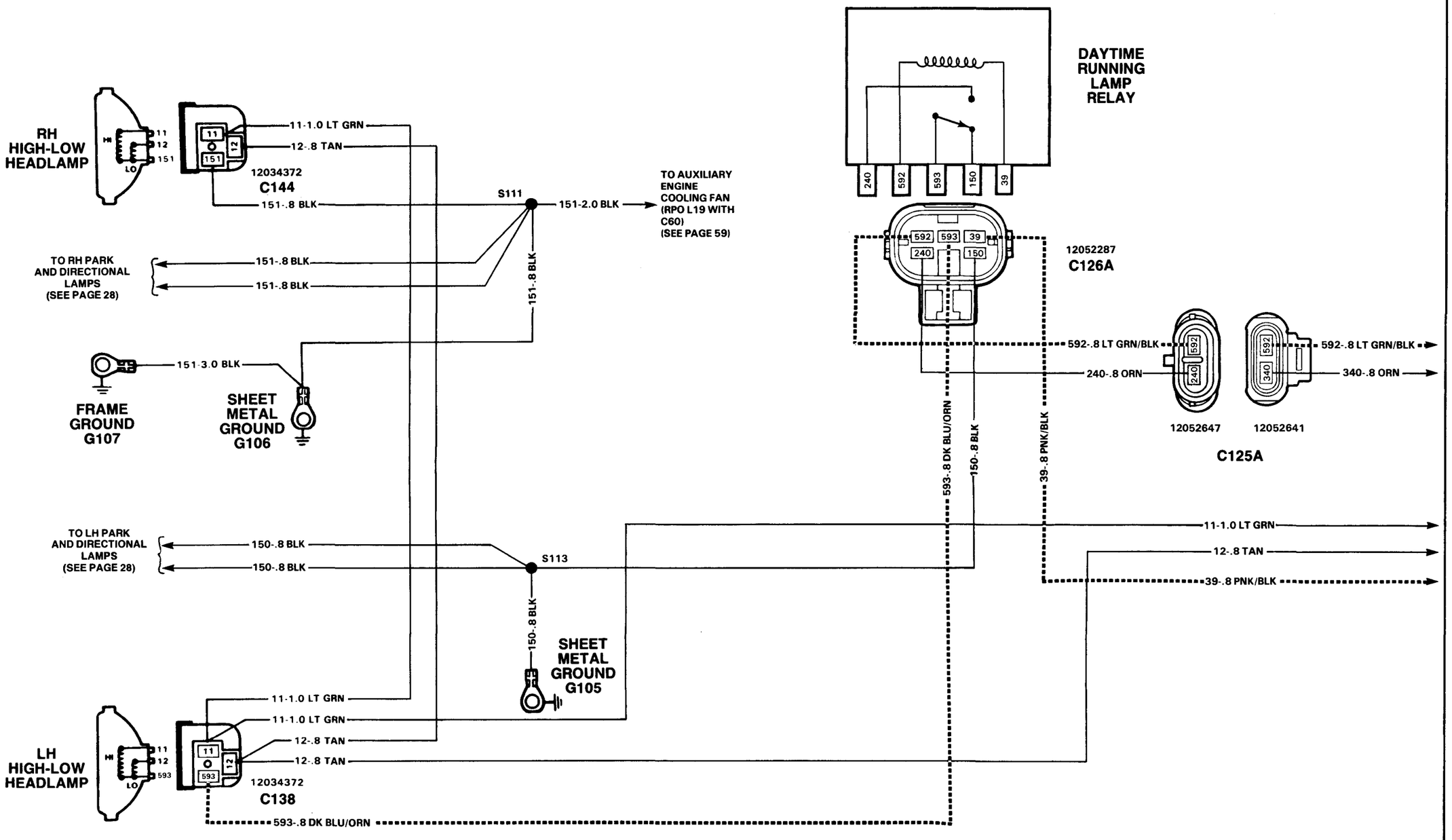
DAYTIME RUNNING LAMPS STAY ON (CANADA ONLY)

TEST	RESULT	ACTION
Disconnect daytime running lamp module connector C211A. Place ignition switch to RUN and headlamp switch to ON position. Connect a J 34029-A multimeter to YEL (10) wire from module connector to ground. Measure voltage.	Battery voltage.	REPLACE daytime running lamp module.
	No voltage.	LOCATE and REPAIR open in YEL (10) wire from daytime running lamp module to headlamp switch.



RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N



RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
MD8 — AUTOMATIC 4-SPEED TRANSMISSION

HEADLAMPS - BASE MODEL WITH DAYTIME RUNNING LAMPS (CANADA ONLY)

PARK BRAKE WARNING SWITCH

12004267
C293

I/P CLUSTER CONNECTOR

C203
12066261

DAYTIME RUNNING LAMPS MODULE

PARKING BRAKE INPUT
IGNITION
HEADLAMP SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRAWING LAMP OUTPUT AND RELAY CONNECTOR
GROUND

12015308
C211A

DIODE MODULE ANTILOCK BRAKES AND DAYTIME RUNNING LAMPS (CIRCUITS 820 AND 420 WITH RPO MD8)

DIODE ASSEMBLY
2977647
C290

12006377
C213A

12020486
C291

DAYTIME RUNNING LAMPS INDICATOR
6294974
C212A

150-.8 BLK
33-.5 TAN/WHT
629-.8 WHT
592-.8 LT GRN/BLK
340-.8 ORN
420-.8 PPL
820-.8 PPL/WHT
39-.8 PNK/BLK
39-.5 PNK/BLK
11-1.0 LT GRN
12-.8 TAN
10-1.0 YEL
150-1.0 BLK

S219
S202
S201

TO STOP LAMP SWITCH (RPO MD8) (SEE PAGE 109)
TO FOUR-WHEEL DRIVE INDICATOR LAMP (RPO MD8) (SEE PAGE 111)
TO TRANSMISSION CONVERTER CLUTCH SOLENOID (RPO MD8) (SEE PAGE 77)
TO STOP LAMP SWITCH (RPO MD8) (SEE PAGE 109)
TO CONVENIENCE CENTER (SEE PAGE 105)
TO I/P CLUSTER CONNECTOR (SEE PAGE 95)
TO FUEL PUMP CYCLE RELAY (SEE PAGE 46)
TO CONVENIENCE CENTER (SEE PAGE 5)
TO CHECK ENGINE LAMP DRIVER (SEE PAGE 73)
TO LOW COOLANT WARNING MODULE (SEE PAGE 98)
(RPO LN6, LL4 ONLY)
TO GLOW PLUG LAMP (SEE PAGE 99, 101)
TO HEATER A/C CONTROL LAMP (SEE PAGE 92)
TO WINDSHIELD WIPER SWITCH (SEE PAGE 144)
TO RADIO (SEE PAGE 121, 122)

GROMMET 105
12020457

FRONT BODY CONNECTOR
11-1.0 LT GRN
12-.2 TAN
39-.8 PNK/BLK
12020100
C100

I/P
12020184
C100

GROUND G200

HOT IN RUN OR START
GAGE/IDLE 20 AMP
HOT AT ALL TIMES
DRL 15 AMP

FRONT
REAR
FUSE BLOCK

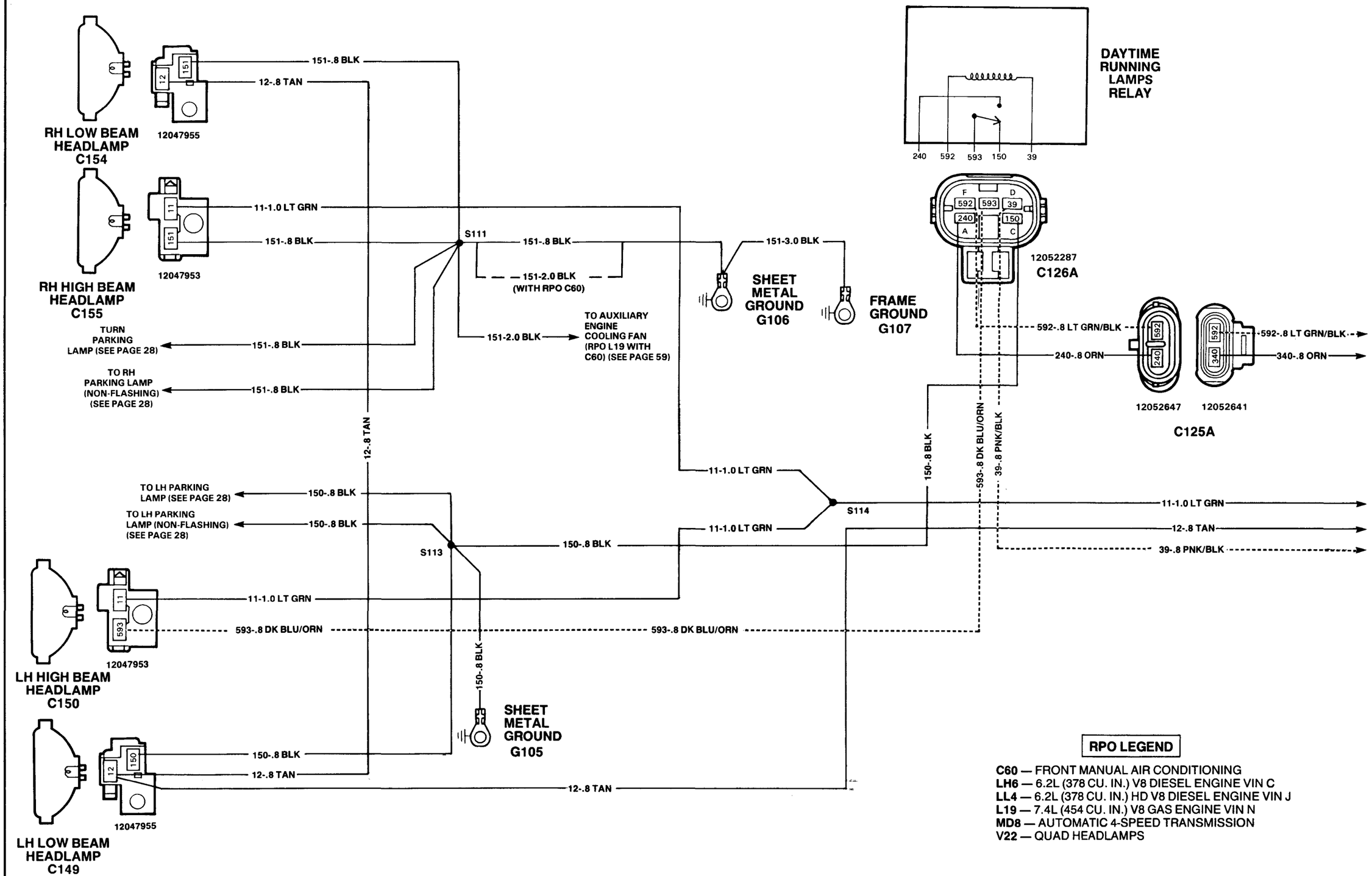
GAGE/IDLE 20 AMP
DRL 15 AMP

HEADLAMP SWITCH

12004628
C202

DIMMER SWITCH
8917693
C201

HEADLAMPS — BASE MODEL
WITH DAYTIME RUNNING LAMPS (CANADA ONLY)



RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
MD8 — AUTOMATIC 4-SPEED TRANSMISSION
V22 — QUAD HEADLAMPS

HEADLAMPS (RPO V22) WITH DAYTIME RUNNING LAMPS (CANADA ONLY)

PARK BRAKE WARNING SWITCH

12004267
C293

33-.5 TAN/WHT

GROMMET 105
12020457

592-.8 LT GRN/BLK
340-.8 ORN

I/P CLUSTER CONNECTOR

12066261
C203

150-.8 BLK
33-.5 TAN/WHT
629-.8 WHT

PARKING BRAKE INPUT
IGNITION
HEADLAMP SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRIVING LAMP OUTPUT
AND RELAY CONTROL
GROUND

12015308
C211A

DAYTIME RUNNING LAMPS MODULE
DIODE ASSEMBLY

2977647
C290

12006377
C213A

DIODE MODULE ANTILOCK BRAKES AND DAYTIME RUNNING LAMPS (CIRCUITS 820 AND 420 WITH RPO MD8)

12020486
C291

DAYTIME RUNNING LAMPS INDICATOR

6294974
C212A

420-.8 PPL → TO STOP LAMP SWITCH (RPO MD8) (SEE PAGE 109)

420-.8 PPL → TO FOUR-WHEEL DRIVE INDICATOR LAMP (RPO MD8) (SEE PAGE 111)

820-.8 PPL/WHT

39-.8 PNK/BLK

S219

592-.8 LT GRN/BLK

10-1.0 YEL

TO TRANSMISSION CONVERTER CLUTCH SOLENOID (RPO MD8) (SEE PAGE 77)

TO STOPLAMP SWITCH (RPO MD8) (SEE PAGE 109)

39-.8 PNK/BLK

39-.5 PNK/BLK → TO CONVENIENCE CENTER (SEE PAGE 105)

S202

39-.5 PNK/BLK → TO I/P CLUSTER CONNECTOR (SEE PAGE 95)

39-.5 PNK/BLK

39-.8 PNK/BLK → TO FUEL PUMP CYCLE RELAY (SEE PAGE 46)

11-1.0 LT GRN

12-.8 TAN

340-.8 ORN

S201

150-.8 BLK → TO CONVENIENCE CENTER (SEE PAGE 5)

150-.8 BLK → TO CHECK ENGINE LAMP DRIVER (SEE PAGE 73)

150-.8 BLK → TO LOW COOLANT WARNING MODULE (SEE PAGE 98)

150-.8 BLK → TO GLOW PLUG LAMP (SEE PAGE 99, 101)

(RPO LH6, LL4 ONLY)

150-.8 BLK → TO HEATER A/C CONTROL LAMP (SEE PAGE 92)

150-.8 BLK → TO WINDSHIELD WIPER SWITCH (SEE PAGE 144)

150-.8 BLK → TO RADIO (SEE PAGE 121, 122)

150-1.0 BLK

FRONT BODY CONNECTOR

11-1.0 LT GRN
12-.8 TAN
39-.8 PNK/BLK

12020100
C100

12020184
C100

I/P

HEADLAMP SWITCH

OFF
PARK
HEAD

150
156
44
9
40
2
10

12004628
C202

8917693
C201

DIMMER SWITCH

HI
LO

GROUND
G200

HOT IN START AND RUN
GAGE/IDLE
20 AMP

HOT AT ALL TIMES
DRL
15 AMP

FUSE BLOCK

FRONT

REAR

GAGE/IDLE
20 AMP

DRL
15 AMP

HEADLAMPS (RPO V22) WITH DAYTIME RUNNING LAMPS (CANADA ONLY)

SECTION A - PAGE 21

RH LOW BEAM HEADLAMP
RH PARK AND DIRECTIONAL LAMP
RH HIGH BEAM HEADLAMP
RH PARK LAMP
LH PARK LAMP
LH HIGH BEAM HEADLAMP
LH PARK AND DIRECTIONAL LAMP
LH LOW BEAM HEADLAMP
HEADLAMPS (RPO V22)
SECTION A - PAGE 22
12047955 C154
12066689 C156
12047953 C155
08905769 C158
08905769 C152
12047955 C149
12047953 C150
12066689 C151
6294015 C153
RH SIDE MARKER LAMP
LH SIDE MARKER LAMP
6294015 C157
HOT AT ALL TIMES
T/L CTSY 20 AMP
SHEET METAL GROUND G106
SHEET METAL GROUND G105
FRAME GROUND G107
FUSE BLOCK
FRONT
REAR
T/L CTSY 20 AMP
I/P CLUSTER CONNECTOR
12066261 C203
FROM AUXILIARY ENGINE COOLING FAN (RPO L19 AND C60) (SEE PAGE 59)
S111
S112
S113
S114
S115
151-.8 BLK
12-.8 TAN
151-3.0 BLK
9-.8 BRN
151-2.0 BLK
11-1.0 LT GRN
150-.8 BLK
2-3.0 RED
11-.8 LT GRN
10-1.0 YEL
COWL
I/P
12020184 C100
12020100 C100
ENGINE
HEADLAMP SWITCH
12004628 C202
DIMMER SWITCH
8917693 C201

RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
V22 — QUAD HEADLAMPS, CHROME GRILLE

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 Directional Signal Switch Assembly. With the Hazard Switch in HAZARD FLASH, voltage is applied to both Front and Rear Directional Lamps. All of the Directional Lamps and both Directional 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.

PARK AND MARKER LAMPS

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

COMPONENT LOCATION

		Page	Figure
Bus Bar Ground	LH side, behind I/P	166	6
Convenience Center	LH side, behind I/P	168	12
Directional Signal Switch	On steering column	166	5
Fuse Block	Behind LH side of I/P, above kick panel	166	4
Hazard Flasher	At convenience center	168	12
Headlamp Switch	LH side of I/P	168	13
Park and Directional Lamp, LH	LH front of vehicle	165	2
Park and Directional Lamp, RH	RH front of vehicle	165	2
Roof Marker Lamps	Front top of roof	168	13
Side Clearance Lamp, LH Front	Front LH side of rear fender	167	10
Side Clearance Lamp, LH Rear	Rear LH side of rear fender	167	10
Side Clearance Lamp, RH Front	Front RH side of rear fender	167	10
Side Clearance Lamp, RH Rear	Rear RH side of rear fender	167	10
Side Marker Lamp, LH Front	Front LH side of vehicle	165	2
Side Marker Lamp, LH Rear	Rear LH side of vehicle	167	8
Side Marker Lamp, RH Front	Front RH side of vehicle	165	2
Side Marker Lamp, RH Rear	Rear RH side of vehicle	167	8
Stop Lamp Switch	On top of brake pedal	168	11
C100	Engine compartment, on LH front of cowl	165	2
C137	Front LH side marker lamp	165	2
C138	Front LH side high-low headlamp	165	2
C139	Front LH park and directional lamp	165	2
C140	Front LH park and directional lamp	165	2
C144	Front RH high-low headlamp	165	2
C145	Front RH side marker lamp	165	2
C146	Front RH park and directional lamp	165	2
C147	Front RH park and directional lamp	165	2
C149 (RPO V22)	Front LH high-low headlamp	165	3
C150 (RPO V22)	Front LH high beam headlamp	165	3
C151 (RPO V22)	Front LH park and directional lamp	165	3
C153 (RPO V22)	Front LH marker lamp	165	3
C154 (RPO V22)	Front RH high-low headlamp	165	3
C155 (RPO V22)	Front RH high beam headlamp	165	3
C156 (RPO V22)	Front RH park and directional lamp	165	3
C157 (RPO V22)	Front RH side marker lamp	165	3
C200	At directional signal switch	166	5
C202	At headlamp switch	168	13
C203	LH side of I/P	166	4
C238	LH I/P, behind I/P cluster	168	13
C244	At stoplamp switch	181	55
C300	Above rear crossmember, towards RH side of vehicle	167	8
C301	Above rear crossmember, towards LH side of vehicle	167	8
C411	RH taillamp	167	8

COMPONENT LOCATION

		Page	Figure
C412	LH taillamp	167	8
C413	Rear LH side marker lamp	167	8
C414	Rear RH side marker lamp	167	8
C415	RH side front clearance lamp	167	10
C416	RH side rear clearance lamp	167	10
C417	LH side front clearance lamp	167	10
C418	RH side rear clearance lamp	167	10
G105	LH front of vehicle, above LH headlamps	165	2
G106	RH front of vehicle, above RH headlamps	165	2
G107	RH front of vehicle, on frame below RH headlamps	165	2
G402	At LH rear lamps	167	9
G403	At RH rear lamps	167	9
S109	Forward lamps harness, LH side	165	2
S110	Forward lamps harness, LH side	165	2
S111	Forward lamps harness, in front of RH headlamps	165	2
S112	Forward lamps harness, in front of LH headlamps	165	2
S113	Forward lamps harness, LH side behind headlamps	165	3
S210	I/P harness, LH side	166	4
S300	Rear lamps extension harness	168	14
S301	LH frame rail, towards rear of vehicle	168	14
S302	LH frame rail, towards rear of vehicle	168	14
S402	Rear taillamp harness, LH side rear of vehicle	167	8
S403	Rear taillamps harness, RH side of vehicle	167	8
S404	Rear taillamps harness, rear center of vehicle	167	9
S405	Rear taillamps harness, RH side of vehicle	167	8
S406	Rear taillamps harness, LH side of vehicle	167	8

TROUBLESHOOTING CHART—FRONT PARK, MARKER, ROOF AND HAZARD LAMPS

FRONT PARK AND SIDE MARKER LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp switch in PARK position. Connect a test lamp from BRN (40) wire at headlamp switch connector C202 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (40) wire between headlamp switch and fuseblock or REPLACE T/L CTSY fuse.
2. Connect test lamp from BRN (9) wire at headlamp switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect test lamp at BRN (9) wire at left hand 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 headlamp switch.

ROOF MARKER LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at headlamp 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 headlamp switch and fuse block or REPLACE (T/L CTSY) fuse.
2. Connect test lamp from BRN (9) wire at headlamp switch connector C202 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect test lamp at WHT (45) wire at left hand 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 headlamp switch.
4. Connect test lamp from WHT (45) wire to BLK (150) wire at left hand 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 directional 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 directional signal lamps and put hazard warning lamps ON. Connect a test lamp from BRN (27) wire at directional signal switch connector C200 to ground.	Test lamp lights.	REPLACE directional 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 directional signal switch connector C200 to ground.	Test lamp flashes.	LOCATE and REPAIR open in wires from directional signal switch to convenience center.
	Test lamp does not light.	REPLACE directional signal switch.

RH SIDE MARKER LAMP
6294015
C157
9-.8 BRN
RH PARK AND DIRECTIONAL LAMP
8917280
C146
9-.8 BRN
TO RH AND LH PARK LAMPS (SEE PAGE 22)
9-.8 BRN
9-.8 BRN
S112
FRONT BODY CONNECTOR
12020100
C100
C140
8917280
9-.8 BRN
LH PARK AND DIRECTIONAL LAMP
REAR BODY CONNECTOR
12020099
C100
9-.8 BRN
C153
6294015
LH SIDE MARKER LAMP
HOT AT ALL TIMES
T/L CTSY 20 AMP
FUSE BLOCK
FRONT
REAR
T/L CTSY 20 AMP
COWL
HEADLAMP SWITCH
12004628
C202
40-.8 BRN
TO COURTESY LAMPS (SEE PAGE 117)
9-.8 BRN
40-.8 BRN
I/P
12020184
C100
9-.8 BRN
RH SIDE MARKER LAMP
6294015
C414
9-.8 BRN
150-.8 BLK
TO Rr. TAIL, STOP AND DIRECTIONAL LAMP (SEE PAGE 151)
S406
9-.8 BRN
12015798
150-.8 BLK
SHEET METAL GROUND
G400
150-.8 BLK
150-.8 BLK
FROM BACKUP LAMP (PAGE 147)
S402
12015024
C301
9-.8 BRN
9-.8 BRN
FROM LICENSE LAMP (SEE PAGE 153)
S300
9-.8 BRN
12015024
S403
150-.8 BLK
FROM BACKUP LAMP (SEE PAGE 147)
150-.8 BLK
150-.8 BLK
G403 & 405
12015798
C300
SHEET METAL GROUND
S405
TO LH TAIL, STOP AND DIRECTIONAL LAMP (SEE PAGE 151)
9-.8 BRN
9-.8 BRN
9-.8 BRN
6294015
C413
LH SIDE MARKER LAMP

RPO LEGEND

V22 — QUAD HEADLAMPS, CHROME GRILLE

PARK AND MARKER LAMPS (SUBURBAN AND UTILITY)

RH SIDE MARKER LAMP
6294015
C157
9-.8 BRN
TO RH PARK AND DIRECTIONAL LAMPS (SEE PAGE 25)
TO RH AND LH PARK LAMPS (RPO V22) (SEE PAGE 22)
TO LH PARK AND DIRECTIONAL LAMPS (SEE PAGE 25)
S112
12020100
C100
FRONT BODY CONNECTOR
12020099
REAR BODY CONNECTOR
C100
COWL
HEADLAMP SWITCH
12004628
C202
I/P
1202184
C100
40-.8 BRN
50/130
WIDESIDE PICK-UP (R05) ONLY
RH FRONT CLEARANCE LAMP
RH REAR CLEARANCE LAMP
6294015
C415
C416
C414
150-.8 BLK
TO RH TAIL, STOP AND DIRECTIONAL LAMP (SEE PAGE 151)
TO BACKUP LAMP (SEE PAGE 147)
S402
12015024
12015798
C300
S404
TO LICENSE LAMP(S) (SEE PAGE 153)
TO END GATE IDENTIFICATION LAMPS (SEE PAGE 152)
S403
TO BACKUP LAMP (SEE PAGE 147)
SHEET METAL GROUND
G403
TO LH TAIL, STOP AND DIRECITONAL LAMP (SEE PAGE 151)
C417
C418
C413
LH FRONT CLEARANCE LAMP
LH REAR CLEARANCE LAMP
LH SIDE MARKER LAMP
HOT AT ALL TIMES
C153
T/L CTSY 20 AMP
FRONT
REAR
FUSE BLOCK

RPO LEGEND

- **E63** — FLEETSIDE BODY
- **R05** — DUAL REAR WHEEL CONVERSION
- **V22** — QUAD HEADLAMPS, CHROME GRILLE

PARK AND MARKER LAMPS (FLEETSIDE (RPO E63) AND WIDESIDE (RPO R05))

RIGHT MARKER LAMP

FRONT IDENTIFICATION LAMPS

LEFT MARKER LAMP

150-.8 BLK

45-.8 WHT

150-.8 BLK

45-.8 WHT

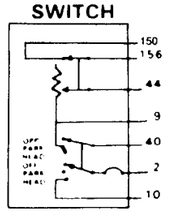
150-.8 BLK

45-.8 WHT

150-.8 BLK

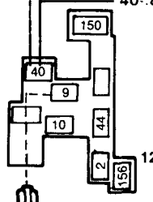
45-.8 WHT

HEADLAMP SWITCH



40-.8 ORN → TO COURTESY LAMPS (SEE PAGE 117)

40-.8 ORN



12004628
C202

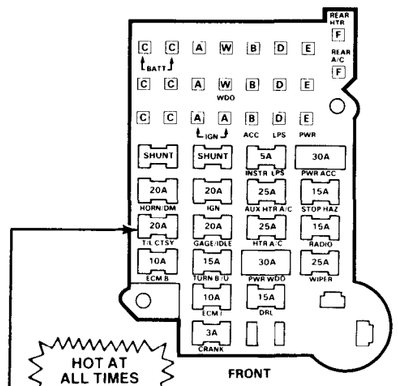
9-.8 BRN

9-.8 BRN → TO RADIO WITH DIGITAL CLOCK (SEE PAGE 121)

9-.8 BRN

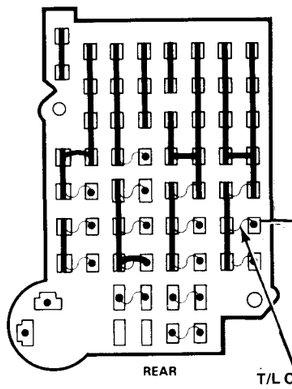
8900420

2977253



HOT AT ALL TIMES

T/L CTSY 20 AMP

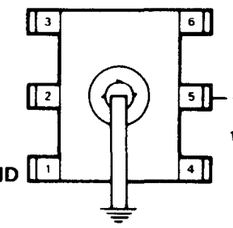


FUSE BLOCK

T/L CTSY 20 AMP

40-.8 ORN

BUS BAR GROUND



150

12004267

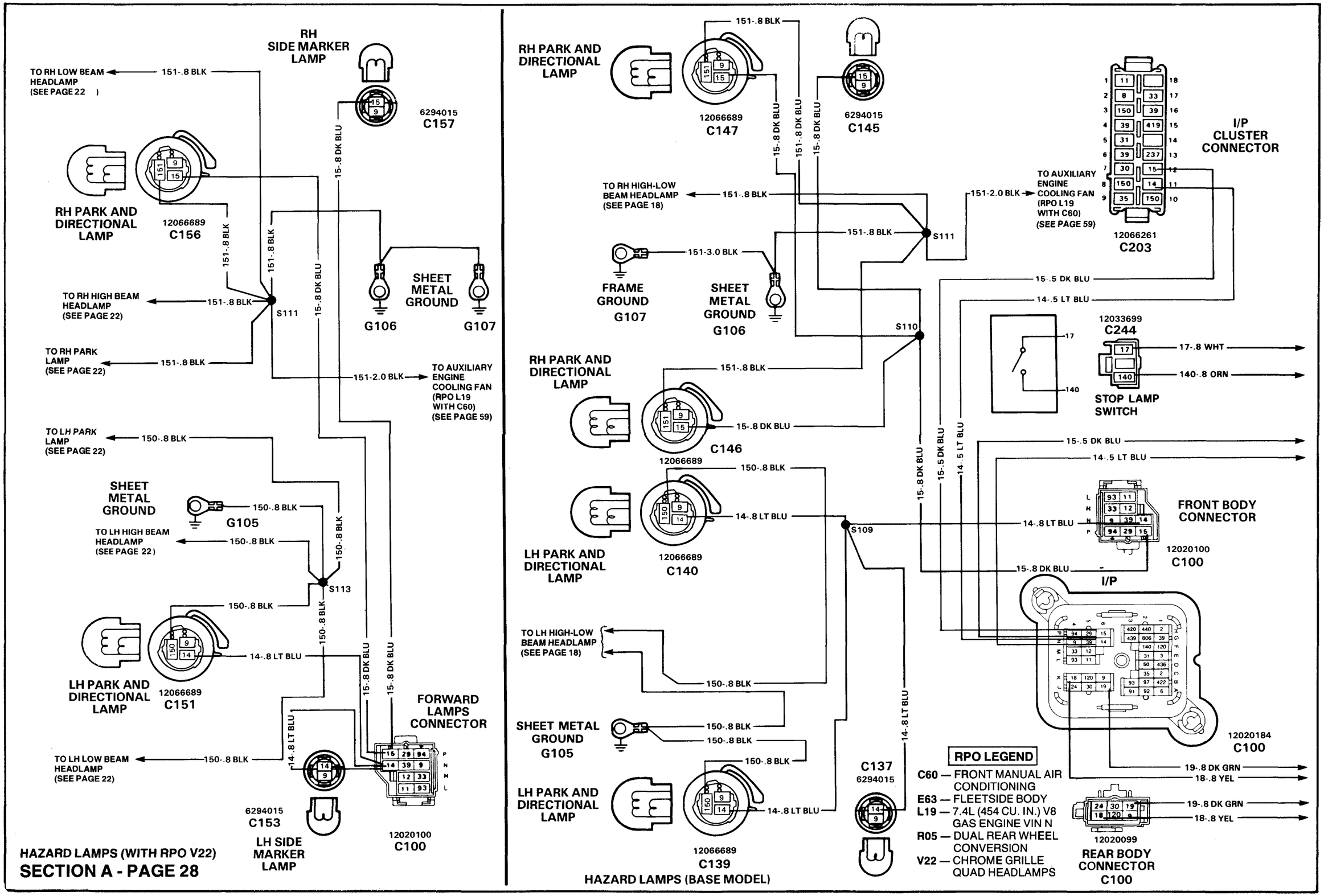
150-.8 BLK

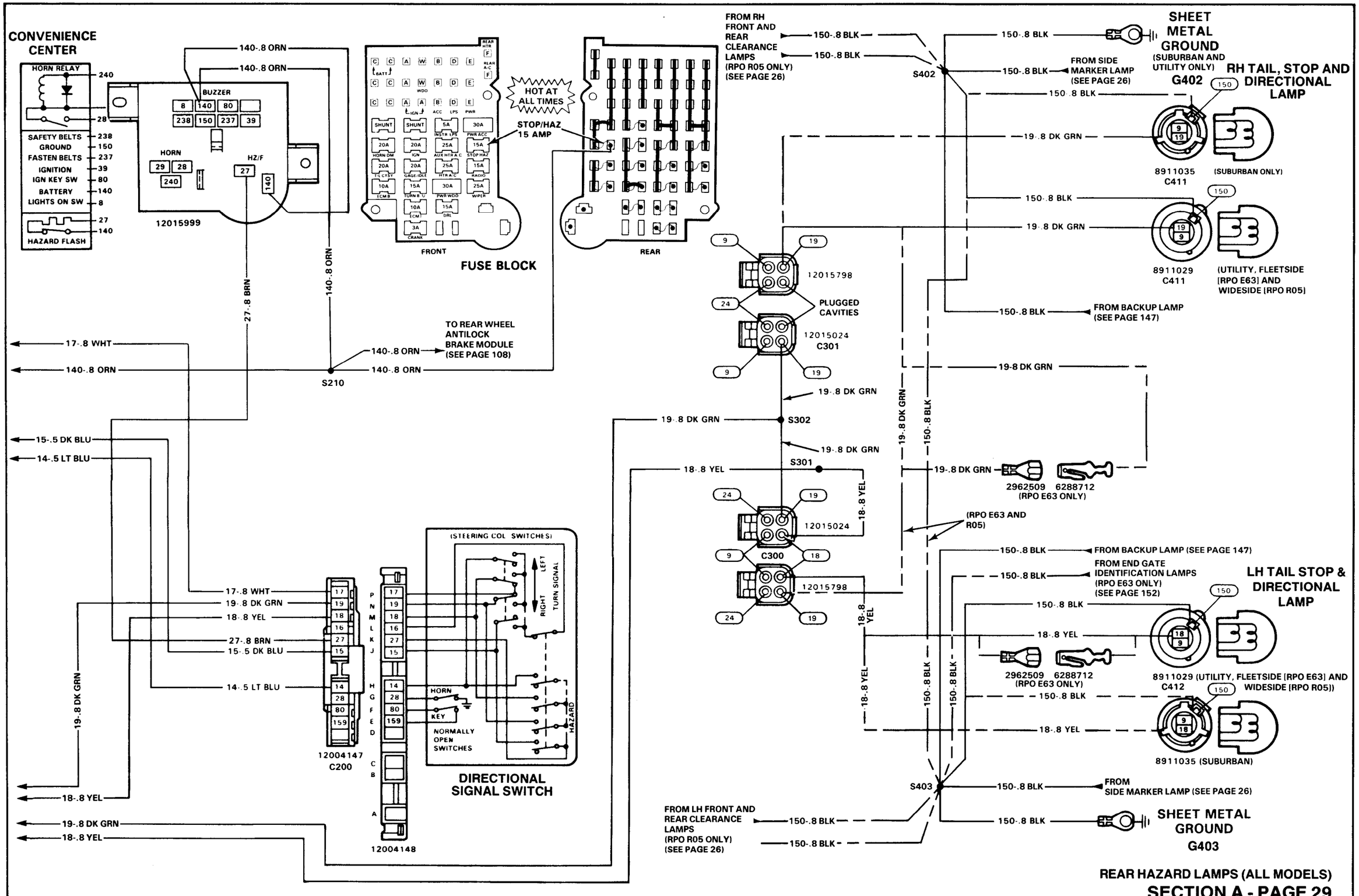
45-.8 WHT

RPO LEGEND

U01 — ROOF MARKER LAMPS

ROOF MARKER LAMPS (RPO U01)


RH SIDE MARKER LAMP
6294015
C157
TO RH LOW BEAM HEADLAMP (SEE PAGE 22)
151-.8 BLK
15-.8 DK BLU
RH PARK AND DIRECTIONAL LAMP
12066689
C156
151-.8 BLK
TO RH HIGH BEAM HEADLAMP (SEE PAGE 22)
151-.8 BLK
S111
TO RH PARK LAMP (SEE PAGE 22)
151-.8 BLK
SHEET METAL GROUND
G106
G107
151-2.0 BLK
TO AUXILIARY ENGINE COOLING FAN (RPO L19 WITH C60) (SEE PAGE 59)
TO LH PARK LAMP (SEE PAGE 22)
150-.8 BLK
SHEET METAL GROUND
G105
TO LH HIGH BEAM HEADLAMP (SEE PAGE 22)
150-.8 BLK
150-.8 BLK
S113
150-.8 BLK
LH PARK AND DIRECTIONAL LAMP
12066689
C151
14-.8 LT BLU
150-.8 BLK
15-.8 DK BLU
FORWARD LAMPS CONNECTOR
TO LH LOW BEAM HEADLAMP (SEE PAGE 22)
150-.8 BLK
14-.8 LT BLU
6294015
C153
LH SIDE MARKER LAMP
12020100
C100
HAZARD LAMPS (WITH RPO V22)
SECTION A - PAGE 28
RH PARK AND DIRECTIONAL LAMP
151-.8 BLK
12066689
C147
15-.8 DK BLU
151-.8 BLK
15-.8 DK BLU
6294015
C145
I/P CLUSTER CONNECTOR
TO RH HIGH-LOW BEAM HEADLAMP (SEE PAGE 18)
151-.8 BLK
151-2.0 BLK
TO AUXILIARY ENGINE COOLING FAN (RPO L19 WITH C60) (SEE PAGE 59)
151-.8 BLK
S111
12066261
C203
151-3.0 BLK
FRAME GROUND
G107
SHEET METAL GROUND
G106
15-.5 DK BLU
14-.5 LT BLU
S110
12033699
C244
17-.8 WHT
140-.8 ORN
STOP LAMP SWITCH
RH PARK AND DIRECTIONAL LAMP
151-.8 BLK
15-.8 DK BLU
C146
12066689
150-.8 BLK
14-.8 LT BLU
LH PARK AND DIRECTIONAL LAMP
12066689
C140
S109
15-.8 DK BLU
15-.5 DK BLU
14-.5 LT BLU
FRONT BODY CONNECTOR
14-.8 LT BLU
12020100
C100
15-.8 DK BLU
I/P
TO LH HIGH-LOW BEAM HEADLAMP (SEE PAGE 18)
150-.8 BLK
SHEET METAL GROUND
G105
150-.8 BLK
150-.8 BLK
LH PARK AND DIRECTIONAL LAMP
150-.8 BLK
14-.8 LT BLU
12066689
C139
HAZARD LAMPS (BASE MODEL)
C137
6294015
14-.8 LT BLU
12020184
C100
19-.8 DK GRN
18-.8 YEL
19-.8 DK GRN
18-.8 YEL
12020099
REAR BODY CONNECTOR
C100
RPO LEGEND
C60 — FRONT MANUAL AIR CONDITIONING
E63 — FLEETSIDE BODY
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
R05 — DUAL REAR WHEEL CONVERSION
V22 — CHROME GRILLE QUAD HEADLAMPS



REAR HAZARD LAMPS (ALL MODELS)

CIRCUIT OPERATION

DIRECTIONAL SIGNAL LAMPS

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

With the Signal Switch in LH Turn position, voltage is applied to both the LH Directional Indicator and the LH Front Park/Directional Lamp (LT BLU wires). Voltage is applied to the LH Rear Directional 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 Directional Lamp will also be applied to the LH Front Marker Lamp. If the Lamp 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 Directional 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 Lamp 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 Directional Signal Switch is in TURN LEFT, the LH Front Marker Lamp will have voltage at both connections and will go out. When the flasher removes voltage to the Directional Lamp, the Marker Lamp will be grounded through the Directional Lamp and will go on. In this way, the LH Front Marker Lamp will flash on when the LH Front Park and Directional Lamp goes off, and off when the Directional Lamp goes on.

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

COMPONENT LOCATION

		Page — Figure
Directional Signal Flasher	On fuse block	166 — 4
Directional Signal Switch	On steering column	166 — 5
Fuse Block	Behind LH side of I/P, above kick panel	166 — 4
Headlamp, LH High Beam (RPO V22)	LH front of vehicle	165 — 3
Headlamp, LH High-Low (Base)	LH front of vehicle	165 — 2
Headlamp, LH Low Beam (RPO V22)	LH front of vehicle	165 — 3
Headlamp, RH High Beam (RPO V22)	RH front of vehicle	165 — 3
Headlamp, RH High-Low (Base)	RH front of vehicle	165 — 2
Headlamp, RH Low Beam (RPO V22)	RH front of vehicle	165 — 3
Park and Directional Lamp, LH	LH front of vehicle	165 — 2
Park and Directional Lamp, RH	RH front of vehicle	165 — 2
Park Lamp, LH (RPO V22)	LH front of vehicle	165 — 3
Park Lamp, RH (RPO V22)	RH front of vehicle	165 — 3
Side Marker Lamp, LH Front	Front LH side of vehicle	165 — 2
Side Marker Lamp, LH Rear	Rear LH side of vehicle	167 — 8
Side Marker Lamp, RH Front	Front RH side of vehicle	165 — 2
Side Marker Lamp, RH Rear	Rear RH side of vehicle	167 — 8
C100	Engine compartment, on LH front of cowl	165 — 2
C137 (Base)	Front LH side marker lamp	165 — 2
C138 (Base)	Front LH side high-low headlamp	165 — 2
C139 (Base)	Front LH park and directional lamp	165 — 2
C140 (Base)	Front LH park and directional lamp	165 — 2
C144 (Base)	Front RH high-low headlamp	165 — 2
C145 (Base)	Front RH side marker lamp	165 — 2
C146 (Base)	Front RH park and directional lamp	165 — 2
C147 (Base)	Front RH park and directional lamp	165 — 2
C149 (RPO V22)	Front LH high-low headlamp	165 — 3
C150 (RPO V22)	Front LH high beam headlamp	165 — 3
C151 (RPO V22)	Front LH park and directional lamp	165 — 3
C152 (RPO V22)	Front LH park lamp	165 — 3
C153 (RPO V22)	Front LH marker lamp	165 — 3
C154 (RPO V22)	Front RH high-low headlamp	165 — 3
C155 (RPO V22)	Front RH high beam headlamp	165 — 3
C156 (RPO V22)	Front RH park and directional lamp	165 — 3
C157 (RPO V22)	Front RH side marker lamp	165 — 3
C158 (RPO V22)	Front RH park lamp	165 — 3
C200	At directional signal switch	166 — 5

COMPONENT LOCATION

		Page — Figure
C203	LH side of I/P	166 — 4
C300	Above rear crossmember, towards RH side of vehicle	167 — 8
C301	Above rear crossmember, towards LH side of vehicle	167 — 8
C411	RH taillamp	167 — 9
C412	LH taillamp	167 — 9
G105	LH front of vehicle, above LH headlamps	165 — 2
G106	RH front of vehicle, above RH headlamps	165 — 2
G107	RH front of vehicle, on frame below RH headlamps	165 — 2
G402	At LH rear lamps	167 — 9
G403	At RH rear lamps	167 — 9
S109	Forward lamps harness, LH side	165 — 2
S110	Forward lamps harness, LH side	165 — 2
S111	Forward lamps harness, in front of RH headlamp	165 — 2
S113	Forward lamps harness, LH side behind headlamps	165 — 3
S301	LH frame rail, towards rear of vehicle	168 — 14
S302	LH frame rail, towards rear of vehicle	168 — 14
S402	Rear taillamp harness, LH side rear of vehicle	167 — 8
S403	Rear taillamps harness, RH side of vehicle	167 — 8

PRELIMINARY CHECKS:

1. Check condition of TURN B/U 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.

TROUBLESHOOTING CHART—DIRECTIONAL SIGNAL LAMPS

DIRECTIONAL SIGNALS DO NOT WORK ON ONE SIDE

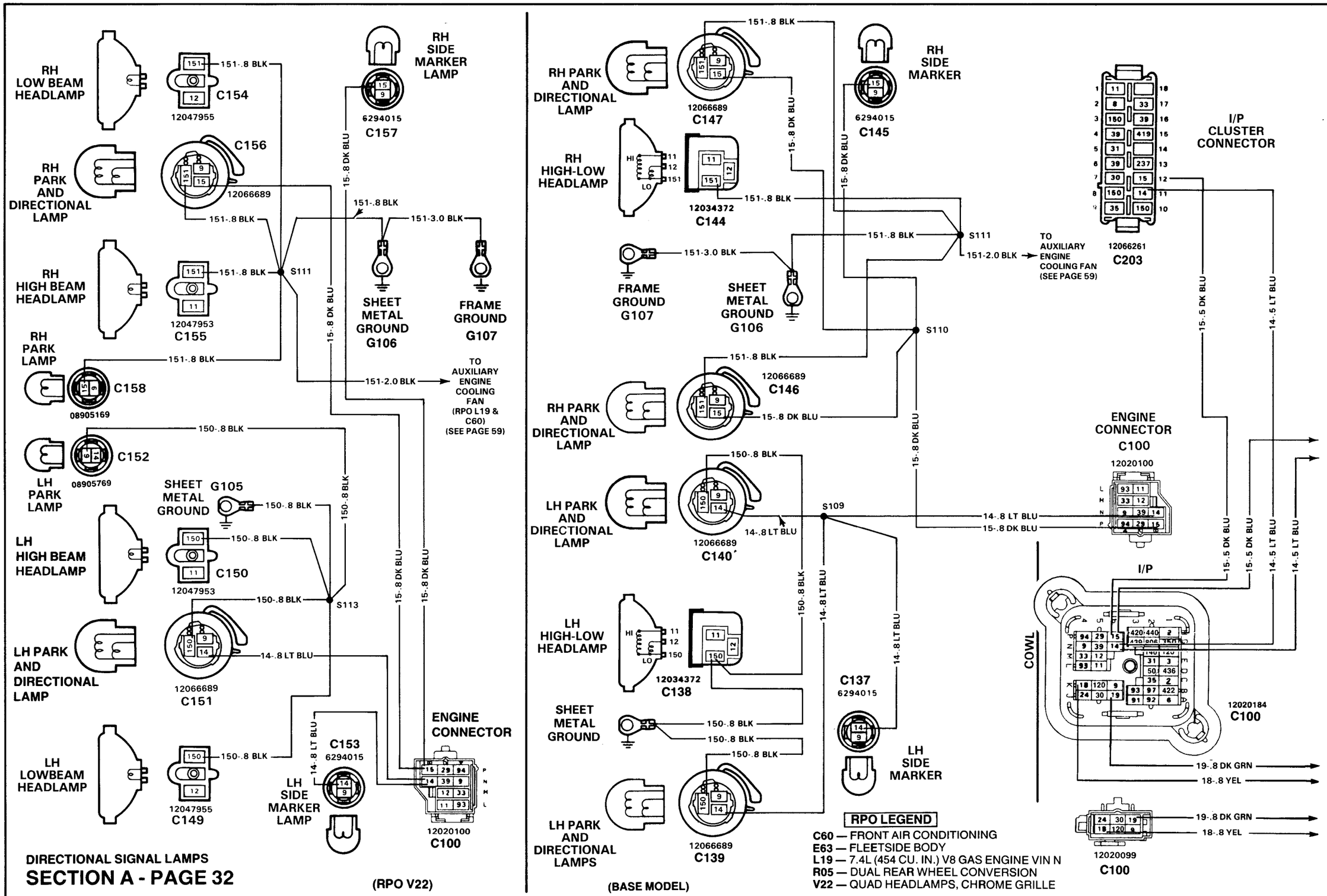
TEST	RESULT	ACTION
1. Turn hazard warning system ON. Observe lights on side of directional signals that did not work.	Lights flash.	CHECK for improper bulb. REPLACE if necessary.
	Lights do not come on.	GO to step 2.
2. Turn hazard warning system off. Place ignition switch to RUN and directional signal 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 directional signal switch connector C200 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 directional signal switch connector C200 to ground.	Test lamp lights.	REPLACE directional signal switch.
	Test lamp does not light.	REPLACE directional 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 directional lamp connector C137, C139, C140, C145, C146, C147 (Base) or C151, C152, C153, C156, C157, C158 (RPO V22) 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 test lamp from LT BLU (14) or DK BLU (15) wire to BLK (150 or 151) wire at park and directional lamp connector C139, C140, C146, C147 (Base) or C151, C156 (RPO V22).	Test lamp lights.	CHECK condition of bulb sockets.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire.

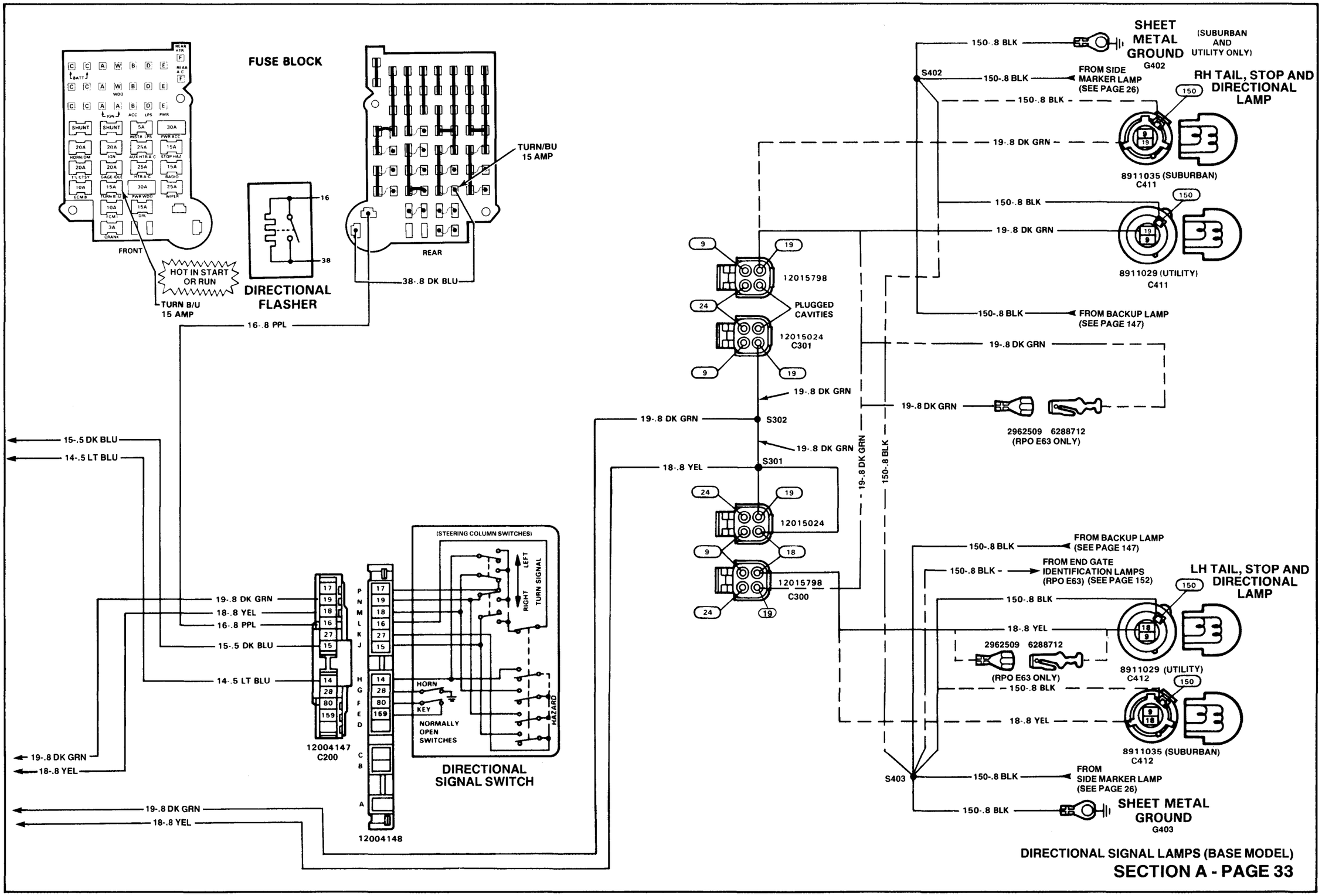
DIRECTIONAL SIGNALS DO NOT OPERATE

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 at directional signal switch connector C200 to ground.	Test lamp lights.	REPLACE directional 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 directional signal flasher.
3. Place ignition switch in RUN position and put directional signal switch as if making a left turn. Connect test lamp from LT BLU (14) wire at directional signal switch connector C200 to ground.	Test lamp flashes.	LOCATE and REPAIR open in wires from directional signal switch to convenience center.
	Test lamp does not light.	REPLACE directional signal switch.

DIRECTIONAL SIGNAL LAMPS FLASH RAPIDLY

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


RH LOW BEAM HEADLAMP
RH PARK AND DIRECTIONAL LAMP
RH HIGH BEAM HEADLAMP
RH PARK LAMP
LH LOWBEAM HEADLAMP
LH HIGH BEAM HEADLAMP
LH PARK AND DIRECTIONAL LAMP
LH PARK LAMP
SHEET METAL GROUND G105
LH SIDE MARKER LAMP
RH SIDE MARKER LAMP
6294015 C157
12047955 C154
12066689 C156
12047953 C155
08905169 C158
12047955 C149
12047953 C150
12066689 C151
08905769 C152
6294015 C153
12020100 C100
SHEET METAL GROUND G106
FRAME GROUND G107
S111
S113
151-.8 BLK
151-3.0 BLK
151-2.0 BLK
150-.8 BLK
14-.8 LT BLU
15-.8 DK BLU
TO AUXILIARY ENGINE COOLING FAN (RPO L19 & C60) (SEE PAGE 59)
ENGINE CONNECTOR
DIRECTIONAL SIGNAL LAMPS
SECTION A - PAGE 32
(RPO V22)
RH PARK AND DIRECTIONAL LAMP
RH HIGH-LOW HEADLAMP
LH PARK AND DIRECTIONAL LAMP
LH HIGH-LOW HEADLAMP
LH PARK AND DIRECTIONAL LAMPS
HI
LO
12066689 C147
12034372 C144
12066689 C146
12066689 C140
12034372 C138
12066689 C139
6294015 C145
6294015 C137
RH SIDE MARKER
LH SIDE MARKER
S110
S109
TO AUXILIARY ENGINE COOLING FAN (SEE PAGE 59)
12066261 C203
I/P CLUSTER CONNECTOR
15-.5 DK BLU
14-.5 LT BLU
ENGINE CONNECTOR C100
12020100
I/P
COWL
12020184 C100
19-.8 DK GRN
18-.8 YEL
12020099 C100
RPO LEGEND
C60 — FRONT AIR CONDITIONING
E63 — FLEETSIDE BODY
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
R05 — DUAL REAR WHEEL CONVERSION
V22 — QUAD HEADLAMPS, CHROME GRILLE
(BASE MODEL)



DIRECTIONAL SIGNAL LAMPS (BASE MODEL)

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.

COMPONENT LOCATION

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.

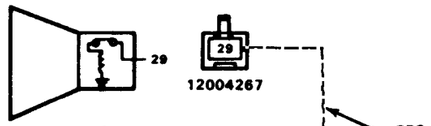
TROUBLESHOOTING CHART—HORNS

HORN(S) WILL NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from BLK/LT GRN (29) wire at horn connector to ground. Press horn switch.	Test lamp lights.	REPLACE.
	Test lamp does not light.	GO to step 3.
2. Remove horn relay. Connect test lamp from ORN (240) wire at convenience center to ground.	Test lamp lights at both connections.	GO to step 3.
	Test lamp does not light at one or either connection.	LOCATE and REPAIR open in ORN (240) wire.
3. Disconnect directional signal switch connector C200. Use a jumper wire to ground BLK (28) wire at directional signal switch connector C200.	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 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 BLK/LT GRN (29) wire between C100 and horn(s).

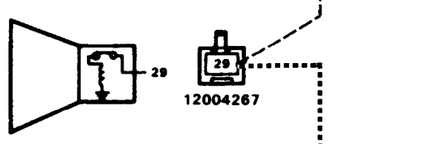
HORN SOUNDS CONTINUOUSLY WITHOUT DEPRESSING HORN SWITCH

TEST	RESULT	ACTION
1. Disconnect directional signal switch connector C200.	Horn stops.	REPLACE horn 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 (28) wires.	No shorts found.	REPLACE relay.
	Short(s) found.	REPAIR or REPLACE as required.

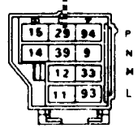


RPO Z62

29-1.0 LT GRN/BLK



29-1.0 LT GRN/BLK

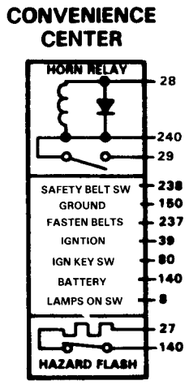


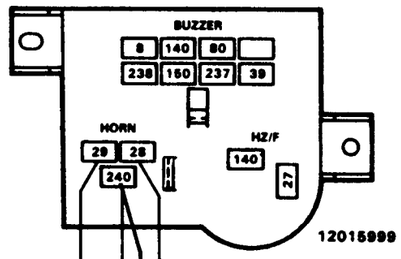
ENGINE CONNECTOR

12020100

C100

COWL





28-.5 BLK

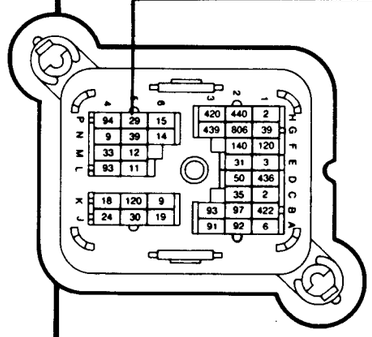
240-1.0 ORN → TO CIGARETTE LIGHTER

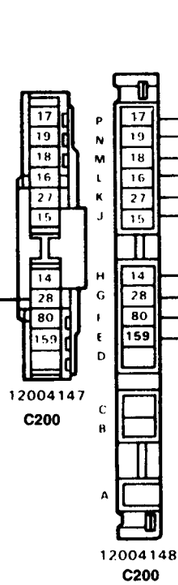
240-1.0 ORN

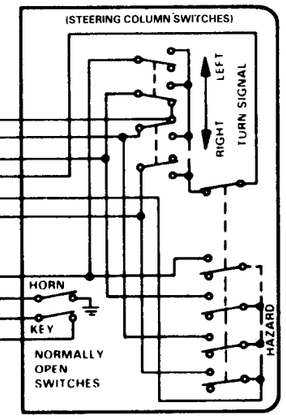
240-1.0 ORN

29-1.0 DK GRN

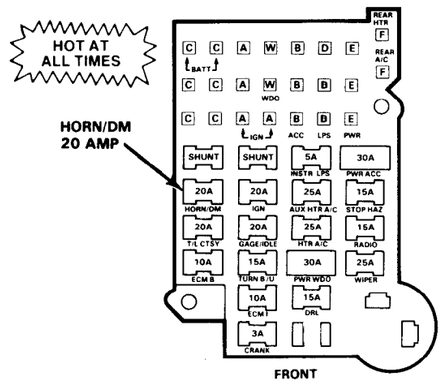
I/P

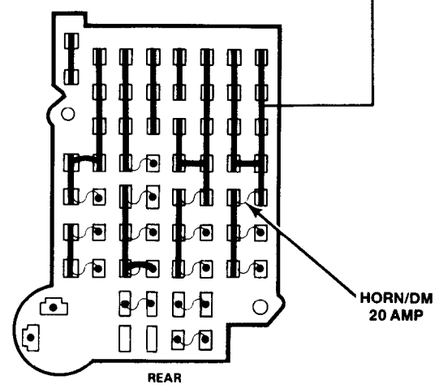






DIRECTIONAL SIGNAL SWITCH





FUSE BLOCK

RPO LEGEND

Z62 — EQUIPMENT PACKAGE, COMFORT, CONVENIENCE AND DECOR

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 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.

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.

COMPONENT LOCATION

		Page	Figure
Battery (Gasoline)	RH front of engine compartment	170	20
Battery, LH (Diesel)	LH front of engine compartment	169	16
Battery, RH (Diesel)	RH front of engine compartment	169	16
Clutch Start Switch	Below LH side of I/P, on clutch pedal support	166	5
Coil (Gasoline)	Rear of engine	171	22
Distributor (Gasoline)	Rear of engine	171	22
Electronic Control Module	Under center of I/P	176	37
Fuse Block	Behind LH side of I/P, above kick panel	166	4
Generator (RPO LH6, LL4)	Upper RH front of engine	170	18
Generator (RPO L05, L19)	Upper RH front of engine	169	17
Grommet 100	Engine compartment, center of cowl	169	17
Ignition Switch	RH side of steering column	166	5
Junction Block	Engine compartment, LH front of cowl	165	2
Starter Motor Assembly (RPO LH6, LL4)	Lower RH side of engine	170	18
Starter Motor Assembly (RPO L05, L19)	Lower RH side of engine	169	17
Tachometer (Gasoline)	Near distributor	—	
C103	Engine harness, LH side of engine	175	35
C106	At generator	169	17
C111	At distributor	171	22
C112	At coil	171	22
C113	At tachometer	171	22
C117	Under center of I/P, in engine harness	169	17
C120	At ECM	176	37
C203	LH side of I/P	166	4
C209	At ignition switch	166	5
C237	At clutch switch	166	5
G111 (Gasoline)	RH side of radiator support	170	20
G112 (Gasoline)	RH side of engine	170	19
G113 (Diesel)	LH side of engine	169	16
G114 (Diesel)	RH side of engine	169	16
S108	Top, RH side of engine	171	21
S206	I/P harness, LH side of steering column	166	5
S207	In I/P harness, bottom of steering column	166	5
S208	I/P harness, near fuse block	166	4

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 1990 Light Duty Truck Service Manual. If battery has sufficient charge, use the following procedures.

TROUBLESHOOTING CHART—START AND CHARGE

ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK

TEST	RESULT	ACTION
1. Place transmission in PARK (auto) or depress clutch pedal for manual transmission. 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 manual transmission. GO to step 5 for auto transmission.
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 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 BAT 2 terminal at ignition switch connector C209 to ground. Repeat step except connect from BAT 3 terminal to ground.	Battery voltage.	REPLACE ignition switch.
	No voltage.	LOCATE 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 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.

VOLTS INDICATOR DOES NOT LIGHT WITH IGNITION SWITCH IN RUN AND ENGINE STOPPED

TEST	RESULT	ACTION
Disconnect generator connector C106. Place ignition switch in RUN position. Connect a fused jumper from BRN (25) wire at generator connector C106 to ground.	VOLTS indicator lights.	REPAIR generator.
	VOLTS indicator does not light.	CHECK condition of indicator bulb. If good, LOCATE and REPAIR open in BRN (25) wire from generator to I/P cluster.

VOLTS INDICATOR STAYS ON WHEN ENGINE IS RUNNING

TEST	RESULT	ACTION
Disconnect generator connector C106.	VOLTS indicator does not light.	REPAIR generator.
	VOLTS indicator remains lit.	LOCATE and REPAIR short to ground in BRN (25) wire from generator to I/P cluster.

BATTERY IS UNDERCHARGED OR OVERCHARGED

TEST	RESULT	ACTION
1. Disconnect generator connector C106. Place ignition switch in RUN position. Connect voltmeter from BRN (25) wire at generator connector C109 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of indicator bulb. If good, LOCATE and REPAIR open in BRN (25) wire from generator to I/P cluster.
2. Connect voltmeter from RED (2) wire at generator to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in RED (2) wire and fusible link from generator to junction block.
3. 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 Service Manual.
	Reading of less than or greater than 13-16 volts.	REPAIR generator.

1-32.0 BLK

6-3.0 PPL

STARTER MOTOR SOLENOID

JUNCTION BLOCK

2-3.0 RST (FUSIBLE LINK)

(RPO L19 ONLY)

2-.8 RED

S2

(RPO L19 ONLY)

2-1.0 RST (FUSIBLE LINK)

S2

2-3.0 RED

ENGINE

12020183
C100

50/130

2-3.0 RED

12 SI GENERATOR

12052315
C106

2-1.0 RST (FUSIBLE LINK)

25-1.0 BRN

2-1.0 RST (FUSIBLE LINK)

2-1.0 RST (FUSIBLE LINK)

GENERATOR

2-.8 BLK/RED

1-32.0 BLK

2-8.0 BLK

1-32.0 BLK

BATTERY

SHEET METAL GROUND
G111

ENGINE GROUND
G112

START (GASOLINE)
(L05, WITH 12 SI GENERATOR)

SECTION A - PAGE 38

COWL

33-.5 TAN/WHT

33-.5 TAN/WHT

TO PARK BRAKE WARNING SWITCH
(SEE PAGE 107)

I/P CLUSTER CONNECTION

8900371
C203

I/P

50/130

12020184
C100

S206

(RPO M40 AND MD8 ONLY)

2-3.0 RED

2-3.0 RED

130-.22 BRN/WHT

2-3.0 RED

(RPO M20 ONLY)

12010966
C209

6294641

33-.5 TAN/WHT

2-3.0 RED

6-3.0 PPL

5-3.0 YEL

8917548
C237

6-3.0 PPL

CLUTCH START SWITCH
(MANUAL TRANSMISSION ONLY)

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

HOT AT ALL TIMES

PWR ACC 30 AMP

HORN/DM 20 AMP

T/L CTSY 20 AMP

ECM B 10 AMP

HOT IN START

FRONT

CRANK 3 AMP

FUSE BLOCK

2-3.0 RED

PWR ACC 30 AMP

HORN/DM 20 AMP

2-3.0 RED

T/L CTSY 20 AMP

6-3.0 PPL

806-.8 PPL/WHT

REAR

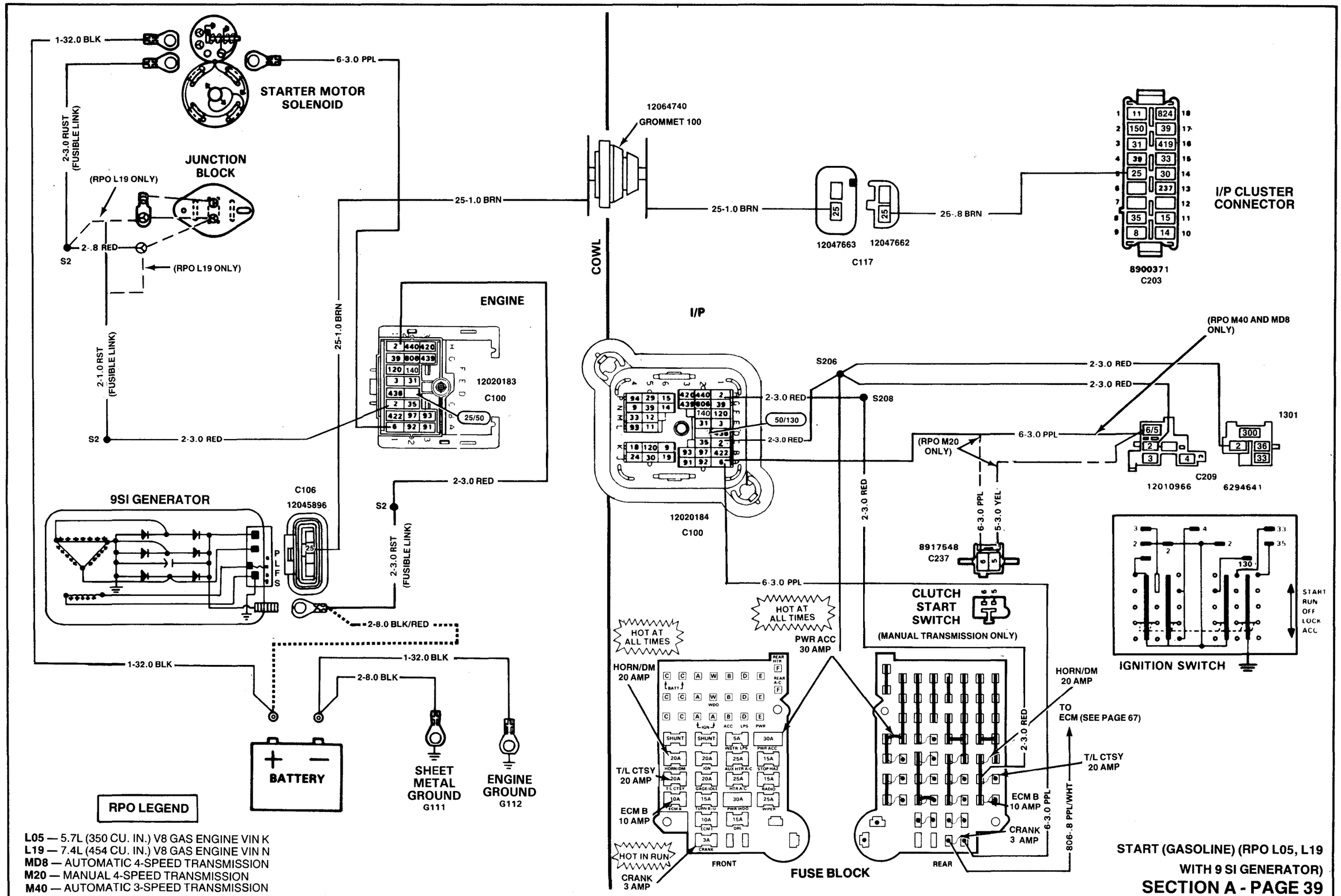
CRANK 3 AMP

ECM B 10 AMP

TO ECM (SEE PAGE 67)

RPO LEGEND

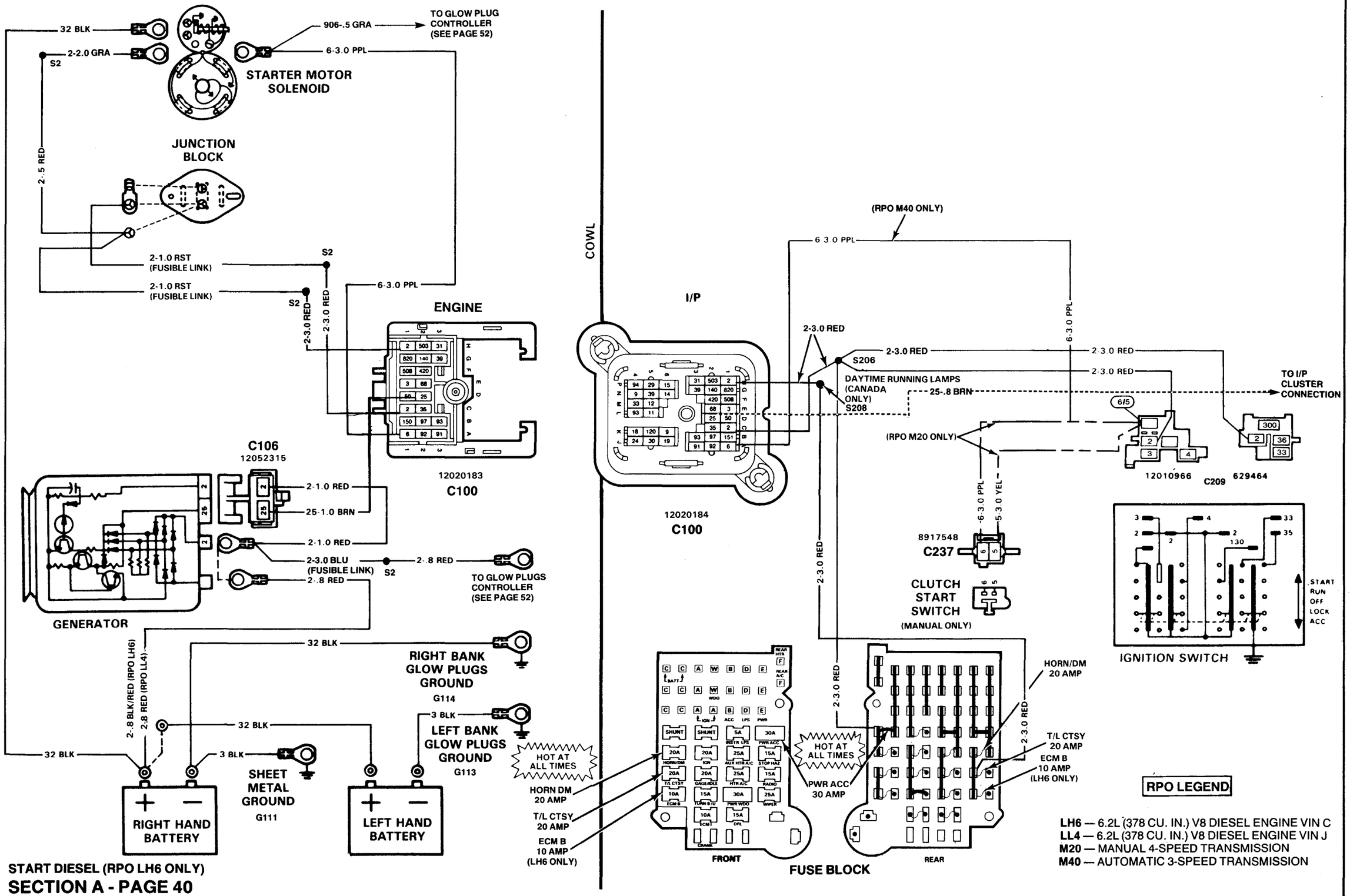
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
MD8 — AUTOMATIC 4-SPEED TRANSMISSION
M20 — MANUAL 4-SPEED TRANSMISSION
M40 — AUTOMATIC 3-SPEED TRANSMISSION



RPO LEGEND

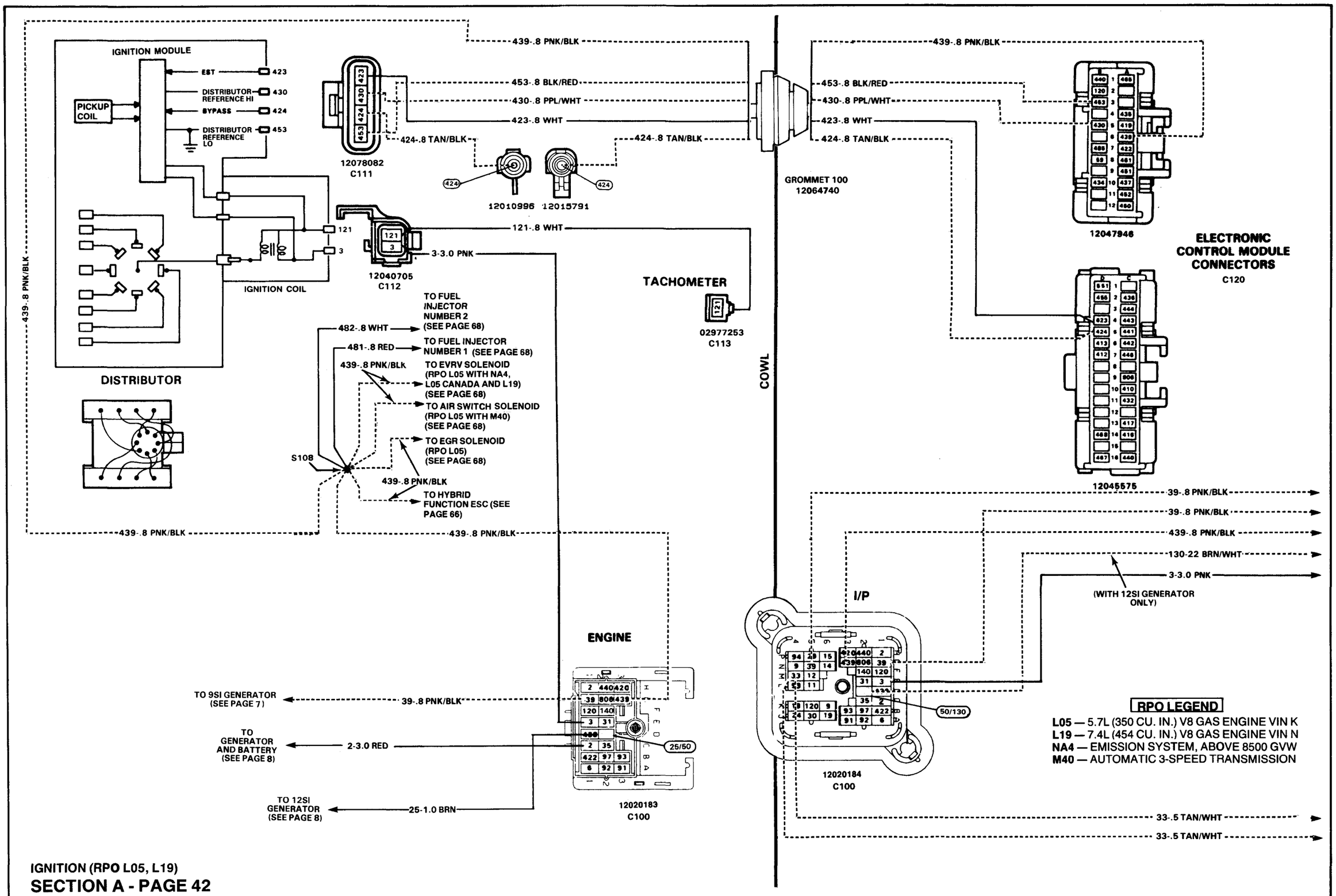
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
MD8 — AUTOMATIC 4-SPEED TRANSMISSION
M20 — MANUAL 4-SPEED TRANSMISSION
M40 — AUTOMATIC 3-SPEED TRANSMISSION

START (GASOLINE) (RPO L05, L19 WITH 9 SI GENERATOR)


32 BLK
2-2.0 GRA
S2
906-.5 GRA
TO GLOW PLUG CONTROLLER (SEE PAGE 52)
6-3.0 PPL
STARTER MOTOR SOLENOID
JUNCTION BLOCK
2-.5 RED
2-1.0 RST (FUSIBLE LINK)
2-1.0 RST (FUSIBLE LINK)
S2
S2
2-3.0 RED
2-3.0 RED
6-3.0 PPL
ENGINE
C106
12052315
12020183
C100
2-1.0 RED
25-1.0 BRN
2-1.0 RED
2-3.0 BLU (FUSIBLE LINK)
S2
2-.8 RED
2-.8 RED
TO GLOW PLUGS CONTROLLER (SEE PAGE 52)
GENERATOR
32 BLK
RIGHT BANK GLOW PLUGS GROUND
G114
2-.8 BLK/RED (RPO LH6)
2-.8 RED (RPO LL4)
32 BLK
3 BLK
LEFT BANK GLOW PLUGS GROUND
G113
32 BLK
3 BLK
SHEET METAL GROUND
G111
RIGHT HAND BATTERY
LEFT HAND BATTERY
HOT AT ALL TIMES
HORN DM 20 AMP
T/L CTSY 20 AMP
ECM B 10 AMP (LH6 ONLY)
START DIESEL (RPO LH6 ONLY)
SECTION A - PAGE 40
COWL
I/P
12020184
C100
(RPO M40 ONLY)
6-3.0 PPL
2-3.0 RED
2-3.0 RED
S206
2-3.0 RED
2-3.0 RED
DAYTIME RUNNING LAMPS (CANADA ONLY)
S208
25-.8 BRN
TO I/P CLUSTER CONNECTION
(RPO M20 ONLY)
6-3.0 PPL
5-3.0 YEL
6/5
12010966
C209
629464
8917548
C237
CLUTCH START SWITCH
(MANUAL ONLY)
2-3.0 RED
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC
FRONT
REAR
FUSE BLOCK
HOT AT ALL TIMES
PWR ACC 30 AMP
HORN/DM 20 AMP
T/L CTSY 20 AMP
ECM B 10 AMP (LH6 ONLY)
2-3.0 RED
RPO LEGEND
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
M40 — AUTOMATIC 3-SPEED TRANSMISSION

COMPONENT LOCATION

		Page — Figure
Electronic Control Module (RPO L05)	Under center of I/P	171 — 21
Electronic Control Module (RPO L19)	Under center of I/P	172 — 23
Fuel Injector 1	In throttle body	171 — 21
Fuel Injector 2	In throttle body	171 — 21
Fuel Pump	In fuel tank	173 — 25
Fuel Pump Cycle Relay	Under I/P	—
Fuel Pump Oil Pressure Switch (RPO L05)	Rear LH side of engine	171 — 22
Fuel Pump Oil Pressure Switch (RPO L19)	Front LH side of engine	172 — 24
Fuel Pump Relay	Engine compartment, center of cowl	171 — 21
Fuse Block	Behind LH side of I/P, above kick panel	166 — 4
Grommet 100	Engine compartment, center of cowl	171 — 21
Grommet 101	Front of throttle body	171 — 21
Idle Air Control Actuator (RPO L05)	RH side of engine, near throttle body	171 — 21
Idle Air Control Actuator (RPO L19)	RH side of engine, near throttle body	172 — 23
Oxygen Sensor	LH exhaust manifold	171 — 22
Throttle Position Sensor	RH side of throttle body	171 — 21
C100	Engine compartment, LH side of cowl	165 — 2
C109	At oxygen sensor	171 — 22
C115	At fuel pump oil pressure switch	172 — 24
C118	Under center of I/P	171 — 21
C120	At electronic control module	171 — 21
C122	At fuel pump relay	171 — 21
C123	At fuel pump prime	171 — 21
C125	At throttle position sensor	171 — 21
C126	At idle air control actuator	171 — 21
C128	At fuel injector 1	171 — 21
C129	At fuel injector 2	171 — 21
C134	At idle air control actuator	172 — 23
C194	Under I/P	—
C409	At fuel tank	173 — 25
G102	At front RH side of engine	172 — 24
G103	Rear RH side of engine	171 — 22
G409	On frame, near fuel tank	173 — 25
S103	Engine harness, rear RH side of engine	171 — 22
S104	Engine harness in front of grommet 100	171 — 21
S105	Engine harness in front of grommet 100	171 — 21
S106	Engine harness rear RH side of engine	171 — 21
S107	Engine harness, RH side of engine	171 — 21
S108	Engine harness, RH side of engine	171 — 21
S200	I/P harness, behind LH side of I/P	166 — 4
S202	I/P harness, behind LH side of I/P	166 — 4


IGNITION MODULE
EST
423
DISTRIBUTOR REFERENCE HI
430
BYPASS
424
DISTRIBUTOR REFERENCE LO
453
PICKUP COIL
DISTRIBUTOR
IGNITION COIL
121
3
439-.8 PNK/BLK
453-.8 BLK/RED
430-.8 PPL/WHT
423-.8 WHT
424-.8 TAN/BLK
12078082
C111
12010996
12015791
121-.8 WHT
3-3.0 PNK
12040705
C112
TACHOMETER
02977253
C113
482-.8 WHT
TO FUEL INJECTOR NUMBER 2 (SEE PAGE 68)
481-.8 RED
TO FUEL INJECTOR NUMBER 1 (SEE PAGE 68)
TO EVRV SOLENOID (RPO L05 WITH NA4, L05 CANADA AND L19) (SEE PAGE 68)
TO AIR SWITCH SOLENOID (RPO L05 WITH M40) (SEE PAGE 68)
TO EGR SOLENOID (RPO L05) (SEE PAGE 68)
S108
TO HYBRID FUNCTION ESC (SEE PAGE 66)
COWL
GROMMET 100
12064740
12047946
ELECTRONIC CONTROL MODULE CONNECTORS
C120
12045575
39-.8 PNK/BLK
130-22 BRN/WHT
(WITH 12SI GENERATOR ONLY)
I/P
50/130
12020184
C100
ENGINE
TO 9SI GENERATOR (SEE PAGE 7)
TO GENERATOR AND BATTERY (SEE PAGE 8)
2-3.0 RED
25/50
TO 12SI GENERATOR (SEE PAGE 8)
25-1.0 BRN
12020183
C100
33-.5 TAN/WHT
RPO LEGEND
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
NA4 — EMISSION SYSTEM, ABOVE 8500 GVW
M40 — AUTOMATIC 3-SPEED TRANSMISSION

(WITH 12SI GENERATOR ONLY)

130-.22 BRN/WHT

130/300

C209

12010966

6294641

3-3.0 PNK

4-3.0 BRN

33-.5 TAN/WHT

300-3.0 ORN

START
RUN
OFF
LOCK
ACC

IGNITION SWITCH

39-.5 PNK/BLK → TO I/P CLUSTER CONNECTOR (SEE PAGE 99)

39-.5 PNK/BLK

39-.8 PNK/BLK → TO STOP LAMP SWITCH (SEE PAGE 109)

39-.8 PNK/BLK → TO CONVENIENCE CENTER (SEE PAGE 105)

S202

39-.8 PNK/BLK

39-.8 PNK/BLK → TO FUEL PUMP CYCLE RELAY (HOT FUEL HANDLING MODULE) (SEE PAGE 46)

39-.8 PNK/BLK

439-.8 PNK/BLK

130-.22 BRN/WHT

3-3.0 PNK

S207

3-3.0 PNK

439-.8 PNK/BLK

33-.5 TAN/WHT → TO I/P CLUSTER CONNECTOR (SEE PAGE 99)

33-.5 TAN/WHT

HOT IN RUN

AUX HTR A/C 25 AMP

HTR A/C 25 AMP

PWR WDO 30 AMP

HOT IN RUN, BULB TEST OR START

GAGE/IDLE 20 AMP

HOT IN START OR RUN

ECM 1 10 AMP

HOT IN ACCY OR RUN

RADIO 15 AMP

WIPER 25 AMP

FRONT

FUSE BLOCK

REAR

RADIO 15 AMP

AUX HTR A/C 25 AMP

GAGE IDLE 20 AMP

HTR A/C 25 AMP

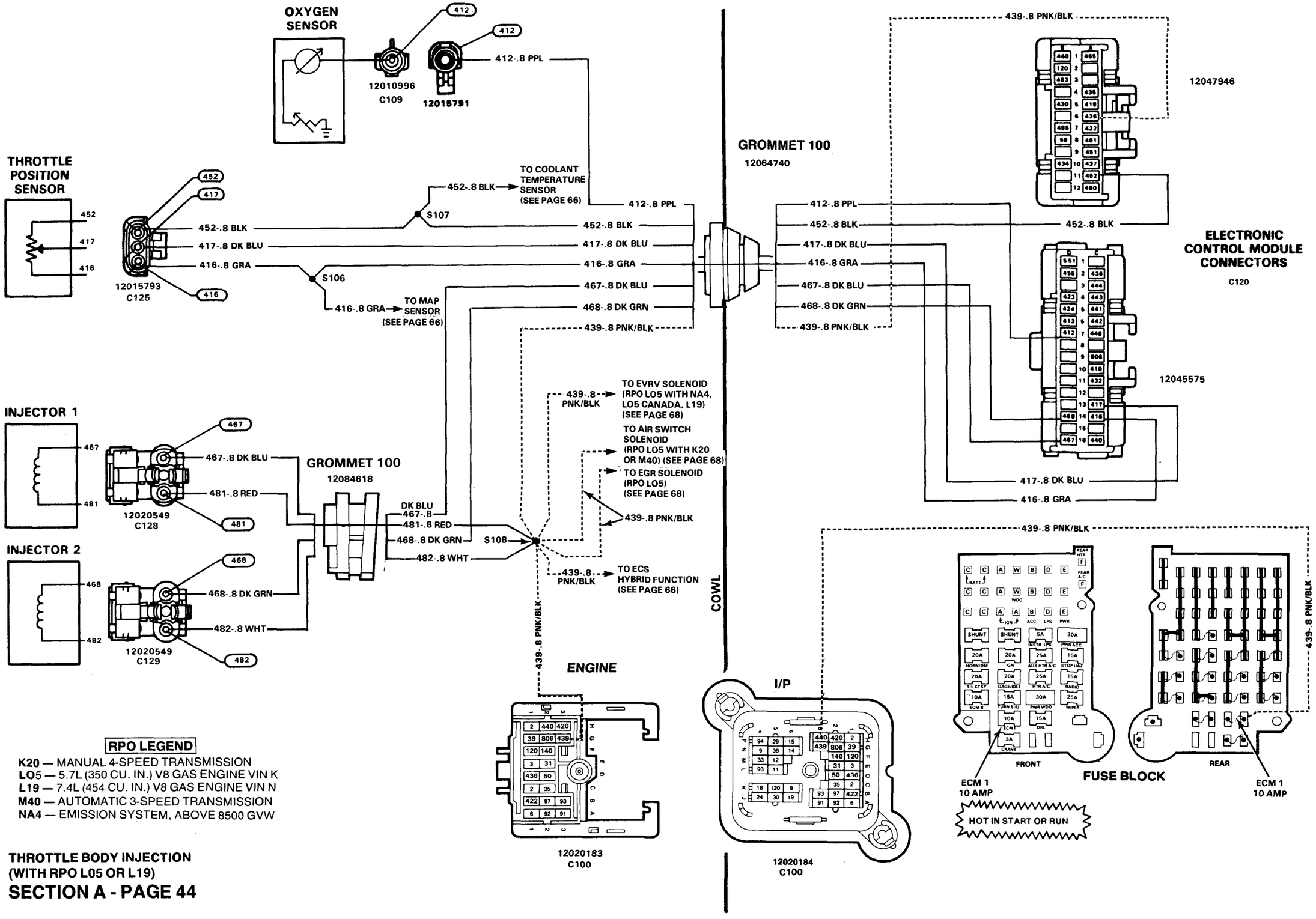
PWR WDO 30 AMP

WIPER 25 AMP

ECM 1 10 AMP

IGNITION (RPO L05, L19)

SECTION A - PAGE 43



RPO LEGEND

K20 — MANUAL 4-SPEED TRANSMISSION
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION
NA4 — EMISSION SYSTEM, ABOVE 8500 GVW

THROTTLE BODY INJECTION (WITH RPO L05 OR L19)

(FUEL PUMP CYCLE RELAY HOT FUEL HANDLING MODULE

IGNITION SWITCH

GROUND

FUEL PUMP FUSED

450
39
120

12045688

C294

12047886

450-.8 BLK

12015345

12015344

C135

450-.8 BLK

450-.8 BLK/WHT

450-.8 BLK

450-.8 BLK/WHT → TO ALDL CONNECTOR (SEE PAGE 69)

S200

450-.8 BLK/WHT → TO VEHICLE SPEED SENSOR (SEE PAGE 67)

450-.8 BLK/WHT → TO PARK/ NEUTRAL SWITCH

120-.8 TAN/WHT

450-.8 BLK

39-.8 PNK/BLK

39-.8 PNK/BLK → TO I/P CLUSTER CONNECTOR (SEE PAGE 95)

39-.8 PNK/BLK → S202

39-.8 PNK/BLK → TO CONVENIENCE CENTER (SEE PAGE 105)

39-.8 PNK/BLK → TO STOPLAMP SWITCH (SEE PAGE 109)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP (CANADA ONLY) (SEE PAGE 21)

ELECTRIC FUEL PUMP FUEL GAGE SENDING UNIT

450-.8 BLK/WHT → TO FUEL PUMP RELAY (SEE PAGE 46)

TO ESC HYBRID FUNCTION (SEE PAGE 66) ← 486-.8 BLK/WHT

TO EVRV SOLENOID (RPO LO5 WITH NA4 LO5 CANADA AND L19) (SEE PAGE 68) ← 450-.8 BLK/WHT

S105

12064770

C118

GROMMET 100

12064740

120-.8 TAN/WHT

120-.8 TAN/WHT

450-.8 BLK/WHT

450-.8 BLK/WHT

S103

120-1.0 TAN/WHT → TO FUEL PUMP OIL PRESS SWITCH (SEE PAGE 68)

120-1.0 TAN/WHT → TO FUEL PUMP RELAY (SEE PAGE 68)

COWL

ELECTRONIC CONTROL MODULE CONNECTOR

12047946

39-.8 PNK/BLK

39-.8 PNK/BLK

120-.8 TAN/WHT

39-.8 PNK/BLK

TO ELECTRONIC CONTROL MODULE CONNECTOR C120 (SEE PAGE 67) ← 413-.8 TAN

ENGINE GROUND G102

120-.8 TAN/WHT

I/P

12020184

ENGINE

HOT IN START OR RUN

GAGE/IDLE 20 AMP

FRONT

REAR

FUSE BLOCK

GAGE/IDLE 20 AMP

FRAME GROUND

12015792

C409

12059473

50/25

50/130

12020183

C100

C100

120-.8 TAN/WHT

120-1.0 TAN/WHT

120-1.0 TAN/WHT

30-.8 PNK

12020094

C100

30-.5 PNK

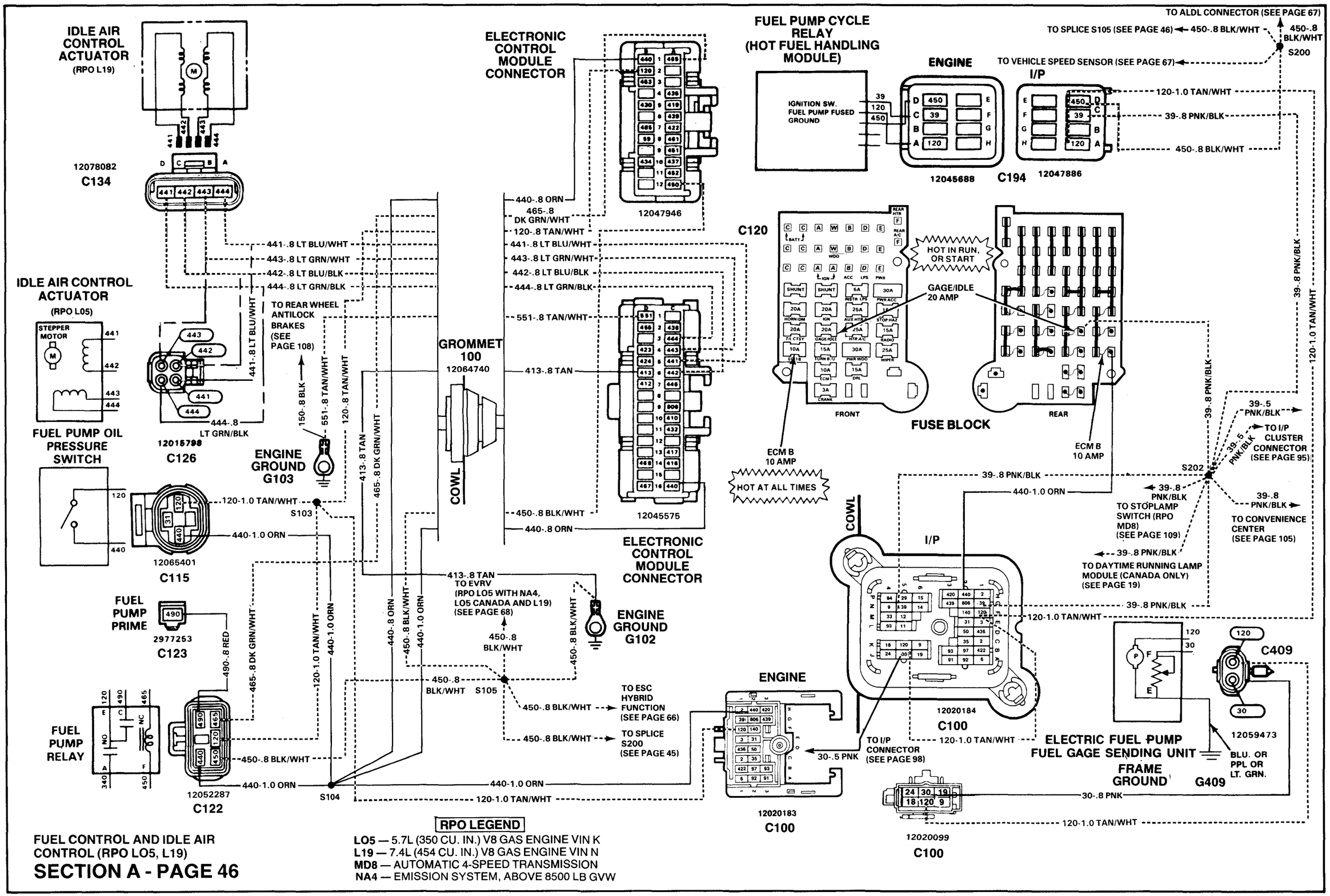
TO I/P CLUSTER CONNECTOR (SEE PAGE 95)

30-.8 PNK

RPO LEGEND

LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
NA4 — OVER 8500 LBS GVWR

HOT FUEL HANDLING
(RPO L05 OR L19)



FUEL CONTROL AND IDLE AIR CONTROL (RPO LO5, L19)

SECTION A - PAGE 46

RPO LEGEND

LO5 — 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
NA4 — EMISSION SYSTEM, ABOVE 8500 LB GVW

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 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 5 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 5 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 (V8 VIN C) will keep the relay contacts open so that no plug heating takes place.

COMPONENT LOCATION

		Page — Figure
Check Engine Lamp Driver (RPO LH6)	Under I/P	179 — 49
Cold Advance Control Solenoid (RPO LH6)	Front LH side of engine	170 — 18
Cold Advance Glow Plug Inhibit Relay (RPO LH6)	LH inner fender	173 — 26
Electronic Control Module (RPO LH6)	Under center of I/P	173 — 27
Fuel Shutoff Solenoid (RPO LH6)	Front LH side of engine	170 — 18
Fuse Block	Behind LH side of I/P, above kick panel	166 — 4
Glow Plug Controller Module (RPO LH6)	Rear RH side of engine	173 — 26
Glow Plugs	Above exhaust manifold, at each engine	173 — 26
Grommet 100	Engine compartment, center of cowl	173 — 27
Ignition Switch	RH side of steering column	166 — 5
C106	At cold advance flow plug inhibit relay	173 — 26
C120 (RPO LH6)	At electronic control module	173 — 27
C167	At cold advance solenoid	170 — 18
C168	At glow plug controller module	170 — 18
C169	Under I/P, near electronic control module	173 — 27
C172	At check engine lamp driver module	179 — 49
C199	At fuel shutoff solenoid	170 — 18
C209	At ignition switch	166 — 5
G110	Engine harness front LH side of engine	170 — 18
G113	Engine harness, LH cylinder head	169 — 16
G114	Engine harness, RH cylinder head	169 — 16
S122	Engine harness, RH side of engine	173 — 26
S130	Engine harness, RH front of engine	170 — 18
S131	Engine harness, rear of engine	173 — 26
S132	Engine harness, rear of engine	173 — 26
S133	Engine harness, LH side of engine	173 — 26
S134	Engine harness, RH side of engine	170 — 18

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 operating temperature, turn ignition switch to RUN. The WAIT indicator should not flash for an RPO LH6 engine, but should flash for an RPO LL4 engine.

TROUBLESHOOTING CHART—GLOW PLUGS

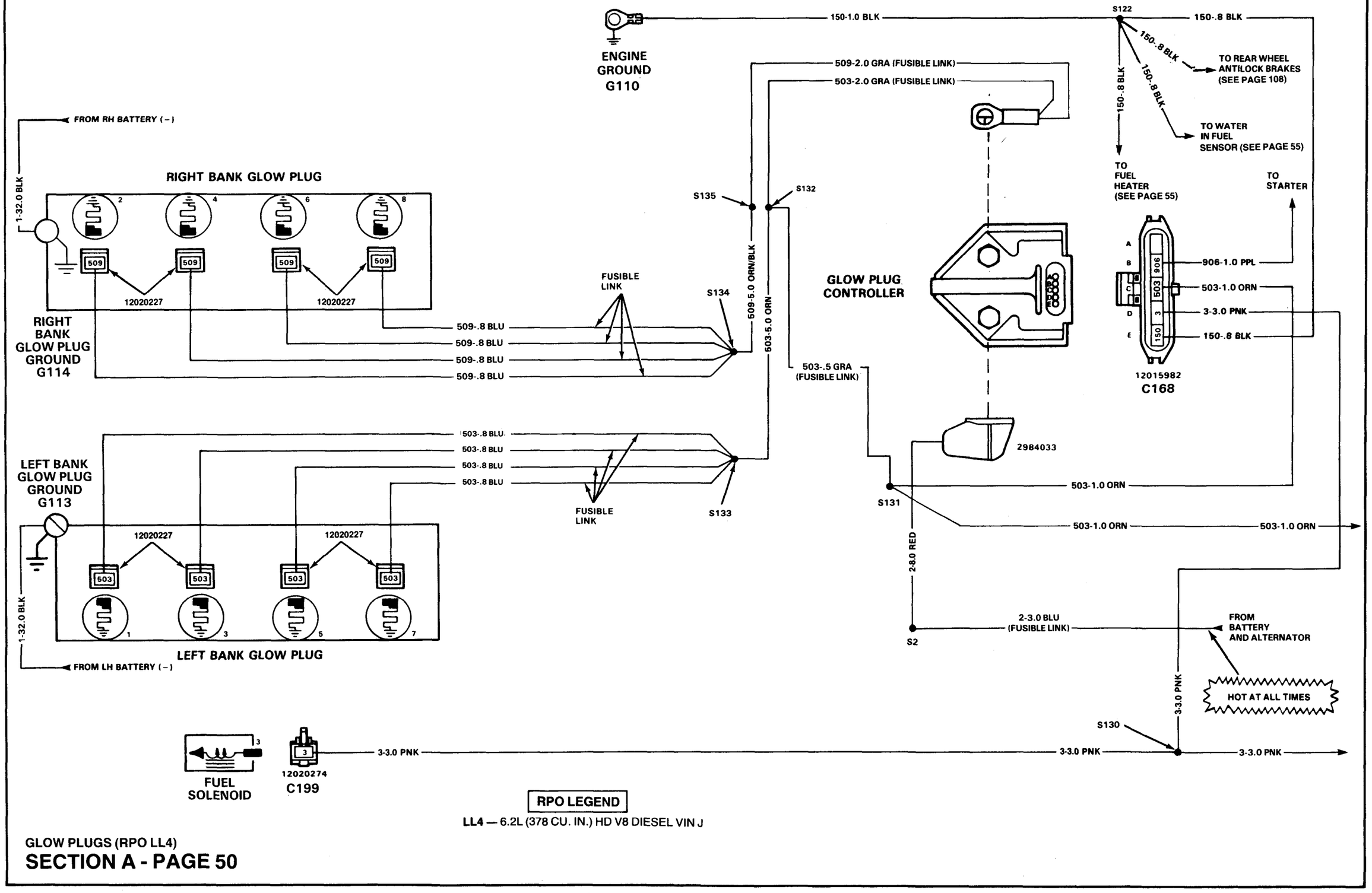
WAIT INDICATOR DOES NOT FLASH OR FLASHES FOR THE INCORRECT AMOUNT OF TIME WHEN ENGINE IS BELOW NORMAL OPERATING TEMPERATURE

TEST	RESULT	ACTION
NOTE: For V8 diesel engines with an RPO LH6, ground BRN (905) wire at cold advance glow plug inhibit relay connector C106. 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 test lamp from LT GRN/BLK (531) wire for RPO LH6 or PNK (3) wire for RPO LL4 engines at glow plug controller connector C168 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	GO to step 3 for RPO LH6 engines. For RPO LL4 engines LOCATE and REPAIR open in PNK (3) wire from glow plug controller to fuel shutoff valve.
3. Connect test lamp from PNK/BLK (39) wire at cold advance glow plug inhibit relay connector C106 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 test lamp from PNK/BLK (39) wire at cold advance glow plug inhibit relay connector C106 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire.
5. Connect a 10 amp fused jumper from BRN (905) wire at cold advance glow plug inhibit relay connector C106 to ground. Connect test lamp from LT GRN/BLK (531) wire at inhibit relay connector C106 to ground.	Test lamp lights.	CHECK for open in BRN (905) wire from inhibit relay to ECM. If wire is good, problem is with ECM. Refer to Section 6E in 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.
6. Connect test lamp from LT GRN/BLK (531) wire for RPO LH6 engines or PNK (3) wire for RPO LL4 engines to BLK (150) wire at glow plug controller connector C168.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from glow plug controller to ground terminal G110.

7. Connect test lamp from PPL (906) wire at glow plug controller connector C168 to ground. Move ignition switch to START position.	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in PPL (906) wire from glow plug controller to starter motor.
8. 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 9.
9. Disconnect glow plug controller connector C168. Using a positive polarity ohmmeter. Check continuity between ORN (503) and BLK (150) wires.	Reading of 2 ohms or less.	GO to step 10.
	Reading greater than 2 ohms.	LOCATE and REPAIR open in GRA (503) and ORN (503) wires from glow plug controller connector to glow plug harness splice S109.
10. Reconnect glow plug controller connector. Connect test lamp from ORN (503) wire at glow plug controller 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.
11. 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.

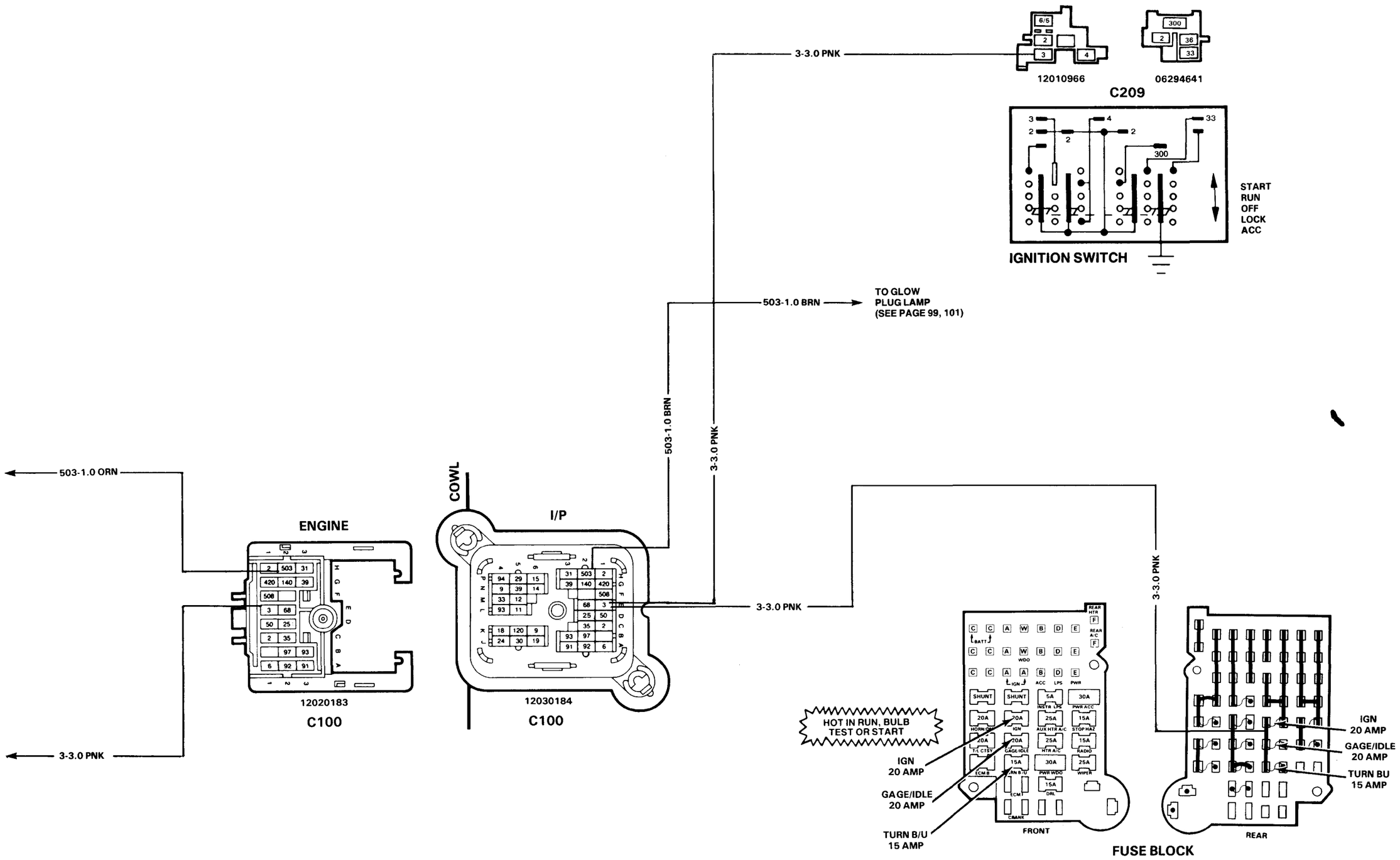
WAIT INDICATOR STAYS ON OR FLASHES WHEN ENGINE IS AT NORMAL OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN POSITION (LH6 ENGINE ONLY)

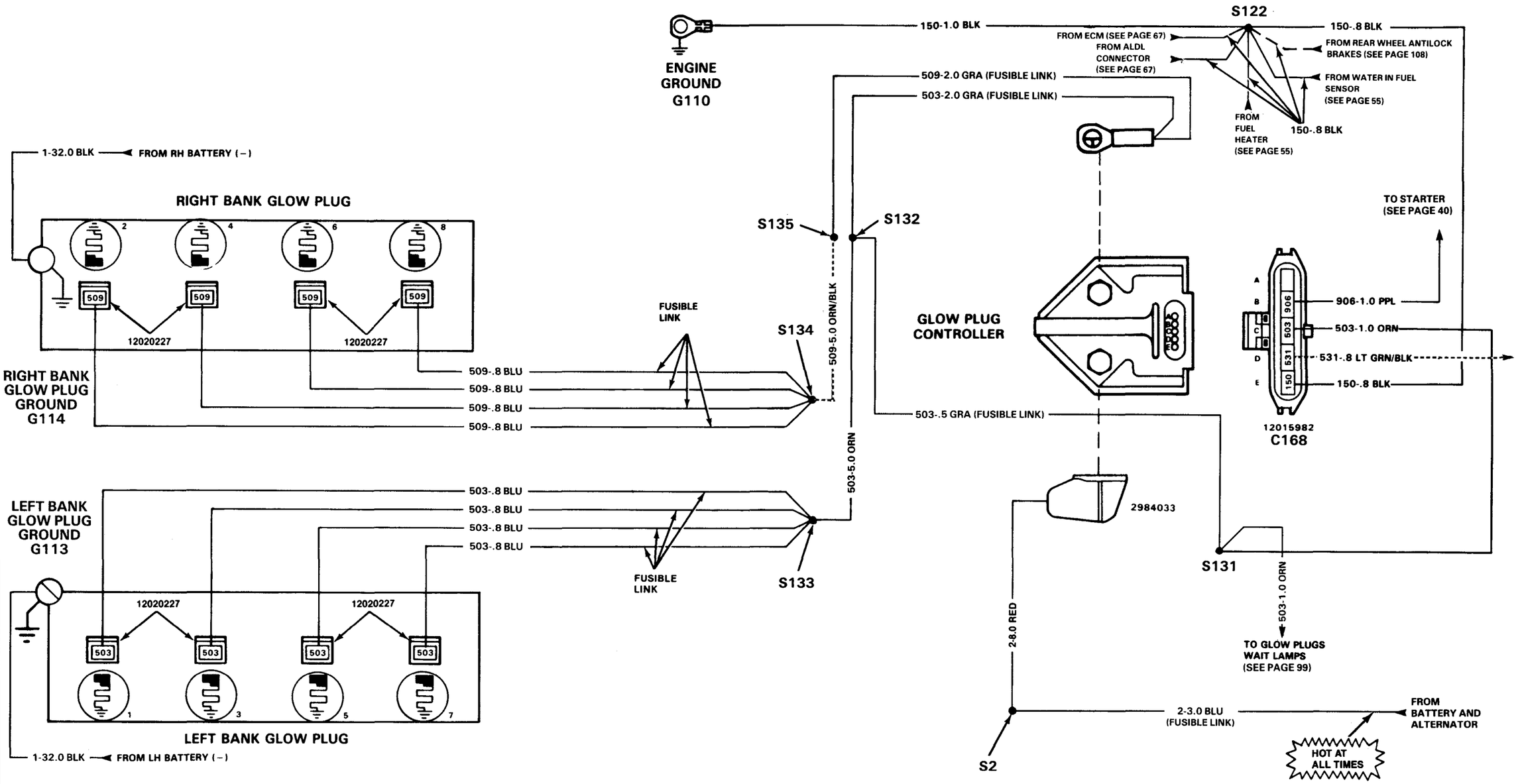
TEST	RESULT	ACTION
1. Connect test lamp from PNK (39) wire at cold advance glow plug inhibit relay connector C106 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of (GAGE/IDLE) fuse. If fuse is good, LOCATE and REPAIR open from inhibit relay to fuse block.
2. Connect test lamp from PNK/BLK (39) wire at cold advance glow plug inhibit relay connector C106 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire.
3. Connect a fused jumper from BRN (905) wire at cold advance glow plug inhibit relay connector C106 to ground. Connect test lamp from LT GRN/BLK (531) wire at inhibit relay connector C106 to ground.	Test lamp lights.	CHECK for open in BRN (905) wire from inhibit relay to ECM. If wire is good, problem is with ECM. Refer to Section 6E in Service Manual.
	Test lamp does not light.	REPLACE cold advance glow plug inhibit relay.



RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL VIN J

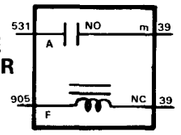

3-3.0 PNK
6/5
2
3
4
12010966
300
2
36
33
06294641
C209
3
2
4
2
2
33
300
START
RUN
OFF
LOCK
ACC
IGNITION SWITCH
503-1.0 BRN
TO GLOW
PLUG LAMP
(SEE PAGE 99, 101)
503-1.0 BRN
3-3.0 PNK
503-1.0 ORN
ENGINE
12020183
C100
COWL
I/P
12030184
C100
3-3.0 PNK
3-3.0 PNK
HOT IN RUN, BULB
TEST OR START
IGN
20 AMP
GAGE/IDLE
20 AMP
TURN B/U
15 AMP
FRONT
REAR
IGN
20 AMP
GAGE/IDLE
20 AMP
TURN BU
15 AMP
FUSE BLOCK
3-3.0 PNK

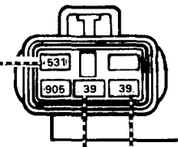


RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C

COLD ADVANCE GLOW PLUG TIMER INHIBIT RELAY





12065169
C106

531-.8 LT GRN/BLK

S121

531-.8 LT GRN/BLK

39-.8 PNK/BLK

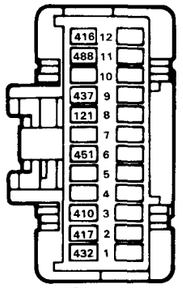
39-.8 PNK/BLK

905-.8 BRN

12064760
GROMMET 100

905-.8 BRN

ELECTRONIC CONTROL MODULE CONNECTORS



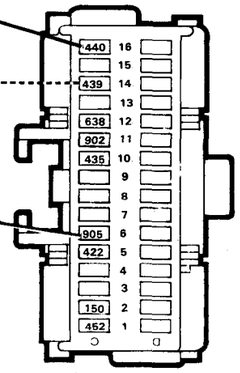
12047948

C120

440-.8 ORN

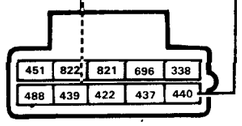
439-.8 PNK/BLK

905-.8 BRN



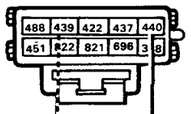
12045575

439-.8 PNK/BLK



12064770

C169



12064769

39-.8 PNK/BLK → TO EPR VALVE (SEE PAGE 74)

39-.8 PNK/BLK → TO EGR VALVE (SEE PAGE 74)

39-.8 PNK/BLK → TO EGR DUMP VALVE (SEE PAGE 74)

S120

39-.8 PNK/BLK → TO I/P CONNECTOR C100 (SEE PAGE 98)

39-.8 PNK/BLK → *TO COLD ADVANCE FAST IDLE* TEMPERATURE SWITCH (SEE PAGE 56)

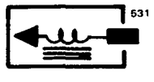
39-.8 PNK/BLK → TO FUEL HEATER (SEE PAGE 56)

39-.8 PNK/BLK → TO WATER IN FUEL SENSOR (SEE PAGE 56)

440-.8 ORN

439-.8 PNK/BLK

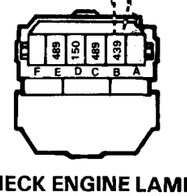
COLD ADVANCE CONTROL



2977253

C167

531-.8 LT GRN/BLK



12010488
C172

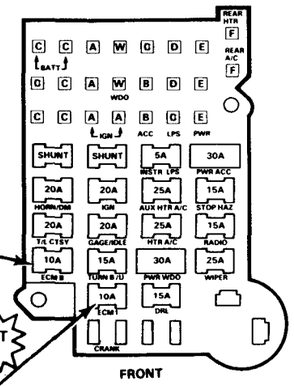
CHECK ENGINE LAMP DRIVER CONNECTOR

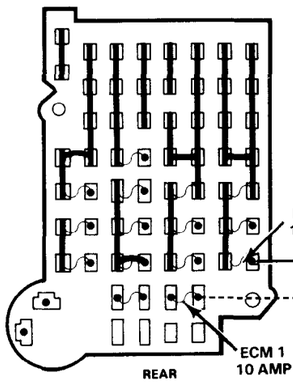
HOT AT ALL TIMES

ECM B 10 AMP

HOT IN START OR RUN

ECM 1 10 AMP





FUSE BLOCK

439-.8 PNK/BLK

GLOW PLUGS (RPO LH6 DIESEL)

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 the presence of excess water in the fuel; and
5. It 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.

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 GAGE/IDLE Fuse.

COMPONENT LOCATION

		Page — Figure
Cold Advance Control Solenoid	On front of engine	170 — 18
Cold Advance/Fast Idle Temperature Switch	RH rear bottom of engine	170 — 18
Fast Idle Solenoid	On front top of engine	170 — 18
Fuel Heater	Engine compartment, on cowl behind engine	170 — 18
Fuel Shutoff Solenoid	On front top of engine	170 — 18
Fuse Block	LH side of I/P, above kick panel	166 — 4
Glow Plug Controller	Rear RH side of engine	173 — 26
Ignition Switch	RH side of steering column	166 — 5
Transmission Kickdown Switch	LH side of transmission	173 — 28
Vacuum Regulator Valve	Engine compartment, LH side of engine	—
C100	Engine compartment, LH side of cowl	165 — 2
C100A	At fast idle solenoid	170 — 18
C101A	At cold advance control solenoid	170 — 18
C102A	At cold advance/fast idle temperature switch	170 — 18
C103A	At water-in-fuel sensor	170 — 18
C104A	At fuel heater	170 — 18
C168	At glow plug controller module	173 — 26
C189	At transmission kickdown switch	173 — 28
C199	At fuel shut-off solenoid	170 — 18
C209	At ignition switch	166 — 5
G110	Engine harness, front LH side of engine	170 — 18
S120	Engine harness, RH side of engine	170 — 18
S122	Engine harness, RH side of engine	173 — 26
S130	Engine harness, RH front of engine	170 — 18
S202	I/P harness, behind LH side of I/P	166 — 4

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.

TROUBLESHOOTING CHART—DIESEL ENGINE FUEL CONTROLS

FUEL HEATER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Disconnect fuel heater connector C104A. Place ignition switch to RUN position. Connect voltmeter from PNK/BLK (39) wire at fuel heater connector C104A 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 voltmeter from PNK/BLK (39) wire to BLK (150) wire at fuel heater connector C104A.	Battery voltage.	REPLACE fuel heater.
	No voltage.	LOCATE and REPAIR open in BLK (150) wire from fuel heater to ground terminal G110.

SERVICE FUEL FILTER INDICATOR LIGHTS WITH NO WATER IN FUEL

TEST	RESULT	ACTION
Place ignition switch in RUN position. Disconnect water-in-fuel sensor connector C103A.	SERVICE FUEL FILTER indicator stays on.	LOCATE and REPAIR short to ground in YEL (508) wire.
	SERVICE FUEL FILTER indicator goes out.	REPLACE water-in-fuel sensor.

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

TEST	RESULT	ACTION
1. Disconnect water-in-fuel sensor connector C103A and place ignition switch in RUN. Connect a voltmeter from PNK/BLK (39) wire at fuel sensor connector C103A 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 voltmeter from PNK/BLK (39) to BLK (150) wire at water-in-fuel sensor connector C103A.	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 voltmeter from YEL (508) wire at water-in-fuel sensor connector C103A to ground.	Battery voltage.	REPLACE water-in-fuel sensor.
	No voltage.	CHECK Service Fuel Filter lamp. If lamp is good, LOCATE and REPAIR open in YEL (508) wire.

FAST IDLE SOLENOID

936

COLD ADVANCE CONTROL

936

COLD ADVANCE FAST IDLE TEMPERATURE SWITCH

936 39

2977373
C102A

(RPO M40) VACUUM REGULATOR VALVE SWITCH

12052647

12052641
C121A

55-.8 ORN

39-.8 PNK/BLK

C209 12010966

6294641

SOL BAT 1 BAT 2 IGN 1 ACC BAT 3 300 IGN 3 GRD 1 GRD 2

3-3.0 PNK

IGNITION SWITCH

START RUN OFF LOCK ACC

12004267
C100A

2977253
C101A

936-.8 LT GRN

936-.8 LT GRN

S120

39-.8 PNK/BLK

39-.8 PNK/BLK

2984092
C189

TRANSMISSION SWITCH
(M40)

WATER IN FUEL SENSOR

SOLID STATE

39 508 150

12015793
C103A

39-.8 PNK/BLK

508-.8 YEL

150-.8 BLK

508-.8 YEL

150-.8 BLK

39-.8 PNK/BLK

TO LOW COOLANT WARNING LAMP (SEE PAGE 99)

39-.8 PNK/BLK

TO STOPLAMP SWITCH (SEE PAGE 77)

3-3.0 PNK

39-.8 PNK/BLK

39-.8 PNK/BLK

TO SERVICE FUEL FILTER LAMP (SEE PAGE 99)

39-.5 PNK/BLK

TO I/P CLUSTER CONNECTOR (SEE PAGE 95)

TO CONVENIENCE CENTER (SEE PAGE 5)

S202

39-.8 PNK/BLK

FUEL HEATER

150 39

12020397
C104A

150-.8 BLK

39-.8 PNK/BLK

150-.8 BLK

TO REAR WHEEL ANTILOCK BRAKES (SEE PAGE 108)

39-.8 PNK/BLK

TO WATER IN FUEL FILTER LAMP (SEE PAGE 99)

ENGINE GROUND

G110

150-1.0 BLK

S122

39-.8 PNK/BLK

I/P

HOT IN START OR RUN

IGN 20 AMP

HOT IN START OR RUN

GAGE/IDLE 20 AMP

906 903 3 150

3-3.0 PNK

150-1.0 BLK

12015982
C168

GLOW PLUG CONTROLLER

ENGINE

25/130

S130

FUEL SOLENOID

12020183
C110

12020274
C199

3-3.0 PNK

3-3.0 PNK

COWL

25/130

12020184
C100

3-3.0 PNK

508-.8 YEL

3-3.0 PNK

FRONT

FUSE BLOCK

REAR

IGN 20 AMP

GAGE/IDLE 20 AMP

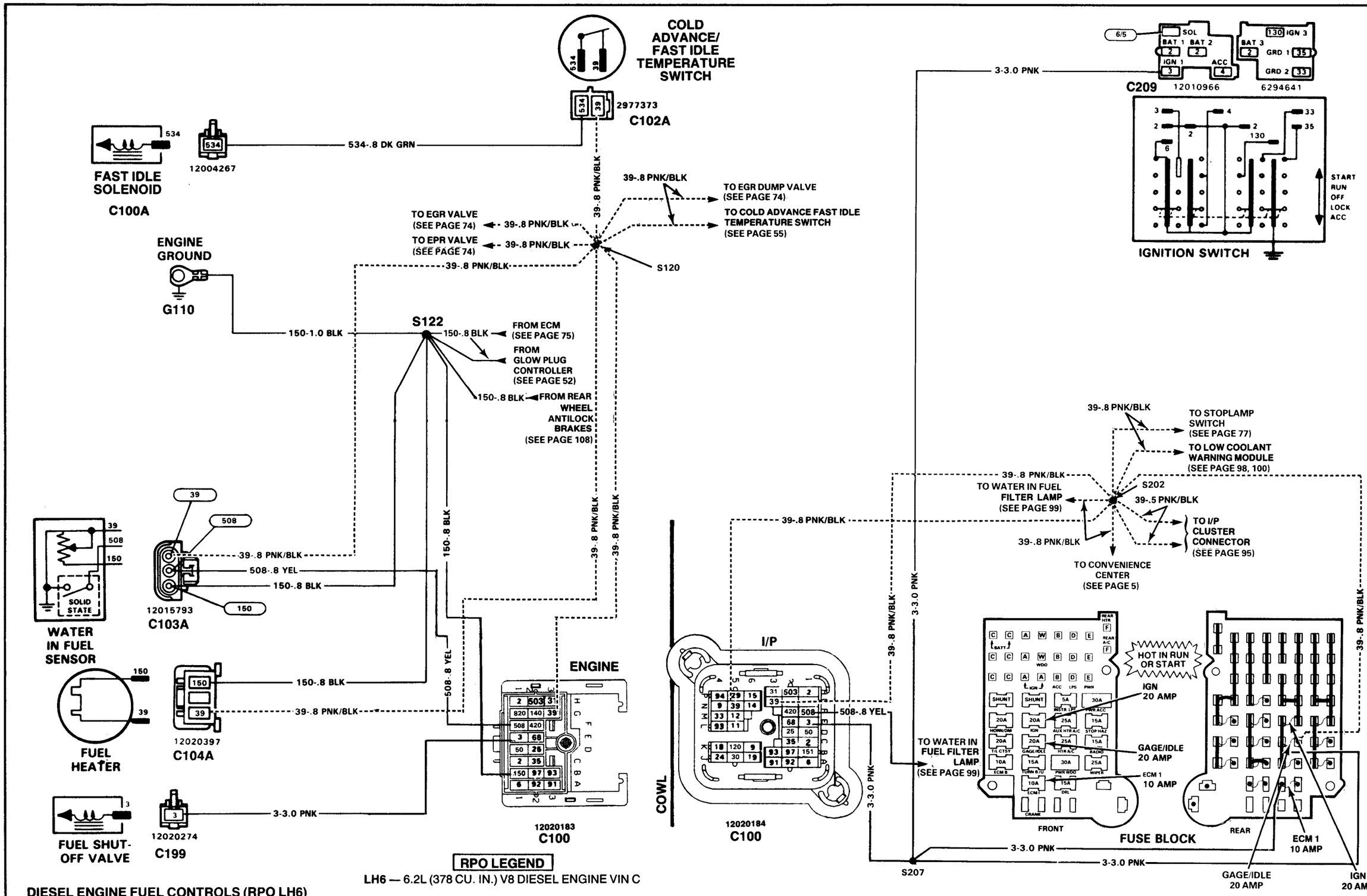
3-3.0 PNK

3-3.0 PNK

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

M40 — AUTOMATIC 3-SPEED TRANSMISSION



RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C

BLANK

CIRCUIT OPERATION

Battery voltage is applied to the 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, BULB TEST or START. When the Cooling Fan Switch closes at 107°C (225°F), the DK GRN (935) wire is grounded and the Cooling Fan Relay energizes. Battery voltage is applied across the Cooling Fan Motor and the Cooling Fan runs.

COMPONENT LOCATION

		Page — Figure
Auxiliary Cooling Fan	Behind RH side of radiator support	174 — 30
Auxiliary Cooling Fan Relay	LH inner fender, in engine compartment	174 — 30
Auxiliary Fan Temperature Switch	RH side of engine, above exhaust manifold	174 — 29
Fuse Block	Behind LH side of I/P, above kick panel	166 — 4
Junction Block	Engine compartment, center of cowl	165 — 2
C100	Engine compartment, LH front of cowl	165 — 2
C190	At auxiliary cooling fan relay	174 — 30
C191	At auxiliary cooling fan	174 — 30
C192	Engine compartment to RH side of bulkhead connector	174 — 30
C193	At auxiliary fan temperature switch	174 — 29
G106	RH front of vehicle, above RH headlamps	165 — 2
G107	RH front of vehicle, on frame below RH headlamps	165 — 2
S111	Forward lamp harness, in front of RH headlamps	165 — 2
S202	I/P harness, behind LH side of I/P	166 — 4

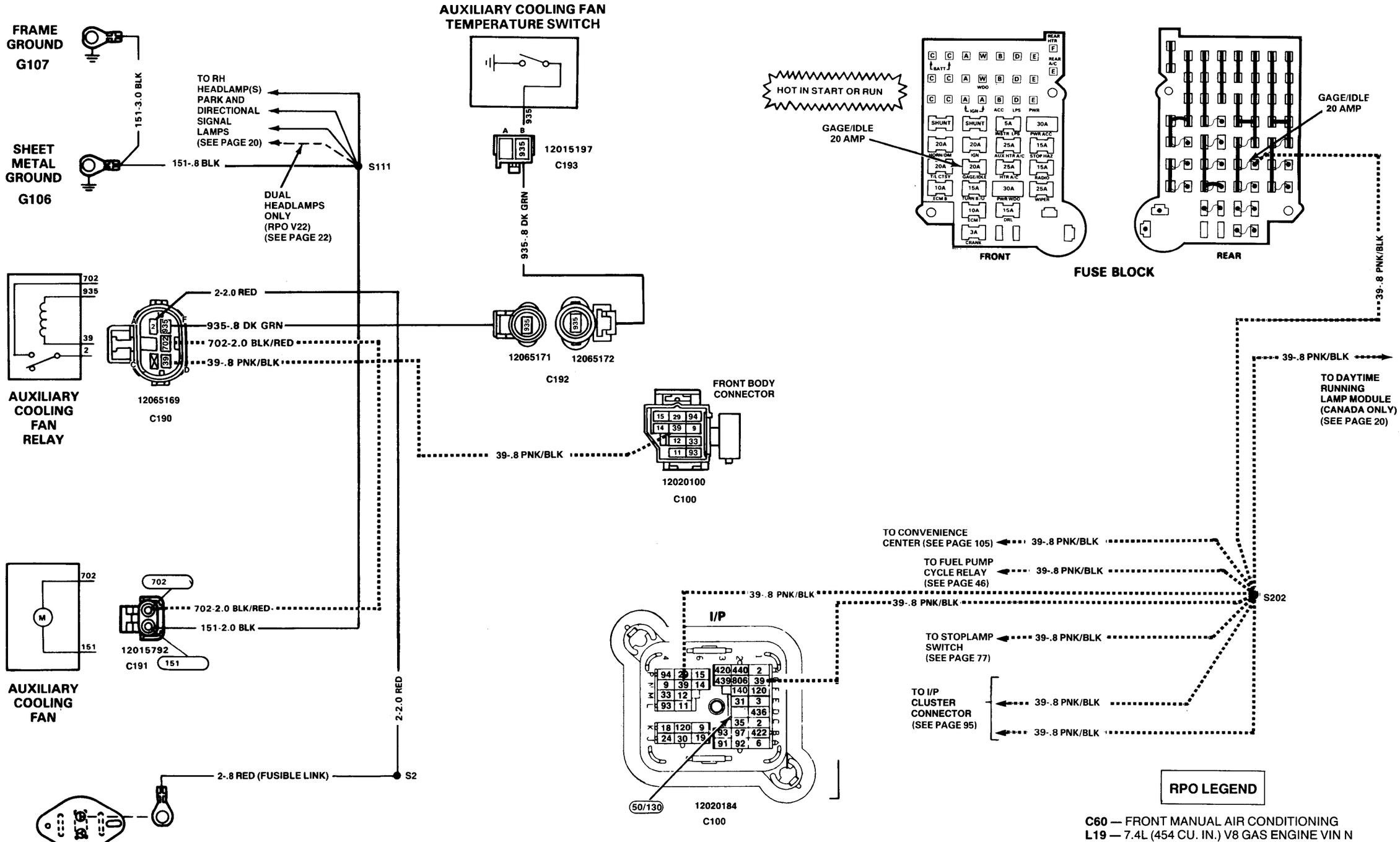
TROUBLESHOOTING CHART—AUXILIARY COOLING FAN

COOLING FAN DOES NOT RUN

TEST	RESULT	ACTION
1. Disconnect fan temperature switch connector C193. Connect a fused jumper from DK GRN (935) wire at fan temperature switch connector C193 to ground.	Cooling fan does not run.	GO to step 2.
	Cooling fan runs.	REPLACE cooling fan temperature switch.
2. Disconnect fan relay connector C190. Connect test lamp from PNK/BLK (39) wire at 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 fan relay to fuse block.
3. Connect fused jumper from DK GRN (935) wire at fan temperature switch connector C193 to ground. Connect test lamp from PNK/BLK (39) wire to DK GRN (935) wire at fan relay connector C190.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (935) wire.
4. Connect test lamp from RED (2) wire at 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 30 amp fused jumper from RED (2) wire to BLK/RED (702) wire at the fan relay connector C190.	Cooling fan does not run.	GO to step 6.
	Cooling fan runs.	REPLACE cooling fan relay.
6. Leave 30 amp fused jumper connected. Disconnect cooling fan connector C191. Connect a test lamp from BLK/RED (702) at 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 cooling fan to fan relay.
7. Connect test lamp from BLK/RED (702) to BLK (151) wires at cooling fan connector C191.	Test lamp lights.	REPLACE cooling fan.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (151) wire from 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 fan temperature switch connector C193.	Cooling fan runs.	GO to step 2.
	Cooling fan does not run.	REPLACE cooling fan temperature switch.
2. Disconnect fan relay connector C190. Connect test lamp from PNK/BLK (39) to DK GRN (935) wires at fan relay connector C190.	Test lamp lights.	CHECK for short in DK GRN (935) wire from fan relay to fan temperature switch.
	Test lamp does not light.	REPLACE cooling fan relay.



RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
V22 — QUAD HEADLAMPS

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	LH side of I/P	166 — 6
Electric Fuel Pump (Gas), LH	At LH fuel tank	175 — 33
Electric Fuel Pump (Gas), RH	At RH fuel tank	175 — 33
Fuel Tank (Diesel), LH	LH side of vehicle	174 — 32
Fuel Tank (Diesel), RH	RH side of vehicle	174 — 32
Fuel Tank Selector Switch	RH side of I/P, near steering column	174 — 31
Fuel Tank Selector Valve and Meter Switch (Diesel)	On frame rail, near RH fuel tank	174 — 32
Fuel Tank Selector Valve and Meter Switch (Gas)	On frame rail, near RH fuel tank	175 — 33
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Grommet 105	Engine compartment, LH side of cowl	174 — 31
C100	Engine compartment, LH side of cowl	165 — 2
C105A	Engine compartment, LH side of cowl	174 — 31
C107A	At fuel tank selector valve and meter switch	174 — 32
C203	Behind I/P cluster	166 — 4
C245	At fuel tank selector switch	174 — 31
C246	At fuse block	174 — 31
C247	At bus bar ground	174 — 31
C278	In auxiliary fuel harness	175 — 35
C303 (Gas)	In auxiliary fuel harness	175 — 35
C304 (Gas)	In auxiliary fuel harness	175 — 35
C409 (Diesel)	At LH fuel tank	174 — 32
C410 (Diesel)	At RH fuel tank	174 — 32
S136 (Diesel)	In auxiliary fuel harness	174 — 32
S137 (Diesel)	In auxiliary fuel harness	174 — 32
S138 (Gas)	In auxiliary fuel harness	175 — 33
S139 (Gas)	In auxiliary fuel harness	175 — 33

ENGINE

12020183
C100

I/P

COWL

12020184
C100

420/820

30-.5 PNK

25/130

I/P CLUSTER
CONNECTOR
C203

8900371

30-.5 PNK

RIGHT TANK
AUXILIARY

6288440

830

C410

830

FRAME
GROUND

BLU OR PPL OR LT GRN

G410

30-.8 PNK

6288440

8911220

C278

30-.8 PNK

830-.8 PNK/BLK

GROMMET
105
08911781

53-.8 LT GRN

54-.8 DK GRN

6288424

2984855

C105A

54-.8 DK GRN

53-.8 LT GRN

COWL

FUEL
TANK
SELECTOR
SWITCH

LEFT

RIGHT

150

53

139

139

54

150

12004101
C245

S136

54-.8 DK GRN

S137

53-.8 LT GRN

150-.8 BLK

54-.8 DK GRN

53-.8 LT GRN

12020089
C107A

54

53

930

30

830

LEFT

RIGHT

A

PM
VALVE

FUEL TANK
SELECTOR VALVE
AND METER SWITCH

830-.8 PNK/BLK

930-.8 PNK/WHT

54-.8 DK GRN

53-.8 LT GRN

12004888

139-.8 PNK

HOT IN RUN OR START

IGN
20 AMP

FRONT

REAR

IGN
20 AMP

BUS
BAR
GROUND

150-.8 BLK

150

12004267

930

C409

6288440

930

BLU OR PPL OR LT GRN

G409

FRAME
GROUND

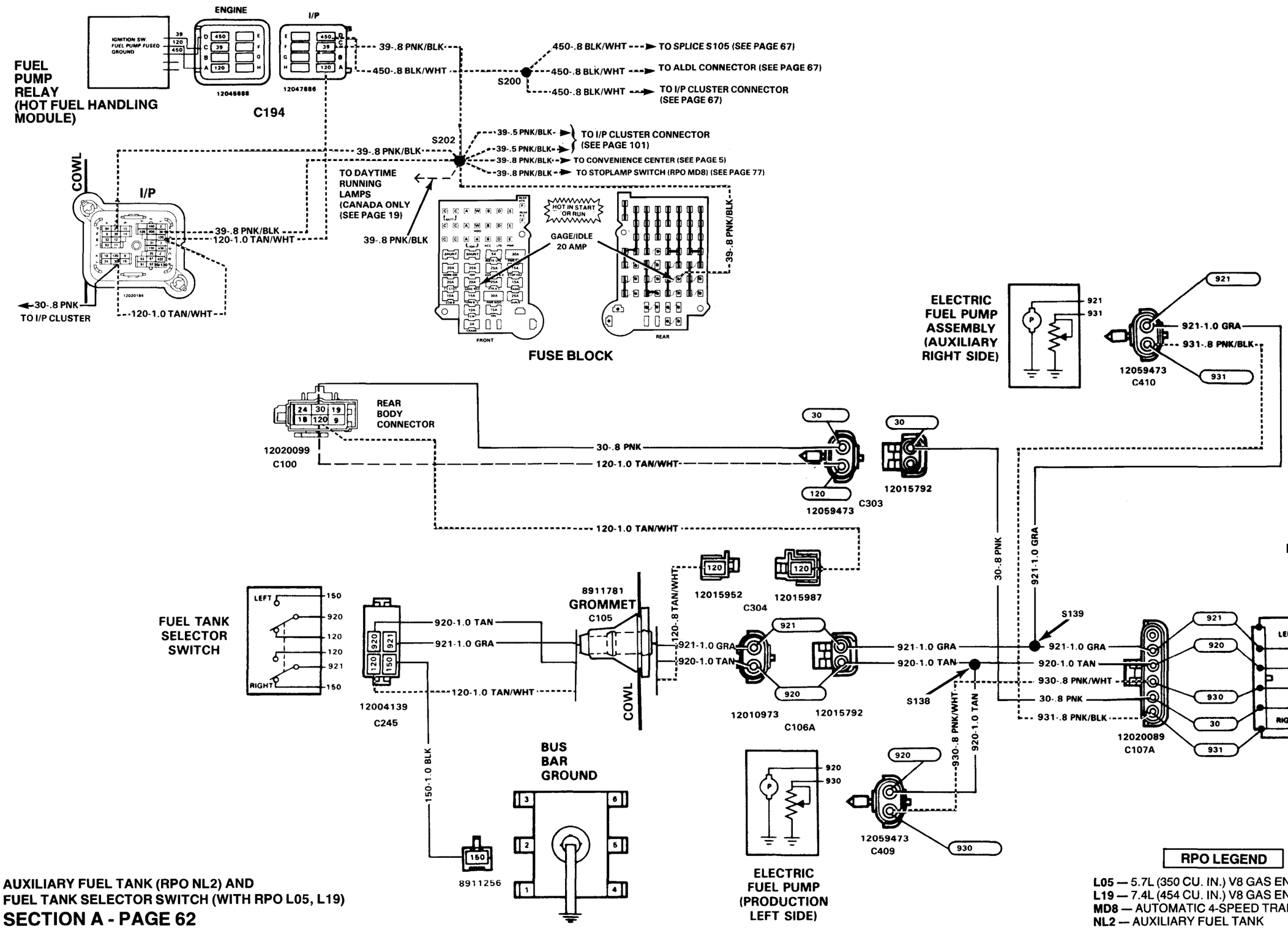
LEFT TANK
(PRODUCTION)

FUSE BLOCK

RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
NL2 — AUXILIARY FUEL TANK

**AUXILIARY FUEL TANK (RPO NL2)
AND FUEL TANK SELECTOR SWITCH
(WITH RPO LH6 OR LL4)**



AUXILIARY FUEL TANK (RPO NL2) AND FUEL TANK SELECTOR SWITCH (WITH RPO L05, L19)

SECTION A - PAGE 62

RPO LEGEND

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
NL2 — AUXILIARY FUEL TANK

BLANK

COMPONENT LOCATION

		Page — Figure
Air Switch Solenoid (RPO L05)	Front RH side of engine	175 — 35
ALDL Connector	Under LH side of I/P	166 — 4
Coolant Temperature Sensor (RPO L05)	Front of engine	175 — 34
Coolant Temperature Sensor (RPO L19)	Front of engine	176 — 38
Digital Ratio Adapter Controller Module	Under LH side of I/P	177 — 39
EGR Solenoid (RPO L05)	RH rear side of engine	171 — 21
Electronic Control Module	Under RH side of I/P	175 — 34
Electronic Spark Timing (EST) Module	At distributor	171 — 22
Electronic Spark Control (ESC) Hybrid Function (RPO L05)	RH side of engine	175 — 34
Electronic Spark Control (ESC) Hybrid Function (RPO L19)	Engine compartment, RH side of cowl	176 — 37
EVRV Solenoid (RPO L05)	RH rear of engine	175 — 34
EVRV Solenoid (RPO L19)	RH front of engine	176 — 38
Fuel Injectors	Top of engine, in throttle body	175 — 34
Fuel Pump Oil Pressure Switch (RPO L05)	Rear of engine	171 — 22
Fuel Pump Oil Pressure Switch (RPO L19)	Front lower LH side of engine	176 — 38
Fuel Pump Relay	Engine compartment RH side of cowl	175 — 34
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Grommet 100	Center of cowl	175 — 34
Grommet 101	Front of throttle body	175 — 34
Idle Air Control Actuator (RPO L05)	Top RH side of engine	175 — 34
Idle Air Control Actuator (RPO L19)	Top RH side of engine	176 — 37
Knock Sensor (RPO L05)	Lower RH side of engine	175 — 34
Knock Sensor (RPO L19)	Lower RH side of engine	176 — 37
Manifold Absolute Pressure Sensor (RPO L05)	Top of RH side of engine	175 — 34
Manifold Absolute Pressure Sensor (RPO L19)	Top of RH side of engine	176 — 37
Oxygen Sensor	In LH exhaust manifold	171 — 22
Throttle Position Sensor	RH side of throttle body	175 — 34
Transmission Converter Clutch Solenoid (RPO L05)	Rear LH of transmission	175 — 36
Vehicle Speed Sensor	Rear of transmission	175 — 36

COMPONENT LOCATION

		Page — Figure
C100	Engine compartment, LH side of cowl	175 — 35
C103	Engine compartment, LH side of cowl	175 — 35
C108	At vehicle speed sensor	175 — 36
C109	At oxygen sensor	171 — 22
C110	At transmission converter clutch solenoid	175 — 36
C111	At electronic spark timing module	171 — 22
C115	At fuel pump oil pressure switch	176 — 38
C116 (RPO L05)	At knock sensor	175 — 34
C116 (RPO L19)	At knock sensor	176 — 37
C118	Near ECM module, under I/P	175 — 34
C120	At electronic control module	175 — 34
C122	At fuel pump relay	175 — 34
C124 (RPO L05)	At EGR Solenoid	171 — 21
C125	At throttle position sensor	175 — 34
C126 (RPO L05)	At idle air control actuator	175 — 34
C127	At manifold absolute pressure sensor	175 — 34
C128	LH fuel injector	175 — 34
C129	RH fuel injector	175 — 34
C130 (RPO L05)	At ESC hybrid function	175 — 34
C130 (RPO L19)	AT ESC hybrid function	176 — 37
C131 (RPO L05)	At EVRV solenoid	175 — 34
C131 (RPO L19)	At EVRV solenoid	176 — 38
C132 (RPO L05)	At coolant temperature sensor	175 — 34
C132 (RPO L19)	At coolant temperature sensor	176 — 38
C133 (RPO L05)	At air switch solenoid	175 — 35
C134 (RPO L19)	At idle air control solenoid	176 — 37
C135	Near ECM, under I/P	172 — 23
C203	At I/P cluster	166 — 4
C279	Behind I/P	—
C289	At DRAC module	177 — 39
G102 (RPO L19)	At front side of engine	172 — 24
G103	Rear RH side of engine	171 — 22
S103	Engine harness, rear RH side of engine	171 — 22
S104	Engine harness, in front of grommet 100	171 — 21
S106	Engine harness, rear RH side of engine	171 — 21
S107	Engine harness, RH side of engine	175 — 34
S108	Engine harness, RH side of engine	171 — 21
S200	I/P harness, behind LH side of I/P	166 — 4
S211	I/P harness, under I/P	177 — 39
S213	I/P harness, under I/P	177 — 39

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 (RPO L05) EVRV (RPO L05 WITH NA4, L05 CANADA & 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 (RPO MD8)
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASSEMBLY LINE DIAGNOSTIC LINK
437	.8	BRN	A10	SPEED SENSOR (RPO L05, L19 WITHOUT REAR WHEEL ANTI LOCK BRAKES) DRAC MODULE (RPO L05, L19 WITH REAR WHEEL ANTI LOCK BRAKES)
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

ELECTRONIC CONTROL MODULE CONNECTOR

*AUTO TRANS ONLY

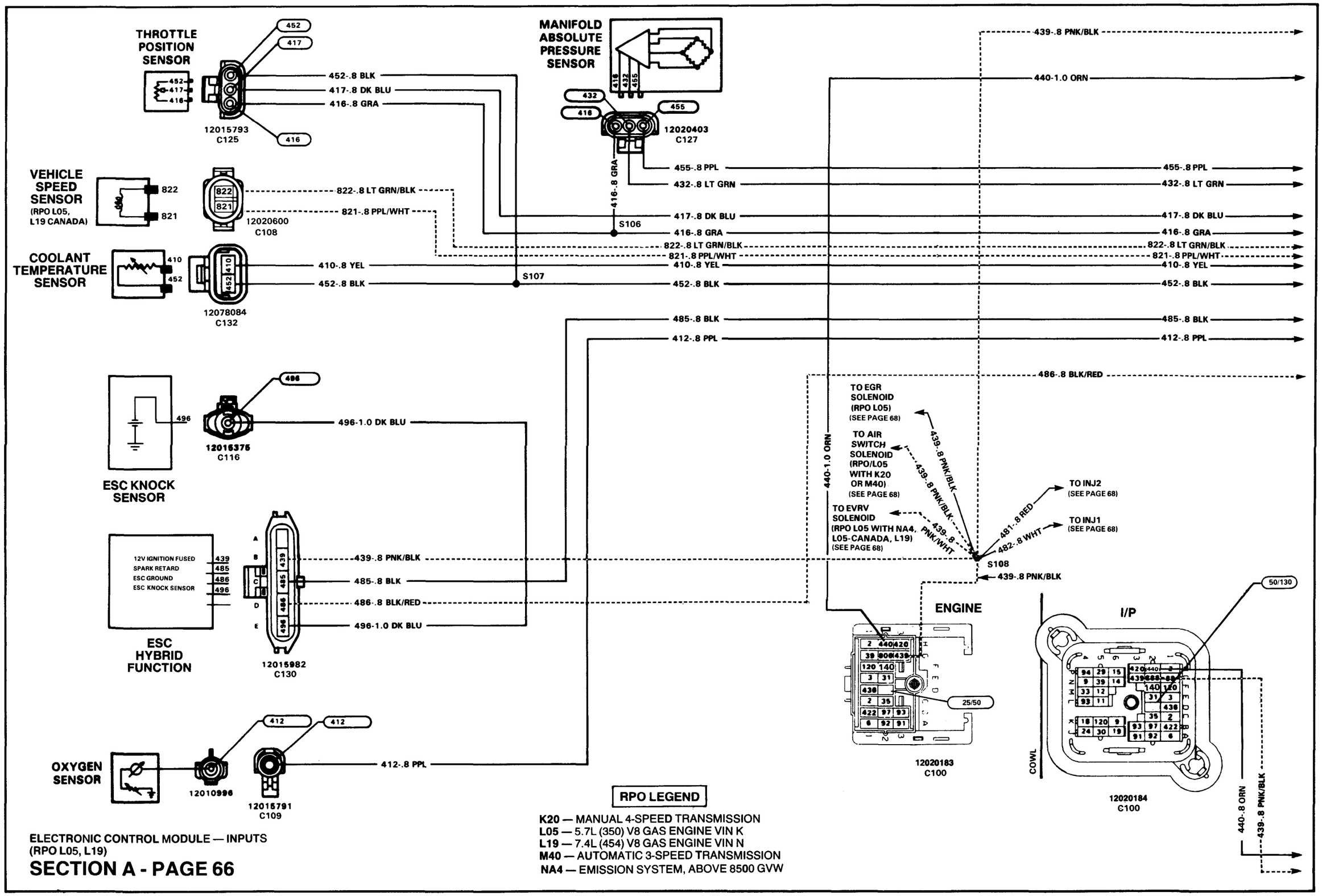
RPO LEGEND

K20 — MANUAL 4-SPEED TRANSMISSION
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
M40 — AUTOMATIC 3-SPEED TRANSMISSION
NA4 — EMISSION SYSTEM, OVER 8500 LBS GVW

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			C1	NOT USED
436	.8	BRN	C2	AIR SWITCH SOLENOID (RPO L05 WITH K20 OR M40)
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) (RPO L05 WITH MD8)
			C8	NOT USED
806	.8	PPL/WHT	C9	CRANK DISCONNECT (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
			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

ELECTRONIC CONTROL MODULE CONNECTOR

*AUTO TRANS ONLY



RPO LEGEND

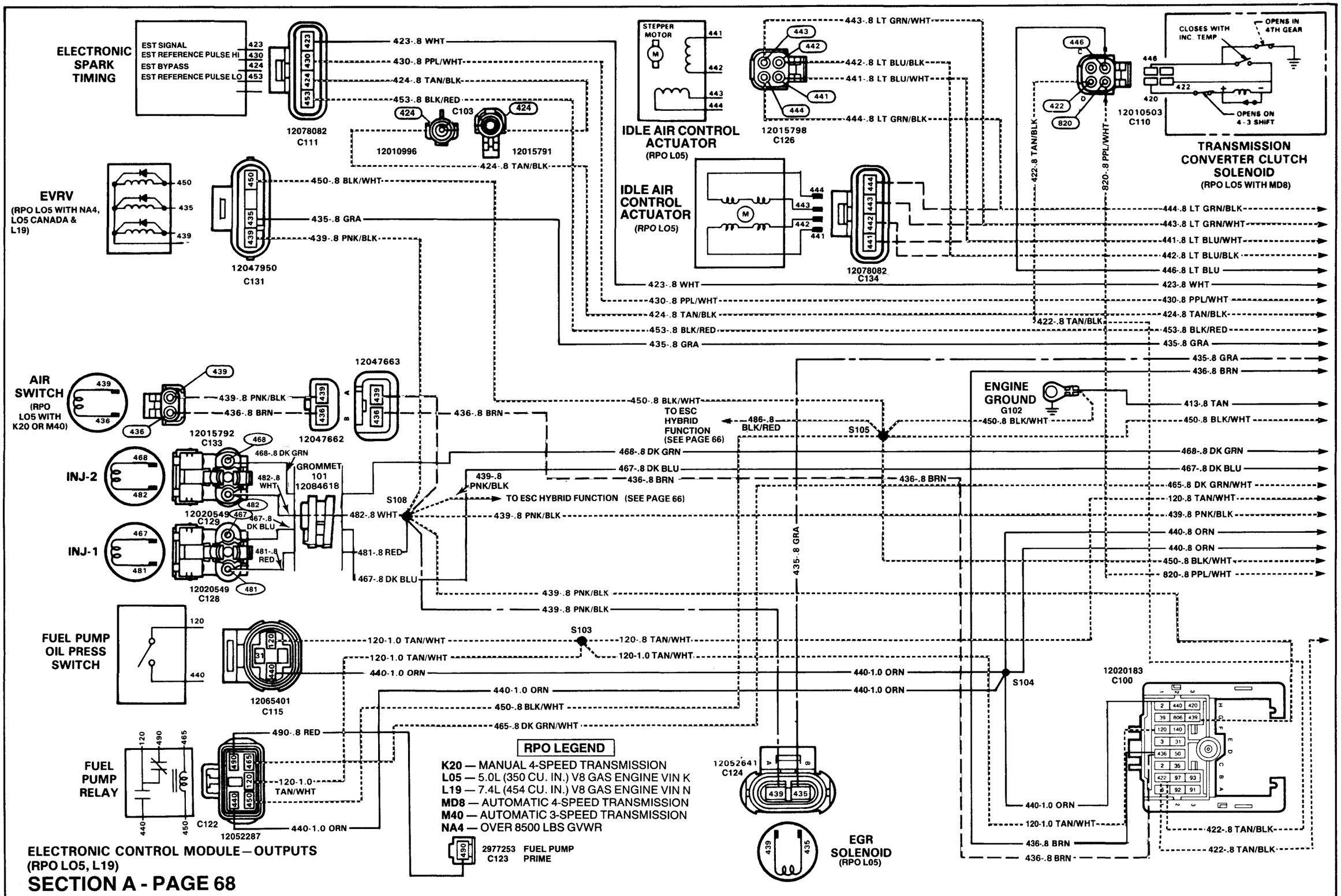
K20 — MANUAL 4-SPEED TRANSMISSION
L05 — 5.7L (350) V8 GAS ENGINE VIN K
L19 — 7.4L (454) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION
NA4 — EMISSION SYSTEM, ABOVE 8500 GVW

ELECTRONIC CONTROL MODULE — INPUTS
(RPO L05, L19)

SECTION A - PAGE 66

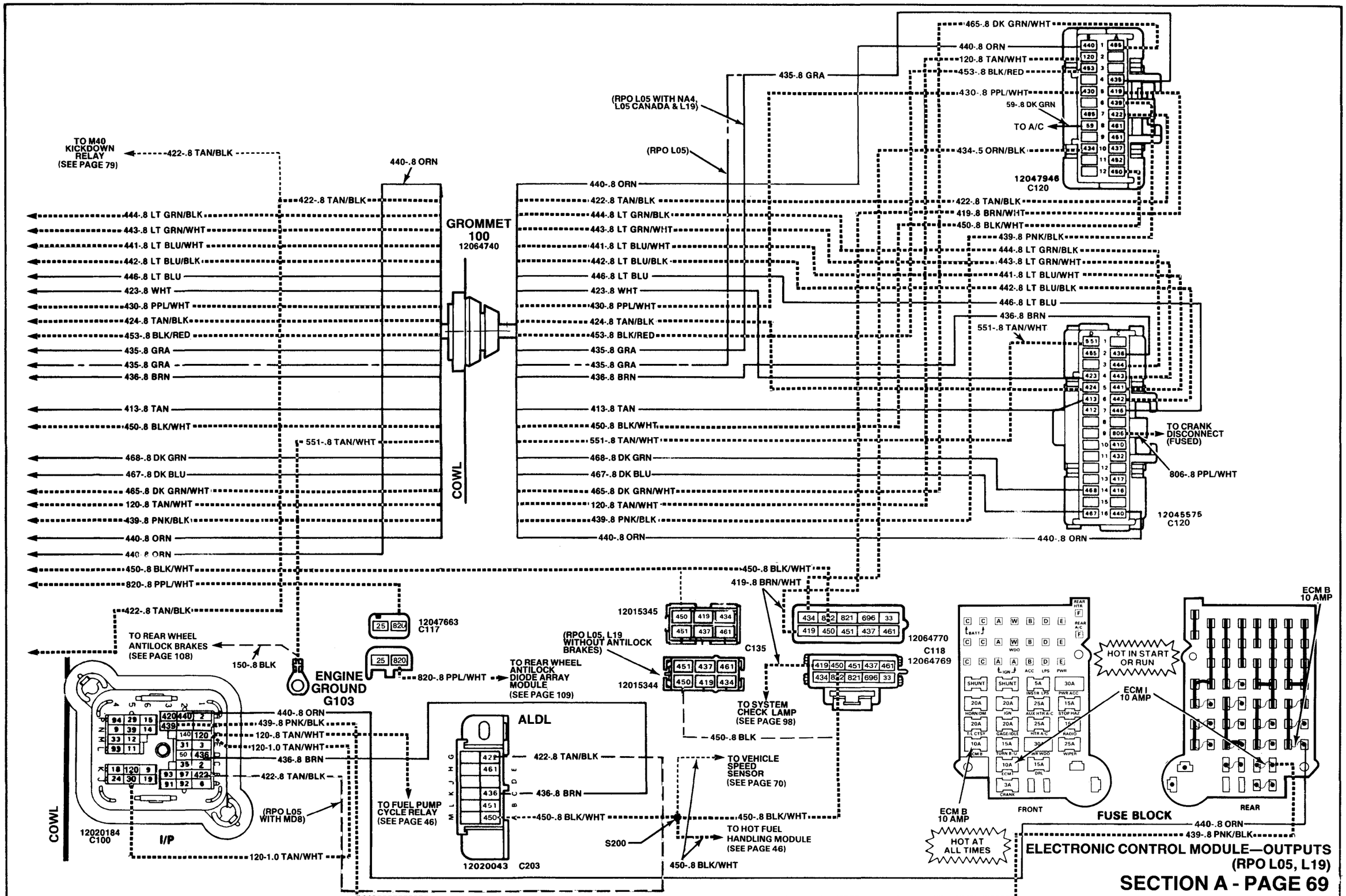
439-.8 PNK/BLK
440-1.0 ORN
TO FUEL PUMP RELAY (SEE PAGE 46)
440-.8 ORN
440-1.0 ORN
440-.8 ORN
TO OIL PRESSURE SWITCH (SEE PAGE 46)
S104
440-1.0 ORN
GROMMET 100
12064740
455-.8 PPL
432-.8 LT GRN
417-.8 DK BLU
416-.8 GRA
822-.8 LT GRN/BLK
821-.8 PPL/WHT
410-.8 YEL
452-.8 BLK
485-.8 BLK
412-.8 PPL
FROM FUEL PUMP RELAY (SEE PAGE 46)
450-.8 BLK/WHT
S105
486-.8 BLK/RED
FROM EVRV (RPO L05 WITH MA4, L19) (SEE PAGE 46)
450-.8 BLK/WHT
450-.8 BLK/WHT
450-.8 BLK/WHT
413-.8 TAN
ENGINE GROUND
G102
FROM REAR WHEEL ANTILOCK BRAKES (SEE PAGE 108)
551-.8 TAN/WHT
150-.8 BLK
ENGINE GROUND
G103
450-.8 BLK/WHT
439-.8 PNK/BLK
440-.8 ORN
440-.8 ORN
ELECTRONIC CONTROL MODULE CONNECTOR
419-.8 BRN/WHT
TO SYSTEM CHECK LAMP
485-.8 BLK
TO A/C
59-.8 DK GRN
12047946
C120
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
452-.8 BLK
437-.8 BRN
461-.8 ORN
451-.8 WHT/BLK
551-.8 TAN/WHT
485-.8 BLK
412-.8 PPL
413-.8 TAN
450-.8 BLK/WHT
551-.8 TAN/WHT
455-.8 PPL
412-.8 PPL
413-.8 TAN
ELECTRONIC CONTROL MODULE CONNECTOR
806-.8 PPL/WHT
TO CRANK DISCONNECT (FUSED)
12045575
821-.8 PPL/WHT
822-.8 LT GRN/BLK
461-.8 ORN
451-.8 WHT/BLK
450-.8 BLK/WHT
440-.8 ORN
416-.8 GRA
417-.8 DK BLU
432-.8 LT GRN
410-.8 YEL
451-.8 WHT/BLK
461-.8 ORN
437-.8 BRN
450-.8 BLK/WHT
439-.8 PNK/BLK
450-.8 BLK/WHT
437-.8 BRN
VEHICLE SPEED SENSOR
(RPO L05, L19 WITHOUT REAR WHEEL ANTILOCK BRAKES)
439 A
450 B
437 C
12015686
C279
C135
12015345
(RPO L05, L19 WITHOUT REAR WHEEL ANTILOCK BRAKES)
12015344
C118
12064770
HOT AT ALL TIMES
ECM B 10 AMP
12064764
HOT IN START OR RUN
ECM I 10 AMP
FRONT
FUSE BLOCK
REAR
ECM I 10 AMP
ECM B 10 AMP
ALDL
12020043
C206
461-.5 ORN
437-.8 BRN
451-.8 WHT/BLK
450-.8 BLK/WHT
S200
450-.8 BLK
450-.8 BLK/WHT
TO HOT FUEL HANDLING MODULE (SEE PAGE 46)
821-.8 PPL/WHT
822-.8 LT GRN/BLK
TO DRAC MODULE (SEE PAGE 70)
440-.8 ORN
439-.8 PNK/BLK
439-.8 PNK/BLK
439-.8 PNK/BLK
440-.8 ORN
439-.8 PNK/BLK

ELECTRONIC CONTROL MODULE—INPUTS (RPO L05, L19)



ELECTRONIC CONTROL MODULE—OUTPUTS (RPO LO5, L19)

SECTION A - PAGE 68



ELECTRONIC CONTROL MODULE—OUTPUTS (RPO L05, L19)

SECTION A - PAGE 69

ELECTRONIC CONTROL MODULE CONNECTOR

12047946
C120

437-.8 BRN

DIGITAL RATIO ADAPTOR CONTROLLER

VEHICLE SPEED SIGNAL CLUSTER
VEHICLE SPEED SIGNAL INPUT
VEHICLE SPEED TO ECM SIGNAL
VEHICLE SIGNAL TO RMAL CONTROLLER
12 VOLT (IGNITION)
GROUND
VEHICLE SPEED SIGNAL INPUT

12066130
C289

437-.8 BRN
50-1.0 BRN
450-.8 BLK/WHT
822-.8 LT GRN/BLK
824-.8 LT BLU/BLK
821-.8 PPL/WHT
696-.8 WHT

50-2.0 BRN → TO SELECTOR CONTROL SWITCH (SEE PAGE 83)

S211

50-1.0 BRN
50-2.0 BRN
50-2.0 BRN → TO REAR WHEEL ANTILOCK CONTROLLER MODULE (SEE PAGE 108)

50-2.0 BRN

VEHICLE SPEED SENSOR

822
821

12020600
C108

GROMMET 100
12064740

437-.8 BRN
822-.8 LT GRN/BLK
821-.8 PPL/WHT
696-.8 WHT

696-.8 WHT
S213
S200
450-.8 BLK/WHT → TO FUEL PUMP CYCLE RELAY (HOT FUEL HANDLING) (SEE PAGE 46)
824-.8 LT BLU/BLK

TO REAR WHEEL ANTILOCK CONTROLLER (SEE PAGE 108)
696-.8 WHT

TO GROUND G102 (SEE PAGE 67
450-.8 BLK/WHT

696-.8 WHT

12064770
C118
12064764

434 822 821 696 33
419 450 451 437 461

419 450 451 437 461
434 822 821 696 33

422
696 461
436
451
450

450-.8 BLK/WHT

ALDL CONNECTOR
12020043
C206

696-.8 WHT
821-.8 PPL/WHT
450-.8 BLK/WHT
450-.8 BLK/WHT

11 824
150 39
31 419
39 33
25 30
237
35 15
8 14

12066261
C203

HOT IN ACCY OR RUN
HTR A/C 25 AMP

FUSE BLOCK

FRONT
REAR
HTR A/C 25 AMP

DIGITAL RATIO ADAPTOR CONTROLLER (DRAC) MODULE

COMPONENT LOCATION

		Page — Figure
ALDL Connector	Under LH side of I/P	166 — 4
Check Engine Lamp Driver	Under I/P	179 — 49
Cold Advance Control Solenoid	Front of engine	170 — 18
Cold Advance Glow Plug Inhibit Delay	LH inner fender	173 — 26
Coolant Temperature Switch	Front of engine	170 — 18
EGR Dump Valve	Top RH side of engine	173 — 26
EGR Valve	Top RH side of engine	173 — 26
Electronic Control Module	Under center I/P	173 — 27
Engine Speed Sensor	Rear RH side of engine	170 — 18
EPR Valve	Top RH side of engine	173 — 26
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Glow Plug Controller	Rear RH side of engine	173 — 26
Grommet 100	Center of cowl	173 — 27
Manifold Absolute Pressure Sensor	Rear RH side of engine	170 — 18
Throttle Position Sensor	Front RH side of engine	170 — 18
Transmission Converter Clutch Solenoid	Rear LH side of transmission	175 — 36
Vehicle Speed Sensor	Rear of transmission	175 — 36
C100	Engine compartment, LH side of cowl	173 — 26
C106	At cold advance glow plug inhibit relay	173 — 26
C108	At vehicle speed sensor	175 — 36
C108A	At coolant temperature switch	170 — 18
C109A	At engine speed sensor	170 — 18
C120	At electronic control module	173 — 27
C125	At throttle position sensor	170 — 18
C127	At manifold absolute pressure sensor	170 — 18
C160	At EGR valve	173 — 26
C161	At EPR valve	173 — 26
C162	At EGR dump valve	173 — 26
C163	Engine compartment, LH side of cowl	170 — 18
C167	At cold advance control solenoid	170 — 18
C168	At glow plug controller	173 — 26
C169	Under center of I/P	173 — 27
C170	At transmission converter clutch solenoid	175 — 36
C172	At check engine lamp driver	179 — 49
G110	Engine harness, LH side of engine	170 — 18
S120	Engine harness, LH side rear of engine	173 — 26
S121	Engine harness, RH side rear of engine	173 — 26
S122	Engine harness, LH side rear of engine	173 — 26
S123	Under I/P, near ECM module	173 — 27
S124	Under I/P	170 — 18
S140	Engine harness, LH side of engine	173 — 26
S141	Engine harness, on side of engine	173 — 26

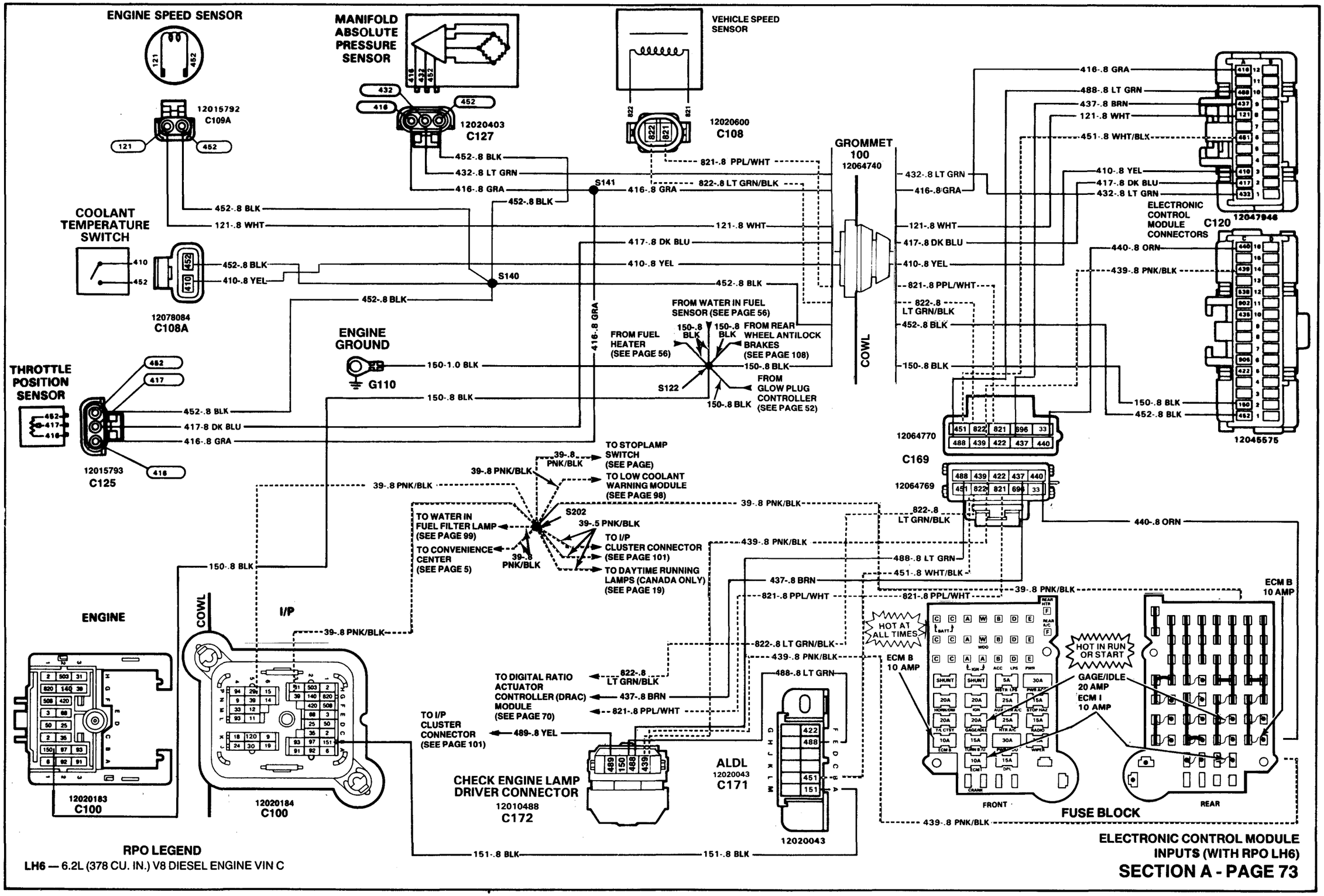
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
432	.8	LT GRN	A1	MANIFOLD ABSOLUTE PRESSURE
417	.8	DK BLU	A2	THROTTLE POSITION SENSOR
410	.8	YEL	A3	COOLANT TEMPERATURE SWITCH
			A4	NOT USED
			A5	NOT USED
451	.8	WHT/BLK	A6	ASSEMBLY LINE DIAGNOSTIC LINK CONNECTOR
			A7	NOT USED
121	.8	WHT	A8	ENGINE SPEED SENSOR
437	.8	BRN	A9	VEHICLE SPEED SIGNAL FROM DRAC MODULE
488	.8	LT GRN	A10	ASSEMBLY LINE DIAGNOSTIC LINK CONNECTOR
			A11	NOT USED
416	.8	GRA	A12	THROTTLE POSITION SENSOR AND MANIFOLD ABSOLUTE PRESSURE 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 RETURN
150	.8	BLK	C2	SYSTEM GROUND
			C3	NOT USED
			C4	NOT USED
*422	.8	TAN/BLK	C5	TORQUE CONVERTER CLUTCH
905	.8	BRN	C6	COLD ADVANCE/GLOW PLUG TIMER INHIBIT RELAY
			C7	NOT USED
			C8	NOT USED
			C9	NOT USED
435	.5	GRA	C10	EGR DIAGNOSTIC CONNECTOR
902	.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

ELECTRONIC CONTROL MODULE CONNECTOR

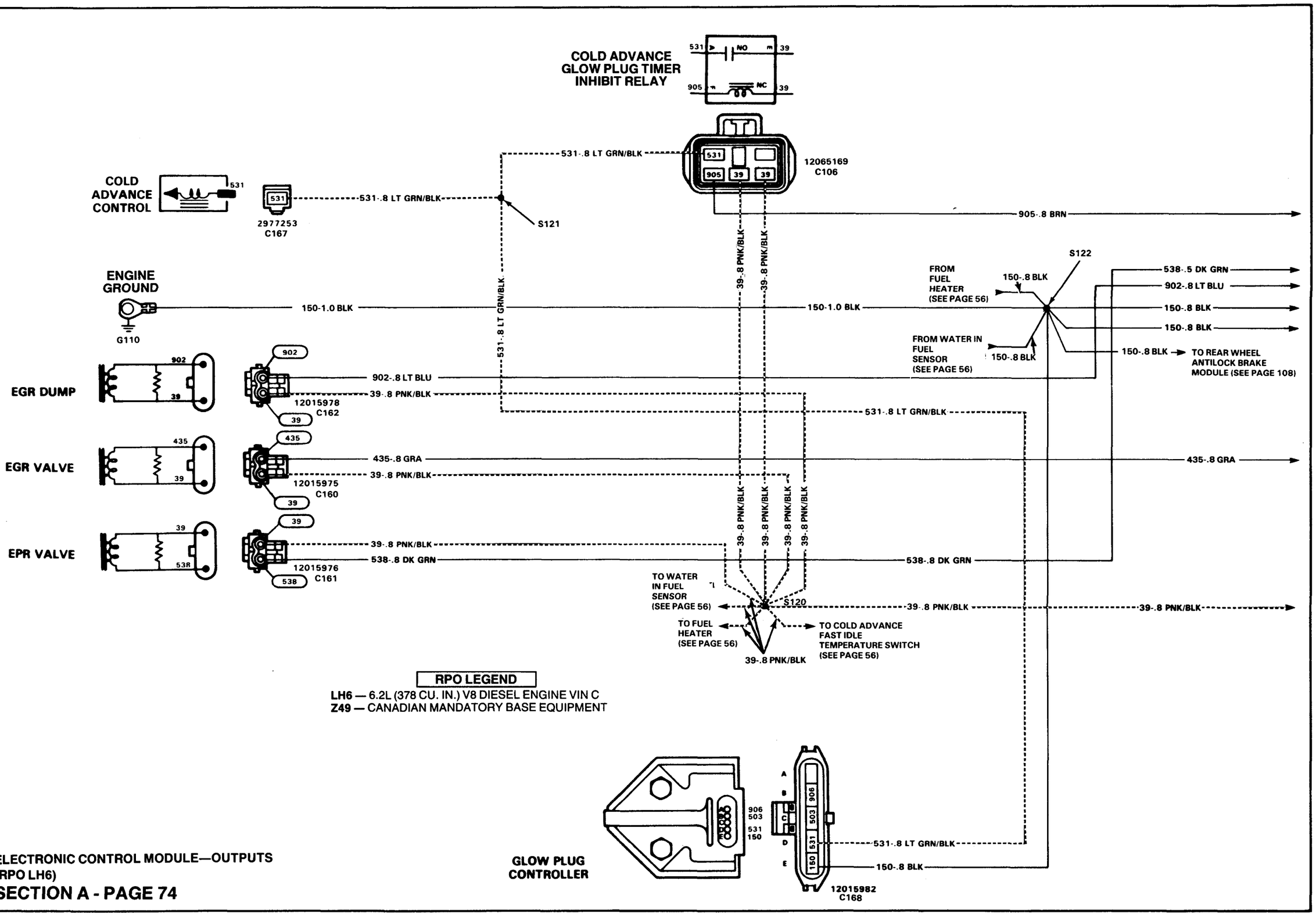
*AUTO TRANS ONLY



RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C

ELECTRONIC CONTROL MODULE INPUTS (WITH RPO LH6)



ELECTRONIC CONTROL MODULE—OUTPUTS
(RPO LH6)

TRANSMISSION CONVERTER CLUTCH SOLENOID
(AUTOMATIC TRANSMISSION)

422
383
422
422-.8 TAN/BLK
820-.8 PPL/WHT
820
12015390
C170
A B

S123
422-.8 TAN/BLK
422-.8 TAN/BLK

905-.8 BRN
905-.8 BRN
905-.8 BRN
538-.8 DK GRN
902-.8 LT BLU
150-.8 BLK
150-.8 BLK
435-.8 GRA
435-.8 GRA
150-.8 BLK

DIAGNOSTIC CONNECTOR
435
12015256
C163

COWL

GROMMET
12064760

12047946
C120
416 12
11
488 10
437 9
121 8
7
461 6
5
4
410 3
417 2
432 1

440-.8 ORN
439-.8 PNK/BLK
538-.8 DK GRN
902-.8 LT BLU
435-.8 GRA
905-.8 BRN
422-.8 TAN/BLK
150-.8 BLK

12045575
C120
C D
440 16
15
439 14
13
538 12
902 11
435 10
9
8
905 7
422 6
5
4
3
180 2
452 1

422-.8 TAN/BLK

12064770
C169
451 822 821 696 33
488 439 422 437 440

12064769
488 439 422 437 440
451 822 821 696 33
440-.8 ORN

435-.8 GRA
39-.8 PNK/BLK
TO REAR WHEEL ANTILOCK DIODE ARRAY MODULE (SEE PAGE 109)
TO STOP LAMP SWITCH (SEE PAGE 109)
39-.8 PNK/BLK
150-.8 BLK
820-.8 PPL/WHT
820-.8 PPL/WHT
39-.8 PNK/BLK
S202
TO CONVENIENCE CENTER (SEE PAGE 5)
39-.8 PNK/BLK
TO WATER IN FUEL FILTER LAMP (SEE PAGE 99)
39-.8 PNK/BLK
TO LOW COOLANT WARNING MODULE (SEE PAGE 98, 100)
39-.8 PNK/BLK
TO DAYTIME RUNNING LAMPS (SEE PAGE 19)
39-.5 PNK/BLK
TO I/P CLUSTER CONN (SEE PAGE 101)
39-.5 PNK/BLK

39-.8 PNK/BLK

ENGINE
12020183
C100
2 503 31
820 140 39
508 420
3 68
50 25
2 35
150 97 93
6 92 91
H G F E D C B A
1 2 3

820-.8 PPL/WHT

I/P
94 29 15
9 39 14
33 12
93 11
18 120 9
24 30 19
31 503 2
39 140 820
420 508
68 3
25 50
35 2
93 97 151
91 92 6
M L K J H G F E D C B A
1 2 3 4 5 6

12020184
C100

COWL

TO DRAC MODULE (SEE PAGE 70)
151-.8 BLK
151-.8 BLK

422
488
451
151
G H J K L M
F E D C B A

A.L.D.L.
12020043
C171

422-.8 TAN/BLK

12010488
C172
150
488
439

CHECK ENGINE LAMP DRIVER CONNECTOR

439-.8 PNK/BLK

HOT AT ALL TIMES
ECM B 10 AMP

HOT IN START OR RUN
GAGE/IDLE 20 AMP
ECM I 10 AMP
ECM B 10 AMP

FUSE BLOCK
FRONT
REAR

439-.8 PNK/BLK

ELECTRONIC CONTROL MODULE—OUTPUTS (RPO LH6)

COMPONENT LOCATION

		Page — Figure
ALDL Connector	Under LH side of I/P	166 — 4
Electronic Control Module	Under RH side of I/P	173 — 27
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Grommet 100	Center of cowl	165 — 2
Stop Lamp Switch	On top of brake pedal	168 — 11
Transmission Converter Clutch Solenoid	On rear LH side of transmission	175 — 36
C100	Engine compartment, LH side of cowl	165 — 2
C110	At transmission converter clutch solenoid	175 — 36
C117	Under I/P	173 — 27
C120	At electronic control module	173 — 27
C244	At stoplamp switch	181 — 55
S202	I/P harness, behind LH side of I/P	166 — 4

GROMMET 100
12064740

422-.8 TAN/BLK
446-.8 LT BLU
422-.8 TAN/BLK
446-.8 LT BLU

COWL

TRANSMISSION CONVERTER CLUTCH SOLENOID

CLOSES WITH INCREASED TEMPERATURE
OPENS IN 4TH GEAR
OPENS ON 4-3 SHIFT

12010503
C110

446
422
820

422-.8 TAN/BLK
820-.8 PPL/WHT
446-.8 LT BLU
422-.8 TAN/BLK
820-.8 PPL/WHT

12047946

C120

12045575

12047663
C117
12047662

820-.8 PPL/WHT → TO REAR WHEEL ANTILOCK DIODE ARRAY MODULE (SEE PAGE 109)

ELECTRONIC CONTROL MODULE CONNECTORS

STOP LAMP SWITCH
(MD8 ONLY)

39
420

12004267
C292

420-.8 PPL → TO REAR WHEEL ANTILOCK ARRAY MODULE (SEE PAGE 109)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP MODULE (CANADA ONLY) (SEE PAGE 19)

39-.8 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
39-.8 PNK/BLK
422-.8 TAN/BLK

S202

TO FUEL CYCLE RELAY (SEE PAGE 46) ← 39-.8 PNK/BLK

TO CONVENIENCE CENTER (SEE PAGE 5) ← 39-.8 PNK/BLK

TO I/P CLUSTER CONNECTOR (SEE PAGE 101) ← 39-.8 PNK/BLK
← 39-.8 PNK/BLK

E D C B A
422 461 436 451 450
G H J K L M
12020043
ALDL
C203

ENGINE

422-.8 TAN/BLK
422-.8 TAN/BLK

12020183
C100

I/P

39-.8 PNK/BLK
39-.8 PNK/BLK
422-.8 TAN/BLK

12020184
C100

HOT IN RUN OR START
GAGE/IDLE 20 AMP

FRONT
REAR

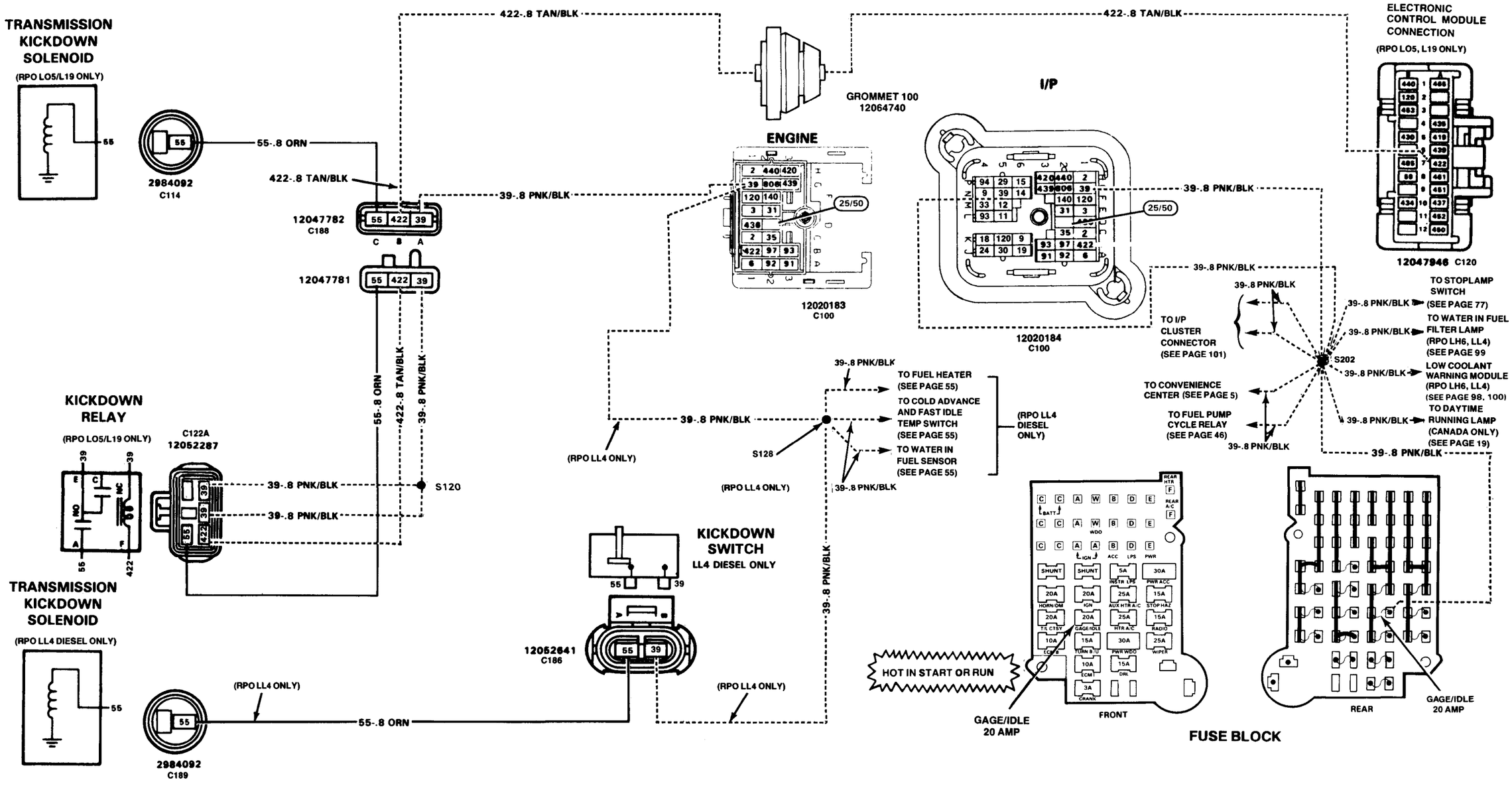
FUSE BLOCK

RPO LEGEND
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
MD8 — AUTOMATIC 4-SPEED TRANSMISSION

TRANSMISSION CONVERTER CLUTCH DETENT SOLENOID (RPO L05 ONLY)

COMPONENT LOCATION

		Page — Figure
Electronic Control Module	Under RH side of I/P	173 — 27
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Grommet 100	Center of cowl	173 — 27
Transmission Kickdown Relay (RPO LO5, L19)	Engine compartment, RH side of cowl	172 — 23
Transmission Kickdown Solenoid (RPO L05, L19)	LH rear of transmission	177 — 40
Transmission Kickdown Solenoid (RPO LH6, LL4)	LH rear of transmission	177 — 41
Transmission Kickdown Switch (RPO LL4)	Front RH side of engine	170 — 18
C100	Engine compartment, LH side of cowl	173 — 26
C114	At transmission kickdown relay	172 — 23
C120	At electronic control module	173 — 27
C186 (RPO LL4)	At transmission kickdown switch	170 — 18
C188	Engine compartment, below kickdown relay	177 — 41
C189 (RPO LH6, LL4)	At transmission kickdown solenoid	177 — 41
C189 (RPO L05, L19)	At transmission kickdown solenoid	177 — 40
S128	RH side of engine	170 — 18
S202	I/P harness, behind LH side of I/P	166 — 4



RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

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.

When the Ignition Switch is in the RUN or ACCY 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 Switch is turned 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 Air Conditioning 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 Air Conditioning 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.

COMPONENT LOCATION

PRELIMINARY CHECK:

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

TROUBLESHOOTING CHART—AIR CONDITIONING

A/C COMPRESSOR CLUTCH DOES NOT ENGAGE

TEST	RESULT	ACTION
1. Turn A/C switch OFF. Connect voltmeter from BRN (50) at A/C controller connector C280 to ground.	Battery voltage.	GO to step 2.
	No voltage.	LOCATE and REPAIR open in BRN (50) wire from A/C controller to fuse block. Check HTR/AC fuse.
2. Turn A/C switch ON. Connect voltmeter from BRN (50) wire at A/C controller connector C280 to ground.	A reading of less than 0.5 volt.	A/C controller is operating properly. GO to step 3.
	A reading greater than 0.5 volt.	REPLACE A/C controller.
3. Disconnect A/C evaporator pressure control switch connector C110A and turn A/C switch to ON. Connect a fused jumper between LT GRN (66) wire and DK GRN (59) wire at A/C evaporator pressure control switch connector C110A.	A/C clutch engages.	GO to step 4.
	A/C clutch does not engage.	CHECK for open switch. If switch is open and refrigerant pressure is normal, REPLACE A/C pressure cycling switch.
4. Connect voltmeter from DK GRN (59) wire at A/C compressor clutch connector C123A 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 evaporator pressure control switch.
5. Connect voltmeter from DK GRN (59) wire to BLK (150) wire at A/C compressor clutch connector C123A.	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 G116.

BLOWER MOTOR DOES NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Disconnect blower motor connector C174. Place ignition switch in RUN position, A/C selector control to VENT-UPPER and blower switch to HI. Connect voltmeter from PPL (65) wire at connector C174 to ground.	Battery voltage.	GO to step 2.
	No voltage.	Check for open in PPL (65) wire. If no open is found, REPLACE Hi Blower Relay.
2. Connect voltmeter from PPL (65) wire to BLK ground wire at blower motor connector C174.	Battery voltage.	REPLACE blower motor.
	No voltage.	LOCATE and REPAIR open in BLK ground wire from blower motor to ground terminal G117.

BLOWER MOTOR DOES NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition switch to RUN and turn blower switch to HI. Connect voltmeter from ORN (52) wire at Hi Blower Relay connector C112A 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 C112A to ground.	Battery voltage.	GO to step 3.
	No voltage.	LOCATE and REPAIR open in RED (2) wire on fusible link.
3. Connect voltmeter to RED (2) wire at Hi Blower Relay connector C112A 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 C205 to ground.	Battery voltage.	GO to step 2.
	No voltage.	REPLACE blower switch.
2. Connect voltmeter to LT BLU (72) wire at resistor block connector C173 to ground.	Battery voltage.	REPLACE resistor block.
	No voltage.	LOCATE and REPAIR open in LT BLU (72) wire between resistor block 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 C205 to ground.	Battery voltage.	GO to step 2.
	No voltage.	REPLACE blower switch.
2. Connect voltmeter to TAN (63) wire at resistor block connector C173 to ground.	Battery voltage.	REPLACE resistor block.
	No voltage.	LOCATE and REPAIR open in TAN (63) wire between resistor block and blower switch.

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.

TROUBLESHOOTING CHART—AIR CONDITIONING, REAR (RPO C69)

BLOWER MOTOR DOES NOT OPERATE AT ALL

TEST	RESULT	ACTION
1. Disconnect blower motor connector C423. Place ignition switch in RUN position. Connect a test lamp from PPL (52) wire at blower motor connector C423 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 C134.	Test lamp lights.	REPLACE blower motor.
	Test lamp does not light.	LOCATE and REPAIR open in ground BLK (2) wire to ground terminal G405.
3. Connect a test lamp from BRN (50) wire at blower switch connector C281 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) and/or BRN (250) wire(s).
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 test lamp from ORN (52) wire at blower switch connector C281 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect test lamp from ORN (52) wire at resistor connector C124A to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (52) wire from resistor to blower switch.

BLOWER MOTOR DOES NOT OPERATE IN LO BUT ONLY IN HI

TEST	RESULT	ACTION
1. Place blower switch in LO position. Connect 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 test lamp from YEL (51) LO wire at resistor connector C124A to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (51) wire from resistor to blower switch.
3. Connect test lamp from ORN (52) wire at resistor connector C124A to ground.	Test lamp does not light.	REPLACE resistor.

RPO LEGEND
C60 — FRONT MANUAL AIR CONDITIONING

GROUND
G115

SHEET METAL GROUND
G117

BLOWER MOTOR

BLK

COWL

52-.8 ORN
65-5.0 PPL
150-.8 BLK
101-1.0 DK BLU
2-5.0 RED

HI BLOWER RELAY

2984911
C112A

2977976
C174

2984570
C173

RESISTOR

8911212
GROMMET 103

64-1.0 BRN/WHT
63-1.0 TAN
72-1.0 LT BLU
52-.8 ORN

63-1.0 TAN
52-.8 ORN
72-1.0 LT BLU
64-1.0 BRN/WHT
66-.8 LT GRN

BLOWER SWITCH

12004067
C205

12004827

66-1.0 LT GRN
59-1.0 DK GRN

EVAPORATOR PRESSURE CONTROL SWITCH

C110A

12015987
C111A
12015952

59-1.0 DK GRN

COMPRESSOR

C123A

150-1.0 BLK

2973407
899
12034599

DIODE

MOUNTING BRACKET GROUND
G116

59-1.0 DK GRN

2-5.0 RED

JUNCTION BLOCK

59-.8 DK GRN

HOT IN ACCY OR RUN
HTR A/C
25 AMP

12015952
LO5 ONLY
12015987

FRONT

REAR

FUSE BLOCK

S211

50-2.0 BRN

HTR A/C
25 AMP

64-1.0 BRN/WHT

50-1.0 BRN

8917372
C280

SELECTOR CONTROL

OFF MAX NORM BILEV VENT HEAT DEFROST

12025952
C204

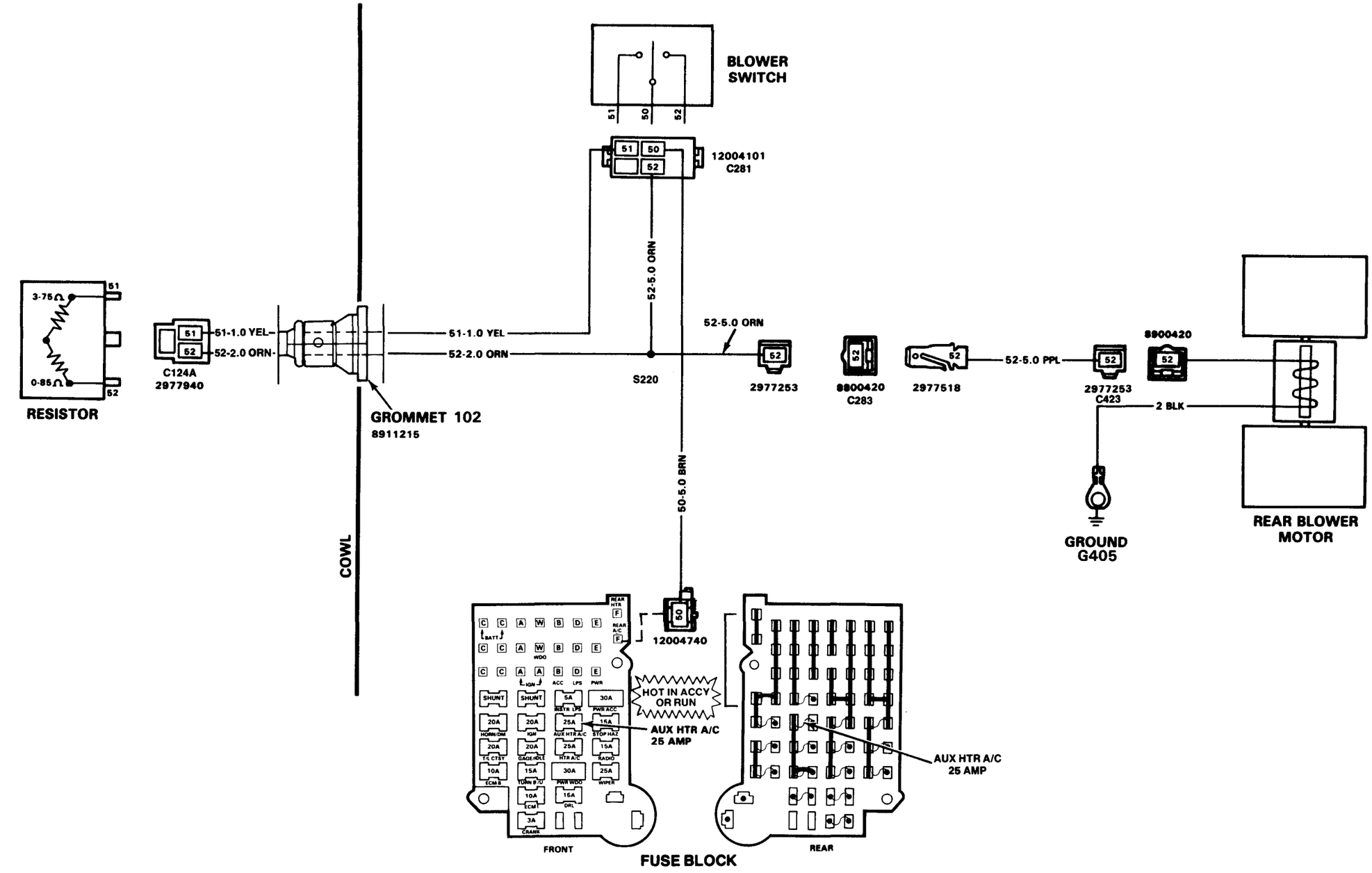
12015987
50-1.0 BRN
50-2.0 BRN

TO DIGITAL RATIO ACTUATOR CONTROLLER (DRAC) MODULE (SEE PAGE 70)

TO REAR WHEEL ANTILOCK BRAKES (SEE PAGE 109)

ELECTRONIC CONTROL MODULE CONNECTOR

12047946
C120


BLOWER SWITCH
51
50
52
12004101
C281
52-5.0 ORN
51-1.0 YEL
52-2.0 ORN
52-5.0 ORN
3-75Ω
0-85Ω
51
52
RESISTOR
C124A
2977940
GROMMET 102
8911215
S220
2977253
8900420
C283
2977518
52-5.0 PPL
2977253
C423
8900420
2 BLK
REAR BLOWER MOTOR
GROUND
G405
COWL
50-5.0 BRN
12004740
HOT IN ACCY OR RUN
AUX HTR A/C
25 AMP
AUX HTR A/C
25 AMP
FRONT
REAR
FUSE BLOCK

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 the 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 Motor to flow to ground. With the rear Blower Switch in HI, a ground path allows full voltage at the rear Blower Motor to flow to ground.

COMPONENT LOCATION

		Page — Figure
Auxiliary Heater Blower Motor	Rear RH side of vehicle	179 — 48
Auxiliary Heater Blower Switch	Center of I/P, next to ashtray	178 — 47
Auxiliary Heater Resistor	At rear blower motor	179 — 48
Blower Motor, Front Heater	Engine compartment, RH side	177 — 43
Blower Switch, Front Heater	Center of I/P	178 — 44
Bus Bar Ground	Under LH I/P, above kick panel	178 — 47
Fuse Block	Under LH I/P, above kick panel	178 — 47
Grommet 201	Center of cowl	178 — 47
Grommet 400	Rear RH side of vehicle, under blower motor	179 — 48
Resistor, Front Heater	At front blower motor	177 — 43
C174	At blower motor	177 — 43
C204	Heater control harness	178 — 44
C205	At front heater blower switch	178 — 44
C284	At auxiliary heater blower switch	178 — 47
C285	At fuse block	178 — 47
C311	Engine compartment, near water valve	179 — 48
C312	Engine compartment, near water valve	179 — 48
C424	Rear RH side at blower resistors	179 — 48
C425	Rear RH side at blower motor	179 — 48

TROUBLESHOOTING CHART—FRONT HEATER

BLOWER MOTOR DOES NOT OPERATE AT ALL

TEST	RESULT	ACTION
1. Check condition of fuse (HTR A/C).	Fuse is not blown.	GO to step 2.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
2. Disconnect blower motor connector C174. Connect a test lamp from ORN (52) wire at blower motor connector C174 to ground.	Test lamp lights.	REPLACE blower motor.
	Test lamp does not light.	GO to step 3.
3. Connect a test lamp from BRN (50) wire at blower switch connector C205 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire.
4. Place blower switch in LO, MED, or HI. Connect a test lamp from blower switch connector C205 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.

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

TEST	RESULT	ACTION
1. Connect test lamp from ORN (52) wire at blower switch connector C205 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect test lamp from ORN (52) wire at resistor connector C173 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (52) wire from resistor to blower switch.

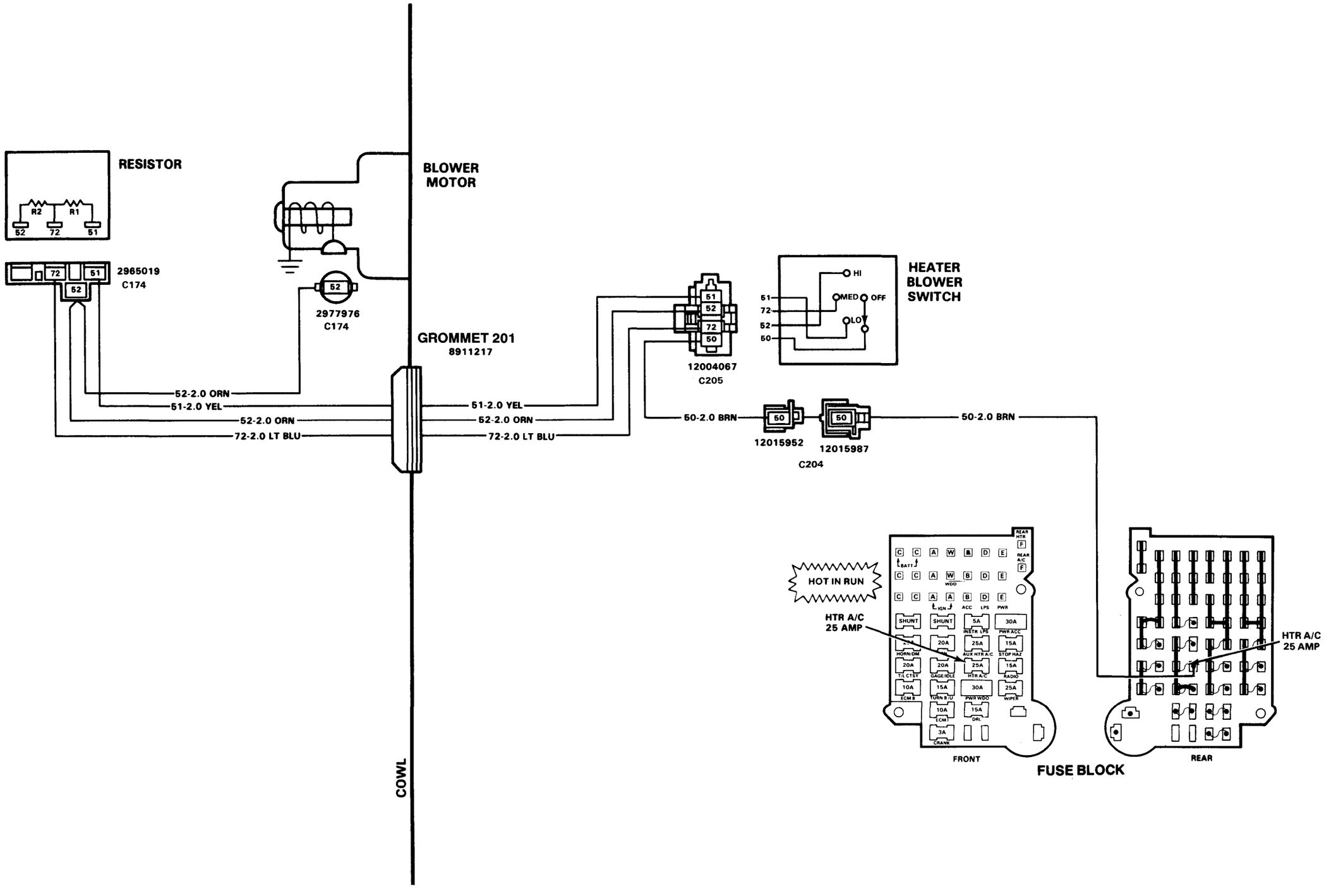
BLOWER MOTOR DOES NOT OPERATE IN LO AND/OR MED BUT ONLY IN HI

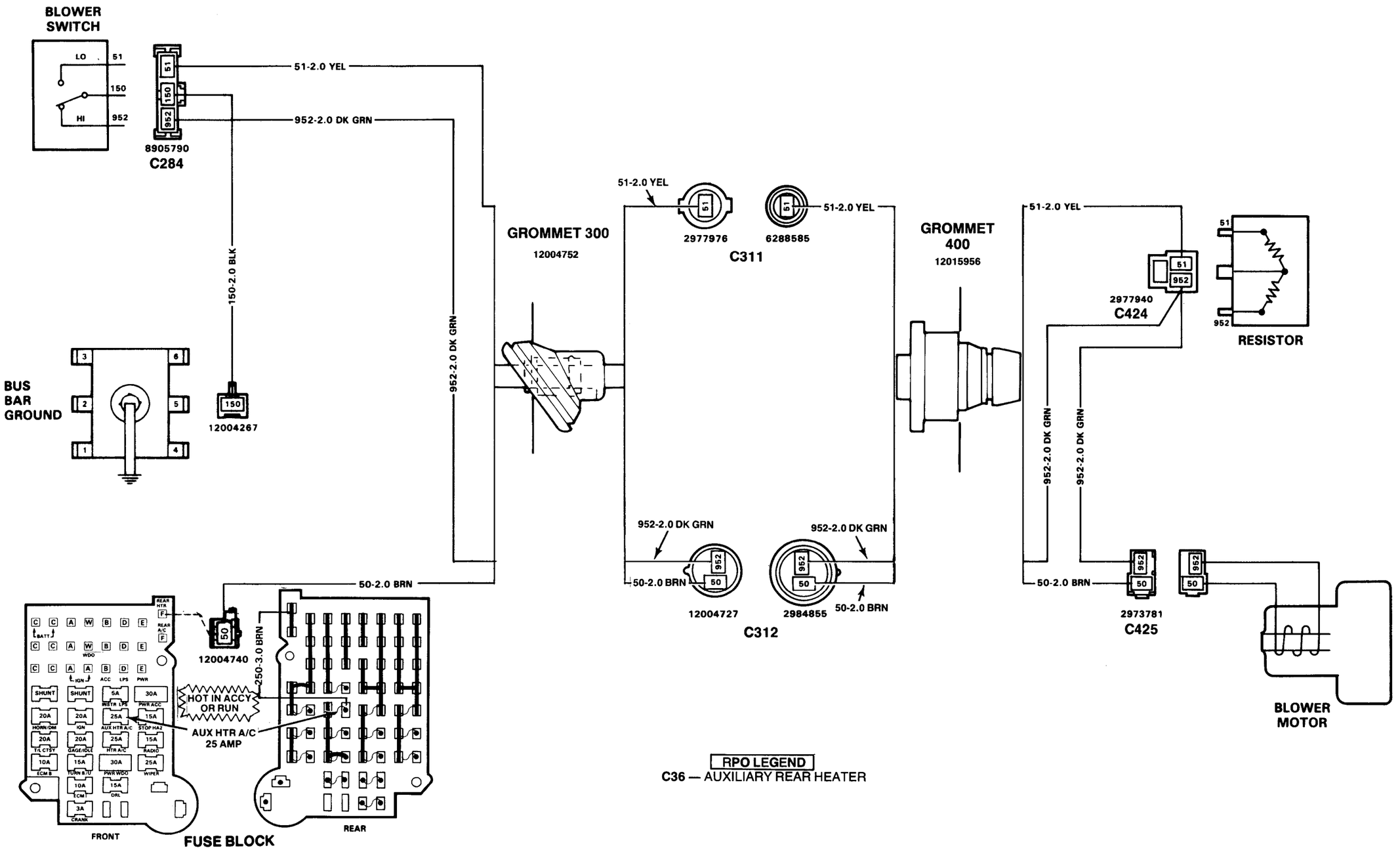
TEST	RESULT	ACTION
1. Place blower switch in position where blower motor does not work. Connect test lamp from either YEL (51) LO wire or LT BLU (72) MED wire (depending on switch position) at blower motor switch connector C205 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect test lamp from either YEL (51) LO wire or LT BLU (72) MED wire (depending on switch position) at resistor connector C173 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in wire(s) (51 or 72) from resistor to blower switch.
3. Connect test lamp from ORN (52) wire at resistor connector C173 to ground.	Test lamp does not light.	REPLACE resistor.

TROUBLESHOOTING CHART—AUXILIARY HEATER

REAR 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. Disconnect blower motor connector C425. Connect 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.
3. Connect test lamp to rear of blower motor connector C425 at DK GRN (952) wire to ground.	Test lamp lights.	GO to Step 4.
	Test lamp does not light.	REPLACE blower motor.
4. Disconnect resistor connector C424. Connect test lamp from DK GRN (952) wire to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (952) wire.
5. Disconnect blower switch connector C284. Connect test lamp from DK GRN (952) wire to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (952) wire.
6. Connect test lamp from DK GRN (952) wire to BLK (150) wire, at blower switch connector C284.	Test lamp lights.	REPLACE blower switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire to ground.


RESISTOR
R2
R1
52
72
51
2965019
C174
72
51
52
2977976
C174
52
BLOWER
MOTOR
GROMMET 201
8911217
COWL
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
12004067
C205
HI
MED
OFF
LO
51
72
52
50
HEATER
BLOWER
SWITCH
50-2.0 BRN
50
50
12015952
12015987
C204
50-2.0 BRN
HOT IN RUN
HTR A/C
25 AMP
FRONT
REAR
HTR A/C
25 AMP
FUSE BLOCK



RPO LEGEND
C36 — AUXILIARY REAR HEATER

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 260°F (hot coolant) and its resistance becomes greater at low temperatures. It is approximately 1400 ohms at 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, BULB TEST, 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.

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	Under LH I/P, above kick panel	178 — 47
Convenience Center	LH side, behind I/P	168 — 12
Coolant Temperature Sender (RPO LH6, LL4)	Front LH side of engine	173 — 26
Coolant Temperature Sender (RPO L05)	Front LH side of engine	175 — 35
Coolant Temperature Sender (RPO L19)	Front LH side of engine	172 — 24
Daytime Running Lamp Indicator	I/P cluster	—
Dimmer Switch	LH side of I/P, on steering column	166 — 5
Directional Signal Switch	On steering column	166 — 5
Electronic Control Module	Under center of I/P	171 — 21
Fuel Pump Oil Pressure Switch (RPO L05)	Rear LH side of engine	171 — 22
Fuel Pump Oil Pressure Switch (RPO L19)	Front LH side of engine	176 — 38
Fuel Tank Sender	In fuel tank	173 — 25
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Glow Plugs Wait Lamp	Top RH side of I/P	179 — 49
Headlamp Switch	LH side of I/P	166 — 4
Heater A/C Control Assembly Lamp	LH I/P, RH side of steering column	177 — 39
Ignition Switch	RH side of steering column	166 — 5
Instrument Cluster	LH side of I/P	179 — 49
Low Coolant Module	Behind LH side of I/P	179 — 49
Low Coolant Warning Lamp	Below fuel gage	179 — 49
Oil Pressure Sender (RPO LH6, LL4)	Rear of engine	173 — 26
Water in Fuel Lamp	Top of I/P cluster	179 — 49
C100	Engine compartment, LH side of cowl	165 — 2
C107 (RPO LH6, LL4)	At coolant temperature sender	173 — 26
C107 (RPO L05)	At coolant temperature sender	175 — 35
C107 (RPO L19)	At coolant temperature sender	172 — 24
C115 (RPO L05)	At fuel pump oil pressure switch	171 — 22
C115 (RPO L19)	At fuel pump oil pressure switch	176 — 38
C120	At electronic control module	171 — 21
C127A (RPO LH6, LL4)	At oil pressure sender	173 — 26
C135	Near ECM, under I/P	171 — 21
C200	At directional signal switch	166 — 5
C201	LH side of I/P, at dimmer switch	166 — 5
C202	LH side of I/P, at headlamp switch	166 — 4
C203	LH side of I/P	166 — 4
C209	At ignition switch	166 — 5
C221A	At heater A/C control assembly lamp	177 — 39
C222A	At glow plugs wait lamp	179 — 49
C223A	At water in fuel lamp	179 — 49
C224A	At low coolant warning lamp	179 — 49
C225A	At low coolant warning module	179 — 49
C409	At fuel tank	173 — 25
S201	I/P harness, behind LH side of I/P	166 — 4
S202	I/P harness, behind LH side of I/P	166 — 4
S209	I/P harness, behind I/P cluster	166 — 4

TROUBLESHOOTING CHART—INSTRUMENT PANEL: GAGES AND INDICATORS

FUEL GAGE INDICATES FULL OR BEYOND AT ALL TIMES

TEST	RESULT	ACTION
Disconnect fuel tank 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.	REPAIR/REPLACE fuel gage sender.

FUEL GAGE INDICATES EMPTY WHEN THERE IS FUEL IN THE TANK

TEST	RESULT	ACTION
Disconnect fuel tank sender connector C409 and place ignition switch to RUN.	Fuel gage indicates full.	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
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 wire 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
Disconnect temperature sender connector C107. Ground the DK GRN (35) wire at temperature sender connector C107.	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 INDICATOR STAYS ON AT ALL TIMES WITH IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
1. Disconnect temperature sender connector C107 and place ignition switch to RUN. Observe temperature indicator.	Indicator stays on.	GO to step 2.
	Indicator goes out.	REPLACE temperature sender.
2. Disconnect DK GRN (35) wire at ignition switch connector C209. Observe temperature indicator.	Indicator stays on.	LOCATE and REPAIR short in DK GRN (35) wire. If wire is good, REPLACE instrument cluster.
	Indicator goes out.	REPLACE ignition switch.

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.

TEMPERATURE INDICATOR DOES NOT LIGHT WITH THE ENGINE COOLANT OVERHEATED

TEST	RESULT	ACTION
Disconnect temperature sender connector C107 and place ignition switch to RUN. Connect fused jumper from DK GRN (35) wire at temperature sending connector C107 to ground. Observe temperature indicator.	Indicator lights.	REPLACE temperature sender.
	Indicator does not light.	LOCATE and REPAIR open in bulb and DK GRN (35) wire. If wire and bulb are good, REPLACE instrument cluster.

CHECK GAGES OR TEMPERATURE INDICATOR DOES NOT LIGHT WITH IGNITION SWITCH IN BULB TEST OR START

TEST	RESULT	ACTION
Disconnect half of ignition switch connector C209 that contains DK GRN (35) wire. Connect a fused jumper from DK GRN (35) wire at ignition switch connector C209 to ground. Place ignition switch to RUN. Do not place ignition in RUN position until fused jumper is grounded.	Temperature or check gages indicator lights.	REPLACE ignition switch.
	Temperature or check gages does not light.	LOCATE and REPAIR open in DK GRN (35) wire from ignition switch to instrument cluster.

OIL PRESSURE GAGE INDICATES LOW PRESSURE WHEN OIL PRESSURE IS GOOD (GAGE EQUIPPED) OR OIL PRESSURE INDICATOR IS ALWAYS LIT

TEST	RESULT	ACTION
Disconnect oil pressure sender connector G115 (Gasoline) or C127A (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 TAN (31) wire. If wire is good, REPLACE oil pressure gage or instrument cluster if equipped with indicator light.

OIL PRESSURE GAGE INDICATES HIGH PRESSURE AT ALL TIMES (GAGE EQUIPPED) OR OIL PRESSURE INDICATOR DOES NOT LIGHT

TEST	RESULT	ACTION
Disconnect oil presure sender connector C115 (Gasoline) or C127A (Diesel) and place ignition switch to RUN. Connect a fused jumper from TAN (31) wire at oil pressure sender connector C115 (Gasoline) or C127A (Diesel) 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 or instrument cluster if equipped with indicator light.

OIL PRESSURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
Disconnect oil pressure sender connector C115 (Gasoline) or C127A (Diesel). Connect one red lead of J33431-B tester to TAN (31) wire at oil pressure sender connector C115 (Gasoline) or C127A (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. (HTR A/C).
	No voltage.	CHECK condition of fuse (BRAKE). 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 (gas engines) or Service Manual (diesel engines) 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 C108A 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 C225A. Connect voltmeter from PNK/BLK (39) wire at low coolant module connector C225A 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 C225A.	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 C225A 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) at low coolant module connector C225A.	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 C108A 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."

RPO LEGEND

E63 — FLEETSIDE
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

HEATER A/C CONTROL ASSEMBLY LAMP

8905381
C221A

8-.5 GRA

150-.8 BLK

150-1.0 BLK

ILLUM (5)

W/O TACH

HIGH BEAM

RIGHT TURN

LEFT TURN

SAFETY BELT

CHECK ENGINE

BRAKE

(RPO L05, L19) ONLY

TEMP

OIL

FUEL

VOLTS

W/O

C203

FROM SAFETY BELT RETRACTOR SWITCH (SEE PAGE 103)

FROM CONVENIENCE CENTER (SEE PAGE 5)

FROM HEADLAMP SWITCH (SEE PAGE 19, 21)

FROM RADIO (SEE PAGE 121, 122)

S201

(RPO LL4)

FROM LOW COOLANT WARNING MODULE (SEE PAGE 98, 100)

FROM GLOW PLUGS LAMP (SEE PAGE 99, 101)

FROM WINDSHIELD WIPER WASHER SWITCH (SEE PAGE 144)

S209

TO CONVENIENCE CENTER (SEE PAGE 5)

TO RADIO (SEE PAGE 121, 122)

8900371

HEADLAMP SWITCH

12004628
C202

BUS BAR GROUND

INSTRUMENT PANEL LAMPS (FLEETSIDE—RPO E63)

HOT AT ALL TIMES

HOT WITH HEADLAMP SWITCH IN HEAD OR PARK

INSTR LPS 5 AMP

T/L CTSY 20 AMP

FRONT

REAR

FUSE BLOCK

44-1.0 DK GRN

40-.8 ORN

RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

HEATER A/C CONTROL ASSEMBLY LAMP

8905381
C221A

8-.5 GRA

150-.8 BLK

ILLUM (5)

LOW COOLANT
RPO LH6, LL4 ONLY

HIGH BEAM

RIGHT TURN

W/O TACH

LEFT TURN

SAFETY BELT

CHECK ENGINE
RPO LO5, L19 (CIRCUIT 419) LH6 (CIRCUIT 489)

BRAKE

DAYTIME RUNNING LAMP (CANADA ONLY)

TEMP

OIL

FUEL

VOLTS

SPEEDO-METER

C203

(RPO LH6, LL4 ONLY)

FROM SAFETY BELT RETRACTOR SWITCH (SEE PAGE 103)

FROM CONVENIENCE CENTER (SEE PAGE 5)

FROM HEADLAMP SWITCH (SEE PAGE 19, 21)

FROM RADIO (SEE PAGE 121, 122)

S201

FROM LOW COOLANT WARNING MODULE (SEE PAGE 98, 100)

FROM GLOW PLUGS LAMP (SEE PAGE 99, 101)

FROM CHECK ENGINE LAMP DRIVER (LH6) (SEE PAGE 100)

FROM WINDSHIELD WIPER WASHER SWITCH (SEE PAGE 144)

TO CONVENIENCE CENTER (SEE PAGE 5)

S209

TO RADIO (SEE PAGE 121, 122)

8900371

HEADLAMP SWITCH

12004628
C202

44-1.0 DK GRN

40-.8 ORN

BUS BAR GROUND

HOT AT ALL TIMES

HOT WITH HEADLAMP SWITCH IN HEAD OR PARK

INSTR LPS 5 AMP

T/L CTSY 20 AMP

T/L CTSY 20 AMP

FRONT

FUSE BLOCK

REAR

INSTRUMENT PANEL LAMPS (SUBURBAN AND UTILITY)

SECTION A - PAGE 93

COOLANT TEMPERATURE SENDER

35

35-.8 DK GRN

12015306

C107

FUEL PUMP OIL PRESSURE SWITCH (RPO L05, L19)

120

31

440

31-.8 TAN

12065401

C115

OIL PRESSURE SENDER (RPO LH6, LL4)

31

31-.8 TAN

2977935

C127A

FUEL TANK SENDER (RPO LH6, LL4)

30

30

30-.8 PNK

6288440

C409

HOT IN START OR RUN

GAGE/IDLE 20 AMP

FRONT

REAR

FUSE BLOCK

GAGE/IDLE 20 AMP

39-.5 PNK/BLK

(RPO LH6, LL4 ONLY)

TO DAYTIME RUNNING LAMPS (SEE PAGE 19) (CANADA ONLY)

TO LOW COOLANT WARNING MODULE (SEE PAGE 98, 100)

LOW COOLANT WARNING LAMP (SEE PAGE 99, 101)

TO WATER IN FUEL LAMP (SEE PAGE 99)

39-.3 PNK/BLK

TO HOT FUEL HANDLING MODULE (SEE PAGE 46)

TO CONVENIENCE CENTER (SEE PAGE 5)

TO STOPLAMP SWITCH (SEE PAGE 77)

39-.8 PNK/BLK

S202

39-.8 PNK/BLK

39-.5 PNK/BLK

39-.5 PNK/BLK

39-.8 PNK/BLK

30-.8 PNK

120-1.0 TAN/WHT

REAR BODY 12020199 C100

WITHOUT TACHOMETER

30-.5 PNK

30-.5 PNK

WITH TACHOMETER

31-.5 TAN

WITH TACHOMETER

120-1.0 TAN/WHT

35-.5 DK GRN

WITHOUT TACHOMETER

30-.5 PNK

30-.8 PNK

31-.8 TAN

35-.8 DK GRN

ENGINE

12020183

COWL

I/P

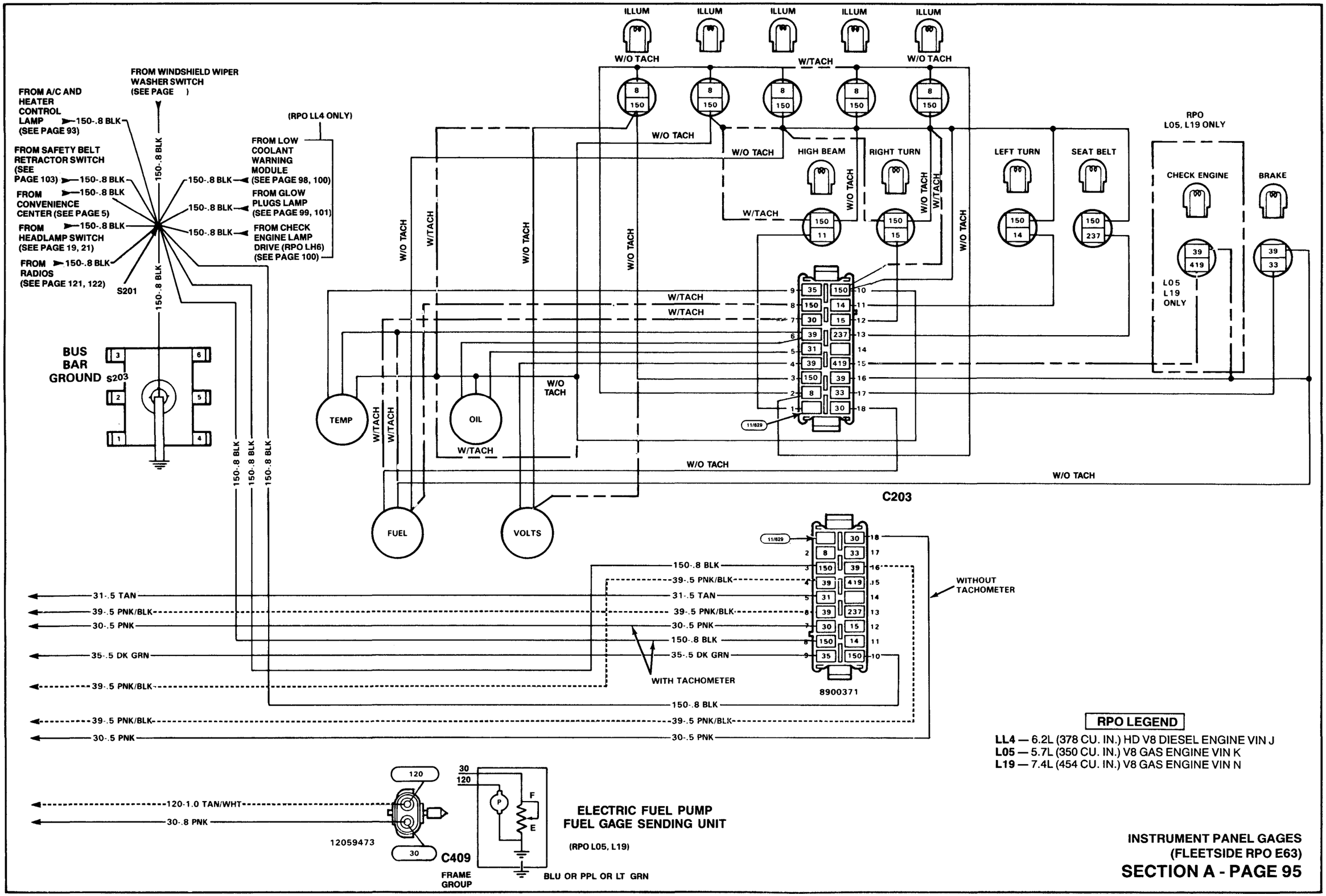
120-1.0 TAN/WHT

12020184

C100

INSTRUMENT PANEL GAGES
(FLEETSIDE—RPO E63)

SECTION A - PAGE 94



RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

COOLANT TEMPERATURE SENDER
(RPO L05, L19, LH6, LL4)

35

35-.8 DK GRN

35

12015306

C107

FUEL PUMP OIL PRESSURE SWITCH
(RPO L05, L19)

120
31
440

31-.8 TAN

120
31
440

12065401

C115

OIL PRESSURE SENDER
(RPO LH6, LL4)

31

31

31-.8 TAN

2977935

C127A

FUEL TANK SENDER
(RPO LH6, LL4)

30

30

30-.8 PNK

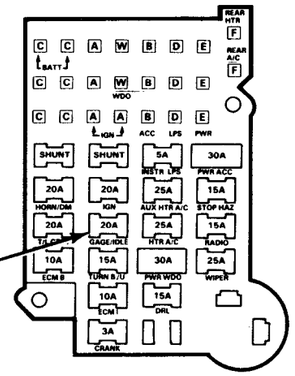
6288440

C409

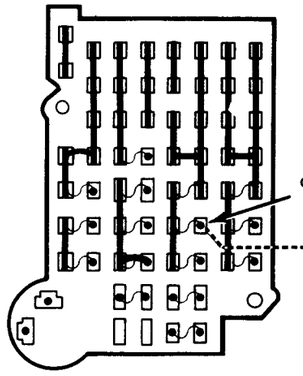
35-.8 DK GRN

HOT IN START OR RUN

GAGE/IDLE 20 AMP



FRONT



REAR

GAGE/IDLE 20 AMP

FUSE BLOCK

39-.8 PNK/BLK

TO CHECK ENGINE LAMP (SEE PAGE 100)

LOW COOLANT WARNING MODULE (SEE PAGE 98, 100)

(RPO LH6, LL4)

LOW COOLANT WARNING LAMP (SEE PAGE 99, 101)

TO WATER IN FUEL LAMP (SEE PAGE 99)

39-.8 PNK/BLK

TO HOT FUEL HANDLING MODULE (L05, L19) (SEE PAGE 46)

TO CONVENIENCE CENTER (SEE PAGE 5)

TO STOPLAMP SWITCH (MD8) (SEE PAGE 77)

39-.8 PNK/BLK

39-.8 PNK/BLK

TO DAYTIME RUNNING LAMPS (SEE PAGE 19)

39-.8 PNK/BLK

39-.8 PNK/BLK

S202

39-.5 PNK/BLK

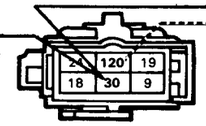
39-.8 PNK/BLK

30-.8 PNK

120-1.0 TAN/WHT

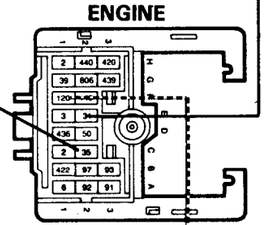
REAR BODY C100

12020199



31-.8 TAN

ENGINE



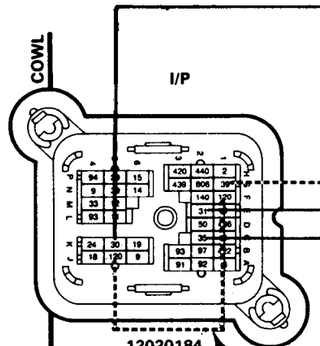
12020183

TO S103 (SEE PAGE 45)

120-1.0 TAN/WHT

COWL

I/P



12020184

C100

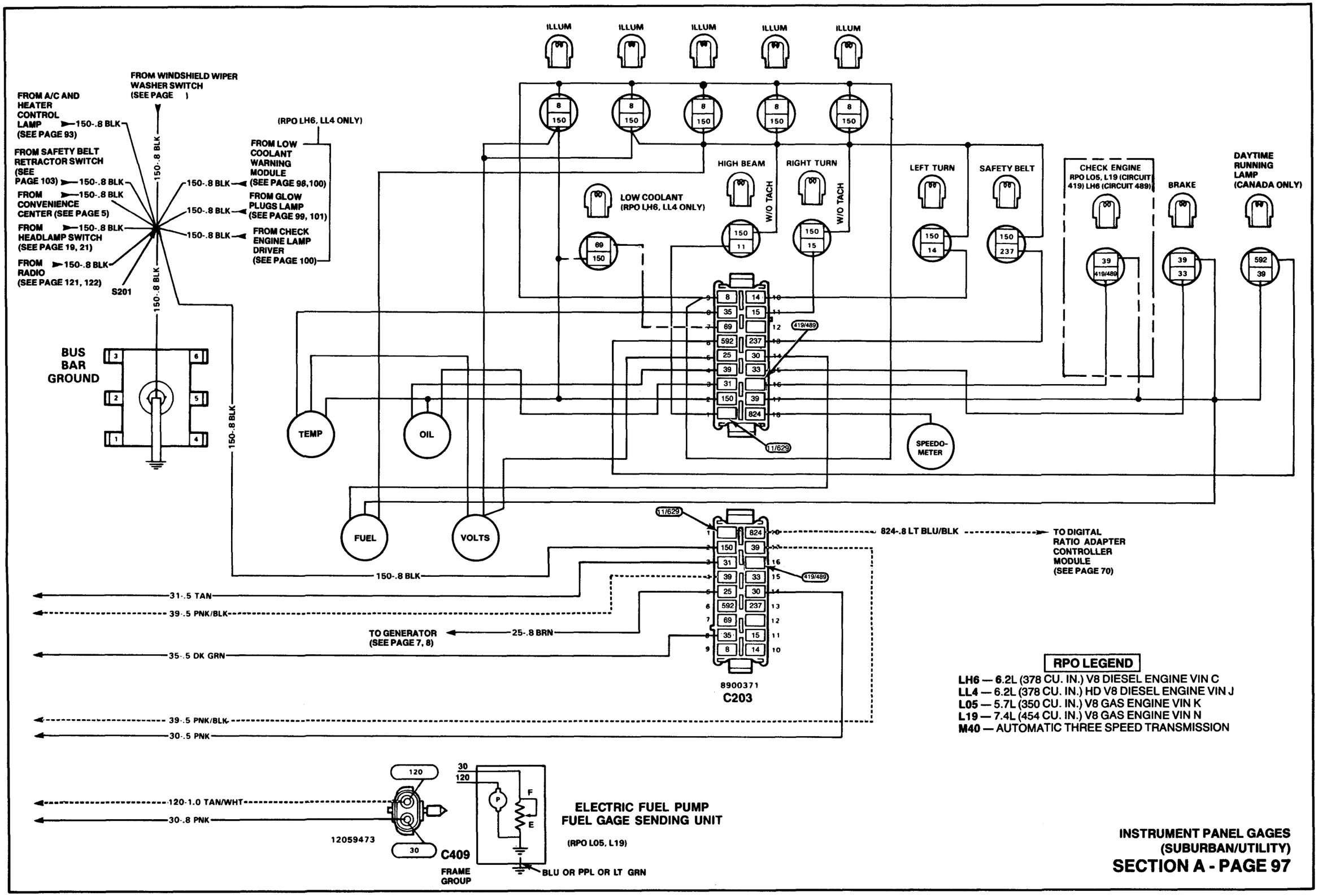
120-1.0 TAN/WHT

31-.5 TAN

35-.5 DK GRN

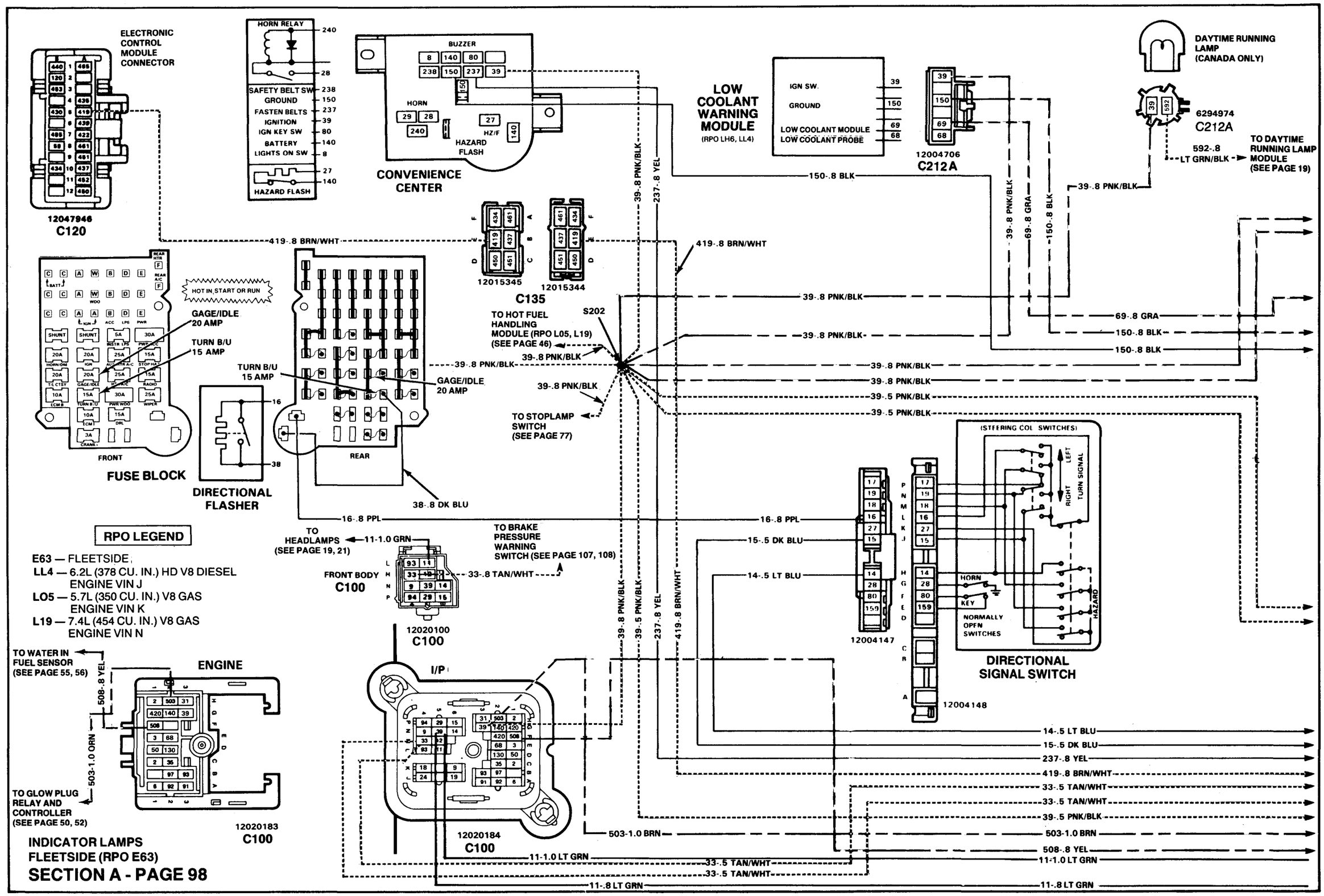
30-.5 PNK

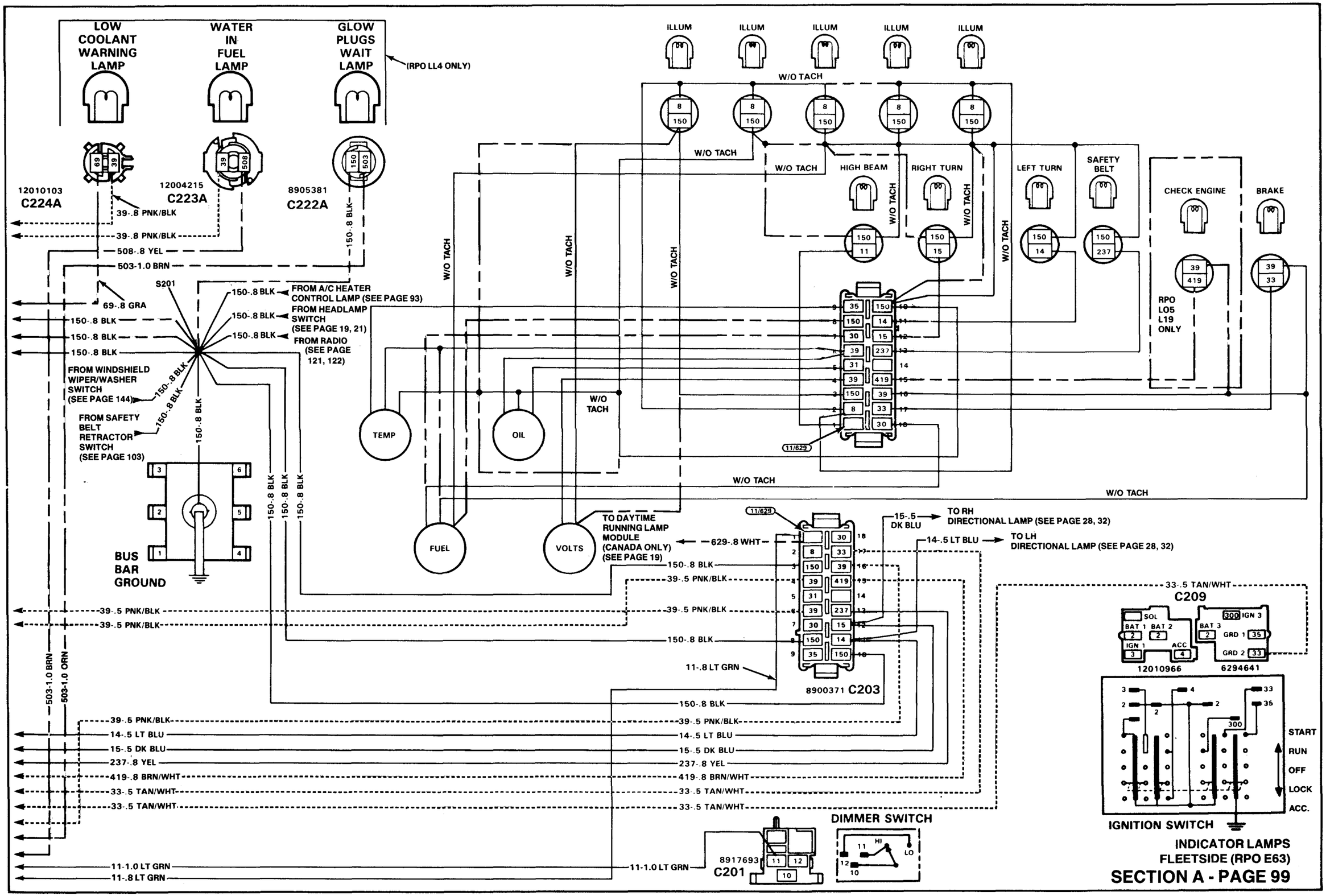
INSTRUMENT PANEL GAGES (SUBURBAN AND UTILITY)



RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC THREE SPEED TRANSMISSION


ELECTRONIC CONTROL MODULE CONNECTOR
12047946
C120
HORN RELAY
240
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
BUZZER
8 140 80
238 150 237 39
HORN
29 28
240
27
HZ/F
140
HAZARD FLASH
CONVENIENCE CENTER
LOW COOLANT WARNING MODULE
(RPO LH6, LL4)
IGN SW. 39
GROUND 150
LOW COOLANT MODULE 69
LOW COOLANT PROBE 68
12004706
C212A
DAYTIME RUNNING LAMP (CANADA ONLY)
6294974
C212A
592-.8 LT GRN/BLK
TO DAYTIME RUNNING LAMP MODULE (SEE PAGE 19)
150-.8 BLK
39-.8 PNK/BLK
69-.8 GRA
419-.8 BRN/WHT
12015345
12015344
C135
HOT IN START OR RUN
GAGE/IDLE 20 AMP
TURN B/U 15 AMP
TO HOT FUEL HANDLING MODULE (RPO L05, L19) (SEE PAGE 46)
S202
39-.8 PNK/BLK
TO STOPLAMP SWITCH (SEE PAGE 77)
39-.5 PNK/BLK
FUSE BLOCK
FRONT
REAR
DIRECTIONAL FLASHER
16
38
38-.8 DK BLU
16-.8 PPL
TO HEADLAMPS (SEE PAGE 19, 21)
11-1.0 GRN
FRONT BODY C100
33-.8 TAN/WHT
12020100
C100
TO BRAKE PRESSURE WARNING SWITCH (SEE PAGE 107, 108)
15-.5 DK BLU
14-.5 LT BLU
237-.8 YEL
419-.8 BRN/WHT
12004147
12004148
(STEERING COL SWITCHES)
LEFT TURN SIGNAL
RIGHT
HORN
KEY
NORMALLY OPEN SWITCHES
HAZARD
DIRECTIONAL SIGNAL SWITCH
TO WATER IN FUEL SENSOR (SEE PAGE 55, 56)
508-.8 YEL
503-1.0 ORN
TO GLOW PLUG RELAY AND CONTROLLER (SEE PAGE 50, 52)
ENGINE
12020183
C100
I/P
12020184
C100
503-1.0 BRN
508-.8 YEL
11-1.0 LT GRN
33-.5 TAN/WHT
11-.8 LT GRN
RPO LEGEND
E63 — FLEETSIDE
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
INDICATOR LAMPS
FLEETSIDE (RPO E63)
SECTION A - PAGE 98


LOW COOLANT WARNING LAMP
WATER IN FUEL LAMP
GLOW PLUGS WAIT LAMP
(RPO LL4 ONLY)
12010103
C224A
12004215
C223A
8905381
C222A
39-.8 PNK/BLK
39-.8 PNK/BLK
508-.8 YEL
503-1.0 BRN
150-.8 BLK
S201
69-.8 GRA
150-.8 BLK
150-.8 BLK
150-.8 BLK
FROM A/C HEATER CONTROL LAMP (SEE PAGE 93)
FROM HEADLAMP SWITCH (SEE PAGE 19, 21)
FROM RADIO (SEE PAGE 121, 122)
FROM WINDSHIELD WIPER/WASHER SWITCH (SEE PAGE 144)
FROM SAFETY BELT RETRACTOR SWITCH (SEE PAGE 103)
BUS BAR GROUND
503-1.0 BRN
503-1.0 ORN
ILLUM
W/O TACH
HIGH BEAM
RIGHT TURN
LEFT TURN
SAFETY BELT
CHECK ENGINE
BRAKE
RPO LO5 L19 ONLY
TEMP
OIL
FUEL
VOLTS
TO DAYTIME RUNNING LAMP MODULE (CANADA ONLY) (SEE PAGE 19)
629-.8 WHT
11/629
8900371 C203
15-.5 DK BLU
TO RH DIRECTIONAL LAMP (SEE PAGE 28, 32)
14-.5 LT BLU
TO LH DIRECTIONAL LAMP (SEE PAGE 28, 32)
11-.8 LT GRN
39-.5 PNK/BLK
14-.5 LT BLU
15-.5 DK BLU
237-.8 YEL
419-.8 BRN/WHT
33-.5 TAN/WHT
11-1.0 LT GRN
11-.8 LT GRN
8917693
C201
DIMMER SWITCH
33-.5 TAN/WHT
C209
12010966
6294641
IGNITION SWITCH
START
RUN
OFF
LOCK
ACC.
INDICATOR LAMPS
FLEETSIDE (RPO E63)

ELECTRONIC CONTROL MODULE CONNECTOR

12047946
C120

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

BUZZER
HORN
HZ/F
CONVENIENCE CENTER

LOW COOLANT WARNING MODULE
(RPO LH6, LL4)
IGN SW.
GROUND
LO COOLANT MODULE
LO COOLANT PROBE

12004706
C225A

C226A
12020004
CHECK ENGINE LAMP DRIVE MODULE
(RPO LH6)

12015345
C135
12015344

419-.8 BRN/WHT
39-.8 PNK/BLK
237-.8 YEL
150-.8 BLK
69-.8 GRA
489-.8 YEL

RPO LEGEND
LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

HOT IN RUN OR START
GAGE/IDLE 20 AMP
TURN B/U 15 AMP
FUSE BLOCK
FRONT
REAR

TO HOT FUEL HANDLING MODULE (RPO L05, L19) (SEE PAGE 26)
S202
39-.8 PNK/BLK
TO STOP LAMP SWITCH (SEE PAGE 77)
38-.8 DK BLU

DIRECTIONAL FLASHER
16-.8 PPL

TO BRAKE PRESSURE WARNING SWITCH (SEE PAGE 107, 108)
33-.8 TAN/WHT
12020100
C100

(STEERING COL. SWITCHES)
RIGHT TURN SIGNAL
LEFT
HORN
KEY
NORMALLY OPEN SWITCHES
HAZARD
12004147
C200
12004148
DIRECTIONAL SIGNAL SW

15-.5 DK BLU
14-.5 LT BLU
39-.5 PNK/BLK
237-.8 YEL
419-.8 BRN/WHT
69-.8 GRA
33-.5 TAN/WHT

TO GLOW PLUG RELAY AND CONTROLLER (SEE PAGE 50, 52)
TO WATER IN FUEL SENSOR (SEE PAGE 55, 56)
503-1.0 ORN
508-.8 YEL
ENGINE
12020183
C100

COWL
I/P
12020184
C100

503-1.0 BRN
508-.8 YEL
11-.8 LT GRN
11-1.0 LT GRN

INDICATOR LAMPS (SUBURBAN AND UTILITY)

WATER IN FUEL LAMP

GLOW PLUGS WAIT LAMP

(RPO LH6, LL4 ONLY)

12004215
C223A

8905381
C222A

39-.5 PNK/BLK

508-.8 YEL

503-1.0 BRN

150-.8 BLK

S201

FROM A/C HEATER CONTROL LAMP (SEE PAGE 92)

FROM HEADLAMP SWITCH (SEE PAGE 19, 21)

FROM RADIO (SEE PAGE 121, 122)

FROM WINDSHIELD WIPER/WASHER SWITCH (SEE PAGE 144)

FROM SAFETY BELT RETRACTOR SWITCH (SEE PAGE 103)

BUS BAR GROUND

489-.8 YEL

69-.8 GRA

ILLUM

HIGH BEAM

RIGHT TURN

W/O TACH

LOW COOLANT (RPO LH6, LL4 ONLY)

LEFT TURN

SAFETY BELT

CHECK ENGINE RPO LO5, L19 (CIRCUIT 419) LH6 (CIRCUIT 489)

BRAKE

DAYTIME RUNNING LAMP (CANADA ONLY)

419/489

11/629

TEMP

OIL

FUEL

VOLTS

SPEEDO-METER

C203

8900371

TO DAYTIME RUNNING LAMP MODULE (CANADA ONLY) (SEE PAGE 19)

629-.8 WHT

592-.8 LT GRN/BLK

11-.8 LT GRN

15-.5 DK BLU

TO RH DIRECTIONAL LAMP (SEE PAGE 28, 32)

14-.5 LT BLU

TO LH DIRECTIONAL LAMP (SEE PAGE 28, 32)

33-.5 TAN/WHT

C209

12010966

6294641

IGNITION SWITCH

START

RUN

OFF

LOCK

ACC

DIMMER SWITCH

8917693
C201

11-1.0 LT GRN

INDICATOR LAMPS (SUBURBAN/UTILITY)

SECTION A - PAGE 101

CIRCUIT OPERATION

With the Ignition Switch in RUN, BULB TEST, or START, voltage is applied through the GAGES Fuse to the Safety Belt Buzzer at the Convenience Center. With the driver's safety belt not buckled, terminal 39 of the module is grounded through the Safety Belt Switch. The Fasten Belts Indicators always goes on for about 5 seconds when the Ignition Switch is turned to RUN, BULB TEST, or START.

COMPONENT LOCATION

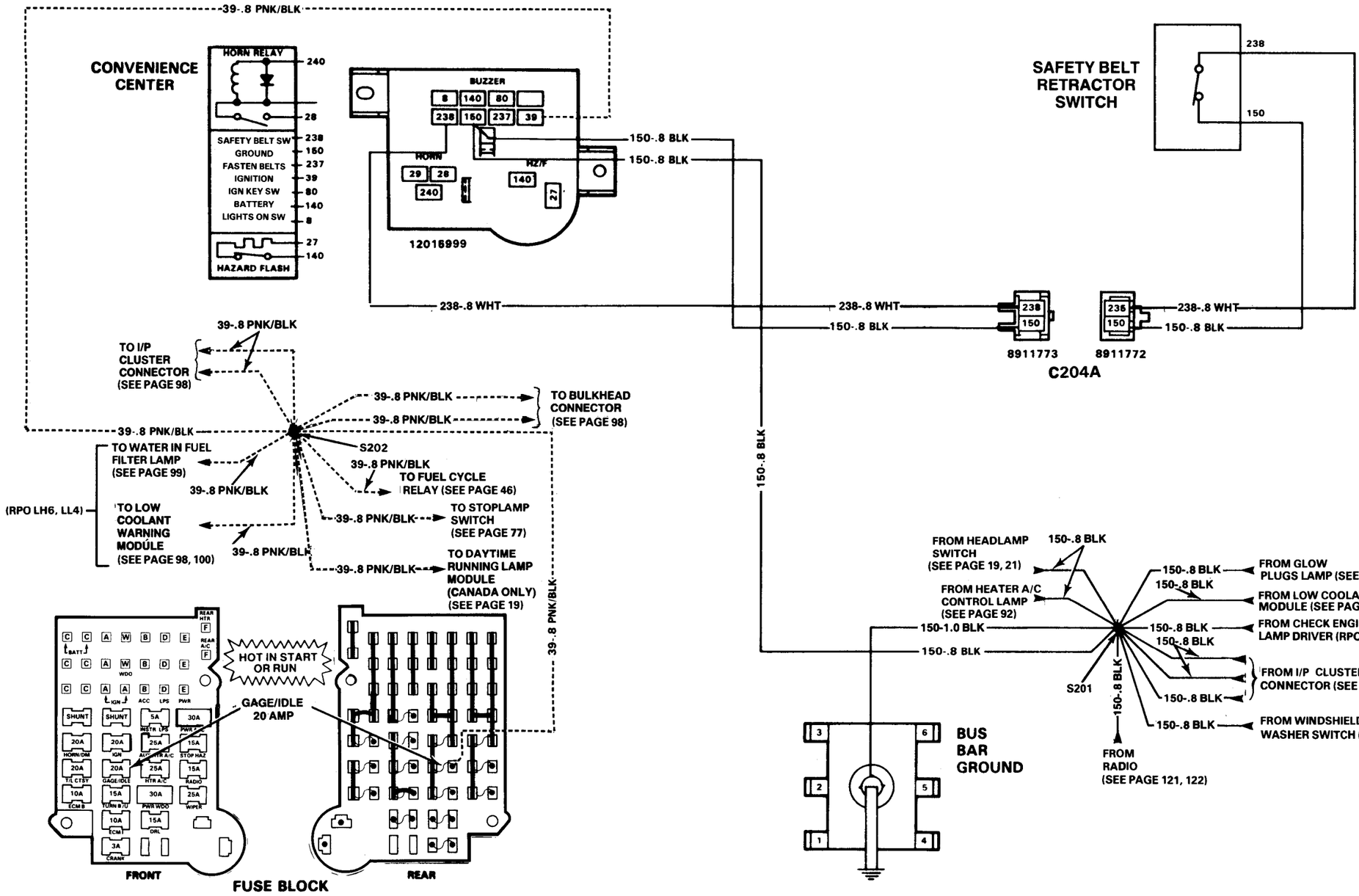
TROUBLESHOOTING CHART—SAFETY BELT WARNING BUZZER

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 C204 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 C204 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 C204.	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.

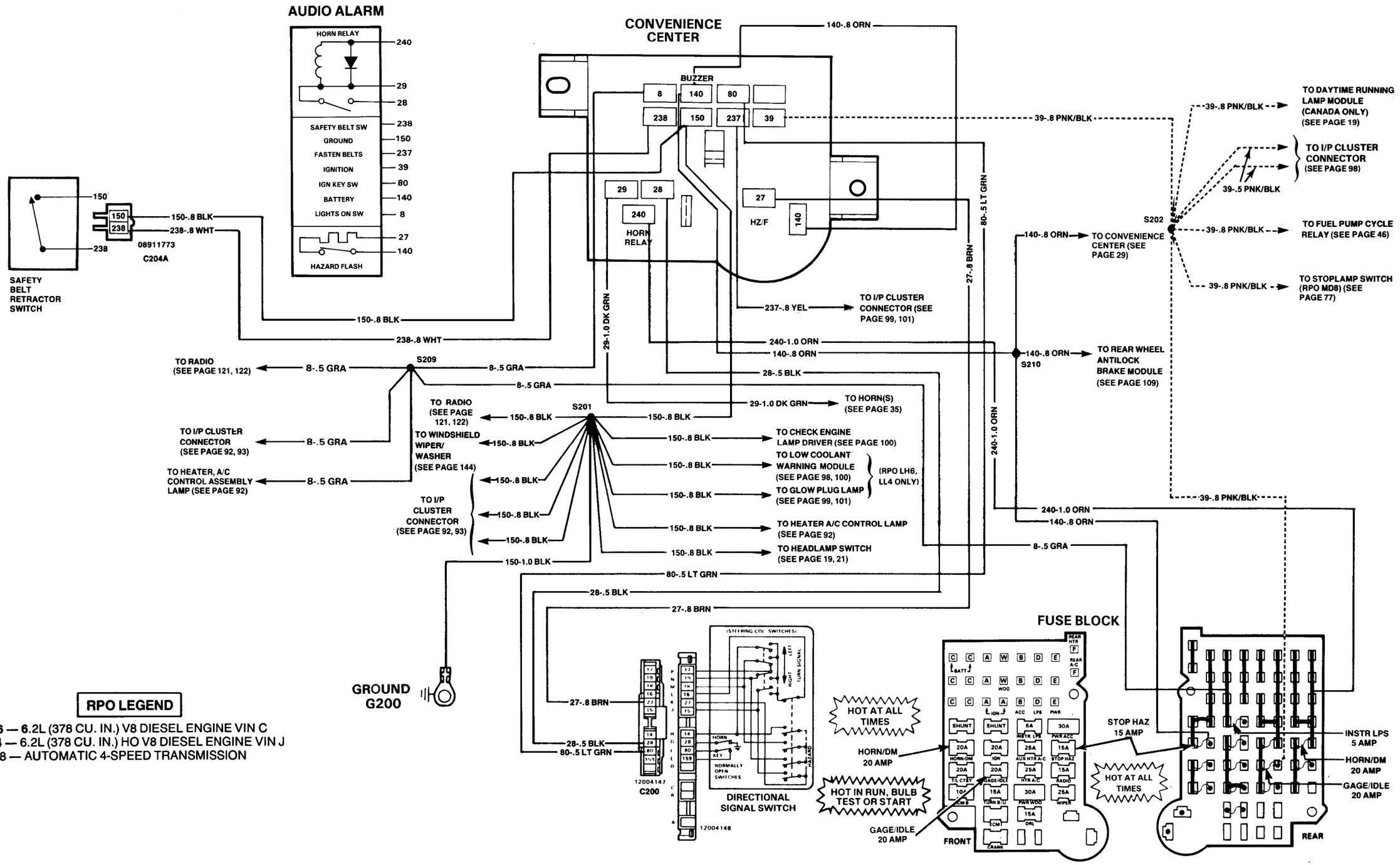


RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

COMPONENT LOCATION

		Page — Figure
Convenience Center	LH side, behind I/P	168 — 12
Directional Signal Switch	On steering column	166 — 5
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Safety Belt Retractor Switch	Under LH seat, at safety belt assembly	179 — 50
C200	At directional signal switch	166 — 5
C204	Under LH seat, at safety belt assembly	179 — 50
G200	LH side, behind I/P	166 — 6
S201	I/P harness, behind LH side of I/P	166 — 4
S202	I/P harness, behind LH side of I/P	166 — 4
S209	I/P harness, behind I/P cluster	166 — 4
S210	I/P harness, LH side	166 — 4



RPO LEGEND

LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HO V8 DIESEL ENGINE VIN J
MD8 — AUTOMATIC 4-SPEED TRANSMISSION

AUDIO ALARM

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 Rear Wheel Antilock Brake 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 Service Manual for Switch reset procedures. This can only be accomplished after the faulty system has been repaired.

The Rear Wheel Antilock Brake Module grounds the Brake Indicator when the module senses a fault in the Antilock Brake System. For Rear Wheel Antilock Brake Diagnosis, refer to Section 5A in the Service Manual.

COMPONENT LOCATION

		Page — Figure
ALDL Connector	Under LH side of I/P	166 — 4
Brake Pressure Warning Switch	Engine compartment, LH side of master cylinder	176 — 38
Digital Ratio Adapter Controller	Under LH side of I/P	177 — 39
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Grommet 100	Center of cowl	165 — 2
Ignition Switch	RH side of steering column	166 — 5
Park Brake Warning Switch	Under LH side of I/P	166 — 4
Rear Wheel Antilock Controller Module	Engine compartment, next to master cylinder	176 — 38
Stoplamp Switch	On top of brake pedal (RPO MD8 only)	168 — 11
C100	Engine compartment, LH side of cowl	176 — 38
C104	At brake pressure warning switch	176 — 38
C105	At rear wheel antilock controller module	176 — 38
C118	Under center of I/P	171 — 21
C203	LH side of I/P	166 — 4
C209	At ignition switch	166 — 5
C289	At digital ratio adaptor controller module	177 — 39
C290	At diode assembly, under I/P	—
C291	At diode assembly, under I/P	—
C292	At stoplamp switch (RPO MD8 only)	181 — 55
C293	At parking brake warning switch	166 — 4
G103	Rear RH side of engine	171 — 22
S143	Engine harness, near master cylinder	176 — 38
S202	I/P harness, behind LH side of I/P	166 — 4
S210	I/P harness, LH side	166 — 4
S211	I/P harness, under LH side	177 — 39
S213	I/P harness, under I/P	177 — 39
S214	I/P harness, under I/P	—

TROUBLESHOOTING CHART—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 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 brake switch.
2. Disconnect brake pressure warning switch connector C104.	Brake indicator lamp does not go out.	GO to step 3.
	Brake indicator lamp goes out.	CHECK for a possible leak or loss of fluid in the brake system.
3. Disconnect rear wheel antilock module connector C105.	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 in 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 not come on.	GO to step 2.
	Brake indicator lamp comes on.	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 park brake switch connector C104 to ground.	Brake indicator lamp does not come on.	GO to step 3.
	Brake indicator lamp comes on.	REPLACE brake pressure warning switch.
3. Disconnect rear wheel antilock module connector C105. Connect a fused jumper from TAN/WHT (33) wire at antilock module connector C105 to ground.	Brake indicator lamp does not come on.	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 comes on.	CHECK for an inoperative antilock brake system. Refer to Section 5A in the 1990 Service Manual for a diagnostic circuit check.

I/P CLUSTER CONNECTOR

12066261
C203

33-.5 TAN/WHT

33-.5 TAN/WHT

33-.5 TAN/WHT

33-.5 TAN/WHT

33-.5 TAN/WHT

I/P

FRONT BODY CONNECTOR

12020100
C100

33-.8 TAN/WHT

33-.8 TAN/WHT

12020184

50/130

C100

COWL

6/5

130/300

12010966
C209

6294641

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

33-.5 TAN/WHT

PARK BRAKE WARNING SWITCH

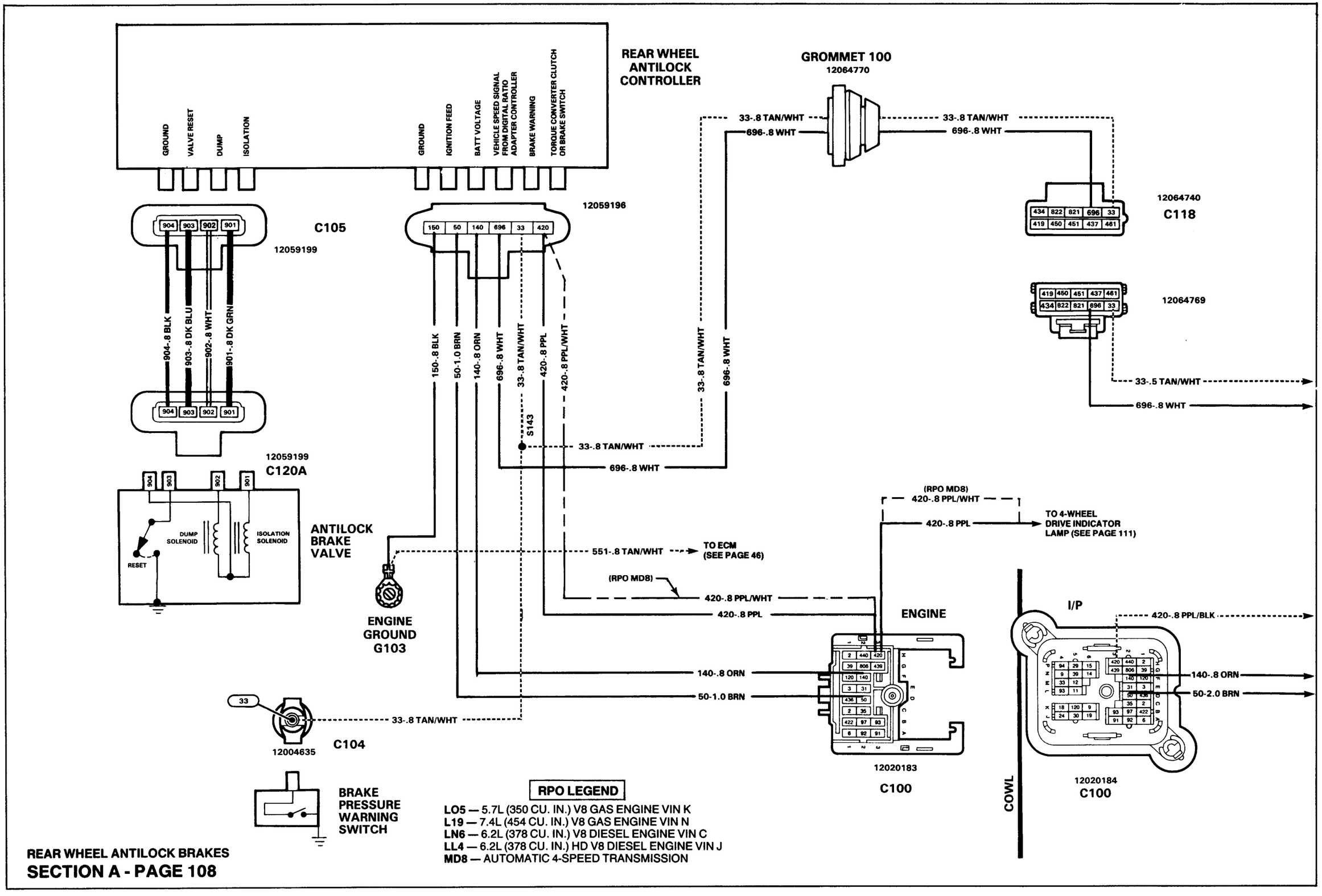
BRAKE SET

12004267
C210

02977976
C104

BRAKE PRESSURE WARNING SWITCH

BRAKE WARNING SYSTEM
WITHOUT REAR WHEEL ANTILOCK BRAKES



RPO LEGEND

LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
LN6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
MD8 — AUTOMATIC 4-SPEED TRANSMISSION

DIODE ASSEMBLY ANTILOCK BRAKES ONLY

2977647

C290

12006377

DIGITAL RATIO ADAPTOR CONTROLLER

VEHICLE SPEED SIGNAL CLUSTER
VEHICLE SPEED SIGNAL INPUT
VEHICLE SPEED TO ECM SIGNAL
VEHICLE SIGNAL TO RWAL CONTROLLER
12 VOLT (IGNITION)
GROUND
VEHICLE SPEED SIGNAL INPUT

824 821 437 696 50 450 822

12066130

C289

PARK BRAKE WARNING SWITCH

BRAKE SET

33

C293

12004267

DIODE MODULE ANTILOCK BRAKES AND DAYTIME RUNNING LAMPS

33 33 33 820 420 420

12020486

C291

(RPO MD8 ONLY)

33-.5 TAN/WHT

33-.5 TAN WHT

TO DAYTIME RUNNING LAMPS (SEE PAGE 19)

(RPO MD8 ONLY)

C292

12004267

STOP LAMP SWITCH

(OPENS WHEN BRAKES ARE APPLIED)

420-.8 PPL

39-.8 PNK/BLK

S214

696-.8 WHT

50-1.0 BRN

S213

W/DAYTIME RUNNING LAMPS CANADA ONLY

420-.8 PPL/WHT

820-.8 PPL/WHT

TO TRANSMISSION CONVERTER CLUTCH SOLENOID (SEE PAGE 77)

TO DAYTIME RUNNING LAMP MODULE (CANADA ONLY) (SEE PAGE 19)

39-.8 PNK/BLK

S202

39-.5 PNK/BLK — TO I/P CLUSTER (SEE PAGE 98)

39-.5 PNK/BLK — TO CONVENIENCE CENTER (SEE PAGE 5)

39-.8 PNK/BLK — TO FUEL PUMP CYCLE RELAY (SEE PAGE 46)

422 696 436 451 450

ALDL CONNECTOR

12020043

C206

50-2.0 BRN

TO SELECTOR CONTROL SWITCH (SEE PAGE 83)

S211

140-.8 ORN

S210

TO CONVENIENCE CENTER (SEE PAGE 29)

11 150 31 39 25 88 824 39 419 33 30 237 35 15 14

I/P CLUSTER CONNECTOR

12066261

C203

HOT IN RUN OR START

GAGE/IDLE 20 AMP

HOT IN ACCY OR RUN

HTR A/C 25 AMP

HOT AT ALL TIMES

STOP HAZ 15 AMP

FRONT

REAR

GAGE/IDLE 20 AMP

HTR A/C 25 AMP

STOP HAZ 15 AMP

FUSE BLOCK

REAR WHEEL ANTILOCK BRAKES

CIRCUIT OPERATION

When the Ignition Switch is in RUN and the Four-Wheel-Drive Control 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 V100 and V200 models. On V300 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 Rear Wheel Antilock Brake Module in the V100 and V200 models. This will keep the antilock braking system disabled in 4WD mode. The In-Line Resistor (automatic transmission only) prevents the Transmission Converter Clutch Solenoid from engaging when the Front Axle Switch is closed.

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	Under LH side of I/P, on kick panel	166 — 6
Four-Wheel Drive Indicator Lamp (V100, V200)	In I/P cluster	180 — 51
Four-Wheel Drive Indicator Lamp (V300)	In I/P cluster	180 — 52
Four-Wheel Drive Shift Lever Lamp (V100, V200)	At transfer case shift lever	180 — 51
Fuse Block	Under LH side of I/P	166 — 4
Grommet 101	LH side of cowl	180 — 51
In-Line Diode	In 4WD harness, behind I/P cluster	—
Transfer Case Switch (V100, V200)	Top of transfer case	180 — 51
Transfer Case Switch (V300)	Top of transfer case	180 — 52
C195 (V100, V200)	Engine compartment, LH side of cowl	180 — 51
C211 (V100, V200)	Behind I/P cluster	180 — 51
C211 (V300)	Behind I/P cluster	180 — 52
C215 (V300)	Under 4WD shift lever housing	180 — 52
C306 (V100, V200)	At transfer case switch	180 — 51
C306 (V300)	At transfer case switch	180 — 52
C307 (V100, V200)	At 4WD shift lever lamp	180 — 51

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.

TROUBLESHOOTING CHART—FOUR-WHEEL DRIVE INDICATOR LAMP

FOUR-WHEEL DRIVE INDICATOR LAMP WILL NOT TURN OFF

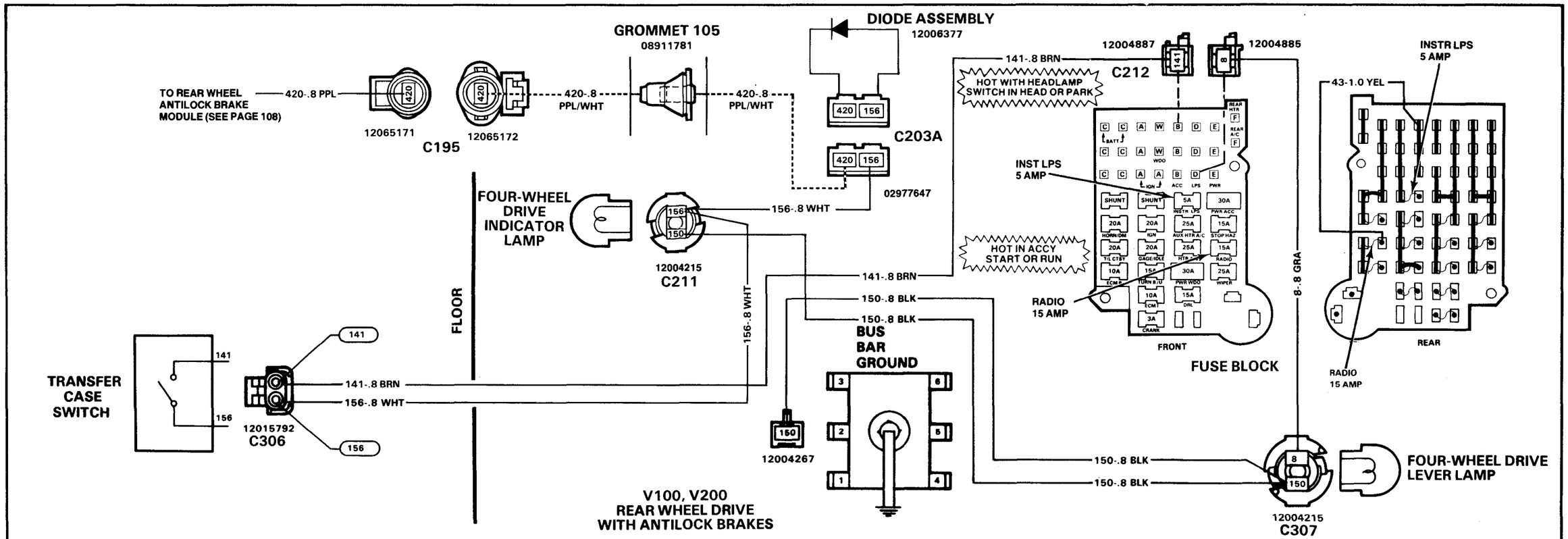
TEST	RESULT	ACTION
Disconnect transfer case switch connector C306.	4WD indicator lamp goes off.	REPLACE transfer case switch.

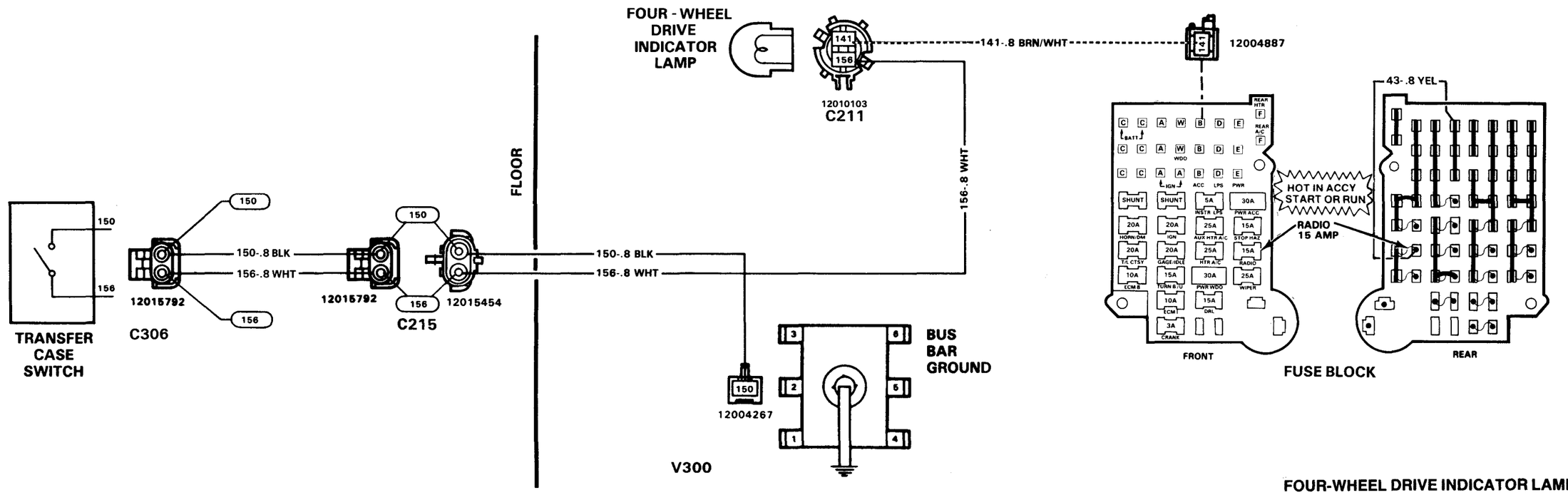
FOUR-WHEEL DRIVE ENGAGES BUT 4WD INDICATOR LAMP DOES NOT LIGHT (V100, V200)

TEST	RESULT	ACTION
1. Place ignition switch in RUN. Remove transfer case connector C306. Connect a test lamp from the BRN (141) wire to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK radio fuse, if good, LOCATE and REPAIR open in BRN (141) wire.
2. Reconnect transfer case connector C306. Connect a test lamp to the WHT (156) wire at the back of the transfer case connector C306 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 indicator lamp connector C211. 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.
4. Connect a test lamp between WHT (156) wire and BLK (150) wire at connector C211.	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 C211. 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 good LOCATE and REPAIR open in BRN/WHT (141) wire.
2. Connect test lamp to connector C211 at BRN/WHT (141) wire 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. Disconnect transfer case switch connector C306. Connect test lamp to WHT (156) wire to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (156) wire.
4. Connect test lamp between WHT (156) wire and BLK (150) wire at transfer case switch connector C211 make sure four-wheel drive is engaged.	Test lamp lights.	REPAIR transfer case switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire to ground.





FOUR-WHEEL DRIVE INDICATOR LAMP

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 Digital Ratio Adapter. 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.

COMPONENT LOCATION

		Page — Figure
Brake Switch	On top of brake pedal assembly	181 — 55
Bus Bar Ground	On LH kick panel, under I/P	181 — 55
Clutch Switch	On top of clutch pedal assembly	181 — 54
Cruise Control Actuator	Part of multi-function switch	182 — 58
Cruise Control Module	Behind I/P, on LH side of steering column	181 — 54
Cruise Control Servo (RPO L05, L19)	Front of engine	182 — 56
Cruise Control Servo (RPO LH6, LL4)	Rear of engine	182 — 57
Digital Ratio Actuator Controller	Behind I/P, on LH side steering column	177 — 39
Fuse Block	Behind LH side of I/P	181 — 55
Grommet 202	Behind LH side of I/P	181 — 55
Vehicle Speed Sensor	At transmission	—
C196 (RPO LH6, LL4)	Near front of engine	182 — 56
C196 (RPO L05, L19)	Near rear of engine	182 — 57
C197 (RPO LH6, LL4)	At cruise control servo	182 — 56
C197 (RPO L05, L19)	At cruise control servo	182 — 57
C216	At cruise control module	181 — 54
C217	At brake switch	181 — 55
C218	Under steering column	181 — 55
C219	At clutch switch	181 — 54
C220	At DRAC	—
C221 (RPO LH6, LL4)	At vehicle speed sensor	—
C222 (RPO L05, L19)	At vehicle speed sensor	—
S204	Cruise control harness, under LH side of I/P	181 — 54
S205 (RPO LH6, LL4)	Cruise control harness, under LH side of I/P	181 — 54

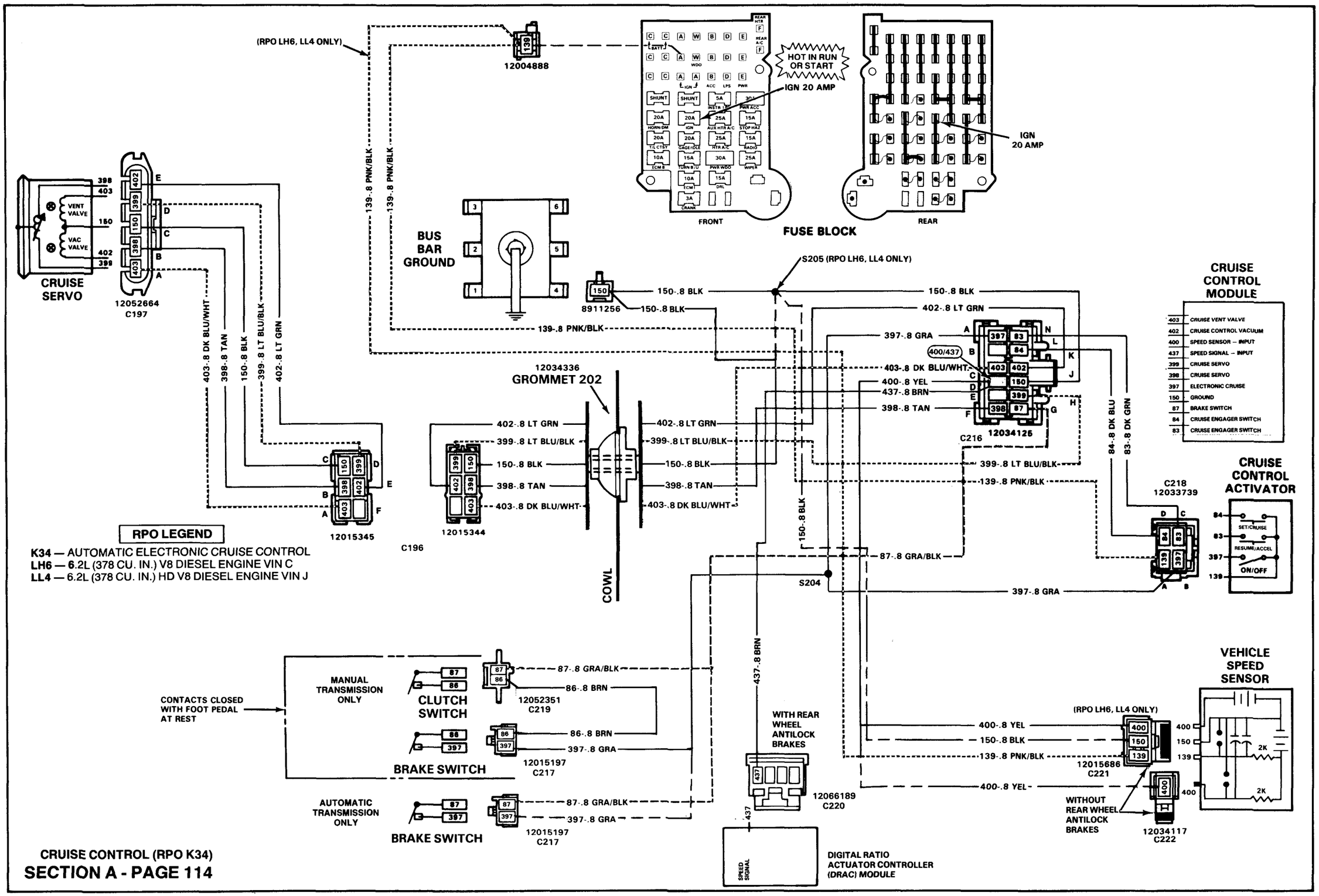
TROUBLESHOOTING CHART—CRUISE CONTROL

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

TEST	RESULT	ACTION
1. Place ignition switch in RUN position and cruise control activator to ON. Connect a test lamp from GRA (397) wire at brake switch connector C217 to ground.	Test lamp lights.	GO to step 2, if vehicle equipped with manual transmission. GO to step 5, if equipped with automatic transmission.
	Test lamp does not light.	LOCATE and REPAIR open in GRA (397) wire between brake switch and cruise control activator.
2. Connect a test lamp from BRN (86), wire at brake switch connector C217 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 C219 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 C219 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 C217 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 activator to ON. Connect a test lamp from GRA (397) wire at cruise control activator connector C218 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 activator and fuse block. If wire is in good condition, REPLACE cruise control activator.
2. Connect a test lamp from DK BLU (84) wire at cruise control activator connector C218 to ground.	Test lamp lights.	REPLACE cruise control activator.
	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 C216 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 activator and cruise control module. If wire is in good condition, REPLACE cruise control activator.
4. DEPRESS and HOLD RESET/ACCELERATE switch. Connect a test lamp from DK GRN (83) wire at cruise control module connector C216 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 activator.
5. Connect a test lamp from GRA (397) wire at cruise control module connector C216 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 activator.
6. Connect a test lamp from BLK (150) wire to GRA (397) wire at cruise control module connector C251.	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 position. Disconnect cruise control servo connector C146. Using 4 jumper leads, connect cavities A, B, D and E to ground. Place ignition switch to RUN position. 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 servo connector C197 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.
8. Connect a digital ohmmeter at BLK (150) cavity in cruise control servo connector C197 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 LEGEND

K34 — AUTOMATIC ELECTRONIC CRUISE CONTROL
LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

CIRCUIT OPERATION

COURTESY DOME, VANITY, GLOVE BOX, CARGO AND UNDERHOOD LAMPS

Voltage is applied at all times from the T/L CTSY Fuse to the Courtesy Lamp, Dome Lamp, Glove 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 Glove 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, power 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.

COMPONENT LOCATION

		Page — Figure
Cargo Lamp	Outside rear of cab	185 — 65
Cargo Lamp Switch	In 'B' pillar	185 — 65
Courtesy Lamp	Under center of I/P	183 — 60
Dome Lamp, Front	Above passenger seats in roof	183 — 59
Dome Lamp, Rear	Above rear cargo area in roof	183 — 59
Dome Jamb Switch, LH Front	In LH 'A' pillar	183 — 60
Door Jamb Switch, LH Rear	In LH 'B' pillar	183 — 59
Door Jamb Switch, RH Front	In RH 'A' pillar	183 — 60
Door Jamb Switch, RH Rear	In RH 'B' pillar	183 — 59
Fuse Block	Under LH side of I/P, above kick panel	183 — 60
Glove Box Lamp Switch	In glove box on RH side of I/P	183 — 60
Grommet 502	LH 'A' pillar	183 — 60
Grommet 602	RH 'A' pillar	183 — 60
Headlamp Switch	LH side of I/P	166 — 4
In-Line Fuse (RPO LH6, LL4)	Engine compartment, LH fender	184 — 62
In-Line Fuse (RPO L05, L19)	Engine compartment, RH cowl	184 — 63
Junction Block	Center of cowl, in engine compartment	184 — 62
Rear Gate Switch	At rear tailgate	184 — 64
Underhood Lamp (RPO LH6, LL4)	Engine compartment, LH fender	184 — 62
Underhood Lamp (RPO L05, L19)	Engine compartment, RH cowl	184 — 63
Vanity Mirror Switch	On RH side vanity	184 — 61
C100	Engine compartment, LH cowl	183 — 60
C115A (RPO LH6, LL4)	At in-line fuse	184 — 62
C115A (RPO L05, L19)	At in-line fuse	184 — 63
C116A (RPO LH6, LL4)	At underhood lamp	184 — 62
C116A (RPO L05, L19)	At underhood lamp	184 — 63
C202	At headlamp switch	166 — 4
C217A	At glove box switch	183 — 60
C220A	In LH 'B' pillar	183 — 59
C323	Bottom of RH 'A' pillar	184 — 61
C324	At RH vanity mirror	184 — 61
C430	At cargo lamp switch	185 — 65
C431	At cargo lamp	185 — 65
C432	Above rear tailgate	184 — 64
C433	At rear gate switch	184 — 64
C434	In 'B' pillar	185 — 65
G118 (RPO LH6, LL4)	Center of cowl, in engine compartment	184 — 62
G118 (RPO L05, L19)	Center of cowl, in engine compartment	184 — 63
S212	I/P harness, RH side under I/P	183 — 60
S413	I/P harness, above LH rear door	183 — 59

PRELIMINARY CHECKS:

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

TROUBLESHOOTING CHART—INTERIOR LAMPS

COURTESY LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at courtesy lamp connector C218A 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.

DOME LAMP DOES NOT WORK OR STAYS ON ALL THE TIME

TEST	RESULT	ACTION
1. Connect 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 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 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 headlamp switch connector C202. Connect ohmmeter from WHT (156) terminal to BLK (150) terminal at panel lamp switch. Turn panel lamp switch to ON and then 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 panel lamp switch.

CARGO LAMP DOES NOT WORK

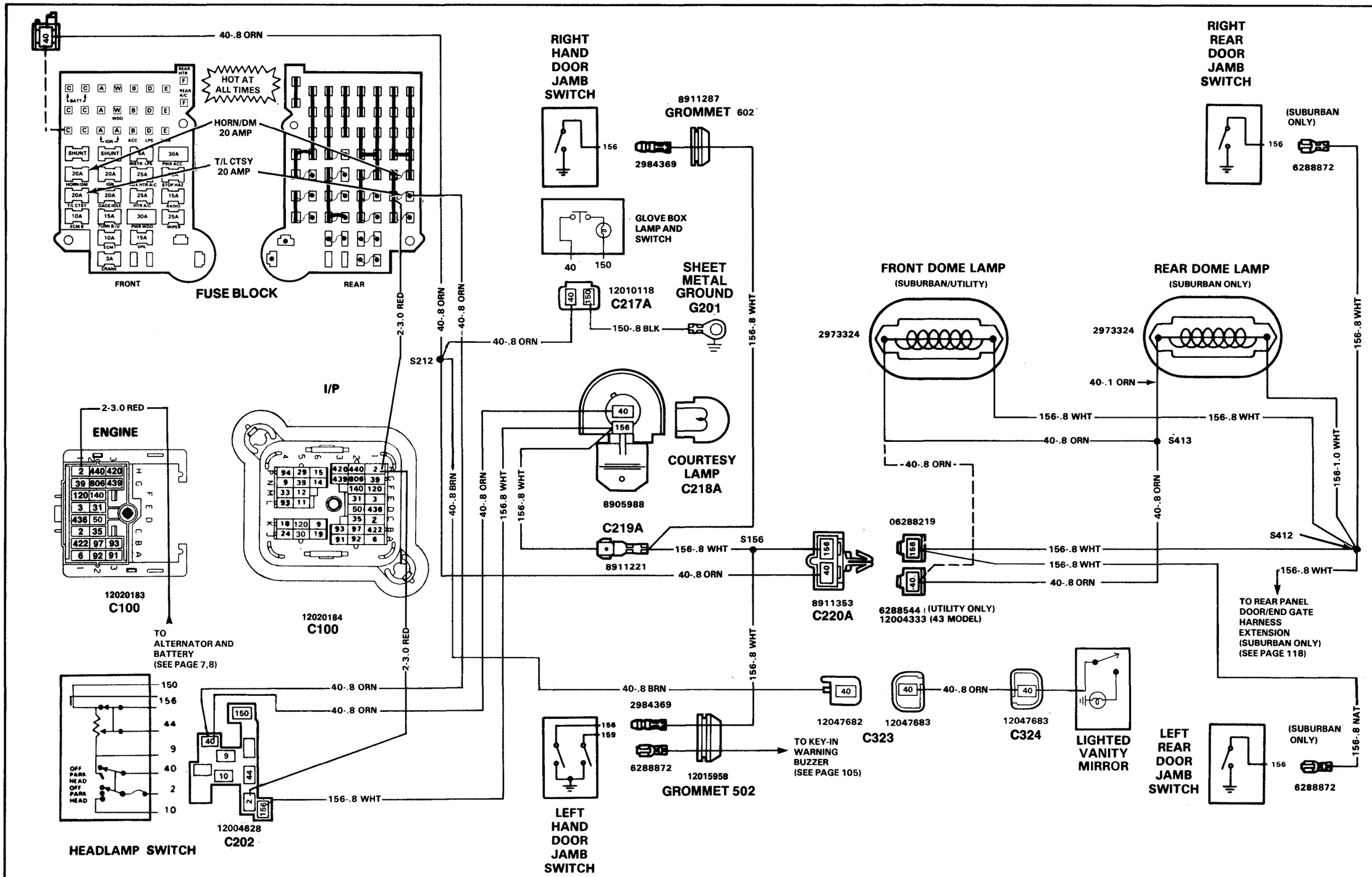
TEST	RESULT	ACTION
1. Turn cargo switch ON. Connect test lamp from ORN (140) wire at cargo lamp connector C431 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect test lamp from ORN (140) wire to WHT (156) wire at cargo lamp connector C431.	Test lamp lights.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

GLOVE BOX LAMP DOES NOT WORK

TEST	RESULT	ACTION
1. Open glove box door. Connect test lamp from ORN (40) wire at glove box lamp connector C217A 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 glove box lamp connector C217A.	Test lamp lights.	REPLACE glove box lamp assembly.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from glove box lamp to ground terminal G201.

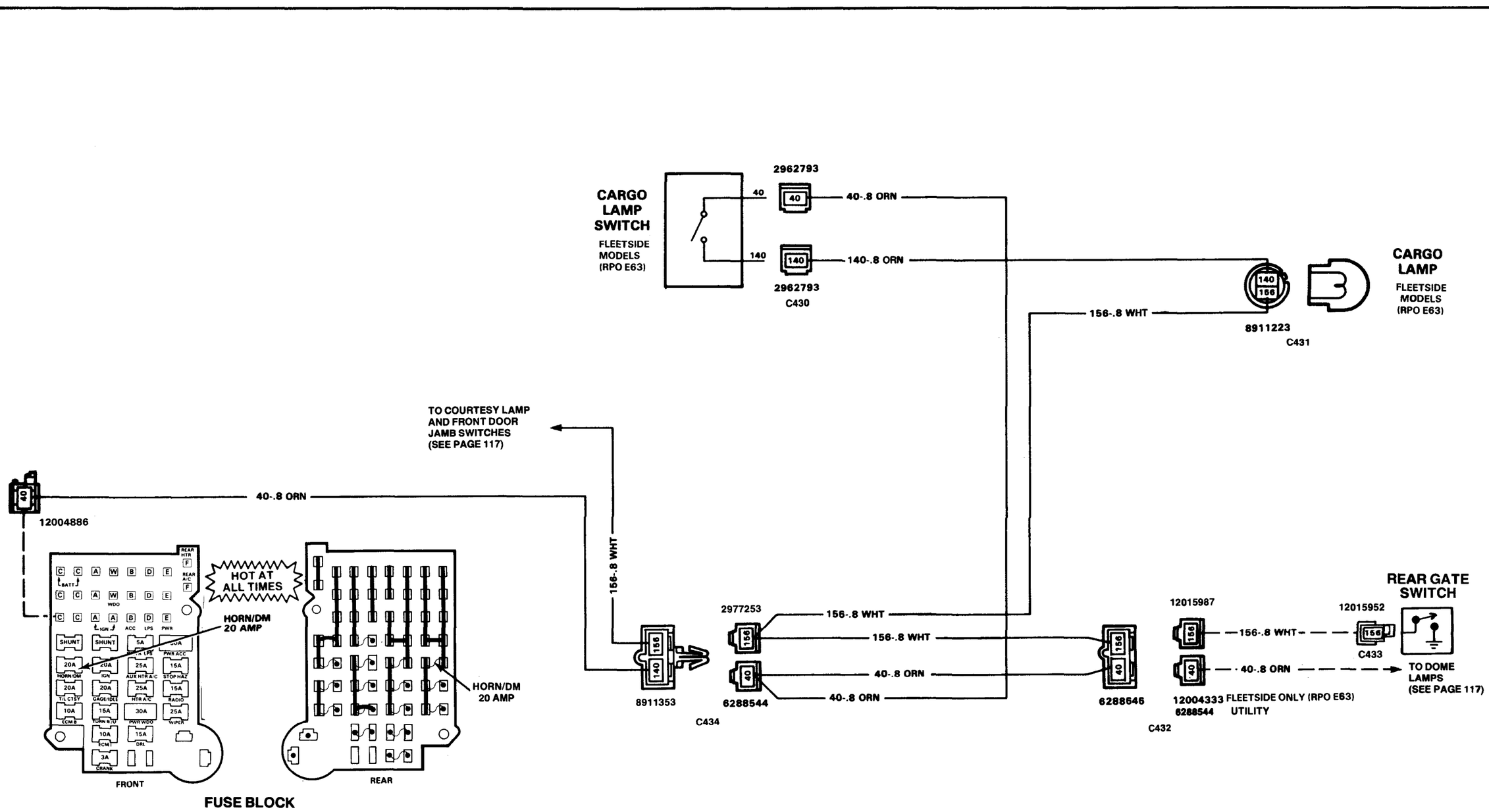
UNDERHOOD LAMP DOES NOT WORK

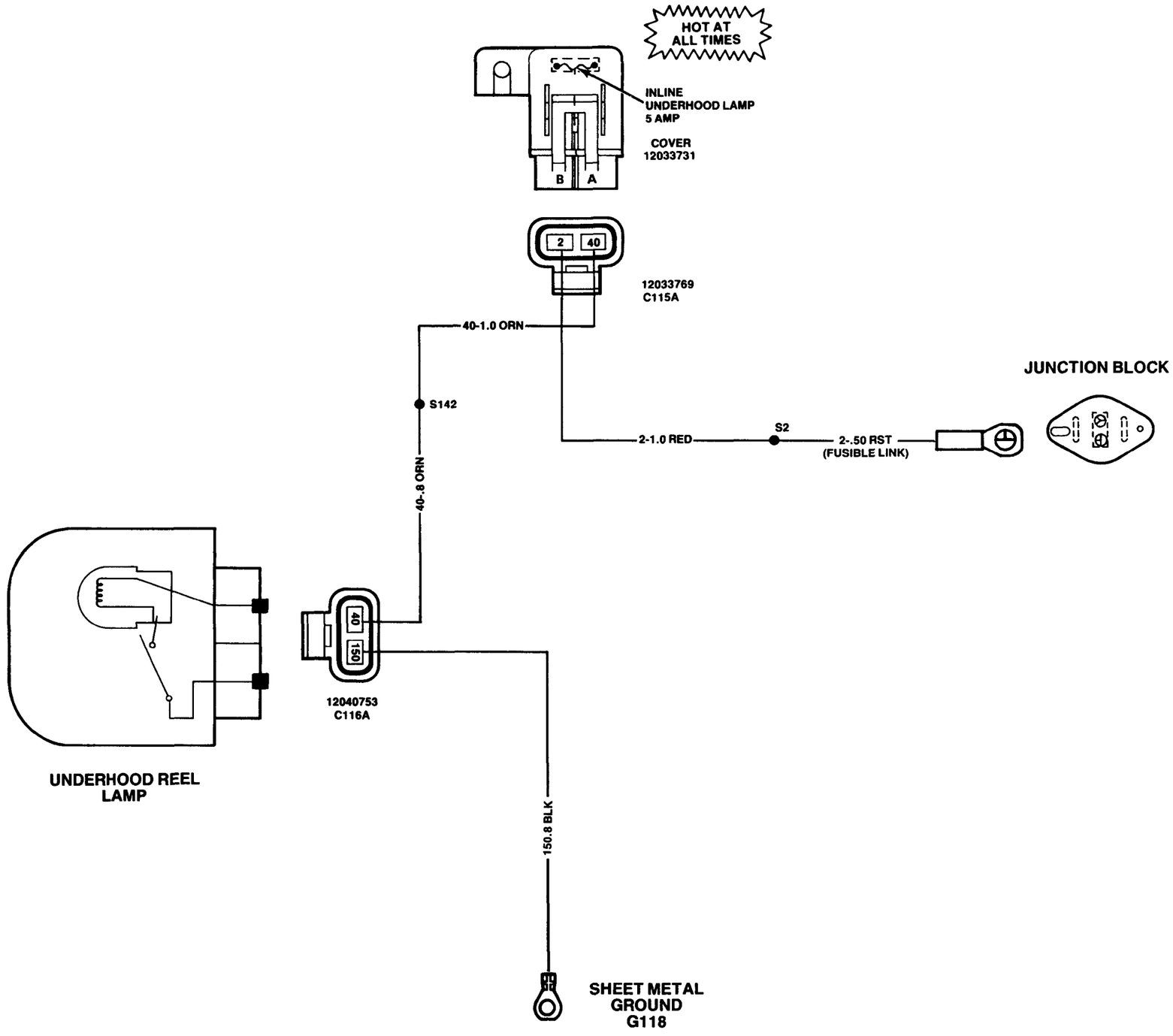
TEST	RESULT	ACTION
1. Connect a test lamp from ORN (40) wire to BLK (150) wire at underhood lamp connector C116A.	Test lamp lights.	REPLACE underhood lamp bulb.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp to RED (2) wire at in-line fuse connector C115A to ground.	Test lamp lights.	REPLACE in-line fuse.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire or fusible link.



DOME LAMPS, GLOVE BOX LAMP AND LIGHTED VANITY MIRROR

SECTION A - 117


CARGO LAMP SWITCH
FLEETSIDE MODELS (RPO E63)
2962793
40
40-.8 ORN
140
140-.8 ORN
2962793
C430
CARGO LAMP
FLEETSIDE MODELS (RPO E63)
156-.8 WHT
8911223
C431
TO COURTESY LAMP AND FRONT DOOR JAMB SWITCHES (SEE PAGE 117)
40-.8 ORN
12004886
HOT AT ALL TIMES
HORN/DM 20 AMP
HORN/DM 20 AMP
FRONT
REAR
FUSE BLOCK
156-.8 WHT
8911353
2977253
156-.8 WHT
156-.8 WHT
40-.8 ORN
40-.8 ORN
6288544
C434
6288645
C432
12015987
12015952
156-.8 WHT
C433
REAR GATE SWITCH
40-.8 ORN
TO DOME LAMPS (SEE PAGE 117)
12004333 FLEETSIDE ONLY (RPO E63)
6288544 UTILITY



RPO LEGEND

TR9 — LAMP GROUP

CIRCUIT OPERATION

The RADIO Fuse provides main power to the Radio and to the Power Antenna. With the Ignition Switch in ACCY 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 (without Cassette) or Radio Control Head (with Cassette). 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 powered at all times through the HORN/DM Fuse. If power to the ETR model is cut off — by disconnecting the Battery, for example — the operator must reset the memory functions when power is restored.

COMPONENT LOCATION

TROUBLESHOOTING CHART—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. Connect voltmeter from YEL (43) wire at radio connector C241 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of fuse (RADIO). If fuse is good, LOCATE and REPAIR open in YEL (43) wire.
2. Connect 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 (RPO UM6)

TEST	RESULT	ACTION
Disconnect radio connector C239. Connect voltmeter from ORN (40) wire at radio connector C239 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	CHECK condition of fuse HORN/DM. If fuse is good, LOCATE and REPAIR open in ORN (40) wire.

PANEL LAMP DOES NOT COME ON

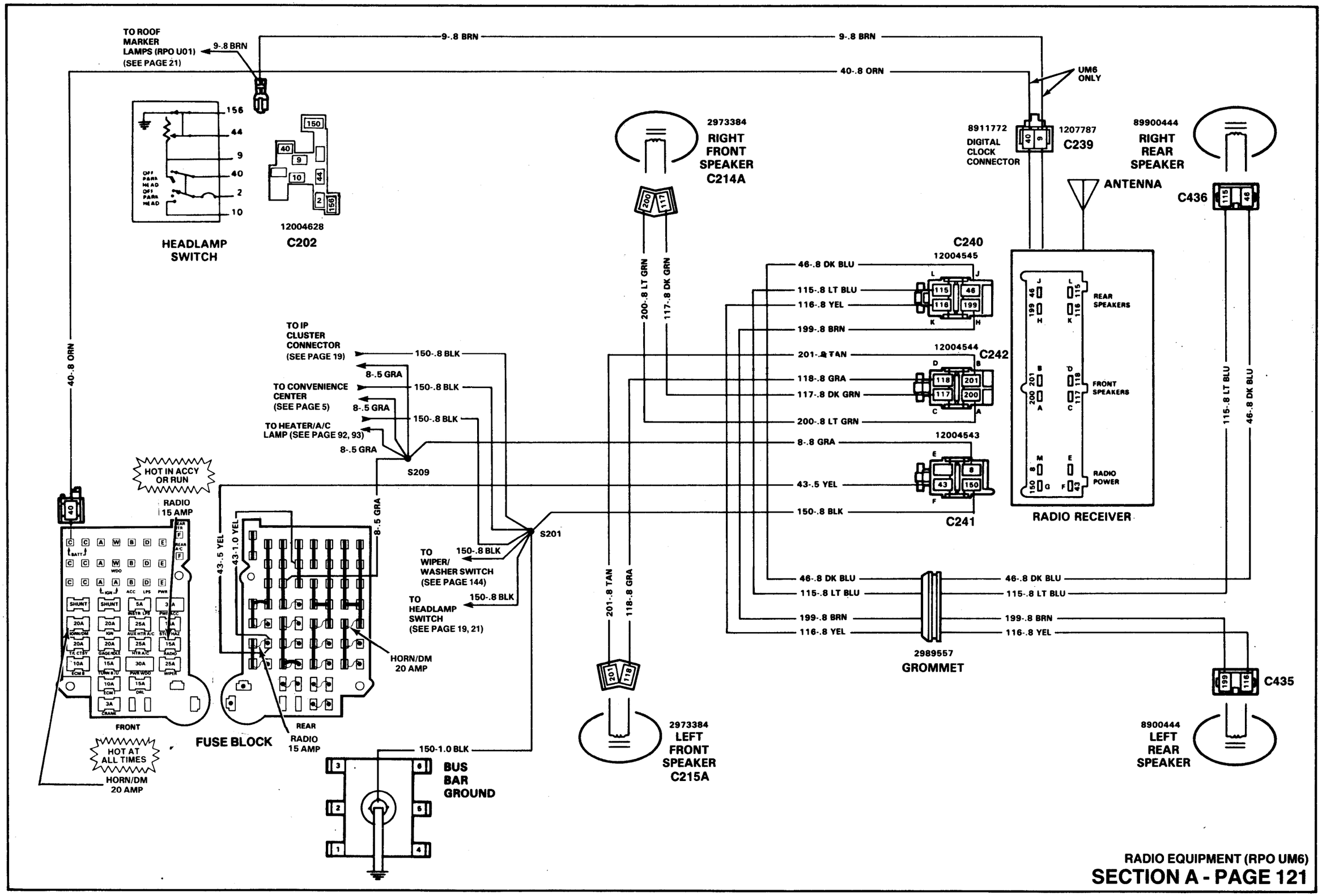
TEST	RESULT	ACTION
Disconnect radio connector C241. Place light switch to PARK and panel dimmer switch to HIGH. Connect voltmeter from GRY (8) wire at radio connector C241 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	CHECK condition of fuse (INST LPS). If fuse is good,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

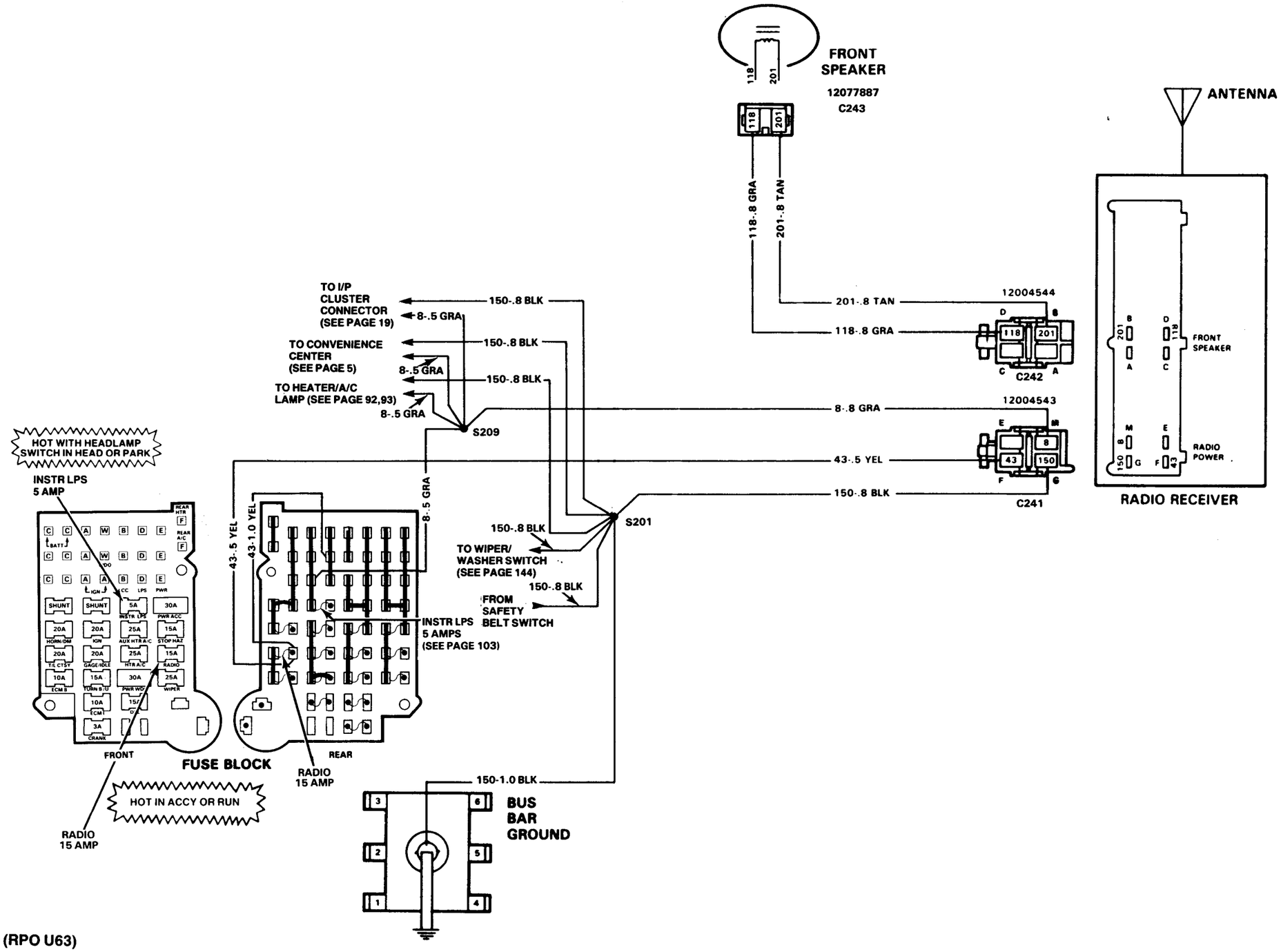
DISPLAY DIMMING FUNCTION WILL NOT OPERATE (RPO UM6)

TEST	RESULT	ACTION
Disconnect radio connector C239. Place headlamp switch to PARK. Connect voltmeter from BRN (9) wire at radio connector C239 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	LOCATE and REPAIR open in BRN (9) wire from radio to headlamp switch.

NO SOUND OR DISTORTED SOUND FROM A SPEAKER

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


TO ROOF MARKER LAMPS (RPO U01) (SEE PAGE 21)
9-.8 BRN
9-.8 BRN
9-.8 BRN
40-.8 ORN
40-.8 ORN
UM6 ONLY
156
44
9
40
2
10
OFF PARK HEAD
OFF PARK HEAD
HEADLAMP SWITCH
150
40
9
10
44
2
156
12004628
C202
2973384
RIGHT FRONT SPEAKER C214A
200
117
200-.8 LT GRN
117-.8 DK GRN
8911772
DIGITAL CLOCK CONNECTOR
40
9
1207787
C239
89900444
RIGHT REAR SPEAKER
ANTENNA
C436
115
46
C240
12004545
46-.8 DK BLU
115-.8 LT BLU
116-.8 YEL
199-.8 BRN
201-.8 TAN
118-.8 GRA
117-.8 DK GRN
200-.8 LT GRN
8-.8 GRA
43-.5 YEL
150-.8 BLK
12004544
C242
12004543
C241
REAR SPEAKERS
FRONT SPEAKERS
RADIO POWER
RADIO RECEIVER
TO IP CLUSTER CONNECTOR (SEE PAGE 19)
150-.8 BLK
8-.5 GRA
TO CONVENIENCE CENTER (SEE PAGE 5)
150-.8 BLK
8-.5 GRA
TO HEATER/A/C LAMP (SEE PAGE 92, 93)
150-.8 BLK
8-.5 GRA
S209
HOT IN ACCY OR RUN
RADIO 15 AMP
40
S201
TO WIPER/ WASHER SWITCH (SEE PAGE 144)
150-.8 BLK
TO HEADLAMP SWITCH (SEE PAGE 19, 21)
150-.8 BLK
43-.5 YEL
43-1.0 YEL
8-.5 GRA
HORN/DM 20 AMP
FRONT
REAR
FUSE BLOCK
RADIO 15 AMP
HOT AT ALL TIMES
HORN/DM 20 AMP
150-1.0 BLK
BUS BAR GROUND
201-.8 TAN
118-.8 GRA
201
118
2973384
LEFT FRONT SPEAKER C215A
2989557
GROMMET
199
116
C435
8900444
LEFT REAR SPEAKER


FRONT SPEAKER
12077887
C243
118
201
118-.8 GRA
201-.8 TAN
ANTENNA
12004544
201-.8 TAN
118-.8 GRA
C242
FRONT SPEAKER
RADIO POWER
RADIO RECEIVER
TO I/P CLUSTER CONNECTOR (SEE PAGE 19)
150-.8 BLK
8-.5 GRA
TO CONVENIENCE CENTER (SEE PAGE 5)
150-.8 BLK
8-.5 GRA
TO HEATER/A/C LAMP (SEE PAGE 92,93)
150-.8 BLK
8-.5 GRA
S209
8-.8 GRA
12004543
43-.5 YEL
150-.8 BLK
C241
S201
HOT WITH HEADLAMP SWITCH IN HEAD OR PARK
INSTR LPS 5 AMP
43-.5 YEL
43-1.0 YEL
8-.5 GRA
150-.8 BLK
TO WIPER/ WASHER SWITCH (SEE PAGE 144)
150-.8 BLK
FROM SAFETY BELT SWITCH
INSTR LPS 5 AMPS (SEE PAGE 103)
FRONT
FUSE BLOCK
REAR
RADIO 15 AMP
HOT IN ACCY OR RUN
RADIO 15 AMP
150-1.0 BLK
BUS BAR GROUND

BLANK

CIRCUIT OPERATION

With the Ignition Switch in RUN, voltage is applied to the Rear Defogger Control. When the Rear Defogger Control 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 5 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.

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	LH side of I/P, above kick panel	188 — 74
Fuse Block	LH side of I/P, above kick panel	188 — 74
Rear Window Defogger Switch	Center of I/P	188 — 74
Rear Window Heater	In LH panel door window	188 — 77
Rear Window Heater	In rear window glass	188 — 76
Timer Relay	Under fuse block	188 — 74
C198	LH side of engine compartment	188 — 74
C223	At timer relay	188 — 74
C224	At rear window defogger switch	188 — 74
C225	At bus bar ground	188 — 74
C226	Near bus bar ground	188 — 74
C231	In LH kick panel, below "A" pillar	188 — 74
C400	LH rear, near frame rail	188 — 75
C401	In LH rear of vehicle	188 — 77
C402	In LH rear of vehicle	188 — 77
C403	In rear RH side of vehicle	188 — 76
C404	In rear RH side of vehicle	188 — 76
C909	In LH side of tailgate	188 — 75
C910	In top LH side of tailgate	188 — 75
C911	In LH rear door	188 — 77
C912	In RH rear door	188 — 76
C913	In LH rear door	188 — 77
C914	In LH rear door	188 — 77
C915	In RH rear door	188 — 76
G400	Rear top LH side of vehicle	188 — 77
S400	Rear top LH side of vehicle	188 — 77
S401	Rear top LH side of vehicle	188 — 77

TROUBLESHOOTING CHART—REAR DEFOGGER

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

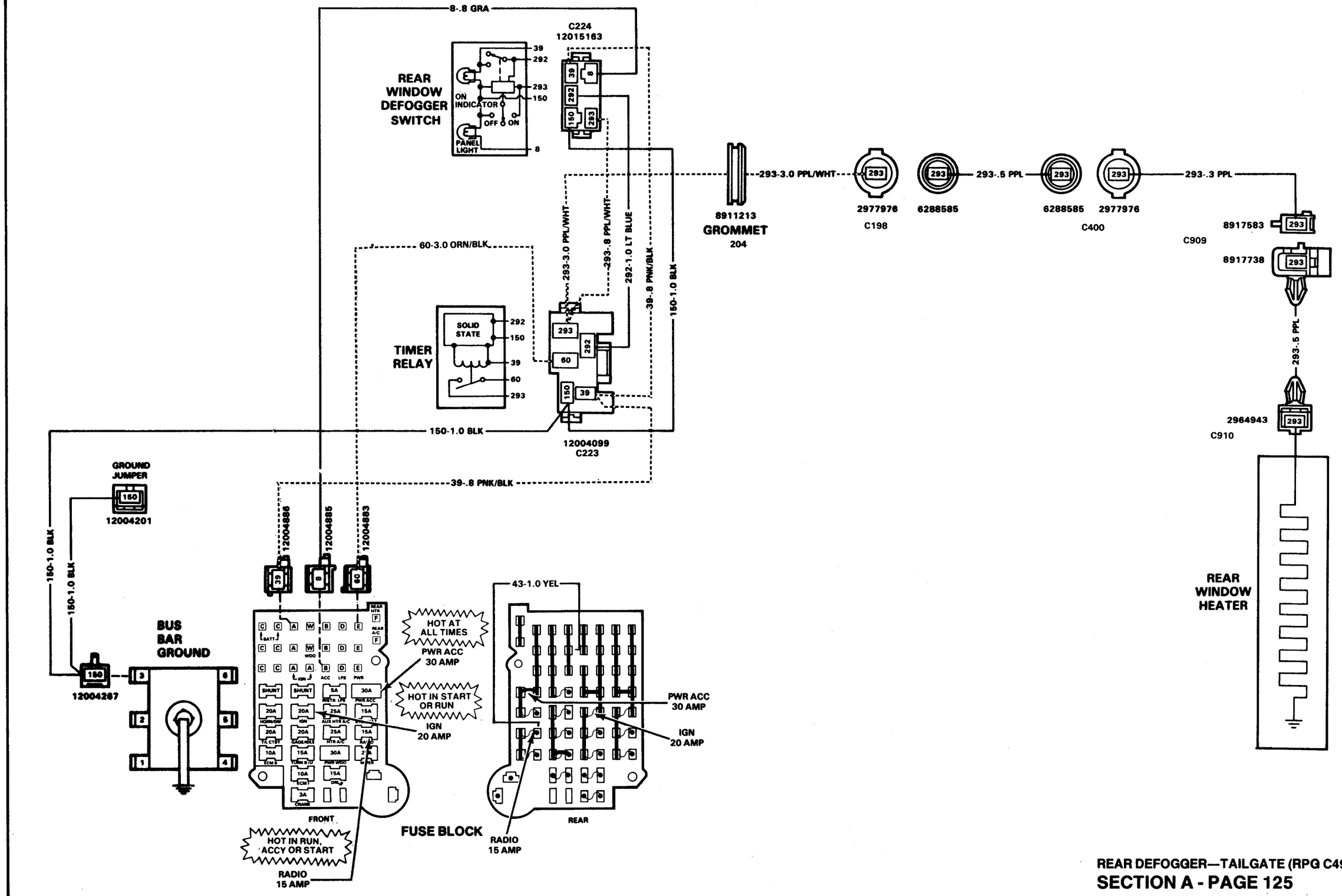
TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect test lamp from ORN/BLK (60) at timer relay connector C223 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of circuit breaker (PWR ACC). If circuit breaker is good, LOCATE and REPAIR open in ORN/BLK (60) wire.
2. Connect test lamp from PNK/BLK (39) wire at rear window defogger switch connector C224 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of fuse (IGN). If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire.
3. Connect test lamp from PNK/BLK (39) and BLK (150) wires at rear window defogger switch connector C224.	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 test lamp from LT BLU (292) wire at rear window defogger switch connector C224 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 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

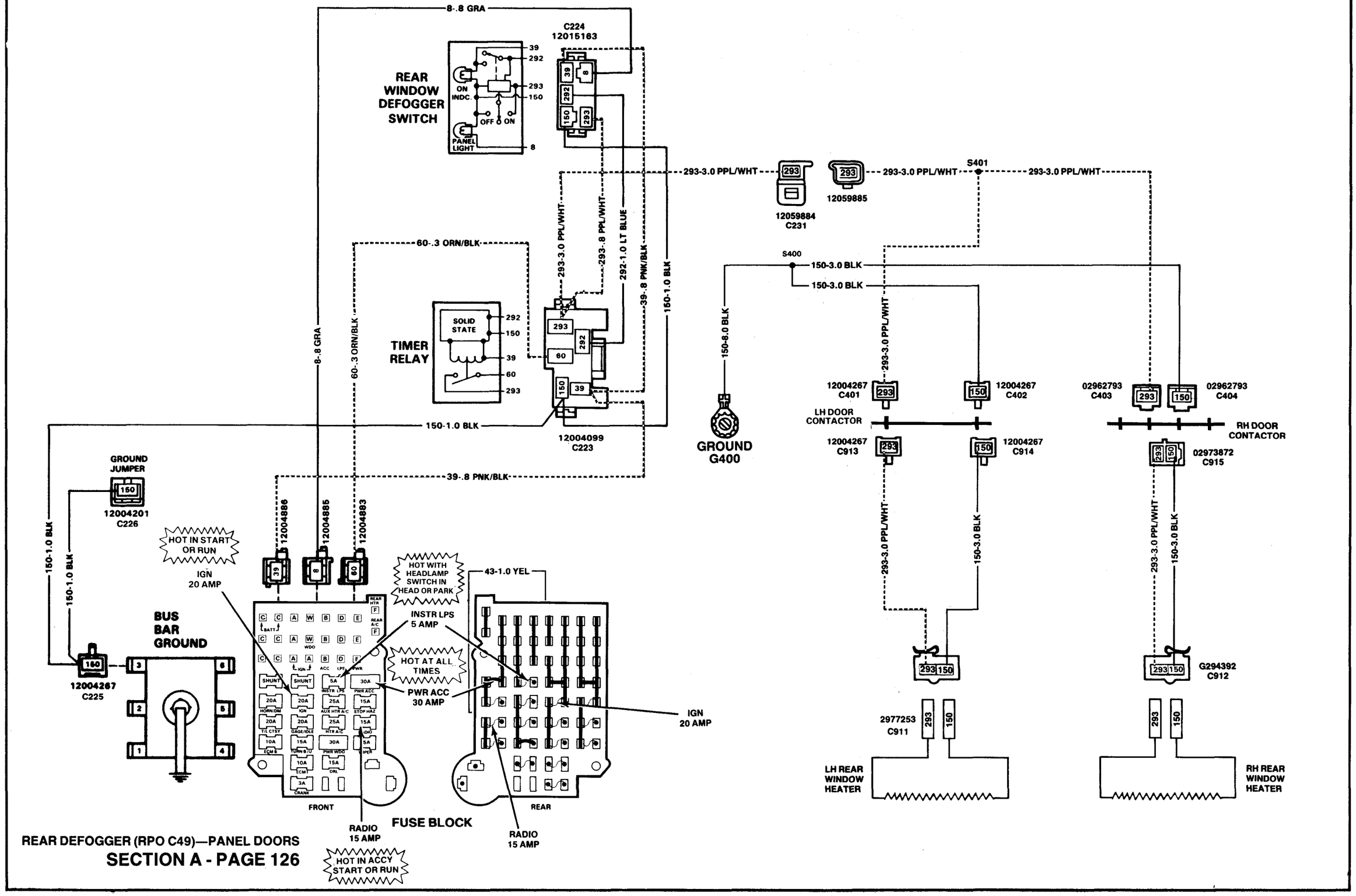
TEST	RESULT	ACTION
1. Place ignition switch in RUN and rear defogger switch ON. Connect test lamp from PPL (293) wire to ground (tailgate models) or PPL/WHT (293) wire at rear window defogger to ground (panel door models).	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PPL and PPL/WHT (293) wires.
2. Connect test lamp from PPL (293) to ground wires at rear window defogger (tailgate models) or PPL/WHT (293) to ground G400 wires at rear window defogger (panel door models).	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 connecto C224 to ground.	Test lamp lights.	REPLACE panel light bulb.
	Test lamp does not light.	LOCATE and REPAIR open in GRA (8) wire.



REAR DEFOGGER—TAILGATE (RPQ C49)



REAR DEFOGGER (RPO C49)—PANEL DOORS

CIRCUIT OPERATION

A permanent magnet (PM) motor operates each of the Power Windows. Each Motor raises or lowers the glass 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 Motors. (except Tailgate Window Motor). 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 as it cools.

When the Ignition Switch is in RUN, or ACCY, battery voltage is applied to the Master Door Lock/Power Window Switch Assembly, the PWR WDO Circuit Breaker, and the PNK wires. (ORN/BLK wire for Rear Window.)

When any of the UP Switches are operated, battery voltage is applied to the Window Motor through the DK BLU (TAN/WHT wire for Rear Window) 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 wire. (LT BLU wire for Rear Window). The Window Motor is grounded through the UP contact. The Motor runs to drive the window down.

WINDOW SWITCH OPERATION

When the Ignition Switch is in RUN or ACCY, 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 wire. (TAN/WHT wire for Rear Window). The Motor is grounded through the BRN (LT BLU for Rear Window) wire, the DN contact in the Window Switch, the TAN wire and the DN contact in the Master Door Lock/ Power Window Switch Assembly. (Rear Window grounds at motor). 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 (LT BLU for Rear Window) wire. The Motor is grounded through the DK BLU wire, the UP contact in the Window Switch, the DK BLU/WHT wire and the UP contact in the Master Door Lock/Power Window Switch Assembly. The Motor runs to drive the window down.

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	LH side, under I/P	185 — 67
Cut-out Switch (Suburban)	Top LH side of tailgate	187 — 73
Cut-out Switch (Utility)	Top RH side of tailgate	187 — 72
Fuse Block	LH side, under I/P	185 — 67
Grommet 500	LH side, at kick panel	185 — 67
Grommet 600	RH side, at kick panel	185 — 67
Tailgate Window Motor (Utility)	Center of tailgate	187 — 72
Tailgate Window Switch	I/P panel	—
Tailgate Window Switch — Key Operated	Center of tailgate	187 — 72
Window Motor, LH Front	Bottom of LH front door	186 — 69
Window Motor, LH Rear	Center of LH rear door	186 — 71
Window Motor, RH Front	Bottom of RH front door	186 — 69
Window Motor, RH Rear	Center of RH rear door	186 — 71
Window Switch, LH Front	Top of door panel	186 — 69
Window Switch, LH Rear	Top of door panel	186 — 71
Window Switch, RH Front	Top of door panel	186 — 69
Window Switch, RH Rear	Top of door panel	186 — 69
C125A	LH side of engine compartment	185 — 66
C126A	LH side of engine compartment	185 — 66
C232	At tailgate window switch, in I/P	185 — 66
C314	In RH kick panel, under I/P	185 — 67
C317	In LH kick panel, under I/P	185 — 67
C405	In rear, near LH frame	187 — 73
C406	In rear, near LH frame	187 — 73
C407	In rear, near LH frame	187 — 72
C408	In rear, near LH frame	187 — 72
C500	In bottom of LH door, at window motor	186 — 69
C501	In LH front door, at window switch	186 — 69
C504	In LH front door, at window switch	186 — 69
C510	In LH rear door, at window switch	186 — 71
C511	In LH rear door, at window motor	186 — 71
C600	In bottom of RH door, at window motor	186 — 69
C603	In RH front door, at window switch	186 — 69

COMPONENT LOCATION

		Page — Figure
C605	In RH rear door, at window switch	186 — 71
C606	In RH rear door, at window motor	186 — 71
C916 (Suburban)	At key operated tailgate under switch	187 — 73
C916 (Utility)	At key operated tailgate window switch	187 — 72
C917 (Suburban)	At cut-out switch, in tailgate	187 — 73
C917 (Utility)	At cut-out switch, in rear tailgate	187 — 72
C918	At tailgate window motor	187 — 72
G401	LH side, near rear cross member	187 — 73
G904	In tailgate, at window motor	187 — 73
S309	Near LH kick panel	186 — 69
S311	Near LH kick panel	186 — 69
S908 (Suburban)	In tailgate window harness	187 — 73
S908 (Utility)	In tailgate window harness	187 — 72
S909 (Suburban)	In tailgate window harness	187 — 73
S909 (Utility)	In tailgate window harness	187 — 72

PRELIMINARY CHECKS:

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

TROUBLESHOOTING CHART—POWER WINDOWS

POWER WINDOW(S) DO NOT OPERATE OR ONLY GO IN ONE DIRECTION

TEST	RESULT	ACTION
1. Place ignition switch in ACC position. Connect test lamp from PNK (76) wire at affected window switch connector C504, C510, C603 or C605 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 test lamp from PNK (76) wire to BLK (150) wire at affected window switch connector C504.	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 test lamp from BRN (165, 667, or 669) wire at affected window switch connector C504, C510, C603 or C605 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE affected window switch.
4. Connect test lamp from BRN (165, 667 or 669) wire to DK BLU (164, 666, or 668) wire at affected window switch connector C504, C510, C603 or C605.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPLACE affected window switch.
5. Connect test lamp from BRN (165, 667 or 669) wire at affected window motor connector C500, C511, C600 or C606 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 test lamp from BRN (165, 667 or 669) wire to DK BLU (164, 666, or 668) wire at affected window motor connector C500, C511, C600 or C606.	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 ACCY position. Connect test lamp from PNK (76) wire at affected window switch connector C603, C605 or C510 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 C603, C605 or C510 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 C603, C605 or C510 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 to ACCY position. Position and hold affected window switch to UP. Connect test lamp from BRN (667 or 669) wire at affected window motor connector C600, C606 or C511 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 C600, C606 or C511.	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 C504 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) wire at affected window switch connector C504.	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 C504.	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 C504.	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 C504.	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 C603, C605 or C510.	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:

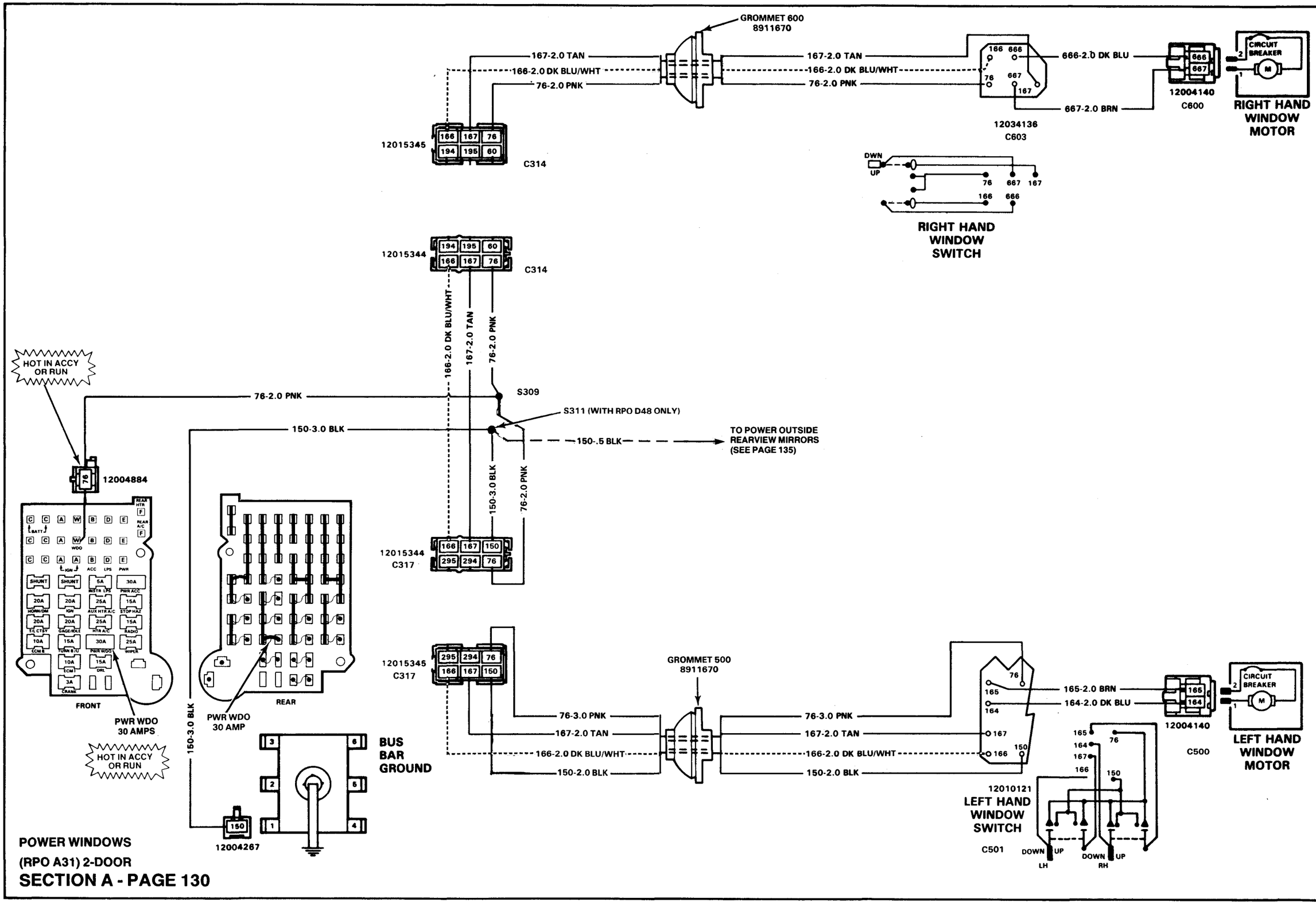
1. Tailgate should remain closed throughout the diagnosis of the POWER REAR WINDOW circuit.
2. CHECK condition of PWR WDO and PWR ACC circuit breakers. If circuit breakers are in good condition, use the following diagnostic procedures.

POWER REAR WINDOW DOES NOT OPERATE FROM TAILGATE WINDOW SWITCH (FRONT)

TEST	RESULT	ACTION
1. Place ignition switch in ACC position. Connect a test lamp from PNK (76) wire at tailgate window switch connector C232 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from tailgate window switch to fuse block.
2. Position and hold tailgate window switch in the UP position. Connect a test lamp from TAN/WHT (184) wire at tailgate window switch connector C232 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE tailgate window switch.
3. Position and hold tailgate window switch in the DOWN position. Connect a test lamp from LT BLU (183) wire at tailgate window switch connector C232 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE tailgate window switch.
4. Connect a fused jumper from PNK (76) wire at the tailgate window switch connector C232 to TAN/WHT (184) wire. Then connect a test lamp from TAN/WHT (184) wire at tailgate window motor connector C918 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 and tailgate window switch.
5. Connect a fused jumper from PNK (76) wire at the tailgate window switch connector C232 to LT BLU (183) wire. Then connect a test lamp from one LT BLU (183) wire at cut out switch connector C917 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 cut out switch to tailgate window switch.If wire is in good condition, REPLACE cut out switch.
6. Connect a test lamp from LT BLU (183) at tailgate window motor connector C918 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 and cutout switch. If wire is in good condition, REPLACE tailgate window motor.

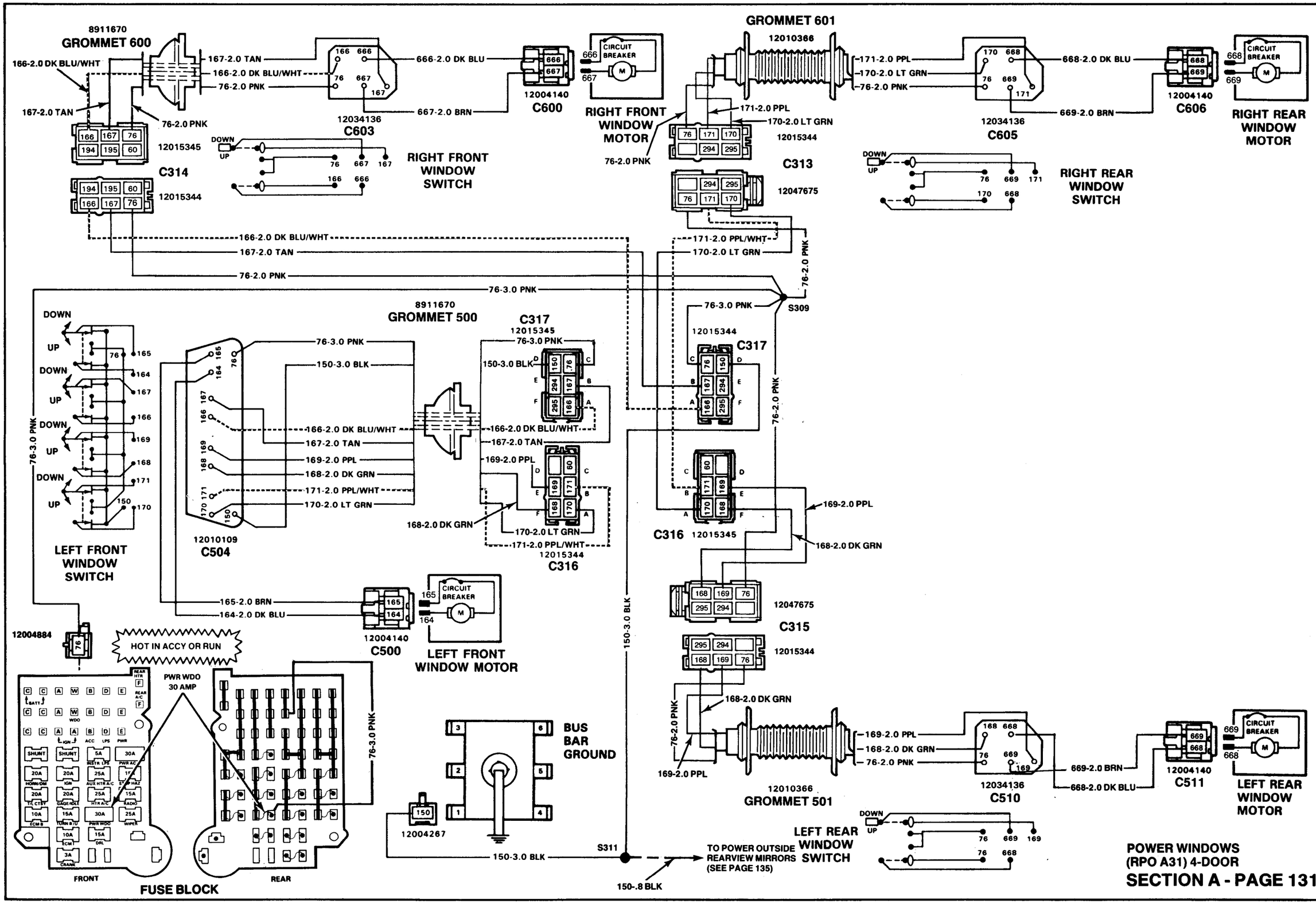
POWER REAR WINDOW DOES NOT OPERATE FROM TAILGATE WINDOW SWITCH (KEY-OPERATED)

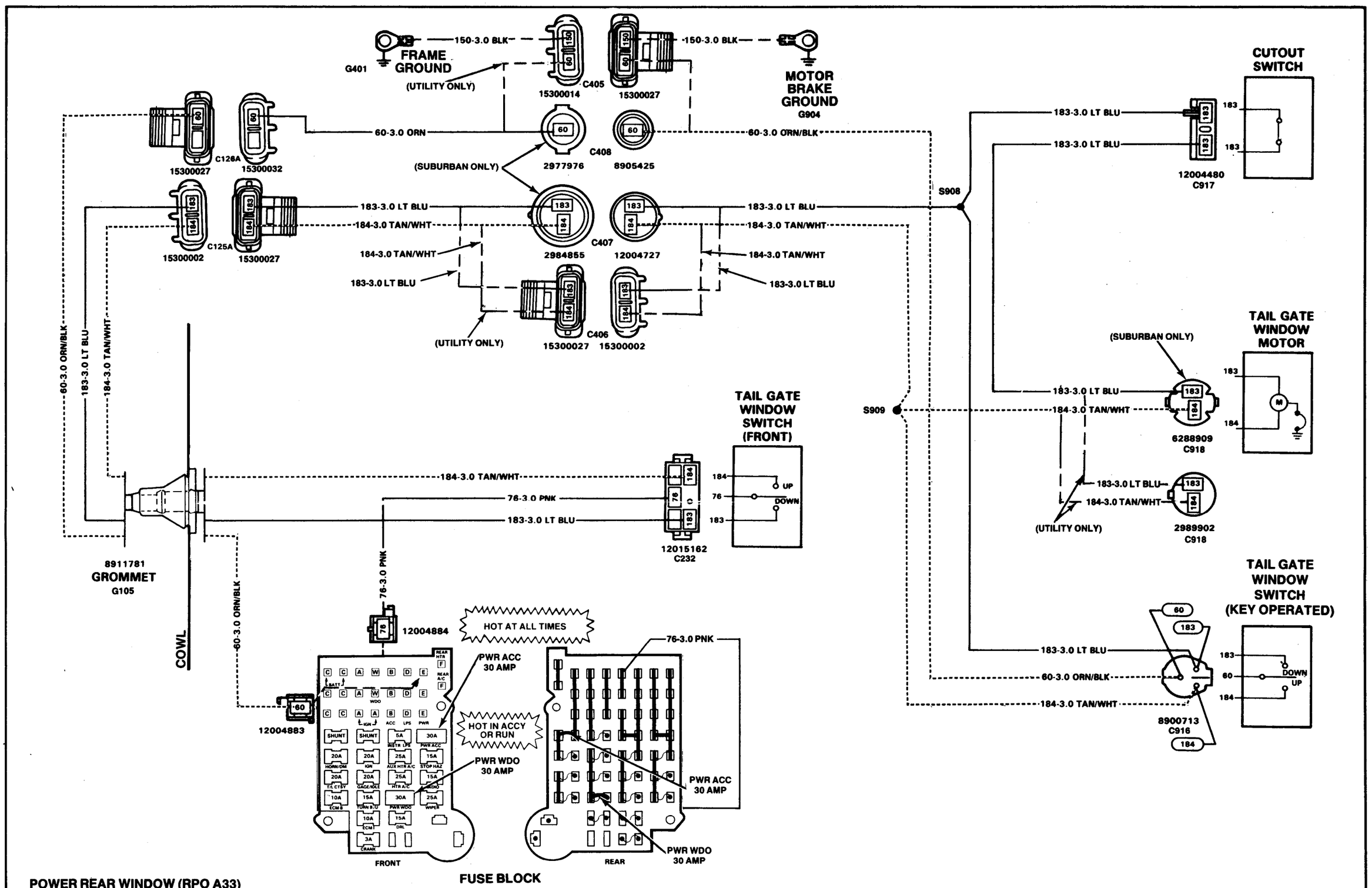
TEST	RESULT	ACTION
1. Connect a test lamp from ORN (60) wire at tailgate window switch connector C916 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (60) wire from tailgate window switch to fuse block.
2. Position and hold tailgate window switch in UP position. Connect a test lamp from TAN/WHT (184) wire at tailgate window switch connector C916 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE tailgate window switch.
3. Connect a test lamp from TAN/WHT (184) wire at tailgate window motor connector C918 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in TAN/WHT (184) wire from window motor to tailgate window switch.
4. Position and hold tailgate window switch in DOWN position. Connect a test lamp from LT BLU (183) wire at cut out switch connector C917 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 from cutout switch to tailgate window switch. If wire is in good condition, REPLACE 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 tailgate window motor connector C917 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 to cutout switch. If wire is in good condition, REPLACE tailgate window motor.



POWER WINDOWS

(RPO A31) 2-DOOR


8911670
GROMMET 600
166-2.0 DK BLU/WHT
167-2.0 TAN
76-2.0 PNK
167-2.0 TAN
166-2.0 DK BLU/WHT
76-2.0 PNK
666-2.0 DK BLU
667-2.0 BRN
12034136
C603
12004140
C600
12015345
C314
12015344
DOWN
UP
RIGHT FRONT WINDOW SWITCH
CIRCUIT BREAKER
RIGHT FRONT WINDOW MOTOR
GROMMET 601
12010366
171-2.0 PPL
170-2.0 LT GRN
76-2.0 PNK
C313
12047675
171-2.0 PPL/WHT
170-2.0 LT GRN
668-2.0 DK BLU
669-2.0 BRN
C605
C606
RIGHT REAR WINDOW SWITCH
RIGHT REAR WINDOW MOTOR
166-2.0 DK BLU/WHT
167-2.0 TAN
76-2.0 PNK
76-3.0 PNK
S309
8911670
GROMMET 500
C317
12015345
150-3.0 BLK
169-2.0 PPL
168-2.0 DK GRN
171-2.0 PPL/WHT
170-2.0 LT GRN
C316
12015345
C504
12010109
LEFT FRONT WINDOW SWITCH
165-2.0 BRN
164-2.0 DK BLU
C500
12004140
LEFT FRONT WINDOW MOTOR
12004884
HOT IN ACCY OR RUN
PWR WDO 30 AMP
FUSE BLOCK
FRONT
REAR
BUS BAR GROUND
12004267
150-3.0 BLK
S311
150-.8 BLK
TO POWER OUTSIDE REARVIEW MIRRORS (SEE PAGE 135)
C315
12047675
12015344
GROMMET 501
12010366
C510
12034136
C511
12004140
LEFT REAR WINDOW MOTOR
LEFT REAR WINDOW SWITCH
POWER WINDOWS
(RPO A31) 4-DOOR
SECTION A - PAGE 131



POWER REAR WINDOW (RPO A33)

SECTION A - PAGE 132

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 wire and to the Door Lock Motors, which are grounded by the TAN wire from the other terminal of the Motor through the other switch contact to the BLK wire and 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 wires to the Motors supply battery voltage and the GRA 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.

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	LH side of I/P, above kick panel	185 — 67
Fuse Block	Under LH side of I/P, above kick panel	185 — 67
Door Lock Motor, LH Front	Rear of LH front door	186 — 69
Door Lock Motor, LH Rear	Rear of LH door	186 — 71
Door Lock Motor, RH Front	Rear of RH front door	186 — 69
Door Lock Motor, RH Rear	Rear of RH rear door	—
Door Lock Relay	Center of cowl	185 — 67
Door Lock Switch, LH Front	LH front door	186 — 70
Door Lock Switch, LH Rear	RH rear door	—
Door Lock Switch, RH Front	RH front door	186 — 70
Door Lock Switch, RH Rear	RH rear door	—
In-Line Auto Fuse	At fuse block	185 — 67
Power Outside Rearview Mirror, LH	On outside of LH front door	—
Power Outside Rearview Mirror, RH	On outside of RH front door	—
Power Outside Rearview Mirror Switch	In top LH front door	186 — 69
Rear Panel Door Lock Motor	In RH rear panel door	186 — 68
C201A	At door lock relay	185 — 67
C209A	At in-line autofuse	185 — 67
C313	RH 'B' pillar	186 — 71
C314	RH kick panel	185 — 67
C315	LH 'B' pillar	186 — 71
C317	LH kick panel	185 — 67
C318	LH kick panel	185 — 67
C320	In RH 'B' pillar	186 — 68
C321	Under I/P	185 — 67
C322	Under I/P	—
C436	In RH rear of vehicle	186 — 68
C502	At front LH door lock switch	186 — 69
C503	At LH front door lock motor	186 — 70
C508	At LH power outside rearview mirror	186 — 69
C509	In LH front door	186 — 69
C512	At rear LH door lock motor	186 — 71
C601	At RH front door lock motor	186 — 70
C602	At front RH door lock switch	186 — 69
C604	At RH power outside rearview mirror	186 — 69
C607	At rear RH door lock motor	186 — 71
C926	In RH rear door	186 — 68
C927	In lower part of RH rear door	186 — 68
S217	Under LH side of I/P	185 — 67
S310	In RH kick panel	186 — 69
S312	In LH kick panel	186 — 69
S313	In LH kick panel	186 — 69

PRELIMINARY CHECKS:

1. Check to see that the HORN/DM, PWR ACC and in-line (C209A) fuses are not blown. Replace if blown.
2. Refer to Section 9 of the 1990 Light Duty Truck Electrical Service Manual for diagnosis and repair of all non-electrical system components.

TROUBLESHOOTING CHART—POWER MIRRORS

NEITHER MIRROR IS OPERATIONAL

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at mirror switch connector C509 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between mirror switch and fuse block. If none can be found check condition of in-line fuse (C209A) and HORN/DM fuse.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from ORN (40) wire to BLK (150) wire at mirror switch connector C509.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between mirror switch 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 C209A and connector C508 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 C508. 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 switch and motor. If none is found, REPLACE switch.

LH MIRROR WILL NOT ADJUST LEFT AND RIGHT

TEST	RESULT	ACTION
Disconnect in-line fuse connector C209A and connector C508 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 C508. 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 switch and motor. If none is found, REPLACE switch.

RH MIRROR WILL NOT ADJUST UP AND DOWN

TEST	RESULT	ACTION
Disconnect in-line fuse connector C209A and connector C609 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 C604. 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 switch and motor. If none is found, REPLACE switch.

RH MIRROR WILL NOT ADJUST LEFT AND RIGHT

TEST	RESULT	ACTION
Disconnect in-line fuse connector C209A and C604 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 C604. 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 switch and motor. If none is found, REPLACE switch.

TROUBLESHOOTING CHART—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 C201A to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN/BLK (60) wire between door lock relay and fuse block. Also inspect splice S310 for open wire or 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 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 S310.
	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 switch and door lock relay.
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 switch and door lock relay.

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.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (294) wire between inoperative motor connector and splice.

NO DOOR LOCK MOTORS LOCK OR UNLOCK FROM ANY SWITCHES

TEST	RESULT	ACTION
None.	None.	REPLACE door lock relay.

IN-LINE
3 AMP
AUTOFUSE

40
640

12010105
C209A

40-.5 ORN
640-1.0 ORN

640-1.0 ORN

640
12004886

150-3.0 BLK
S311
150-.5 BLK
150-3.0 BLK
TO POWER WINDOWS (SEE PAGE 130, 131)

40-.5 ORN

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

12015345

C321

12015344

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

GROMMET 600
8911670

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

S600

82-.5 LT BLU/BLK
82-.5 LT BLU/BLK

12047785
C604

82 888 881 82
UP/DOWN
LEFT/RIGHT

RH POWER OUTSIDE REARVIEW MIRROR

12064763

C322

12064762

POWER OUTSIDE REARVIEW MIRROR SWITCH

150 40 888 881 81 88 82 82

UP/DOWN
LEFT/RIGHT

82 88 81 82

LH POWER OUTSIDE REARVIEW MIRROR

FRONT

REAR

FUSE BLOCK

HORN/DM
20 AMP

HOT AT ALL TIMES

HORN/DM
20 AMP

150-3.0 BLK

12004267
C206A

BUS
BAR
GROUND
12004267

12045688
C509

12047785
C508

82-.5 LT BLU
82-.5 LT BLU

88-.5 YEL
81-.5 WHT
82-.5 LT BLU

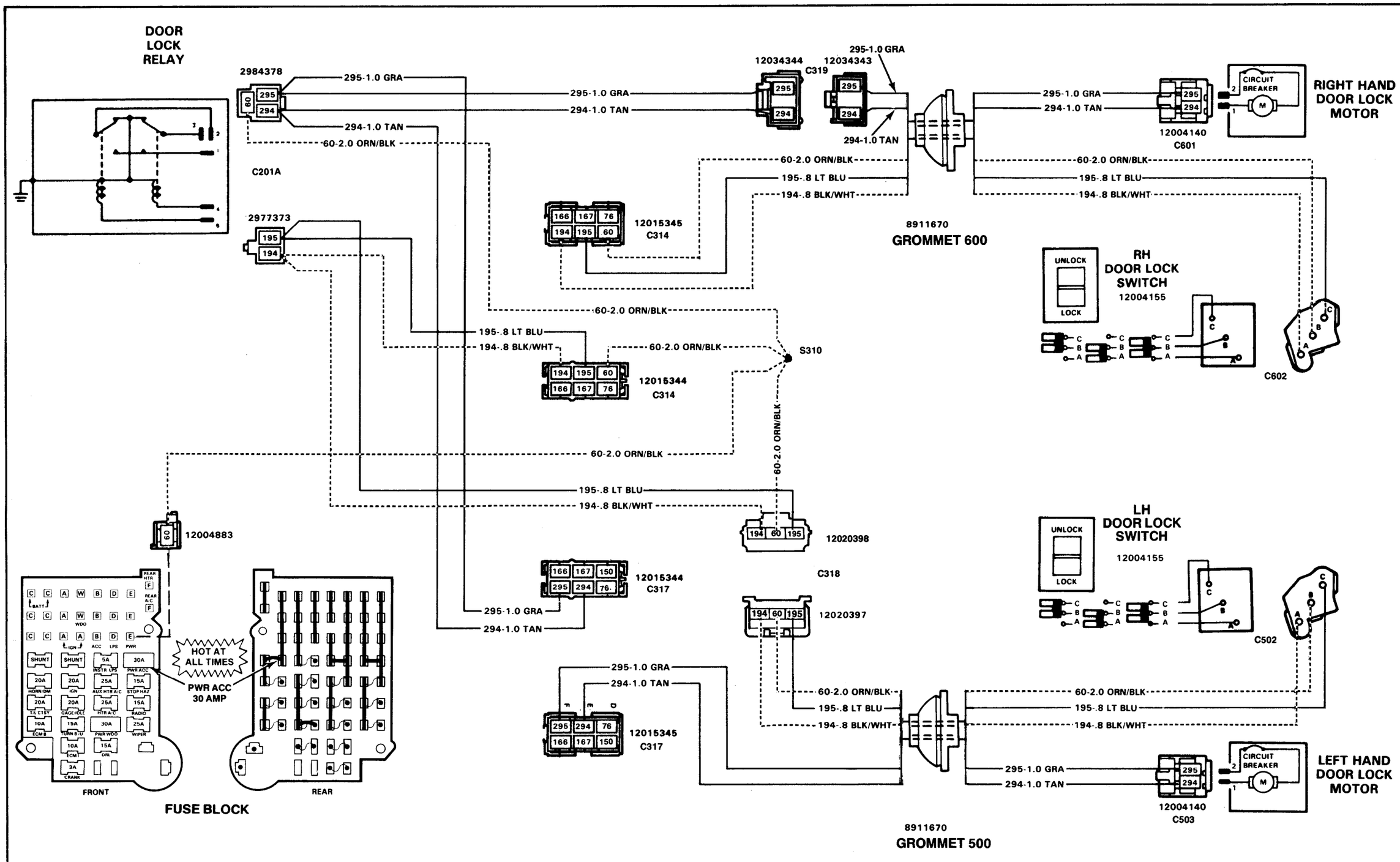
S500

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

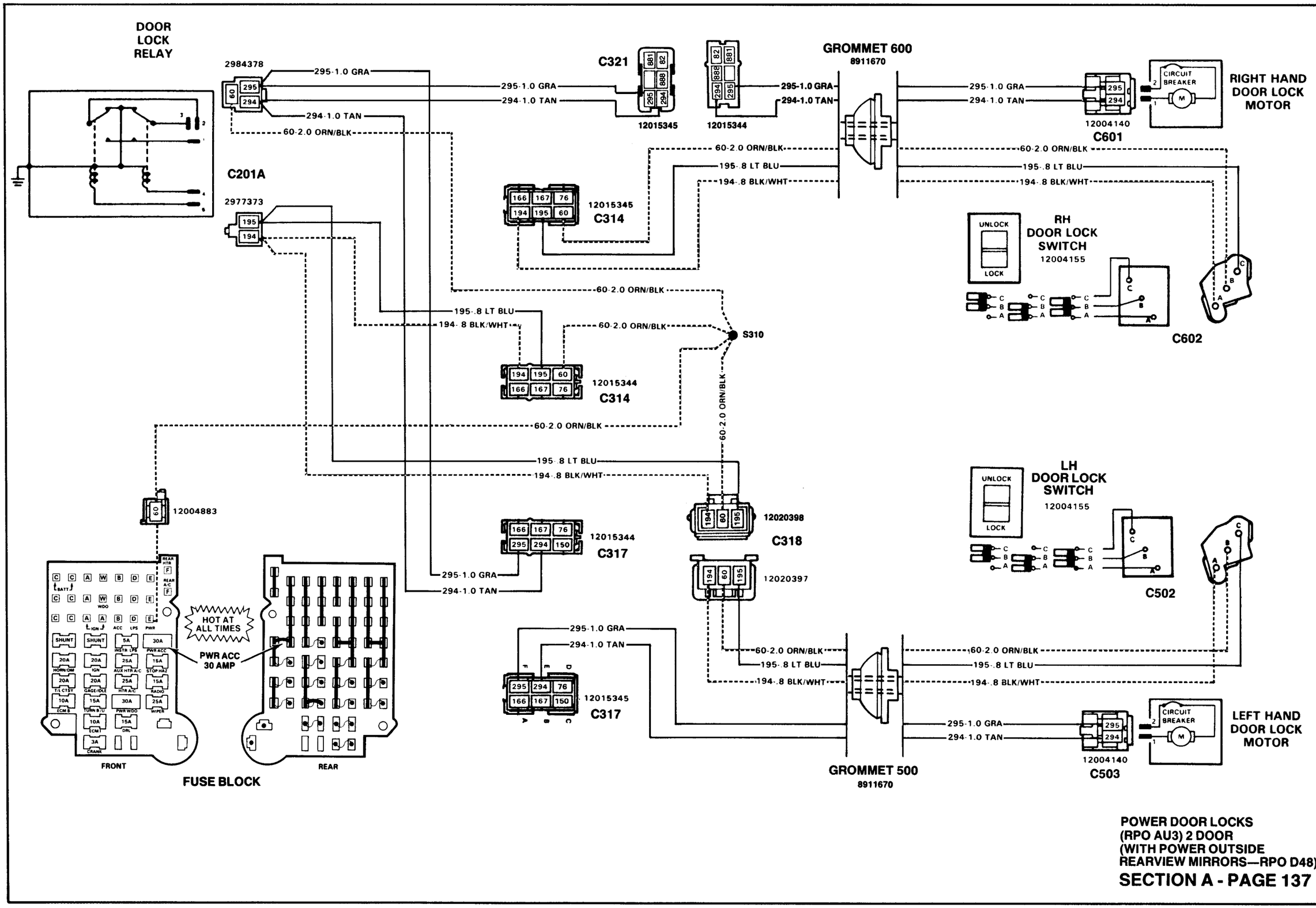
40-.5 ORN
150-.5 BLK
881-.5 WHT/BLK
82-.5 LT BLU/BLK
888-.5 YEL/BLK

GROMMET 500
8911670

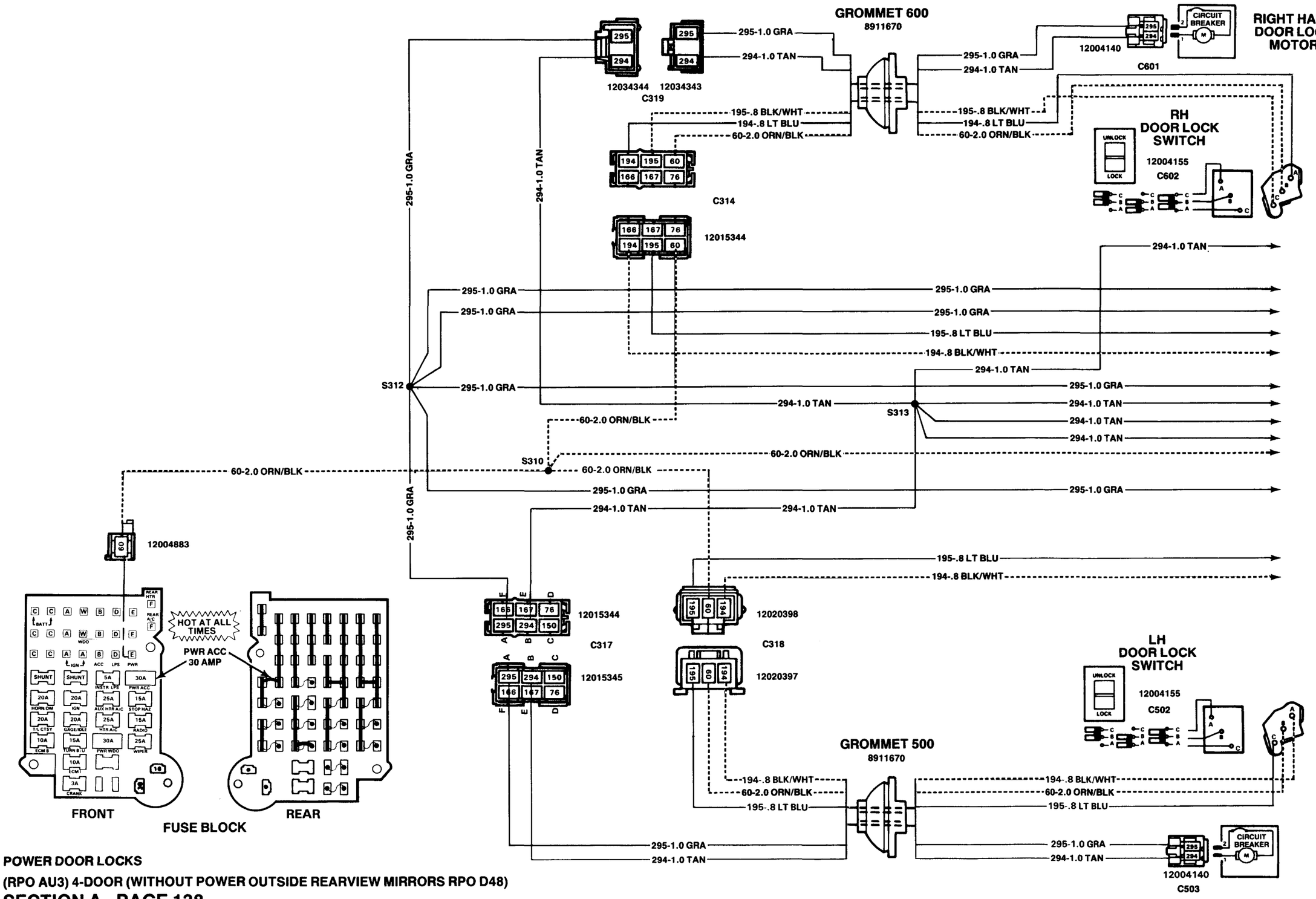
POWER OUTSIDE REARVIEW MIRRORS
(RPO D48)



POWER DOOR LOCKS
(RPO AU3) 2 DOOR
(WITHOUT POWER OUTSIDE REARVIEW MIRRORS—RPO D48)



POWER DOOR LOCKS
(RPO AU3) 2 DOOR
(WITH POWER OUTSIDE REARVIEW MIRRORS—RPO D48)



POWER DOOR LOCKS

(RPO AU3) 4-DOOR (WITHOUT POWER OUTSIDE REARVIEW MIRRORS RPO D48)

GROMMET 601
12010366

295-1.0 GRA
294-1.0 TAN

12015344
C313

295-1.0 GRA
294-1.0 TAN

12004140
C607

CIRCUIT BREAKER

RIGHT REAR DOOR LOCK MOTOR

SIDE DOOR CONTACT BUTTONS

12047675

295-1.0 GRA
294-1.0 TAN
295-1.0 GRA
195-.8 LT BLU
194-.8 BLK/WHT

12047676
C320

12020397
C435

12004267
C436

12004267
C925

12004267
C926

12004140
C927

REAR PANEL DOOR LOCK MOTOR

C201A

DOOR LOCK RELAY

295-1.0 GRA
294-1.0 TAN
294-1.0 TAN
294-1.0 TAN
60-2.0 ORN/BLK
295-1.0 GRA

2984378

195-.8 LT BLU
194-.8 BLK/WHT

2977373
C201A

12047675
C315

12015344

295-1.0 GRA
294-1.0 TAN

GROMMET 501
12020366

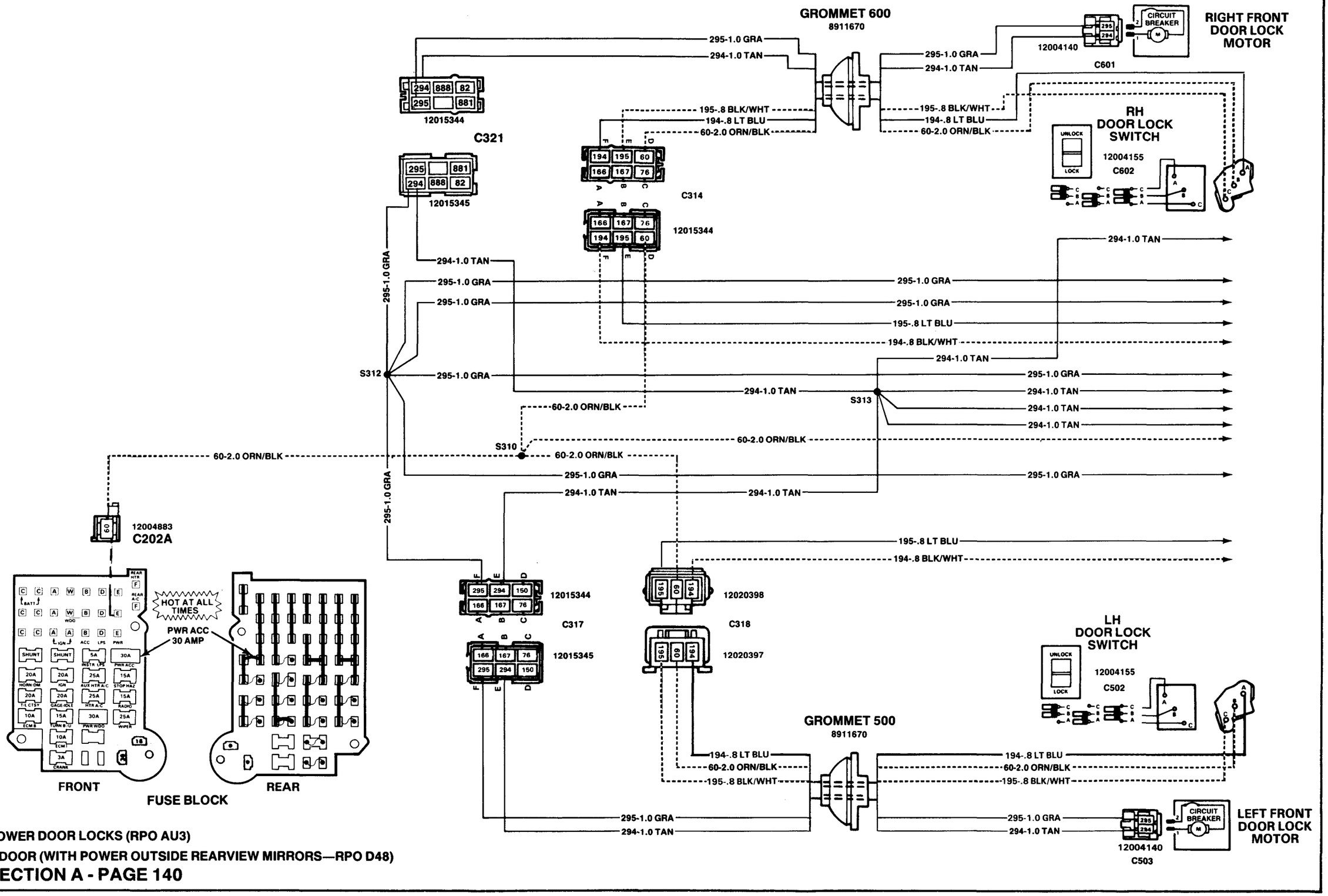
295-1.0 GRA
294-1.0 TAN

12004140
C512

CIRCUIT BREAKER

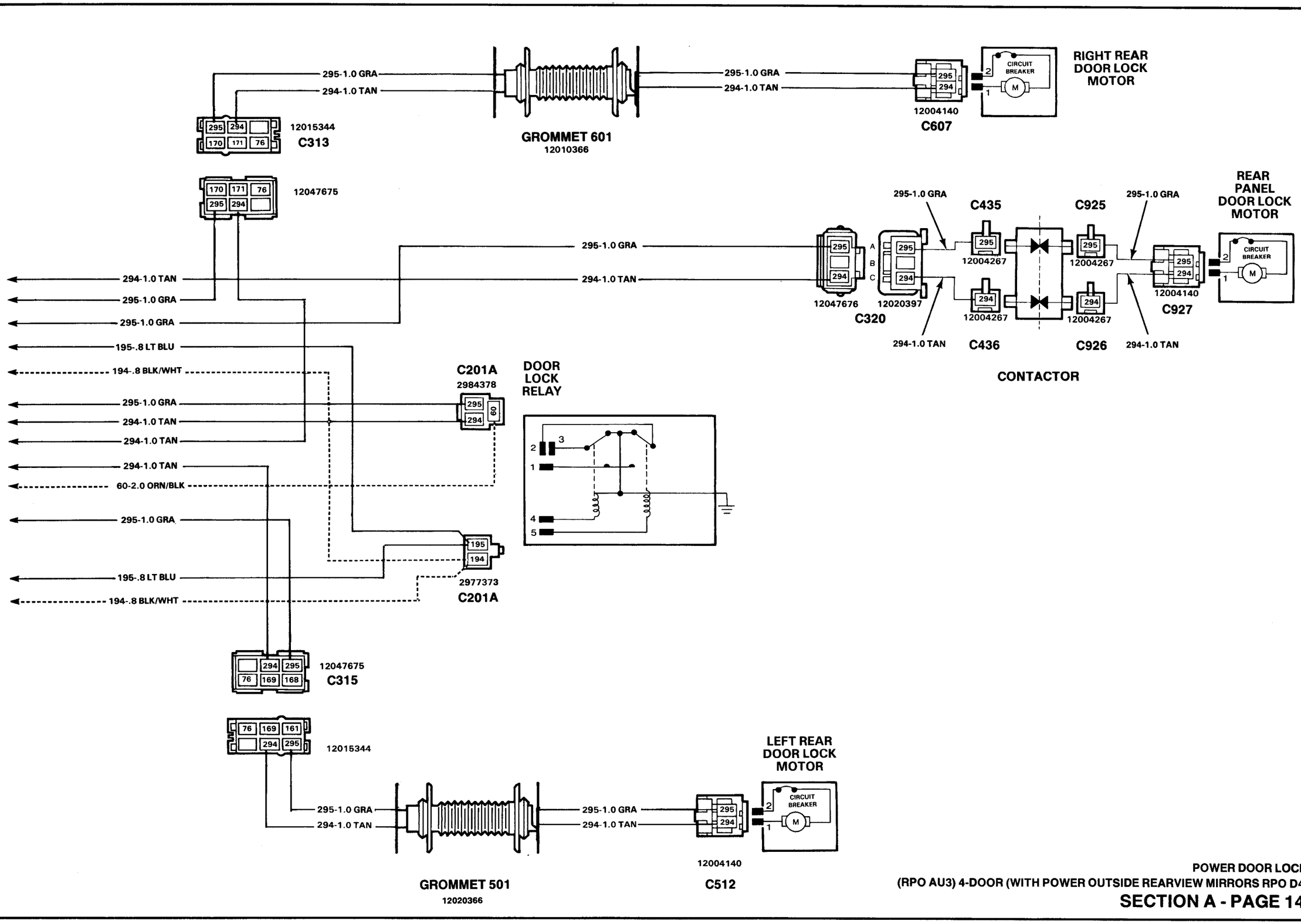
LEFT REAR DOOR LOCK MOTOR

POWER DOOR LOCKS
(RPO AU3) 4-DOOR
(WITHOUT POWER OUTSIDE
REARVIEW MIRRORS RPO D48)



POWER DOOR LOCKS (RPO AU3)

4-DOOR (WITH POWER OUTSIDE REARVIEW MIRRORS—RPO D48)



POWER DOOR LOCKS
(RPO AU3) 4-DOOR (WITH POWER OUTSIDE REARVIEW MIRRORS RPO D48)

CIRCUIT OPERATION

CONVENTIONAL WIPER

WIPERS

When the Wiper/Washer Switch is in LO, battery voltage is applied through the GRA wire directly to the low speed brushes of the Wiper Motor. The Wiper Motor runs at low speed.

When the Wiper/Washer Switch is in HI, battery voltage is applied through the PPL wire to the high speed brushes of the Wiper Motor. The motor operates at a higher speed.

The Park Switch is open only when the wiper blades are in the PARK position. In all other positions, the Park Switch is closed. When the Wiper/Washer Switch is moved to OFF, the Wiper Motor continues to run at low speed until the wiper blades reach the PARK position. At that time the Park Switch opens and stops the Wiper Motor.

The Wiper Motor is protected by a circuit breaker which opens if the current through the Motor rises to a high level. This may happen if the wiper blades are blocked by ice or snow. The circuit breaker resets automatically after it cools off.

WASHER

The Washer Motor is energized whenever the Washer Switch is pressed and runs as long as the Washer Switch is closed. Battery voltage is applied to the Washer Motor by the GRA wire and a ground is supplied by the switch by the PNK wire.

CIRCUIT OPERATION—PULSE WIPERS

In addition to the features of a conventional (non-pulse) Wiper System (MIST, LO, and HI speeds), 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, High Speed and Park positions operate the same as non-pulse wipers.

LOW SPEED

In the LO position, the Wiper/Washer Switch supplies voltage in the GRA wire and the Pulse/Speed/Wash Control. The Pusle/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 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 shunts 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 wire, the Wiper Motor Module, and the Solid State Control Board. Voltage is applied to the 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 run the 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 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.

COMPONENT LOCATION

		Page — Figure
Fuse Block	Behind LH side of I/P, above kick panel	185 — 67
Washer Motor	Engine compartment, LH fender	165 — 3
Wiper Motor	LH side of cowl	176 — 38
Wiper Pulse Module	Under steering column	189 — 78
Wiper Switch	On directional signal lever	182 — 58
C100	Engine compartment, LH side of cowl	176 — 38
C101	At wiper motor	176 — 38
C102	At wiper motor	176 — 38
C187	At windshield washer bottle	165 — 3
C202	At pulse wiper control module	166 — 4
C204	At pulse wiper control module	189 — 78
G200	LH side, behind I/P	166 — 6

PRELIMINARY CHECKS:

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

TROUBLESHOOTING CHART—WINDSHIELD WIPERS AND WASHERS (PULSE)

WIPERS DO NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Place ignition in ACC and turn wipers to HI. Connect test lamp from WHT (93) wire at wiper motor connector C101 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between wiper motor and fuse block.
	Test lamp lights.	GO to step 2.
2. Conect a fused jumper from BLK (150) wire at pulse wiper module connector C202 to ground.	Wiper motor runs.	LOCATE and REPAIR open in BLK (150) wire between pulse wiper module C202 and ground G200.
	Wiper motor does not run.	REPLACE wiper motor.

WIPERS DO NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition in ACC and wipers to HI. Connect a fused jumper from PPL (92) wire at pulse wiper module connector C202 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire betwen wiper motor and pulse wiper module or 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 and pulse wiper module connector C202. If wire is in good condition, REPLACE pulse wiper control module.
	Wiper motor runs.	REPLACE wiper, washer switch.

WIPERS DO NOT OPERATE IN LO OR DELAY

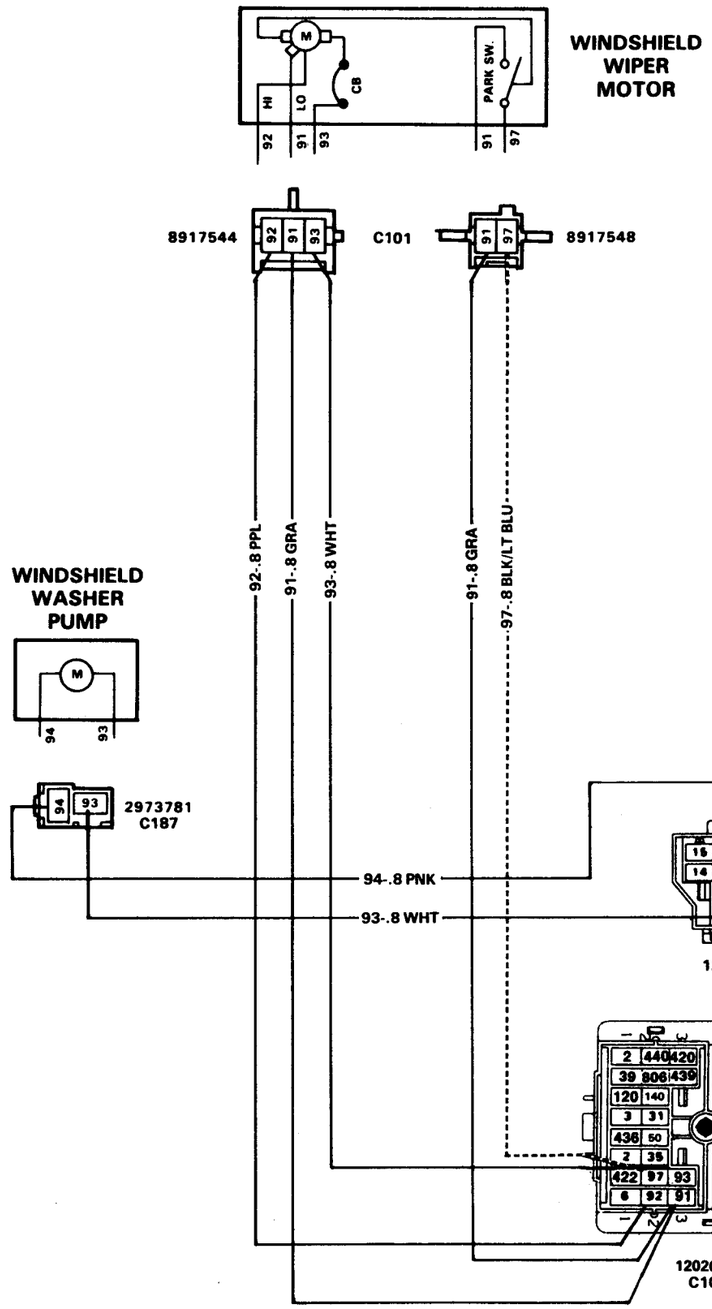
TEST	RESULT	ACTION
1. Place ignition in RUN and wipers to LO. Connect a fused jumper from GRA (91) wire at pulse wiper module connector C202 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRA (91) wire between wiper motor and pulse wiper module. If wire is in good condition, REPLACE wiper 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 and pulse wiper module. If wire is in good condition, REPLACE pulse wiper control module.
	Wiper motor runs.	REPLACE pulse wiper/washer switch.

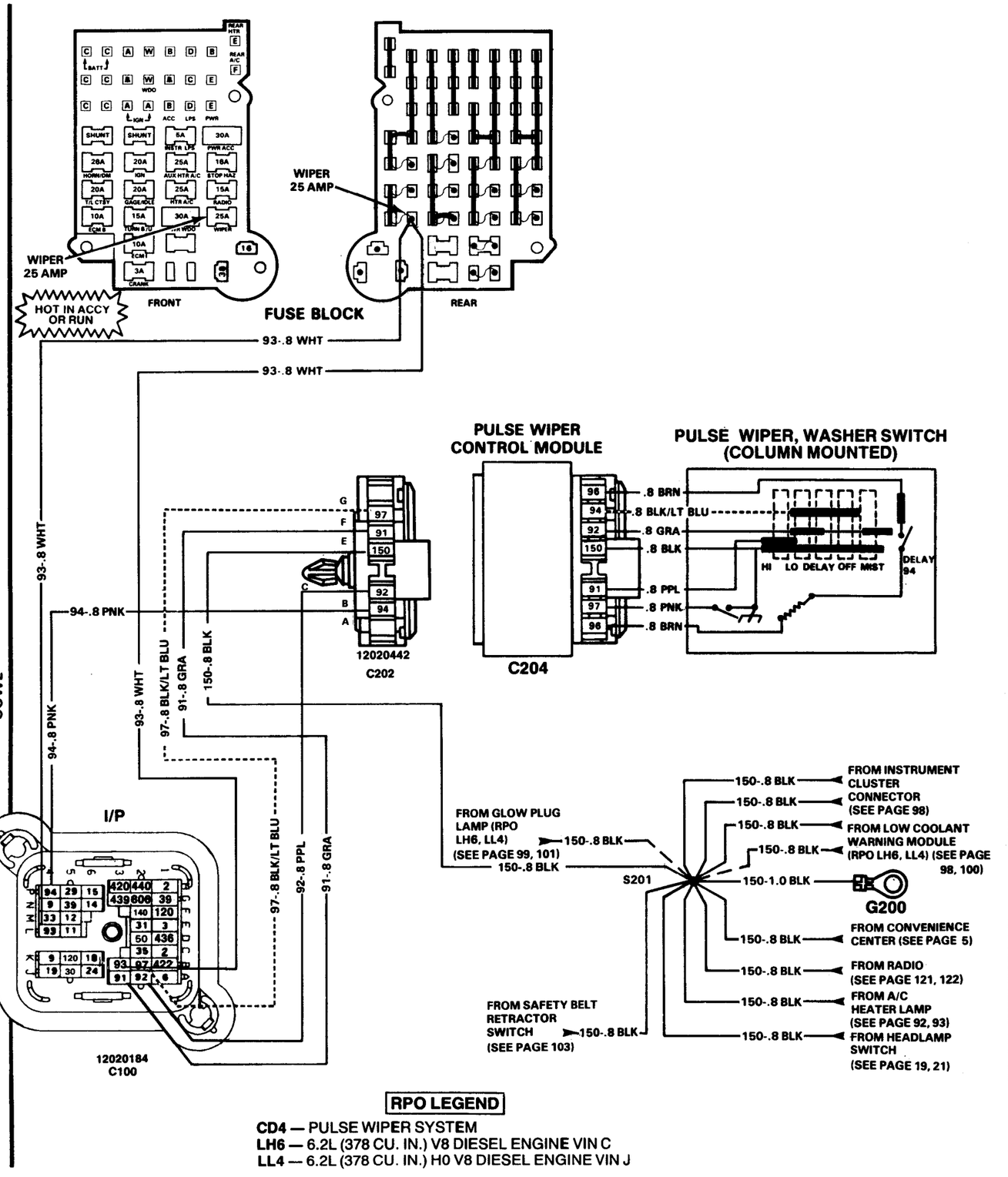
WASHER MOTOR DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition to ACC and pulse wiper/washer switch to WASH. Connect 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 and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect 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 C202 to ground.	Washer motor does not pump.	LOCATE and REPAIR open in PNK (94) wire between washer pump and pulse wiper control module.
	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 and pulse wiper switch.
	Washer 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 and ground G200.

WASHER MOTOR DOES NOT SHUT OFF

TEST	RESULT	ACTION
1. Place ignition in 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 C202.	Washer motor stops pumping.	REPLACE wiper control module.
	Washer motor pumps.	LOCATE and REPAIR short to ground in PNK (94) wire between pulse wiper control module and washer pump.





RPO LEGEND

CD4 — PULSE WIPER SYSTEM
LH6 — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
LL4 — 6.2L (378 CU. IN.) H0 V8 DIESEL ENGINE VIN J

BLANK

CIRCUIT OPERATION

BACKUP LAMPS

With the Ignition Switch in RUN, BULB TEST, 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 Headlamp Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps.

COMPONENT LOCATION

		Page — Figure
Backup Lamps, LH	At rear LH side of vehicle	167 — 8
Backup Lamps, RH	At rear RH side of vehicle	167 — 8
Backup Lamp Switch, (Automatic Transmission)	Bottom of steering column	166 — 5
Backup Lamp Switch, (Manual Transmission)	On LH side of transmission	189 — 79
Fuse Block	Under LH side of I/P, above kick panel	166 — 4
Grommet 104	LH side of cowl	189 — 79
Headlamp Switch	LH side of I/P	166 — 4
License Lamp	Rear center of vehicle	167 — 8
Taillamp, LH	Rear RH side of vehicle	167 — 9
Taillamp, RH	Rear LH side of vehicle	167 — 9
C100	Engine compartment, LH side of cowl	165 — 2
C117A	Engine compartment, top LH side of cowl	189 — 79
C118A	At manual transmission backup lamp switch	189 — 79
C202	At headlamp switch	166 — 4
C286	Automatic transmission backup lamp switch	166 — 5
C300	Rear center of vehicle	167 — 9
C301	Rear center of vehicle	167 — 8
C411	At rear taillamp	167 — 8
C412	At RH rear taillamp	167 — 8
C419	At license lamp	167 — 8
C420	At RH rear license lamp	189 — 80
C421	At LH rear license lamp	189 — 80
C428	At RH rear backup lamp	167 — 8
C429	At rear LH backup lamp	167 — 8
G402	At LH rear lamps	167 — 9
G403	At RH rear lamps	167 — 9
G406	Rear center of vehicle	—
G407	RH rear of vehicle	—
G408	LH rear of vehicle	167 — 9
S308	Rear of vehicle	167 — 9
S402	Rear LH side of vehicle	167 — 8
S403	Rear taillamp harness RH side of vehicle	167 — 8
S404	Rear taillamps harness, rear center of vehicle	167 — 9
S405	Rear taillamp harness, RH side of vehicle	167 — 8
S406	Rear LH side of vehicle	167 — 8
S410	Rear RH side of vehicle	167 — 8
S412	Rear RH side of vehicle	167 — 8
S907	License lamp extension harness rear of vehicle	189 — 80

PRELIMINARY CHECK

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.

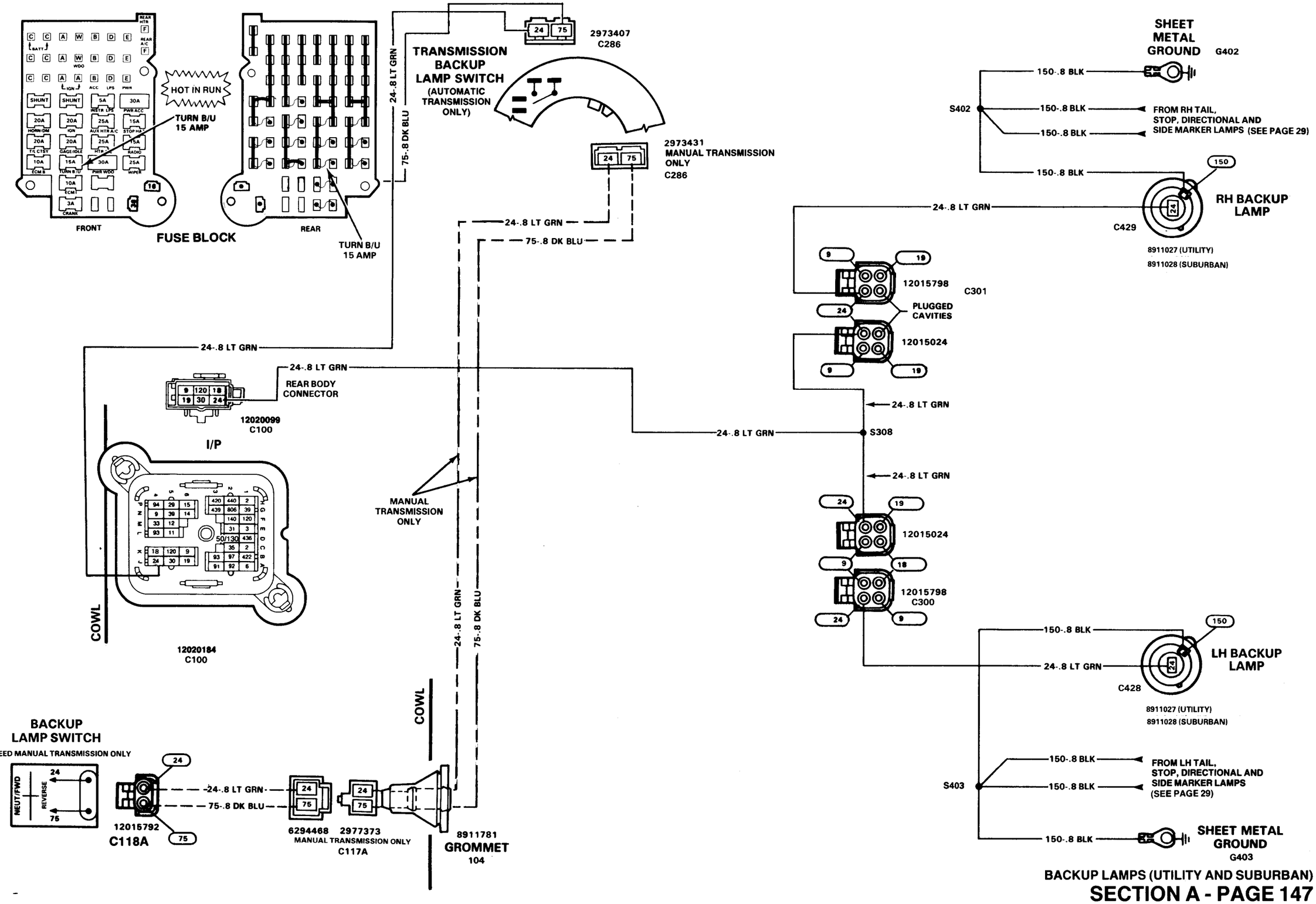
TROUBLESHOOTING CHART—REAR EXTERIOR LAMPS

BACKUP LAMPS DO NOT OPERATE

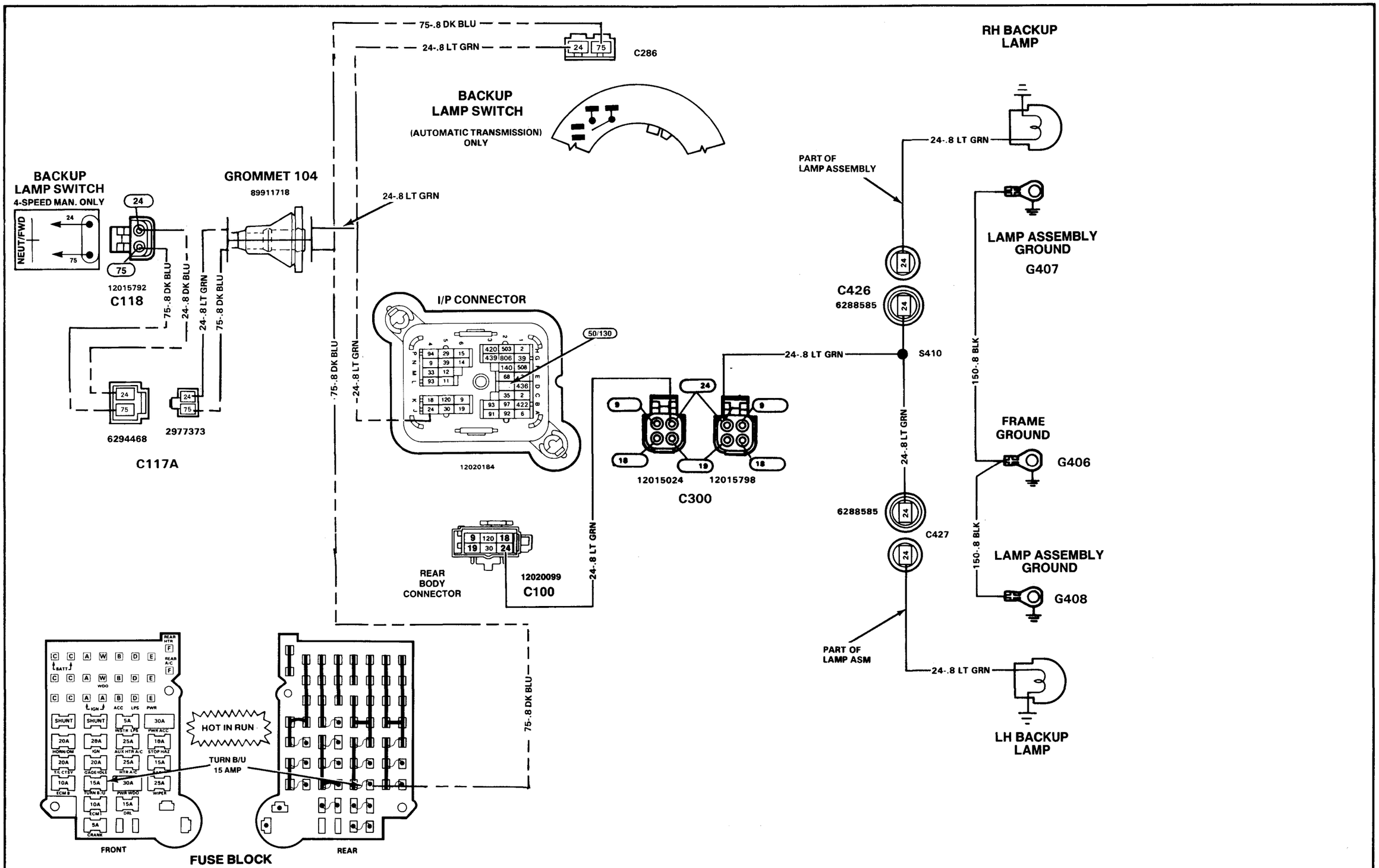
TEST	RESULT	ACTION
1. Place transmission in reverse. Connect test lamp from LT GRN (24) wire at backup lamp connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect test lamp from LT GRN (24) wire to BLK (150) wire at backup lamp connector.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from backup lamp to ground terminal G403.
3. Connect test lamp from DK BLU (75) wire at backup lamp switch connector C286 or C118A to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	CHECK condition of fuse (TURN/BU). If fuse is good LOCATE and REPAIR open in DK BLU (75) wire from backup lamp switch to fuse block.
4. Connect test lamp from LT GRN wire at backup lamp switch connector C286 or C118A to ground.	Test lamp lights.	LOCATE and REPAIR open in LT GRN (24) wire from backup lamp switch to backup lamps.
	Test lamp does not light.	Adjust backup lamp switch. If backup lamp switch will not adjust properly, REPLACE backup lamp switch.

REAR PARK, MARKER AND LICENSE LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place Headlamp Switch in HEAD or PARK position. If only license lamp does not operate, GO to step 7. If only one rear park lamp does not operate, GO to step 3. If only one rear marker lamp does not operate, GO to step 5. Connect test lamp from BRN (9) wire at S404 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between Headlamp Switch connector C202 and S404.
	Test lamp lights.	If only RH rear Park/Marker lamps and license lamps do not operate, GO to step 2. If only LH Rear Park/Marker lamps do not operate, GO to step 3.
2. Connect test lamp from BRN (9) wire at RH lamp connector to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between S404 and RH lamp connector.
	Test lamp lights.	GO to step 3.
3. Connect test lamp from BRN (9) wire at inoperative park lamp connector to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between lamp connector and S404.
	Test lamp lights.	GO to step 4.
4. Connect test lamp from BRN (9) wire and BLK (150) wire at inoperative lamp connector.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) between lamp connector and G403.
	Test lamp lights.	If rear park lamp is inoperative, REPLACE blub. For inoperative side license lamps. GO to step 5.
5. Connect test lamp from BRN (9) wire at license lamp connector to ground.	Test lamp does not light.	LOCATE and REPAIR open BRN (9) wire between connector and S300 and S404.
	Test lamp lights.	Inspect ground connection at license bulb socket. If satisfactory REPLACE bulb.

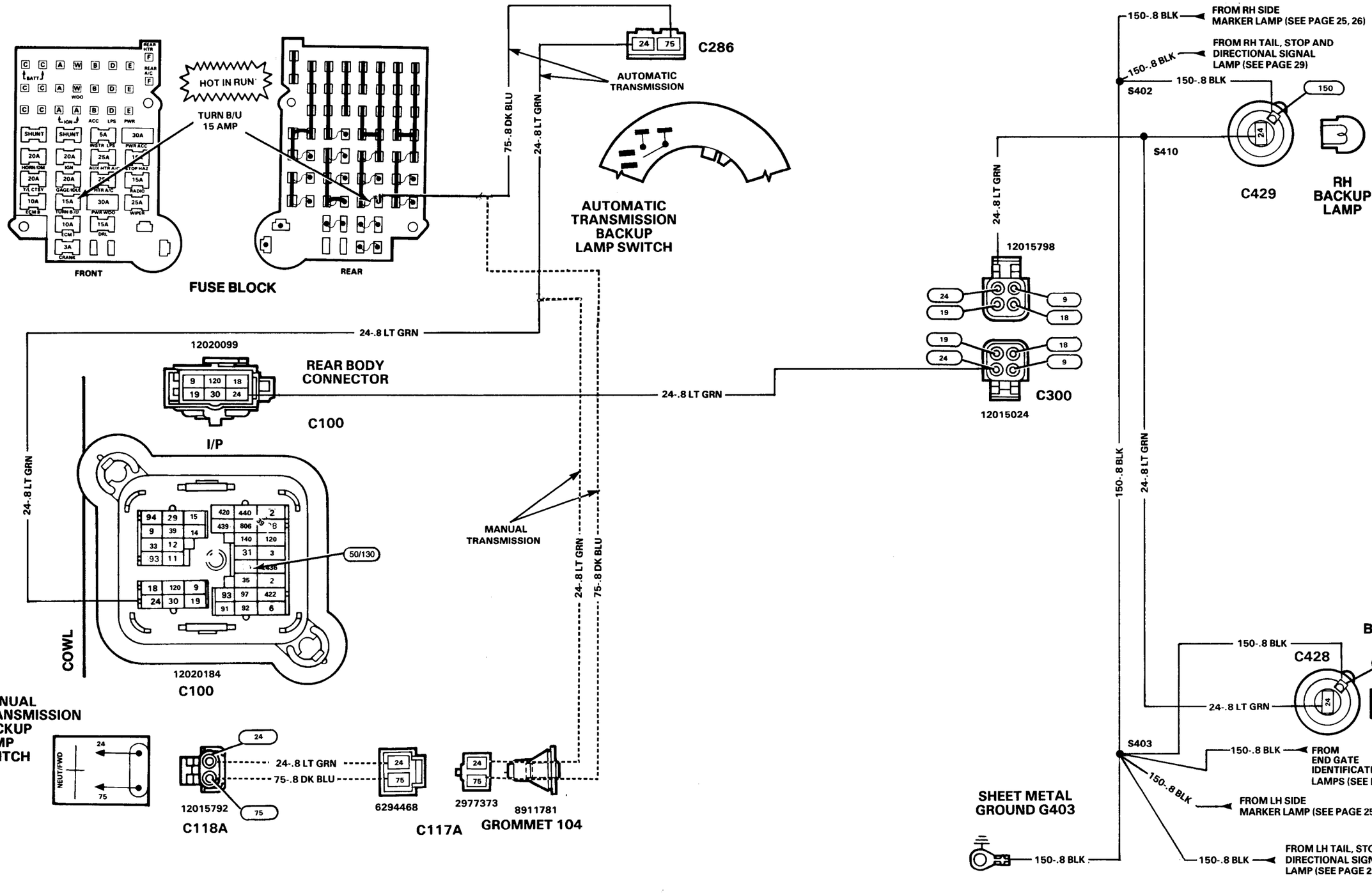


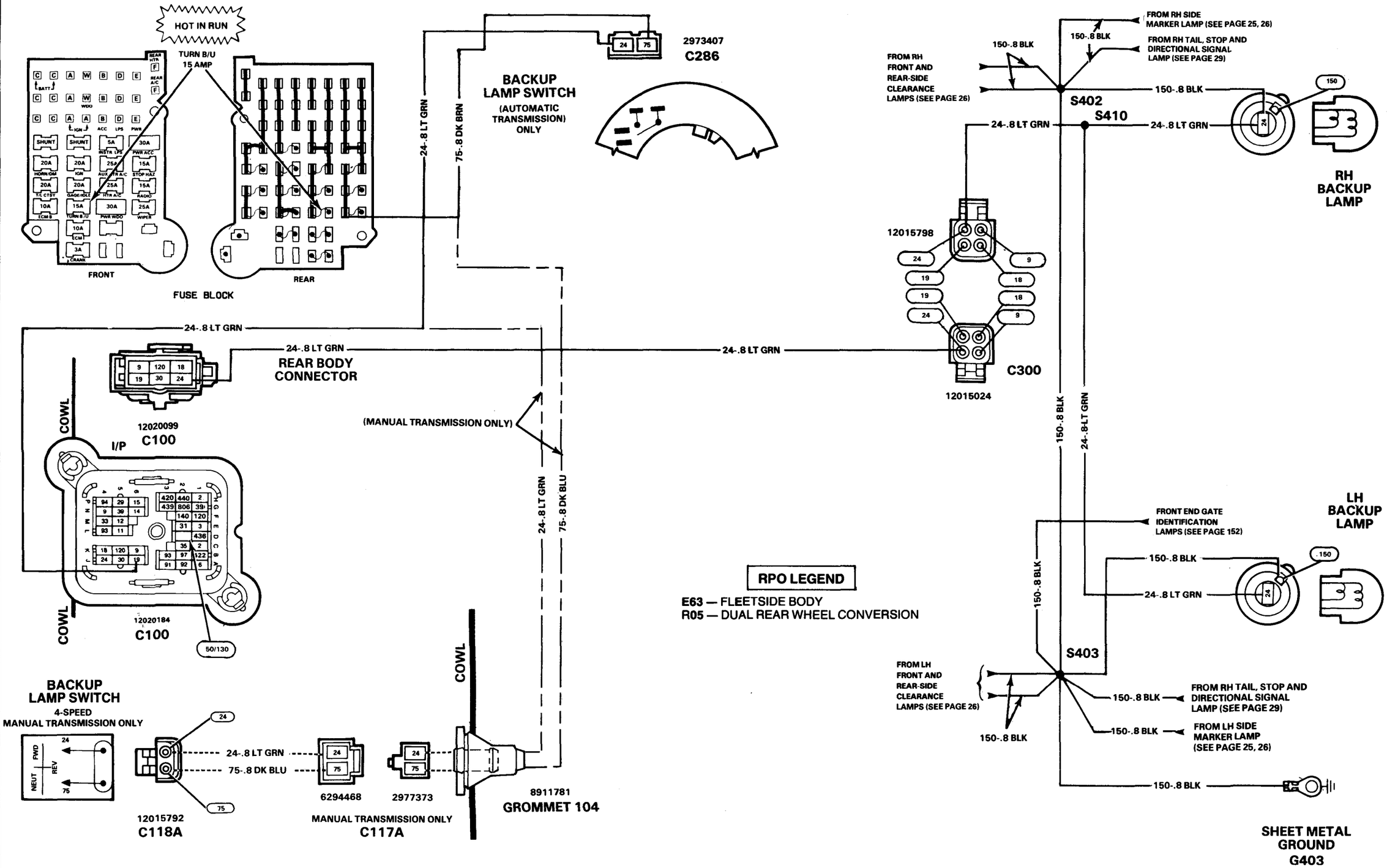
BACKUP LAMPS (UTILITY AND SUBURBAN)



BACKUP LAMPS (STEPSIDE)

SECTION A - PAGE 148


FUSE BLOCK
FRONT
REAR
HOT IN RUN
TURN B/U
15 AMP
C286
AUTOMATIC TRANSMISSION
AUTOMATIC TRANSMISSION BACKUP LAMP SWITCH
75-.8 DK BLU
24-.8 LT GRN
12020099
REAR BODY CONNECTOR
C100
I/P
12020184
C100
COWL
50/130
MANUAL TRANSMISSION
MANUAL TRANSMISSION BACKUP LAMP SWITCH
NEUT/FWD
12015792
C118A
6294468
C117A
2977373
8911781
GROMMET 104
12015798
C300
12015024
150-.8 BLK
FROM RH SIDE MARKER LAMP (SEE PAGE 25, 26)
FROM RH TAIL, STOP AND DIRECTIONAL SIGNAL LAMP (SEE PAGE 29)
S402
S410
C429
RH BACKUP LAMP
LH BACKUP LAMP
C428
S403
FROM END GATE IDENTIFICATION LAMPS (SEE PAGE 152)
FROM LH SIDE MARKER LAMP (SEE PAGE 25, 26)
FROM LH TAIL, STOP AND DIRECTIONAL SIGNAL LAMP (SEE PAGE 25, 26)
SHEET METAL GROUND G403


HOT IN RUN
TURN B/U 15 AMP
FRONT
REAR
FUSE BLOCK
24-.8 LT GRN
75-.8 DK BRN
2973407
C286
BACKUP LAMP SWITCH
(AUTOMATIC TRANSMISSION) ONLY
FROM RH FRONT AND REAR-SIDE CLEARANCE LAMPS (SEE PAGE 26)
150-.8 BLK
FROM RH SIDE MARKER LAMP (SEE PAGE 25, 26)
FROM RH TAIL, STOP AND DIRECTIONAL SIGNAL LAMP (SEE PAGE 29)
S402
S410
RH BACKUP LAMP
12015798
C300
12015024
REAR BODY CONNECTOR
12020099
C100
I/P
COWL
(MANUAL TRANSMISSION ONLY)
24-.8 LT GRN
75-.8 DK BLU
12020184
C100
50/130
BACKUP LAMP SWITCH
4-SPEED
MANUAL TRANSMISSION ONLY
NEUT
FWD
REV
12015792
C118A
6294468
2977373
MANUAL TRANSMISSION ONLY
C117A
8911781
GROMMET 104
RPO LEGEND
E63 — FLEETSIDE BODY
R05 — DUAL REAR WHEEL CONVERSION
S403
FRONT END GATE IDENTIFICATION LAMPS (SEE PAGE 152)
LH BACKUP LAMP
FROM LH FRONT AND REAR-SIDE CLEARANCE LAMPS (SEE PAGE 26)
FROM RH TAIL, STOP AND DIRECTIONAL SIGNAL LAMP (SEE PAGE 29)
FROM LH SIDE MARKER LAMP (SEE PAGE 25, 26)
SHEET METAL GROUND
G403

COWL

HEADLAMP SWITCH

150
156
44
9
40
2
10

OFF
PARK HEAD
OFF
PARK HEAD

12004628
C202

I/P

40-.8 ORN → TO COURTESY LAMPS (SEE PAGE 117)

40-.8 ORN

9-.8 ORN

9-.8 BRN

40-.8 ORN

9-.8 BRN

REAR BODY CONNECTOR
12020099

C100

9-.8 BRN

12020184
C100

HOT AT ALL TIMES

T/L CTSY
20 AMP

FRONT

FUSE BLOCK

40-.8 ORN

REAR

T/L CTSY
20 AMP

TO RH SIDE MARKER LAMP (SEE PAGE 25, 26)

150-.8 BLK

150

8911035
C411

(SUBURBAN)

RH TAIL, STOP AND DIRECTIONAL LAMP

9-.8 BRN

150-.8 BLK

150

150-.8 BLK

9-.8 BRN

S406

9-.8 BRN

(UTILITY)

8911029
C411

12015798

150-.8 BLK

SHEET METAL GROUND
G402

150-.8 BLK

150-.8 BLK

150-.8 BLK

150-.8 BLK

FROM BACKUP LAMP (SEE PAGE 147, 149)

S402

12015024

C301

9-.8 BRN

9-.8 BRN

FROM BACKUP LAMP (SEE PAGE 25)

S300

9-.8 BRN

12015024

S403

150-.8 BLK

FROM BACKUP LAMP (SEE PAGE 147, 149)

12015798

C300

150-.8 BLK

SHEET METAL GROUND
G403

150-.8 BLK

150

S405

9-.8 BRN

9-.8 BRN

(UTILITY)

8911029
C412

LH TAIL, STOP AND DIRECTIONAL LAMP

9-.8 BRN

150-.8 BLK

150-.8 BLK

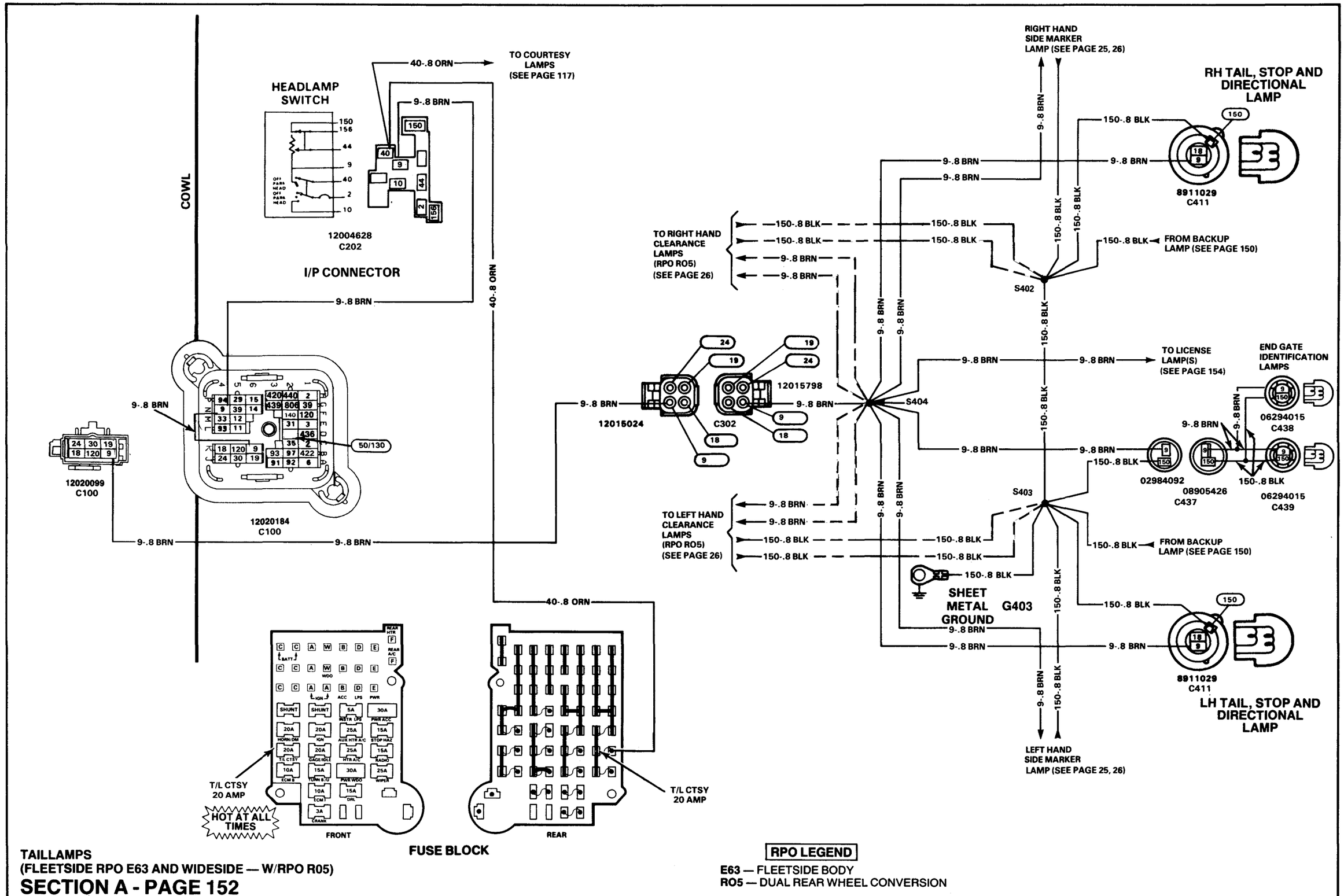
150-.8 BLK

TO LH SIDE MARKER LAMP (SEE PAGE 25, 26)

(SUBURBAN)

8911035
C412

TAILLAMPS (UTILITY AND SUBURBAN)



FUSE BLOCK

RPO LEGEND

E63 — FLEETSIDE BODY
RO5 — DUAL REAR WHEEL CONVERSION

TAILLAMPS
(FLEETSIDE RPO E63 AND WIDESIDE — W/RPO R05)

SECTION A - PAGE 152

COWL

HEADLAMP SWITCH

150
156
44
9
40
2
10

OFF
PARK HEAD
OFF
PARK HEAD

I/P

40-.8 ORN → TO COURTESY LAMPS (SEE PAGE 117)

12004628
C202

9-.8 BRN

40-.8 ORN

9-.8 BRN

12020099

C100

9-.8 BRN

12020184
C100

FUSE BLOCK

FRONT

REAR

HOT AT ALL TIMES

T/L CTSY 20 AMP

40-.8 ORN

T/L CTSY 20 AMP

12015798

12015024
C301

9-.8 BRN

S300

9-.8 BRN

12015024

12015798
C300

9-.8 BRN

SHEET METAL GROUND G402

SHEET METAL GROUND G403

150-.8 BLK

R H SIDE MARKER LAMP (SEE PAGE 25, 26)

9-.8 BRN

150-.8 BLK

150-.8 BLK

(SUBURBAN) 9-.8 BRN

(UTILITY) 9-.8 BRN

TO RH TAIL, STOP AND DIRECTIONAL LAMP (SEE PAGE 29)

S406

S402

150-.8 BLK

150-.8 BLK

150-.8 BLK FROM RH BACKUP LAMP (SEE PAGE 147)

LICENSE LAMP

9-.8 BRN

2977107 2977721

C419

S403

150-.8 BLK FROM LH BACKUP LAMP (SEE PAGE 147)

150-.8 BLK

150-.8 BLK

(UTILITY)

S405

9-.8 BRN

9-.8 BRN

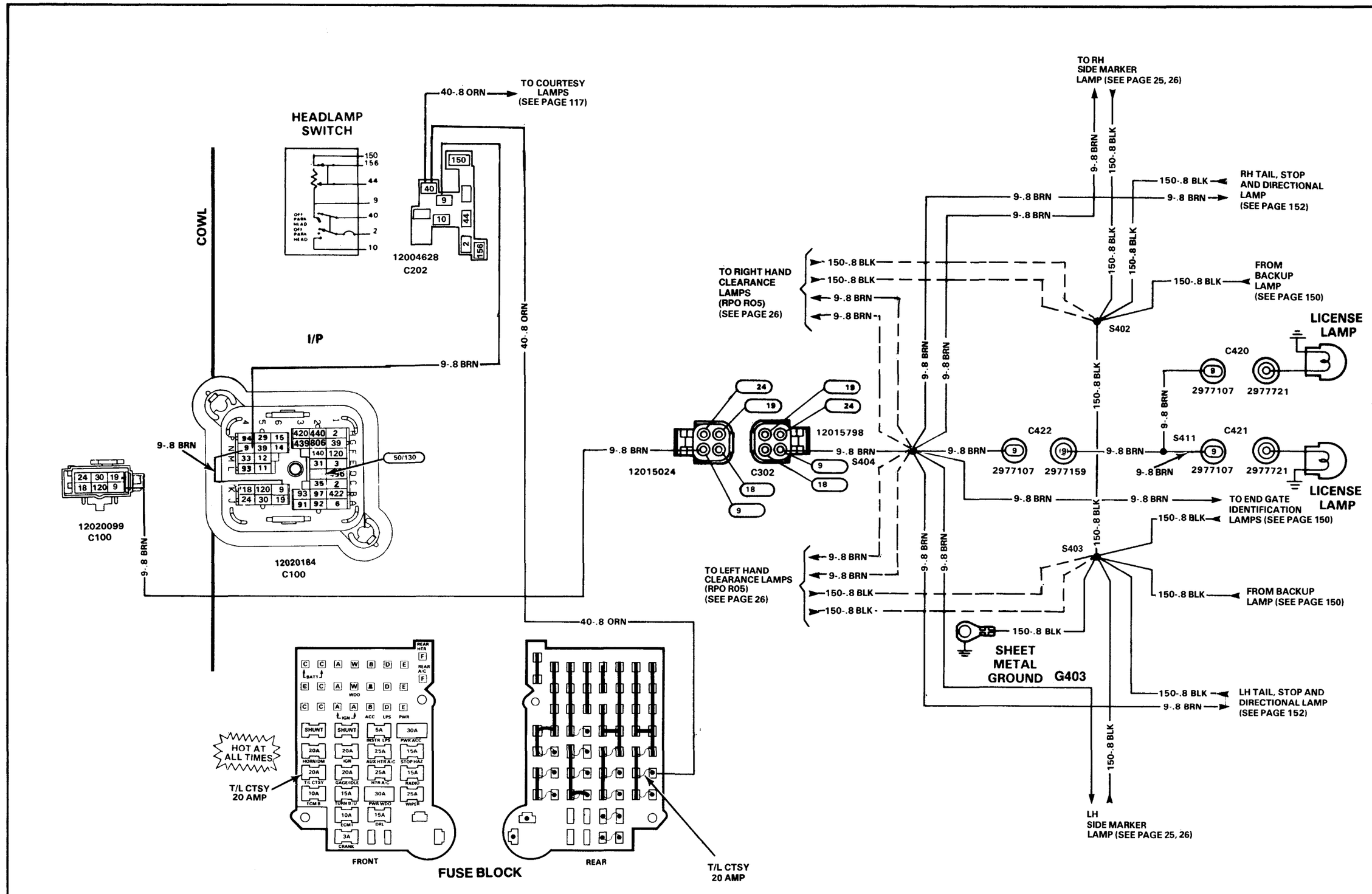
TO LH SIDE MARKER LAMP (SEE PAGE 25, 26)

9-.8 BRN

TO LH TAIL, STOP AND DIRECTIONAL LAMP (SEE PAGE 29)

(SUBURBAN) 150-.8 BLK

LICENSE LAMP (UTILITY AND SUBURBAN)



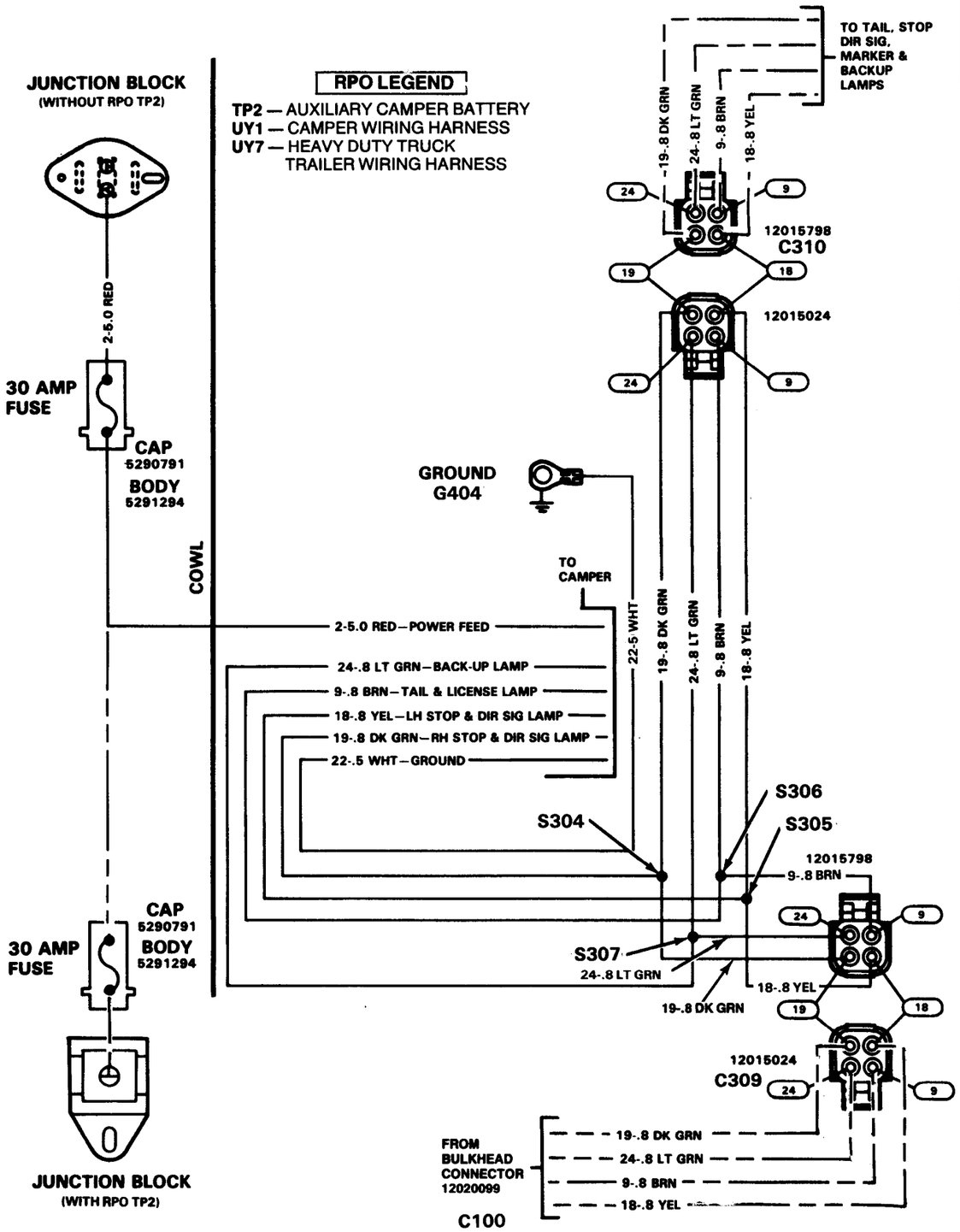
LICENSE LAMP—FLEETSIDE (RPO E63) AND WIDESIDE (RPO R05)

BLANK

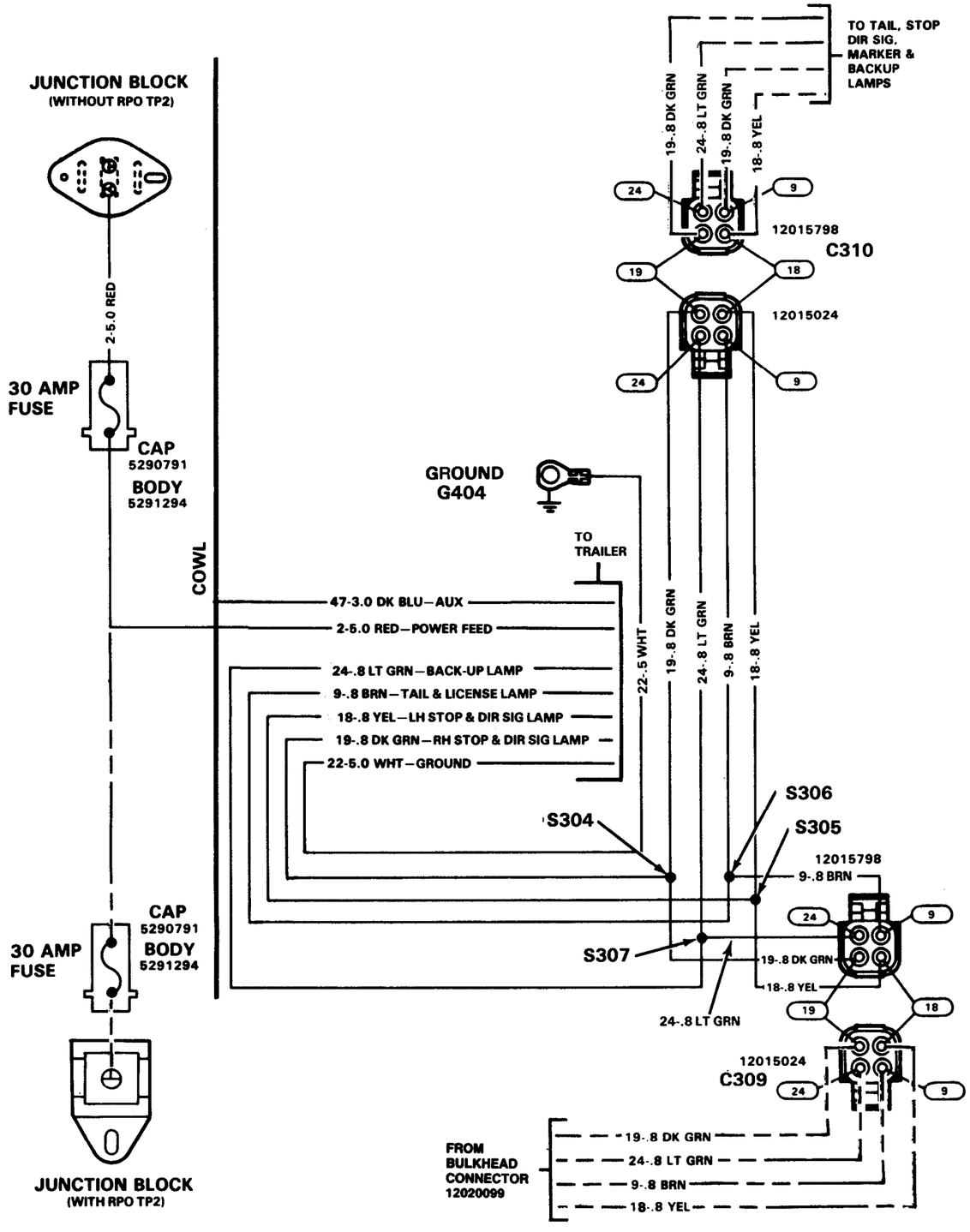
COMPONENT LOCATION

RPO LEGEND

TP2 — AUXILIARY CAMPER BATTERY
UY1 — CAMPER WIRING HARNESS
UY7 — HEAVY DUTY TRUCK TRAILER WIRING HARNESS



CAMPER EQUIPMENT (RPO UY1)



HEAVY DUTY TRAILER (RPO UY7)

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 power 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 power 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 (RPO C60) is a three-position actuator.

The servo unit of the cruise control (RPO K34) 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 (RPO K34) VACUUM CONTROL" in this section.

AUXILIARY HEATER (RPO C36) 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 power 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 (RPO C60) 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 rear 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 (RPO K34) 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 diaphragm 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 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 power 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.

COMPONENT LOCATION

		Page—Figure
Air Conditioning Control Assembly	Instrument panel, RH side of instrument cluster	178 — 44
Air Conditioning Module	Under RH side of instrument panel.	—
Auxiliary Heater Control Switch	Instrument panel, to right of steering column	178 — 45
Auxiliary Heater Hot Water Valve	Forward of cowl, lower RH side of engine compartment	—
Cruise Control Module	On upper LH side of brake pedal bracket	181 — 54
Cruise Control Servo	Bracket on rear of LH cylinder head (gas engines); bracket on top front of engine behind water pump (diesel engines)	182 — 56
Cruise Control Servo Check Valve	In vacuum supply line to cruise control servo	—
Cruise Control Vacuum Release Valve	Brake pedal bracket	—
Vacuum Tank	On cowl, LH side of engine compartment	—

TROUBLESHOOTING

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.

TROUBLESHOOTING CHART — 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 "Troubleshooting Chart Auxiliary Heater," page 86.
	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.

TROUBLESHOOTING CHART — FRONT MANUAL AIR CONDITIONING VACUUM CONTROL

PRELIMINARY CHECKS

Use the charts in this section to verify that air is either being 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 quick 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

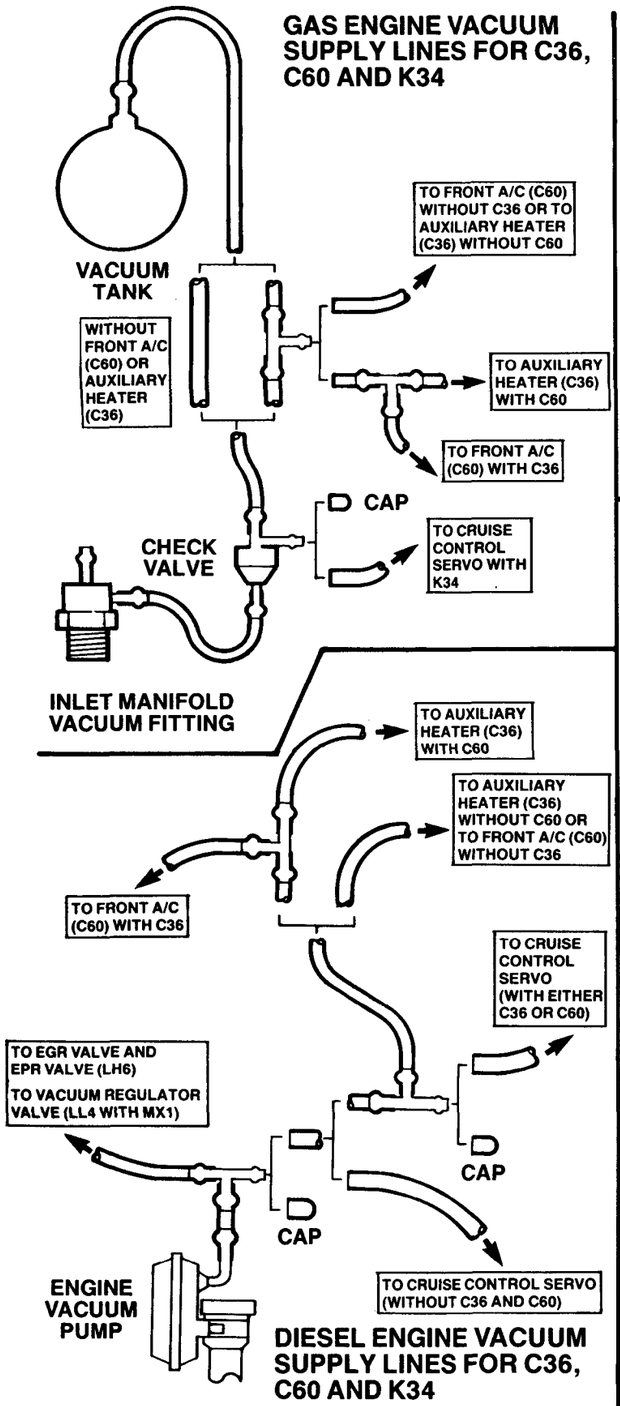
TEST	RESULT	ACTION
1. Disconnect the vacuum hose at the actuator for the inoperative air valve ("door"). With the engine idling and the mode lever set in a position that will apply vacuum to the actuator, check for vacuum at the disconnected hose.	Vacuum at or near engine vacuum at idle.	REPAIR binding 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.

TROUBLESHOOTING CHART — CRUISE CONTROL VACUUM HARNESS

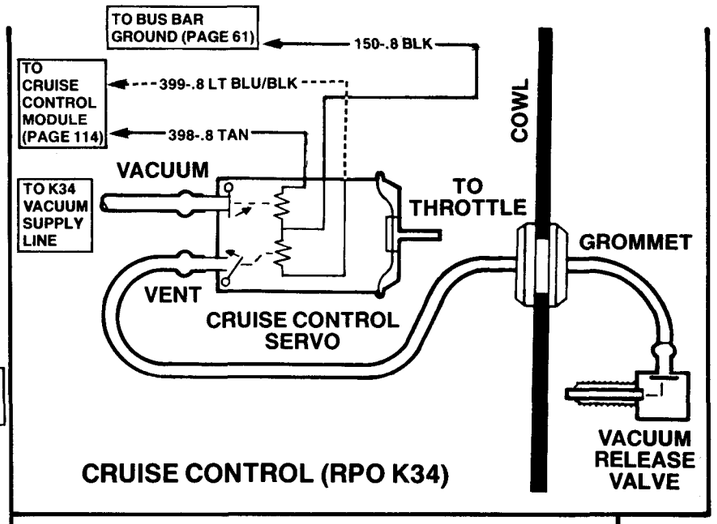
CRUISE CONTROL DOES NOT OPERATE

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 "Troubleshooting Chart Cruise Control," page 112.

GAS ENGINE VACUUM SUPPLY LINES FOR C36, C60 AND K34



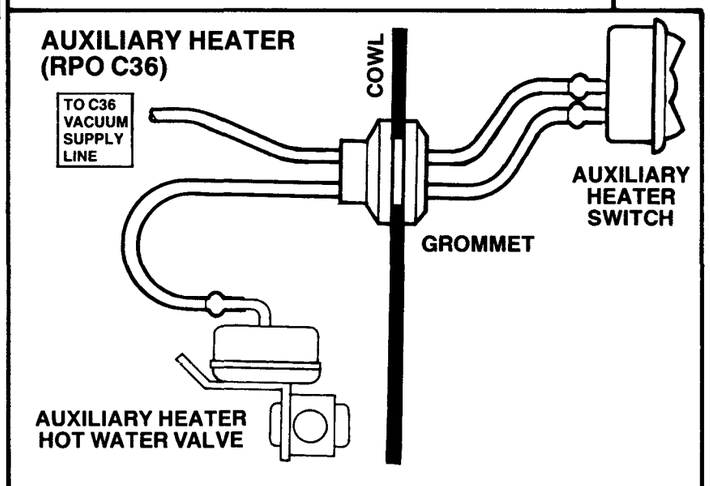
DIESEL ENGINE VACUUM SUPPLY LINES FOR C36, C60 AND K34

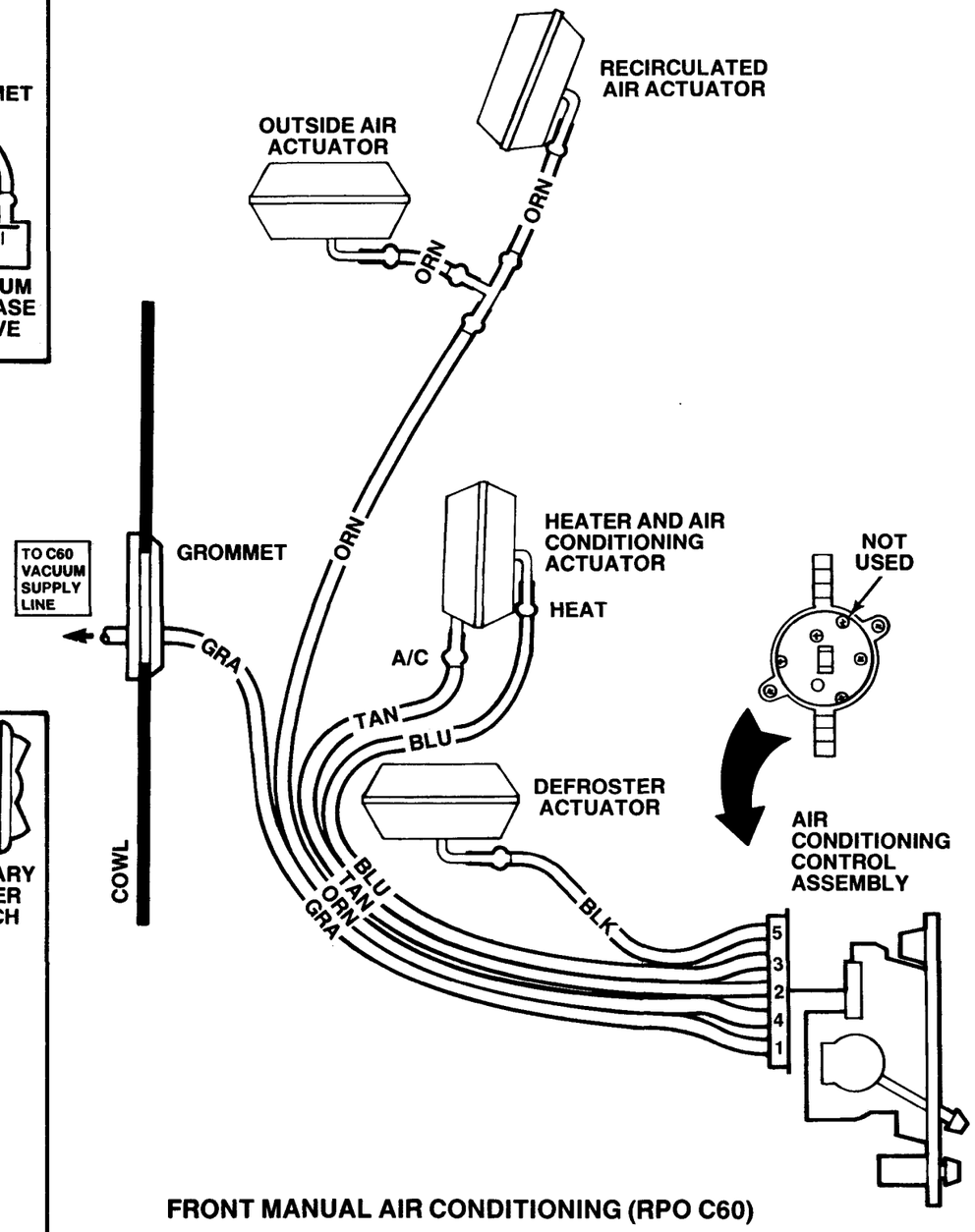


CRUISE CONTROL (RPO K34)

RPO LEGEND

- **C36** — AUXILIARY HEATER
- **C60** — FRONT MANUAL AIR CONDITIONING
- **K34** — CRUISE CONTROL
- **LH6** — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
- **LL4** — 6.2L (378 CU. IN.) HEAVY DUTY V8 DIESEL ENGINE VIN J
- **MX1** — 3-SPEED AUTOMATIC TRANSMISSION





FRONT MANUAL AIR CONDITIONING (RPO C60)

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 pressures 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 diaphragms. As a result, air pressures within the diaphragm 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 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.

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.

TRANSMISSION VACUUM MODULATOR SYSTEM

Shift points and oil pressure of the MX1 three speed automatic transmission are controlled by a vacuum modulator that responds to engine vacuum as an indicator of engine operation. The vacuum modulator controls modulator oil pressure within the transmission to hold the 1-2 and 2-3 shift valves closed until governor oil pressure increases with an increase in engine speed or torque and forces an upshift. A part-throttle 3-2 downshift is forced when the accelerator pedal is depressed enough to overcome the force of governor oil while operating in third gear.

With L05 and L19 gasoline engines, vacuum is taken from the inlet manifold and routed directly to the transmission vacuum modulator. In the LL4 heavy duty diesel engine, vacuum is supplied by the engine-driven vacuum pump and modified by the vacuum regulator valve on the injection distributor pump before reaching the transmission vacuum modulator.

COMPONENT LOCATION

		Page — Figure
EGR Valve Hose Vacuum Source:		
Gasoline Engines	Front of throttle body, port "J" (NA1 Light Duty Emissions); Front of throttle body, port "S" (NA4 Heavy Duty Emissions)	—
LH6 Diesel Engine (Combined EGR Valve/EPR Valve Hose Vacuum Source)	T-fitting in line from vacuum pump, RH rear of engine	—
EGR Valve Solenoid:		
LH6 Diesel Engine	On bracket, LH rear of engine	173 — 26
EGR Valve Vent Solenoid:		
LH6 Diesel Engine	On bracket, LH rear of engine	—
Electronic Vacuum Regulator Valve Solenoid:		
L05/L19 Gasoline Engines	On bracket, inboard side of RH cylinder head	175 — 34
EPR Valve Solenoid:		
LH6 Diesel Engine	On bracket, LH rear of engine	173 — 26
Exhaust Gas Recirculation (EGR) Valve		
L05 V8 Engine	Rear of inlet manifold	171 — 21
L19 V8 Engine	Front of inlet manifold, LH side	171 — 21
LH6 Diesel Engine	In air intake of inlet manifold	173 — 26
Exhaust Pressure Regulator (EPR) Valve:		
LH6 Diesel Engine	Between LH exhaust manifold and exhaust pipe	173 — 26
MAP Sensor:		
Gasoline Engines	On bracket, RH cylinder head	176 — 37
LH6 Diesel Engines	Upper front of cowl, RH side	170 — 18
MAP Sensor Hose Vacuum Source:		
Gasoline Engines	Rear of throttle body, port "F"	176 — 37
LH6 Diesel Engine	Branch fitting at EGR valve hose connection to EGR valve solenoid, LH rear of engine	—
Power Brake Booster Unit	Front of cowl, LH Side	—
Power Brake Hose Vacuum Fitting:		
L05 V8 Gasoline Engine	Front of inlet manifold riser, LH side	—
L19 V8 Gasoline Engine	Rear of inlet manifold riser, RH side	—
Transmission Vacuum Modulator Hose Vacuum Source:		
Gasoline Engines	On rear of inlet manifold	—
LL4 Diesel Engine	T-fitting in line from vacuum pump, RH rear of engine	—
Transmission Vacuum Modulator (MX1 three-speed automatic transmission)	RH side of transmission case, just above transmission oil pan flange	—

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

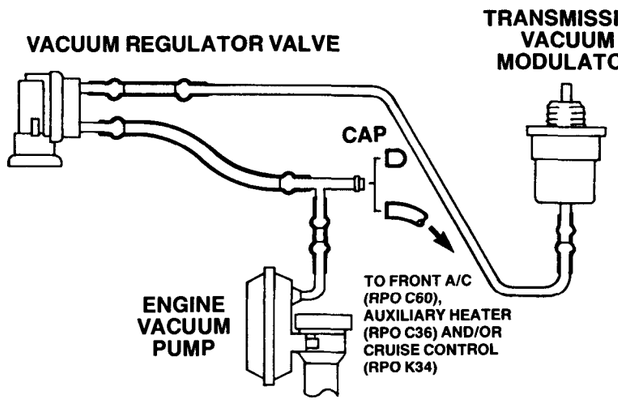
A leak in the EGR (exhaust gas recirculation) vacuum system can upset the ECM's programmed control of exhaust gas recirculation and adversely affect engine operation. Too much exhaust gas recirculation at idle or cruise with a gasoline engine can result in the engine stalling after closed throttle deceleration, 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."

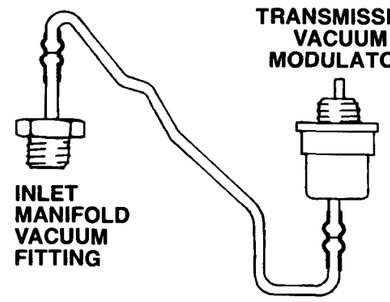
TRANSMISSION VACUUM MODULATOR VACUUM SYSTEM

A leak in the vacuum system for the transmission vacuum modulator of the MX1 three speed automatic transmission can cause high line pressure in the transmission hydraulic control system, a condition that can result in a variety of upshift problems ranging from delayed upshifts to no 1-2 or 2-3 shifts. An improper engine speed signal from the vacuum system of the LH6 diesel engine can result in early, soft or slipping shifts or no part-throttle downshifts as well as the symptoms mentioned in the previous sentence.

The conditions described here may be caused by a vacuum system problem. However, mechanical or hydraulic conditions also might cause the same problems. Therefore, it is advisable to follow diagnosis procedures that check out all possibilities in a systematic order, not just a check for a malfunctioning vacuum component. For effective diagnosis procedures, refer to the R/V, G and P Truck Service Manual, Section 7A2.

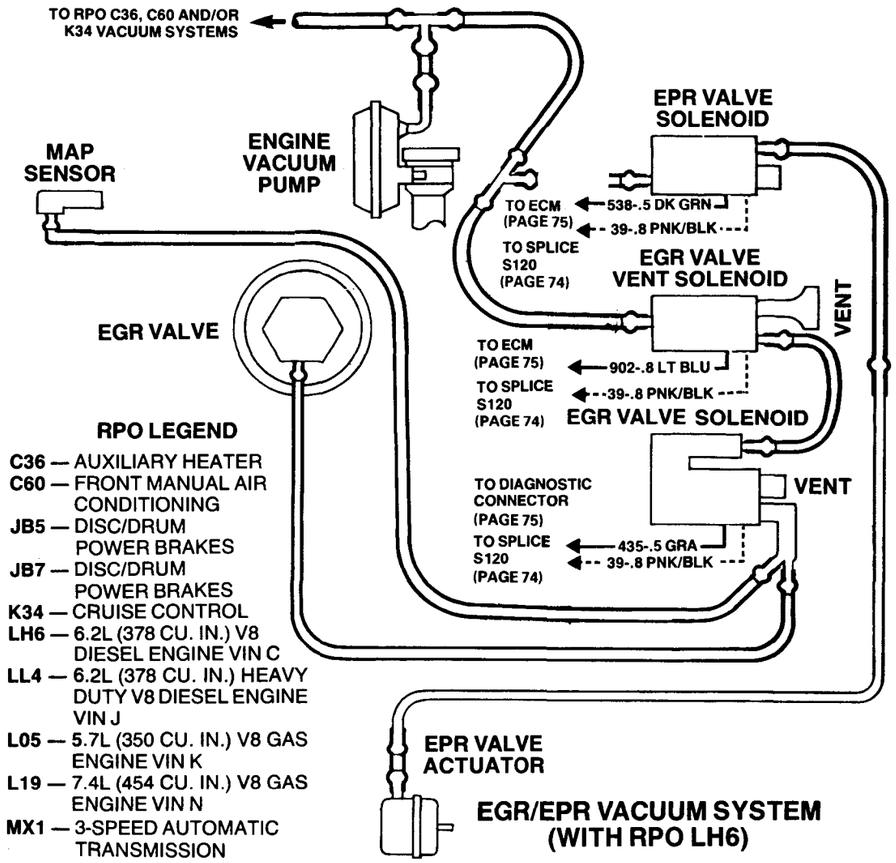


TRANSMISSION VACUUM MODULATOR SYSTEM WITH DIESEL ENGINE (RPO LL4)



TRANSMISSION VACUUM MODULATOR SYSTEM WITH GAS ENGINES (RPO L05 AND L19)

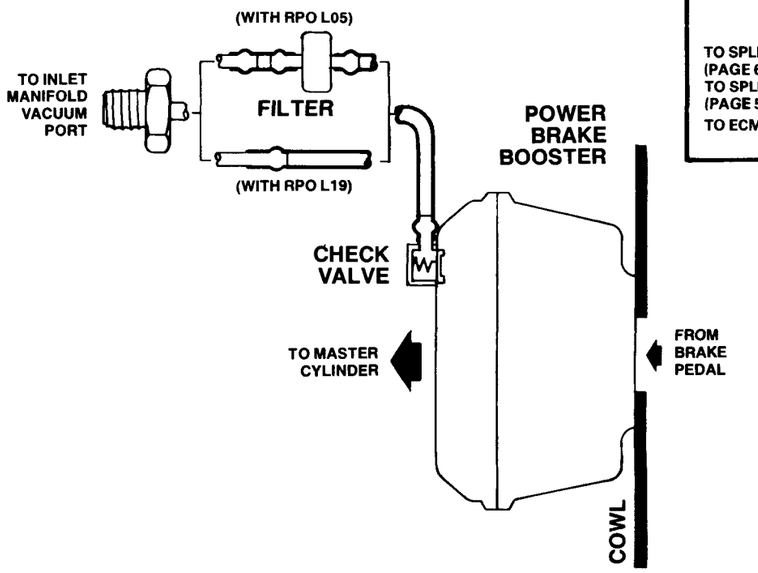
TRANSMISSION VACUUM MODULATOR SYSTEM (WITH RPO MX1)



RPO LEGEND

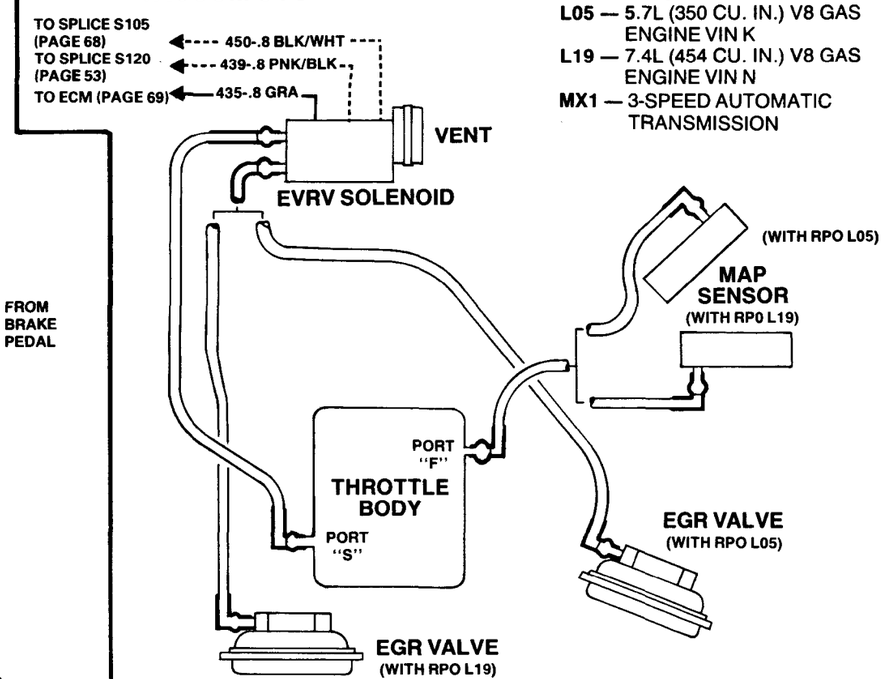
- **C36** — AUXILIARY HEATER
- **C60** — FRONT MANUAL AIR CONDITIONING
- **JB5** — DISC/DRUM POWER BRAKES
- **JB7** — DISC/DRUM POWER BRAKES
- **K34** — CRUISE CONTROL
- **LH6** — 6.2L (378 CU. IN.) V8 DIESEL ENGINE VIN C
- **LL4** — 6.2L (378 CU. IN.) HEAVY DUTY V8 DIESEL ENGINE VIN J
- **L05** — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
- **L19** — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
- **MX1** — 3-SPEED AUTOMATIC TRANSMISSION

EGR/EPR VACUUM SYSTEM (WITH RPO LH6)

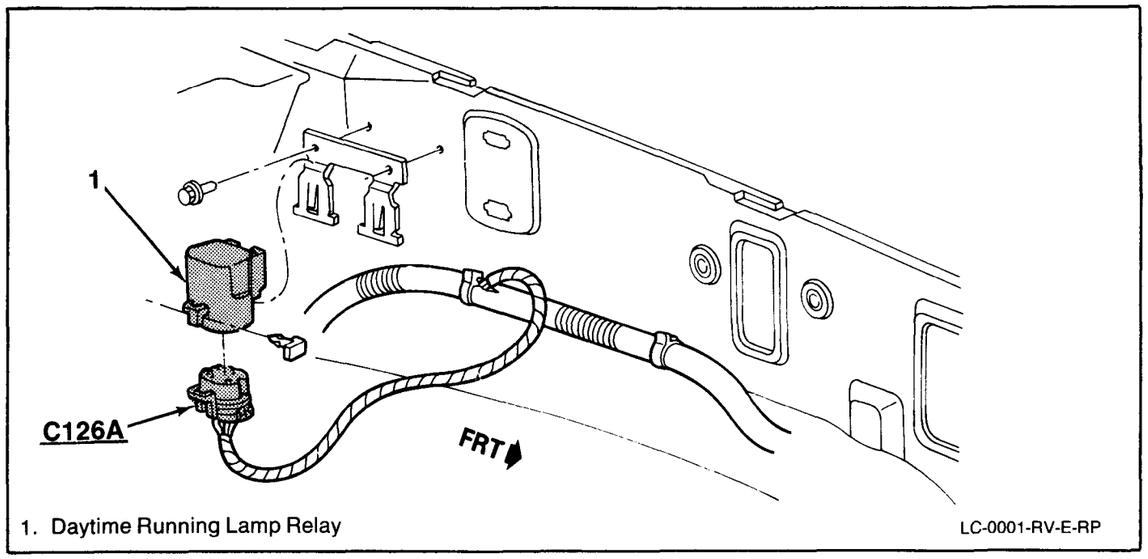


POWER BRAKE BOOSTER VACUUM SYSTEM (WITH RPO JB5 OR JB7)

EXHAUST GAS RECIRCULATION VACUUM SYSTEM



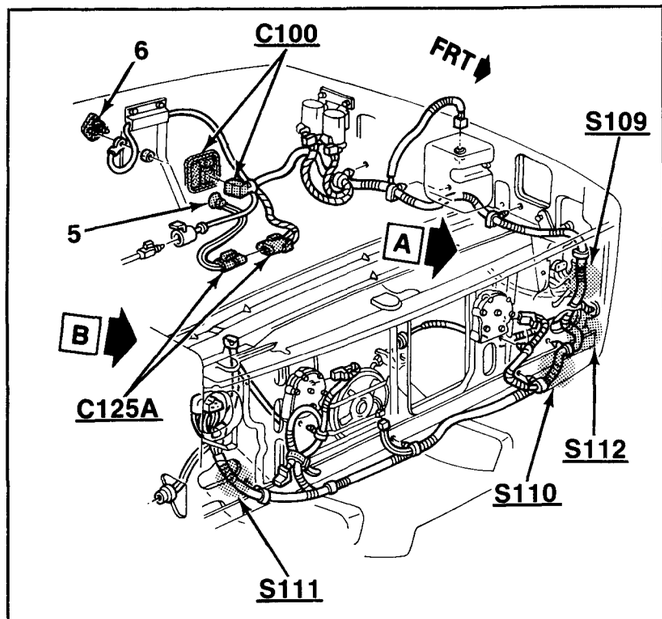
EGR VALVE VACUUM SYSTEM (WITH RPO L05 AND L19)

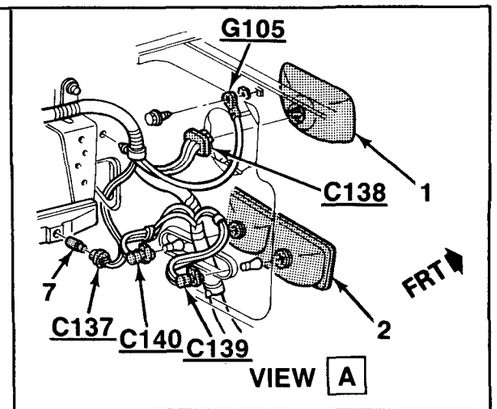


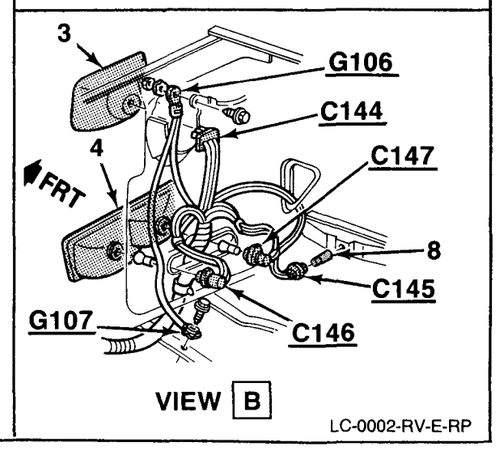
1. Daytime Running Lamp Relay

LC-0001-RV-E-RP

Figure 1 - Daytime Running Lamps Relay (Canada Only)



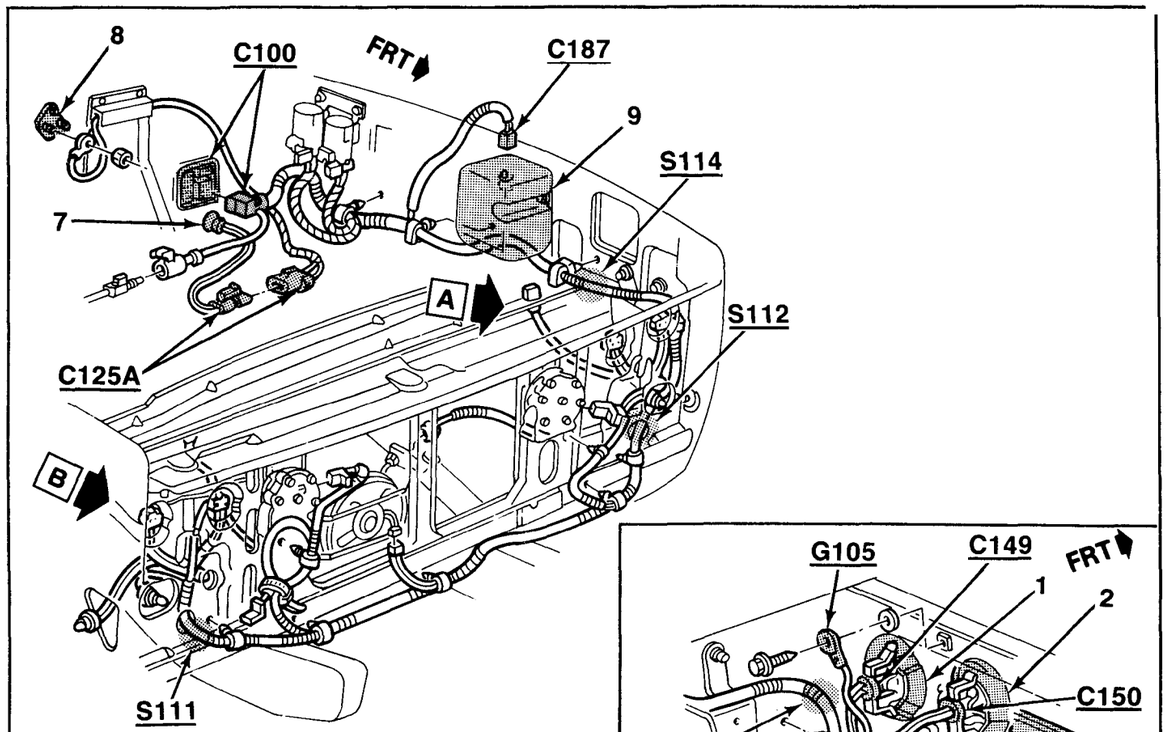


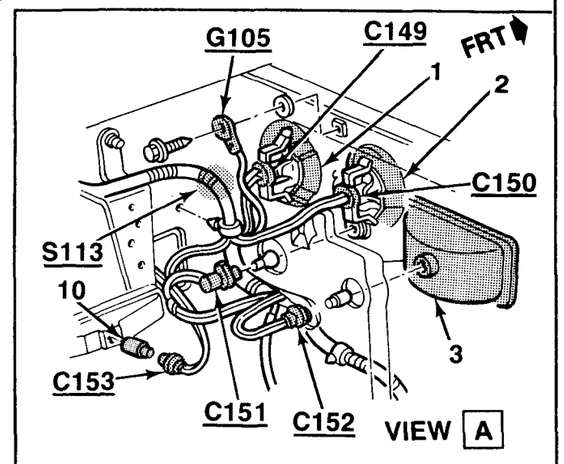


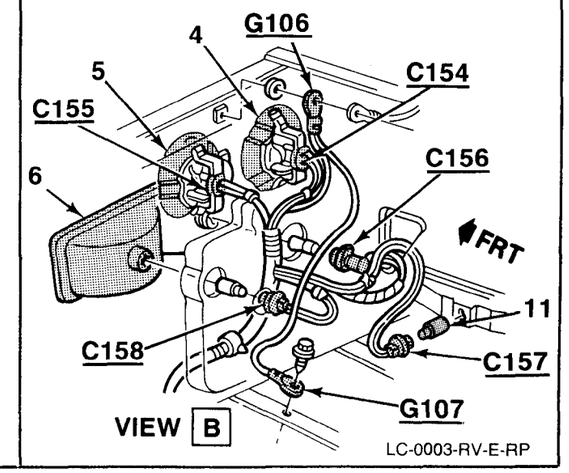
1. LH High-Low Headlamp
2. LH Park and Directional Lamp
3. RH High-Low Headlamp
4. RH Park and Directional Lamp
5. Grommet 105
6. Junction Block
7. LH Front Side Marker Lamp
8. RH Front Side Marker Lamp

LC-0002-RV-E-RP

Figure 2 - Front Headlamps-Base







1. LH High-Low Headlamp
2. LH High Beam Headlamp
3. LH Park and Directional Lamp
4. RH High-Low Headlamp
5. RH High Beam Headlamp
6. RH Park and Directional Lamp
7. Grommet 105
8. Junction Block
9. Windshield Washer Motor
10. LH Front Side Marker Lamp
11. RH Front Side Marker Lamp

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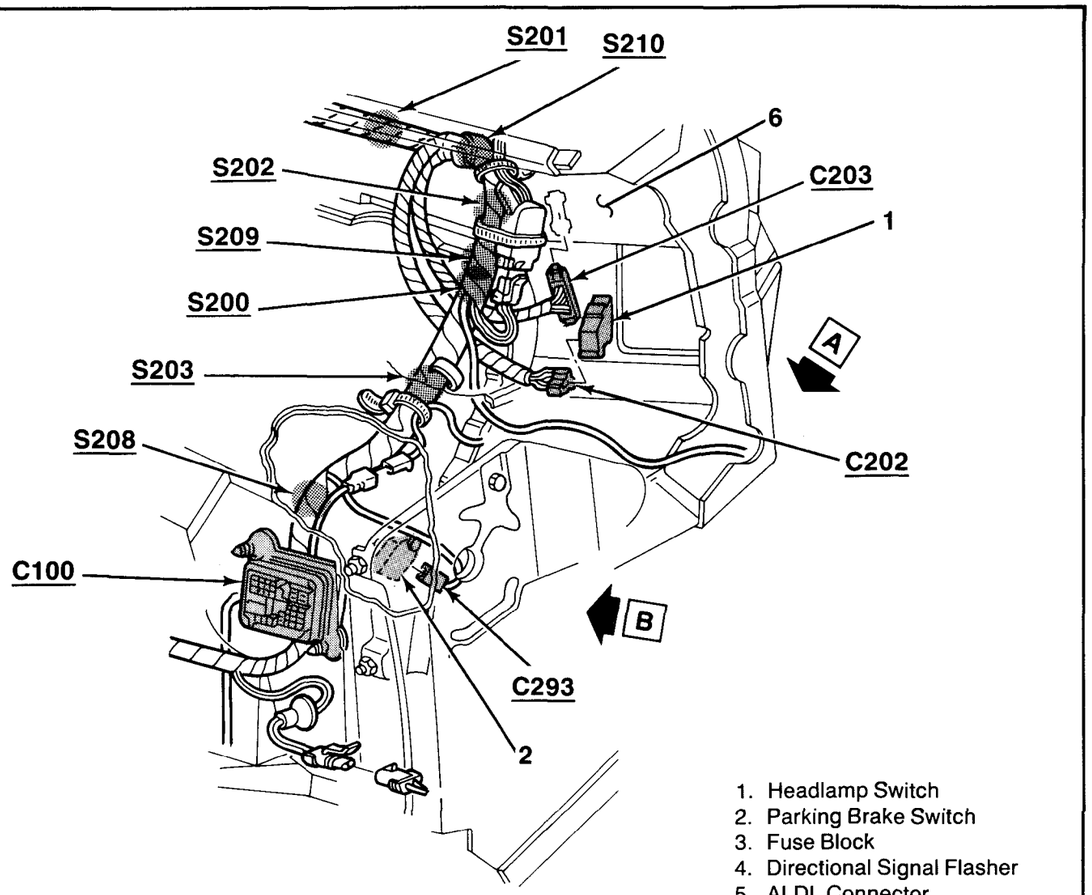
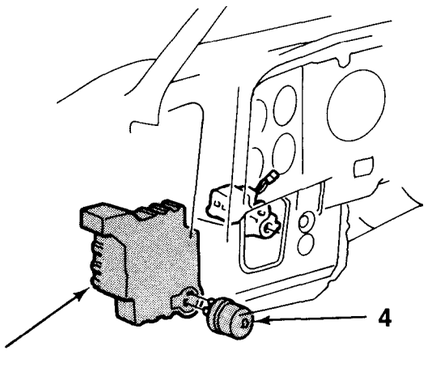
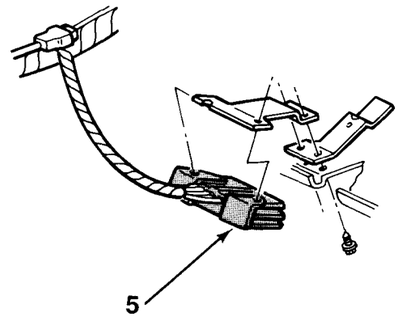
Figure 3 - Front Headlamps-Dual Headlamps RPO V22



1. Headlamp Switch
2. Parking Brake Switch
3. Fuse Block
4. Directional Signal Flasher
5. ALDL Connector
6. I/P Cluster



VIEW A



VIEW B

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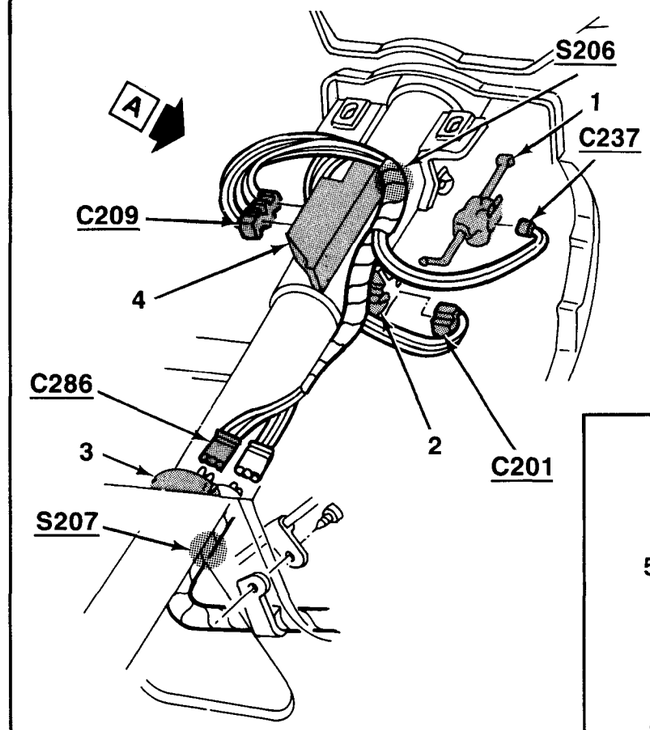
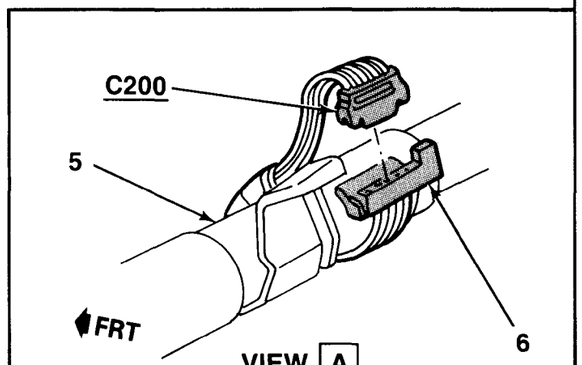
Figure 4 - Headlamp Switch and Fuse Block

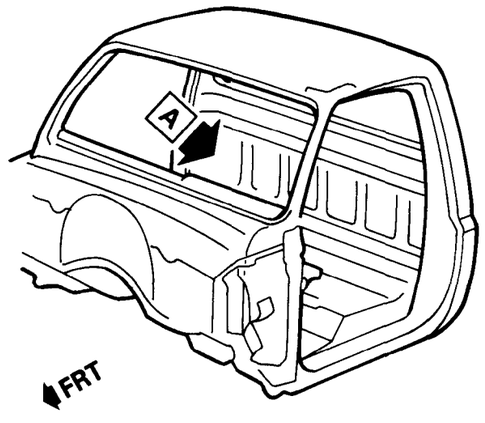


1. Clutch Switch
2. Dimmer Switch
3. Backup Lamp Switch
4. Ignition Switch
5. Steering Column
6. Directional Signal Switch



VIEW A

Figure 5 - Dimmer Switch



1. Busbar Ground

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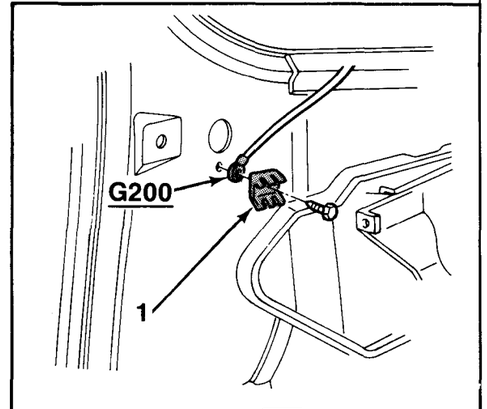

VIEW A

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Figure 6 - I/P Ground

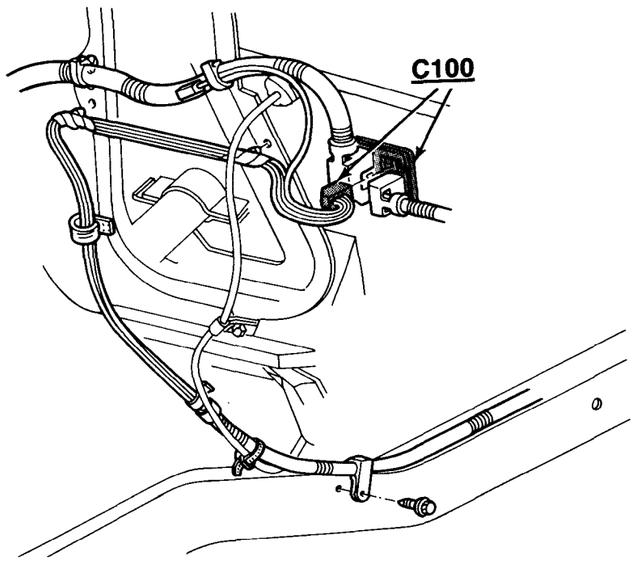


Figure 7 - Rear Lamps Wiring Extension Harness

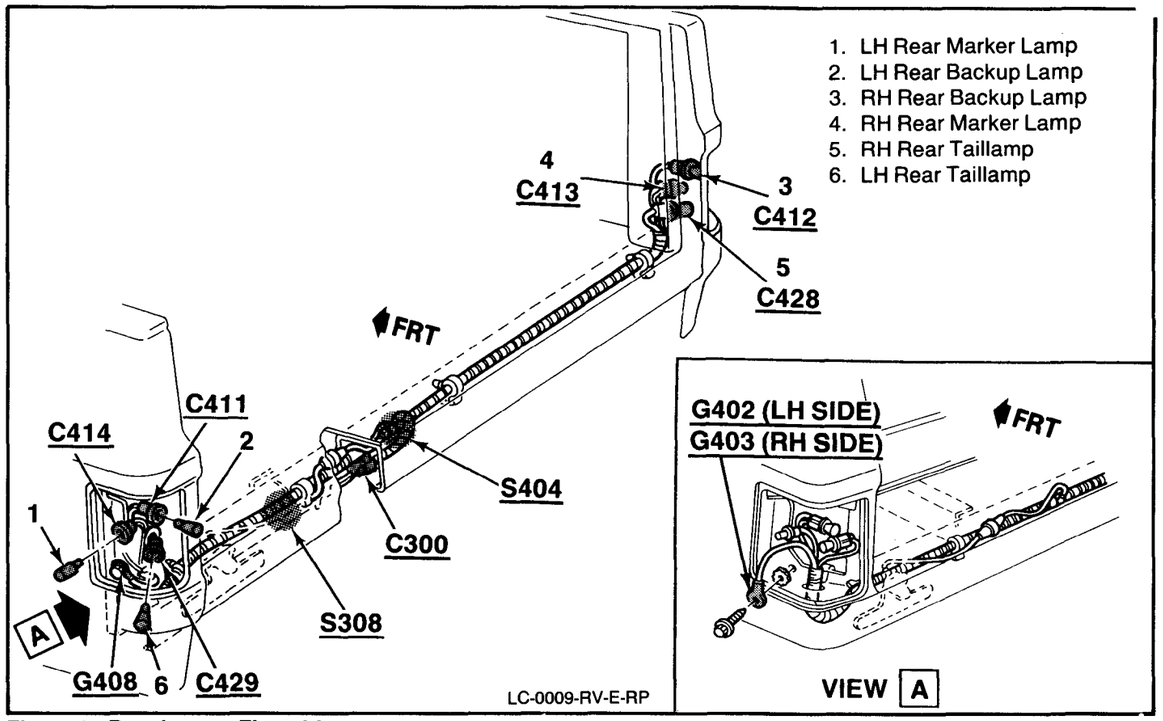


Figure 9 - Rear Lamps-Fleetside

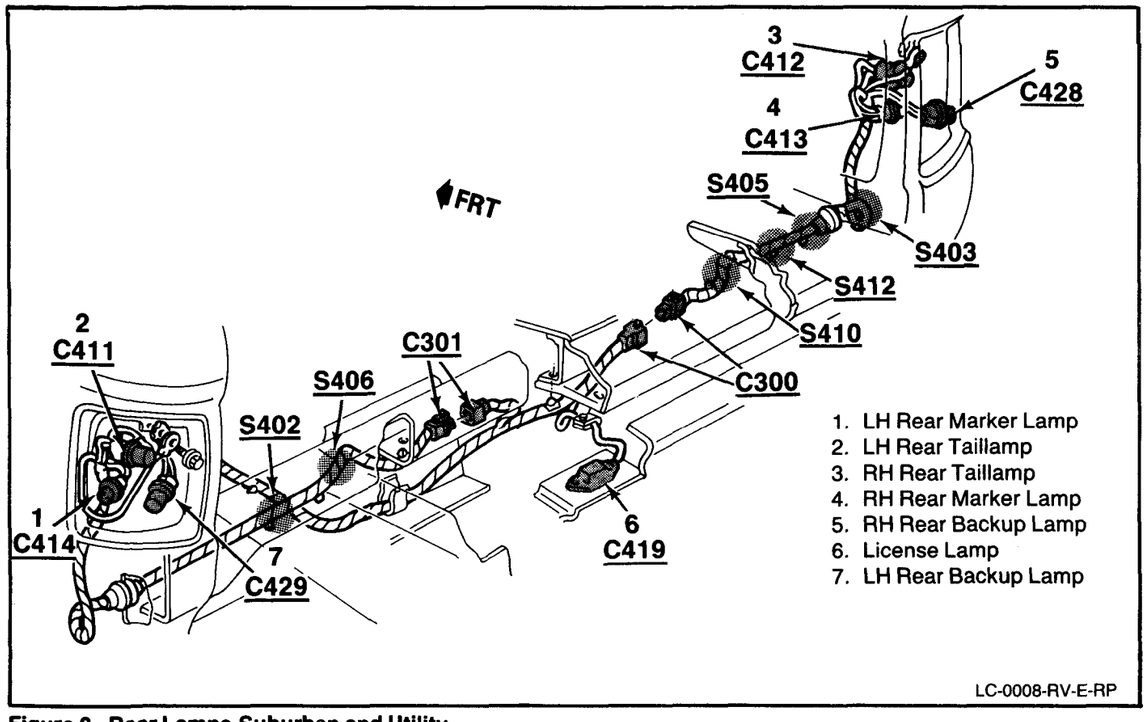


Figure 8 - Rear Lamps-Suburban and Utility

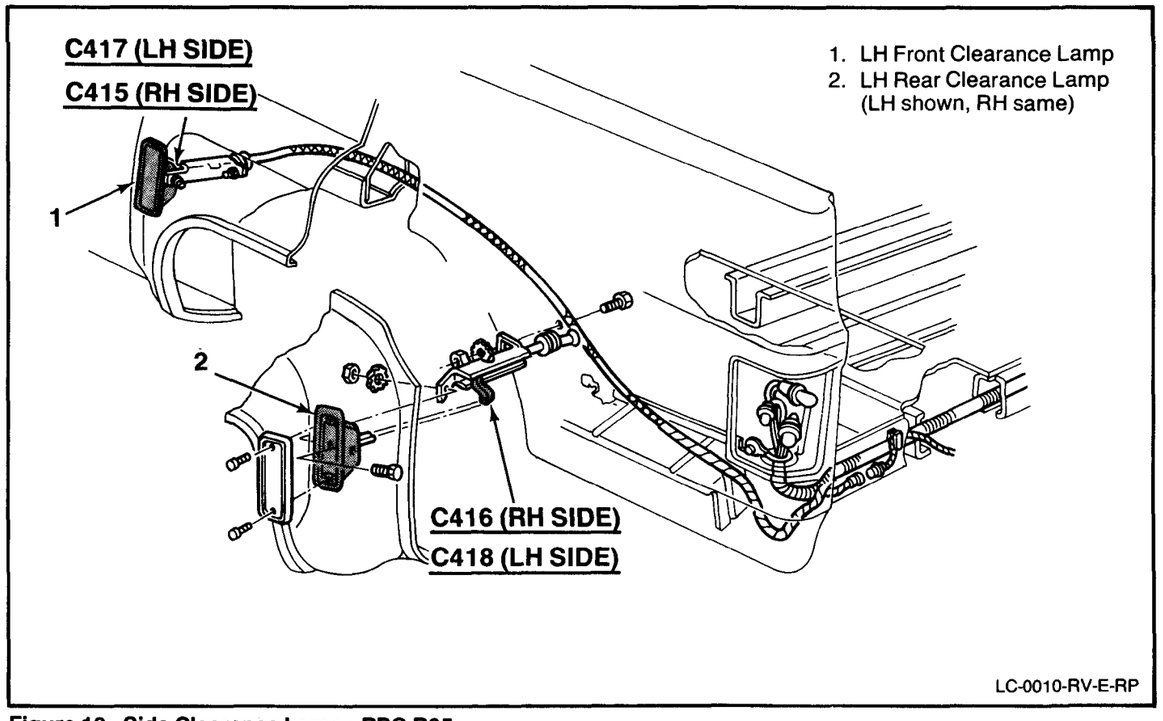


Figure 10 - Side Clearance Lamps-RPO R05

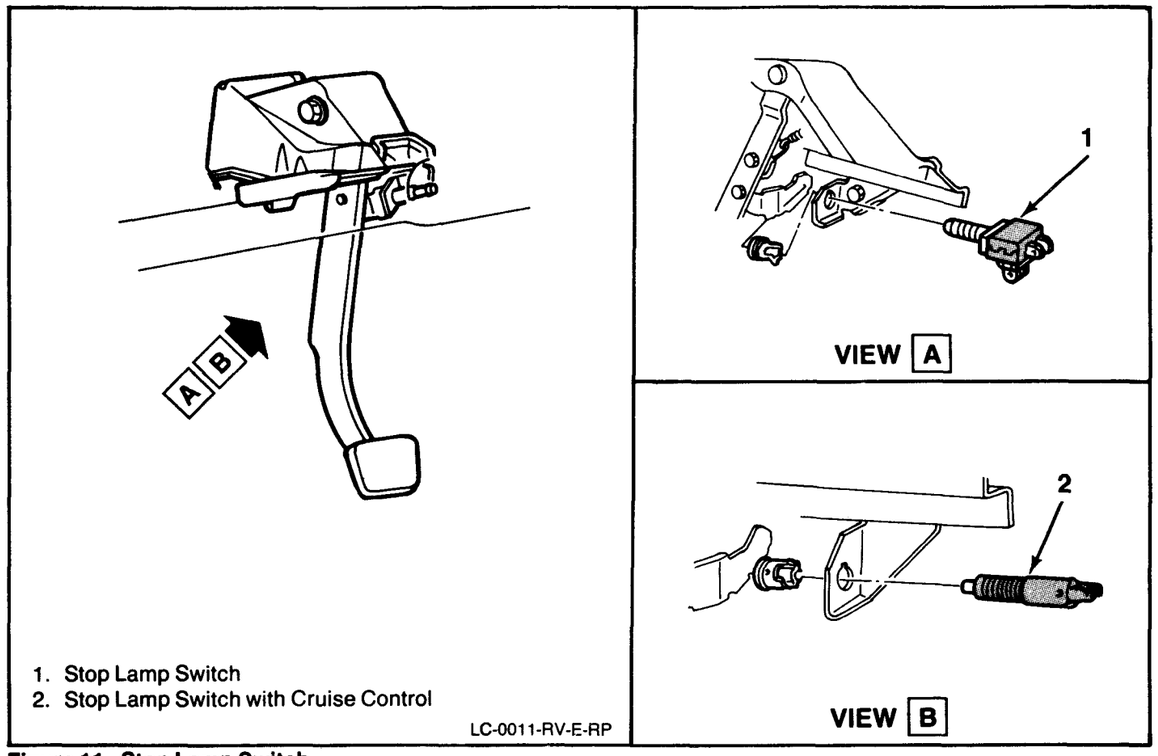


Figure 11 - Stop Lamp Switch

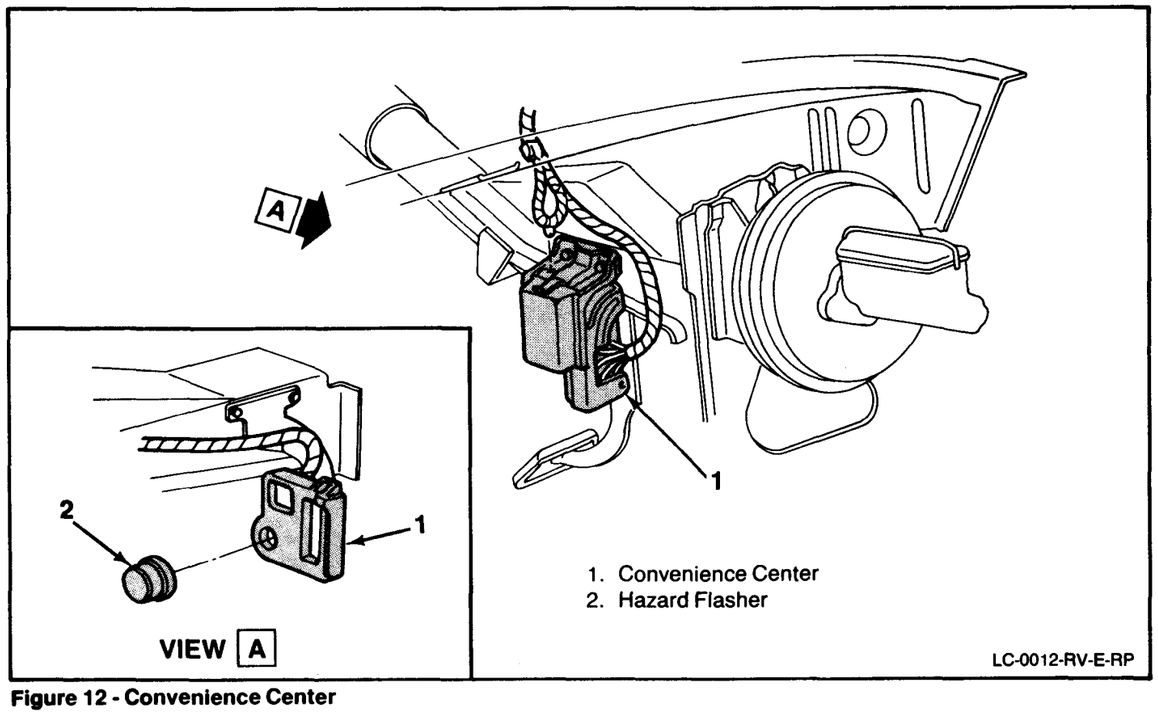


Figure 12 - Convenience Center

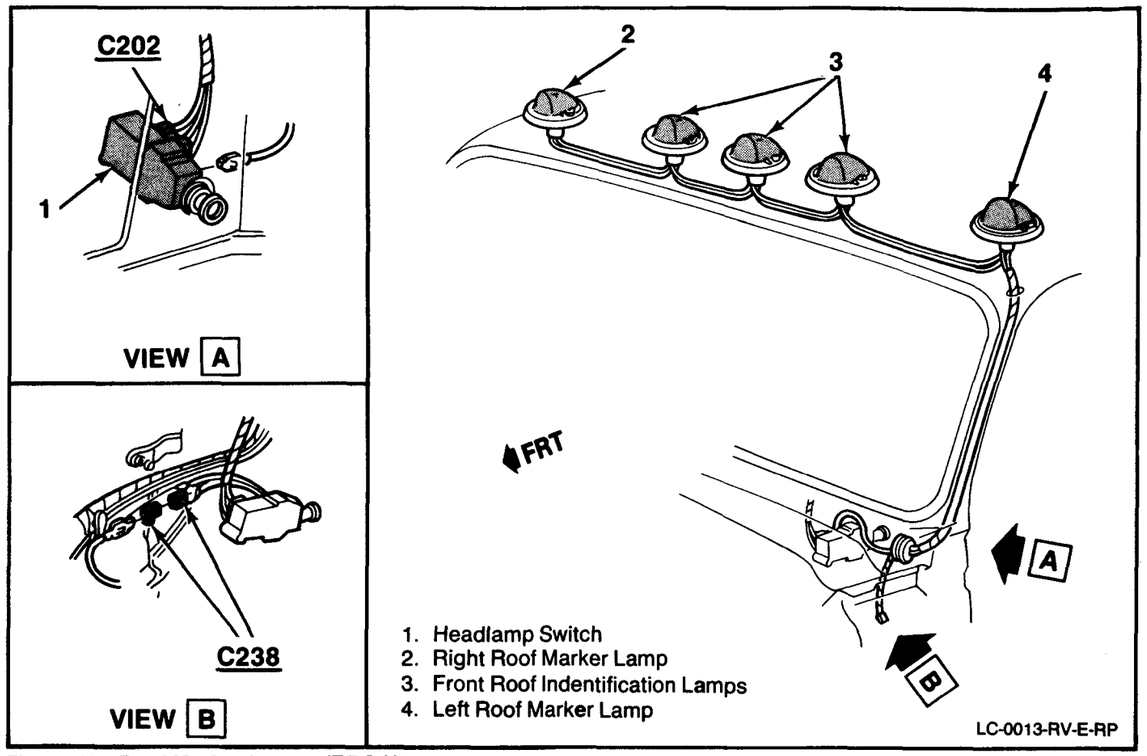


Figure 13 - Roof Marker Lamps (RPO U01)

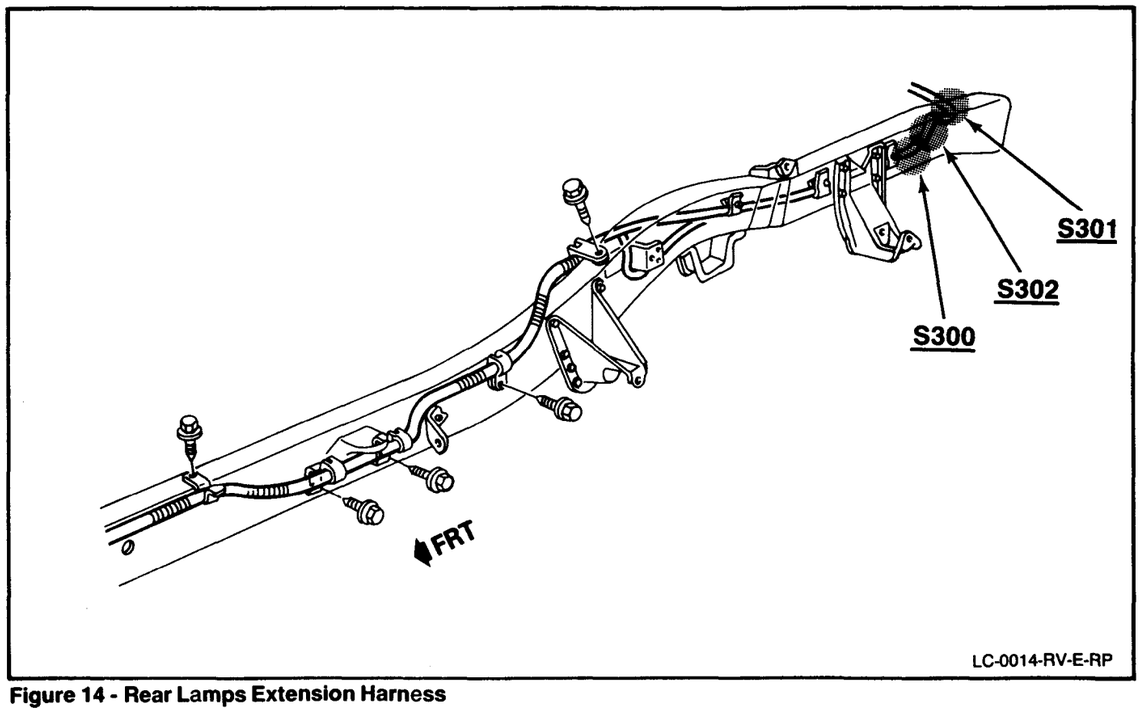
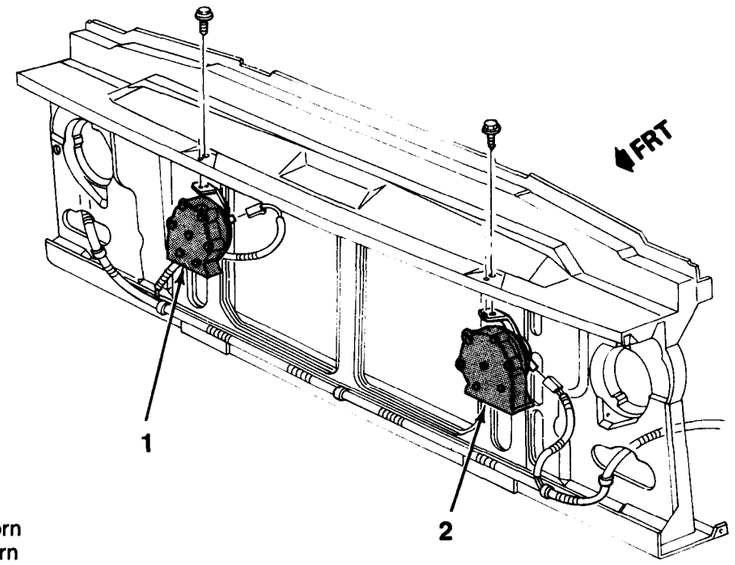


Figure 14 - Rear Lamps Extension Harness



1. RH Horn
2. LH Horn

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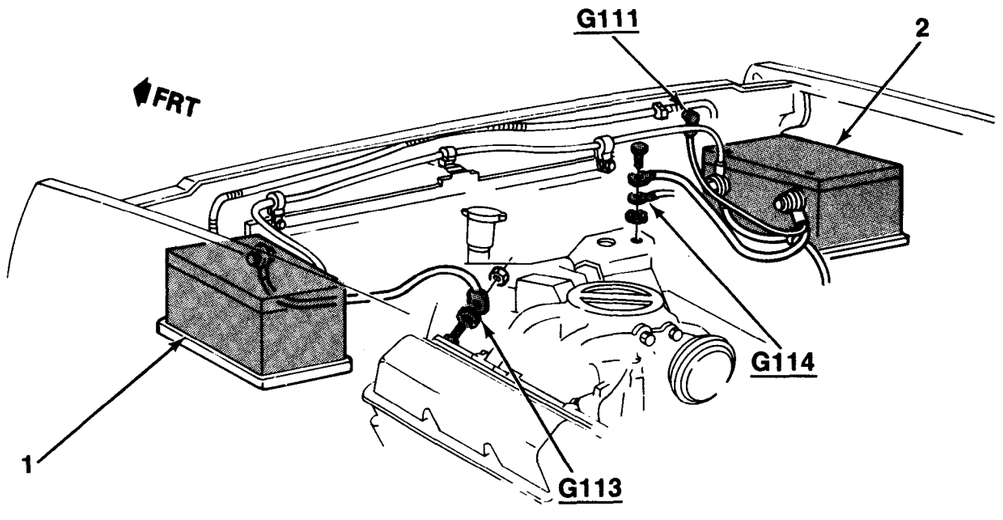
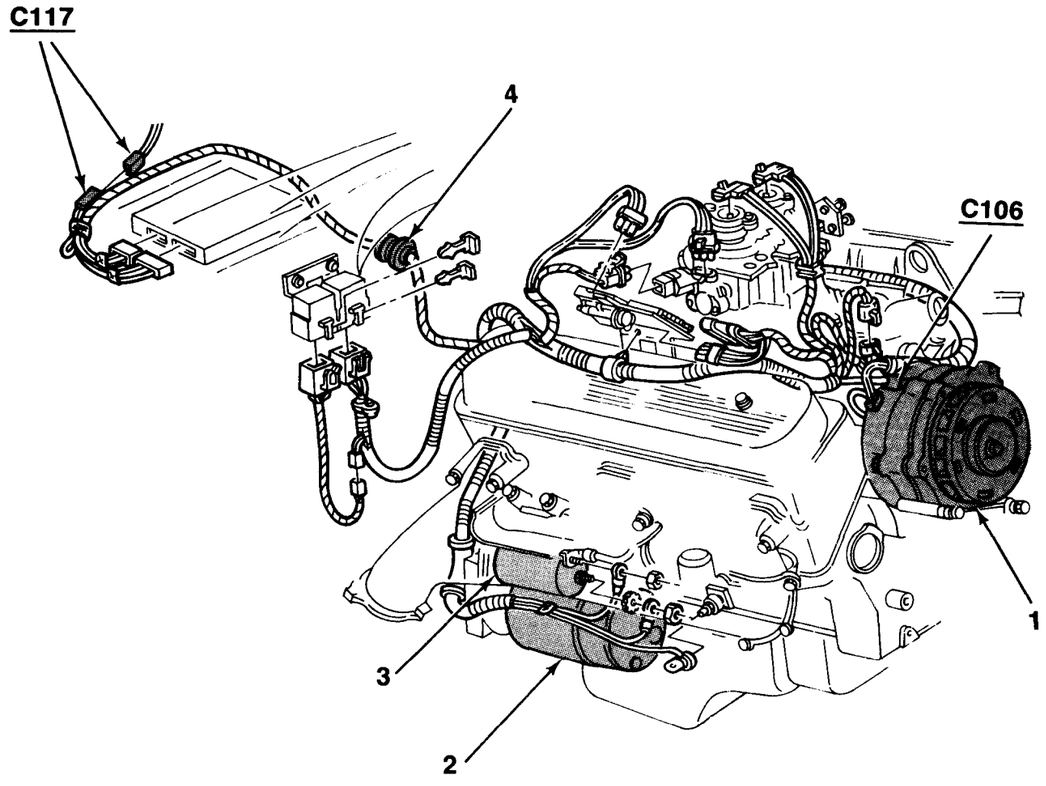
Figure 15 - Horn Assemblies



1. LH Battery
2. RH Battery

LC-0016-RV-E-RP

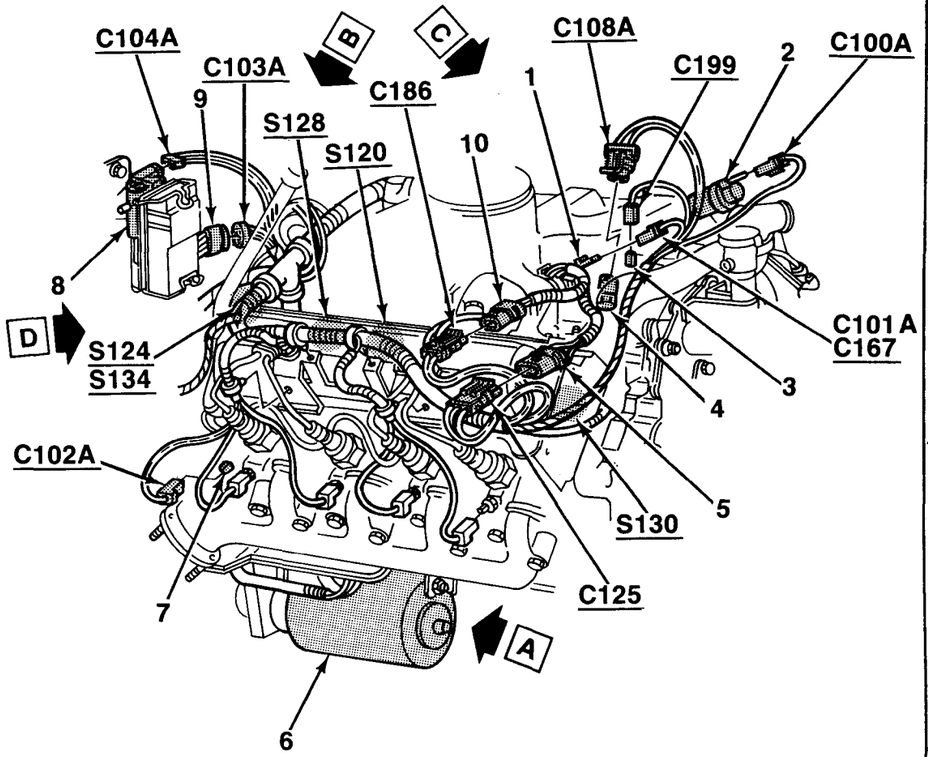
Figure 16 - Batteries — RPO LH6 and LL4



1. Generator
2. Starter Motor
3. Starter Motor Solenoid
4. Grommet 100

LC-0017-RV-E-RP

Figure 17 - Generator and Starter Motor — RPO L05 and L19



1. Cold Advance Control Solenoid
2. Fast Idle Solenoid
3. Fuel Shut Off Solenoid
4. Coolant Temperature Switch
5. Throttle Position Sensor
6. Starter Motor
7. Cold Advance/Fast Idle Temperature Switch
8. Fuel Heater
9. Water in Fuel Sensor
10. Transmission Kickdown Switch
11. Generator
12. Starter Motor Solenoid
13. Engine Speed Sensor
14. Manifold Absolute Pressure Sensor

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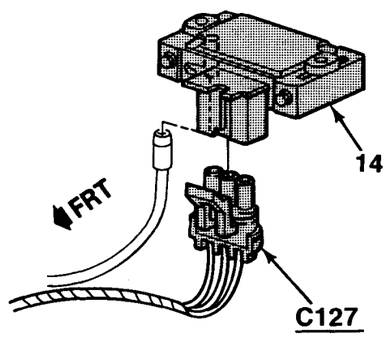
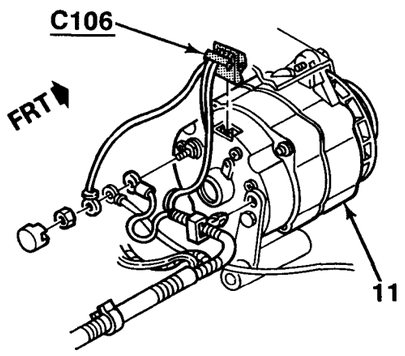
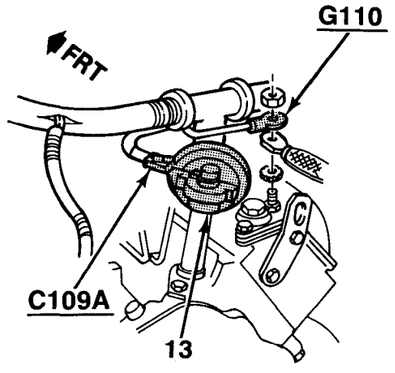


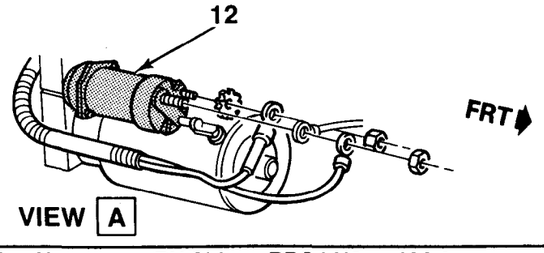
VIEW B



VIEW C

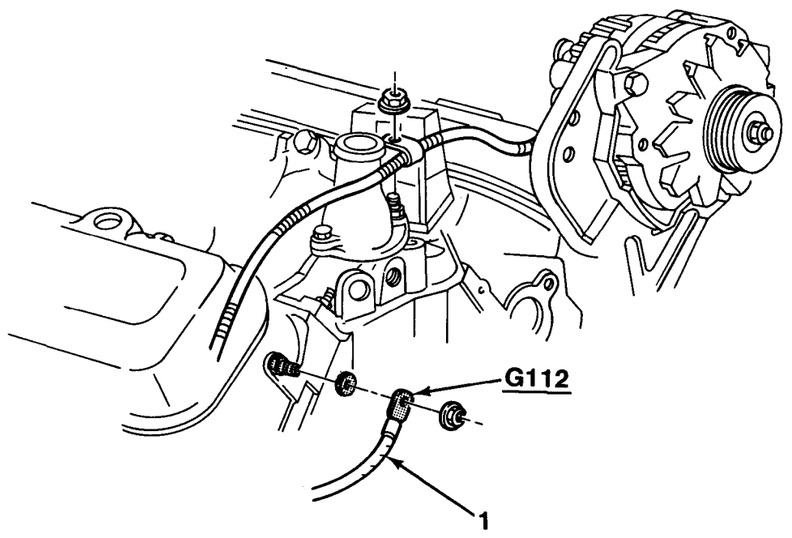


VIEW D



VIEW A

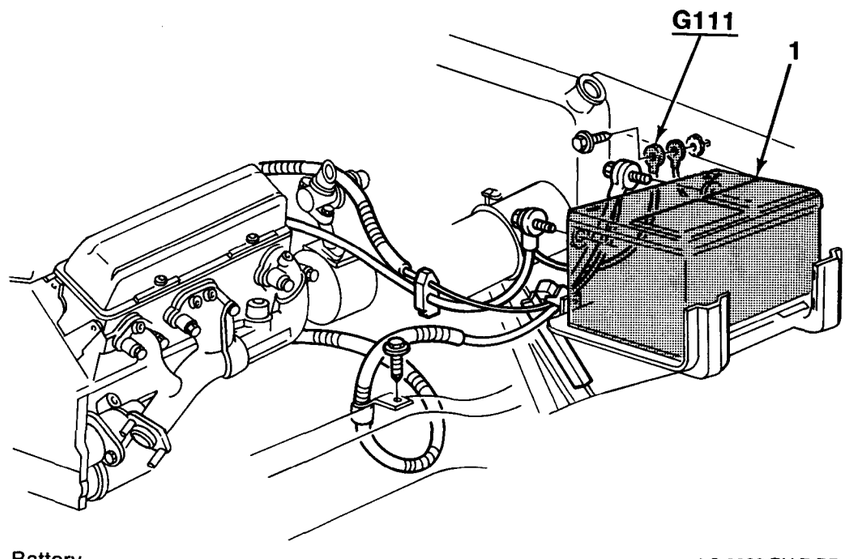
Figure 18 - Engine Wiring Harness — RH Side — RPO LH6 and LL4



1. Negative Battery Cable

LC-0019-RV-E-RP

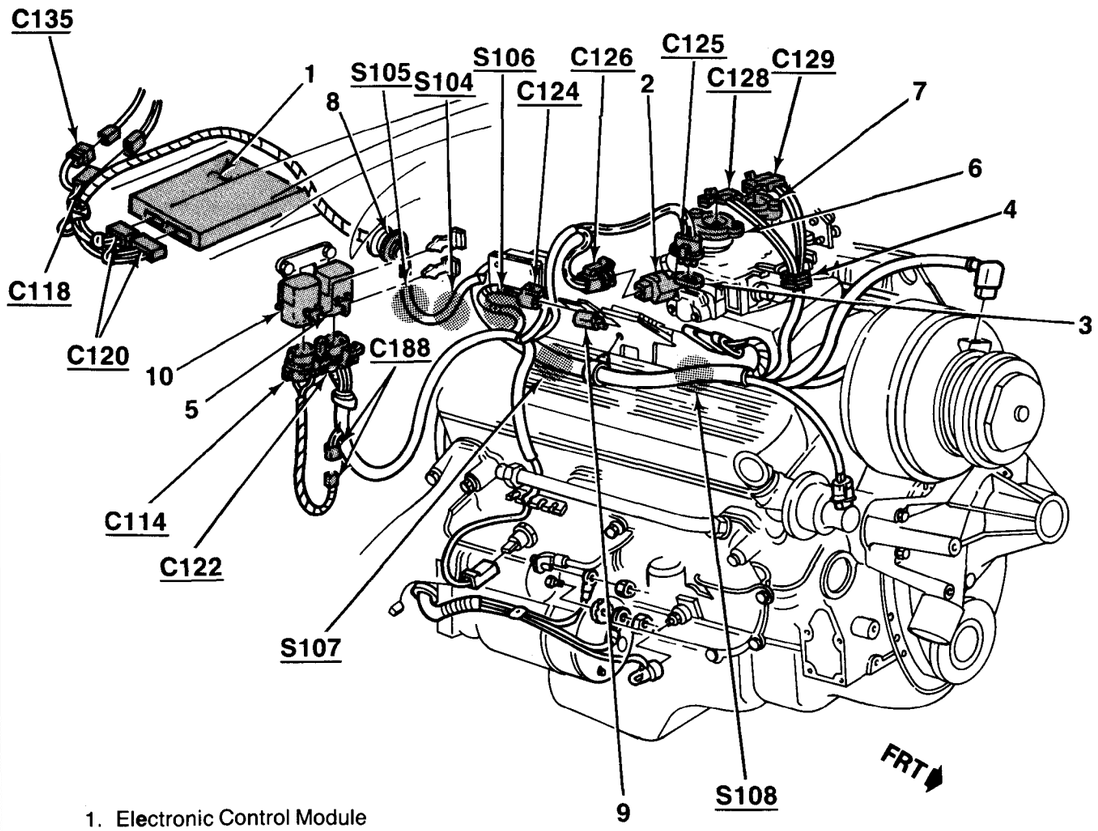
Figure 19 - Battery to Engine Ground — RPO L05 and L19



1. Battery

LC-0020-RV-E-RP

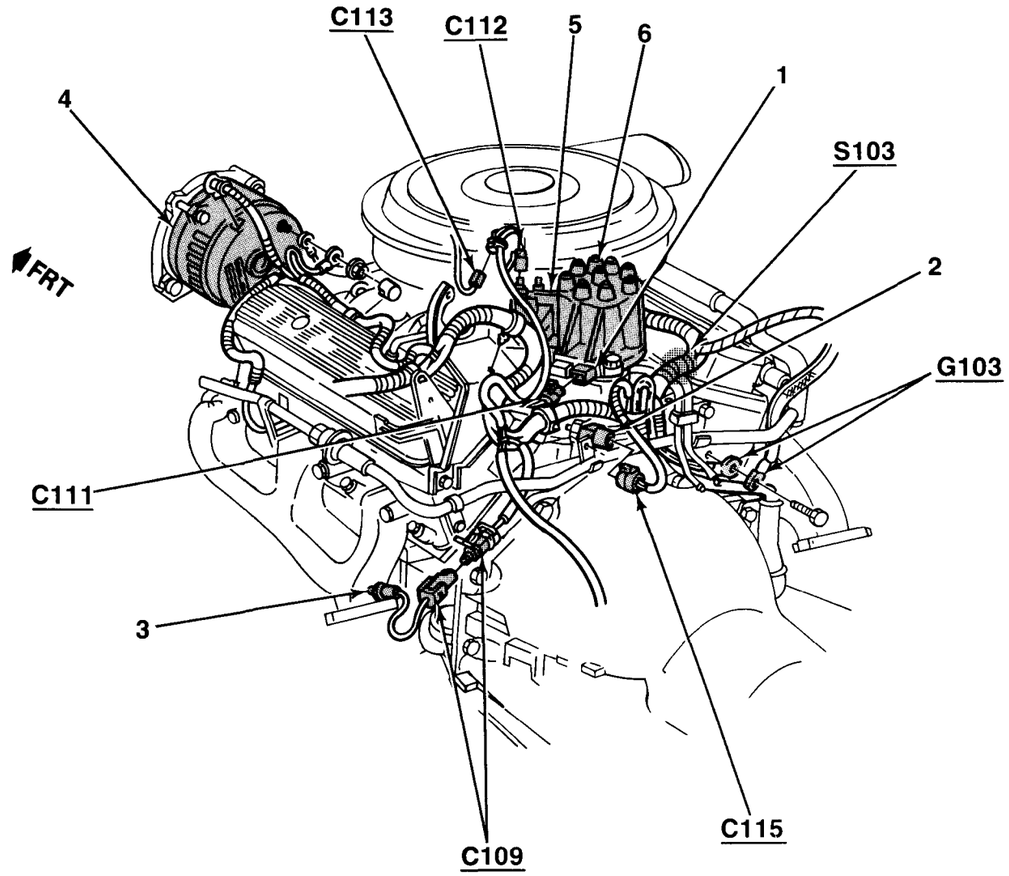
Figure 20 - Battery — RPO L05 and L19



1. Electronic Control Module
2. Idle Air Control Actuator
3. Throttle Position Sensor
4. Grommet 101
5. Fuel Pump Relay
6. Fule Injector 1
7. Fuel Injector 2
8. Grommet 100
9. EGR Solenoid
10. Transmission Kickdown Relay

LC-0021-RV-E-RP

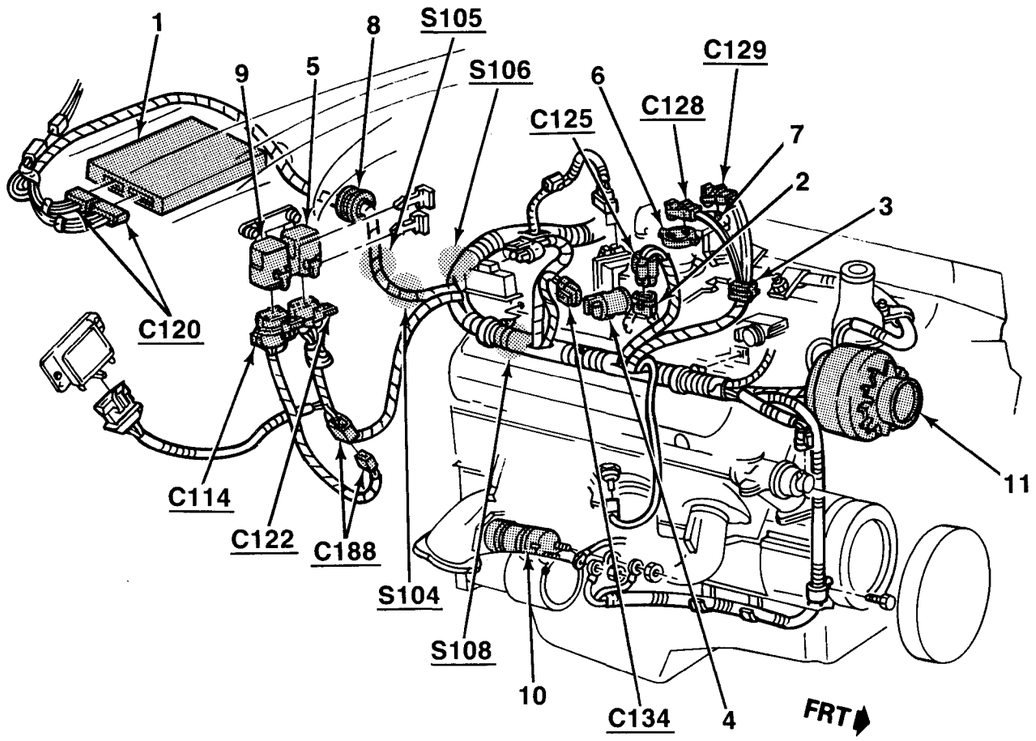
Figure 21 - Engine Wiring, Right Side — RPO L05



1. Electronic Spark Timing Module
2. Fuel Pump Oil Pressure Switch
3. Oxygen Sensor
4. Generator
5. Coil
6. Distributor

LC-0022-RV-E-RP

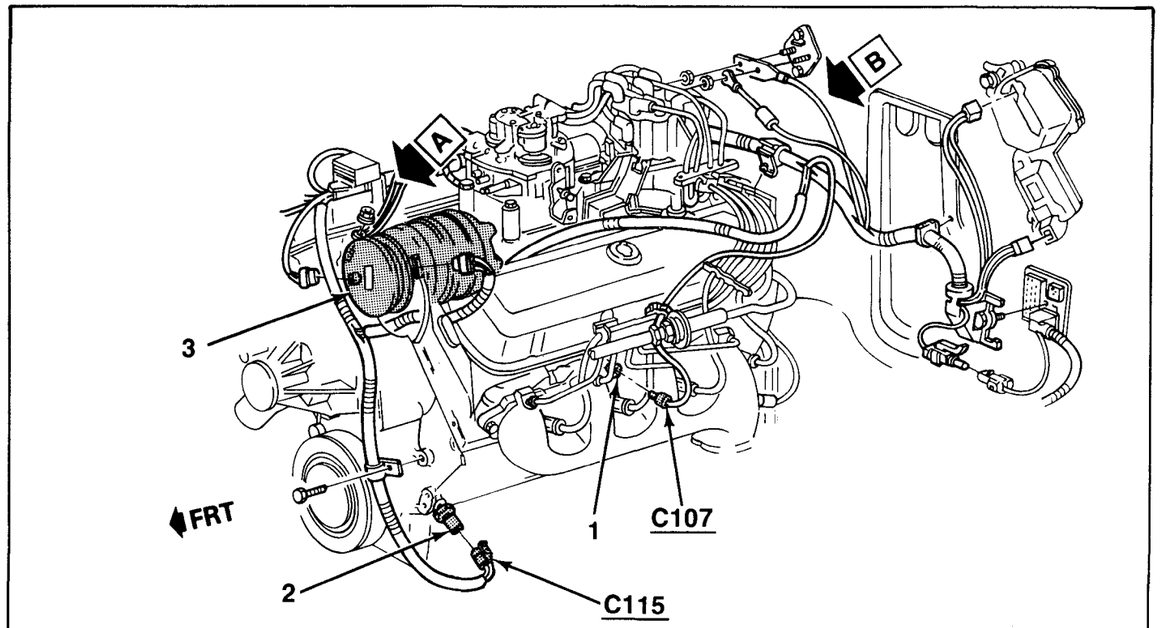
Figure 22 - Engine Wiring, Rear Left Side — RPO L05 (Suburban/Utility)

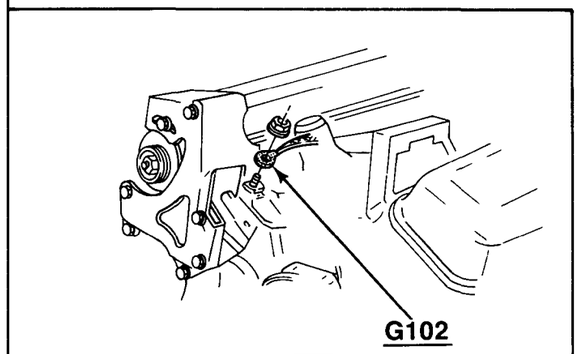


1. Electronic Control Module
2. Throttle Position Sensor
3. Grommet 101
4. Idle Air Control Actuator
5. Fuel Pump Relay
6. Fuel Injector 1
7. Fuel Injector 2
8. Grommet 100
9. Transmission Kickdown Relay
10. Starter Motor Solenoid
11. Generator

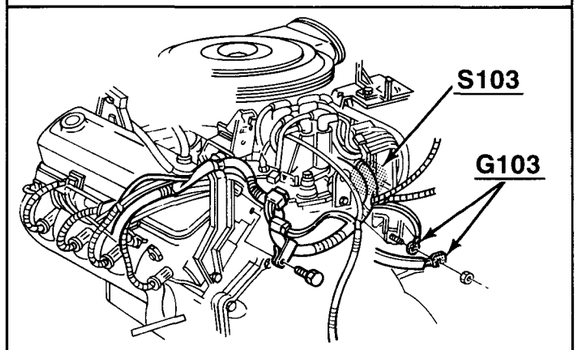
LC-0023-RV-E-RP

Figure 23 - Engine Wiring, Right Side — RPO L19





VIEW A



VIEW B

1. Coolant Temperature Sender
2. Fuel Pump Oil Pressure Switch
3. Generator

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Figure 24 - Engine Wiring, Rear Left Side — RPO L19 (Fleetside)

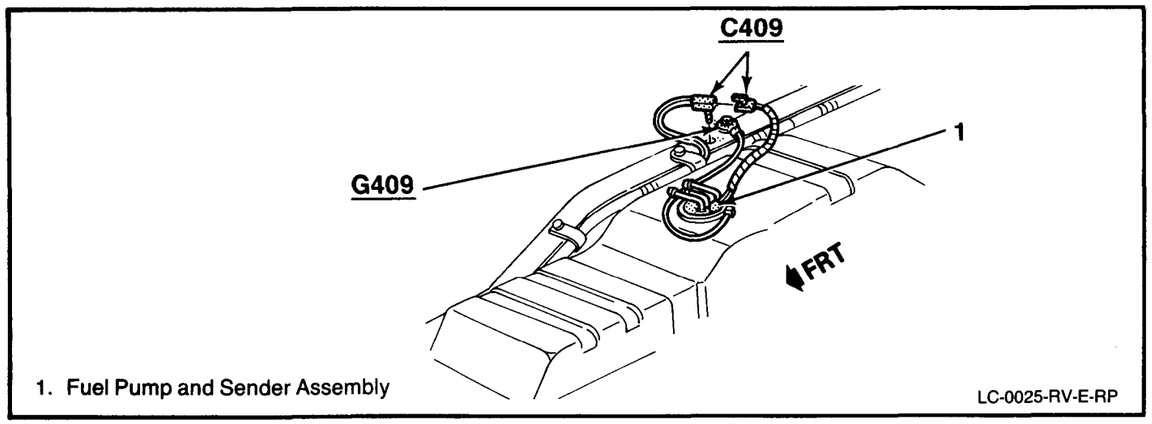


Figure 25 - Fuel Pump and Sender Assembly

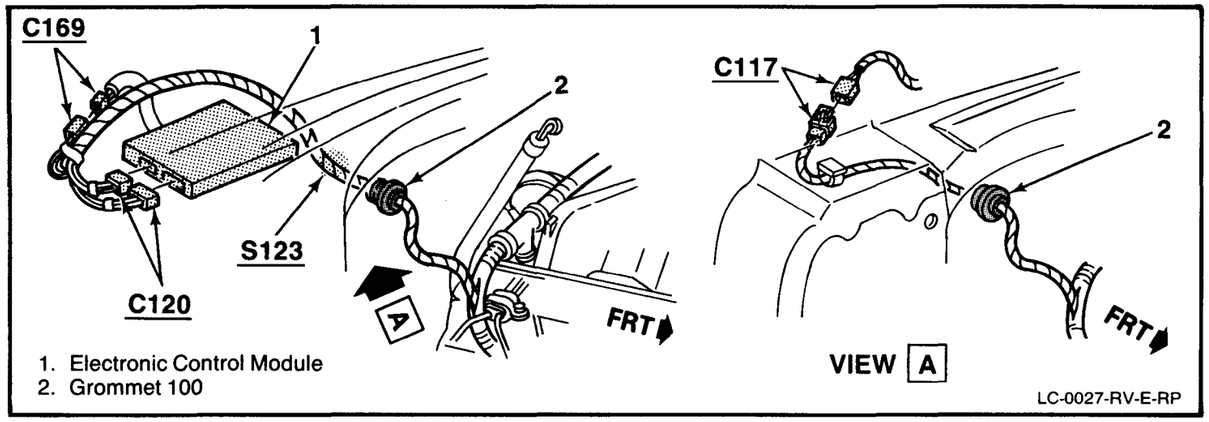


Figure 27 - Electronic Control Module — Diesel

1. EPR Valve
2. EGR Valve
3. EGR Dump Valve
4. Glow Plugs
5. Coolant Temperature Sender
6. Glow Plug Controller
7. Oil Pressure Sensor
8. Cold Advance Glow Plug Inhibit Relay

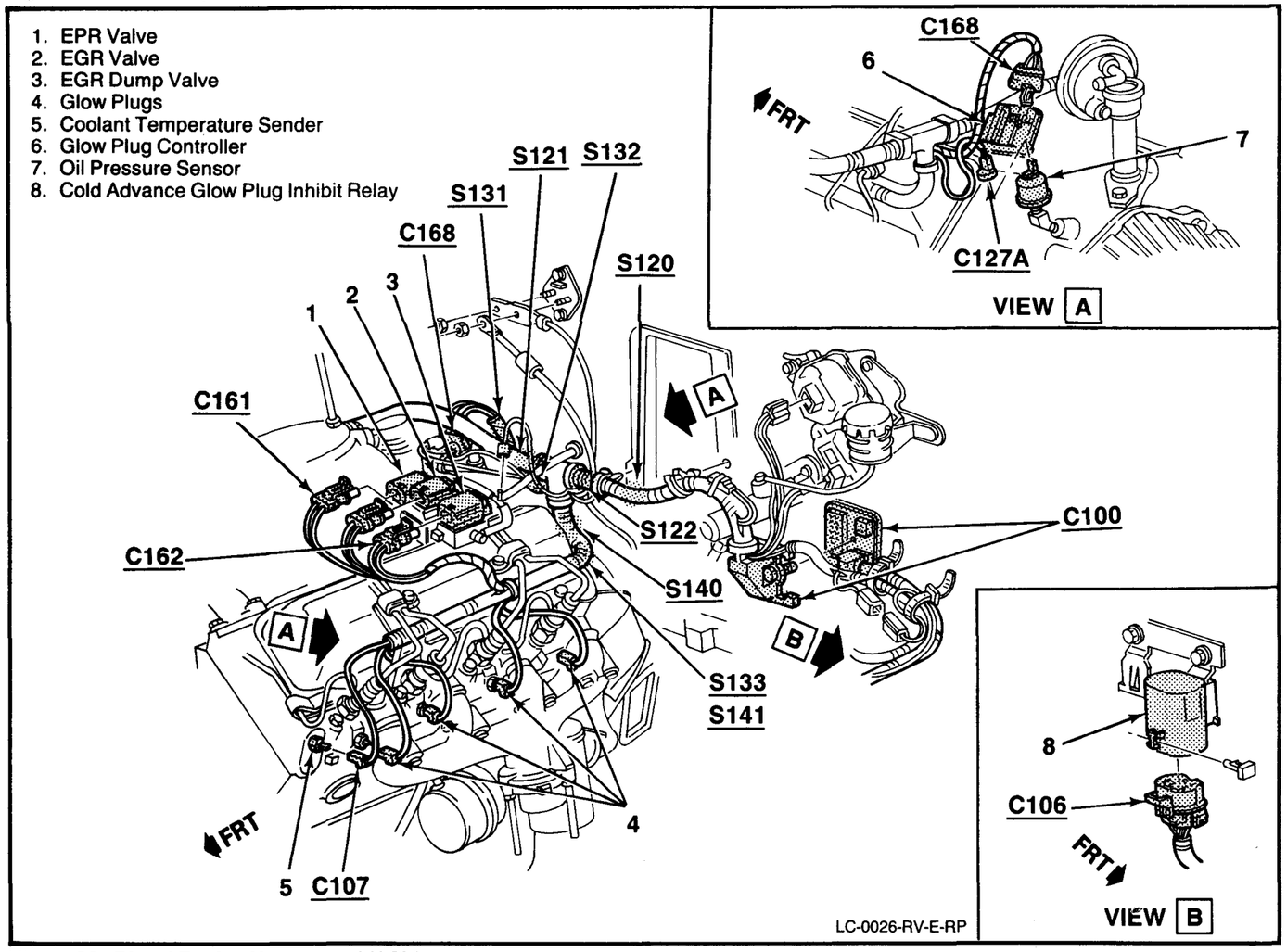


Figure 26 - Diesel Engine Harness — LH Side

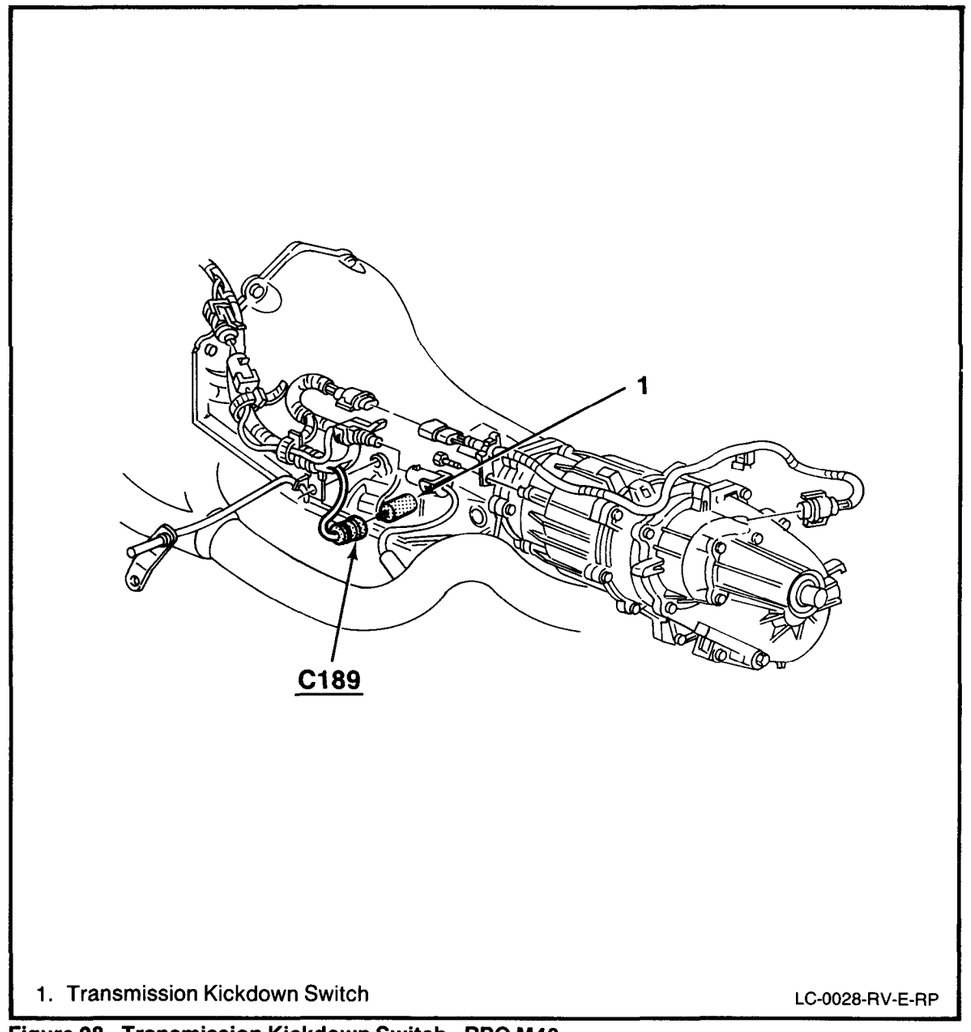
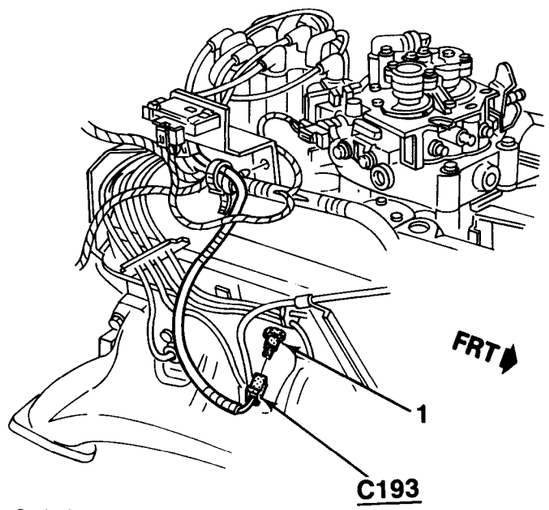


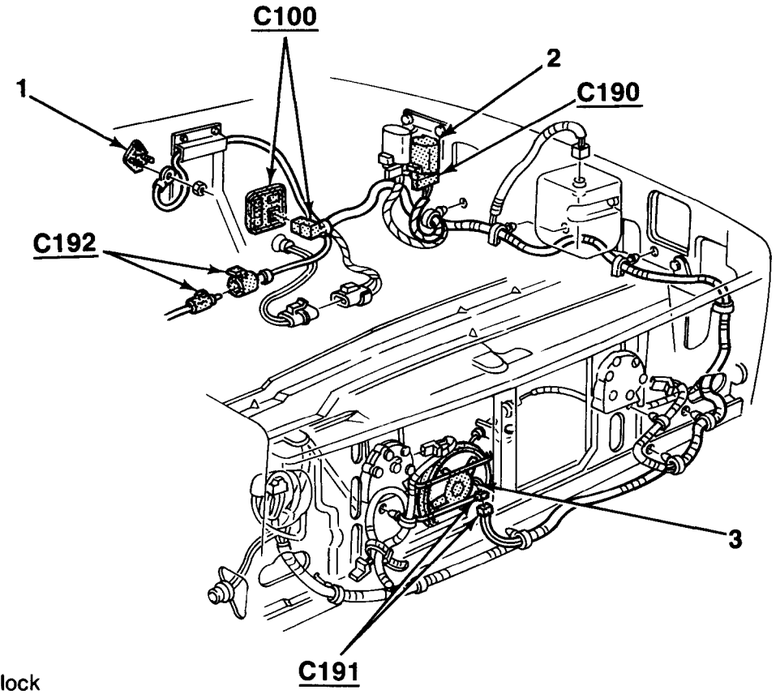
Figure 28 - Transmission Kickdown Switch - RPO M40



1. Auxiliary Fan Temperature Switch

LC-0029-RV-E-RP

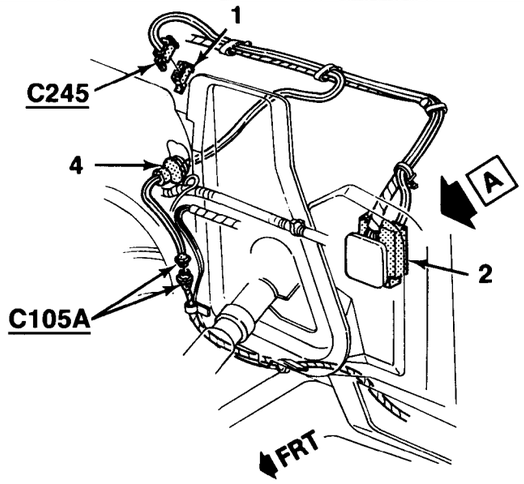
Figure 29 - Auxiliary Cooling Fan Wiring Harness

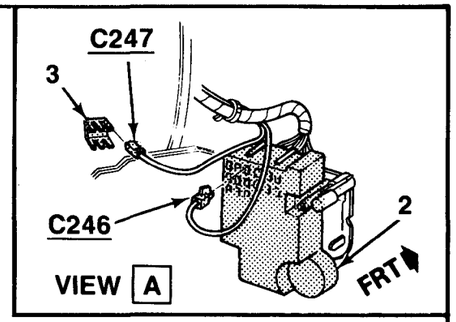


1. Junction Block
2. Auxiliary Cooling Fan Relay
3. Auxiliary Cooling Fan

LC-0030-RV-E-RP

Figure 30 - Auxiliary Cooling Fan

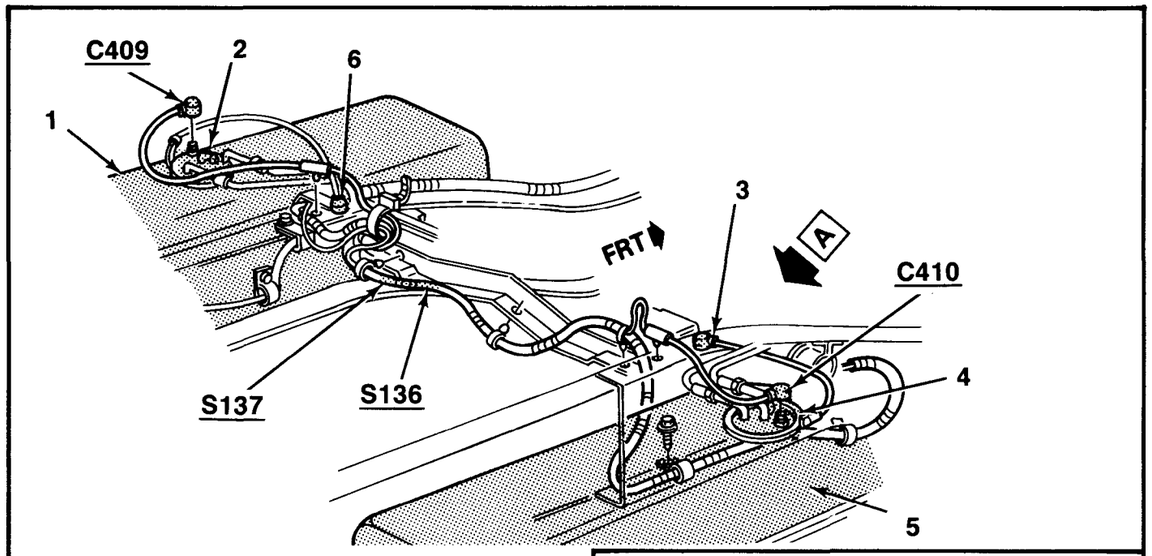


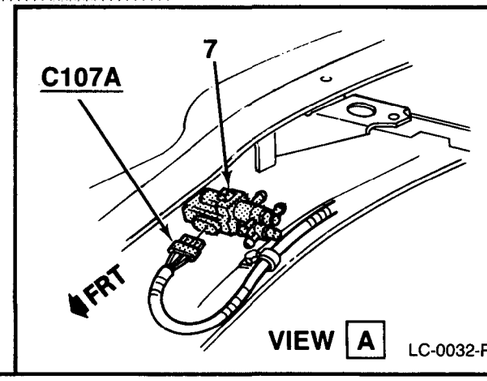


1. Auxiliary Fuel Tank Selector Switch
2. Fuse Block
3. Bus Bar Ground
4. Grommet 105

LC-0031-RV-E-RP

Figure 31 - Auxiliary Fuel Tank Selector Switch





1. LH Fuel Tank (Production)
2. RH Fuel Sender Assembly
3. RH Frame Ground
4. RH Fuel Sender Assembly
5. RH Fuel Tank (Auxiliary)
6. LH Frame Ground
7. Fuel Tank Selector Valve and Motor Switch

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Figure 32 - Auxiliary Fuel Tanks — Diesel

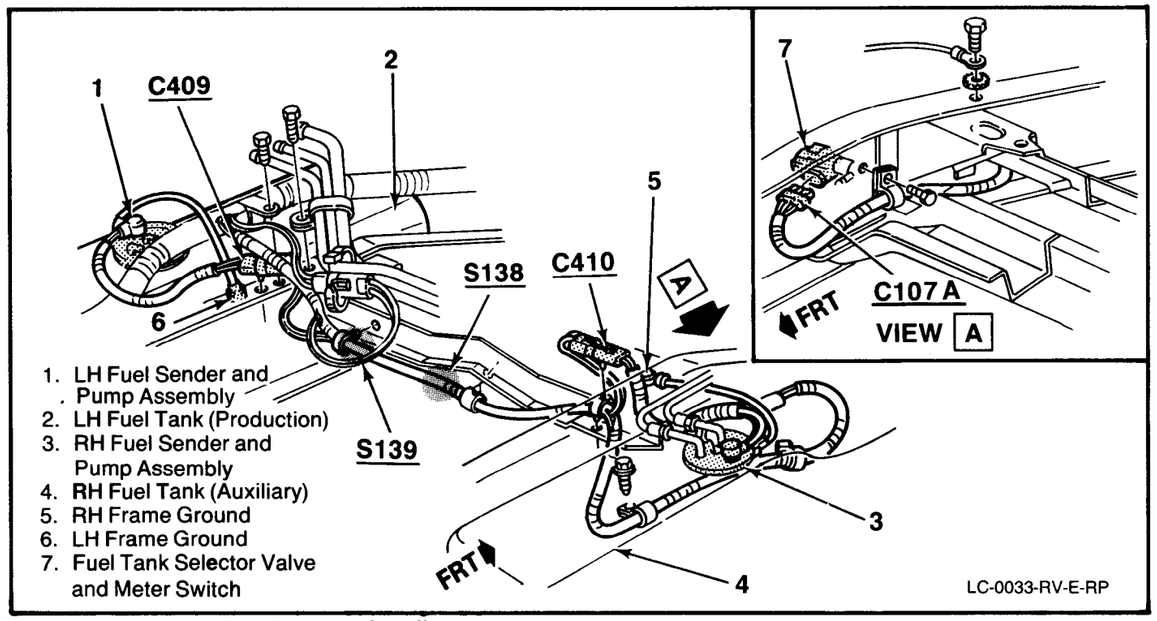


Figure 33 - Auxiliary Fuel Tanks — Gasoline

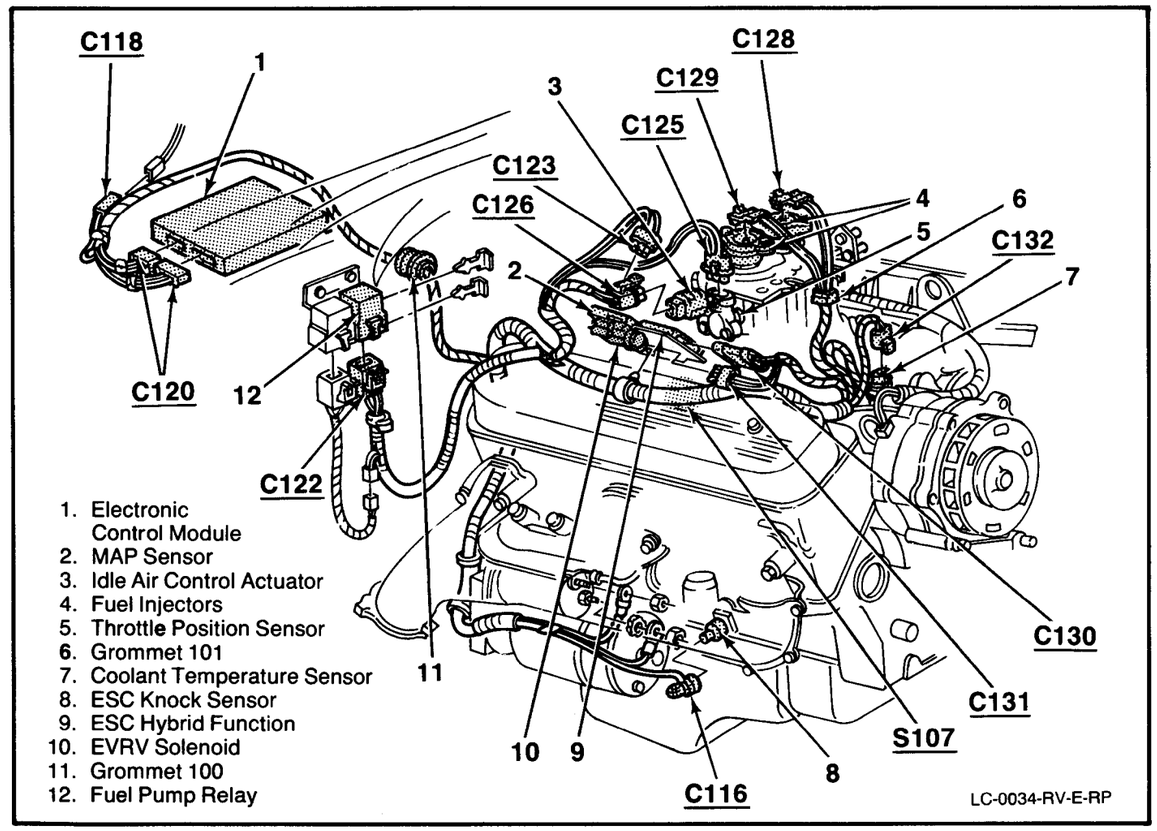


Figure 34 - Electronic Engine Controls — RPO L05

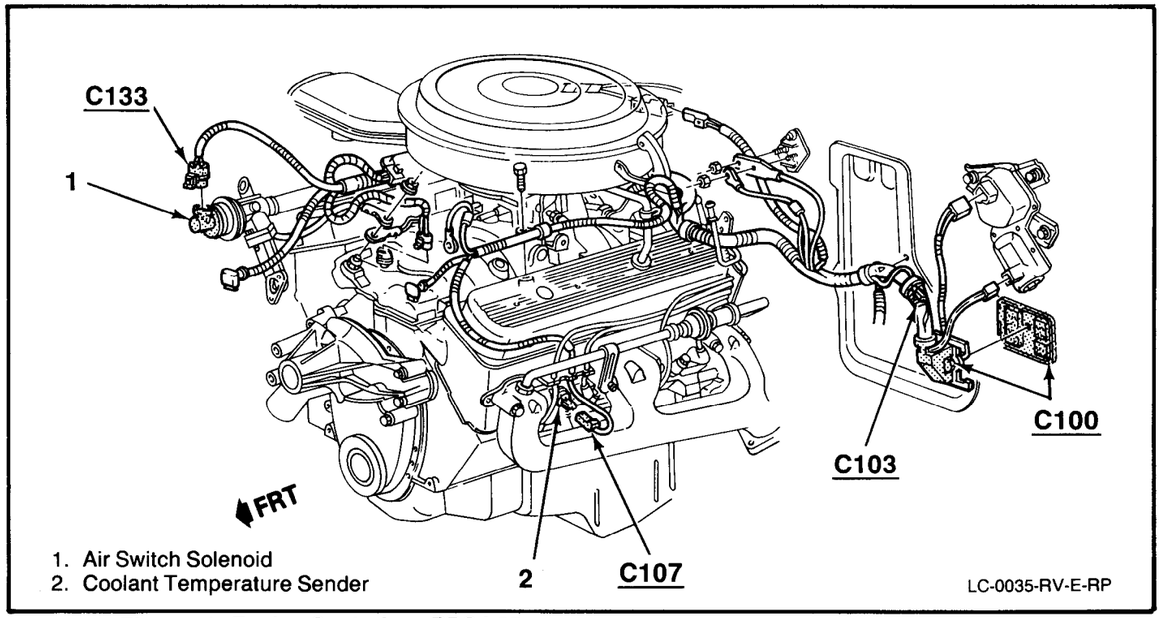


Figure 35 - Electronic Engine Controls — RPO L05

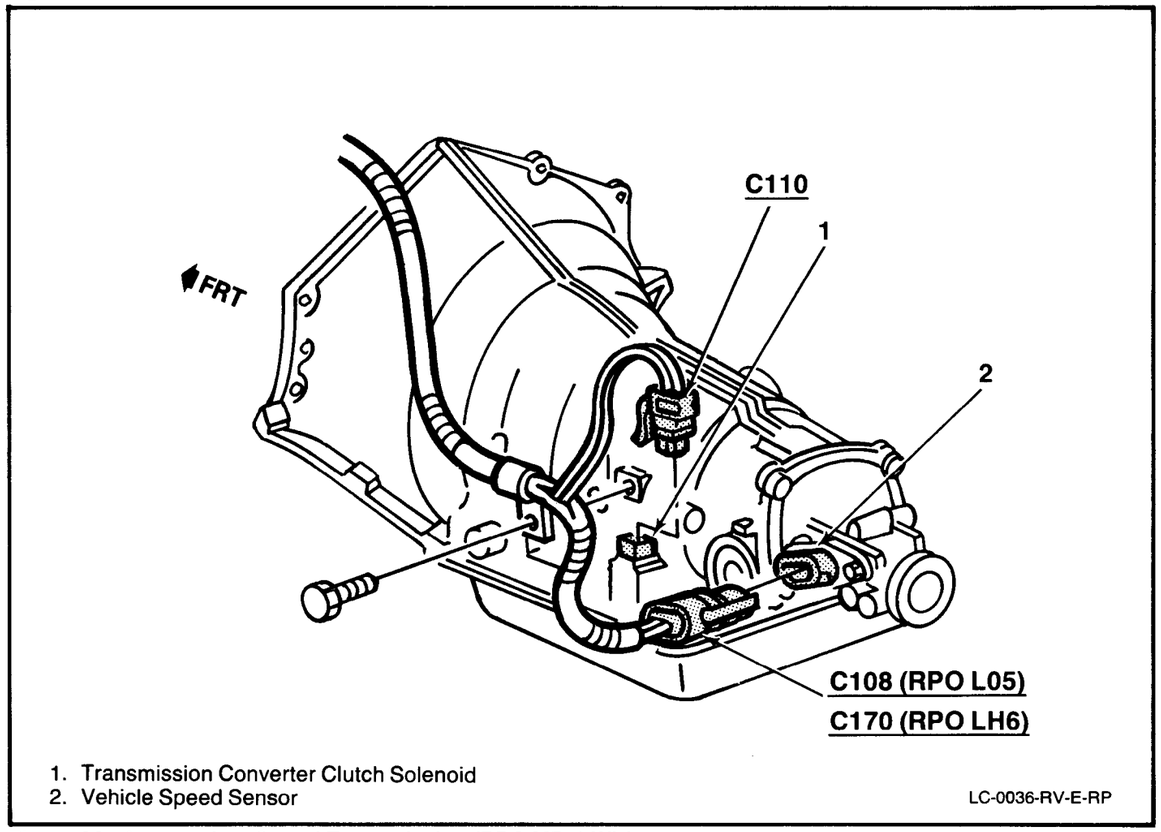
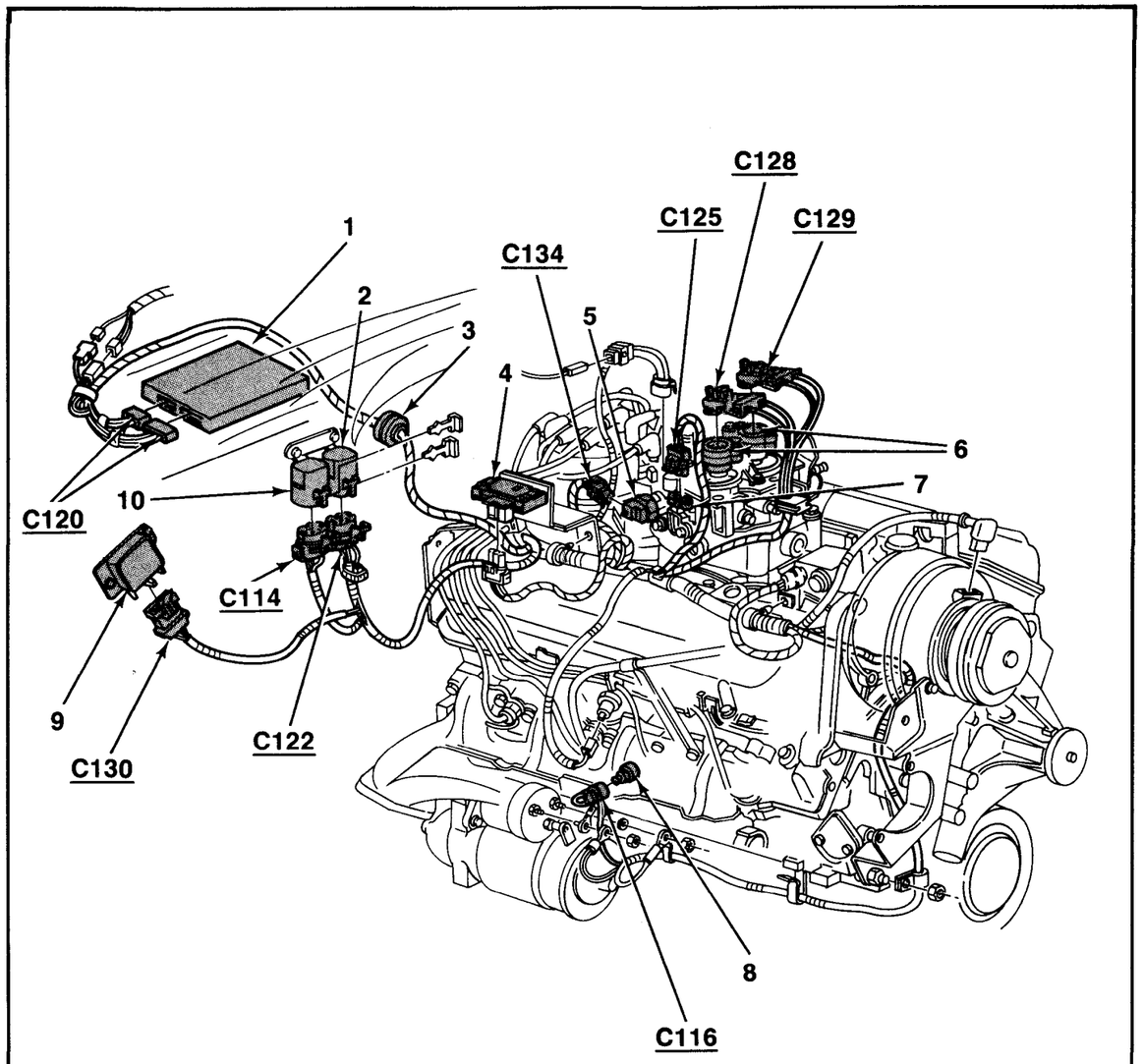


Figure 36 - Automatic 4-Speed Transmission (RPO MD8) Wiring



1. Electronic Control Module
2. Fuel Pump Relay
3. Grommet 100
4. Manifold Absolute Pressure Sensor
5. Idle Air Control Actuator
6. Fuel Injectors
7. Throttle Position Sensor
8. ESC Knock Sensor
9. ESC Hybrid Function
10. Transmission Downshift Relay

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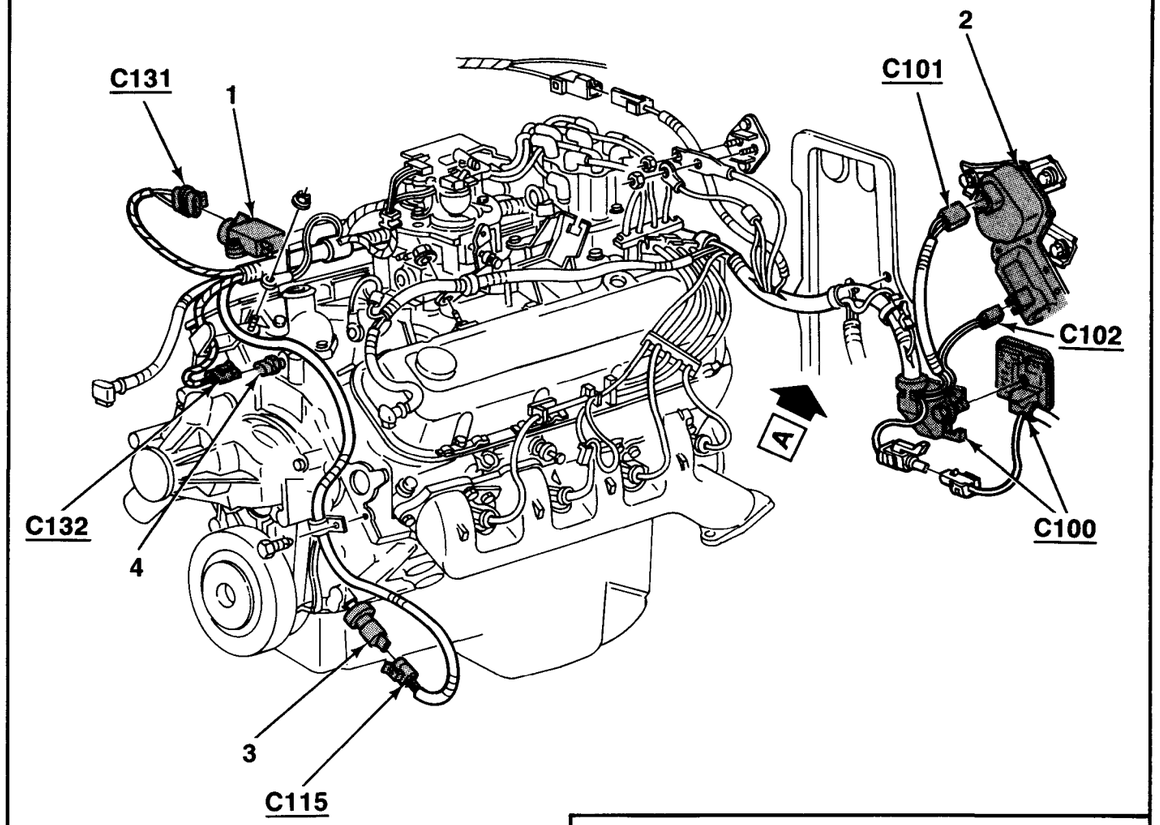
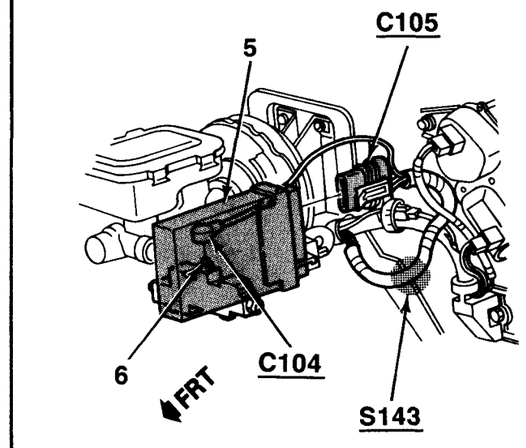
Figure 37 - Electronic Engine Controls, RH Side — RPO L19



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



VIEW A

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Figure 38 - Electronic Engine Controls, LH Side — RPO L19

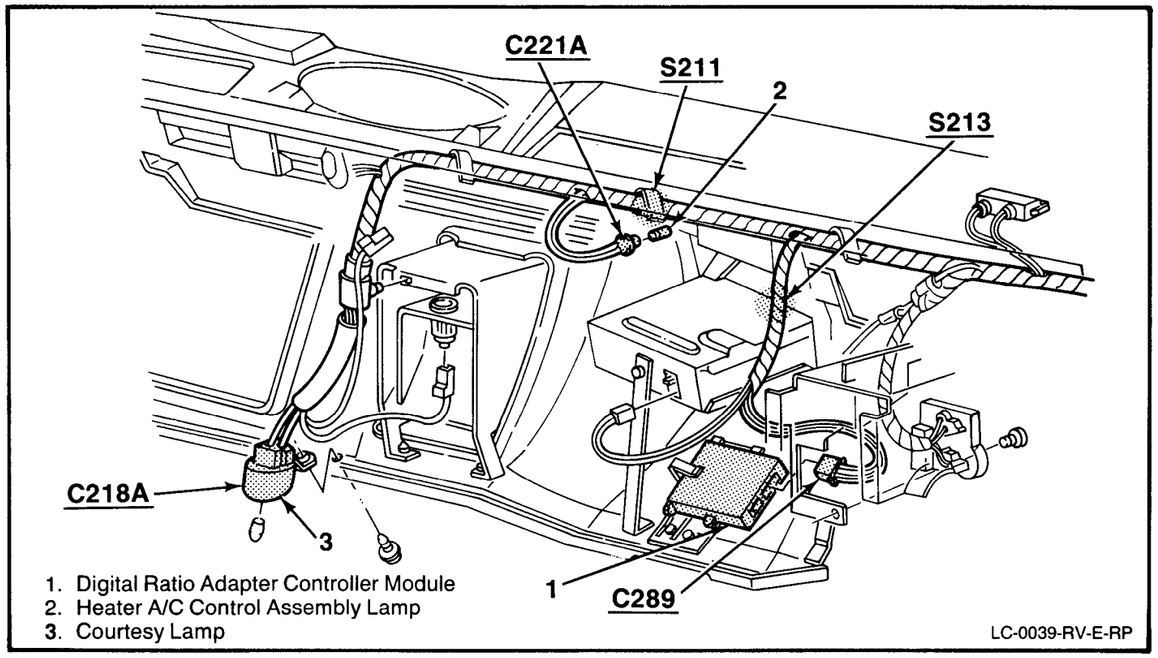


Figure 39 - Digital Ratio Adapter Controller Module

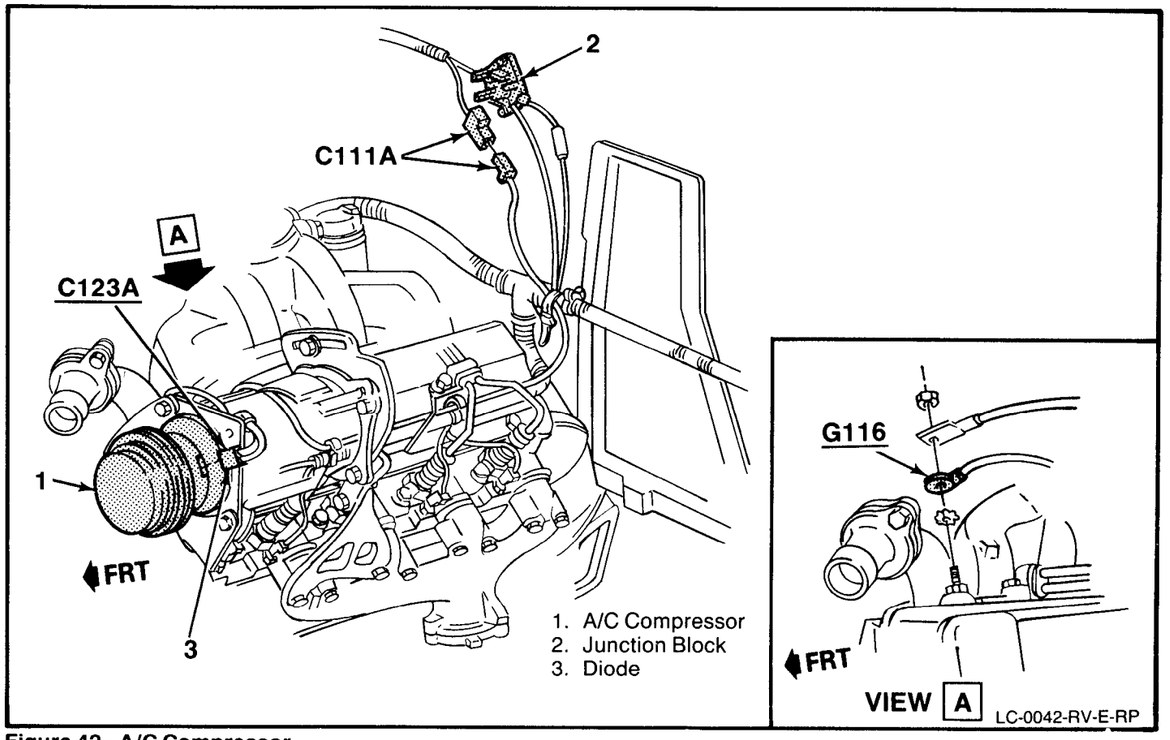


Figure 42 - A/C Compressor

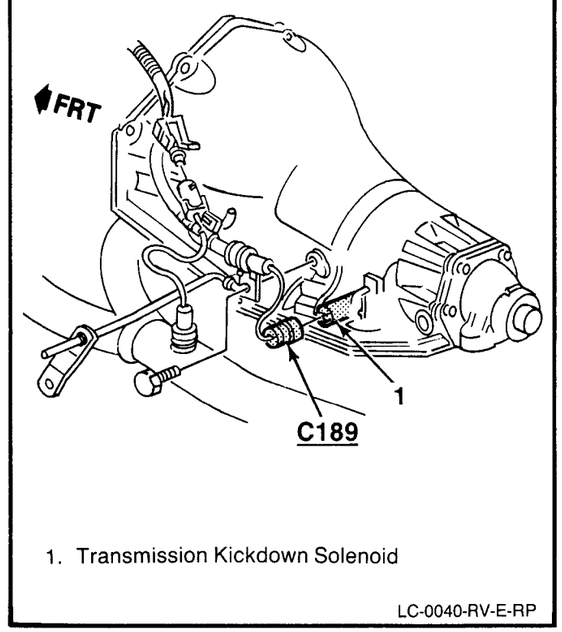


Figure 40 - Transmission Kickdown Solenoid with RPO L05/L19

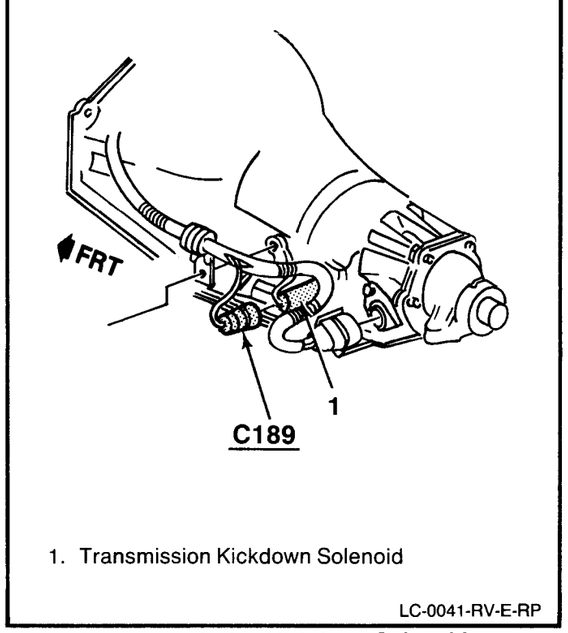


Figure 41 - Transmission Kickdown Solenoid with RPO LH6/LL4

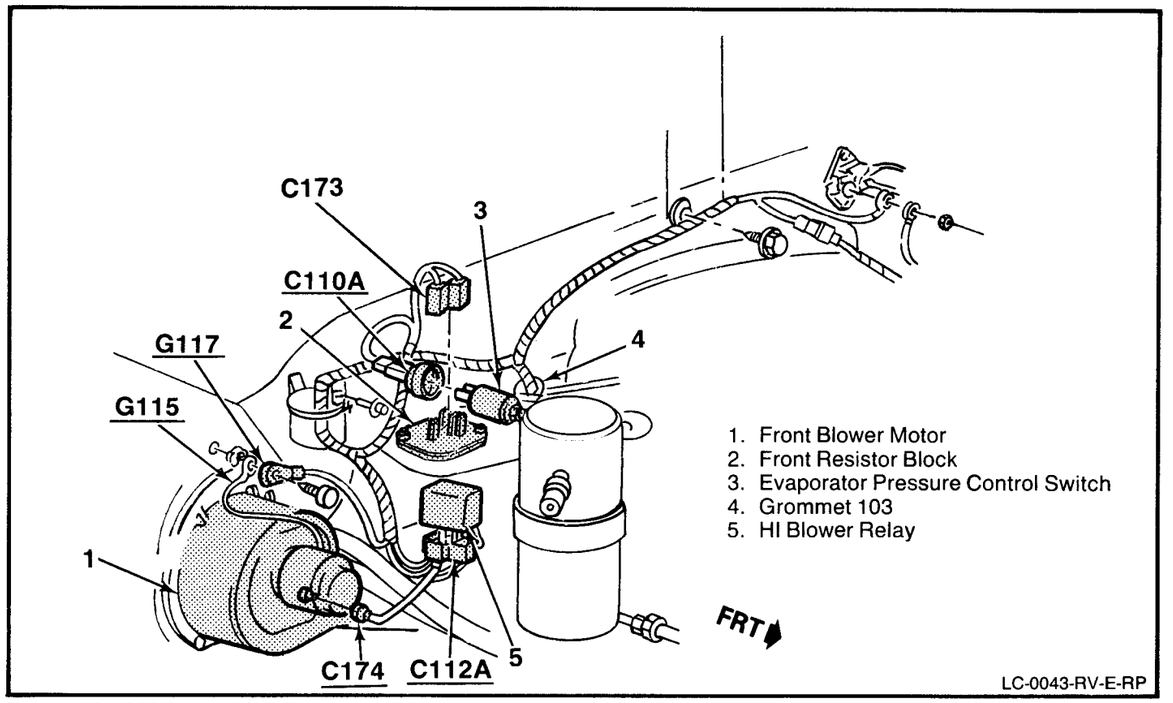
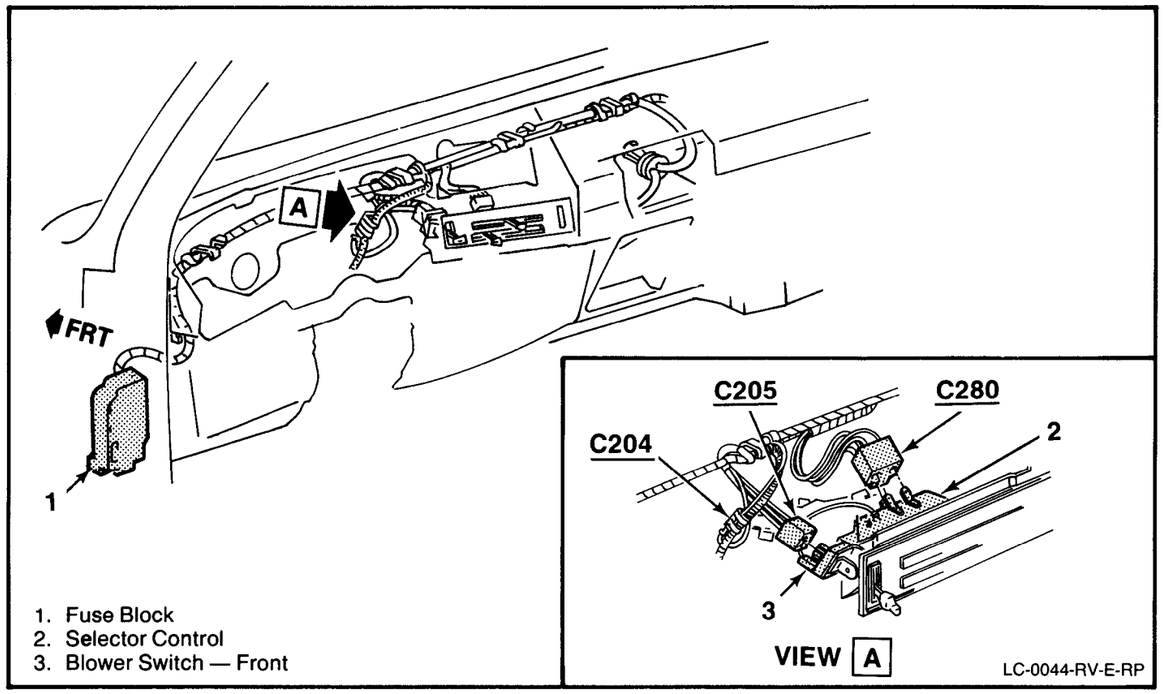
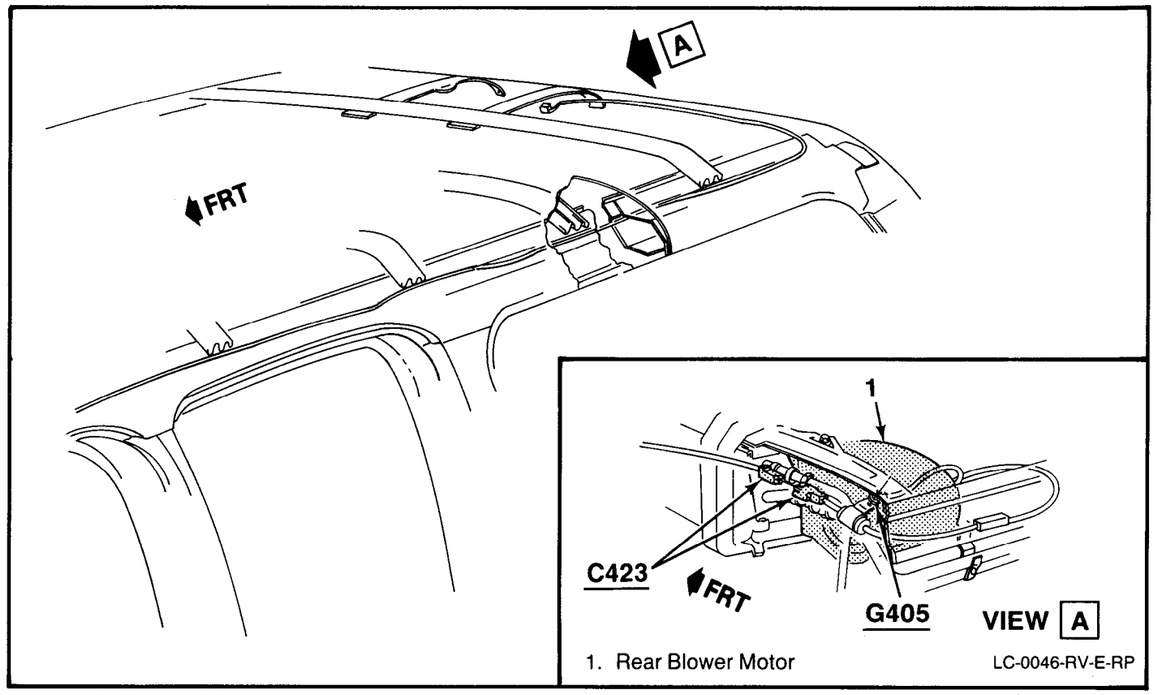


Figure 43 - A/C System Wiring



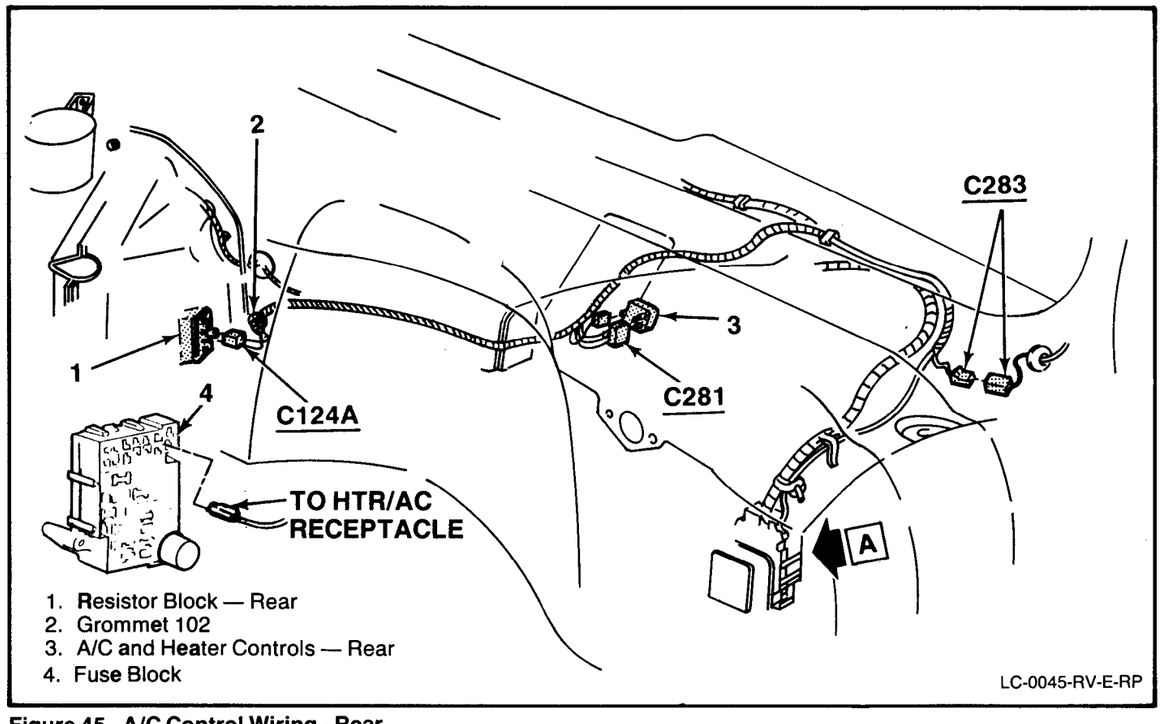
1. Fuse Block
2. Selector Control
3. Blower Switch — Front

Figure 44 - A/C and Heater Control Wiring — Front



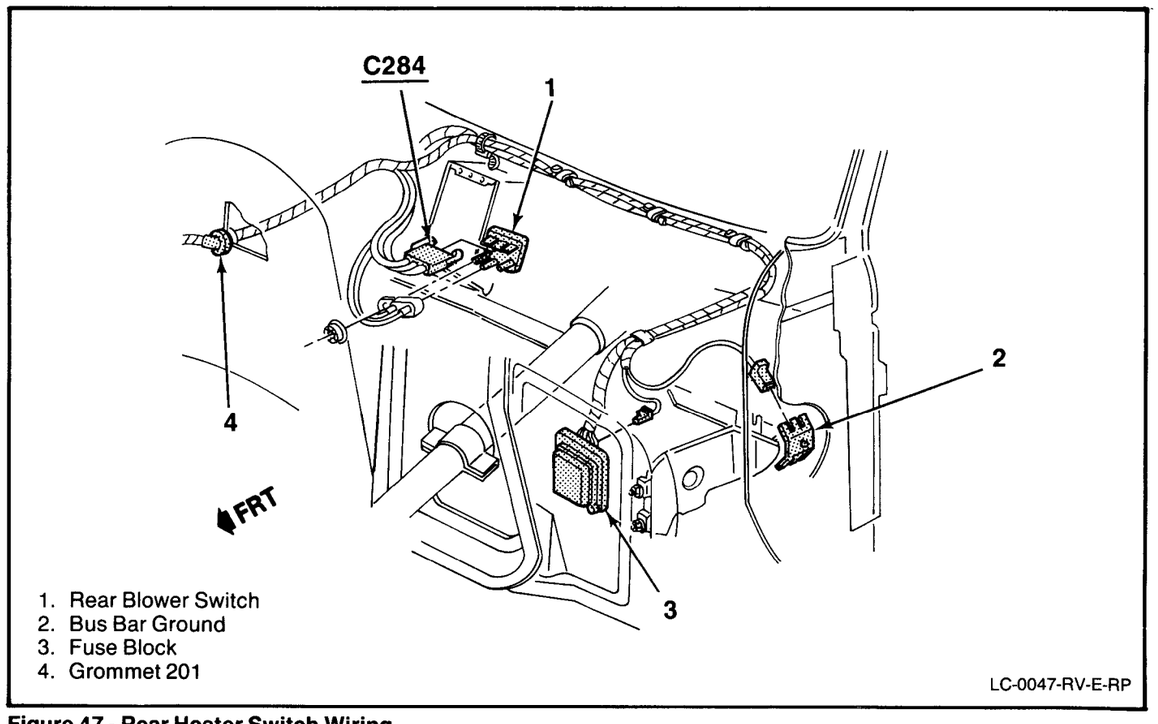
1. Rear Blower Motor

Figure 46 - Rear A/C Blower Motor



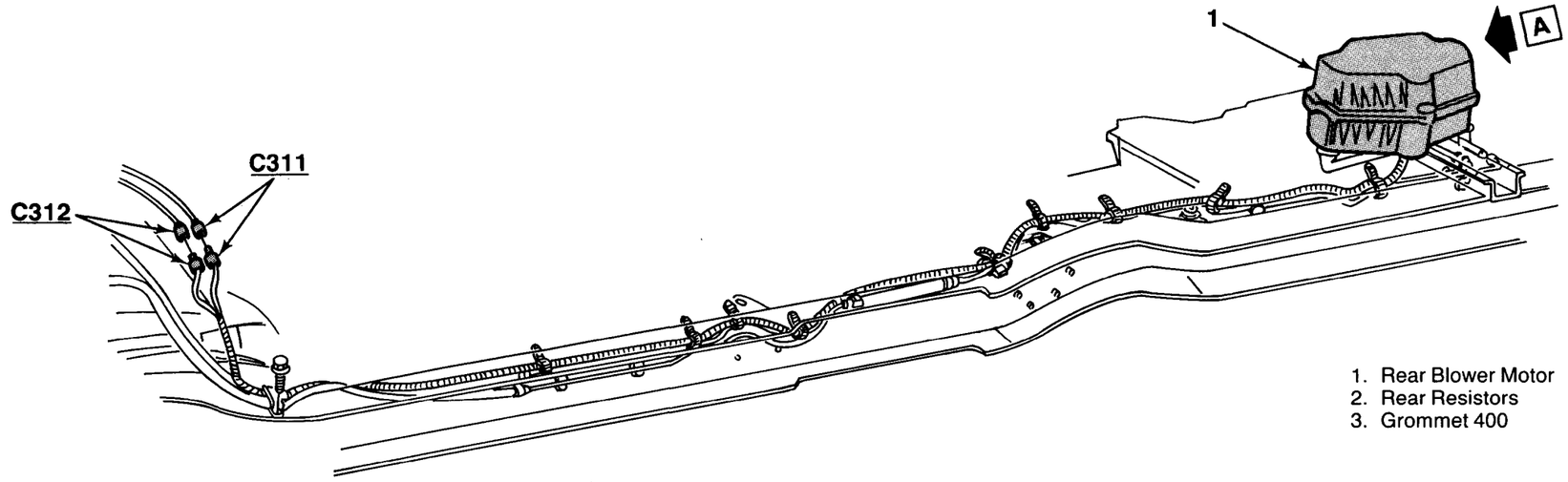
1. Resistor Block — Rear
2. Grommet 102
3. A/C and Heater Controls — Rear
4. Fuse Block

Figure 45 - A/C Control Wiring - Rear



1. Rear Blower Switch
2. Bus Bar Ground
3. Fuse Block
4. Grommet 201

Figure 47 - Rear Heater Switch Wiring



1. Rear Blower Motor
2. Rear Resistors
3. Grommet 400

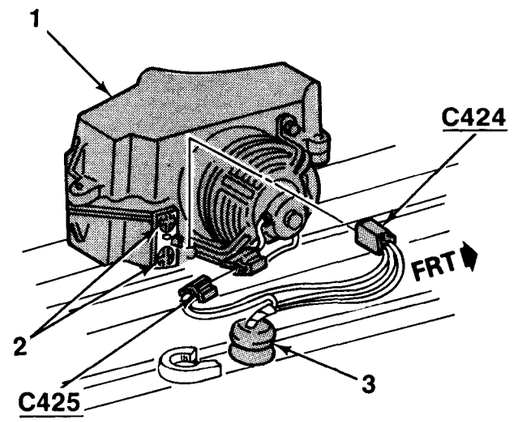


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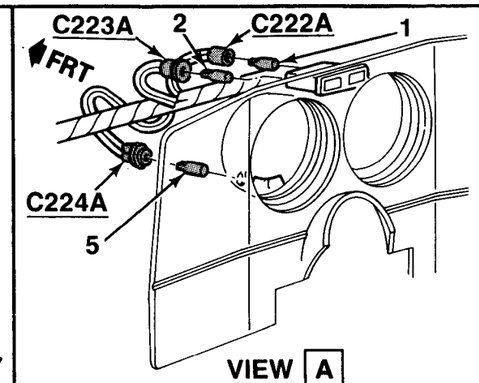
Figure 48 - Rear Heater Blower Wiring

1. Glow Plugs Wait Lamp
2. Water In Fuel Indicator
3. Check Engine Lamp Driver Module
4. Low Coolant Warning Module
5. Low Coolant Warning Lamp
6. Instrument Cluster



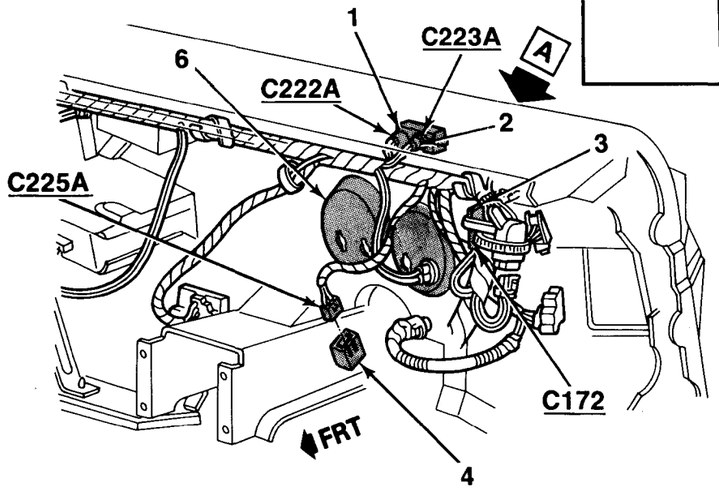


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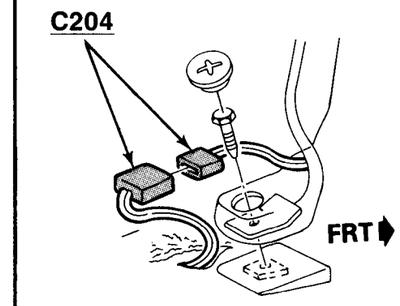
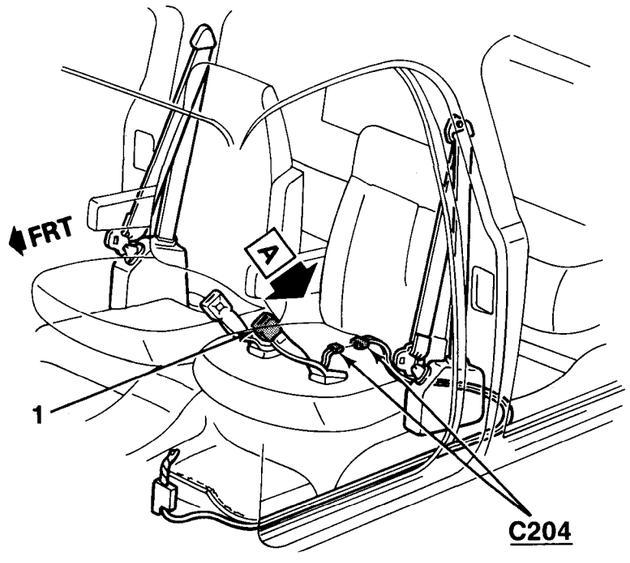
Figure 49 - I/P Wiring—RPO LH6/LL4

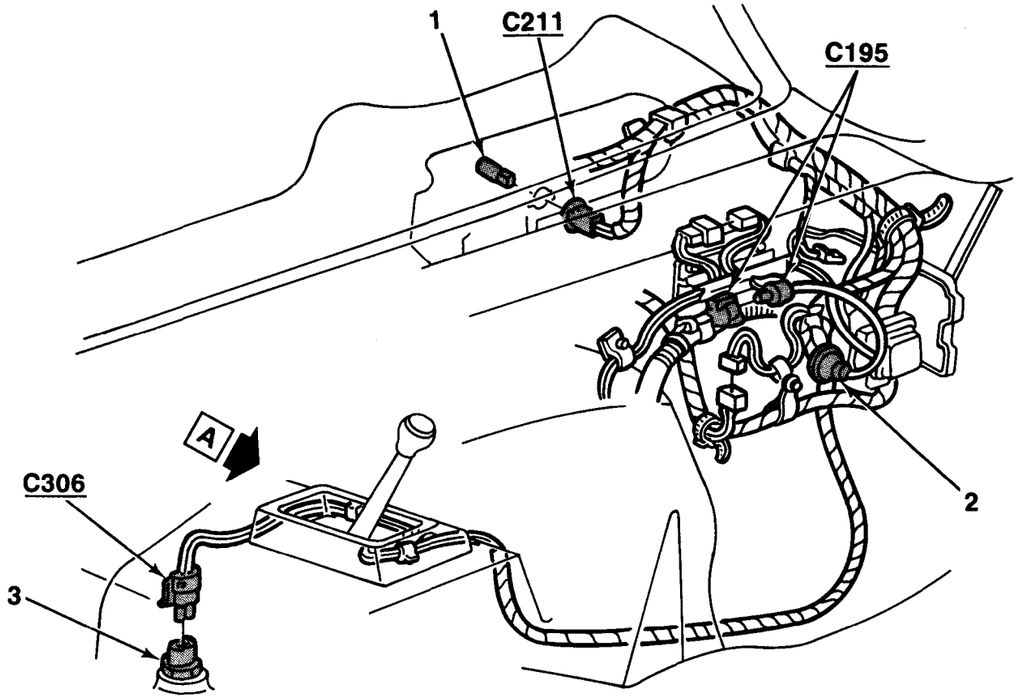




1. Safety Belt Retractor Switch

LC-0050-RV-E-RP

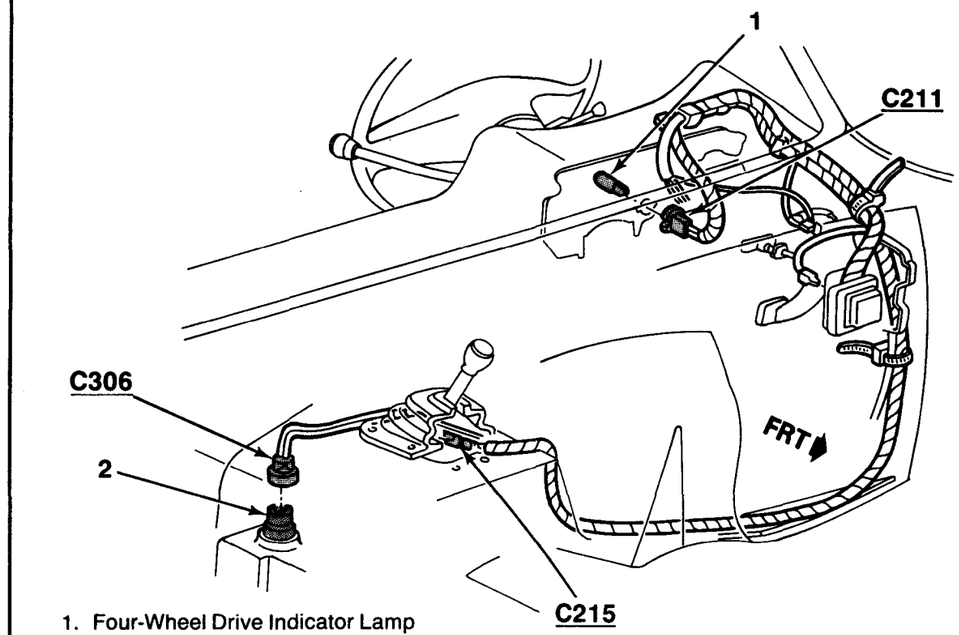
Figure 50 - Safety Belt Retractor Switch Wiring



1. Four-Wheel Drive Indicator Lamp
2. Grommet 101
3. Transfer Case Switch
4. Four-Wheel Drive Shift Lever Lamp

LC-0051-RV-E-RP

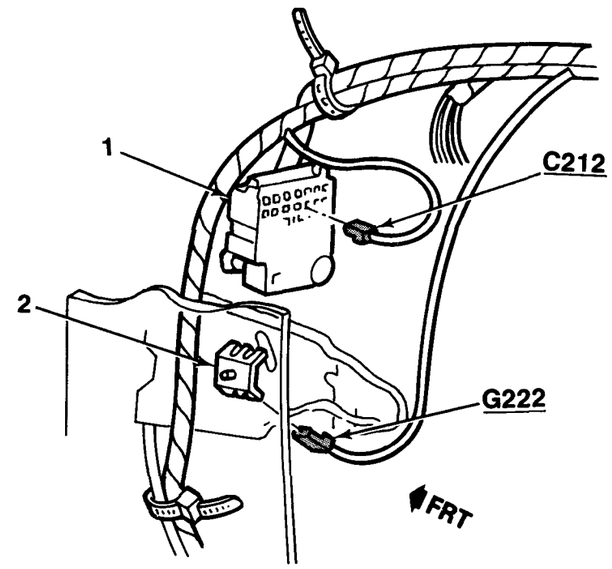
Figure 51 - Transfer Case Wiring — V100, V200



1. Four-Wheel Drive Indicator Lamp
2. Transfer Case Switch

LC-0052-RV-E-RP

Figure 52 - Transfer Case Wiring — V300



1. Fuse Block
2. Bus Bar Ground

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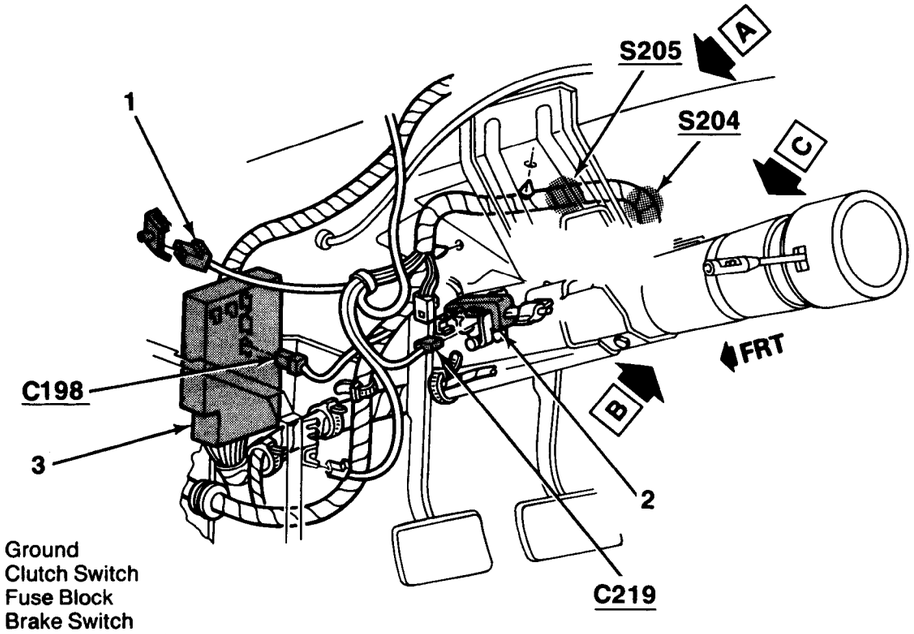
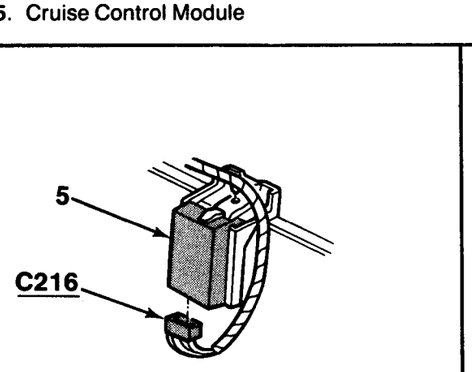
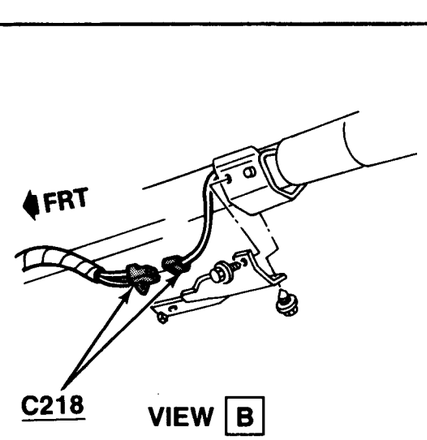
Figure 53 - Transfer Case — Power and Ground Connections



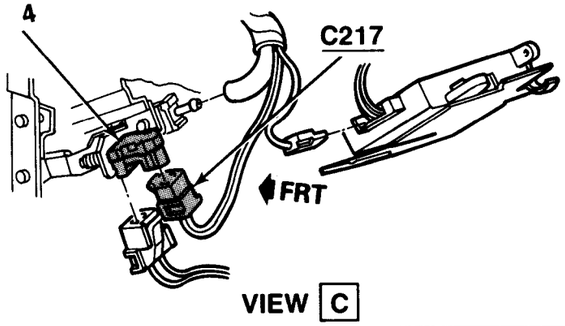
1. Ground
2. Clutch Switch
3. Fuse Block
4. Brake Switch
5. Cruise Control Module



VIEW A



VIEW B



VIEW C

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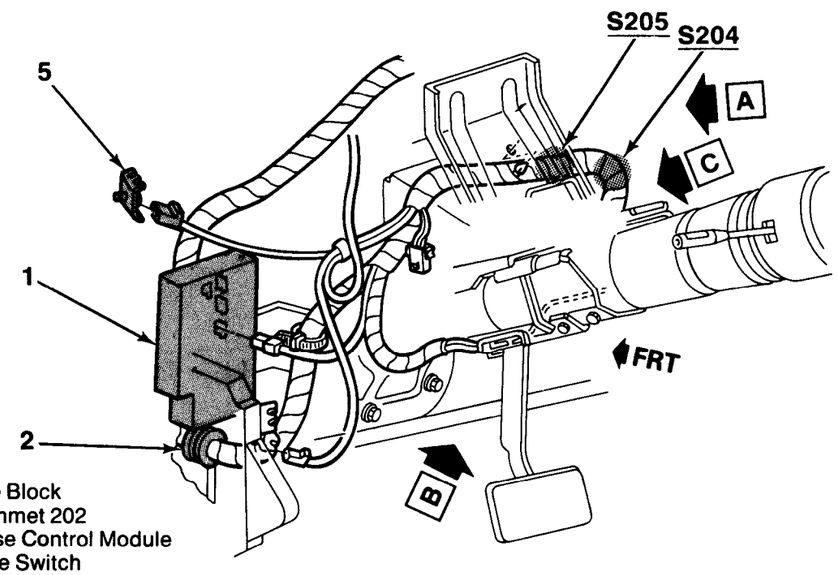
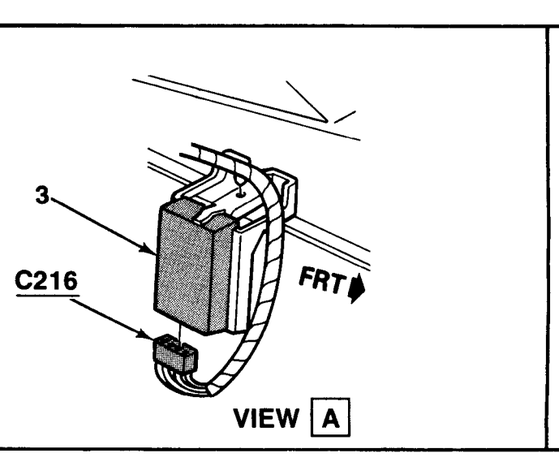
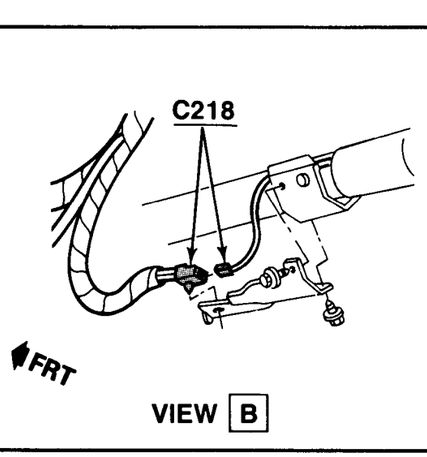
Figure 54 - Cruise Control Wiring—Manual Transmission



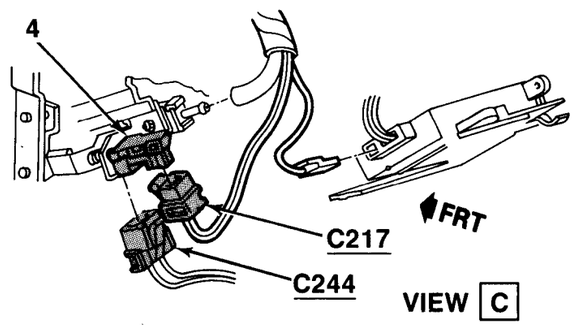
1. Fuse Block
2. Grommet 202
3. Cruise Control Module
4. Brake Switch
5. Bus Bar Ground



VIEW A



VIEW B



VIEW C

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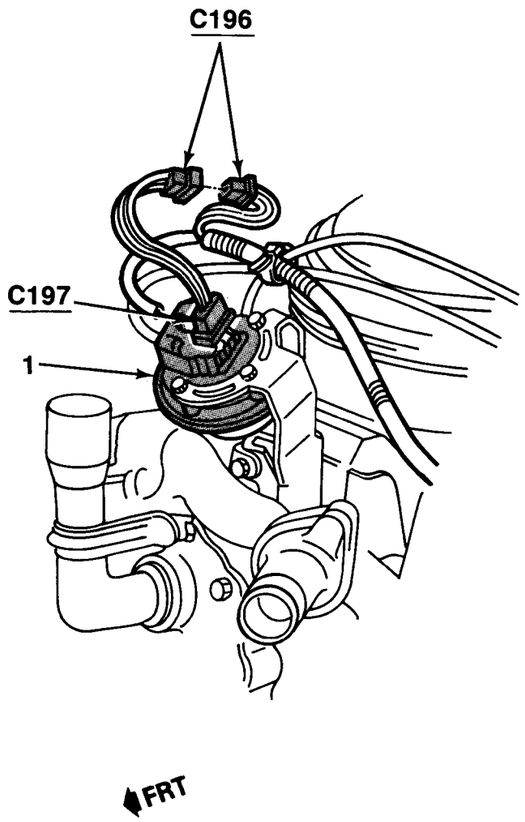
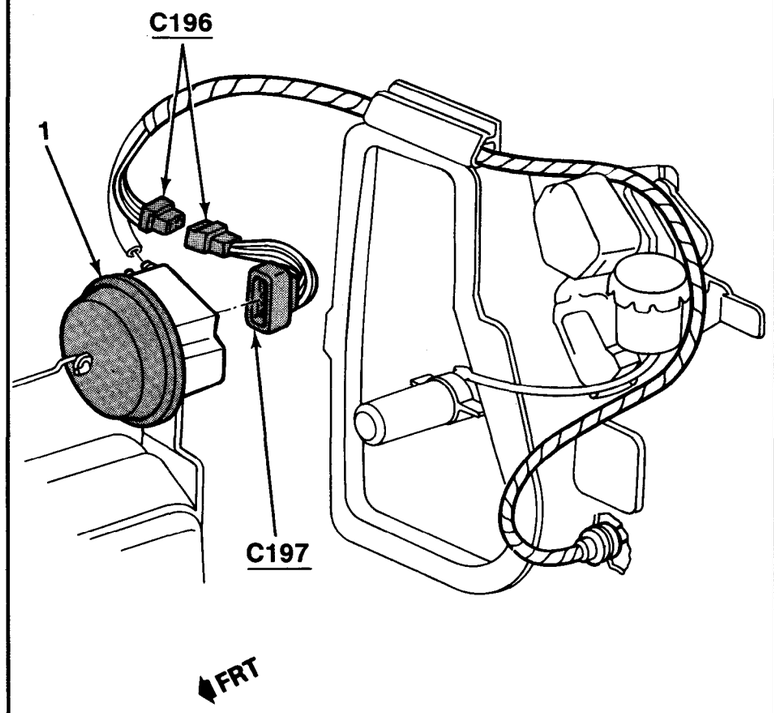
Figure 55 - Cruise Control Wiring—Automatic Transmission



1. Cruise Control Servo

LC-0056-RV-E-RP

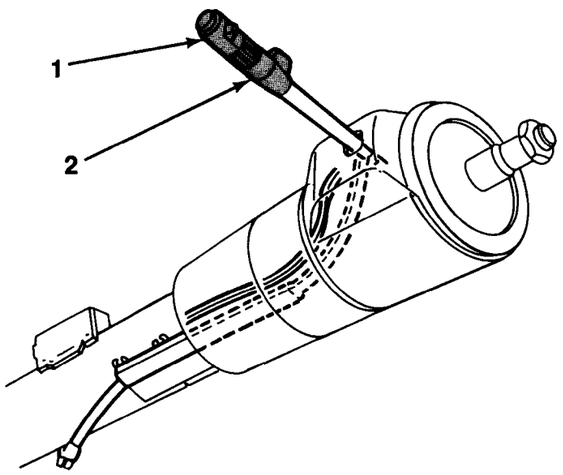
Figure 56 - Cruise Control Servo—RPO LH6/LL4



1. Cruise Control Servo

LC-0057-RV-E-RP

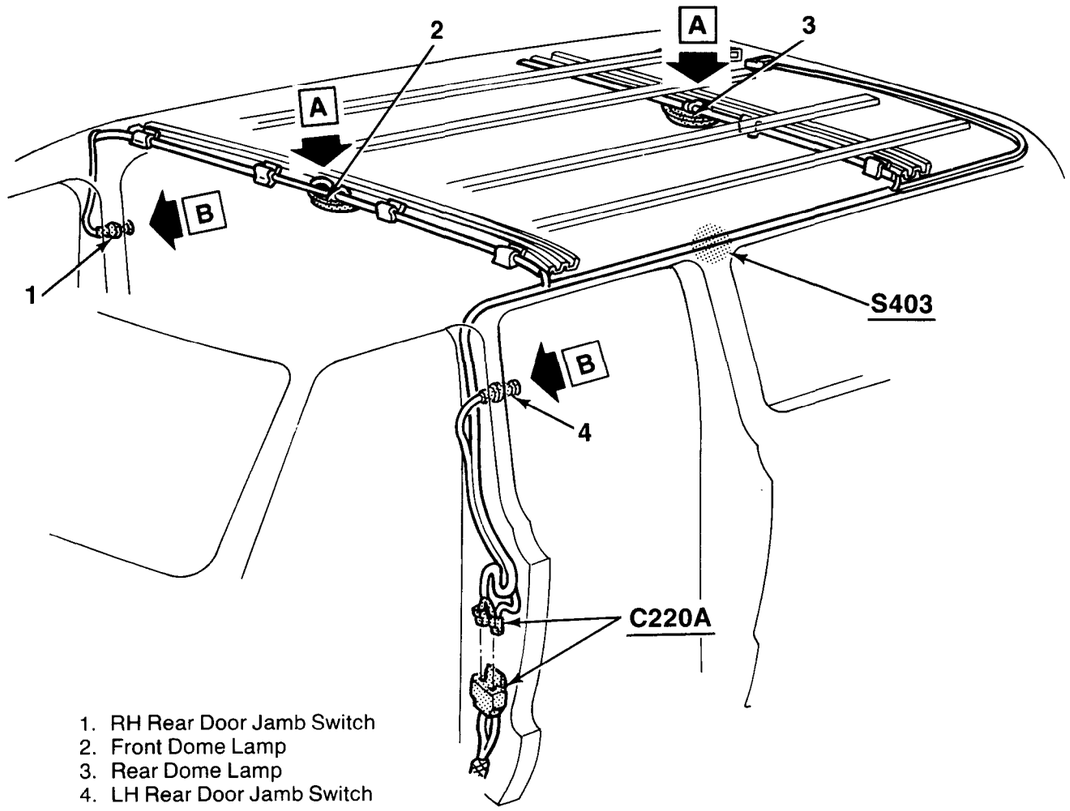
Figure 57 - Cruise Control Servo—RPO L05/L19



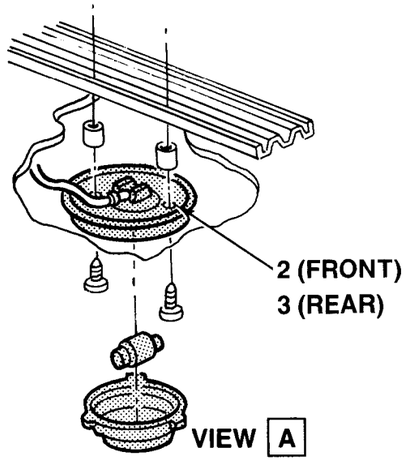
1. Cruise Control Actuator
2. Multifunctional Switch

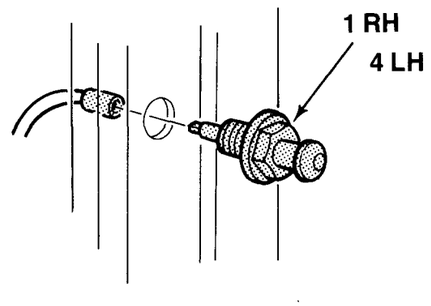
LC-0058-RV-E-RP

Figure 58 - Cruise Control Actuator



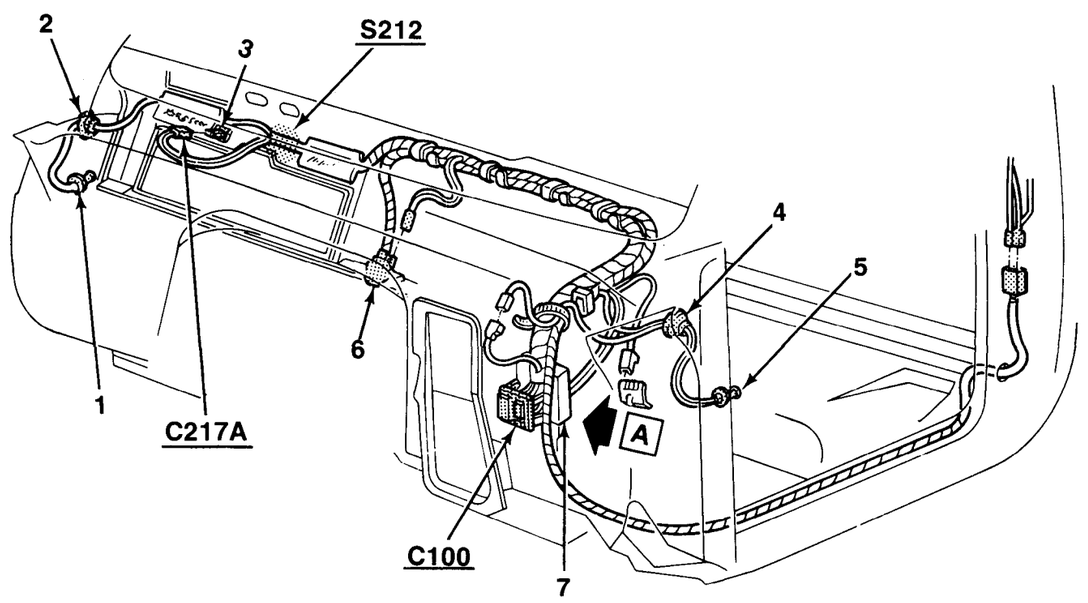
1. RH Rear Door Jamb Switch
2. Front Dome Lamp
3. Rear Dome Lamp
4. LH Rear Door Jamb Switch





LC-0059-RV-E-RP

Figure 59 - Dome Lamp Wiring



1. RH Front Door Jamb Switch
2. Grommet 602
3. Glove Box Lamp Switch
4. Grommet 502
5. LH Front Door Jamb Switch
6. Courtesy Lamp
7. Fuse Panel

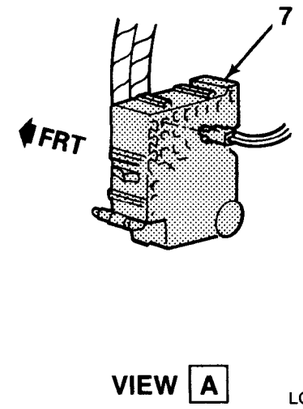


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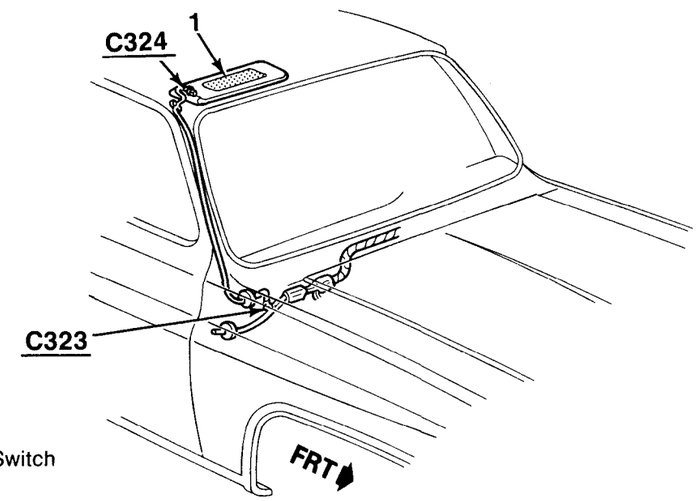
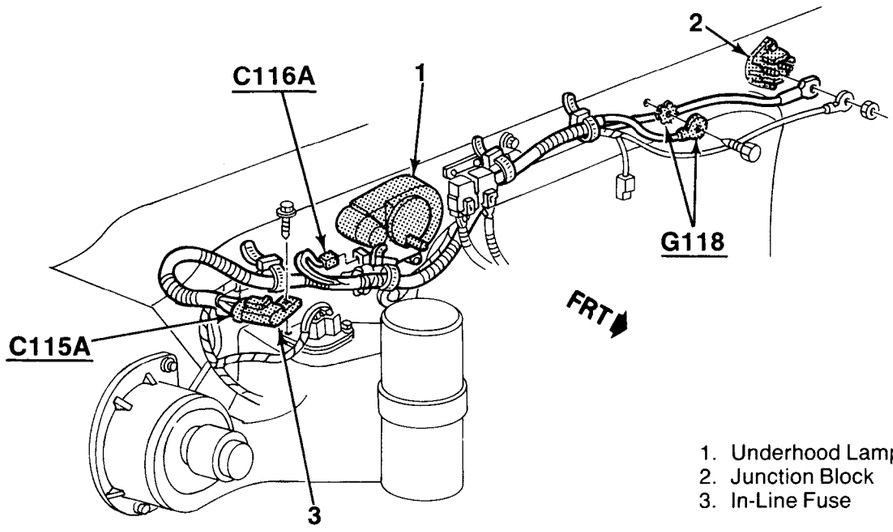
Figure 60 - Front Door Jamb Switch Wiring



1. Vanity Mirror Switch

LC-0061-RV-E-RP

Figure 61 - Vanity Mirror Switch Wiring



1. Underhood Lamp
2. Junction Block
3. In-Line Fuse

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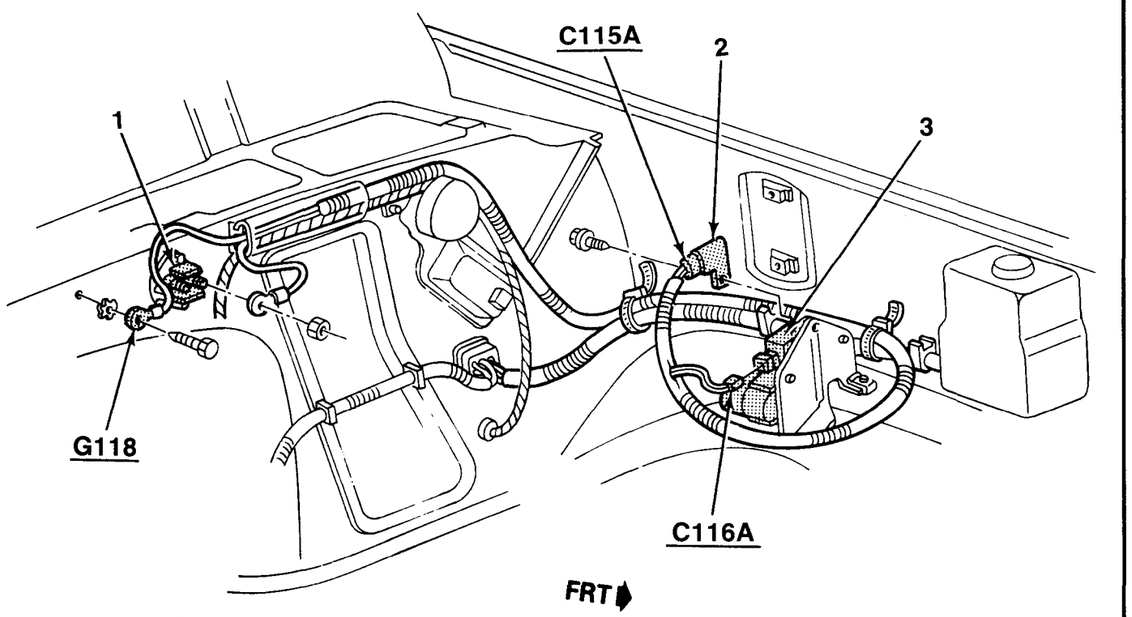
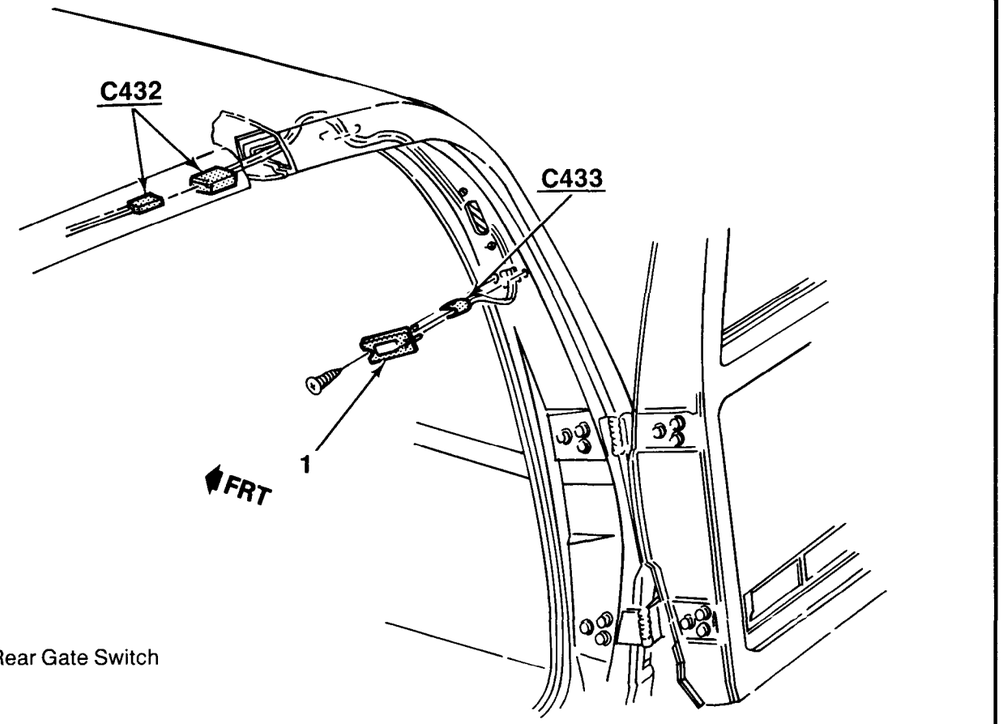
Figure 63 - Underhood Lamp Wiring — RPO L05/L19



1. Junction Block
2. In-Line Fuse
3. Underhood Lamp

LC-0062-RV-E-RP

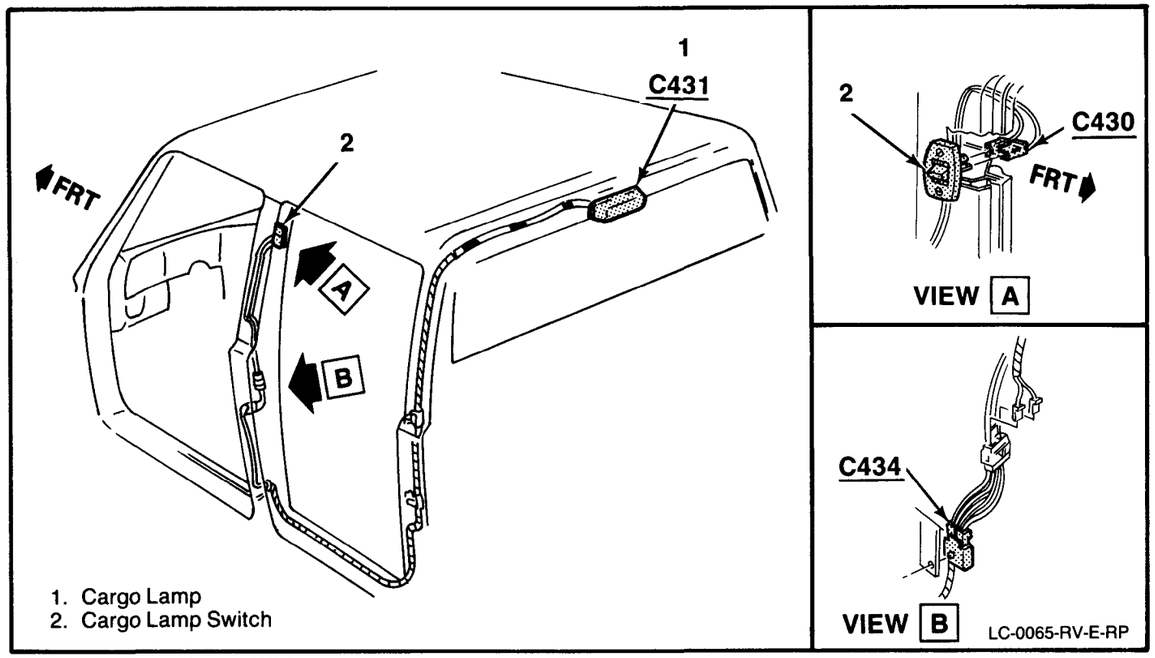
Figure 62 - Underhood Lamp Wiring — RPO LH6/LL4



1. Rear Gate Switch

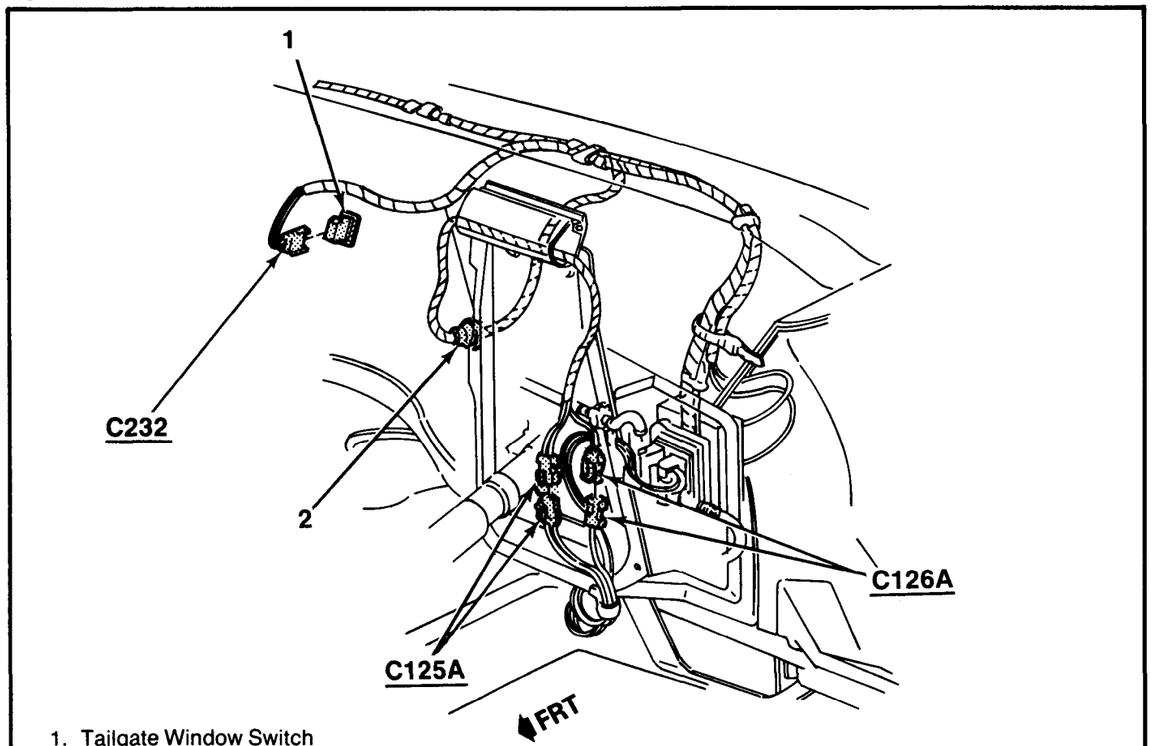
LC-0064-RV-E-RP

Figure 64 - Rear Gate Switch Wiring



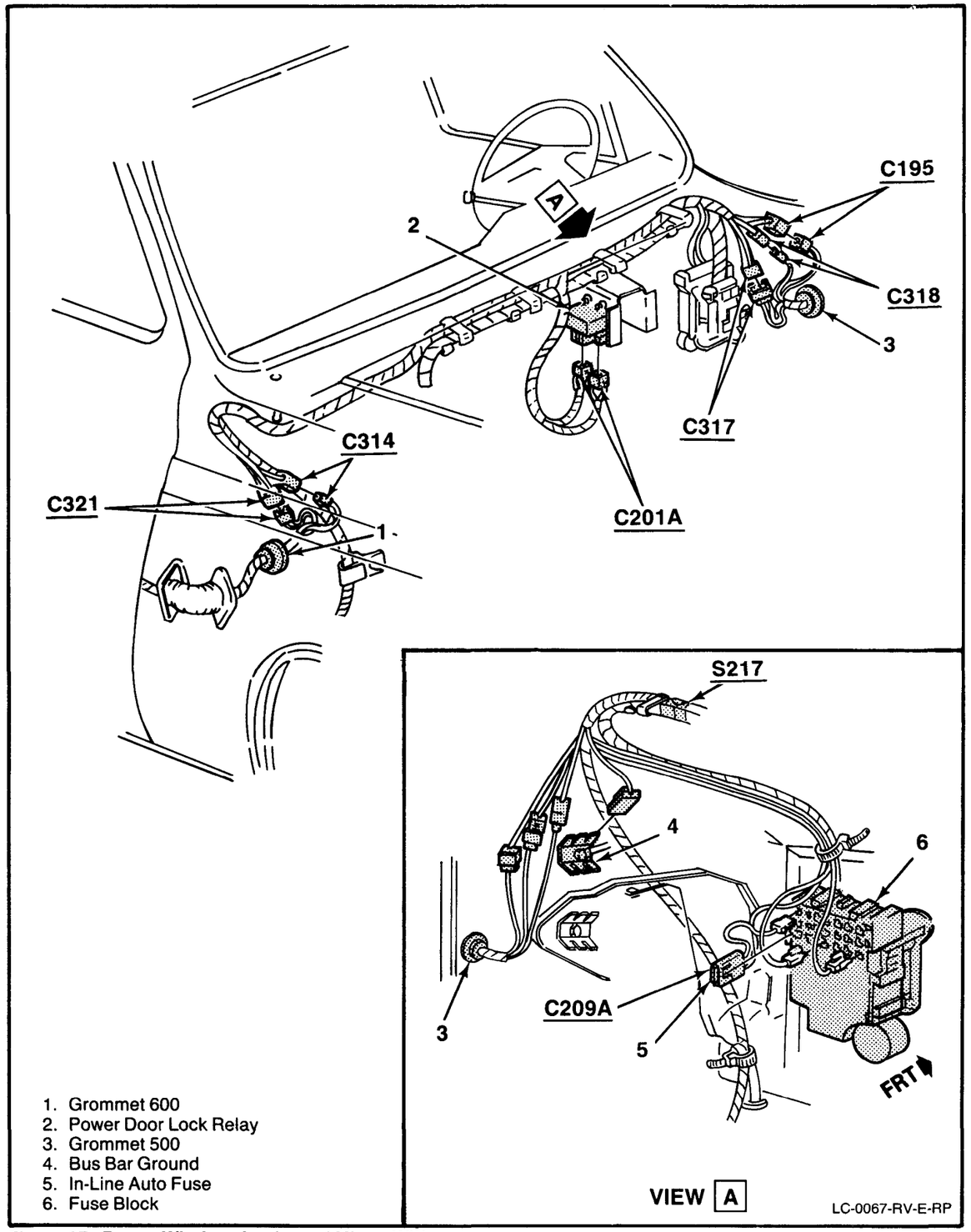
1. Cargo Lamp
2. Cargo Lamp Switch

Figure 65 - Cargo Lamp Wiring



1. Tailgate Window Switch
2. Grommet 105

Figure 66 - Tailgate Window Front Wiring



1. Grommet 600
2. Power Door Lock Relay
3. Grommet 500
4. Bus Bar Ground
5. In-Line Auto Fuse
6. Fuse Block

Figure 67 - Power Window, Locks and Mirror Wiring

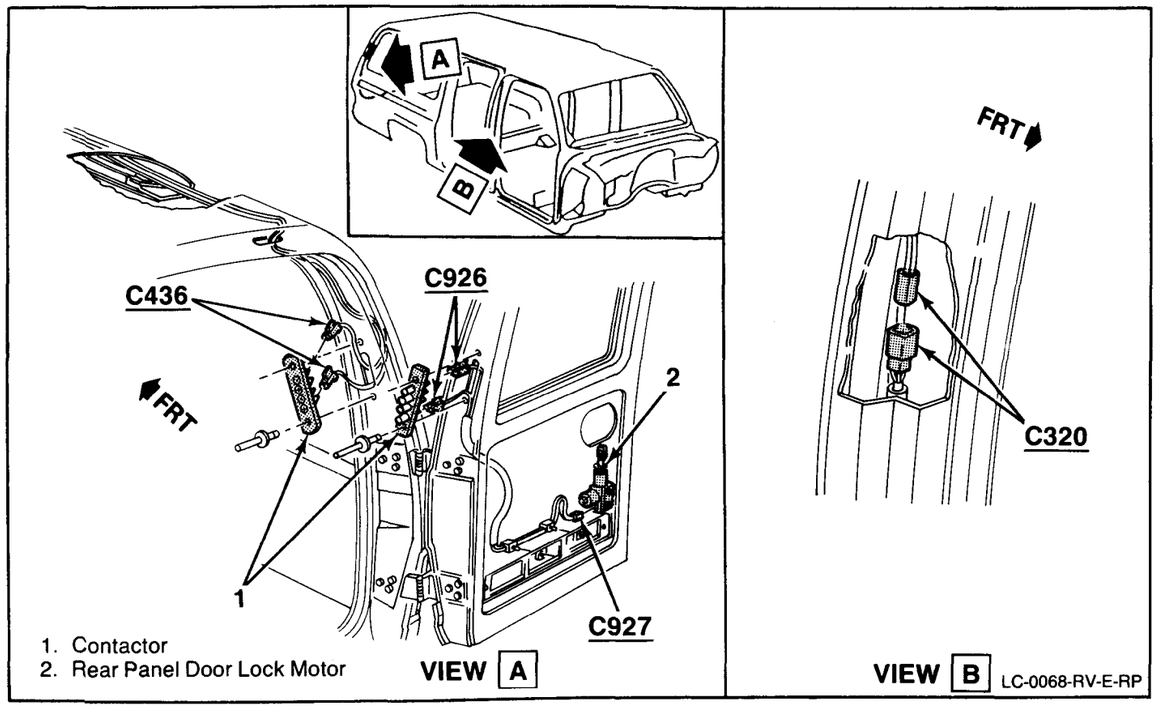


Figure 68 - Rear Panel Door Lock Wiring

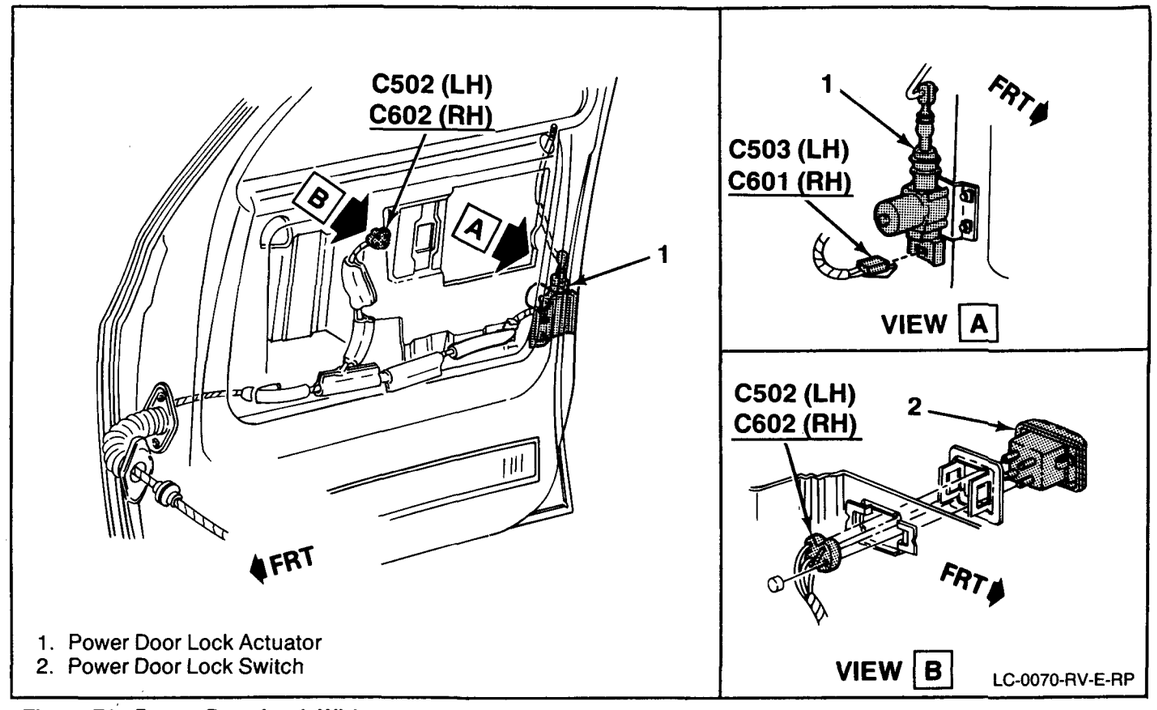


Figure 70 - Power Door Lock Wiring

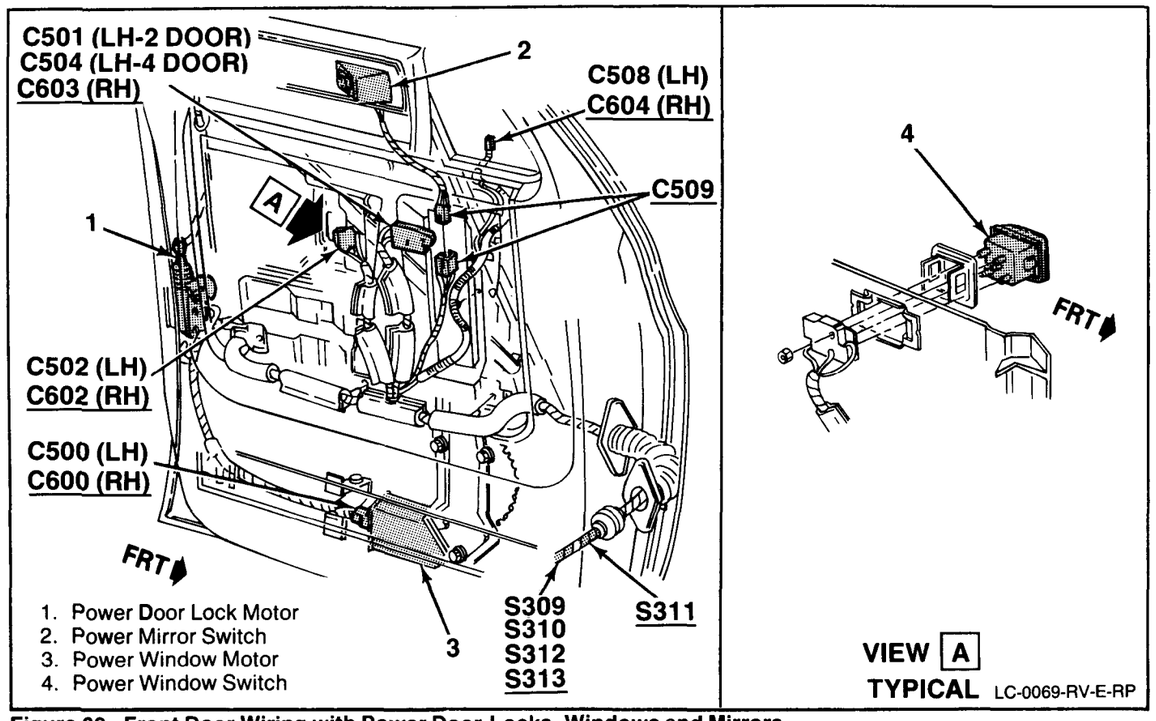


Figure 69 - Front Door Wiring with Power Door Locks, Windows and Mirrors

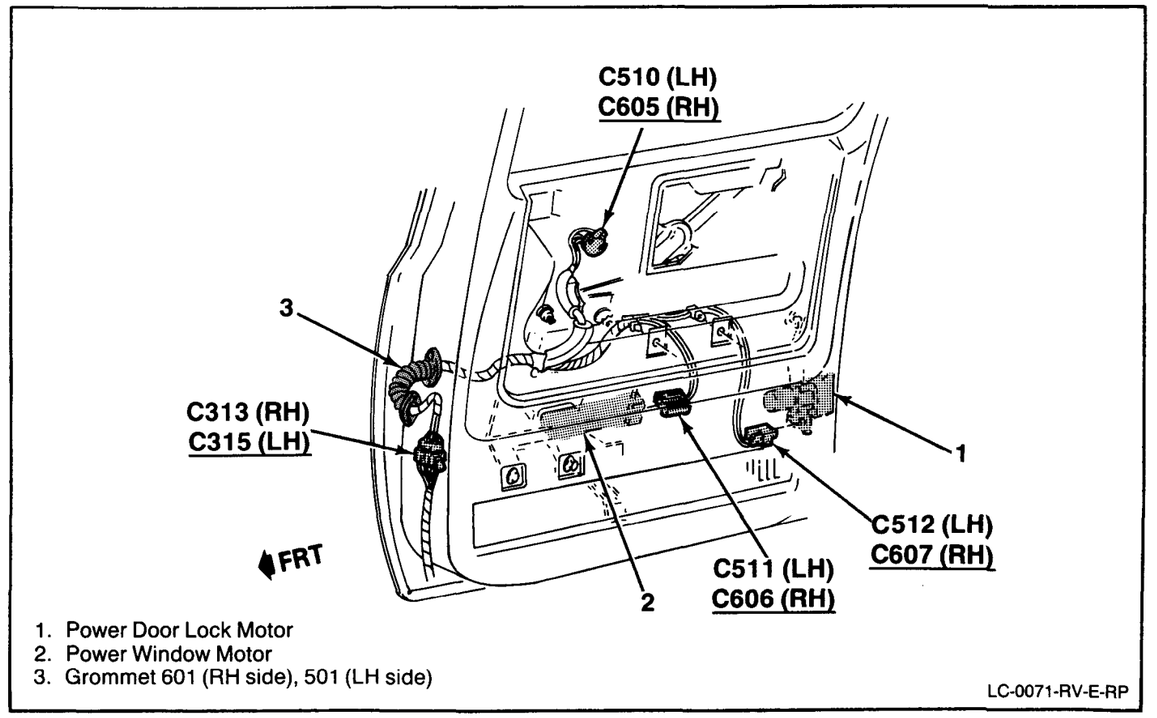
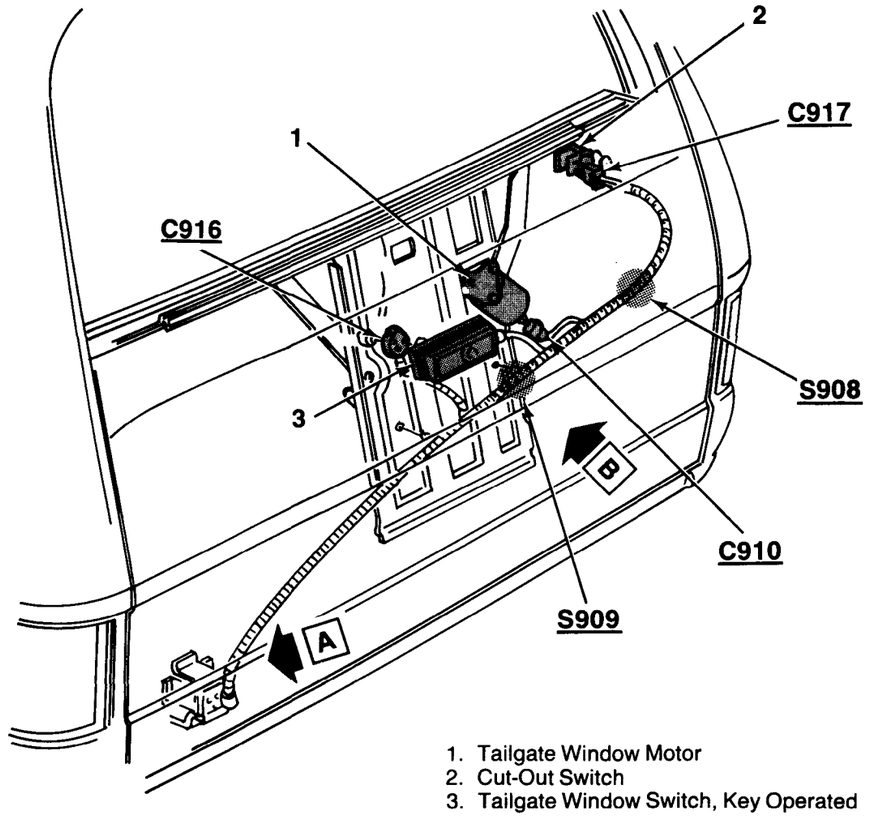
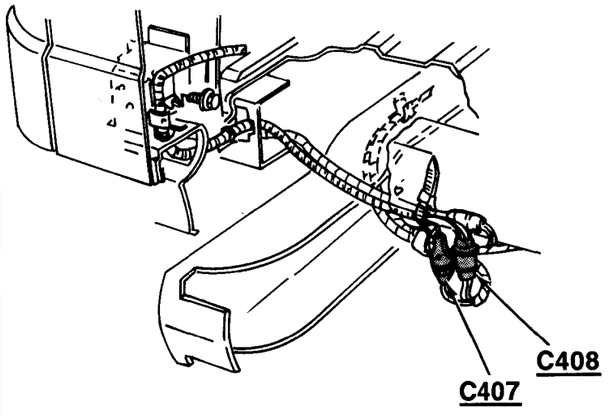


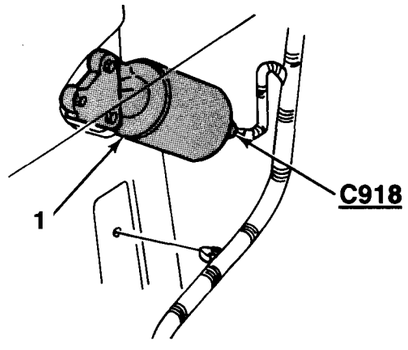
Figure 71 - Rear Door Power Windows and Locks



1. Tailgate Window Motor
2. Cut-Out Switch
3. Tailgate Window Switch, Key Operated



VIEW A



VIEW B

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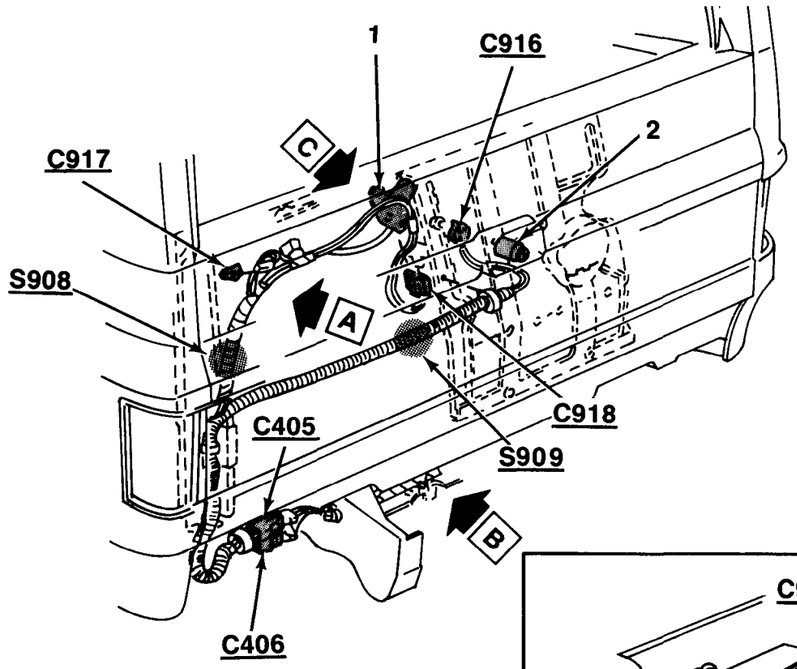
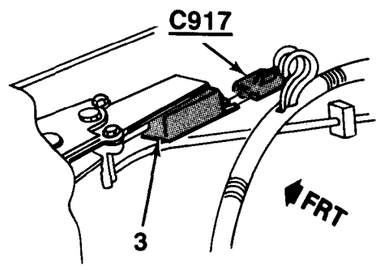
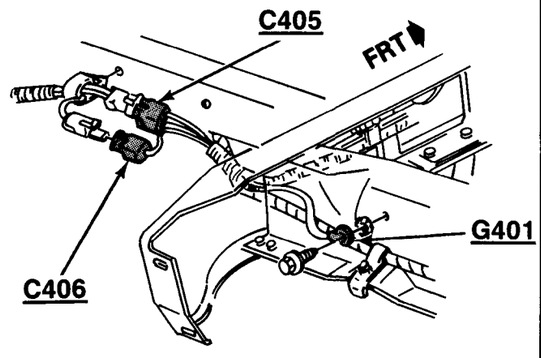
Figure 72 - Tailgate Rear Window Wiring—Utility



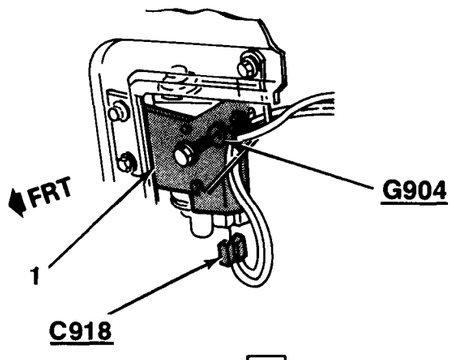
1. Rear Tailgate Window Motor
2. Tailgate Window Switch, Key Operated
3. Cut-Out Switch



VIEW A



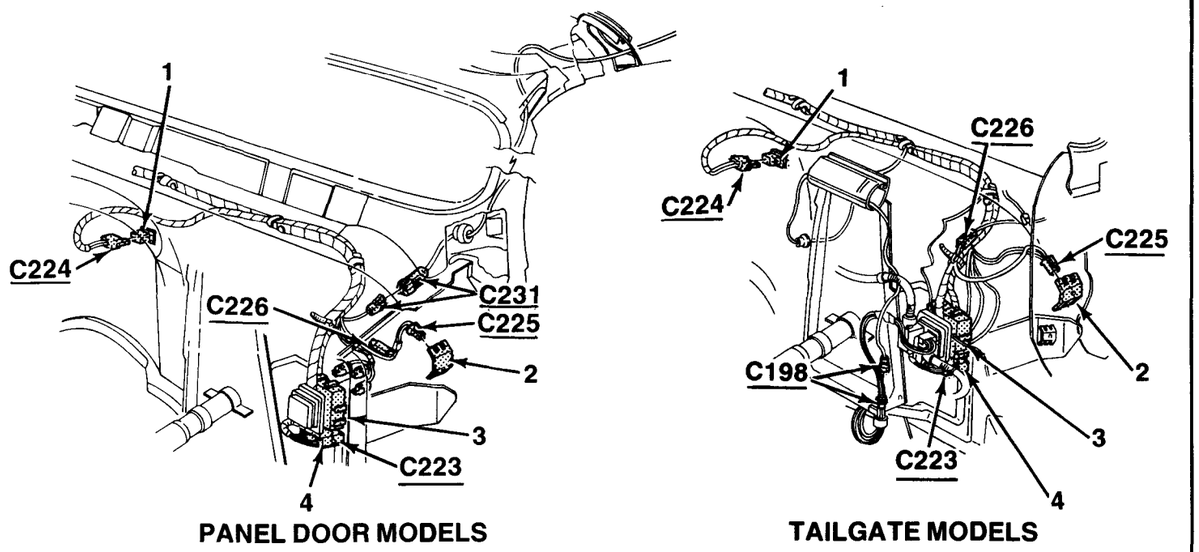
VIEW B



VIEW C

LC-0073-RV-E-RP

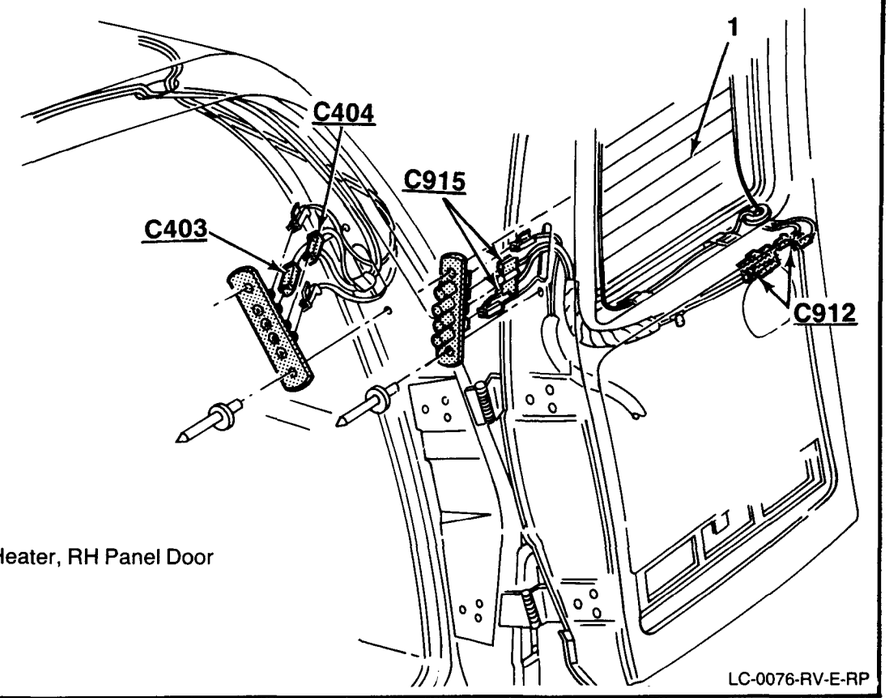
Figure 73 - Tailgate Rear Window Wiring—Suburban



1. Rear Window Defogger Switch
2. Bus Bar Ground
3. Fuse Block
4. Timer Relay

LC-0074-RV-E-RP

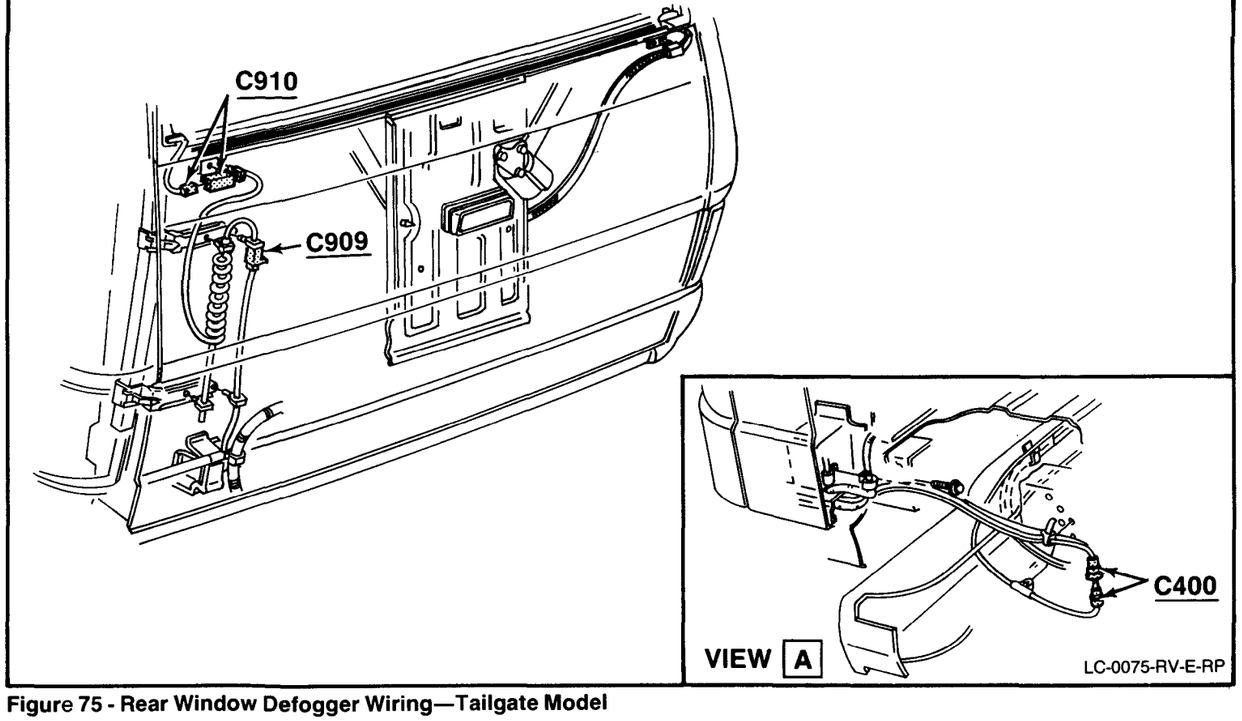
Figure 74 - Rear Defogger i/P Wiring—All Models



1. Rear Window Heater, RH Panel Door

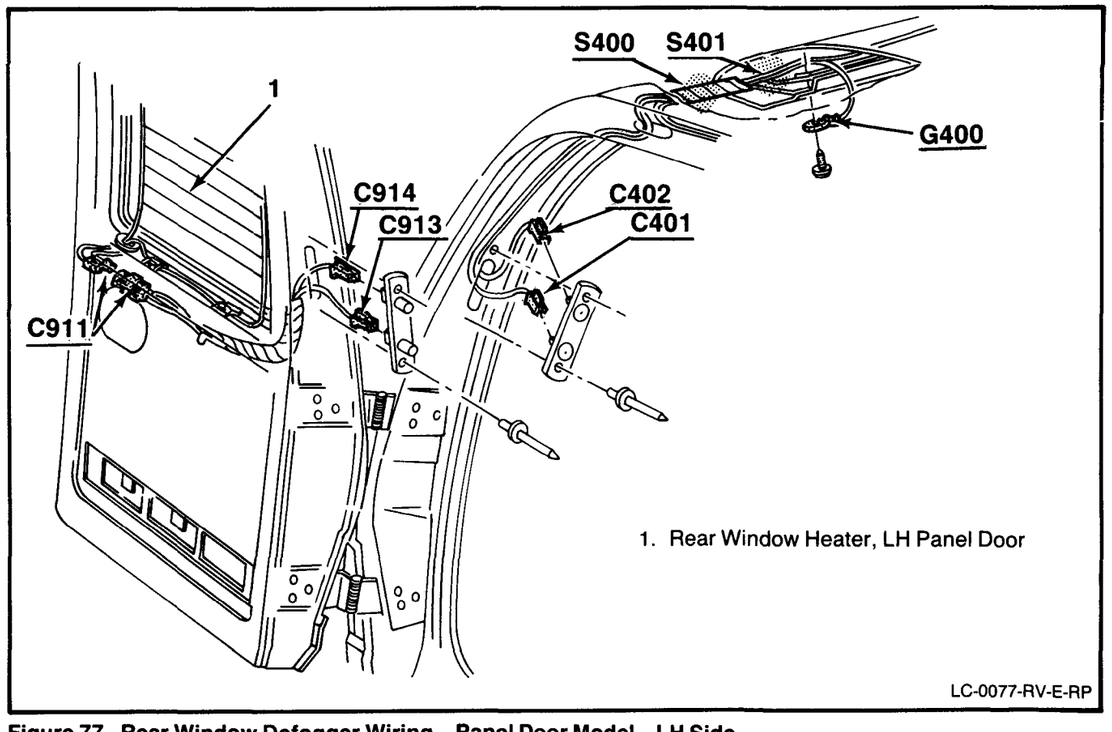
LC-0076-RV-E-RP

Figure 76 - Rear Window Defogger Wiring—Panel Door Model



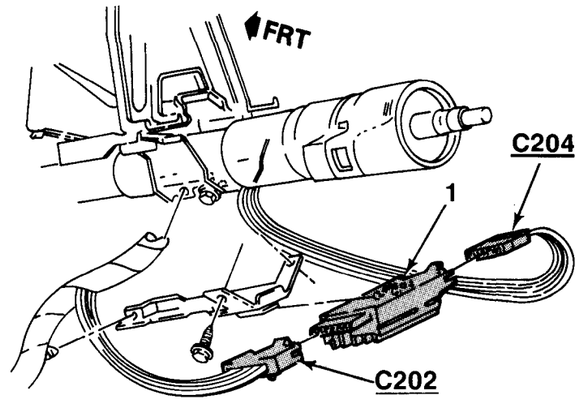
LC-0075-RV-E-RP

Figure 75 - Rear Window Defogger Wiring—Tailgate Model



LC-0077-RV-E-RP

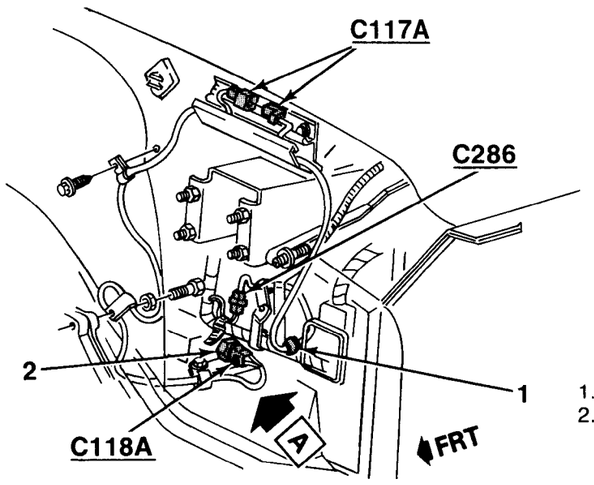
Figure 77 - Rear Window Defogger Wiring—Panel Door Model—LH Side

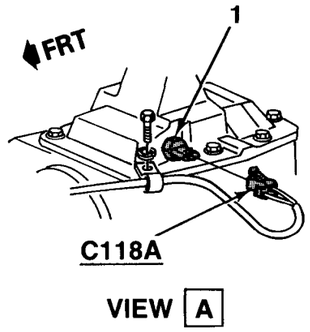


1. Pulse Wiper Module

LC-0078-RV-E-RP

Figure 78 - Pulse Wiper Module Wiring

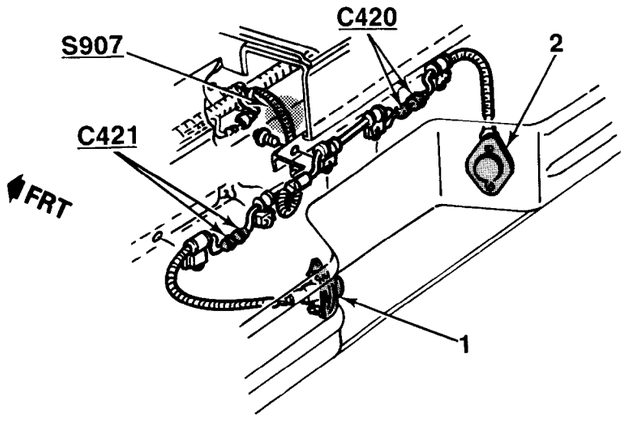




1. Grommet 104
2. Backup Lamp Switch—Manual Transmission

LC-0079-RV-E-RP

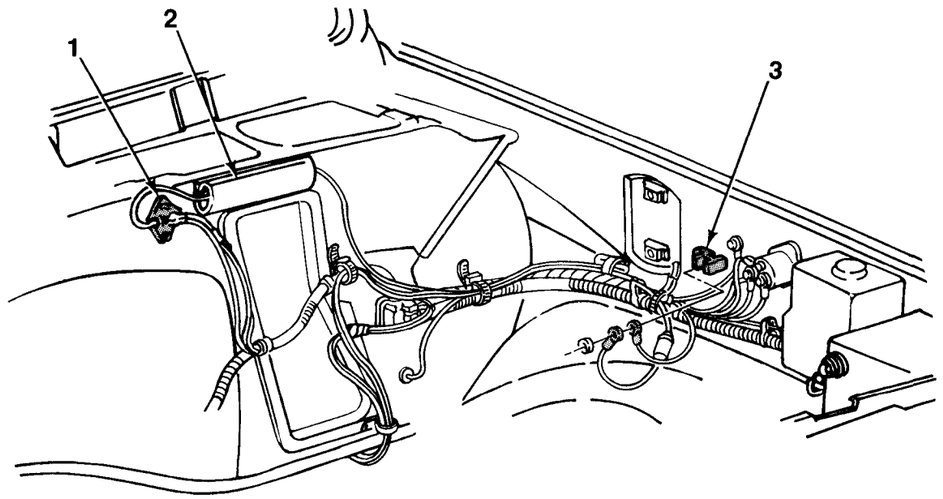
Figure 79 - Backup Lamp Switch Wiring—Manual Transmission



1. LH License Lamp
2. RH License Lamp

LC-0080-RV-E-RP

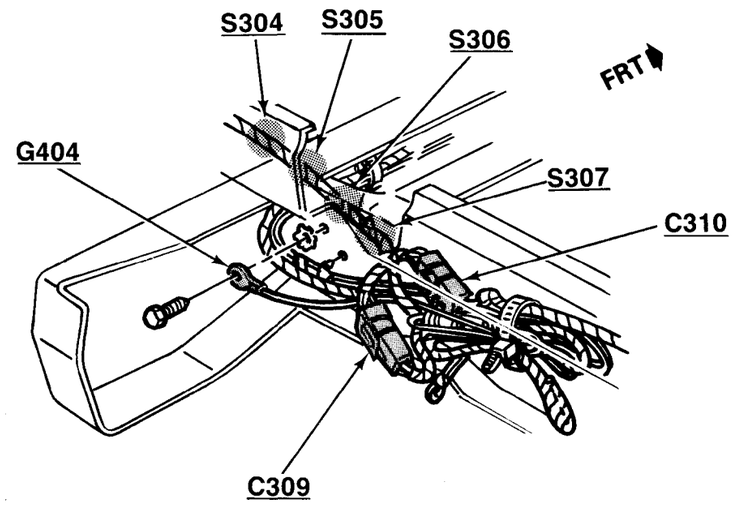
Figure 80 - License Lamps Wiring — Fleetside



1. Junction Block
2. In-Line Fuse (located inside dash wiring conduit)
3. Auxiliary Junction Block

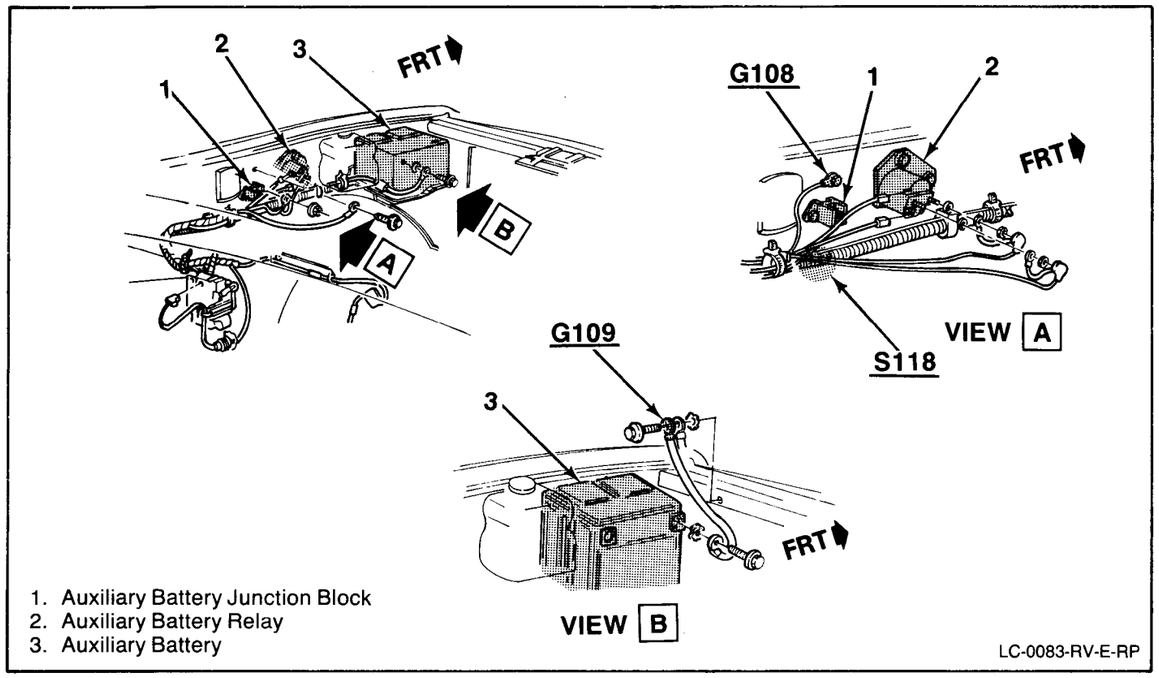
LC-0081-RV-E-RP

Figure 81 - Camper and Trailer Equipment Harness — Engine Compartment



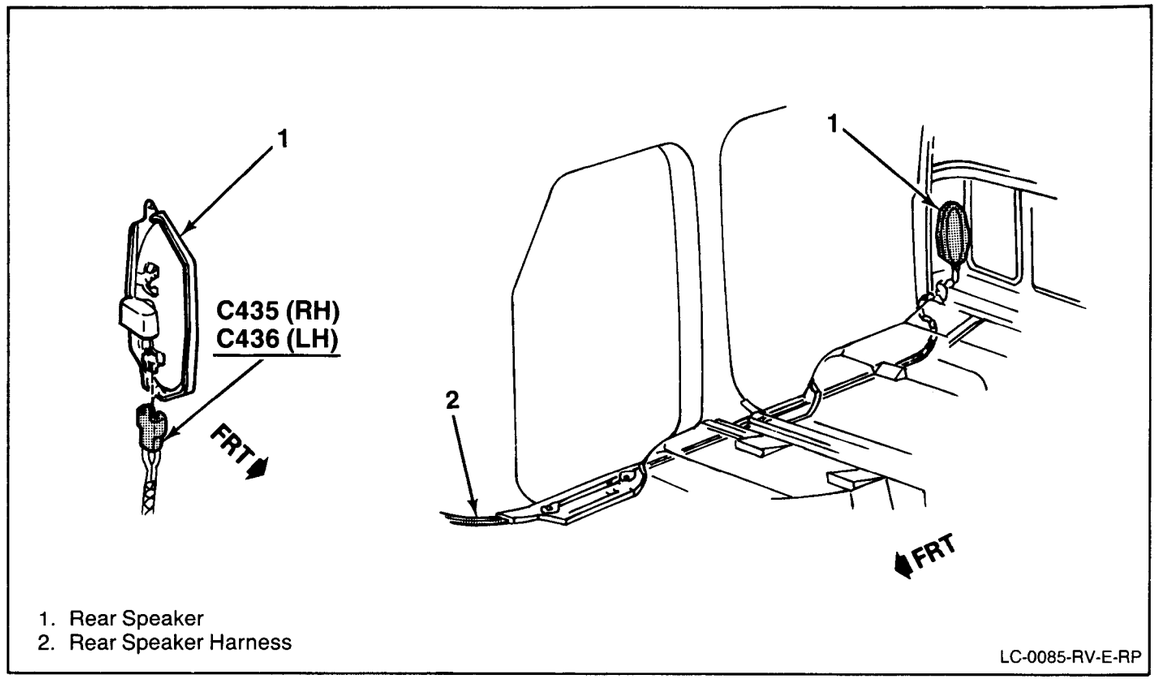
LC-0082-RV-E-RP

Figure 82 - Camper and Trailer Equipment Wiring



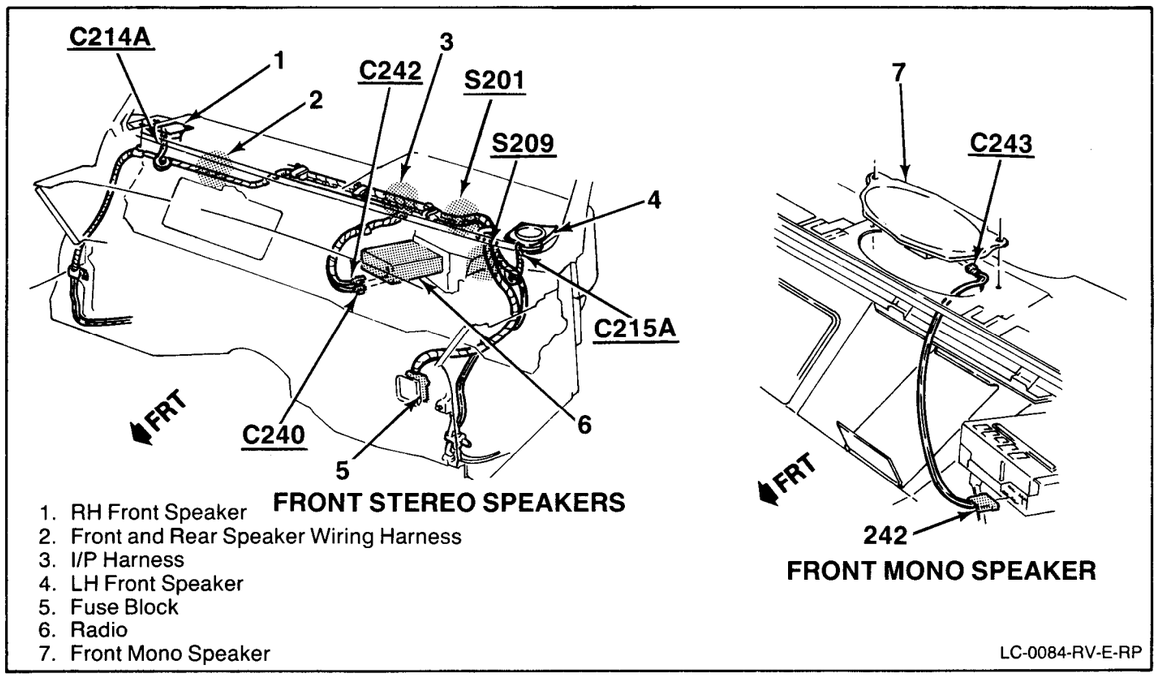
1. Auxiliary Battery Junction Block
2. Auxiliary Battery Relay
3. Auxiliary Battery

Figure 83 - Auxiliary Battery



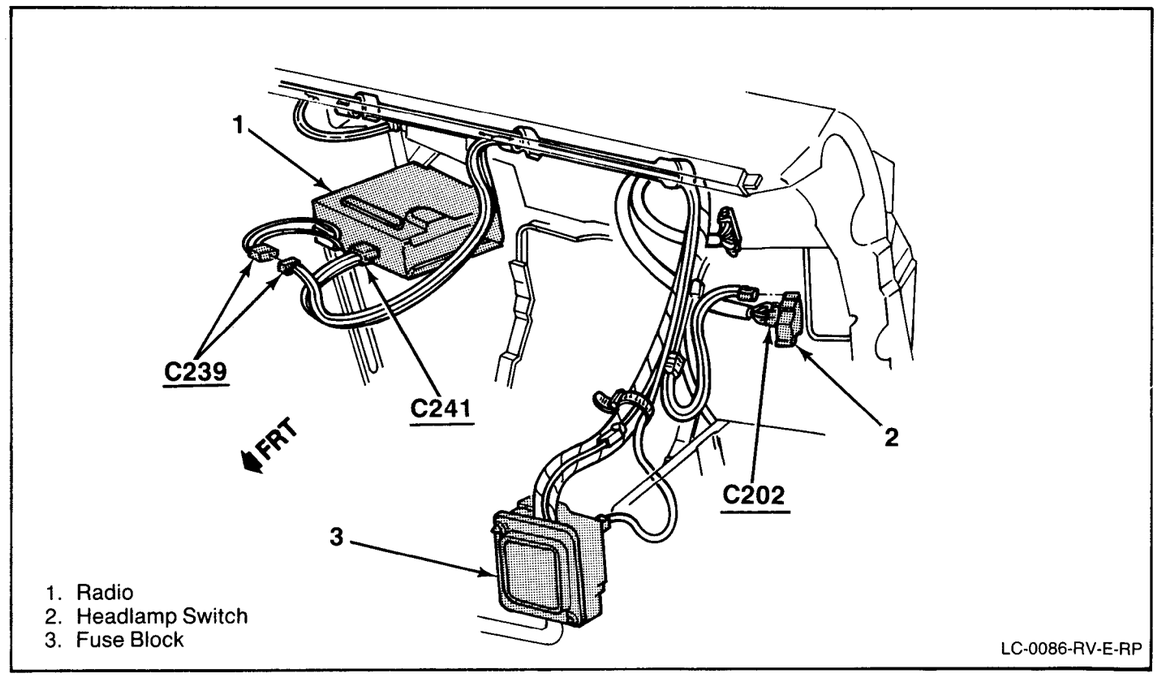
1. Rear Speaker
2. Rear Speaker Harness

Figure 85 - Rear Speaker Wiring Harness



1. RH Front Speaker
2. Front and Rear Speaker Wiring Harness
3. I/P Harness
4. LH Front Speaker
5. Fuse Block
6. Radio
7. Front Mono Speaker

Figure 84 - Radio and Front Speaker Wiring Harness



1. Radio
2. Headlamp Switch
3. Fuse Block

Figure 86 - Radio Wiring, Front Harness

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	2	2057	2-32
License Lamp	3	67	4
Directional Signal (Front Park Lamps)	4**	2457NA	1.5-24
Directional 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[1]	1	194	2
Clock	1	168	3
Safety Belt Warning	1	168	3
Glow Plugs Indicator[1]	1	194	2
4 WD Shift Lever	1	194	2
Water in Fuel[1]	1	194	2
"SERVICE ENGINE SOON" Lamp (w/Gas Engine) (w/LH6 Diesel)	 1 1	 194 1893	 2 2
Underhood Lamp	1	19/10	9.9
Reading Lamp	2	906	6

Double filament bulb.
[1]Diesel only.
*Not used on Suburban and Utility.
**2 required with 4 headlamp system.

R/V TRUCK COMPONENT LOCATOR INDEX

R/V TRUCK COMPONENT LOCATOR INDEX

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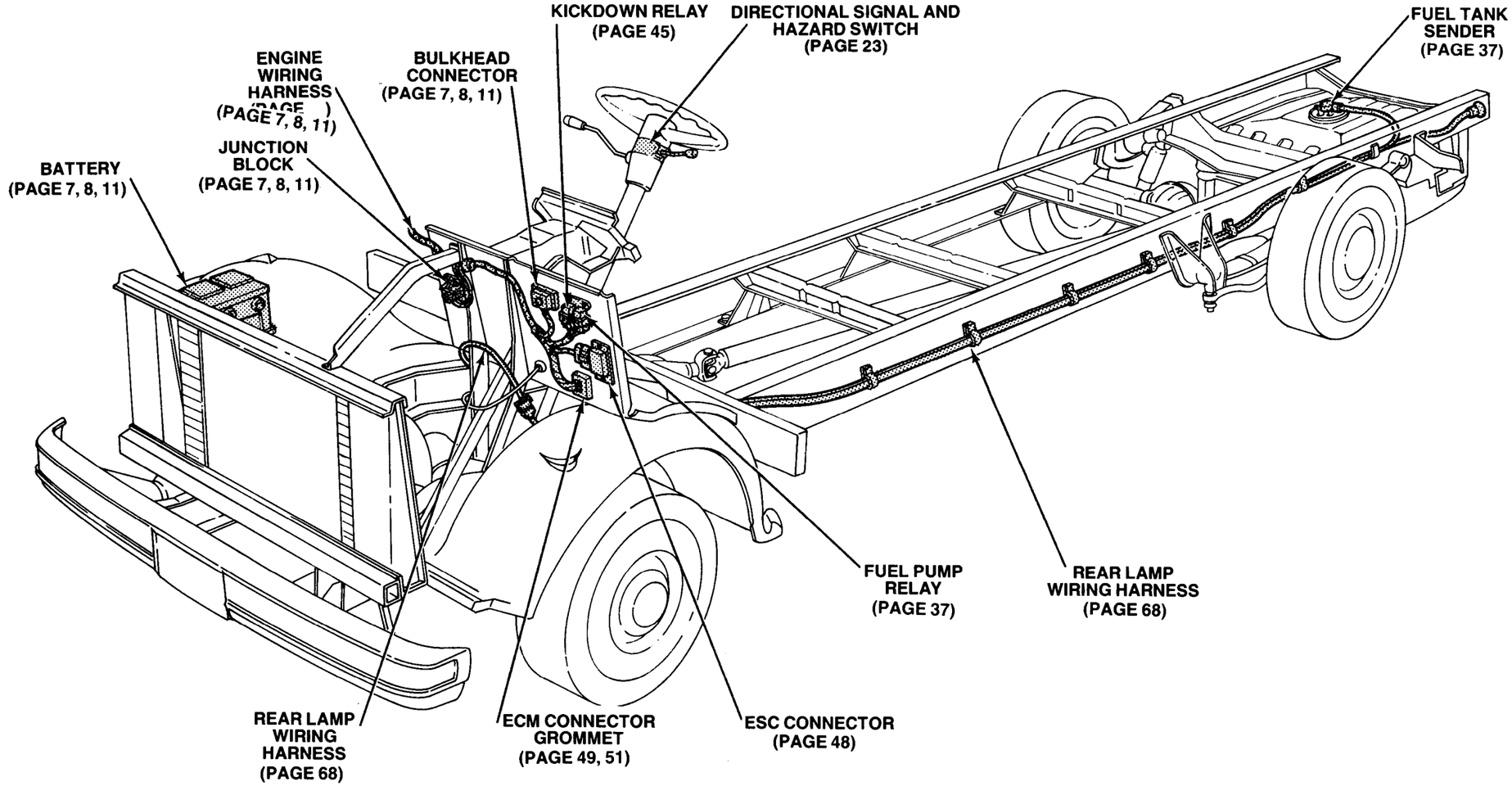
R/V TRUCK COMPONENT LOCATOR INDEX

R/V TRUCK COMPONENT LOCATOR INDEX

R/V TRUCK COMPONENT LOCATOR INDEX


KICKDOWN RELAY
(PAGE 45)
DIRECTIONAL SIGNAL AND
HAZARD SWITCH
(PAGE 23)
FUEL TANK
SENDER
(PAGE 37)
ENGINE
WIRING
HARNESS
(PAGE 7, 8, 11)
BULKHEAD
CONNECTOR
(PAGE 7, 8, 11)
JUNCTION
BLOCK
(PAGE 7, 8, 11)
BATTERY
(PAGE 7, 8, 11)
FUEL PUMP
RELAY
(PAGE 37)
REAR LAMP
WIRING HARNESS
(PAGE 68)
REAR LAMP
WIRING
HARNESS
(PAGE 68)
ECM CONNECTOR
GROMMET
(PAGE 49, 51)
ESC CONNECTOR
(PAGE 48)

SYMPTOMS INDEX

CAVITY "W" — CIRCUIT 50

IGNITION "ON" 25A FUSED FEED
- HEATER AND AIR CONDITIONING

CAVITY "I" — CIRCUIT 39

IGNITION "ON AND CRANK" 20A FUSED FEED
- AUTOMATIC TRANSMISSION
- DIESEL INDICATOR LAMPS
- BRAKE WARNING
- LOW COOLANT INDICATOR/CHOKE LAMPS
- FUEL PUMP FEED

CAVITY "B" — CIRCUIT 140

BATTERY 15A FUSED FEED
- CLOCK
- CIGAR LIGHTER
- DOOR JAMB SWITCH
- DOME/CARGO LAMPS

CAVITY "A" — CIRCUIT 141

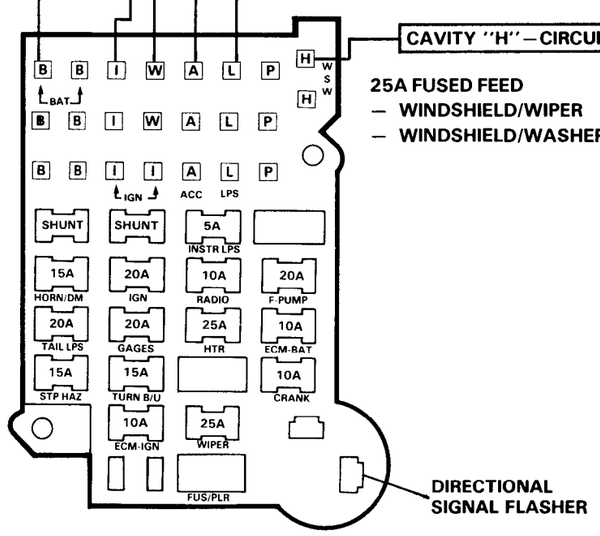
IGNITION "ON AND ACC" 10A FUSED FEED
- RADIO

CAVITY "L" — CIRCUIT 8

PANEL LAMPS 5A FUSED FEED
- TILT WHEEL (32)
- WINDSHIELD/WIPER SWITCH ILLUMINATION (42)
- TRANSMISSION INDICATOR LAMP
- RADIO DIAL

CAVITY "H" — CIRCUIT 93

25A FUSED FEED
- WINDSHIELD/WIPER
- WINDSHIELD/WASHERS



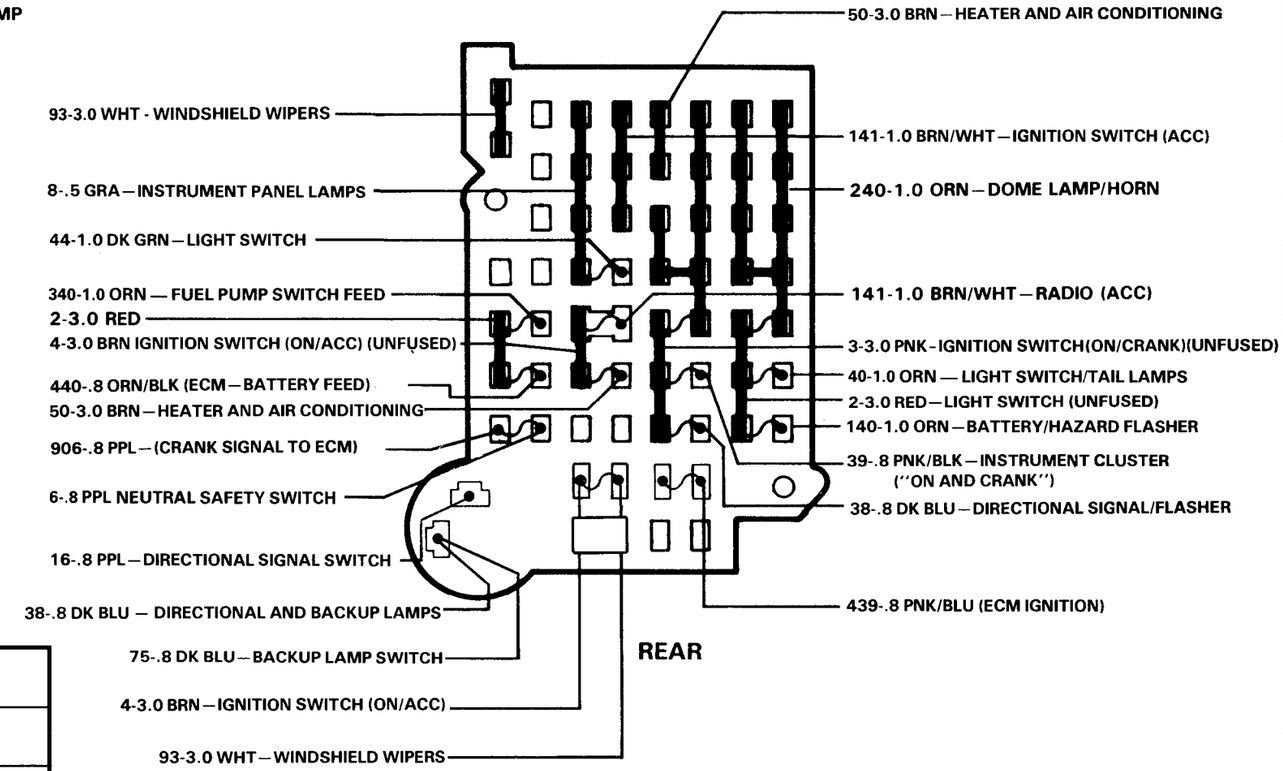
FRONT

12034359 FUSE BLOCK

DIRECTIONAL SIGNAL FLASHER

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N



FUSE AND CIRCUIT BREAKER IDENTIFICATION

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	DESCRIPTION		FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	DESCRIPTION
CRANK	12004007	RED 10 AMP	ELECTRONIC CONTROL MODULE CRANK CIRCUIT		IGN	12004009	YELLOW 20 AMP	CRUISE CONTROL BRAKE WARNING FUEL PUMP FEED
ECM-IGN	12004007	RED 10 AMP	ELECTRONIC CONTROL MODULE IGNITION 1		INSTR LPS	12004005	TAN 5 AMP	INSTRUMENT PANEL LAMPS
ECM-BAT	12004007	RED 10 AMP	ELECTRONIC CONTROL MODULE		RADIO	12004007	RED 10 AMP	RADIO
F-PUMP	12004009	YELLOW 20 AMP	FUEL PUMP AND DAYTIME RUNNING LAMPS (CANADA ONLY)		STP HAZ	12004008	LT BLUE 15 AMP	STOP LAMPS AND HAZARD FLASHERS
GAGES	12004009	YELLOW 20 AMP	INSTRUMENT PANEL GAGES		TAIL LPS	12004009	YELLOW 20 AMP	TAIL LAMPS AND PARKING LAMPS
HTR	12004010	WHITE 25 AMP	HEATER AND DAYTIME RUNNING LAMPS (CANADA ONLY)		TURN-B/U	12004008	LT BLUE 15 AMP	DIRECTIONAL SIGNALS AND BACKUP LAMPS
HORN/DM	12004008	LT BLUE 15 AMP	HORN AND DOME LAMPS		WIPER	12004010	WHITE 25 AMP	WINDSHIELD WIPERS

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

	COLOR	MALE CONN
I	NAT	12004888
A	BRN	12004887
B	BLK	12004886
L	GRN	12004885
P	RED	12004883
W	BLU	12004884
H	DK GRA	12004740

CAVITY "W" – CIRCUIT 50

IGNITION "ON" 25A FUSED FEED
- HEATER AND AIR CONDITIONING

CAVITY "I" — CIRCUIT 39

IGNITION "ON AND CRANK" 20A FUSED FEED
- AUTOMATIC TRANSMISSION
- DIESEL INDICATOR LAMPS
- BRAKE WARNING
- LOW COOLANT INDICATOR/CHOKE LAMPS
- FUEL PUMP FEED

CAVITY "B" – CIRCUIT 140

BATTERY 15A FUSED FEED
- CLOCK
- CIGAR LIGHTER
- DOOR JAMB SWITCH
- DOME/CARGO LAMPS

CAVITY "A" – CIRCUIT 141

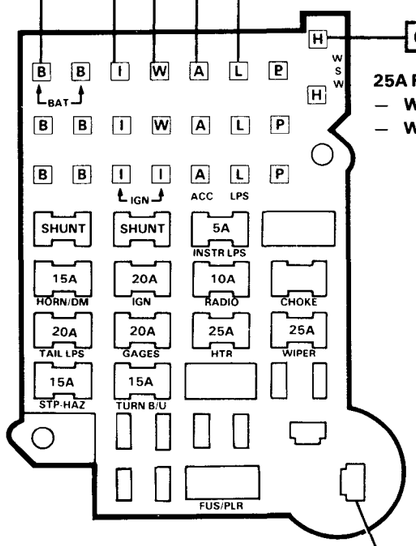
IGNITION "ON AND ACC" 10A FUSED FEED
- RADIO

CAVITY "L" – CIRCUIT 8

PANEL LAMPS-5A FUSED FEED
- TILT WHEEL (32)
- WINDSHIELD/WIPER SWITCH ILLUMINATION (42)
- TRANSMISSION INDICATOR LAMP
- RADIO DIAL

CAVITY "H" – CIRCUIT 93

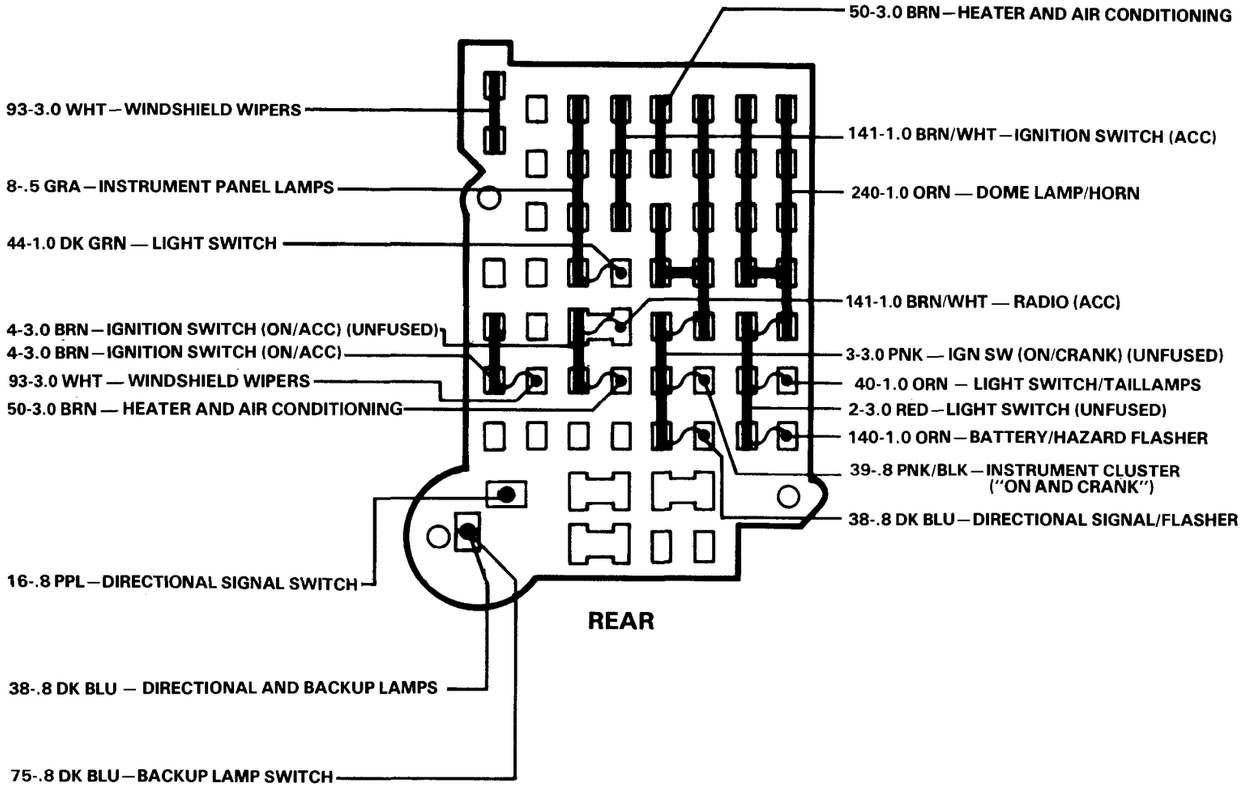
25A FUSED FEED
- WINDSHIELD/WIPER
- WINDSHIELD/WASHERS



DIRECTIONAL SIGNAL FLASHER

FRONT

2034359 FUSE BLOCK



REAR

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

	COLOR	MALE CONN
I	NAT	12004888
A	BRN	12004887
B	BLK	12004886
L	GRN	12004885
P	RED	12004883
W	BLU	12004884
H	DK GRA	12004740

FUSE AND CIRCUIT BREAKER IDENTIFICATION

FUSE LOCATION	FUSE PART NO.	COLOR AND AMPERE	DESCRIPTION
GAGES	12004009	YELLOW 20 AMP	INSTRUMENT PANEL GAGES
HTR	12004010	WHITE 25 AMP	HEATER AND DAYTIME RUNNING LAMPS (CANADA ONLY)
HORN/DM	12004008	LT BLUE 15 AMP	HORN, DOME LAMPS AND DAYTIME RUNNING LAMPS (CANADA ONLY)
IGN	12004009	YELLOW 20 AMP	CRUISE CONTROL BRAKE WARNING LOW COOLANT INDICATORS
INSTR LPS	12004005	TAN 5 AMP	INSTRUMENT PANEL LAMPS
RADIO	12004007	RED 10 AMP	RADIO
STP HAZ	12004008	LT BLUE 15 AMP	STOP LAMPS AND HAZARD FLASHERS
TAIL LPS	12004009	YELLOW 20 AMP	TAILLAMPS AND PARKING LAMPS
TURN-B/U	12004008	LT BLUE 15 AMP	DIRECTIONAL SIGNALS AND BACKUP LAMPS
WIPER	12004010	WHITE 25 AMP	WINDSHIELD WIPERS

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

FUSE BLOCK (RPO LL4)

SECTION B - PAGE 4

BLANK

COMPONENT LOCATION

		Page — Figure
Battery (P32 w/RPO L19)	On RH frame rail	80 — 20
Battery (P32, P42 w/RPO LB4, L05, L19) w/o RPO B3M	RH side of engine compartment	80 — 22
Battery (P42 w/RPO B3M, LB4, L05)	On RH frame rail	80 — 21
Bulkhead Connector (P42 w/RPO LB4, L05, L19)	Lower RH side of cowl	78 — 16
Fuse Block (Gasoline)	Body builder installed	—
Fuse Block (Gasoline P32, P42)	Body builder installed	—
Generator (P32, P42 w/RPO L19)	Top RH side of engine	76 — 9
Generator (P42 w/RPO LB4)	Top RH side of engine	77 — 13
Generator (P42 w/RPO L05)	Top RH side of engine	76 — 11
Headlamp Switch	Body builder installed	—
Ignition Switch	Body builder installed	—
Junction Block (P42 w/RPO LB4, L05, L19)	LH side of cowl	78 — 16
Starter Motor Solenoid (P32, P42 w/B3M, LB4, L05)	Bottom RH side of engine	80 — 21
Starter Motor Solenoid (P32, P42 w/LB4, L05, L19 w/o RPO B3M)	Bottom RH side of engine	80 — 22
Temporary Fuel Tank (P32 w/RPO L19)	Temporary location	—
C100 (P32 w/RPO L19)	Lower, LH side of cowl	78 — 14
C100 (P42 w/RPO LB4, L05, L19)	Lower, LH side of cowl	78 — 16
C203	At ignition switch	—
C209	At headlamp switch	—
C219	At clutch start switch (with manual transmission) or neutral safety switch (with automatic transmission)	—
G110	Top, radiator support	80 — 22
G110 (P32 w/RPO L19)	On RH frame assembly	80 — 20
G110 (P42 w/RPO B3M, LB4, L05)	On RH frame assembly	80 — 21
G111 (P32, P42 w/RPO LB4, L05, L19 w/o RPO B3M)	On top RH front of engine	80 — 22
G111 (P42 w/RPO B3M, LB4, L05)	On top RH front of engine	80 — 21
G200 (P32 w/RPO L19)	Near C100 (bulkhead connector)	—
S108 (P32 w/RPO L19)	Engine harness, LH side of cowl	78 — 14
S108 (P42 w/RPO L05, L19)	Engine harness, LH side of cowl	78 — 16
S203	Body builder installed harness	—
S204	Body builder installed harness	—
S205	Body builder installed harness	—
S206	Body builder installed harness	—
S207	Body builder installed harness	—
S208	Body builder installed harness	—
S209	Body builder installed harness	—
S210	Body builder installed harness	—

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

STARTER MOTOR SOLENOID

6-5.0 PPL

2-3.0 RST (FUSIBLE LINK)

2-1.0 RST (FUSIBLE LINK)

1-19.0 BLK

S2

2-8.0 RED

JUNCTION BLOCK

2-2.0 RST (FUSIBLE LINK)

2-5.0 RED

GENERATOR

2-8.0 RED

2-3.0 RED

ENGINE

12020183
C100

3-3.0 PNK

TO COIL (SEE PAGE 32)

BATTERY

ENGINE GROUND G111

SHEET METAL GROUND G110

2-3.0 BLK

1-19.0 BLK

TO CLUTCH START SWITCH (MANUAL TRANSMISSION) OR NEUTRAL SAFETY SWITCH (AUTOMATIC TRANSMISSION)

8911921
C219

6-3.0 PPL

5-3.0 YEL

TO PARK/ NEUTRAL RELAY (AUTOMATIC TRANSMISSION ONLY) (SEE PAGE 33)

TO PARK BRAKE SWITCH (SEE PAGE 53,54)

2-5.0 RED

33-.5 TAN/WHT

S206

S207

6288702
C203

5-3.0 YEL

INSTRUMENT PANEL GROUND G200

150-3.0 BLK

FROM I/P CLUSTER CONNECTOR (SEE PAGE 61, 63, 64) ➤ 150-.8 BLK

FROM DIRECTIONAL SIGNAL INDICATOR LAMPS (SEE PAGE 25) ➤ 150-.5 BLK

FROM PARK BRAKE SWITCH (SEE PAGE 53) ➤ 150-.5 BLK

S203

150-.5 BLK ➤ FROM OIL PRESSURE GAGE (SEE PAGE 64)

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

I/P

COWL

12020184
C100

3-3.0 PNK

S204

HEADLAMP SWITCH

PARK OFF

HEAD PARK OFF

TO HEADLAMP DIMMER SWITCH (SEE PAGE 13, 19)

10-1.0 YEL

TO EXTERIOR LAMPS (SEE PAGE 68, 69)

9-1.0 BRN

12004628
C209

156-.8 WHT ➤ PROVISION FOR DOME LAMP(S)

44-1.0 DK GRN

40-1.0 ORN

6-.8 PPL

4-3.0 BRN

3-3.0 PNK

S205

S210

4-3.0 BRN

FUSE BLOCK

HOT AT ALL TIMES

HOT WITH HEADLAMP SWITCH IN HEAD OR PARK

INSTR LPS 5 AMP

HOT AT ALL TIMES

HORN DM 15 AMP

TAIL LPS 20 AMP

STP HAZ 15 AMP

HOT IN RUN OR START

IGN 20 AMP

GAGES 20 AMP

TURN-B/U 15 AMP

ECM-IGN 10 AMP

CRANK 10 AMP

HOT IN START

F-PUMP 20 AMP

ECM – BAT 10 AMP

HOT IN ACCY/START AND RUN

RADIO 10 AMP

HTR 25 AMP

WIPER 25 AMP

FRONT

REAR

ECM-BAT 10 AMP

CRANK 10 AMP

F-PUMP 20 AMP

INSTR LPS 5 AMP

RADIO 10 AMP

IGN 20 AMP

GAGES 20 AMP

HORN DM 15 AMP

STP HAZ 15 AMP

TAIL LPS 20 AMP

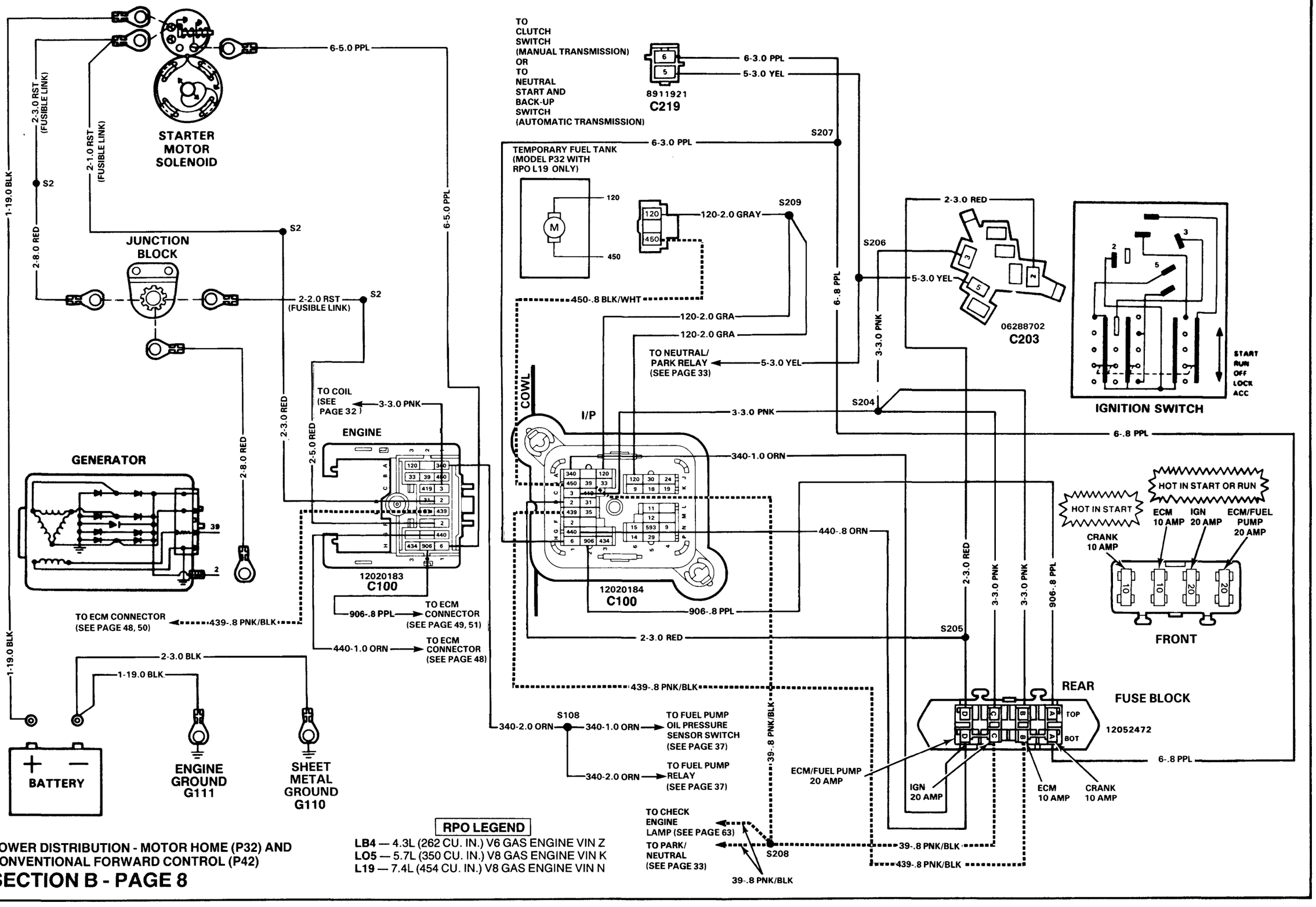
TURN-B/U 15 AMP

WIPER 25 AMP

HTR 25 AMP

ECM-IGN 10 AMP

POWER DISTRIBUTION
(RPO LB4, LO5 AND L19)



RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

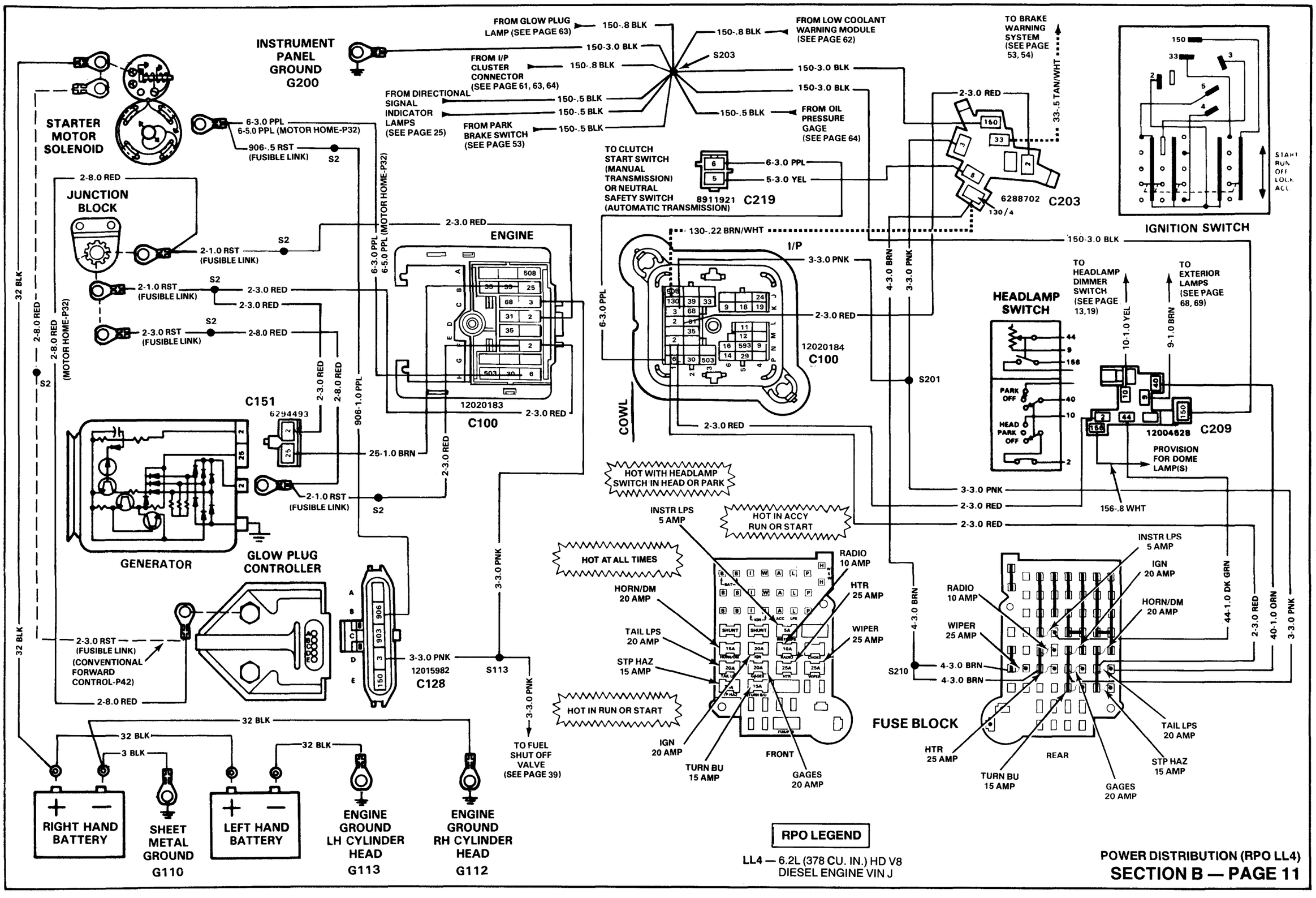
POWER DISTRIBUTION - MOTOR HOME (P32) AND CONVENTIONAL FORWARD CONTROL (P42)

SECTION B - PAGE 8

BLANK

COMPONENT LOCATION

		Page — Figure
Battery, LH (P42)	Front LH side of engine compartment	73 — 1
Battery, RH (P32, P42 w/RPO B3M)	RH frame rail, behind engine	73 — 1
Battery, RH (P42)	Front RH side of engine compartment	73 — 1
Fuse Block	LH front of cowl	—
Generator	RH front of engine	73 — 2
Glow Plug Controller	Top LH rear of engine	74 — 4
Headlamp Switch	Body builder installed	—
Ignition Switch	Body builder installed	—
Junction Block (P32)	LH front of cowl	74 — 5
Junction Block (P42)	LH front of cowl	75 — 6
Starter Motor Solenoid	Lower RH side of engine	73 — 1
C100 (P32)	LH front of cowl (temporary)	74 — 5
C100 (P42)	LH front of cowl (temporary)	75 — 6
C128	At glow plug controller	74 — 4
C151	At generator	73 — 2
C203	At ignition switch	—
C209	At headlamp switch	—
C219	At clutch start or neutral safety switch	—
G110 (P32, P42 w/RPO B3M)	RH frame rail, below batteries	73 — 1
G110 (P42)	RH front of engine compartment	73 — 1
G112 (P32, P42 w/RPO B3M)	Top right rear of engine	73 — 1
G112 (P42)	Top right front of engine	73 — 1
G113 (P42)	Top left front of engine	73 — 1
G200	Body builder installed harness	—
S113	RH front of engine, near rocker cover	73 — 2
S201	Body builder installed harness	—
S203	Body builder installed harness	—
S210	Body builder installed harness	—



RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

CIRCUIT OPERATION

Voltage is applied to the Headlamp Switch at all times. The Headlamp 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 Headlamp 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.

COMPONENT LOCATION

		Page — Figure
Dimmer Switch	Body builder installed	—
Fuse Block	Body builder installed	—
Headlamp Switch	Body builder installed	—
High-Low Headlamp, LH	Body builder installed	—
High-Low Headlamp, RH	Body builder installed	—
Park and Directional Lamp, LH	Body builder installed	—
Park and Directional Lamp, RH	Body builder installed	—
Side Marker Lamp, LH	Body builder installed	—
Side Marker Lamp, RH	Body builder installed	—
C100 (P32 w/RPO LL4)	LH front of cowl	74 — 5
C100 (P32 w/RPO L19)	LH front of cowl	78 — 14
C100 (P42 w/RPO LB4, L05, L19)	LH front of cowl	78 — 16
C100 (P42 w/RPO LL4)	LH front of cowl	75 — 6
C140	Body builder installed	—
C141	Body builder installed	—
C142	Body builder installed	—
C143	Body builder installed	—
C144	Body builder installed	—
C145	Body builder installed	—
C205	Body builder installed	—
C209	Body builder installed	—
C210	Body builder installed	—
G104	Body builder installed harness	—
G105	Body builder installed harness	—
G106	Body builder installed harness	—
G107	Body builder installed harness	—
G108	Body builder installed harness	—
S120	Body builder installed harness	—
S121	Body builder installed harness	—
S122	Body builder installed harness	—
S211	Body builder installed harness	—

TROUBLESHOOTING CHART—HEADLAMPS

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at headlamp 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 headlamp switch to junction block.
2. With the headlamp switch on and the dimmer switch to HIGH BEAM, connect a test lamp from YEL/BLK (10) wire at headlamp switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 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 headlamp switch ON and 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 3.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from TAN (12) to BLK (150 or 151) wire(s) at headlamp connectors C140 or C144.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) from headlamp connector(s) C140 or C144 to ground terminal(s) G104, G105, G106 or G107. If wire(s) is (are) in good condition, GO to step 3.
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from TAN (12) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch to headlamp.
4. Connect a test lamp from YEL/BLK (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL/BLK (10) wire from headlamp dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp 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 3.
	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 C140 or C144.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) at headlamp connector(s) C140 or C144 to ground connection(s) G104, G105, G106 or G107. If wire(s) is (are) in good condition, GO to step 3.
	Test lamp lights.	REPLACE headlamps(s).
3. Place dimmer switch in the HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	LOCATE and REPAIR open in LT GRN (11) wire from headlamp(s) to headlamp dimmer switch.
4. Connect a test lamp from YEL/BLK (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL/BLK (10) wire headlamp dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

RH HIGH-LOW HEADLAMP

2973386 (MOTOR HOME-P32)
12034372 (CONVENTIONAL FORWARD CONTROL-P42)

C144
150/151

11-1.0 LT GRN
12-.8 TAN
151-.8 BLK
151-3.0 BLK

SHEET METAL GROUND
G105

G104
FRAME GROUND

SHEET METAL GROUND
G105
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)

150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
S120
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)
150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
FRAME GROUND
G104
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)

ENGINE GROUND
G108
4-GRD STRAP (CONVENTIONAL FORWARD CONTROL-P42 ONLY)

RH SIDE MARKER LAMP
C145
6294015

HOT AT ALL TIMES
TAIL LPS 20 AMP

FRONT
FUSE BLOCK
REAR

TAIL LPS 20 AMP

INSTRUMENT CLUSTER CONNECTOR
2984790
C205

2-3.0 RED
11-.5 LT GRN
S211
2-3.0 RED → TO CRANK FUSE (LB4, LO5 AND L19 ONLY)

9-.5 BRN

COWL
I/P
C100
12020184

9-1.0 BRN
12-.8 TAN
11-.5 LT GRN
11-1.0 LT GRN
2-3.0 RED
2-3.0 RED

HEADLAMP SWITCH
C209
12004628

10-1.0 YEL/BLK

RH PARK AND DIRECTIONAL LAMP
.8 BLK
2984855
C143

9-.8 BRN
S121

(CONVENTIONAL FORWARD CONTROL-P42 ONLY)

150-.8 BLK
150-.8 BLK
11-1.0 LT GRN
12-.8 TAN
9-.8 BRN

LH PARK AND DIRECTIONAL LAMP
.8 BLK
2984855
C142

9-.8 BRN
S122

9-.5 BRN
9-.8 BRN

12034372 (CONVENTIONAL FORWARD CONTROL-P42)
2973386 (MOTOR HOME-P32)

11-1.0 LT GRN
11-1.0 LT GRN
12-.8 TAN
12-.8 TAN
150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)

LH HIGH-LOW HEADLAMP
C140

9-.8 BRN
12-.8 TAN
11-1.0 LT GRN

FRONT BODY CONNECTOR
12020100
C100

DIMMER SWITCH

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

8900855
C210

150-.8 BLK
150-.8 BLK
SHEET METAL GROUND
G107

150-.8 BLK
SHEET METAL GROUND
G106
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)
G106

150-.8 BLK

6294015
C141
LH SIDE MARKER LAMP

RPO LEGEND

- **LB4** — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
- **LO5** — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
- **L19** — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

BLANK

CIRCUIT OPERATION

DAYTIME RUNNING LAMPS (CANADA ONLY)

Battery voltage is applied to the Daytime Running Lamp (DRL) Relay Switch at all times through the ORN (340) wire from the DRL fuse and, when the Ignition Switch is in RUN, through the PNK/BLK (39) wire from the GAGES fuse. Battery voltage is also applied to the Daytime Running Lamp Module from the BRN (50) wire and the HTR fuse.

With the Headlamps on, the Daytime Running Lamp 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(s).

With Ignition in RUN, headlamps off and Parking Brake released, the Daytime Running Lamp 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 LT BLU/ORN (593) wire from ground and internally connects it to the ORN (340) wire, causing it to be 12 volts.

The LT BLU/ORN (593) wire feeds the LH High beam(s) which are connected in series to the RH Headlamp(s) through the LT GRN (11) wire. Grounding of the entire DRL circuit is accomplished through the BLK (151) wire at the RH Headlamp(s). This results in High beam headlamps that are less intense for daytime driving and should provide longer service.

COMPONENT LOCATION

		Page — Figure
Daytime Running Lamp Module	Body builder installed	—
Daytime Running Lamp Relay Switch	Body builder installed	—
Dimmer Switch	Body builder installed	—
Fuse Block (Diesel)	Body builder installed	—
Fuse Block (Gasoline)	Body builder installed	—
Headlamp Switch	Body builder installed	—
High-Low Headlamp, LH	Body builder installed	—
High-Low Headlamp, RH	Body builder installed	—
Park and Directional Lamp, LH	Body builder installed	—
Park and Directional Lamp, RH	Body builder installed	—
Side Marker Lamp, LH	Body builder installed	—
Side Marker Lamp, RH	Body builder installed	—
C100 (P32 w/RPO LL4)	LH front of cowl	74 — 5
C100 (P32 w/RPO L19)	LH front of cowl	78 — 14
C100 (P42 w/RPO LB4, L05, and L19)	LH front of cowl	78 — 16
C100 (P42 w/RPO LL4)	LH front of cowl	75 — 6
C140	At LH high-low headlamp	—
C141	At LH side marker lamp	—
C142	At LH park and directional lamp	—
C143	At RH park and directional lamp	—
C144	At RH high-low headlamp	—
C145	At RH side marker lamp	—
C205	In body builder installed instrument panel	—
C209	At headlamp switch	—
C210	At dimmer switch	—

COMPONENT LOCATION

		Page — Figure
C242	At daytime running lamp switch	—
C243	At daytime running lamp module	—
G104	Body builder installed harness	—
G104 (P42)	Body builder installed harness	—
G105	Body builder installed harness	—
G105 (P42)	Body builder installed harness	—
G106 (P42)	Body builder installed harness	—
G108	Body builder installed harness	—
G200	Near C100 (bulkhead connector)	—
S120	Body builder installed harness	—
S121	Body builder installed harness	—
S122	Body builder installed harness	—
S202	Body builder installed harness	—
S203	Body builder installed harness	—
S211	Body builder installed harness	—
S212	Body builder installed harness	—
S213	Body builder installed harness	—

TROUBLESHOOTING CHART—HEADLAMPS (WITH DAYTIME RUNNING LAMPS)

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at headlamp 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 headlamp switch to fuse block.
2. With the headlamp switch on and the dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at headlamp switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from dimmer switch to headlamps.
	Test lamp does not light.	REPLACE dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn headlamp switch ON and 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 C140 or C144 to ground. (For Canadian vehicles LT BLU/ORN (593) is used in place of BLK (150) wire at connector C140.)	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) from headlamp connector(s) C140 or C144 to ground terminal(s) G107 or G105. (For Canadian vehicles, GO to step 3.)
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from LT BLU/ORN (593) wire at daytime running lamp relay switch connector C242 to ground.	Test lamp does not light.	LOCATE and REPAIR open in LT BLU/ORN (593) wire from headlamp connector C140 to daytime running lamp relay switch C242.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from BLK (150) wire at the daytime running lamp relay switch connector C242 to ground.	Test lamp does not light.	REPLACE daytime running lamp relay switch.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from daytime running lamp relay switch to ground G200.
5. Connect a test lamp from TAN (12) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 6.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from dimmer switch to headlamp.
6. Connect a test lamp from YEL (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp 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 C140 or C144. (For Canadian vehicles, LT BLU/ORN (593) wire is used in place of BLK (150) wire at connector C140.)	Test lamp does not light.	If RH headlamp is inoperative, LOCATE and REPAIR open in BLK (150/151) wire to ground. If LH headlamp is inoperative, GO to step 3.
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from LT BLU/ORN (593) wire to ground at daytime running lamp relay switch connector C242.	Test lamp does not light.	LOCATE and REPAIR open in LT BLU/ORN (593) wire at headlamp connector C140 to daytime running lamp relay switch C242.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from BLK (150) wire at daytime running lamp relay switch connector C242 to ground.	Test lamp does not light.	REPLACE daytime running lamp relay switch.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from daytime running lamp relay switch connector to ground G200.
5. Place dimmer switch in the HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 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 dimmer switch.
6. Connect a test lamp from YEL (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE dimmer switch.

PRELIMINARY CHECKS:

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

1. Place Park Brake in the OFF position.
2. Place Headlamp 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 Headlamp Switch to OFF position.

DAYTIME RUNNING LAMPS DO NOT OPERATE (CANADA ONLY)

TEST	RESULT	ACTION
1. With Ignition in RUN, Headlamps off and park brake released, connect test lamp from ORN (340) (240 RPO LL4) wire at DRL relay connector C242 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (340) (240 RPO LL4) wire between DRL relay connector C242 and fuse block or 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 switch 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 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 C243 and DRL relay switch 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 switch connector C242 to ground. Measure voltage.	No voltage.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between the DRL relay switch and the DRL module or REPLACE daytime running lamp module.
	Battery voltage.	GO to step 5.
5. Connect test lamp from LT BLU/BRN (593) wire at LH HI/LOW beam connector C140.	Test lamp does not light.	LOCATE and REPAIR open in LT BLU/ORN (593) wire between DRL relay switch connector and the LH HI/LOW headlamp connector.
	Test lamp lights.	Daytime running lamps are operational.

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

RH HIGH-LOW HEADLAMP
C144
2973386 (MOTOR HOME-P32)
12034372 (CONVENTIONAL FORWARD CONTROL-P42)
11-1.0 LT GRN
12-.8 TAN
150/151
151-.8 BLK
151-3.0 BLK
SHEET METAL GROUND G105
FRAME GROUND G104
RH SIDE MARKER LAMP
C145
6294015
SHEET METAL GROUND G105
150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
S120
150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
150-.8 BLK (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)
FRAME GROUND G104
ENGINE GROUND G108
4-GRD STRAP (CONVENTIONAL FORWARD CONTROL-P42 ONLY)
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)
9-.5 BRN
9-.8 BRN
S121
.8 BLK
RH PARK AND DIRECTIONAL LAMP
2984855
C143
COWL
I/P
9-1.0 BRN
11-.5 LT GRN
11-1.0 LT GRN
12-.8 TAN
9-1.0 BRN
9-1.0 BRN
150-.8 BLK
11-1.0 LT GRN
12-.8 TAN
9-.8 BRN
S122
12020184
C100
593-.8 LT BLU/ORN
593-.8 LT BLU/ORN
2-3.0 RED
2-3.0 RED
.8 BLK
LH PARK AND DIRECTIONAL LAMP
2984855
C142
9-.5 BRN
9-.8 BRN
12034372 (CONVENTIONAL FORWARD CONTROL-P42)
2973386 (MOTOR HOME-P32)
11-1.0 LT GRN
11-1.0 LT GRN
12-.8 TAN
12-.8 TAN
593-.8 LT BLU/ORN
593-.8 LT BLU/ORN
FRONT BODY CONNECTOR
12020100
C100
LH HIGH-LOW HEADLAMP
593/151
C140
151-.8 BLK
151-.8 BLK
SHEET METAL GROUND
150-.8 BLK
LH SIDE MARKER LAMP
6294015
C141
G107
G106
(CONVENTIONAL FORWARD CONTROL-P42 ONLY)

HEADLAMPS (WITH DAYTIME RUNNING LAMPS)

DAYTIME RUNNING LAMP RELAY SWITCH
12034003
C242
240 592 593 450 50
DAYTIME RUNNING LAMPS MODULE
12015308
C243
240/340
592 150 50 593
(RPO LL4)
33 50 10 11 629 592 150 57
PARKING BRAKE INPUT
IGNITION
HEADLAMP SWITCH INPUT
HIGH BEAM INPUT
I/P CLUSTER OUTPUT
DRIVING LAMP OUTPUT TO RELAY
GROUND
HOT AT ALL TIMES
HORN DM 20 AMP
HOT IN ACCY, START OR RUN
HTR 25 AMP
HORN DM 20 AMP
HOT IN START AND RUN
HOT IN RUN OR START
HTR 25 AMP
F PUMP 20 AMP
FUSE BLOCK (RPO LB4, L05 AND L19)
FRONT
REAR
FUSE BLOCK (RPO LL4)
FRONT
REAR
INSTRUMENT CLUSTER CONNECTOR
2984792
C205
1 39 12
2 35 11
3 39 10
4 33 150 9
5 30 8
6 8 629 7
340-1.0 ORN
50-3.0 BRN
2-3.0 RED
50-3.0 BRN
150-.8 BLK
629-.8 WHT
33-.5 TAN/WHT
10-1.0 YEL
240-1.0 ORN
240-1.0 ORN
340-1.0 ORN
592-.8 LT GRN/BLK
50-3.0 BRN
593-.8 LT BLU/ORN
150-.5 BLK
50-2.0 BRN
S212
S213
240-1.0 ORN
240-1.0 ORN
PROVISION FOR DOME LAMP(S)
240-1.0 ORN
340-1.0 ORN
PROVISION FOR HORN RELAY
50-3.0 BRN
2-3.0 RED
S211
2-3.0 RED
TO CRANK (RPO LB4, LO5 AND L19)
629-.8 WHT
150-.8 BLK
50-3.0 BRN
33-.5 TAN/WHT
33-.5 TAN/WHT
TO PARK BRAKE SWITCH (SEE PAGE 53)
S202
33-.5 TAN/WHT
TO IGNITION SWITCH (SEE PAGE 63)
10-1.0 YEL
9-1.0 BRN
9 44 156
PARK OFF
HEAD PARK OFF
40 10 2
10-1.0 YEL
10-1.0 YEL
12004628
C209
HEADLAMP SWITCH
2-3.0 RED
11-.5 LT GRN
11-1.0 LT GRN
12-.8 TAN
9-1.0 BRN
593-.8 LT BLU/ORN
593-.8 LT BLU/ORN
TO DAYTIME RUNNING LAMPS INDICATOR LAMP (SEE PAGE)
629-.8 WHT
12-.8 TAN
11-1.0 LT GRN
150-.5 BLK
9-1.0 BRN
150-.8 BLK
2-3.0 RED
2-3.0 RED
2-3.0 RED
150-3.0 BLK
11-1.0 LT GRN
10-1.0 YEL
12-.8 TAN
S203
150-3.0 BLK
I/P GROUND
G200
150-.5 BLK
FROM DIRECTIONAL SIGNAL INDICATORS (SEE PAGE 25)
150-.5 BLK
FROM OIL PRESSURE GAGE (SEE PAGE 64)
150-.5 BLK
150-3.0 BLK
FROM IGNITION SWITCH (SEE PAGE 7, 11)
150-.5 BLK
FROM PARK BRAKE SWITCH (SEE PAGE 53)
DIMMER SWITCH
HI 11
10
LO 12
10 12 11
11-1.0 LT GRN
C210
8900855

HEADLAMPS
(WITH DAYTIME RUNNING LAMPS)

CIRCUIT OPERATION

PARK AND MARKER LAMPS

Voltage is applied through the TAIL LPS Fuse to the Headlamp Switch at all times. With the Headlamp 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 Directional Lamps.

HAZARD LAMPS

Voltage is applied at all times, through the STP-HAZ Fuse and the Hazard Flasher to the normally open contact of the Hazard Switch in the Directional Signal Switch.

With the Hazard Switch in HAZARD FLASH, voltage is applied to both Front and Rear Directional Lamps. All of the Directional Lamps and both Directional 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.

COMPONENT LOCATION

		Page — Figure
Directional Signal Indicator Lamp, LH	Body builder installed	—
Directional Signal Indicator Lamp, RH	Body builder installed	—
Directional Signal Switch	In top of steering column	78 — 15
Fuse Block	LH front of cowl	—
Hazard Flasher	Body builder installed	—
Headlamp Switch	Body builder installed	—
Park and Directional Lamp, LH	Body builder installed	—
Park and Directional Lamp, RH	Body builder installed	—
Rear Side Marker Lamp, LH	Body builder installed	—
Rear Side Marker Lamp, RH	Body builder installed	—
Stoplamp Switch	Body builder installed	—
Tail, Stop and Directional Lamp, LH	Body builder installed	—
Tail, Stop and Directional Lamp, RH	Body builder installed	—
C100	LH front of cowl (Temporary)	—
C141	At LH side marker lamp	—
C142	At LH park and directional lamp	—
C143	At RH park and directional lamp	—
C145	At LH side marker lamp	—
C206	At directional signal switch	78 — 15
C209	At handlamp switch	—
C211	At stoplamp switch	—
C212	At RH directional signal indicator lamp	—
C213	At LH directional signal indicator lamp	—
C228	At hazard flasher	—
C402	On rear, LH frame rail	79 — 17
C403	At LH tail, stop and directional lamp	—
C404	At RH tail, stop and directional lamp	—
C408	At RH rear side marker lamp	—
C409	At LH rear side marker lamp	—
G200	Body builder installed harness	—
G401	Body builder installed harness	—
G402	Body builder installed harness	—
S121	Body builder installed harness	—
S122	Body builder installed harness	—
S123	Body builder installed harness	—
S124	Body builder installed harness	—
S203	Body builder installed harness	—
S400	Body builder installed harness	—
S401	Body builder installed harness	—

PRELIMINARY CHECKS:

If only one lamp is inoperative, inspect wire(s) to affected lamp socket, check bulb-to-socket fit or replace bulb.

TROUBLESHOOTING CHART — PARK, MARKER AND HAZARD LAMPS

PARK LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp switch in PARK position. Connect a test lamp from ORN (40) wire at headlamp switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp from RED (2) wire at fuse block to ground.	Test lamp lights.	CHECK condition of fuse (TAIL LPS). If fuse is good, LOCATE and REPAIR open in ORN (40) wire.
	Test lamp does not light.	LOCATE and REPAIR open RED (2) wire from fuse block to junction block.
3. Connect test lamp from BRN (9) wire at headlamp switch connector C209 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE headlamp switch.
4. Connect test lamp at BRN (9) wire at LH park and directional lamp connector C142 to ground. Repeat at RH park and directional lamp connector C143.	Test lamp lights.	CHECK conditions of bulb socket ground. If socket ground is in good condition, REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from park and directional lamp(s) to headlamp switch.

HAZARD WARNING LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in RUN and position directional signal lamps as if making a turn.	Directional signal lights operate.	GO to step 2.
	Directional signal lights do not operate.	Refer to "Directional Signals Do Not Work On One Side" symptom.
2. Turn off directional signal lamps and put hazard warning lamps ON. Connect a test lamp from BRN (27) wire at directional signal switch connector C206 to ground.	Test lamp lights.	REPLACE directional signal switch.
	Test lamp does not light.	CHECK condition of fuse (STP/HAZ) and an 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 headlamp switch in PARK position. Connect a test lamp from BRN (9) wire at LH side marker lamp connector C141 to ground. Repeat at RH side marker lamp connector C145.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire(s) from side marker lamp(s) to headlamp switch.
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 side marker lamp connector(s) C141 or C145.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (14) or DK BLU (15) wire(s) from side marker lamp(s) to park and directional lamp(s).

REAR MARKER LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp switch in PARK position. Connect a test lamp from BRN (9) wire at LH rear side marker lamp connector C409 to ground. Repeat at RH rear side marker lamp connector C408.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire(s) from rear side marker lamp(s) to headlamp switch.
2. REMOVE bulb from socket, then connect a test lamp between BRN (9) wire and BLK (150 or 151) wire(s) at rear side marker lamp connector(s) C408 or C409.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) from rear side marker lamp(s) to ground terminal(s) G401 or G402.

RH SIDE MARKER LAMP
C145
6294015
15-.5 DK BLU
9-.5 BRN
RH PARK AND DIRECTIONAL LAMP
15-.5 DK GRN
S124
S121
2984855
C143
9-.8 BRN
9-.8 BRN
15-.5 DK GRN
LH PARK AND DIRECTIONAL LAMP
S122
9-.8 BRN
2984855
C142
S123
14-.5 LT BLU
9-.8 BRN
6294015
C141
LH SIDE MARKER LAMP
FRONT BODY CONNECTOR
12020100
C100
COWL
I/P
9-.8 BRN
12020184
C100
HEADLAMP SWITCH
PARK OFF
HEAD PARK OFF
12004628
C209
9-.8 BRN
40-1.0 ORN
C100 REAR BODY CONNECTOR
12020099
9-2.0 BRN
HOT AT ALL TIMES
TAIL LPS 20 AMP
FRONT
FUSE BLOCK
REAR
TAIL LPS 20 AMP
6288566
6288565
C402
SHEET METAL GROUND
G401
151-.8 BLK
RH REAR SIDE MARKER LAMP
6294125
C408
9-.8 BRN
9-.8 BRN
RH TAIL, STOP AND DIRECTIONAL LAMP
(SEE PAGE 68)
S400
9-.8 BRN
RH LICENSE LAMP (SEE PAGE 69)
9-.8 BRN
S401
LH LICENSE LAMP (SEE PAGE 69)
9-.8 BRN
9-.8 BRN
LH TAIL, STOP AND DIRECTIONAL LAMP
(SEE PAGE 68)
150-.8 BLK
6294125
C409
SHEET METAL GROUND
G402
LH REAR SIDE MARKER LAMP

PARK AND MARKER LAMPS

RH SIDE MARKER LAMP

6294015
C145

RH PARK AND DIRECTIONAL LAMP

2984855
C143

LH PARK AND DIRECTIONAL LAMP

2984855
C142

LH SIDE MARKER LAMP

6294015
C141

15-.8 DK BLU

15-.5 DK BLU

S124

S123

14-.8 LT BLU

17-1.0 WHT

19-1.0 DK GRN

18-1.0 YEL

27-1.0 BRN

15-.5 DK BLU

14-.5 LT BLU

12004147
C206

(STEERING COL SWITCHES)

DIRECTIONAL SIGNAL SWITCH

LEFT TURN SIGNAL RIGHT

HORN

HAZARD

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

FROM I/P CLUSTER CONNECTOR (SEE PAGE 61, 63, 64)

FROM OIL PRESSURE GAGE (SEE PAGE 64)

FROM IGNITION SWITCH (SEE PAGE 7, 11)

FROM HEADLAMP SWITCH (SEE PAGE 7, 11, 19)

150-.8 BLK

150-.5 BLK

150-3.0 BLK

150-3.0 BLK

150-.8 BLK

S203

FROM LOW COOLANT WARNING MODULE (SEE PAGE 62)

FROM GLOW PLUG LAMP, RPO LL4 (SEE PAGE 63)

FROM PARK BRAKE SWITCH (SEE PAGE 53)

15-.5 DK BLU

150-.5 BLK

14-.5 LT BLU

150-.5 BLK

C212 12004215

C213 6294125

RIGHT

LEFT

DIRECTIONAL SIGNAL INDICATOR LAMPS

PROVISIONS FOR RH TAIL STOP AND DIRECTIONAL LAMP (MOTOR HOME-P32)

RH TAIL, STOP AND DIRECTIONAL LAMP
(CONVENTIONAL FORWARD CONTROL-P42)

.8 BLK

2984855
C404

PROVISIONS FOR LH TAIL, STOP AND DIRECTIONAL LAMP (MOTOR HOME-P32)

RH TAIL, STOP AND DIRECTIONAL LAMP
(CONVENTIONAL FORWARD CONTROL-P42)

.8 BLK

2984855
C403

17-1.0 WHT

27-1.0 BRN

150-.8 BLK

I/P GROUND G200

COWL

I/P

REAR BODY CONNECTOR
12020099
C100

18-2.0 YEL

19-2.0 DK GRN

6288566

6288565

C402

18-.8 YEL

19-.8 DK GRN

12020184
C100

STOP LAMP SWITCH

140

17

140-1.0 ORN

17-1.0 WHT

2984235
C211

FRONT BODY CONNECTOR
12020100

15-.5 DK BLU

14-.5 LT BLU

C228

27

140

2973385
HAZARD FLASHER

27-1.0 BRN

140-1.0 ORN

140-1.0 ORN

HOT AT ALL TIMES

STP HAZ 15 AMP

FRONT

FUSE BLOCK

REAR

HAZARD LAMPS

CIRCUIT OPERATION

DIRECTIONAL SIGNAL LAMPS

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

With the Signal Switch in LH Turn position, voltage is applied to both the LH Directional Indicator and the LH Front Park and Directional Lamp (LT BLU wires). Voltage is applied to the LH Tail, Stop and Directional 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 Park and Directional 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 Directional Lamp to ground. This Lamp provides low resistance paths to ground. The Marker Lamps will flash with the Directional Lamps.

When the Headlamp 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 Directional 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 Directional Lamp, the Marker Lamp will be grounded through the Directional Lamp and will go on. In this way, the LH Side Marker Lamp will flash on when the LH Park and Directional lamp goes off, and off when the directional lamp goes on.

With the Directional Signal Switch in TURN RIGHT, voltage will be applied to the RH Lamps in the same way.

COMPONENT LOCATION

		Page — Figure
Directional Flasher	Body builder installed	—
Directional Signal Indicator Lamp, LH	Body builder installed	—
Directional Signal Indicator Lamp, RH	Body builder installed	—
Directional Signal Switch	In top of steering column	78 — 15
Fuse Block	LH front of cowl	—
Park and Directional Lamp, LH	Body builder installed	—
Park and Directional Lamp, RH	Body builder installed	—
Side Marker Lamp, LH	Body builder installed	—
Side Marker Lamp, RH	Body builder installed	—
Tail, Stop and Directional Lamp, RH	Body builder installed	—
Tail, Stop and Directional Lamp, LH	Body builder installed	—
C100 (P32, RPO LL4)	LH front of cowl	74 — 5
C100 (P32, RPO L19)	LH front of cowl	78 — 14
C100 (P42 w/RPO LB4, L05 and L19)	LH front of cowl	78 — 16
C100 (P42, RPO LL4)	LH front of cowl	75 — 6
C141	At LH side marker lamp	—
C142	At LH park and directional lamp	—
C143	At RH park and directional lamp	—
C145	At RH side marker lamp	—
C206	Top of steering column	78 — 15
C212	At RH directional signal lamp	—
C213	At LH directional signal lamp	—
C402	On rear, LH frame rail	79 — 17
C403	At LH tail, stop and directional lamp	—
C404	At RH tail, stop and directional lamp	—
G200	Near C100 (bulkhead connector)	—
S123	Body builder installed harness	—
S124	Body builder installed harness	—
S203	Body builder installed harness	—

TROUBLESHOOTING CHART—DIRECTIONAL LAMPS

DIRECTIONAL SIGNALS DO NOT WORK ON ONE SIDE

TEST	RESULT	ACTION
1. Turn hazard warning system on. Observe lights on side of directional 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 directional 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 directional 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 directional signal switch connector C206 to ground.	Test lamp lights.	REPLACE directional signal switch.
	Test lamp does not light.	REPLACE directional 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 directional lamp connector C142 or C143 to ground.	Test lamp lights.	CHECK condition of bulb sockets. If sockets are in good condition, REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in either LT BLU (14) or DK BLU (15) wires.

DIRECTIONAL 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 directional signal switch connector C206 to ground.	Test lamp lights.	REPLACE directional signal switch.
	Test lamp does not light.	CHECK condition of fuse (TURN/BU) and an open in PPL (16) wire or DK BLU (38) wire. If fuse and wiring are good, REPLACE directional signal flasher.

DIRECTIONAL SIGNAL LAMPS FLASH RAPIDLY

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

RH SIDE MARKER LAMP

6294015
C145

RH PARK AND DIRECTIONAL LAMP

.8 PPL

15-.8 DK BLU

2984855
C143

S124

15-.5 DK BLU

LH PARK AND DIRECTIONAL LAMP

.8 PPL

2984855
C142

LH SIDE MARKER LAMP

6294015 C141

14-.5 LT BLU

S123

14-.8 LT BLU

15-.5 DK BLU

19-1.0 DK GRN

18-1.0 YEL

16-.8 PPL

16-.5 DK BLU

14-.5 LT BLU

(STEERING COL SWITCHES)

DIRECTIONAL SIGNAL SWITCH

LEFT TURN SIGNAL

RIGHT

HORN

HAZARD

P N M L K J H G f E

12004147
C206

FROM I/P CLUSTER CONNECTOR (SEE PAGE 61, 63, 64)

150-.8 BLK

15-.5 DK BLU

150-.5 BLK

FROM OIL PRESSURE GAGE (SEE PAGE 64)

FROM IGNITION SWITCH (SEE PAGE 7,11)

FROM HEADLAMP SWITCH (SEE PAGE 7, 11, 19)

150-3.0 BLK

I/P GROUND G200

S203

14-.5 LT BLU

150-.5 BLK

12004215 C212

RIGHT

LEFT

DIRECTIONAL SIGNAL INDICATOR LAMPS

150-.5 BLK — FROM PARK BRAKE SWITCH 6294125 C213 (SEE PAGE 53)

150-.8 BLK — FROM LOW COOLANT WARNING MODULE (SEE PAGE 62)

150-.8 BLK — FROM GLOW PLUG LAMP (SEE PAGE 63)

(RPO LL4)

PROVISIONS FOR RH TAIL, STOP AND DIRECTIONAL LAMP (MOTOR HOME-P32)

RH TAIL, STOP AND DIRECTIONAL LAMP (CONVENTIONAL FORWARD CONTROL-P42)

.8 BLK

2984855
C404

19-.8 DK GRN

18-2.0 YEL

19-2.0 DK GRN

16-.8 PPL

6288566

6288565

C402

REAR BODY CONNECTOR
12020099
C100

COWL

I/P

12020184 C100

18-1.0 YEL

2984855
C403

.8 BLK

PROVISIONS FOR LH TAIL, STOP AND DIRECTIONAL LAMP (MOTOR HOME-P32)

LH TAIL, STOP AND DIRECTIONAL LAMP (CONVENTIONAL FORWARD CONTROL-P42)

FUSE BLOCK

HOT IN START OR RUN

TURN-B/U 15 AMP

FRONT

REAR

TURN-B/U 15 AMP

16-.8 PPL

38-.8 DK BLU

75-.8 DK BLU — TO BACKUP LAMP SWITCH (SEE PAGE 67)

DIRECTIONAL FLASHER

16

38

FRONT BODY CONNECTOR
12020100
C100

15-.5 DK BLU

14-.5 LT BLU

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

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 Horns.

COMPONENT LOCATION

		Page — Figure
Directional Signal Switch	On steering column	78 — 15
Fuse Block	LH front of cowl	—
Horn, LH	Body builder installed	—
Horn Relay	Body builder installed	—
Horn, RH	Body builder installed	—
C100	LH front of cowl (temporary)	—
C137	At LH horn	—
C138	At LH horn	—
C139	At RH horn	—
C206	At directional signal switch	78 — 15
C207	At horn relay	—
C208	At dome lamp	—

PRELIMINARY CHECKS:

Check to see that the HORN D/M fuse is not blown. REPLACE if blown.

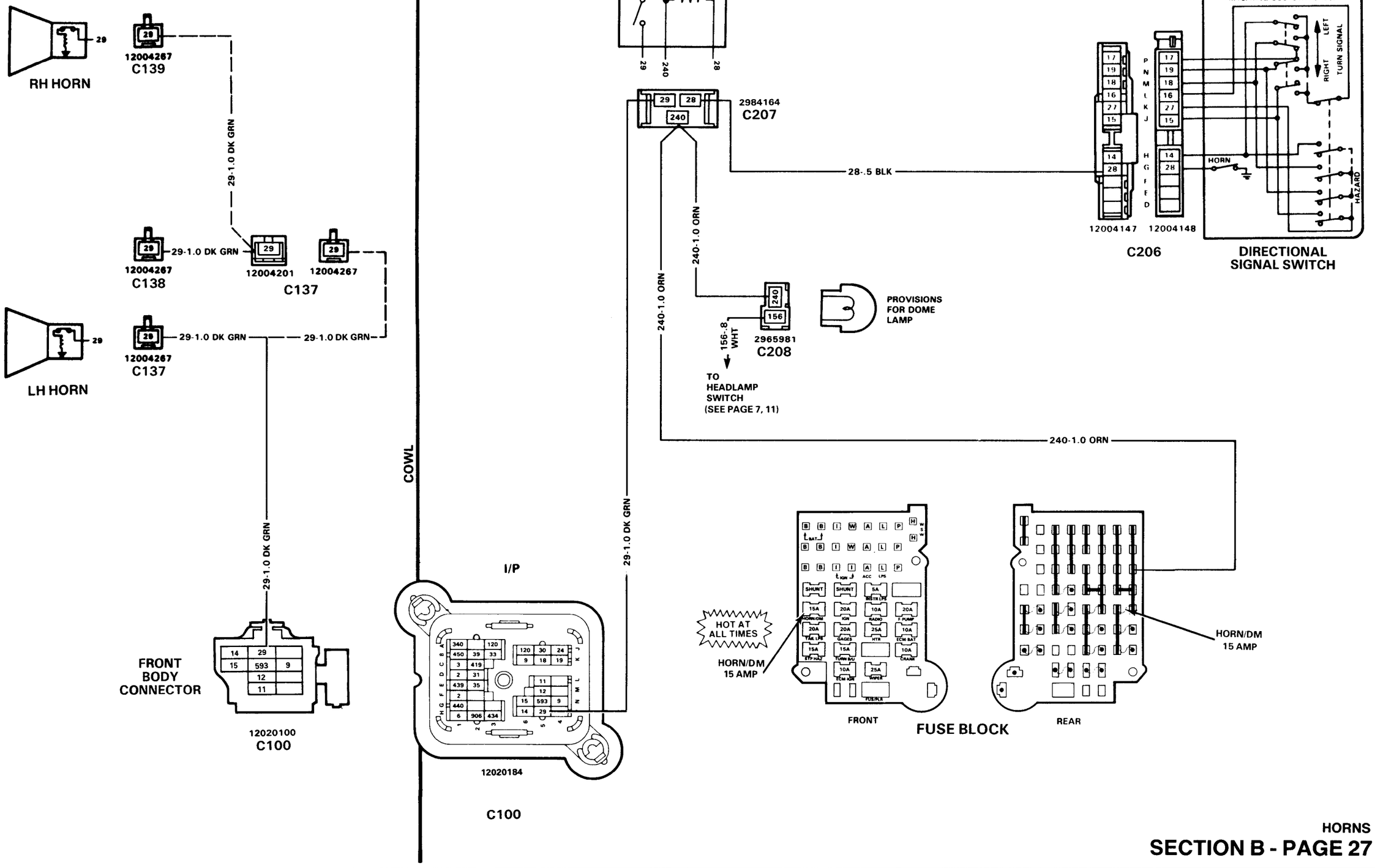
TROUBLESHOOTING CHART—HORNS

HORN(S) WILL NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from DK GRN (29) wire at inoperative horn connector to ground. Press horn switch.	Test lamp lights.	REPLACE horn.
	Test lamp does not light.	GO to step 2.
2. Remove horn relay. Connect test lamp from ORN (240) wire at horn relay 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 and fuse block.
3. REINSERT horn relay. Disconnect directional signal switch connector C206. Use a jumper wire to ground BLK (28) wire at directional 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 to horn(s).

HORN SOUNDS CONTINUOUSLY WITHOUT DEPRESSING HORN SWITCH

TEST	RESULT	ACTION
1. Disconnect directional signal switch connector C206.	Horn stops.	REPLACE horn switch.
	Horn continues to sound.	GO to step 2.
2. Disconnect horn relay. Check for a short to ground in BLK (28) wire.	No shorts found.	REPLACE relay.
	Short(s) found.	REPAIR or REPLACE as required.


RH HORN
29
12004267
C139
29-1.0 DK GRN
12004267
C138
29-1.0 DK GRN
12004201
C137
12004267
LH HORN
29-1.0 DK GRN
29-1.0 DK GRN
12004267
C137
29-1.0 DK GRN
FRONT
BODY
CONNECTOR
14
29
15
593
9
12
11
12020100
C100
COWL
I/P
29-1.0 DK GRN
12020184
C100
HORN RELAY
29
240
28
2984164
C207
29
28
240
28-.5 BLK
240-1.0 ORN
240-1.0 ORN
240
156
156-.8
WHT
2965981
C208
TO
HEADLAMP
SWITCH
(SEE PAGE 7, 11)
PROVISIONS
FOR DOME
LAMP
12004147
12004148
C206
(STEERING COL SWITCHES)
LEFT
TURN SIGNAL
RIGHT
HORN
HAZARD
DIRECTIONAL
SIGNAL SWITCH
240-1.0 ORN
HOT AT
ALL TIMES
HORN/DM
15 AMP
FRONT
REAR
FUSE BLOCK
HORN/DM
15 AMP

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 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.

COMPONENT LOCATION

PRELIMINARY CHECKS:

CHECK condition of WIPER and INST LPS fuses. If fuses are in good condition, use the following diagnostic procedures.

TROUBLESHOOTING CHART—WIPER/WASHER

WIPERS DO NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Place ignition in RUN and turn wipers to HI. Connect test lamp from WHT (93) wire at wiper motor connector C224 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between wiper motor 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 and ground terminal G201.
	Wiper motor does not run.	REPLACE wiper motor.

WIPERS DO NOT OPERATE IN HI

TEST	RESULT	ACTION
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 and wiper switch or REPLACE wiper motor.
	Wiper motor runs.	REPLACE wiper washer switch.

WIPERS DO NOT OPERATE IN LO

TEST	RESULT	ACTION
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 and wiper switch or REPLACE wiper motor.
	Wiper motor runs.	REPLACE wiper washer switch.

WASHER MOTOR DOES NOT OPERATE

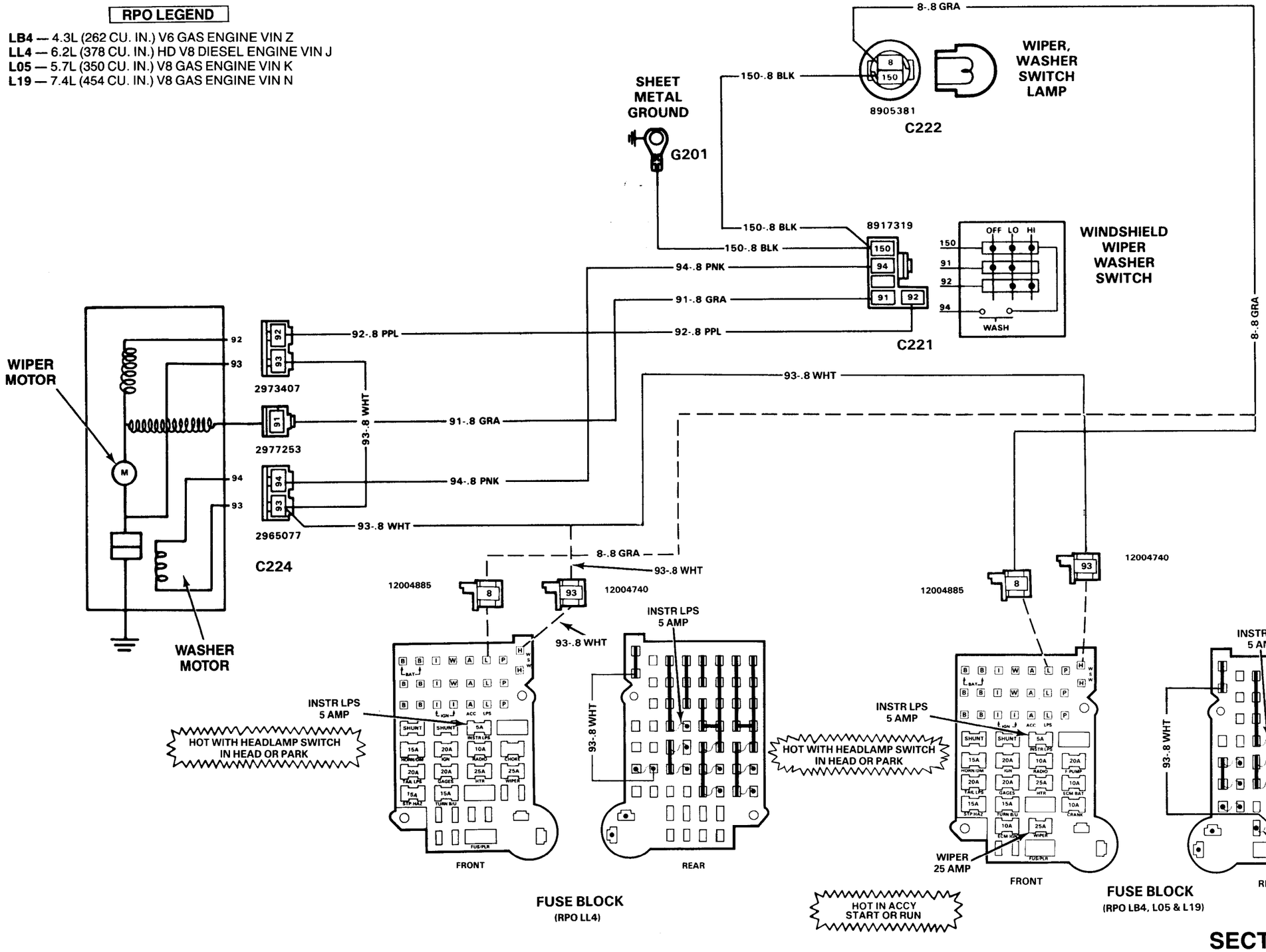
TEST	RESULT	ACTION
1. Place ignition in RUN and wiper switch to WASH. Connect test lamp from WHT (93) wire at washer motor connector C224 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between washer pump and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from WHT (93) wire to PNK (94) wire at washer motor connector C224.	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 wiper switch connector to ground.	Washer motor does not pump.	LOCATE and REPAIR open in PNK (94) wire between washer motor and wiper switch.
	Washer motor pumps.	GO to step 4.
4. Connect a fusible jumper from BLK (150) wire at wiper switch connector C221 to ground.	Washer motor does not pump.	REPLACE wiper switch.
	Washer motor pumps.	LOCATE and REPAIR open in BLK (150) wire between wiper switch and ground terminal G201.

WASHER MOTOR DOES NOT SHUT OFF

TEST	RESULT	ACTION
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 and washer motor.

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N



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 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, crating 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.

COMPONENT LOCATION (RPO LB4, L05, L19)

		Page	Figure
Battery (P32, P42 w/RPO LB4, L05, L19 w/o RPO B3M)	RH side of engine compartment	74	4
Battery (P32 w/RPO L19)	On RH frame rail	73	2
Battery (P42 w/RPO B3M, LB4, L05)	On RH frame rail	74	3
Bulkhead Connector (P42 w/RPO LB4, L05, L19)	Lower, RH side of cowl	78	16
Coil (P32 w/RPO L19)	Top rear of engine	75	7
Coil (P42 w/RPO LB4, L05)	Top rear of engine		—
Coil (P42 w/RPO L19)	Top rear of engine	75	8
Coil Jumper	Between coil and distributor		—
Distributor	Top rear of engine	75	7
Electronic Control Module (ECM)	Lower, LH cowl	79	18
Fuse Block	Body builder installed		—
Generator (P32, P42, w/RPO L19)	Top RH side of engine		—
Generator (P42 w/RPO LB4)	Top RH side of engine	77	13
Generator (P42 w/RPO L05)	Top RH side of engine	76	11
Grommet 100	Lower, LH side of cowl	78	16
Ignition Switch	Body builder installed		—
Junction Block (P42 w/RPO LB4, L05, L19)	LH side of cowl	78	16
Park Neutral Relay	Body builder installed		—
Starter Motor Solenoid (P32, P42 w/RPO B3M, LB4, L05)	Bottom, RH side of engine	73	1
Starter Motor Solenoid (P32, P42 w/RPO LB4, L05, L19 w/o RPO B3M)	Bottom RH side of engine	73	1
C100 (P32 w/RPO L19)	Lower LH side of cowl	78	14
C100 (P42 w/RPO LB4, L05, L19)	Lower LH side of cowl	78	16
C107 (P32, P42, w/RPO L19)	Rear of generator	76	9
C107 (P42 w/RPO LB4)	Rear of generator	77	13
C107 (P42 w/RPO L05)	Rear of generator	76	11
C120 (P32 w/RPO L19)	On distributor	75	7
C120 (P42 w/RPO L19)	On distributor	75	8
C120 (P42 w/RPO L05)	On distributor	76	10
C120 (P42 w/RPO LB4)	On distributor	77	12
C121 (P32 w/RPO L19)	On coil	75	7
C121 (P42 w/RPO L19)	On coil	75	8
C121 (P42 w/RPO L05)	On coil	76	10
C122	Between coil and tachometer		—
C154	Top rear of engine	75	7
C200	LH side of cowl	79	18
C203	Body builder installed		—
C205	Body builder installed		—
C219	Body builder installed		—
C220	Body builder installed		—
G110	Top of radiator support	74	4
G110 (P32 w/RPO L19)	On RH frame assembly	73	2
G110 (P42 w/RPO B3M, LB4, L05)	On RH frame assembly	74	4
G111 (P32, P42 w/RPO LB4, L05, L19 w/o RPO B3M)	On top, RH front of engine	74	4
G111 (P42 w/RPO B3M, LB4, L05)	On top, RH front of engine	74	3

COMPONENT LOCATION (RPO LL4)

		Page	Figure
Battery, RH (P32, P42 w/RPO B3M)	RH frame rail, behind engine	73	1
Battery, LH (P42)	Front LH side of engine compartment	73	1
Battery, RH (P42)	Front RH side of engine compartment	73	1
Fuse Block	LH front of cowl		—
Generator	RH front of engine	73	2
Glow Plug Controller	LH rear of engine, at cylinder head	74	4
Ignition Switch	Body builder installed		—
Junction Block (P32)	LH front of cowl	74	5
Junction Block (P42)	LH front of cowl	75	6
Starter Motor Solenoid	Lower RH side of engine	73	1
C100 (P32)	LH front of cowl (temporary)	74	5
C100 (P42)	LH front of cowl (temporary)	75	6
C128	At glow plug controller	74	4
C151	At generator	73	2
C203	At ignition switch		—
C205	At I/P cluster		—
C219	At clutch start or neutral safety switch		—
G110 (P32, P42 w/RPO B3M)	RH frame rail, below batteries	73	1
G110 (P42)	RH front of engine compartment	73	1
G112 (P32, P42 w/RPO B3M)	Top right rear of engine	73	1
G112 (P42)	Top right front of engine	73	1
G113 (P42)	Top left front of engine	73	1
S113	RH front of engine, near rocker cover	73	2
S201	Body builder installed harness		—
S210	Body builder installed harness		—

TROUBLESHOOTING CHART—START AND CHARGE

ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK

TEST	RESULT	ACTION
1. Place transmission in PARK (auto) or depress clutch pedal for manual transmission. 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 manual transmission. GO to step 5 for automatic transmission.
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 fuse (CRANK). If fuse is good, LOCATE and REPAIR open in PPL (6) wire from clutch start switch to starter solenoid.
5. With ignition switch OFF, connect a voltmeter from BAT 2 terminal at ignition switch connector C203 to ground.	Battery voltage.	REPLACE ignition switch.
	No voltage.	LOCATE 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 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.

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 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 LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC THREE-SPEED TRANSMISSION

IGNITION MODULE
EST — 423
DIST REF — 430
BYPASS — 424
DIST REF LO — 453
PICKUP COIL
DISTRIBUTOR
12040754
C120
453-.8 BLK/RED
430-.8 PPL/WHT
423-.8 WHT
424-.8 TAN/BLK
GROMMET 100
12020107 (UPPER)
12020108 (LOWER)
ELECTRONIC CONTROL MODULE CONNECTORS C200
12047946
439-.8 PNK/BLK
121-.8 WHT
COIL JUMPER
3-3.0 PNK
12040706 C154
12040709
COIL
12040705
C121
2977293
TO TACH
C122
439-.8 PNK/BLK
TO FUEL INJECTORS (SEE PAGE 36)
TO ESC HYBRID FUNCTION (SEE PAGE 48)
S112
12045575
2-3.0 RST (FUSIBLE LINK)
6-5.0 PPL
START MOTOR/ SOLENOID
S2
1-19.0 BLK
2-8 RED
2-1.0 RST (FUSIBLE LINK)
18436572
3-3.0 PNK
6-5.0 PPL
2-1.0 RST (FUSIBLE LINK)
S2
2-3.0 RED
2-3.0 RED
JUNCTION BLOCK
2-2.0 RST (FUSIBLE LINK)
S2
2-5.0 RED
2-5.0 RED
ENGINE
439-1.0 PNK/BLK
12020183
C100
2-3.0 BLK
1-19.0 BLK
BATTERY
ENGINE GROUND G111
SHEET METAL GROUND G110
2-8.0 RED
C107
12045896
GENERATOR
39-.8 PNK/BLK
39-1.0 PNK/BLK
S111
TO RPO M40 KICKDOWN RELAY (SEE PAGE 45)
39-.8 PNK/BLK
TO AIR SWITCH (RPO L19) (SEE PAGE 50)
39-.8 PNK/BLK
450-.8 BLK/WHT
TO GROUNDS G100, G101, ECM, FUEL PUMP RELAY AND EVRV (SEE PAGE 37, 49, 51)

START/IGNITION (RPO LB4, LO5 AND L19)

SECTION B - PAGE 32

PARK/NEUTRAL RELAY (AUTOMATIC TRANSMISSION) ONLY) (SEE PAGE 33)

39
5
450
434

12010015
C220

5-3.0 YEL
450-.8 BLK/WHT
434-.8 ORN/BLK
39-.8 PNK/BLK

TO CLUTCH START SWITCH (MANUAL TRANSMISSION) OR NEUTRAL SAFETY SWITCH (AUTOMATIC TRANSMISSION)

8911921
C219

6-3.0 PPL
5-3.0 YEL

S206
(AUTOMATIC TRANSMISSION ONLY)

6-3.0 PPL

S207

2-5.0 RED

6288702
C203

5-3.0 YEL

33-.5 TAN/WHT

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

TO FUEL CYCLER MODULE (SEE PAGE 37) 39-.8 PNK/BLK

TO CHECK ENGINE LAMP (SEE PAGE 63) 39-.8 PNK/BLK

39-.8 PNK/BLK

TO OIL PRESSURE GAGE (SEE PAGE 64) 39-.5 PNK/BLK

S208

39-.5 PNK/BLK
39-.5 PNK/BLK
39-.5 PNK/BLK

33-.5 TAN/WHT

TO BULK-HEAD CONNECTOR (SEE PAGE 53)

2984792
C205
I/P CLUSTER CONNECTOR

6-3.0 PPL
4-3.0 BRN
3-3.0 PNK
2-5.0 RED

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

COWL

I/P

12020184
C100

2-5.0 RED
3-3.0 PNK
S204
3-3.0 PNK
439-.8 PNK/BLK
39-.8 PNK/BLK
S205
2-3.0 RED

HOT IN ACCY, START OR RUN
GAGES 20 AMP
HOT AT ALL TIMES
TAIL LPS 20 AMP
HOT IN START OR RUN
ECM-IGN 10 AMP
HOT IN START
CRANK 10 AMP
FRONT WIPER 25 AMP
ECM-BAT 10 AMP

FUSE BLOCK

S210
4-3.0 BRN
6-3.0 PPL
4-3.0 BRN

REAR

2-3.0 RED
39-.8 PNK/BLK
2-3.0 RED
3-3.0 PNK
439-.8 PNK/BLK

TAIL LPS 20 AMP
GAGES 20 AMP
HTR 25 AMP
CRANK 10 AMP
WIPER 25 AMP
ECM-IGN 10 AMP

TO CLUTCH SWITCH (MANUAL TRANSMISSION) OR TO NEUTRAL START AND BACK UP SWITCH (AUTOMATIC TRANSMISSION)

8911921
C219

6-3.0 PPL
5-3.0 YEL

5-3.0 YEL → TO NEUTRAL/PARK RELAY (SEE PAGE 33)

2-3.0 RED

IGNITION SWITCH CONNECTOR

6288702
C203

S207
S206
5-3.0 YEL

3-3.0 PNK

S204

6-3.0 PPL

COWL

I/P

12020184
C100

2-3.0 RED
3-3.0 PNK
3-3.0 PNK
6-8 PPL
439-.8 PNK/BLK
S205
39-.8 PNK/BLK

HOT IN START OR RUN
ECM 10 AMP
HOT IN START
CRANK 10 AMP
HOT IN START OR RUN
IGN 20 AMP

FUSE BLOCK
12052472

HOT IN START OR RUN
ECM/FUEL PUMP 20 AMP

TO PARK/ NEUTRAL RELAY (SEE PAGE 33) 39-.8 PNK/BLK
TO CHECK ENGINE LAMP (SEE PAGE 63) 39-.8 PNK/BLK
39-.8 PNK/BLK
S208

START/IGNITION—CONVENTIONAL FORWARD CONTROL
P42 (RPO LB4, L05, AND L19)

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

32 BLK

STARTER MOTOR SOLENOID

6-3.0 PPL

6-5.0 PPL (MOTOR HOME-P32)

906-.5 RST — 906-1.0 PPL — S2

2-8 RED

JUNCTION BLOCK

2-3.0 RST (FUSIBLE LINK) — S2

2-1.0 RST (FUSIBLE LINK) — S2 — 2-3.0 RED

2-1.0 RST (FUSIBLE LINK) — S2 — 2-3.0 RED

2-3.0 RST (FUSIBLE LINK) — S2 — 2-8.0 RED

906-1.0 PPL

32 BLK — 2-8 RED — S2 — 2-3.0 RST (FUSIBLE LINK)

2-3.0 RST (MODEL 42) (FUSIBLE LINK)

6294493

2-3.0 RED

25-1.0 BRN

2-1.0 RST (FUSIBLE LINK) — S2

2-.8 RED

CONVENTIONAL (P42) FORWARD CONTROL

GENERATOR

2-8.0 RED

GLOW PLUG CONTROLLER

(MODEL 32)

2-3.0 RED

ENGINE

12020183

C100

A B C D E

906 903 3 150

12015982

C128

3-3.0 PNK

S113

3-3.0 PNK

TO FUEL SHUT-OFF VALVE (SEE PAGE 39)

COWL

I/P

130-.22 BRN/WHT

6-3.0 PPL

12020184

C100

2-3.0 RED → TO HEADLAMP SWITCH (SEE PAGE)

3-3.0 PNK

8911921

C219

5-3.0 YEL

6-3.0 PPL

2-3.0 RED

6288702

C203

3-3.0 PNK

130-.22 BRN/WHT

2-3.0 RED

S201

33-.5 TAN/WHT

TO BULKHEAD CONNECTOR C100 (SEE PAGE 53)

150 33 3 2 5 4

START RUN OFF LOCK ACC

IGNITION SWITCH

2984792

C205

3-3.0 PNK

2-3.0 RED

2-3.0 RED

4-3.0 BRN

S210

4-3.0 BRN

ENGINE GROUND RH CYLINDER HEAD G112

ENGINE GROUND LH CYLINDER HEAD G113

32 BLK

32 BLK

32 BLK

32 BLK

3 BLK

SHEET METAL GROUND G110

RIGHT HAND BATTERY

LEFT HAND BATTERY

HOT AT ALL TIMES

TAIL LPS 20 AMP

HOT IN START AND RUN

GAGES 20 AMP

HOT IN ACCY START AND RUN

HTR 25 AMP

WIPER 25 AMP

FRONT

FUSE BLOCK

REAR

TAIL LPS 20 AMP

GAGES 20 AMP

WIPER 25 AMP

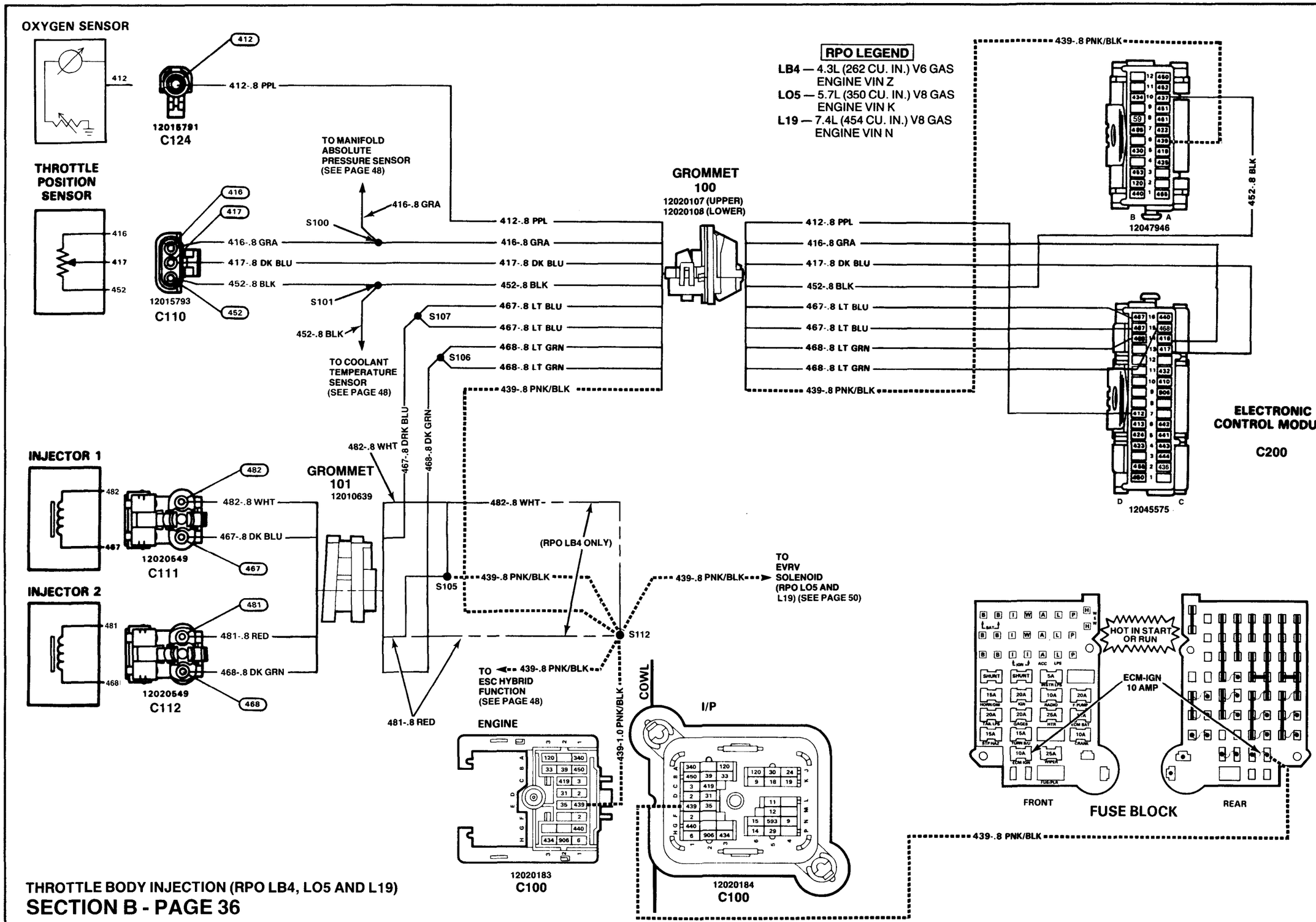
HTR 25 AMP

START/IGNITION (RPO LL4)

SECTION B - PAGE 34

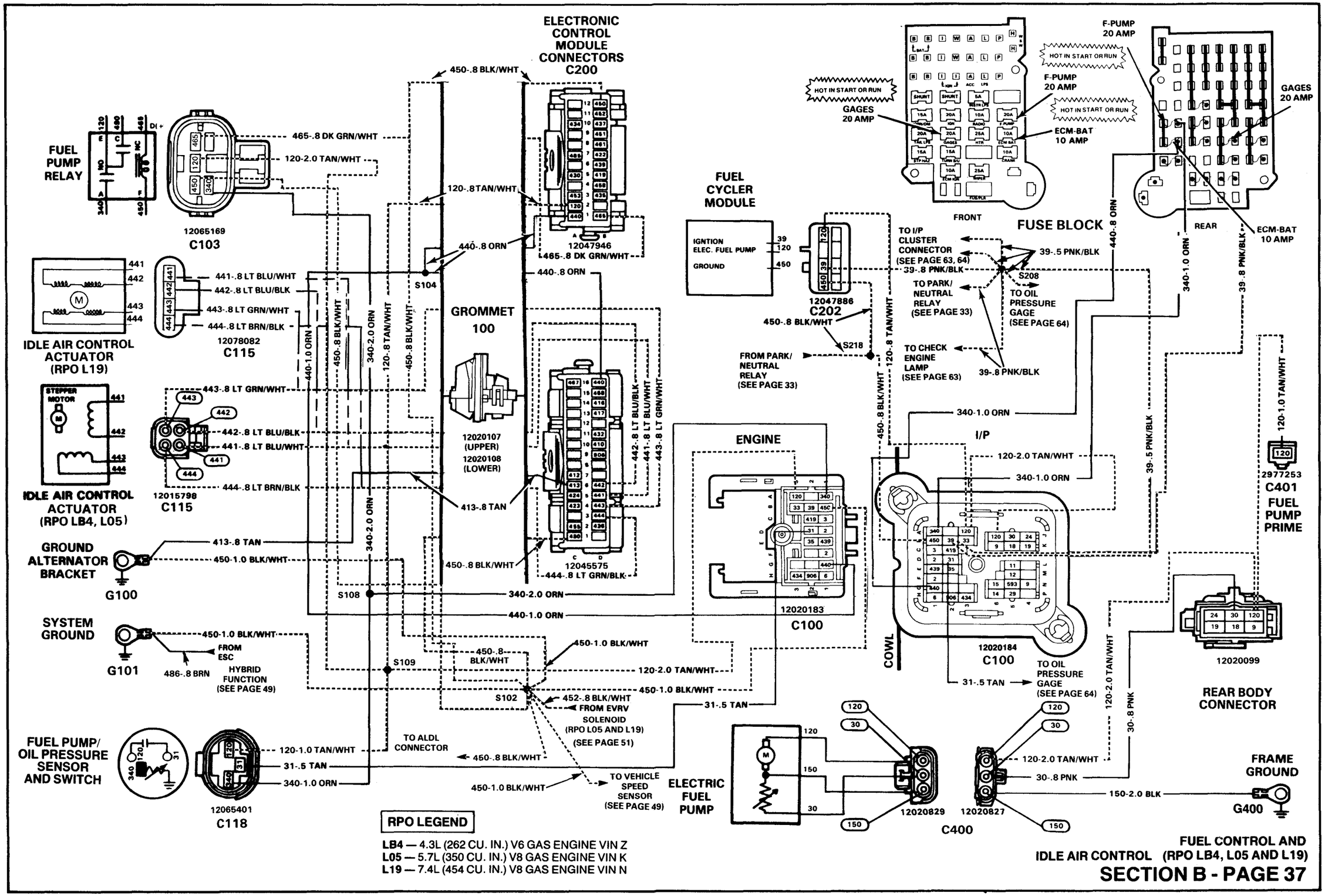
COMPONENT LOCATION

		Page — Figure
Electric Fuel Pump	In fuel tank	79 — 17
Electronic Control Module	Lower, LH side of cowl	79 — 18
Fuel Cycler Module	Body builder installed	—
Fuel Pump/Oil Pressure Sensor and Switch	Rear, LH side of engine	76 — 10
Fuel Pump Relay	LH side of cowl	78 — 14
Fuse Block	Body builder installed	—
Grommet 100	Lower, LH side of cowl	78 — 16
Grommet 101	Top, center of engine	76 — 9
Idle Air Control Actuator	Top, center of engine	76 — 9
Injector 1	Top of throttle body injection	76 — 9
Injector 2	Top of throttle body injection	76 — 9
Oxygen Sensor	Lower, rear LH side of engine	77 — 12
Throttle Position Sensor	Top, RH side of engine	76 — 9
C100 (P32 w/RPO L19)	LH side of cowl	78 — 14
C100 (P42 w/RPO LB4, L05, L19)	LH side of cowl	78 — 16
C103	At fuel pump relay	—
C110 (P32, P42 w/RPO L19)	At throttle position sensor	76 — 9
C110 (RPO LB4)	At throttle position sensor	77 — 13
C111 (P32, P42 w/RPO L19)	At injector	76 — 9
C111 (RPO LB4)	At injector	77 — 13
C112 (P32, P42 w/RPO L19)	At injector	76 — 9
C112 (RPO LB4)	At injector	77 — 13
C115 (RPO LB4, L05)	On idle air control actuator	76 — 11
C115 (RPO L19)	On idle air control actuator	76 — 9
C118 (P42 w/RPO LB4)	At fuel pump/oil pressure sensor switch	77 — 12
C200	LH side of cowl	79 — 18
C202	At fuel cycler module	—
C400	Rear, RH frame rail	79 — 17
C401	Body builder installed	—
G100	At alternator bracket	76 — 9
G101	RH side of engine	76 — 9
G400	On fuel tank cross member	79 — 17
S100 (P32, P42 w/RPO L19)	Engine harness, RH side of engine	76 — 9
S100 (P42 w/RPO L05)	Engine harness, RH side of engine	76 — 11
S101 (P32, P42 w/RPO L19)	Engine harness, front of engine	76 — 9
S102 (P32 w/RPO L19)	LH side of cowl	78 — 14
S102 (P42 w/RPO LB4, L05, L19)	LH side of cowl	78 — 16
S104 (P32 w/RPO L19)	LH side of cowl	78 — 14
S104 (P42 w/RPO LB4, L05, L19)	LH side of cowl	78 — 16
S105 (P32, P42 w/RPO L19)	Top of engine	76 — 9
S105 (P42 w/RPO LB4)	RH side of engine	77 — 13
S106 (P32 w/RPO L19)	LH side of cowl	78 — 14
S106 (P42 w/RPO LB4, L19)	LH side of cowl	78 — 16
S107 (P32 w/RPO L19)	LH side of cowl	78 — 14
S107 (P42 w/RPO LB4, L19)	LH side of cowl	78 — 16
S108 (P32 w/RPO L19)	Engine harness, LH side of cowl	78 — 14
S108 (P42 w/RPO L05, L19)	Engine harness, LH side of cowl	78 — 16
S109 (P32 w/RPO L19)	LH side of cowl	78 — 14
S109 (P42 w/RPO LB4, L19)	LH side of cowl	78 — 16
S112 (P32 w/RPO L19)	LH side of cowl	78 — 14
S112 (P42 w/RPO LB4, L19)	LH side of cowl	78 — 16
S112 (P42 w/RPO LB4)	RH side of engine	77 — 13
S208	Body builder installed harness	—



THROTTLE BODY INJECTION (RPO LB4, LO5 AND L19)

SECTION B - PAGE 36



RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

FUEL CONTROL AND IDLE AIR CONTROL (RPO LB4, L05 AND L19)

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.

COMPONENT LOCATION

		Page — Figure
Cold Advance and Fast Idle Temperature Switch	Right rear side of engine	73 — 2
Cold Advance Control	Top front center of engine	73 — 2
Fast Idle Solenoid	Top front center of engine	73 — 2
Fuel Shut-Off Valve	Top front center of engine	73 — 2
Fuse Block	LH front of cowl	—
Glow Plug Controller	Top LH rear of engine	74 — 4
Ignition Switch	Body builder installed	—
Transmission Kickdown Switch (RPO M40)	Body builder installed	—
Transmission Switch (RPO M40)	LH side of transmission	74 — 4
Water-in-Fuel Sensor	Top rear center of engine	74 — 4
C100	LH front of cowl (temporary)	75 — 6
C128	At glow plug controller	74 — 4
C129	At fuel shut-off valve	73 — 2
C130	At water-in-fuel sensor	74 — 4
C131	At cold advance and fast idle temperature switch	73 — 2
C132	At fuel heater	74 — 4
C133	At transmission kickdown switch (RPO M40)	73 — 2
C134	At cold advance control	73 — 2
C135	At fast idle solenoid	73 — 2
C136	At transmission switch	74 — 4
C203	At ignition switch	—
G102	RH front of engine, at cylinder head	73 — 2
G103	Near C100 (Body builder installed)	74 — 5
S113	LH side of engine, near center of rocker cover	74 — 3
S114	Rear of engine, near transmission filler tube	74 — 4
S115	Rear of engine, near transmission filler tube	74 — 4
S201	Body builder installed harness	—

TROUBLESHOOTING CHART—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 fuse (GAGES). If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from fuel heater 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 to ground terminal G102.

WATER-IN-FUEL INDICATOR LIGHTS WITH NO WATER IN FUEL

TEST	RESULT	ACTION
Place ignition switch in RUN position. Disconnect water-in-fuel sensor connector C130.	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.

SERVICE FUEL FILTER 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 reading.	CHECK condition of fuse (GAGES). If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from water-in-fuel sensor 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 fuel sensor to ground terminal 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.

FAST IDLE SOLENOID

COLD ADVANCE CONTROL

COLD ADVANCE AND FAST IDLE TEMPERATURE SWITCH

TRANSMISSION KICKDOWN SWITCH (RPO M40)

12052641
C133

2984092
C136

TRANSMISSION SWITCH
(RPO M40)

531

12004267
C135

2977253
C134

2973872
C131

531-.8 LT GRN/BLK

55-.8 ORN

39-.8 PNK/BLK

S115

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
M40 — AUTOMATIC 3-SPEED TRANSMISSION

SHEET METAL GROUND G103

150-1.0 BLK

WATER IN FUEL SENSOR

SOLID STATE

12015793
C130

508-.8 BRN/WHT

150-.8 BLK

150-1.0 BLK

IGNITION SWITCH

6288702
C203

START
RUN
OFF
LOCK
ACC

3-3.0 PNK

S201

FUEL HEATER

12020397
C132

ENGINE GROUND
G102

S114

COWL

I/P

508-.8 YEL

TO WATER IN FUEL LAMP
(SEE PAGE 64)

HOT IN RUN OR START

GAGES 20 AMP

GLOW PLUG CONTROLLER

12015982
C128

ENGINE

12020184
C100

FRONT

FUSE BLOCK

REAR

GAGES 20 AMP

S113

FUEL SHUT-OFF VALVE

12020274
C129

12020183

39-.5 PNK/BLK

TO SPLICE S208
(SEE PAGE 37)

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 5 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 5 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.

COMPONENT LOCATION

		Page — Figure
Fuel Shut-Off Valve	Top front center of engine	73 — 2
Fuse Block	LH front of cowl	—
Glow Plug Controller	Top LH rear of engine	74 — 4
Ignition Switch	Body builder installed	—
Left Bank Glow Plug	In LH cylinder head	74 — 3
Right Bank Glow Plug	In RH cylinder head	73 — 2
C100	LH front of cowl (temporary)	75 — 6
C128	At glow plug controller	74 — 4
C129	At fuel shut off valve	73 — 2
C152	At left bank of glow plugs	74 — 3
C153	At right bank of glow plugs	73 — 2
G102	RH front of engine, at cylinder head	73 — 2
G103	Near C100 (body builder installed)	74 — 5
S113	LH side of engine, near rocker cover	74 — 3
S114	Rear of engine, near transmission filler tube	74 — 4
S116	LH side of engine, near rocker cover	74 — 3
S117	RH side of engine, near rocker cover	74 — 3
S201	Body builder installed harness	—

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.

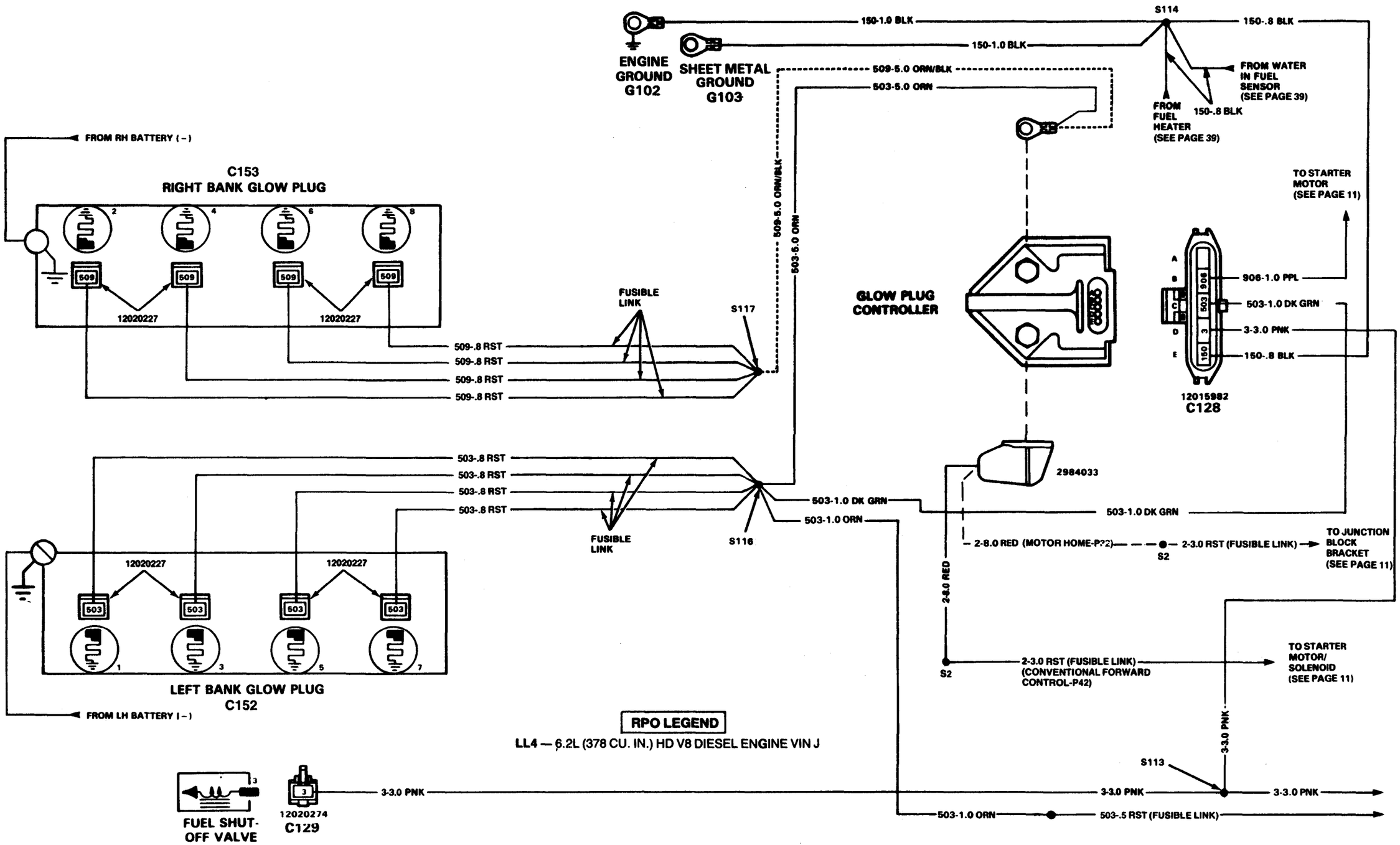
Turn ignition switch to OFF and then momentarily to START and return to RUN position. The WAIT indicator should flash for approximately 25 seconds and then go out.

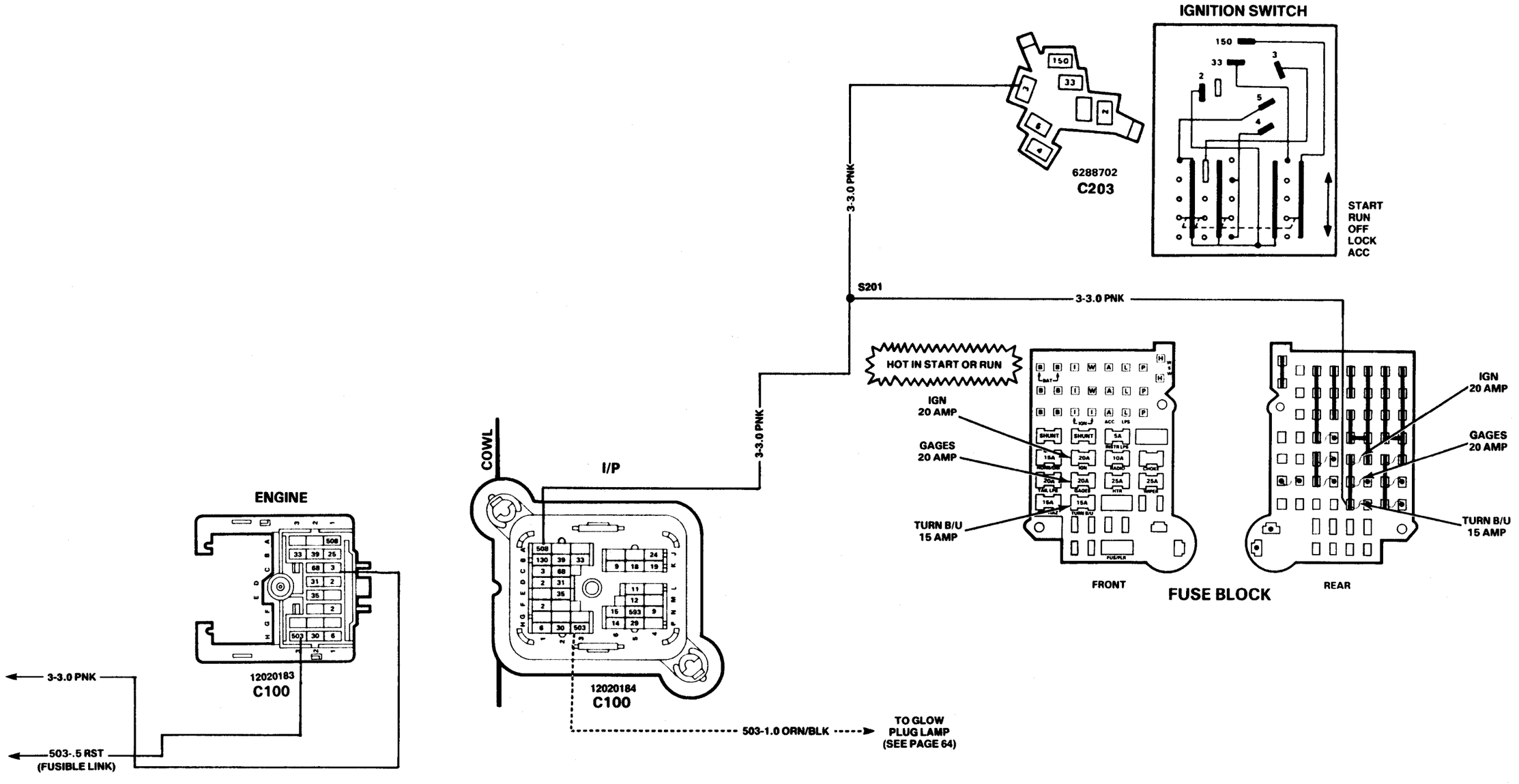
With engine at normal operating temperature, turn ignition switch to RUN. The WAIT indicator should flash for a RPO LL4 engine.

TROUBLESHOOTING CHART—GLOW PLUGS

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 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 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 to fuel shutoff valve.
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 to ground terminal G102 and/or G103.
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 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 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 continuity between DK GRN (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 DK GRN (503) and ORN (503) wires from glow plug controller connector to glow plug harness splice S116.
7. Reconnect glow plug controller connector. Connect test lamp from ORN (503) and ORN/BLK (509) wires at glow plug controller 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 controller.
	Test lamp does not light for one or more glow plugs.	REPLACE glow plug(s) where test lamp did not light.


ENGINE GROUND G102
SHEET METAL GROUND G103
150-1.0 BLK
150-1.0 BLK
S114
150-.8 BLK
FROM WATER IN FUEL SENSOR (SEE PAGE 39)
FROM FUEL HEATER (SEE PAGE 39)
150-.8 BLK
509-5.0 ORN/BLK
503-5.0 ORN
509-5.0 ORN/BLK
503-5.0 ORN
FROM RH BATTERY (-)
C153
RIGHT BANK GLOW PLUG
2
4
6
8
509
509
509
509
12020227
12020227
FUSIBLE LINK
S117
509-.8 RST
509-.8 RST
509-.8 RST
509-.8 RST
GLOW PLUG CONTROLLER
TO STARTER MOTOR (SEE PAGE 11)
A
B
C
D
E
906
503
3
150
906-1.0 PPL
503-1.0 DK GRN
3-3.0 PNK
150-.8 BLK
12015982
C128
2984033
503-.8 RST
503-.8 RST
503-.8 RST
503-.8 RST
FUSIBLE LINK
S116
503-1.0 DK GRN
503-1.0 ORN
503-1.0 DK GRN
2-8.0 RED (MOTOR HOME-P?2)
S2
2-3.0 RST (FUSIBLE LINK)
TO JUNCTION BLOCK BRACKET (SEE PAGE 11)
2-8.0 RED
12020227
12020227
503
503
503
503
1
3
5
7
LEFT BANK GLOW PLUG
C152
FROM LH BATTERY (-)
S2
2-3.0 RST (FUSIBLE LINK) (CONVENTIONAL FORWARD CONTROL-P42)
TO STARTER MOTOR/ SOLENOID (SEE PAGE 11)
3-3.0 PNK
S113
RPO LEGEND
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
3
FUEL SHUT-OFF VALVE
3
12020274
C129
3-3.0 PNK
3-3.0 PNK
3-3.0 PNK
503-1.0 ORN
503-.5 RST (FUSIBLE LINK)


IGNITION SWITCH
150
33
3
2
5
4
6288702
C203
START
RUN
OFF
LOCK
ACC
3-3.0 PNK
S201
3-3.0 PNK
HOT IN START OR RUN
IGN
20 AMP
GAGES
20 AMP
TURN B/U
15 AMP
FRONT
FUSE BLOCK
REAR
IGN
20 AMP
GAGES
20 AMP
TURN B/U
15 AMP
COWL
I/P
3-3.0 PNK
12020184
C100
503-1.0 ORN/BLK
TO GLOW
PLUG LAMP
(SEE PAGE 64)
ENGINE
12020183
C100
3-3.0 PNK
503-.5 RST
(FUSIBLE LINK)

COMPONENT LOCATION

		Page — Figure
Electronic Control Module	LH side of cowl	79 — 18
Fuse Block (Diesel)	Body builder installed	—
Fuse Block (Gas)	Body builder installed	—
Grommet 100	LH front of cowl	78 — 16
Kickdown Relay (P32)	LH front of cowl	78 — 14
Kickdown Relay (P42)	LH front of cowl	78 — 16
Kickdown Switch	Body builder installed	—
Transmission Kickdown Solenoid (RPO LB4)	LH side of transmission	77 — 12
Transmission Kickdown Solenoid (RPO LL4)	LH side of transmission	76 — 10
Transmission Kickdown Solenoid (RPO L05)	LH side of transmission	74 — 4
Transmission Kickdown Solenoid (RPO L19)	LH side of transmission	75 — 8
C100 (P32 w/RPO LL4)	LH front of cowl	74 — 5
C100 (P32 w/RPO L19)	LH front of cowl	78 — 16
C100 (P42 w/RPO LB4, L05, L19)	LH front of cowl	78 — 14
C100 (P42 w/RPO LL4)	LH front of cowl	75 — 6
C104 (P32)	LH front of cowl	78 — 14
C104 (P42)	LH front of cowl	78 — 16
C123 (RPO LB4)	At transmission kickdown solenoid	77 — 12
C123 (RPO L05)	At transmission kickdown solenoid	76 — 10
C123 (RPO L19)	At transmission kickdown solenoid	75 — 8
C133	At transmission kickdown switch	73 — 2
C136	At transmission kickdown solenoid	74 — 4
C200	At electronic control module	79 — 18
S111	LH side of cowl	78 — 16
S115	Rear of engine, near transmission filler tube	74 — 4
S119 (P32)	LH front of cowl	78 — 14
S119 (P42)	LH front of cowl	78 — 16
S208	Body builder installed harness	—

TRANSMISSION KICKDOWN SOLENOID

55

2984092
C123

55-.8 ORN

TO GENERATOR (SEE PAGE 32)

S119

422-.8 TAN/BLK

TO ALDL CONNECTOR (SEE PAGE 51)

422-.8 TAN/BLK

422-.8 TAN/BLK

KICKDOWN RELAY

39-.8 PNK/BLK

39-.8 PNK/BLK

422-.8 TAN/BLK

55-.8 ORN

12065169 C104

S111

ENGINE

12020183
C100

COWL

I/P

GROMMET 100
12020107 (UPPER)
12020108 (LOWER)

422-.8 TAN/BLK

HOT IN RUN OR START

INSTR LPS 5 AMP

GAGES 20 AMP

TURN/BU 15 AMP

FRONT

FUSE BLOCK

REAR

39-.8 PNK/BLK

ELECTRONIC CONTROL MODULE CONNECTOR C200

12047946

RPO LB4, LO5 AND L19

I/P

39-.8 PNK/BLK

ENGINE

25/130

12020183
C100

12020184
C100

COWL

39-.8 PNK/BLK

TO OIL PRESSURE GAUGE (SEE PAGE 64)

39-.5 PNK/BLK

TO I/P CLUSTER CONNECTOR (SEE PAGE 63, 64)

TO LOW COOLANT WARNING MODULE (SEE PAGE 62)

39-.8 PNK/BLK

S208

TO LOW COOLANT WARNING LAMP (SEE PAGE 63)

39-.8 PNK/BLK

TO WATER IN FUEL LAMP (SEE PAGE 63)

39-.8 PNK/BLK

HOT IN START OR RUN

GAGES 20 AMP

INSTR LPS 5 AMP

GAGES 20 AMP

TURN B/U 15 AMP

STP HAZ 15 AMP

GAGES 20 AMP

FRONT

FUSE BLOCK

REAR

39-.8 PNK/BLK

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

39-.8 PNK/BLK

KICKDOWN SWITCH

55 39

12052641
C133

TRANSMISSION KICKDOWN SOLENOID

55

55-.8 ORN

2984092
C136

39-.8 PNK/BLK

S115

39-.8 PNK/BLK

TO COLD ADVANCE AND TEMPERATURE SWITCH (SEE PAGE 39)

39-.5 PNK/BLK

TO WATER IN FUEL SENSOR (SEE PAGE 39)

TO FUEL HEATER (SEE PAGE 39)

39-.8 PNK/BLK

RPO LL4

AUTOMATIC TRANSMISSION KICKDOWN SOLENOID (M40)

COMPONENT LOCATION

		Page — Figure
ALDL	Body builder installed	—
Coolant Temperature Sensor (RPO LB4)	Top, front of engine	77 — 13
Coolant Temperature Sensor (RPO L05)	Top, front of engine	76 — 10
Coolant Temperature Sensor (RPO L19)	RH side of engine, behind alternator	76 — 9
EGR Solenoid (LB4)	Rear, top RH side of engine	77 — 13
Electronic Control Module	LH side of cowl	79 — 18
Electronic Spark Timing	Rear, top of engine	75 — 8
ESC Hybrid Function	RH side of engine	76 — 11
EVRV (RPO L05)	Top, RH side of engine	76 — 11
EVRV (RPO L19)	Top, RH side of engine	76 — 9
Fuel Pump Oil Pressure Sensor and Switch (LB4)	Top, rear of engine	77 — 12
Fuel Pump Oil Pressure Sensor and Switch (L05)	Top, rear of engine	76 — 10
Fuel Pump Relay (P32 w/RPO L19)	LH side of cowl	78 — 14
Fuel Pump Relay (P42)	LH side of cowl	78 — 16
Fuse Block	Body builder installed	—
Grommet 100	LH side of cowl	78 — 16
Grommet 101	Top, center of engine	76 — 9
Idle Air Control Actuator (RPO LB4)	Top, RH rear of engine	77 — 13
Idle Air Control Actuator (RPO L05)	Top, RH rear of engine	76 — 11
Idle Air Control Actuator (RPO L19)	Top, RH rear of engine	76 — 9
INJ-1 (RPO LB4)	In throttle body injection unit	77 — 13
INJ-1 (RPO L05)	In throttle body injection unit	76 — 11
INJ-1 (RPO L19)	In throttle body injection unit	76 — 9
INJ-2 (RPO LB4)	In throttle body injection unit	77 — 13
INJ-2 (RPO L05)	In throttle body injection unit	76 — 11
INJ-2 (RPO L19)	In throttle body injection unit	76 — 9
Knock Sensor (RPO LB4)	Lower, LH side of engine	77 — 12
Knock Sensor (RPO L05)	Lower, RH side of engine	76 — 11
Knock Sensor (RPO L19)	Lower, RH side of engine	76 — 9
Manifold Absolute Pressure Sensor (RPO LB4)	On rear of engine	77 — 13
Manifold Absolute Pressure Sensor (RPO L19)	On rear of engine	76 — 9
Oxygen Sensor (RPO LB4)	On LH side of transmission	77 — 12
Oxygen Sensor (RPO L05)	On LH side of transmission	76 — 10
Oxygen Sensor (RPO L19)	ON LH side of transmission	76 — 10
Throttle Position Sensor (RPO LB4)	RH side of throttle body	77 — 13
Throttle Position Sensor (RPO L05)	RH side of throttle body	76 — 11
Throttle Position Sensor (RPO L19)	RH side of throttle body	76 — 9
Vehicle Speed Sensor	LH side of transmission	75 — 8
C100 (P32 w/RPO L19)	LH front of cowl	78 — 14
C100 (P42 w/RPO LB4, L05, L19)	LH front of cowl	78 — 16
C103 (P32 w/RPO L19)	At fuel pump relay	78 — 14
C103 (P42)	At fuel pump relay	78 — 16
C109 (RPO LB4)	At coolant temperature sensor	77 — 13
C109 (RPO L05)	At coolant temperature sensor	76 — 10
C109 (RPO L19)	At coolant temperature sensor	76 — 9
C110 (RPO LB4)	At throttle position sensor	77 — 13
C110 (RPO L05)	At throttle position sensor	76 — 11
C110 (RPO L19)	At throttle position sensor	76 — 9
C111 (RPO LB4)	At throttle body injector	77 — 13
C111 (RPO L05)	At throttle body injector	76 — 11
C111 (RPO L19)	At throttle body injector	76 — 9
C112 (RPO LB4)	At throttle body injector	77 — 13
C112 (RPO L05)	At throttle body injector	76 — 11
C112 (RPO L19)	At throttle body injector	76 — 9
C113	At ESC hybrid function	76 — 11
C114 (RPO L19)	At EVRV solenoid	76 — 9

COMPONENT LOCATION

		Page — Figure
C115 (RPO LB4)	At idle air control actuator	77 — 13
C115 (RPO L05)	At idle air control actuator	76 — 11
C115 (RPO L19)	At idle air control actuator	76 — 9
C116 (RPO LB4)	At manifold absolute pressure sensor	77 — 13
C116 (RPO L19)	At manifold absolute pressure sensor	76 — 9
C117 (RPO LB4)	Lower LH side of engine	77 — 12
C117 (RPO L05)	Lower RH side of engine	76 — 11
C117 (RPO L19)	Lower RH side of engine	76 — 9
C118 (RPO LB4)	At fuel pump oil pressure sensor and switch	77 — 12
C118 (RPO L05)	At fuel pump oil pressure sensor and switch	76 — 10
C119	At vehicle speed sensor	75 — 8
C120 (RPO LB4)	At electronic spark timer	77 — 12
C120 (RPO L05)	At electronic spark timer	76 — 10
C120 (RPO L19)	At electronic spark timer	75 — 8
C124 (RPO LB4)	At oxygen sensor	77 — 12
C124 (RPO L05)	At oxygen sensor	76 — 10
C124 (RPO L19)	At oxygen sensor	75 — 8
C127 (RPO LB4)	At EGR solenoid	77 — 13
C200	LH side of cowl	79 — 18
C201	Body builder installed	—
G100	On alternator bracket	76 — 9
G101	On alternator bracket	76 — 9
S100 (P32, P42 w/RPO L19)	Engine harness, RH side of engine	76 — 9
S100 (RPO L05)	Engine harness, RH side of engine	76 — 11
S101	Engine harness, front of engine	76 — 9
S102	LH front of cowl	78 — 16
S102 (P32 w/RPO L19)	LH front of cowl	78 — 14
S104 (P32 w/RPO L19)	LH front of cowl	78 — 14
S104	LH front of cowl	78 — 16
S105 (P32, P42 w/RPO L19)	Top of engine	76 — 9
S105 (P42 w/RPO LB4)	RH side of engine	77 — 13
S106 (P32 w/RPO L19)	LH front of cowl	78 — 14
S106	LH front of cowl	78 — 16
S107 (P32 w/RPO L19)	LH front of cowl	78 — 14
S107	LH front of cowl	78 — 16
S108 (P32 w/RPO L19)	LH front of cowl	78 — 14
S108	LH front of cowl	78 — 16
S109 (P32 w/RPO L19)	LH front of cowl	78 — 14
S109	LH front of cowl	78 — 16
S111	LH front of cowl	78 — 16
S112 (P32 w/RPO L19)	LH front of cowl	78 — 14
S112 (RPO LB4)	RH side of engine	77 — 13
S112	LH front of cowl	78 — 16
S119 (P32 w/RPO L19)	LH front of cowl	78 — 14
S119	LH front of cowl	78 — 16

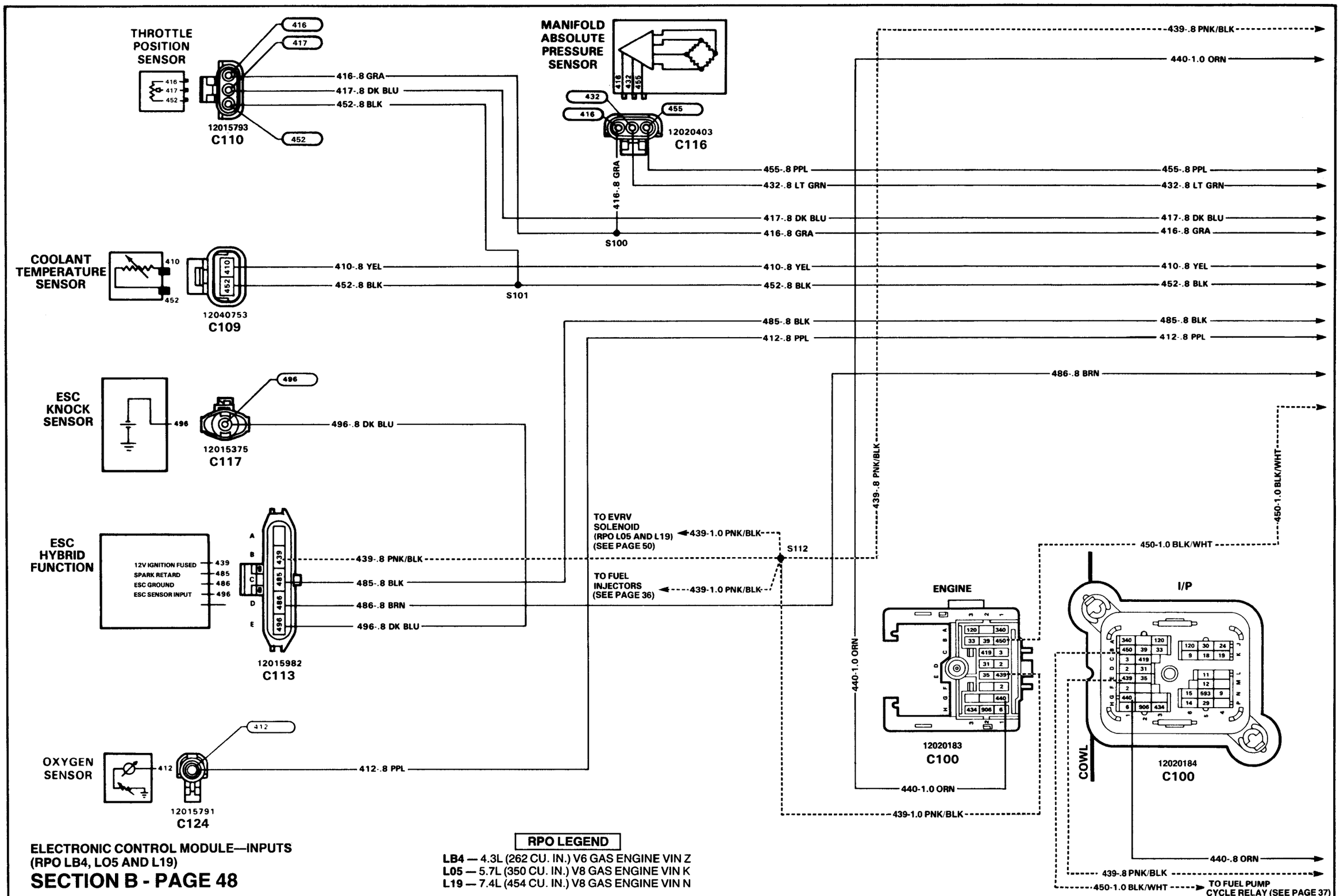
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
			A2	NOT USED
			A3	NOT USED
435	.8	GRA	A4	EVRV (RPO L05 AND L19) EGR (RPO LB4)
419	.8	BRN/WHT	A5	SYSTEM CHECK LAMP
439	.8	PNK/BLK	A6	12V IGNITION FUSED
*422	.8	TAN/BLK	A7	KICKDOWN RELAY (RPO M40)
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASS'Y LINE DIAG/LINK
437	.8	BRN	A10	SPEED SENSOR
452	.8	BLK	A11	5V SYSTEM RETURN A
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	A/C INPUT
			B9	NOT USED
*434	.8	ORN/BLK	B10	PARK/NEUTRAL SWITCH
			B11	NOT USED
			B12	NOT USED

*AUTO TRANS ONLY

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			C1	NOT USED
436	.5	BRN	C2	AIR SW SOLENOID (RPO L19)
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	C9	CRANK DISCONNECT 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	LT GRN	C15	INJECTOR B DRIVE
440	.8	ORN	C16	12V BATTERY FUSED
450	.8	BLK/WHT	D1	SYSTEM RETURN
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	LT GRN	D14	INJECTOR B DRIVE
467	.8	LT BLU	D15	INJECTOR A DRIVE
467	.8	LT BLU	D16	INJECTOR A DRIVE

RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

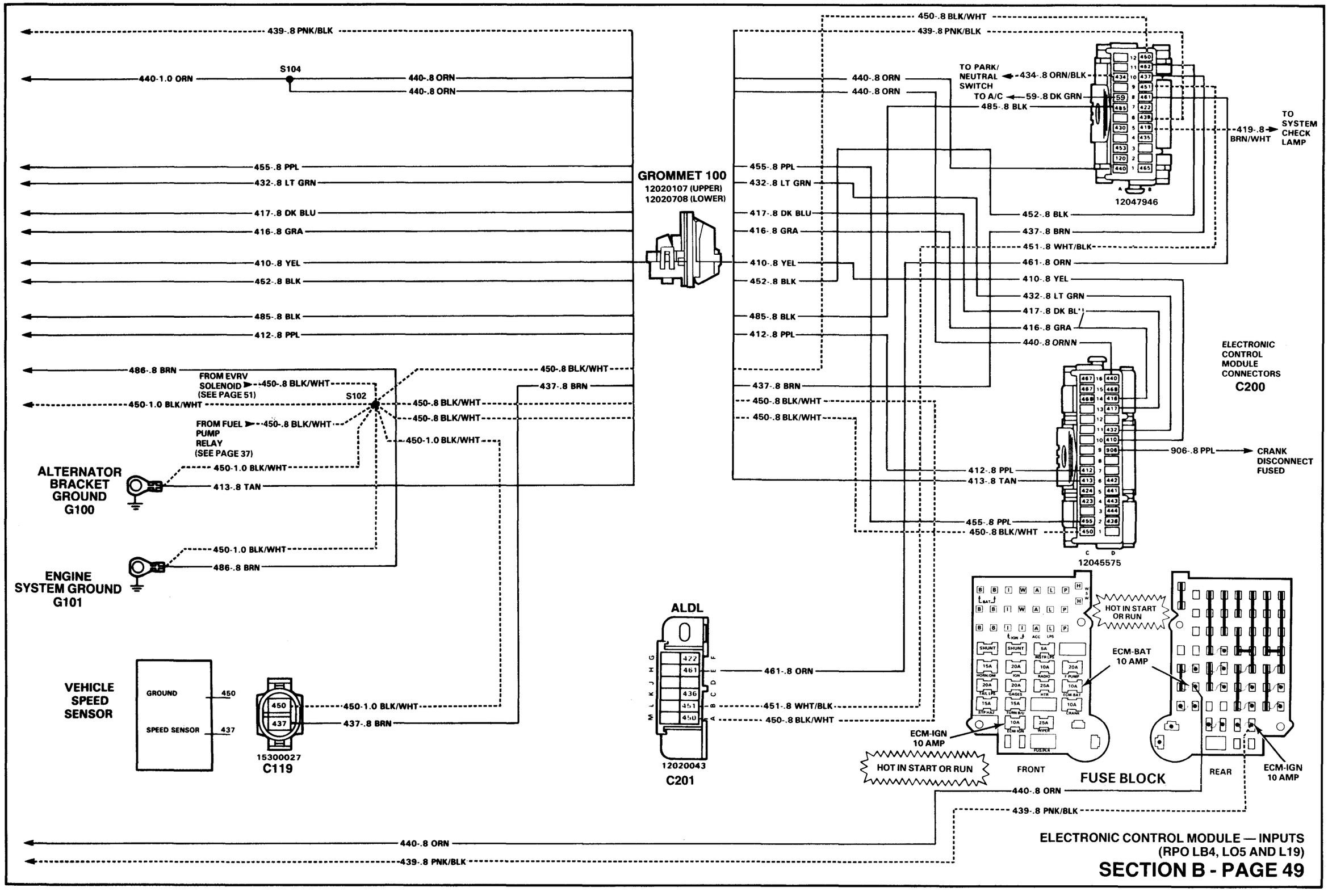


ELECTRONIC CONTROL MODULE—INPUTS
(RPO LB4, LO5 AND L19)

SECTION B - PAGE 48

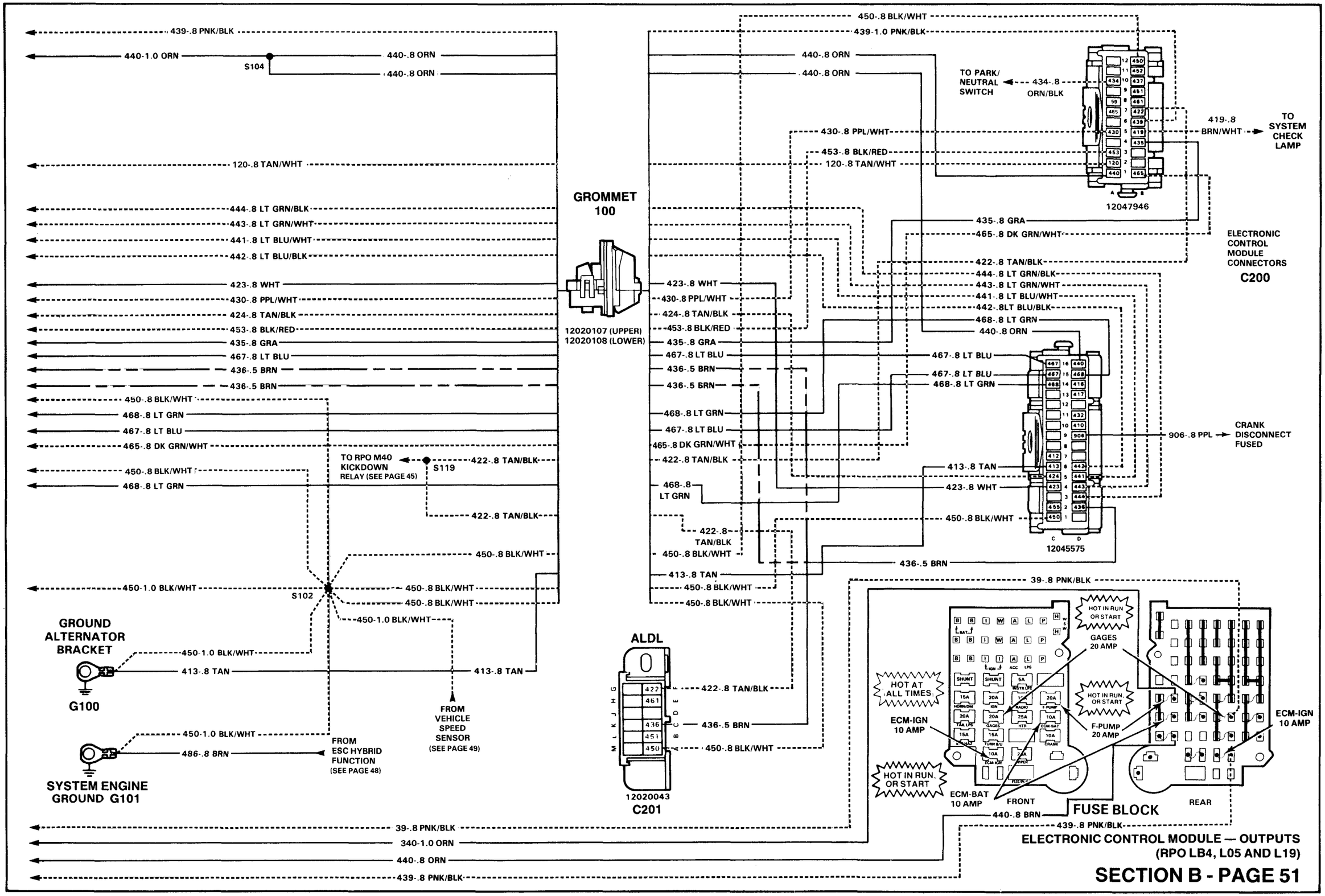
RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N



ELECTRONIC CONTROL MODULE — INPUTS
(RPO LB4, LO5 AND L19)

ELECTRONIC SPARK TIMING
12V IGNITION FUSED 423
SPARK RETARD 424
ESC GROUND 430
ESC SENSOR 453
12040754 C120
423-.8 WHT
430-.8 PPL/WHT
424-.8 TAN/BLK
453-.8 BLK/RED
424
12015791
12010996 C125
424-.8 TAN/BLK
EVRV SOLENOID (RPO LO5 AND L19)
450
435
439
12047950 C114
450-.8 BLK/WHT
435-.8 GRA
439-.8 PNK/BLK
AIR SWITCH (MOTOR HOME-P32 WITH RPO L19)
39
436
12015975 C126
39-.8 PNK/BLK
436-.8 BRN
12020549 C112
481
481-.8 RED
468-.8 DK GRN
468
INJ-2
482
482-.8 WHT
467-.8 DK BLU
467
INJ-1
12020549 C111
GROMMET 101
12010639
S105
S110
S112
S106
S107
S108
S109
S111
439-.8 PNK/BLK
468-.8 DK GRN
467-.8 DK BLU
TO ESC HYBRID FUNCTION (SEE PAGE 48)
(RPO LB4 ONLY)
IDLE AIR CONTROL ACTUATOR (RPO L19)
441
442
443
444
M
STEPPER MOTOR
IDLE AIR CONTROL ACTUATOR (RPO LB4, LO5)
12078082 C115
441-.8 BLU/WHT
442-.8 LT BLU/BLK
443-.8 LT GRN/WHT
444-.8 LT BRN/BLK
12015798 C115
439-.8 PNK/BLK
440-1.0 ORN
120-.8 TAN/WHT
444-.8 LT GRN/BLK
443 .8 LT GRN/WHT
441-.8 LT BLU/WHT
442 .8 LT BLU/BLK
423-.8 WHT
430-.8 PPL/WHT
424-.8 TAN/BLK
453-.8 BLK/RED
435-.8 GRA
467-.8 LT BLU
436-.5 BRN
436-.5 BRN
450-.8 BLK/WHT
468-.8 LT GRN
467-.8 LT BLU
465-.8 DK GRN/WHT
450-.8 BLK/WHT T
468-.8 LT GRN
FUEL PUMP RELAY
120
465
NO
340
450
12065169 C103
465-.8 DK GRN/WHT
120-2.0 TAN/WHT
450-.8 BLK/WHT
340-2.0 ORN
435-.8 GRA
12065401 C118
FUEL PUMP OIL PRESSURE SENSOR AND SWITCH
120
31
340
120-1.0 TAN/WHT
31-.5 TAN
340-1.0 ORN
TO GENERATOR (SEE PAGE 32)
39-.8 PNK/BLK
TO RPO M40 KICKDOWN RELAY (SEE PAGE 45)
39-1.0 PNK/BLK
31-.5 TAN
340-2.0 ORN
ENGINE
120-2.0 TAN/WHT
450-1.0 BLK/WHT
440-1.0 ORN
12020183 C100
450-1.0 BLK/WHT
450-.8 BLK/WHT
120-.8 TAN/WHT
TO FUEL PUMP CYCLE RELAY (SEE PAGE 37)
120-2.0 TAN/WHT
31-.5 TAN
TO OIL PRESSURE GAGE (SEE PAGE 64)
COWL
12020184 C100
440-.8 ORN
439-.8 PNK/BLK
39
435
EGR SOLENOID
12052641 C127 (RPO LB4)
RPO LEGEND
LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
ELECTRONIC CONTROL MODULE — OUTPUTS (RPO LB4, LO5 AND L19)
SECTION B - PAGE 50



ELECTRONIC CONTROL MODULE — OUTPUTS
(RPO LB4, L05 AND L19)

CIRCUIT OPERATION

Vehicles equipped with the Hydro-Boost Brake system have an optional warning harness that plugs into the I/P harness in place of the Park Brake Warning Switch. Refer to the 1990 Light Duty Truck Service Manual, Section 5A1 for further description and operation of the Hydro-Boost System.

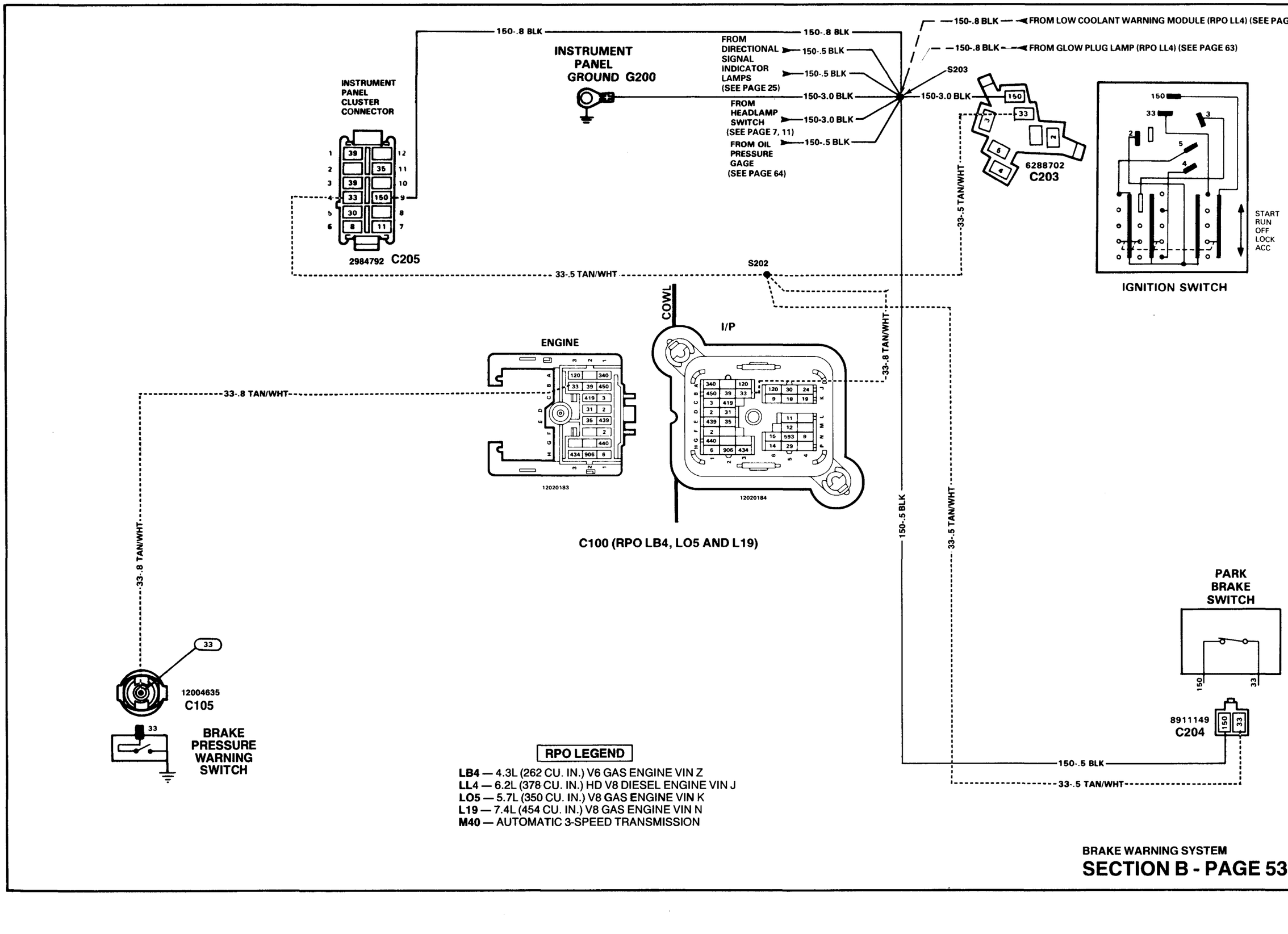
COMPONENT LOCATION

		Page — Figure
Alarm	Body builder installed	—
Brake Pressure Warning Switch	On brake cylinder	74 — 5
Flasher Unit	Body builder installed	—
Fuse Block	Body builder installed	—
Grommet 104	Body builder installed	—
Hydro-Boost Pressure Switch	Body builder installed	—
Ignition Switch	Body builder installed	—
Low Vacuum Switch (RPO LL4)	Body builder installed	—
Park Brake Switch	Body builder installed	—
C100	At bulkhead, on LH front of cowl	78 — 16
C105	At brake pressure warning switch	78 — 16
C147	At low vacuum switch	—
C148	At hydro-boost pressure switch	—
C149	At flow switch	—
C203	At flow switch	—
C204	At park brake switch	—
C205	In instrument panel	—
C216	At flasher unit	—
C217	At alarm assembly	—
G109	Body builder installed harness	—
G200	Body builder installed harness	—
S202	Body builder installed harness	—
S203	Body builder installed harness	—

TROUBLESHOOTING CHART—BRAKE WARNING SYSTEM

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

TEST	RESULT	ACTION
1. Disconnect park brake switch connector C205.	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.	GO to step 3, for vehicles equipped with RPO UJ1.
	Brake indicator lamp goes out.	CHECK for a possible leak or loss of fluid in the brake system.
3. Connect a digital ohmmeter from I/P side of TAN/WHT (33) wire at connector C225. CHECK for continuity to ground.	Continuity.	REPAIR short to ground in TAN/WHT (33) wire between C225 and instrument cluster.
	No continuity.	REFER to 1990 Light Duty Truck Service Manual for diagnosis of the brake system Section 5A1.

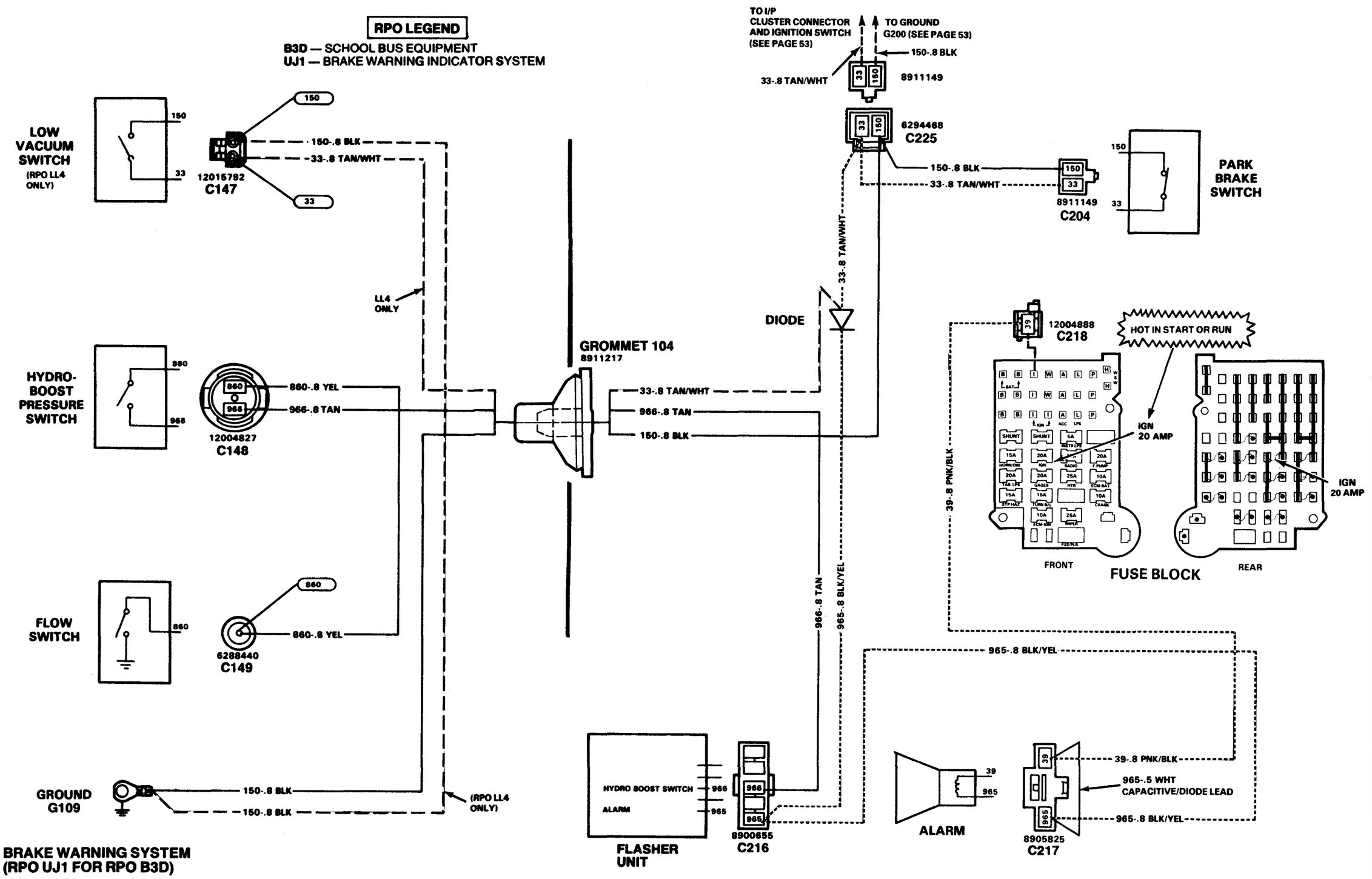


RPO LEGEND

LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J
LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

RPO LEGEND

B3D — SCHOOL BUS EQUIPMENT
UJ1 — BRAKE WARNING INDICATOR SYSTEM



BRAKE WARNING SYSTEM
(RPO UJ1 FOR RPO B3D)

BLANK

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 Activator
- Brake Switch
- Vehicle Speed Sensor

The Cruise Control Module receives voltage from the IGN fuse in RUN or START. A speed signal is received from the Vehicle Speed Sensor. 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.

COMPONENT LOCATION

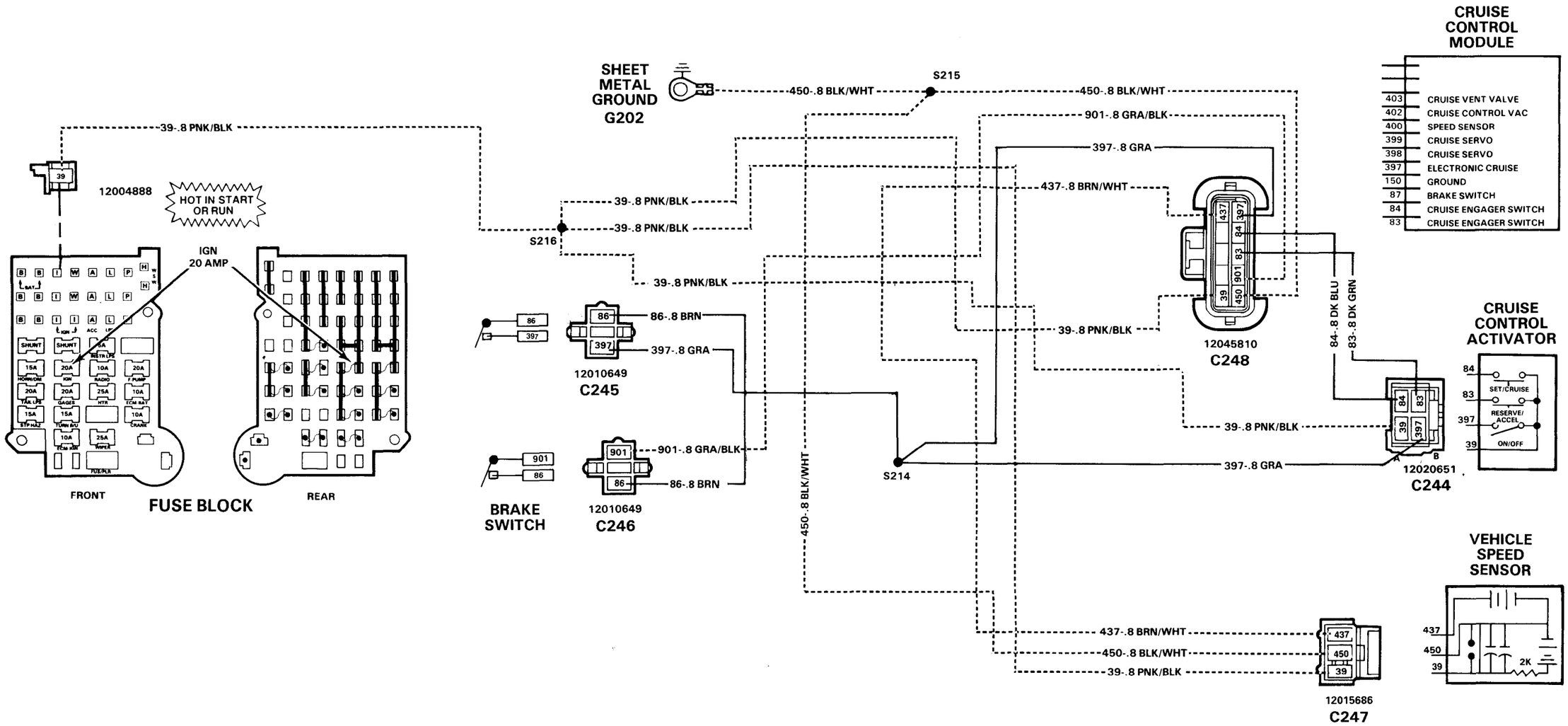
TROUBLESHOOTING CHART—CRUISE CONTROL

CRUISE CONTROL DOES NOT DISENGAGE WHEN BRAKE PEDAL IS DEPRESSED

TEST	RESULT	ACTION
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 test lamp from PNK/BLK (39) wire at cruise control activator 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 fuse (IGN). If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire from cruise control switch and cruise module to fuse block.
2. Connect test lamp from GRA (397) wire at cruise control activator connector C244 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE cruise control activator.
3. Connect 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 to cruise control activator.
4. Connect test lamp from GRA (397) to BLK/WHT (450) 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/WHT (450) wire from cruise control module to ground terminal G202.
5. Connect 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 to splice S214.
6. Connect test lamp from GRA/BLK (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 GRA/BLK (901) wire from brake switch to cruise control module.
7. Connect 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 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 test lamp from DK BLU (84) wire at cruise control activator connector C244 to ground.	Test lamp lights.	REPLACE cruise control activator.
	Test lamp does not light.	GO to step 10.
10. Depress SET switch. Connect test lamp from DK BLU (84) wire at cruise control activator connector C244 to ground.	Test lamp lights.	GO to step 11.
	Test lamp does not light.	REPLACE cruise control activator.
11. Connect 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 to cruise control activator.
12. Depress and hold RES/ACCEL switch. Connect test lamp from DK GRN (83) wire at cruise control activator connector C248 to ground.	Test lamp lights.	GO to step 13.
	Test lamp does not light.	REPLACE cruise control switch.
13. Connect 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 to cruise control activator.
14. Raise vehicle so drive wheels can be turned by hand. Connect voltmeter from PNK/WHT (39) wire to BRN (50) 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 Section 6E of Fuel and Emission Manual (Gasoline).


CRUISE CONTROL MODULE
403 CRUISE VENT VALVE
402 CRUISE CONTROL VAC
400 SPEED SENSOR
399 CRUISE SERVO
398 CRUISE SERVO
397 ELECTRONIC CRUISE
150 GROUND
87 BRAKE SWITCH
84 CRUISE ENGAGER SWITCH
83 CRUISE ENGAGER SWITCH
SHEET METAL GROUND G202
450-.8 BLK/WHT
S215
450-.8 BLK/WHT
901-.8 GRA/BLK
397-.8 GRA
437-.8 BRN/WHT
39-.8 PNK/BLK
39-.8 PNK/BLK
S216
39-.8 PNK/BLK
12045810
C248
84-.8 DK BLU
83-.8 DK GRN
CRUISE CONTROL ACTIVATOR
84
83
397
39
SET/CRUISE
RESERVE/ ACCEL
ON/OFF
39-.8 PNK/BLK
397-.8 GRA
12020651
C244
12004888
HOT IN START OR RUN
IGN 20 AMP
FRONT
REAR
FUSE BLOCK
86
397
86-.8 BRN
397-.8 GRA
12010649
C245
901
86
BRAKE SWITCH
901
86
901-.8 GRA/BLK
86-.8 BRN
12010649
C246
450-.8 BLK/WHT
S214
VEHICLE SPEED SENSOR
437
450
39
2K
437-.8 BRN/WHT
450-.8 BLK/WHT
39-.8 PNK/BLK
12015686
C247

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.

BRAKE WARNING LAMP

Battery voltage is applied to the Brake Indicator when the Ignition Switch is in RUN, BULB TEST or START. Three Switches are connected to the Brake Indicator. When any one of these Switches closes, 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 BULB CHECK or 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 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 260°F (hot coolant) and its resistance becomes greater at low temperatures. It is approximately 1400 ohms at 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 (RPO LL4)

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 (RPO LB4, L05 AND L19) INDICATOR

Refer to Light Duty Truck Fuel, Driveability and Emissions Service Manual, Section 3.

WATER-IN-FUEL WARNING INDICATOR

Refer to Fuel Controls (RPO LL4), Page B-38.

GLOW PLUG INDICATOR

Refer to Glow Plugs (RPO LL4), Page B-11.

RH/LH DIRECTIONAL SIGNAL INDICATORS

Refer to Front Exterior Lamps, Page B-24.

HIGH BEAM INDICATOR

Refer to Headlamps, Page B-12, B-16.

COMPONENT LOCATION

		Page — Figure
Brake Pressure Warning Switch	On brake cylinder	75 — 8
Check Engine Lamp (Gasoline)	Body builder installed	—
Coolant Temperature Sender (RPO LL4)	LH front of engine, on cylinder head	74 — 3
Daytime Running Lamps Indicator (CANADA ONLY)	Body builder installed	74 — 3
Dimmer Switch	Body builder installed	—
Directional Signal Lamp, LH	Body builder installed	—
Directional Signal Lamp, RH	Body builder installed	—
Directional Signal Switch	In upper steering column	78 — 15
Engine Temperature Switch (RPO LB4)	LH side of engine	77 — 12
Engine Temperature Switch (RPO L05)	LH side of engine	76 — 10
Engine Temperature Switch (RPO L19)	LH side of engine	75 — 8
Fuel Pump	In fuel tank	79 — 17
Fuel Pump/Oil Pressure Sensor and Switch (RPO LB4)	LH side of engine	77 — 12
Fuel Pump/Oil Pressure Sensor and Switch (RPO L05)	LH side of engine	76 — 10
Fuse Block	Body builder installed	—
Generator (RPO LB4)	Top, RH side of engine	77 — 13
Generator (RPO LL4)	Right front of engine	73 — 2
Generator (RPO L05)	Top, RH side of engine	76 — 11
Generator (RPO L19)	Top, RH side of engine	76 — 9
Glow Plug Lamp (RPO LL4)	Body builder installed	—
Hazard Flasher	Body builder installed	—
Headlamp Switch	Body builder installed	—
Ignition Switch	Body builder installed	—
Low Coolant Warning Lamp (RPO LL4)	Body builder installed	—
Low Coolant Warning Module (RPO LL4)	Body builder installed	—
Low Coolant Warning Switch (RPO LL4)	Top, RH side of radiator	—
Oil Pressure Gage	Body builder installed	—
Park Brake Switch	Body builder installed	—
Water-In-Fuel Sensor (RPO LL4)	Top rear center of engine	74 — 4
Water-In-Fuel Warning Lamp (RPO LL4)	Body builder installed	—
Windshield Wiper/Washer Switch	Body builder installed	—
Wiper/Washer Switch Lamp	Body builder installed	—
C100 (P32 w/RPO L19)	LH front of cowl	78 — 16
C100 (P42 w/RPO LB4, L05, L19)	LH front of cowl	78 — 14
C100 (P32 w/RPO LL4)	LH front of cowl	74 — 5
C100 (P42 w/RPO LL4)	LH front of cowl	75 — 6
C105	At brake pressure warning switch	78 — 16
C106 (RPO LL4)	At coolant temperature sender	74 — 3
C107 (P32 w/RPO L19)	At generator	76 — 9
C107 (RPO LB4)	At generator	76 — 13
C107 (RPO L05)	At generator	77 — 13
C108 (RPO LB4)	At engine temperature switch	77 — 12
C108 (RPO L05)	At engine temperature switch	76 — 10
C108 (RPO L19)	At engine temperature switch	75 — 8
C118 (P42 w/RPO LB4)	At fuel pump/oil pressure sensor and switch	77 — 12
C118 (RPO L05)	At fuel pump/oil pressure sensor and switch	76 — 10
C130 (RPO LL4)	At water-in-fuel sensor	74 — 4
C150 (RPO LL4)	At low coolant warning switch	75 — 6
C151 (RPO LL4)	At generator	73 — 2
C203	Body builder installed	—
C204	Body builder installed	—
C205	Body builder installed	—
C206	Top of steering column	—
C209	Body builder installed	—
C210	Body builder installed	—
C212	At RH directional signal lamp	—
C213	At LH directional signal lamp	—
C221	Body builder installed	—
C222	Body builder installed	—
C228	Body builder installed	—
C235	At oil pressure gage	—
C236 (RPO LL4)	At low coolant warning lamp	—
C237 (RPO LL4)	At low coolant warning lamp	—
C238 (RPO LL4)	At water-in-fuel warning lamp	—

COMPONENT LOCATION

		Page — Figure
C239 (RPO LL4)	At glow plug lamp	—
C240 (Gas)	At check engine lamp	—
C241 (CANADA ONLY)	At daytime running lamps indicator	—
C400	Rear, RH frame rail	79 — 17
G200	Body builder installed	—
G201	Body builder installed	—
S111	Engine harness, LH front of cowl	—
S202	Body builder installed harness	—
S203	Body builder installed harness	—
S208	Body builder installed harness	—

PRELIMINARY CHECKS:

CHECK condition of GAGES and INST LPS fuses. If fuses are in good condition use the following diagnostic procedures.

TROUBLESHOOTING CHART—INSTRUMENT PANEL: GAGES AND INDICATORS

FUEL GAGE INDICATES FULL OR BEYOND AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect fuel tank sender connector C100 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 a short in PNK (30) wire. If no short is found, REPLACE fuel gage.
	Fuel gage indicates empty.	GO to step 2.
2. Connect fused jumper from PNK (30) wire to BLK (150) wire at fuel pump connector C400.	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
Disconnect fuel pump 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
Disconnect fuel pump connector C400. Connect one red lead of J34029-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 GAGE INDICATES HOT WITH ENGINE COOLANT BELOW OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
Disconnect temperature sender connector C108 (Gas) 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 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
Disconnect temperature sender connector C108 (Gas) or C106 (Diesel). Ground the DK GRN (35) wire at temperature sender connector C108 (Gas) 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. If wire is good, REPLACE temperature gage.

TEMPERATURE INDICATOR STAYS ON AT ALL TIMES WITH IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
Disconnect temperature sender connector C108 (Gas) 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 out.	REPLACE temperature sender.

TEMPERATURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
Disconnect temperature sender connector C108 (Gas) 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 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.

TEMPERATURE INDICATOR DOES NOT LIGHT WITH THE ENGINE COOLANT OVERHEATED

TEST	RESULT	ACTION
Disconnect temperature sender connector C108 (Gas) or C106 (Diesel) and place ignition switch to RUN. Connect fused jumper from DK GRN (35) wire at temperature sending connector C108 (Gas) or C106 (Diesel) to ground. Observe temperature indicator.	Indicator lights.	REPLACE temperature sender.
	Indicator does not light.	LOCATE and REPAIR open in bulb and DK GRN (35) wire. If wire and bulb are good, REPLACE instrument cluster.

OIL PRESSURE GAGE INDICATES LOW PRESSURE WHEN OIL PRESSURE IS GOOD

TEST	RESULT	ACTION
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 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
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 IS NOT ACCURATE

TEST	RESULT	ACTION
Disconnect oil pressure sender connector C118. Connect one red lead of J34029-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. 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 module connector C236. Connect voltmeter from PNK/BLK (39) wire at low coolant module connector C236 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 C236.	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 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 module to low coolant warning lamp.
5. Connect voltmeter from PNK/BLK (39) wire to YEL/BLK (68) at low coolant module connector C236.	Battery voltage.	LOCATE and REPAIR short to ground in YEL/BLK (68) wire from low coolant module to low coolant warning switch.
	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 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."

RPO LEGEND

LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

WIPER/WASHER SWITCH LAMP

C222
8905381

150-.8 BLK

150-.8 BLK

SHEET METAL GROUND G201

8917310
C221

OFF LO HI
150
91
92
94
WASH

WINDSHIELD WIPER WASHER SWITCH

8-.8 GRA

ILLUM
ILLUM
ILLUM
HIGH BEAM

BRAKE

TEMP
FUEL

6 8 11 7
5 30 8
4 33 150 9
3 39 10
2 35 11
1 39 12

2984792
C205

1 39 12
2 35 11
3 39 10
4 33 150 9
5 30 8
6 8 11 7

PARK OFF
HEAD
PARK
OFF

HEADLAMP SWITCH

12004628
C209

12004885

HOT WITH HEADLAMP SWITCH IN HEAD OR PARK

8-.5 GRA

8-.5 GRA

INSTR LPS
5 AMP

44-1.0 DK GRN

FRONT
REAR

FUSE BLOCK

FROM DIRECTIONAL SIGNAL INDICATOR LAMPS (SEE PAGE 25) — 150-.5 BLK

FROM OIL PRESSURE GAGE (SEE PAGE 64) — 150-.5 BLK

150-3.0 BLK

S203

150-.8 BLK

I/P GROUND G200

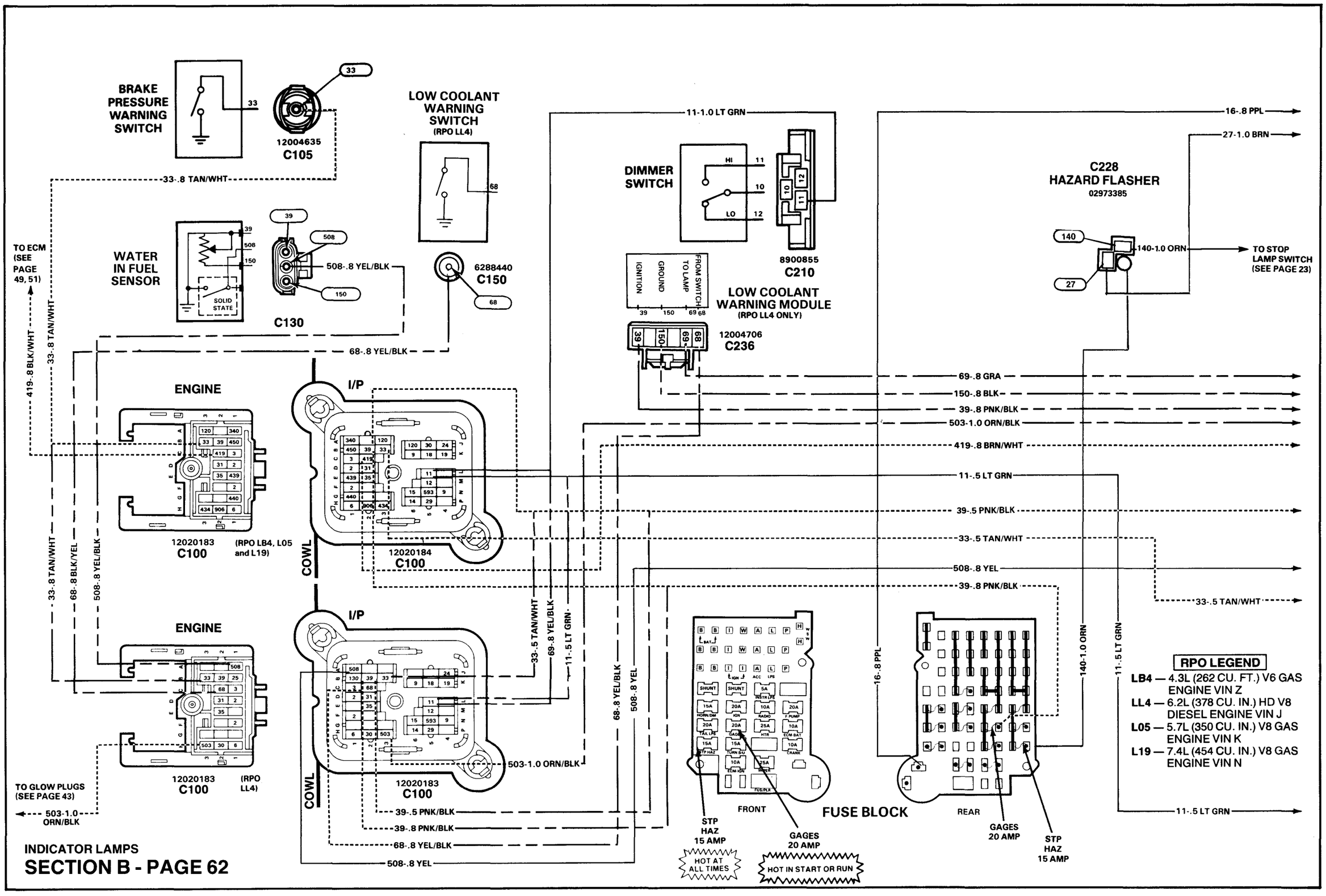
150-3.0 BLK

FROM IGNITION SWITCH (SEE PAGE 7, 11) — 150-3.0 BLK

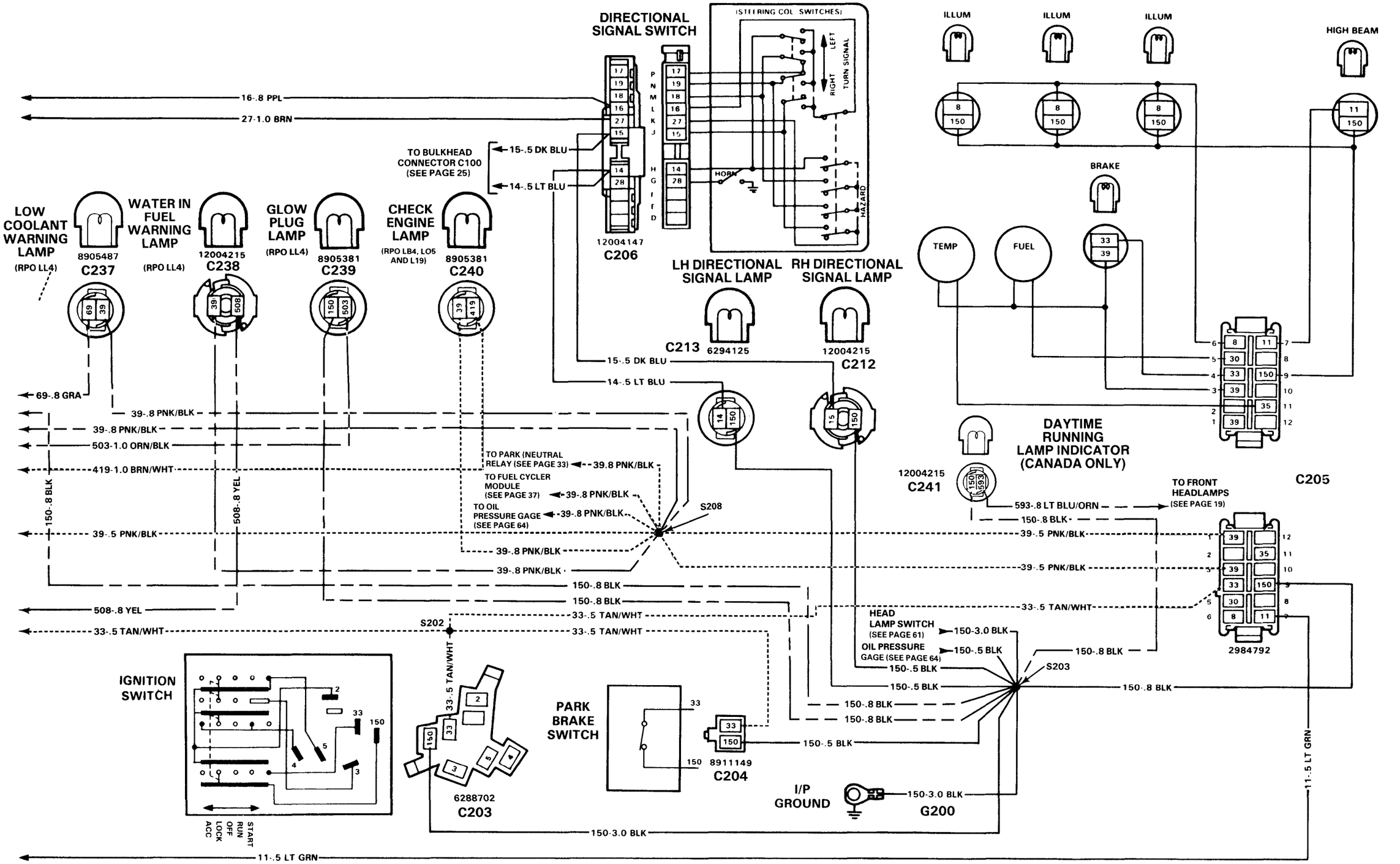
FROM PARK BRAKE WARNING SWITCH (SEE PAGE 53) — 150-.5 BLK

150-.8 BLK — FROM LOW COOLANT WARNING MODULE (RPO LL4) (SEE PAGE 62)

150-.8 BLK — FROM GLOW PLUG LAMP (RPO LL4) (SEE PAGE 63)



INDICATOR LAMPS


DIRECTIONAL SIGNAL SWITCH
(STEERING COL SWITCHES)
TURN SIGNAL
LEFT
RIGHT
HAZARD
HORN
12004147
C206
16-.8 PPL
27-1.0 BRN
TO BULKHEAD CONNECTOR C100 (SEE PAGE 25)
15-.5 DK BLU
14-.5 LT BLU
LOW COOLANT WARNING LAMP
(RPO LL4)
8905487
C237
WATER IN FUEL WARNING LAMP
(RPO LL4)
12004215
C238
GLOW PLUG LAMP
(RPO LL4)
8905381
C239
CHECK ENGINE LAMP
(RPO LB4, LO5 AND L19)
8905381
C240
LH DIRECTIONAL SIGNAL LAMP
C213
6294125
RH DIRECTIONAL SIGNAL LAMP
12004215
C212
ILLUM
ILLUM
ILLUM
HIGH BEAM
BRAKE
TEMP
FUEL
C205
69-.8 GRA
39-.8 PNK/BLK
39-.8 PNK/BLK
503-1.0 ORN/BLK
419-1.0 BRN/WHT
150-.8 BLK
508-.8 YEL
39-.5 PNK/BLK
508-.8 YEL
TO PARK (NEUTRAL RELAY (SEE PAGE 33)
39.8 PNK/BLK
TO FUEL CYCLER MODULE (SEE PAGE 37)
39-.8 PNK/BLK
TO OIL PRESSURE GAGE (SEE PAGE 64)
39-.8 PNK/BLK
S208
39-.8 PNK/BLK
39-.8 PNK/BLK
150-.8 BLK
150-.8 BLK
33-.5 TAN/WHT
33-.5 TAN/WHT
S202
33-.5 TAN/WHT
33-.5 TAN/WHT
12004215
C241
DAYTIME RUNNING LAMP INDICATOR (CANADA ONLY)
593-.8 LT BLU/ORN
150-.8 BLK
TO FRONT HEADLAMPS (SEE PAGE 19)
39-.5 PNK/BLK
39-.5 PNK/BLK
33-.5 TAN/WHT
2984792
HEAD LAMP SWITCH (SEE PAGE 61)
150-3.0 BLK
OIL PRESSURE GAGE (SEE PAGE 64)
150-.5 BLK
150-.8 BLK
S203
150-.5 BLK
150-.5 BLK
150-.8 BLK
150-.8 BLK
150-.5 BLK
150-.8 BLK
IGNITION SWITCH
LOCK
ACC
OFF
RUN
START
6288702
C203
PARK BRAKE SWITCH
8911149
C204
I/P GROUND
150-3.0 BLK
G200
150-3.0 BLK
11-.5 LT GRN
11-.5 LT GRN

ENGINE TEMPERATURE SWITCH

COOLANT TEMPERATURE SENDER

6288704
C108 35

2962965
C106 35

FUEL PUMP OIL PRESSURE SENSOR & SWITCH

12065401
C118

FUEL PUMP

12020829
12020827
C400

30-.8 PNK

31-.5 TAN

35-.5 DK GRN

RPO LEGEND

M40 — AUTOMATIC 3-SPEED TRANSMISSION
LL4 — 6.2L (378 CU. IN.) HD V8 DIESEL ENGINE VIN J

REAR BODY CONNECTOR
12020099
C100

ILLUM
ILLUM
ILLUM
HIGH BEAM
BRAKE

OIL
TEMP
FUEL

8905388
C235

31-.5 TAN
150-.5 BLK
39-.5 PNK/BLK

C203

TO WATER IN FUEL WARNING LAMP (RPO LL4) (SEE PAGE 63)

CHECK ENGINE LAMP (SEE PAGE 63)

39-.8 PNK/BLK

TO LOW COOLANT WARNING LAMP (RPO LL4) (SEE PAGE 63)

TO LOW COOLANT WARNING MODULE (RPO LL4) (SEE PAGE 62)

S208

TO PARK NEUTRAL RELAY (SEE PAGE 33)

LO5 ONLY

TO FUEL CYCLER MODULE (SEE PAGE 37)

2984792

ENGINE

12020183
C100

39-1.0 PNK/BLK

I/P

12020184
C100

COWL

39-.5 PNK/BLK
39-.8 PNK/BLK
30-.5 PNK
35-.5 DK GRN

GENERATOR CONNECTOR

12045896
C107 (GASOLINE)
C151 (DIESEL)

S111

39-.8 PNK/BLK

TO RPO M40 KICKDOWN RELAY (SEE PAGE 45)

TO AIR SWITCH (RPO L19) (SEE PAGE 50)

GAGES 20 AMP

HOT IN RUN OR START

FRONT

FUSE BLOCK

REAR

GAGES 20 AMP

FROM DIRECTIONAL SIGNAL INDICATOR LAMPS (SEE PAGE 25)

150-.5 BLK

I/P GROUND G200

150-3.0 BLK

S203

150-.8 BLK

TO GLOW PLUG LAMP (SEE PAGE 63)

TO LOW COOLANT WARNING MODULE (SEE PAGE 62)

(RPO LL4 ONLY)

FROM HEAD LAMP SWITCH (SEE PAGE 61)

FROM IGNITION SWITCH (SEE PAGE 7,11)

FROM PARK BRAKE SWITCH (SEE PAGE 53)

INSTRUMENT PANEL GAGES

BLANK

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 Headlamp Switch at all times. With the Headlamp Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps.

COMPONENT LOCATION

		Page — Figure
Backup Lamp, LH	Body builder installed	—
Backup Lamp, RH	Body builder installed	—
Backup Lamp Switch (Automatic Transmission)	On lower steering column	78 — 15
Backup Lamp Switch (Manual Transmission)	On top of transmission	75 — 8
Fuse Block	Body builder installed	—
Headlamp Switch	Body builder installed	—
License Lamp, LH	Body builder installed	—
License Lamp, RH	Body builder installed	—
Tail, Stop and Directional Lamp, LH	Body builder installed	—
Tail, Stop and Directional Lamp, RH	Body builder installed	—
C100	At bulkhead, LH front of cowl	78 — 16
C146	At backup lamp switch	75 — 8
C209	Body builder installed	—
C214 (Automatic Transmission)	On lower steering column	78 — 15
C214 (Manual Transmission)	On lower steering column	78 — 15
C402	On rear, LH frame rail	79 — 17
C404	At LH tail, stop and directional lamp	—
C405	At LH backup lamp	—
C406	At RH backup lamp	—
C407	Body builder installed	—
S400	Body builder installed harness	—
S401	Body builder installed harness	—

PRELIMINARY CHECKS:

The rear lamp systems (tail lamps, backup lamps, and license plate lamps) 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.

TROUBLESHOOTING CHART—REAR EXTERIOR LAMPS

NONE OF THE REAR LAMP SYSTEMS OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at headlamp switch connector C209 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of fuse (TAIL LPS). If fuse is good, LOCATE and REPAIR open in RED (2) wire from headlamp switch to junction block and/or ORN (40) wire from headlamp switch to fuse block.
2. Place headlamp switch to PARK position. Connect test lamp from BRN (9) wire at headlamp switch connector C209 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect test lamp from BRN (9) wire at rear lamp 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 lamps to headlamp switch.

BACKUP LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place transmission in reverse. Connect test lamp from LT GRN (24) wire at backup lamp connector(s) C405 and C406 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. CHECK condition of bulb socket(s).	Bulb socket(s) in good condition.	REPLACE bulb(s).
	Bulb socket(s) in poor condition.	REPLACE socket.
3. Connect test lamp from DK BLU (75) wire at backup lamp switch connector C214 (automatic) or C146 (manual) to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	CHECK condition of fuse (TURN/BU). If fuse is good, LOCATE and REPAIR open in DK BLU (75) wire from backup lamp switch to fuse block and DK BLU (38) wire.
4. Connect test lamp from LT GRN (24) wire at backup lamp switch connector C214 (automatic) or C146 (manual) to ground.	Test lamp lights.	LOCATE and REPAIR open in LT GRN (24) wire from backup lamp switch to backup lamps.
	Test lamp does not light.	Adjust backup lamp switch. If backup lamp switch will not adjust properly, REPLACE backup lamp switch.

TRANSMISSION BACKUP LAMP SWITCH

(AUTOMATIC TRANSMISSION ONLY)

75 24

2973407

C214

MANUAL TRANSMISSION ONLY

2973407 C214 8917095

75-.8 DK BLU

24-1.0 LT GRN

24-.8 LT GRN

75-.8 DK BLU

HOT AT ALL TIMES

TAIL LPS 20 AMP

TURN-B/U 15 AMP

TAIL LPS 20 AMP

STP-HAZ 15 AMP

STP HAZ 15 AMP

FRONT

TURN B/U 15 AMP

FUSE BLOCK

REAR

38-.8 DK BLU

75-.8 DK BLU

HOT IN START OR RUN

REAR BODY CONNECTOR

12020099

C100

MANUAL ONLY

24-2.0 LT GRN

24-1.0 LT GRN

6288566 6288565

C402

24-.8 LT GRN

PROVISIONS FOR BACK-UP LP

RH BACKUP LAMP

C406

2977107

.8 BLK

COWL

I/P

12020184

24-.8 LT GRN

75-.8 DK BLU

BACKUP LAMP SWITCH

4-SPEED MANUAL TRANSMISSION ONLY

NEUT/FWD

24

75

12015792

C146

.24-.8 LT GRN

75-.8 DK BLU

COWL

8911781

GROMMET 102

24-.8 LT GRN

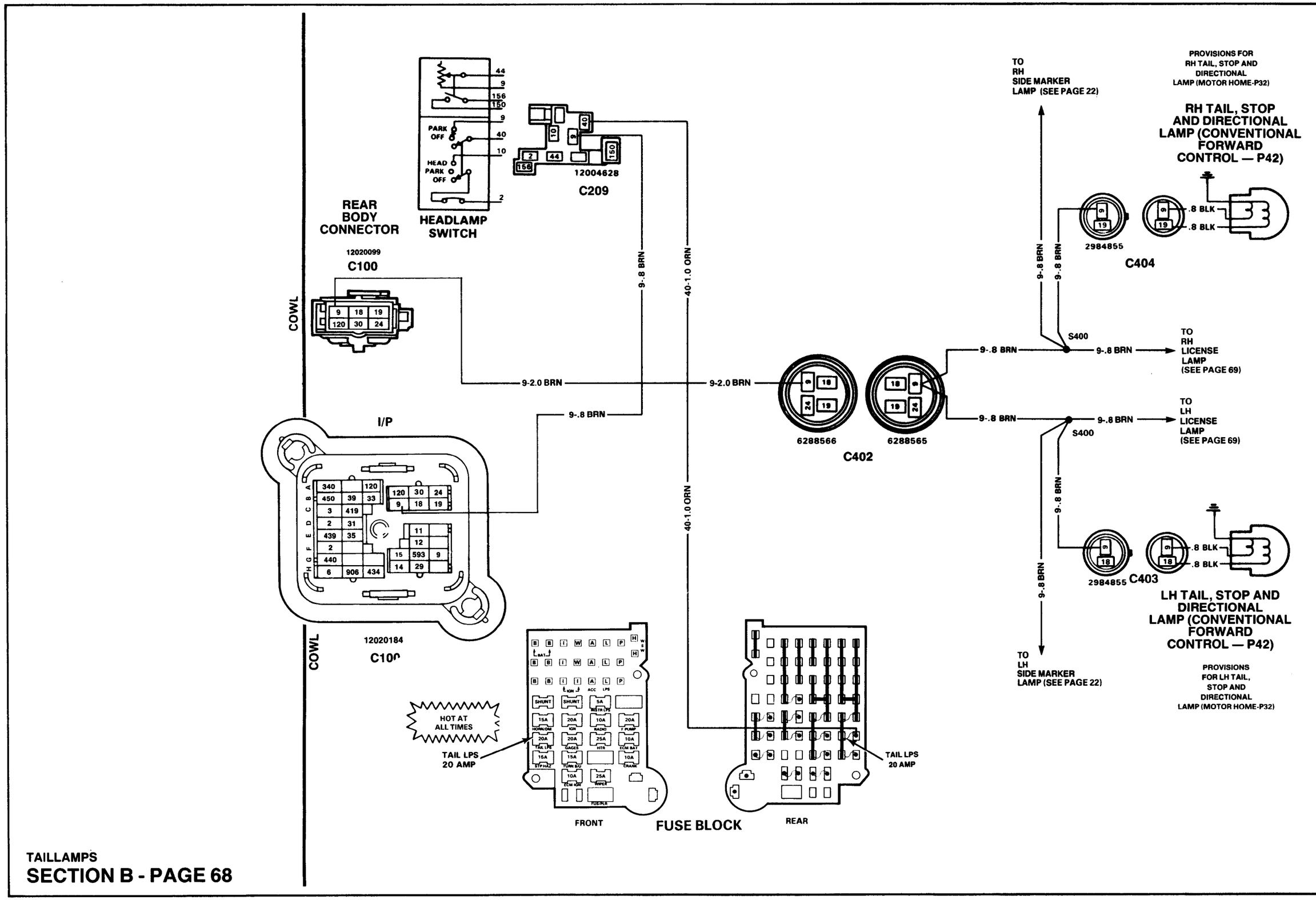
.8 BLK

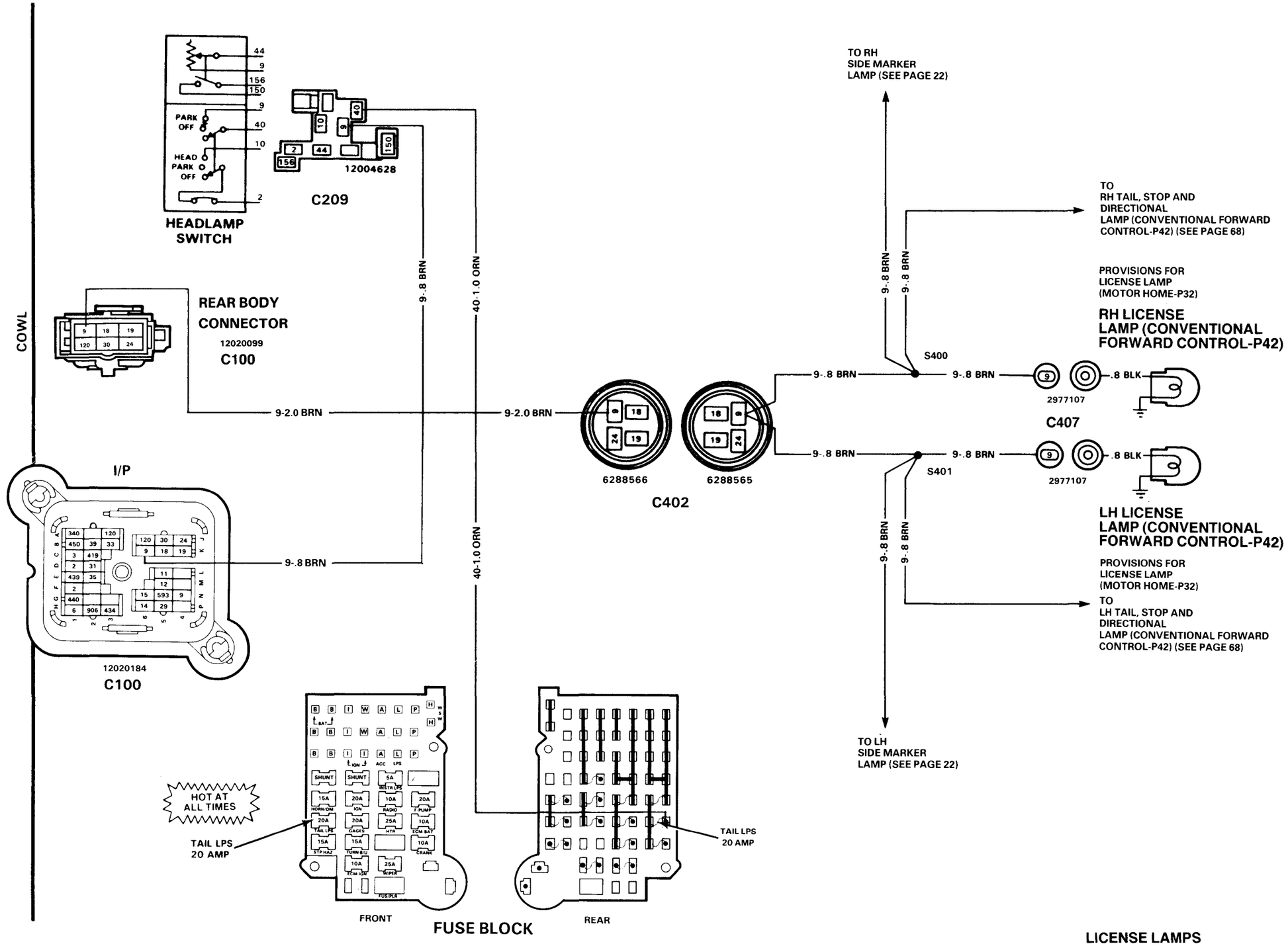
2977107

C405

PROVISIONS FOR BACKUP LAMP

LH BACKUP LAMP


HEADLAMP SWITCH
PARK OFF
HEAD PARK OFF
REAR BODY CONNECTOR
12020099
C100
COWL
I/P
12020184
C100
C209
12004628
9-.8 BRN
40-1.0 ORN
9-2.0 BRN
C402
6288566
6288565
TO RH SIDE MARKER LAMP (SEE PAGE 22)
PROVISIONS FOR RH TAIL, STOP AND DIRECTIONAL LAMP (MOTOR HOME-P32)
RH TAIL, STOP AND DIRECTIONAL LAMP (CONVENTIONAL FORWARD CONTROL — P42)
C404
2984855
.8 BLK
S400
TO RH LICENSE LAMP (SEE PAGE 69)
TO LH LICENSE LAMP (SEE PAGE 69)
C403
TO LH SIDE MARKER LAMP (SEE PAGE 22)
LH TAIL, STOP AND DIRECTIONAL LAMP (CONVENTIONAL FORWARD CONTROL — P42)
PROVISIONS FOR LH TAIL, STOP AND DIRECTIONAL LAMP (MOTOR HOME-P32)
HOT AT ALL TIMES
TAIL LPS 20 AMP
FRONT
FUSE BLOCK
REAR


COWL
HEADLAMP SWITCH
PARK OFF
HEAD PARK OFF
44
9
156
150
9
40
10
2
C209
12004628
REAR BODY CONNECTOR
12020099
C100
9-2.0 BRN
9-.8 BRN
40-1.0 ORN
I/P
12020184
C100
6288566
6288565
C402
TO RH SIDE MARKER LAMP (SEE PAGE 22)
TO RH TAIL, STOP AND DIRECTIONAL LAMP (CONVENTIONAL FORWARD CONTROL-P42) (SEE PAGE 68)
PROVISIONS FOR LICENSE LAMP (MOTOR HOME-P32)
RH LICENSE LAMP (CONVENTIONAL FORWARD CONTROL-P42)
S400
S401
.8 BLK
2977107
C407
LH LICENSE LAMP (CONVENTIONAL FORWARD CONTROL-P42)
PROVISIONS FOR LICENSE LAMP (MOTOR HOME-P32)
TO LH TAIL, STOP AND DIRECTIONAL LAMP (CONVENTIONAL FORWARD CONTROL-P42) (SEE PAGE 68)
TO LH SIDE MARKER LAMP (SEE PAGE 22)
HOT AT ALL TIMES
TAIL LPS 20 AMP
TAIL LPS 20 AMP
FRONT
REAR
FUSE BLOCK

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 power that operates 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 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.

FRONT MANUAL AIR CONDITIONING (RPO C60)
VACUUM SYSTEM

The front manual air conditioning system (RPO C60) is available in 1990 P-Truck forward control chassis models with the 5.7L V8 gasoline engine, VIN K (RPO L05). This air conditioning system uses vacuum to operate the air valves ("doors") that control airflow through the air conditioning module and the heater core hot water bypass valve that controls the flow of coolant through the heater core of the air conditioning system.

Installation of the air conditioning control assembly, air conditioning module and many other components of the air conditioning system is the responsibility of the second unit body installer. Refer to the body builder/installer service literature for more information.

TRANSMISSION VACUUM MODULATOR VACUUM SYSTEM

Shift points and oil pressure of the MX1 three-speed automatic transmission are controlled by a vacuum modulator that responds to engine vacuum as an indicator of engine operation and performance demands. The vacuum modulator controls modulator oil pressure within the transmission to hold the 1-2 and 2-3 shift valves closed until governor oil pressure increases with an increase in engine speed or torque and forces an upshift. A part-throttle 3-2 downshift is forced when the accelerator pedal is depressed enough to overcome the force of governor oil while operating in third gear.

With gasoline engines, vacuum is taken from the inlet manifold and routed directly to the transmission vacuum modulator. In the diesel engine, vacuum is supplied by the engine-driven vacuum pump and modified by the vacuum regulator valve on the injection distributor pump before reaching the transmission vacuum modulator.

EXHAUST GAS RECIRCULATION VACUUM SYSTEM

All 1990 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 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 (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.

COMPONENT LOCATION (RPO LB4, L05, L19)

		Page — Figure
Inlet Manifold Vacuum Fitting:		
RPO LB4 4.3L (262 Cu. In.) V6	In top of inlet manifold, RH front of engine	—
RPO L05 5.7L (350 Cu. In.) and RPO L19 7.4L (454 Cu. In.) V8s	In top of inlet manifold, RH rear of engine	—
Engine Vacuum Pump:		
RPO LL4 Diesel Engine	Lower RH front of engine	—
Vacuum Regulator Valve:		
RPO LL4 Diesel Engine	On injection distributor pump, top center of engine	—
Transmission Vacuum Modulator (MX1 three-speed automatic transmission	RH side of transmission case, just above oil pan flange	—
Exhaust Gas Recirculation (EGR) Valve:		
RPO LB4 4.3L (262 Cu. In.) V6	Rear of inlet manifold riser	77 — 13
Electronic Vacuum Regulator Valve (EVRV) and Solenoid (V8 gasoline engines)	On bracket, inboard side of RH cylinder head	76 — 9
EGR Valve Solenoid (V6 engine)	On bracket, inboard side of RH cylinder head	76 — 11
Manifold Absolute Pressure (MAP) Sensor (gasoline engines)	On bracket, inboard side of RH cylinder head	77 — 13
MAP Sensor Hose Vacuum Source:		
RPO LB4 4.3L (262 Cu. In.) V6	Port "F", RH rear of throttle body	77 — 13
RPO L05 5.7L (350 Cu. In.) and RPO L19 7.4L (454 Cu. In.) V8s	Port "S," LH front of throttle body	76 — 9

TROUBLESHOOTING

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.

FRONT MANUAL AIR CONDITIONING VACUUM SYSTEM

For diagnosis of the air conditioning vacuum system, refer first to service literature and instructions released by the body builder/installer. If the information is not adequate, refer to the diagnosis instructions for the air conditioning vacuum system in Section C — P-Cab Chassis. Although some details may differ, the information given there should serve as a guide to troubleshooting the P-Truck forward control chassis model air conditioning vacuum system.

TRANSMISSION VACUUM MODULATOR VACUUM SYSTEM

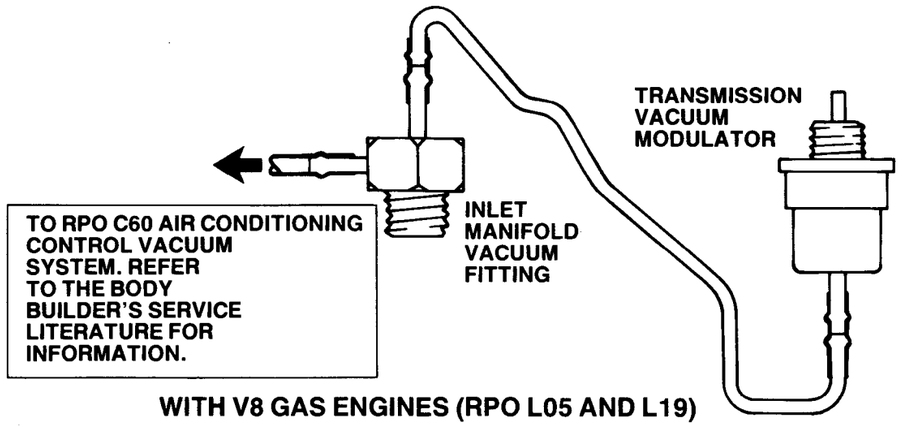
A leak in the vacuum system for the transmission vacuum modulator of the three-speed automatic transmission can cause high line pressure in the transmission hydraulic control system, a condition that can result in a variety of upshift problems ranging from delayed upshifts to no 1-2 or 2-3 shifts. An improper engine speed signal from the vacuum regulator valve in the vacuum system of the diesel engine can result in early, soft or slipping shifts or no part-throttle downshifts as well as the symptoms mentioned in the previous sentence.

The conditions described here may be caused by a vacuum system problem. However, mechanical or hydraulic conditions also might cause the same problems. Therefore, it is advisable to follow diagnosis procedures that check out all possibilities in a systematic order, not just a check for a malfunctioning vacuum component. For effective diagnosis procedures, refer to the 1990 R/V, G and P Truck Service Manual, Section 7A2.

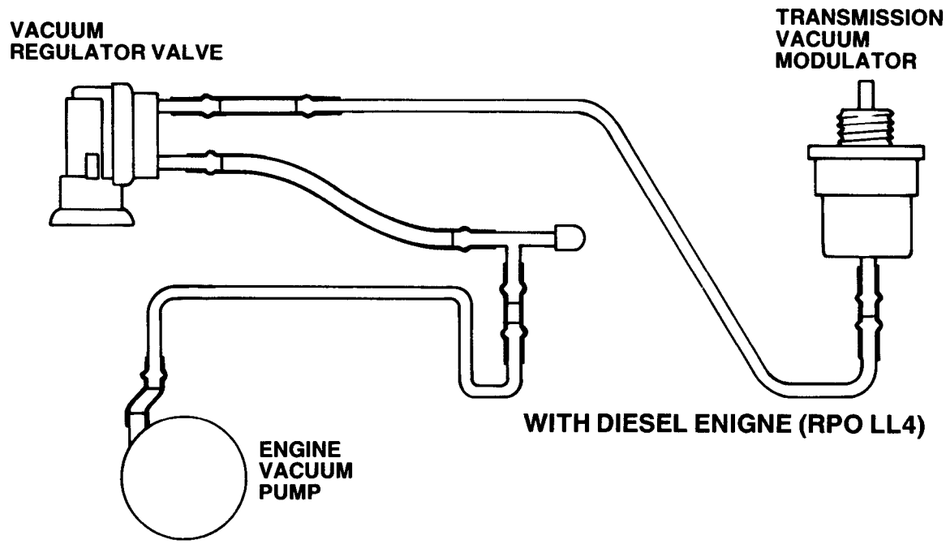
EGR VALVE VACUUM SYSTEM

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 1990 "Fuel and Emissions Service Manual."



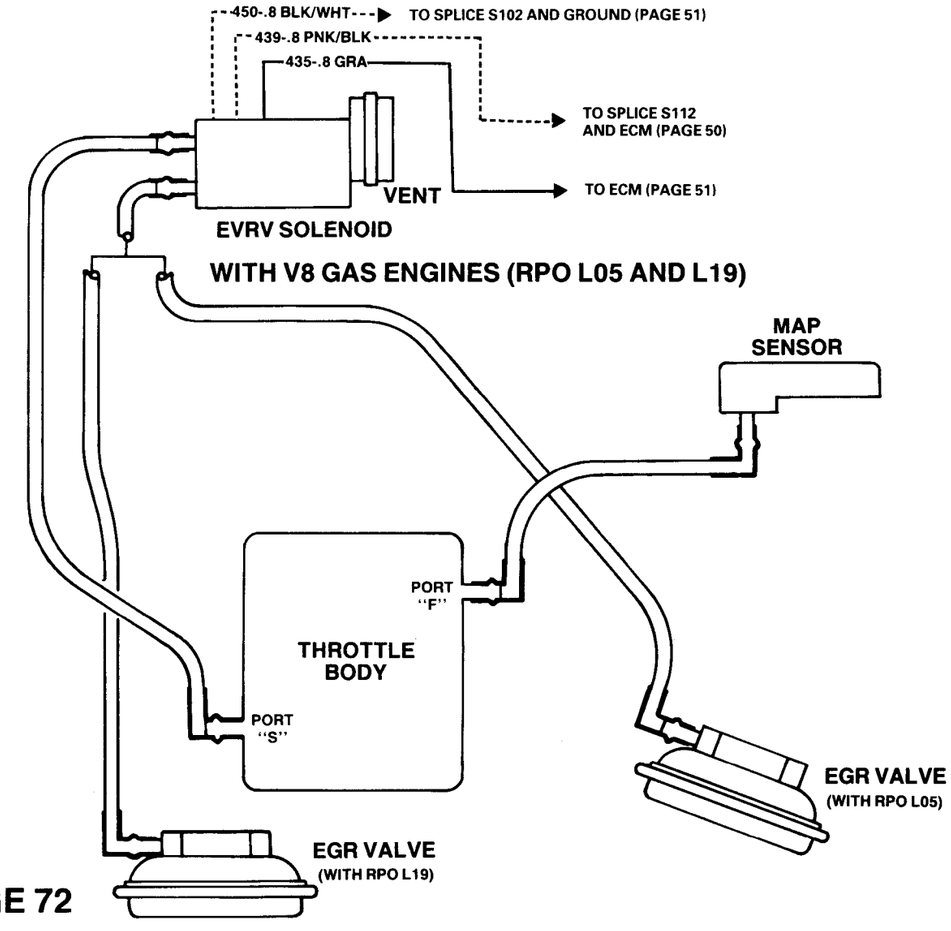
WITH V8 GAS ENGINES (RPO L05 AND L19)



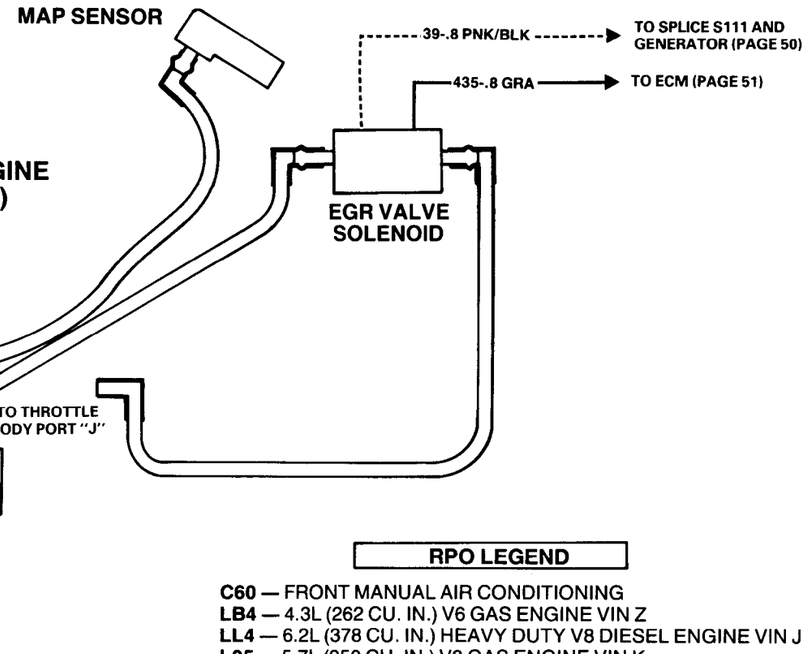
WITH DIESEL ENIGNE (RPO LL4)

AIR CONDITIONING (RPO C60) AND AUTOMATIC TRANSMISSION (RPO MX1) VACUUM SYSTEMS

EXHAUST GAS RECIRCULATION (EGR) VACUUM SYSTEMS



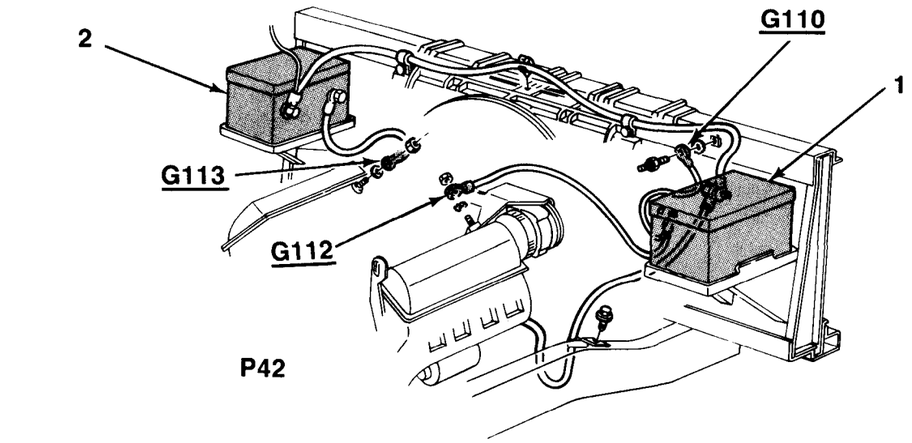
WITH V8 GAS ENGINES (RPO L05 AND L19)



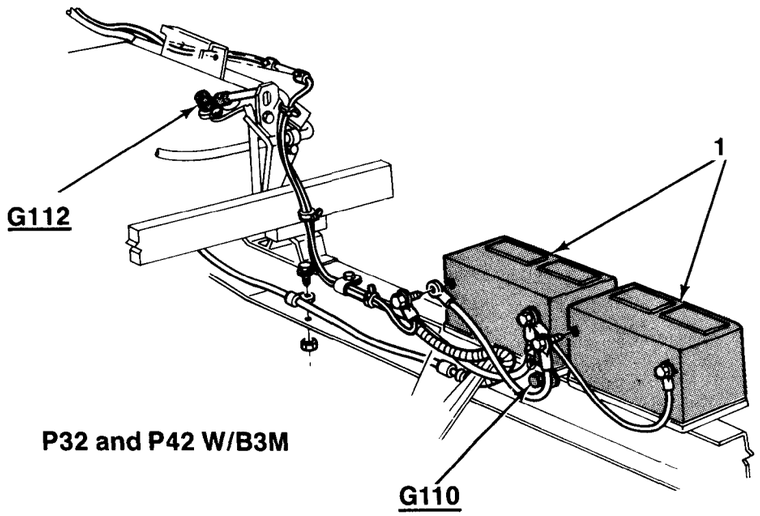
WITH V6 ENGINE (RPO LB4)

RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
LB4 — 4.3L (262 CU. IN.) V6 GAS ENGINE VIN Z
LL4 — 6.2L (378 CU. IN.) HEAVY DUTY V8 DIESEL ENGINE VIN J
L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
MX1 — 3-SPEED AUTOMATIC TRANSMISSION

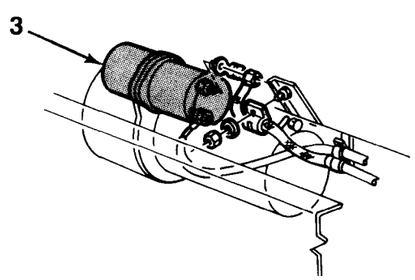


P42



P32 and P42 W/B3M

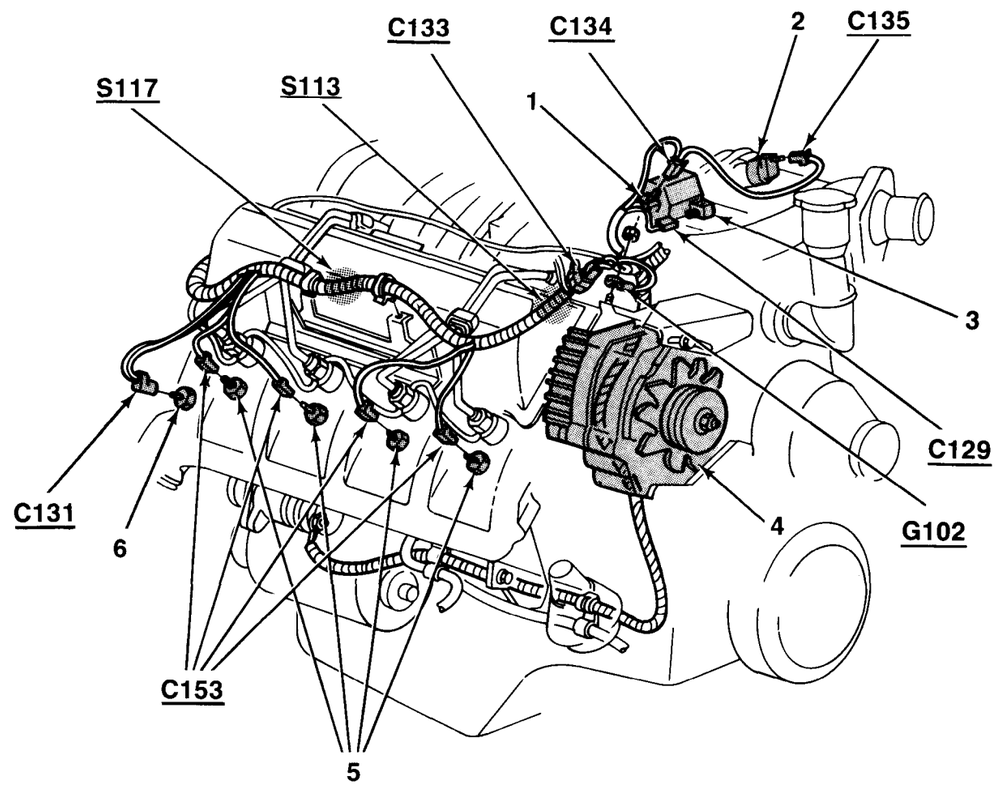
1. RH Batteries
2. LH Battery
3. Starter Motor Solenoid



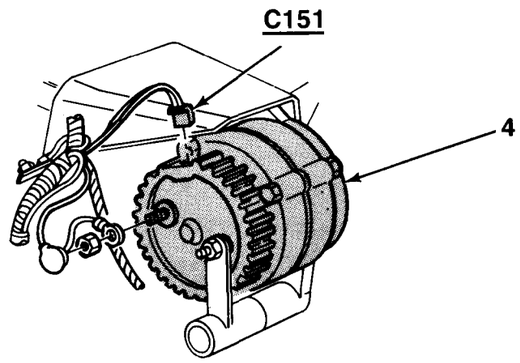
VIEW A

LC-0001-P-E-RP

Figure 1 - Batteries and Cables (RPO LL4)



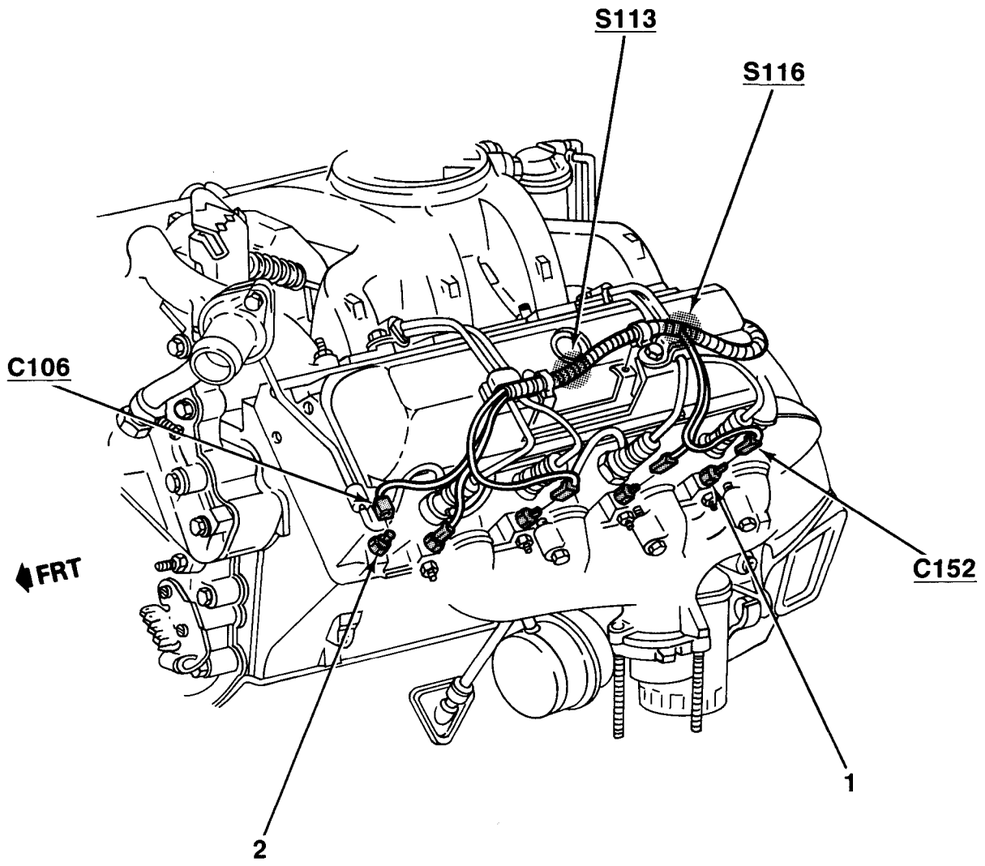
1. Cold Advance Control
2. Fast Idle Solenoid
3. Fuel Shut-Off Valve
4. Generator
5. Glow Plug (RH)
6. Cold Advance and Fast Idle Temperature Switch



VIEW A

LC-0002-P-E-RP

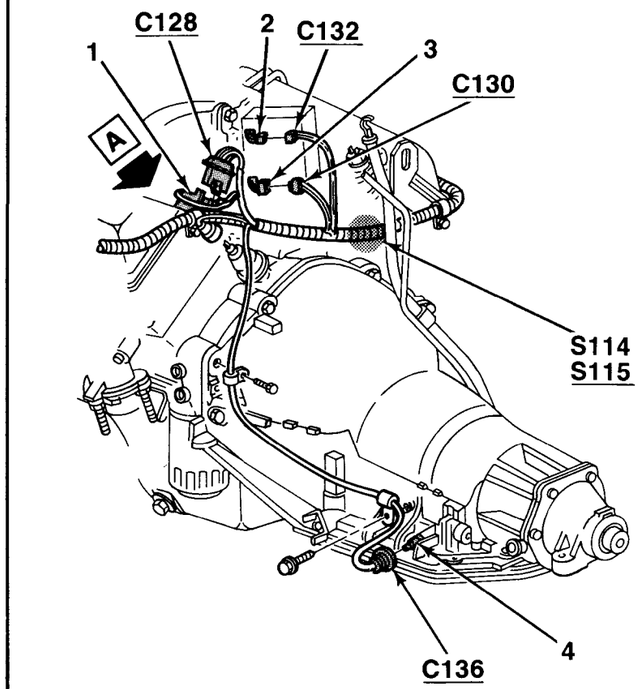
Figure 2 - Engine Wiring Harness — Right Side (RPO LL4)

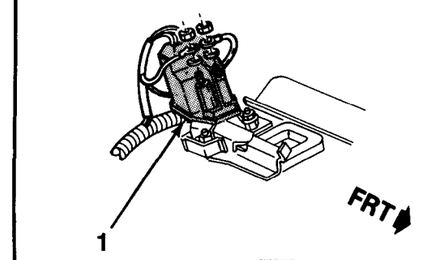


1. Glow Plug (LH)
2. Coolant Temperature Sender

LC-0003-P-E-RP

Figure 3 - Engine Wiring Harness — Left Side (RPO LL4)

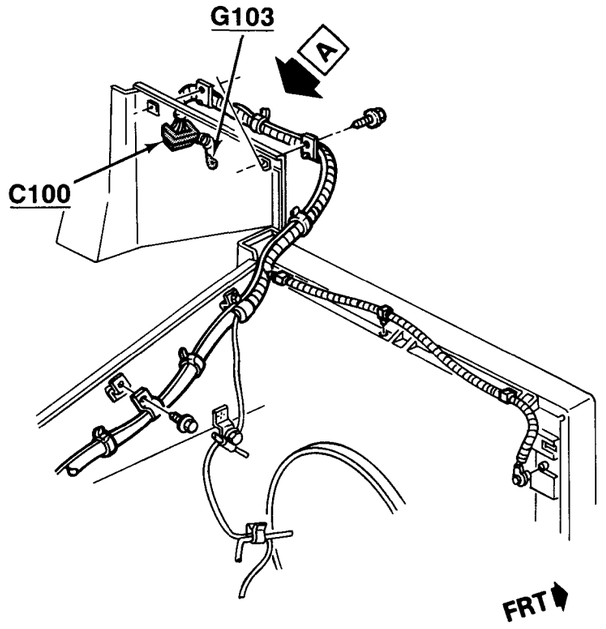


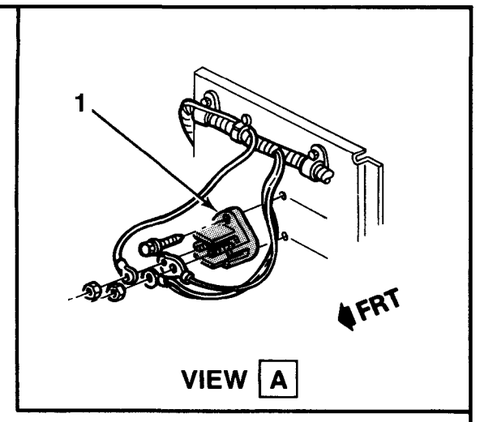


1. Glow Plug Controller
2. Fuel Heater
3. Water in Fuel Sensor
4. Transmission Kickdown Solenoid

LC-0004-P-E-RP

Figure 4 - Engine Wiring Harness — Rear (RPO LL4)

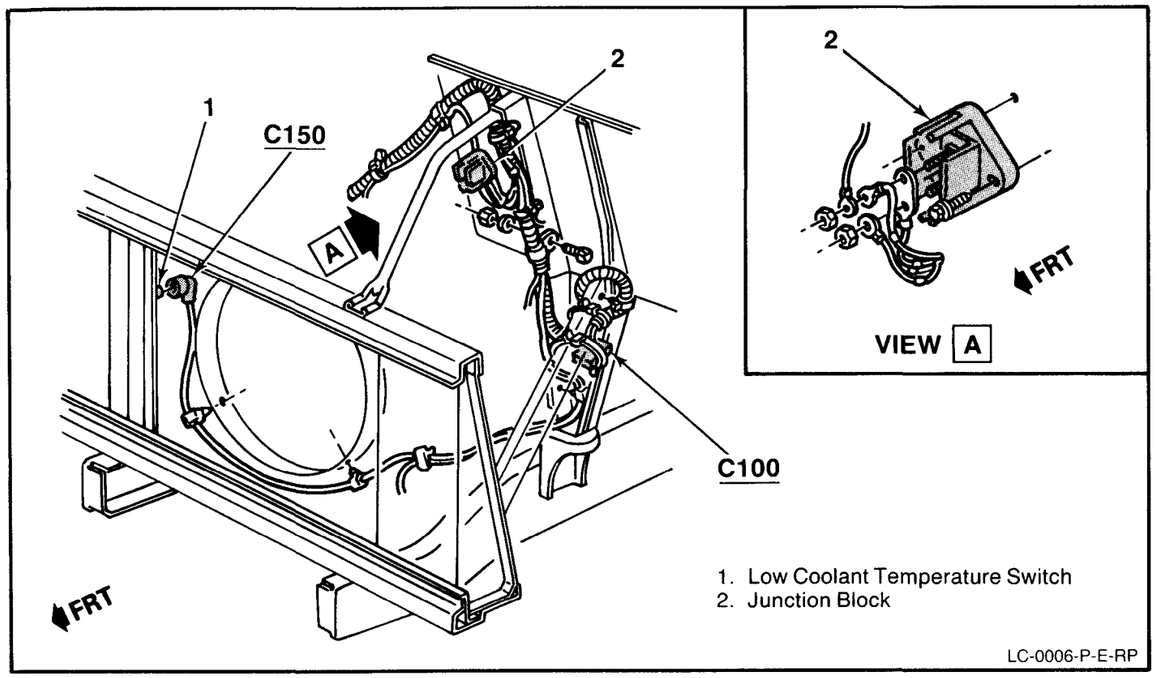




1. Junction Block

LC-0005-P-E-RP

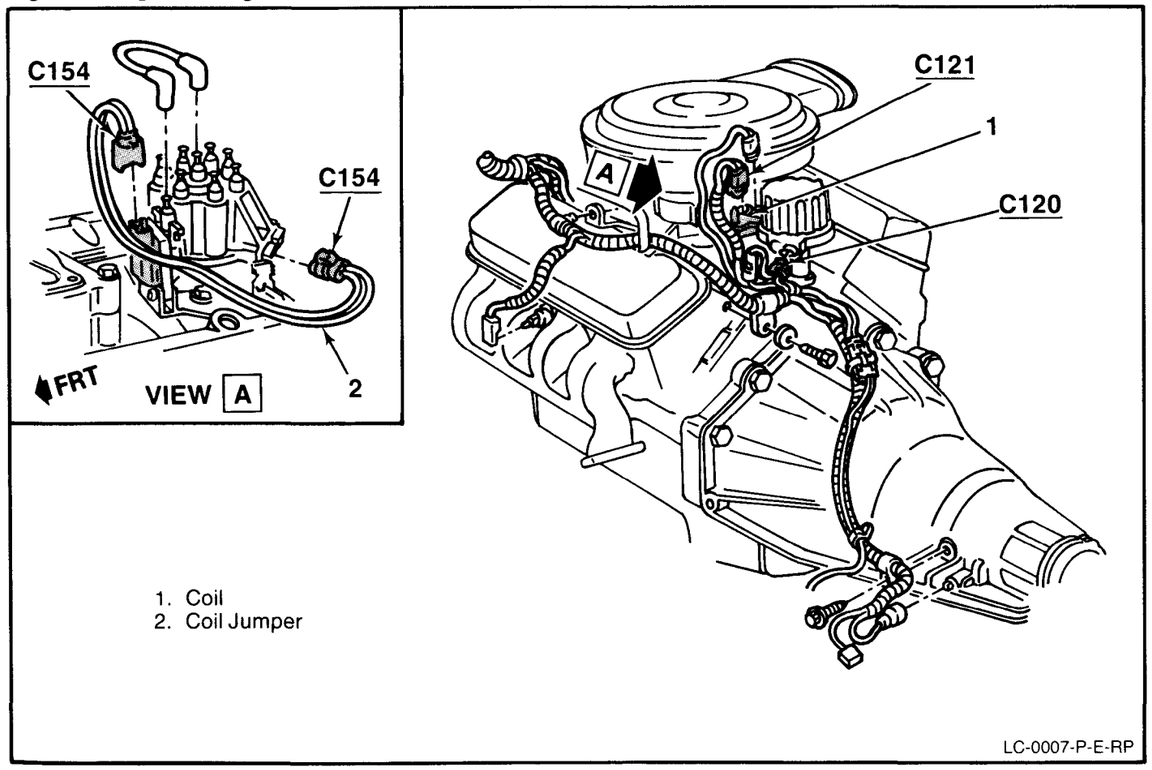
Figure 5 - Engine Wiring Harness to Cowl/Radiator (RPO LL4 w/P32)



1. Low Coolant Temperature Switch
2. Junction Block

LC-0006-P-E-RP

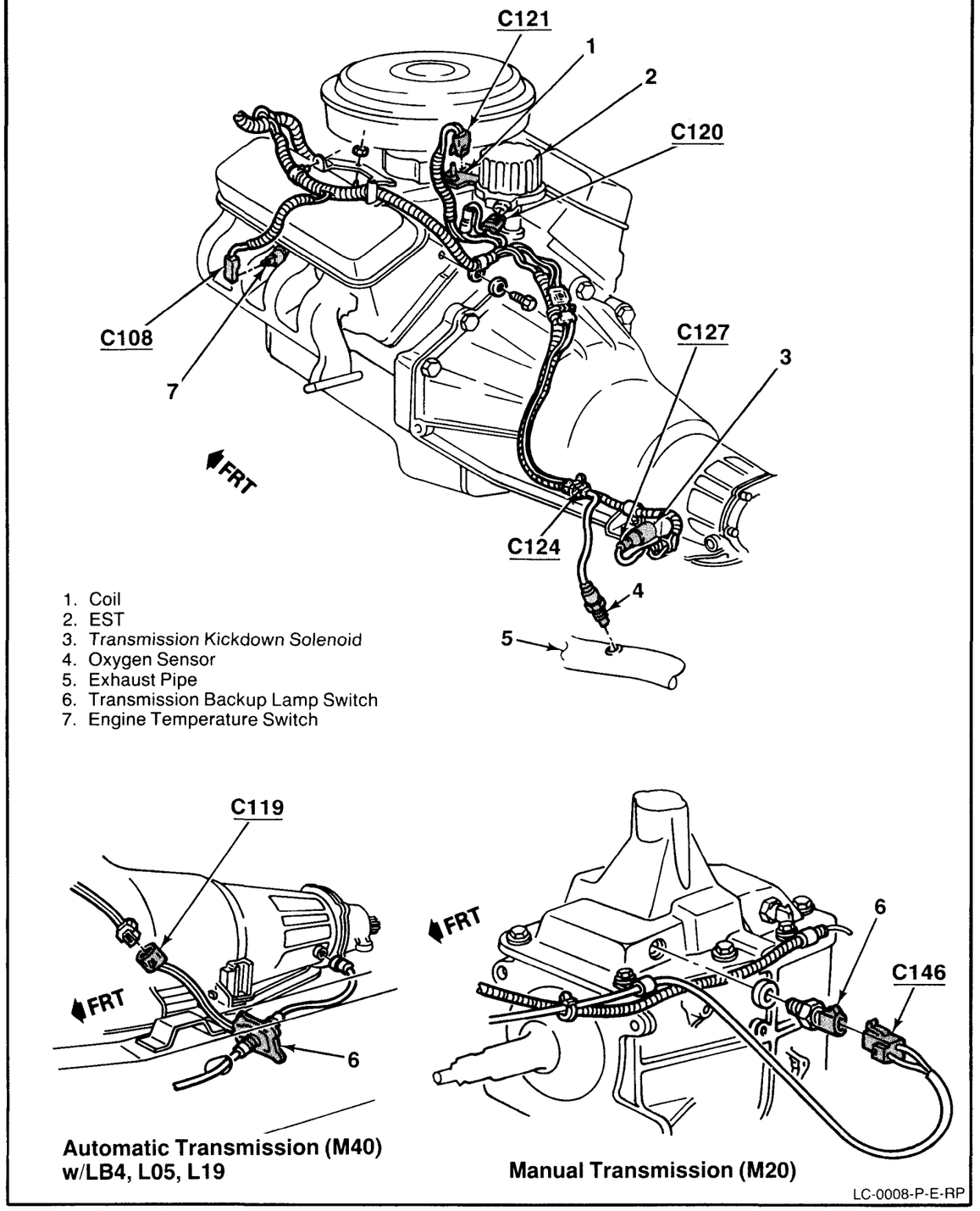
Figure 6 - Engine Wiring Harness to Cowl/Radiator (RPO LL4 w/P42)



1. Coil
2. Coil Jumper

LC-0007-P-E-RP

Figure 7 - Engine Wiring Harness, LH Side (RPO L19 w/P32)



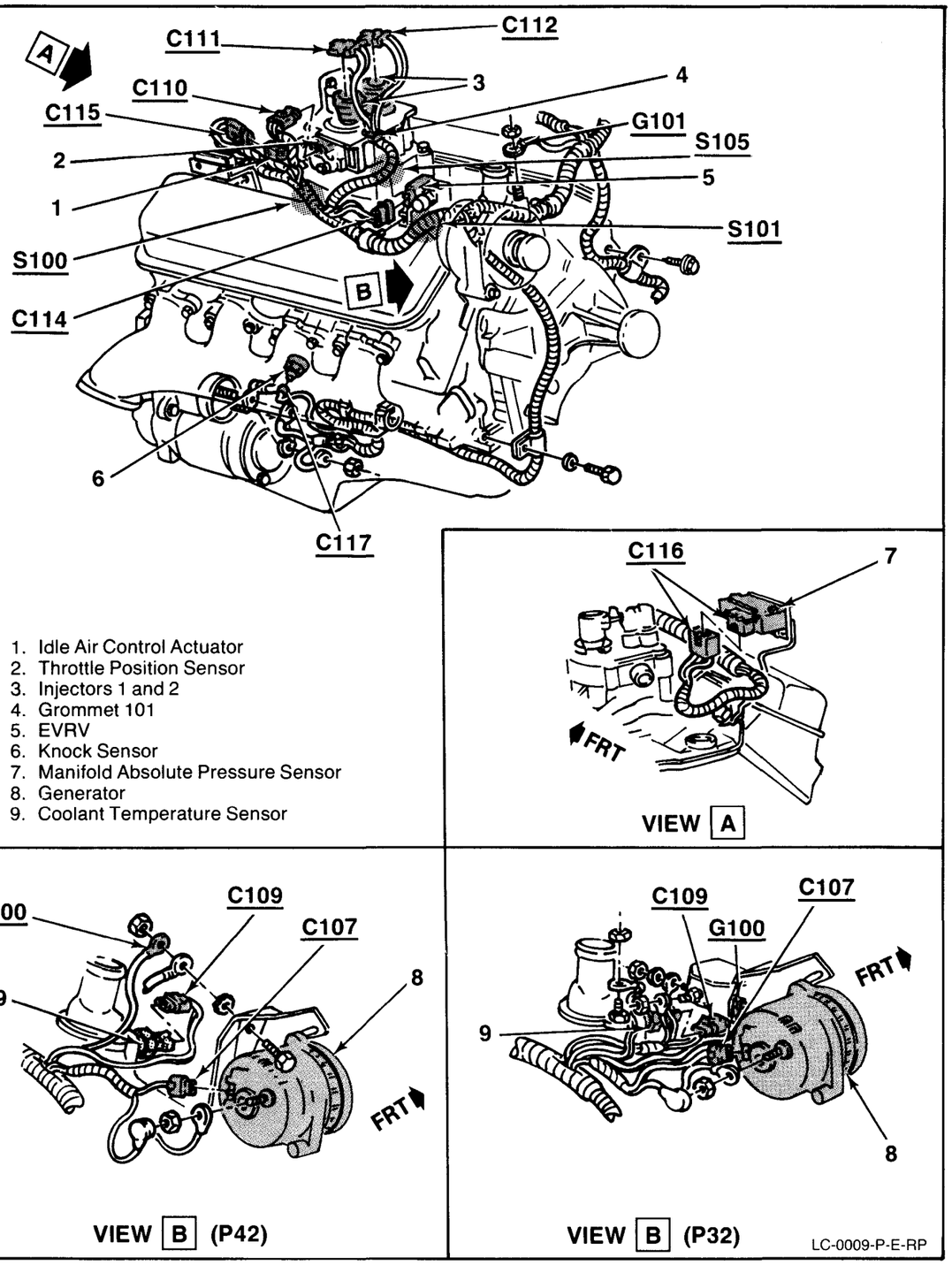
1. Coil
2. EST
3. *Transmission Kickdown Solenoid*
4. Oxygen Sensor
5. Exhaust Pipe
6. Transmission Backup Lamp Switch
7. Engine Temperature Switch

Automatic Transmission (M40) w/LB4, L05, L19

Manual Transmission (M20)

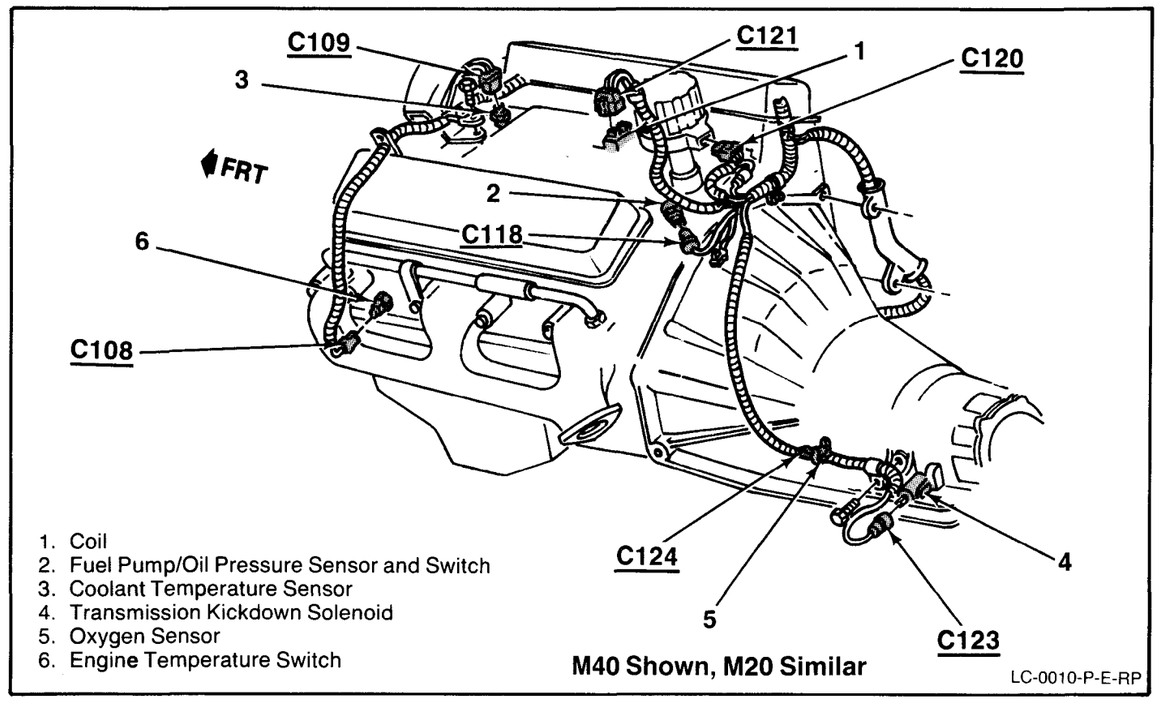
LC-0008-P-E-RP

Figure 8 - Engine Wiring Harness, LH Side (RPO L19 w/P42)



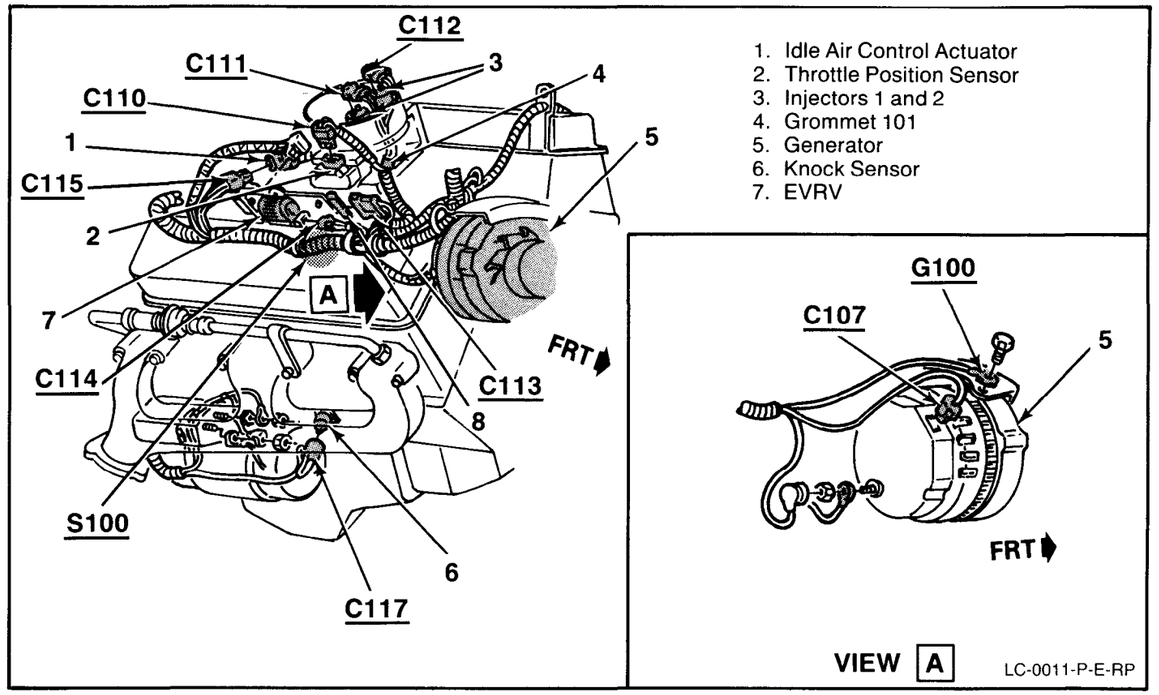
1. Idle Air Control Actuator
2. Throttle Position Sensor
3. Injectors 1 and 2
4. Grommet 101
5. EVRV
6. Knock Sensor
7. Manifold Absolute Pressure Sensor
8. Generator
9. Coolant Temperature Sensor

Figure 9 - Engine Wiring Harness, RH Side (RPO L19 w/P32, P42)



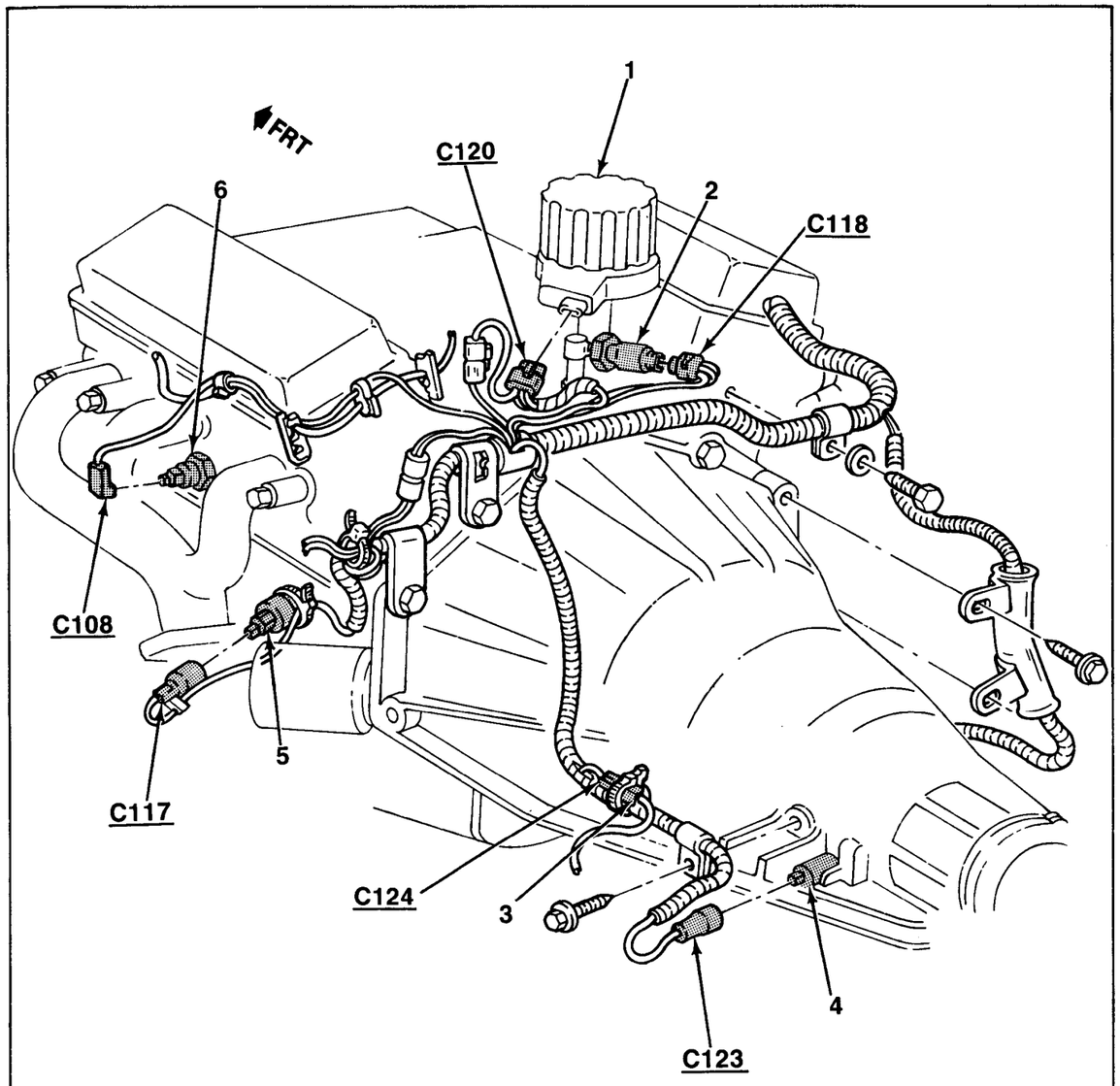
1. Coil
2. Fuel Pump/Oil Pressure Sensor and Switch
3. Coolant Temperature Sensor
4. Transmission Kickdown Solenoid
5. Oxygen Sensor
6. Engine Temperature Switch

Figure 10 - Engine Wiring Harness, LH Side (RPO L05 w/P42)



1. Idle Air Control Actuator
2. Throttle Position Sensor
3. Injectors 1 and 2
4. Grommet 101
5. Generator
6. Knock Sensor
7. EVRV

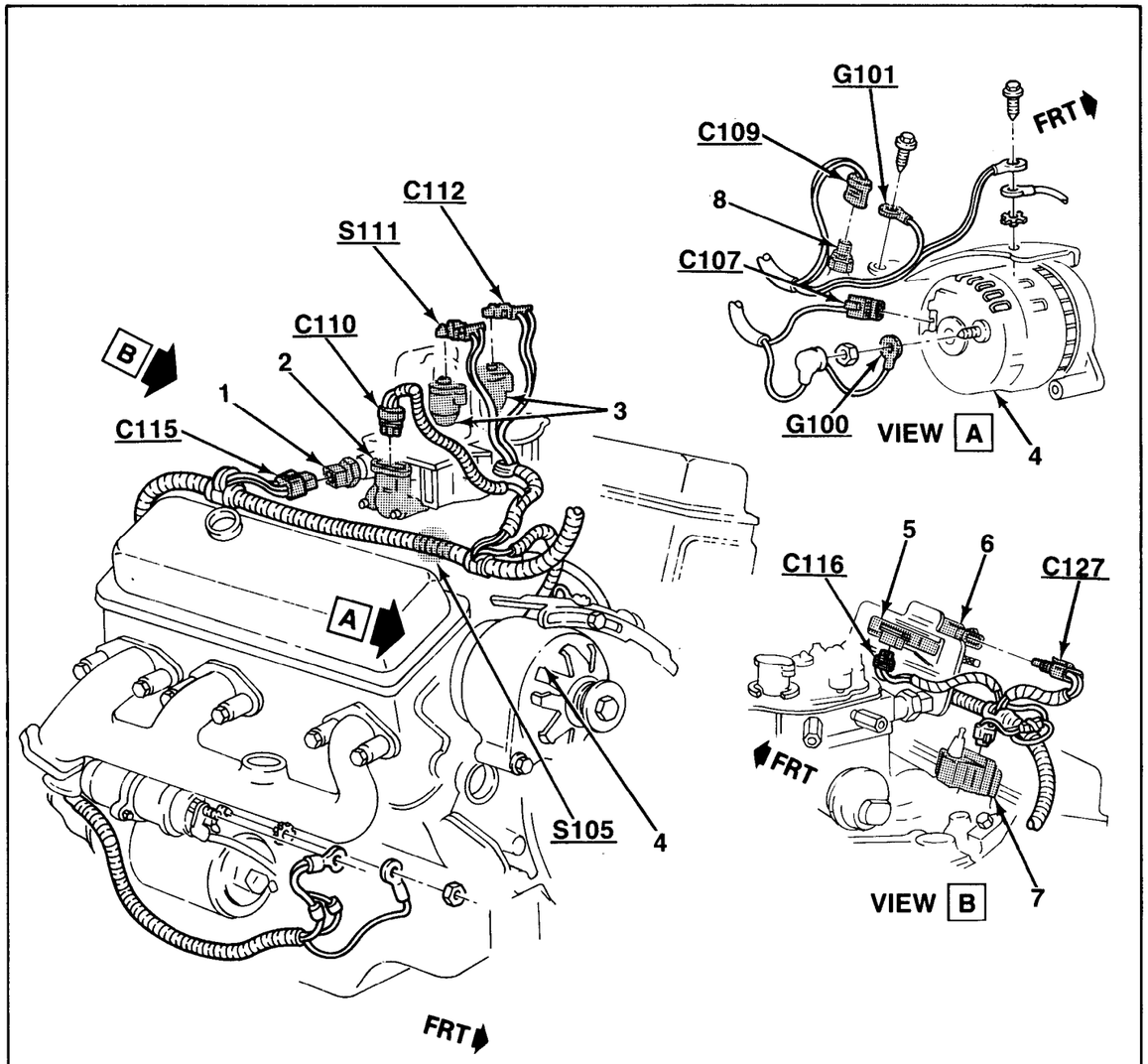
Figure 11 - Engine Wiring Harness, RH Side (RPO L05 w/P42)



1. Distributor
2. Fuel Pump/Oil Pressure Sensor Switch
3. Oxygen Sensor
4. Transmission Kickdown Solenoid
5. Knock Sensor
6. Temperature Switch

LC-0012-P-E-RP

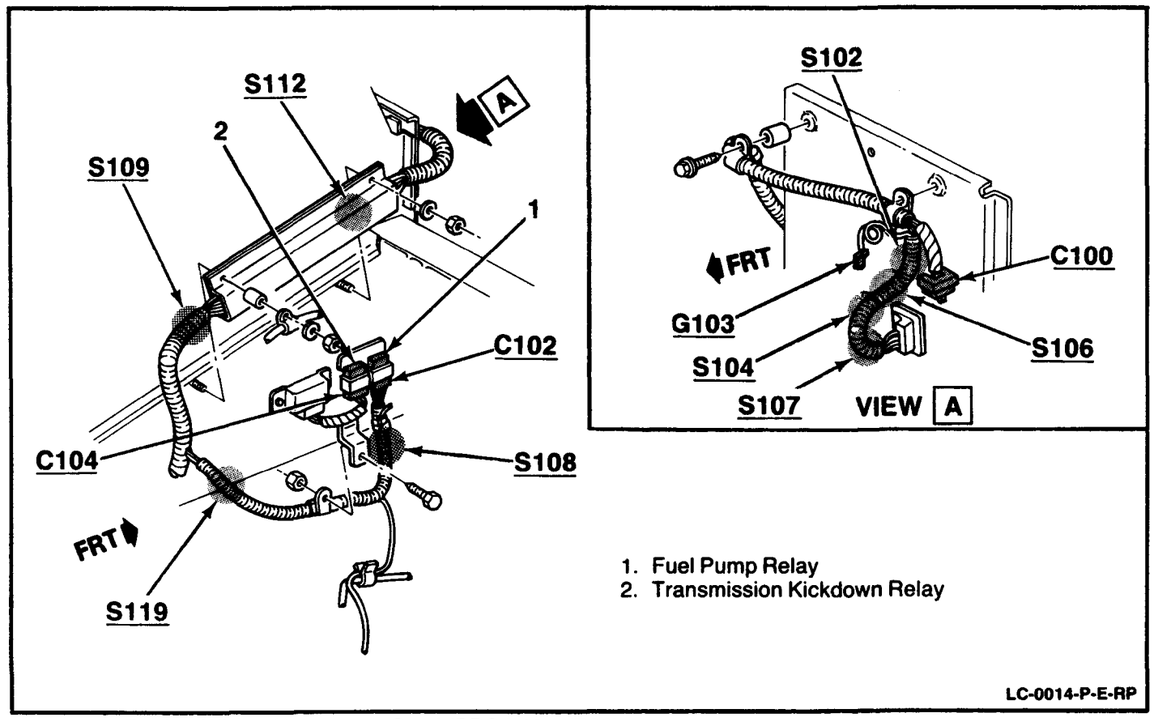
Figure 12 - Engine Wiring Harness, LH Side (RPO LB4 w/P42)



1. Idle Air Control Actuator
2. Throttle Position Sensor
3. Injectors 1 and 2
4. Generator
5. Manifold Absolute Pressure Sensor
6. EGR Solenoid
7. Coil
8. Coolant Temperature Sensor

LC-0013-P-E-RP

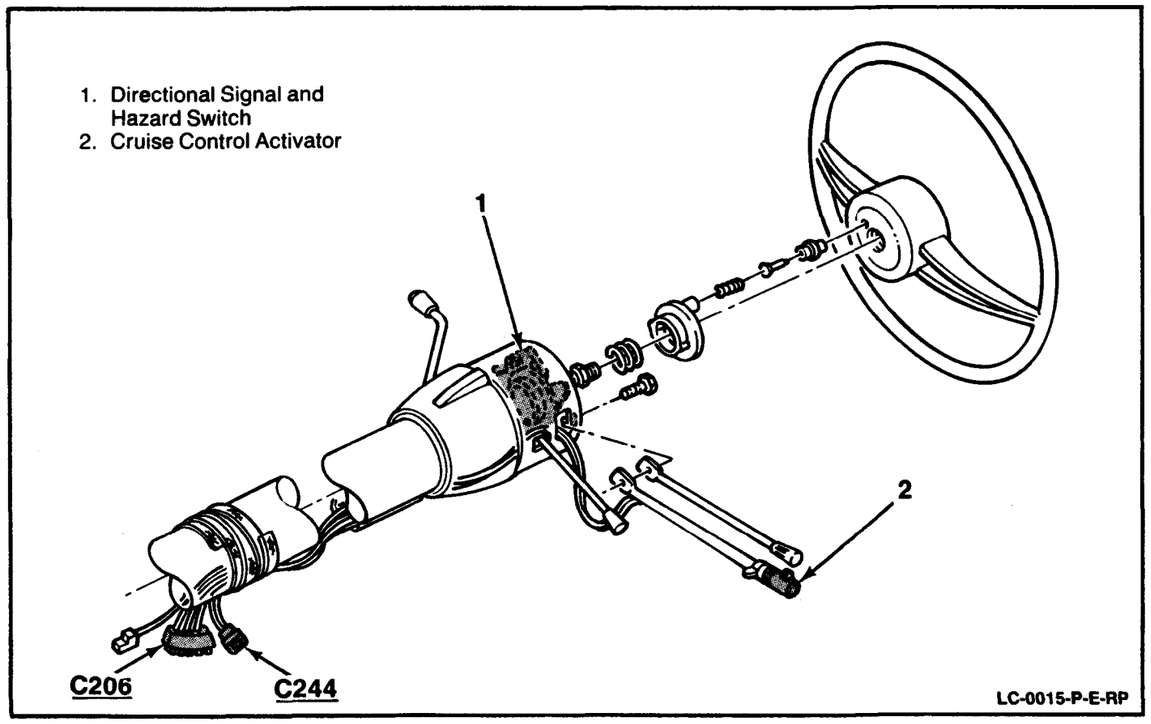
Figure 13 - Engine Wiring Harness, RH Side (RPO LB4 w/P42)



1. Fuel Pump Relay
2. Transmission Kickdown Relay

LC-0014-P-E-RP

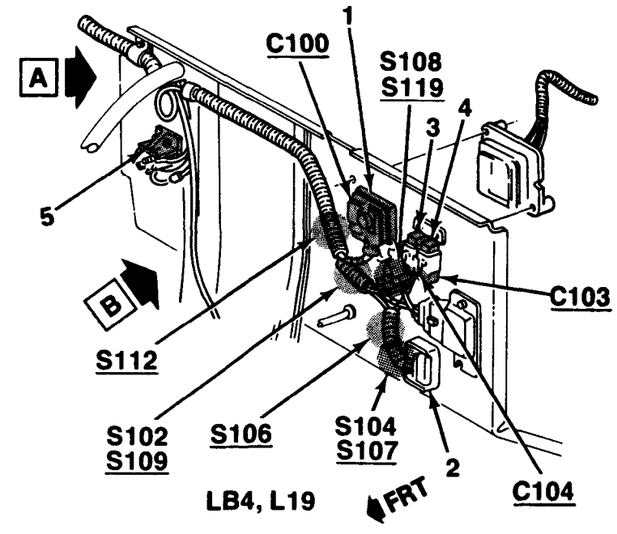
Figure 14 - Engine Wiring Harness to Cowl (RPO L19 w/P32)

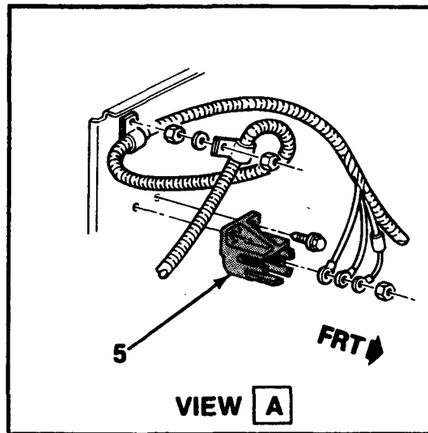


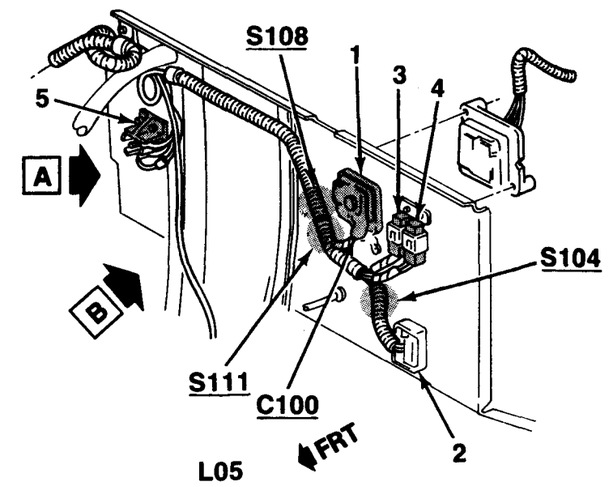
1. Directional Signal and Hazard Switch
2. Cruise Control Activator

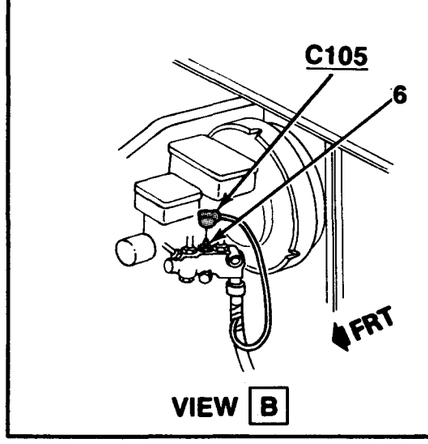
LC-0015-P-E-RP

Figure 15 - Steering Column Switches





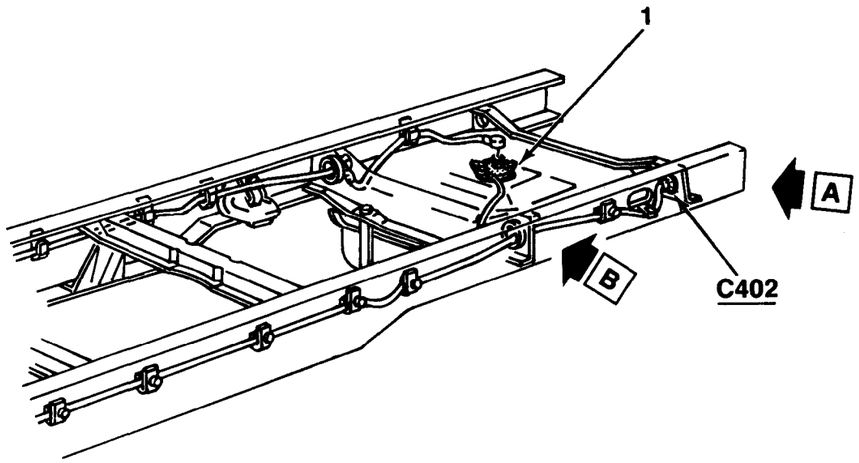




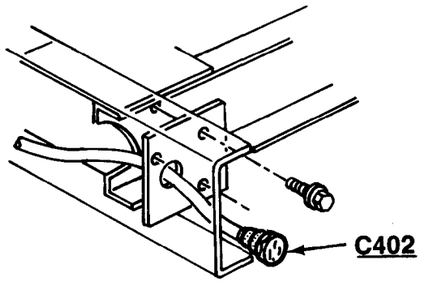
1. Bulkhead Connector
2. Grommet 100
3. Kickdown Relay
4. Fuel Pump Relay
5. Junction Block
6. Brake Pressure Warning Switch

LC-0016-P-E-RP

Figure 16 - Engine Wiring Harness to Cowl (RPO LB4, L05, L19 w/P42)

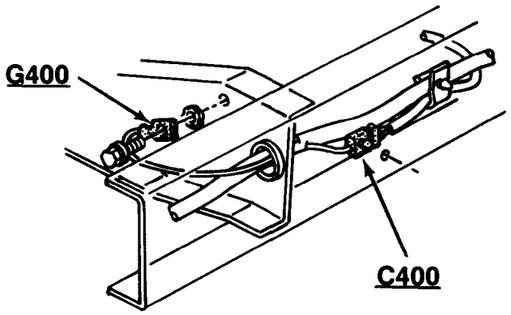


1. Fuel Sender Assembly



VIEW A

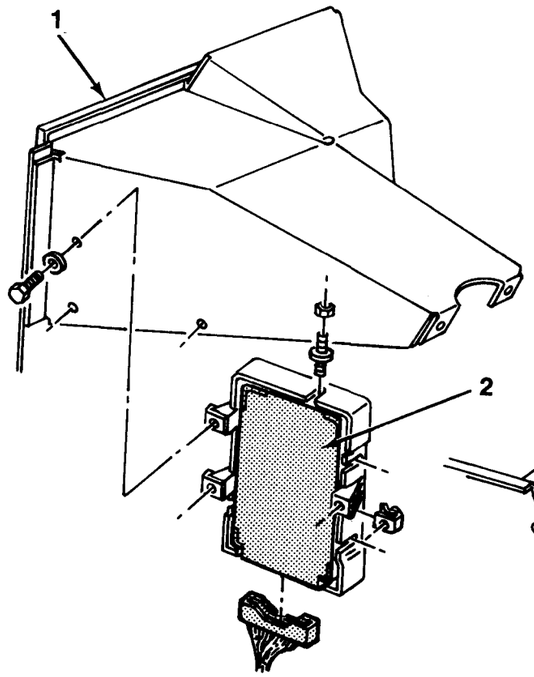
LB4, L05, L19



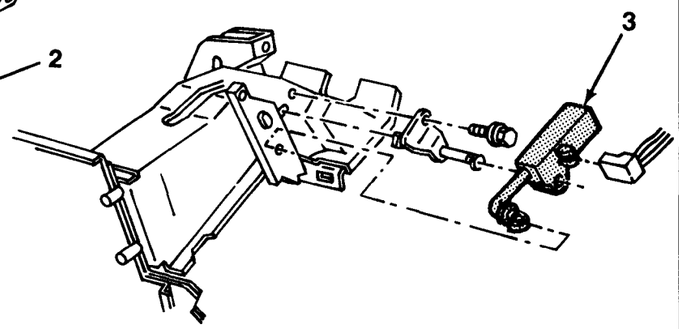
VIEW B

LC-0017-P-E-RP

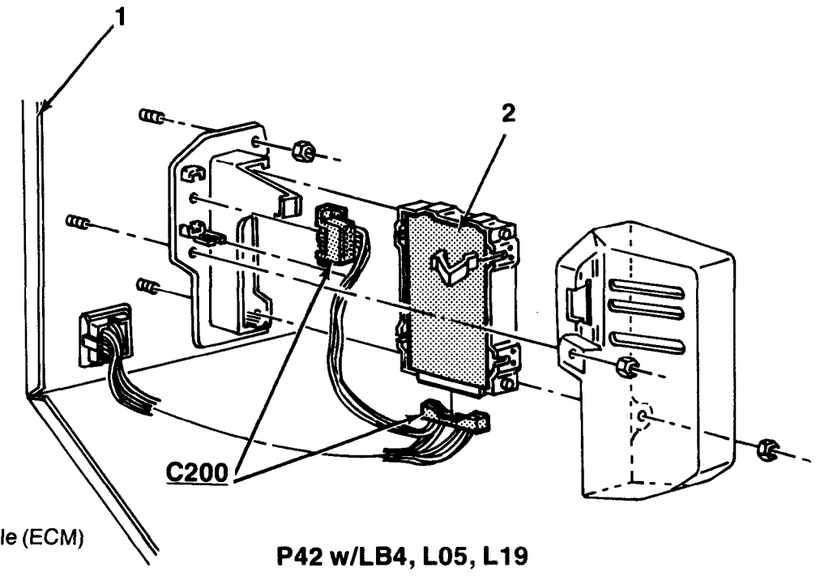
Figure 17 - Fuel Sender and Rear Lamp Wiring (Typical)



P32 w/L19



P32, P42 (with manual transmission)



1. Cowl
2. Electronic Control Module (ECM)
3. Neutral Start Switch

P42 w/LB4, L05, L19

LC-0018-P-E-RP

Figure 18 - Electronic Control Module

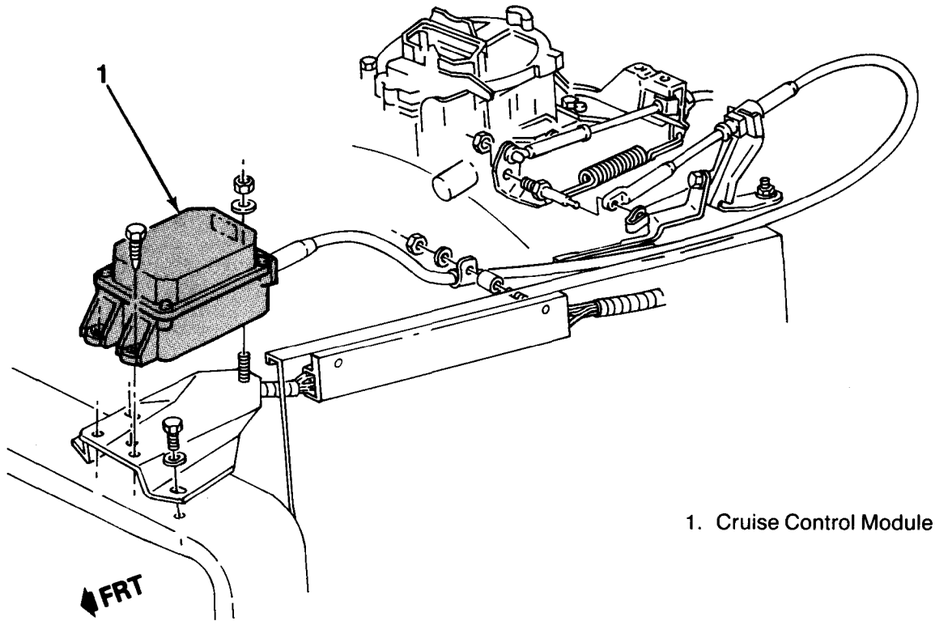


Figure 19 - Cruise Control Module

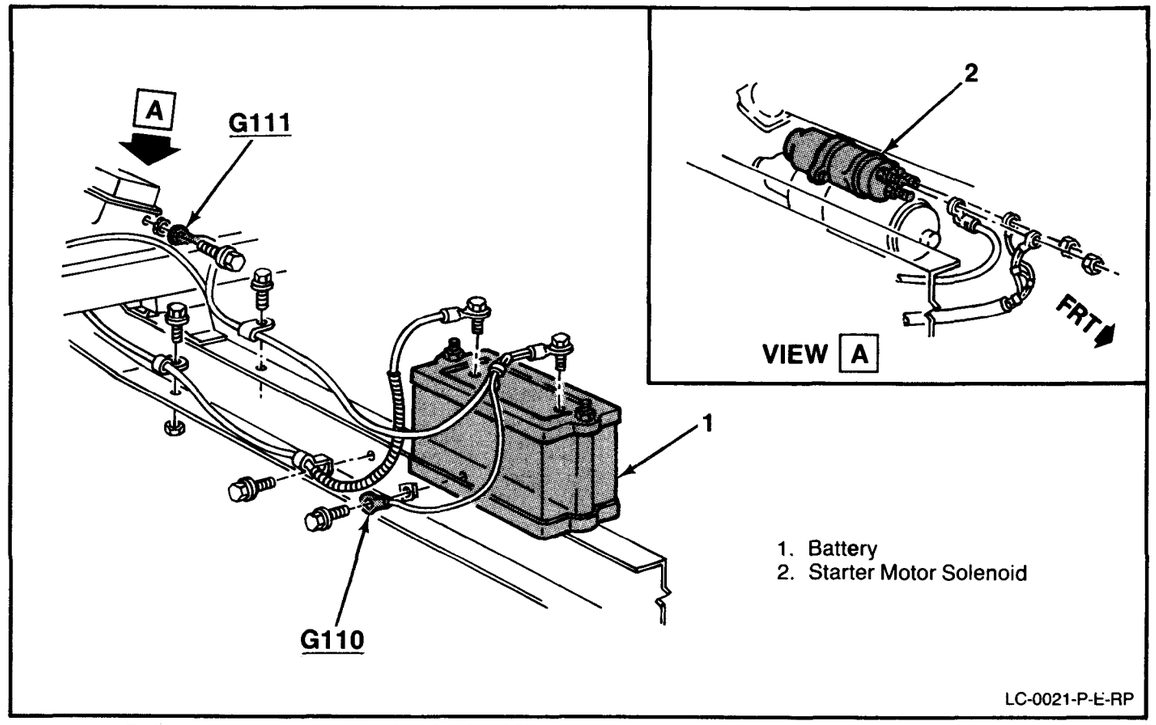


Figure 21 - Battery and Leads (RPO B3M, LB4, L05)

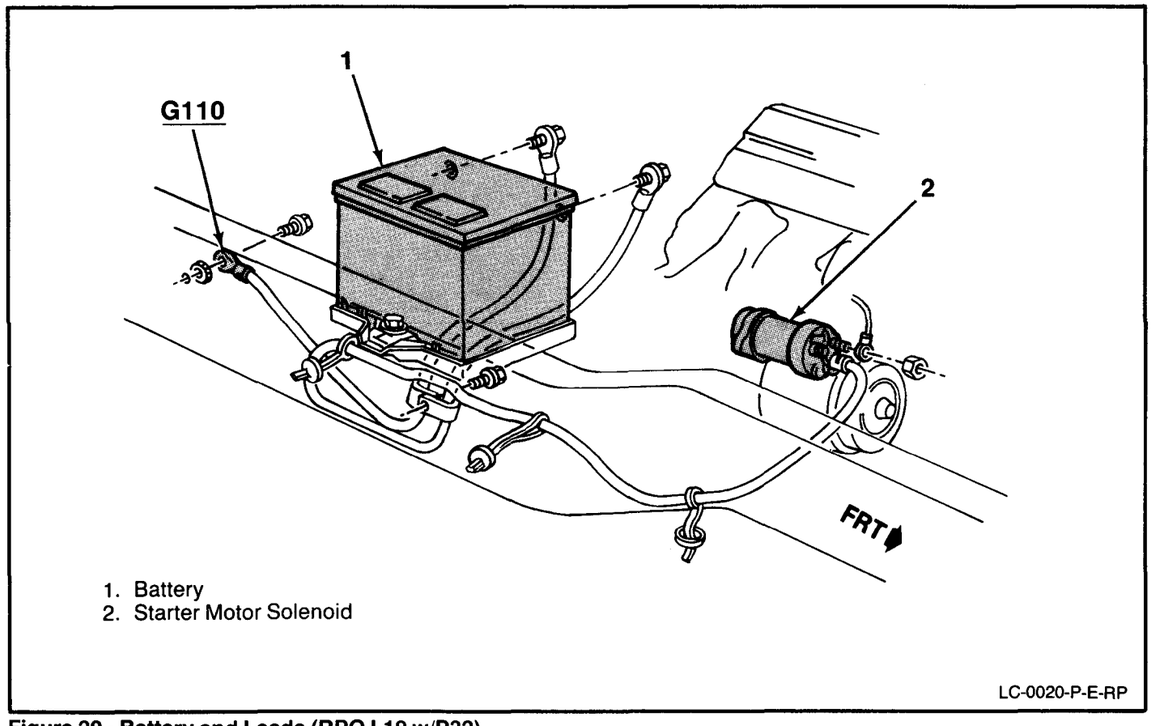


Figure 20 - Battery and Leads (RPO L19 w/P32)

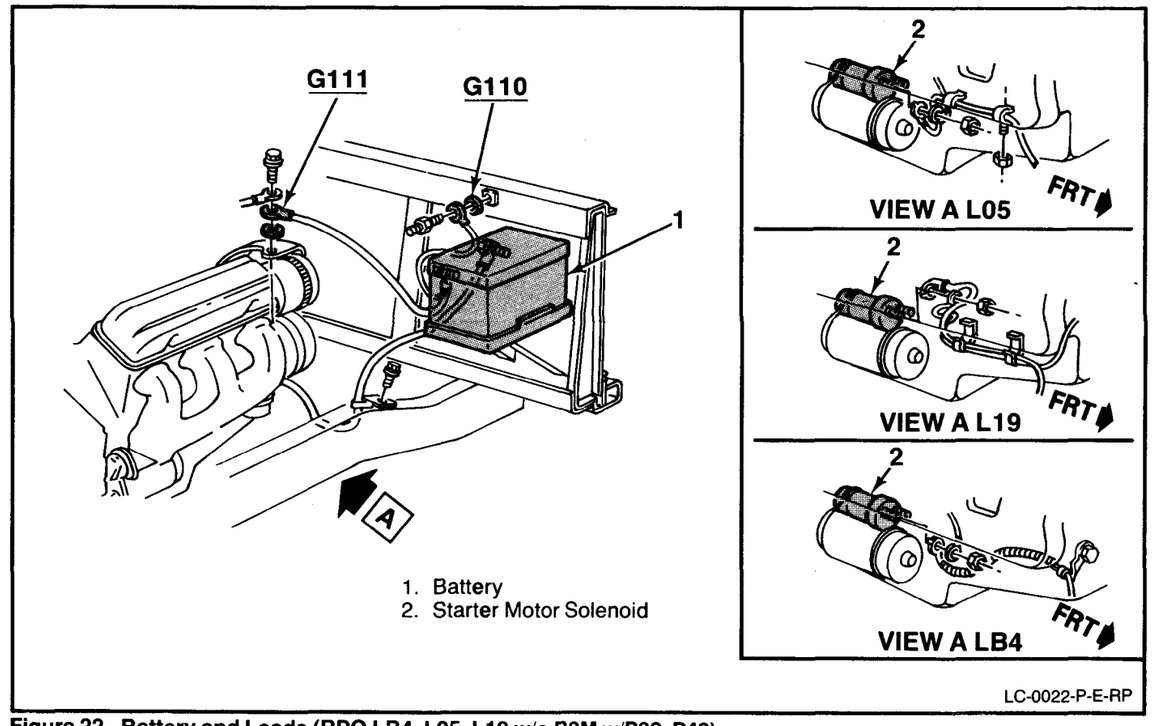


Figure 22 - Battery and Leads (RPO LB4, L05, L19 w/o B3M w/P32, P42)

LAMP BULB DATA

Always replace with AC type Guide Lamps.

Lamp Usage	Quantity	Trade No.	Power Rating at 12V, Watts
Headlamp[1]	2	6014	50/60W
			Candle Power
Park and Signal Lamp[2]	2	2057	2-32
Tail and Stop Lamp[2]	2	2057	2-32
Backup Lamp[3]	2	1156	32
Marker Lamp	4	194	2
License Lamp	2	67	4
Instrument Cluster Illumination	3	168	3
Directional Indicator	2	168	3
Headlamp High Beam Indicator	1	168	3
Brake Warning Indicator	1	168	3
Transmission Control Illumination	1	1445	0.7
Windshield Wiper Switch Illumination	1	161	1
Backup Lamp[4]	2	1295	50
Choke Heater Indicator	1	1893	2
Low Coolant Lamp (Diesel)	1	194	2
Glow Plugs Lamp (Diesel)	1	194	2
Water in Fuel (Diesel)	1	194	2

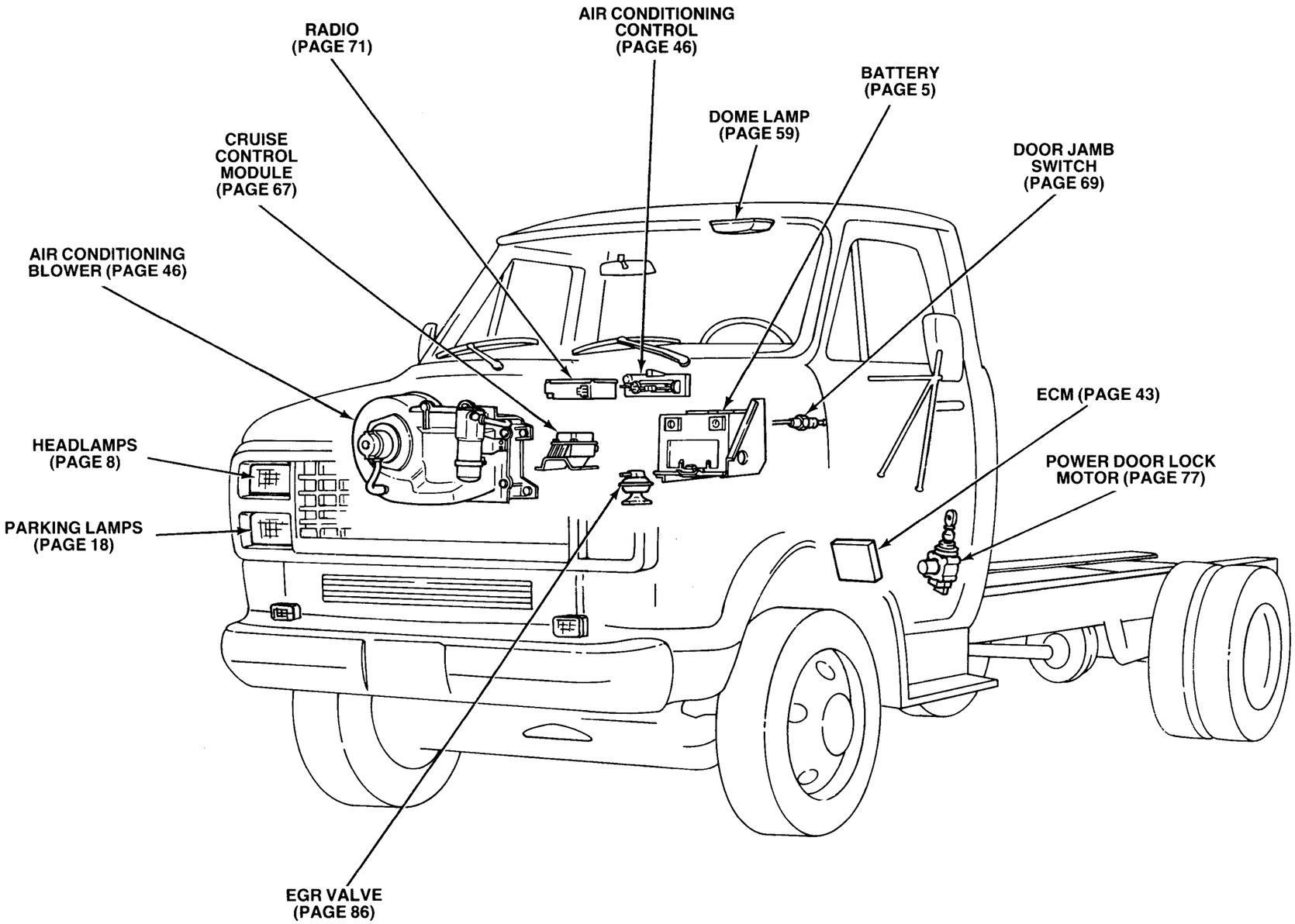
[1]Double filament sealed beam: 50W low beam, 60W high beam.
[2]Double filament lamp: 2CP low, 32CP high.
[3]Model 42
[4]Model 32

P TRUCK COMPONENT LOCATOR INDEX

P TRUCK COMPONENT LOCATOR INDEX

P TRUCK COMPONENT LOCATOR INDEX

P TRUCK COMPONENT LOCATOR INDEX


RADIO
(PAGE 71)
AIR CONDITIONING
CONTROL
(PAGE 46)
BATTERY
(PAGE 5)
DOME LAMP
(PAGE 59)
CRUISE
CONTROL
MODULE
(PAGE 67)
DOOR JAMB
SWITCH
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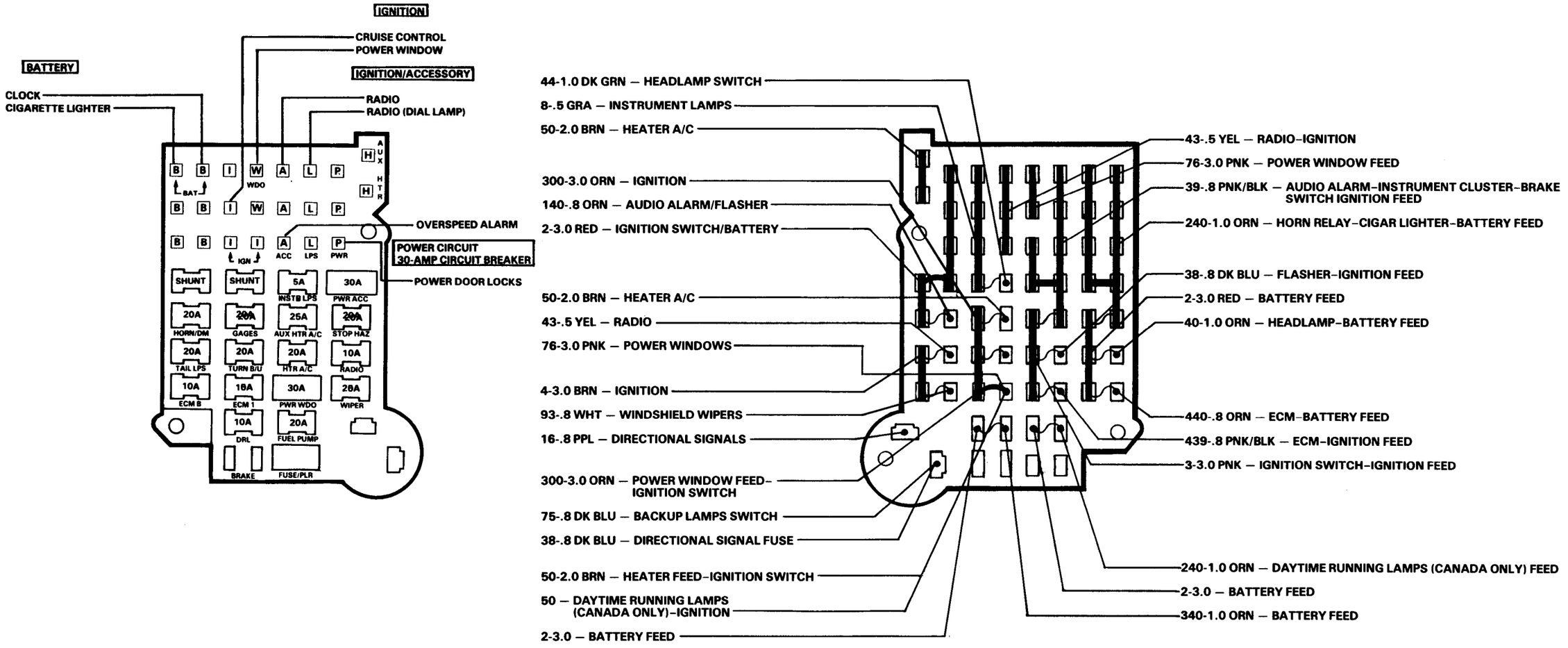
AIR CONDITIONING
BLOWER (PAGE 46)
ECM (PAGE 43)
HEADLAMPS
(PAGE 8)
POWER DOOR LOCK
MOTOR (PAGE 77)
PARKING LAMPS
(PAGE 18)
EGR VALVE
(PAGE 86)

SYMPTOMS INDEX



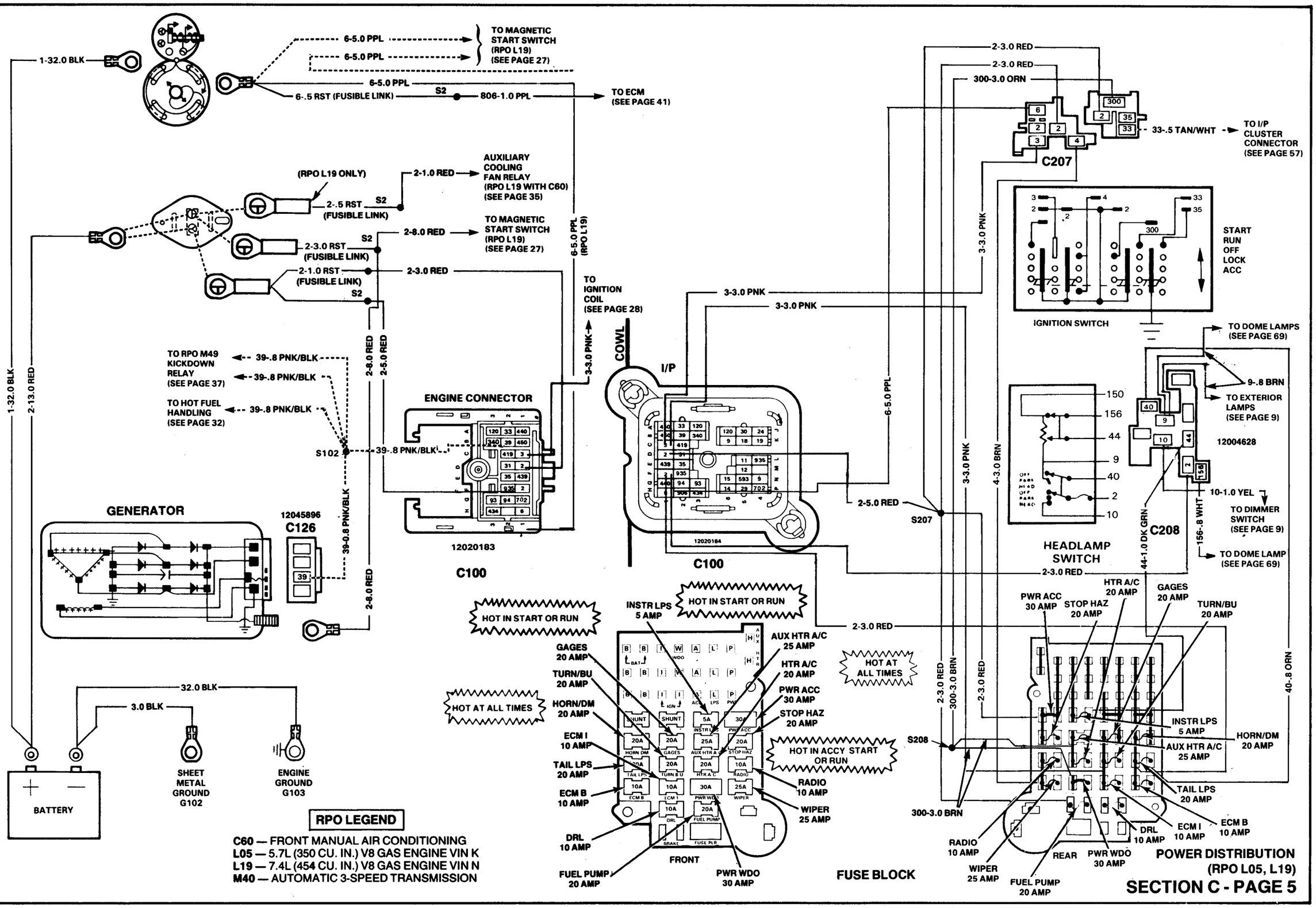
CAUTION: Determine if non-cycling circuit breakers are hot before removing them. Hot non-cycling circuit breakers can cause personal injury.

FUSE AND CIRCUIT BREAKER IDENTIFICATION

FUSE LOCATION	FUSE PART NO.	COLOR & AMPERES	DESCRIPTION
AUX HTR A/C	12004010	WHITE 25 AMP	Auxiliary Heater, Air Conditioning
DRL	12004007	RED 10 AMP	Daytime Running Lamps (Canada Only)
ECM I	12004007	RED 10 AMP	Electronic Control Module Ignition
ECM B	12004007	RED 10 AMP	Electronic Control Module Battery Feed
FUEL PUMP	12004009	YELLOW 20 AMP	Electric Fuel Pump Feed
GAGES	12004009	YELLOW 20 AMP	Audio Alarm, Instrument Panel Gauges, Brake Switch, Instrument Cluster, Cruise Control
HTR A/C	12004009	YELLOW 20 AMP	Heater, Air Conditioning
HORN/DM	12004009	YELLOW 20 AMP	Horn Relay, Cigarette Lighter, Dome Lamp, Clock
INSTR LPS	12004005	TAN 5 AMP	Instrument Lamps

FUSE LOCATION	FUSE PART NO.	COLOR & AMPERES	DESCRIPTION
PWR ACC	CIRCUIT BREAKER	30 AMP	Power Door Locks
PWR WDO	CIRCUIT BREAKER	30 AMP	Power Windows
RADIO	12004007	RED 10 AMP	Radio, Radio Dial Lamp, Overspeed Alarm
STOP-HAZ	12004009	YELLOW 20 AMP	Audio Alarm, Hazard Flasher, Stop Lamps
TAIL LPS	12004009	YELLOW 20 AMP	Headlamps, Taillamps
TURN B/U	12004009	YELLOW 20 AMP	Backup Lamps, Directional Lamps
WIPER	12004010	WHITE 25 AMP	Windshield Wipers, Windshield Washers

COMPONENT LOCATION



RPO LEGEND

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
M40 — AUTOMATIC 3-SPEED TRANSMISSION

BLANK

CIRCUIT OPERATION

Voltage is applied to the Headlamp Switch at all times. The Headlamp 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 Headlamp 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.

COMPONENT LOCATION

		Page — Figure
Dimmer Switch	Part of multi-function lever	95 — 20
Fuse Block	LH side of cowl, under I/P	92 — 13
Headlamp Switch	LH side of I/P	92 — 13
Headlamp, High Beam LH (RPO V22)	LH front of vehicle	87 — 1
Headlamp, High Beam RH (RPO V22)	RH front of vehicle	87 — 2
Headlamp, High-Low LH	LH front of vehicle	87 — 1
Headlamp, High-Low RH	RH front of vehicle	87 — 2
Park and Directional Lamp, LH	LH front of vehicle	87 — 1
Park and Directional Lamp, RH	RH front of vehicle	87 — 2
Side Marker Lamp, LH	LH front of vehicle	87 — 1
Side Marker Lamp, RH	RH front of vehicle	87 — 2
C100	Engine compartment, LH side of cowl	91 — 9
C127	At RH side marker lamp	87 — 2
C128	At LH side marker lamp	87 — 1
C129	At RH park and directional lamp	87 — 2
C130	At LH park and directional lamp	87 — 1
C131	At RH high-low headlamp	87 — 2
C132	At LH high-low headlamp	87 — 1
C133 (RPO V22)	At RH high beam headlamp	87 — 2
C134 (RPO V22)	At LH high beam headlamp	87 — 2
C135	LH side of engine compartment, in forward lamp harness	88 — 4
C136	LH side of engine compartment, in forward lamp harness	88 — 4
C208	At headlamp switch	92 — 13
C209	Behind I/P, at I/P cluster	96 — 24
C210	Under I/P, on LH side of steering column	92 — 12
G104 (P52)	On side of radiator support	88 — 3
G104 (P62)	At radiator support	88 — 4
G105 (P52)	On side of radiator support	88 — 3
G105 (P62)	At radiator support	88 — 4
S110	In forward lamp harness, LH side	87 — 1
S111	In forward lamp harness, RH side	87 — 2
S112	In forward lamp harness, LH side	87 — 1

TROUBLESHOOTING CHART—HEADLAMPS

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at headlamp switch connector C208 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from headlamp switch to junction block.
2. With the headlamp switch ON and the dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at headlamp switch connector C208 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 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 headlamp switch ON and 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 3.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from TAN (12) to BLK (151 or 152) wire(s) at headlamp connectors C131 or C132.	Test lamp does not light.	LOCATE and REPAIR open in BLK (151 or 152) wire(s) from headlamp connector(s) C131 or C132 to ground terminal(s) G104 or G105. If wire(s) is (are) in good condition, to to step 3.
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from TAN (12) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from headlamp dimmer switch to headlamp.
4. Connect a test lamp from YEL (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from headlamp dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp 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 3.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from LT GRN (11) wire to BLK (151 or 152) wire(s) at headlamp connectors C131 or C132 and/or C133 or C134; if vehicle is equipped with RPO V22.	Test lamp does not light.	LOCATE and REPAIR open in BLK (151 or 152) wire(s) at headlamp connector(s) C131 or C132 and/or C133 or C134, if vehicle is equipped with RPO V22, to ground connection(s) G104 or G105. If wire(s) is (are) in good condition, GO to step 3.
	Test lamp lights.	REPLACE headlamps(s).
3. Place dimmer switch in the HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 4.
	Test lamp lights.	LOCATE and REPAIR open in LT GRN (11) wire from headlamps to headlamp dimmer switch.
4. Connect a test lamp from YEL (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire headlamp dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE headlamp dimmer switch.

RH SIDE MARKER LAMP

6294015
C127

9-.5 BRN

HOT AT ALL TIMES

TAIL LPS 20 AMP

FRONT

FUSE BLOCK

REAR

TAIL LPS 20 AMP

I/P CLUSTER CONNECTOR

12066292
C209

RH HIGH-LOW HEADLAMP

12-.8 TAN
11-1.0 LT GRN
151-1.0 BLK
151-.8 BLK

6288471
C131

RH PARK AND DIRECTIONAL LAMP

151-.8 BLK
9-.8 BRN
S111

8917962
C129

RH HIGH BEAM HEADLAMP

151-.8 BLK
151-.8 BLK
11-1.0 LT GRN

6288472
C133

SHEET METAL GROUND

G104

2-3.0 RED
11-.8 LT GRN
2-3.0 RED
9-.8 BRN

9-.8 BRN → TO DOME LAMP (SEE PAGE 69)

COWL

I/P

S110

S112

12085015 12065562
C135

12020184
C100

2-3.0 RED
2-3.0 RED

HEADLAMP SWITCH

12004628
C208

LH HIGH BEAM HEADLAMP

152-.8 BLK
152-.8 BLK
11-1.0 LT GRN

6288472
C134

LH PARK AND DIRECTIONAL LAMP

150-.8 BLK
9-.8 BRN

3917962
C130

12065862 12085015
C136

10-1.0 YEL

DIMMER SWITCH

8917693
C210

LH HIGH-LOW HEADLAMP

152-1.0 BLK
152-.8 BLK
11-1.0 LT GRN
11-1.0 LT GRN
12-.8 TAN
12-.8 TAN

6288471
C132

6294015
C128

LH SIDE MARKER LAMP

SHEET METAL GROUND

G105

FRONT BODY

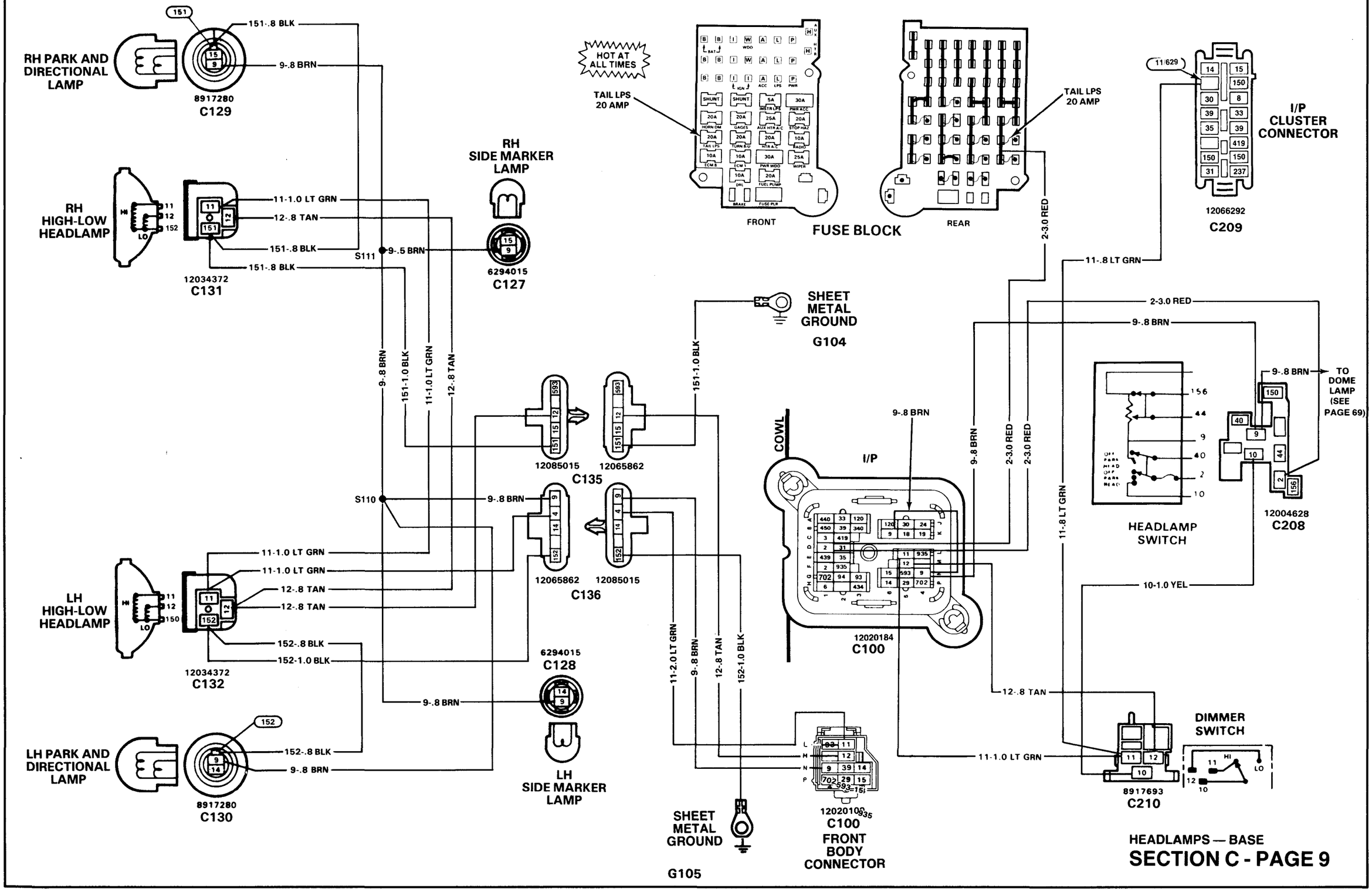
12020100
C100

RPO LEGEND

V22 — QUAD HEADLAMPS AND CHROME GRILLE

HEADLAMPS (RPO V22)

SECTION C - PAGE 8



HEADLAMPS — BASE

SECTION C - PAGE 9

CIRCUIT OPERATION

DAYTIME RUNNING LAMPS (CANADA ONLY)

Battery voltage is applied to the Daytime Running Lamp (DRL) Relay Switch 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 GAGES fuse. Battery voltage is also applied to the Daytime Running Lamp Module from the PNK/BLK (39) wire and the GAGES fuse.

With the Headlamps on, the Daytime Running Lamp Relay is not energized and the DK BLU/ORN (593) wire is grounded to BLK (153) wire, inside the relay. This serves as ground for the LH Headlamps.

With Ignition in RUN, headlamps off and Parking Brake released, the Daytime Running Lamp 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/ORN (593) wire from ground and internally connects it to the ORN (240) wire.

The DK BLU/ORN (593) wire feeds the LH High beam(s) which is/are connected in series to the RH Headlamp(s) through the LT GRN (11) wire.

Grounding of the entire circuit is accomplished through the BLK (151) wire at the RH Headlamps. This results in High beam headlamps which are less intense for daytime driving and should provide longer service life.

COMPONENT LOCATION

		Page — Figure
Daytime Running Lamp Diode Array Module	Behind LH side of I/P, near ALDL	93 — 14
Daytime Running Lamp Indicator	In instrument cluster	—
Daytime Running Lamp Module	Behind LH side of I/P, near ALDL	93 — 14
Daytime Running Lamp Relay Switch	Behind LH side of I/P, near ALDL	93 — 14
Dimmer Switch	Part of multi-function lever	95 — 20
Fuse Block	LH side of cowl, under I/P	92 — 13
Headlamp Switch	LH side of I/P	92 — 13
Headlamp, High Beam, LH	LH front of vehicle	87 — 1
Headlamp, High Beam, RH	RH front of vehicle	87 — 2
Headlamp, High-Low, LH	LH front of vehicle	87 — 1
Headlamp, High-Low, RH	RH front of vehicle	87 — 2
Park and Directional Lamp, LH	LH front of vehicle	87 — 1
Park and Directional Lamp, RH	RH front of vehicle	87 — 2
Park Brake Warning Switch	Under I/P, on top of park brake pedal support	92 — 13
Side Marker Lamp, LH	LH front of vehicle	87 — 1
Side Marker Lamp, RH	RH front of vehicle	87 — 2
C100	Engine compartment, LH side of cowl	91 — 9
C127	At RH side marker lamp	87 — 2
C128	At LH side marker lamp	87 — 1
C129	At RH park and directional lamp	87 — 2
C130	At LH park and directional lamp	87 — 1
C131	At RH high-low headlamp	87 — 2
C132	At LH high-low headlamp	87 — 1
C133	At RH high beam headlamp	87 — 2
C134	At LH high beam headlamp	87 — 1
C208	Behind LH side of I/P, at headlamp switch	92 — 13
C209	Behind I/P, at I/P cluster	96 — 24
C210	Under I/P, on LH side of steering column	92 — 12
C217	LH side of I/P	—
C220	Under I/P, on park brake pedal support	92 — 13
C251	At daytime running lamp module	93 — 14
C252	At daytime running lamp diode array module	93 — 14
C253	At daytime running lamp relay switch	93 — 14
G104 (P52)	On side of radiator support	88 — 3
G104 (P62)	At radiator support	88 — 4
G105 (P52)	On side of radiator support	88 — 3
G105 (P62)	At radiator support	88 — 4
G200	Under LH I/P, at bus bar ground	92 — 13
S110	In forward lamp harness, LH side	87 — 1
S111	In forward lamp harness, RH side	87 — 2
S112	In forward lamp harness, LH side	87 — 1
S200	I/P harness, above fuse block	92 — 13
S206	I/P harness, above steering column	92 — 12

TROUBLESHOOTING CHART—HEADLAMPS (WITH DAYTIME RUNNING LAMPS, CANADA ONLY)

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS—BOTH SIDES

TEST	RESULT	ACTION
1. Connect a test lamp from RED (2) wire at headlamp switch connector C208 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in RED (2) wire from headlamp switch to fuse block or REPLACE GAGES fuse.
2. With the headlamp switch ON and the dimmer switch to HIGH BEAM, connect a test lamp from YEL (10) wire at headlamp switch connector C208 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE headlamp switch.
3. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 to ground.	Test lamp lights.	REPAIR open in LT GRN (11) wire from dimmer switch to headlamps.
	Test lamp does not light.	REPLACE dimmer switch.

LOW BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn headlamp switch ON and 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 C131 or C132 to ground. (For Canadian vehicles w/o quad, DK BLU/WHT (593) is used in place of BLK (152) wire at connector C132.)	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 151) wire(s) from headlamp connector(s) C131 or C132 to ground terminal(s) G104 or G105. (For Canadian vehicles w/o quad, GO to step 3.)
	Test lamp lights.	REPLACE headlamp(s).
3. Connect a test lamp from DK BLU/WHT (593) at daytime running lamp relay switch connector C253 to ground.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/WHT (593) wire from headlamp connector C132 to daytime running lamp relay switch C253.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from BLK (153) wire at the daytime running lamp relay switch connector C253 to ground.	Test lamp does not light.	REPLACE daytime running lamp relay switch.
	Test lamp lights.	LOCATE and REPAIR open in BLK (153) wire from daytime running lamp relay switch to ground G200.

5. Connect a test lamp from TAN (12) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	GO to step 6.
	Test lamp lights.	LOCATE and REPAIR open in TAN (12) wire from dimmer switch to headlamps.
6. Connect a test lamp from YEL (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire from dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE dimmer switch.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp 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 (151) or DK BLU (593) wire at inoperative headlamp connector.	Test lamp does not light.	If RH headlamps are inoperative LOCATE and REPAIR open in BLK (151) wire between headlamp connector and ground G104. If LH headlamps are inoperative, GO to step 3.
	Test lamp lights.	REPLACE headlamps(s).
3. Connect a test lamp from DK BLU/WHT (593) wire to ground at daytime running lamp relay switch connector C253.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/WHT (593) wire at headlamp connector C132 to daytime running lamp relay switch C253.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from BLK (153) wire at daytime running lamp relay switch connector C253 to ground.	Test lamp does not light.	REPLACE daytime running lamp relay switch.
	Test lamp lights.	LOCATE and REPAIR open in BLK (153) wire from daytime running lamp relay switch connector to ground G200.
5. Place dimmer switch in the HIGH BEAM position. Connect a test lamp from LT GRN (11) wire at dimmer switch connector C210 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 dimmer switch.
6. Connect a test lamp from YEL (10) wire at dimmer switch connector C210 to ground.	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire dimmer switch to headlamp switch.
	Test lamp lights.	REPLACE dimmer switch.

PRELIMINARY CHECKS:

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

1. Place Park Brake in the OFF position.
2. Place Headlamp 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 Headlamp Switch to OFF position.

DAYTIME RUNNING LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. With Ignition in RUN, Headlamps off and park brake released, connect test lamp from ORN (240) wire at DRL relay connector switch C253 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (240) wire between DRL relay switch and fuse block or REPLACE DRL fuse.
	Test lamp lights.	GO to step 2.
2. Connect J 34029-A Multimeter from PNK/BLK (39) wire at DRL module connector C251 and DRL relay switch connector C253 to ground. Measure voltage.	Battery voltage at only one connector.	LOCATE and REPAIR open in PNK/BLK (39) wire between splice S206 and connector with missing voltage.
	No battery voltage at either connector.	LOCATE and REPAIR open in PNK/BLK (39) wire between splice S206 and fuse block or REPLACE GAGES fuse.
	Battery voltage at both connectors.	GO to step 3.
3. Connect J 34029-A Multimeter from PNK/BLK (39) wire at DRL module connector C251 and DRL relay switch connector C253 to BLK (150) and BLK (153) respectively. Measure voltage.	No voltage.	LOCATE and REPAIR open in BLK (150) or BLK (153) wire between connectors and ground G200.
	Battery voltage.	GO to step 4.
4. Connect J 34029-A Multimter from LT GRN/BLK (592) wire at DRL relay switch connector C253 to ground. Measure voltage.	No voltage.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between the DRL relay switch and the DRL module or REPLACE daytime running lamp module.
	Battery voltage.	GO to step 5.
5. Connect test lamp from DK BLU/WHT (593) wire at LH HI/LOW beam connector C132.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/WHT (593) wire between DRL relay switch and the LH HI/LOW headlamp connector.
	Test lamp lights.	Daytime running lamps operational.

RH HIGH-LOW HEADLAMP

RH SIDE MARKER LAMP

C131
6288471
12
11
151
12-.8 TAN
11-1.0 LT GRN
151-1.0 BLK
151-.8 BLK
9-.5 BRN
6294015
C127
15
9

RH PARK AND DIRECTIONAL LAMP

C129 8917962
151
151-.8 BLK
9
15
9-.8 BRN

RH HIGH BEAM HEADLAMP

C133
6288472
151
151-.8 BLK
151-.8 BLK
11
11-1.0 LT GRN

S111

9-.8 BRN
12-.8 TAN
11-1.0 LT GRN
11-1.0 LT GRN
151-1.0 BLK

S110

151-1.0 BLK

SHEET METAL GROUND G104

ENGINE

12020183
C100

33-.8 TAN/WHT

TO BRAKE PRESSURE WARNING SWITCH (SEE PAGE 61)

33-.5 TAN/WHT
9-.8 BRN
I/P
2-3.0 RED
39-.8 PNK/BLK
2-3.0 RED
11-1.0 LT GRN
12-.8 TAN
9-.8 BRN
593-1.0 DK BLU/ORN

12020184
C100

COWL

LH HIGH BEAM HEADLAMP

C134
6288472
593
593-.8 DK BLU/WHT
11
11-1.0 LT GRN

S112

9-.5 BRN
12-.8 TAN
11-1.0 LT GRN
11-1.0 LT GRN
9-.8 BRN
593-1.0 DK BLU/WHT
12-.8 TAN

12085015
C135
12065862

LH PARK AND DIRECTIONAL LAMP

8917962
C130
152
152-.8 BLK
9
14
9-.8 BRN

12065862
12085015
C136

152-1.0 BLK
9-.8 BRN
12-.8 TAN
11-2.0 LT GRN
593-.8 DK BLU/WHT

LH HIGH-LOW HEADLAMP

6288471
C132
593
593-1.0 DK BLU/WHT
593-.8 DK BLU/WHT
11
11-1.0 LT GRN
11-1.0 LT GRN
12
12-.8 TAN
12-.8 TAN

LH SIDE MARKER LAMP

C128
6294015
14
9
9-.5 BRN

SHEET METAL GROUND G105

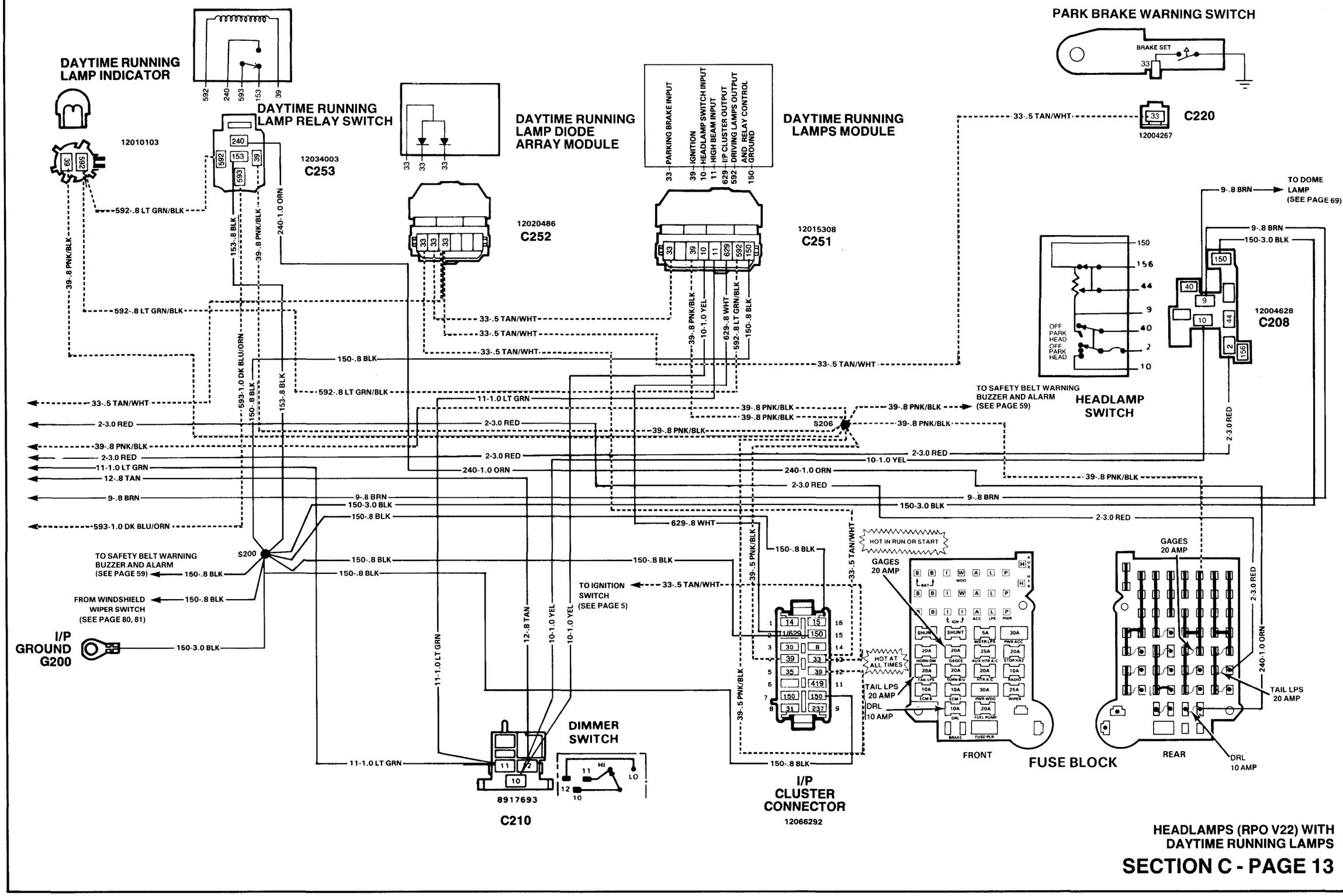
FRONT BODY

12020100
C100

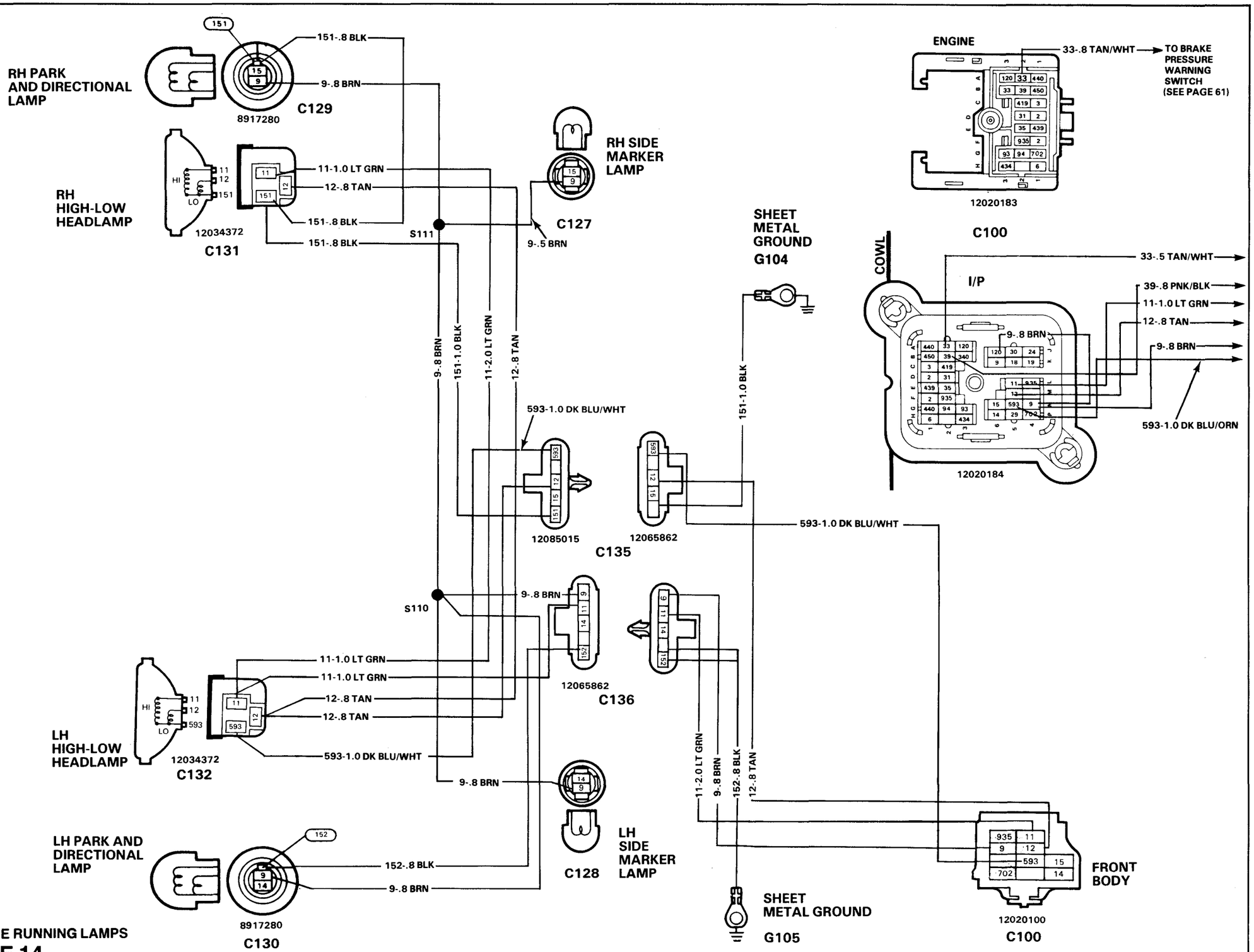
RPO LEGEND

V22 — QUAD HEADLAMPS AND CHROME GRILLE

HEADLAMPS
(RPO V22) WITH DAYTIME RUNNING LAMPS



HEADLAMPS (RPO V22) WITH DAYTIME RUNNING LAMPS



HEADLAMPS
BASE MODEL WITH DAYTIME RUNNING LAMPS

DAYTIME RUNNING LAMP INDICATOR

DAYTIME RUNNING LAMPS RELAY

12034003
C253

DAYTIME RUNNING LAMPS DIODE ARRAY MODULE

12020486
C252

DAYTIME RUNNING LAMPS MODULE

12015308
C251

PARK BRAKE WARNING SWITCH

12010103
C217

12004267 C220

12004628
C208

HEADLAMP SWITCH

I/P GROUND G200

DIMMER SWITCH

8917693
C210

12066292
C209

I/P CLUSTER CONNECTOR

FUSE BLOCK

FRONT

REAR

S200

S206

TO DOME LAMP (SEE PAGE 69)

TO SAFETY BELT WARNING BUZZER (SEE PAGE 59)

FROM SAFETY BELT WARNING BUZZER (SEE PAGE 59)

FROM WINDSHIELD WIPER SWITCH (SEE PAGE 80, 81)

TO IGNITION SWITCH (SEE PAGE 5)

HOT IN START OR RUN

HOT IN RUN, BULB TEST OR START

GAGES 20 AMP

DRL 10 AMP

HEADLAMPS
BASE MODEL WITH DAYTIME RUNNING LAMPS

BLANK

CIRCUIT OPERATION

PARK AND MARKER LAMPS

Voltage is applied through the TAIL LPS fuse to the Headlamp Switch at all times. With the Headlamp Switch in PARK or HEAD, voltage is applied to the Park and Marker 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 Directional Signal Switch Assembly. With the Hazard Switch in HAZARD FLASH, voltage is applied to Front Directional Signal Lamps. All of the Directional Signal Lamps and both Directional Signal 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 on.

In HAZARD, the circuit is always open, and the Hazard Flasher controls the Lamps.

COMPONENT LOCATION

		Page — Figure
Body Builder Connector	LH frame rail at end crossmember	98 — 30
Directional Signal Switch	Inside top of steering column	95 — 20
Fuse Block	Under I/P, LH side of cowl	92 — 13
Hazard Flasher	Under I/P, below headlamp switch	95 — 19
Headlamp Switch	LH side of I/P	92 — 13
Park and Directional Lamp, LH	LH front of vehicle	87 — 1
Park and Directional Lamp, RH	RH front of vehicle	87 — 2
Side Marker Lamp, LH	LH front of vehicle	87 — 1
Side Marker Lamp, RH	RH front of vehicle	87 — 2
Stop Lamp Switch	Top of brake pedal, at brake pedal support	93 — 16
C100	Engine compartment, LH side of cowl	91 — 9
C127	At RH side marker lamp	87 — 2
C128	At LH side marker lamp	87 — 1
C129	At RH park and directional lamp	87 — 2
C130	At LH park and directional lamp	87 — 1
C135	LH side of engine compartment, in forward lamp harness	88 — 4
C136	LH side of engine compartment, in forward lamp harness	88 — 4
C208	At headlamp switch	92 — 13
C209	Behind I/P, at I/P cluster	96 — 24
C212	Lower steering column, under I/P	92 — 12
C249	At hazard flasher	95 — 19
C250	At stop lamp switch	93 — 16
C403	At body builder connector	98 — 30
S110	In forward lamp harness, LH side	87 — 1
S111	In forward lamp harness, RH side	87 — 2
S116	In forward lamp harness, LH side	87 — 1
S117	In forward lamp harness, RH side	87 — 2

TROUBLESHOOTING CHART—PARK, MARKER AND HAZARD LAMPS

HAZARD WARNING LAMPS DO NOT OPERATE

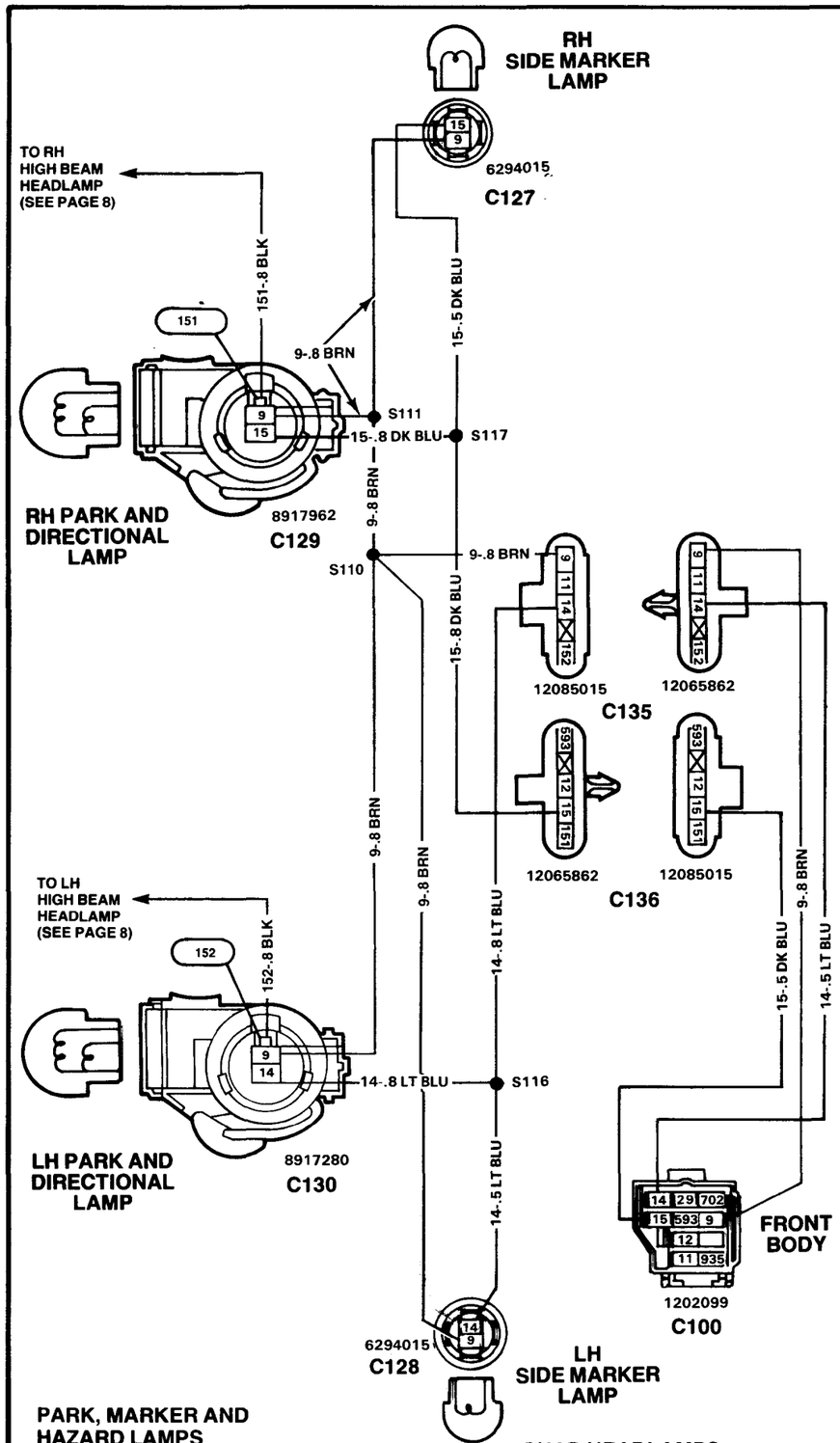
TEST	RESULT	ACTION
1. Place ignition switch in RUN and position directional signal lamps as if making a turn.	Directional signal lamps operate.	GO to step 2.
	Directional signal lamps do not operate.	REFER to "Directional Signals Do Not Operate" symptom.
2. Turn off directional signal lamps and put hazard warning lamps ON. Connect a test lamp from BRN (27) wire at directional signal switch connector C212 to ground.	Test lamp lights.	REPLACE directional 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.

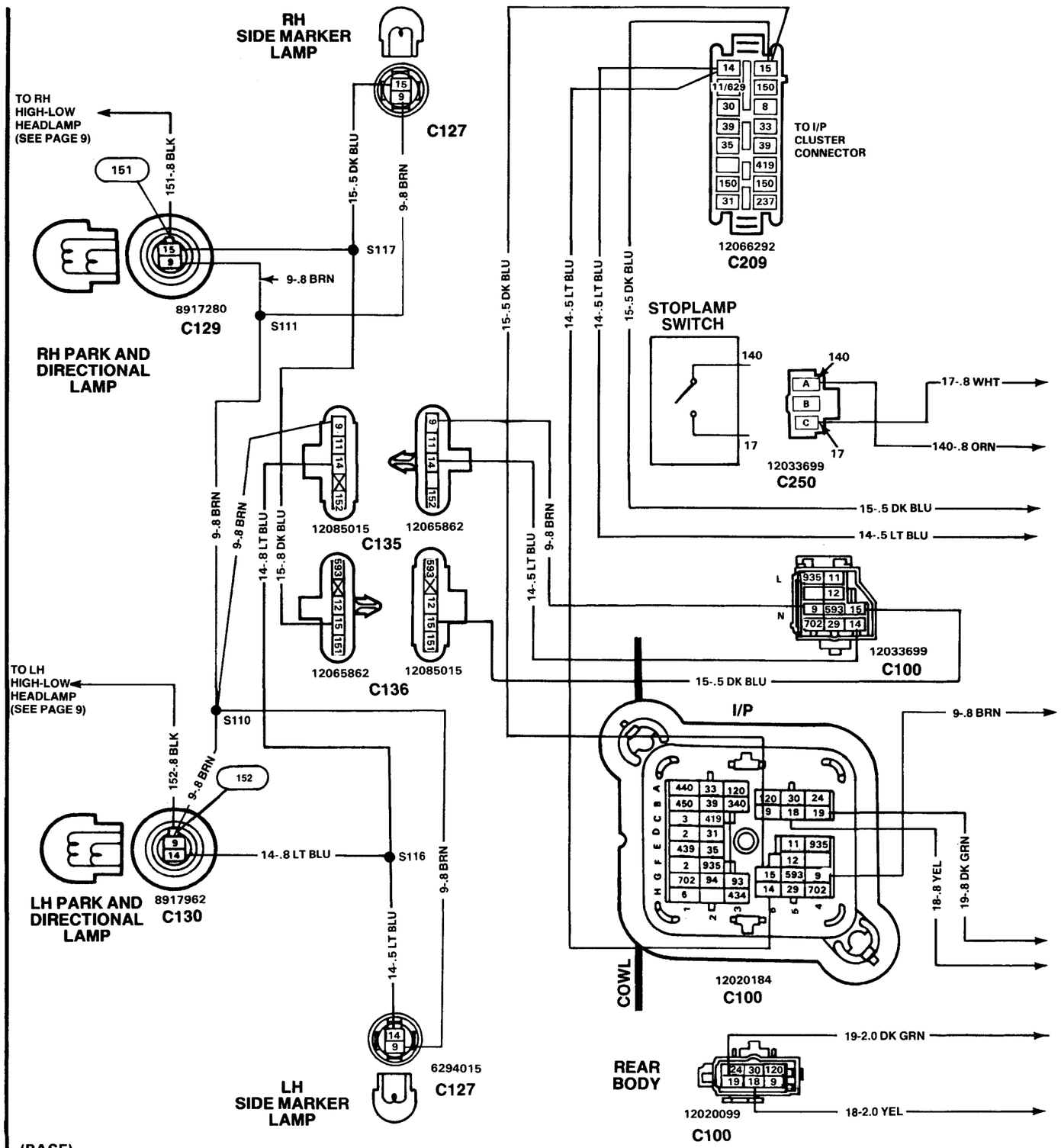
PARK LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp switch in PARK position. Connect a test lamp from ORN (40) wire at headlamp switch connector C208 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp from RED (2) wire at fuse block to ground.	Test lamp lights.	CHECK condition of fuse (TAIL LPS). If fuse is good, LOCATE and REPAIR open in ORN (40) wire.
	Test lamp does not light.	LOCATE and REPAIR open RED (2) wire from fuse block to junction block.
3. Connect test lamp from BRN (9) wire at headlamp switch connector C208 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE headlamp switch.
4. Connect test lamp at BRN (9) wire at LH park and directional lamp connector C130 to ground. Repeat at RH park and directional lamp connector C129.	Test lamp lights.	CHECK conditions of bulb sockets and BLK (151 and 152) wire(s) from park and directional lamp(s) to ground terminal(s) G104 and G105.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire from park lamps to headlamp switch.

SIDE MARKER LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Place headlamp switch in PARK position. Connect a test lamp from BRN (9) wire at LH side marker lamp connector C141 to ground. Repeat at RH side marker lamp connector C145.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire(s) from side marker lamp(s) to headlamp switch.
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 side marker lamp connector(s) C141 or C145.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (14) or DK BLU (15) wire(s) from side marker lamp(s) to park and directional lamp(s).


RH SIDE MARKER LAMP
TO RH HIGH BEAM HEADLAMP (SEE PAGE 8)
6294015
C127
151
151-.8 BLK
9-.8 BRN
15-.5 DK BLU
S111
15-.8 DK BLU
S117
RH PARK AND DIRECTIONAL LAMP
8917962
C129
9-.8 BRN
S110
15-.8 DK BLU
12085015
12065862
C135
12065862
12085015
C136
TO LH HIGH BEAM HEADLAMP (SEE PAGE 8)
152
152-.8 BLK
14-.8 LT BLU
S116
LH PARK AND DIRECTIONAL LAMP
8917280
C130
14-.5 LT BLU
15-.5 DK BLU
9-.8 BRN
FRONT BODY
1202099
C100
6294015
C128
LH SIDE MARKER LAMP
PARK, MARKER AND HAZARD LAMPS
SECTION C - PAGE 18
QUAD HEADLAMPS AND CHROME GRILLE (RPO V22)


RH SIDE MARKER LAMP
TO RH HIGH-LOW HEADLAMP (SEE PAGE 9)
C127
151
151-.8 BLK
15-.5 DK BLU
9-.8 BRN
S117
8917280
C129
S111
RH PARK AND DIRECTIONAL LAMP
9-.8 BRN
14-.8 LT BLU
15-.8 DK BLU
12085015
12065862
C135
12065862
12085015
C136
TO LH HIGH-LOW HEADLAMP (SEE PAGE 9)
152
152-.8 BLK
S110
14-.8 LT BLU
S116
LH PARK AND DIRECTIONAL LAMP
8917962
C130
14-.5 LT BLU
9-.8 BRN
6294015
C127
LH SIDE MARKER LAMP
(BASE)
12066292
C209
TO I/P CLUSTER CONNECTOR
STOPLAMP SWITCH
140
17
12033699
C250
17-.8 WHT
140-.8 ORN
15-.5 DK BLU
14-.5 LT BLU
12033699
C100
I/P
9-.8 BRN
18-.8 YEL
19-.8 DK GRN
COWL
12020184
C100
19-2.0 DK GRN
REAR BODY
12020099
C100
18-2.0 YEL

HOT AT ALL TIMES

TAIL LPS 20 AMP

STOP HAZ 20 AMP

HAZARD FLASHER

140 27

2973385
C249

27-.8 BRN

FUSE BLOCK

FRONT

REAR

12004628
C208

HEADLAMP SWITCH

40-.8 BRN

140-.8 ORN

17-.8 WHT

140-.8 ORN

9-.8 BRN

9-.8 BRN

BODY BUILDER CONNECTOR

12065158
C403

17-.8 WHT
19-.8 DK GRN
18-.8 YEL
27-.8 BRN
15-.5 DK BLU
14-.5 LT BLU

12004147
C212

12004148

(STEERING COL SWITCHES)

LEFT TURN SIGNAL

RIGHT

HORN

KEY

NORMALLY OPEN SWITCHES

PRNDL

HAZARD

DIRECTIONAL SIGNAL SWITCH

19-2.0 DK GRN

18-2.0 YEL

19-2.0 DK GRN
18-2.0 YEL

CONNECTOR C403		
Pin	Circuit Number Wire Gauge and Color	Purpose
A	24-2.0 LT GRN	Backup Lamps
B	19-2.0 DK GRN	RH Stop and Turn
C	9-2.0 BRN	Taillamps and License Lamps
D	150-2.0 BLK	Ground
E	18-2.0 YEL	LH Stop and Turn

RPO LEGEND

V22 — QUAD HEADLAMPS AND CHROME GRILLE

BLANK

CIRCUIT OPERATION

DIRECTIONAL SIGNAL LAMPS

With the Ignition Switch in RUN or START, voltage is applied through the TURN B/U fuse and Directional Flasher to the normally closed contact of the Hazard Switch in the Directional Signal Switch.

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

The Directional 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 Directional Lamp will also be applied to the LH Side Marker Lamp. If the Parking Lamps are not on, the LH Side Marker Lamp will find a path to ground through splice S116 and the many Lamps connected in parallel to ground. These Lamps provide low resistance paths to ground. The Marker Lamp will flash with the Directional 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 Parking or Headlamps are on, voltage is applied through the Tail LPS fuse, Headlamp Switch, and splices S110 and S111 to the Marker and Park Lamps. If the Directional 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 Directional Lamp, the Marker Lamp will be grounded through the Directional Lamp and will go on. In this way, the LH Side Marker Lamp will flash on when the LH Directional Lamp goes off, and off when the Park and Directional Lamp goes on.

With the Park and Directional Signal Switch in TURN RIGHT, voltage will be applied to the RH Lamps in the same way.

COMPONENT LOCATION

TROUBLESHOOTING CHART—DIRECTIONAL LAMPS

DIRECTIONAL SIGNALS DO NOT WORK ON ONE SIDE

TEST	RESULT	ACTION
1. Turn hazard warning system ON. Observe lamps on side of directional signals that did not work.	Lamps flash.	CHECK for improper bulb. REPLACE if necessary.
	Lamps do not come on.	GO to step 2.
2. Turn hazard warning system off. Place ignition switch to RUN and directional 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 directional signal switch connector C212 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 directional signal switch connector C212 to ground.	Test lamp lights.	REPLACE directional signal switch.
	Test lamp does not light.	REPLACE directional signal flasher.
4. Connect test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side did not work) at park lamp connector C129 or C130 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 test lamp from LT BLU (14) or DK BLU (15) wire to BLK (151 or 152) wire at park lamp C129 or C130.	Test lamp lights.	CHECK condition of bulb sockets.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (151 or 152) wire.

DIRECTIONAL 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 at directional signal switch connector C212 to ground.	Test lamp lights.	REPLACE directional signal switch.
	Test lamp does not light.	CHECK condition of fuse (TURN/BU) and an open in PPL (16) wire, DK BLU (38) wire. If fuse and wiring are good, REPLACE directional signal flasher.
3. Place ignition switch in RUN position and put directional signal switch as if making a left turn. Connect test lamp from LT BLU (14) wire at directional signal switch connector C212 to ground.	Test lamp flashes.	LOCATE and REPAIR open in wires from directional signal switch to convenience center.
	Test lamp does not light.	REPLACE directional signal switch.

DIRECTIONAL SIGNAL LAMPS FLASH RAPIDLY

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

RH SIDE MARKER LAMP

C127

6294015

15-.5 DK BLU

151

RH PARK AND DIRECTIONAL LAMP

15-.8 DK BLU

S117

C129

8917962

C135

12085015

12065862

15-.8 DK BLU

14-.8 LT BLU

12065862

12085015

C136

15-.5 DK BLU

14-.5 LT BLU

152

LH PARK AND DIRECTIONAL LAMP

14-.8 LT BLU

S116

C130

8917962

14-.5 LT BLU

15-.5 DK BLU

FRONT BODY CONNECTOR

12620099

C100

6294015

LH SIDE MARKER LAMP

C128

DIRECTIONAL LAMPS

SECTION C - PAGE 22

QUAD HEADLAMPS AND CHROMED GRILLE (RPO V22)

RH SIDE MARKER LAMP

6294015

C127

15-.5 DK BLU

TO I/P CLUSTER CONNECTOR

14-.5 LT BLU

11/629

12066292

C209

15-.5 DK BLU

14-.5 LT BLU

15-.5 DK BLU

RH PARK AND DIRECTIONAL LAMP

151

15-.8 DK BLU

S117

8917962

C129

C135

12085015

12065862

15-.8 DK BLU

14-.8 LT BLU

12065862

12085015

C136

14-.5 LT BLU

15-.5 DK BLU

14-.5 LT BLU

15-.8 DK BLU

FRONT BODY CONNECTOR

C100

12020099

I/P

LH PARK AND DIRECTIONAL LAMP

152

14-.8 LT BLU

S116

8917962

C130

14-.5 LT BLU

18-.8 YEL

19-.8 DK GRN

COWL

C100

6294015

LH SIDE MARKER LAMP

6294015

REAR BODY CONNECTOR

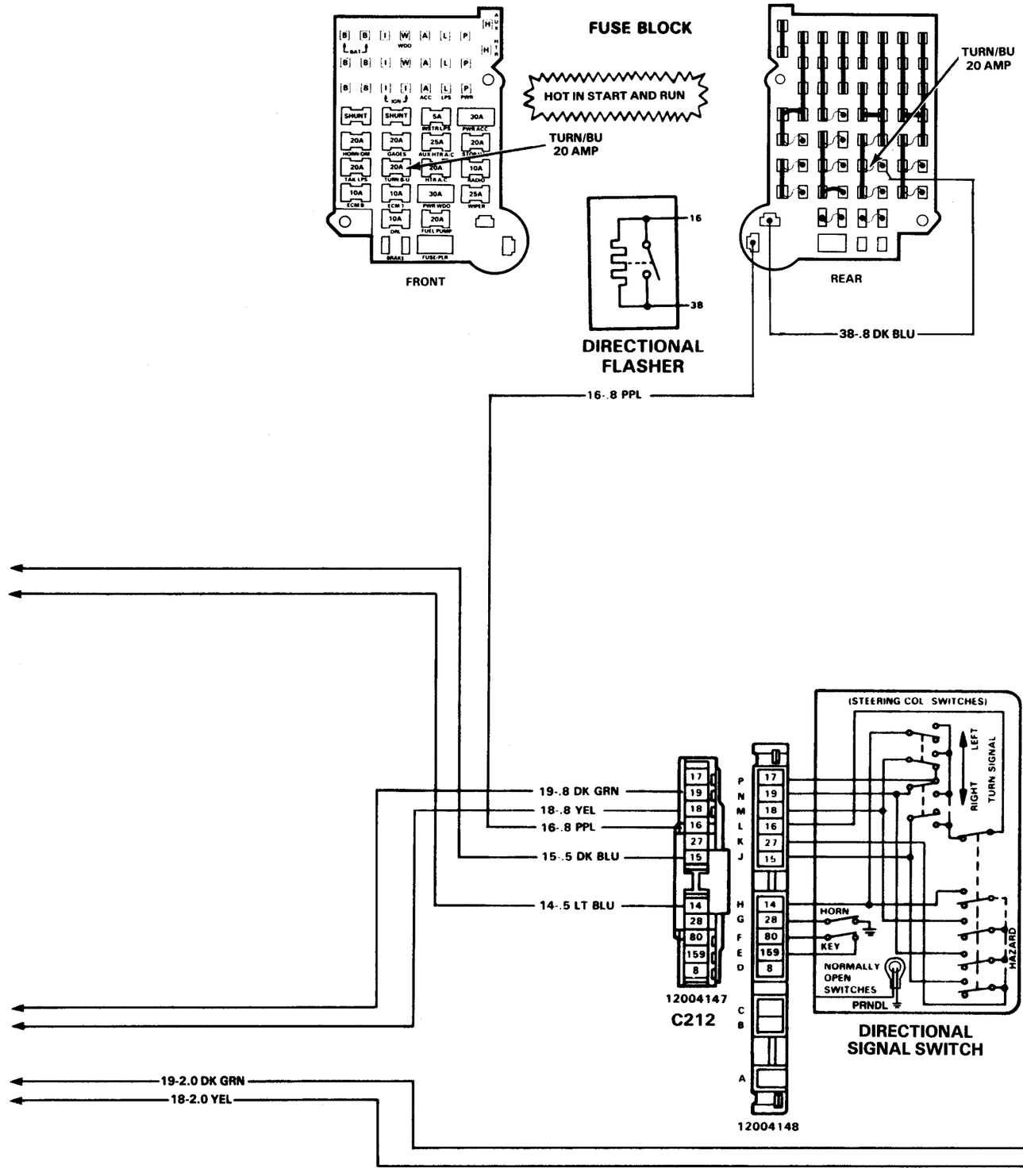
19-2.0 DK GRN

18-2.0 YEL

12020099

C100

BASE



CONNECTOR C403		
Pin	Circuit Number Wire Gauge and Color	Purpose
A	24-2.0 LT GRN	Backup Lamps
B	19-2.0 DK GRN	RH Stop and Turn
C	9-2.0 BRN	Taillamps and License Lamps
D	150-2.0 BLK	Ground
E	18-2.0 YEL	LH Stop and Turn

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 Horns.

COMPONENT LOCATION

PRELIMINARY CHECKS:

Check to see that the HORN D/M fuse is not blown. REPLACE if blown.

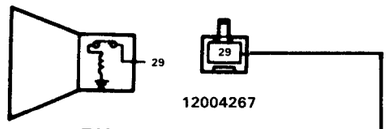
TROUBLESHOOTING CHART—HORNS

HORN(S) WILL NOT OPERATE

TEST	RESULT	ACTION
1. Connect test lamp from DK GRN (29) wire at inoperative horn connector to ground. Press horn switch.	Test lamp lights.	REPLACE horn.
	Test lamp does not light.	GO to step 2.
2. Remove horn relay. Connect test lamp from ORN (240) wire at horn relay connector C211 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 and fuse block.
3. Insert horn relay. Disconnect directional signal switch connector C212. Use a jumper wire to ground BLK (28) wire at directional signal switch connector C212.	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.	Horn sounds.	REPLACE horn relay.
	Horn does not sound.	LOCATE and REPAIR open in DK GRN (29) wire from horn relay connector to horn(s).

HORN SOUNDS CONTINUOUSLY WITHOUT DEPRESSING HORN SWITCH

TEST	RESULT	ACTION
1. Disconnect directional signal switch connector C212.	Horn stops.	REPLACE horn switch.
	Horn continues to sound.	GO to step 2.
2. Disconnect horn relay. Check for a short to ground in BLK (28) wires.	No shorts found.	REPLACE relay.
	Short(s) found.	REPAIR or REPLACE as required.

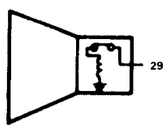


RH HORN

12004267

C138

29-1.0 BLK/GRN



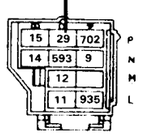
LH HORN

12004267

C137

29-2.0 DK ORN

FRONT BODY



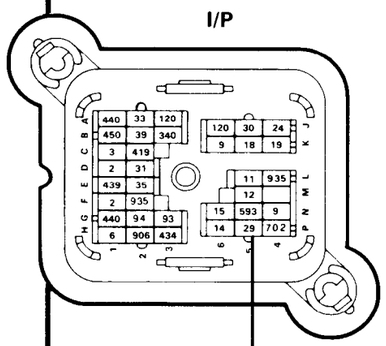
12020100

C100

COWL

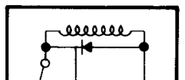
COWL

I/P

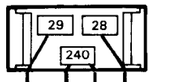


12020184

C100



HORN RELAY



2984164

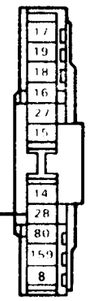
C211

29-1.0 BLK/GRN

240-1.0 ORN

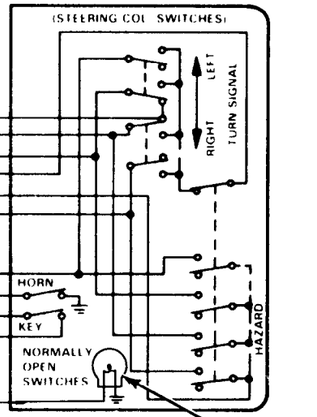
28-.5 BLK

240-.8 ORN → TO DOME LAMP (SEE PAGE 69)



12004147

C212



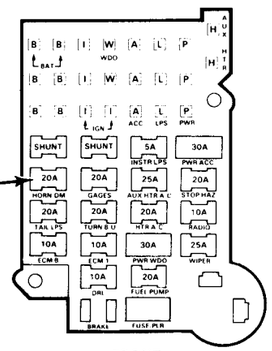
DIRECTIONAL SIGNAL SWITCH

PRNDL

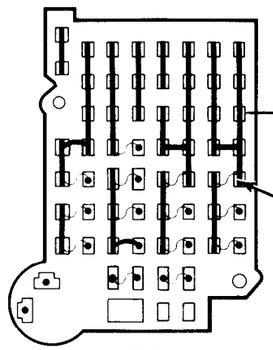
12004148

HOT AT ALL TIMES

HORN/DM 20 AMP



FRONT



REAR

HORN/DM 20 AMP

FUSE BLOCK

CIRCUIT OPERATION

STARTER

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.

CHARGING

The Generator provides voltage to operate the vehicle's electrical system and to charge the 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 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.

COMPONENT LOCATION

		Page — Figure
Battery	LH front of cowl	.89 — 5
Distributor (P52)	Top rear of engine	.89 — 6
Distributor (P62)	Top rear of engine	.90 — 7
Electronic Control Module	Under driver's seat	.95 — 21
Fuse Block	LH side of cowl, under I/P	.92 — 13
Generator	RH front of engine	.90 — 8
Ignition Switch	RH side of steering column	.95 — 20
Junction Block	LH front of cowl	.89 — 5
Starter Motor Solenoid	Lower RH side of engine	.90 — 8
Grommet 100	Under driver's seat	.95 — 21
C100	Engine compartment, LH side of cowl	.91 — 9
C118 (P52)	At distributor	.89 — 6
C118 (P62)	At distributor	.90 — 7
C124 (P52)	Top rear of engine	.89 — 6
C124 (P62)	Top rear of engine	.90 — 7
C126	At generator	.90 — 8
C139 (P52)	At ignition coil	.89 — 6
C139 (P62)	At ignition coil	.90 — 7
C140	To tachometer, top rear of engine	.90 — 7
C207	RH side of steering column, under I/P	.92 — 12
C209	Behind I/P, at I/P cluster	.96 — 24
C308	At ECM, under driver's seat	.95 — 21
G102	On RH frame rail, beneath battery	.89 — 5
G103	Rear, RH cylinder head	.89 — 5
S102	Engine wiring harness, center of cowl	.91 — 9

COMPONENT LOCATION

		Page — Figure
S103	Engine harness, RH side of engine	.90 — 8
S206	I/P harness, above steering column	.92 — 12
S207	I/P hanesss, above fuse block	.92 — 13
S208	I/P harness, above fuse block	.92 — 13
S300	Under driver's seat	.95 — 21

TROUBLESHOOTING CHART—START AND CHARGE

ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK

TEST	RESULT	ACTION
1. Place transmission in PARK (auto) or depress clutch pedal for manual transmission. 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 manual transmission.
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. With ignition switch OFF, connect a voltmeter from BAT 2 terminal at ignition switch connector C207 to ground. Repeat step except connect from BAT 3 terminal to ground.	Battery voltage.	REPLACE ignition switch.
	No voltage.	LOCATE 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 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.

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 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.

1-32.0 BLK

6-5.0 PPL

6-.5 RST (FUSIBLE LINK)

S2

STARTER MOTOR SOLENOID

MAGNETIC START SWITCH (RPO L19 ONLY)

S300

450-.8 BLK/WHT → TO ECM (SEE PAGE 41, 43)

450-.8 BLK/WHT

450-.8 BLK/WHT → TO HOT FUEL HANDLING MODULE (SEE PAGE 32)

JUNCTION BLOCK

2-3.0 RST (FUSIBLE LINK)

2-8.0 RED

2-1.0 RST (FUSIBLE LINK)

2-3.0 RED

2-1.0 RST (FUSIBLE LINK)

2-8.0 RED

6-5.0 PPL (L19)

6-3.0 PPL (LO5)

450-1.0 BLK/WHT

ENGINE

S2

2-5.0 RED

12020183
C100

COWL

I/P

12020184
C100

33-.5 TAN/WHT

33-.5 TAN/WHT → TO BRAKE WARNING SWITCH (SEE PAGE 61)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP INDICATOR (CANADA ONLY (SEE PAGE 13, 15)

39-.5 PNK/BLK

39-.8 PNK/BLK

S206

39-.8 PNK/BLK → TO SAFETY BELT WARNING BUZZER AND TIMER (SEE PAGE 59)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP MODULE (CANADA ONLY) (SEE PAGE 13, 15)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP RELAY (CANADA ONLY) (SEE PAGE 13, 15)

39-.5 PNK/BLK

I/P CLUSTER CONNECTOR

12066292
C209

39-.8 PNK/BLK

2-3.0 RED

2-3.0 RED

2-3.0 RED

S207

2-3.0 RED

6-5.0 PPL

39-.8 PNK/BLK

2-3.0 RED

2-3.0 RED

2-3.0 RED

2-3.0 RED

2-3.0 RED

TO HEADLAMP SWITCH (SEE PAGE 8, 9, 12)

12010966

6294641

C207

GENERATOR 1204589 C126

39-.8 PNK/BLK

S102

39-.8 PNK/BLK

39-.8 PNK/BLK

39-.8 PNK/BLK

39-.8 PNK/BLK

TO RPO M40 KICKDOWN RELAY (SEE PAGE 37)

TO HOT FUEL HANDLING MODULE (SEE PAGE 32)

HOT IN RUN

GAGES 20 AMP

HOT AT ALL TIMES

HORN/DM 20 AMP

TAIL LPS 20 AMP

ECM B 10 AMP

PWR ACC 30 AMP

STP HAZ 20 AMP

HOT IN START OR RUN

FUEL PUMP 20 AMP

FRONT

PWR ACC 30 AMP

STP HAZ 20 AMP

FUEL PUMP 20 AMP

GAGES 20 AMP

HORN/DM 20 AMP

TAIL LPS 20 AMP

ECM B 10 AMP

REAR

FUSE BLOCK

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

2-13.0 RED

1-32.0 BLK

32.0 BLK

3.0 BLK

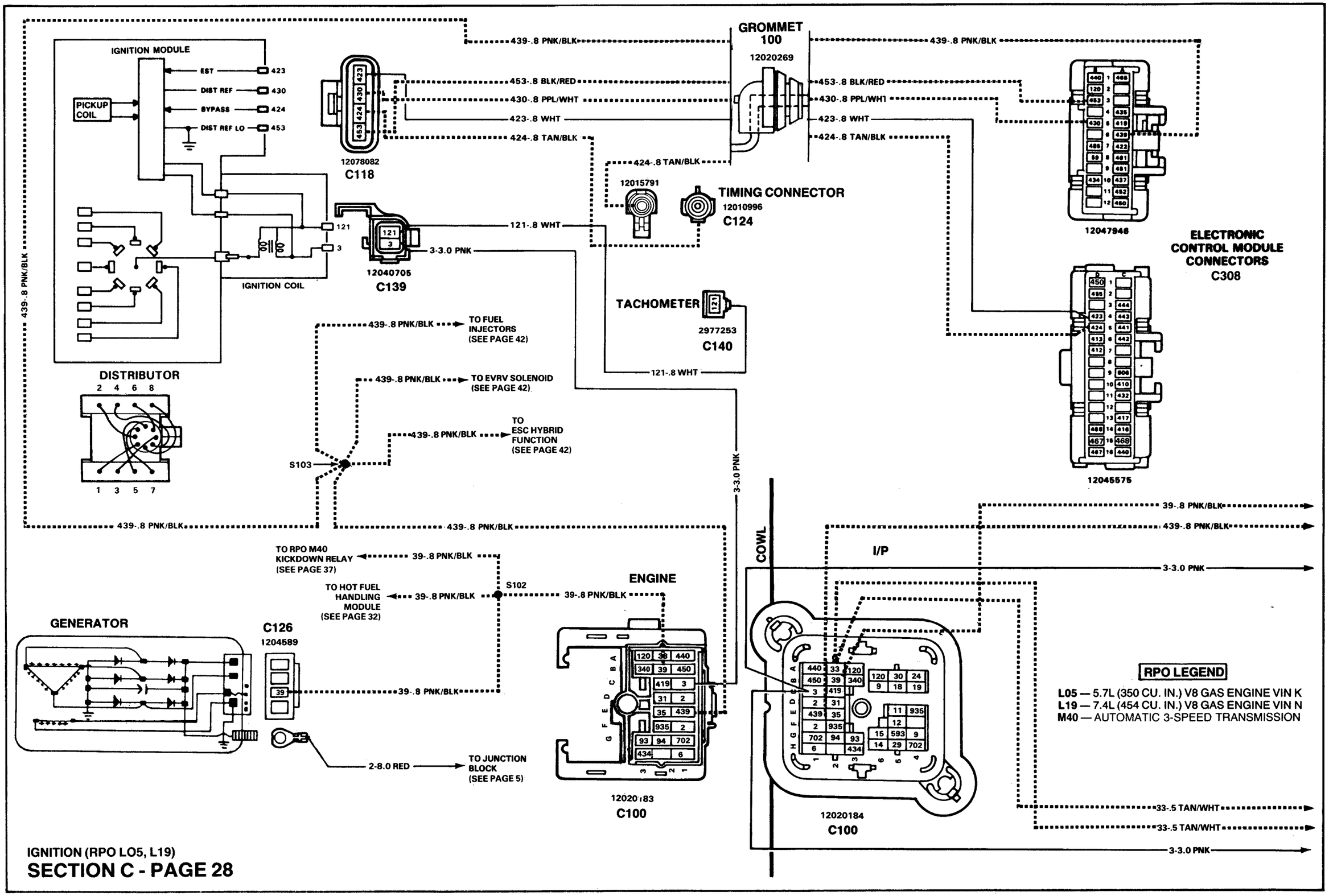
BATTERY

SHEET METAL GROUND G102

ENGINE GROUND G103

RPO LEGEND

LO5 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION



IGNITION (RPO LO5, L19)

SECTION C - PAGE 28

TO SAFETY BELT WARNING BUZZER AND TIMER (SEE PAGE 59)

39-.8 PNK/BLK

I/P CLUSTER CONNECTOR

11/629

39-.5 PNK/BLK

39-.5 PNK/BLK

S206

12066292
C209

33-.5 TAN/WHT

33-.5 TAN/WHT

39-.8 PNK/BLK

39-.8 PNK/BLK

33-.5 TAN/WHT

39-.8 PNK/BLK

439-.8 PNK/BLK

130-.22 BRN/WHT

3-3.0 PNK

130-.22 BRN/WHT

300-3.0 ORN

3-3.0 PNK

4-3.0 BRN

12010966

6294641

C207

HOT IN START OR RUN

AUX HTR A/C 25 AMP

HTR A/C 20 AMP

PWR WDO 30 AMP

HOT AT ALL TIMES

HORN/DM 20 AMP

TAIL LPS 20 AMP

ECM B 10 AMP

HOT IN ACCY OR RUN

RADIO 10 AMP

WIPER 25 AMP

HOT IN START OR RUN

TURN/BU 20 AMP

ECM I 10 AMP

GAGES 20 AMP

FRONT

FUSE BLOCK

3-3.0 PNK

4-3.0 BRN

AUX HTR A/C 25 AMP

GAGES 20 AMP

TURN/BU 20 AMP

HTR A/C 20 AMP

HORN/DM 20 AMP

RADIO 10 AMP

TAIL LPS 20 AMP

WIPER 25 AMP

PWR WDO 30 AMP

REAR

ECM I 10 AMP

ECM B 10 AMP

439-.8 PNK/BLK

300-3.0 ORN

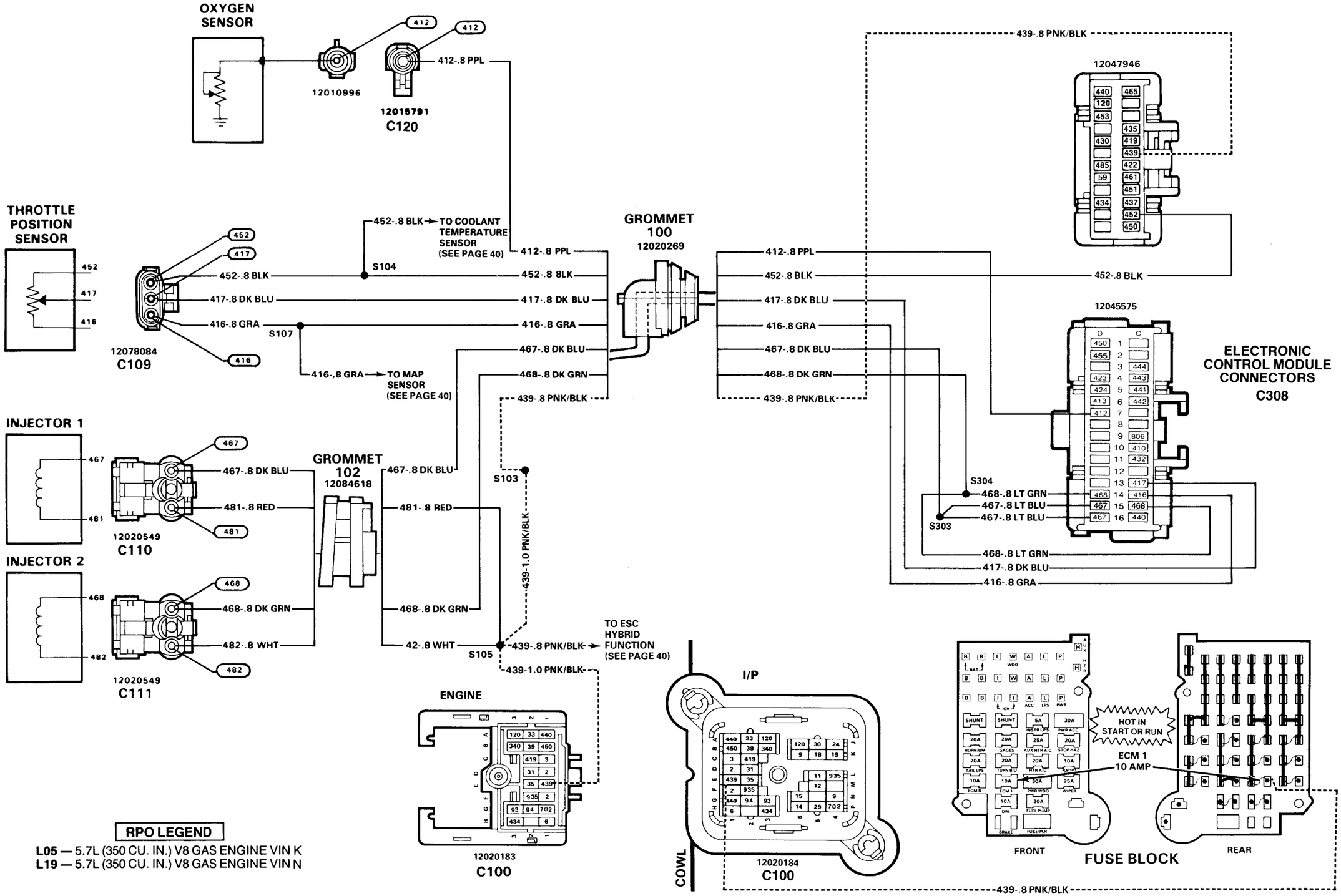
S208

IGNITION SWITCH

START
RUN
OFF
LOCK
ACC

COMPONENT LOCATION

		Page — Figure
Electric Fuel Pump/Fuel Gage Sending Unit	In top of fuel tank	98 — 30
Electronic Control Module	Under driver's seat	95 — 21
Fuel Pump/Oil Pressure Switch	Top LH rear of engine	90 — 7
Fuel Pump Relay	RH side of cowl	91 — 9
Fuse Block	LH side of cowl, under I/P	92 — 13
Grommet 100	Under driver's seat	95 — 21
Grommet 102	Engine compartment, under throttle body	90 — 8
Hot Fuel Handling Module	Under driver's seat	95 — 21
Idle Air Control	RH side of engine	90 — 8
Injector 1	On throttle body	90 — 8
Injector 2	On throttle body	90 — 8
Oxygen Sensor	In exhaust pipe	89 — 6
Throttle Position Sensor	RH side of throttle body	90 — 8
C100	Engine compartment, LH side of cowl	91 — 9
C104	At fuel pump relay, RH side of cowl	91 — 9
C109	At throttle position sensor	90 — 8
C110	At injector 1	90 — 8
C111	At injector 2	90 — 8
C113	At idle air control	90 — 8
C116	At fuel pump/oil pressure switch	90 — 7
C120	LH side of transmission case	89 — 6
C308	At ECM, under driver's seat	95 — 21
C312	Under driver's seat	95 — 21
C313	At hot fuel handling module	95 — 21
C400	At electric fuel pump/fuel gage sending unit	98 — 30
C401	At fuel tank crossmember, LH frame side rail	98 — 30
G100	On generator bracket	90 — 8
G101	Top front center of engine	90 — 7
G400	LH side of rear crossmember, in front of fuel tank	98 — 30
S100	Engine harness, RH side of cowl	91 — 9
S101	Engine harness, RH side of cowl	91 — 9
S102	Engine harness, center of cowl	91 — 9
S105	TBI harness, RH front of engine	90 — 8
S108	Engine harness, rear of engine	90 — 7
S206	I/P harness, above steering column	92 — 12
S300	Under driver's seat	95 — 21
S301	Under driver's seat	95 — 21
S303	Under driver's seat	95 — 21
S304	Under driver's seat	95 — 21



RPO LEGEND

L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN N

HOT FUEL HANDLING MODULE

GROUND 450
IGNITION SWITCH 39
FUEL PUMP FUSED 120

450-.8 BLK/WHT → TO EVRV SOLENOID (SEE PAGE 42)

450-.8 BLK/WHT → TO VEHICLE SPEED SENSOR (SEE PAGE 40)

450-.8 BLK/WHT → TO FUEL PUMP RELAY (SEE PAGE 33)

C313 — 12010000 — C312 — 12045688 — 12047886

GROMMET 100 — 12020269

S101

S108

S102

120-.8 TAN/WHT

450-1.0 BLK/WHT

120-2.0 TAN/WHT

39-.8 PNK/BLK

TO FUEL PUMP OIL PRESSURE SWITCH (SEE PAGE 33)

TO FUEL PUMP RELAY (SEE PAGE 33)

TO GENERATOR (SEE PAGE 5)

TO RPO M40 KICKDOWN RELAY (SEE PAGE 37)

ELECTRONIC CONTROL MODULE CONNECTOR C308 — 12047946

S300

450-.8 BLK/WHT

TO ALDL CONNECTOR (SEE PAGE 41)

TO ECM CONNECTOR (SEE PAGE 41, 43)

39-.8 PNK/BLK

486-.8 BRN → TO ESC HYBRID FUNCTION (SEE PAGE 41)

GROUND ON ALTERNATOR BRACKET G100

413-.8 TAN → TO ECM (SEE PAGE 40)

ENGINE GROUND G101

ENGINE — 12020183 — C100

COWL

I/P — 12020184 — C100

30-.5 PNK

TO I/P CLUSTER CONNECTOR (SEE PAGE 54)

HOT IN START OR RUN

GAGES 20 AMP

FRONT

FUSE BLOCK

REAR

GAGES 20 AMP

39-.5 PNK/BLK → TO DAYTIME RUNNING LAMP INDICATOR (CANADA ONLY) (SEE PAGE 13, 15)

39-.8 PNK/BLK → TO I/P CLUSTER CONNECTOR (SEE PAGE 54, 56)

39-.8 PNK/BLK → SAFETY BELT WARNING BUZZER AND ALARM (SEE PAGE 59)

S206

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP MODULE (SEE PAGE 13, 15)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP RELAY (SEE PAGE 13, 15)

(CANADA ONLY)

ELECTRIC FUEL PUMP/ FUEL GAGE SENDING UNIT

C400 — 12020829 — 12020827

150-2.0 BLK

30-.8 PNK

120-2.0 TAN/WHT

FUEL PUMP PRIME — C401 — 2977253

REAR BODY — 12020099 — C100

150-2.0 BLK → TO TAILLAMPS (SEE PAGE 83)

SHEET METAL GROUND G400

RPO LEGEND

L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

HOT FUEL HANDLING
(RPO L05, L19)

IDLE AIR CONTROL
(RPO L19)

12040754
C113

441 442 443 444

D C B A

450-.8 BLK/WHT

443-.8 LT GRN/WHT
442-.8 LT BLU/BLK
441-.8 LT BLU/WHT
444-.8 LT GRN/BLK

IDLE AIR CONTROL
(RPO L05)

STEPPER MOTOR

FUEL PUMP OIL PRESSURE SWITCH

12015798
C113

GROUND ON GENERATOR BRACKET G100

450-1.0 BLK/WHT

S300

GROMMET 100
12020269

ELECTRONIC CONTROL MODULE CONNECTORS C204

440-.8 ORN
465-.8 DK GRN/WHT
120-.8 TAN/WHT
450-.8 BLK/WHT
443-.8 LT GRN/WHT
442-.8 LT BLU/WHT
441-.8 LT BLU/WHT
444-.8 LT GRN/BLK
450-.8 BLK/WHT

12047946
C308

440-1.0 ORN
440-.8 ORN
120-.8 TAN/WHT
465-.8 DK GRN/WHT
413-.8 TAN

12045575

HOT AT ALL TIMES

ECM B 10 AMP
FUEL PUMP 20 AMP

FRONT
FUSE BLOCK
REAR

ECM B 10 AMP
FUEL PUMP 20 AMP

440-.8 ORN
340-2.0 ORN

12020829

ELECTRIC FUEL PUMP FUEL GAGE SENDING UNIT

12020827
C400

120-1.0 TAN/WHT
120-.8 TAN/WHT

S108

340-1.0 ORN

12065401
C116

S100
340-2.0 ORN
440-1.0 ORN
120-2.0 TAN/WHT
120-.8 TAN/WHT

TO HOT FUEL HANDLING MODULE (SEE PAGE 32)

340-1.0 ORN
465-.8 DK GRN/WHT
440-1.0 ORN
120-1.0 TAN/WHT

S301
440-.8 ORN

S101
450-.8 BLK/WHT
FROM EVRV SOLENOID (SEE PAGE 42)
450-1.0 BLK/WHT
450-.8 BLK/WHT

ENGINE GROUND G101

VEHICLE SPEED SENSOR (SEE PAGE 40)

440-1.0 ORN
340-2.0 ORN
120-1.0 TAN/WHT

ENGINE

12020183
C100

COWL
I/P

120-2.0 TAN/WHT

1202184
C100

TO I/P CLUSTER CONNECTOR (SEE PAGE 54)
30-.5 PNK

12020099
C100

30-.8 PNK
150-2.0 BLK
120-2.0 TAN/WHT

SHEET METAL GROUND G400

FUEL PUMP RELAY

465-.8 DK GRN/WHT
120-2.0 TAN/WHT
450-1.0 BLK/WHT
340-1.0 ORN

12052287
C104

REAR BODY

120-1.0 TAN/WHT

FUEL PUMP PRIME

2977253
C401

RPO LEGEND

L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

FUEL CONTROL AND IDLE AIR CONTROL (RPO L05, L19)

CIRCUIT OPERATION

Battery voltage is applied to the Auxiliary Cooling Fan Relay at the RED (2) wire at all times and to the PNK/BLK (39) wire when the Ignition Switch is in RUN or START. When the Auxiliary Cooling Fan Switch closes, circuit 935 is grounded and Auxiliary Cooling Fan Relay energizes. Battery voltage is applied across the Auxiliary Cooling Fan Motor and the Auxiliary Cooling Fan runs.

COMPONENT LOCATION

		Page — Figure
Auxiliary Cooling Fan, LH	LH front of engine compartment	—
Auxiliary Cooling Fan Relay	RH side, front of cowl	91 — 9
Auxiliary Cooling Fan, RH	RH front of engine compartment	—
Auxiliary Cooling Fan Switch	Behind, RH side of radiator	88 — 3
Fuse Block	LH side of cowl, under I/P	92 — 13
Junction Block	LH front of cowl	89 — 5
C100	Engine compartment, LH side of cowl	91 — 9
C123	At auxiliary cooling fan relay	91 — 9
C125	At auxiliary cooling fan switch	88 — 3
G105 (P52)	On side of radiator support	88 — 3
G105 (P62)	At radiator support	88 — 4
S102	Engine wiring harness, center of cowl	91 — 9
S206	I/P harness, above steering column	92 — 12

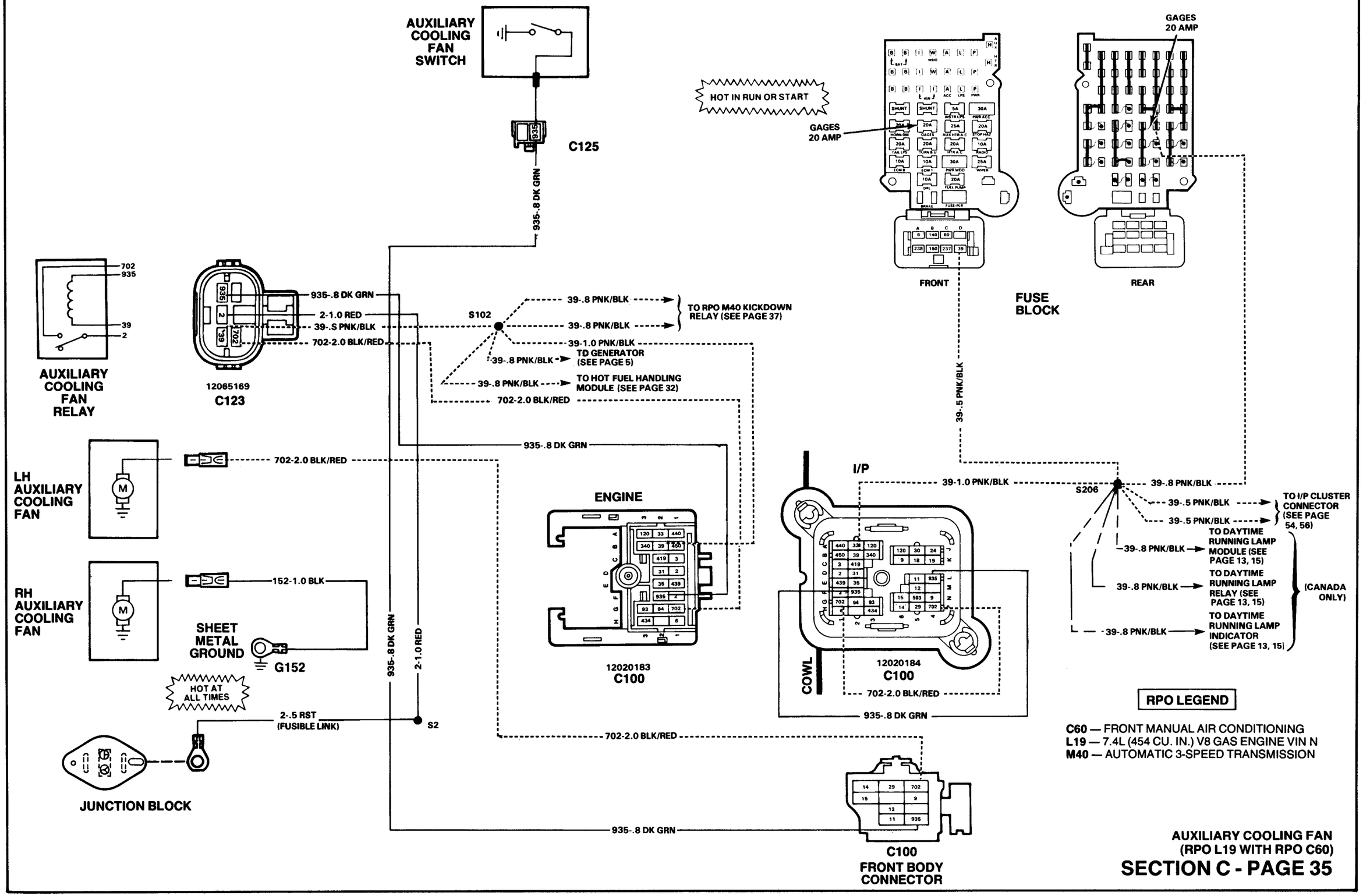
TROUBLESHOOTING CHART—AUXILIARY COOLING FAN

COOLING FAN DOES NOT RUN

TEST	RESULT	ACTION
1. Place ignition switch in RUN. Disconnect fan temperature switch connector C125. Connect a fused jumper from DK GRN (935) wire at fan temperature switch connector C125 to ground.	Cooling fan does not run.	GO to step 2.
	Cooling fan runs.	REPLACE cooling fan temperature switch.
2. Disconnect fan relay connector C123. Connect test lamp from PNK/BLK (39) wire at fan relay connector C123 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK condition of fuse (GAGES) and/or LOCATE and REPAIR open in PNK/BLK (39) wire from fan relay to fuse block.
3. Connect fused jumper from DK GRN (935) wire at fan temperature switch connector C125 to ground. Connect test lamp from PNK/BLK (39) wire to DK GRN (935) wire at fan relay connector C141.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (935) wire.
4. Connect test lamp from RED (2) wire at fan relay connector C123 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 30 amp fused jumper from RED (2) wire to BLK/RED (702) wire at the fan relay connector C123.	Cooling fan does not run.	GO to step 6.
	Cooling fan runs.	REPLACE cooling fan relay.
6. Leave 30 amp fused jumper connected. Disconnect cooling fan connector C139. Connect a test lamp from BLK/RED (702) at cooling fan connector to ground.	Test lamp lights.	REPLACE cooling fan.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/RED and BLK/WHT (702) wires from cooling fan to fan relay.

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 fan temperature switch connector C125.	Cooling fan runs.	GO to step 2.
	Cooling fan does not run.	REPLACE fan temperature switch.
2. Disconnect fan relay connector C123. Connect test lamp from PNK/BLK(39) to DK GRN (935) wires at fan relay connector C123.	Test lamp lights.	CHECK for short in DK GRN (935) wire from fan relay to fan temperature switch.
	Test lamp does not light.	REPLACE fan relay.



RPO LEGEND

C60 — FRONT MANUAL AIR CONDITIONING
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

AUXILIARY COOLING FAN (RPO L19 WITH RPO C60)

COMPONENT LOCATION

		Page — Figure
Electronic Control Module	Under driver's seat	95 — 21
Fuse Block	LH side of cowl, under I/P	92 — 13
Grommet 100	Under driver's seat	95 — 21
Kickdown Relay	RH side of cowl	91 — 9
Transmission Kickdown Solenoid	Rear, LH side of transmission	90 — 7
C100	Engine compartment, LH side of cowl	91 — 9
C105	At transmission kickdown relay	91 — 9
C121	At transmission kickdown solenoid	90 — 7
C308	At ECM, under driver's seat	95 — 21
S102	Engine wiring harness, center of cowl	91 — 9
S206	I/P harness, above steering column	92 — 12

TRANSMISSION KICKDOWN SOLENOID

55

55

2984092
C121

55-.8 ORN

GROMMET
100
12020269

422-.8 TAN/BLK

422-.8 TAN/BLK

440	1		465
120	2		
435	3		
	4		453
430	5		419
	6		439
485	7		422
59	8		461
	9		451
434	10		437
	11		452
	12		460

12047946

ELECTRONIC CONTROL MODULE CONNECTOR
C308

39-.8 PNK/BLK → TO HOT FUEL HANDLING MODULE (SEE PAGE 32)

39-.8 PNK/BLK → TO GENERATOR (SEE PAGE 5)

S102

39-.8 PNK/BLK

KICKDOWN RELAY
LO5/L19 ONLY

39 39
E C
NO NC
A F
55 422

39-.8 PNK/BLK

39-.8 PNK/BLK

55-.8 ORN

422-.8 TAN/BLK

12065169
C105

ENGINE

12020183
C100

COWL

I/P

39-.8 PNK/BLK

12020184
C100

S206

39-.5 PNK/BLK → TO I/P CLUSTER CONNECTOR (SEE PAGE 54, 56)

39-.5 PNK/BLK

39-.8 PNK/BLK → TO SEAT BELT WARNING BUZZER AND ALARM (SEE PAGE 59)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP MODULE (SEE PAGE 13, 15)

39-.8 PNK/BLK → TO DAYTIME RUNNING LAMP RELAY (SEE PAGE 13, 15)

(CANADA ONLY)

HOT IN RUN OR START

GAGES 20 AMP

FUSE BLOCK

FRONT

GAGES 20 AMP

REAR

RPO LEGEND

L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 — AUTOMATIC 3-SPEED TRANSMISSION

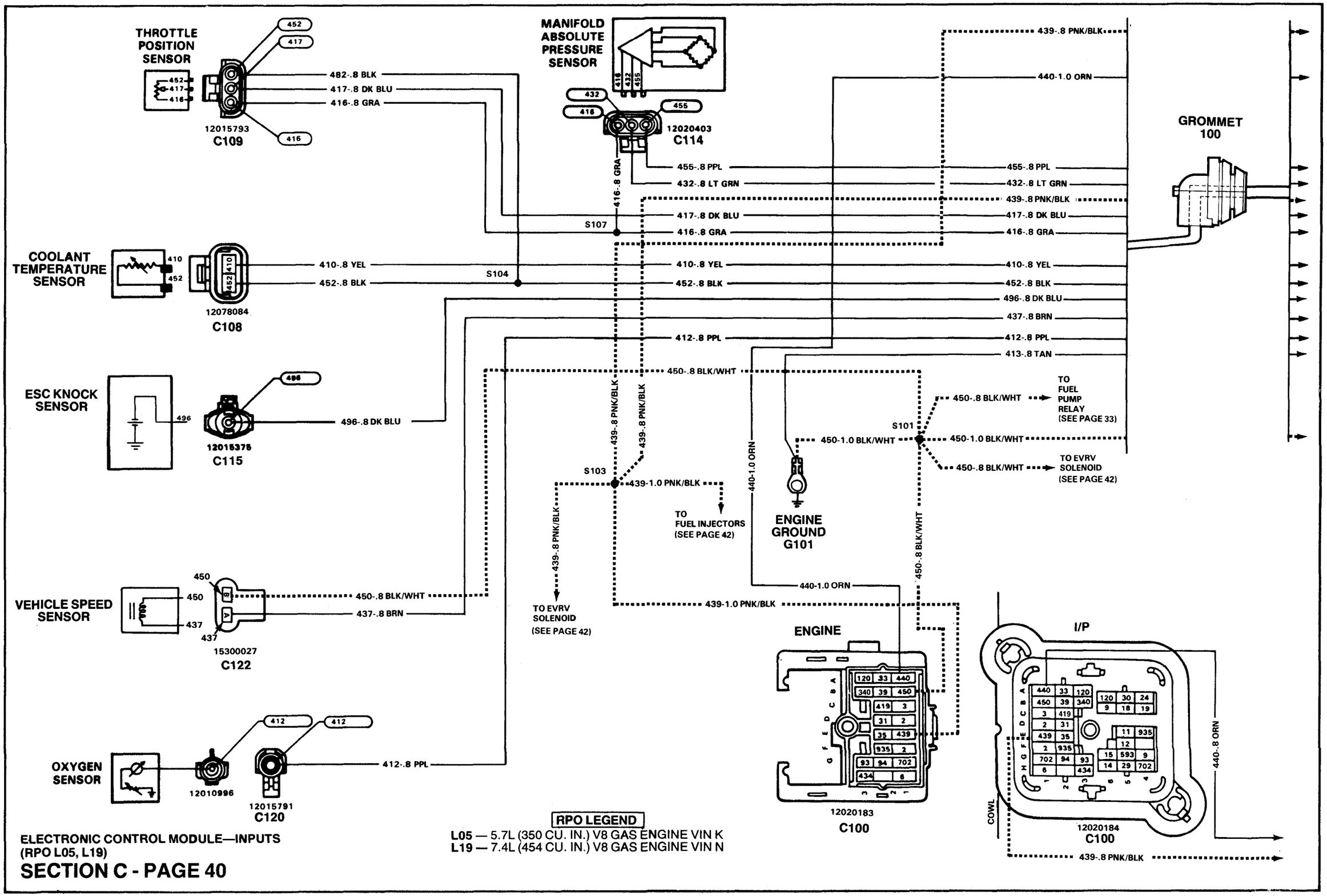
AUTOMATIC TRANSMISSION KICKDOWN SOLENOID (RPO M40)

COMPONENT LOCATION

		Page — Figure
ALDL	Under LH side of I/P	93 — 14
Coolant Temperature Sensor	Top, center of engine	90 — 7
Distributor (P52)	Top, rear of engine	89 — 6
Distributor (P62)	Top, rear of engine	90 — 7
Electronic Control Module	Under driver's seat	95 — 21
ESC Hybrid Function	Under driver's seat	95 — 21
ESC Knock Sensor	Top, RH side of engine	90 — 8
EVRV	Top, RH side of engine	90 — 8
Fuel Pump Oil Pressure Sensor Switch	Top, rear of engine	90 — 7
Fuel Pump Relay (P52)	RH side of cowl	91 — 9
Fuel Pump Relay (P62)	RH side of cowl	91 — 9
Fuse Block	LH side of cowl, under I/P	92 — 13
Grommet 100	Under driver's seat	95 — 21
Grommet 102	Engine compartment, under throttle body	90 — 8
Idle Air Control Actuator	RH side of engine	90 — 8
INJ-1	On throttle body	90 — 8
INJ-2	On throttle body	90 — 8
Manifold Absolute Pressure Sensor	Top, RH side of engine	90 — 8
Oxygen Sensor	In exhaust pipe	89 — 6
Throttle Position Sensor	RH side of throttle body	90 — 8
Vehicle Speed Sensor	LH side of transmission case	—
C100	Engine compartment, LH side of cowl	91 — 9
C104	At fuel pump relay, RH side of cowl	91 — 9
C108	Front of engine, at coolant temperature sensor	90 — 7
C109	At throttle position sensor	90 — 8
C110	At injector 1	90 — 8
C111	At injector 2	90 — 8
C112	Top, RH side of engine	90 — 8
C113	At idle air control	90 — 8
C114	At MAP sensor	90 — 8
C115	At lower RH side of engine	90 — 8
C116 (RPO L05)	Top, LH rear of engine	90 — 7
C118 (P52)	At distributor	89 — 6
C118 (P62)	At distributor	90 — 7
C120	LH side of transmission case	90 — 6
C122 (P52)	Engine harness, rear of engine, top of transmission	89 — 6
C122 (P62)	Engine harness, rear of engine, top of transmission	90 — 7
C124 (P52)	Top, rear of engine	89 — 6
C124 (P62)	Top, rear of engine	90 — 7
C308	At ECM, under driver's seat	95 — 21
C309 (RPO L05)	Under driver's seat	95 — 21
C309 (RPO L19)	Under driver's seat	95 — 21
C310	At ALDL pigtail	95 — 21
C311	Under LH side of I/P	93 — 14
G100	On generator bracket	90 — 8
S100	Engine harness, RH side of cowl	91 — 9
S101	Engine harness, RH side of cowl	91 — 9
S103	Engine harness, RH side of engine	90 — 8
S104	Engine harness, RH side of engine	90 — 8
S105	TBI harness, RH front of engine	90 — 8
S107	Engine harness, rear RH side of engine	90 — 8
S108	Engine harness, rear of engine	90 — 7
S300	Under driver's seat	95 — 21
S301	Under driver's seat	95 — 21
S302	Under driver's seat	95 — 21
S303	Under driver's seat	95 — 21
S304	Under driver's seat	95 — 21

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
419	.8	BRN/WHT	A5	SYSTEM CHECK LAMP
439	.8	PNK/BLK	A6	12V IGNITION FUSED
422	.8	TAN/BLK	A7	RPO M40 KICKDOWN RELAY
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASSEMBLY LINE DIAGNOSTIC LINK
437	.8	BRN	A10	SPEED SENSOR
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 REFERENCE LOW
			B4	NOT USED
430	.8	PPL/WHT	B5	DISTRIBUTOR REFERENCE HIGH
			B6	NOT USED
485	.8	BLK	B7	SPARK RETARD CONTROL
59	.8	DK GRN	B8	AIR CONDITIONING
			B9	NOT USED
434	.5	ORN/BLK	B10	PARK/NEUTRAL SWITCH
			B11	NOT USED
			B12	NOT USED

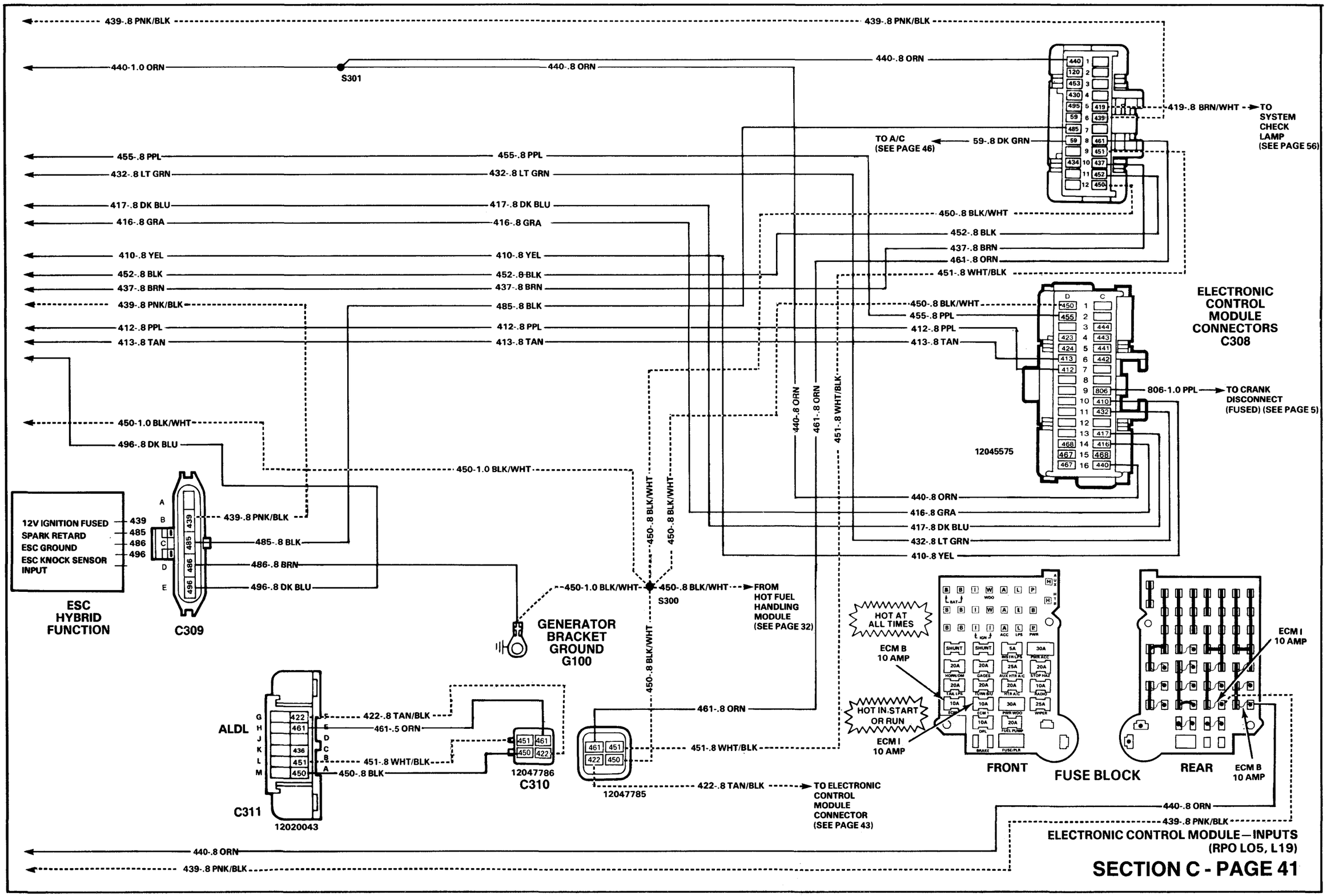
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
			C1	NOT USED
			C2	NOT USED
444	.8	LT GRN/BLK	C3	STEPPER COIL B LOW
443	.8	LT GRN/WHT	C4	STEPPER COIL B HIGH
441	.8	LT BLU/WHT	C5	STEPPER COIL A HIGH
442	.8	LT BLU/BLK	C6	STEPPER COIL A LOW
			C7	NOT USED
			C8	NOT USED
806	1.0	PPL/WHT	C9	CRANK DISCRETE FUSED
410	.8	YEL	C10	COOLANT TEMPERATURE
432	.8	LT GRN	C11	MANIFOLD ABSOLUTE PRESSURE
			C12	NOT USED
417	.8	DK BLU	C13	THROTTLE POSITION SENSOR
416	.8	GRA	C14	5V SENSOR REFERENCE
468	.8	LT GRN	C15	INJECTOR B 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	LT GRN	D14	INJECTOR B DRIVE
467	.8	LT BLU	D15	INJECTOR A DRIVE
467	.8	LT BLU	D16	INJECTOR A DRIVE



RPO LEGEND

L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N

ELECTRONIC CONTROL MODULE—INPUTS (RPO L05, L19)



ELECTRONIC CONTROL MODULE—INPUTS (RPO LO5, L19)

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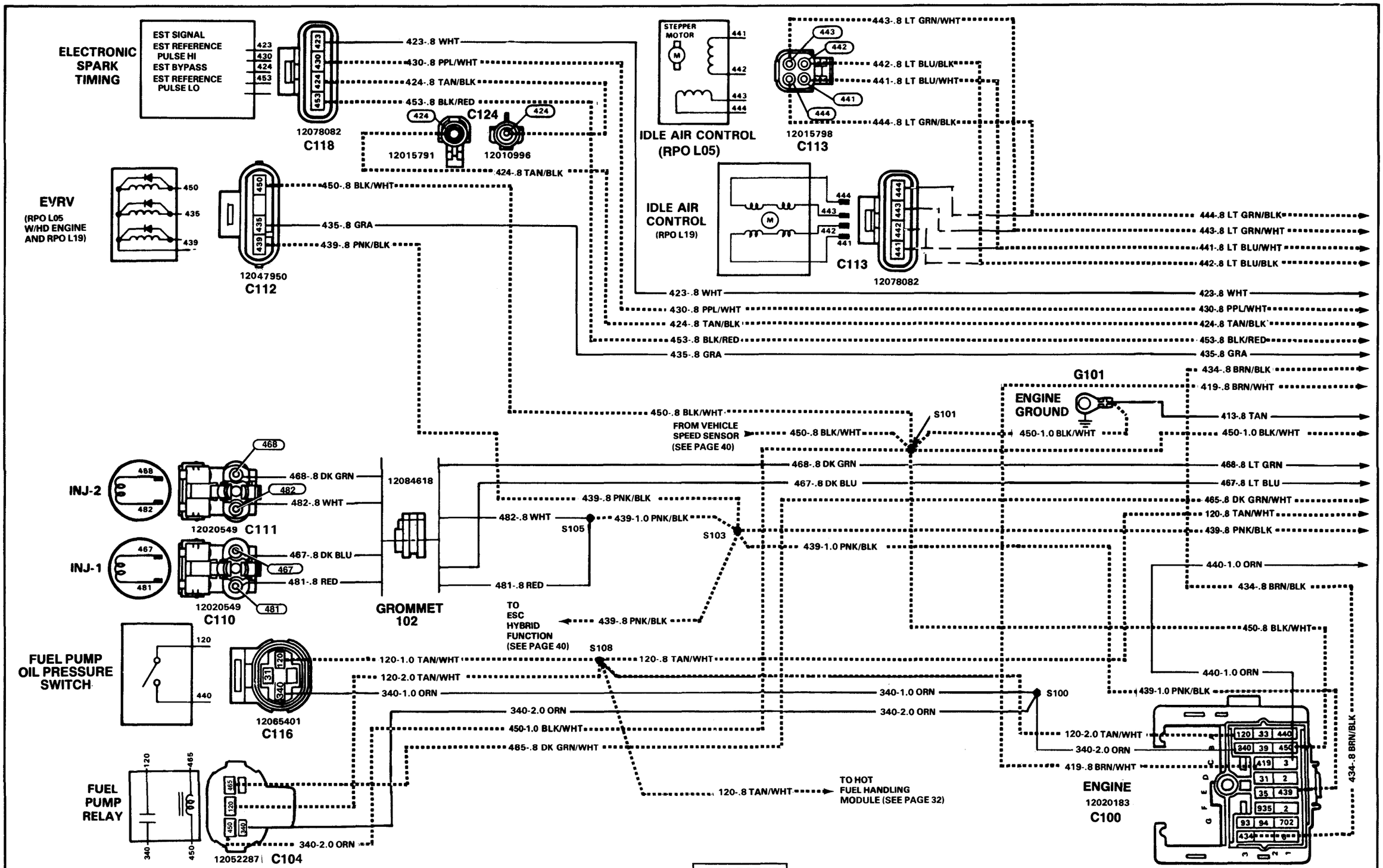

RPO LEGEND

L05 — 5.7L (350 CU. IN.) V8 GAS ENGINE VIN K
L19 — 7.4L (454 CU. IN.) V8 GAS ENGINE VIN N
M40 —AUTOMATIC THREE SPEED TRANSMISSION

ELECTRONIC CONTROL MODULE—OUTPUTS (RPO L05, L19)

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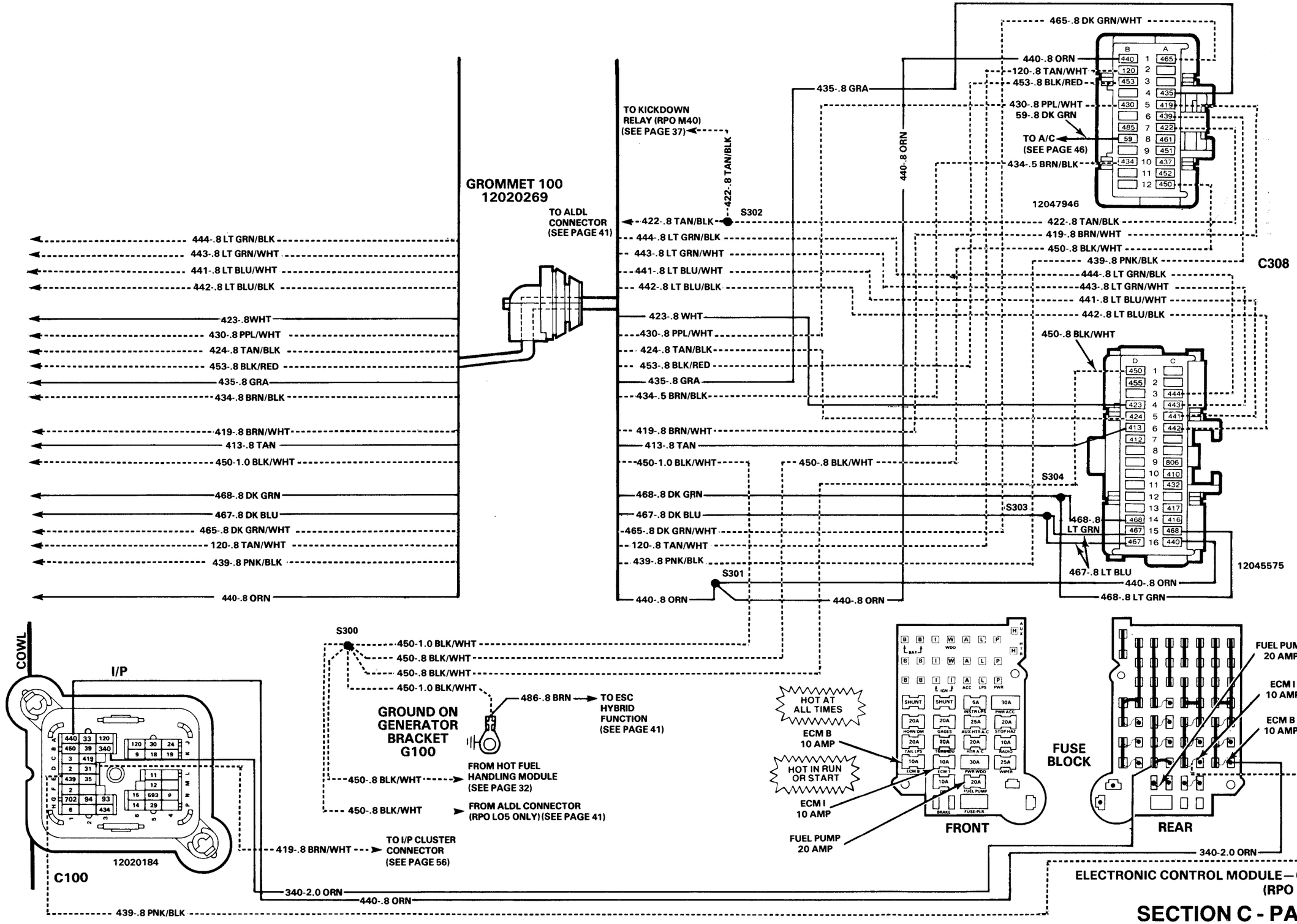


ELECTRONIC CONTROL MODULE—OUTPUTS
(RPO LO5, L19)

CIRCUIT OPERATION

COMPRESSOR CONTROLS

With the A/C-Heater Select Control in any mode except VENT or HEAT, current flows from the HTR-A/C fuse through the Selector Control, and Evaporator Pressure Control Switch to the A/C Compressor Clutch, and the A/C Compressor operates. At the same time a signal is sent to the Electronic Control Module (ECM). This A/C Request signal increases engine idle speed.

If the A/C system pressure drops below 25 psi, the Evaporator Pressure Control Switch opens, stopping current flow to the A/C Compressor. When the A/C system pressure rises to 45 psi, the switch closes and current again flows to the A/C Compressor.

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.

BLOWER MOTOR CONTROL

In all blower speeds except HI, power to the Blower Motor is supplied by the HTR-A/C fuse. In HI blower speed, the blower motor is supplied by Fuse Link C.

The Blower Motor operates whenever the A/C-Heater Select Control is in MAX A/C, NORM A/C, BI-LEVEL, BLEND or DEFROST. Power through the A/C-Heater Select Control is available to the Blower resistors through the 51 (YEL) wire. The current then flows through all three resistors and the normally closed contacts of the HI Blower Relay to the Blower Motor and the Blower Motor runs at very low speed. With the A/C-Heater Select Control in VENT or HEAT no power is available to the Blower Motor.

With the Blower Switch in LO, current flows from the HTR-A/C fuse through the Blower Switch to the 63 (TAN) wire at the Blower Resistors. Current then flows through two of the resistors and the normally closed contacts of the HI Blower Relay to the Blower Motor. The Blower Motor then runs at low speed.

With the Blower Switch in MED, the blower operates the same as in Low Speed, except that the current is directed to the Blower Resistors through the 72 (LT BLU) wire and passes through only one resistor and the Blower Motor runs at slightly faster speed.

With the Blower Switch in HI, current bypasses the Blower Resistors and flows to the HI Blower Relay. This current energizes the relay and closes the normally open contacts of the relay. This allows current to flow from Fuse Link B through the relay to the Blower Motor and the Blower Motor runs at high speed.

COMPONENT LOCATION

		Page — Figure
A/C Compressor	Engine compartment, in front of RH cylinder head	91 — 10
Blower Switch	A/C control assembly, RH side of I/P cluster	93 — 15
Blower Motor	Engine compartment, RH side of cowl	91 — 10
Electronic Control Module	Under driver's seat	95 — 21
Evaporator Pressure Control Switch	Engine compartment, front of evaporator accumulator	91 — 10
Fuse Block	LH side of cowl, under I/P	92 — 13
Grommet 103	Engine compartment, RH side of cowl	91 — 10
HI Blower Relay	Engine compartment, RH side of cowl	91 — 10
Junction Block	Engine compartment, LH side of cowl	91 — 10
Resistor	Engine compartment, RH side of cowl	91 — 10
Selector Control	A/C control assembly, right of I/P cluster	93 — 15
C141	RH side of I/P, right of blower motor	91 — 10
C142	Front of blower motor	91 — 10
C143	RH side of I/P, right of blower motor	91 — 10
C144	Engine compartment, front of evaporator accumulator	91 — 10
C145	Center of engine compartment, above air cleaner snorkel	91 — 10
C150	At top of A/C compressor	91 — 10
C213	At A/C control assembly, right of I/P cluster	93 — 15
C214	At A/C control assembly, right of I/P cluster	93 — 15
C215 (RPO L05)	Behind I/P, RH side of steering column	93 — 15
C308	Under driver's seat	95 — 21
G107	Engine compartment, above air cleaner snorkel	91 — 10
G108	Engine compartment, center of cowl	91 — 10

TROUBLESHOOTING CHART—AIR CONDITIONING

A/C COMPRESSOR CLUTCH DOES NOT ENGAGE

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

TEST	RESULT	ACTION
1. Place ignition in RUN, A/C ON and blower to HI. Listen for blower operation.	Blower motor runs.	GO to step 3.
	Blower motor does not run.	GO to step 2.
2. Connect test lamp from BRN (50) wire at selector control connector C214 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire between selector control connector C214 and fuse block.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from LT GRN (66) wire at evaporator pressure control switch connector C144 to ground.	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (66) wire between evaporator pressure control switch connector C144 and selector control connector C214 or REPLACE selector control switch.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from DK GRN (59) wire at A/C compressor connector C150 to ground.	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (59) wire between A/C compressor and evaporator pressure control switch connector C144 or REPLACE evaporator pressure control switch.
	Test lamp lights.	GO to step 5.
5. Connect a test lamp from DK GRN (59) wire to BLK (150) wire at A/C compressor connector C150.	Test lamp lights.	REPLACE A/C compressor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between A/C compressor and ground G107.

BLOWER MOTOR DOES NOT OPERATE AT ANY SPEED

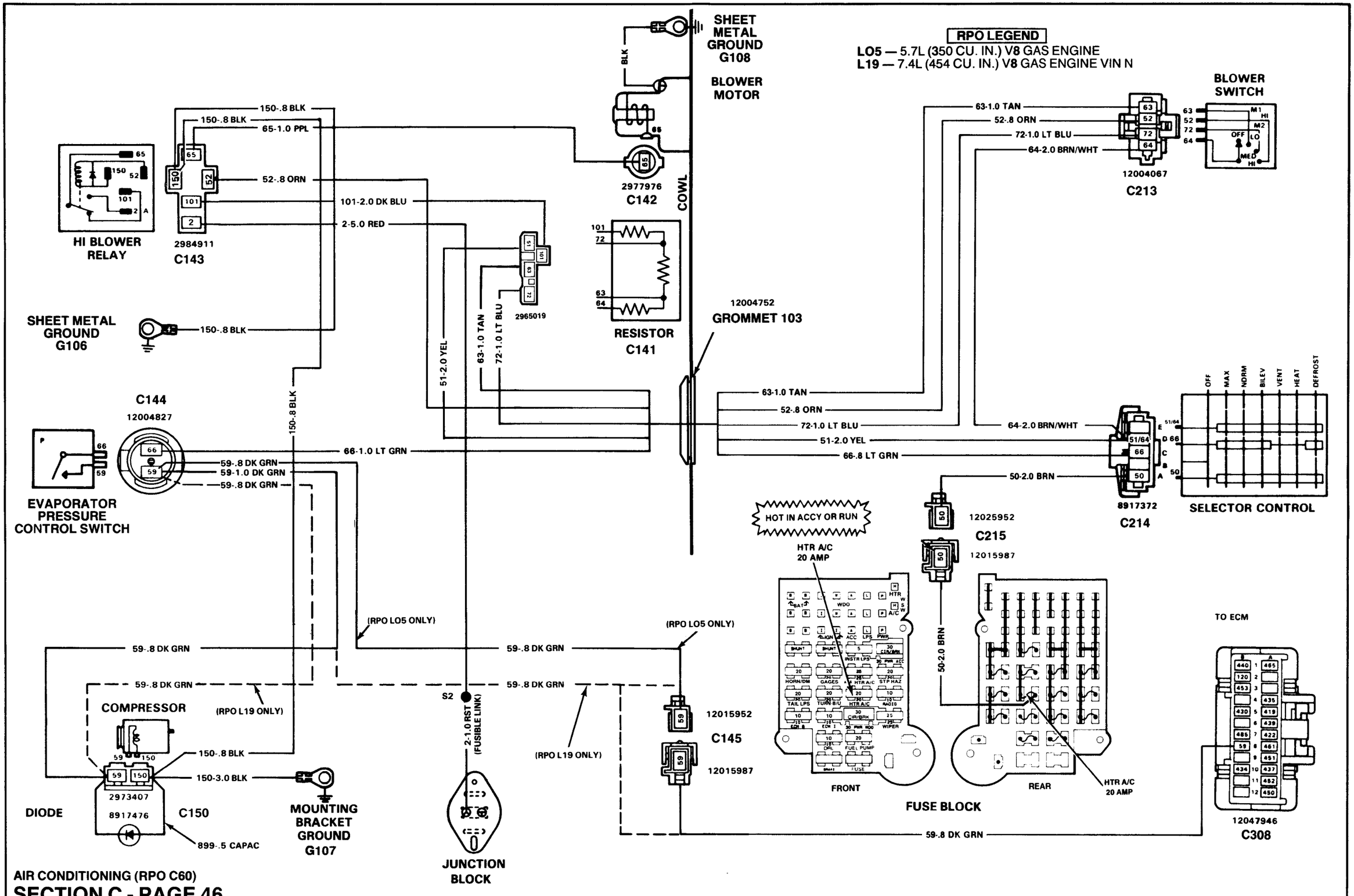
TEST	RESULT	ACTION
1. Place ignition in RUN and blower speed to HI. Connect test lamp from BRN (50) wire at selector control connector C214 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire between selector control and fuse block or REPLACE HTR A/C fuse.
	Test lamp lights.	GO to step 2.
2. Connect a test lamp from BRN/WHT (64) wire at blower switch connector C213 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BRN/WHT (64) wire between selector control and blower switch or REPLACE selector control.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from PPL (65) wire at blower motor connector C142 to ground.	Test lamp does not light.	LOCATE and REPAIR open in PPL (65) wire between hi blower relay and blower motor.
	Test lamp lights.	GO to step 4.
4. Connect test lamp from PPL (65) wire to BLK (150) wire at blower motor.	Test lamp lights.	REPLACE blower motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) between blower motor and ground G108.

BLOWER DOES NOT OPERATE IN HI

TEST	RESULT	ACTION
1. Place ignition in RUN and blower speed to HI. Connect test lamp from ORN (52) wire at blower switch *connector* C213 to *ground*.	Test lamp does not light.	REPLACE blower switch.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from ORN (52) wire at HI blower relay connector C143 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (52) wire between hi blower relay and blower switch.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from RED (2) wire at hi blower relay connector C143 to ground	Test lamp does not light.	LOCATE and REPAIR open in RED (2) fusible link.
	Test lamp lights.	GO to step 4.
4. Connect test lamp from RED (2) wire to BLK (150) wire at hi blower relay connector C143.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between hi blower relay and ground G107.
	Test lamp lights.	REPLACE hi blower relay.

BLOWER MOTOR DOES NOT OPERATE IN LO AND/OR MED SPEED

TEST	RESULT	ACTION
1. Place ignition in RUN and blower to inoperative blower speed. If blower does not operate in both LO and MED, go to step 2. If LO speed is inoperative, connect test lamp from TAN (63) wire at blower resistor connector C141 to ground. If MED speed is inoperative, connect test lamp from LT BLU (72) wire at blower resistor connector C141 to ground.	Test lamp does not light.	LOCATE and REPAIR open in TAN (63) or LT BLU (72) wire between blower switch and blower resistor.
	Test lamp lights.	GO to step 2.
2. Connect a fused jumper from TAN (63) or LT BLU (72) (depending on which speed is inoperative) to DK BLU (101) wire at blower resistor connector C141.	Blower runs.	REPLACE blower resistor.
	Blower does not run.	GO to step 3.
3. Connect a fused jumper from DK BLU (101) wire at blower motor resistor connector to DK BLU (101) wire at hi blower relay connector C143.	Blower runs.	LOCATE and REPAIR open in DK BLU (101) wire between blower motor resistor and hi blower relay.
	Blower does not run.	REPLACE hi blower relay.



AIR CONDITIONING (RPO C60)

SECTION C - PAGE 46

BLANK

CIRCUIT OPERATION

The Blower Motor delivers air to the interior of the vehicle. Its speed is controlled by the Blower switch and the Blower Resistors. When the Ignition Switch is in RUN, battery voltage is applied to the Blower Switch. With the Blower Switch in LO, voltage is applied across both Blower Resistors and the Blower Motor. The Blower Motor runs at its slowest speed. With the Blower Switch in MED, one of the Blower Resistors is bypassed and the Blower Motor runs faster. When the Blower Switch is set to HI, battery voltage is applied directly to the Blower Motor and the Blower Motor runs at its fastest speed.

COMPONENT LOCATION

		Page — Figure
Blower Motor	Engine compartment side of cowl, RH side	91 — 10
Fuse Block	LH side of cowl, under I/P	92 — 13
Grommet 103	Engine compartment, RH side of cowl	91 — 10
Heater Blower Switch	On heater control assembly, to right of instrument cluster	93 — 15
Resistor	In top of heater blower housing, RH side of cowl	91 — 10
C141	At resistor	91 — 10
C142	At blower motor	91 — 10
C213	At heater blower switch, behind I/P	93 — 15
C215	Heater blower switch jumper, under I/P	93 — 15

TROUBLESHOOTING CHART—HEATER

BLOWER MOTOR DOES NOT OPERATE AT ALL

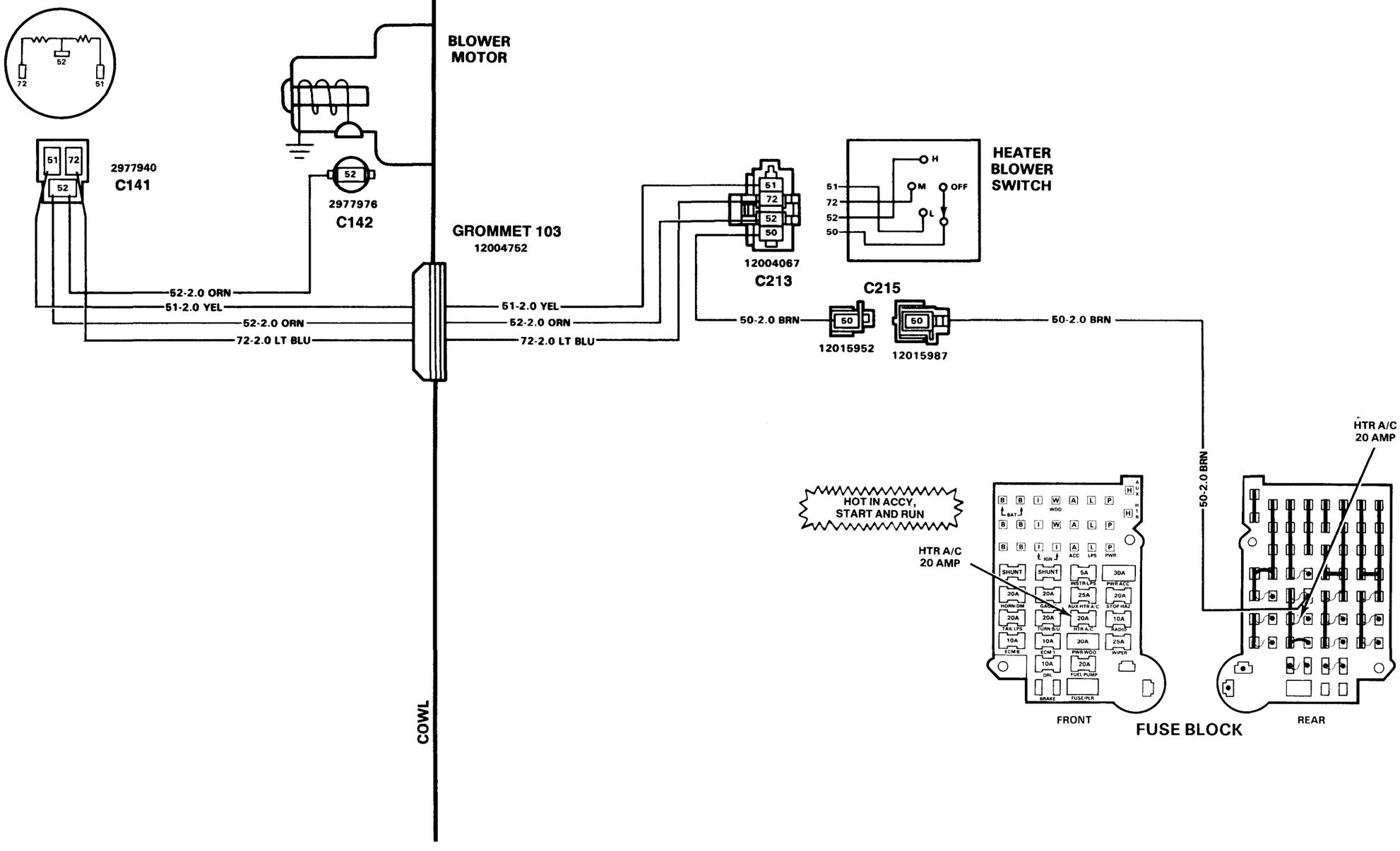
TEST	RESULT	ACTION
1. Check condition of fuse (HTR A/C).	Fuse is not blown.	GO to step 2.
	Fuse is blown.	LOCATE and REPAIR source of overload. Then, REPLACE fuse.
2. Disconnect blower motor connector C142. Connect a test lamp from ORN (52) wire at blower motor connector C142 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 4.
3. Inspect ground connection at blower motor.	Connection in good condition.	REPLACE blower motor.
	Poor ground connection.	REPAIR ground connection.
4. Connect a test lamp from BRN (50) wire at blower switch connector C213 to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (50) wire.
5. Place blower switch in LO, MED, or HI. Connect a test lamp from blower switch connector C213 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.

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

TEST	RESULT	ACTION
1. Connect test lamp from ORN (52) wire at blower switch connector C213 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect test lamp from ORN (52) wire at resistor connector C213 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (52) wire from resistor to blower switch.

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 test lamp from either YEL (51) LO wire or LT BLU (72) MED wire (depending on switch position) at blower motor switch connector C213 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE blower switch.
2. Connect test lamp from either YEL (51) LO wire or LT BLU (72) MED wire (depending on switch position) at resistor connector C141 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in wire(s) (51 or 72) from resistor to blower switch.
3. Connect test lamp from ORN (52) wire at resistor connector C141 to ground.	Test lamp does not light.	REPLACE resistor.


52
72
51
2977940
C141
51
72
52
2977976
C142
52
BLOWER
MOTOR
GROMMET 103
12004752
COWL
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
72
52
50
12004067
C213
H
M
OFF
L
51
72
52
50
HEATER
BLOWER
SWITCH
C215
50-2.0 BRN
50
50
12015952
12015987
50-2.0 BRN
HOT IN ACCY,
START AND RUN
HTR A/C
20 AMP
HTR A/C
20 AMP
50-2.0 BRN
FRONT
REAR
FUSE BLOCK

BLANK

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.

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, 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. Refer to Section 5 for Switch reset procedure. This can only be accomplished after the faulty system has been repaired.

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 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 260°F (hot coolant) and its resistance becomes greater at low temperatures. It is approximately 1400 ohms at 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 shows the battery voltage. The Voltmeter is connected across the 39 (PNK/BLK) wire and the 150 (BLK) circuits of the cluster.

If the generator output is high, low or 0 volts, the BATT indicator, which monitors generator output by monitoring the differences in voltage between circuits 25 and 29, will come ON.

Refer to the 1990 Light Duty Truck Fuel and Emissions Manual.

CHECK ENGINE INDICATOR

Refer to Light Duty Truck Fuel, Driveability and Emissions Service Manual, Section 3.

RH/LH DIRECTIONAL SIGNAL INDICATORS

Refer to Directional Signal Lamps, Page 21.

HIGH BEAM INDICATOR

Refer to Headlamps, Page 7.

FASTEN BELTS INDICATOR

Refer to Safety Belt Key-In Warning Buzzer, Page 58.

COMPONENT LOCATION

		Page	Figure
Coolant Temperature Sender	Top front center of engine	90	7
Daytime Running Lamp Indicator	In instrument cluster	—	—
Dimmer Switch	Part of multifunction lever	95	20
Directional Signal Switch	In upper steering column	95	20
Electric Fuel Pump/Fuel Gage Sending Unit	In top of fuel tank	98	30
Fuel Pump/Oil Pressure Switch	Top LH rear of engine	90	7
Fuse Block	LH side of cowl, under I/P	92	13
Headlamp Switch	LH side of I/P	92	13
Heater A/C Control Assembly Lamp	Behind LH side of I/P, at heater, A/C Control	93	14
Ignition Switch	RH side of steering column	95	20

COMPONENT LOCATION

		Page	Figure
C100	Engine compartment, LH side of cowl	91	9
C107	At coolant temperature sender	90	7
C116	At fuel pump/oil pressure switch	90	7
C207	RH side of steering column, under I/P	92	12
C208	At headlamp switch	92	13
C209	Behind I/P, at I/P cluster	96	24
C210	Under I/P, on LH side of steering column	92	12
C212	Under I/P, on RH side of steering column	92	12
C216	Behind LH side of I/P, at heater, A/C control	93	14
C217	LH side of I/P		—
C400	LH side of rear crossmember, in back of fuel tank	98	30
G200	Under LH side of I/P, at bus bar ground	92	13
G400	LH side of rear crossmember, in front of fuel tank	98	30
S200	I/P harness, above fuse block	92	13
S206	I/P harness, above steering column	92	12

PRELIMINARY CHECKS:

CHECK condition of GAGES and INST LPS fuses. If fuses are in good condition, use following diagnostic procedures.

TROUBLESHOOTING CHART—INSTRUMENT PANEL: GAGES AND INDICATORS

FUEL GAGE INDICATES FULL OR BEYOND AT ALL TIMES

TEST	RESULT	ACTION
1. Disconnect fuel tank sending unit connector C400 and place ignition switch to RUN. Connect a fused jumper from PNK (30) wire at fuel tank sending unit connector C400 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.	GO to step 2.
2. Connect fused jumper from PNK (30) wire to BLK (150) wire at fuel tank sending unit connector C400.	Fuel gage indicates full.	LOCATE and REPAIR open in BLK (150) wire.
	Fuel gage indicates empty.	REPAIR/REPLACE fuel gage sending unit.

FUEL GAGE INDICATES EMPTY WHEN THERE IS FUEL IN THE TANK

TEST	RESULT	ACTION
Disconnect fuel tank sending unit connector C400 and place ignition switch to RUN.	Fuel gage indicates full.	REPAIR/REPLACE fuel gage sending unit.
	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
Disconnect fuel tank sending unit connector C400. 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 BLK (150) wire for high resistance. If wire is good, REPAIR/REPLACE fuel gage sending unit.
	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 coolant 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 "Temperature Gage Is Not Accurate" symptom.

TEMPERATURE GAGE INDICATES COLD ALL THE TIME

TEST	RESULT	ACTION
Disconnect temperature sender connector C107. Ground the DK GRN (35) wire at temperature sender connector C107.	Temperature gage indicates hot.	REPAIR/REPLACE coolant 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 INDICATOR STAYS ON AT ALL TIMES WITH IGNITION SWITCH IN RUN

TEST	RESULT	ACTION
Disconnect temperature sender connector C107 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 out.	REPLACE coolant temperature sender.

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 coolant temperature sender.
	Gage is not correct.	LOCATE and REPAIR open in DK GRN (35) wire. If wire is good, REPLACE temperature gage.

TEMPERATURE INDICATOR DOES NOT LIGHT WITH ENGINE COOLANT OVERHEATED

TEST	RESULT	ACTION
Disconnect temperature sender connector C107 and place ignition switch to RUN. Connect fused jumper from DK GRN (35) wire at temperature sending connector C107 to ground. Observe temperature indicator.	Indicator lights.	REPLACE coolant temperature sender.
	Indicator does not light.	LOCATE and REPAIR open in bulb and DK GRN (35) wire. If wire and bulb are good, REPLACE instrument cluster.

OIL PRESSURE GAGE INDICATES LOW PRESSURE WHEN OIL PRESSURE IS GOOD

TEST	RESULT	ACTION
Disconnect oil pressure sender connector C116 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 in TAN (31) wire. If wire is good, REPLACE oil pressure gage.

OIL PRESSURE GAGE INDICATES HIGH PRESSURE AT ALL TIMES

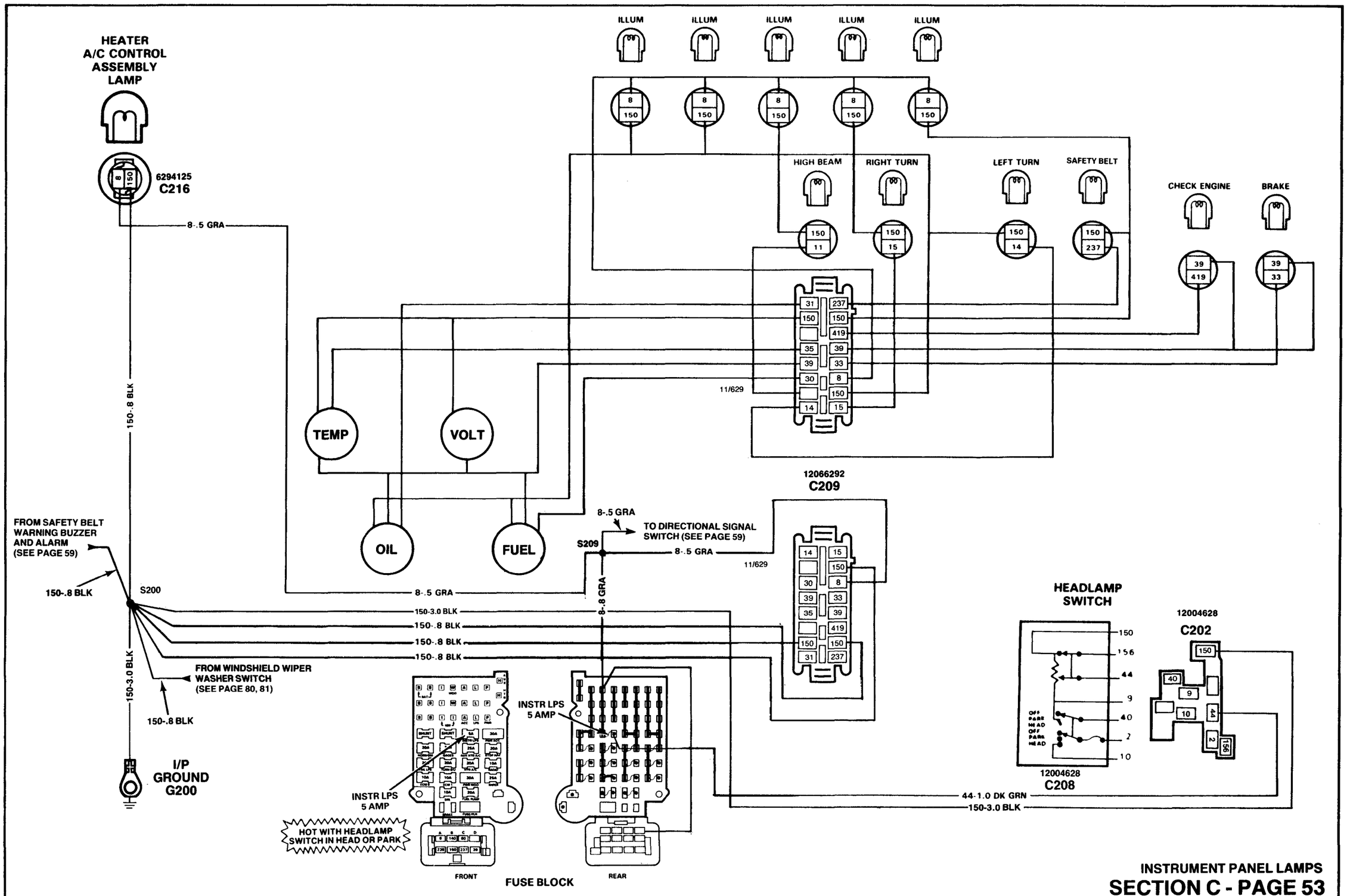
TEST	RESULT	ACTION
Disconnect oil pressure sender connector C116 and place ignition switch to RUN. Connect a fused jumper from TAN (31) wire at oil pressure sender connector C116 to ground.	Oil pressure gage indicates low pressure.	REPLACE oil pressure sender.
	Oil pressure gage indicates high pressure.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

OIL PRESSURE GAGE IS NOT ACCURATE

TEST	RESULT	ACTION
Disconnect oil pressure sender connector C116. Connect one red lead of J 33431-B tester to TAN (31) wire at oil pressure sender connector C116 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.



INSTRUMENT PANEL LAMPS

SECTION C - PAGE 53

COOLANT TEMPERATURE SENDER

35

C107
6288704

35-.5 DK GRN

HOT IN START OR RUN

GAGES 20 AMP

FUSE BLOCK

FRONT

REAR

39-.8 PNK/BLK

TO SAFETY BELT BUZZER (SEE PAGE 59)

39-.8 PNK/BLK

39-.8 PNK/BLK

TO DAYTIME RUNNING LAMPS RELAY (CANADA ONLY) (SEE PAGE 13, 15)

S206

39-.8 PNK/BLK

TO DAYTIME RUNNING LAMPS MODULE (CANADA ONLY) (SEE PAGE 13, 15)

39-.8 PNK/BLK

39-.5 PNK/BLK

39-.5 PNK/BLK

FUEL PUMP/ OIL PRESSURE SWITCH

120
31
440

31
120
440

12065401
C116

31-.5 TAN

35-.5 DK GRN

30-.5 PNK

120-2.0 TAN/WHT

REAR BODY
C100
12020199

39-.8 PNK/BLK

120-2.0 TAN/WHT

30-.5 PNK

30-.8 PNK

31-.5 TAN

35-.5 DK GRN

39-.8 PNK/BLK

39-.8 PNK/BLK

31-.5 TAN

ENGINE

I/P

120-2.0 TAN/WHT

TO SPLICE S108 (SEE PAGE 42)

120-.8 TAN/WHT

12020183
C100

COWL

12020184
C100

INSTRUMENT PANEL GAGES

FROM W/S WIPER WASHER SWITCH (SEE PAGE 80, 81)

FROM A/C HEATER CONTROL LAMP (SEE PAGE 53)

150-.8 BLK

150-.8 BLK

FROM SAFETY BELT BUZZER AND ALARM (SEE PAGE 59)

150-.8 BLK

S200

150-.8 BLK

FROM HEADLAMP SWITCH (SEE PAGE 13, 15)

150-3.0 BLK

I/P GROUND G200

150-.8 BLK

150-.8 BLK

150-.8 BLK

ILLUM

ILLUM

ILLUM

ILLUM

ILLUM

8 150

8 150

8 150

8 150

8 150

HIGH BEAM

RIGHT TURN

LEFT TURN

SAFETY BELT

CHECK ENGINE

BRAKE

150 11

150 15

150 14

150 237

39 419

39 33

31 237

150 150

419

35 39

39 33

30 8

150

14 15

11/629

TEMP

VOLT

OIL

FUEL

C209

11/629

14 15

150

30 8

39 33

35 39

419

150 150

31 237

150-.8 BLK

39-.5 PNK/BLK

31-.5 TAN

31-.5 TAN

30-.5 PNK

30-.5 PNK

150-.8 BLK

35-.5 DK GRN

35-.5 DK GRN

39-.5 PNK/BLK

12066292

150-.8 BLK

39-.5 PNK/BLK

39-.5 PNK/BLK

150-2.0 BLK

120-2.0 TAN/WHT

30-.8 PNK

150-2.0 BLK → TO TAILLAMPS (SEE PAGE 83)

SHEET METAL GROUND G400

12059473

150

30

120

30

30

120

150

120

150

30

F

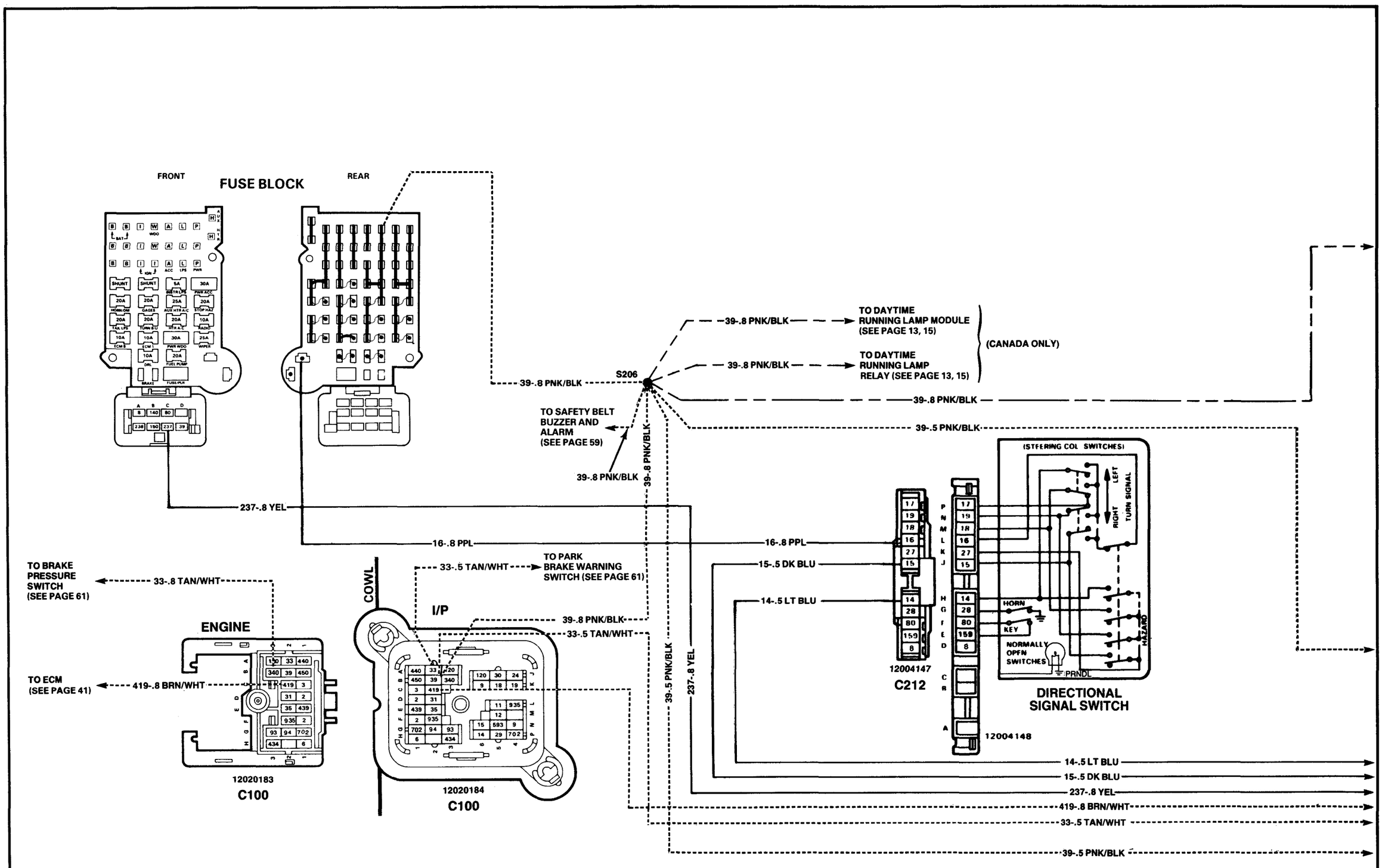
P

E

12020827 12020829

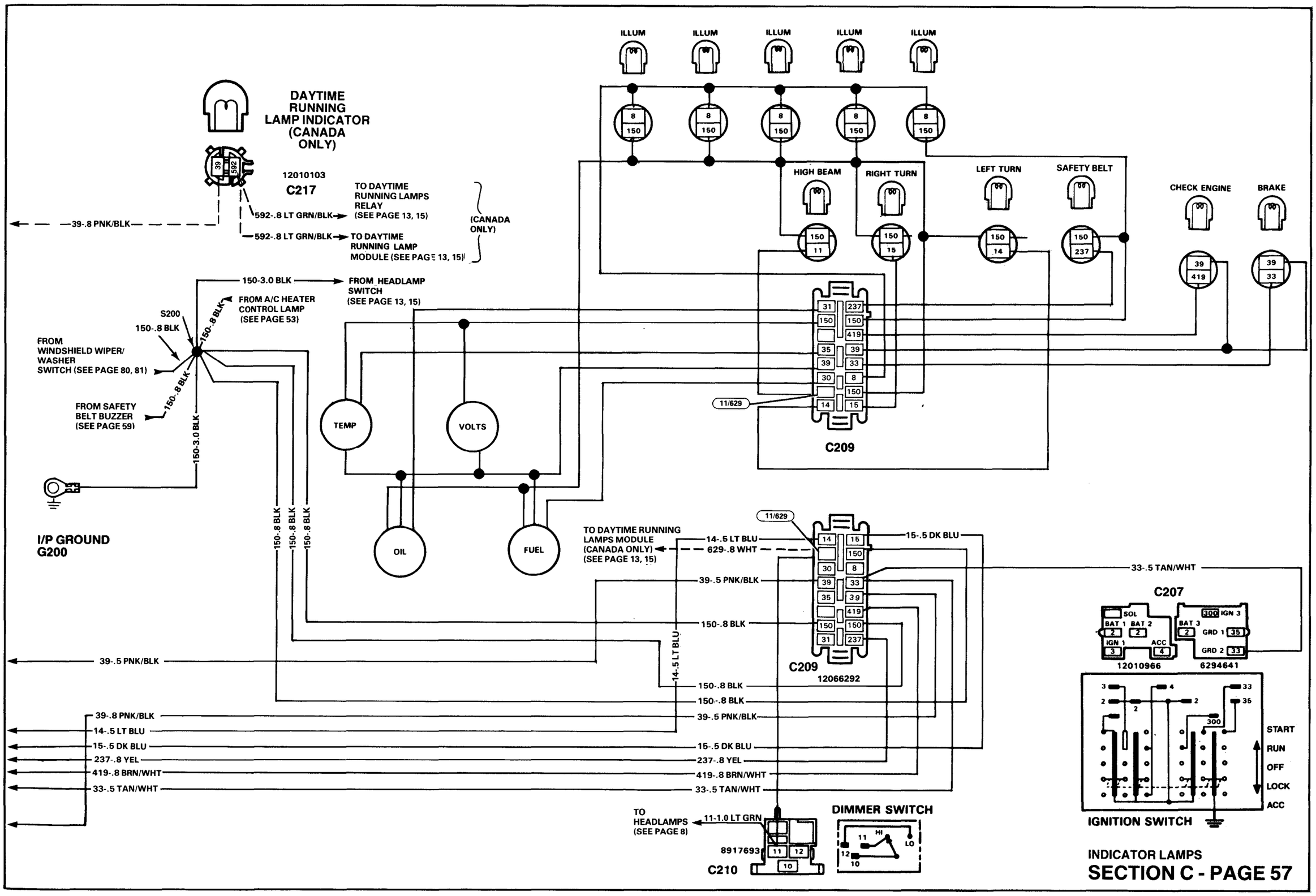
C400

ELECTRIC FUEL PUMP
FUEL GAGE SENDING UNIT



INDICATOR LAMPS

SECTION C - PAGE 56


DAYTIME RUNNING LAMP INDICATOR (CANADA ONLY)
12010103
C217
39
592
TO DAYTIME RUNNING LAMPS RELAY (SEE PAGE 13, 15)
592-.8 LT GRN/BLK
39-.8 PNK/BLK
592-.8 LT GRN/BLK
TO DAYTIME RUNNING LAMP MODULE (SEE PAGE 13, 15)
(CANADA ONLY)
150-3.0 BLK
FROM HEADLAMP SWITCH (SEE PAGE 13, 15)
FROM A/C HEATER CONTROL LAMP (SEE PAGE 53)
S200
150-.8 BLK
150-.8 BLK
FROM WINDSHIELD WIPER/ WASHER SWITCH (SEE PAGE 80, 81)
150-.8 BLK
FROM SAFETY BELT BUZZER (SEE PAGE 59)
150-3.0 BLK
I/P GROUND G200
TEMP
VOLTS
OIL
FUEL
150-.8 BLK
150-.8 BLK
150-.8 BLK
ILLUM
ILLUM
ILLUM
ILLUM
ILLUM
8
150
HIGH BEAM
RIGHT TURN
LEFT TURN
SAFETY BELT
CHECK ENGINE
BRAKE
150
11
150
15
150
14
150
237
39
419
39
33
C209
11/629
31
237
150
150
419
35
39
39
33
30
8
150
14
15
C209
12066292
11/629
14
15
150
30
8
39
33
35
39
419
150
150
31
237
TO DAYTIME RUNNING LAMPS MODULE (CANADA ONLY) (SEE PAGE 13, 15)
14-.5 LT BLU
629-.8 WHT
39-.5 PNK/BLK
150-.8 BLK
14-.5 LT BLU
39-.5 PNK/BLK
150-.8 BLK
150-.8 BLK
39-.5 PNK/BLK
14-.5 LT BLU
15-.5 DK BLU
237-.8 YEL
419-.8 BRN/WHT
33-.5 TAN/WHT
15-.5 DK BLU
237-.8 YEL
419-.8 BRN/WHT
33-.5 TAN/WHT
TO HEADLAMPS (SEE PAGE 8)
11-1.0 LT GRN
8917693
C210
11
12
10
DIMMER SWITCH
HI
LO
11
12
10
33-.5 TAN/WHT
C207
SOL
BAT 1
BAT 2
IGN 1
ACC
BAT 3
300
IGN 3
GRD 1
GRD 2
35
33
12010966
6294641
3
2
4
2
2
33
35
300
START
RUN
OFF
LOCK
ACC
IGNITION SWITCH

CIRCUIT OPERATION

SAFETY BELT WARNING BUZZER

With the Ignition Switch in RUN or START, voltage is applied through the GAGES fuse to the Safety Belt Buzzer at the Audio Alarm Center. With the driver's safety belt not buckled, terminal 39 of the module is grounded through the Safety Belt Retractor Switch. The Safety Belts Indicator always goes on for about 5 seconds when the Ignition Switch is turned to RUN or START.

KEY-IN WARNING BUZZER

Whenever the key is in the Ignition Switch, the Ignition Switch is in LOCK, OFF, or ACCY, and the driver's door is open, terminal 80 of the Directional Signal Switch is grounded. This sounds the alarm.

COMPONENT LOCATION

		Page — Figure
Audio Alarm Center	Attached below fuse block	97 — 27
Directional Signal Switch	In upper steering column	95 — 20
Fuse Block	LH side of cowl, under I/P	97 — 27
Safety Belt Retractor Switch	Base of driver safety belt, RH side of seat riser	97 — 27
C212	RH side of steering column	92 — 12
C218	Base of driver seat riser, LH lower flange	97 — 27
G200	Under LH side of I/P, at bus bar ground	92 — 13
S200	I/P harness, above fuse block	92 — 13
S206	I/P harness, above steering column	92 — 12
S209	I/P harness, above steering column	96 — 24

TROUBLESHOOTING CHART—SAFETY BELT AND KEY-IN WARNING BUZZER

THE SAFETY BELT WARNING BUZZER DOES NOT OPERATE

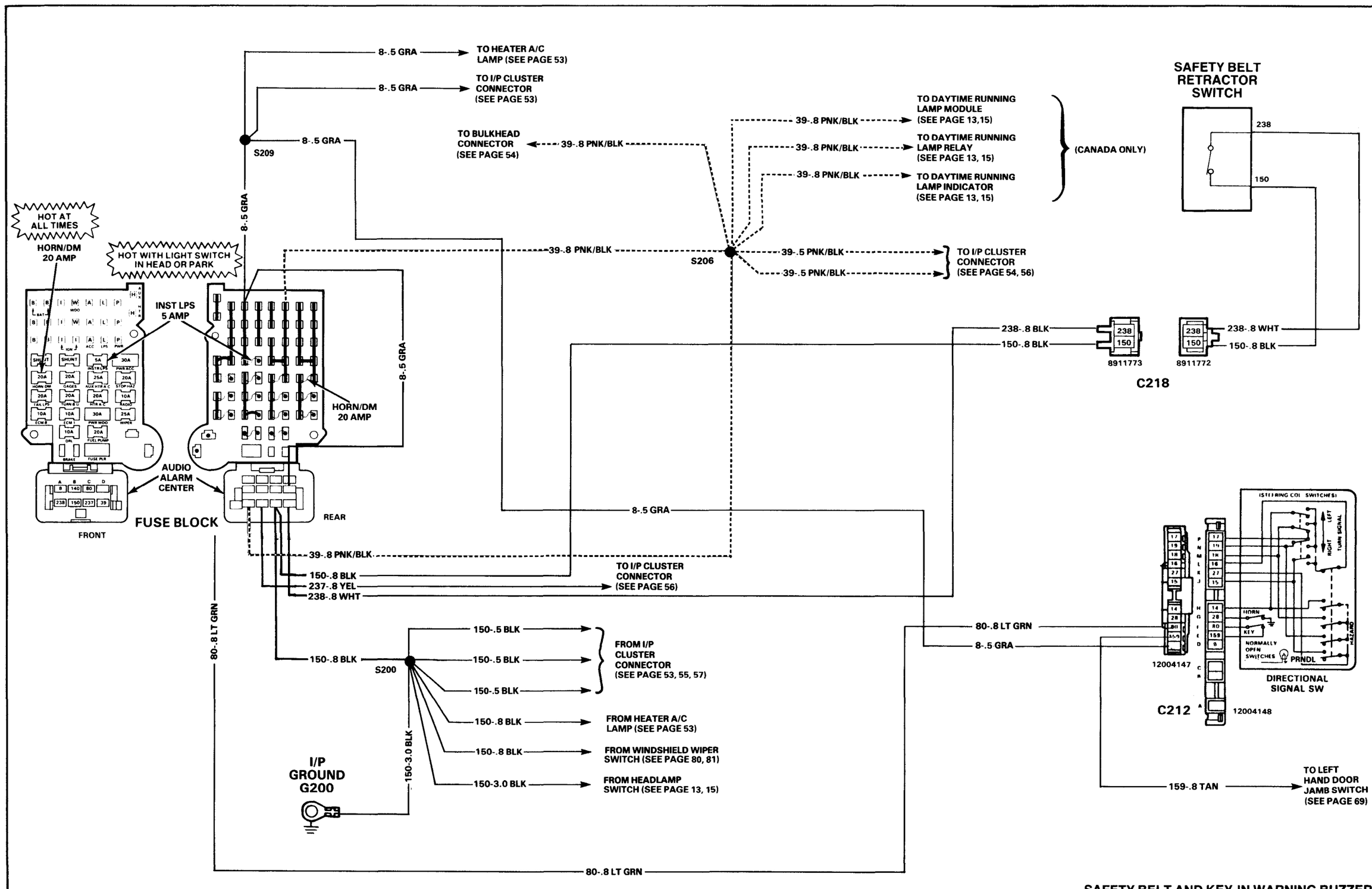
TEST	RESULT	ACTION
1. Connect test lamp from PNK/BLK (39) wire at audio alarm center to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of fuse (GAGES) and/or LOCATE and REPAIR open in PNK/BLK (39) wire from audio alarm center to fuse block.
2. Connect test lamp from WHT (238) wire and BLK (150) wire at audio alarm center.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from audio alarm center to ground terminal G200.
3. Connect test lamp from WHT (238) wire at safety belt retractor switch connector C218 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 audio alarm center.
4. Buckle safety belt. Connect test lamp from BLK (150) wire at safety belt retractor switch connector C218 to ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire from safety belt retractor switch to audio alarm center and/or ground terminal G200.
	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 C218.	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.

KEY-IN WARNING BUZZER DOES NOT OPERATE

TEST	RESULT	ACTION
1. Insert key in ignition switch and open left hand door. Connect a test lamp from PNK/BLK (39) wire at audio alarm center to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of fuse (GAGES). If fuse is good, LOCATE and REPAIR open in PNK/BLK (39) wire.
2. Connect a test lamp from LT GRN (80) wire at directional signal switch connector C212 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (80) wire. If wire is good, REPLACE audio alarm center.
3. Connect test lamp from TAN (159) wire at directional signal switch connector C212 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE directional signal switch.
4. Disconnect left hand jamb switch connector C504. Connect ohmmeter from TAN (159) terminal to ground terminal on jamb switch.	A reading of 0 ohms.	Close door. If reading stays at 0 ohms, REPLACE jamb switch. If reading is infinite GO to step 5.
	A reading of infinite ohms.	REPLACE left hand jamb switch.
5. Connect ohmmeter from ground terminal at left hand jamb switch connector C504 to ground.	A reading of 0 ohms.	LOCATE and REPAIR open in TAN (159) wire from jamb switch to directional signal switch.
	A reading of infinite ohms.	REPLACE left hand jamb switch.



SAFETY BELT AND KEY-IN WARNING BUZZER

CIRCUIT OPERATION

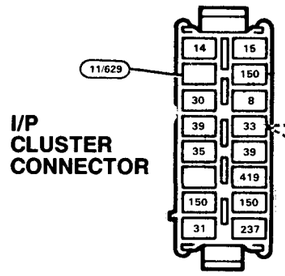
Vehicles equipped with the Hydro-Boost Brake system have an optional warning harness that plugs into the I/P harness in place of the Park Brake Warning Switch. Refer to the 1990 Light Duty Truck Service Manual, Section 5A1 for further description and operation of the Hydro-Boost System.

COMPONENT LOCATION

TROUBLESHOOTING CHART—BRAKE WARNING SYSTEMS

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

TEST	RESULT	ACTION
1. Disconnect park brake warning switch connector C220.	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 warning switch.
2. Disconnect brake pressure warning switch connector C101.	Brake indicator lamp does not go out.	GO to step 3 for vehicles equipped with RPO UJ1.
	Brake indicator lamp goes out.	CHECK for a possible leak or loss of fluid in the brake system.
3. Connect a digital ohmmeter from I/P side of TAN/WHT (33) wire at connector C219 and check for continuity to ground.	Continuity.	REPAIR short to ground in TAN/WHT (33) wire between C219 and instrument panel.
	No continuity.	REFER to 1990 Light Duty Truck Service Manual Section 5A1 for diagnosis of the brake system.



I/P
CLUSTER
CONNECTOR

12066292
C209

33-.5 TAN/WHT

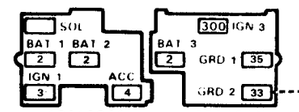
33-.5 TAN/WHT

33-.5 TAN/WHT

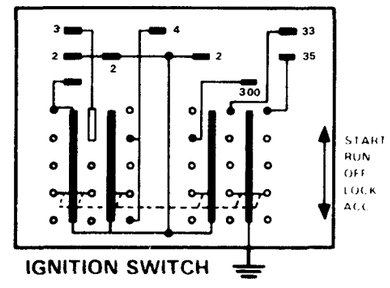
33-.5 TAN/WHT

I/P

C207



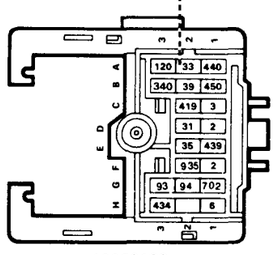
12010966 6294641



IGNITION SWITCH

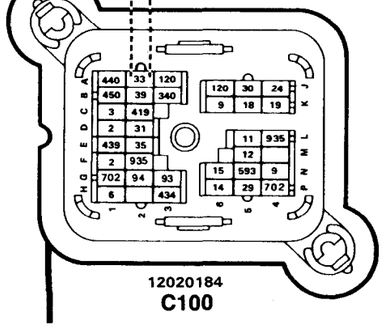
ENGINE

33-.8 TAN/WHT



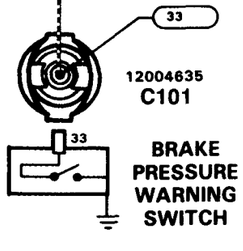
12020183
C100

COWL



12020184
C100

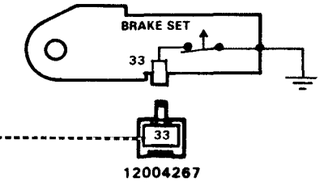
33-.8 TAN/WHT



12004635
C101

BRAKE
PRESSURE
WARNING
SWITCH

PARK BRAKE
WARNING SWITCH



12004267
C220

RPO LEGEND

UJ1 — BRAKE SYSTEM WARNING INDICATOR

CONNECTS TO I/P HARNESS PARK BRAKE SWITCH WHEN VEHICLE IS EQUIPPED WITH RPO UJ1

33

12004201
C219

33-.8 TAN/WHT

33

12004267
C220

PARK BRAKE WARNING SWITCH

33

33-.8 TAN/WHT

DIODE

GROMMET 104
8911781

HYDRO-BOOST PRESSURE SWITCH

860

966

860

966

860-.8 YEL

966-.8 LT GRN

12004827
C147

12004888

39

HOT IN START OR RUN

GAGES 20 AMP

39-.8 PNK/BLK

966-.8 LT GRN

965-.8 BLK/YEL

FRONT

REAR

FUSE BLOCK

965-.8 BLK/YEL

FLOW SWITCH

860

860

860-.8 YEL

6288440
C146

HYDRO-BOOST SWITCH 966

ALARM 965

966

965

8900655
C222

ELECTRONIC DELAY MODULE ASSEMBLY

39

965

ALARM

39

965

39-.8 PNK/BLK

965-.22 WHT CAPACITOR/DIODE

965-.8 BLK/YEL

8905825
C221

SHEET METAL GROUND G109

150-.8 BLK

SHEET METAL GROUND G110

BRAKE WARNING SYSTEM
(RPO UJ1)

BLANK

CIRCUIT OPERATION

The Overspeed Alarm consists of an Amplifier with Chime module, a Dual Vehicle Speed Sensor Buffer module and an optically triggered Vehicle Speed Sensor. The Amplifier with Chime and Dual Vehicle Speed Sensor Buffer are located behind the LH side of the I/P, and the Vehicle Speed Sensor is mounted at the cowl, to the right of the fuse block.

The Vehicle Speed Sensor receives pulses of light, converts them to electronic signals and feeds this information to the Dual Vehicle Speed Sensor Buffer. If the vehicle exceeds a preset speed, the Dual Vehicle Speed Sensor Buffer supplies a voltage to the Amplifier with Chime which alerts the driver to an overspeed condition.

COMPONENT LOCATION

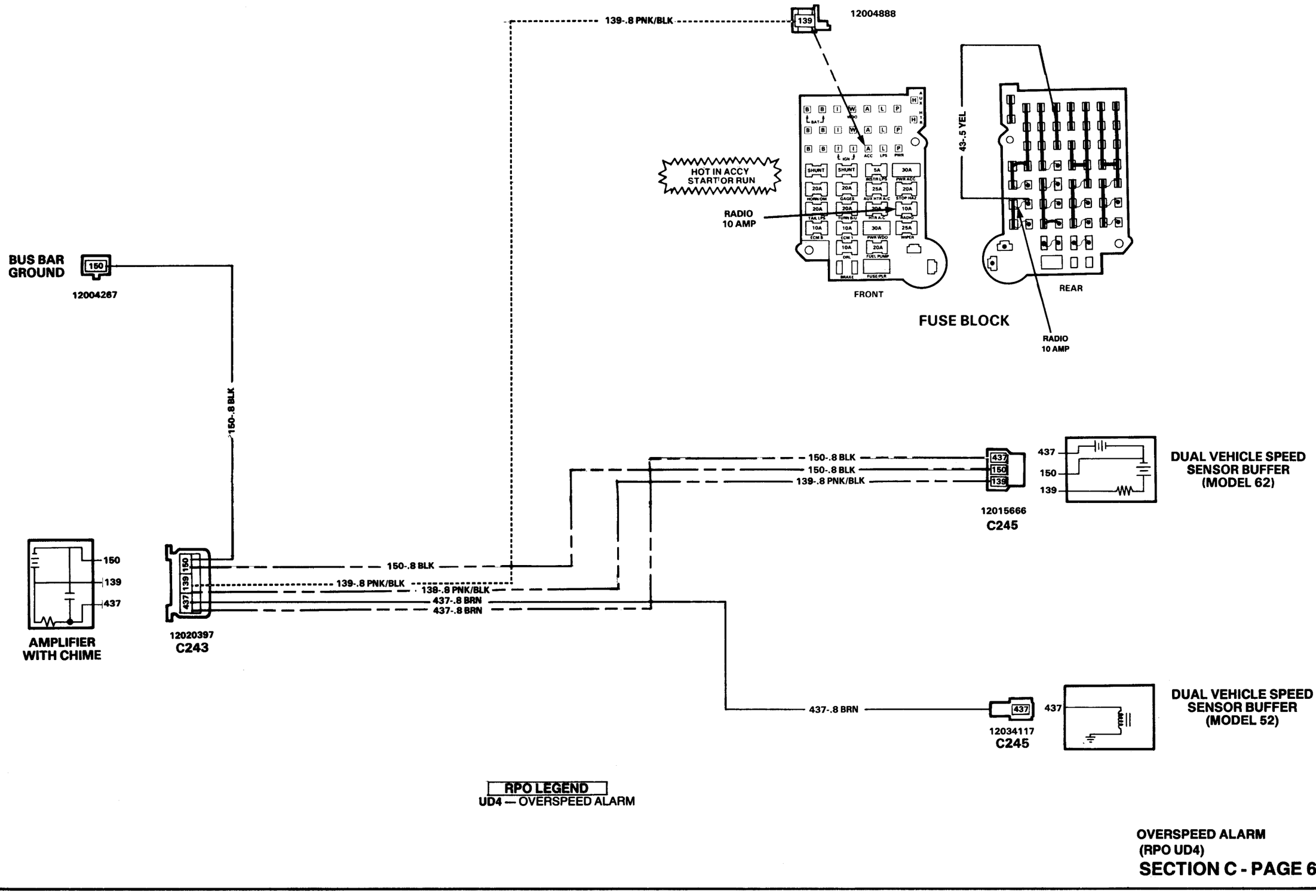
PRELIMINARY CHECKS:

1. Before beginning overspeed alarm diagnosis, check to see that the RADIO fuse is not blown. REPLACE if blown.
2. If speedometer and cruise control also do not function, check to see that the GAGES fuse is not blown. REPLACE if blown.

TROUBLESHOOTING CHART—OVERSPEED ALARM

OVERSPEED ALARM DOES NOT SOUND

TEST	RESULT	ACTION
1. Place ignition switch to ACCY position. Disconnect amplifier with chime connector C243 and connect test lamp from PNK/BLK (139) wire to ground.	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (139) wire between amplifier with chime and fuse block or REPLACE RADIO fuse.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from PNK/BLK (139) wire to BLK (150) wire at amplifier with chime connector C243.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between amplifier with chime and bus bar ground.
	Test lamp lights.	If vehicle is a commercial type (model 62) GO to step 3. If vehicle is a motor home (model 52) GO to step 5.
3. Disconnect dual vehicle speed sensor buffer connector C245. Place ohmmeter on RX1 scale. Connect ohmmeter from cavity C at amplifier with chime connector C243 to cavity C at dual vehicle speed sensor buffer connector C245. Measure resistance.	No continuity.	LOCATE and REPAIR open in BLK (150) wire between dual vehicle speed sensor buffer and amplifier with chime.
	Continuity.	GO to step 4.
4. Connect ohmmeter from cavity B at amplifier with chime connector C243 to cavity B at dual vehicle speed sensor buffer connector C245. Measure resistance.	No continuity.	LOCATE and REPAIR open in PNK/BLK (139) wire between dual vehicle speed sensor buffer and amplifier with chime.
	Continuity.	GO to step 5.
5. Connect ohmmeter from cavity A at amplifier with chime connector C243 to cavity A at dual vehicle speed sensor buffer connector C245. Measure resistance.	No continuity.	LOCATE and REPAIR open in BRN (437) wire between dual vehicle speed sensor buffer and amplifier with chime.
	Continuity.	GO to step 6.
6. REPLACE amplifier with chime module and road test vehicle for proper operation.	Overspeed alarm is operational.	No further action is necessary.
	Overspeed alarm is not operational.	GO to step 7.
7. REPLACE dual vehicle speed sensor buffer module and road test vehicle for proper operation.	Overspeed alarm is operational.	No further action is necessary.
	Overspeed alarm is not operational.	REFER to Section 6E of 1990 Service Manual to troubleshoot speed sensor circuit.



OVERSPEED ALARM
(RPO UD4)

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 Activator
- Brake Switch
- Vehicle Speed Sensor

The Cruise Control Module receives voltage from the IGN fuse in RUN or START. A speed signal is received from the Instrument Cluster Speed Sensor Buffer. 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.

COMPONENT LOCATION

		Page — Figure
Brake Switch	On brake support bracket, to right of steering column	93 — 16
Bus Bar Ground	On cowl, to right of fuse block	93 — 16
Cruise Control Activator	Part of multi-function switch	95 — 20
Cruise Control Module	Top left of radiator support	91 — 11
Fuse Block	LH side of cowl, under I/P	93 — 16
Vehicle Speed Sensor	On cowl, to right of fuse block	93 — 16
C223	On steering column, under I/P	—
C224	Above and to the right of steering column	93 — 16
C225	Left of steering column	93 — 16
C226	At speed sensor	93 — 16
C227	On brake support bracket, to right of steering column	93 — 16
C228	On brake support bracket, to right of steering column	93 — 16
S214	Cruise control harness, above steering column	93 — 16
S215	Cruise control harness, RH side of steering column	93 — 16

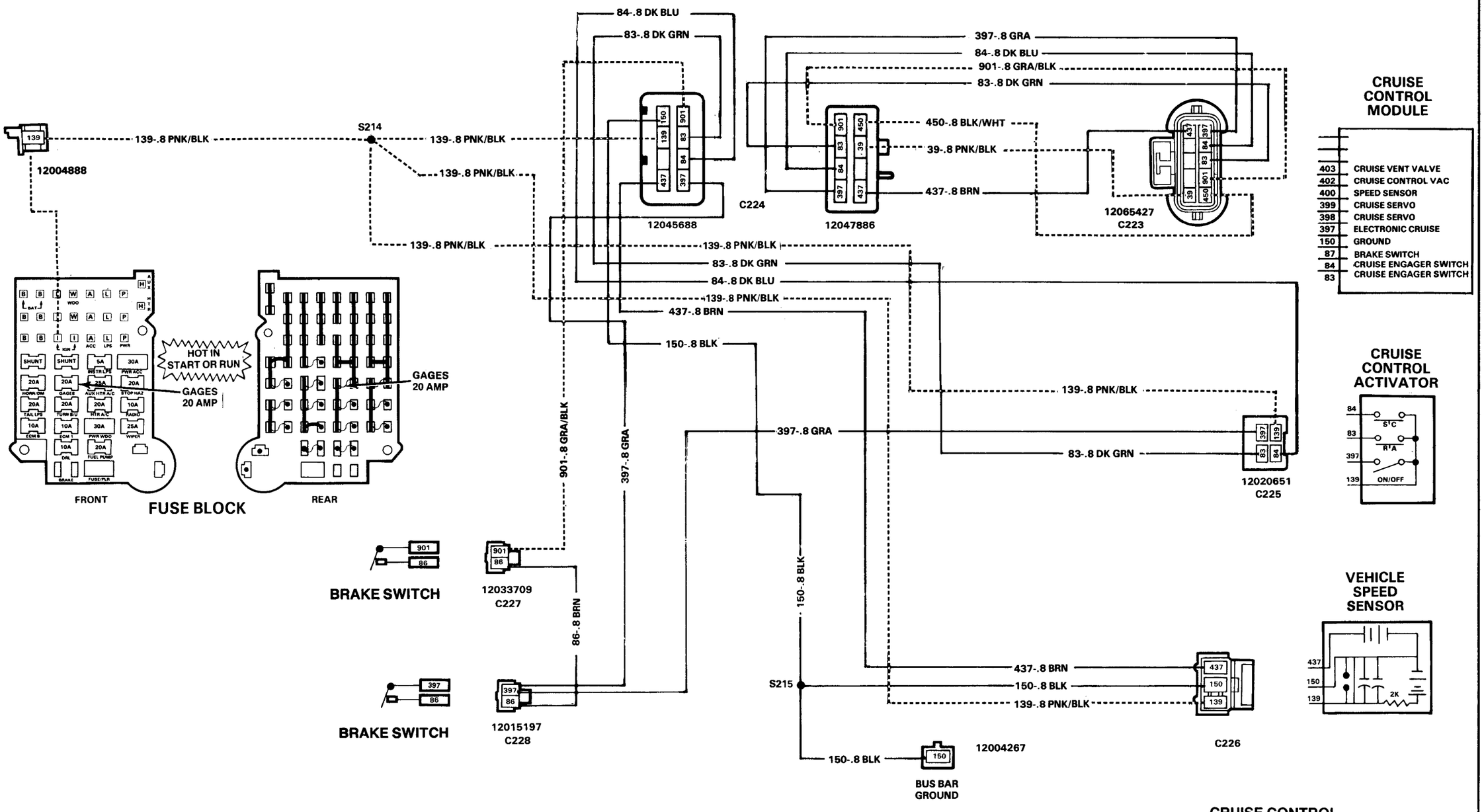
TROUBLESHOOTING CHART—CRUISE CONTROL

CRUISE CONTROL DOES NOT DISENGAGE WHEN BRAKE PEDAL IS DEPRESSED

TEST	RESULT	ACTION
Place ignition switch in RUN position and cruise control activator to ON. Depress brake pedal. Connect test lamp from BRN (86) wire at brake switch connector(s) C227 and C228 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 test lamp from PNK/BLK (139) wire at cruise control activator connector C225 to ground and then cruise control module connector C223 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of (GAGES) fuse. If fuse is good, LOCATE and REPAIR open in PNK/BLK (139) wire from cruise control activator and cruise module to fuse block.
2. Connect test lamp from GRA (397) wire at cruise control activator connector C225 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE cruise control activator.
3. Connect test lamp from GRA (397) at cruise control module connector C223 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 to brake switch.
4. Connect test lamp from GRA (397) to BLK/WHT (450) wires at cruise control module connector C223.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (450) wire from cruise control module to connector C224 and BLK (150) wire from C224 to bus bar ground.
5. Connect test lamp from GRA/BLK (901) wire at brake switch connector C227 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in GRA/BLK (901) wire from brake switch to cruise control module.
6. Connect test lamp from BRN (86) wire at brake switch connector C227 to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	CHECK adjustment of brake switch. If properly adjusted, REPLACE brake switch.
7. Connect test lamp from BRN (86) wire at brake switch connector C228 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 test lamp from DK BLU (84) wire at cruise control activator connector C225 to ground.	Test lamp lights.	REPLACE cruise control activator.
	Test lamp does not light.	GO to step 9.
9. Depress SET switch. Connect test lamp from DK BLU (84) wire at cruise control activator connector C225 to ground.	Test lamp lights.	GO to step 10.
	Test lamp does not light.	REPLACE cruise control activator.
10. Connect test lamp from DK BLU (84) wire at cruise control module connector C223 to ground.	Test lamp lights.	GO to step 11.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (84) wire from cruise control module to cruise control activator.
11. Depress and hold RES/ACCEL switch. Connect test lamp from DK GRN (83) wire at cruise control activator connector C225 to ground.	Test lamp lights.	GO to step 12.
	Test lamp does not light.	REPLACE cruise control activator.
12. Connect test lamp from DK GRN (83) wire at cruise control module connector C223 to ground.	Test lamp lights.	GO to step 13.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (83) wire from cruise control module to cruise control activator.
13. Raise vehicle so drive wheels can be turned by hand. Connect voltmeter from BRN (437) wire to PNK/BLK (139) wire at cruise control module connector C223. 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 Section 6E of Fuel and Emission Manual (Gasoline).



CRUISE CONTROL
(RPO K34)

SECTION C - PAGE 67

CIRCUIT OPERATION

The Dome Lamp receives battery voltage at all times from the TAIL LPS fuse. The Dome Lamps can be turned on by either opening one of the front doors, or by turning the Headlamp Switch to the full counterclockwise position.

COMPONENT LOCATION

		Page — Figure
Dome Lamp	Center of roof	97 — 25
Door Jamb Switch, LH	At LH A-pillar	98 — 28
Door Jamb Switch, RH	At RH A-pillar	98 — 28
Fuse Block	Under I/P, LH side of cowl	97 — 25
Grommet 500	At LH A-pillar	—
Grommet 600	At RH A-pillar	—
Headlamp Switch	LH side of I/P	92 — 13
C100	Engine compartment, LH side of cowl	91 — 9
C208	At headlamp switch	92 — 13
C231	Below I/P, near fuse block	97 — 25
C232	Below I/P, near fuse block	97 — 25
C300	Body Harness, near center of roof	97 — 25
C301	Taped to roof bow	97 — 25
C302	Taped to roof bow	97 — 25
C504	At LH door jamb switch	98 — 28
C604	At RH door jamb switch	98 — 28

PRELIMINARY CHECK:

Check condition of TAIL LPS fuse. If fuse is good, refer to appropriate diagnostic procedure.

TROUBLESHOOTING CHART—INTERIOR LAMPS

DOME LAMP DOES NOT WORK OR STAYS ON ALL THE TIME

TEST	RESULT	ACTION
1. Connect test lamp from ORN (40) wire at dome lamp connector C300 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 headlamp switch to full counter–clockwise position. Connect test lamp from ORN (40) wire to WHT (156) wire at dome lamp connector C300.	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 C504 and C604. Connect ohmmeter from WHT (156) terminal to ground 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 headlamp switch connector C208. Connect ohmmeter from WHT (156) terminal to BLK (150) terminal at headlamp switch. Turn headlamp switch to full counter-clockwise and then full clockwise positions, and take a reading in each position. When counterclockwise, reading must be 0 ohms and when clockwise, reading must be infinite ohms.	Correct readings.	LOCATE and REPAIR open or short in WHT (156) wire and BLK (150) wire.
	Incorrect readings.	REPLACE headlamp switch.

HOT AT ALL TIMES

TAIL LPS 20 AMP

FRONT

FUSE BLOCK

REAR

TAIL LPS 20 AMP

40-.8 ORN

RIGHT HAND DOOR JAMB SWITCH

156

8911287 GROMMET 600

6288872 C604

156-.8 WHT

DOME LAMP 8900938

240-.8 ORN → TO HORN RELAY (SEE PAGE 25)

ENGINE

COWL

I/P

156-.8 WHT

40-.8 ORN

2977253 C300

6294053 C301

CARGO LAMP FEEDS

8900420 C302

CLEARANCE LAMP FEED

12020183 C100

12020184 C100

12047881 12047882 C232

TO JUNCTION BLOCK (SEE PAGE 5) ← 2-3.0 RED

2-3.0 RED

40-.8 ORN

9-.8 BRN

156-.8 WHT

C504

6288872

6288872

12015958 GROMMET 500

159-.8 TAN → TO DIRECTIONAL SIGNAL SWITCH (KEY-IN IGNITION WARNING BUZZER) (SEE PAGE 59)

150

156

44

9

40

2

10

HEADLAMP SWITCH

12004628 C208

12047665 12047662 C231

LEFT HAND DOOR JAMB SWITCH

CIRCUIT OPERATION

The RADIO fuse provides main power to the Radio. With the Ignition Switch in START or RUN, voltage is applied through the RADIO fuse and the YEL wire to the On/Off Switch in the Radio.

The circuit is grounded at the Bus Bar ground. With the On/Off Switch closed, voltage is applied to the Solid State Radio circuits to ground. Two wires connect each front speaker to the Radio. The ETR Radio has two inputs that other models do not have: Display Dim Signal and Clock/Memory Power.

The ETR model is an AM/FM Radio that changes stations electronically. The frequency of pre-selected 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 Head Panel and Dome Lamp Switch controls panel light dimming. In the ETR model, dimming of the station and clock display is controlled within the Radio itself by means of the Dim Display Input Signal.

The ETR Clock memory and Radio memory functions are powered at all times. If power to the ETR model is cut off — by disconnecting the Battery, for example — the operator must reset the memory functions when power is restored.

COMPONENT LOCATION

		Page — Figure
Bus Bar Ground	On cowl, to right of steering column	93 — 16
Front Speaker, LH	Top of instrument panel	96 — 22
Front Speaker, RH	Top of instrument panel	96 — 22
Fuse Block	LH side of cowl, under I/P	92 — 13
Headlamp Switch	LH side of I/P	92 — 13
Radio Receiver	Center of I/P	96 — 22
C208	At headlamp switch	92 — 13
C233	At radio receiver	96 — 24
C236	At left front speaker	96 — 22
C237	At right front speaker	96 — 22
C239	Under I/P, left of radio receiver	96 — 23
C303	Rear speaker harness	—
C402	Rear speaker harness	—

TROUBLESHOOTING CHART—RADIO: AM

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

TEST	RESULT	ACTION
1. Disconnect the half of the radio connector C233 containing the YEL (43) wire and place ignition switch to RUN. Connect voltmeter from YEL (43) wire at radio connector C233 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of fuse (RADIO). If fuse is good, LOCATE and REPAIR open in YEL (43) wire.
2. Connect voltmeter from YEL (43) wire to BLK (150) wire at radio connector C233.	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.

PANEL LAMP DOES NOT COME ON

TEST	RESULT	ACTION
Disconnect the half of the radio connector C233 containing the GRA (8) wire. Place headlamp switch to PARK and panel dimmer switch to HIGH. Connect voltmeter from GRA (8) wire at radio connector C233 to ground.	Battery voltage.	REMOVE radio and send in for service.
	No voltage.	LOCATE and REPAIR open in GRA (8) wire from radio to fuse block.

NO SOUND OR DISTORTED SOUND FROM A SPEAKER

TEST	RESULT	ACTION
1. Disconnect suspected speaker connector C236 or C237. Set analog ohmmeter on RX1 scale. Connect ohmmeter across speaker terminals.	Speaker pops.	GO to step 2.
	No noise.	REPLACE speaker.
2. Place ignition switch to RUN and turn radio ON. Tune radio to a strong signal. Connect voltmeter across outputs for suspect speaker. LT GRN (200) and DK GRN (117) wires for RH speaker. GRA (118) and TAN (201) wires for LH speaker.	Varying around 1 volt AC.	LOCATE and REPAIR speaker wires between radio and speaker.
	No voltage or greater than 1 volt AC.	REMOVE radio and send in for repairs.

TROUBLESHOOTING CHART—RADIO: AM/FM STEREO WITH OPTIONS

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

TEST	RESULT	ACTION
1. Disconnect one third of radio connector C233 containing the YEL (43) wire and place ignition switch to RUN. Connect voltmeter from YEL (43) wire at radio connector C233 to ground.	Battery voltage.	GO to step 2.
	No voltage.	CHECK condition of fuse (RADIO). If fuse is good, LOCATE and REPAIR open in YEL (43) wire.
2. Connect voltmeter from YEL (43) wire to BLK (150) wire at radio connector C233.	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

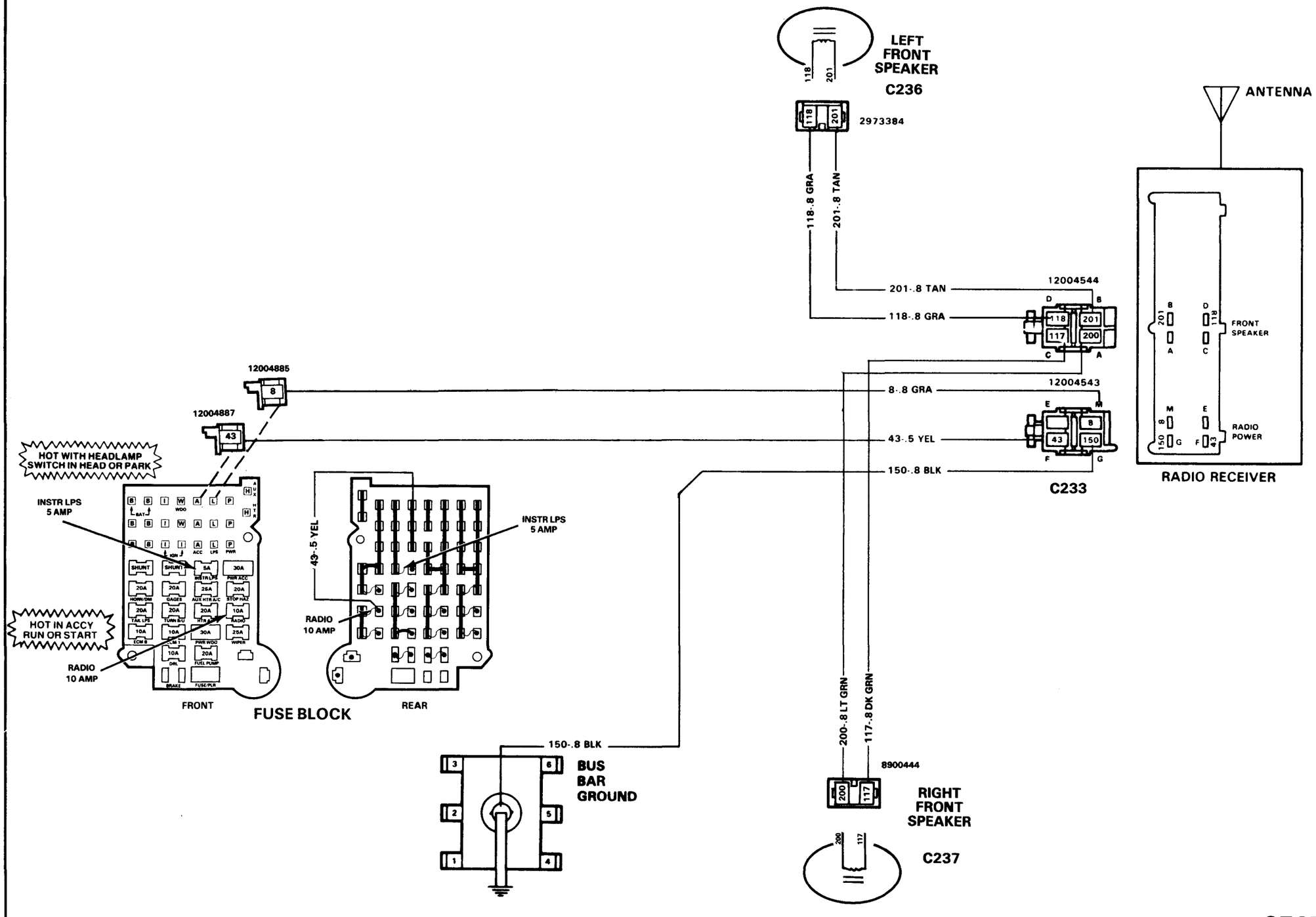
TEST	RESULT	ACTION
Disconnect radio connector C239. Connect voltmeter from ORN (140) wire at radio connector C239 to ground.	Battery voltage.	REMOVE radio control head and send in for service.
	No voltage.	CHECK condition of fuse (HORN/DM). If fuse is good, LOCATE and REPAIR open in ORN (40) wire.

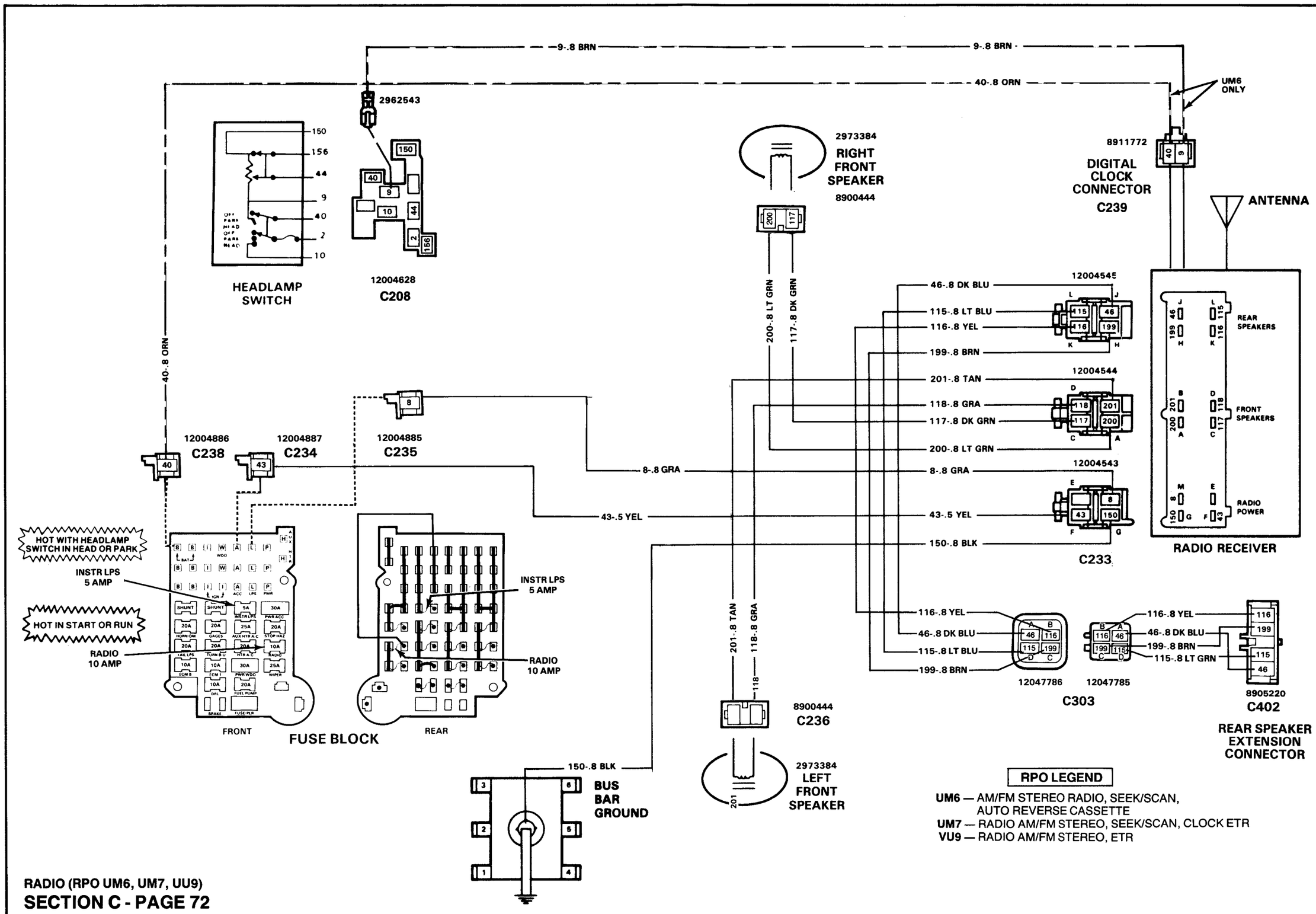
PANEL LAMP DOES NOT COME ON

TEST	RESULT	ACTION
Place light switch to PARK and panel dimmer switch to HIGH. Connect voltmeter from GRA (8) wire at radio connector C245 to ground.	Battery voltage.	REMOVE radio control head and send in for service.
	No voltage.	LOCATE and REPAIR open in GRA (8) wire from radio to fuse block or REPLACE (INST LPS) fuse.

DISPLAY DIMMING FUNCTION WILL NOT OPERATE

TEST	RESULT	ACTION
Place light switch to PARK. Connect voltmeter from BRN (9) wire at radio connector C239 to ground.	Battery voltage.	REMOVE radio control head and send in for repairs.
	No voltage.	LOCATE and REPAIR open in BRN (9) wire from radio to headlamp switch connector.


LEFT
FRONT
SPEAKER
C236
118
201
2973384
118-.8 GRA
201-.8 TAN
ANTENNA
12004544
201-.8 TAN
118-.8 GRA
FRONT
SPEAKER
12004885
8
8-.8 GRA
12004543
12004887
43
43-.5 YEL
150-.8 BLK
RADIO
POWER
C233
RADIO RECEIVER
HOT WITH HEADLAMP
SWITCH IN HEAD OR PARK
INSTR LPS
5 AMP
HOT IN ACCY
RUN OR START
RADIO
10 AMP
49-.5 YEL
INSTR LPS
5 AMP
RADIO
10 AMP
FRONT
REAR
FUSE BLOCK
150-.8 BLK
BUS
BAR
GROUND
200-.8 LT GRN
117-.8 DK GRN
8900444
RIGHT
FRONT
SPEAKER
C237



RPO LEGEND

UM6 — AM/FM STEREO RADIO, SEEK/SCAN, AUTO REVERSE CASSETTE
UM7 — RADIO AM/FM STEREO, SEEK/SCAN, CLOCK ETR
VU9 — RADIO AM/FM STEREO, ETR

CIRCUIT OPERATION

A permanent magnet (PM) motor operates each of the Power Windows. Each Motor raises or lowers the glass 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 both of the Motors. The RH Window Switch controls only the RH Window Motor.

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 as it cools.

When the Ignition Switch is in RUN, or ACCY, battery voltage is applied to the Master Door Lock/Power Window Switch Assembly, the PWR WDO Circuit Breaker, and the PNK wires. When any of the UP Switches are operated, battery voltage is applied to the Window Motor through the DK BLU 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 wire. The Window Motor is gounded through the UP contact. The Motor runs to drive the Window down.

RH WINDOW SWITCH OPERATION

When the Ignition Switch is in RUN or ACCY, battery voltage is applied to the RH Window Switch through the PWR WDO Circuit Breaker and the PNK wires to Terminal 76. When the UP Switch in the RH Window Switch is operated, battery voltage is applied to the RH Window Motor through the DK BLU wire. The Motor is grounded through the BRN wire, the DN contact in the RH Window Switch, the TAN 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 RH Window Switch is operated, battery voltage is applied to the RH Window Motor in the opposite direction through the BRN wire. The Motor is grounded through the DK BLU wire, the UP contact in the RH Window Switch, the DK BLU/WHT wire and the UP contact in the Master Door Lock/Power Window Switch Assembly. The Motor runs to drive the Window down.

COMPONENT LOCATION

TROUBLESHOOTING CHART—POWER WINDOWS

BOTH POWER WINDOWS DO NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect test lamp from PNK (76) wire at left window switch connector C502 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	CHECK condition of circuit breaker (PWR WDO). If fuse is good, LOCATE and REPAIR open in PNK (76) wire from window switch to fuse block.
2. Connect test lamp from PNK (76) wire to BLK (150) wire at left window switch connector C502.	Test lamp lights.	REPLACE left window switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from left window switch to bus bar ground.

LH POWER WINDOW DOES NOT OPERATE OR ONLY GOES IN ONE DIRECTION

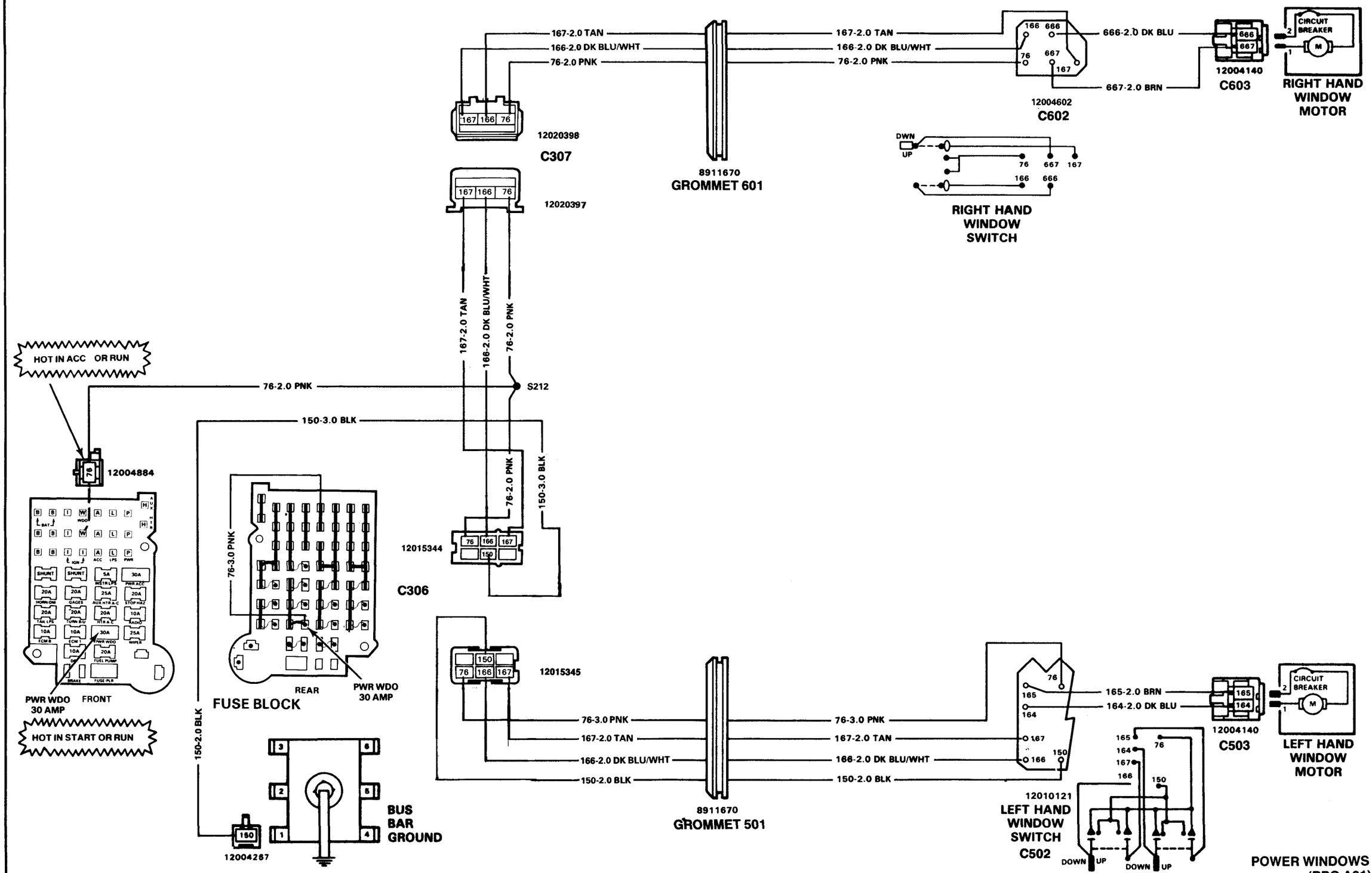
TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect test lamp from PNK (76) wire at left window switch connector C502 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from left window switch to splice S212.
2. Connect test lamp from PNK (76) wire to BLK (150) wire at left window switch connector C502.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from left window switch bus bar ground.
3. Move and hold left window switch to UP position. Connect test lamp from BRN (165) wire at left window switch connector C502 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE left window switch.
4. Connect test lamp from BRN (165) wire to DK BLU (164) wire at left window switch connector C502.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPLACE left window switch.
5. Connect test lamp from BRN (165) wire at left window motor connector C503 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (165) wire from left window motor to left window switch.
6. Connect test lamp from BRN (165) wire to DK BLU (164) wire at left window motor connector C503.	Test lamp lights.	REPLACE left window motor.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (164) wire between left window motor and left window switch.

RH POWER WINDOW ONLY OPERATES FROM DRIVER'S SIDE WINDOW SWITCH

TEST	RESULT	ACTION
1. Place ignition switch in RUN position. Connect test lamp from PNK (76) wire at right window switch connector C602 to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from right window switch to splice S212.
2. Move right window switch to UP position. Connect test lamp from BRN (667) wire at right window switch connector C602 to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE right window switch.
3. Move right window switch to DOWN position. Connect test lamp from DK BLU (666) wire at right window switch connector C602 to ground.	Test lamp does not light.	REPLACE right window switch.

RH POWER WINDOW DOES NOT OPERATE FROM EITHER SWITCH

TEST	RESULT	ACTION
1. Place ignition switch to RUN position. Position and hold right window switch to UP. Connect test lamp from BRN (667) wire at right window motor connector C603 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) wire to DK BLU (666) wire at right window motor connector C603.	Test lamp lights.	REPLACE right window motor.
	Test lamp does not light.	GO to step 4.
3. Connect a test lamp from PNK (76) wire at left window switch connector C502 to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (76) wire from left window switch to fuse block.
4. Connect test lamp from PNK (76) wire to DK BLU/WHT (166) wire at left window switch connector C502.	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 left window switch connector C502.	Test lamp lights.	REPLACE left window switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from left window switch to bus bar ground.
6. Connect test lamp from PNK (76) wire to TAN (167) wire at left window switch connector C502.	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 left window switch connector C502.	Test lamp lights.	REPLACE left window switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from left window switch to bus bar ground.
8. Connect test lamp from PNK (76) wire to DK BLU/WHT (166) wire and then to TAN (167) wire at right window switch connector C602.	Test lamp lights at both wires (166 and 167).	REPLACE right window switch.
	Test lamp lights at only one wire or not at all.	LOCATE and REPAIR open in wires (166 and 167) from right window switch to left window switch.



POWER WINDOWS
(RPO A31)

CIRCUIT OPERATION

The Power Door Locks are operated by reversible motors located in each front door, the side door and the RH rear door. Power to the door locks is supplied through the PWR/ACC circuit breaker.

Moving either Door Lock Switch mounted in the front doors to LOCK applies power to the lock coil of the Door Lock Relay. This energizes the lock coil in the relay and power flows direction to the front, side and rear Door Locks through the 295 (GRA) wires. Ground for the motors is provided through the 294 (TAN) wires and the normally closed contacts of the UNLOCK contacts in the Door Lock Relay. Moving one of the Door Lock Switches to UNLOCK reverses the polarity of the system. Power flows through the energized UNLOCK contacts in the Door Lock Relay contacts.

COMPONENT LOCATION

TROUBLESHOOTING CHART—POWER DOOR LOCKS (WITHOUT DELAY RELAY)

POWER DOOR LOCKS DO NOT OPERATE

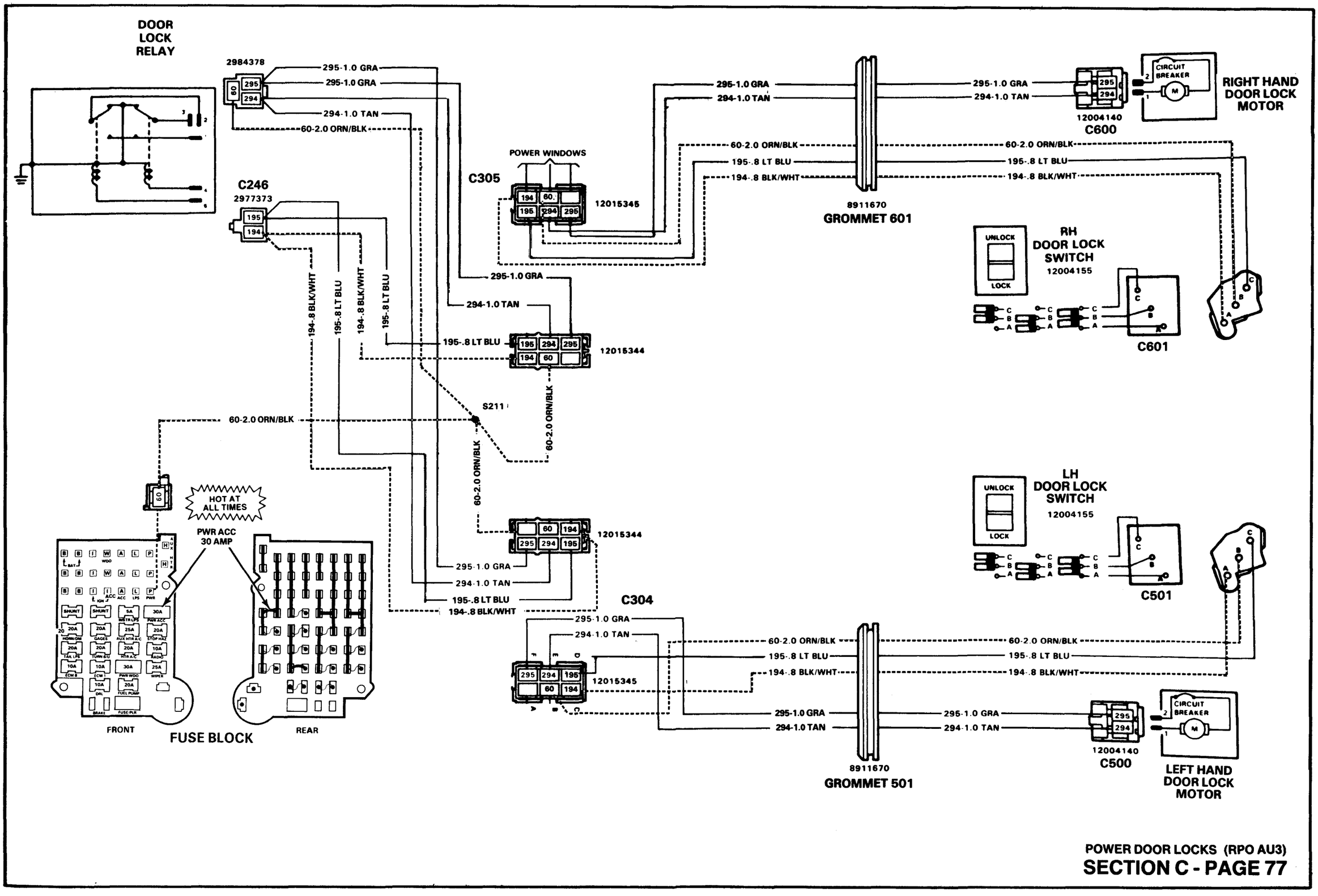
TEST	RESULT	ACTION
Connect test lamp from ORN/BLK (60) wire at door lock relay connector C246 to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN/BLK (60) wire between door lock relay and fuse block. Also inspect splice S211 for open wire or REPLACE PWR ACC circuit breaker.
	Test lamp lights.	INSPECT door lock relay for poor ground condition or REPLACE door lock relay.

DOOR LOCK MOTOR DOES NOT OPERATE FROM A PARTICULAR SWITCH

TEST	RESULT	ACTION
1. Connect 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 S211.
	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 switch and door lock relay.
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 switch and door lock relay.

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.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (294) wire between inoperative motor connector and splice.


DOOR LOCK RELAY
2984378
295-1.0 GRA
295-1.0 GRA
294-1.0 TAN
60-2.0 ORN/BLK
C246
2977373
195
194
194-.8 BLK/WHT
195-.8 LT BLU
194-.8 BLK/WHT
195-.8 LT BLU
POWER WINDOWS
C305
12015345
295-1.0 GRA
294-1.0 TAN
60-2.0 ORN/BLK
195-.8 LT BLU
194-.8 BLK/WHT
8911670
GROMMET 601
12004140
C600
CIRCUIT BREAKER
RIGHT HAND DOOR LOCK MOTOR
UNLOCK
LOCK
RH DOOR LOCK SWITCH
12004155
C601
295-1.0 GRA
294-1.0 TAN
195-.8 LT BLU
12015344
S211
60-2.0 ORN/BLK
60-2.0 ORN/BLK
HOT AT ALL TIMES
PWR ACC 30 AMP
FRONT
REAR
FUSE BLOCK
12015344
295-1.0 GRA
294-1.0 TAN
195-.8 LT BLU
194-.8 BLK/WHT
C304
12015345
295-1.0 GRA
294-1.0 TAN
60-2.0 ORN/BLK
195-.8 LT BLU
194-.8 BLK/WHT
8911670
GROMMET 501
12004140
C500
CIRCUIT BREAKER
LEFT HAND DOOR LOCK MOTOR
UNLOCK
LOCK
LH DOOR LOCK SWITCH
12004155
C501

CIRCUIT OPERATION

WIPER

The Wiper Motor is supplied power at all times 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 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.

The Park Switch is only open when the wipers are in the PARK position. In all other positions, the park switch is closed. When the Wiper Switch is moved to OFF, battery voltage at the WHT wire is applied through the motor, out the GRA wire, through the park switch and to the Wiper/Washer Switch to ground. The Wiper Motor continues to run at low speed until the wiper blades reach the PARK position. At that time the Park Switch opens and the Wiper Motor stops.

The Wiper Motor is protected by a circuit breaker switch which opens if the current through the Motor rises to a high level. This may happen if the wiper blades are blocked by ice or snow. The circuit breaker resets automatically after it cools off.

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.

DELAY

With the Wiper Switch in DELAY, the solid state Pulse Wiper Control Module controls the wiper delay time through the wiper ground circuit. In all other modes of operation, the Pulse Wiper Control Module is bypassed and the wiper system functions the same as the standard wiper system.

COMPONENT LOCATION

TROUBLESHOOTING CHART—WIPER/WASHER (AND RPO CD4)

WIPERS DO NOT OPERATE IN ANY MODE

TEST	RESULT	ACTION
1. Place ignition in RUN and turn wipers to HI. Connect test lamp from WHT (93) wire at windshield wiper motor connector C148 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between windshield wiper motor and fuse block or REPLACE (WIPER) fuse.
	Test lamp lights.	GO to step 2.
2. Connect a fused jumper from BLK (150) wire at wiper switch connector C240 to ground.	Wiper motor runs.	LOCATE and REPAIR open in BLK (150) wire between wiper switch ground terminal 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 pulse wiper module connector C224 or wiper/washer switch connector C241 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire between wiper motor and pulse wiper module or wiper/washer switch or REPLACE wiper motor.
	Wiper motor runs.	GO to step 2, if vehicle is equipped with pulse wipers.
2. Connect a fused jumper from PPL (92) wire at column wiper switch to ground.	Wiper motor does not run.	LOCATE and REPAIR open in PPL (92) wire between wiper switch and pulse wiper module or 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 and wipers to LO. Connect a fused jumper from GRA (91) wire at pulse wiper module connector C240 or wiper/washer switch connector C241 to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRA (91) wire between wiper motor and pulse wiper module or REPLACE wiper motor.
	Wiper motor runs.	GO to step 2, if vehicle is equipped with pulse wipers.
2. Connect a fused jumper from GRA (91) wire at wiper switch to ground.	Wiper motor does not run.	LOCATE and REPAIR open in GRA (91) wire between wiper switch and pulse wiper module or REPLACE pulse wiper control module.
	Wiper motor runs.	REPLACE wiper washer switch.

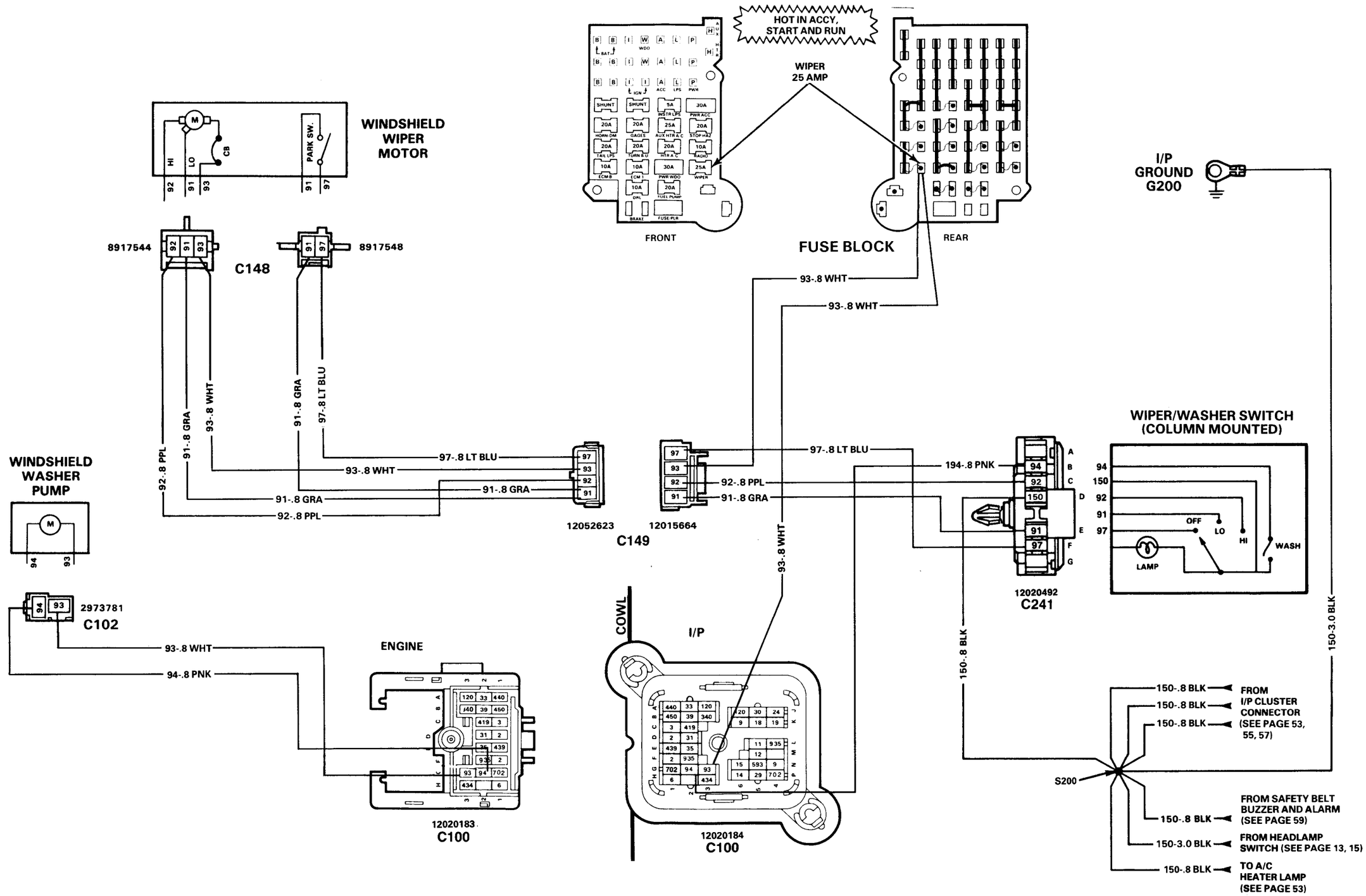
WASHER MOTOR DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place ignition to RUN and wiper switch to WASH. Connect test lamp from WHT (93) wire at washer pump connector C102 to ground.	Test lamp does not light.	LOCATE and REPAIR open in WHT (93) wire between washer pump and fuse block.
	Test lamp lights.	GO to step 2.
2. Connect test lamp from WHT (93) wire to PNK (94) wire at washer pump connector C102.	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 C240 or wiper/washer switch connector C241 to ground.	Washer motor does not pump.	LOCATE and REPAIR open in PNK (94) wire between washer pump and pulse wiper control module or wiper/washer switch.
	Washer motor pumps.	GO to step 4, if vehicle is equipped with pulse wipers. GO to step 5 for standard wipers.

4. Connect a fusible jumper from PNK (94) wire at wiper switch to ground.	Washer motor does not pump.	LOCATE and REPAIR open in PNK (94) wire between pulse wiper control module and wiper switch.
	Washer motor pumps.	GO to step 5.
5. Connect a fusible jumper from BLK (150) wire at pulse wiper module connector C240 or wiper/washer switch connector C241 to ground.	Washer motor does not pump.	REPLACE wiper switch.
	Washer motor pumps.	LOCATE and REPAIR open in BLK (150) wire between wiper/washer switch or pulse wiper module and ground terminal G200.

WASHER MOTOR DOES NOT SHUT OFF

TEST	RESULT	ACTION
1. Place ignition in RUN and wiper switch to WASH. Disconnect wiper/washer switch connector C241.	Washer motor stops pumping.	REPLACE wiper switch.
	Washer motor pumps.	GO to step 2, if vehicle is equipped with pulse wipers.
2. Disconnect wiper control module connector C240.	Washer motor stops pumping.	REPLACE wiper control module.
	Washer motor pumps.	LOCATE and REPAIR short to ground in PNK (94) wire between pulse wiper control module and washer pump.


WINDSHIELD WIPER MOTOR
M
HI
LO
CB
PARK SW.
92
91
93
91
97
8917544
C148
8917548
92-.8 PPL
91-.8 GRA
93-.8 WHT
91-.8 GRA
97-.8 LT BLU
HOT IN ACCY, START AND RUN
WIPER 25 AMP
FRONT
FUSE BLOCK
REAR
93-.8 WHT
93-.8 WHT
I/P GROUND G200
WIPER/WASHER SWITCH (COLUMN MOUNTED)
97-.8 LT BLU
194-.8 PNK
92-.8 PPL
91-.8 GRA
94
150
92
91
97
OFF
LO
HI
WASH
LAMP
12020492
C241
WINDSHIELD WASHER PUMP
94
93
2973781
C102
93-.8 WHT
94-.8 PNK
ENGINE
12020183
C100
COWL
I/P
12020184
C100
12052623
12015664
C149
93-.8 WHT
150-.8 BLK
150-3.0 BLK
150-.8 BLK
FROM I/P CLUSTER CONNECTOR (SEE PAGE 53, 55, 57)
S200
150-.8 BLK
FROM SAFETY BELT BUZZER AND ALARM (SEE PAGE 59)
150-3.0 BLK
FROM HEADLAMP SWITCH (SEE PAGE 13, 15)
150-.8 BLK
TO A/C HEATER LAMP (SEE PAGE 53)

WINDSHIELD WIPER MOTOR

M
HI
LO
CB
PARK SW.
91'
92
91
93
97

8917544
C148
8917548

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

WINDSHIELD WASHER PUMP

M
94
93

2973781
C102

93-.8 WHT
94-.8 PNK

ENGINE CONNECTOR

12020183

97-.8 LT BLU
93-.8 WHT
91-.8 GRA
91-.8 GRA

12052623
C149

2015664

FRONT
REAR
FUSE BLOCK

HOT IN ACCY OR RUN
WIPER 25 AMP

93-.8 WHT
97-.8 PPL
92-.8 PPL
91-.8 GRA
94-.8 PNK
91-.8 GRA
93-.8 WHT

COWL
I/P

12020184
C100

I/P GROUND G200
150-3.0 BLK

PULSE WIPER CONTROL MODULE

12615829
12015829
C240

PULSE WIPER WASHER SWITCH (COLUMN MOUNTED)

96-.8 BRN
94-.8 BLK/LT BLU
92-.8 GRA
150-.8 BLK
91-.8 PPL
97-.8 PNK
96-.8 BRN
HI LO DELAY OFF MIST
DELAY 94

150-.8 BLK
FROM I/P CLUSTER CONNECTOR (SEE PAGE 53, 55, 57)
S200
150-3.0 BLK
150-.8 BLK
FROM SAFETY BELT BUZZER AND ALARM (SEE PAGE 59)
150-3.0 BLK
FROM HEADLAMP SWITCH (SEE PAGE 13, 15)
150-.8 BLK
TO A/C HEATER LAMP (SEE PAGE 53)

PULSE WIPER/WASHER (RPO CD4)

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 Headlamp Switch at all times. With the Headlamp Switch in PARK or HEAD, voltage is applied to the Park, Tail, Marker, and License Lamps.

COMPONENT LOCATION

HEADLAMP SWITCH

150
156
44
9
40
2
10

12004628
C208

2973407
C248

TRANSMISSION BACKUP LAMP SWITCH

24-2.0 LT GRN

REAR BODY

12020099
C100

9-2.0 BRN

24-.8 LT GRN

COWL

12020184
C100

9-.8 BRN

HOT AT ALL TIMES

TAIL LPS 20 AMP

HOT IN START OR RUN

TURN/BU 20 AMP

FRONT

FUSE BLOCK

REAR

75-.8 DK BLU

40-1.0 ORN

9-.8 BRN

24-.8 LT GRN

9-2.0 BRN

24-2.0 LT GRN

BODY BUILDER CONNECTOR

12065158
C403

150-2.0 BLK

SHEET METAL GROUND G400

TURN/BU 20 AMP

TAIL LPS 20 AMP

38-.8 DK BLU

CONNECTOR C403		
PIN	CIRCUIT NUMBER, WIRE GAUGE & COLOR	PURPOSE
A	24-2.0 LT GRN	BACKUP LAMPS
B	19-2.0 DK GRN	RH STOP AND TURN
C	9-2.0 BRN	TAILLAMPS AND LICENSE LAMPS
D	150-2.0 BLK	GROUND
E	18-2.0 YEL	LH STOP AND TURN

BACKUP, TAIL 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 provide power that operates the component. The vacuum created within the inlet manifold when the engine is running is stored in a ball-shaped vacuum tank on the air conditioning evaporator and blower module, adjacent to the accumulator. 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 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.

FRONT MANUAL AIR CONDITIONING (RPO C60) VACUUM SYSTEM

The front manual air conditioning system uses vacuum to operate the air valves ("doors") that control airflow through the air conditioning module and the heater core hot water bypass valve that controls the flow of coolant through the heater core of the air conditioning system.

Vacuum is supplied from the vacuum tank adjacent to the refrigeration system accumulator. Just ahead of the air conditioning control assembly in the instrument panel, the vacuum supply line divides into two branches. One branch brings vacuum to an on-off vacuum valve on the control assembly. When the control assembly temperature lever is in the full "COLD" position, the vacuum valve is open and vacuum is supplied to a hot water bypass valve in the right side of the engine compartment, forward of the air conditioning heater inlet and outlet pipes. This causes hot water to bypass the air conditioning system heater core to prevent unwanted heat from reducing the cooling effect of the system. When the temperature lever is moved away from the full "COLD" position, bypass valve vacuum is vented and the bypass valve permits hot water to reach the heater core.

The other branch of the vacuum supply line brings vacuum to the rotary selector valve that is operated by the mode lever of the control assembly. 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 air conditioning vacuum actuators are two-positioned actuators, each controlled by one vacuum hose. Application of vacuum or vented air to each actuator except the hot water bypass valve 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.

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
2	RECIRC.	ORN	VENT	VAC	VENT	VENT	VENT	VENT	VENT
3	HEAT-DEF.	RED	VAC	VAC	VAC	VAC	VAC	VAC	VENT
4	SOURCE	TAN	VAC	VAC	VAC	VAC	VAC	VAC	VAC
5	A/C	BLU	VENT	VAC	VAC	VENT	VAC	VENT	VENT
9	BI-LEVEL	GRA	VENT	VAC	VAC	VAC	VAC	VENT	VENT

TRANSMISSION VACUUM MODULATOR SYSTEM

Shift points and oil pressure of the MX1 three-speed automatic transmission are controlled by a vacuum modulator that responds to engine vacuum as an indicator of engine operation and performance demands. Vacuum is taken from the inlet manifold and routed directly to the transmission vacuum modulator on the right side of the transmission case. The vacuum modulator controls modulator oil pressure within the transmission to hold the 1-2 and 2-3 shift valves closed until governor oil pressure increases with an increase in engine speed or torque and forces an upshift. A part-throttle 3-2 downshift is forced when the accelerator pedal is depressed enough to overcome the force of governor oil while operating in third gear.

EXHAUST GAS RECIRCULATION 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 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. This 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.

AIR DISTRIBUTION

MODE SELECTION	UPPER (I/P) A/C OUTLETS	LOWER (FLOOR) HEATER OUTLETS	DEFROSTER OUTLETS	REMARKS
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.

COMPONENT LOCATION

		Page	Figure
Air Conditioning Control Assembly	Instrument panel, RH side of instrument cluster	93	15
Air Conditioning Heater Hot Water Valve	In heater hose assembly, RH side of engine compartment	—	—
Air Conditioning Module	Under RH side of instrument panel	—	—
EGR Valve Hose Vacuum Source	Front of throttle body, port "S"	—	—
Electronic Vacuum Regulator Valve (EVRV)	On bracket, inboard side of RH cylinder head	90	8
Exhaust Gas Recirculation (EGR) Valve;			
RPO L05 5.7L (350 cu. in.) V8	Rear of inlet manifold, RH side	—	—
RPO L16 7.4L (454 cu. in.) V8	Front of inlet manifold, LH side	—	—
Heat-Defrost, A/C and Bi-Level Air Valve Actuators	On air conditioning module	—	—
Inlet Manifold Vacuum Fitting	In top of inlet manifold, RH rear of engine	—	—
Manifold Absolute Pressure (MAP) Sensor	On bracket, RH cylinder head	90	8
MAP Sensor Hose Vacuum Source	Rear of throttle body, port "F"	—	—
Recirculating/Fresh Air Valve Actuator	In RH side cowl panel	—	—
Transmission Vacuum Modulator	RH side of transmission case, just above transmission oil pan flange	—	—
Vacuum Tank	Adjacent to A/C accumulator on A/C evaporator and blower module, RH side of engine compartment	—	—

TROUBLESHOOTING

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.

TROUBLESHOOTING CHART — FRONT MANUAL AIR CONDITIONING VACUUM CONTROL

PRELIMINARY CHECKS:

Verify the validity of the complaint by comparing the discharge air temperature of the suspected air conditioning system against the discharge air temperature of a known good system in a comparable 1990 vehicle.

After making quick 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.

INSUFFICIENT COOLING — "HI" BLOWER, "MAX A/C" MODE, "COLD" TEMPERATURE SETTING

TEST	RESULT	ACTION
1. Disconnect vacuum hose from the heater water bypass valve. With engine running and air conditioning controls set for "HI" blower, "MAX A/C" mode and "COLD" temperature, measure vacuum at disconnected end of vacuum hose.	Vacuum reading close to inlet manifold vacuum at idle.	REPLACE the heater water bypass valve.
	Little or no vacuum.	GO to step 2.
2. Disconnect the hose to the heater water bypass valve (lower hose) at the L-shaped 2-hose connector to the valve at the LH side of the A/C control assembly. (Do not disconnect the connector from the valve.) With the engine idling and A/C controls set as in step 1, check for vacuum at the exposed nipple of the connector.	Strong vacuum.	REPAIR vacuum leak or obstruction in hose to the heater water bypass valve.
	Little or no vacuum.	GO to step 3.
3. Disconnect the L-shaped connector from the vacuum valve at the LH side of the A/C control assembly. With the same test conditions as in step 2, check for vacuum at the vacuum supply port (upper port) of the connector.	Strong vacuum.	REPLACE the vacuum valve.
	Little or no vacuum.	REPAIR vacuum leak or obstruction in vacuum supply line branch to the vacuum valve.

PRELIMINARY CHECKS:

Use the charts in this section to verify that air is either being 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 quick 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 inlet manifold 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 inlet manifold 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 inlet manifold vacuum.	REPLACE rotary selector valve.
	Little or no vacuum.	REPAIR obstruction or vacuum leak in vacuum supply hose.

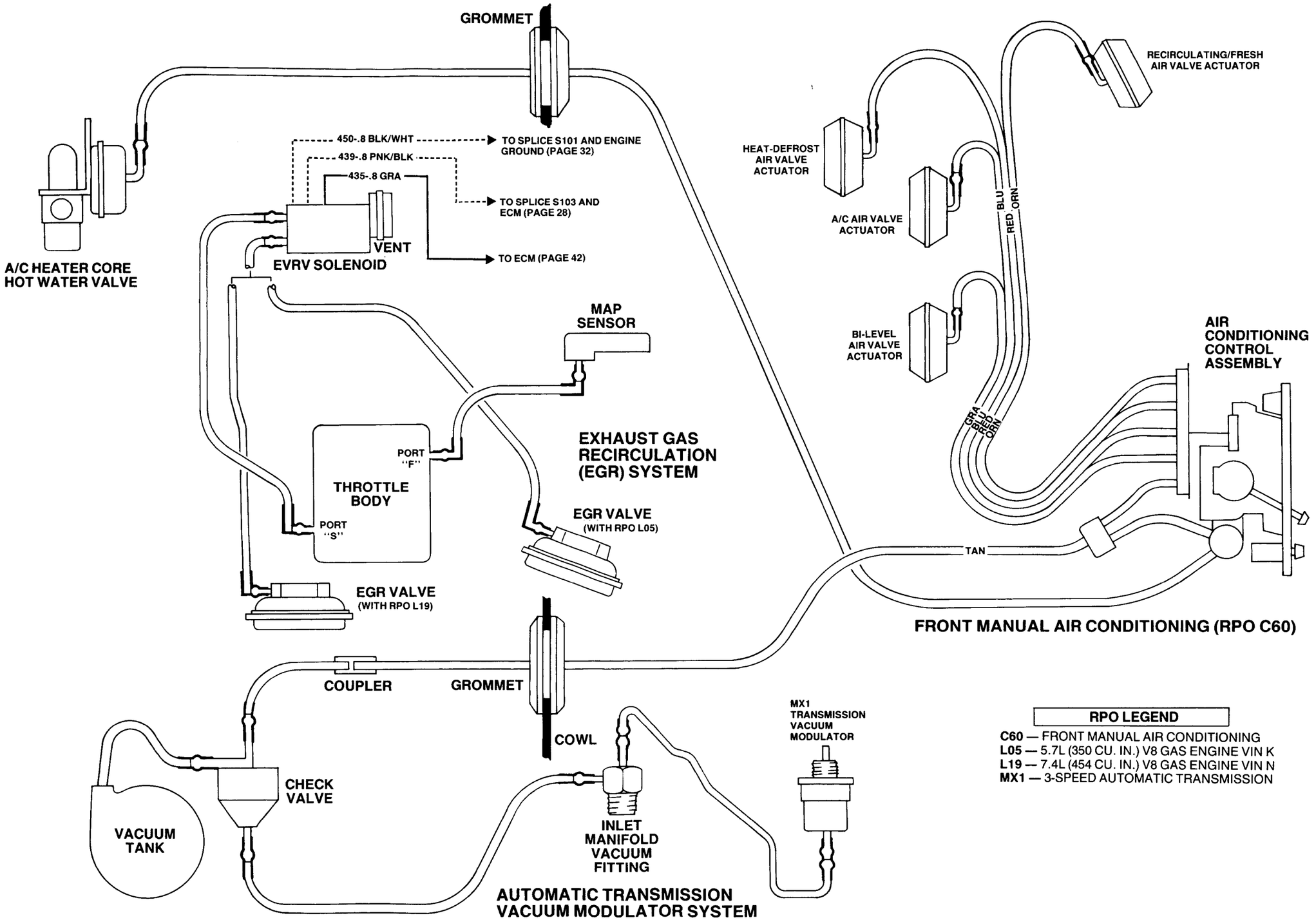
TRANSMISSION VACUUM MODULATOR VACUUM SYSTEM

A leak in the vacuum system for the transmission vacuum modulator of the MX1 three speed automatic transmission can cause high line pressure in the transmission hydraulic control system, a condition that can result in a variety of upshift problems ranging from delayed upshifts to no 1-2 or 2-3 shifts. These conditions may be caused by a vacuum system problem. However, mechanical or hydraulic conditions also might cause the same problems. Therefore, it is advisable to follow diagnosis procedures that check out all possibilities in a systematic order, not just a check for a manlfunctioning vacuum component. For effective diagnosis procedures, refer to the R/V, G and P Truck Service Manual, Section 7A2.

EGR VALVE VACUUM SYSTEM

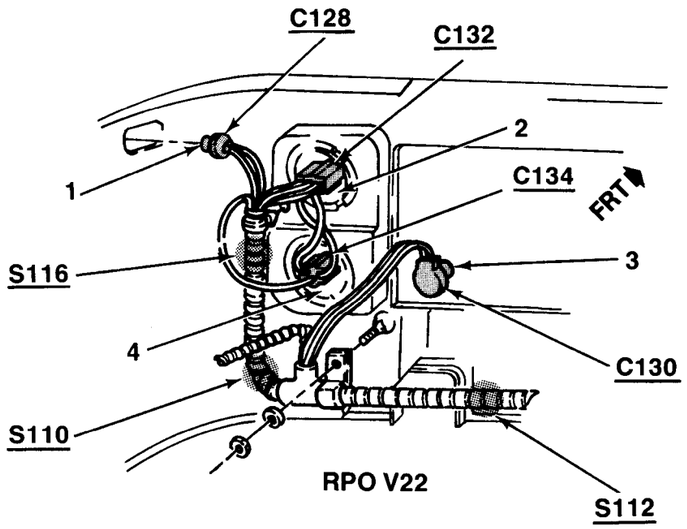
A leak in the EGR (exhaust gas recirculation) vacuum system can upset the ECM's programmed control of exhaust gas recirculation and adversely affect engine operation. Too much exhaust gas recirculation at idle or cruise can result in the engine stalling after closed throttle deceleration, surging during 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 "Fuel and Emissions Service Manual."

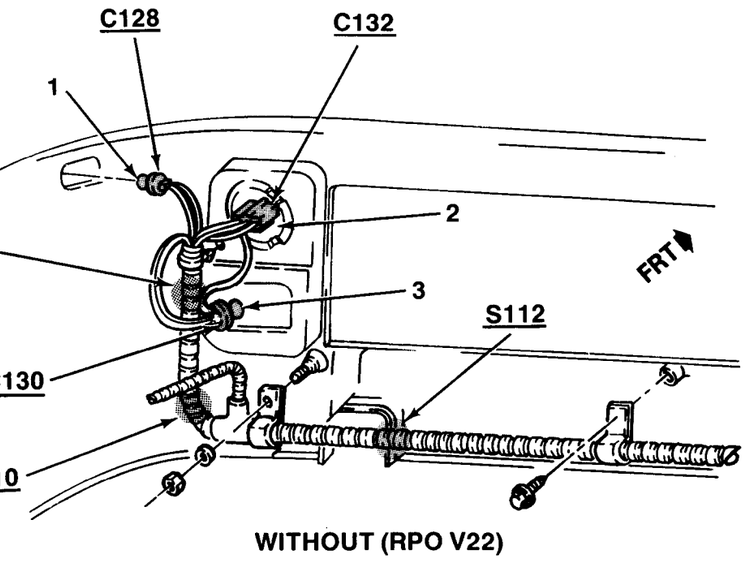


RPO LEGEND

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
MX1 — 3-SPEED AUTOMATIC TRANSMISSION



RPO V22

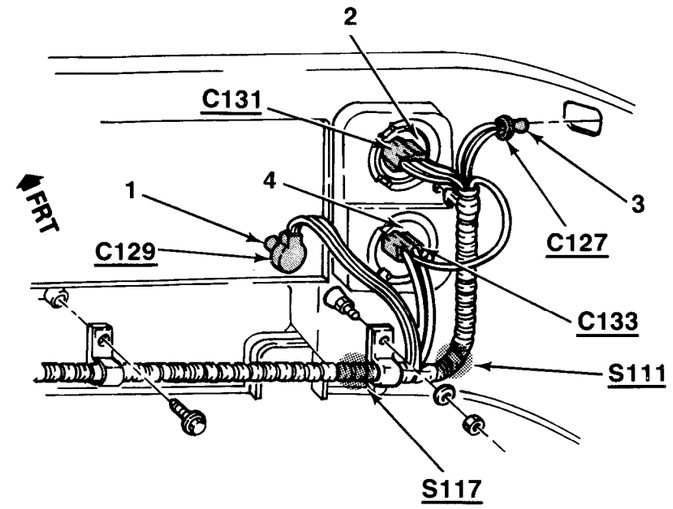


WITHOUT (RPO V22)

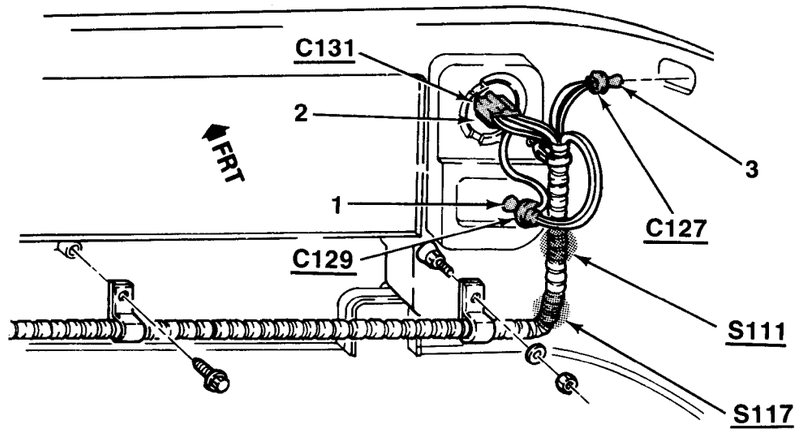
1. LH Side Marker Lamp
2. LH High-Low Beam Headlamp
3. LH Park and Directional Lamp
4. LH High Beam Headlamp

LC-0001-GP-E-RP

Figure 1 - Forward Lamp Wiring Harness, LH Side



RPO V22

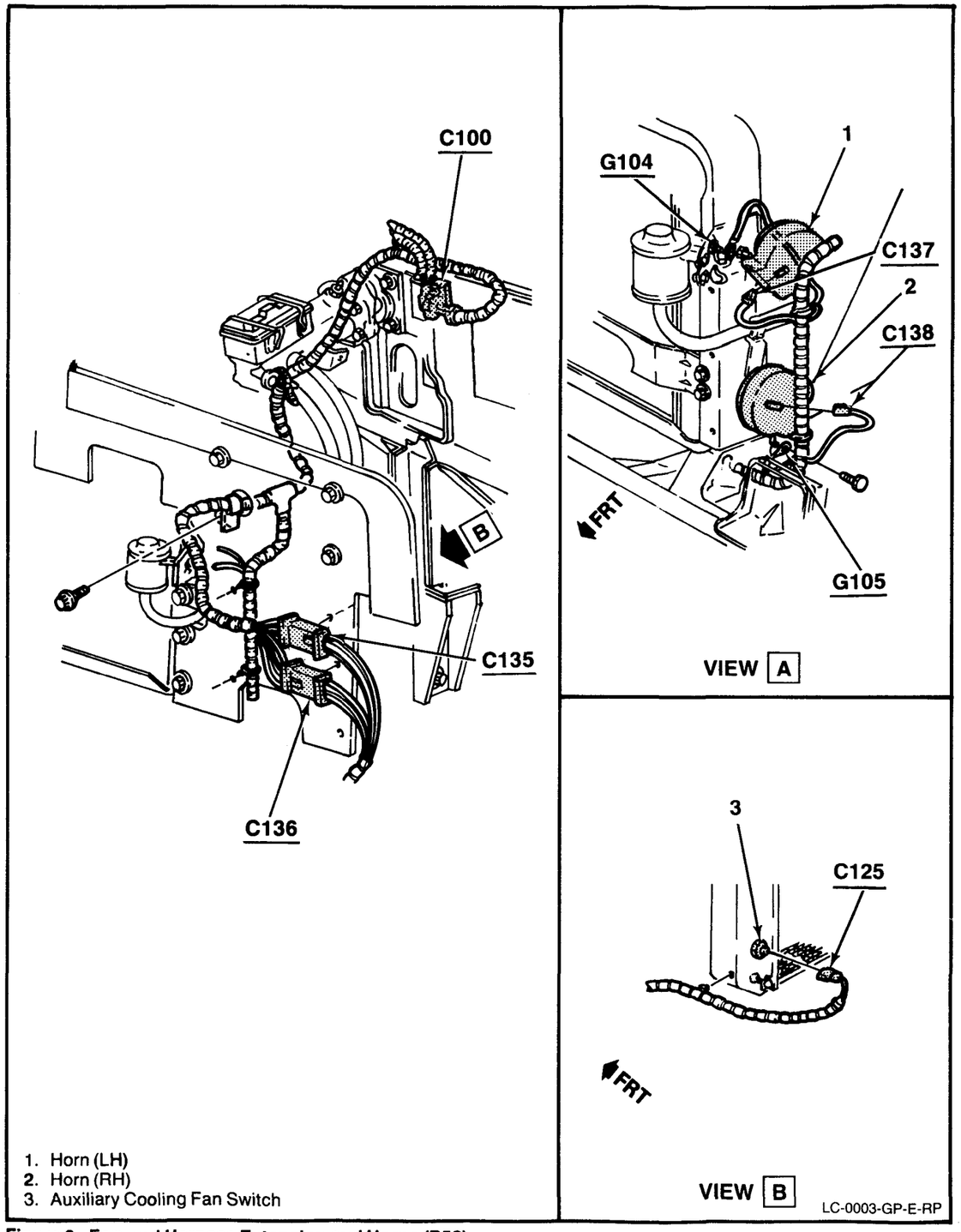


RPO V22

1. RH Park and Directional Lamp
2. RH High Low Headlamp
3. RH Side Marker
4. RH High Beam Headlamp

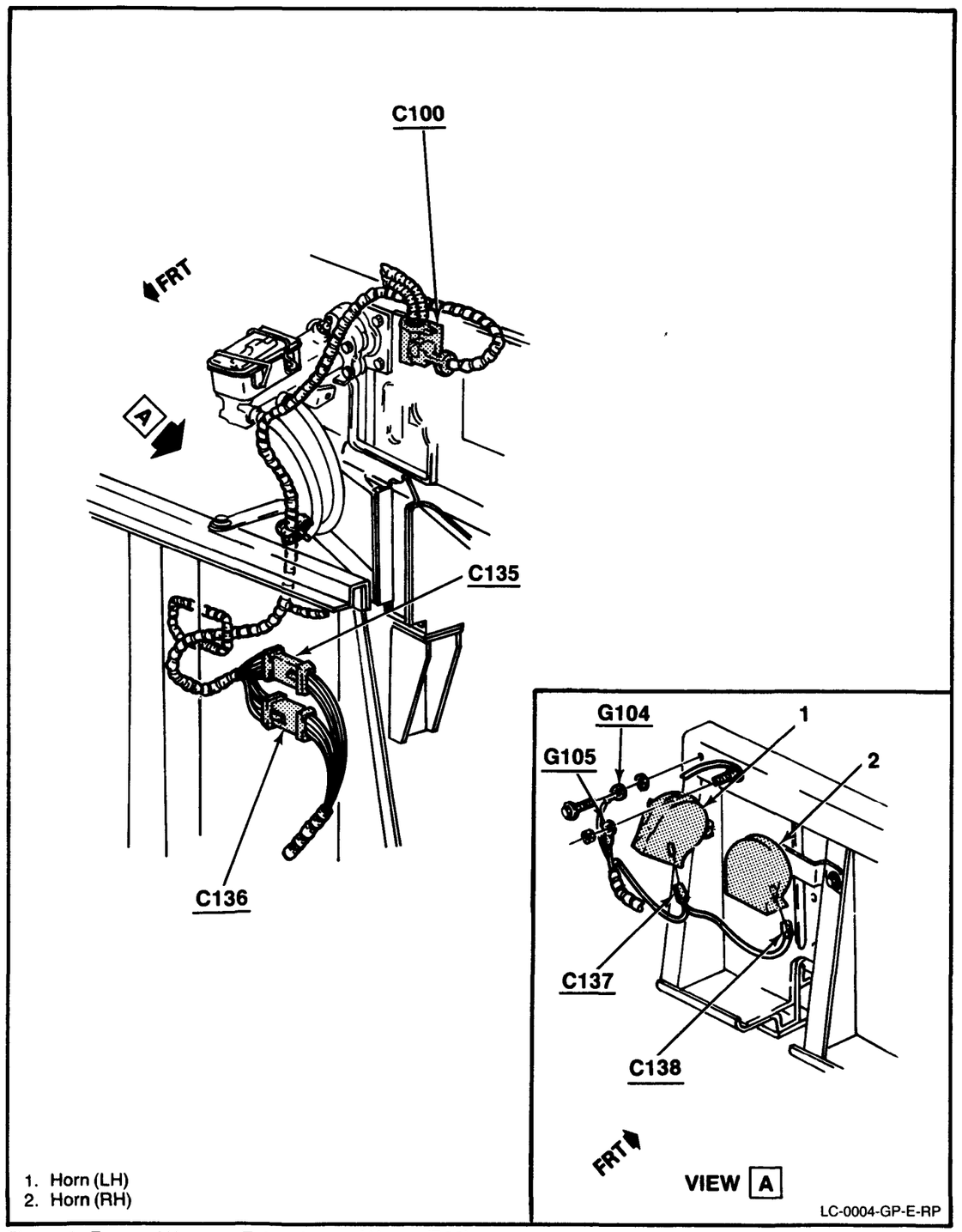
LC-0002-GP-E-RP

Figure 2 - Forward Lamp Wiring Harness, RH Side



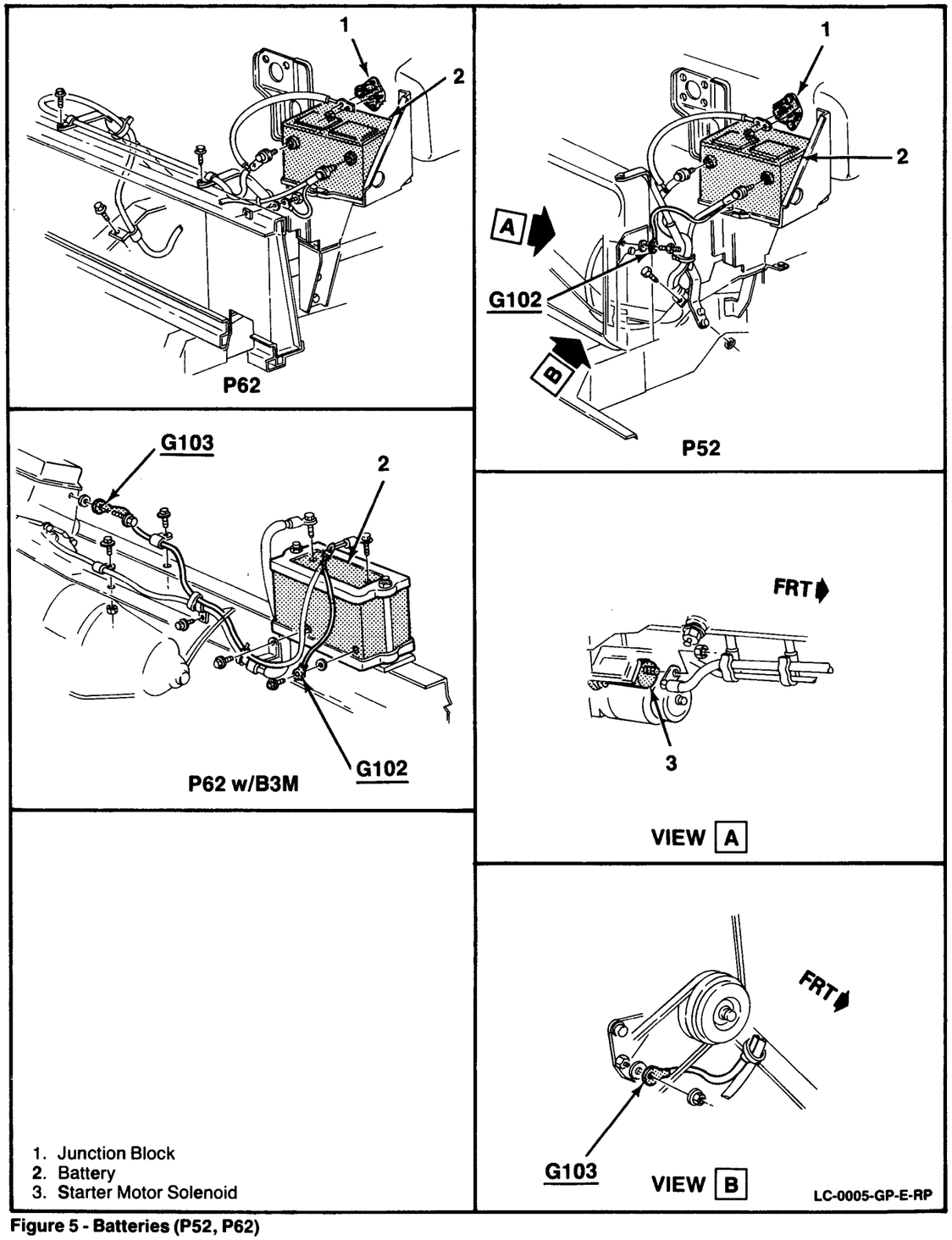
1. Horn (LH)
2. Horn (RH)
3. Auxiliary Cooling Fan Switch

Figure 3 - Forward Harness Extension and Horns (P52)



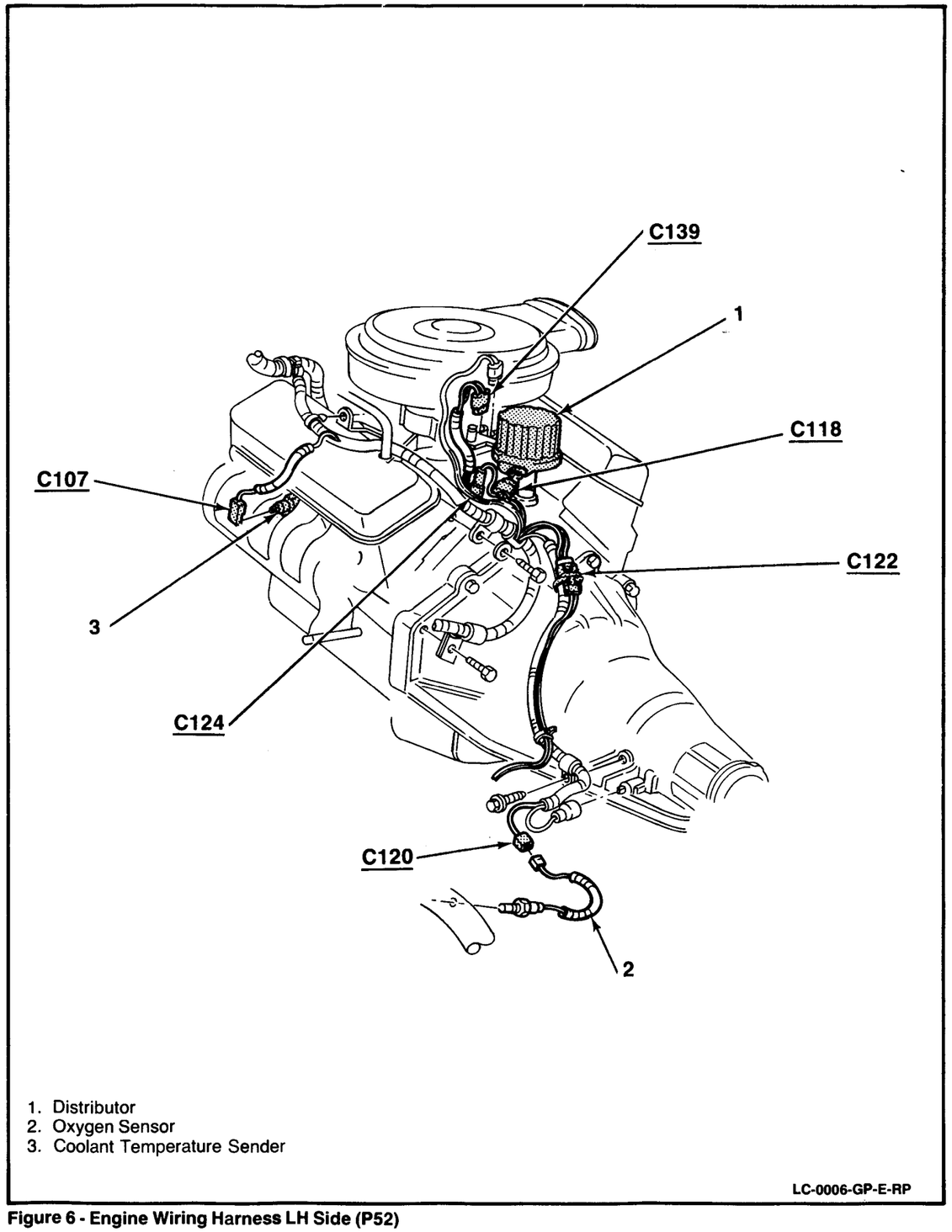
1. Horn (LH)
2. Horn (RH)

Figure 4 - Forward Harness Extension and Horns (P62)



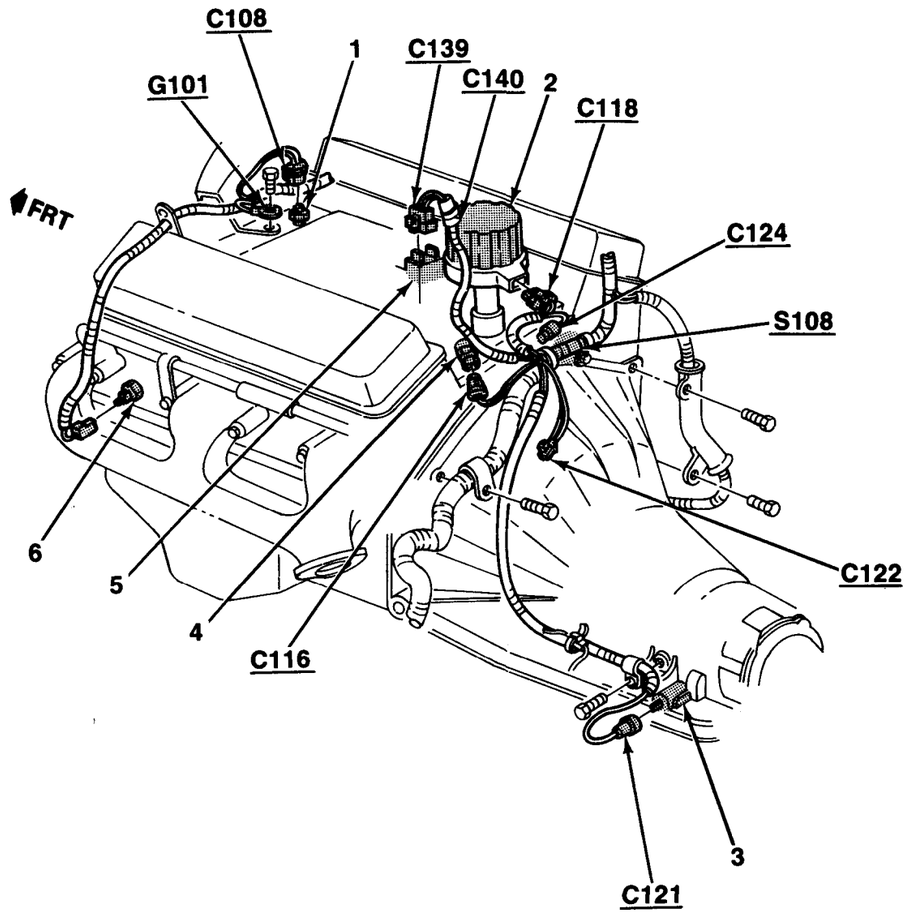
1. Junction Block
2. Battery
3. Starter Motor Solenoid

Figure 5 - Batteries (P52, P62)



1. Distributor
2. Oxygen Sensor
3. Coolant Temperature Sender

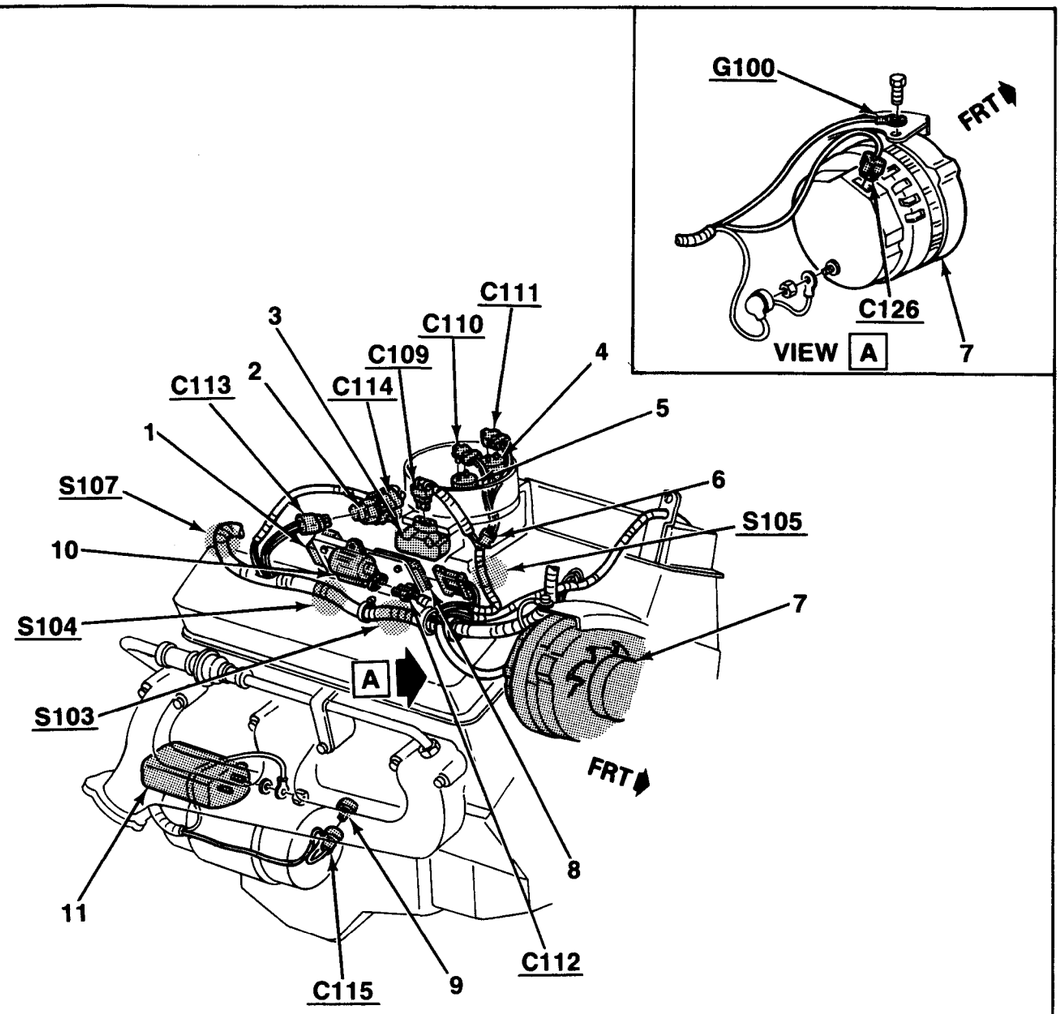
Figure 6 - Engine Wiring Harness LH Side (P52)



1. Coolant Temperature Sensor
2. Distributor
3. Transmission Kickdown Solenoid
4. Fuel Pump/Oil Pressure Switch
5. Coil
6. Engine Temperature Switch

LC-0007-GP-E-RP

Figure 7 - Engine Wiring Harness, LH side (P62)



1. Manifold Absolute Pressure Sensor
2. Idle Air Control
3. Throttle Position Sensor
4. Injector 2
5. Injector 1
6. Grommet 102
7. Generator
8. ESC Hybrid Function
9. ESC Knock Sensor
10. EVRV
11. Starter Motor Solenoid

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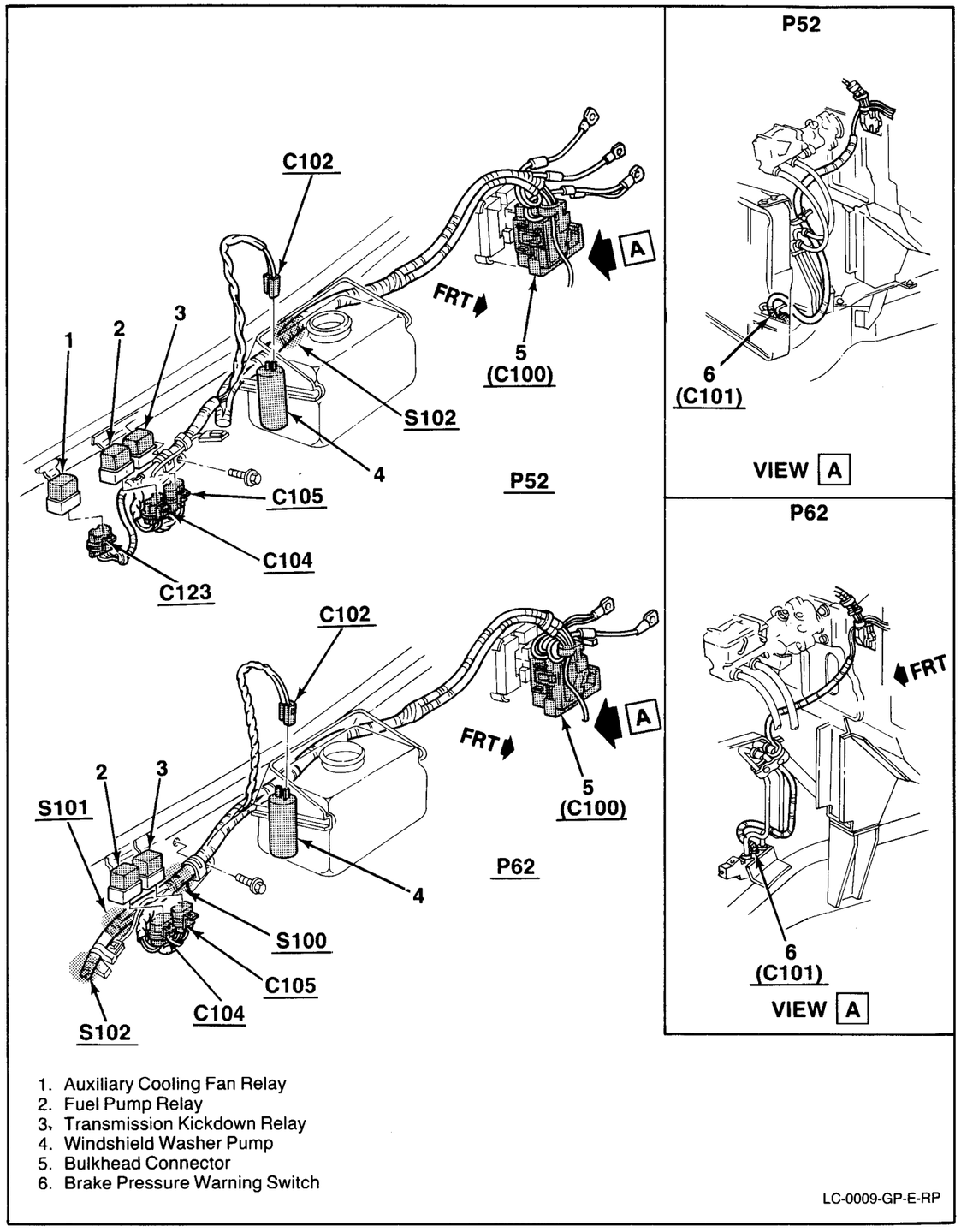
Figure 8 - Engine Wiring Harness, RH side (P62)



1. Auxiliary Cooling Fan Relay
2. Fuel Pump Relay
3. Transmission Kickdown Relay
4. Windshield Washer Pump
5. Bulkhead Connector
6. Brake Pressure Warning Switch

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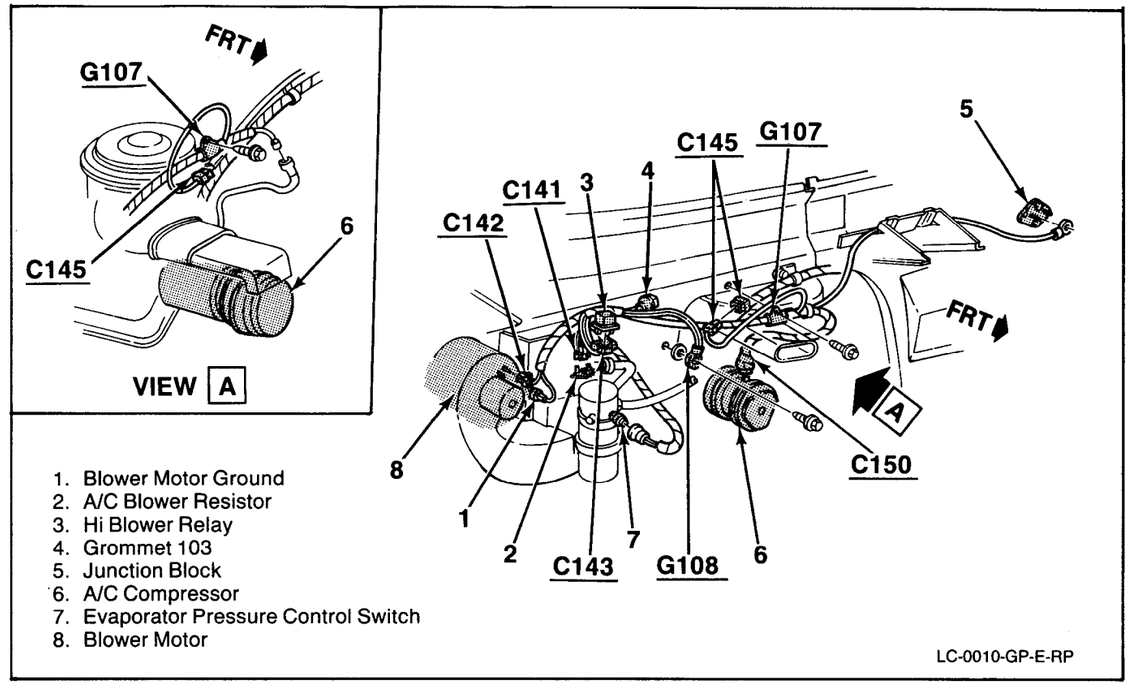
Figure 9 - Engine Wiring Harness, Cowl



1. Blower Motor Ground
2. A/C Blower Resistor
3. Hi Blower Relay
4. Grommet 103
5. Junction Block
6. A/C Compressor
7. Evaporator Pressure Control Switch
8. Blower Motor

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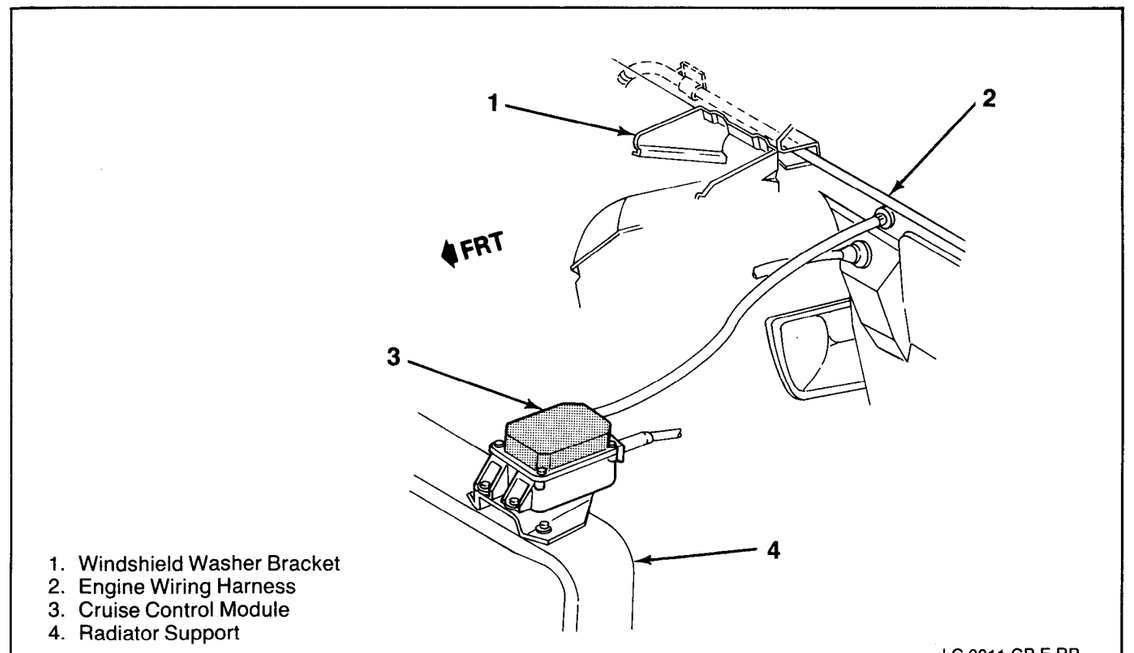
Figure 10 - Air Conditioning, Engine Compartment



1. Windshield Washer Bracket
2. Engine Wiring Harness
3. Cruise Control Module
4. Radiator Support

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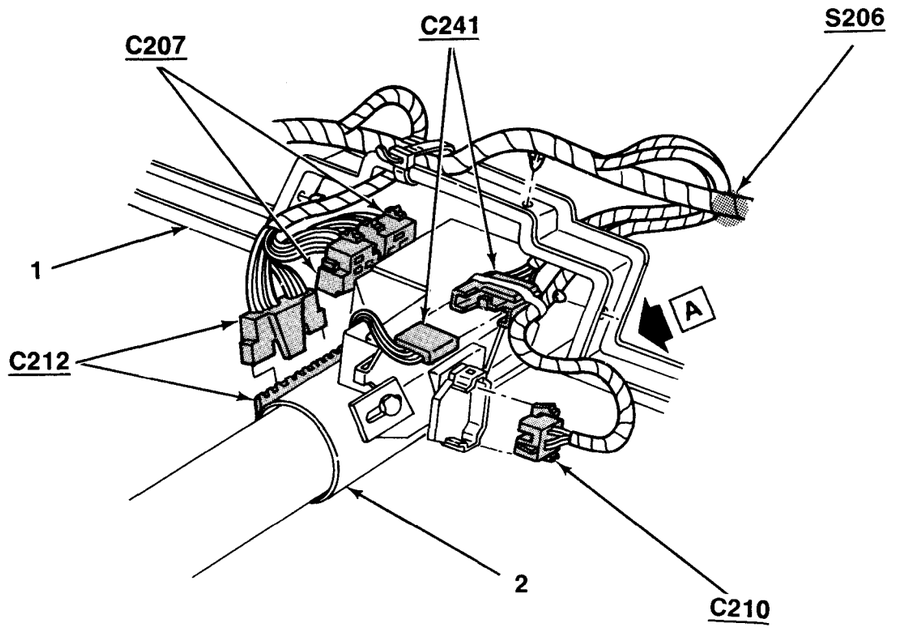
Figure 11 - Cruise Control Module



1. Cowl
2. Steering Column
3. Transmission Backup Switch

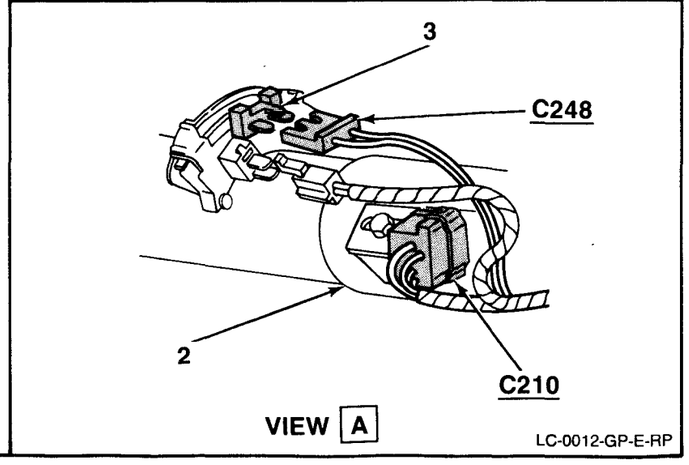
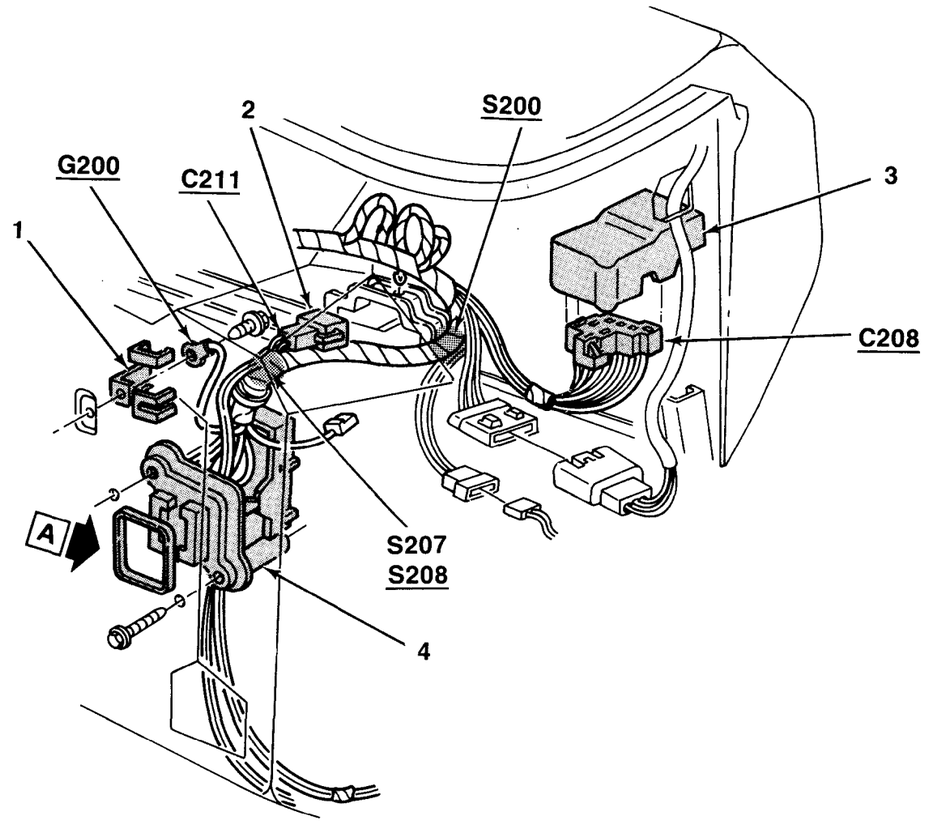


Figure 12 - I/P Harness and Controls



1. Bus Bar Ground
2. Horn Relay
3. Headlamp Switch
4. Fuse Block
5. Park Brake Warning Switch

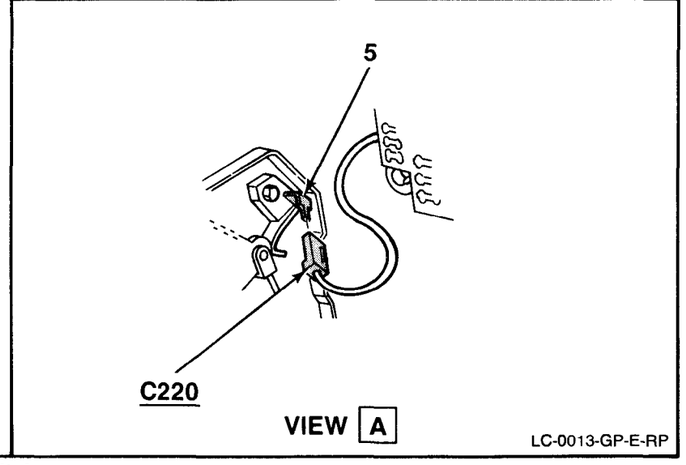
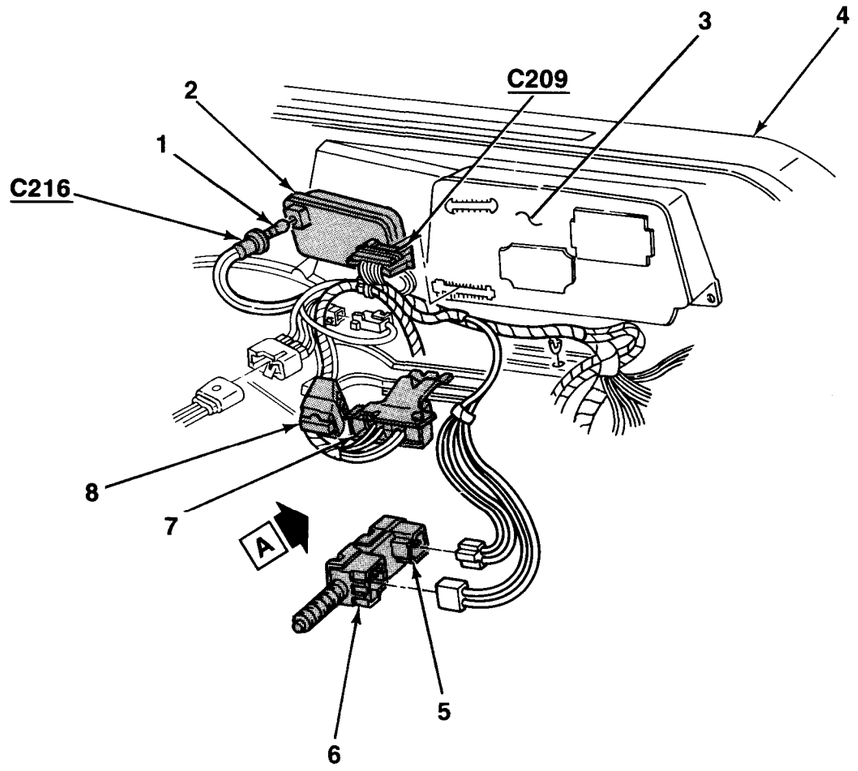
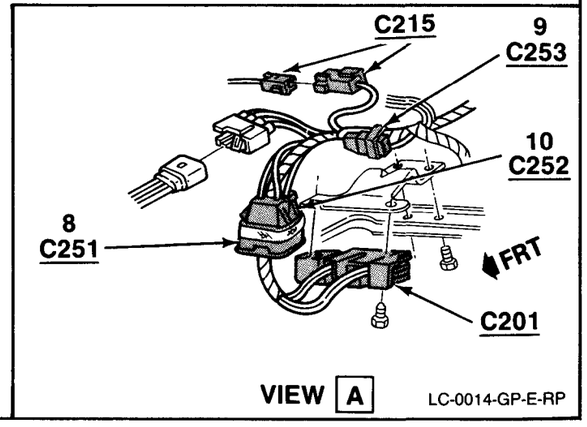


Figure 13 - Steering Column Wiring and Switches

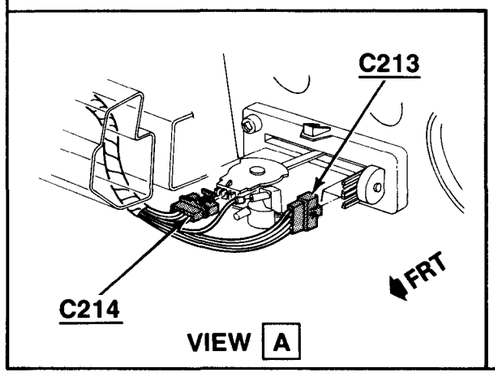




1. Heater A/C Control Assembly Lamp
2. Heater A/C Control
3. I/P Cluster
4. I/P
5. TCC Brake Switch
6. Stop Lamp Switch
7. ALDL Connector
8. Daytime Running Lamp Module
9. Daytime Running Lamp Relay Switch
10. Daytime Running Lamp Diode Array Module

Figure 14 - I/P Wiring, LH Side

1. A/C Selector Control
2. Blower Switch



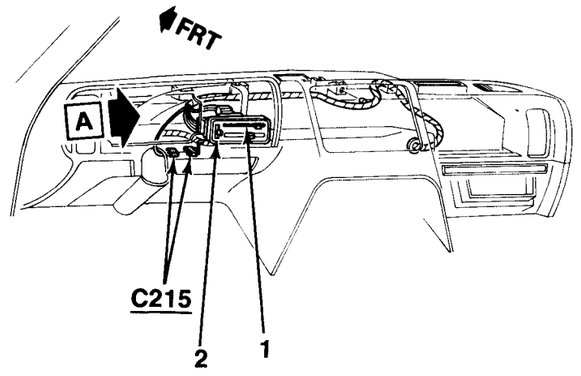
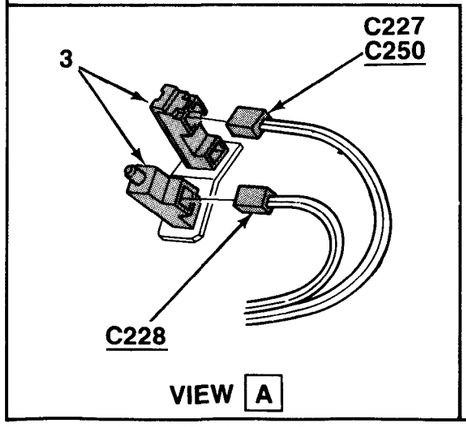


Figure 15 - Air Conditioning, I/P

1. Bus Bar Ground
2. Vehicle Speed Sensor
3. Stop Lamp Switch
4. Fuse Block



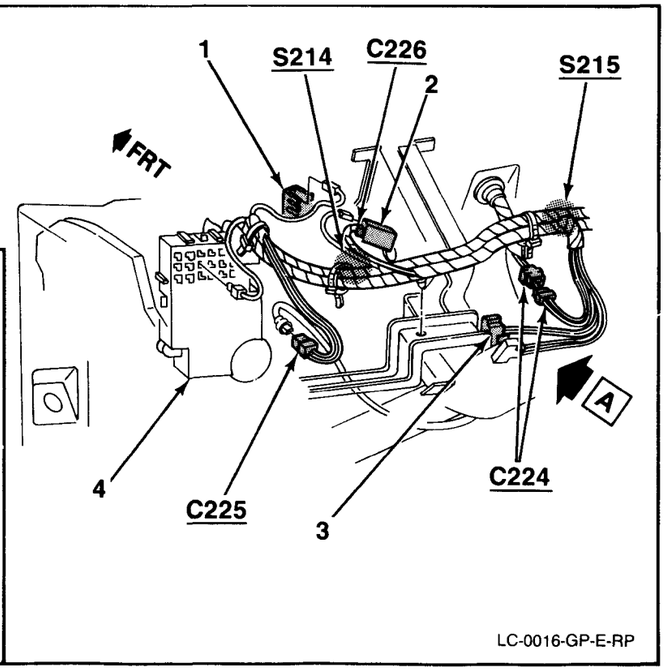
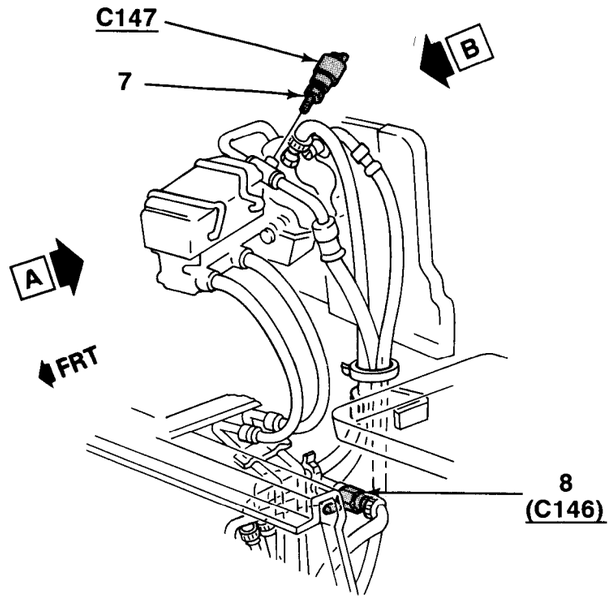
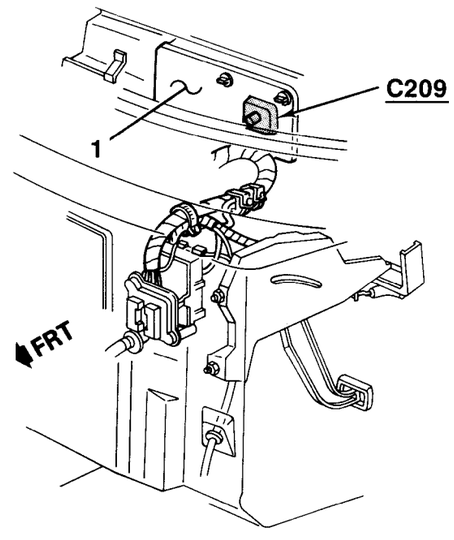


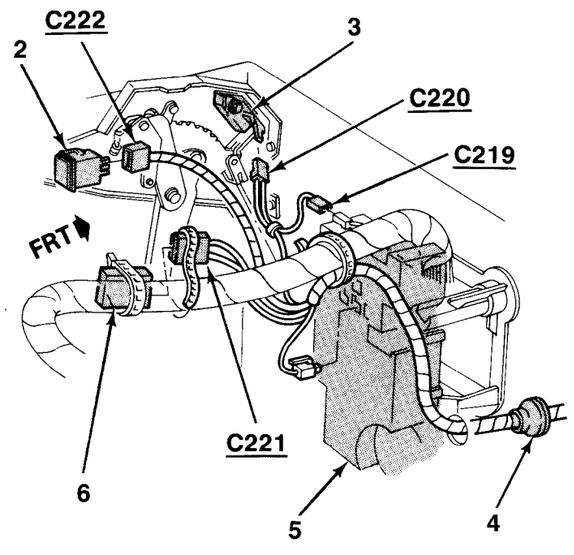
Figure 16 - Cruise Control Wiring Harness (P52)



1. Instrument Cluster
2. Electronic Delay Module
3. Park Brake Warning Switch
4. Grommet 104
5. Fuse Block
6. Alarm
7. Hydro-Boost Pressure Switch
8. Flow Switch



VIEW A



VIEW B

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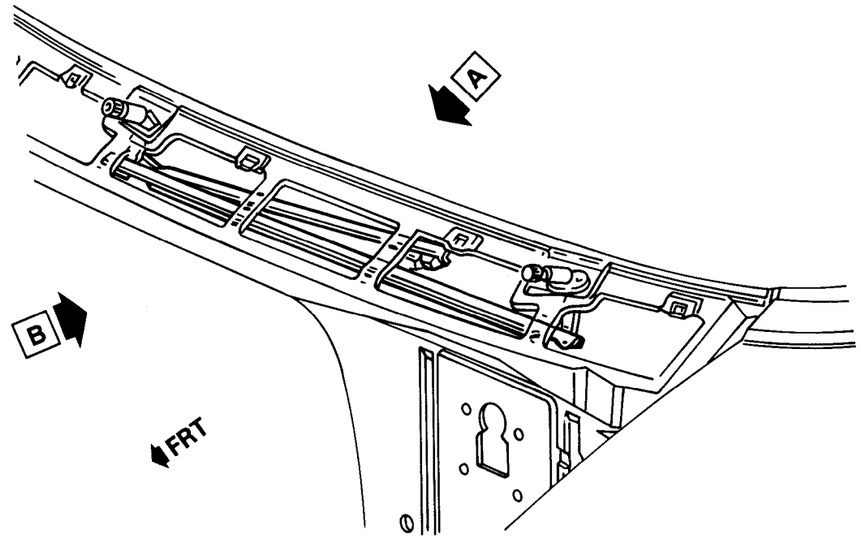
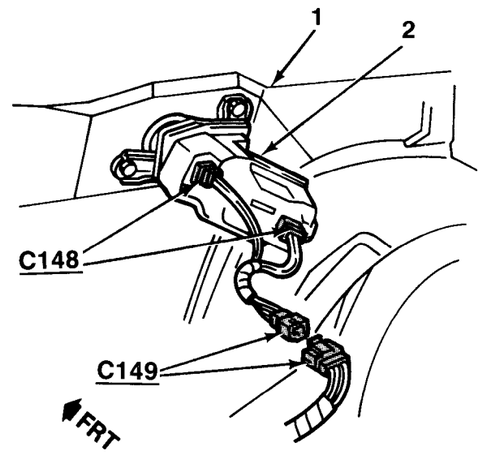
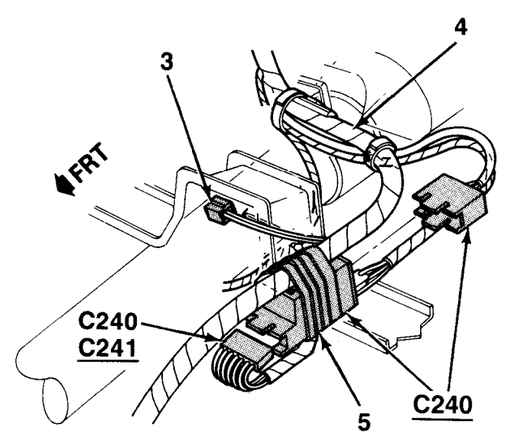
Figure 17 - Hydro-Boost and Alarm Switch Wiring



1. Cowl
2. Windshield Wiper Motor
3. Neutral Safety Switch Connector
4. I/P Harness
5. Windshield Wiper Pulse Controller Module



VIEW A



VIEW B

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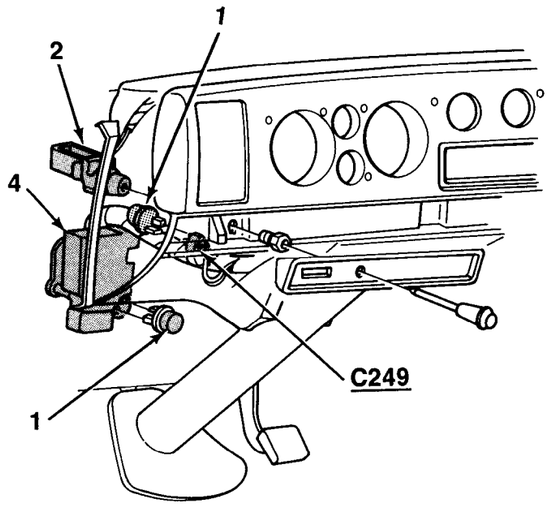
Figure 18 - Pulse Windshield Wiper/Washer Wiring



1. Hazard Flasher
2. Headlamp Switch
3. Hazard Flasher Switch Knob
4. Fuse Block
5. Steering Column
6. Directional Flasher

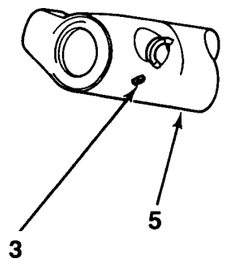


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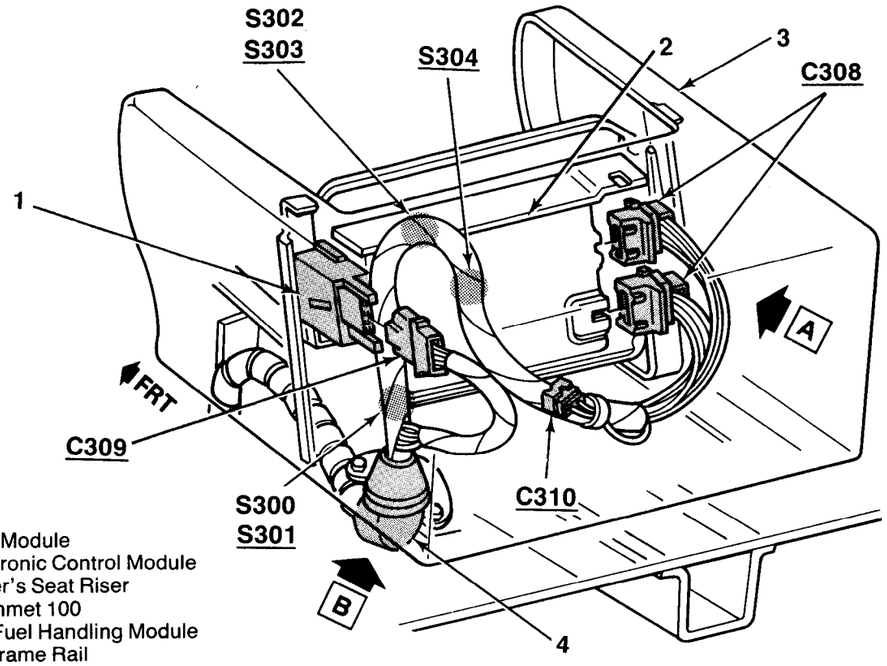
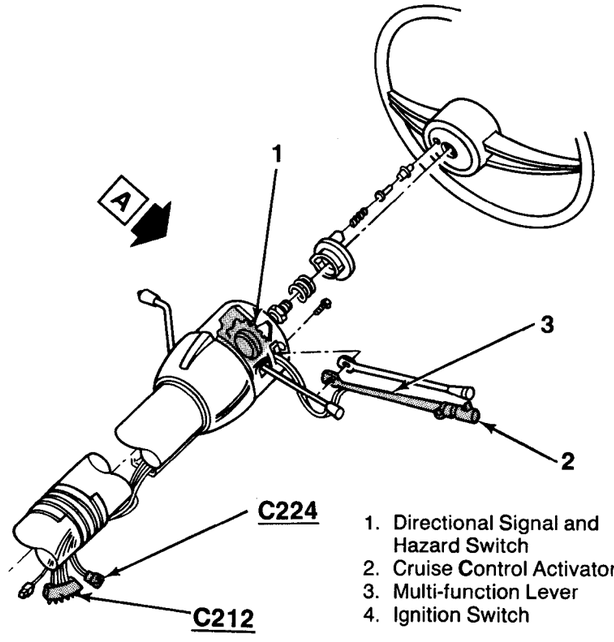
Figure 19 - Hazard Flasher



1. ESC Module
2. Electronic Control Module
3. Driver's Seat Riser
4. Grommet 100
5. Hot Fuel Handling Module
6. LH Frame Rail



1. Directional Signal and Hazard Switch
2. Cruise Control Activator
3. Multi-function Lever
4. Ignition Switch

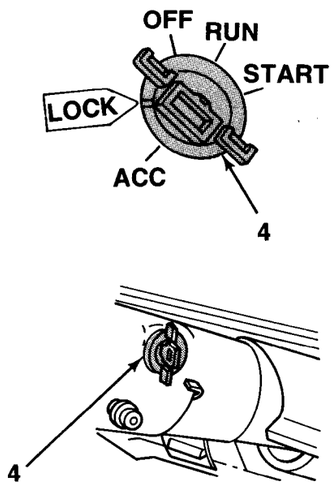


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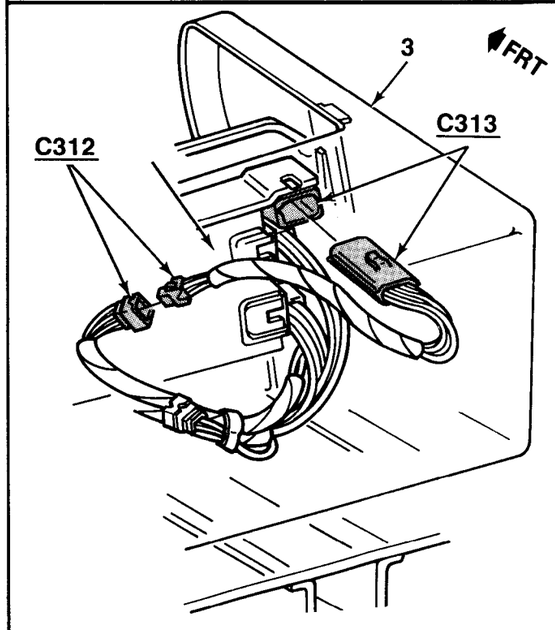
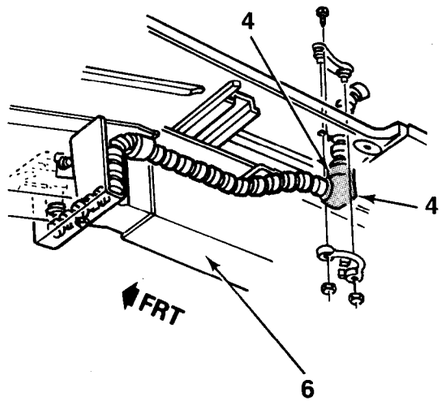
Figure 20 - Multi-function Switch

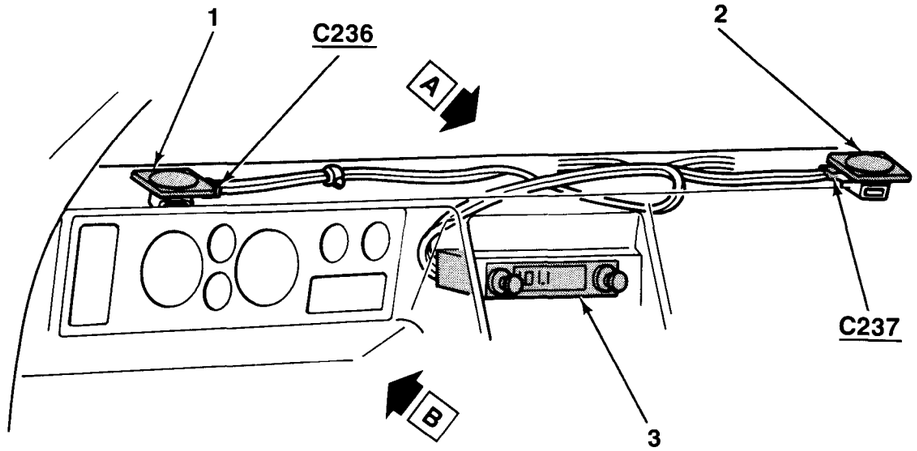


VIEW A

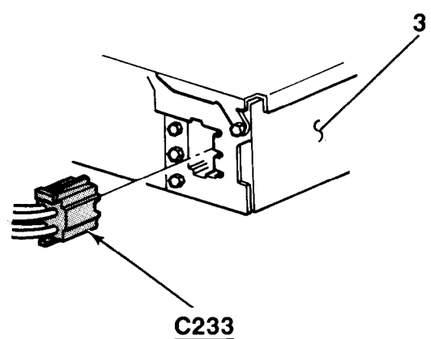


VIEW B LC-0021-GP-E-RP

Figure 21 - Electronic Control Module and Wiring



1. LH Speaker
2. RH Speaker
3. Radio Receiver



VIEW A

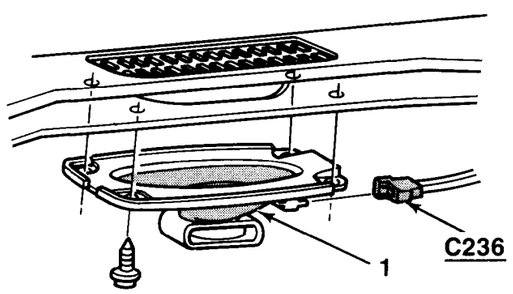


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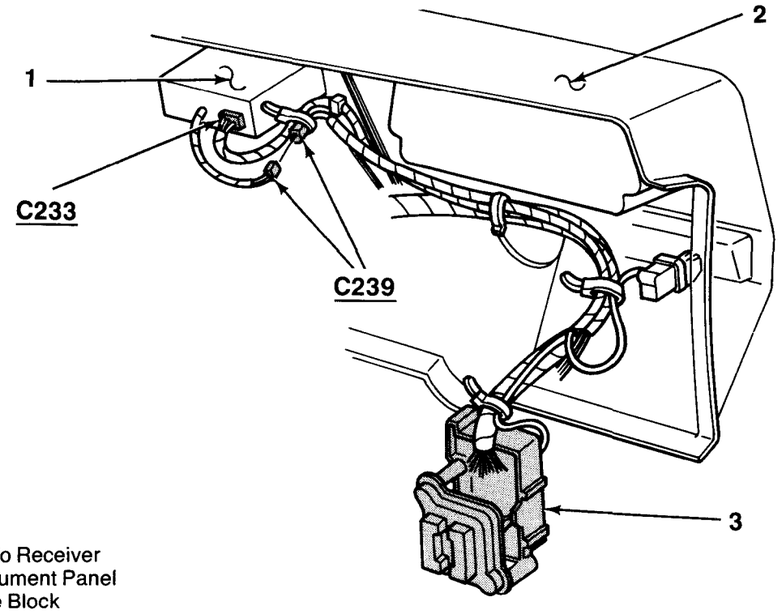
Figure 22 - Radio Front Speaker Harness



1. Radio Receiver
2. Instrument Panel
3. Fuse Block

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Figure 23 - Radio Wiring Harness, I/P with Digital Clock

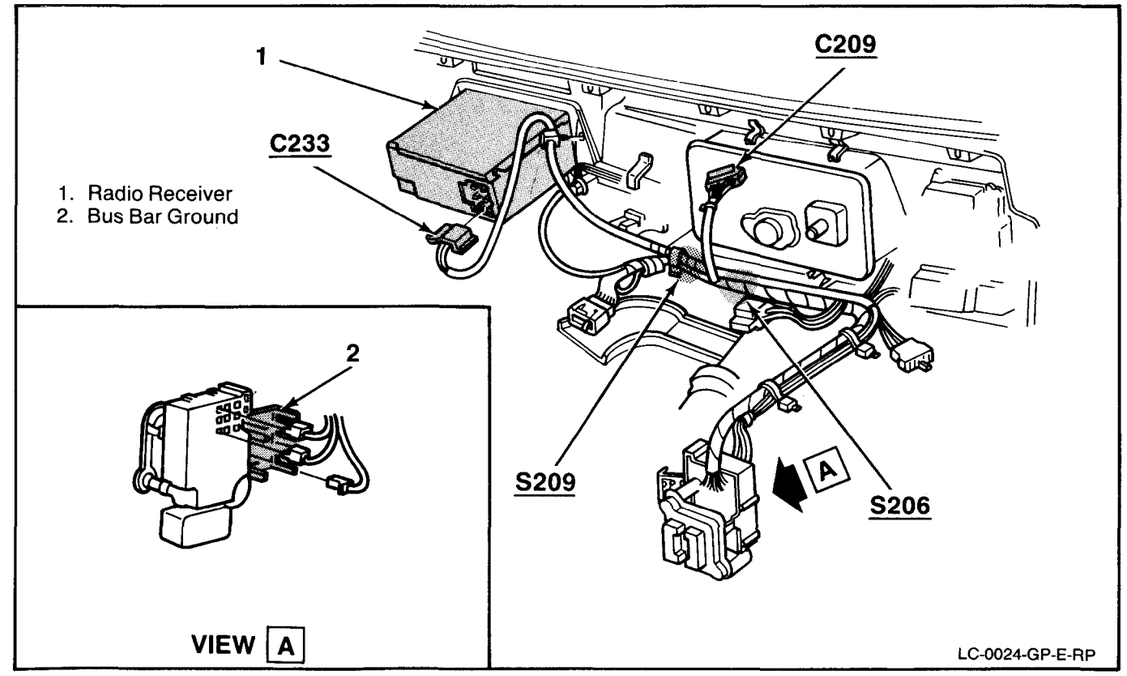
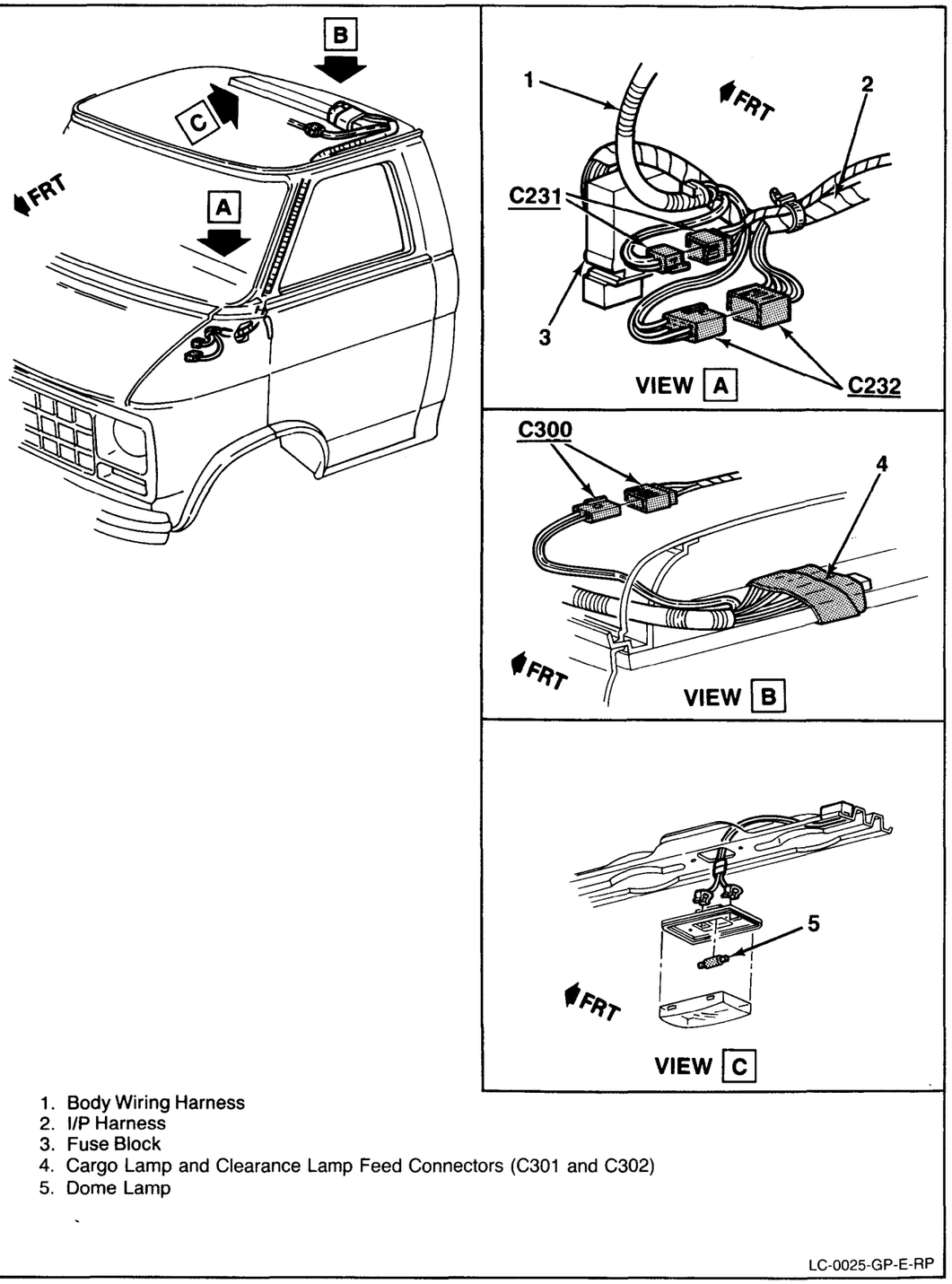


Figure 24 - Radio Wiring Harness, I/P without Digital Clock



1. Body Wiring Harness
2. I/P Harness
3. Fuse Block
4. Cargo Lamp and Clearance Lamp Feed Connectors (C301 and C302)
5. Dome Lamp

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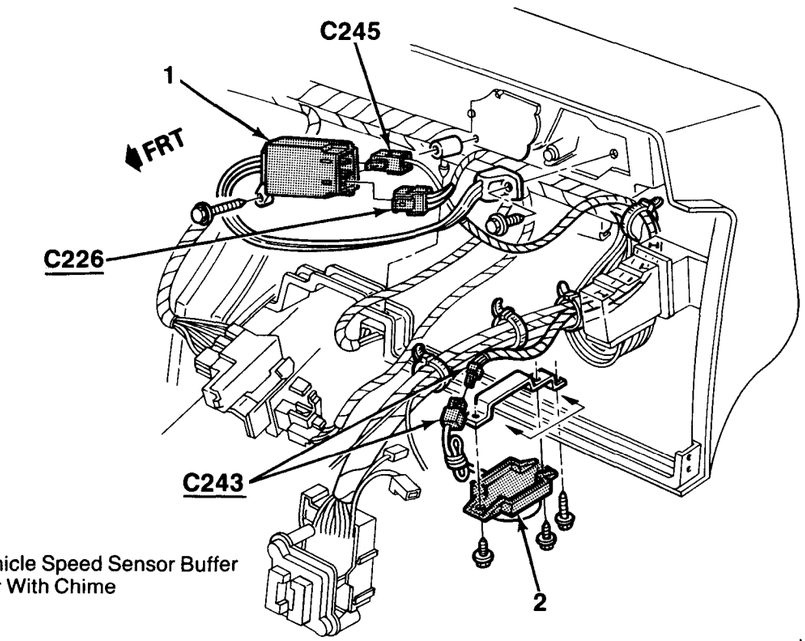
Figure 25 - Dome Lamp and Body Wiring Harness



1. Dual Vehicle Speed Sensor Buffer
2. Amplifier With Chime

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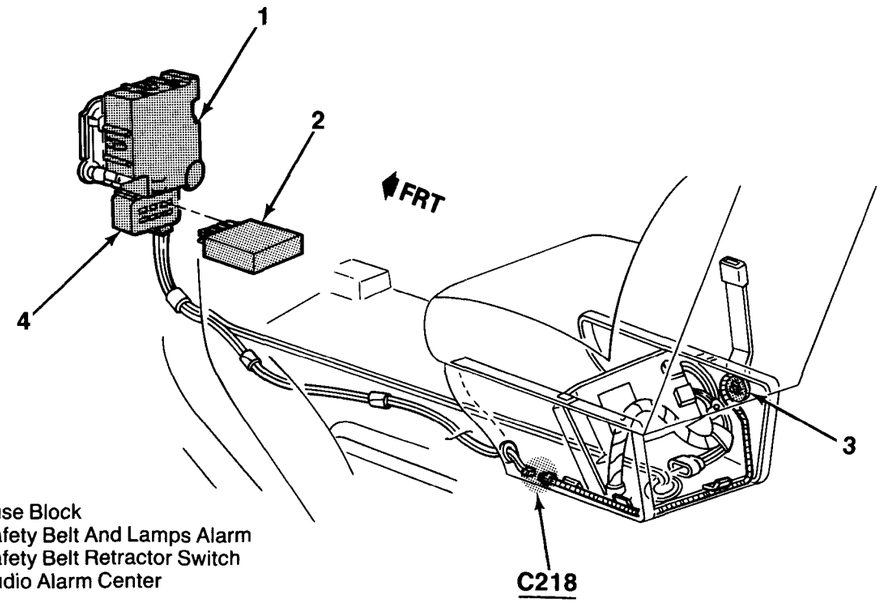
Figure 26 - Overspeed Alarm



1. Fuse Block
2. Safety Belt And Lamps Alarm
3. Safety Belt Retractor Switch
4. Audio Alarm Center

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Figure 27 - Safety Belt and Key-In Warning Buzzer

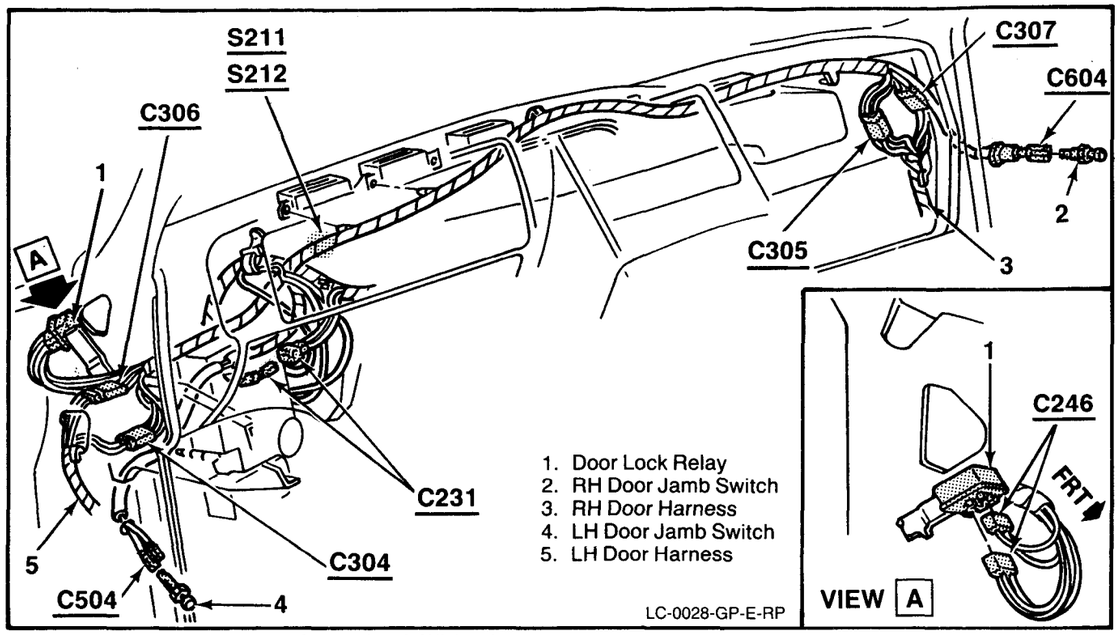

Figure 28 - Power Window and Door Lock Wiring Harness

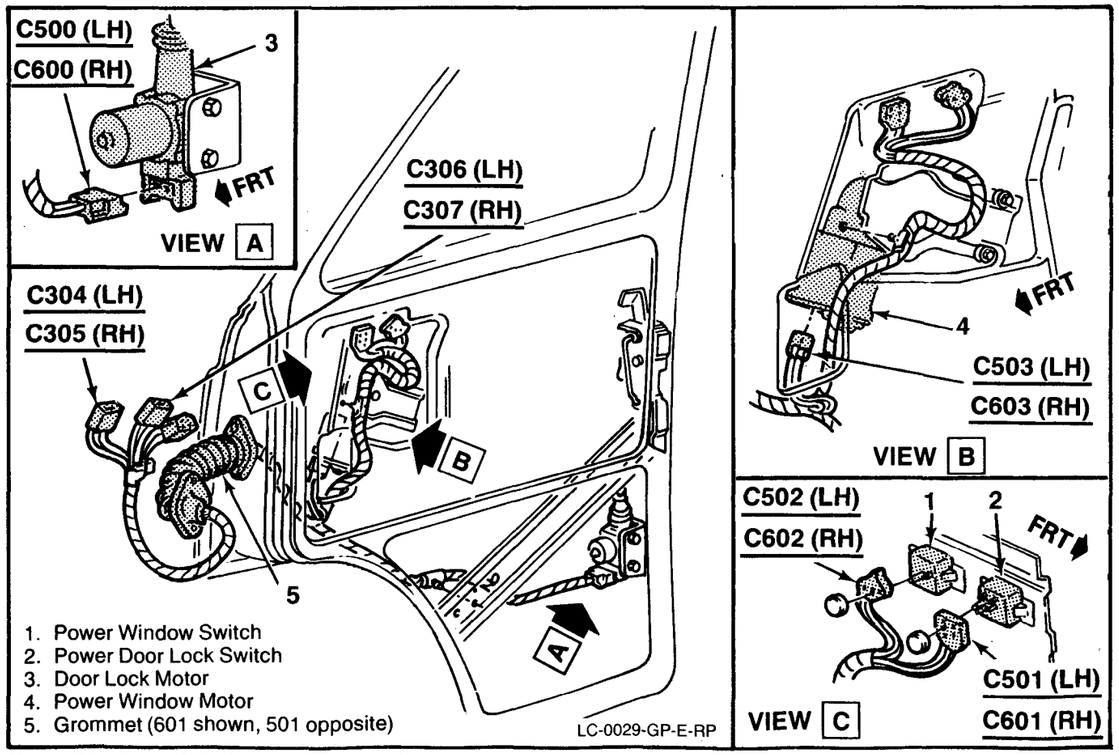

Figure 29 - Power Windows and Power Door Locks

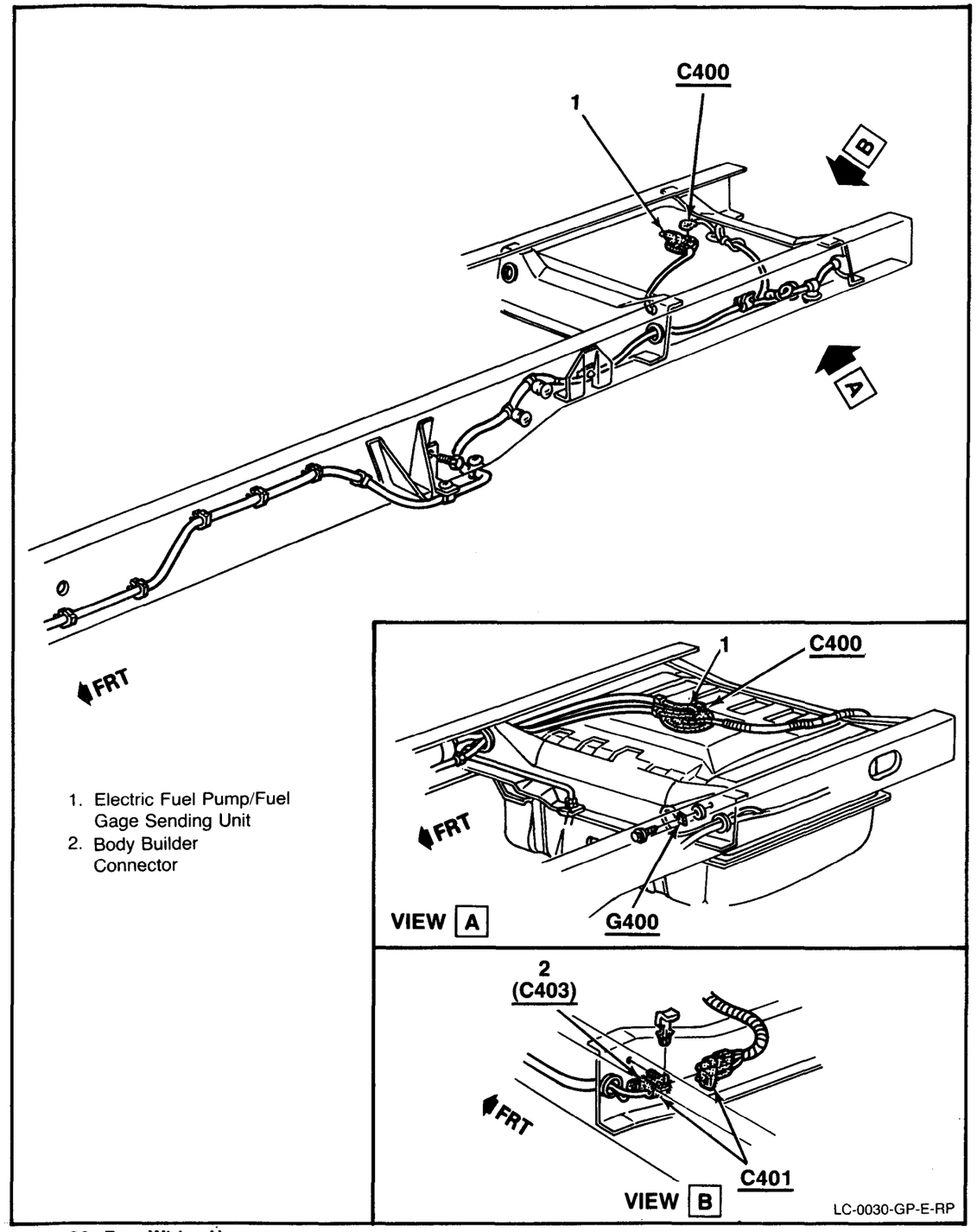

Figure 30 - Rear Wiring Harness

LAMP BULB DATA

AC Type Guide Lamps are recommended when replacement becomes necessary.

Lamp Usage	Quantity	Trade No.	Power Rating at 12.8V, Watts
Headlamps	2	4652	60 40*
Quad System	2	4651 (Opt.)	50
		H4651	50
Dual System	2	6052 (Opt.)	55 65*
	2	H6054 (Opt.)	35 65*
			Candle Power
Dome Lamp	1	211-2	12
Headlamp Beam Indicator Lamp	1	161	1
Park, Signal Lamp Asm.	2	2057NA	1.5-24*
Taillamp, Stoplamps	2	2057	2-32*
License Lamp	2	67	4
Temperature Indicator Lamp	1	194	2
Directional Indicator Lamp	2	194	2
Marker Lamps	4	194	2
Brake Warning Indicator Lamp	1	194	2
Backup Lamp	2	1156	32
Radio Dial Lamp	1	1893	2
Heater or A/C Control Lamp	1	194	2
Transmission Indicator Dial Lamp with Automatic Transmission	1	1445	0.7
Check Engine Lamp	1	194	2
Safety Belt Warning Lamp	1	194	2
Service Engine Soon Indicator	1	194	2
Instrument Cluster Illum.[1]	3	168	3
Instrument Cluster Illum.[1]	1	161	1
Instrument Cluster Illum.[1]	1	194	2
Daytime Running Lamps Indicator (Canada Only)	1	194	2

[1] With gages only.
* Double filament bulb.

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C504	At LH door jamb switch	98 — 28
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C601	At RH door lock switch	98 — 29
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