

**SECTION 8A**  
**ELECTRICAL DIAGNOSIS**  
**1996 C/K TRUCK**

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## INTRODUCTION

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## DIAGNOSTIC INFORMATION

The Electrical Diagnosis section contains the following types of diagnostic information (the way in which the information is arranged may vary from system to system or vehicle to vehicle):

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

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

The **Circuit Schematic** shows the electrical current paths when a circuit is operating properly. It is essential to understand how a circuit should work before trying to diagnose a failure.

The **Component Location List** helps to find where the components of a system can be located. A brief statement of the location is given and also a reference to a drawing that shows the component and its connecting wires. These **Component Location Views** are in SECTION 8A-201.

The **Harness Connector Faces** show the cavity or terminal locations in all the 4 pin or larger connectors shown in the schematic. Together with the wire colors and terminals given in the schematic, they help locate test points. The drawings show the connector faces as seen after the harness connector has been disconnected from a component or mating connector.

The **Troubleshooting Hints** offer short-cuts or checks to help determine the cause of a complaint. They are not intended to be a rigid procedure for solving an electrical situation. Rather, Troubleshooting Hints represent a common-sense approach, based on an understanding of the circuit.

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

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

The **Circuit Operation** describes the components and how the circuit works.

## SECTION/PAGE NUMBER

Sections are organized by subsystems with most containing a circuit schematic and the associated text. This makes the section easy to use, since the page number will stay the same year after year. For example, the Cruise Control schematic will always begin on page 8A-34-0. The other information for Cruise Control follows and is paged 8A-34-1, 8A-34-2, etc.

Some sections may have more than one circuit schematic, such as Power Distribution, Interior Lights and Air Conditioning. The circuit of interest can either be

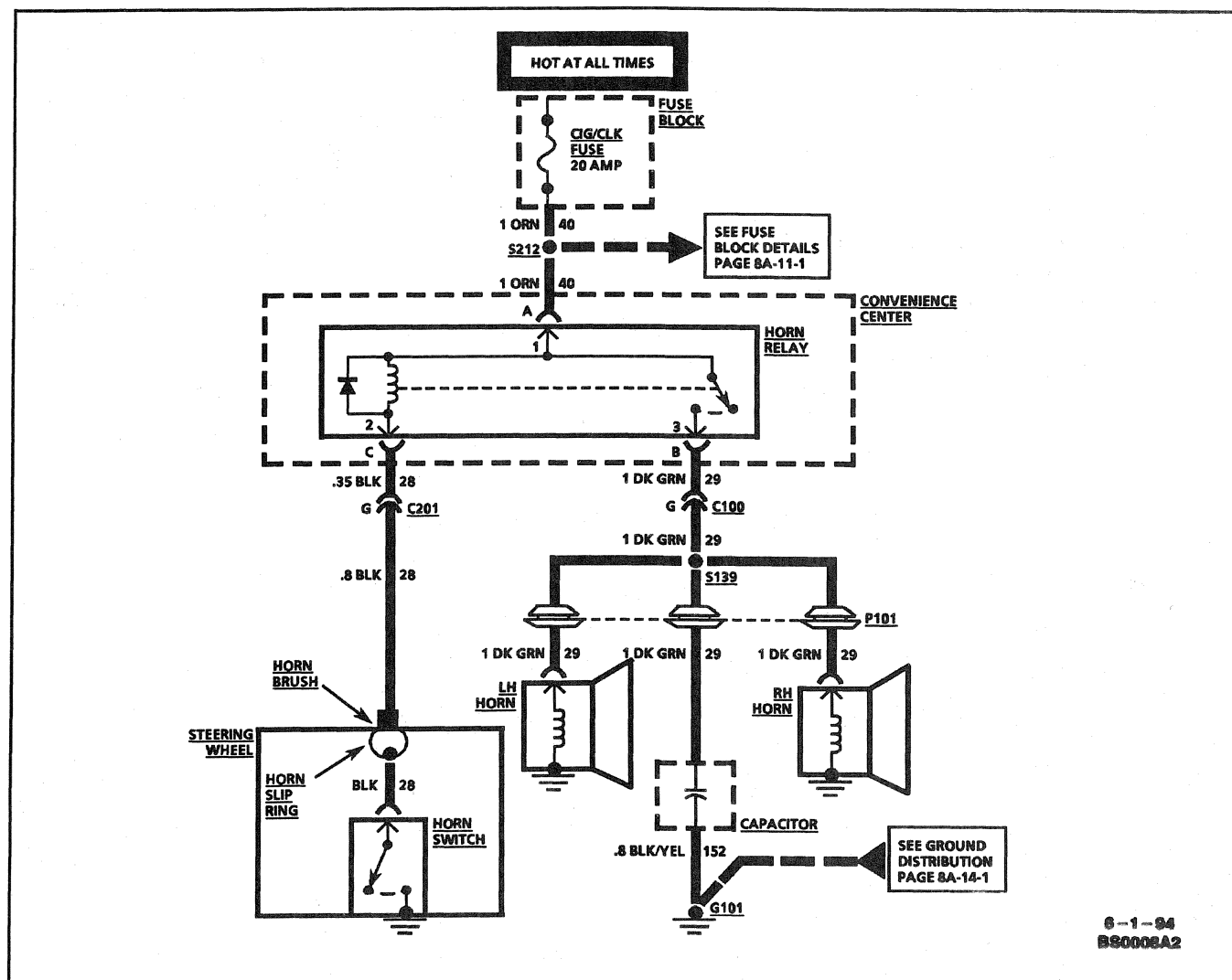


Figure 1—Typical Horn Schematic

located by using the Index or by a quick look through the related section.

All the engine circuits for a particular engine VIN type are in the same section. This makes that section easy to use, since schematics for other engines are not in your way. The Instrument Panel schematics are organized similarly. If you are working on a vehicle with a Digital Cluster, only the schematics that apply to that vehicle's Digital Cluster will be in the section you use. Information on the Indicators and Gages Clusters will be in other sections.

## SCHEMATICS

Schematics break the entire electrical system down into individual circuits. Wiring which is not part of the circuit of interest is referenced to another page, where the circuit is shown complete.

### ! Important:

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

When diagnosing a Horn problem, the technician would reference the Horn section. The schematic in Figure 1 is a typical example of what would be found in a Horn section of SECTION 8A, along with the following text.

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

## INTRODUCTION

### COMPONENT LOCATIONS

To locate the schematic components on the vehicle, use the Component Location List. Refer to "Typical Entries in the Component Location List."

Listed in the left hand column are the components, connectors, grounds and splices shown on the schematic. To the right of the component is the location, "Under RH side of I/P." Reference to LH and RH is made as though the technician was sitting in the driver's seat. On the same line, in the next two columns, are page and figure references for SECTION 8A-201, "Component Location Views." In this case, you are directed to Figure 4 on page 8A-201-1.

Where connectors are listed, the number of cavities is provided. This represents the total number of cavities in the connector, regardless of how many are actually used. This information is provided to help identify connectors on the vehicle. In the far right column is a page reference where a view of the connector face may be found. Connectors with 3 cavities or less are not included in SECTION 8A-202, "Harness Connector Faces."

Grounds are listed next in the table. The location description for G101 reads, "Behind LH Composite Headlamp." You are directed to page 8A-201-8, Figure 14.

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

## Typical Entries in the Component Location List

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under RH side of I/P .....	1 .....	4	
Fuse Block.....	Behind I/P Compartment Door .....	0 .....	2	
<b>CONNECTORS</b>				
C100 (34 cavities).....	Mounted to LH Hood Hinge.....	7 .....	11 .....	Fig. 27
C210 (15 cavities).....	Above Convenience Center, behind I/P Compartment .....	18 .....	23 .....	Fig. 32
<b>GROUND</b>				
G101.....	Behind LH Composite Headlamp .....	8 .....	14	
<b>SPLICES</b>				
S139 .....	Forward Lamp Wiring Harn, behind RH Composite Headlamp.....	8 .....	15	
S212 .....	I/P Wiring Harn, behind I/P, above Steering Column.....	6 .....	8	

Figure 2—Typical Entries in the Component Location List

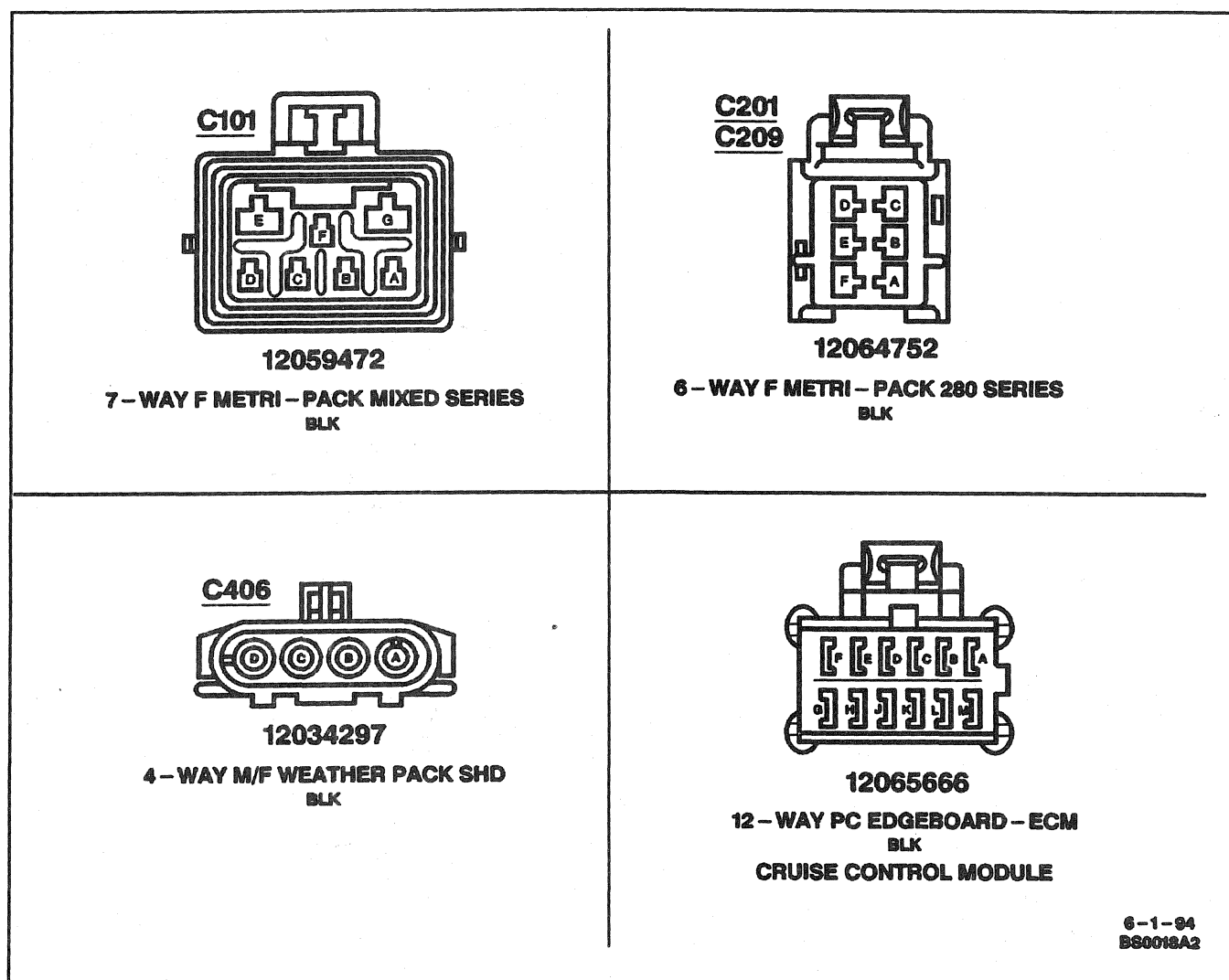


Figure 3—Typical Harness Connector Faces

## HARNESS CONNECTOR FACES

The connectors (see Figure 3) are labeled with the component they are connected to, or the connector number. In addition the color of the connector is given along with the family/series name.

If you need to backprobe a connector while it is on the component (refer to page 8A-4-3 for probing procedures), the order of the terminals must be mentally reversed. The wire color is a help in this situation. If there is more than one wire of the same color, you may need to locate a test point from its terminal number. A useful trick is to imagine that you are probing a terminal from behind the page you are looking at. Then mentally locate that terminal with respect to the keyway or other reference mark.

## OTHER INFORMATION

### VIN REFERENCES

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

### SERVICE PARTS IDENTIFICATION LABEL

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

## INTRODUCTION

## ABBREVIATIONS

A/C	Air Conditioning
CCM	Central Control Module
CKT	Circuit
CONN	Connector
EBCM	Electronic Brake Control Module
EBTCM	Electronic Brake and Traction Control Module
ECM	Engine Control Module
HARN	Harness
I/P	Instrument Panel
LH	Left Hand
PCM	Powertrain Control Module
RH	Right Hand
TERM	Terminal

For a list of additional abbreviations, refer to SECTION 0A.

## POWER DISTRIBUTION

The Power Distribution schematic shows the wiring from the Battery and Generator to the Starter Solenoid, Fuse Block, Ignition Switch and Light Switch. The first component after a Fusible Link is also shown. In certain instances, the first component after a Fuse Block fuse and Light Switch is also shown.

The Power Distribution schematic refers to Fuse Block Details or the appropriate section schematics. By using these schematics, power distribution wiring can be followed from the Battery and Generator to the first component after a Fusible Link, Fuse or Light Switch. The ability to follow the power distribution wiring to the first component in each circuit is extremely helpful in locating short circuits which cause fusible links and fuses to open.

Figure 4 is a sample Power Distribution schematic. It shows how voltage is applied from the positive battery terminal to the various circuits on the vehicle. For example,

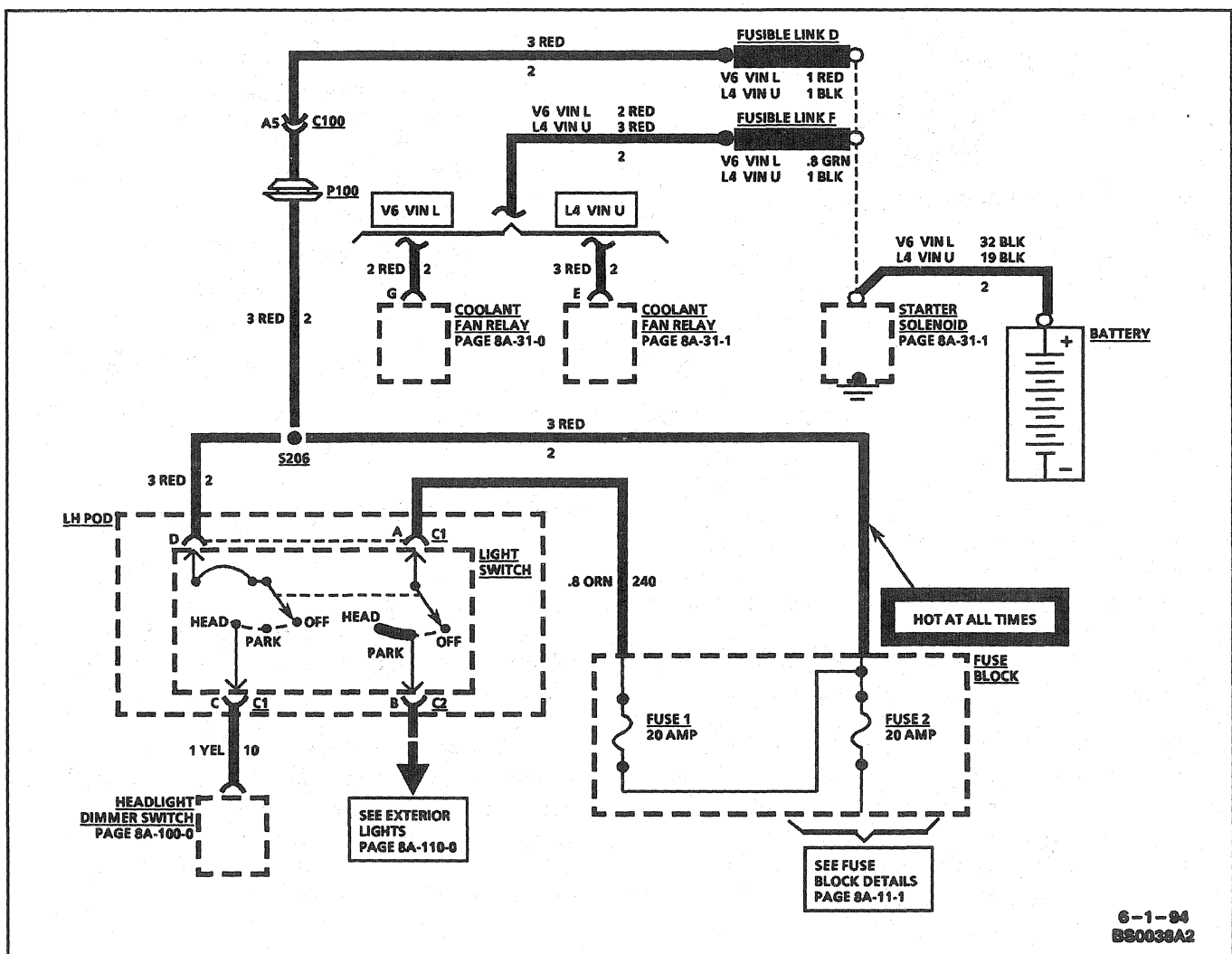


Figure 4—Typical Power Distribution Schematic



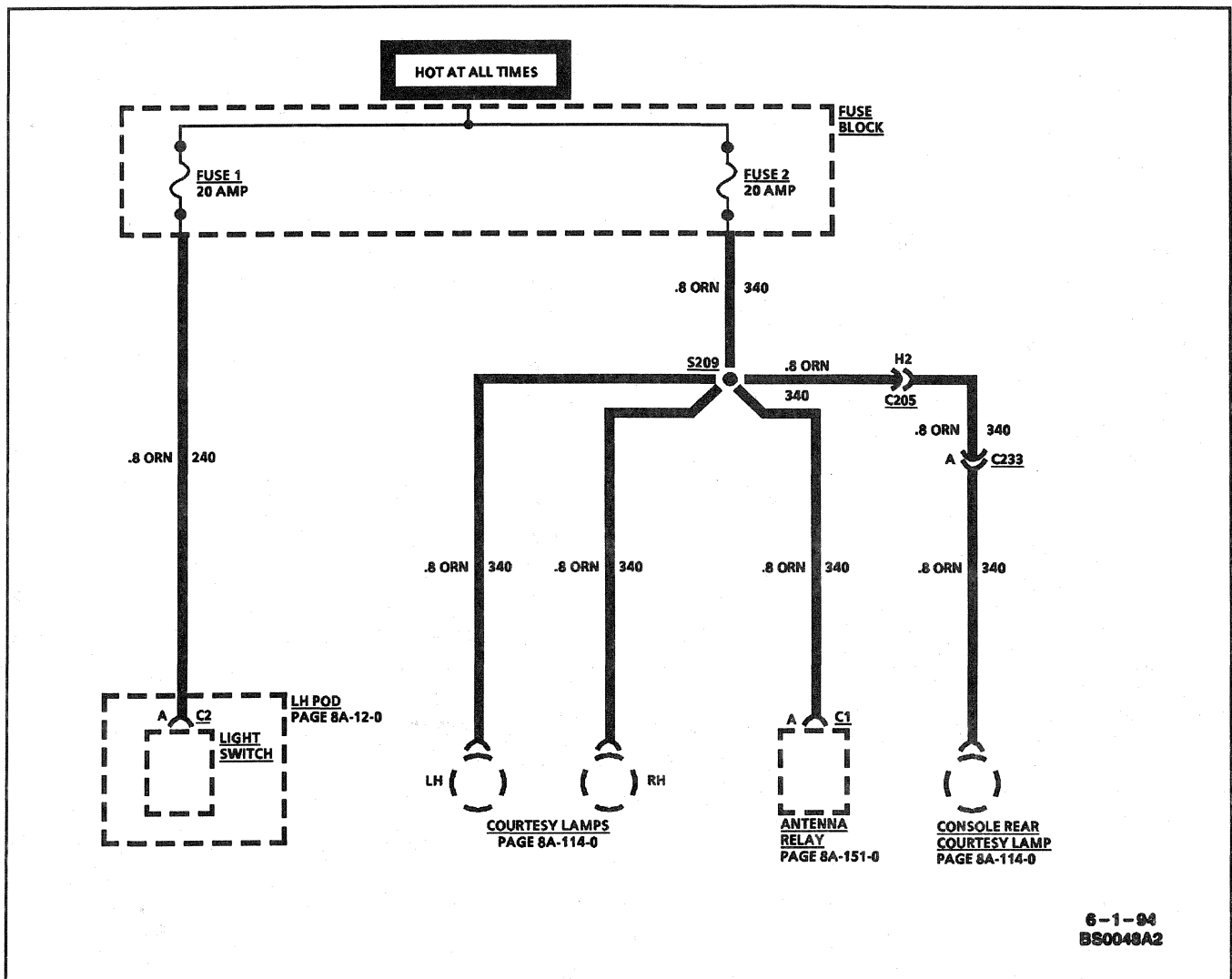


Figure 5—Typical Fuse Block Details Schematic

battery voltage is applied to the Starter Solenoid, Fusible Link D, Fuses 1 and 2 in the Fuse Block and the Light Switch in the LH Pod. These fuses are Hot At All Times, since battery voltage is always applied to them.

Notice that battery voltage is also applied to Fusible Link F and Coolant Fan Relay.

### FUSE BLOCK DETAILS

The Fuse Block Details schematic (see Figure 5) shows all of the wiring between a fuse and the components connected to the fuse. The Fuse Block Details schematic is extremely helpful in locating a short circuit that causes a fuse to open.

## INTRODUCTION

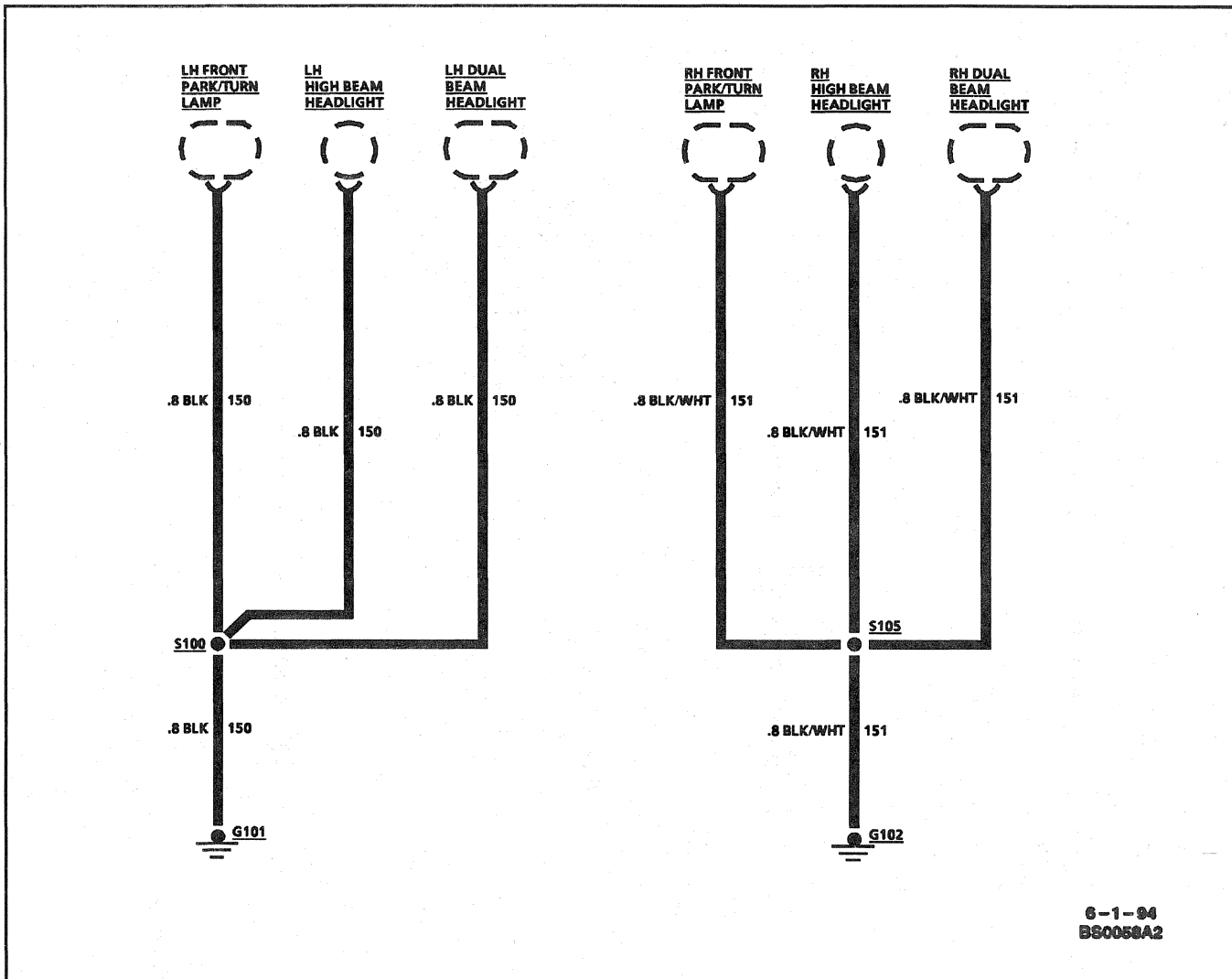


Figure 6—Typical Ground Distribution Schematic

## GROUND DISTRIBUTION

Figure 6 is a sample Ground Distribution schematic for the Headlamps. It shows exactly which components share each ground. This information can often be a time-saver when troubleshooting ground circuits.

For example, if both Headlamps and the Park/Turn Lamp on one side are out, suspect an open in their common ground wire or the ground connection itself. On the other hand, if one of the lamps work, the ground and the wire up to the splice are good. You have learned this just by inspecting the schematic and knowing the vehicle's symptoms. No actual work on the lighting system was needed.

**BLANK**

## SYMBOLS

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ELECTROSTATIC DISCHARGE (ESD)  
SENSITIVE DEVICES

All ESD sensitive components are Solid State and the following information applies to them.

The ESD symbol (Figure 1) is used on schematics (Figure 2) to indicate which components are ESD sensitive. When handling any electronic part, the service technician should follow the guidelines below to reduce any possible electrostatic charge build-up on the service technician's body and inadvertent discharge to the electronic part. If it is not known whether or not a component is ESD sensitive, assume it is susceptible.

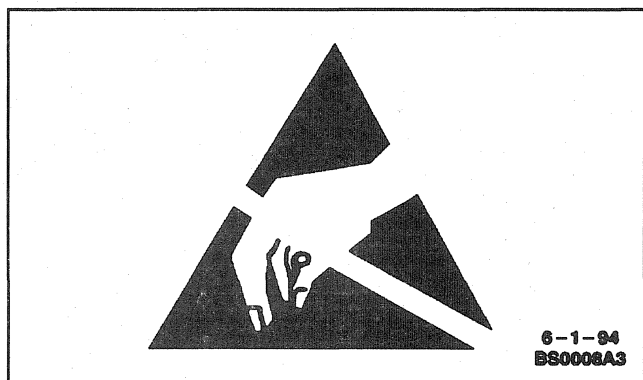


Figure 1 - ESD Symbol

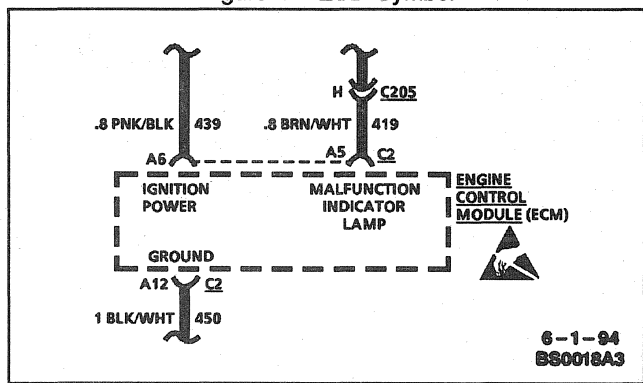


Figure 2 - Typical Schematic

## HANDLING PROCEDURES

1. Always touch a known good ground before handling the part. This should be repeated while handling the part and more frequently after sliding across a seat, sitting down from a standing position or walking a distance.
2. Avoid touching electrical terminals of the part, unless so instructed by a written diagnostic procedure.
3. When using a voltmeter, be sure to connect the ground lead first.
4. Do not remove a part from its protective package until it is time to install the part.
5. Before removing the part from its package, ground the package to a known good ground on the vehicle.

## MEASURING PROCEDURES

The circuits shown within the boxes are greatly simplified. Do not troubleshoot by measuring resistance at any terminal of these devices unless so instructed by a written diagnostic procedure. Due to the simplification of the schematics, resistance measurements could be misleading, or could lead to electrostatic discharge.

SUPPLEMENTAL INFLATABLE RESTRAINT  
(SIR) SYSTEM

The SIR symbol (Figure 3) is used on schematics to alert the technician to the following important caution:

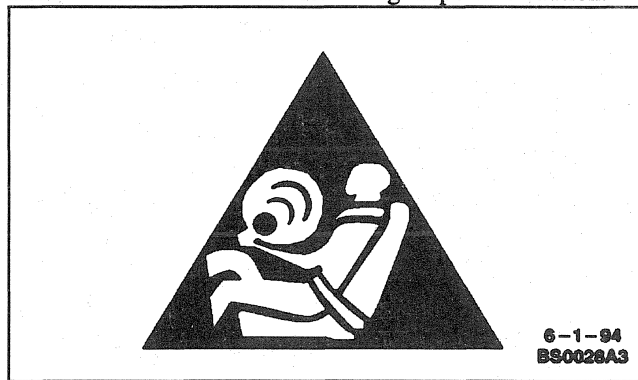


Figure 3 - SIR Symbol

**CAUTION:** This vehicle is equipped with Supplemental Inflatable Restraint (SIR). Refer to **CAUTIONS** in SECTION 9J under "ON-VEHICLE SERVICE" and the SIR Component and Wiring Location view in SECTION 9J before performing service on or around SIR components or wiring. Failure to follow **CAUTIONS** could result in possible air bag deployment, personal injury, or otherwise unneeded SIR system repairs.

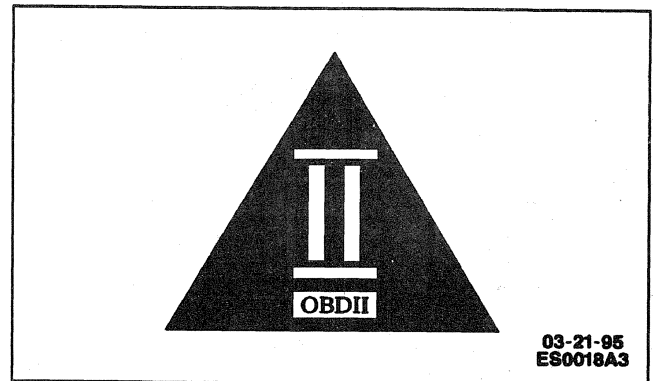
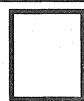


Figure 4 - OBDII Symbol

### **ON-BOARD DIAGNOSTICS II (OBDII) SYMBOL**

The OBDII symbol (Figure 4) is used on circuit diagrams to alert the technician that the circuit is essential for proper OBDII emission control circuit operation. Any circuit which, if it fails, causes the SERVICE ENGINE SOON indicator to turn on, is identified as an OBDII circuit.

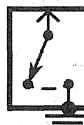
## SYMBOLS



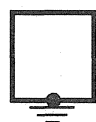
ENTIRE  
COMPONENT  
SHOWN



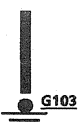
PART OF A  
COMPONENT  
SHOWN



NAME OF COMPONENT  
DETAILS ABOUT COMPONENT OR ITS OPERATION



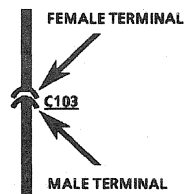
COMPONENT CASE IS DIRECTLY ATTACHED TO METAL PART OF VEHICLE (GROUNDED).



WIRE IS ATTACHED TO METAL PART OF VEHICLE (GROUNDED).  
GROUND IS NUMBERED FOR REFERENCE ON COMPONENT LOCATION LIST.



WIRE IS INDIRECTLY CONNECTED TO GROUND.  
WIRE MAY HAVE ONE OR MORE SPLICES OR CONNECTORS BEFORE IT IS GROUNDED.



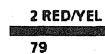
CONNECTOR REFERENCE NUMBER FOR COMPONENT LOCATION LIST  
LIST ALSO SHOWS TOTAL NUMBER OF TERMINALS POSSIBLE. C103 (6 CAVITIES)



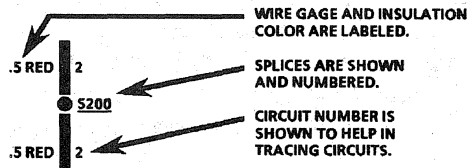
CONNECTOR ATTACHED TO COMPONENT



CONNECTOR ON COMPONENT LEAD (PIGTAIL)



WIRE INSULATION IS RED WITH A YELLOW STRIPE.



WIRE GAGE AND INSULATION COLOR ARE LABELED.

SPLICES ARE SHOWN AND NUMBERED.

CIRCUIT NUMBER IS SHOWN TO HELP IN TRACING CIRCUITS.



PASS THROUGH GROMMET, NUMBERED FOR REFERENCE.

A WAVY LINE MEANS A WIRE IS TO BE CONTINUED.



FUSIBLE LINK SIZE AND INSULATION COLOR ARE LABELED.



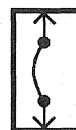
CURRENT PATH IS CONTINUED AS LABELED. THE ARROW SHOWS THE DIRECTION OF CURRENT FLOW AND IS REPEATED WHERE CURRENT PATH CONTINUES.

TO GENERATOR  
PAGE 8A-30-0

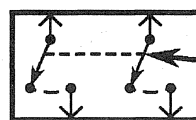


A WIRE WHICH CONNECTS TO ANOTHER CIRCUIT. THE WIRE IS SHOWN AGAIN ON THAT CIRCUIT.

TO INSTRUMENT CLUSTER  
PAGE 8A-81-3

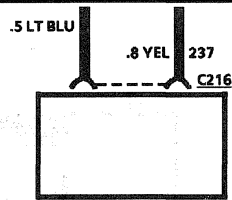


CIRCUIT BREAKER



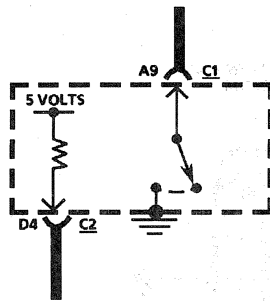
SWITCH CONTACTS THAT MOVE TOGETHER

DASHED LINE SHOWS A MECHANICAL CONNECTION BETWEEN SWITCH CONTACTS.



TWO TERMINALS  
IN THE SAME  
CONNECTOR

DASHED LINE SHOWS  
A PHYSICAL  
CONNECTION  
BETWEEN PARTS  
(SAME CONNECTOR).

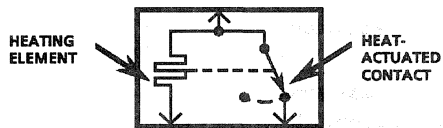


#### ECM CONNECTOR IDENTIFICATION

C1 - BLACK - 32 WAY  
C2 - BLACK - 24 WAY

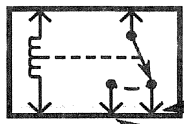
ENGINE  
CONTROL  
MODULE (ECM)

ELECTROSTATIC DISCHARGE  
(ESD) SENSITIVE DEVICES  
ARE IDENTIFIED. REFER TO  
PAGE 8A-3-0 FOR HANDLING  
AND MEASURING PROCEDURES.



HEATING  
ELEMENT

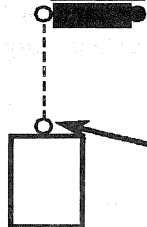
UNLESS NOTED,  
THE RELAY WILL  
BE SHOWN IN A  
DE-ENERGIZED STATE  
WITH NO CURRENT  
FLOWING THROUGH  
THE COIL.



NORMALLY  
CLOSED  
CONTACT  
  
NORMALLY  
OPEN  
CONTACT

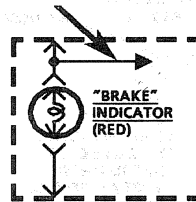
WHEN CURRENT FLOWS  
THROUGH COIL, CONTACT  
WILL TOGGLE.

#### FUSIBLE LINK



FUSIBLE LINK  
CONNECTS TO  
SCREW TERMINAL.  
SHOWN SEPARATED

INDICATES THIS CIRCUIT  
CONTINUES WITHIN DEVICE;  
I.E., OTHER BULBS

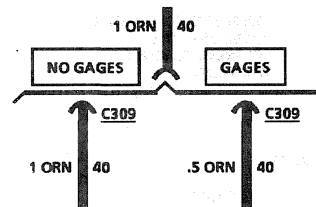


AN INDICATOR  
WHICH DISPLAYS  
THE LIGHTED  
WORD "BRAKE"

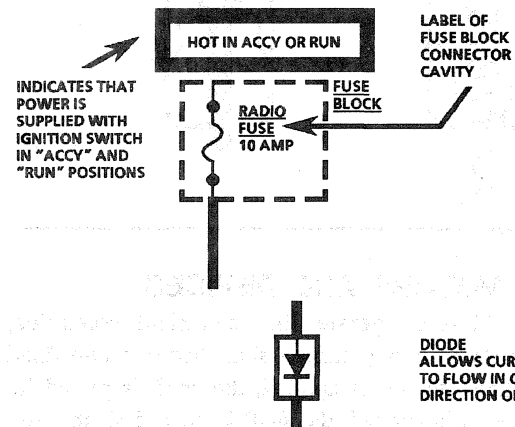


SEE GROUND  
DISTRIBUTION  
PAGE 8A-14-0

INDICATES THAT  
THE CIRCUITRY IS  
NOT SHOWN IN  
COMPLETE DETAIL  
BUT IS COMPLETE ON  
THE INDICATED PAGE



WIRE CHOICES  
FOR OPTIONS  
OR DIFFERENT  
MODELS ARE  
SHOWN AND  
LABELED.

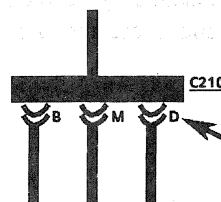


INDICATES THAT  
POWER IS  
SUPPLIED WITH  
IGNITION SWITCH  
IN "ACCY" AND  
"RUN" POSITIONS

LABEL OF  
FUSE BLOCK  
CONNECTOR  
CAVITY



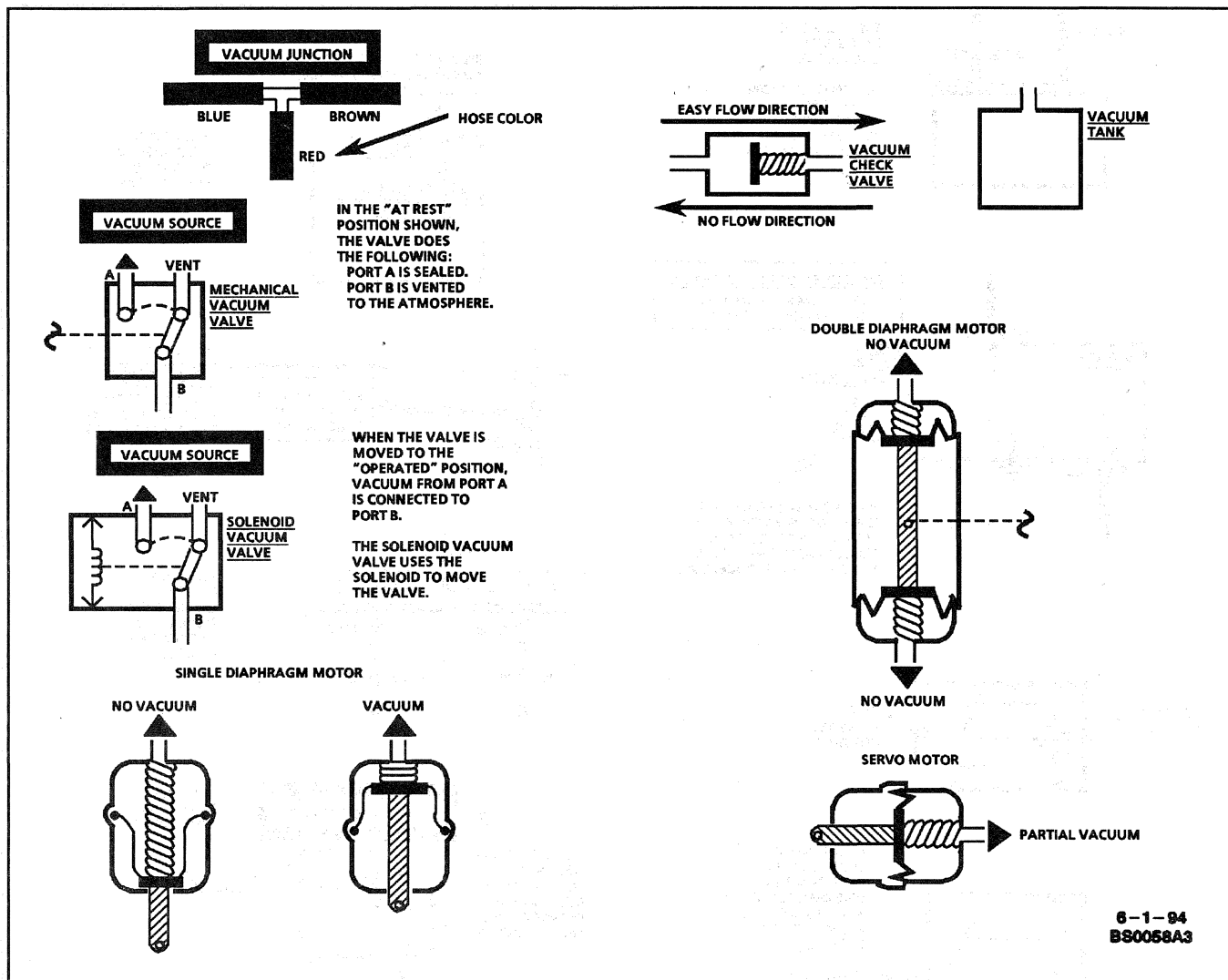
DIODE  
ALLOWS CURRENT  
TO FLOW IN ONE  
DIRECTION ONLY



3 CONNECTORS ARE  
SHOWN CONNECTED  
TOGETHER AT A  
JUNCTION BLOCK.  
FOURTH WIRE IS  
SOLDERED TO COMMON  
CONNECTION ON  
BLOCK.

NUMBER FOR TOTAL  
CONNECTOR  
  
LETTERS FOR EACH  
CONNECTOR TERMINAL

# SYMBOLS



## VACUUM MOTORS AND DEVICES

Vacuum Motors operate like electrical solenoids, mechanically pushing or pulling a shaft between two fixed positions. When vacuum is applied, the shaft is pulled in. When no vacuum is applied, the shaft is pushed all the way out by a spring.

Double Diaphragm Motors can be operated by vacuum in two directions. When there is no vacuum, the motor is in the center "at rest" position.

Some Vacuum Motors such as the Servo Motor in the Cruise Control can position the actuating arm at any position between fully extended and fully retracted. The servo is operated by a control valve that applies varying amounts of vacuum to the motor. The higher the vacuum level, the greater the retraction of the motor arm. Servo Motors work like the two position motors; the only difference is in the way the vacuum is applied. Servo Motors are generally larger and provide a calibrated control.



**BLANK**

## TROUBLESHOOTING PROCEDURES

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**BASIC KNOWLEDGE REQUIRED**

Without a basic knowledge of electricity, it will be difficult to use the diagnostic procedures contained in this section. You should understand the basic theory of electricity and know the meaning of voltage, current (amps) and resistance (ohms). You should understand what happens in a circuit with an open or a shorted wire. You should be able to read and understand a wiring diagram.

The following four-step troubleshooting procedure is recommended:

**Step 1: Check the Problem**

Perform a System Check to determine a symptom. Don't waste time fixing part of the problem! Do not begin disassembly or testing until you have narrowed down the possible causes.

**Step 2: Read the Electrical Schematic**

Study the schematic. Read the Circuit Operation text if you do not understand how the circuit should work. Check circuits that share wiring with the problem circuit. (Shared

circuits are shown on Power Distribution, Ground Distribution, Fuse Block Details and Light Switch Details pages.) Try to operate the shared circuits. If the shared circuits work, then the shared wiring is OK. The cause must be within the wiring used only by the problem circuit. If several circuits fail at the same time, chances are the power (fuse) or ground circuit is faulty.

**Step 3: Find the fault and repair**

- Narrow down the possible causes.
- Use the Troubleshooting Hints.
- Make the necessary measurements or checks as given in the System Diagnosis.
- Before replacing a component, check power, signal and ground wires at the component harness connector. If the checks and connections are OK, the most probable cause is component failure.

**Step 4: Test the Repair**

Repeat the System Check to verify that the fault has been corrected and that no other faults were induced during the repair.

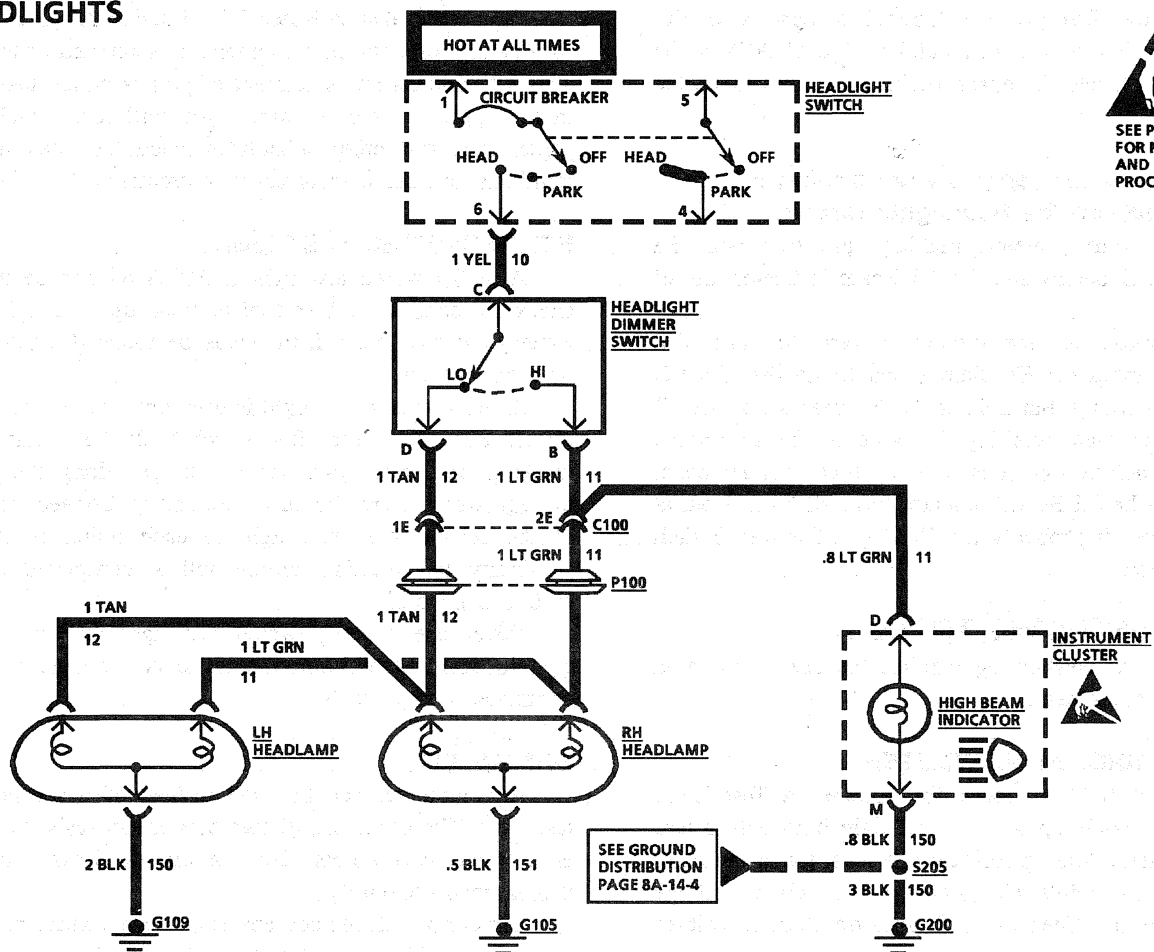
**HEADLIGHTS**

Figure 1—Typical Headlights Schematic

**Example:**

A customer brings in a vehicle and says that the HI beams do not work.

**Step 1: Perform a System Check on the Headlight Circuit**

You may discover that both LO beams operate. In “HI,” you may notice that the HI Beam Indicator comes on, but neither HI beam operates.

**Step 2: Read the Headlights Electrical Schematic (Figure 1)**

This is the step that will save time and labor. Remember, it is essential to understand how a circuit should work, before trying to figure out why it doesn’t.

After you understand how the circuit should operate, read the schematic again, this time keeping in mind what you have learned by operating the circuit.

Since both LO beams work, you know that the Headlight Switch, the YEL wire, the LO contacts of the Headlight Dimmer Switch, terminal “1E” of C100, the TAN wires and grounds G105 and G109 are all good.

Furthermore, since you saw that the HI Beam Indicator came on when the Headlight Dimmer Switch was moved to “HI,” you know that the HI contacts of the Headlight Dimmer Switch and the LT GRN wire between the Headlight Dimmer Switch and C100 are good.

At this point, you could test for voltage at the RH Headlamp with the Headlight Dimmer Switch in “HI.” However, it is extremely unlikely that the HI beam filaments have burned out in both headlamps, or that both headlamps connections are bad. The cause must be a bad connection at C100, or a break in the LT GRN wire between C100 and the RH Headlamp.

You have quickly narrowed the possible causes down to one specific area, and have done absolutely no work on the vehicle itself.

### TROUBLESHOOTING PROCEDURES

#### Step 3: Find the fault and repair it.

Using the Component Location List and the corresponding figure, you can quickly find C100 and the LT GRN wire, locate the exact trouble point and make the repair.

#### Step 4: Check the repair by performing a System Check on the Headlights Circuit.

This, of course, means making sure that both HI beams, both LO beams and the HI Beam Indicator are all working.

Now suppose that the symptoms were different. You may have operated the Headlamps and found that the LO beams were working, but neither the HI beams nor the HI Beam Indicator were working. Looking at the schematic, you might conclude that it is unlikely that both HI beam filaments and the HI Beam Indicator have all burned out at once. The cause is probably the Headlight Dimmer Switch or its connector.

### TROUBLESHOOTING TOOLS

Electrical troubleshooting requires the use of common electrical test equipment.

#### TEST LIGHT/DIGITAL VOLTMETER

Use a test light to check for voltage. A Test Light (J 34142-B) is made up of a 12 volt light bulb with a pair of leads attached. After grounding one lead, touch the other lead to various points along the circuit where voltage should be present. When the bulb goes on, there is voltage at the point being tested.

A DVM can be used instead of a test light. While a test light shows whether or not voltage is present, a DVM indicates how much voltage is present.

An increasing number of circuits include solid state control modules. One example is the Engine Control Module (ECM). Voltages in these circuits should be tested only with a 10-megohm or higher impedance DVM or multimeter (J 39200). Unless directed to within the diagnostics, never use a test light on circuits that contain solid state components, since damage to these components may result.

When testing for voltage or continuity at the connection, it is not necessary to separate the two halves of the connector. Unless testing a Weather Pack® or a Metri Pack® connector 150 series and below, always probe the connector from the back. Always check both sides of the connector. An accumulation of dirt and corrosion between contact surfaces is sometimes a cause of electrical problems. A terminal contact checking procedure can be found on page 8A-4-5.

#### CONNECTOR TEST ADAPTERS

Connector Test Adapter Kit (J 35616-A) is available for making tests and measurements at separated connectors. This kit contains an assortment of probes which mate with many of the types of terminals you will see. Avoid using paper clips and other substitutes since they can damage terminals and cause incorrect measurements.

#### SELF-POWERED TEST LIGHT

A self-powered test light (J 21008-A) can be used to check for continuity. This tool is made up of a light bulb, Battery and two leads. If the leads are touched together, the bulb will go on.

A self-powered test light is used only on an unpowered circuit. First remove the fuse which feeds the circuit you're working on. Select two specific points along the circuit through which there should be continuity. Connect one lead of the self-powered test light to each point. If there is continuity, the test light circuit will be completed and the bulb will go on.

Never use a self-powered test light on circuits that contain solid state components, since damage to these components may result.

#### OHMMETER

An ohmmeter can be used instead of a self-powered test light. The ohmmeter shows how much resistance there is between two points along a circuit. Low resistance means good continuity.

Circuits which include any solid state control modules, such as the Engine Control Module (ECM), should be tested only with a 10-megohm or higher impedance digital multimeter (J 39200).

When measuring resistance with a DVM, the vehicle Battery should be disconnected. This will prevent incorrect readings. DVMs apply such a small voltage to measure resistance that the presence of voltages can upset a resistance reading.

Diodes and solid state components in a circuit can cause an ohmmeter to give a false reading. To find out if a component is affecting a measurement, take a reading once, reverse the leads and take a second reading. If the readings differ, the solid state component is affecting the measurement.

#### FUSED JUMPER WIRE

A fused jumper (J 36169) is available with small clamp connectors providing adaptation to most connectors without damage. This fused jumper wire is supplied with a 20 amp fuse which may not be suitable for some circuits. Do not use a fuse with a higher rating than the fuse that protects the circuit being tested.

**NOTICE:** A fused jumper may not protect solid state components from being damaged.

### SHORT FINDER

Short Finders (J 8681-A) are available to locate hidden shorts to ground. The short finder creates a pulsing magnetic field in the shorted circuit and shows you the location of the short through body trim or sheet metal.

### FUSE TESTER

A simple tester (J 34764) can detect a blown fuse. To check a fuse, the tester is applied directly to the fuse in the Fuse Block. Two probes contact the fuse, either into the slots of a flat fuse or to the metal ends of a glass fuse. With power on, a red LED in the tester lights if the fuse is open. The handle of the tester is a tool for removing either type of fuse.

## TROUBLESHOOTING TESTS

### AFTERMARKET ACCESSORIES

Do not tie aftermarket accessories into SIR circuits. All such circuits are indicated on circuit diagrams with the SIR symbol. (See SECTION 8A-3.)

Do not tie aftermarket accessories into OBDII circuits. All such circuits are indicated on circuit diagrams with the OBDII symbol. (See SECTION 8A-3.)

Always check for aftermarket accessories (non-OEM) as the first step in diagnosing electrical problems. If the vehicle is so equipped, disconnect the system to verify that these add-on accessories are not the cause of the problems.

Some possible causes of vehicle problems related to aftermarket accessories include:

1. Power feeds connected to points other than the Battery.
2. Antenna location.
3. Transceiver wiring located too close to vehicle electronic modules or wiring.
4. Poor shielding or poor connectors on antenna feed line.

Refer to 1990/1991 model year bulletin entitled, "Installation Guidelines for Aftermarket Accessories" for specific information.

### PROBING

After probing, when reconnecting connectors or replacing terminals, always be sure to reinstall Connector Position Assurance (CPA) and Terminal Position Assurance (TPA).

#### Frontprobe

When frontprobing of connectors is required, always use a mating terminal adapter from Connector Test Adapter Kit (J 35616-A). The use of proper adapters will ensure

that proper terminal contact integrity is maintained. For a terminal contact checking procedure, refer to page 8A-4-5.

#### Backprobe

Only backprobe connector terminals when specifically called for in diagnostic procedures. Since backprobing can be a source of damage to connector terminals, extra care must be taken to avoid deforming the terminal, either by forcing the test probe too far into the cavity or by using too large a test probe.

After backprobing any connector, always check for terminal damage. If terminal damage is suspected, check for proper terminal contact (refer to "Checking Terminal Contact," page 8A-4-5).

### TESTING FOR VOLTAGE (Figure 2)

1. Connect one lead of a test light to a known good ground. When using a DVM, be sure the voltmeter's negative lead is connected to ground.
2. Connect the other lead of the test light or voltmeter to a selected test point (connector or terminal).
3. If the test light illuminates, there is voltage present. When using a DVM, note the voltage reading.

### TESTING FOR CONTINUITY (Figure 3)

1. Remove the fuse to the circuit involved.
2. Connect one lead of a self-powered test light or ohmmeter to one end of the part of the circuit you wish to test.
3. Connect the other lead to the other end of the circuit.
4. If the self-powered test light glows, there is continuity. When using an ohmmeter, low or no resistance means good continuity.

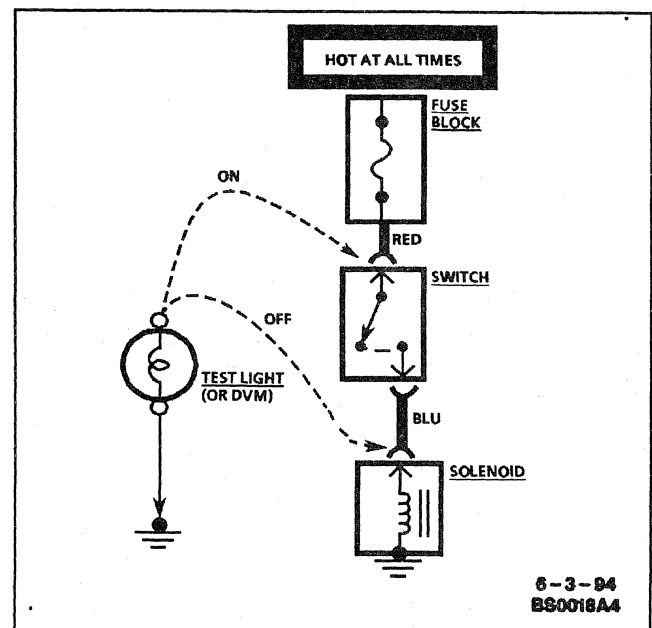


Figure 2—Voltage Check

# TROUBLESHOOTING PROCEDURES

## TESTING FOR VOLTAGE DROP (Figure 4)

This test checks for voltage being lost along a wire, or through a connection or switch.

1. Connect the positive lead of a DVM to the end of the wire (or to one side of the connection or switch) which is closer to the Battery.

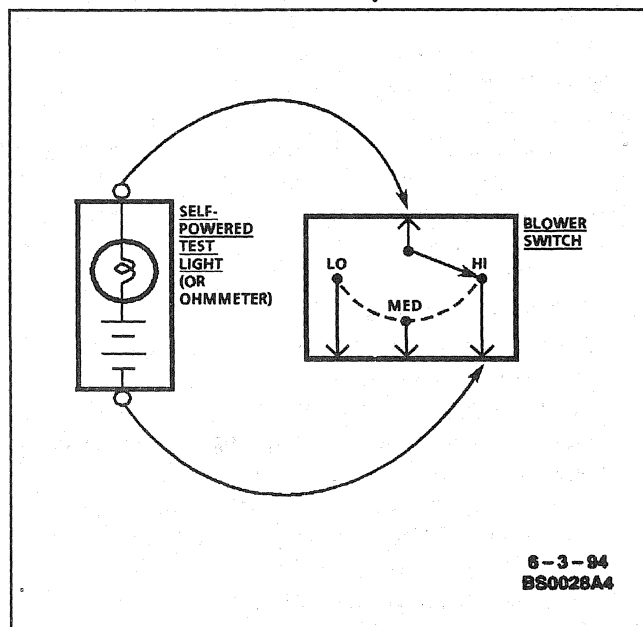


Figure 3—Continuity Check through a Switch

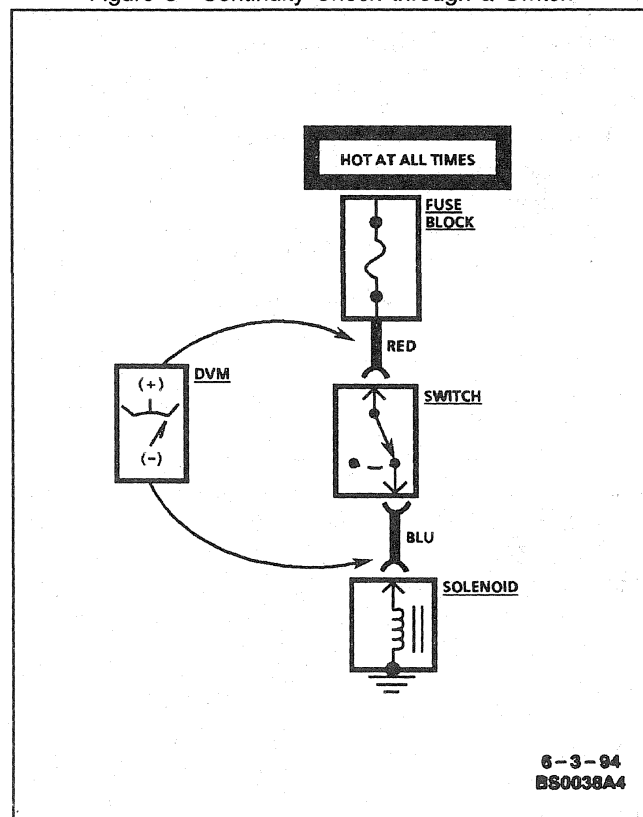


Figure 4—Voltage Drop Test

2. Connect the negative lead to the other end of the wire (or the other side of the connection or switch).
3. Operate the circuit.
4. The DVM will show the difference in voltage between the two points.

## TESTING FOR SHORT TO GROUND

### With a Test Light or DVM (Figure 5)

1. Remove the blown fuse and disconnect the load.
2. Connect a test light or voltmeter across the fuse terminals (be sure that the fuse is powered).
3. Beginning near the Fuse Block, wiggle the harness from side to side. Continue this at convenient points (about 6 inches apart) while watching the test light or DVM.
4. When the test light glows, or the DVM registers, there is a short to ground in the wiring near that point.

### With a Self-Powered Test Light or Ohmmeter (Figure 6)

1. Remove the blown fuse and disconnect the Battery and load.
2. Connect one lead of a self-powered test light or ohmmeter to the fuse terminal on the load side.
3. Connect the other lead to a known good ground.

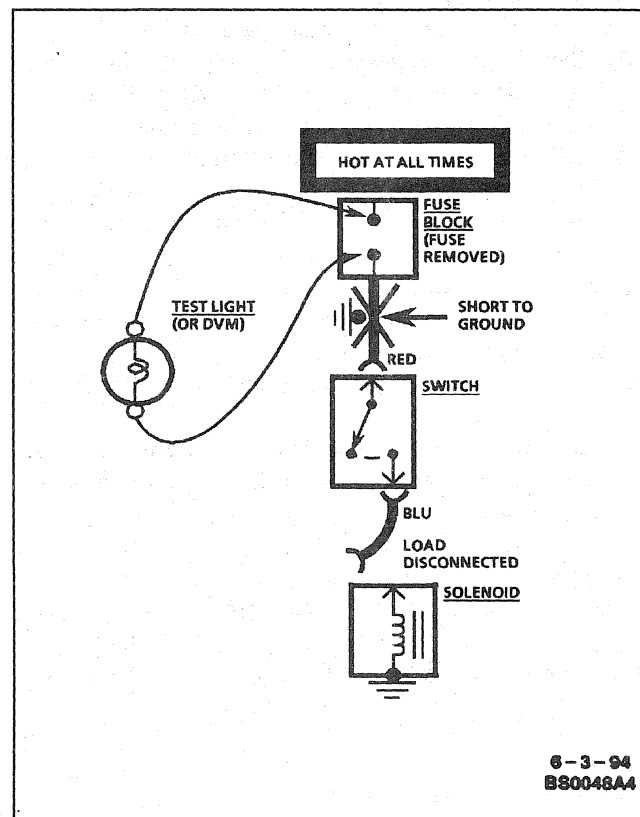


Figure 5 - Testing for Short with Test Light or DVM

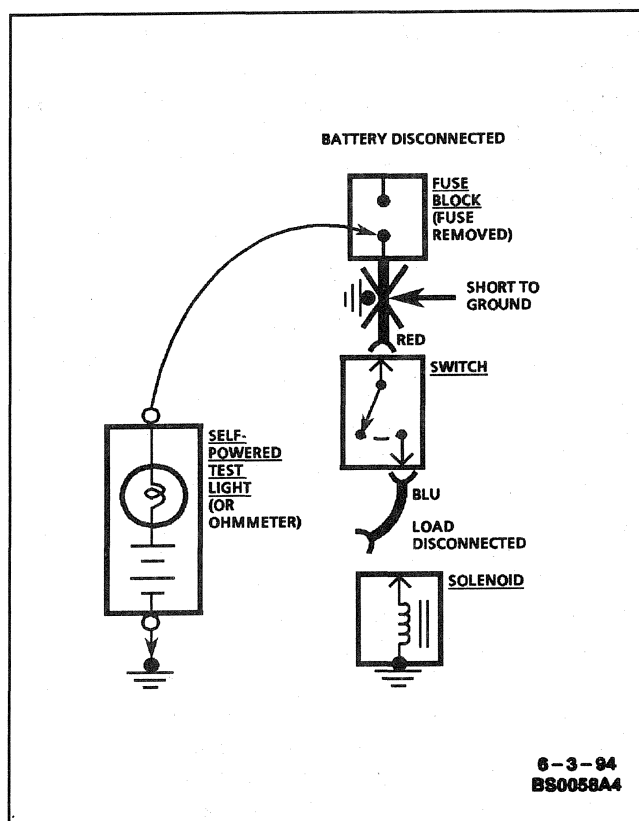


Figure 6 - Testing for Short with Self-Powered Test Light or Ohmmeter

4. Beginning near the Fuse Block, wiggle the harness from side to side. Continue this at convenient points (about 6 inches apart) while watching the self-powered test light or ohmmeter.
5. When the self-powered test light glows, or the ohmmeter registers, there is a short to ground in the wiring near that point.

#### Fuses Powering Several Loads

1. Find the schematic in "Fuse Block Details," page 8A-11-0, for the fuse that has blown.
2. Open the first connector or switch leading from the fuse to each load.
3. Replace the fuse.
  - If the fuse blows, the short is in the wiring leading to the first connector or switch. Use a test light or meter as described on previous page.
  - If fuse does not blow, refer to next step.
4. Close each connector or switch until the fuse blows in order to find which circuit has the short. Connect test lamp or meter at the connector to the suspect circuit (disconnected) rather than at the fuse terminals.

#### JUMP STARTING PROCEDURE

Refer to SECTION 6D-1 for jump starting procedure.

#### INTERMITTENT AND POOR CONNECTIONS

Most intermittents are caused by faulty electrical connections or wiring, although occasionally a sticking relay or solenoid can be a problem. Some items to check are:

- Poor mating of connector halves, or terminals not fully seated in the connector body (backed out).
- Dirt or corrosion on the terminals. The terminals must be clean and free of any foreign material which could impede proper terminal contact.
- Damaged connector body, exposing the terminals to moisture and dirt, as well as not maintaining proper terminal orientation with the component or mating connector.
- Improperly formed or damaged terminals. All connector terminals in problem circuits should be checked carefully to ensure good contact tension. Use a corresponding mating terminal to check for proper tension. Refer to "Checking Terminal Contact" in this section for the specific procedure.
- The J 35616-A Connector Test Adapter Kit must be used whenever a diagnostic procedure requests checking or probing a terminal. Using the adapter will ensure that no damage to the terminal will occur, as well as giving an idea of whether contact tension is sufficient. If contact tension seems incorrect, refer to "Checking Terminal Contact" in this section for specifics.
- Poor terminal-to-wire connection. Some conditions which fall under this description are poor crimps, poor solder joints, crimping over wire insulation rather than the wire itself, corrosion in the wire-to-terminal contact area, etc.
- Wire insulation which is rubbed through, causing an intermittent short as the bare area touches other wiring or parts of the vehicle.
- Wiring broken inside the insulation. This condition could cause a continuity check to show a good circuit, but if only 1 or 2 strands of a multi-strand type wire are intact, resistance could be far too high.

To avoid any of the above problems when making wiring or terminal repairs, always follow the instructions for wiring and terminal repair outlined in SECTION 8A-5.

#### CHECKING TERMINAL CONTACT

When diagnosing an electrical system that utilizes Metri-Pack 150/280/480/630 series terminals (refer to Terminal Repair Kit, J 38125-A, instruction manual, J 38125-4 for terminal identification), it is important to check terminal contact between a connector and component, or between in-line connectors, before replacing a suspect component.

## TROUBLESHOOTING PROCEDURES

Frequently, a diagnostic chart leads to a step that reads: "Check for poor connection." Mating terminals must be inspected to assure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination is caused by the connector halves being improperly connected, a missing or damaged connector seal, or damage to the connector itself, exposing the terminals to moisture and dirt. Contamination, usually in underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter, improperly joining the connector halves or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact (see Figure 7), causing an open or intermittently open circuit.

Follow the procedure below to check terminal contact.

1. Separate the connector halves. Refer to Terminal Repair Kit, J 38125-A, instruction manual, J 38125-4.
2. Inspect the connector halves for contamination. Contamination will result in a white or green build-up within the connector body or between terminals, causing high terminal resistance, intermittent contact or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals and connector body.
3. Using an equivalent male terminal from the Terminal Repair Kit, J 38125-A, check the retention force of the female terminal in question by inserting and removing the male terminal to the female terminal in the connector body. Good terminal contact will require a certain amount of force to separate the terminals.
4. Using an equivalent female terminal from the Terminal Repair Kit, J 38125-A, compare the retention force of this terminal to the female terminal in question by joining and separating the male terminal to the good female terminal, and then joining and separating the male terminal to the female terminal in question. If the retention force is significantly different between the two female terminals, replace the female terminal in question (refer to Terminal Repair Kit, J 38125-A).

If a visual (physical) check does not reveal the cause of the problem, the vehicle may be able to be driven with a DVM connected to the suspected circuit. An abnormal voltage reading when the problem occurs indicates the problem may be in that circuit.

## DETECTING ELECTRICAL INTERMITTENTS

Use the following procedure to detect intermittent terminal contact or a broken wire with an intermittent connection inside the insulation.

The J 39200 Digital Multimeter has the ability to monitor current, resistance, or voltage while recording the minimum (MIN) and maximum (MAX) values measured. The meter can also be set to display the average (AVG) value measured.

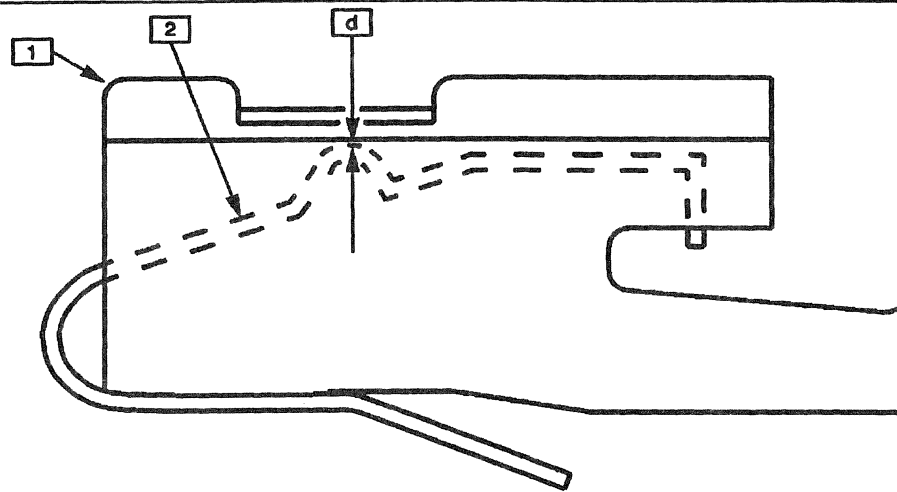
When diagnosing circuits that have voltage applied, use the voltage setting to monitor a connector (or length of a circuit) which is suspected of having an intermittent connection but is currently operating normally.

1. Connect the J 39200 Digital Multimeter to both sides of a suspect connector (still connected) or from one end of a suspect circuit to the other. This will continuously monitor the terminal contacts or length of wire being checked. See "Meter Connections" for examples of the various methods for connecting the meter to the circuit.
2. Set the meter for voltage. Since the "MIN MAX" mode does not use auto ranging, manually select the voltage range necessary before proceeding.
3. Press the "MIN MAX" button. The meter should read "100 ms RECORD" (100 millisecond record) and emit a 1/4 second beep. The meter is now ready to record and will generate an audible tone for any change in voltage. At this point, you may wish to press the "PEAK MIN MAX" button, which will record any voltage variations that occur for at least 1 millisecond.
4. Try to simulate the condition that is potentially causing an intermittent connection, either by wiggling connections or wiring, test driving or performing other operations. If an open or resistance is created, a voltage will be present and the meter will emit a tone for as long as the open or resistance exists. Any change in voltage will cause the meter to emit a tone for no less than 1/4 second. (Listening for a tone while manipulating wiring is very helpful for narrowing down an intermittent connection.)

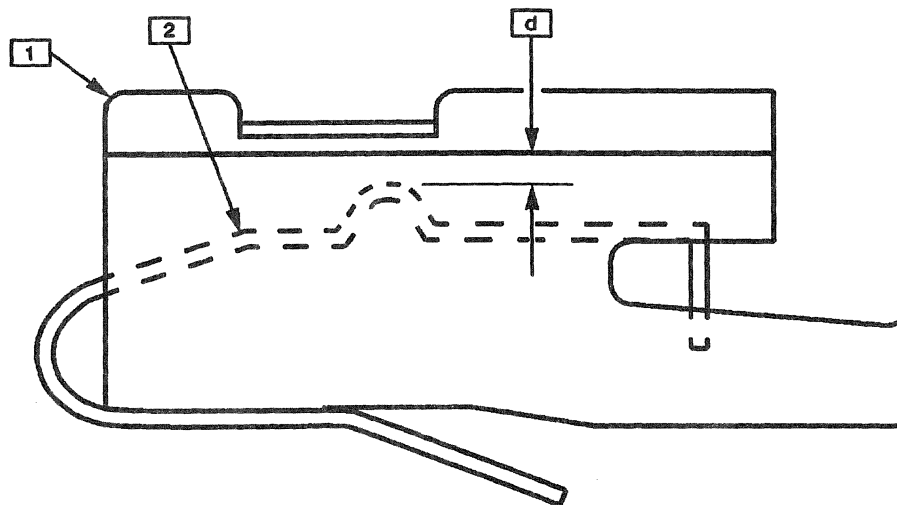
Use the MIN and MAX values when the meter is out of sight or sound range, in noisy areas or for test driving when it may not be possible to monitor the meter.

To check the MIN and MAX recorded voltages press "MIN MAX" once for MAX and twice for MIN. A variation between MIN and MAX recorded voltages (unless nearly 0 volts) suggests an intermittent open or that resistance exists and should be repaired as necessary. Refer to SECTION 8A-5 of any current GM Service Manual for approved repair procedures.





d ABOUT EQUAL TO 0, GOOD TERMINAL CONTACT



d MUCH GREATER THAN 0, POOR TERMINAL CONTACT

- 1 TYPICAL METRI-PACK 150/280/480/630 SERIES FEMALE TERMINAL  
(150 SERIES PUSH-TO-SEAT SHOWN)
- 2 CONTACT TANG
- d AMOUNT OF DEFORMATION

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Figure 7 - Deformation of a Typical Metri-Pack 150/280/480/630 Series Female Terminal

### TROUBLESHOOTING PROCEDURES

#### Important:

- The “100 ms RECORD” (100 millisecond record) mode is NOT the amount of time allowed to perform a specific procedure. It is the amount of time used to record each snapshot of information used for calculating “AVG” when in the “MIN MAX” mode.

#### METER CONNECTIONS

The previous diagnostic procedure was written to detect intermittents using the meter set to voltage. Whether using the current, voltage or resistance setting to detect intermittents, it is necessary to connect the meter to the circuit.

Following are examples of the various methods of connecting the meter to the circuit to be checked:

- Backprobe both ends of the connector and either hold the leads in place while manipulating the connector or tape the leads to the harness for continuous monitoring while performing other operations or test driving. (Do not backprobe “Weather Pack®” type connectors.)
- Disconnect the harness at both ends of the suspect circuit where it connects either to a component or to other harnesses.
- Use Connector Test Adapter Kit J 35616-A to connect the meter to the circuit.
- If the system being diagnosed has a specified pinout or breakout box, it may be used to simplify connecting the meter to the circuit or for checking multiple circuits quickly.

#### ADDITIONAL INFORMATION

**NOTICE:** Turn off power to the test circuit before attempting in-circuit resistance measurements to prevent false readings or damage to the meter. Do not use the meter to measure resistance through a solid state module.

Continuity tests that work well for detecting intermittent shorts to ground can be performed by setting the meter to “ohms” then pressing the “PEAK MIN MAX” button. An audible tone will be heard whenever the meter detects continuity for at least 1 millisecond.

The J 39200 Instruction Manual is a good source of information and should be read thoroughly upon receipt of the meter as well as kept on hand for reference during new procedures.

**BLANK**

## REPAIR PROCEDURES

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## ELECTRICAL REPAIRS

This section provides instruction in the following repairs:

- Circuit Protection
- Typical Electrical Repairs
- Splicing Copper Wire
- Splicing Twisted/Shielded Cable
- Repairing Connectors (Except Weather Pack®)
- Repairing Weather Pack® (Environmental) Connectors
- Terminal Repair
- Diode Replacement
- Heated Oxygen Sensor (HO2S) Repair
- OBDII Circuit Repair
- GMPSO Service Parts Ordering

After any electrical repair is made, always test the circuit afterwards by operating the devices in the circuit. This confirms not only that the repair is correct but, also, that it was the cause of the complaint.

Repair of circuits which are part of the OBDII (On-Board Diagnostics II) emissions control system have several special requirements which must be followed to ensure proper system operation. These requirements are listed on page 8A-5-12 under OBDII CIRCUIT REPAIRS.

## CIRCUIT PROTECTION

The purpose of circuit protection is to protect the wiring assembly during normal and overload conditions. An overload is defined as a current requirement that is higher than normal. This overload could be caused by a short circuit or system malfunction. The short circuit could be the result of a pinched or cut wire or an internal device short circuit, such as an electronic module failure.

The circuit protection device is only applied to protect the wiring assembly, and not the electrical load at the end of the assembly. For example, if an electronic component short circuits, the circuit protection device will assure a minimal amount of damage to the wiring assembly.

However, it will not necessarily prevent damage to the component.

There are three basic types of circuit protection devices: Circuit Breaker, Fuse and Fusible Link.

## CIRCUIT BREAKERS

A circuit breaker is a protective device designed to open the circuit when a current load is in excess of rated breaker capacity. If there is a short or other type of overload condition in the circuit, the excessive current will open the circuit between the circuit breaker terminals. There are two basic types of circuit breakers used in GM vehicles: cycling and non-cycling.

### CYCLING CIRCUIT BREAKER

The cycling breaker will open due to heat generated when excessive current passes through it for a period of time. Once the circuit breaker cools, it will close again after a few seconds. If the cause of the high current is still present it will open again. It will continue to cycle open and closed until the condition causing the high current is removed.

### NON-CYCLING CIRCUIT BREAKER

There are two types of non-cycling circuit breakers. One type is mechanical and is nearly the same as a cycling breaker. The difference is a small heater wire within the non-cycling circuit breaker. This wire provides enough heat to keep the bimetallic element open until the current source is removed.

The other type is solid state, called out in this section as Electronic Circuit Breaker (ECB). This device has a Positive Temperature Coefficient. It increases its resistance greatly when excessive current passes through it. The excessive current heats the ECB. As it heats, its resistance increases, therefore having a Positive Temperature Coefficient. Eventually the resistance gets so high that the circuit is effectively open. The ECB will not reset until the circuit is opened, removing voltage from its terminals. Once voltage is removed, the circuit breaker will re-close within a second or two.

## FUSES

The most common method of automotive wiring circuit protection is the fuse (Figure 1). A fuse is a device that, by the melting of its element, opens an electrical circuit when the current exceeds a given level for a sufficient time. The action is non-reversible and the fuse must be replaced each time a circuit is overloaded or after a malfunction is repaired.

Fuses are color coded. The standardized color identification and ratings are shown in Figure 2. For service replacement, non-color coded fuses of the same respective current rating can be used.

Examine a suspect fuse for a break in the element. If the element is broken or melted, replace the fuse with one of equal current rating.

There are additional specific circuits with in-line fuses. These fuses are located within the individual wiring harness and will appear to be an open circuit if blown.

## AUTOFUSE

The Autofuse, normally referred to simply as "Fuse," is the most common circuit protection device in today's vehicle. The Autofuse is most often used to protect the wiring assembly between the Fuse Block and the system components.

## MAXIFUSE

The Maxifuse was designed to replace the fusible link and Pacific Fuse elements. The Maxifuse is designed to protect cables, normally between the battery and fuse block, from both direct short circuits and resistive short circuits.

Compared to a fusible link or a Pacific Fuse element, the Maxifuse performs much more like an Autofuse, although the average opening time is slightly longer. This is because the Maxifuse was designed to be a slower blowing fuse, with less chance of nuisance blows.

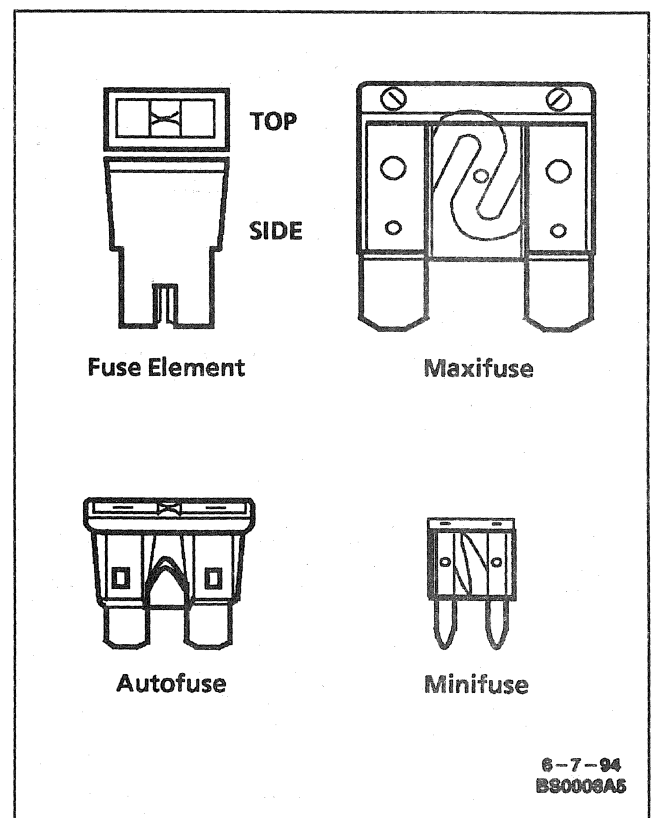


Figure 1 - Fuse Devices

## REPAIR PROCEDURES

AUTOFUSE	
CURRENT RATING	COLOR
3	VIOLET
5	TAN
7.5	BROWN
10	RED
15	BLUE
20	YELLOW
25	NATURAL
30	GREEN

MAXIFUSE	
CURRENT RATING	COLOR
20	YELLOW
30	GREEN
40	AMBER
50	RED
60	BLUE
70	BROWN
80	NATURAL

MINIFUSE	
CURRENT RATING	COLOR
5	TAN
7.5	BROWN
10	RED
15	BLUE
20	YELLOW
25	NATURAL
30	GREEN

PACIFIC FUSE ELEMENT	
CURRENT RATING	COLOR
30	PINK
40	GREEN
50	RED
60	YELLOW

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Figure 2 - Fuse Rating and Color

## MINIFUSE

The Minifuse is a smaller version of the Autofuse and has a similar performance. As with the Autofuse, the Minifuse is usually used to protect the wiring assembly between a fuse block and system components. Since the Minifuse is a smaller device, it allows for more system specific fusing to be accomplished within the same amount of space as Autofuses.

## PACIFIC FUSE ELEMENT/MAXIFUSE

The Pacific Fuse Element and Maxifuse were developed to be a replacement for the fusible link. Like a fusible link, the fuses are designed to protect wiring from a direct short to ground. These elements are easier to service and inspect than a fusible link and will eventually replace fusible links in all future vehicle applications.

## FUSIBLE LINKS

In addition to circuit breakers and fuses, some circuits use fusible links to protect the wiring. Like fuses, fusible links are "one-time" protection devices that will melt and create an open circuit (see Figure 3).

Not all fusible link open circuits can be detected by observation. Always inspect that there is battery voltage past the fusible link to verify continuity.

Fusible links are used instead of a fuse in wiring circuits that are not normally fused, such as the ignition circuit. For AWG sizes, each fusible link is four wire gage sizes smaller than the wire it is designed to protect. For example: to protect a 10 gage wire use a 14 gage link or for metric, to protect a 5 mm<sup>2</sup> wire use a 2 mm<sup>2</sup> link (see Figure 6). Links are marked on the insulation with wire-gage size because the heavy insulation makes the link appear to be a heavier gage than it actually is. The same wire size fusible link must be used when replacing a blown fusible link.

Fusible links are available with three types of insulation: Hypalon®, Silicone/GXL (SIL/GXL) and Expanded Duty. All future vehicles that use fusible links will utilize the Expanded Duty type of fusible link. When servicing fusible links, all fusible links can be replaced with the Expanded Duty type. SIL/GXI fusible links can be used to replace either SIL/GXI or Hypalon® fusible links. Hypalon® fusible links can only be used to replace Hypalon® fusible links.

Determining characteristics of the types of fusible links are:

- Hypalon® (limited use): only available in 0.35 mm<sup>2</sup> or smaller and its insulation is one color all the way through.
- SIL/GXL (widely used): available in all sizes and has a white inner core under the outer color of insulation.

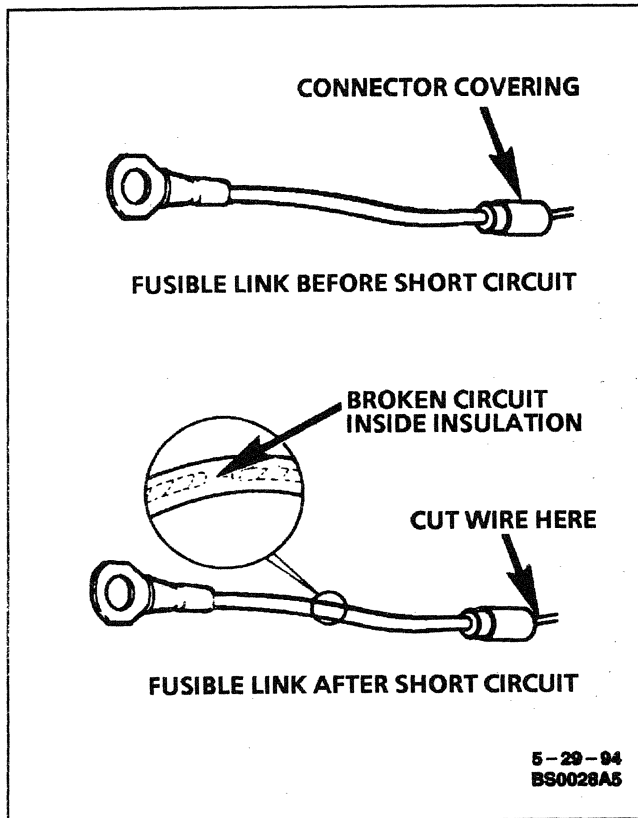


Figure 3 - Good and Damaged Fusible Links

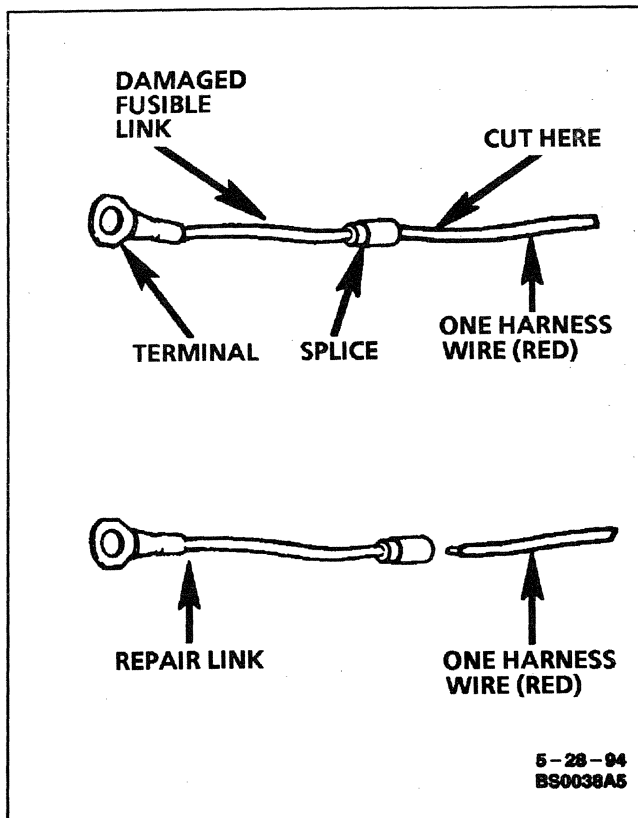


Figure 4 - Single Wire Feed Fusible Link

— Expanded Duty: available in all sizes, has an insulation that is one color all the way through and has three dots following the writing on the insulation.

Service fusible links are available in many lengths. Choose the shortest length that is suitable. If the fusible link is to be cut from a spool, it should be cut 150-225 mm (approx. 6-9 in.) long. NEVER make a fusible link longer than 225 mm (approx. 9 in.).

**CAUTION: Fusible links cut longer than 225 mm (approx. 9 in.) will not provide sufficient overload protection.**

To replace a damaged fusible link (Figure 4), cut it off beyond the splice. Replace with a repair link. When connecting the repair link, strip wire and use staking-type pliers to crimp the splice securely in two places. For more details on splicing procedures, see "Splicing Copper Wire." Use crimp and seal splices whenever possible. When using splice clips, refer to page 8A-5-4; when using crimp and seal splice sleeves, refer to page 8A-5-6.

To replace a damaged fusible link which feeds two harness wires, cut them both off beyond the splice. Use two repair links, one spliced to each harness wire (see Figure 5).

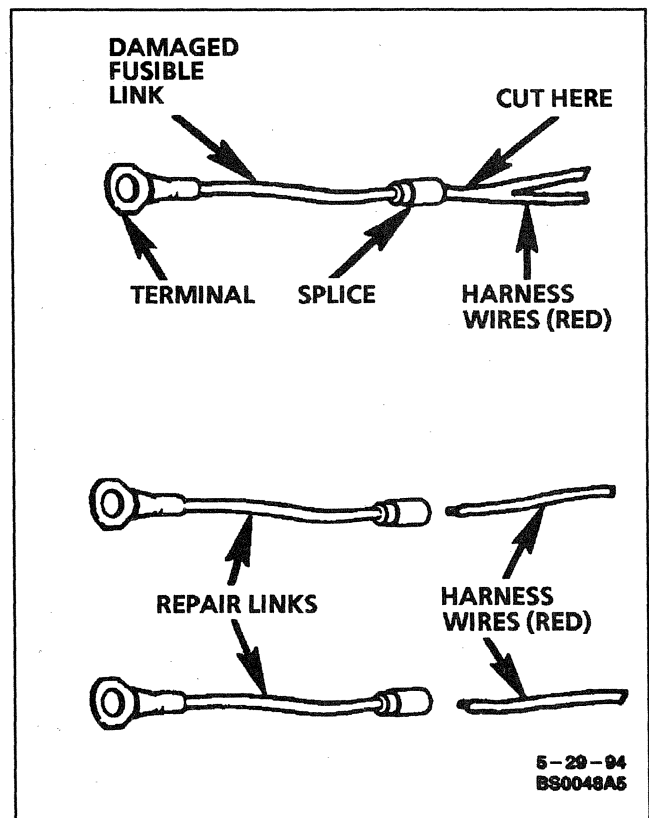


Figure 5 - Double Wire Feed Fusible Link

## REPAIR PROCEDURES

### TYPICAL ELECTRICAL REPAIRS

An open circuit is an incomplete circuit. Power cannot reach the load or reach ground. If a circuit is open, active components do not energize. A short circuit is an unwanted connection between one part of the circuit and either ground or another part of the circuit. A short circuit causes a fuse to blow or a circuit breaker to open.

### REPAIRING SHORT CIRCUITS CAUSED BY DAMAGED WIRE INSULATION

- Locate the damaged wire.
- Find and correct the cause of the wire insulation damage.
- For minor damage, tape over the wire. If damage is more extensive, replace the faulty segment of the wire (refer to the splicing instructions for copper or shielded cable for the correct splicing procedure).

### SPLICING COPPER WIRE USING SPLICE CLIPS

Splice clips are included in the J 38125-A Terminal Repair Kit. The splice clip is a general purpose wire repair device. It may not be acceptable for applications having special requirements such as moisture sealing. Refer to the appropriate Service Manual section to determine if there are any special requirements.

#### Step 1: Open the Harness

If the harness is taped, remove the tape. To avoid wire insulation damage, use a sewing "seam ripper" to cut open the harness (available from sewing supply stores). If the harness has a black plastic conduit, simply pull out the desired wire.

#### Step 2: Cut the Wire

Begin by cutting as little wire off the harness as possible. You may need the extra length of the wire later if you decide to cut more wire off to change the location of a splice. You may have to adjust splice locations to make certain that each splice is at least 40 mm (1.5 in.) away from other splices, harness branches or connectors.

#### Step 3: Strip the Insulation

When replacing a wire, use a wire of the same size as the original wire or larger. The schematics list wire size in metric units. The following table (Figure 6) shows the commercial (AWG) wire sizes that can be used to replace each metric wire size. Each AWG size is either equal to or larger than the equivalent metric size.

To find the correct wire size either find the wire on the schematic page and convert the metric size to the AWG size, or use an AWG wire gage.

If you aren't sure of the wire size, start with the largest opening in the wire stripper and work down until a clean strip of the insulation is removed. Be careful to avoid nicking or cutting any of the wires.

METRIC WIRE SIZES (mm <sup>2</sup> )	AWG SIZES
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

Figure 6 - Wire Size Conversion Table

#### Step 4: Crimp the Wires

Select the proper clip to secure the splice. To determine the proper clip size for the wire being spliced, follow the directions included in the J 38125-A Terminal Repair Kit. Select the correct anvil on the crimper. (On most crimpers your choice is limited to either a small or large anvil.) Overlap the stripped wire ends and hold them between your thumb and forefinger as shown in Figure 7. Then, center the splice clip under the stripped wires and hold it in place.

- Open the crimping tool to its full width and rest one handle on a firm flat surface.
- Center the back of the splice clip on the proper anvil and close the crimping tool to the point where the former touches the wings of the clip.
- Make sure that the clip and wires are still in the correct position. Then, apply steady pressure until the crimping tool closes (see Figure 8).
- Before crimping the ends of the clip, be sure that:
  - The wires extend beyond the clip in each direction.
  - No strands of wire are cut loose.
  - No insulation is caught under the clip.

Crimp the splice again, once on each end. Do not let the crimping tool extend beyond the edge of the clip or you may damage or nick the wires (see Figure 9).

#### Step 5: Solder

Apply 60/40 rosin core solder to the opening in the back of the clip (see Figure 10). Follow the manufacturer's instruction for the solder equipment you are using.



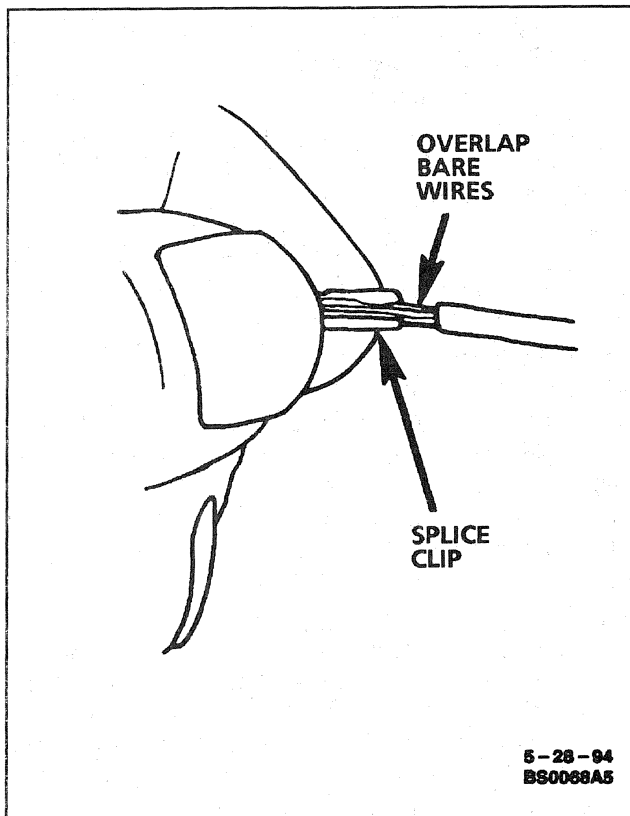


Figure 7 - Centering the Splice Clip

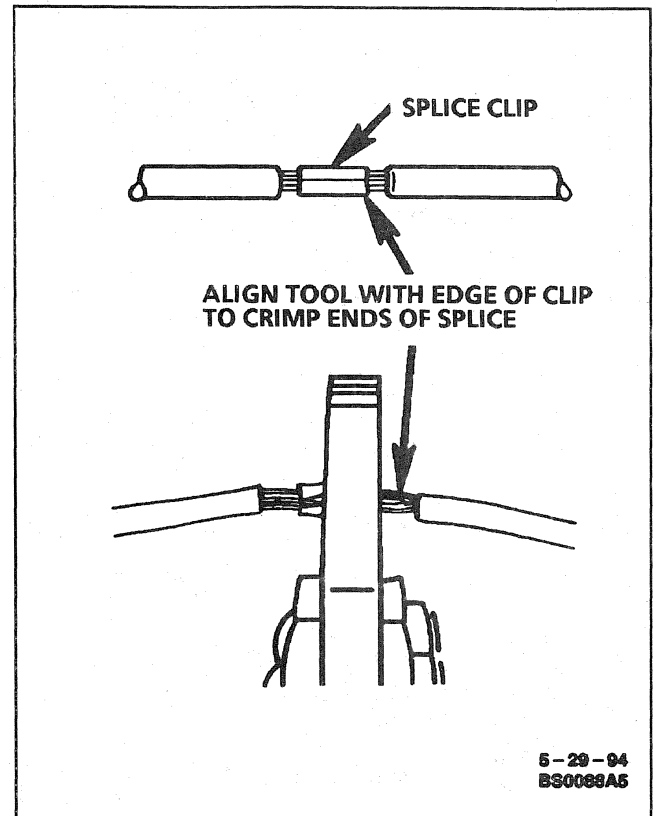


Figure 9 - Completing the Crimp

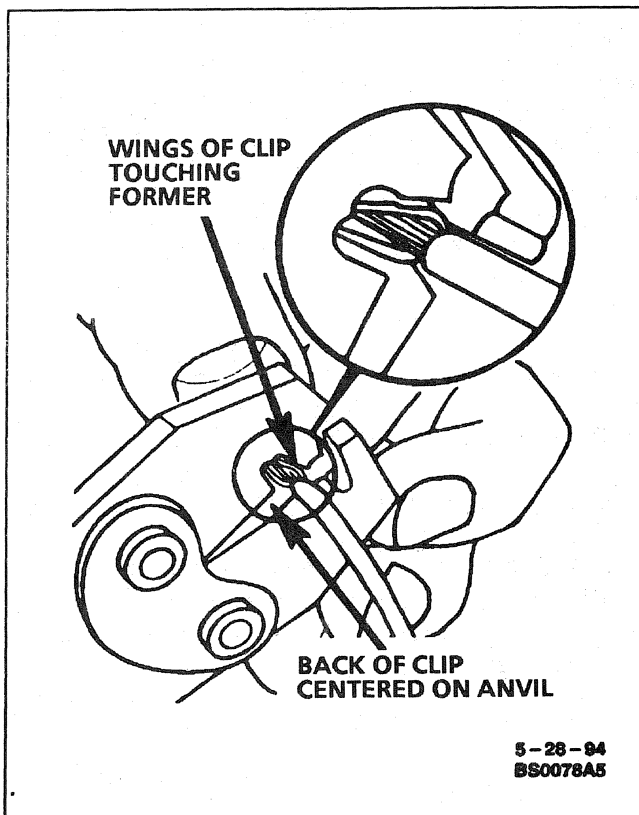


Figure 8 - Crimping the Splice Clip

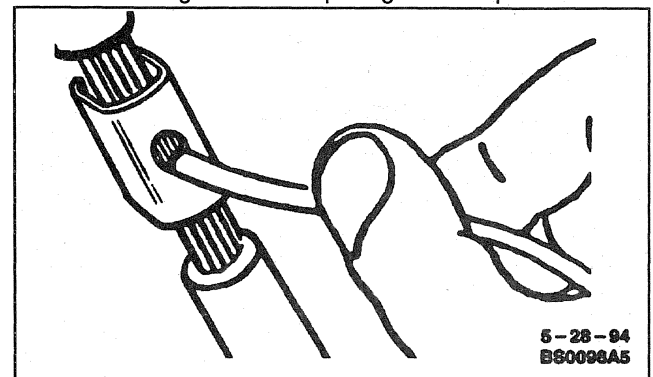


Figure 10 - Applying the Solder

**Step 6: Tape the Splice**

Center and roll the splicing tape. The tape should cover the entire splice. Roll on enough tape to duplicate the thickness of the insulation on the existing wires. Do not flag the tape. Flagged tape may not provide enough insulation, and the flagged ends will tangle with the other wires in the harness (see Figure 11).

If the wire does not belong in a conduit or other harness covering, tape the wire again. Use a winding motion to cover the first piece of tape (Figure 12).

## REPAIR PROCEDURES

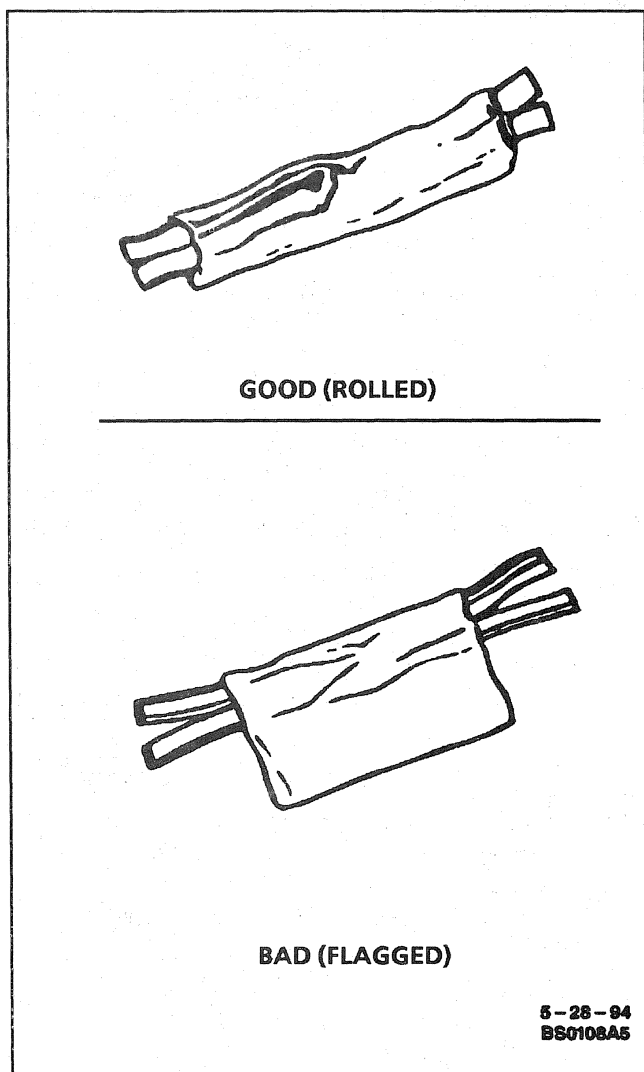


Figure 11 - Proper First Taping

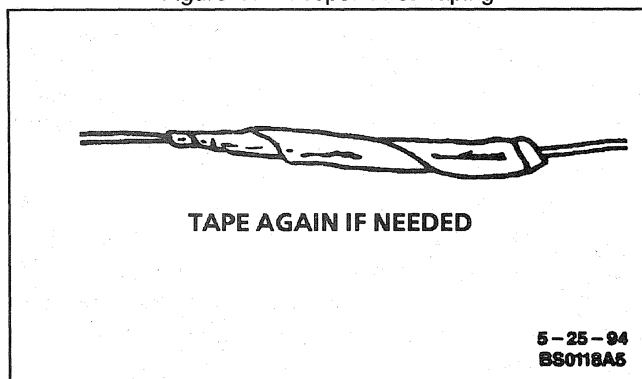


Figure 12 - Proper Second Taping

**SPlicing COPPER WIRE USING CRIMP AND SEAL SPLICE SLEEVES**

Crimp and seal splice sleeves may be used on all types of insulation except Tefzel and coaxial to form a one-to-one splice. They are to be used where there are special requirements such as moisture sealing. Refer to the appropriate section of the Service Manual to determine if the crimp and seal is necessary. Crimp and seal splice sleeves are included in the J 38125-A Terminal Repair Kit.

**Step 1: Open the Harness**

If the harness is taped, remove the tape. To avoid wire insulation damage, use a sewing "seam ripper" to cut open the harness (available from sewing supply stores). The crimp and seal splice sleeves may be used on all types of insulation except Tefzel and coaxial and may only be used to form a one-to-one splice.

**Step 2: Cut the Wire**

Begin by cutting as little wire off the harness as possible. You may need the extra length of wire later if you decide to cut more wire to change the location of a splice. You may have to adjust splice locations to make certain that each splice is at least 40 mm (1.5 in.) away from other splices, harness branches or connectors. This will help prevent moisture from bridging adjacent splices and causing damage.

**Step 3: Strip the Insulation**

If it is necessary to add a length of wire to the existing harness, be certain to use the same size as the original wire (refer to Figure 6, "Wire Size Conversion Table").

To find the correct wire size either find the wire on the schematic and convert the metric size to the equivalent AWG size or use an AWG wire gage. If unsure about the wire size, begin with the largest opening in the wire stripper and work down until a clean strip of the insulation is removed. Strip approximately 7.5 mm (5/16 in.) of insulation from each wire to be spliced. Be careful to avoid nicking or cutting any of the wires. Check the stripped wire for nicks or cut strands. If the wire is damaged, repeat this procedure after removing the damaged section.

**Step 4: Select and Position the Splice Sleeve**

Select the proper splice sleeve according to wire size. The splice sleeves and tool nests are color coded (see following chart).

## CRIMP AND SEAL SPLICE SLEEVE CHART

Color splice sleeve	Crimp tool nest color	Wire gage AWG/(metric)
Salmon (yellowish-pink)	Red	20, 18/(0.5, 0.8)
Blue	Blue	16, 14/(1.0, 2.0)
Yellow	Yellow	12, 10/(3.0, 5.0)

Using the J 38125-8 splice crimp tool (Figure 13), position the splice sleeve in the proper color nest of the hand crimp tool. Place the splice sleeve in the nest so that the crimp falls midway between the end of the barrel and the stop.

The sleeve has a stop in the middle of the barrel to prevent the wire from going further (see Figure 14). Close the hand crimper handles slightly to hold the splice sleeve firmly in the proper nest.

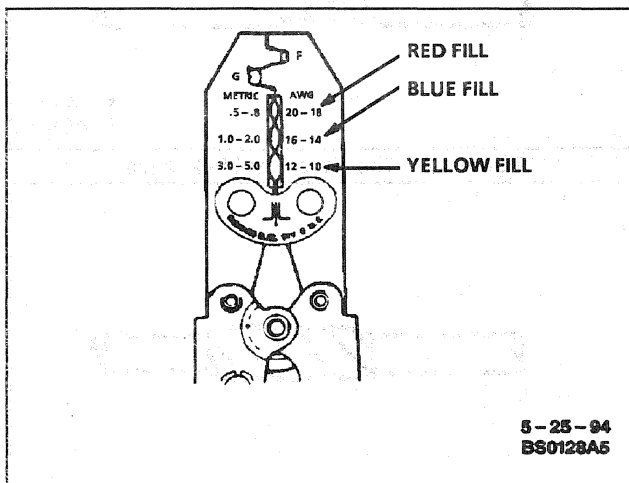


Figure 13 - Hand Crimp Tool

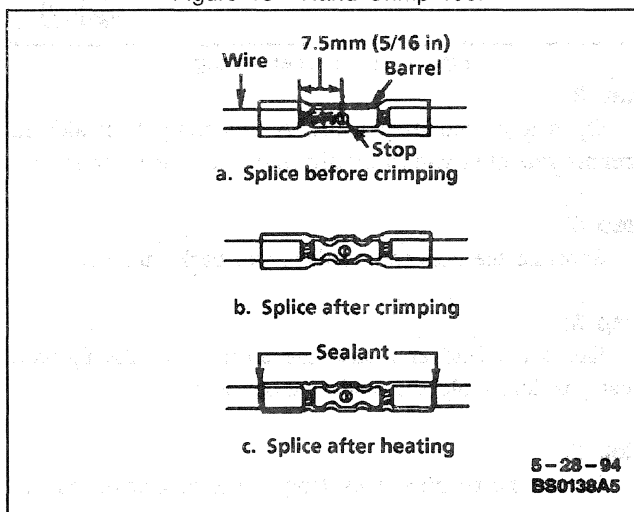


Figure 14 - Seal Splice Sequence

### Step 5: Insert Wires into Splice Sleeve and Crimp

Insert the wire into the splice sleeve until it hits the barrel stop and close the handles of the J 38125-8 crimper tightly until the crimper handles open when released. The crimper handles will not open until the proper amount of pressure is applied to the splice sleeve. Repeat steps 4 and 5 for opposite end of the splice.

### Step 6: Shrink the Insulation Around the Splice

Using the Ultratorch J 38125-5 (follow instructions that accompany Ultratorch), apply heat where the barrel is crimped. Gradually move the heat barrel to the open end of the tubing, shrinking the tubing completely as the heat is moved along the insulation. A small amount of sealant will come out of the end of the tubing when sufficient shrinking is achieved (Figure 14).

## SPLICING TWISTED/SHIELDED CABLE

Twisted/shielded cable is sometimes used to protect wiring from electrical noise (stray signals). For example, two-conductor cable of this construction is used between the ECM and the distributor. See Figure 15 for a breakdown of twisted/shielded cable construction.

### Step 1: Remove Outer Jacket

Remove the outer jacket and discard it. Be careful to avoid cutting into the drain wire or the mylar tape.

### Step 2: Unwrap the Tape

Unwrap the aluminum/mylar tape, but do not remove it. The tape will be used to rewrap the twisted conductors after the splices have been made.

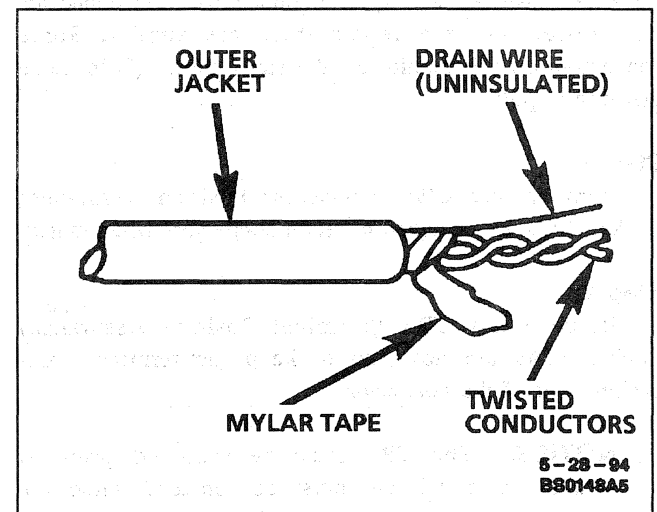


Figure 15 - Twisted/Shielded Cable

## REPAIR PROCEDURES

### Step 3: Prepare the Splice

Untwist the conductors. Then, prepare the splice by following the splicing instructions for copper wire presented earlier. Remember to stagger splices to avoid shorts (Figure 16).

### Step 4: Re-assemble the Cable

After you have spliced and taped each wire, rewrap the conductors with the mylar tape. Be careful to avoid wrapping the drain wire in the tape.

Next, splice the drain wire following the splicing instructions for copper wire. Then, wrap the drain wire around the conductors and mylar tape (Figure 17).

### Step 5: Tape the Cable

Tape over the entire cable using a winding motion (see Figure 18). This tape will replace the section of the jacket you removed to make the repair.

## REPAIRING CONNECTORS

- The following general repair procedures can be used to repair most types of connectors. The repair procedures are divided into three general groups: Push-to-Seat and Pull-to-Seat and Weather Pack®.
- See "Harness Connector Faces," page 8A-202-0, to determine which type of connector is to be serviced.
- Use the proper Pick(s) or Tool(s) that apply to the terminal.
- The Terminal Repair Kit (J 38125-A) contains further information.

### PUSH-TO-SEAT AND PULL-TO-SEAT CONNECTOR REPAIR

Follow the steps below to repair Push-to-Seat (Figure 19) or Pull-to-Seat (Figure 20) connectors. The steps are illustrated with typical connectors. Your connector may differ, but the repair steps are similar. Some connectors do not require all the steps shown. Skip those that don't apply.

#### Step 1:

Remove any CPA (Connector Position Assurance) Locks. CPAs are designed to retain connectors when mated.

#### Step 2:

Remove any TPA (Terminal Position Assurance) Locks. TPAs are designed to keep the terminal from backing out of the connector.

**NOTICE:** The TPA must be removed prior to terminal removal and must be replaced when the terminal is repaired and resealed.

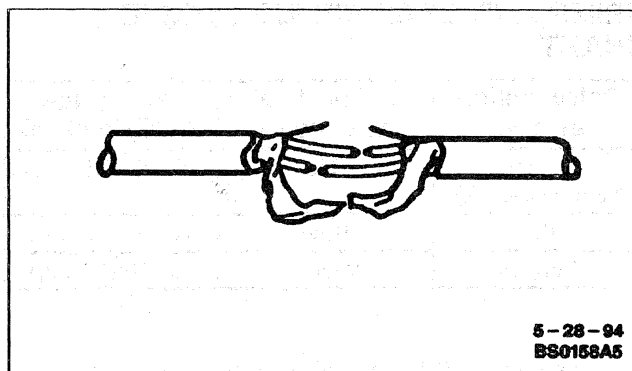


Figure 16 - The Untwisted Conductors

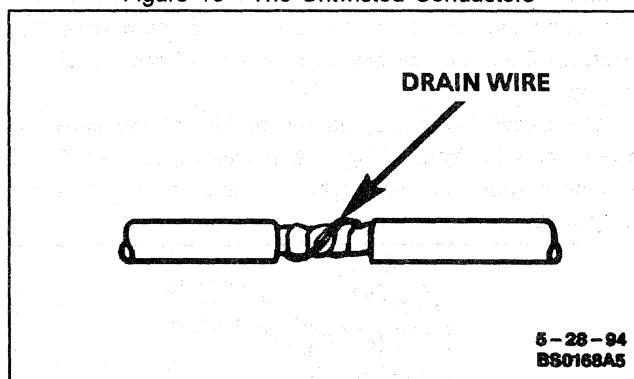


Figure 17 - The Re-assembled Cable

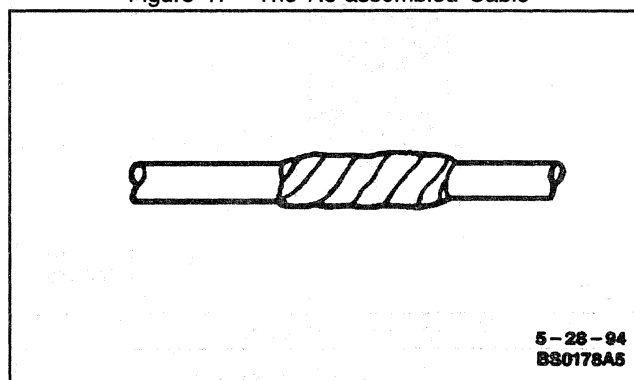


Figure 18 - Proper Taping

#### Step 3:

Open any secondary locks. A secondary lock aids in terminal retention and is usually molded to the connector.

#### Step 4:

Separate the connector halves and back out seals.

#### Step 5:

Grasp the lead and push the terminal to the forward most position. Hold the lead at this position.

#### Step 6:

Locate the terminal lock tang in the connector canal.

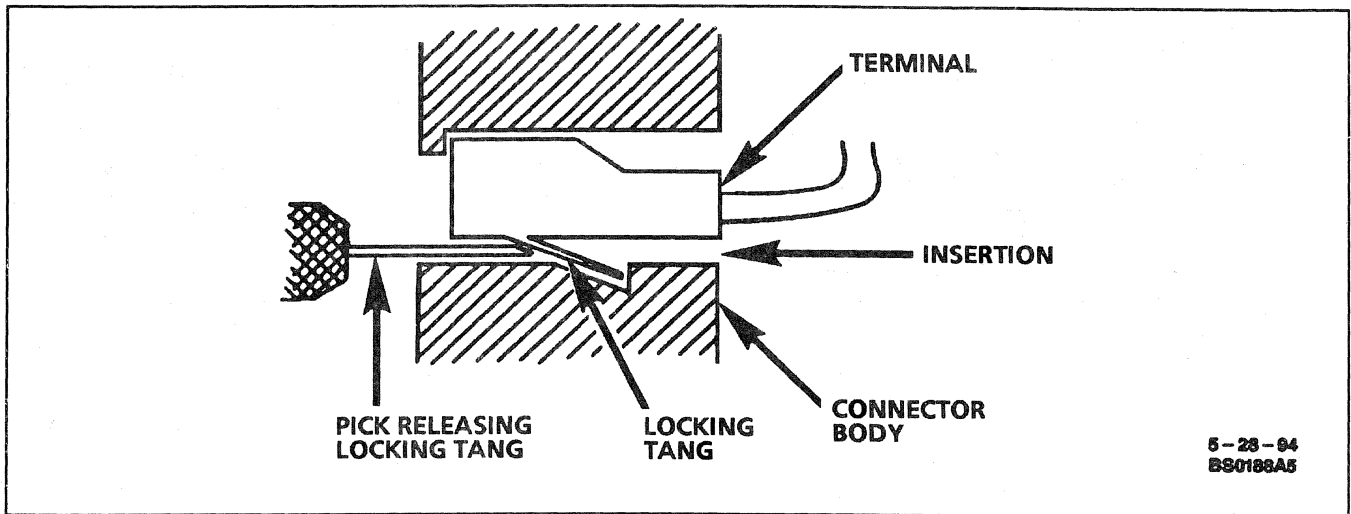


Figure 19 - Typical Push-to-Seat Connector and Terminal

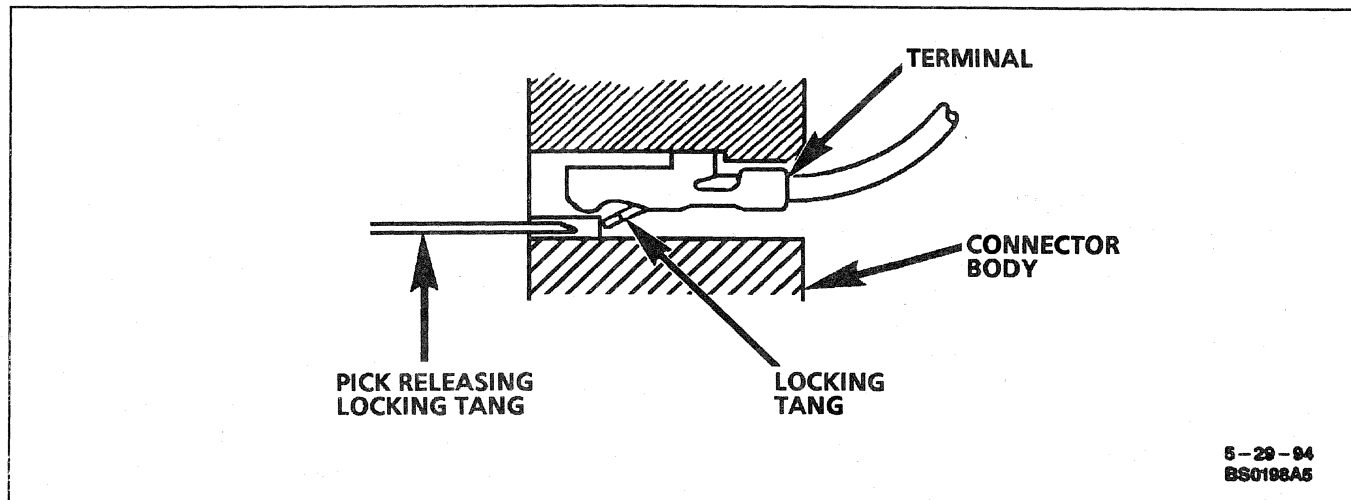


Figure 20 - Typical Pull-to-Seat Connector and Terminal

**Step 7:**

Insert the proper size pick (refer to Terminal Repair Kit J 38125-A) straight into the connector canal at the mating end of the connector.

**Step 8:**

Depress the locking tang to unseat the terminal.

- Push-to-Seat—Gently pull on the lead to remove the terminal through the back of the connector.
- Pull-to-Seat—Gently push on the lead to remove the terminal through the front of the connector.

**NOTICE:** Never use force to remove a terminal from a connector.

**Step 9:**

Inspect terminal and connector for damage. Repair as necessary (see "Terminal Repair," page 8A-5-10).

**Step 10:**

Reform lock tang and reseat terminal in connector body. Apply grease if connector was originally equipped with grease.

**Step 11:**

Install any CPAs or TPAs, close any secondary locks and join connector halves.

**WEATHER PACK® CONNECTOR REPAIR**

Follow the steps below to repair Weather Pack® connectors (Figure 21).

**Step 1:**

Separate the connector halves.

**Step 2:**

Open secondary lock. A secondary lock aids in terminal retention and is usually molded to the connector.

## REPAIR PROCEDURES

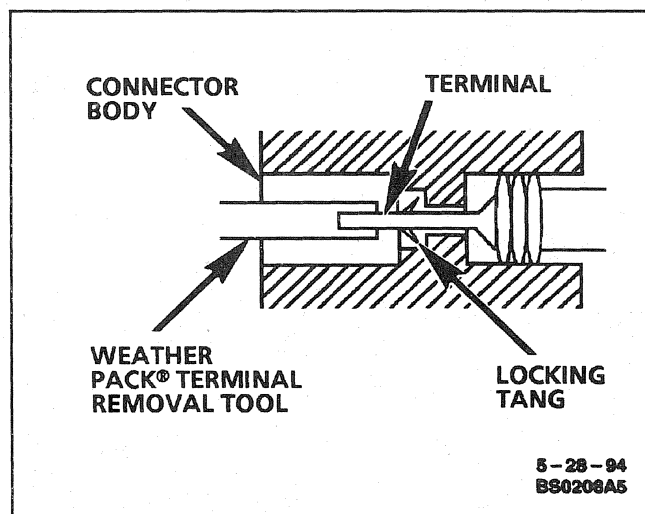


Figure 21 - Typical Weather Pack® Connector and Terminal

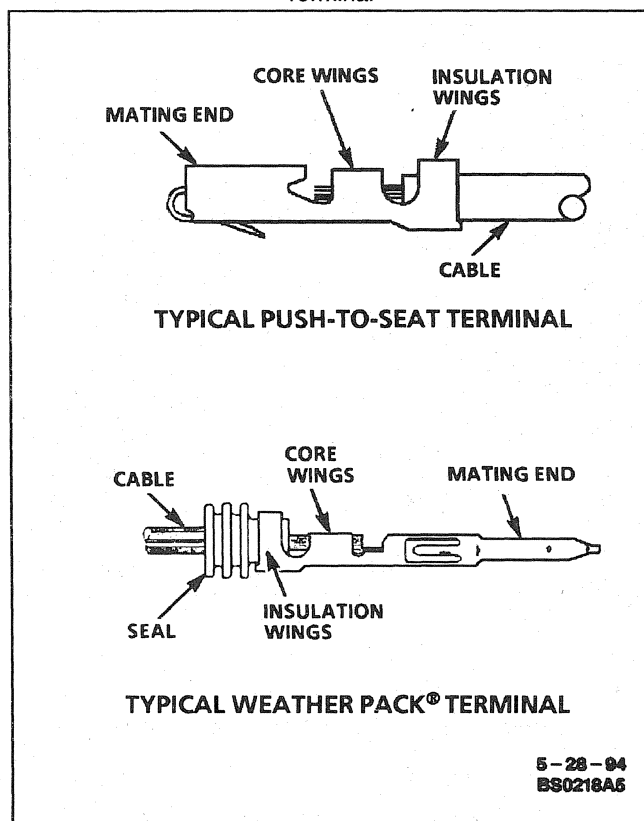


Figure 22 - Terminal Repair

**Step 3:**

Grasp the lead and push the terminal to the forward most position. Hold the lead at this position.

**Step 4:**

Insert the Weather Pack® terminal removal tool into the front (mating end) of the connector cavity until it rests on the cavity shoulder.

**Step 5:**

Gently pull on the lead to remove the terminal through the back of the connector.

**NOTICE:** Never use force to remove a terminal from a connector.

**Step 6:**

Inspect the terminal and connector for damage. Repair as necessary (see "Terminal Repair," on this page).

**Step 7:**

Re-form the lock tang and reseal terminal in connector body.

**Step 8:**

Close secondary locks and join connector halves.

**TERMINAL REPAIR**

The following repair procedures can be used to repair Push-to-Seat, Pull-to-Seat or Weather Pack® terminals (Figure 22). Some terminals do not require all steps shown. Skip those that don't apply. The Terminal Repair Kit (J 38125-A) contains further information.

**Step 1:**

Cut off terminal between core and insulation crimp (minimize wire loss) and remove seal for Weather Pack® terminals.

**Step 2:**

Apply correct seal per gauge size of wire and slide back along wire to enable insulation removal (Weather Pack® terminals only).

**Step 3:**

Remove insulation.

**Step 4:**

Align seal with end of cable insulation (Weather Pack® terminals only).

**Step 5:**

Position strip (and seal for Weather Pack®) in terminal.

**Step 6:**

Hand crimp core wings.

**Step 7:**

Hand crimp insulation wings (non-Weather Pack®). Hand crimp insulation wings around seal and cable (Weather Pack®).

**Step 8:**

Solder all hand crimped terminals.

**DIODE REPLACEMENT**

Many vehicle electrical systems use a diode to isolate circuits and protect the components from voltage spikes. When installing a new diode, use the following procedure:

**Step 1: Open the Harness**

If the diode is taped to the harness, remove all of the tape.

**Step 2: Remove Inoperative Diode**

Paying attention to current flow direction, remove inoperative diode from the harness with a suitable soldering tool. If the diode is located next to a connector terminal, remove the terminal(s) from the connector to prevent damage from the soldering tool.

**Step 3: Strip the Insulation**

Carefully strip away a section of insulation next to the old soldered portion of the wire(s). Do not remove any more than is needed to attach the new diode.

**Step 4: Install New Diode**

Check current flow direction of the new diode, being sure to install the diode with correct bias. Reference the appropriate service manual wiring schematic to obtain the correct diode installation position. Reference Figure 23 for replacement diode symbols and current flow explanations. Attach the new diode to the wire(s) using 60/40 rosin core

solder. Use a heat sink (aluminum alligator clip) attached across the diode wire ends to protect the diode from excess heat. Follow the manufacturer's instructions for the soldering equipment you are using.

**Step 5: Install Terminal(s)**

Install terminal(s) into the connector body if previously removed in Step 2.

**Step 6: Tape Diode to Harness**

Tape the diode to the harness or connector using electrical tape. To prevent shorts to ground and water intrusion, completely cover all exposed wire and diode attachment points.

**ACCEPTABLE DIODE REPLACEMENTS**

Diode Brand	Rating Number	Rating	P/N
GMSP0	1N4004	1 amp, 400 PIV	12112421
GMSP0	1N5404	3 amp, 400 PIV	12112422
GMSP0	1N4001	1 amp, 50 PIV	16020519
GMSP0	1N4005	1 amp, 600 PIV	16011840
GMSP0	1N4004	1 amp, 400 PIV	16039386

In the event 1 amp, 50 PIV (Peak Inverse Rating) diodes are unavailable, a universal diode with a 1 amp, 400 PIV rating can be used for the following applications:

- A/C Compressor Clutch
- ABS/4WAL (the ABS Diode on the Delco Moraine is hidden inside of an electrical connector under the carpet at the right panel)

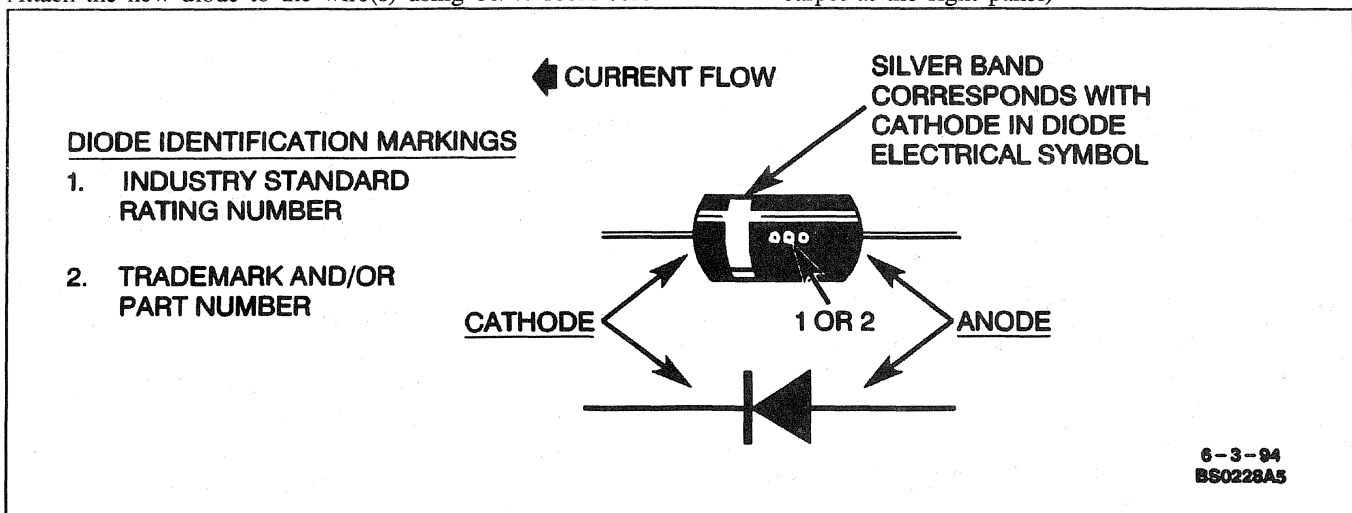


Figure 23 - Diode Identification

### REPAIR PROCEDURES

- Wiper
- Charging System (hidden in wire harness)
- Parking Brake (vehicle with ABS)
- Relays
- Solenoids
- Diesel Glow Plug Circuit

### HEATED OXYGEN SENSOR (HO2S) REPAIR

If the Heated Oxygen Sensor pigtail wiring, connector or terminal is damaged, the entire Oxygen Sensor Assembly must be replaced. Do not attempt to repair the wiring, connector or terminals. In order for the sensor to function properly, it must have provided to it a clean air reference. This clean air reference is obtained by way of the Oxygen Sensor signal and heater wires. Any attempt to repair the wires, connectors or terminals could result in the obstruction of the air reference and degraded Oxygen Sensor performance.

The following guidelines should be used when servicing the Heated Oxygen Sensor:

- Do not apply contact cleaner or other materials to the sensor or vehicle harness connectors. These materials may get into the sensor causing poor performance. Also, the sensor pigtail and harness wires must not be damaged in such a way that the wires inside are exposed. This could provide a path for foreign materials to enter the sensor and cause performance problems.
- Neither the sensor or vehicle lead wires should be bent sharply or kinked. Sharp bends, kinks, etc., could block the reference air path through the lead wire.
- Do not remove or defeat the Oxygen Sensor ground wire (where applicable). Vehicles that utilize the ground wired sensor may rely on this ground as the only ground contact to the sensor. Removal of the ground wire will also cause poor engine performance.
- To prevent damage due to water intrusion, be sure that the peripheral seal remains intact on the vehicle harness connector.

The Engine Harness may be repaired using Packard's Crimp and Splice Seals Terminal Repair Kit J 38125-A. Under no circumstances should repairs be soldered since this could result in the air reference being obstructed.

### OBDII CIRCUIT REPAIRS

Repairs for On-Board Diagnostics II (OBDII) emission control circuits follow the procedures stated in SECTION 8A-5. When servicing OBDII circuits, the following guidelines are also essential:

- Do not move or alter grounds from their manufactured locations.
- Do not tie aftermarket accessories into OBDII circuits.

- Only repair OBDII circuits in accordance with the manufactured configuration.
- Always replace a relay in an OBDII circuit the same replacement part. Damaged relays should be discarded, not repaired.
- Refer to SECTION 8A-11 to identify OBDII circuit fusing.
- Make sure that CPA (connector position assurance) locks and TPA (terminal position assurance) locks are reinstalled on connectors that use them.
- After repair of connectors or connector terminals, make sure to achieve proper terminal retention. Refer to REPAIRING CONNECTORS on page 8A-5-8 for procedures.
- Before repairing OBDII heated oxygen sensors and related wiring, always review the special repair guidelines provided on page 8A-5-12 under HEATED OXYGEN SENSOR REPAIR.
- When installing an electrical ground fastener, be sure to apply the specified torque. Ground torque specifications are listed in SECTION 8A-14.
- After repair of connectors, make sure to reinstall connector seals, where used. Inspect seals for wear and damage. Replace worn or damaged seals.

### GMSP0 SERVICE PARTS

#### GMSP0 STANDARD PARTS CATALOG

Check the GMSP0 Standard Parts Catalog, Group 8.965. Fuses, circuit breakers, connectors, terminals, conduit, pigtail kits, and seals are listed in that group.

#### GMSP0 CARLINE PARTS CATALOG

The GMSP0 Carline Parts Catalog, Group 2.535 contains connector repair kits with terminals and leads.

### COMPLETE HARNESS

In many cases repairs can be made by ordering pigtail assemblies (prewired connectors) rather than the entire wiring harness. Only order complete harnesses when there is major damage to the wiring harness. Always repair minor damage. Complete harnesses and pigtail part numbers can be found in the GMSP0 Carline Parts Catalog.

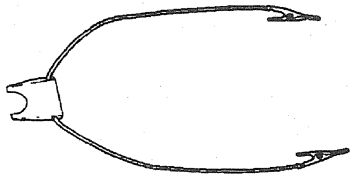
### ORDERING SERVICE PARTS

1. If you can't find the repair parts you need in the J 38125-A Terminal Repair Kit, GMSP0 Standard Parts Catalog, or the GMSP0 Carline Parts Catalog, refer to SECTION 8A-202 (Harness Connector Faces) to find a listing of the OE part number(s).

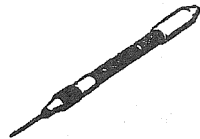


2. Call PARTECH (1-800-433-6961) and give the PARTECH advisor the OE part number(s). The PARTECH advisor can determine if there is a GMSPO part number(s) for the OE part number(s).
3. If PARTECH cannot find a GMSPO part number, call the Service Parts Assistance Center (SPAC) with the OE part number(s). The SPAC advisor will assist you in placing a priority order using the "No Part Number" process with the Packard Electric Division. The SPAC advisor may have you place the order with the Packard Electric Division (1-800-PACKARD). Parts are typically shipped within 24 hours direct to your dealership.

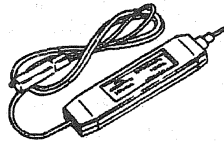
REPAIR PROCEDURES



J 36169  
Jumper Wire



J 35689 - A  
Micro-Pack Connector  
Terminal Remover



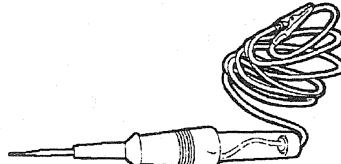
J 34636  
Solenoid, Relay  
and Circuit Tester



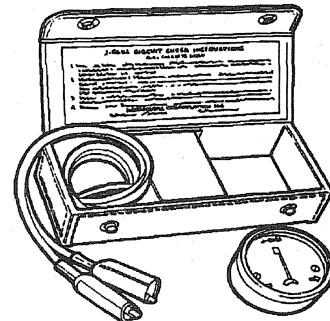
J 35616 - A  
Connector Test Adapter Kit



J 28742 - A  
Weather Pack II Terminal Remover



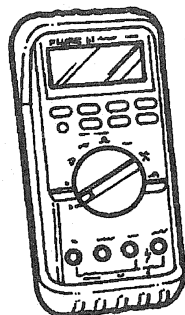
J 34142 - B  
Unpowered Test Light



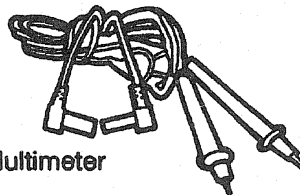
J 8681 - A  
Universal Short Checker



J 22727  
Electrical Terminal Remover



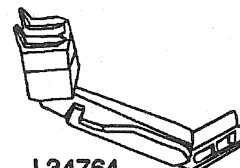
J 39200  
Digital Multimeter



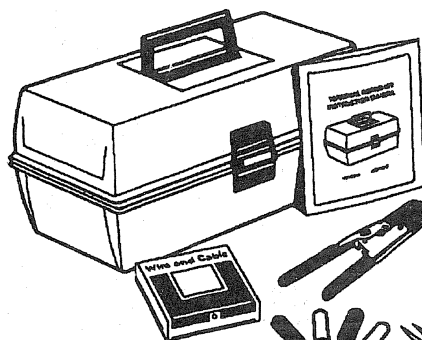
J 21008 - A  
Self-Powered Test Light



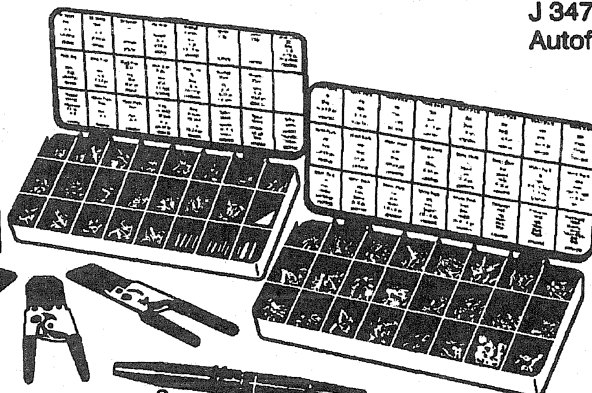
J 33095  
Terminal Remover: Micro Pack,  
Com-Pack III and ECM Edgeboard  
Connectors



J 34764  
Autofuse Tester



J 38125 - A  
Terminal Repair Kit

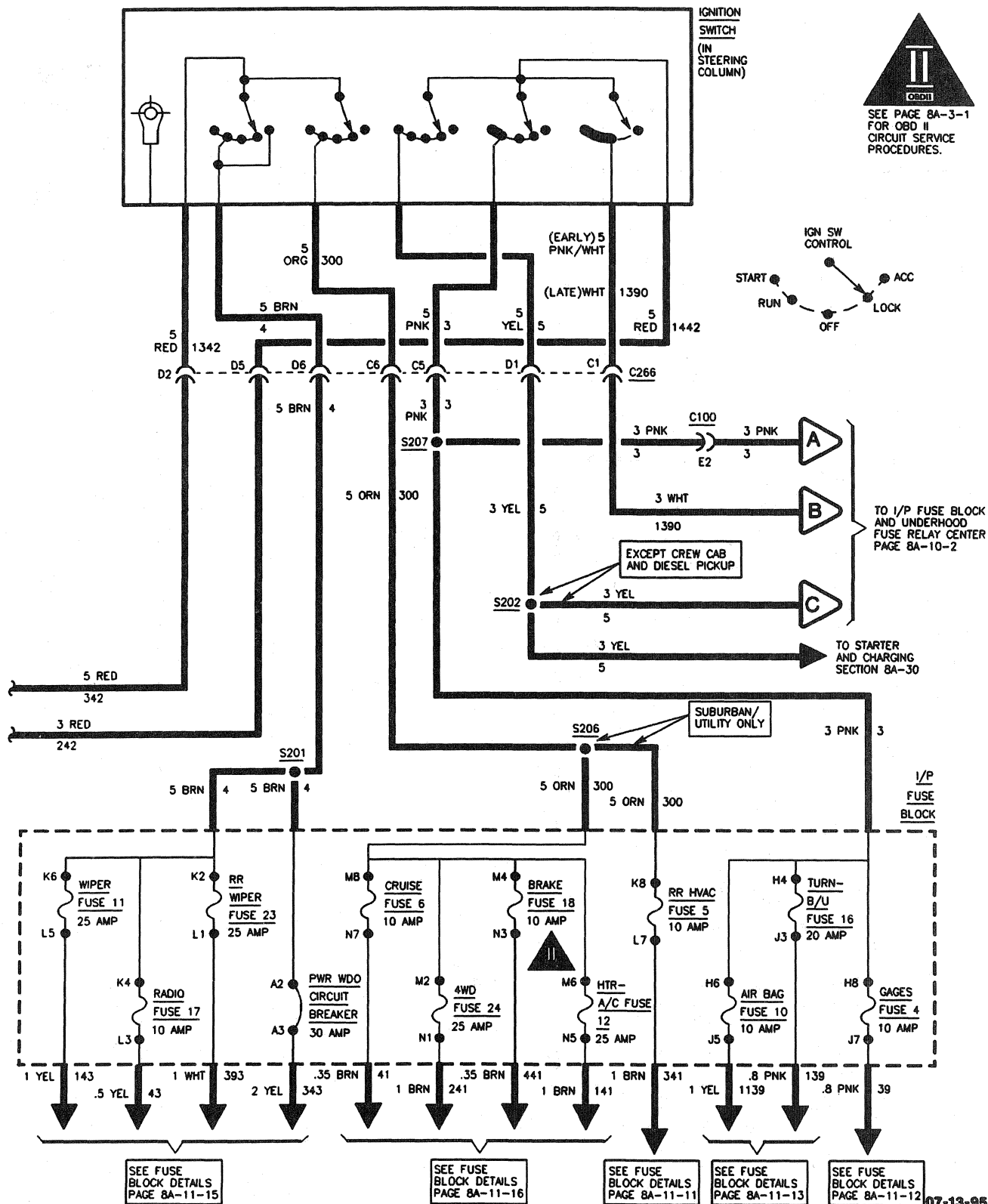


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**BLANK**

## POWER DISTRIBUTION





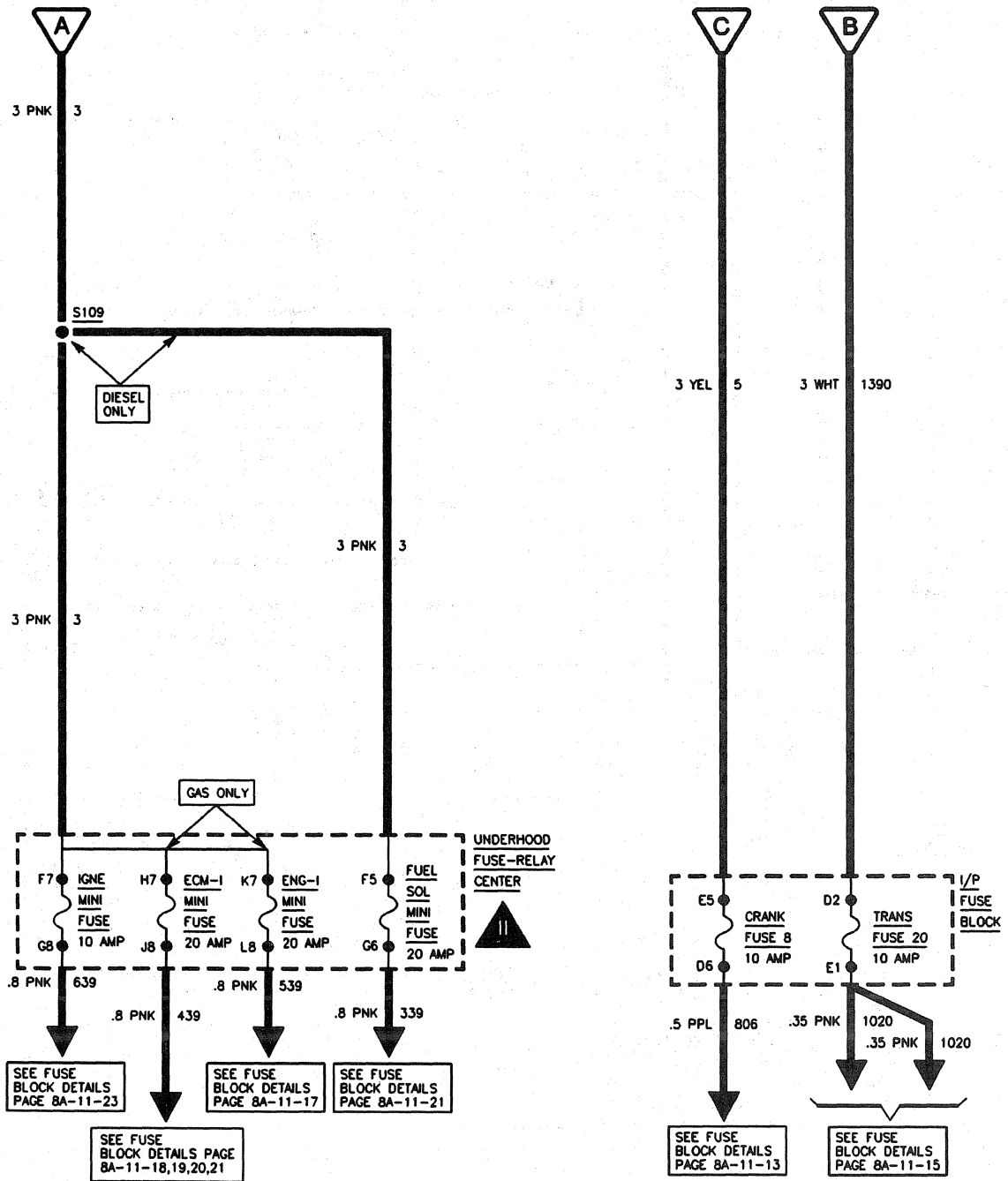
# 8A - 10 - 2 ELECTRICAL DIAGNOSIS

## POWER DISTRIBUTION



SEE PAGE 8A-3-1  
FOR OBD II  
CIRCUIT SERVICE  
PROCEDURES.

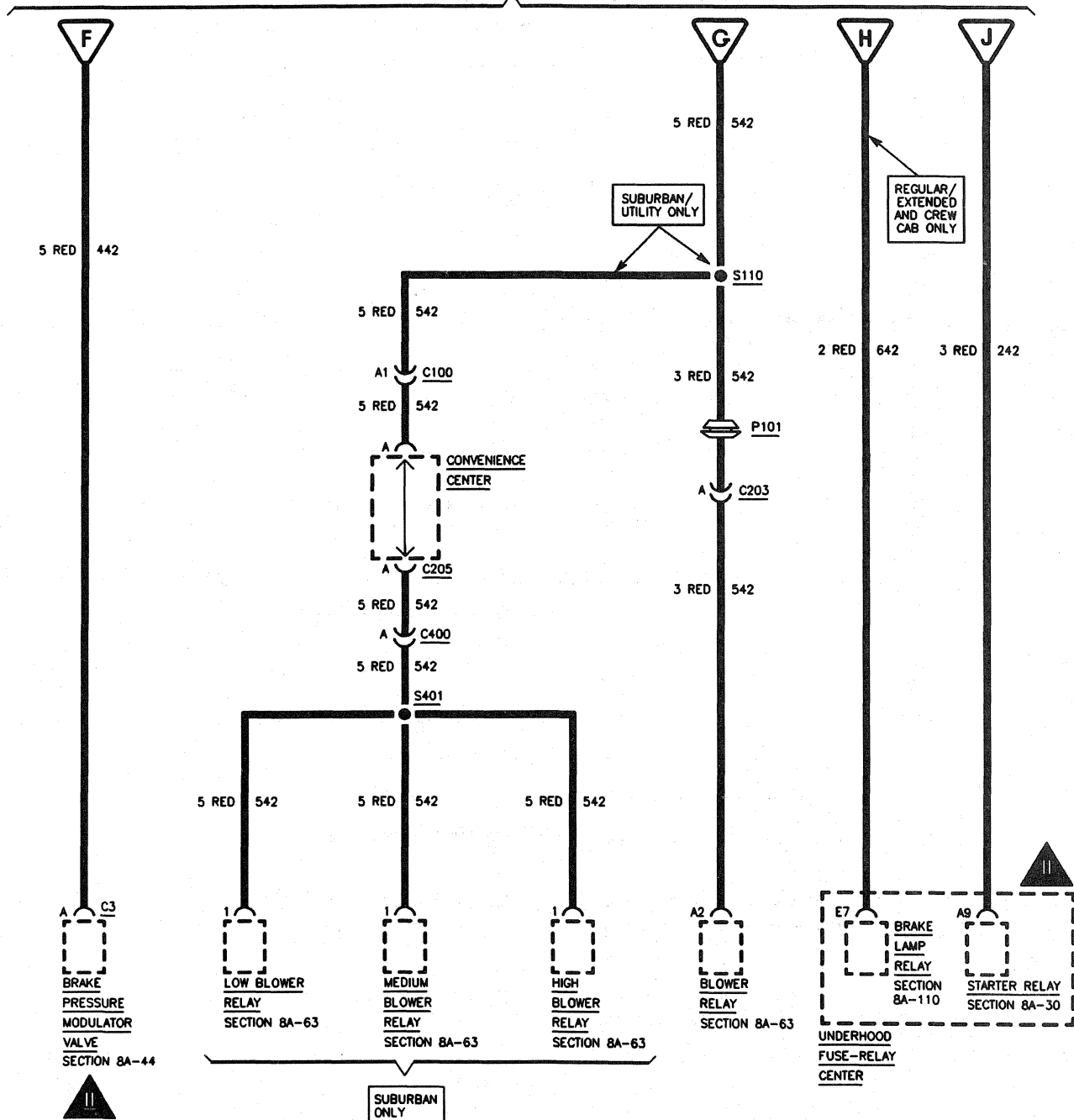
FROM IGNITION SWITCH  
PAGE 8A-10-1





SEE PAGE 8A-3-1  
FOR OBD II  
CIRCUIT SERVICE  
PROCEDURES.

FROM PAGE 8A-10-0



## 8A - 10 - 4 ELECTRICAL DIAGNOSIS

### POWER DISTRIBUTION

COMPONENT	LOCATION	201-PG	FIG.	CONN
Blower Motor Relay, High Front .....	Behind I/P Compartment Box on HVAC Plenum			
Brake Lamp Relay .....	In Underhood Fuse-Relay Center.....	4.....	9	
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH Front Wheelhouse.....	22.....	33	
Convenience Center .....	Under LH Side of I/P, on Bulkhead.....	23.....	36	
Generator.....	LH Front of Engine .....	1.....	3	
Headlamp and Panel Dimmer Switch.....	Lower LH Side of I/P .....	23.....	35	
High Blower Relay, Rear (Auxiliary HVAC) .....	On Auxiliary HVAC Plenum, Forward of LH Rear Wheelhouse			
Ignition Switch.....	Under I/P, on Steering Column			
I/P Fuse Block .....	Lower LH Side of I/P .....	23.....	35	
Low Blower Relay, Rear.....	On Auxiliary Heater and A/C Module.....	37.....	60	
Medium Blower Relay, Rear.....	On Auxiliary Heater and A/C Module.....	37.....	60	
Starter Relay .....	In Underhood Fuse - Relay Center			
Starter Solenoid .....	On Starter Motor			
Underhood Fuse-Relay Center.....	LH Rear of Engine Compartment, on Fender .....	4.....	8	
<b>CONNECTORS:</b>				
C100.....	LH Rear of Engine Compartment at Bulkhead .....	22.....	33.....	202-0
C203 .....	Behind RH Portion of I/P, near Heater Motor, in Foam Wrap .....	24.....	38	
C205.....	At Convenience Center			
C266.....	LH Side of Steering Column, near Bulkhead.....	27.....	43.....	202-8
C400.....	RH Rear of Vehicle, Above Auxiliary Blower Motor			
<b>GROMMETS:</b>				
P101 .....	RH Rear of Engine Compartment at Bulkhead			
<b>SPLICES:</b>				
S109 (Diesel).....	Engine Harness, Approx. 11.5 cm into Fuse-Relay Center Breakout			
S110 (VIN M, R Suburban/Utility).....	Engine Harness, Approx. 5 cm from Fuse-Relay Center Toward Taillamp Harness			
S110 (VIN J).....	Engine Harness, Approx. 13 cm from Fuse-Relay Center Breakout near Taillamp Harness Breakout			
S110 (Diesel).....	Engine Harness, Approx. 7.5 cm from Fuel Heater Breakout Toward Glow Plug Controller			



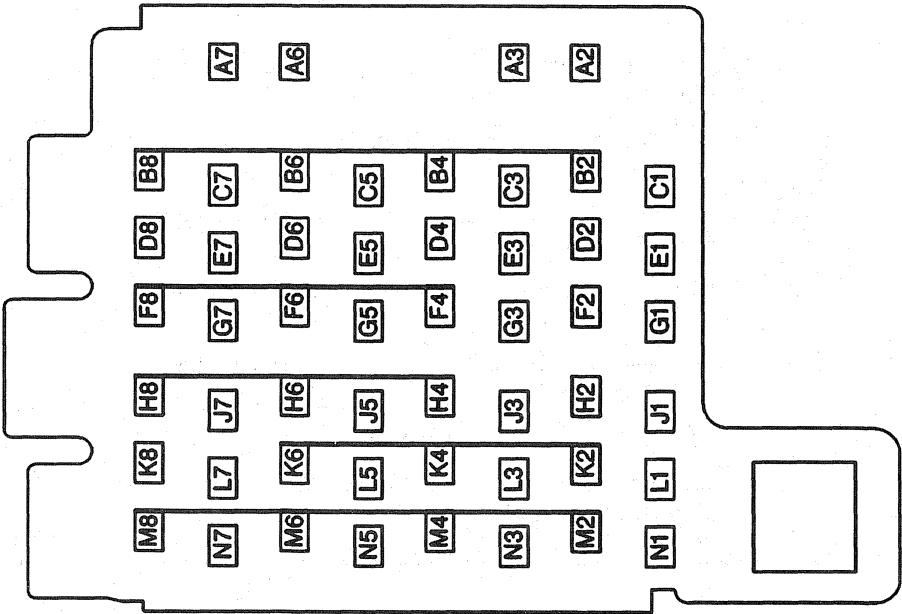
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**POWER DISTRIBUTION**

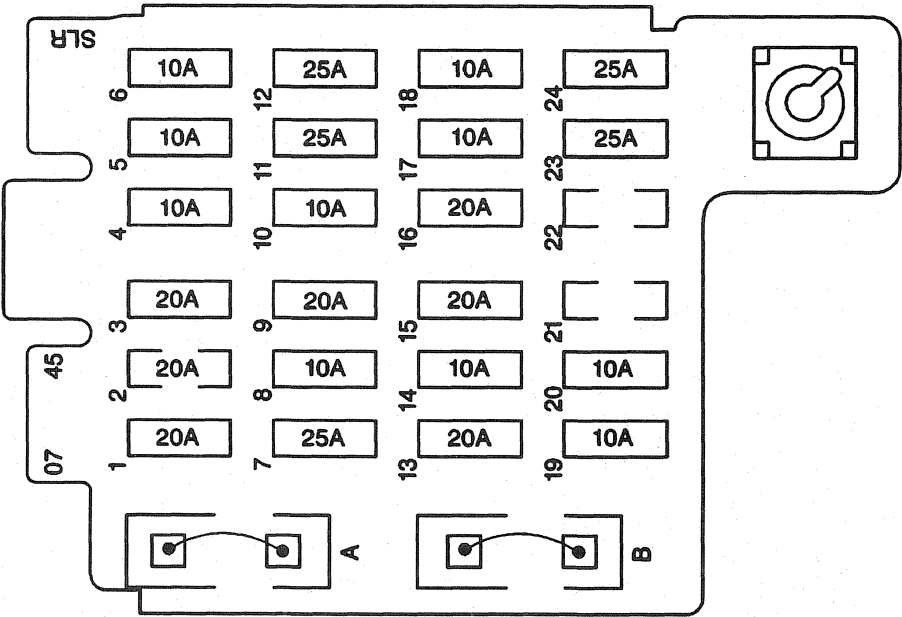
<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG FIG. CONN</b>
S200 .....	I/P Harness, Approx. 4 cm Left of Cruise Control Harness Breakout	
S201 .....	I/P Harness, Approx. 23 cm from TCC Stop Lamp Switch Connector	
S202 .....	I/P Harness, Approx. 27 cm from TCC Stop Lamp Switch Connector	
S205 .....	I/P Harness, Approx. 4 cm Right of Steering Column Connector Breakout	
S206 .....	I/P Harness, Approx. 6 cm Right of Steering Column Connector Breakout	
S207 .....	I/P Harness, Approx. 8 cm Right of Steering Column Connector Breakout	
S401 (Rear A/C) .....	Rear A/C Harness, 23 cm from Blower Motor Relays	
S401 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, Approx. 18 cm from Blower Motor Relays Breakout	

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FUSE BLOCK DETAILS  
I/P FUSE BLOCK



REAR VIEW (WIRE SIDE ENTRY)



FRONT VIEW

## FUSE BLOCK DETAILS

## I/P FUSE BLOCK

NAME	FUSE NUMBER	SIZE	CIRCUIT	LOADS
STOP/HAZ	1	20A FUSE	140	STOP/TCC SWITCH, BUZZER FLASHER, CHMSL, HAZARD LAMPS, STOP LAMPS
T CASE	2	20A FUSE	1640	TRFER CASE FEED
CTSY	3	20A FUSE	40	COURTESY LAMPS, CARGO LAMP, GLOVE LIGHT, DOME RDG LPS, VANITY MIRRORS, POWER MIRRORS
GAUGES	4	10A FUSE	39	DRL RELAY, DRL MDL. BUZZER, HDLP SW, KEYLESS ENTRY, CLUSTER, LOW COOLANT MODULE, ILLUM ENTRY MDL, DRAC
RR HVAC	5	10A FUSE	341	RR HVAC CONTROLS, UTILITY, SUBURBAN ONLY
CRUISE	6	10A FUSE	41	CRUISE MDL, CRUISE ACTIVATOR SW
AUX PWR	7	25A FUSE	840	POWER OUTLET
CRANK	8	10A FUSE	806	DERM.
PARK LPS	9	20A FUSE	240	LIC LP, PARK LP, TAIL LP, ASHTRAY LP, ROOF MARKER, TAIL GATE, LPS PANEL LPS, TRAILER TAIL LPS, FRONT SIDE MARKERS, FOG LP RLY, DOOR SW ILLUM, FENDER LAMPS, H/L SW ILLUMINATION
AIR BAG	10	10A FUSE	1139	DERM (SIR)
WIPER	11	25A FUSE	143	WIPER MOTOR, WASHER PUMP
HTR-A/C	12	25A FUSE	141	L, M1, M2 BLOWER, HVAC IND. LP, A/C COMP, MODE/TEMP/AIR IN ACT., HIGH BLOWER RELAY
CIG LTR	13	20A FUSE	640	POWER AMPLIFIER, REAR LIFTGLASS, CIGAR LIGHTER, DOOR LOCK RELAY, PWR LUMBAR SEAT
ILLUM	14	10A FUSE	8	4WD IND, LP, CLUSTER, HVAC CONTROLS, CHIME MDL, RR HVAC CONTROLS, I/P SWITCHES, RADIO ILLUM
DRL/FOG	15	20A FUSE	340	DRL RELAY, FOG LAMPS
TURN-B/U	16	20A FUSE	139A 139B	FRT TURN, RR TURN, TRAILER TURN, B/U LPS, BTSI SOLENOID
RADIO	17	10A FUSE	43	RADIO (IGN)
BRAKE	18	10A FUSE	441	4WAL/VCM, ABS, CRUISE
RADIO, BATT	19	10A FUSE	1140	RADIO (BATT)
TRANS	20	10A FUSE	1020	PRNDL, AUTO TRANSMISSION, SPEEDO, CHECK GAUGES, TELL TALE
	21			
	22			
RR WIPER	23	25A FUSE	393	REAR WIPER, REAR WASH PUMP, UTILITY, SUBURBAN ONLY
4WD	24	25A FUSE	241	FRT AXLE ACT., 4WD IND. LP,
PWR ACCY	A	C/B 20A	540	PWR DR LK, 6WAY PWR ST, KEYLESS ENTRY MDL
PWR WDOS	B	C/B 30A	343	PWR WDOS

## FUSE BLOCK DETAILS

### UNDERHOOD FUSE-RELAY CENTER

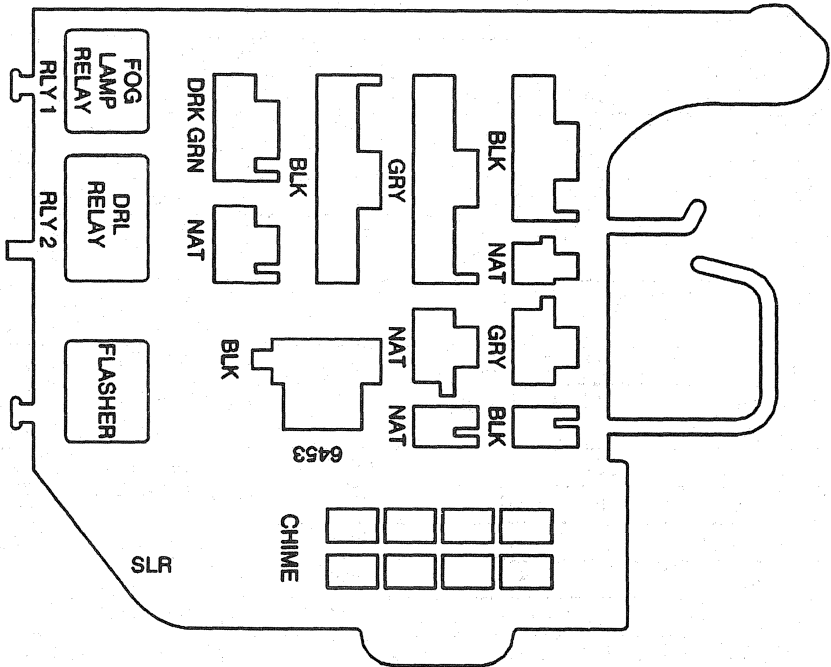


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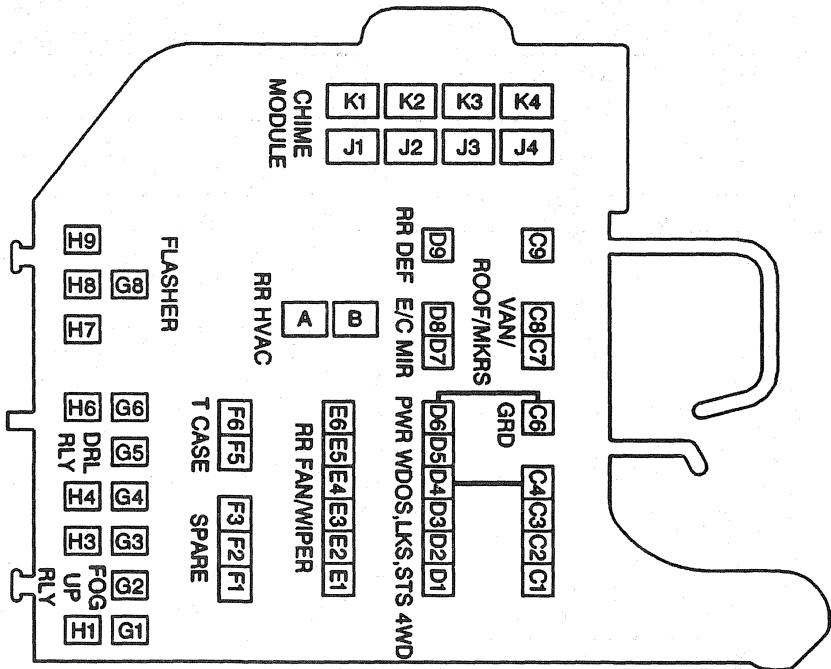
**FUSE BLOCK DETAILS****UNDERHOOD FUSE - RELAY CENTER**

NAME	FUSE NUMBER	SIZE	CIRCUIT	LOADS
	M1-N1			(SPARE)
STOP	M2-N2	30A MAXI FUSE	642/2	STOP LPS (PICKUP ONLY)
A/C	M3-N3	50A MAXI FUSE	542/2	HI BLOWER RLY & REAR BLOWER RELAYS (SUBURBAN)
ABS	M4-N4	60A MAXI FUSE	442/2	ANTI-LOCK BRAKE MODULE
IGN B	M5-N5	50A MAXI FUSE	342/2	IGN B SWITCH GO TO FUSE BLOCK BUSBAR
IGN A	M6-N6	40A MAXI FUSE	242/2	IGN A SWITCH GO TO FUSE BLOCK BUSBAR
BATTERY	M7-N7	50A MAXI FUSE	142/2	BATTERY, FUSE BLOCK BUSBAR
LIGHTING	M8-N8	50A MAXI FUSE	42/2	HDLP & PANEL DIMMER SW., FOG & CTSY FUSES
A/C COMP	L12-K11	10A FUSE	1240/2	SW A/C PRESS TO A/C CLUTCH
HORN	J12-H11	20A FUSE	740/2	HORN, UNDERHOOD LPS
ECM B	G12-F11	20A FUSE	440/2	FUEL PUMP, PCM/VCM
AUX FAN	J10-H9	30A FUSE	1540/2	AUX FAN
RR-DEFOG	G10-F9	30A FUSE	1440/2	RR DEFOG
ENG I	L8-K7	20A FUSE	539/3	IGN A SWITCH TO ENGINE LOADS, EGR, CANISTER PURGE, EVRV IDLE COAST SOLENOID, HEATED O2, FUEL HEATER, WATER SENSOR
ECM I	J8-H7	20A FUSE	439/3	INJECTORS PCM/VCM
IGN E	G8-F7	10A FUSE	339/3	AUX FAN RLY COIL, (L19) A/C COMP RLY, HOT FUEL MODULE, DUAL TANK
FUSE SOL	G6-F5	20A FUSE	639/3 339/3	FUEL SOLENOID, DIESEL ENG., ONLY
GLOW PLUGS	G4-F3	10A FUSE	507B/503H	GLOW PLUGS
STUD "A"	R7-P7	30A		AUX A
STUD "B"	R8-P8	30A		CAMPER/TRAILER WRG

FUSE BLOCK DETAILS  
CONVENIENCE CENTER



FRONT VIEW



REAR VIEW

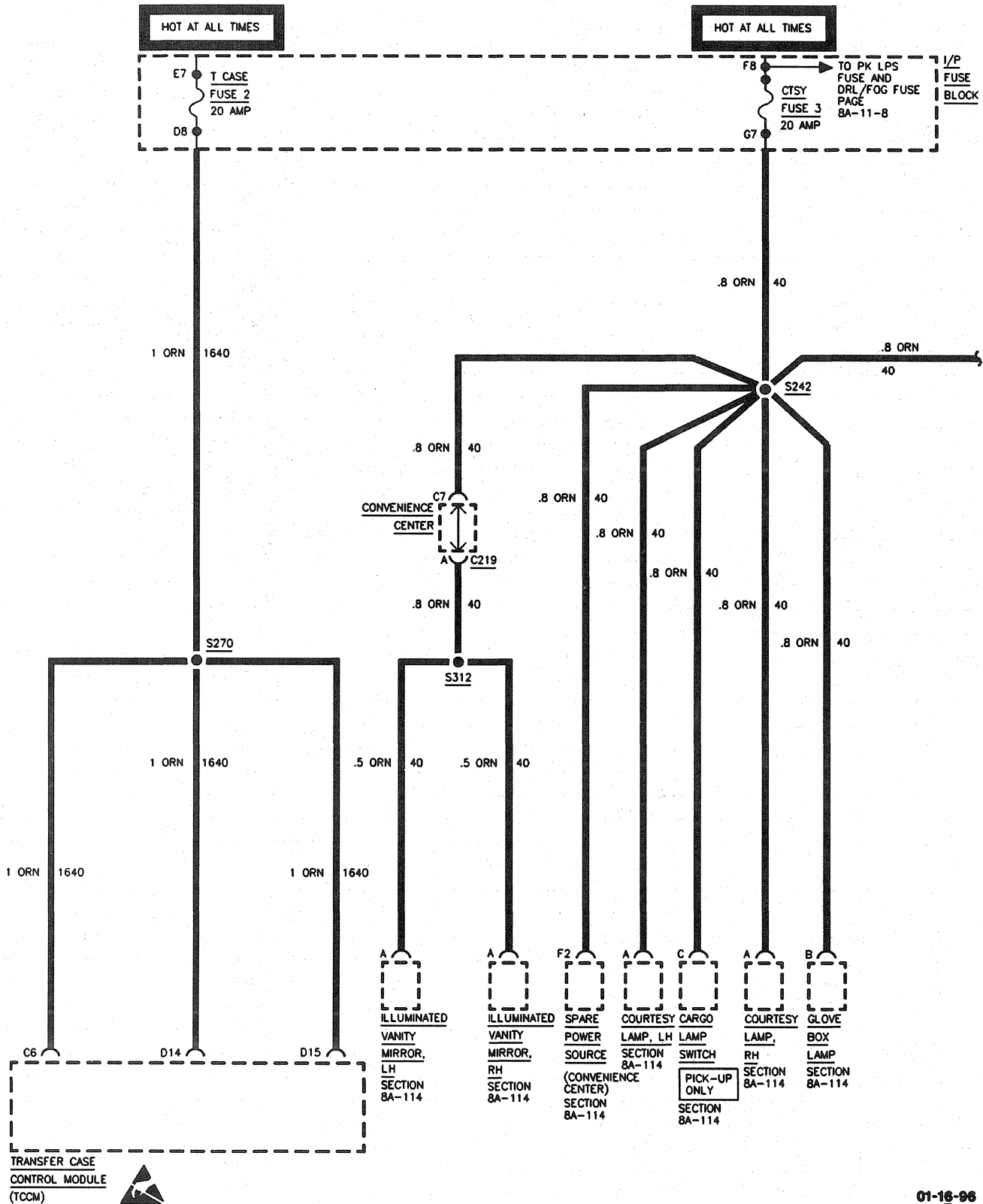
## FUSE BLOCK DETAILS

## CONVENIENCE CENTER

CAVITY	GAGE/COLOR	CIRCUIT #	DESCRIPTION
A	5.0 RED	542	B+ -RR BLOWER (SUBURBAN)
B	1.0 BRN	341	IGN3- RR HVAC
C4			NOT USED
C6	2.0 BLK	150	BUS BAR GRD. E/C MIRRORS/ ROOF MKR/ VANITY
C7	.8 ORN	40	VANITY FEED
C8	.80 BRN	9	ROOF MRKS GRD
C9			NOT USED
D1	1.0 BLK/WHT	1695	4-WD IND
D2	.80 ORN	640	POWER SEATS B+
D3	2.0 ORN	540	POWER DOOR LOCKS B+
D4	2.0 YEL	343	POWER WINDOW FEED
D5	.80 BLK	1576	RR RELEASE SW PWR (SUBURBAN/UTILITY)
D6	2.0 BLK	150	GRD LK/WDO/4WD LP (BUS BAR WITH C6)
D7	.35 PNK	39	E/C MIRRORS
D8	.80 LT GRN	24	E/C MIRROR
D9	2.0 PPL	293	RR DEFOG
E1	.50 DK BLU	1926	BLOWER LOW
E2	.50 RED	1925	RR BLOWER MED
E3	.50 WHT	1924	RR BLOWER HI
E4	1.0 LT BLU	97	RR WIPER MIST/OFF/LOW
E5	1.0 GRY	391	RR WIPER
E6	1.0 DK GRN	392	RR WASHER
F1			NOT USED
F2	.80 ORN	40	B+
F3	1.0 BRN	241	IGN 3
F5			NOT USED
F6			NOT USED
G1	.80 YEL	317	FOG LPS RELAY COIL-FEED
G2			
G3	2.0 PPL	34	FOG LPS FEED
G4	.35 PNK	39	DRL. RLY COIL FEED
G5	1.0 PPL	359	DRL. RLY HEADLAMP FEED
G6	.8 YEL	634	DRL. RLY B+
G8	.80 BLK	150	HAZARD FLASHER GRD
H1	1.0 ORN	340	FOG LP, PWR FEED
H3	1.0 LT GRN	11	FOG LP, RELAY H. BEAM HDLP FEED
H4	1.0 TAN	12	DRL. RELAY LOW BEAM HDLP FEED
H6	.80 LT GRN BLK	592	DRL RELAY OUTPUT-COIL
H7	1.0 PPL	1697	TURN SIGNAL FLASHER OUTPUT
H8	1.0 GRY	1696	ABS
H9	1.0 LT BLU	1508	ELECTRONIC FLASHER FEED
J1	.35 GRY	8	INST PANEL LPS
J2	.80 ORN	140	BUZZER B+
J3	.80 LT GRN	80	BUZZER KEY REMINDER SW. SIGNAL
J4			
K1	.80 BLK/WHT	238	BUZZER SEAT BELT SW. SIGNAL
K2	.80 BLK	150	BUZZER GRD
K3	.80 YEL	234	BUZZER SEAT BELT WARNING
K4	.35 PNK	39	BUZZER COIL FEED

8A - 11 - 6 ELECTRICAL DIAGNOSIS

FUSE BLOCK DETAILS

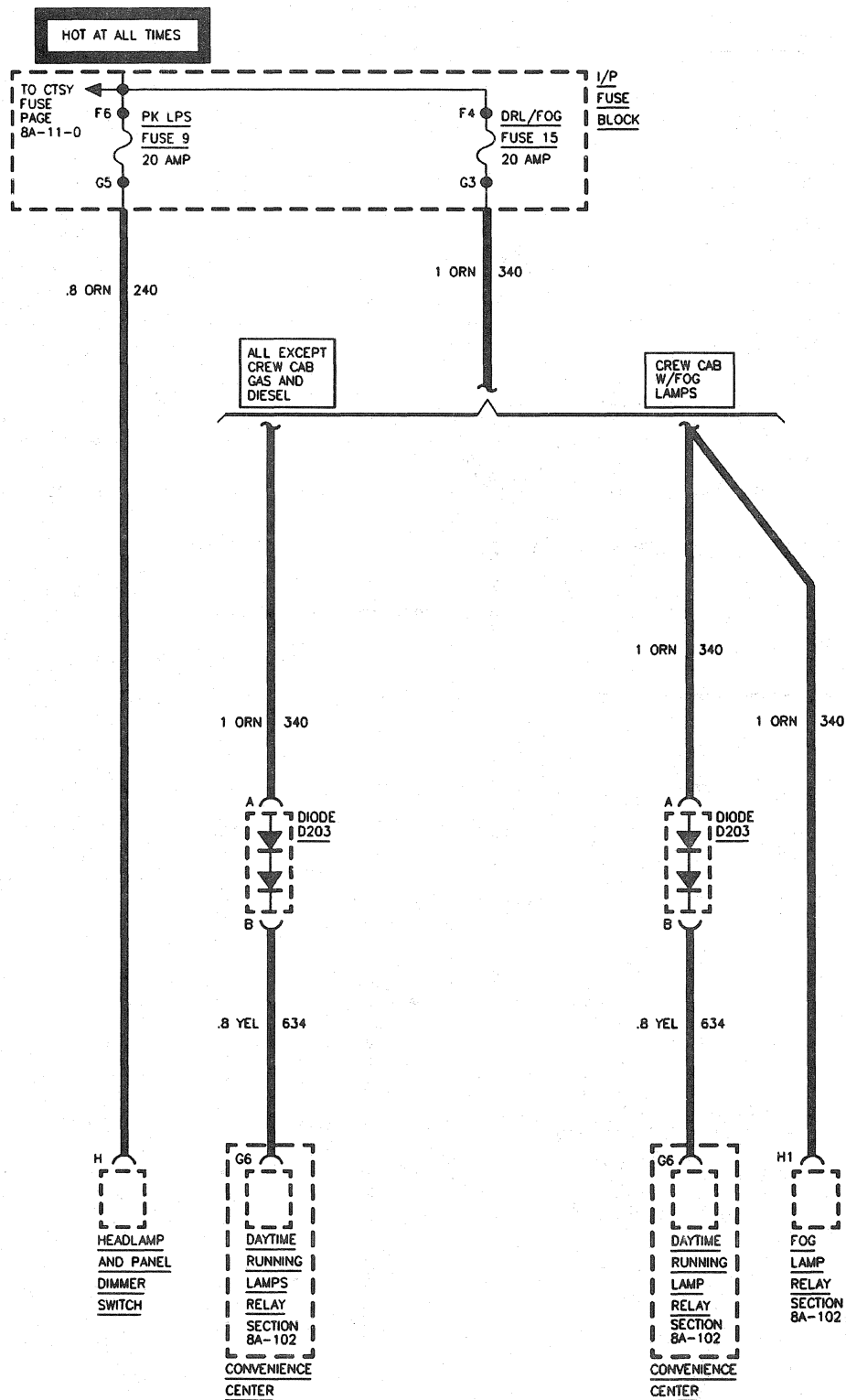


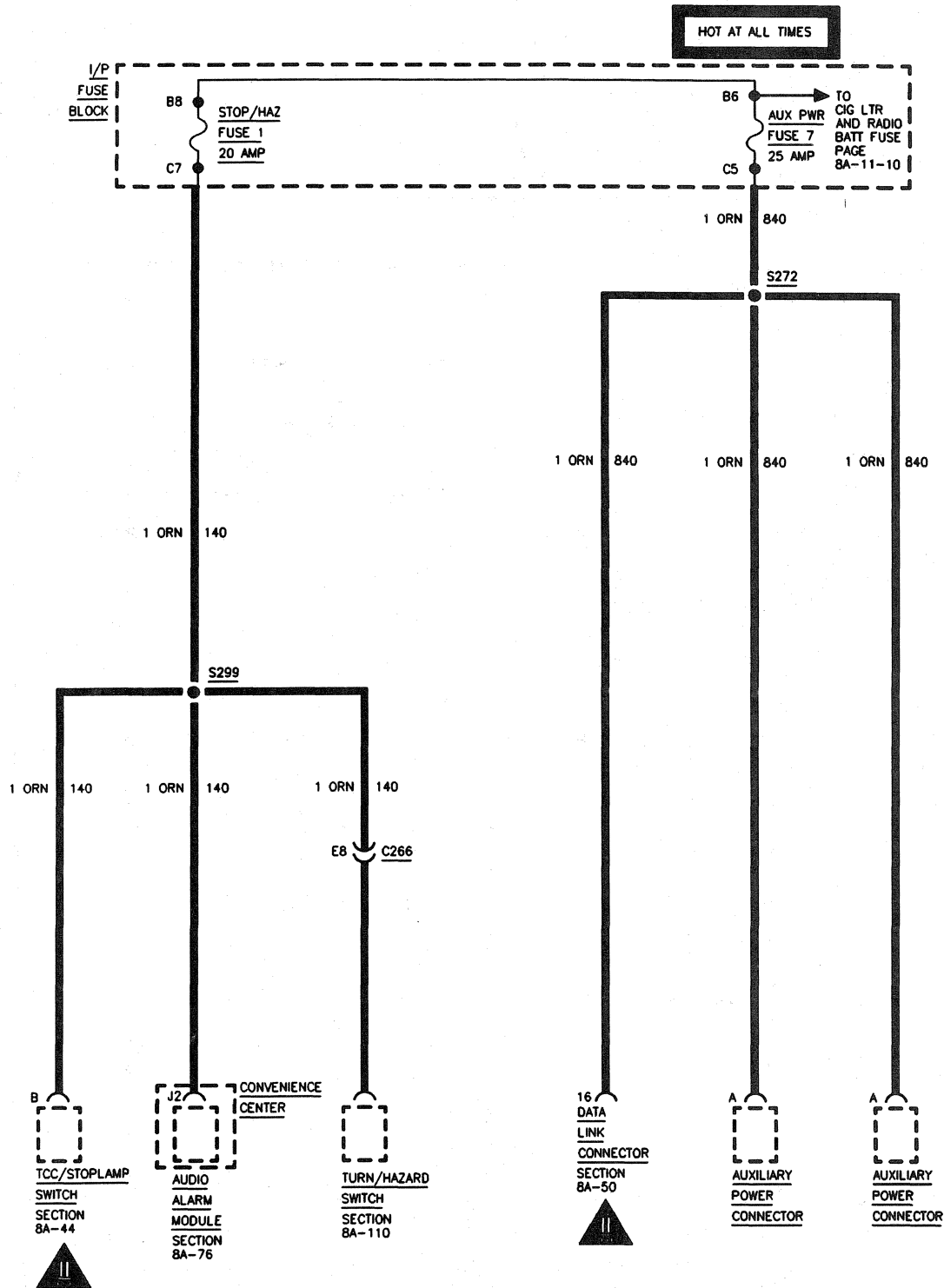




## 8A - 11 - 8 ELECTRICAL DIAGNOSIS

### FUSE BLOCK DETAILS

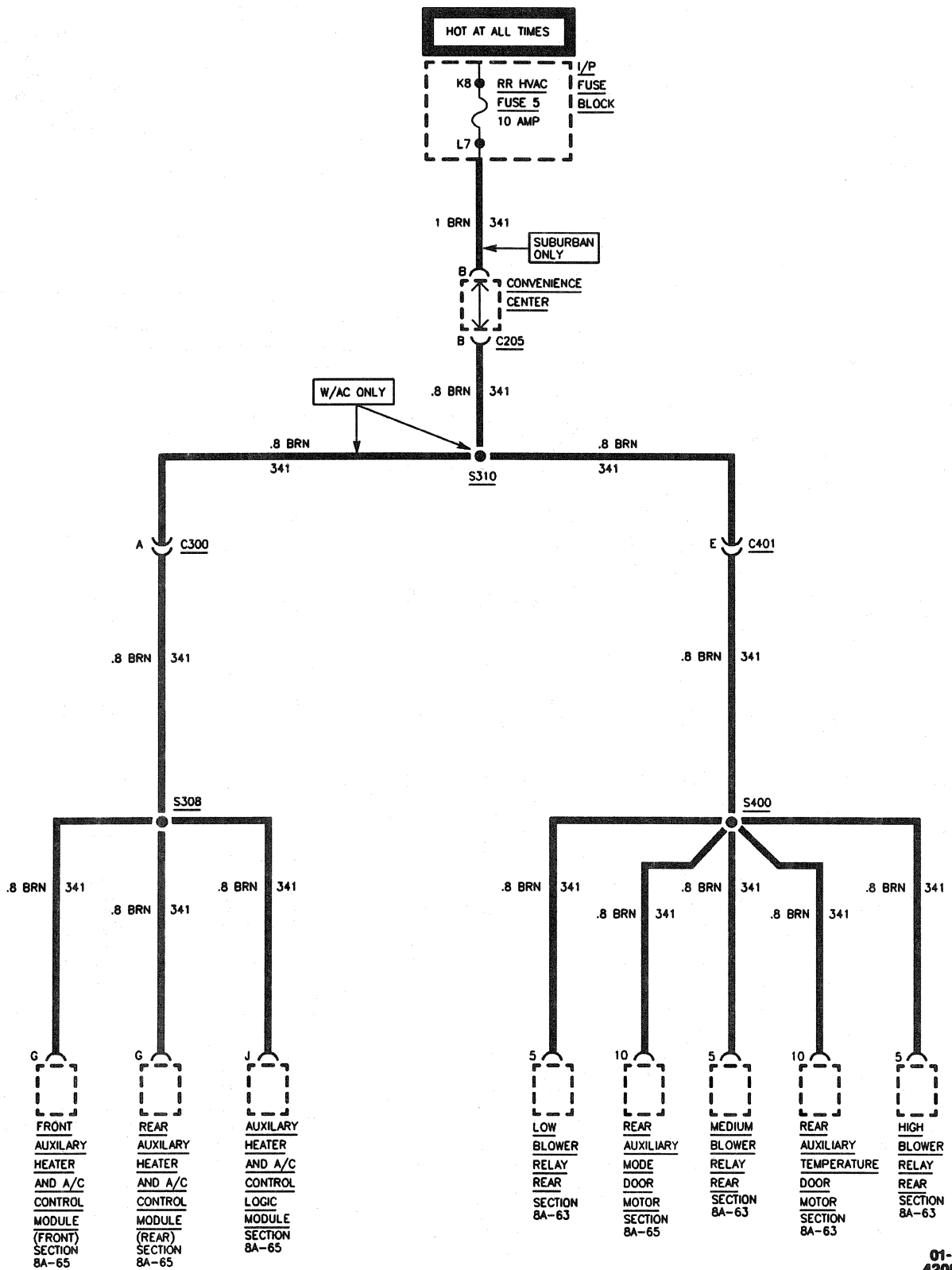




SEE PAGE 8A-3-1  
FOR OBD II  
CIRCUIT SERVICE  
PROCEDURES.

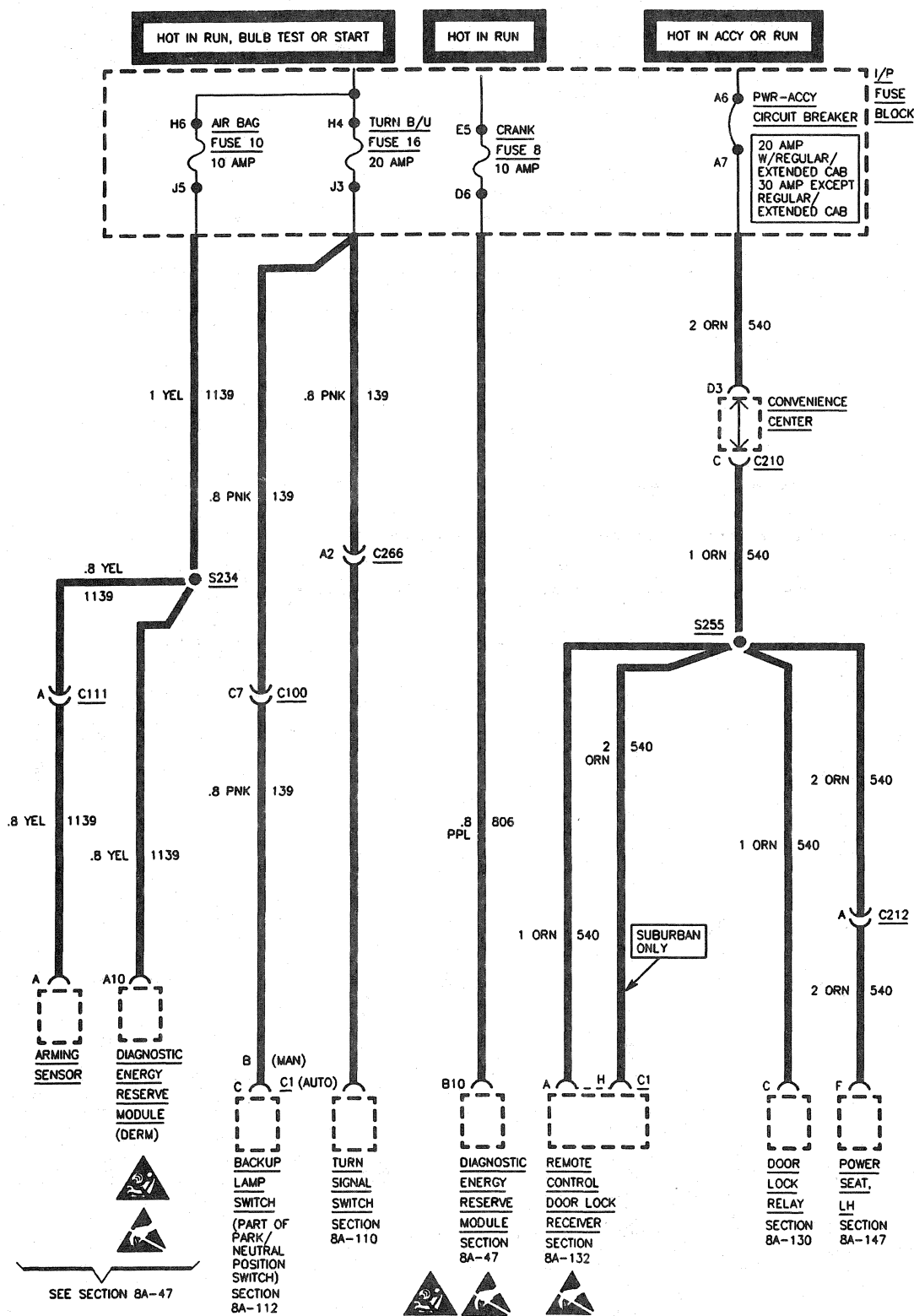
## FUSE BLOCK DETAILS





## FUSE BLOCK DETAILS

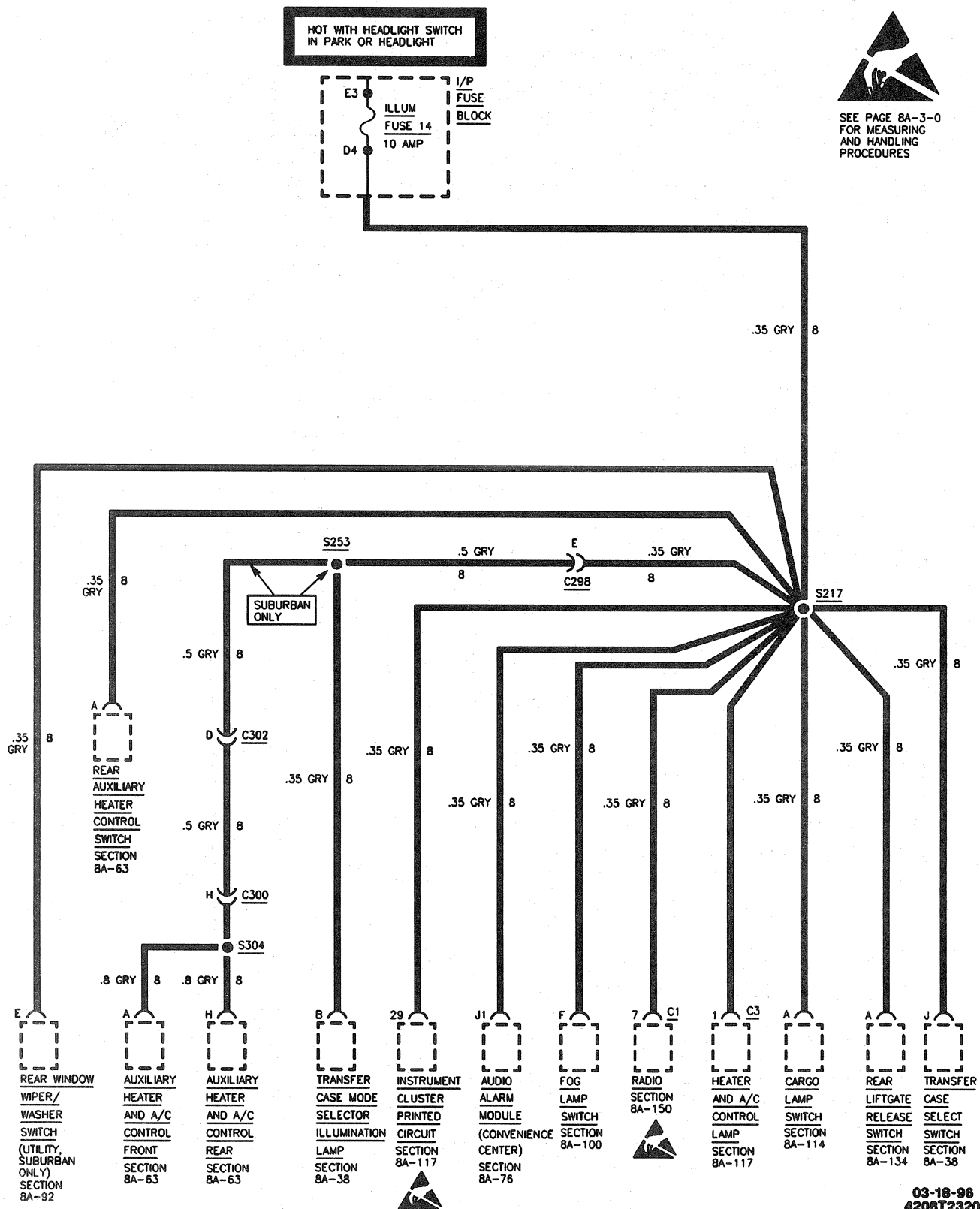




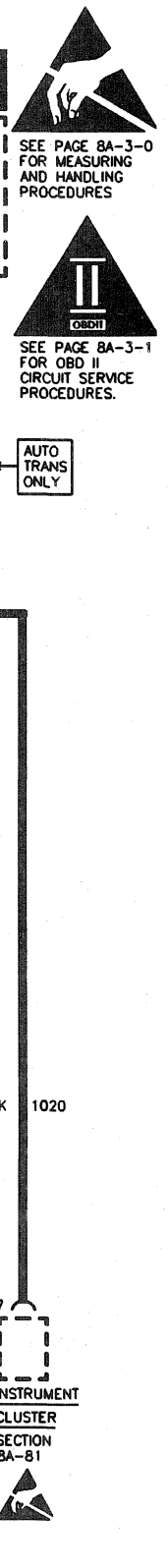
SEE PAGE 8A-3-0  
FOR MEASURING  
AND HANDLING  
PROCEDURES

# 8A - 11 - 14 ELECTRICAL DIAGNOSIS

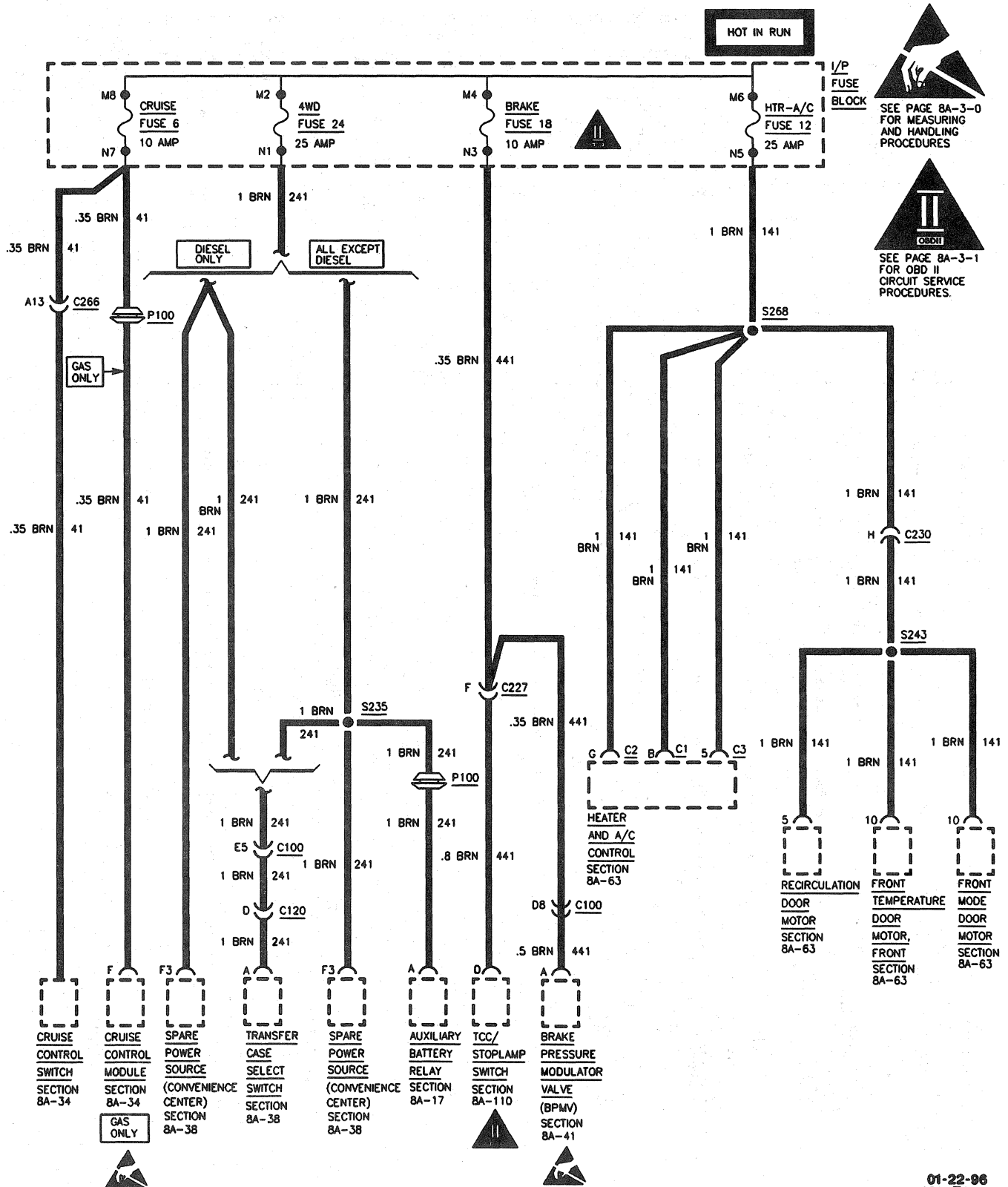
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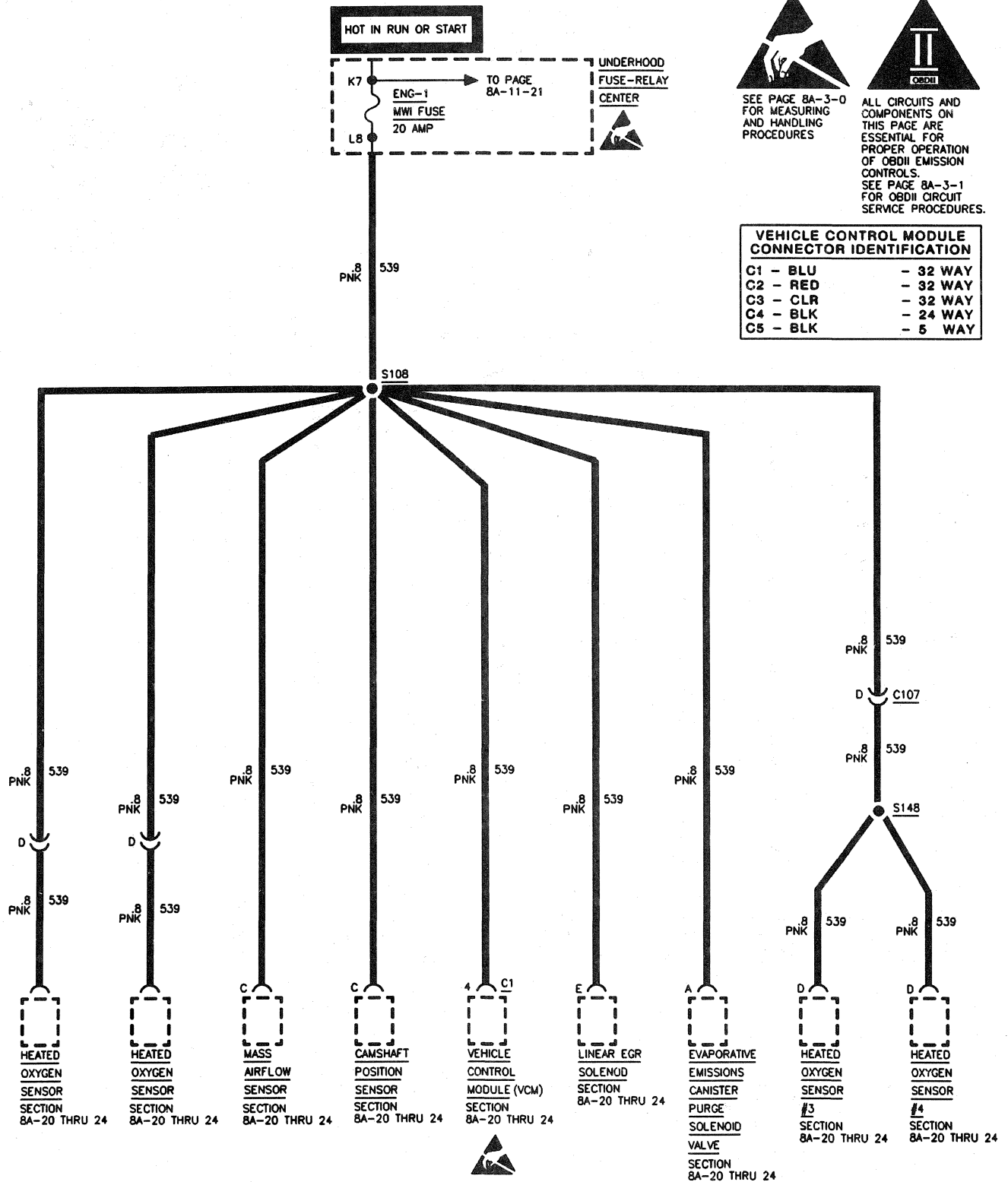






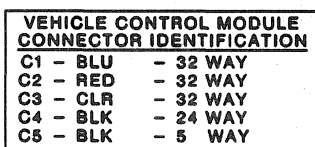
FUSE BLOCK DETAILS

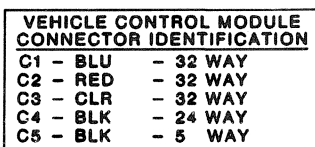




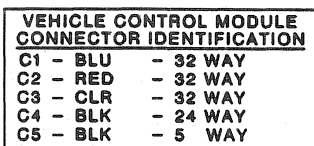
## FUSE BLOCK DETAILS

### 4.3L ENGINE





## FUSE BLOCK DETAILS 7.4L ENGINE



# FUSE BLOCK DETAILS DIESEL ENGINES



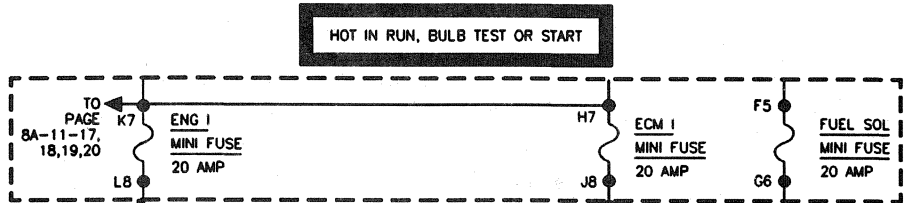
ALL CIRCUITS AND COMPONENTS ON THIS PAGE ARE ESSENTIAL FOR PROPER OPERATION OF OBDII EMISSION CONTROLS. SEE PAGE 8A-3-1 FOR OBDII CIRCUIT SERVICE PROCEDURES.



SEE PAGE 8A-3-0 FOR MEASURING AND HANDLING PROCEDURES

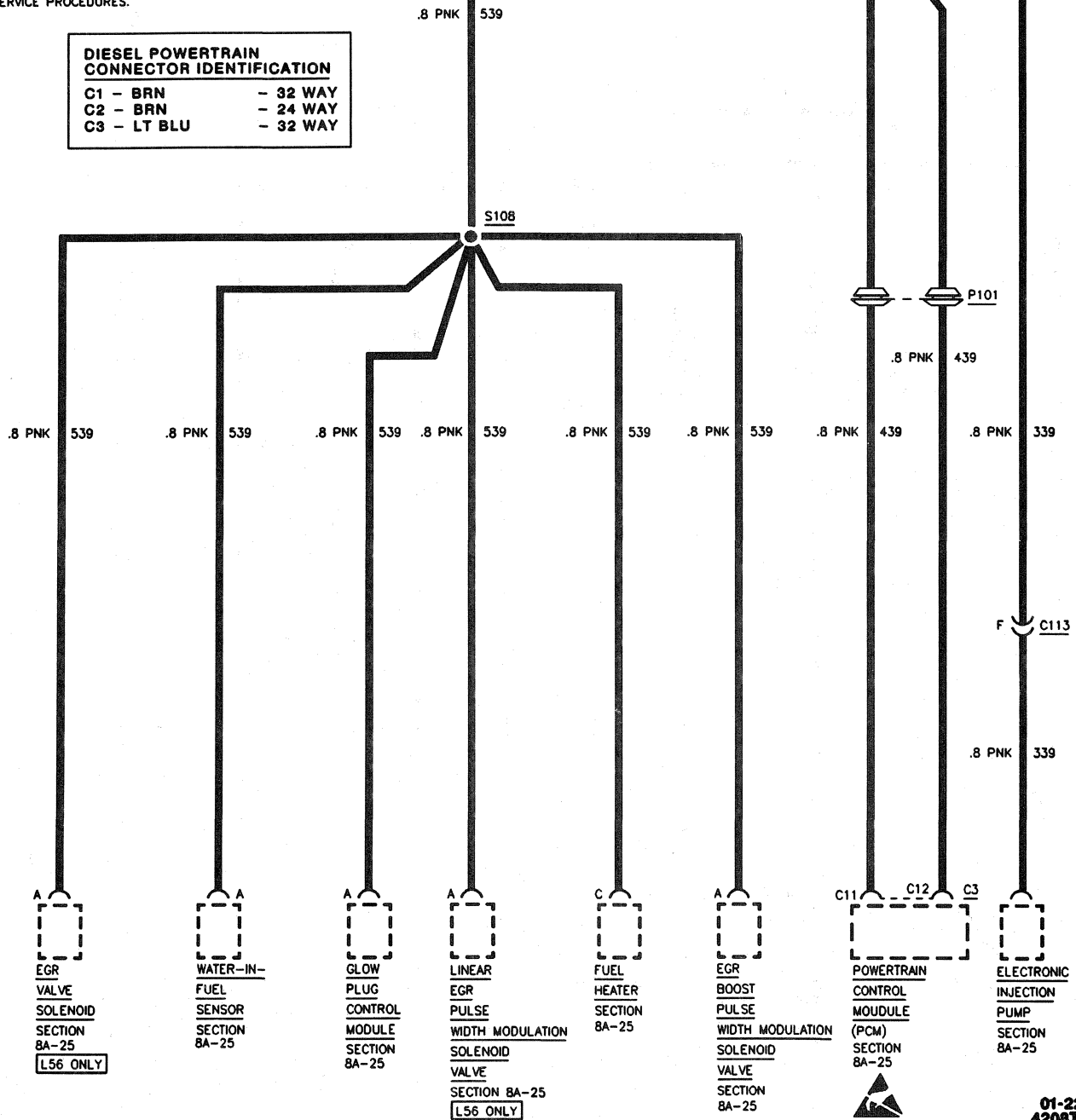


UNDERHOOD FUSE-RELAY CENTER



## DIESEL POWERTRAIN CONNECTOR IDENTIFICATION

C1 - BRN - 32 WAY  
C2 - BRN - 24 WAY  
C3 - LT BLU - 32 WAY

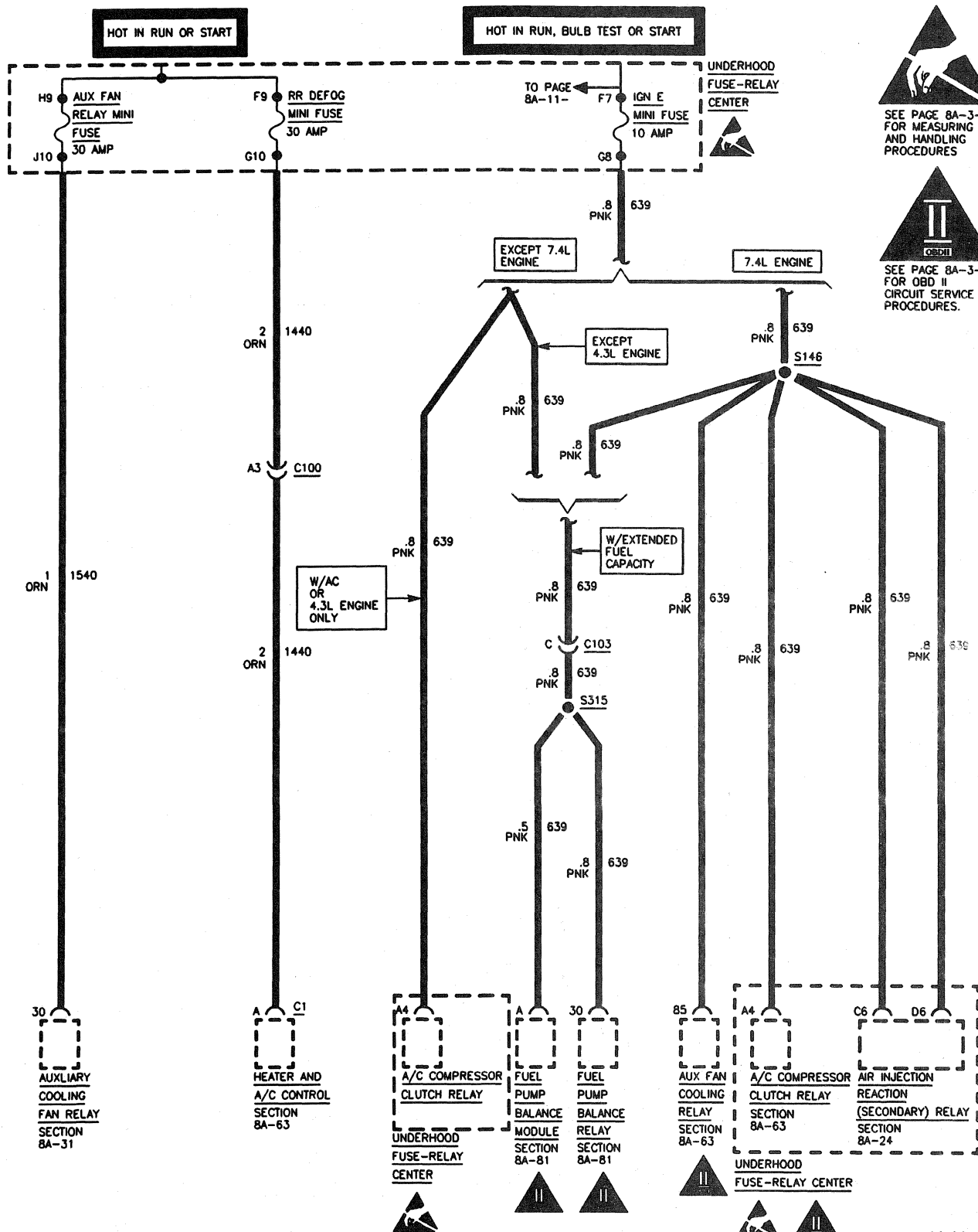


## FUSE BLOCK DETAILS






## FUSE BLOCK DETAILS



SEE PAGE 8A-3-0  
FOR MEASURING  
AND HANDLING  
PROCEDURES



SEE PAGE 8A-3-1  
FOR OBD II  
CIRCUIT SERVICE  
PROCEDURES.

## FUSE BLOCK DETAILS

COMPONENT	LOCATION	201-PG	FIG.	CONN
A/C Compressor Clutch Relay.....	In Underhood Fuse-Relay Center.....	4.....	9	
Air Injection Reaction (Secondary) Relay .....	Underhood Fuse-Relay Center			
Arming Sensor.....	Inside LH Frame Rail, Below Driver's Door			
Audio Alarm Module.....	Under LH Side of I/P, on Convenience Center (RH) Portion.	23.....	36	
Auxiliary Battery Relay.....	LH Rear of Engine Compartment, at Fender, Next to Relay Center .....	4.....	8	
Auxiliary Cooling Fan Relay....	LH Rear Side of Engine Compartment.....	4.....	9	
Auxiliary Heater and A/C Control Switch/Module, Front .....	Front of Overhead Console .....	31.....	49.....	202-13
Auxiliary Heater and A/C Control Switch/Module, Rear .....	Rear of Overhead Console Molding, in Headliner.....	31.....	49.....	202-14
Auxiliary Heater and A/C Logic Module.....	Rear of Overhead Console Molding, in Headliner.....	37.....	60.....	202-12
Auxiliary Power Connectors.....	Center of I/P Area, in Ash Tray			
Backup Lamp Switch (MG5)....	LH Side of Transmission, Below Shift Tower Area.....	21.....	31	
Backup Lamp Switch (MW3)...	LH Top of Transmission.....	20.....	29	
Brake Pressure Modulator Valve (BPMV) .....	near Brake Master Cylinder, at LH Front Wheelhouse .....	22.....	33	
Cargo Lamp Switch .....	Center of I/P.....	29.....	46	
Cigar Lighter .....	Center of I/P, at Ashtray			
Convenience Center .....	Under LH Side of I/P, on Bulkhead.....	23.....	36	
Courtesy Lamp, LH .....	Under RH Side of I/P			
Courtesy Lamp, RH.....	Under RH Side of I/P			
Courtesy Lamp, LH Front Door.....	Inside Mid-Portion of Door, near Free Edge.....	35.....	57	
Courtesy Lamp, RH Front Door.....	Inside Mid-Portion of Door, near Free Edge.....	35.....	57	
Courtesy Lamp, LH Rear Door.....	Inside near Center Rear of Door			
Courtesy Lamp, RH Rear Door.....	Inside near Center Rear of Door			
Crankshaft Position Sensor.....	Lower RH Front Portion of Engine Block, near Crankshaft...	7.....	13	
Cruise Control Module .....	LH Rear Side of Engine Compartment, on Bulkhead .....	22.....	34.....	202-15
Cruise Control Switch .....	In Turn Signal Lever .....	23.....	35	
Data Link Connector (DLC) ....	Under LH Side of I/P.....	26.....	41.....	202-16

COMPONENT	LOCATION	201-PG	FIG.	CONN
Daytime Running Lamp (DRL) Relay.....	Under LH Side of I/P, on Lower Center Portion of Convenience Center.....	23	36	
Daytime Running Lamps (DRL) Module.....	Under LH Side of I/P, Taped on I/P Harness			
Diagnostic Energy Reserve Module (DERM).....	Behind Center of I/P.....	25	39	
Dome/Reading Lamp, Front.....	Inside on Roof			
Dome/Reading Lamp, Rear.....	Inside on Roof			
Door Lock Relay.....	Under Center Portion of I/P, near RKE Module.....	32	51	202-40
Door Lock Switch, LH Front & Rear.....	On Door Trim Panel.....	35	56	202-27
Door Lock Switch, RH Front & Rear.....	On Door Trim Panel.....	35	56	202-28
Electrochromatic Rearview Mirror With Compass.....	On Top Inside of Windshield.....	32	50	
Electronic Injection Pump.....	Top Front of Engine			
Evaporative Emissions Canister Purge Solenoid.....	RH Side of Engine.....	9	15	
Evaporative Gas Recirculation (EGR) Valve Solenoid (Diesel).....	Top of Engine.....	16	22	
Exhaust Gas Recirculation (EGR) Boost Pulse Width Modulation Solenoid Valve, VIN S.....	LH Rear Top of Engine, Above Valve Cover.....	16	22	
Fog Lamp Relay.....	Under LH End of I/P, on Lower LH Portion of Convenience Center.....	23	36	
Fog Lamp Switch.....	Center of I/P Area.....	29	46	202-40
Fuel Heater.....	Top Rear of Engine			
Fuel Injectors #1 through #8 (VIN W, M, P).....	In Intake Manifold.....			202-18
Fuel Pump Balance Module.....	Inside LH Side of Frame Rail			
Fuel Pump Balance Relay.....	On Fuel Pump Balance Module.....			202-41
Fuel Pump Oil Pressure Switch and Sender.....	Rear Top Center of Engine, Behind Distributor.....	8	14	202-40
Fuel Pump Relay.....	In Underhood Fuse and Relay Center			
Glow Plug Relay.....	LH Rear of Engine, near Bulkhead			
Glove Box Lamp.....	In Glove Box			
Headlamp and Panel Dimmer Switch.....	Lower LH Side of I/P.....	23	35	

## FUSE BLOCK DETAILS

COMPONENT	LOCATION	201-PG	FIG.	CONN
Heated Oxygen Sensors #1 through #4.....	In Exhaust Pipe, in Front and Back of Catalytic Converters..	18 .....	26	
Heater and A/C Control Module .....	Center of I/P at Heater Control			
Heater and A/C Control Lamp.....	At Control Switch			
Heater and A/C Control Switch.....	At Center of I/P			
High Blower Relay, Rear (Auxiliary HVAC) .....	On Auxiliary HVAC Plenum, Forward of LH Rear Wheelhouse			
Horn Relay .....	On Convenience Center .....	4 .....	9	
I/P Fuse Block .....	Lower LH Side of I/P .....	23 .....	35	
Ignition Coil .....	RH side Rear of Engine .....	14 .....	20	
Ignition Coil Driver .....	RH side Rear of Engine .....	7 .....	13 .....	202-41
Interior Lamp Control Module .....	Under Center of I/P .....	25 .....	39 .....	202-41
Illuminated Vanity Mirror, LH.....	Part of LH Sunvisor Assembly.....	32 .....	50	
Illuminated Vanity Mirror, RH .....	Part of RH Sunvisor Assembly.....	32 .....	50	
Instrument Cluster .....	LH Upper End of I/P .....			202-25
Instrument Cluster Printed Circuit.....	At Instrument Cluster			
Linear Exhaust Gas Recirculation (EGR) Valve Solenoid.....	LH Top Rear of Engine, Above Valve Cover .....	13 .....	19	
Linear EGR Pulse Width Modulation Solenoid Valve....	LH Top Rear of Engine, Above Valve Cover .....			202-42
Low Blower Relay, Rear .....	On Auxiliary Heater and A/C Module.....	37 .....	60	
Low Coolant Level Indicator Module (Diesel).....	Under Center of I/P .....	27 .....	42 .....	202-42
Mass Air Flow Sensor.....	Air Intake Dock near Air Filter.....	13 .....	19	
Medium Blower Relay, Rear....	On Auxiliary Heater and A/C Module.....	37 .....	60	
Mode Door Motor.....	Under I/P, on Heater-A/C Plenum, LH Side.....	30 .....	47 .....	202-43
Power Amplifier Relay .....	Under I/P, RH Side of Brake Pedal Bracket .....			202-43
Power Lumbar Seat Switch, LH Front .....	Under Driver's Seat			
Power Lumbar Seat Switch, RH Front .....	Under Passenger's Seat			

COMPONENT	LOCATION	201-PG	FIG.	CONN
Power Seat LH.....	Under Driver's Seat			
Power Window Master Switch.....	On LH Front Door.....			202-42
Power Window Switch, RH Front.....	On Door.....	35	56	
Powertrain Control Module (PCM).....	Under RH End of I/P, Above Blower Motor.....	24	38	
Radio.....	Center of I/P.....	29	46.....	202-29
Rear Auxiliary Mode Door Motor.....	In Auxiliary Heater - A/C Module, Forward of LH Rear Wheelhouse			
Rear Auxiliary Temperature Door Motor.....	In Auxiliary Heater - A/C Module, Forward of LH Rear Wheelhouse			
Rear Liftgate Release Switch....	LH Side of I/P			
Rear Window Wiper/Washer Switch.....	Center of I/P.....	29	46.....	202-43
Recirculation Door Motor.....	Under I/P on Heater - A/C Plenum			
Remote Control Door Lock Reciver.....	Under Center Portion of I/P.....	25	39	
Remote Outside Rearview Mirror Switch.....	On Front LH Door, Arm Rest			
Spare Power Source (Convenience Center).....	Under LH side of I/P, on Bulkhead			
TCC/Stoplamp Switch.....	Top of Brake Pedal.....	27	43	
Temperature Door Motor (Module), Front.....	Under I/P, on Heater - A/C Plenum, Center Area.....	30	47	
Transfer Case Control Module (TCCM).....	Under I/P on Steering Column Support Bracker.....			202-32
Transfer Case Mode Selector Illumination Lamp.....	In Switch			
Transfer Case Select Switch.....	On I/P			
Transmission.....	Under Center of Vehicle, Attached to Rear of Engine			
Turn/Hazard Switch.....	Part of Multi-function Switch, LH Upper Steering Column			
Turn Signal Switch.....	Part of Multi-function Switch, LH Upper Steering Column			
Underhood Fuse-Relay Center...	LH Rear of Engine Compartment, on Fender.....	4	8	
Underhood Reel Lamp.....	RH Side Bulkhead			
Underhood Lamp.....	Under Hood, RH Side on Hood.....	5	11	
Vehicle Control Module (VCM).....	Engine Compartment, near BPMV Module.....	24	37	
Vehicle Speed Sensor Buffer....	Under RH Side of I/P.....	26	40.....	202-45
Water-in-Fuel Sensor (Diesel) ...	Top Rear of Engine			

**8A - 11 - 28 ELECTRICAL DIAGNOSIS****FUSE BLOCK DETAILS**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Window Lockout Switch, Rear .....	LH Front Door, forward portion of Arm Rest Area.....	35 .....	56	
Windshield Wiper Motor Module .....	Center Rear Engine Compartment, at Cowl .....	22 .....	34.....	202-45
Windshield Wiper/Washer Switch.....	At Steering Column, Part of Turn Signal Lever			
<b>CONNECTORS:</b>				
C100.....	LH Rear of Engine Compartment at Bulkhead .....	22 .....	33.....	202-0
C103.....	LH Rear of Engine Compartment, Under Brake Master Cylinder.....			202-35
C105 (VIN J) .....	Rear of Intake Manifold, near Center .....	14.....	20.....	202-2
C107.....	LH Front Side of Transmission .....	18 .....	26.....	202-35
C111 .....	LH Rear of Engine Compartment, Below Master Cylinder ....	22 .....	34.....	202-36
C113 (Diesel) .....	Engine Harness, in Line to Engine Sensors			
C120.....	Rear of Engine, near Transmission.....	18 .....	26.....	202-36
C205.....	At Convenience Center			
C206.....	Inside LH "A" Pillar, Lower Portion.....	35 .....	56.....	202-36
C207.....	Inside LH "A" Pillar, Lower Portion.....	35 .....	56.....	202-36
C208.....	Inside LH "A" Pillar, Lower Portion.....	35 .....	56.....	202-36
C209.....	Inside LH "A" Pillar, Lower Portion.....	35 .....	56.....	202-37
C210.....	At Convenience Center .....	23 .....	36.....	202-37
C212.....	Under Driver's Seat .....			202-37
C213.....	Inside RH "A" Pillar, Lower Portion .....	35 .....	56.....	202-37
C215.....	Inside RH "A" Pillar, Lower Portion .....	35 .....	56.....	202-37
C218.....	At Convenience Center .....	23 .....	36	
C219.....	At Convenience Center .....	32 .....	50	
C230.....	Behind RH Side of I/P, Above HVAC Evaporator Housing ...	27 .....	42.....	202-38
C266.....	LH Side of Steering Column, near Bulkhead.....	27 .....	43.....	202-8
C298.....	Behind LH Side of I/P, near Convenience Center .....	23 .....	35.....	202-7
C299.....	Behind RH Side of I/P, Above HVAC Evaporator Housing ...	27 .....	42.....	202-10
C300.....	In Overhead Console.....	34 .....	55.....	202-38
C301.....	LH Front Kick Panel .....	28 .....	45.....	202-11
C302.....	LH Front Kick Panel .....	28 .....	45.....	202-39
C304.....	Under Driver's Seat			
C305.....	In Headliner at #1 Roof Bow			
C401.....	RH Rear of Vehicle, Above Auxiliary Blower Motor			
C411 .....	LH Rear of Cab .....	40 .....	65.....	202-39

COMPONENT	LOCATION	201-PG	FIG.	CONN
C413 .....	LH Rear of Cab			
C496 .....	RH "B" Pillar .....	36 .....	58 .....	202-39
C498 .....	LH "B" Pillar .....	36 .....	58 .....	202-44
<b>DIODE:</b>				
D203 .....	I/P Harness, RH Side of Steering Column Support .....	27 .....	43	
<b>GROMMETS:</b>				
P100 .....	LH Rear of Engine Compartment at Bulkhead .....	3 .....	7	
P101 .....	RH Rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S101 (Gas) .....	Engine Harness, Approx. 10 cm into Underhood Fuse - Relay Center Breakout			
S101 (Diesel) .....	Engine Harness, Approx. 3 cm from Breakout to RH Glow Plugs Toward P101			
S104 (VIN J) .....	Engine Harness, Approx. 29.5 cm to Fuel Injector Connector C105			
S104 (VIN M, R, W) .....	Engine Harness, Approx. 6.5 cm into Breakout to Fuel Injector Connector			
S108 (VIN W, M, R) .....	Engine Harness, Approx. 11.5 cm from Ignition Coil Breakout Toward Starter Solenoid			
S108 (VIN J) .....	Engine Harness, Approx. 13 cm from Ignition Coil Breakout Toward Starter Solenoid			
S108 (Diesel) .....	Engine Harness, Approx. 5 cm from Backup Lamp Switch Harness Breakout Toward EGR Valve			
S113 .....	Engine Harness, 18 cm into Underhood Fuse - Relay Center Breakout			
S146 (VIN J) .....	Engine Harness, Approx. 22 cm into Underhood Fuse - Relay Center Breakout			
S148 .....	Oxygen Sensor Jumper Harness Approx. 17 cm into Harness			
S154 (VIN J Only) .....	In Injector Harness Jumper			
S155 (VIN J Only) .....	In Injector Harness Jumper			
S213 .....	I/P Harness, Approx. 8 cm from Headlamp Dimmer Switch Breakout Toward Cluster			
S217 .....	I/P Harness, Approx. 5 cm from Headlamp Dimmer Switch Breakout Toward I/P Cluster			
S234 .....	I/P Harness, Approx. 10 cm from Crossbody Harness Breakout Toward P100			
S235 .....	I/P Harness, Approx. 8 cm from Crossbody Harness Breakout Toward P100			
S242 .....	I/P Harness, Approx. 8 cm from Headlamp Dimmer Switch Breakout Toward I/P Cluster			

## 8A - 11 - 30 ELECTRICAL DIAGNOSIS

### FUSE BLOCK DETAILS

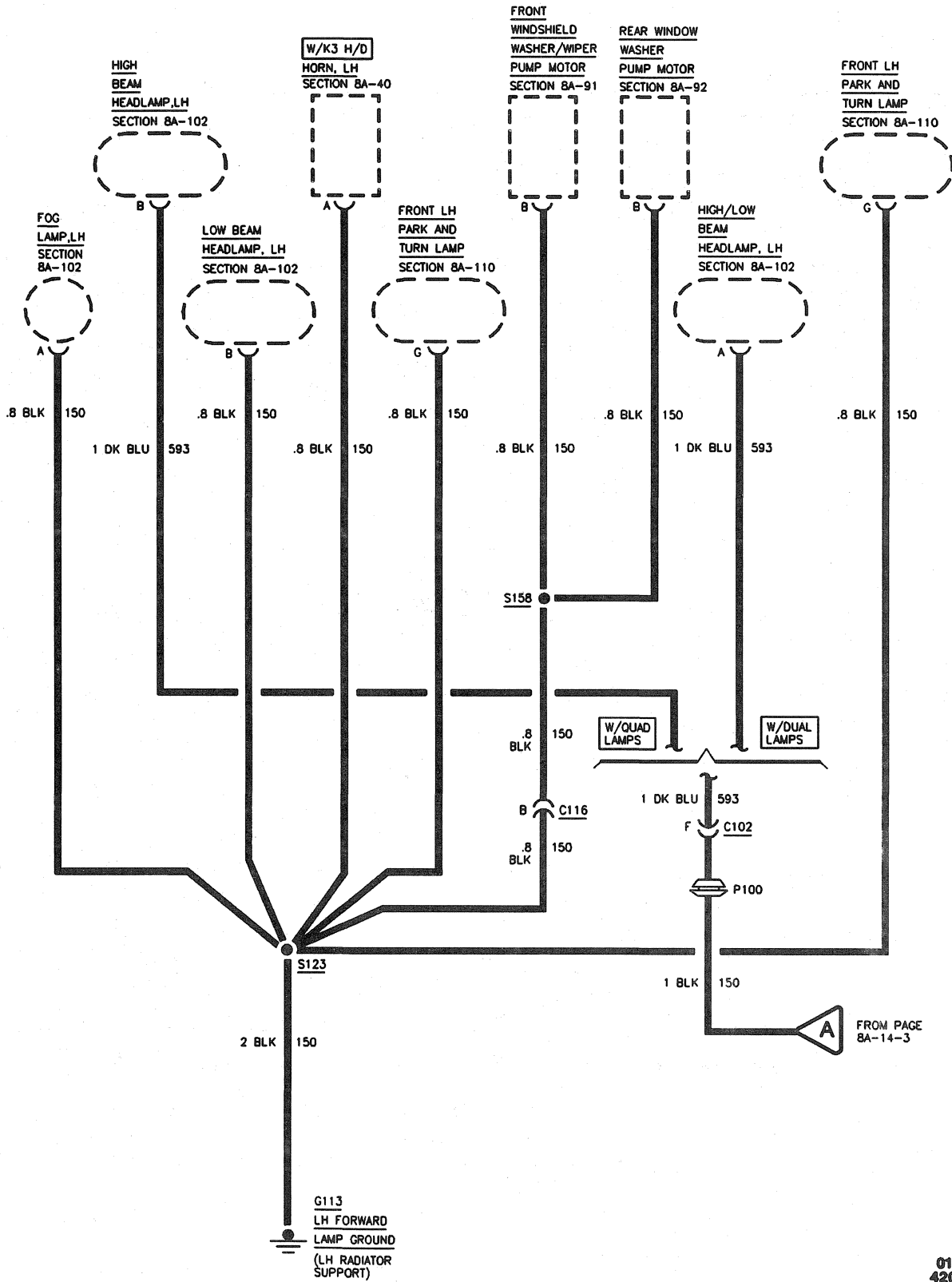
COMPONENT	LOCATION	201-PG	FIG.	CONN
S243 .....	HVAC Harness, 4 cm from Recirculation Door Breakout Toward Blower Motor Relay			
S248 .....	Crossbody Harness, Approx. 13 cm from Rear Speaker Breakout Toward LH Door Harness			
S253 (Suburban).....	Crossbody Harness, 6.5 cm from I/P Harness Breakout Toward Door Lock Relay Breakout			
S255 .....	Crossbody Harness, 24 cm Right of I/P Harness Breakout			
S256 .....	Crossbody Harness, Approx. 18.5 cm from Door Lock Relay Breakout Toward I/P Harness Breakout			
S264 (Suburban/Utility) .....	I/P Harness, Approx. 16 cm from I/P Cluster Breakout Toward Radio			
S266 (Utility/Pickup/Extended Cab) .....	Crossbody Harness, Approx. 8 cm Right of I/P Harness Breakout Toward Door Lock Relay Breakout			
S268 .....	I/P Harness, Approx. 25 cm from Heater A/C Control Connector			
S270 .....	I/P Harness, 5 cm into Transfer Case Control Module Breakout			
S272 .....	I/P Harness, Approx. 4 cm into Auxiliary Power Outlet Breakout			
S299 .....	I/P Harness, Approx. 4 cm into Steering Column Harness Breakout			
S300 .....	Inside Power Lumbar Seat Jumper			
S304 (Suburban).....	Rear HVAC Control Harness, 31 cm forward of HVAC Logic Module Breakout			
S308 (Suburban).....	Rear HVAC Control Harness, 5 cm Rear of HVAC Logic Module Breakout			
S310 (Suburban).....	Front To Rear Body Harness, 6 cm from Front Dome Lamp Breakout			
S312 .....	In Vanity Mirror Jumper Harness in Roof near Windshield			
S315 .....	Taillamp Extension Harness, Approx. 65 cm from Fuel Pump Balance Module Breakout Toward Engine Harness			
S400 (Rear A/C) .....	Rear A/C Harness, 17 cm from Blower Motor Relays			
S400 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, Approx. 7 cm from Blower Motor Relays Breakout			
S426 (2 and 4-Door Utility) .....	Front to Rear Body Harness, 13 cm from Rear Dome Lamp Breakout			
S426 (Suburban).....	Front to Rear Body Harness, Approx. 36 cm from Rear Dome Lamp Breakout			
S501 .....	Inside Left Front Door Harness, near Tweeter .....	35	.....	56

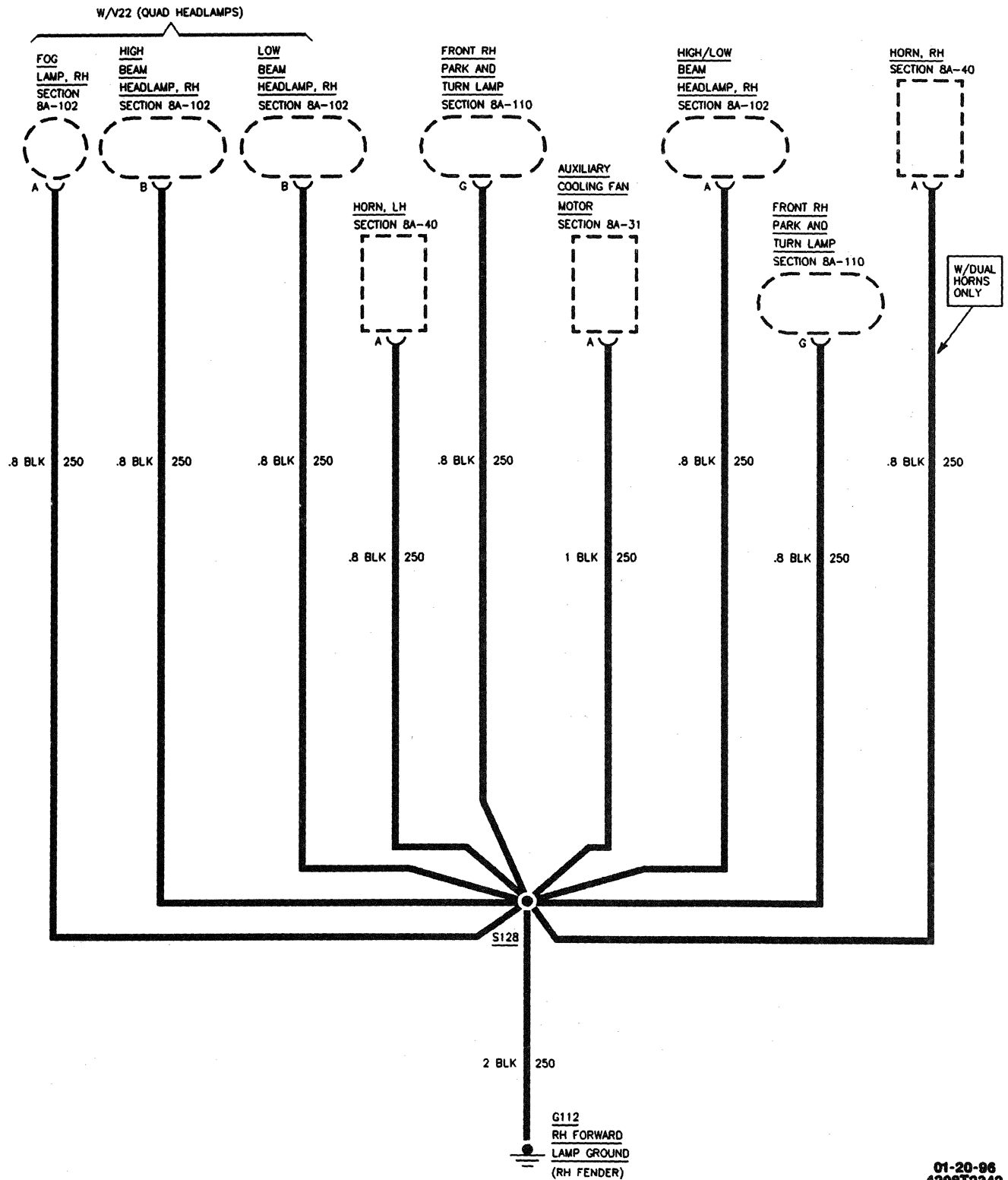


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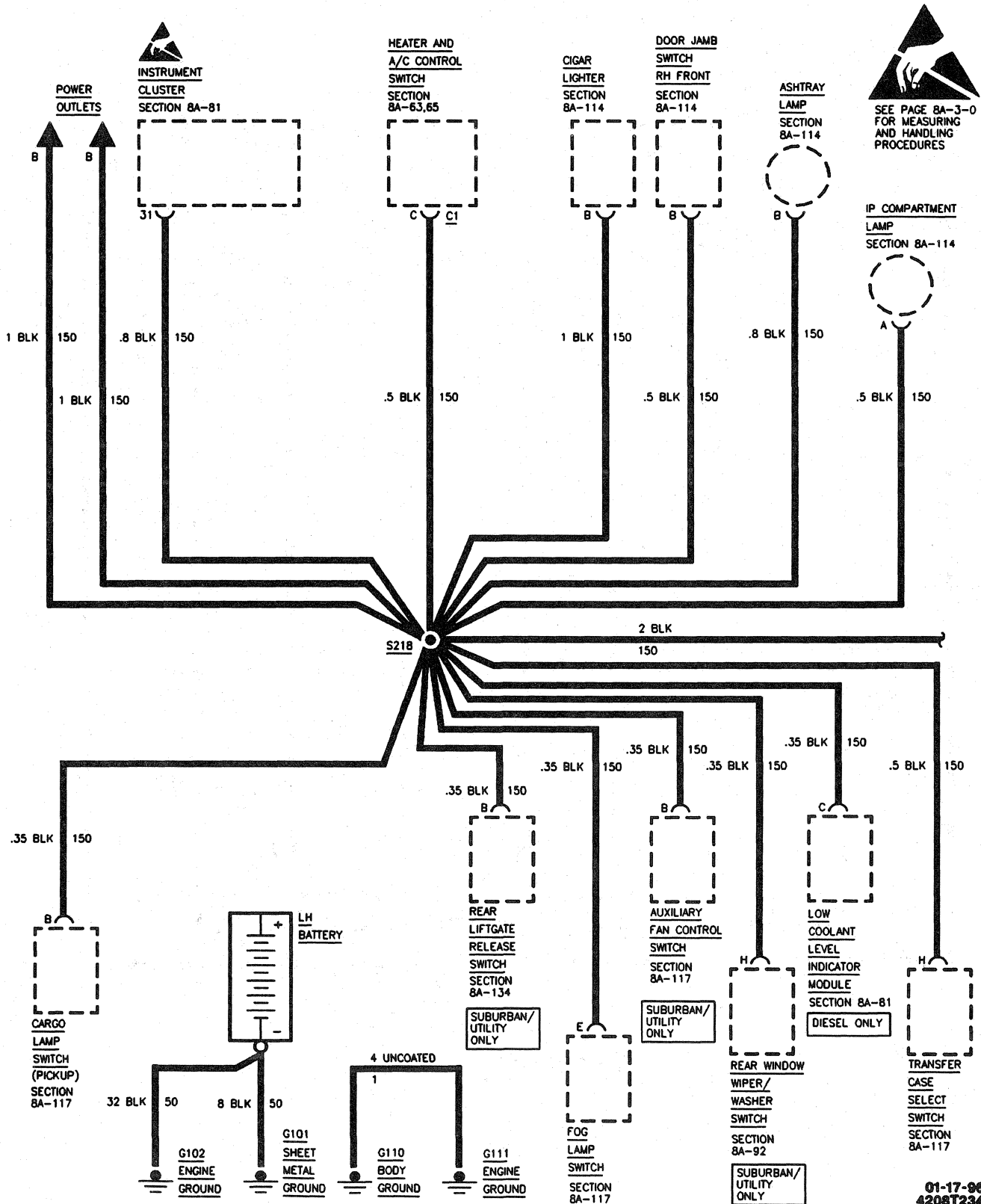
# 8A - 14 - 0 ELECTRICAL DIAGNOSIS

## GROUND DISTRIBUTION

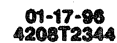




GROUND DISTRIBUTION



SEE PAGE 8A-3-1  
FOR OBD II  
CIRCUIT SERVICE  
PROCEDURES.



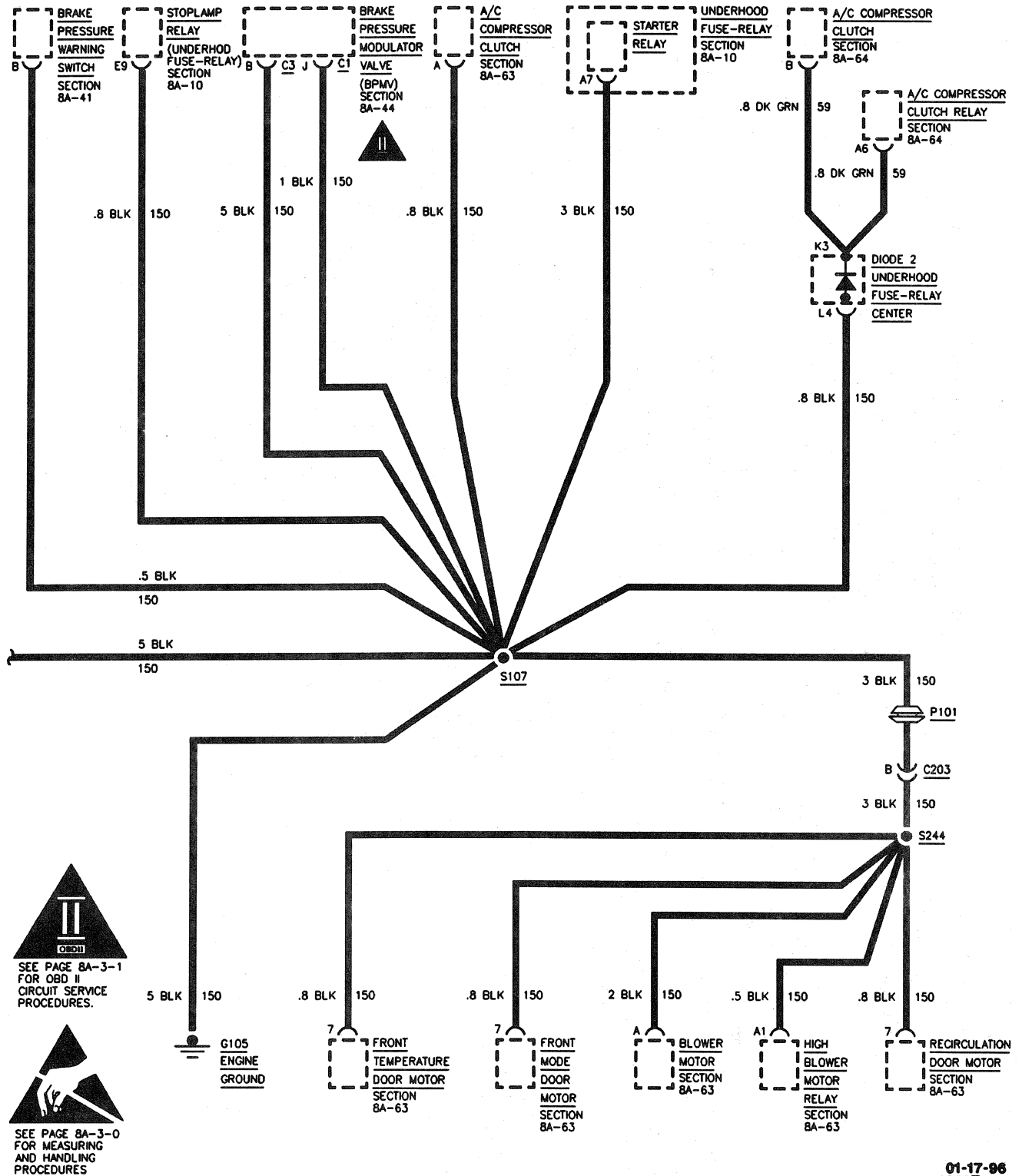
## GROUND DISTRIBUTION

### 4.3L MANUAL TRANSMISSION



ALL CIRCUITS AND COMPONENTS ON THIS PAGE ARE ESSENTIAL FOR PROPER OPERATION OF OBDII EMISSION CONTROLS.  
SEE PAGE 8A-3-1 FOR OBDII CIRCUIT SERVICE PROCEDURES.

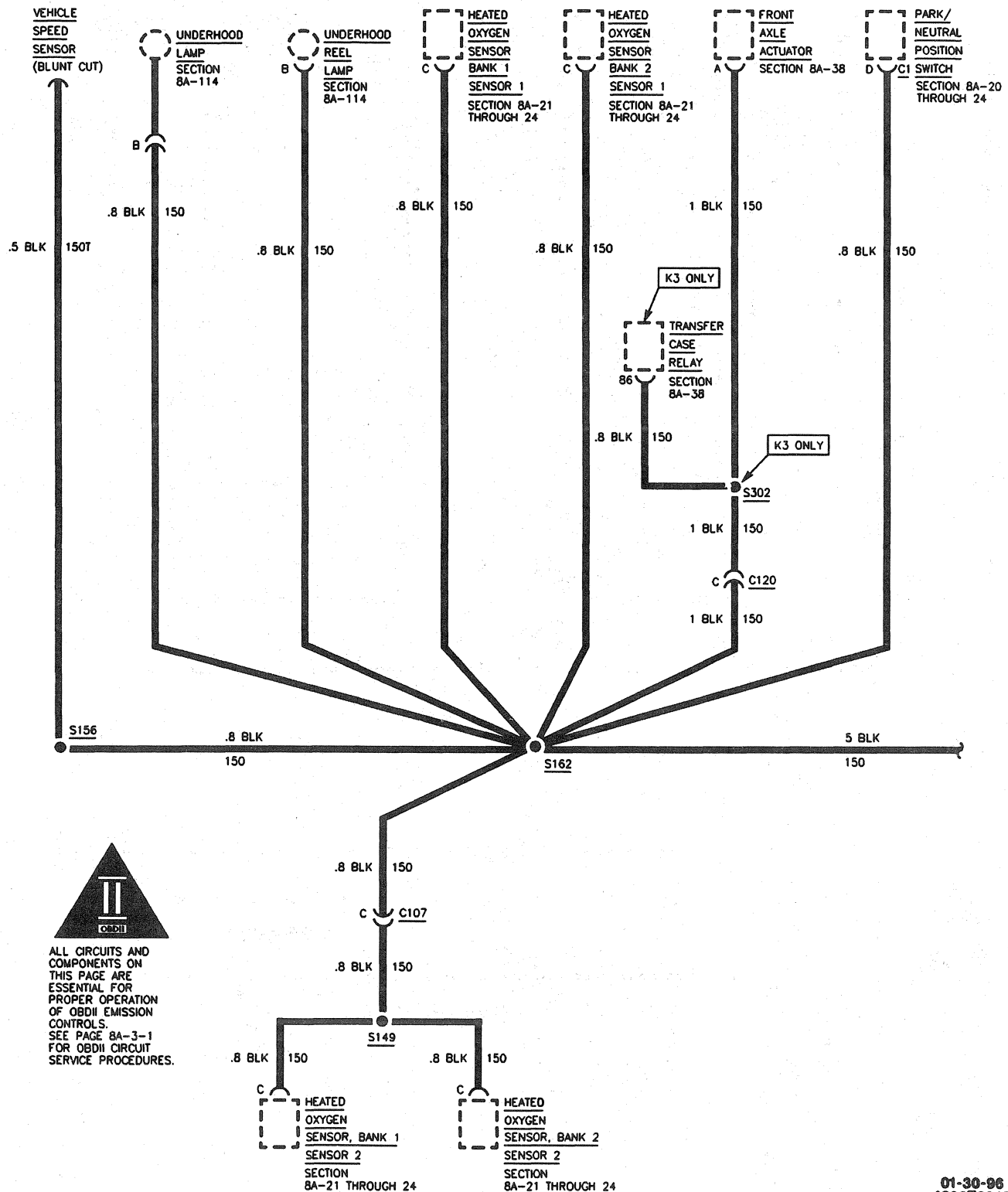
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# 8A - 14 - 6 ELECTRICAL DIAGNOSIS

## GROUND DISTRIBUTION

GAS ENGINE (EXCEPT 4.3L MANUAL TRANSMISSION)

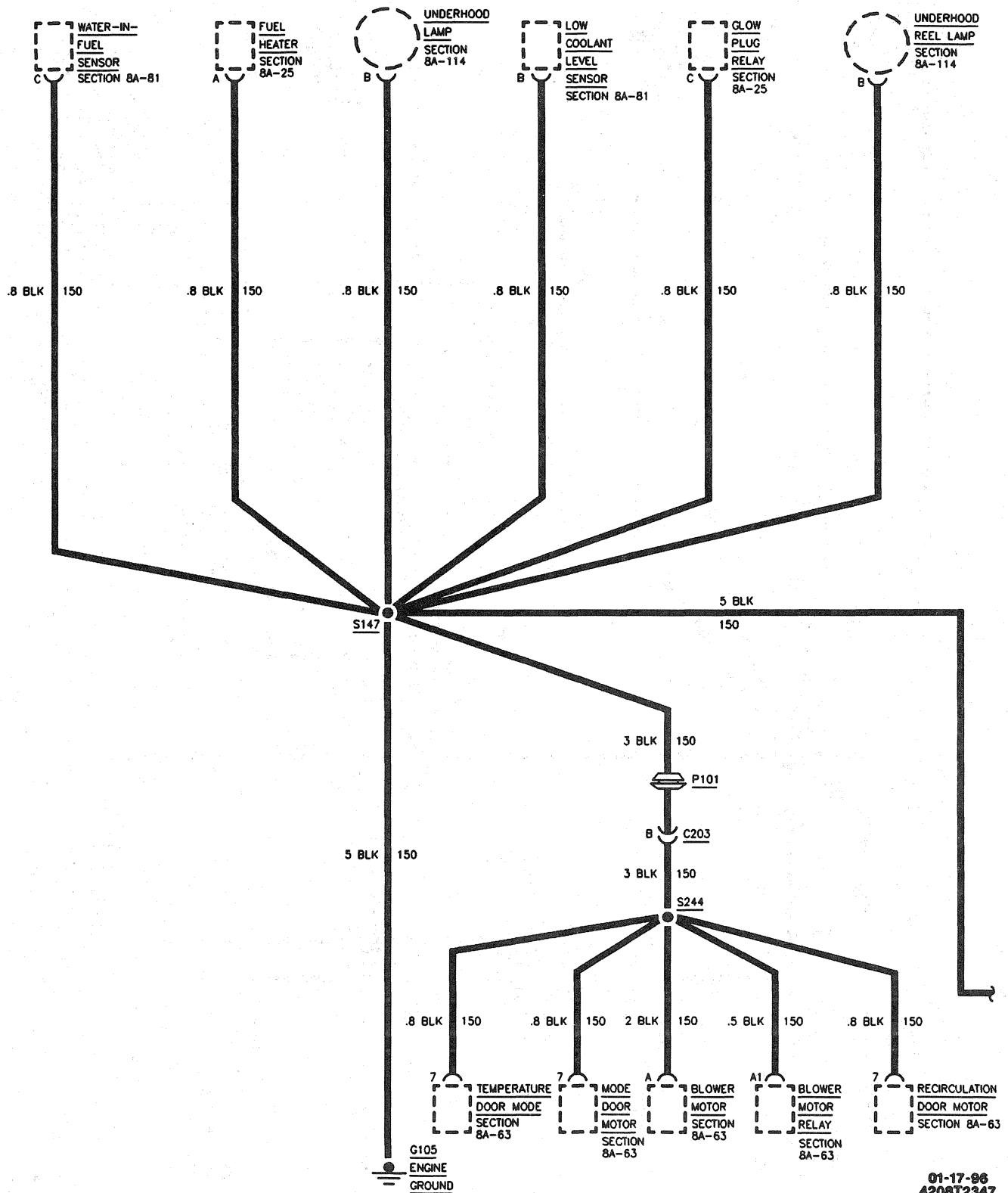






## 8A - 14 - 8 ELECTRICAL DIAGNOSIS

### GROUND DISTRIBUTION DIESEL ENGINES

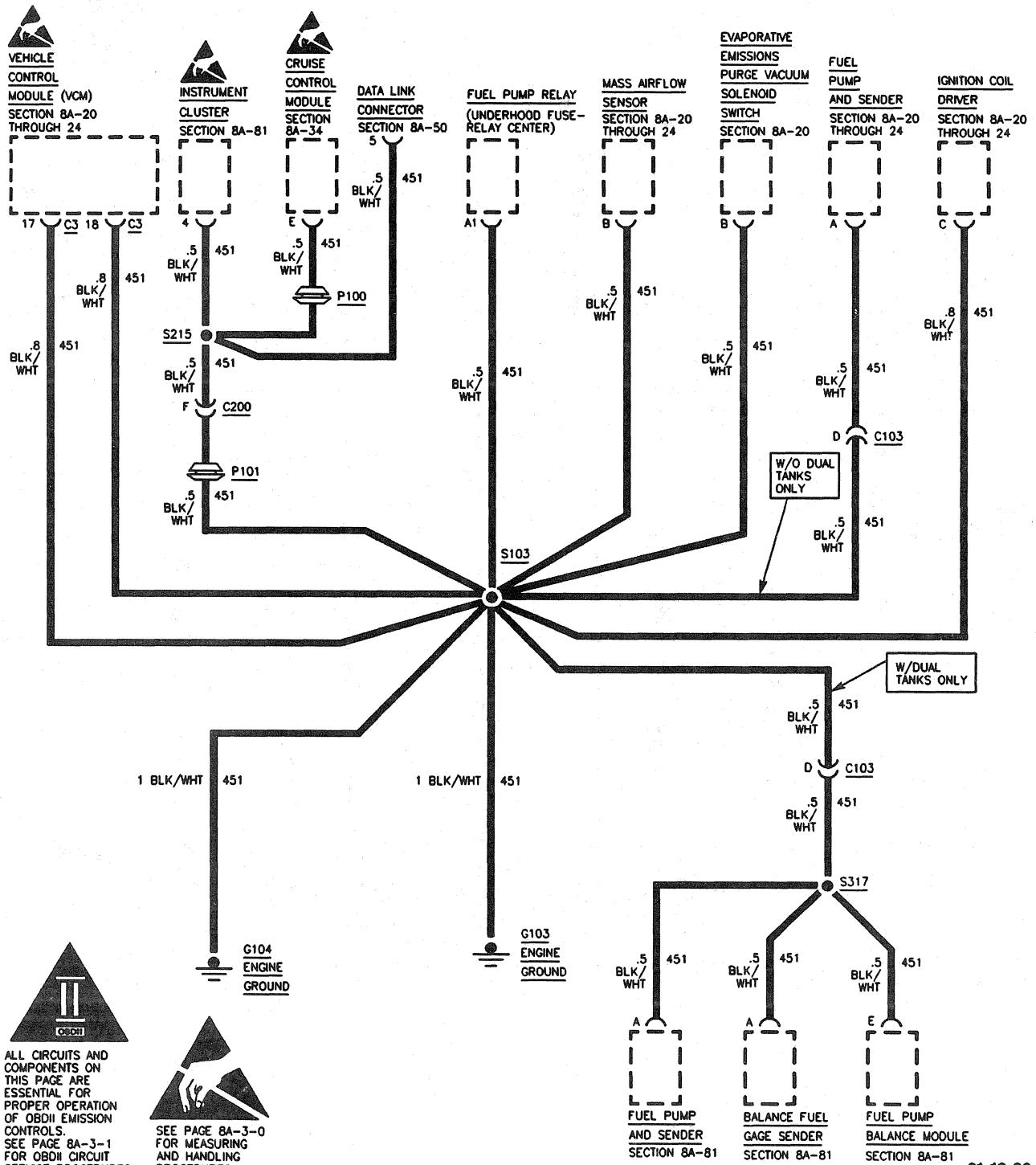


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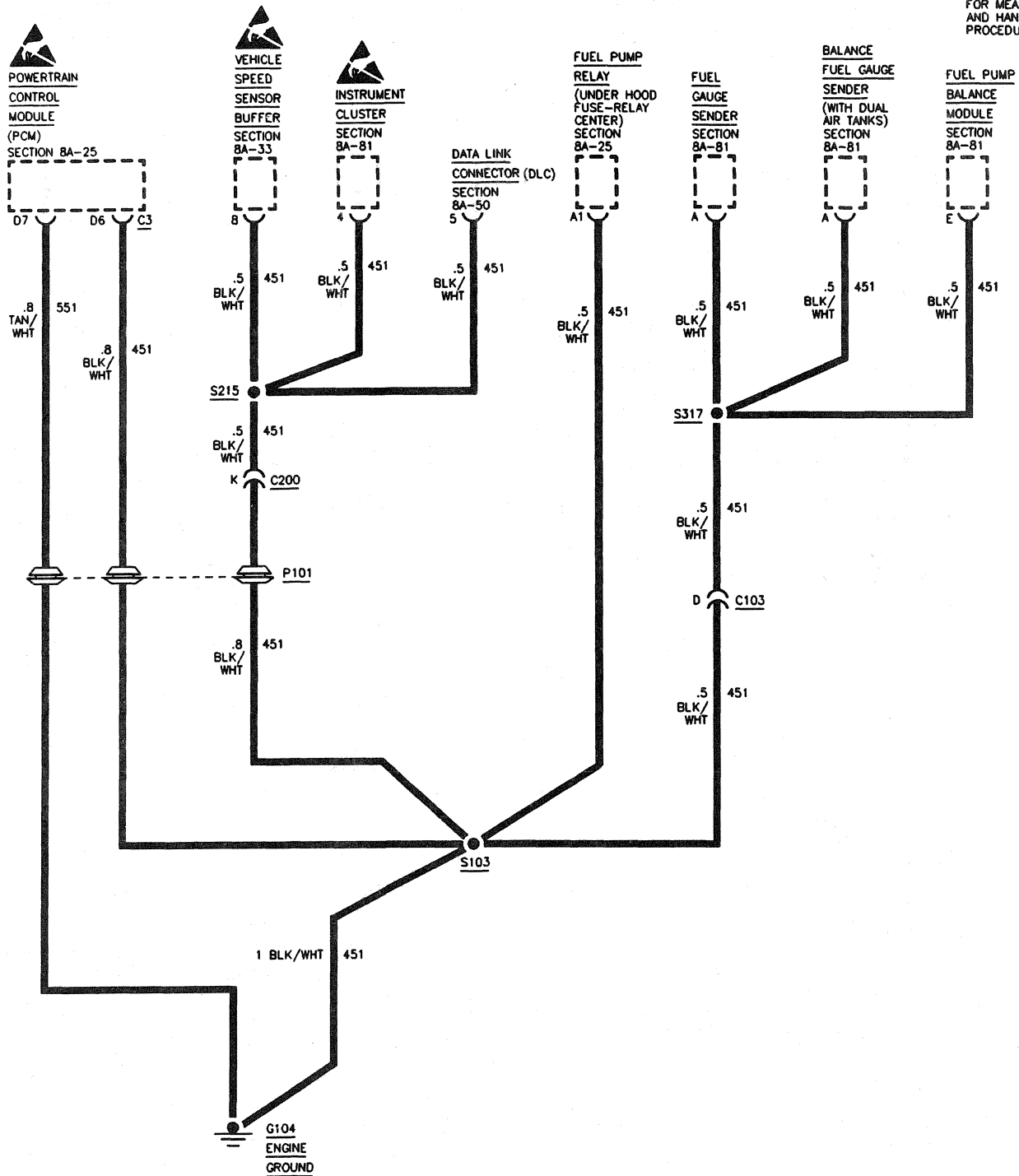


# 8A - 14 - 10 ELECTRICAL DIAGNOSIS

## GROUND DISTRIBUTION GASOLINE ENGINES

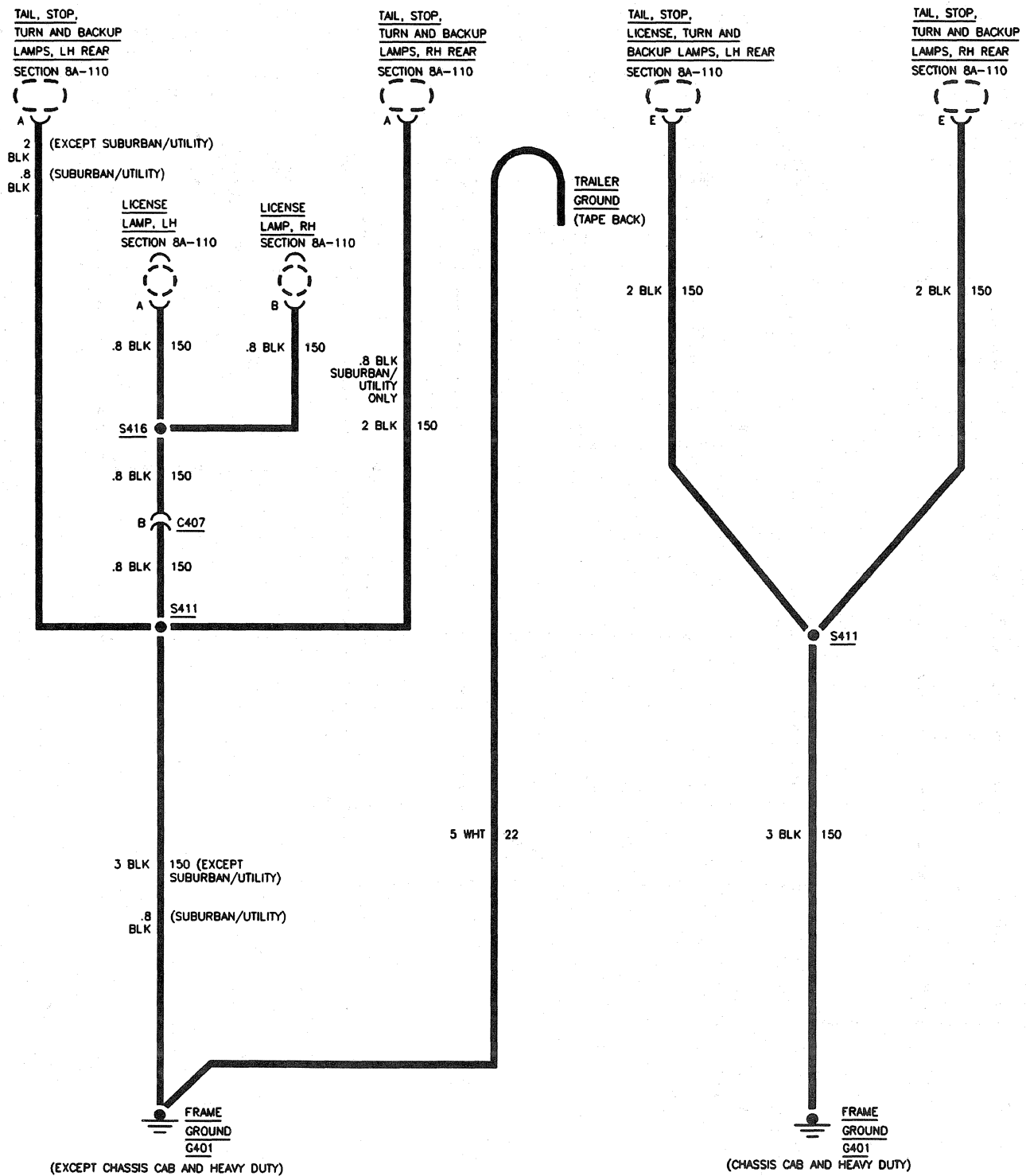


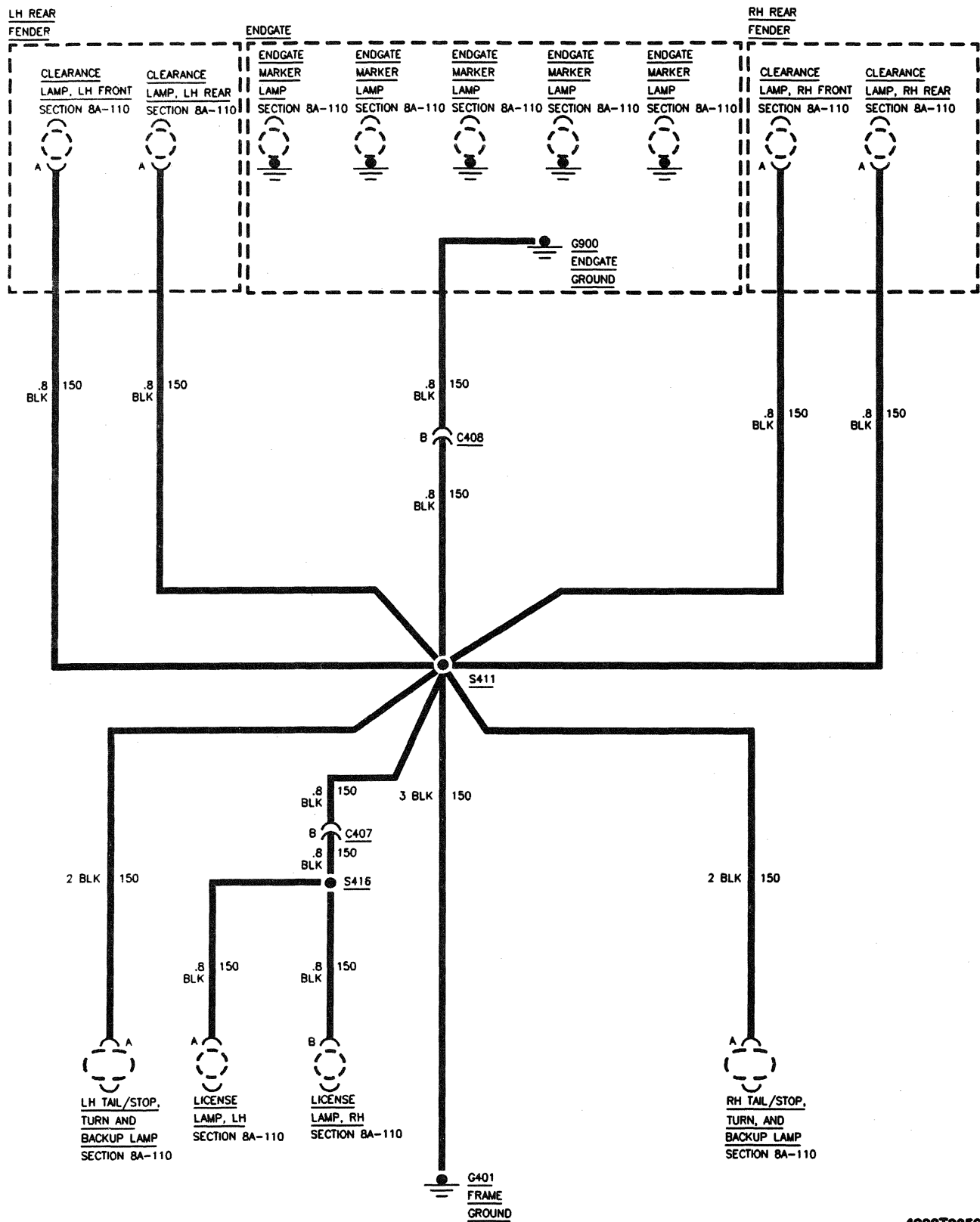
# GROUND DISTRIBUTION DIESEL ENGINES

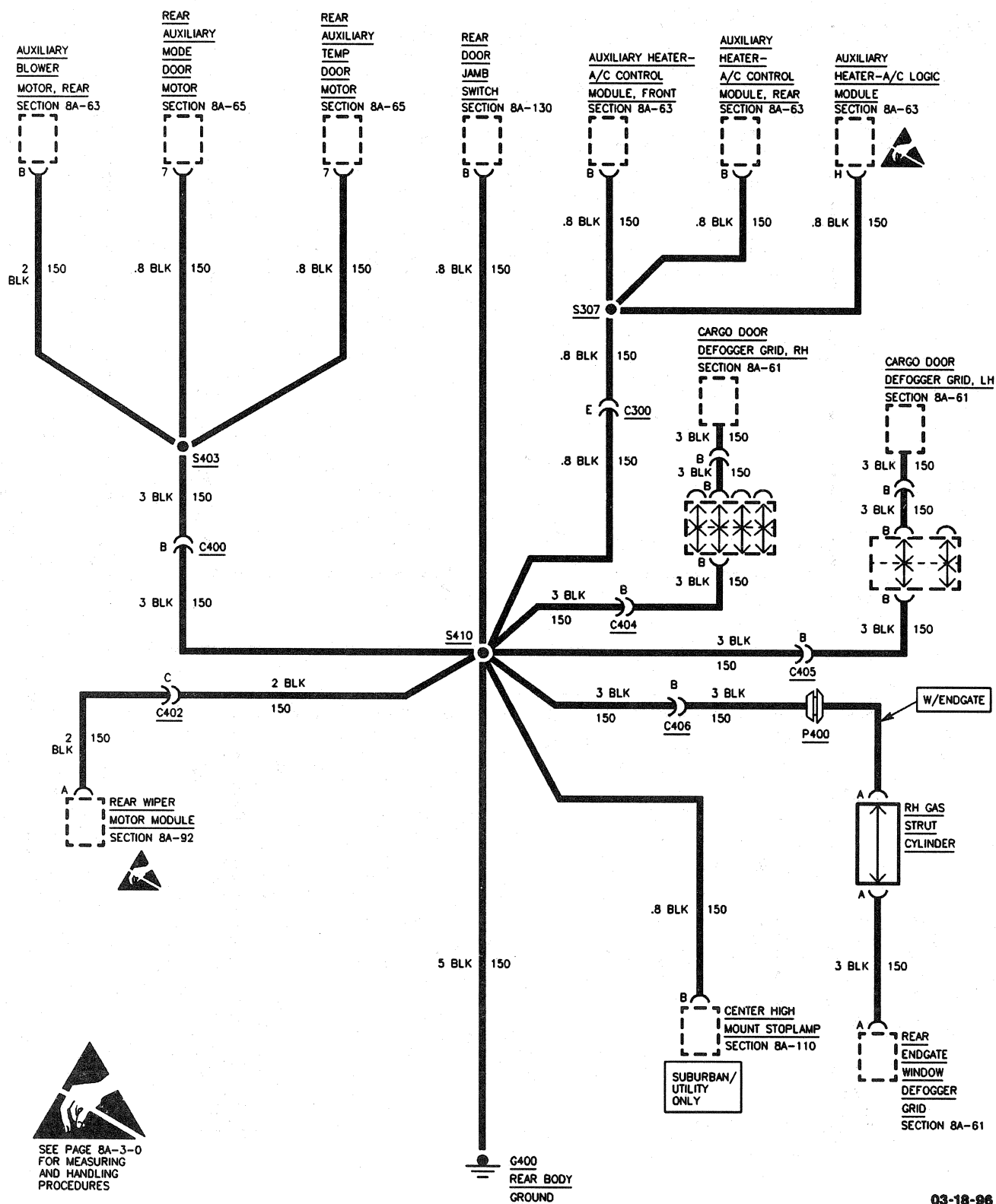


## 8A - 14 - 12 ELECTRICAL DIAGNOSIS

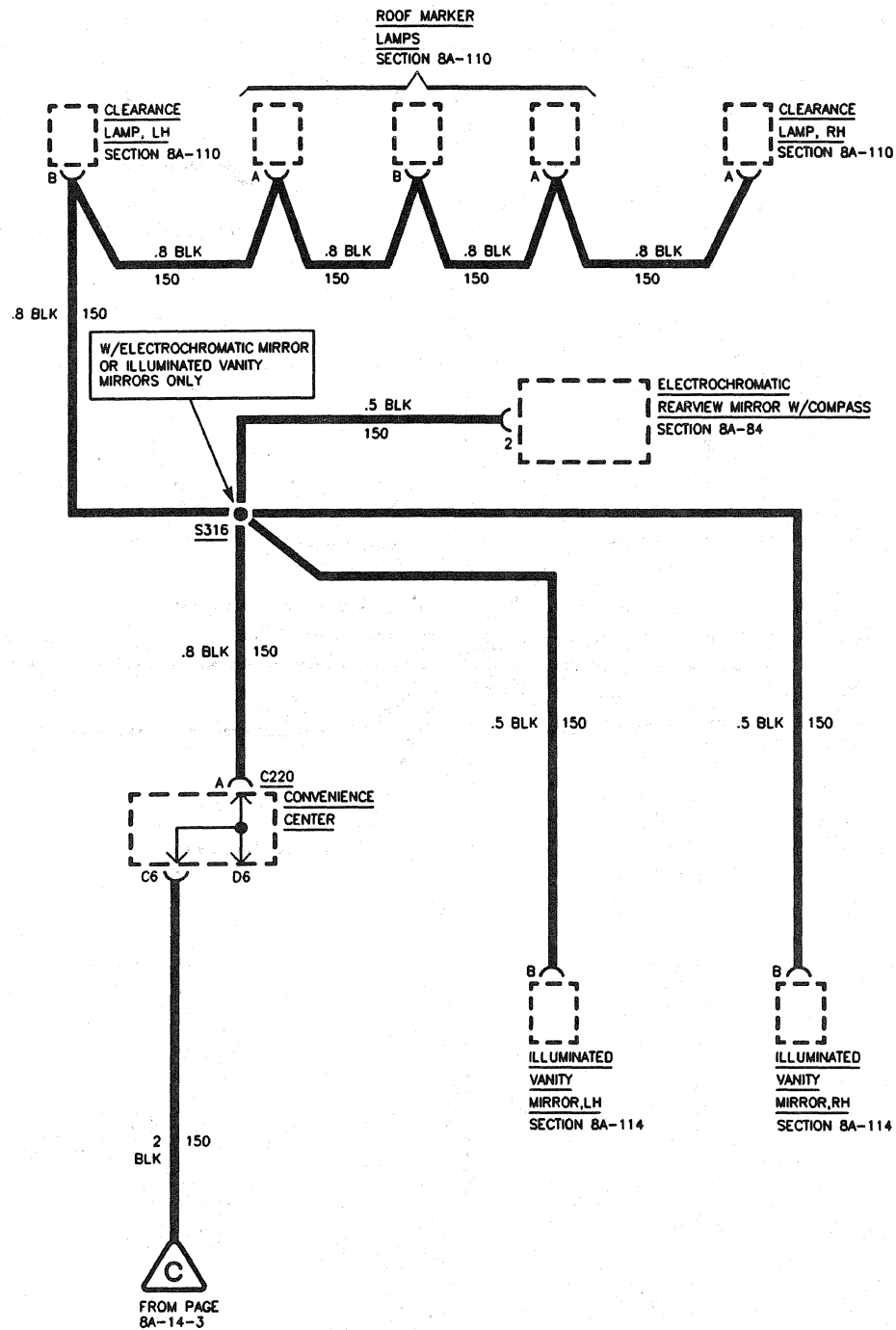
### GROUND DISTRIBUTION



**GROUND DISTRIBUTION  
PICKUP W/DUAL REAR WHEELS**

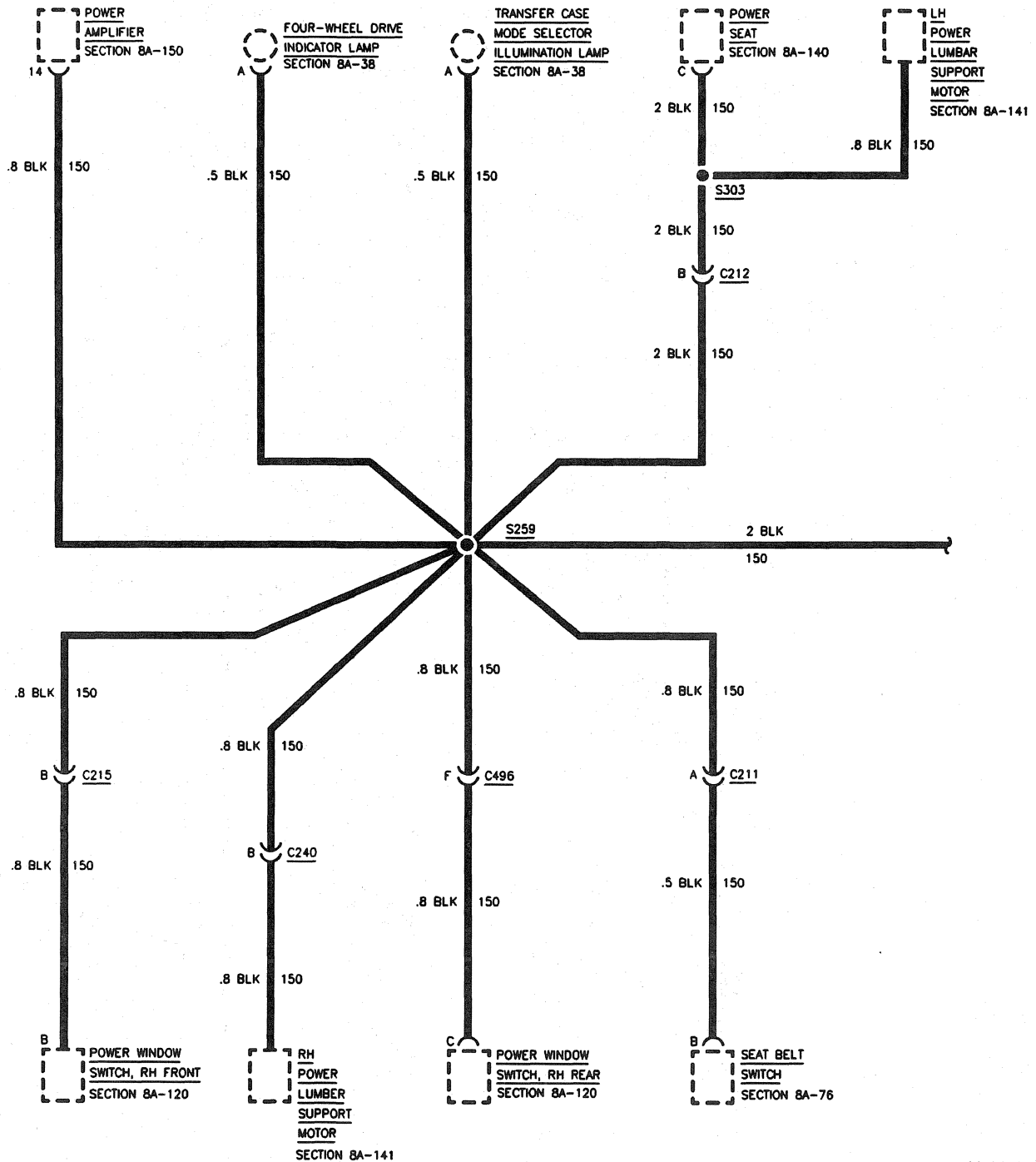
GROUND DISTRIBUTION  
SUBURBAN/UTILITY

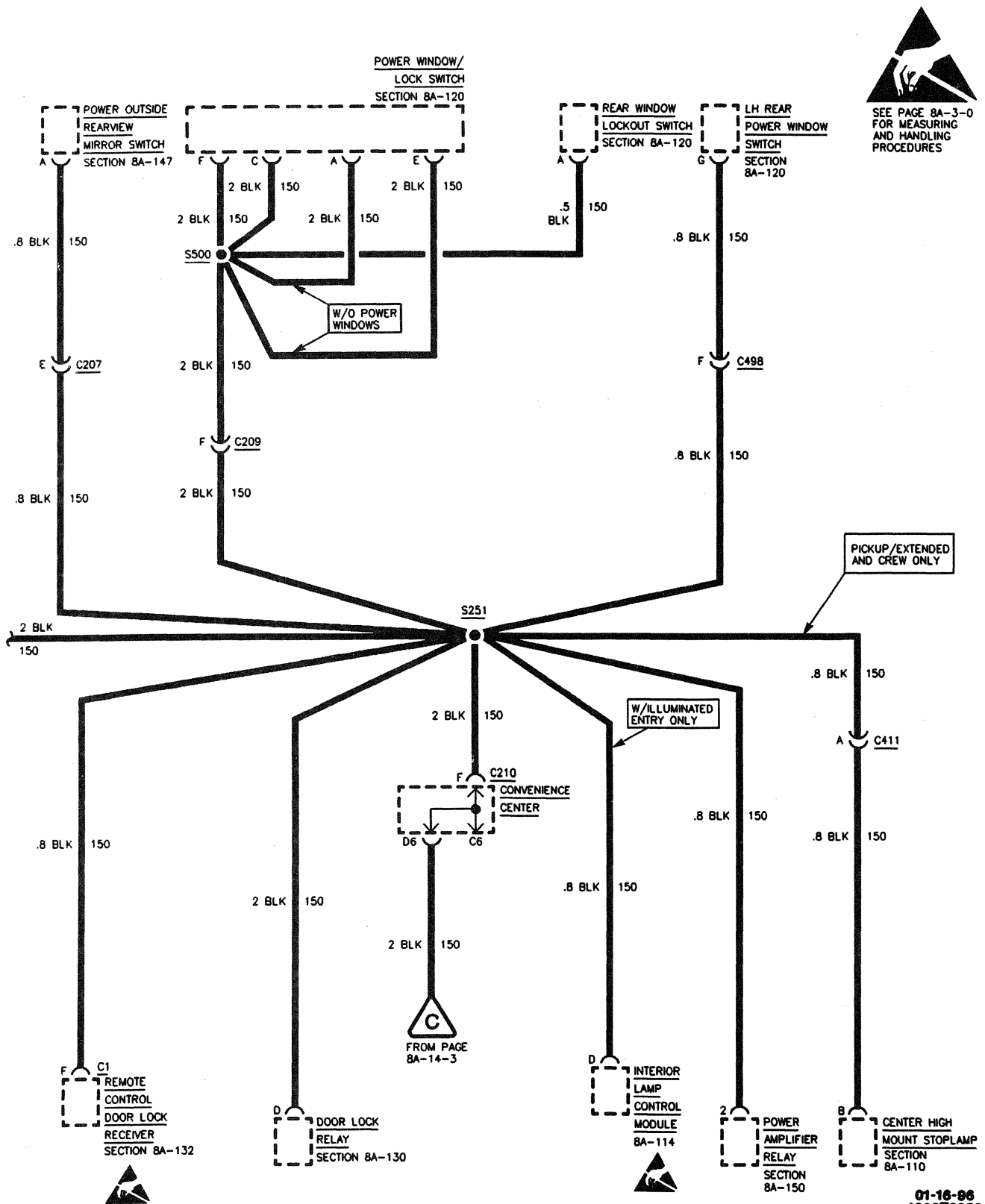




## 8A - 14 - 16 ELECTRICAL DIAGNOSIS

### GROUND DISTRIBUTION

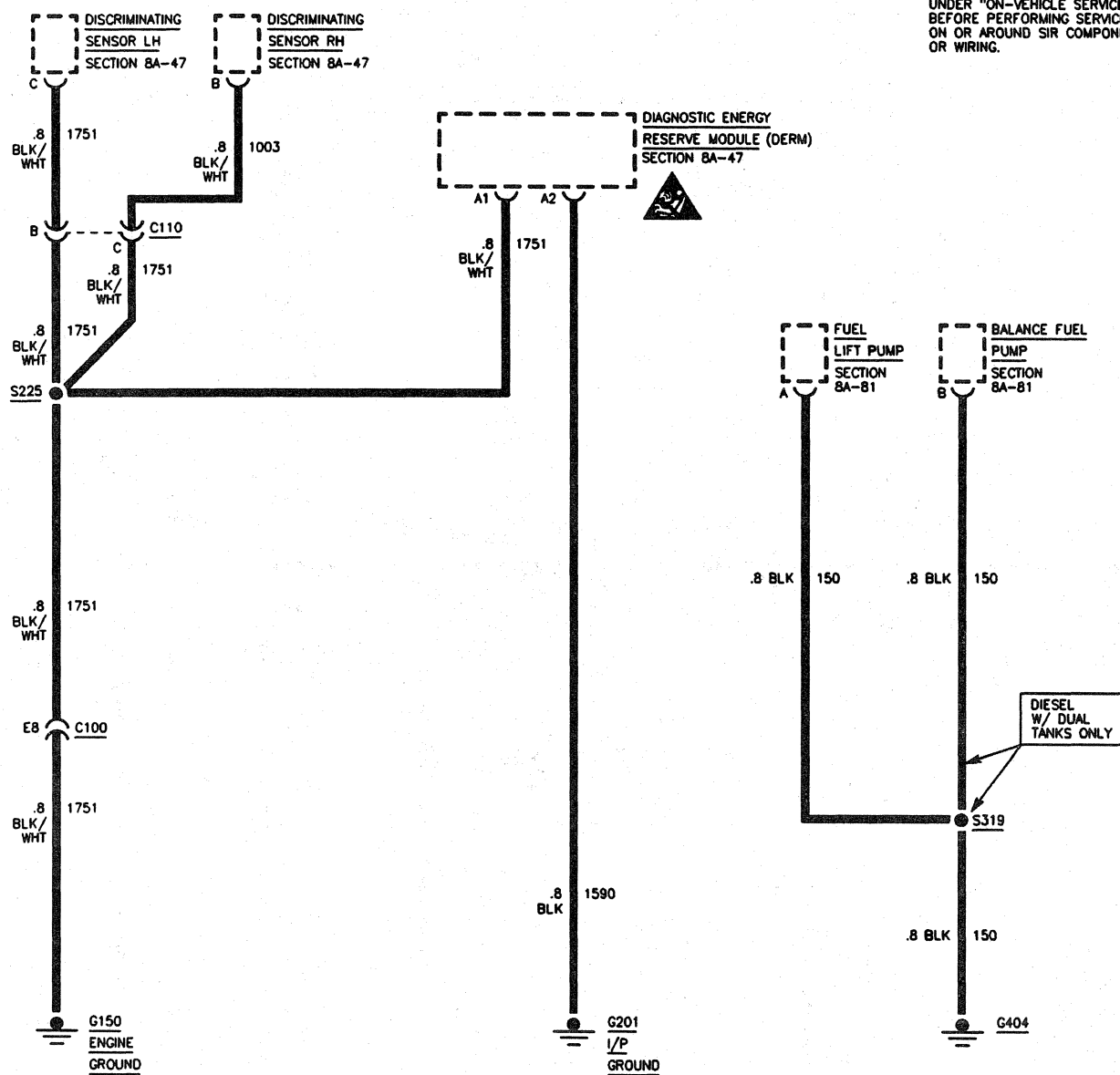


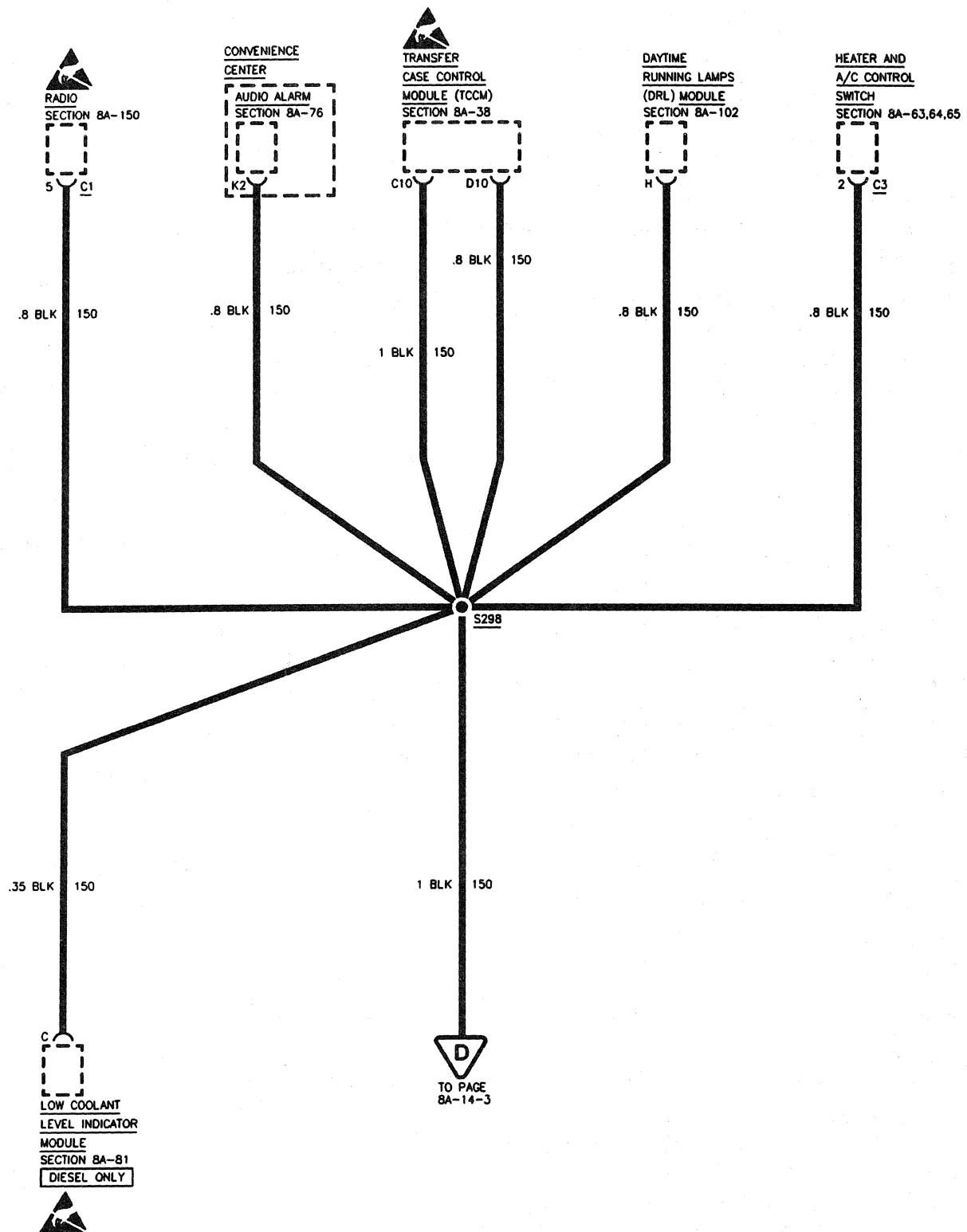


# 8A - 14 - 18 ELECTRICAL DIAGNOSIS GROUND DISTRIBUTION



CAUTION: VEHICLE IS EQUIPPED WITH SUPPLEMENTAL INFLATABLE RESTRAINT (SIR). REFER TO CAUTIONS IN SIR SECTION UNDER "ON-VEHICLE SERVICE" BEFORE PERFORMING SERVICE ON OR AROUND SIR COMPONENT OR WIRING.





**GROUND DISTRIBUTION**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
A/C Compressor Clutch.....	Front of A/C Compressor			
A/C Compressor Clutch Relay.....	In Underhood Fuse-Relay Center.....	4.....	9	
Air Injection Reaction Pump.....	Front of Engine			
Arming Sensor.....	Inside LH Framerrail, below Driver's Door			
Ash Tray Lamp.....	At Ash Tray			
Audio Alarm Module.....	Under LH Side of I/P, on Convenience Center (RH) portion.	23.....	36	
Auxiliary Battery.....	LH Front of Engine Compartment.....	1.....	4	
Auxiliary Battery Relay.....	LH Rear of Engine Compartment, at Fender, next to Relay Center .....	4.....	8	
Auxiliary Cooling Fan A/C Pressure Switch.....	Front of Engine Compartment, on Condenser Manifold Tubing			
Auxiliary Cooling Fan Switch ..	RH Cylinder Head near center of Engine			
Auxiliary Cooling Fan Motor ...	In front of Radiator.....	0.....	2	
Auxiliary Heater and A/C Control Switch/Module, front .....	Front of Overhead Console .....	31.....	49.....	202-13
Auxiliary Heater and A/C Control Switch/Module, rear.....	Rear of Overhead Console Molding, in Headliner.....	31.....	49.....	202-14
Auxiliary Heater and A/C Logic Module.....	Rear of Overhead Console Molding, in Headliner.....	37.....	60.....	202-12
Auxiliary Blower Motor.....	RH rear side of Cabin Area, behind rear Wheel House			
Backup Lamp .....	Rear of vehicle, part of RH and LH Taillamp			
Balance Fuel Gage Sender .....	In rear Fuel Tank			
Balance Fuel Pump.....	On inside LH Framerrail near front and rear tank			
Blower Motor (Front) .....	Under RH side of I/P .....	30.....	47	
Blower Motor (Rear) .....	Behind RH rear Wheelwell			
Blower Motor, Relay, high front .....	Behind I/P Compartment box on HVAC Plenum			
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse .....	22.....	33	
Brake Pressure Warning Switch.....	On rear of Brake Pressure Modulator Valve (BPMV) Casting			
Cargo Door Contractor, RH .....	Upper RH Body Opening and Door			
Cargo Door Defogger Grid, LH Rear .....	On LH rear Cargo Door Glass			
Cargo Door Defogger Grid, RH rear.....	On RH rear Cargo Door Glass			

COMPONENT	LOCATION	201-PG	FIG.	CONN
Cargo Lamp Switch .....	Center of I/P .....	29	46	
Center High Mount Stoplamp (CHMSL) - Pickup .....	Back, top of cab .....	40	65	
Center High Mount Stoplamp (CHMSL) - Suburban, Utility .....	At top rear center of vehicle .....	40	66	
Center High Mount Stoplamp Relay (Pickup) .....	In Underhood Fuse - Relay Center			
Cigar Lighter .....	Center of I/P, at Ashtray			
Clearance Lamp front, LH .....	Front of LH rear Fender .....	39	63	
Clearance Lamp front, RH .....	Front of RH rear Fender .....	39	63	
Clearance Lamp rear, LH .....	Rear of LH rear Fender .....	39	63	
Clearance Lamp rear, RH .....	Rear of RH rear Fender .....	39	63	
Convenience Center .....	Under LH Side of I/P, on Bulkhead .....	23	36	
Cruise Control Module .....	LH rear side of Engine Compartment, on Bulkhead .....	22	34	202-15
Data Link Connector (DLC) .....	Under LH side of I/P .....	26	41	202-16
Daytime Running Lamp (DRL) Relay .....	Under LH side of I/P, on lower center portion of Convenience Center .....	23	36	
Daytime Running Lamps (DRL) Module .....	Under LH side of I/P, Taped on I/P Harness .....			202-40
Diagnostic Energy Reserve Module (DERM) .....	Behind center of I/P .....	25	39	
Door Jamb Switch, LH front ....	At LH end of I/P			
Door Jamb Switch, RH front ....	At RH end of I/P			
Door Lock Relay .....	Under center portion of I/P, near RKE Module .....	32	51	202-40
Electrochromatic Rearview Mirror with Compass .....	On top inside of Windshield .....	32	50	
Endgate Marker Lamp .....	On Endgate .....	41	68	
Evaporative Emissions Canister Purge Solenoid .....	RH side of Engine .....	9	15	
Evaporative Emissions Purge Solenoid Vacuum Switch .....	Top of Engine .....	7	13	
Fog Lamp Switch .....	Center of I/P area .....	29	46	202-40
Fog Lamp, LH .....	At LH lower end of front Bumper .....	0	1	
Four-Wheel Drive Indicator Lamp .....	Center Floor Console .....	31	48	
Fuel Heater .....	Top rear of Engine			
Fuel Lift Pump (Diesel) .....	Inside LH Framerail, below Driver's Door			
Fuel Pump and Sender .....	In Fuel Tank			

**8A - 14 - 22 ELECTRICAL DIAGNOSIS****GROUND DISTRIBUTION**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Fuel Pump Balance Module.....	Inside LH side of Framerrail near Transmission Crossmember .....	.....	.....	202-41
Fuel Pump Balance Relay .....	On Fuel Pump Balance Module.....	.....	.....	202-41
Fuel Pump Relay .....	In Underhood Fuse and Relay Center			
Glow Plug Relay.....	LH rear of Engine, near Bulkhead			
Glove Box Lamp.....	In Glove Box			
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P.....	23 .....	35	
Headlamp, High Beam, LH (Composite).....	LH front of vehicle			
Headlamp, High Beam, RH (Composite).....	RH front of vehicle.....	3 .....	6	
Headlamp, High/Low Beam, LH.....	LH front of vehicle			
Headlamp, High/Low Beam, RH .....	RH front of vehicle			
Headlamp, Low Beam, LH (Composite).....	LH front of vehicle			
Headlamp, Low Beam, RH (Composite).....	RH front of vehicle.....	3 .....	6	
Heated Oxygen Sensors #1 through #4.....	In Exhaust Pipe, in front and back of Catalytic Converters ...	18 .....	26	
Heater and A/C Control Switch.....	Center of I/P			
High Blower Relay .....	Under I/P, on top of HVAC Plenum .....	30 .....	47 .....	202-41
High Blower Relay, rear (Auxiliary HVAC) .....	On Auxiliary HVAC Plenum, forward of LH rear Wheelhouse			
Horn, LH .....	At front of Vehicle			
Horn, RH .....	At front of vehicle .....	3 .....	6	
Ignition Coil Driver .....	RH side rear of Engine .....	7 .....	13 .....	202-41
Ignition Switch.....	Under I/P, on Steering Column			
Interior Lamp Control Module .....	Under center of I/P .....	25 .....	39 .....	202-41
Illuminated Vanity Mirror, LH.....	Part of LH Sunvisor Assembly.....	32 .....	50	
Illuminated Vanity Mirror, RH .....	Part of RH Sunvisor Assembly.....	32 .....	50	
Instrument Cluster .....	LH upper end of I/P .....	.....	.....	202-25
License Lamps.....	Rear of vehicle at License Holder.....	43 .....	71	
Low Coolant Level Indicator Module (Diesel).....	Under center of I/P .....	27 .....	42 .....	202-42



COMPONENT	LOCATION	201-PG	FIG.	CONN
Low Engine Coolant Level Sensor (Diesel).....	In Coolant Reservoir, RH side of Engine Compartment			
Mass Air Flow Sensor.....	Air Intake Duct near Air Filter.....	13	19	
Mode Door Motor.....	Under I/P, on Heater-A/C Plenum, LH side .....	30	47.....	202-43
Park and Turn Lamp, LH, Front .....	LH front corner of vehicle .....	3	7	
Park and Turn Lamp, RH, Front .....	RH front corner of vehicle .....	3	6	
Park/Neutral Position Switch....	On LH side center of Transmission.....	17	25	
Power Amplifier.....	Under Driver's Seat			
Power Amplifier Relay .....	Under I/P, RH side of Brake Pedal Bracket.....			202-43
Power Lumbar Seat Switch (LH Front).....	Under Driver's Seat			
Power Outside Rearview Mirror Switch.....	On LH Door Trim Panel			
Power Window Master Switch.....	On LH front door.....			202-42
Power Window Switch, RH Front .....	On Door Trim Panel			
Power Window Switch LH/RH.....	On Door Trim Panel			
Powertrain Control Module (PCM).....	Under RH end of I/P, above Blower Motor .....	24	38	
Radio .....	Center of I/P.....	29	46.....	202-29
Rear Auxiliary Mode Door Motor .....	In Auxiliary Heater - A/C Module, forward of LH rear Wheelhouse			
Rear Auxiliary Temperature Door Motor .....	In Auxiliary Heater - A/C Module, forward of LH rear Wheelhouse			
Rear Door Jamb Switch .....	RH rear Body Opening Frame.....	38	62	
Rear Liftgate Defogger Grid ....	On rear Liftgate Glass			
Rear Liftgate Release Switch....	LH side of I/P			
Rear Window Defogger Grid ....	On rear Window			
Rear Window Release Switch...	LH side of I/P			
Rear Window Washer Pump Motor .....	In Washer Reservoir			
Rear Window Wiper Washer Module.....	On Lower rear Liftgate Glass .....	41	67	
Rear Window Wiper/Washer Switch.....	Center of I/P.....	29	46.....	202-43
Recirculation Door Motor.....	Under I/P on Heater - A/C Plenum			

## 8A - 14 - 24 ELECTRICAL DIAGNOSIS

### GROUND DISTRIBUTION

COMPONENT	LOCATION	201-PG	FIG.	CONN
Remote Control Door Lock Reciver.....	Under center portion of I/P.....	25	39	
Seat Belt Switch.....	At Driver's Stationary Belt Connector .....	33	52	
Starter Relay.....	In Underhood Fuse-Relay Center			
Stoplamp Relay .....	In Underhood Fuse-Relay Center			
Tail/Stop - Turn Lamp, LH.....	LH rear corner of vehicle.....	42	70	
Tail/Stop - Turn Lamp, RH .....	RH rear corner of vehicle .....	42	70	
Tail, Stop, Turn Signal and Backup Lamp Assembly, LH.....	LH rear corner of vehicle			
Tail, Stop, Turn Signal and Backup Lamp Assembly, RH .....	RH rear corner of vehicle			
Temperature Door Motor (Module), front .....	Under I/P, on Heater - A/C Plenum, center area .....	30	47	
Transfer Case Control Module (TCCM).....	Under I/P, on Steering Column Support Bracket.....			202-32
Transfer Case Mode Selector Illumination Lamp .....	In Switch			
Transfer Case Select Switch.....	On I/P.....			202-31
Turn/Hazard Flasher.....	Convenience Center.....	23	36	
Underhood Fuse-Relay Center ..	LH rear of Engine Compartment, on Fender.....	4	8	
Underhood Reel Lamp.....	RH side of Bulkhead			
Underhood Lamp.....	Under Hood, RH side of Hood .....	5	11	
Vehicle Control Module (VCM).....	Engine Compartment, near BPMV Module .....	24	37	
Vehicle Speed Sensor.....	LH rear side of Transmission (LH side of Transfer Case w/4WD).....	18	26	
Vehicle Speed Sensor Buffer (Diesel).....	Under RH side of I/P .....	26	40	202-45
Water Valve (Suburban Only)...	Engine Compartment, RH rear side of Inner Fender			
Water-in-Fuel Sensor (Diesel) ...	Top rear of Engine			
Windshield Wiper Motor Module .....	Center rear Engine Compartment, at Cowl.....	22	34	202-45
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22	33	202-0
C102.....	LH rear of Engine Compartment near Fuse Relay Center, Mounted on Fender .....	3	7	202-35
C103.....	LH rear of Engine Compartment, Under Brake Master Cylinder .....			202-35
C116.....	LH Front of Vehicle, near Core Support			

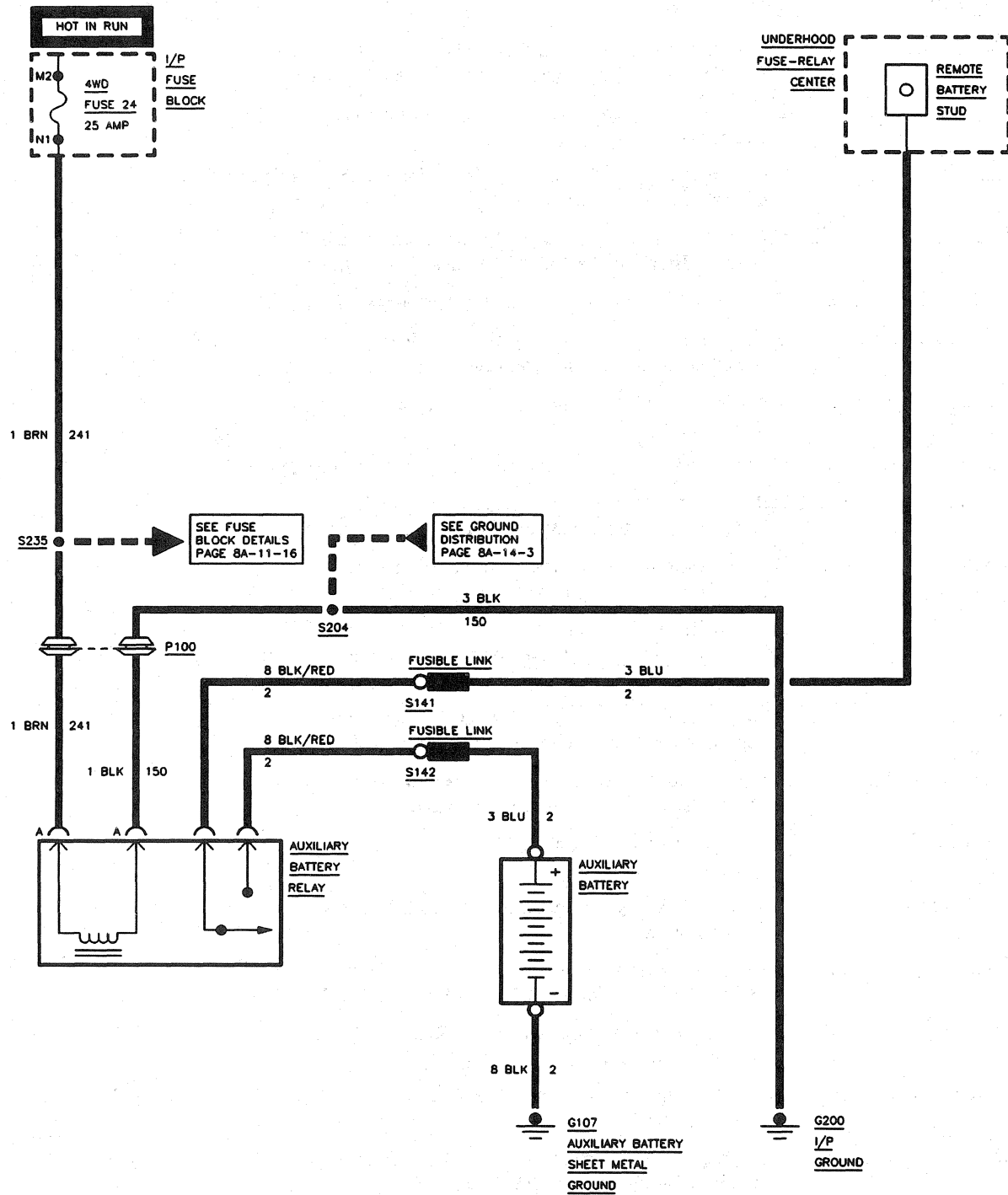
COMPONENT	LOCATION	201-PG	FIG.	CONN
C200.....	Behind RH Portion of I/P, near Heater Motor, in Foam Wrap.....	24.....	38.....	202-4, 5
C203.....	Behind RH Portion of I/P, near Heater Motor, in Foam Wrap.....	24.....	38	
C207.....	Inside LH "A" Pillar, lower portion .....	35.....	56.....	202-36
C209.....	Inside LH "A" Pillar, lower portion .....	35.....	56.....	202-36
C210.....	At Convenience Center .....	23.....	36.....	202-37
C211.....	Under Driver's Seat			
C212.....	Under Driver's Seat			
C215.....	Inside RH "A" Pillar, lower portion .....	35.....	56.....	202-37
C220.....	At Convenience Center			
C266.....	LH side of Steering Column, near Bulkhead.....	26.....	31	
C300.....	In Overhead Console.....	34.....	55.....	202-38
C301.....	LH Front Kick Panel .....	28.....	45.....	202-11
C400.....	RH rear of vehicle, above Auxiliary Blower Motor			
C404.....	LH "D" Pillar, top .....	45.....	74	
C405.....	RH "D" Pillar, top			
C407.....	Beneath LH rear Edge of Bed .....	43.....	71	
C408 (03,53).....	Beneath Center rear Edge of Bed.....	41.....	68	
C408 (06, 16).....	Lower center outside portion of Endgate .....	43.....	72	
C411.....	LH rear of Cab.....	40.....	65.....	202-39
C496.....	RH "B" Pillar .....	36.....	58.....	202-39
C498.....	LH "B" Pillar .....	36.....	58.....	202-44
<b>DIODE:</b>				
DIODE 1.....	In Underhood Fuse - Relay Center			
DIODE 2.....	In Underhood Fuse - Relay Center			
<b>GROMMETS:</b>				
P100.....	LH rear of Engine Compartment at Bulkhead.....	3.....	7	
P101.....	RH rear of Engine Compartment, at Bulkhead			
P400.....	Top rear of body, at RH Lift Gate Hinge			
<b>GROUND:</b>				
G101.....	Sheet Metal at RH front Wheelhouse.....	2.....	5	
G102 (Gas).....	RH front of Engine Block, near Damper Pulley .....	2.....	5	
G102 (Diesel).....	LH front of Intake Manifold .....	1.....	4	
G103 (Gas).....	RH front of Engine, near Thermostat Housing .....	10.....	16	
G104 (Gas).....	RH top of Cylinder Head, near Center .....	12.....	18	
G104 (Diesel).....	RH top of Cylinder Head.....	15.....	21	

## GROUND DISTRIBUTION

COMPONENT	LOCATION	201-PG	FIG.	CONN
G105 (Gas) .....	RH front of Engine Block.....	15.....	21	
G105 (Diesel) .....	RH top of Cylinder Head.....	1.....	4	
G110.....	RH rear of Engine Compartment, below Heater Lines			
G111.....	RH rear of Engine			
G112.....	RH front of Engine Compartment, below Underhood Reel Lamp.....	3.....	6	
G113.....	On Radiator Support, near LH Headlamp.....	3.....	7	
G150 (VIN M, R, J).....	RH front of Engine, near Thermostat Housing .....	10.....	16	
G200.....	Behind LH side of I/P, below Fuse Block			
G201.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34.....	54	
G401.....	Rear of LH Framerrail, behind Bumper.....	42.....	69	
G404.....	Inside LH Framerrail, near rear Crossmember			
G900.....	At Endgate			
<b>SPLICES:</b>				
S103 (VIN W, M, R) .....	Engine Harness, Approx. 11 cm from Breakout to EGR Valve to Taillamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, Approx. 35 cm from Breakout to EGR Valve to Taillamp Extension Harness Breakout			
S107 (VIN W).....	Engine Harness, Approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN M, R) .....	Engine Harness, Approx. 20 cm from Breakout to EGR Valve, toward Taillamp Extension			
S107 (VIN J).....	Engine Harness, Approx. 20 cm from Breakout to Fuel Injector Breakout, toward Taillamp Extension			
S123 .....	Forward Lamps Harness, Approx. 20 cm from LH Park Lamp Breakout toward Windshield Washer Pump			
S128 .....	Forward Lamps Harness, Approx. 5 cm from RH Headlamp Breakout toward G112			
S147 (VIN W, M, R) .....	Engine Harness, Approx. 65 cm from EGR Breakout, toward Taillamp Extension Breakout			
S147 (VIN J).....	Engine Harness, Approx. 5 cm from Fuel Injector Breakout toward Taillamp Harness Breakout			
S147 (Diesel).....	Engine Harness, Approx. 4 cm from Breakout to Glow Plugs (RH side)			
S156 (VIN W).....	Engine Harness, Approx. 16 cm into Vehicle Speed Sensor Breakout			
S158 .....	In Washer Pump Jumper Harness			
S215 .....	I/P Harness, Approx. 8 cm from I/P Cluster Breakout toward Radio			

COMPONENT	LOCATION	201-PG	FIG.	CONN
S218 .....	I/P Harness, Approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets			
S225 .....	I/P Harness, Approx. 6 cm Left of Steering Column Connector Breakout			
S244 .....	HVAC Harness, 14 cm from Recirculation Door Breakout toward Blower Motor			
S251 .....	Crossbody Harness, Approx. 12.5 cm Right of LH Door Harness Breakout toward I/P Harness Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout			
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout			
S307 (Suburban).....	rear HVAC Control Harness, 10 cm forward of HVAC Logic Module Breakout			
S316 .....	In Vanity Mirror Jumper Harness in Roof near Windshield			
S317 (Gas).....	Taillamp Extension Harness, Approx. 10 cm from Fuel Pump and Sender Breakout toward Engine Harness			
S317 (Diesel).....	Taillamp Extension Harness, Approx. 10 cm from Fuel Gage Sender Breakout toward Engine Harness			
S319 (Gas).....	Taillamp Extension Harness, Approx. 20 cm from Fuel Pump and Sender Breakout toward Balance Fuel Pump Breakout			
S319 (Diesel).....	Taillamp Extension Harness, Approx. 20 cm from Fuel Gage Sender Breakout toward Balance Fuel Pump			
S403 (rear Heat & A/C).....	rear Heat and A/C Harness, 7 cm from Blower Motor Resistor Breakout toward Blower Motor			
S410 (2-Door Utility).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout			
S410 (4-Door Utility).....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout			
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout toward CHMSL Harness Breakout			
S411 (Chassis Cab).....	rear Lamps Harness, Approx. 33 cm Right of Taillamps Extension Breakout			
S411 (Fleetside/Stepside).....	rear Lamps Harness, Approx. 17 cm Left of Taillamps Extension Breakout			
S416 .....	In License Lamps Harness, Approx. 4 cm from Breakout to Taillamp Harness toward RH License Lamp			
S500 .....	Inside Left Front Door Harness, near Tweeter .....	35	.....	56

AUXILIARY BATTERY



**AUXILIARY BATTERY**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Auxiliary Battery .....	LH Front of Engine Compartment.....	1 .....	4	
Auxiliary Battery Relay .....	LH Rear of Engine Compartment, at Fender, next to Relay Center.....	4.....	8	
I/P Fuse Block.....	Lower LH side of I/P			
Underhood Fuse-Relay Center...	LH Rear of Engine Compartment, on Fender .....	4.....	8	
<b>GROUNDS:</b>				
G107.....	LH front Fender (Auxiliary Battery Ground)			
G200.....	Behind LH side of I/P, below Fuse Block			
<b>GROMMETS:</b>				
P100 .....	LH Rear of Engine Compartment at Bulkhead .....	3.....	7	
<b>SPLICES:</b>				
S141 .....	Auxiliary Battery Harness, 18 cm from Underhood Fuse-Relay Center			
S142 .....	Auxiliary Battery Harness, 18 cm from Underhood Fuse-Relay Center			
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout			
S235 .....	I/P Harness, approx. 8 cm from Crossbody Harness Breakout toward P100			

## **8A - 20 - 0 ELECTRICAL DIAGNOSIS**

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### **ENGINE CONTROLS - 4.3L VIN W w/4L60-E OR MAN. TRANS.**

For Schematic, Circuit Operation and System Diagnosis regarding the Powertrain Control System, refer to SECTION 6 Engine Controls.



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## **8A - 21 - 0 ELECTRICAL DIAGNOSIS**

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### **ENGINE CONTROLS - 5.0L VIN M 5.7L VIN R w/4L60-E OR MAN. TRANS.**

For Schematic, Circuit Operation and System  
Diagnosis regarding the powertrain Control System, refer to  
SECTION 6 Engine Controls.

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## **8A - 23 - 0 ELECTRICAL DIAGNOSIS**

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### **ENGINE CONTROLS - 5.7L VIN R W/4L80-E**

For Schematic, Circuit Operation and System  
Diagnosis regarding the powertrain Control System, refer to  
SECTION 6 Engine Controls

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## **8A - 24 - 0 ELECTRICAL DIAGNOSIS**

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### **ENGINE CONTROLS - 7.4L VIN J w/4L80-E OR MAN. TRANS**

For Schematic, Circuit Operation and System Diagnosis regarding the powertrain Control System, refer to SECTION 6 Engine Controls.

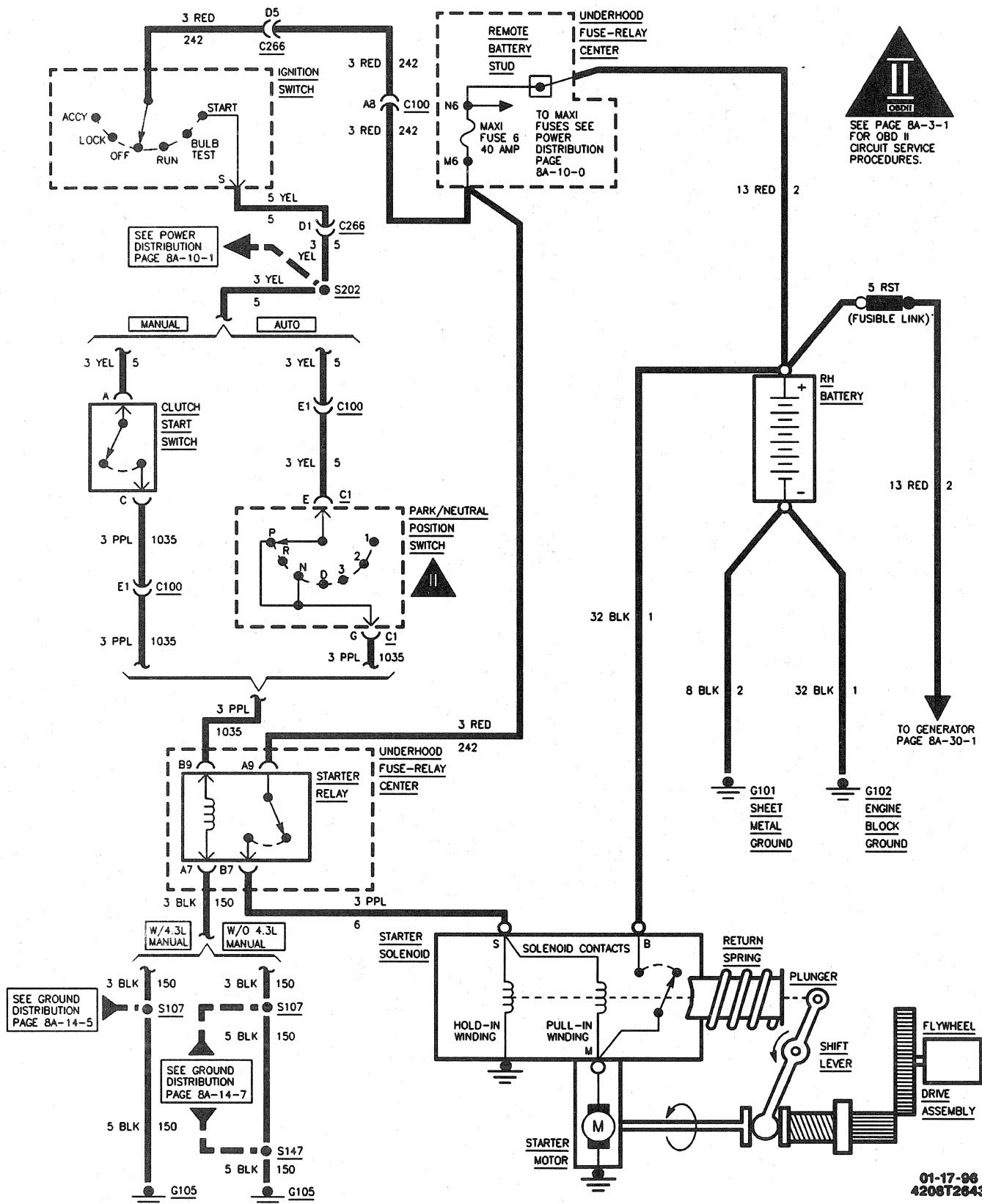
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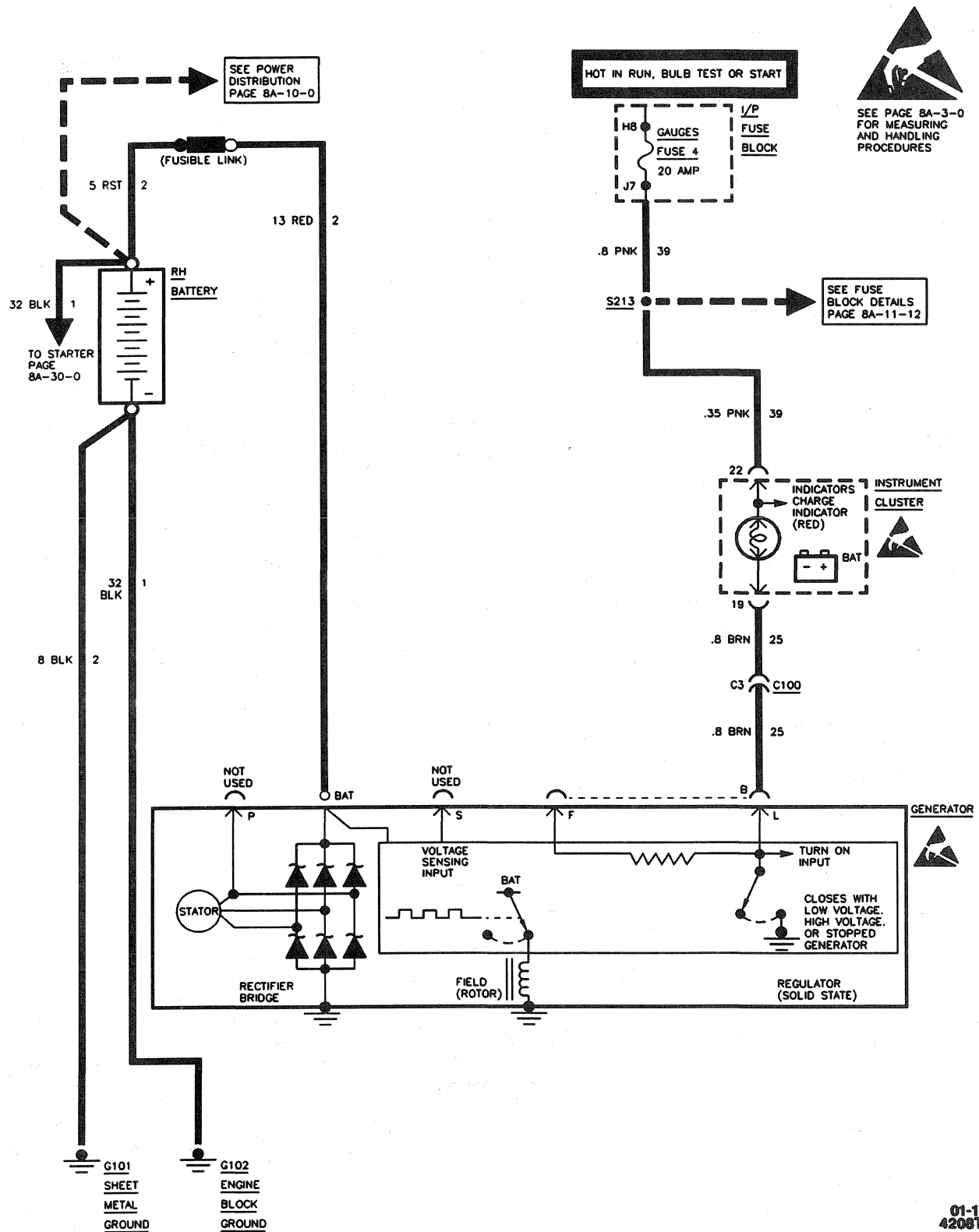
**ENGINE CONTROLS - 6.5L DIESEL VIN F AND S**

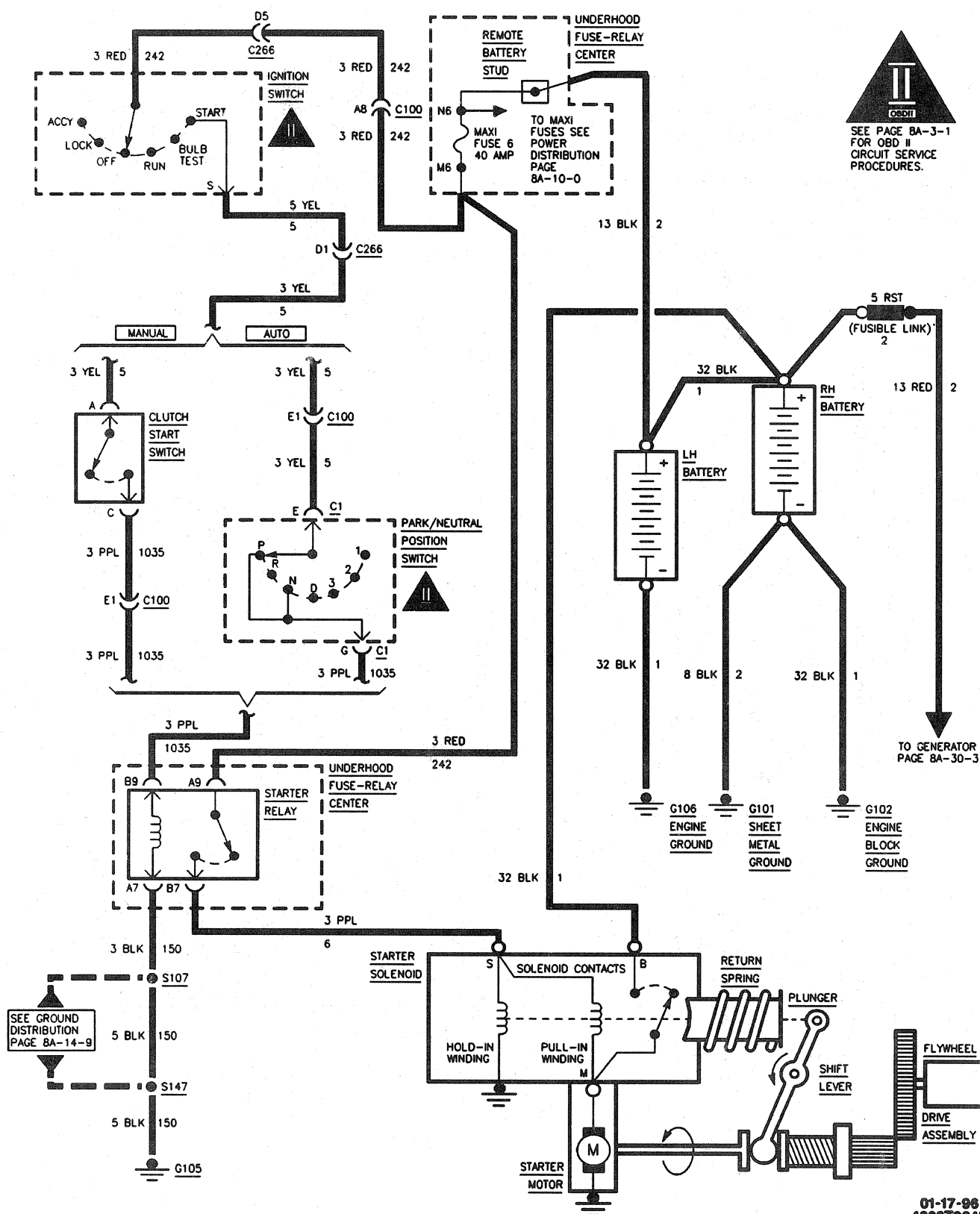
For Schematic, Circuit Operation and System Diagnosis regarding the powertrain Control System, refer to SECTION 6 Engine Controls.



**BLANK**









## 8A - 30 - 4 ELECTRICAL DIAGNOSIS

### STARTER AND CHARGING

COMPONENT	LOCATION	201-PG	FIG.	CONN
Clutch Pedal Switch.....	At top of clutch pedal			
Generator.....	LH front of engine.....	1.....	3	
I/P Fuse Block .....	Lower LH side of I/P .....	23.....	35	
Ignition Switch .....	Under I/P, on steering column			
Instrument Cluster .....	LH upper end of I/P			
Park/Neutral Position Switch.....	On LH side Center of Transmission .....	17.....	25	
Remote Battery Stud.....	At Underhood Fuse-Relay Center			
Starter Motor .....	Rear of Engine, RH Side, Lower			
Starter Relay .....	In Underhood Fuse-Relay Center			
Starter Solenoid .....	On Starter Motor			
Underhood Fuse-Relay Center ..	LH Rear of Engine Compartment, on Fender .....	4.....	8	
<b>CONNECTORS:</b>				
C100.....	LH Rear of Engine Compartment At Bulkhead .....	22.....	33.....	202-0
C200.....	Behind RH Portion of I/P near Heater Motor, in Foam Wrap .....	24.....	38.....	202-4, 5
C266.....	LH Side of Steering Column, Near Bulkhead.....	27.....	43.....	202-8
<b>GROUND:</b>				
G101.....	Sheet Metal At RH Front Wheelhouse .....	2.....	5	
G102 (Gas) .....	RH Front of Engine Block, near Damper Pulley.....	2.....	5	
G102 (Diesel) .....	LH Front of Intake Manifold.....	1.....	4	
G105 (Gas) .....	RH Front of Engine Block.....	9.....	15	
G105 (Diesel) .....	RH Top of Cylinder Head.....	15.....	21	
G106 (Diesel) .....	LH Battery Ground to Engine			
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, Approx 30 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN M, R) .....	Engine Harness, Approx 20 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN J).....	Engine Harness, Approx 20 cm from Breakout to Fuel Injector Breakout toward Taillamp Extension Harness			
S107 (Diesel).....	Engine Harness, Approx. 31 cm from Breakout to BPMV toward EGR Valve			
S147 (VIN W, M, R) .....	Engine Harness, Approx. 6.5 cm from EGR Breakout toward Taillamp Extension Harness Breakout			
S147 (VIN J).....	Engine Harness, Approx. 5 cm from Fuel Injector Breakout toward Taillamp Extension Harness Breakout			
S147 (Diesel).....	Engine Harness, Approx. 4 cm from Breakout to Glow Plugs (RH Side)			

COMPONENT	LOCATION	201-PG FIG. CONN
S162 (VIN W, M, R) .....	Engine Harness, Approx. 12.5 cm from Starter Solenoid Breakout toward LH Oxygen Sensor Breakout	
S162 (VIN J).....	Engine Harness, Approx. 10 cm from Starter Solenoid Breakout toward LH Oxygen Sensor Breakout	
S202 .....	I/P Harness, Approx. 27 cm from TCC/Stoplamp Switch Connector	
S213 .....	I/P harness, Approx. 8 cm from Headlamp Dimmer Switch Breakout toward Cluster	

## DIAGNOSIS - STARTER AND CHARGING

### TROUBLESHOOTING HINTS:

(PERFORM BEFORE BEGINNING SYSTEM DIAGNOSIS)

#### STARTER

1. Visually inspect the hydrometer (built into Battery).
  - Green eye—Battery is charged.
  - Dark eye—Charge and load test Battery, refer to SECTION 6D1-2. If Battery passes load test, refer to "Battery is Undercharged or Overcharged" System Diagnosis, in this SECTION.
  - Clear or light yellow eye—Battery electrolyte is low. REPLACE Battery.
2. Check that Starter Solenoid terminals "S" and "B" and Battery connections are clean and tight.
3. Check the condition of MAXI FUSE 6. If Fuse is open, LOCATE and REPAIR source of overload and REPLACE fuse.
4. Check that Grounds G101, G102 and G105 (Gasoline Engines) or Grounds G101, G102, G105 and G106 (Diesel Engines) are clean and tight.
  - Check for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - Check for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," SECTION 8A-4).

#### CHARGING SYSTEM

1. Visually inspect the hydrometer (built into Battery).
  - Green eye—Battery is charged.
  - Dark eye—CHARGE and LOAD TEST Battery, Refer to Section 6. If Battery passes load test, refer to System Diagnosis, SECTION 8A-30.
  - Clear or light yellow eye—Battery electrolyte is low. REPLACE Battery.
2. Check Gages Fuse 4 for open. If Fuse is open, LOCATE and REPAIR source of overload and REPLACE Fuse.
3. Check that the Generator connector and Generator "BAT" terminal are both clean and tight.
4. Check that the Battery connections are clean and tight.
5. Check Generator belt. ADJUST as per SECTION 6B-1 if required.
6. Check Fusible Link G for an open. If Link is open, LOCATE and REPAIR source of overload and REPLACE Link.
7. Check that Grounds G101, G102 and G105 (Gasoline Engine) or Grounds G101, G102, G105 and G106 (Diesel Engines) are clean and tight.
  - Check for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - Check for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," SECTION 8A).

**STARTER AND CHARGING****SYSTEM DIAGNOSIS**

- The following tests are designed for engines and batteries at normal operating temperatures and assumes that there are no engine symptoms which would cause a no-start symptom. The Battery must be in a charged state before doing diagnosis. To use the tests under other conditions could result in misdiagnosis.

- Perform the On-Board Diagnostic System Check described in Driveability and Emissions SECTION 3 (Diesel) or SECTION 3A or 3B (Gasoline) to be certain that no Diagnostic Trouble Codes (DTCs) are stored in VCM/PCM memory which may lead to misdiagnosis.

**STARTER SOLENOID CLICKS, ENGINE DOES NOT CRANK OR CRANKS SLOWLY**

TEST	RESULT	ACTION
1. Disconnect engine Shutoff Solenoid Connector (Diesel) or Ignition Coil Connector (Gasoline). Ensure no other engine problems which would affect diagnosis. Surface charge removed if battery was recently charged. See SECTION 6D-1. Connect Voltmeter to positive and negative battery terminals. Place Ignition Switch in 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. Refer to Temperature Table in SECTION 6D-1.	PERFORM a Battery Load Test. Refer to Section 6D1. If Battery passes load test, REPAIR Starter Motor.
2. Connect Voltmeter from negative Battery terminal to Engine Block.	Less than 0.5 Volts.	GO to step 3.
	More than .0.5 Volts.	REPLACE Negative Battery Cable.
3. Connect Voltmeter from Starter Solenoid terminal B to BLK (1) wire battery negative.	More than 9.0 volts.	REPAIR Starter Motor.
	Less than 9.0 volts.	Clean and Tighten positive Battery terminals and/or REPLACE Positive Battery Cable.

**ENGINE DOES NOT CRANK AND STARTER SOLENOID DOES NOT CLICK**

TEST	RESULT	ACTION
1. Place Transmission in PARK (Automatic) or depress Clutch Pedal (Manual). Connect Voltmeter from PPL (6) wire at Starter Solenoid Terminal S to engine ground. Place Ignition Switch in START and measure Voltage.	Battery Voltage.	CLEAN Starter Motor mounting bolts, Starter Motor, and mounting surface. REPEAT test. If still bad, REPLACE Starter Motor.
	No Voltage.	GO to step 2.
2. Remove the Starter Relay from the Relay Socket. Using a test lamp, check for Voltage at Starter Relay Socket Cavity A9 to ground.	Test lamp does not light.	LOCATE and REPAIR open in the RED (742) wire between Maxi-Fuse 6 and Starter Relay. REINSTALL Starter Relay.
	Test lamp lights.	GO to step 3.
3. Disconnect the PPL (6) wire from Starter Solenoid Terminal S. Using a self-powered test lamp, check for Continuity between Starter Relay Socket Cavity B7 to the Starter Solenoid end of PPL (6) wire.	Test lamp lights.	RECONNECT the PPL (6) wire at Starter Solenoid Terminal S. GO to Step 4.
	Test lamp does not light.	LOCATE and REPAIR open in PPL (6) wire between Starter Relay and Starter Solenoid. REINSTALL Starter Relay.



TEST	RESULT	ACTION
4. Using a self-powered test lamp, check for continuity between Starter Relay Socket Cavity A7 to ground.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Starter Relay and Ground G105. REINSTALL Starter Relay.
	Test lamp lights.	GO to Step 5.
5. Place Transmission in PARK (Automatic) or depress Clutch Pedal (Manual). Connect Voltmeter from Starter Relay Socket Cavity B9 to ground. Place Ignition Switch in START and measure Voltage.	Test lamp does not light.	REINSTALL Starter Relay in the Underhood Fuse-Relay Center. GO to step 6 for Manual or step 8 for Automatic.
	Test lamp lights.	REPLACE Starter Relay.
6. Disconnect Clutch Start Switch Connector. Connect Voltmeter from YEL (5) wire at Clutch Start Switch Connector to ground. Ignition Switch must be in START position.	Battery voltage.	GO to step 7.
	No voltage.	GO to step 10.
7. Depress Clutch and put Transmission in NEUTRAL. Apply Parking Brake. Connect fused jumper from YEL (5) to PPL (1035) at Clutch Start Switch Connector. Place Ignition Switch in START position.	Engine cranks.	ADJUST Clutch Start Switch. If Start Switch cannot be adjusted, REPLACE Clutch Start Switch.
	Engine does not crank.	LOCATE and REPAIR open in PPL (1035) wire from Clutch Start Switch Connector to Starter Relay.
8. Disconnect Park/Neutral Position Switch Connector. Connect Voltmeter from YEL (5) wire at Park/Neutral Position Switch Connector to ground. Place Ignition Switch in START position.	Battery voltage.	GO to step 9.
	No voltage.	GO to step 10.
9. Connect a fused jumper from Park/Neutral Position Switch Connector YEL (5) wire to PPL (1035) wire. Place Ignition Switch in START position.	Engine cranks.	REPLACE Park/Neutral position Switch.
	Engine does not crank.	LOCATE and REPAIR open in Park/Neutral Position Switch PPL(1035) wire from Park/Neutral position Switch to Starter Relay.
10. Connect a Voltmeter from Ignition Switch YEL (5) wire to ground. Place Ignition Switch in START position.	Battery voltage.	LOCATE and REPAIR open in YEL (5) wire from Ignition Switch to Clutch Start Switch (Man.) or Park/Neutral Position Switch (Automatic).
	No voltage.	GO to step 11.
11. Connect a voltmeter from Ignition Switch RED (242) wire to ground.	Battery voltage.	REPLACE Ignition Switch.
	No Voltage.	LOCATE and REPAIR open in RED (242) wire between Ignition Switch and Underhood Fuse-Relay Center.

**STARTER AND CHARGING****BATTERY INDICATOR DOES NOT LIGHT WITH IGNITION SWITCH IN RUN AND ENGINE STOPPED**

TEST	RESULT	ACTION
1. Disconnect Generator Connector. Place Ignition Switch in RUN position. Connect fused jumper from BRN (25) wire at Generator Connector to ground.	Battery Indicator lights.	REPAIR Generator.
	Battery Indicator does not light.	GO to step 2.
2. Backprobe BRN (25) wire at I/P Cluster with a Fused Jumper to ground.	Battery Indicator lights.	LOCATE and REPAIR open in BRN (25) wire between Instrument Cluster and Generator.
	Battery Indicator does not light.	GO to step 3.
3. Disconnect Instrument Cluster Connector. Connect a Voltmeter from PNK (39) Terminal "22" at Instrument Cluster Connector to ground.	Battery voltage.	Check Charge Indicator lamp for an open filament. If OK, REPLACE Instrument Cluster.
	No voltage.	LOCATE and REPAIR open in PNK (39) wire from Instrument Fuse Block to Instrument Cluster.

**BATTERY INDICATOR STAYS ON WHEN ENGINE IS RUNNING**

TEST	RESULT	ACTION
1. Shut engine off. 2. Disconnect Generator connector. 3. Place Ignition Switch in RUN position.	Battery Indicator does not light.	REPAIR Generator.
	Battery Indicator remains lit.	LOCATE and REPAIR short to ground in BRN (25) wire from Generator Connector to Instrument Cluster Connector. If short cannot be located in BRN (25) wire, then REPLACE Instrument Cluster.

**BATTERY IS UNDERCHARGED OR OVERCHARGED**

TEST	RESULT	ACTION
1. Disconnect Generator Connector. Place Ignition Switch in RUN position. Connect Voltmeter from BRN (25) wire at Generator Connector to ground.	Battery voltage.	GO to step 2.
	No voltage.	GO to step 4.
2. Connect Voltmeter from Terminal (BAT) at Generator to ground.	Battery voltage.	GO to step 3.
	No voltage.	REPAIR/REPLACE BLK/RED (2) wire from Fusible Link to Generator.
3. Connect Generator Connector. Have all accessories turned off and Engine running at fast idle. Connect Voltmeter across Battery Terminals and note Voltage.	Reading of 13-16 volts.	PERFORM Battery Load Test. Refer to SECTION 6D1-5 Diagnosis of the Battery.
	Reading of less than or greater than 13-16 Volts.	PERFORM Generator Bench Test. Refer to SECTION 6D3-3. If Generator is okay, PERFORM Battery Load Test. Refer to SECTION 6D1-5.

TEST	RESULT	ACTION
4. Backprobe BRN (25) wire at Instrument Cluster Connector with a Voltmeter to ground.	Battery Voltage.	LOCATE and REPAIR open in BRN (25) wire from Instrument Cluster to Generator.
	No voltage.	GO to step 5.
5. Backprobe PNK (39) wire at Instrument Cluster Connector Terminal "22" with a Voltmeter to ground.	Battery voltage.	CHECK charge indicator filament. If OK, REPLACE Instrument Cluster.
	No Voltage.	LOCATE and REPAIR open in PNK (39) wire from I/P Fuse Block to Instrument Cluster.

## CIRCUIT OPERATION

### STARTER

Battery Voltage is available at all times through Maxi-Fuse located in the Underhood Fuse-Relay Center. Voltage is made available at the Ignition Switch through the RED (242) wire. When the Ignition Switch is placed in START, contacts in the Switch close to apply Voltage to the YEL (5) wire. The YEL (5) wire terminates at PIN A of the Clutch Start Switch for Manual Transmission or at PIN E of the Park/Neutral Position Switch for Automatic Transmission.

If the Clutch Pedal is depressed for Manual Transmission or if the Automatic Transmission is in the PARK or NEUTRAL position, contacts are closed which applies Voltage to the PPL (1035) wire at PIN B of the Clutch Start Switch or at PIN G of the Park/Neutral Position Switch. The PPL (1035) wire applies Voltage to PIN B9 of the Starter Relay located in the Underhood Fuse-Relay Center. The Starter Relay Coil is connected to PIN B9 and to PIN A7. The BLK (150) wiring from PIN A7 provides a ground path to Ground G105 and the Starter Relay Coil is energized.

When the Relay Coil is energized, contacts are closed to apply, Battery Voltage to the Starter Solenoid. The RED (242) wire from Maxi-Fuse 6 to PIN A9 of the Starter Relay provides Voltage which is sent through the PPL (6) wire connected at Relay PIN B7 to Starter solenoid Terminal S. This provides Voltage to the Hold-In Winding and the Pull-In Winding of the 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 supplied directly to the Starter Motor and it cranks the Engine.

As soon as the Solenoid Switch contacts close, Voltage is no longer supplied through the Pull-In Windings, since battery voltage is supplied 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 supplied from the Motor contacts through both windings to ground at the end of the Hold-In Windings. However, the Voltage supplied to the Pull-In Winding is now opposing the Voltage supplied 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 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 controlling 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.

## **STARTER AND CHARGING**

The Digital Regulator controls the BAT Indicator lamp with a solid-state lamp driver. The Lamp Driver turns on the lamp whenever Undervoltage, Overvoltage or a stopped Generator is detected.

Voltage is available to the indicator lamp and the Generator when the Ignition Switch is in RUN, Bulb Test or START. The 20 Amp gages Fuse 4 located in the I/P Fuse Block provides voltage through the PNK (39) wire to Instrument Cluster PIN 22. When there is no current flowing Battery Voltage is available at PIN 19 and is provided the Generator through the BRN (25) wire. Generator Connector Cavity B connects to Generator PIN

L. This Voltage input provides operating power for the Regulator when the Engine is running and Generator Voltage is too high or too low, this Voltage input is grounded by contacts within the Regulator. This Switch closure allows current to flow which causes the BAT indicator to light.

For Vehicles with the Diesel Engine, the Tachometer input is sensed at PIN P of the Generator. Generator Connector Cavity A connects to Generator PIN P to send the pulsing Voltage signal to PIN 6 of the Instrument Cluster through the WHT (121) wire. The Instrument Cluster converts the Voltage frequency to Engine RPM.

**BLANK**

## COOLING FAN



**COOLING FAN**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Auxiliary Cooling Fan A/C Pressure Switch (VIN H, K).....	Front of Engine Compartment, on Condenser Manifold Tubing			
Auxiliary Cooling Fan Motor....	In Front of Radiator.....	0 .....	2	
Auxiliary Cooling Fan Relay ....	LH Rear side of Engine Compartment.....	4 .....	9	
Auxiliary Cooling Fan Temperature Switch .....	RH Cylinder Head, above Starter Solenoid .....	12 .....	18	
Heater and A/C Control Module.....	Center of I/P at Heater Control			
Recirculation Door Motor.....	Under I/P on Heater-A/C Plenum			
Underhood Fuse-Relay Center...	LH Rear of Engine Compartment, on Fender .....	4 .....	8	
<b>CONNECTORS:</b>				
C100.....	LH Rear of Engine Compartment at Bulkhead .....	22 .....	33.....	202-0
C101 .....	LH Rear of Engine Compartment near Fuse Relay Center.....	3 .....	7.....	202-35
C108 (VIN J) .....	LH RH Side of Intake Manifold, near Throttle Body .....	12 .....	18	
C230.....	Behind RH side of I/P, above HVAC Evaporator Housing .....	27 .....	42.....	202-38
<b>DIODE:</b>				
D100 (VIN J) .....	Engine Harness, Approx. 25 cm from Underhood Lamp			
D101 (VIN J) .....	Engine Harness, Approx. 8 cm from C101 Breakout			
<b>GROUND:</b>				
G105 (Gas) .....	RH Front of Engine Block.....	9 .....	15	
G105 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
G112.....	RH Front of Engine Compartment, below Underhood Reel Lamp.....	3 .....	6	
G200.....	Behind LH Side of I/P, Below Fuse Block			
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, Approx 30 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN M, R).....	Engine Harness, Approx 20 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN J).....	Engine Harness, Approx 20 cm from Fuel Injector Breakout toward Taillamp Extension Harness			
S107 (Diesel).....	Engine Harness, Approx. 31 cm from Breakout to BPMV toward EGR Valve			
S114.....	Engine Harness, Approx. 16 cm from into Fuse-Relay Center Breakout			
S128 .....	Forward Lamps Harness, 5 cm right of RH Headlamp Breakout toward G112			
S129 (VIN J).....	Engine Harness at Starter Breakout			

**COOLING FAN**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG FIG. CONN</b>
S130 (VIN J).....	Engine Harness, at Starter Breakout	
S131 (VIN J).....	In Underhood Fuse Relay Center Breakout, Approx. 8 cm from Engine Harness	
S132 (VIN J).....	Underhood Fuse Relay Center Breakout, Approx. 10 cm from Engine Harness	
S147 (VIN W, M, R) .....	Engine Harness, Approx. 6.5 cm from EGR Breakout toward Taillamp Extension Harness Breakout	
S147 (VIN J).....	Engine Harness, Approx. 5 cm from Fuel Injector Breakout toward Taillamp Extension Harness Breakout	
S147 (Diesel).....	Engine Harness, Approx. 4 cm from Breakout to Glow Plugs (RH Side)	
S212 .....	I/P Harness, Approx. 4 cm from I/P Cluster Breakout toward Radio	

**DIAGNOSIS - AUXILIARY COOLING FAN****TROUBLESHOOTING HINTS:**

1. CHECK condition of IGN E Fuse and AUX FAN Fuse. If either Fuse is open, then LOCATE and REPAIR source of overload. Replace Fuse(s).
2. CHECK that Grounds G105, G112, and G200 are clean and tight.
3. CHECK that the Auxiliary Cooling Fan Relay is securely mounted in its socket.
4. If the Recirculation Door Motor does not move to the Recirculation position when the Auxiliary Cooling Fan is operated by the Auxiliary Cooling Fan A/C Pressure Switch, then Diode D101 may have opened.
5. If the Auxiliary Cooling Fan operates when the A/C controller places the Recirculation Door in the Recirculation position, then Diode D101 may have shorted.
6. If the Recirculation Door moves to the Recirculation position in response to Auxiliary Cooling Fan

operation by the Auxiliary Cooling Fan Temperature Switch, then Diode D100 may have shorted.

7. If the Auxiliary Cooling Fan operates in response to the Auxiliary Cooling Fan Temperature Switch but not in response to the Auxiliary Cooling Fan A/C Pressure Switch, then Diode D100 may have opened.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).



**COOLING FAN****AUXILIARY COOLING FAN DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Under what conditions does the Auxiliary Cooling Fan Motor not operate?	Auxiliary Cooling Fan Motor never operates.	GO to step 2.
	Auxiliary Cooling Fan Motor will not operate via Auxiliary Cooling Fan Temperature Switch.	GO to step 6.
	Auxiliary Cooling Fan Motor will not operate via the Auxiliary cooling Fan A/C Pressure Switch.	GO to step 7.
2. Remove Auxiliary Cooling Fan Relay from the Underhood Fuse-Relay Center. Connect a test lamp from Auxiliary Cooling Fan Relay Cavity "30" to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (1540) wire between Auxiliary Cooling Fan Relay and the AUX FAN Fuse in the Underhood Fuse-Relay Center.
	Test lamp lights.	GO to step 3.
3. Turn Ignition Switch to RUN. Connect a test lamp from Auxiliary Cooling Fan Relay Cavity "85" to ground.	Test lamp does not light.	LOCATE and REPAIR open PNK (639) wire between IGN FUSE and the Auxiliary Cooling Fan Relay in the Underhood Fuse-Relay Center.
	Test lamp light.	GO to step 4.
4. Connect a Fused jumper from Auxiliary Cooling Fan Relay cavities "30" to "87".	Auxiliary Cooling Fan Motor Runs.	Check for an open in LT GRN (37) wire between S129 and Underhood Fuse-Relay Center. If OK, REPLACE Auxiliary Cooling Fan Relay.
	Auxiliary Cooling Fan Motor does not run.	GO to step 5.
5. Connect a self-powered test lamp from Auxiliary Cooling Fan Motor connector Cavity "A" to ground.	Test lamp does not light.	LOCATE and REPAIR open in BLK (250) wire between Auxiliary Cooling Fan Motor and G112.
	Test lamp lights.	Check for an open in RED (702) wire between Underhood Fuse-Relay Center and Auxiliary Cooling Fan Motor. If OK, REPLACE Auxiliary Cooling Fan Motor.
6. Disconnect Auxiliary Cooling Fan Temperature Switch Connector. Turn Ignition Switch to RUN. Connect a Fused jumper from Auxiliary Cooling Fan Temperature Switch Connector Cavity "A" to ground.	Auxiliary Cooling Fan Motor runs.	REPLACE Auxiliary Cooling Fan Temperature Switch.
	Auxiliary Cooling Fan Motor does not run.	LOCATE and REPAIR open in LT GRN (37) wire between Auxiliary Cooling Fan Temperature Switch and S129.
7. Disconnect Auxiliary Cooling Fan A/C Pressure Switch Connector. Turn Ignition Switch to Run. Connect a Fused jumper form Auxiliary Cooling Fan A/C Pressure Switch Connector Cavity "A" to ground.	Auxiliary Cooling Fan Motor runs.	Check for an open in BLK (150) wire between Auxiliary Cooling Fan A/C Pressure Switch and Ground G105. If OK, REPLACE Auxiliary Cooling Fan A/C Pressure Switch.
	Auxiliary Cooling Fan Motor does not run.	LOCATE and REPAIR open in DK GRN/WHT (1614) wire between A/C High Pressure Switch and S129. REPLACE Diode D100 if open.

**COOLING FAN****AUXILIARY COOLING FAN RUNS CONTINUOUSLY**

TEST	RESULT	ACTION
1. Disconnect Auxiliary Cooling Fan Relay in the Underhood Fuse-Relay Center.	Auxiliary Cooling Fan Motor Stops.	GO to step 2.
	Auxiliary Cooling Fan Motor continues to run.	LOCATE and REPAIR short to voltage in RED (702) wire between Underhood Fuse-Relay Center and Auxiliary Cooling Fan Motor.
2. Connect a Digital Multimeter from Auxiliary Cooling Fan Relay Cavity "87" to B+. Measure voltage.	Less than 10.0 volts.	REPLACE Auxiliary Cooling Fan Relay.
	More than 10.0 volts.	GO to step 3.
3. Reconnect Auxiliary Cooling Fan Relay to Underhood Fuse-Relay Center. Disconnect Auxiliary Cooling Fan Temperature Switch Connector.	Auxiliary Cooling Fan Motor stops.	REPLACE Auxiliary Cooling Fan Temperature Switch.
	Auxiliary Cooling Fan Motor Continues to run.	GO to step 4.
4. Reconnect Auxiliary Cooling Fan Temperature Switch Connector. Disconnect A/C Pressure Switch Connector.	Auxiliary Cooling Fan Motor stops.	REPLACE Auxiliary Cooling Fan A/C pressure Switch.
	Auxiliary Cooling Fan Motor continues to run.	Check for a short to ground in LT GRN (37) wire between Underhood Fuse-Relay Center and Auxiliary Cooling Fan Temperature Switch or in Diode D100, Diode D101, and the DK GRN/WHT (1614) wire between Auxiliary Cooling Fan A/C Pressure Switch. If OK, CHECK A/C Controller per SECTION 8A-63.

**CIRCUIT OPERATION**

Auxiliary Cooling Fan operating Voltage is available at all times from the 30 Amp AUX FAN Mini-Fuse located in the Underhood Fuse-Relay Center. Voltage is provided from the Fuse through the ORN (1540) wire which terminates at Pin 30 of the Auxiliary Cooling Fan Relay. When the Relay's Coil is energized, Relay contacts close to apply operating Voltage to the Auxiliary Cooling Fan Motor. The RED (702) wire connects Relay Pin 87 to Motor Pin B. The Motor is grounded from Pin A by the BLK (250) wire to Ground G112.

Voltage to the Auxiliary Cooling Fan Relay Coil is available when the Ignition Switch is in RUN, BULB TEST or START. Relay Coil Voltage is supplied at Pin 85 by the PNK (639) wire from the 10 Amp IGN E Mini-Fuse located in the Underhood Fuse-Relay Center. The Auxiliary Cooling Fan Relay Coil is energized whenever either of two potential ground paths is provided. The LT GRN (37) wire connects Pin 86 of the Relay to Pin A of the Auxiliary Cooling Fan Temperature Switch and to the mode of Diode D100. Diode D100 enables current flow through the Auxiliary Cooling Fan A/C Pressure Switch

when the Switch operates to ground the Relay Coil. Diode functions are described later in the SECTION.

When the Engine coolant reaches a set point, the Auxiliary Cooling Fan Temperature Switch closes the contacts. This provides a ground path from the Auxiliary Cooling Fan Relay Coil through the LT GRN (37) wire and through the Switch contacts to ground at the Engine. The Temperature Switch provides the ground connection at the Engine. The Relay Coil is energized, the contacts close, and the Fan Motor starts.

The Auxiliary Cooling Fan will also operate when the Auxiliary Cooling Fan A/C Pressure Switch operates in response to an increasing compressor high side pressure. When the high side pressure increases to a set point, the Pressure Switch contacts close. This provides a ground path for the Auxiliary Cooling Fan Relay Coil through the LT GRN (37) wire to Diode D100. Through Diode D100, through the LT GRN (1614) wire, through the Pressure Switch contacts and through the BLK (150) wire to Ground G105. The Relay Coil is energized, contacts close, and the Fan Motor starts.

## COOLING FAN

Operation of the Auxiliary Cooling Fan A/C Pressure Switch can also affect the position of the Air Conditioning Recirculation Door. During normal operation of the Recirculation Door, the A/C Controller places the door in the Recirculation position by grounding the Recirculation Door Motor. The ground path is through the DK GRN (1614) wire from door Pin A to A/C controller connector C3, Pin 4. When the ground path is removed, the Recirculation Door moves from the Recirculation Position.

When the Auxiliary Cooling Fan A/C Pressure Switch operates to start the Auxiliary Cooling Fan, it also provides another ground path for the Recirculation Door Motor. If

the Door Motor is not already grounded, it is now grounded from Pin 6 through the DK GRN (1614) wire, through Splice S212, through Diode D101, through Splice S114, and through the Pressure Switch to Ground G105. The Door Motor operates to place the Recirculation Door in the Recirculation Position.

Diode D100 prevents the Recirculation Door Motor from being grounded by the Auxiliary Cooling Fan Temperature Switch. Diode D101 prevents operation of the Auxiliary Cooling Fan when the A/C Controller grounds the Recirculation Door Motor.

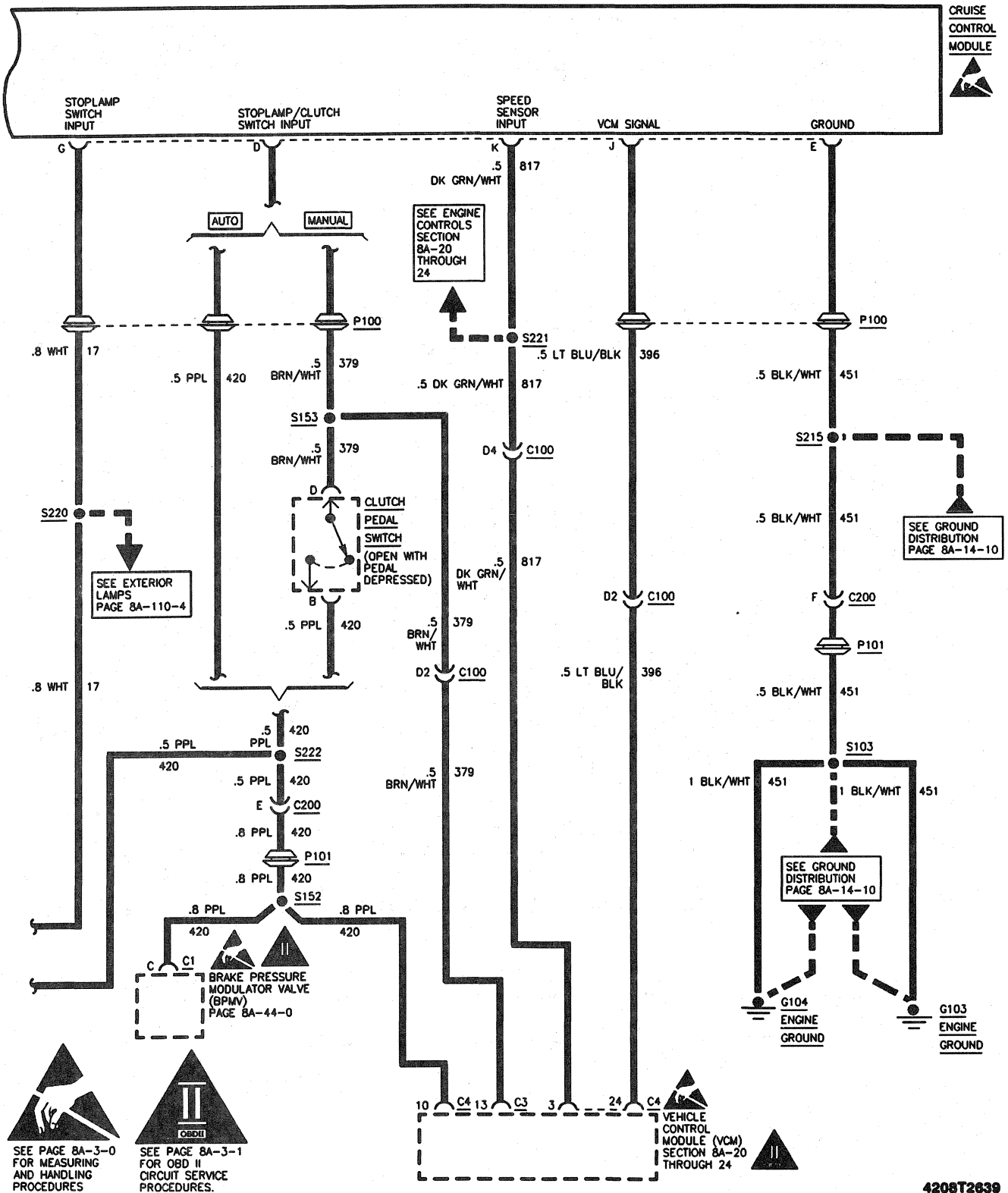
**VEHICLE SPEED SENSOR BUFFER  
DIESEL ENGINE**

For Schematic, Circuit Operation and System Diagnosis regarding the Vehicle Speed Sensor Buffer System, refer to SECTION 6 Engine Controls.

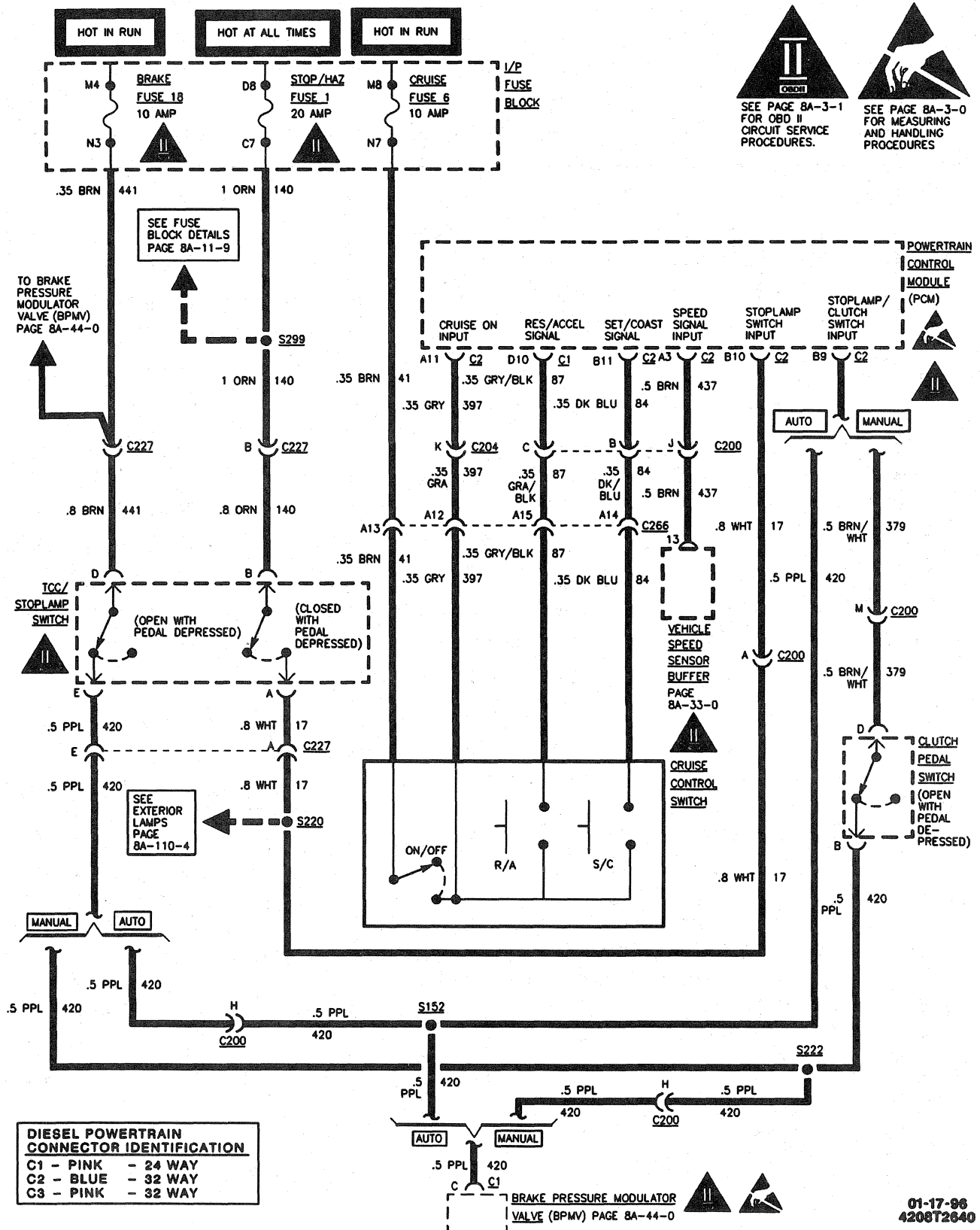
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C1 -	BLU	-	32	WAY
C2 -	RED	-	32	WAY
C3 -	CLR	-	32	WAY
C4 -	BLK	-	24	WAY
C5 -	BLK	-	5	WAY



# CRUISE CONTROL DIESEL ENGINES





**CRUISE CONTROL**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse.....	22 .....	33	
Clutch Pedal Switch.....	At top of Clutch Pedal			
Cruise Control Module .....	LH rear side of Engine Compartment, on Bulkhead.....	22 .....	34.....	202-15
Cruise Control Switch.....	In Turn Signal Lever			
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Powertrain Control Module (PCM).....	Under RH end of I/P, above Blower Motor .....	24 .....	38	
TCC/Stoplamp Switch.....	Top of Brake Pedal.....	27 .....	43	
Vehicle Control Module (VCM)	Engine Compartment, near BPMV Module .....	24 .....	37	
Vehicle Speed Sensor Buffer (Diesel) .....	Under RH side of I/P .....	26 .....	40.....	202-45
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24 .....	38.....	202-4, 5
C266.....	LH side of Steering Column, near Bulkhead.....	27 .....	48.....	202-8
<b>GROUND:</b>				
G103 (Gas) .....	RH front of Engine, near Thermostat Housing .....	10 .....	16	
G104 (Gas) .....	RH top of Cylinder Head, near center .....	12 .....	18	
G104 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
<b>GROMMETS:</b>				
P100 .....	LH rear of Engine Compartment, at Bulkhead.....	3 .....	7	
P101 .....	RH rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S103 (VIN W, M, R) .....	Engine Harness, approx. 11 cm from Breakout to EGR Valve toward Taillamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, approx. 35 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S152 (Gas).....	Engine Harness, approx. 6.5 cm from Underhood Fuse - Relay Center Breakout toward VCM			
S152 (Diesel).....	Engine Harness, approx. 4 cm from I/P Harness Breakout toward P101			
S153 .....	I/P Harness, approx. 17.5 cm from Cruise Control Module toward P100			
S215 .....	I/P Harness, approx. 8 cm from I/P Cluster Breakout toward Radio			
S220 .....	I/P Harness, approx. 12 cm from TCC Stop Lamp Switch Connector			

**CRUISE CONTROL**

COMPONENT	LOCATION	201-PG FIG. CONN
S221 .....	I/P Harness, approx. 16 cm from I/P Cluster Breakout toward Radio	
S222 .....	I/P Harness, approx. 20 cm Right of Heater and A/C Control Breakout	
S299 .....	I/P Harness, approx. 4 cm into Steering Column Harness Breakout	

**DIAGNOSIS - CRUISE CONTROL****TROUBLESHOOTING HINTS:**

1. CHECK condition of BRAKE, STOP/HAZ, and CRUISE Fuses. If Fuse is open, LOCATE and REPAIR source of overload. Replace Fuse.
2. If any Driveability Codes are Set, See SECTION 3 of Driveability and Emissions.
3. If any ABS Codes are Set, See SECTION 5E1.

**! Important:**

- The "Set to get Cruise" feature requires the operator to set the initial Set Speed by using the "Set/Coast" button before the "Resume/Accel" Slider Switch input will be recognized whenever Cruise is turned "OFF" or Ignition Switch is closed.

**! Important:**

- The "Brake Before Cruise" feature requires the Cruise Module to see Terminal "D" change states, once each Ignition Cycle before allowing Cruise Control. (Some Cruise Modules will use either "D" or "G").

4. CHECK that Cruise Control Module Linkage is connected and moving freely.
5. CHECK Cruise Cable Adjustment. See SECTION 9B.
  - CHECK that CKT 17 and the Stoplamps are working properly. If inoperative, Cruise Module will be disabled.
  - Cruise performance can be affected by Trailer Towing and steep grades.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may effect the integrity of other system (see "Troubleshooting Procedures" page 8A-4-0).
  - REFER to System Diagnosis
6. For Diagnosis of Cruise Control with Diesel Engine REFER to Diesel Engine Controls SECTION 6.

**CRUISE CONTROL****SYMPTOM TABLE**

Cruise Control is Inoperative	REFER to Table 1 for diagnosis.
Cruise Surges	REFER to Table 1 for diagnosis. If all OK, CHECK for Harness routing near Spark Plugs. Also, check Cruise Control Cable adjustment. REFER to SECTION 9B of the C/K Service Manual for adjustment procedures.
Cruise does not engage	REFER to Table 1 for diagnosis. If all OK, Inspect/Adjust Cruise Control Cable, REFER to SECTION 9B of the C/K Service Manual for adjustment procedures.
Loses speed	CHECK for proper Cruise Control Cable adjustment. REFER to SECTION 9B of the C/K Service Manual for adjustment procedures.
Loses speed on hills	CHECK for proper Cruise Control Cable adjustment. REFER to SECTION 9B of the C/K Service Manual for adjustment procedures.
Gains speed on down hills	System is not capable of Braking vehicle.
Gains/Loses a certain amount on engagement	CHECK for proper Cruise Control Cable adjustment. REFER to SECTION 9B of the C/K Service Manual for adjustment procedures.
Tap-Up/Down Inop	REFER to Table 2 for diagnosis.
Drops Out/Turns off after certain amount of miles traveled	REFER to Table 1 for diagnosis. If all OK, CHECK resistance of Brake Switch. If resistance is greater than 5 ohms, REPLACE Switch and call Technical Assistance.
Resume/Accelerate Inop	REFER to Table 2 for diagnosis.
Drops out after bumps	CHECK in-line connectors for proper Terminal contact. If all OK, REPLACE TCC/Stoplamp Switch. REFER to SECTION 5 for replacement procedures.
Drops out after Turn Signal/Tilt Wheel operation	Inspect/Repair Steering Column Wiring.

**CRUISE CONTROL IS INOPERATIVE (TABLE 1)**

TEST	RESULT	ACTION
1. Disconnect Cruise Control Module. Turn Ignition to "RUN". Ensure Cruise Control Switch is off. Connect test lamp from BRN (41) wire at Connector C266 Terminal A13 to ground	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (41) wire between I/P Fuse Block and Connector C266.
2. Connect test lamp from GRY (397) wire at Cruise Control Module Connector to ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in GRY (397) wire between Cruise Control Switch and Cruise Control Module. If no short REPLACE Cruise Control Switch.
	Test lamp does not light.	GO to step 3.
3. Connect test lamp from GRY/BLK (87) wire at Cruise Control Module Connector to ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in GRY/BLK (87) wire between Cruise Control Module and Cruise Control Switch. If no short REPLACE Cruise Control Switch.
	Test lamp does not light.	GO to step 4.

**8A - 34 - 6 ELECTRICAL DIAGNOSIS****CRUISE CONTROL**

TEST	RESULT	ACTION
4. Connect test lamp from DK BLU (84) wire at Cruise Control Module Connector to ground.	Test lamp lights.	LOCATE and REPAIR short to voltage in DK BLU (84) wire between Cruise Control Module and Cruise Control Switch. If no short REPLACE Cruise Control Switch.
	Test lamp does not light.	GO to step 5.
5. Slide Cruise Control Switch to on. Connect test lamp from GRY (397) wire at connector C266 to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	REPLACE Cruise Control Switch.
6. Connect test lamp from GRY (397) wire at Cruise Control Module Connector to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (397) wire between Connector C266 and Cruise Control Module.
7. Connect test lamp from BRN (41) at Cruise Control Module Connector to ground.	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (41) wire between Cruise Control Module and I/P Fuse Block.
8. Connect A Self Powered test lamp from BLK/WHT (451) wire at Cruise Control Module Connector to ground.	Test lamp lights.	GO to step 9.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Cruise Control Module and ground.
9. Connect test lamp from GRY/BLK (87) wire at Connector C266. Slide the Cruise Control Switch to Resume/ACC and Hold.	Test lamp lights.	GO to step 10.
	Test lamp does not light.	REPLACE Cruise Control Switch.
10. Connect test lamp from GRY/BLK (87) wire at Cruise Control Module Connector to ground. Slide Cruise Control Switch to Resume/ACC and Hold.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in GRY/BLK (87) wire between Cruise Control Module and Connector C266.
11. Connect test lamp from DK BLU (84) wire at Cruise Control Module Connector to Ground. Push Cruise Control Switch Set/Coast "ON" and Hold.	Test lamp lights.	GO to step 13.
	Test lamp does not light.	GO to step 12.
12. Connect test lamp from DK BLU (84) wire at Connector C266 to ground. Push Cruise Control Switch Set/Coast "ON" and Hold.	Test lamp lights.	LOCATE and REPAIR open in DK BLU (84) wire between Connector C266 and Cruise Control Module.
	Test lamp does not light.	REPLACE Cruise Control Switch.
13. Ensure Brake Pedal is not Depressed. Connect test lamp from WHT (17) wire at Cruise Control Module Connector to ground.	Test lamp lights.	GO to step 14.
	Test lamp does not light.	GO to step 15.
14. With test lamp still connected from WHT (17) wire at Cruise Control Module Connector, Disconnect TCC/Stoplamp Switch.	Test lamp lights.	LOCATE and REPAIR short to voltage in WHT (17) wire between Cruise Control Module and TCC/Stoplamp Switch.
	Test lamp does not light.	REPLACE TCC/Stoplamp Switch.

TEST	RESULT	ACTION
15. With test lamp still connected to WHT (17) wire Depress Brake Pedal.	Test lamp lights.	GO to step 16.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (17) wire between Cruise Control Module and Splice S220.
16. Connect test lamp from Cruise Control Module Connector Terminal "D" to ground.	Test lamp lights.	GO to step 17.
	Test lamp does not light.	GO to step 18.
17. With test lamp still connected from Cruise Control Module Connector Terminal "D" to ground, Depress Brake Pedal.	Test lamp lights.	LOCATE and REPAIR short to voltage in PPL (420) and/or GRY/WHT (379) wire between TCC/Stoplamp Switch and Cruise Control Module, if OK REPLACE TCC/Stoplamp Switch.
	Test lamp does not light.	GO to step 20. Manual Transmission. Go to step 23. Auto Transmission.
18. Connect test lamp from PPL (420) wire at TCC/Stoplamp Switch Connector to Ground.	Test lamp lights.	LOCATE and REPAIR open in PPL (420) wire between TCC/Stoplamp Switch and Cruise Control Module. Auto Trans. GO to step 21 Manual Trans
	Test lamp does not light.	GO to step 19.
19. Connect test lamp from BRN (441) wire at TCC/Stoplamp Switch Connector to ground.	Test lamp lights	REPLACE TCC/Stoplamp Switch.
	Test lamp does not light	LOCATE and REPAIR open in BRN (441) wire between I/P Fuse Block and TCC/Stoplamp Switch.
20. Release Brake Pedal. With test lamp still connected from Cruise Control Module Connector Term "D" to ground, Depress Clutch Pedal.	Test lamp lights	REPLACE Clutch Pedal Switch.
	Test does not light	GO to step 23.
21. Connect test lamp from PPL (420) wire at Clutch Pedal Switch to ground.	Test lamp lights	GO to step 22
	Test lamp does not light	LOCATE and REPAIR open in PPL (420) wire between TCC/Stoplamp Switch and Clutch Pedal Switch.
22. Connect a test lamp from BRN/WHT (379) wire at Clutch Pedal Switch to ground.	Test lamp lights	LOCATE and REPAIR open in BRN/WHT (379) wire between Clutch Pedal Switch and Cruise Control Module.
	Test lamp does not light.	REPLACE Clutch Pedal Switch.
23. Turn Ignition off. Disconnect Vehicle Control Module. Connect a self powered test lamp from DK GRN/WHT (817) wire at Cruise Control Module Connector to ground.	Test lamp lights	LOCATE and REPAIR a short to ground in DK GRN/WHT (817) wire between Cruise Control Module and Vehicle Control Module.
	Test lamp does not light.	GO to step 24.

**CRUISE CONTROL**

TEST	RESULT	ACTION
24. Connect a self powered test lamp from DK GRN/WHT (817) wire at Cruise Control Module Connector and Vehicle Control Module.	Test lamp lights	GO to step 25.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN/WHT (817) wire between Cruise Control Module and Vehicle Control Module.
25. Reconnect Cruise Control Module, Place Ignition Switch and Cruise Control Switch to "ON". Connect a voltmeter from DK GRN/WHT (817) wire at Vehicle Control Module Connector to ground. Measure Voltage.	Measured Voltage above 4.5 Volts.	CHECK for poor connections at Vehicle Control Module, if OK REPLACE Vehicle Control Module.
	Measured Voltage below 4.5 Volts.	CHECK for poor connections at Cruise Control Module, if OK, REPLACE Cruise Control Module.

**CRUISE CONTROL WILL NOT RESUME, ACCELERATE, TAP-UP (TABLE 2)**

STEP	ACTION	VALUE(S)	YES	NO
1	1. Disconnect Cruise Control Module. 2. Ignition Switch to "RUN." 3. Cruise Control Switch to "ON." 4. Front probe with a test light Cruise Control Module Connector between Terminal "C" and ground. 5. While observing test light, press and hold the R/A switch. 6. Does the test light illuminate?		GO to step 2	GO to step 3
2	1. CHECK Circuit 87 for a short to ground. 2. CHECK for poor connection at Cruise Control Module Terminal "C." 3. If OK, REPLACE Cruise Control Module. REFER to Cruise Control Module replacement in SECTION 9B. 4. Is replacement complete?		System OK	
3	1. CHECK Circuit 87 for a poor connection or an open. 2. If OK, REPLACE Multi-Function Lever. REFER to SECTION 3F for Multi-function Lever replacement. 3. Is replacement complete?		System OK	

**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 as follows:

- Cruise Control Switch
- TCC/Stoplamp Switch
- Clutch Pedal Switch
- Vehicle Control Module
- Vehicle Speed Sensor

The Cruise Control Module receives Voltage from the Cruise Fuse 6 in RUN or START. A Speed signal is

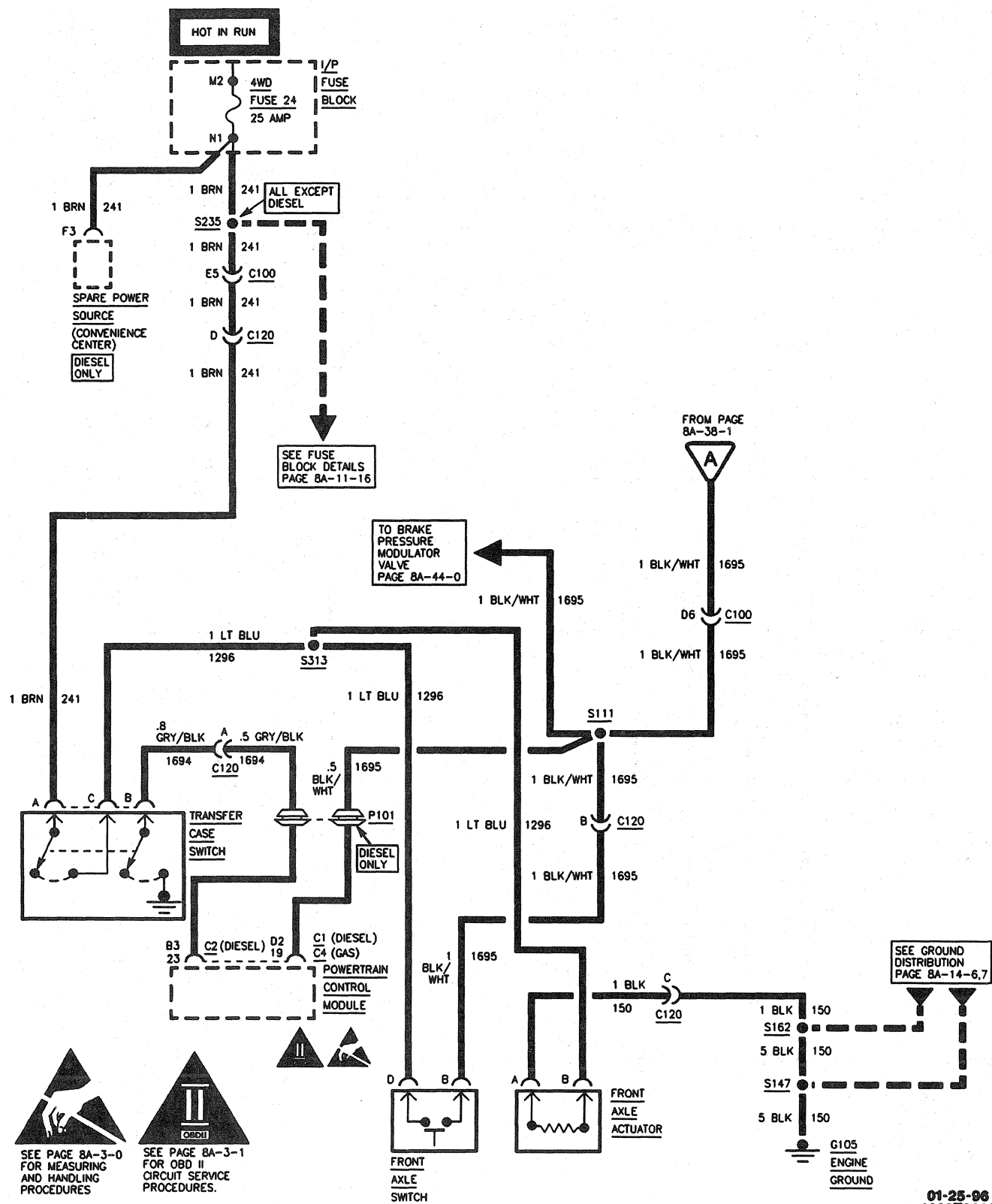
received from the Vehicle Speed Sensor from the Vehicle Control Module. The driver gives his input to the Cruise Control Module through the System Components previously listed. The Cruise Control Module Circuitry receives the driver's input and generates electrical pulses. These pulses cause the Stepper 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 switch which releases the cable when the Cruise Control System must be shut off. This switch will operate when the Brake Pedal is depressed, the Clutch Pedal is depressed, the Cruise Control System is turned off or the Cruise Control System detects a failure.

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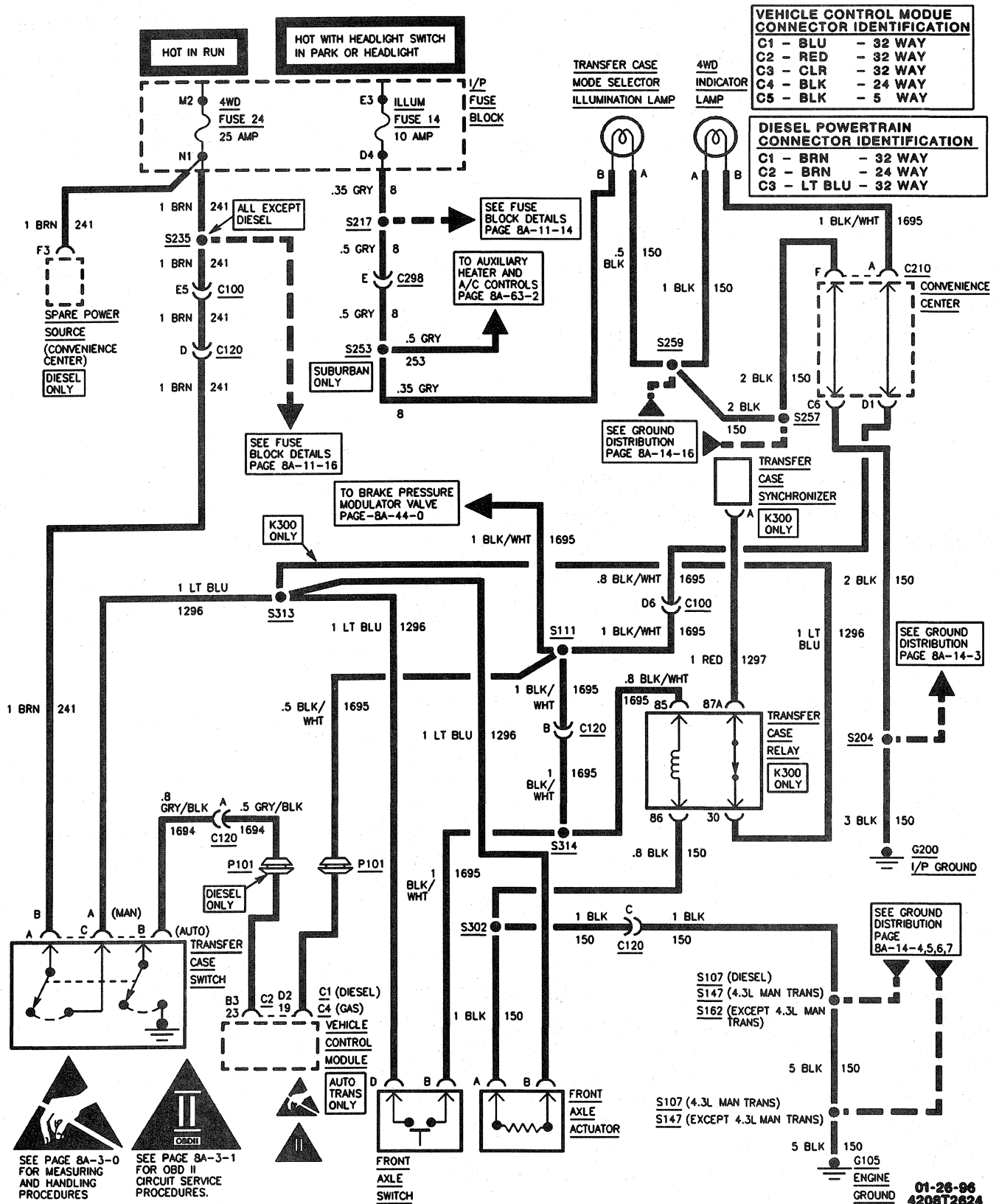








# FOUR WHEEL DRIVE INDICATOR W/O ELECTRIC SHIFT TRANSFER CASE



## 8A - 38 - 4 ELECTRICAL DIAGNOSIS

### FOUR WHEEL DRIVE INDICATOR

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
Four-Wheel Drive Indicator Lamp .....	Center Floor Console .....	31 .....	48	
Front Axle Actuator .....	RH Rear side of Front Drive Axle .....	17 .....	24	
I/P Fuse Block .....	Lower LH side of I/P .....	23 .....	35	
Powertrain Control Module (PCM) .....	Under RH End of I/P .....	24 .....	38	
Transfer Case Control Module..	Under I/P, on Steering Column Support Bracket .....	.....	.....	202-32
Transfer Case Encoder Motor ...	RH side Center of Transfer Case			
Transfer Case Relay .....	RH Rear of Engine Compartment, near Center of Cowl .....	22 .....	25	
Transfer Case Select Switch (Electric Shift only) .....	On I/P			
Transfer Case Shift Illumination Lamp .....	At Transfer Case Selector Lever .....	55 .....	67	
Transfer Case Switch .....	LH Top of Transfer Case .....	25 .....	30	
Vehicle Control Module (VCM)	Engine Compartment, near BPMV Module .....	24 .....	37	

#### CONNECTORS:

C100 .....	LH Rear of Engine Compartment at Bulkhead .....	22 .....	33 .....	202-0
C120 .....	Rear of Engine, near Transmission .....	18 .....	26 .....	202-36
C210 .....	At Convenience Center .....	23 .....	36 .....	202-37
C224 (Electric Shift Transfer Case only) .....	LH Rear of Engine Compartment, Under Brake Master Cylinder .....	22 .....	34 .....	202-38
C225 (Electric Shift Transfer Case only) .....	LH Rear of Engine Compartment, Under Brake Master Cylinder .....	22 .....	34 .....	202-38
C298 .....	Behind LH side of I/P, near Convenience Center .....	23 .....	35 .....	202-7

#### GROMMETS:

P101 .....	RH Lower Cowl (Engine Compartment)
------------	------------------------------------

#### GROUND:

G105 (Gas) .....	RH Top of Cylinder Head .....	9 .....	15
G105 (Diesel) .....	RH Top Rear of Cylinder Head .....	15 .....	21
G200 .....	Behind LH side of I/P, below Fuse Block		

#### SPLICES:

S107 (VIN W) .....	Engine Harness, Approx 30 cm from Breakout to EGR Valve toward Taillamp Extension Harness
S107 (VIN M, R) .....	Engine Harness, Approx 20 cm from Breakout to EGR Valve toward Taillamp Extension Harness

COMPONENT	LOCATION	201-PG FIG. CONN
S107 (VIN J).....	Engine Harness, Approx 20 cm from Fuel Injector Breakout toward Taillamp Extension Harness	
S107 (Diesel).....	Engine Harness, Approx. 31 cm from Breakout to BPMV toward EGR Valve	
S111 (VIN W, M, R).....	Engine Harness, Approx. 3 cm from Breakout to Taillamp Harness toward EGR Valve	
S111 (VIN J).....	Engine Harness, Approx. 6.5 cm from Breakout to Fuse-Relay Center toward Taillamp Harness	
S111 (Diesel).....	Engine Harness, 10.5 cm from Breakout to BPMV toward Glow Plugs	
S204 .....	I/P Harness, Approx. 4 cm left of Steering Column Connector breakout	
S221 .....	I/P Harness, Approx. 4 cm from Engine Harness (C200)	
S235 .....	I/P Harness, Approx. 8 cm from Crossbody Harness Breakout toward P100	
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch	
S271(Suburban/Utility).....	I/P Harness, Approx. 5 cm into Crossbody Harness Breakout	
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout	
S302 (K100/200 w/manual or LD auto trans).....	4WD Harness, Approx. 10 cm right of Engine Harness Breakout	
S302 (K300 w/7.4L) .....	4WD Harness, Approx. 5 cm from Transfer Case Relay Breakout	
S302 (K300 w/o 7.4L) .....	4WD Harness, Approx. 10 cm from Transfer Case Relay Breakout	
S313 .....	4WD Harness, 79 cm from Engine Harness Breakout toward Front Axle Switch	
S314 (K300 w/o 7.4L) .....	4WD Harness, Approx. 5 cm from Transfer Case Relay Breakout	

## FOUR WHEEL DRIVE INDICATOR

## DIAGNOSIS - FOUR-WHEEL DRIVE INDICATOR

## W/MANUAL SHIFT TRANSFER CASE

## TROUBLESHOOTING HINTS:

1. Make sure all Mechanical Components are operative before diagnosing electrical portion of Four-Wheel Drive system.
2. To determine whether Vehicle is in Two-Wheel Drive or Four-Wheel Drive, lift it up so wheels can spin freely.
3. CHECK to see that 4WD and ILLUM Fuses are not open. If open, LOCATE and REPAIR source of overload and REPLACE Fuse.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but

prove "GOOD" in a Continuity/Voltage CHECK with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be CHECKED by monitoring Fuse Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).
4. While performing the following diagnostic procedures, Ignition Switch must be in RUN and 4WD Control Lever must be in 4WD ENGAGED position.

## FOUR-WHEEL DRIVE WILL NOT DISENGAGE

TEST	RESULT	ACTION
1. Place Transfer Case in 2WD position Disconnect Transfer Case Switch.	4WD disengages.	REPLACE Transfer Case Switch.
	4WD does not disengage.	GO to Step 2.
2. Disconnect Front Axle Actuator.	4WD disengages.	REPAIR Short to Battery in CKT 1296.
	4WD does not disengage.	REPLACE Front Axle Actuator.

## FOUR-WHEEL DRIVE INDICATOR LAMP WILL NOT TURN OFF

TEST	RESULT	ACTION
1. Place Transfer Case in 2WD position. Disconnect Transfer Case Switch.	Indicator Lamp goes off.	REPLACE Transfer Case Switch.
	Indicator Lamp Stays on.	REPAIR short to Battery in CKT 1296.

## FOUR-WHEEL DRIVE WILL NOT ENGAGE

TEST	RESULT	ACTION
1. Disconnect Front Axle Actuator. Place Transfer Case in "4WD." Connect a Test Lamp from Terminal "B" to ground with Ignition Switch in "RUN."	Test Lamp on.	CHECK for Open in CKT 150. If OK REPLACE Front Axle Actuator.
	Test Lamp does not Light.	GO to Step 2.
2. Disconnect Transfer Case Switch. Connect a Test lamp CKT 241 to ground with ignition in "RUN."	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPAIR open in CKT 241.
3. Connect a Fused Jumper Between CKTS 241 and 1296 of Transfer Case Switch. Connect a Test Lamp Terminal "B" to ground at Front Axle actuator with Ignition Switch in "RUN."	Test lamp lights.	REPLACE Transfer Case Switch
	Test lamp does not light.	REPAIR open in CKT 1296.

**FOUR-WHEEL DRIVE ENGAGES BUT 4WD INDICATOR LAMP WILL NOT LIGHT**

TEST	RESULT	ACTION
1. Disconnect 4WD Indicator lamp. Place Transfer Case Switch to 4WD. With Ignition Switch in "RUN". Connect a Test lamp Terminal "B" to ground.	Test lamp lights.	CHECK or REPLACE Bulb. If OK, REPAIR open in CKT 150.
	Test lamp does not light.	CHECK for an open in CKT 1695. If OK, REPLACE Front Axle Actuator.

**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 supplied 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 supplied through CKT 1695 across the Four-Wheel Drive indicator lighting the bulb.

Battery Voltage is also supplied through the Front Axle Switch contacts and CKT 1695 to the Rear-Wheel or Four-Wheel Antilock Brake module. This will modify the Antilock Braking System operation in 4WD mode.

A Transfer Case Relay is used on one-ton vehicles with Four-Wheel Drive. This Relay is de-energized when the vehicle is in 4WD mode. From the Transfer Case relay, Voltage is supplied to the Transfer Case synchronizer until 4WD mode is selected.

**SYSTEM DIAGNOSIS****W/ELECTRIC SHIFT TRANSFER CASE**

- REFER to SECTION 7D1A for Circuit Operation and Diagnosis.

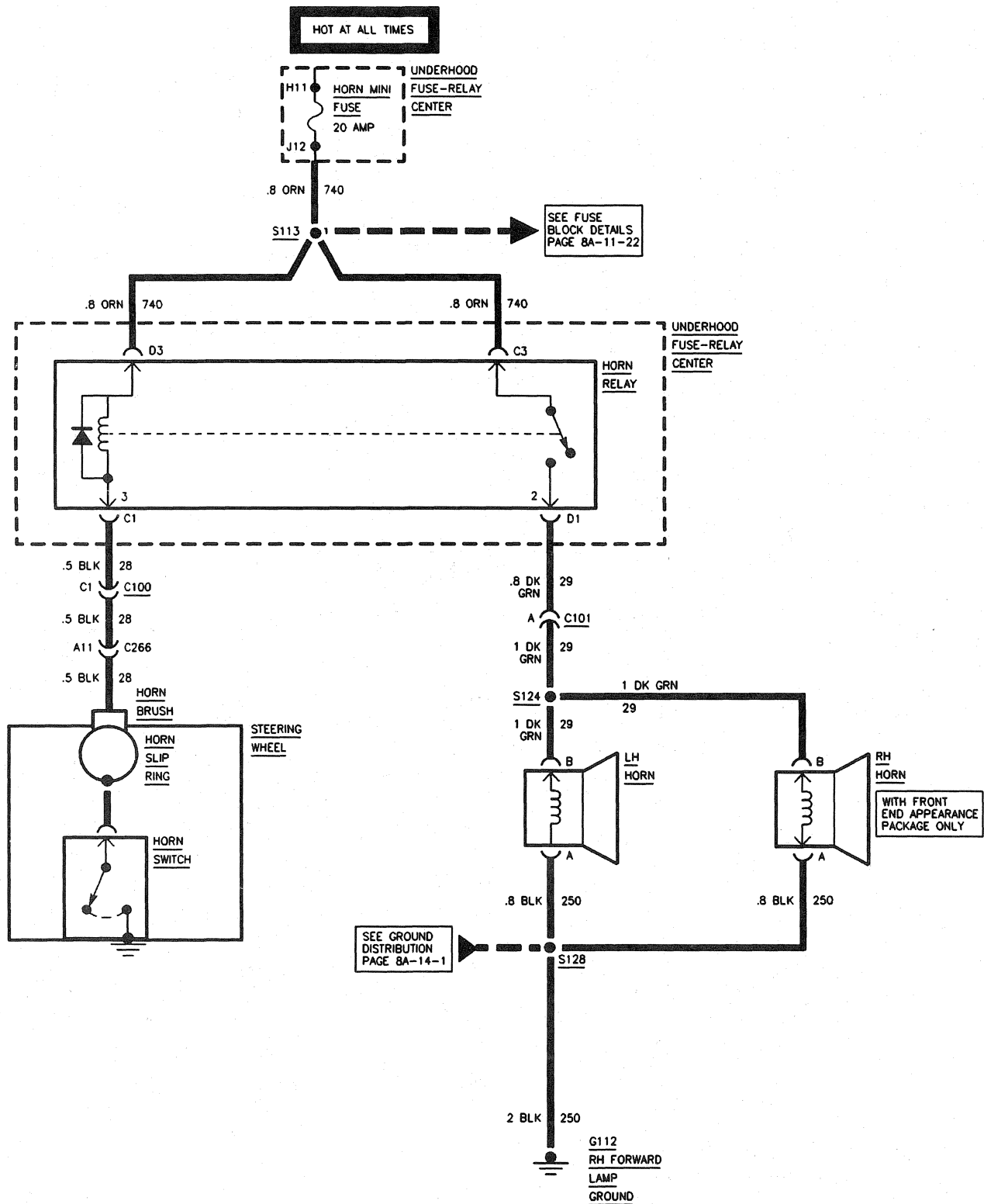
## **AUTOMATIC TRANSMISSION CONTROLS**

For Schematic, Circuit Operation and System Diagnosis regarding the Powertrain Control System, refer to SECTION 7 Transmission Controls.



**BLANK**

## HORNS



COMPONENT	LOCATION	201-PG	FIG.	CONN
Horn LH .....	At Front of Vehicle			
Horn Switch.....	Top of Steering Column under Steering Wheel			
Horn RH .....	At Front of Vehicle .....	3 .....	6	
Horn Relay .....	At Underhood Fuse-Relay center			
Underhood Fuse-Relay Center...	LH Rear of Engine Compartment, on Fender .....	4 .....	8	
<b>CONNECTORS:</b>				
C100 .....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33 .....	202-0
C101 .....	LH rear of Engine Compartment near Fuse Relay Center .....	3 .....	7 .....	202-35
C266 .....	LH side of Steering Column, near Bulkhead.....	27 .....	43 .....	202-8
<b>GROUND:</b>				
G112 .....	RH Front of Engine Compartment, below Underhood Reel Lamp.....	3 .....	6	
<b>SPLICES:</b>				
S113 .....	Engine Harness, 18 cm into Underhood Fuse-Relay Center Breakout			
S124 .....	Forward Lamps Harness Approx. 26.5 cm from LH Headlamp Breakout toward Windshield Washer Pump			
S128 .....	Forward Lamps Harness, 5 cm right of RH Headlamp Breakout toward G112			

## DIAGNOSIS - HORNS

### TROUBLESHOOTING HINTS:

1. CHECK condition of HORN MINI Fuse. If Fuse is open, LOCATE and REPAIR source of overload. REPLACE Fuse.
  2. CHECK that Ground G112 is Clean and Tight.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause a system malfunction but prove "GOOD" in a

Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures," SECTION 8A-0).

## 8A - 40 - 2 ELECTRICAL DIAGNOSIS

### HORNS

#### HORN(S) ARE INOPERATIVE

TEST	RESULT	ACTION
1. Is vehicle equipped with both LH and RH Horn (with V22 only)?	YES.	GO to step 2.
	NO.	GO to step 5.
2. Does LH Horn operate.	YES.	GO TO step 3.
	NO.	GO TO step 5.
3. Backprobe RH Horn Connector with a test lamp from Cavity "A" to B+.	Test lamp does not light.	LOCATE and REPAIR open in BLK (250) wire between RH Horn and G112.
	Test lamp lights.	GO TO step 4.
4. Backprobe RH Horn Connector with a test lamp from Cavity "B" to ground. Press the Horn Switch.	Test lamp lights.	REPLACE RH horn.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (29) wire between RH Horn and S124.
5. Disconnect LH Horn Connector. connect a test lamp from LH Horn Connector Cavity "B" to ground. Press Horn Switch.	Test lamp lights.	GO TO step 6.
	Test lamp does not light.	GO TO step 7.
6. Connect a test lamp from LH Horn Connector Cavity "A" to B+.	Test lamp lights.	REPLACE LH Horn.
	Test lamp does not light.	LOCATE and REPAIR open in BLK(252) wire between LH Horn and G112.
7. Reconnect LH Horn Connector. Remove Horn Relay from Horn Relay Socket. Connect a test lamp from Horn Relay Cavity "C3" to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (740) wire from Horn Mini Fuse to Horn Relay.
	Test lamp lights.	GO TO step 8.
8. Momentarily connect a Fused jumper from Horn Relay Cavity "C3" to Cavity "D1."	Horn(s) sound.	GO TO step 9.
	Horn(s) did not sound.	LOCATE and REPAIR open in DK GRN (29) wire between Horn Relay and LH Horn.
9. Connect a test lamp from Horn Relay Cavity "D3" to ground.	Test lamp lights.	GO TO step 10.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (740) wire between Horn Mini Fuse and Horn Relay Socket.
10. Connect a test lamp from Horn Relay Cavity "C1" to B+. Press horn button.	Test lamp lights.	REPLACE Horn Relay.
	Test lamp does not light.	GO TO step 11.
11. Disconnect Horn Switch Connector. In the Steering Wheel connect a test lamp from Horn Switch terminal (feed side) to B+. Press Horn Button.	Test lamp does not light.	REPLACE Horn Switch.
	Test lamp lights.	CHECK for an open in wiring between Horn Switch and Horn Relay . If OK, REPLACE Horn Brush and Horn Slip Ring.

**HORN(S) SOUND CONTINUOUSLY WITHOUT HORN SWITCH DEPRESSED**

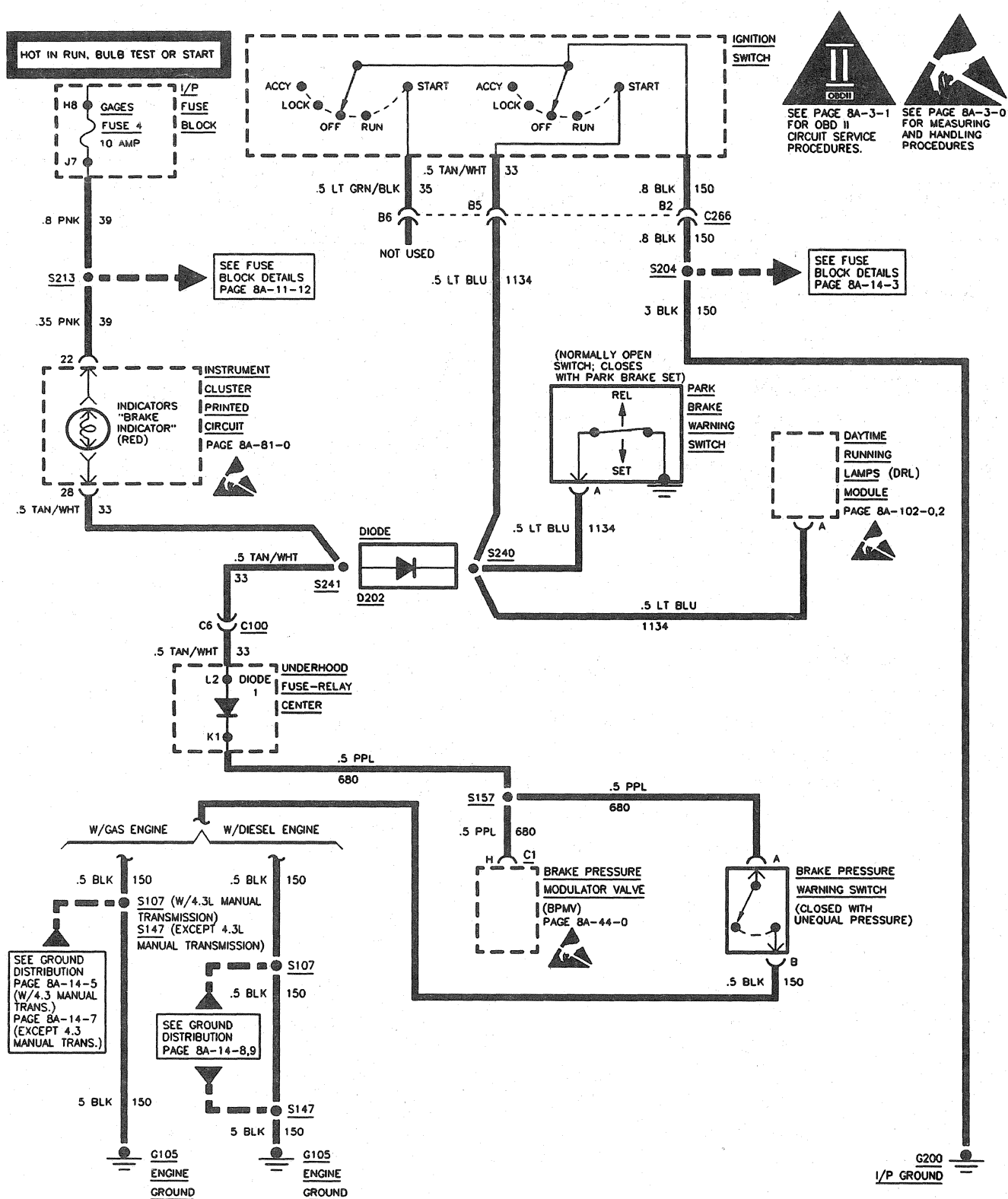
TEST	RESULT	ACTION
1. Remove Horn Relay from Socket.	Horn(s) do not stop.	LOCATE and REPAIR short to B+ in DK GRN(29) wire between Fuse-Relay Center and LH Horn or RH Horn (with V22).
	Horn(s) stop.	GO to step 2.
2. Connect a test lamp from Horn Relay Cavity "C1" to B+.	Test lamp does not light.	REPLACE Horn Relay.
	Test lamp lights.	GO to step 3.
3. Disconnect Horn Switch Connector in the Steering Wheel connect a test lamp from Horn Switch terminal (feed side) to B+.	Test lamp lights.	REPLACE Horn Switch.
	Test lamp does not light.	CHECK for a short to ground in BLK (28) wire between Horn Switch and Horn Relay or in Horn Brush/Horn Slip Ring.

**CIRCUIT OPERATION**

Voltage is applied at all times to the Horn Relay through the HORN MINI FUSE. When the Horn Switch is depressed, the Horn Switch contacts close, thus providing a ground to the coil of the Horn Relay. When the Coil of the

Relay is grounded, the relay energizes and the contacts close, applying Battery Voltage directly to the LH Horn and RH Horn (with V22 only). Because the Horn(s) are grounded at Ground G112, the Horn(s) will sound as long as the Horn Switch is depressed.

## BRAKE WARNING SYSTEM



**BRAKE WARNING SYSTEM**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheel House .....	22 .....	33	
Brake Pressure Warning Switch.....	On rear of Brake Pressure Modulator Valve (BPMV) Casting			
Daytime Running Lamps (DRL) Module .....	Under LH side of I/P, Taped on I/P Harness .....	.....	.....	202-40
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Ignition Switch .....	Under I/P, on Steering Column			
Park Brake Warning Switch .....	At Park Brake, under LH end of I/P			
Underhood Fuse-Relay Center...	LH rear of Engine Compartment, on Fender .....	4 .....	8	
<b>CONNECTORS:</b>				
C100 .....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33 .....	202-0
C266 .....	LH side of Steering Column, near Bulkhead.....	27 .....	43 .....	202-8
<b>DIODES:</b>				
Diode 1 .....	In Underhood Fuse - Relay Center			
D202.....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout toward Park Brake Switch			
<b>GROUND:</b>				
G105 (Gas) .....	RH front of Engine Block.....	9 .....	15	
G105 (Diesel) .....	RH top rear of Cylinder Head .....	15 .....	21	
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN M, R).....	Engine Harness, approx. 20 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN J).....	Engine Harness, approx. 20 cm from Fuel Injector Breakout toward Taillamp Extension Harness			
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve			
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout toward Taillamp Extension Harness Breakout			
S147 (VIN J).....	Engine Harness, approx. 5 cm from Fuel Injector Breakout toward Taillamp Extension Harness Breakout			
S147 (Diesel).....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH Side)			
S157 (Gas).....	Engine Harness, approx. 20 cm into BPMV Breakout			
S157 (Diesel).....	Engine Harness, approx. 22 cm into BPMV Breakout			
S162 (VIN W, M, R) .....	Engine Harness, approx. 12.5 cm from Starter Solenoid Breakout toward LH Oxygen Sensor Breakout			

## 8A - 41 - 2 ELECTRICAL DIAGNOSIS

### BRAKE WARNING SYSTEM

COMPONENT	LOCATION	201-PG FIG.	CONN
S162 (VIN J).....	Engine Harness, approx. 10 cm from Starter Solenoid Breakout toward Oxygen Sensor Harness Breakout		
S213 .....	I/P Harness, approx. 16 cm right of Fuse Block Breakout		
S240 .....	I/P Harness, approx. 4 cm left of Turn Signal Flasher Breakout		
S240 .....	I/P Harness, approx. 11 cm left of Breakout Crossbody Harness Connector C298		
S240 .....	I/P Harness, approx. 4 cm left of Turn Signal Flasher Breakout		
S241 .....	I/P Harness, approx. 4 cm left of Turn Signal Flasher Breakout		
S241 .....	I/P Harness, approx. 11 cm left of Breakout Crossbody Harness Connector C298		
S241 .....	I/P Harness, approx. 4 cm left of Turn Signal Flasher Breakout		

## DIAGNOSIS - BRAKE WARNING SYSTEM

### TROUBLESHOOTING HINTS:

1. CHECK condition of GAGES FUSE 4. If Fuse is Open, LOCATE and REPAIR source of overload and REPLACE Fuse.
2. CHECK that Engine Ground G105 is clean and tight.
3. CHECK the "BRAKE" Indicator Bulb for an open filament.
4. CHECK that the Parking Brake is fully released.
5. Make sure that there is an adequate amount of Brake fluid in the reservoir.
6. If any ABS Diagnostic Codes are Set, see SECTION 5E1.
7. If the Brake Indicator only lights for the Brake Pressure Warning Switch or for the Anti-Lock Brake Module (Ignition Switch Lock to RUN), then Diode D202 may have opened.
8. If the Brake Indicator only lights for the Ignition Switch in BULB test or for the Park Brake Warning Switch, then Diode 1 in the Underhood Fuse-Relay Center may have opened.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).



**BRAKE INDICATOR REMAINS ON CONTINUOUSLY**

TEST	RESULT	ACTION
1. Disconnect Park Brake Switch Connector. Turn Ignition Switch to RUN. CHECK that parking Brake is released.	"BRAKE" Indicator turns off.	CHECK for proper adjustment of Park Brake Warning Switch. If OK, REPLACE Park Brake Warning Switch.
	"BRAKE" Indicator remains on.	GO to step 2.
2. Disconnect Brake Pressure Warning Switch Connector.	"BRAKE" Indicator turns off.	Refer to SECTION 5A for diagnosis of the Hydraulic Brake System.
	"BRAKE" Indicator remains lit.	GO to step 3.
3. Disconnect Antilock Brake Module Connector C1.	"BRAKE" Indicator turns off.	Refer to SECTION 5E1 for diagnosis of the Four Wheel Antilock Brake System.
	"BRAKE" Indicator remains on.	GO to step 4.
4. Disconnect Daytime Running Lamps (DRL) Module Connector.	"BRAKE" Indicator turns off.	REPLACE Daytime Running Lamps (DRL) Module.
	"BRAKE" Indicator remains on.	GO to step 5.
5. Disconnect Ignition Switch Connector.	"BRAKE" Indicator turns off.	CHECK for short to ground at the Ignition Switch. If OK, REPLACE Ignition Switch.
	"BRAKE" Indicator remains on.	GO to step 6.
6. Disconnect Instrument Cluster Printed Circuit Connector. Connect a digital multimeter from Instrument Cluster Printed Circuit Connector Cavity "28" to ground. CHECK for continuity to ground.	No Continuity.	REPLACE Instrument Cluster Printed Circuit.
	Continuity.	CHECK for a short to ground in TAN/WHT (33) wire between Ignition Switch, Park Brake Warning Switch, Daytime Running Lamps (DRL) Module, Antilock Brake Module, and Brake Pressure Warning Switch. If OK, REPLACE Ignition Switch.

**BRAKE WARNING SYSTEM****BRAKE INDICATOR IS INOPERATIVE**

TEST	RESULT	ACTION
1. Under what condition(s) is the "BRAKE" Indicator inoperative?	"BRAKE" Indicator does not light only with Parking Brake engaged.	GO to step 2.
	"BRAKE" Indicator does not light only when Ignition Switch is cycled from the "LOCK" to the RUN position (Antilock Brake System initial self test).	GO to step 3.
	"BRAKE" Indicator does not light only when the Hydraulic Brake System has low Brake Pressure in front or rear Brakes.	GO to step 4.
	"BRAKE" Indicator does not light only while Ignition Switch is in the BULB TEST position.	GO to step 5.
	"BRAKE" Indicator is completely inoperative.	GO to step 6.
	"BRAKE" Indicator does not light either for the Ignition Switch in BULB TEST or for Park Brake Warning Switch but does light for the other conditions.	REPLACE Diode D202.
	"BRAKE" Indicator does not light either for the Antilock Brake Module (Ignition Switch Lock to RUN) or for Brake Pressure Warning Switch but does light for the other conditions.	CHECK for open in the TAN/WHT (33) wire between Diode D202 and Diode D1 in the Underhood Fuse-Relay Center. Also, CHECK for open in the PPL (680) wire between Diode D1 and Splice S157. If OK, REPLACE Diode D1.
2. Disconnect Park Brake Warning Switch Connector. Turn Ignition Switch to RUN. Connect a fused jumper from Park Brake Warning Switch Connector Cavity "A" to ground.	"BRAKE" Indicator lights.	CHECK for improper adjustment of the Park Brake Warning Switch. CHECK Park Brake Warning Switch Connection to ground. If OK, REPLACE Park Brake Warning Switch.
	"BRAKE" Indicator does not light.	LOCATE and REPAIR open in LT BLU (1134) wire between Splice S240 and Park Brake Warning Switch.
3. Disconnect Antilock Brake Module Connector C1. Turn Ignition Switch to RUN. Connect a Fused jumper from Antilock Brake Module Connector C1 Cavity "H" to ground.	"BRAKE" Indicator lights.	Refer to SECTION 5E1 for diagnosis of the Four Wheel Antilock Brake System.
	"BRAKE" Indicator does not light.	LOCATE and REPAIR open in PPL (680) wire between Splice S157 and Antilock Brake Module.
4. Disconnect Brake Pressure Warning Switch Connector. Turn Ignition Switch to RUN. Connect a fused jumper from Brake Pressure Warning Switch Connector Cavity "A" to ground.	"BRAKE" Indicator lights.	CHECK for an open in BLK (150) wire between Brake Pressure Warning Switch and Ground G105. If OK, refer to SECTION 5A for diagnosis of the Combination Valve.
	"BRAKE" Indicator does not light.	LOCATE and REPAIR open in PPL (680) wire between Splice S157 and Brake Pressure Warning Switch.

**BRAKE WARNING SYSTEM**

TEST	RESULT	ACTION
5. Backprobe Ignition Switch Connector with a fused jumper from Cavity "D" to ground. Turn Ignition Switch to BULB TEST.	"BRAKE" Indicator lights.	REPAIR Ignition Switch ground connection or REPLACE Ignition Switch.
	"BRAKE" Indicator does not light.	LOCATE and REPAIR open in LT BLU (1134) wire between Splice S240 and Ignition Switch.
6. Disconnect Instrument Cluster Printed Circuit Connector. Turn Ignition Switch to RUN. Connect a test lamp from Instrument Cluster Printed Circuit Connector Cavity "22" to ground.	Test lamp lights.	CHECK for an open in BLK (150) wire between Brake Pressure Warning Switch and Ground G105. CHECK for an open in TAN/WHT (33) wire between Instrument Cluster and Diode D202. If OK, refer to SECTION 5A for diagnosis of the Combination Valve.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between I/P Fuse Block and Instrument Cluster Printed Circuit.

**CIRCUIT OPERATION**

Battery voltage is applied through the GAGES FUSE 4 to the "BRAKE" Indicator when the Ignition Switch is in the RUN, BULB TEST or START positions. The "BRAKE" Indicator can be lit by having ground applied to it from any of three switches or the Antilock Brake Module.

The "BRAKE" Indicator will light whenever the Parking Brake is engaged. When the Parking Brake is engaged, ground is supplied through the closed contacts of the Parking Brake Warning Switch to the "BRAKE" Indicator. The "BRAKE" Indicator lights to alert the driver that the Parking Brake is engaged.

The "BRAKE" Indicator will light when the Ignition Switch is turned from the "LOCK" to the RUN position. This is when the Antilock Brake Module conducts its initial test which entails lighting the "BRAKE" Indicator and the ABS Indicator. The Antilock Brake Module will also light the "BRAKE" Indicator if there is a malfunction within the Four Wheel Antilock Brake System which is

affecting the operation of the base Hydraulic Braking system.

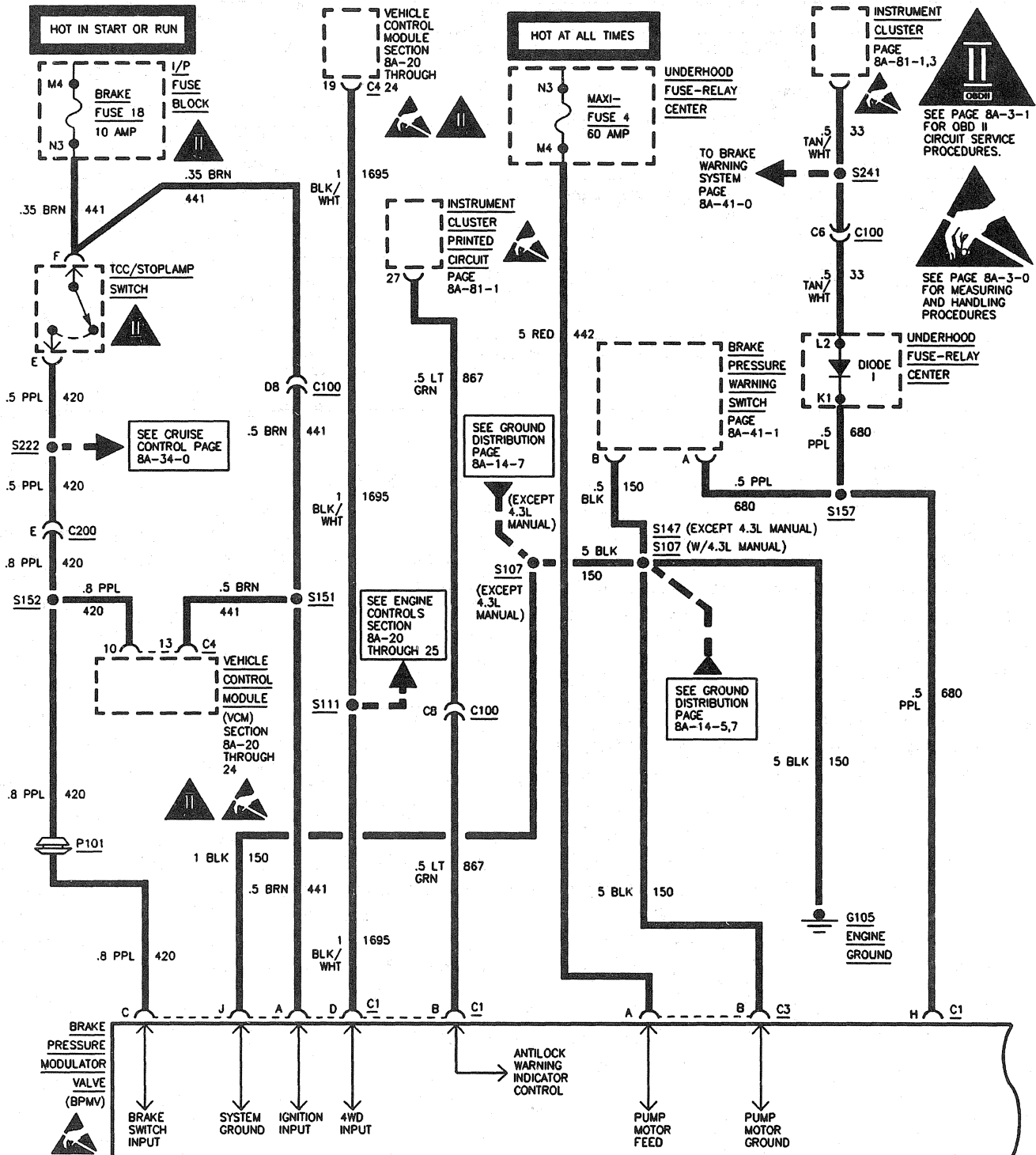
The "BRAKE" Indicator will light if there is low Brake fluid pressure in the front or rear Brakes. When the Combination Valve senses low Brake fluid pressure in the front or rear brakes it closes the Brake Pressure Warning Switch. A ground is supplied through the closed contacts of the Brake Pressure Warning Switch to the "BRAKE" Indicator. With both power and ground applied to the "BRAKE" Indicator, it will light.

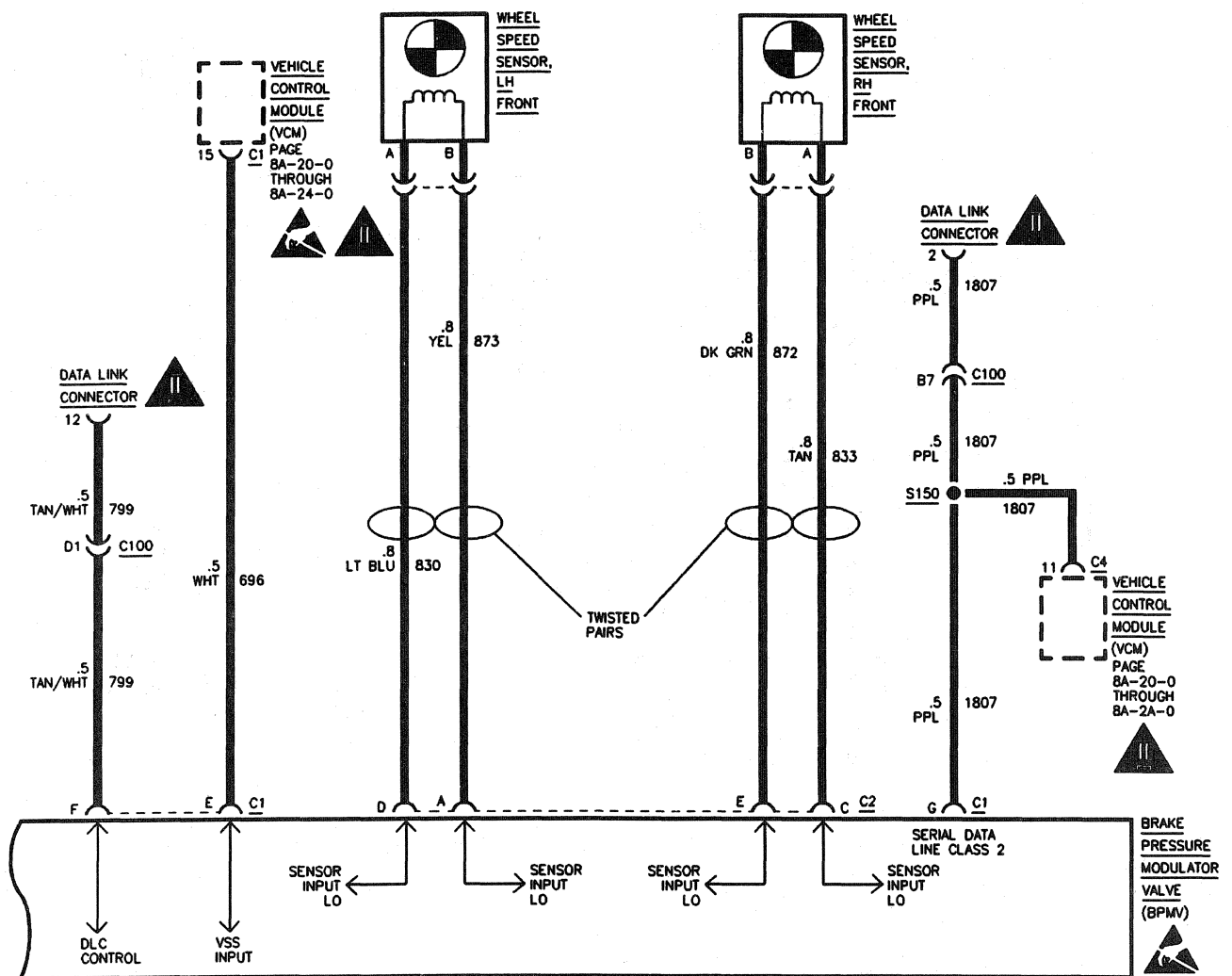
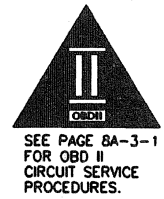
The "BRAKE" Indicator will also light whenever the Ignition Switch is turned to the BULB TEST position.

The Daytime Running Lamps Module senses ground through the Park Brake Warning Switch. When this input is grounded, the Daytime Running Lamps are not energized. Diode D202 prevents Anti-Lock Brake Module or Brake Pressure Warning Switch operation from turning off the Daytime Running Lamps.

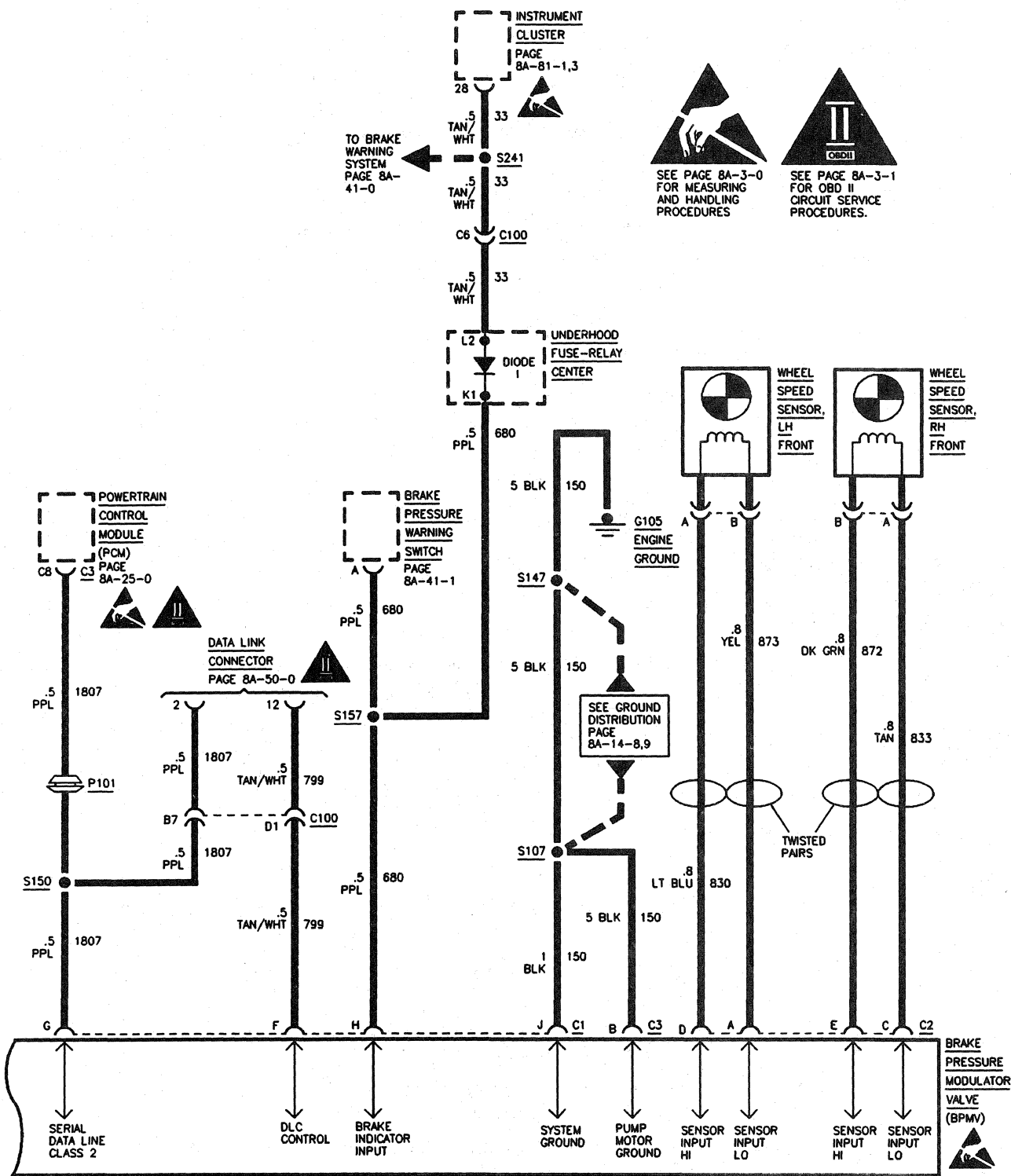
The "BRAKE" Indicator will also light whenever the Ignition Switch is turned to the BULB TEST Position.

# ANTILOCK BRAKES GAS ENGINE









## 8A - 44 - 4 ELECTRICAL DIAGNOSIS

### ANTILOCK BRAKES

COMPONENT	LOCATION	201-PG	FIG.	CONN
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse .....	22.....	33	
Brake Pressure Warning Switch.....	On rear of Brake Pressure Modulator Valve (BPMV) Casting			
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23.....	36	
Data Link Connector (DLC) .....	Under LH side of I/P .....	26.....	41.....	202-16
I/P Fuse Block .....	Lower LH side of I/P .....	23.....	35	
Powertrain Control Module (PCM).....	Under RH End of I/P, above Blower Motor.....	24.....	38	
TCC/Stoplamp Switch .....	Top of Brake Pedal .....	27.....	43	
Underhood Fuse-Relay Center .....	LH rear of Engine Compartment, on Fender.....	4.....	8	
Vehicle Control Module (VCM) .....	Engine Compartment, near BPMV Module .....	24.....	37	
Wheel Speed Sensor, LH Front .....	At LH front Wheel			
Wheel Speed Sensor, RH Front .....	At RH front Wheel			
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22.....	33.....	202-0
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap .....	24.....	38.....	202-4, 5
<b>GROUND:</b>				
G105 (Diesel) .....	RH top of Cylinder Head.....	15.....	21	
G105 (Gas) .....	RH Front of Engine Block.....	9.....	15	
<b>GROMMETS:</b>				
P101 .....	RH rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN M, R) .....	Engine Harness, approx. 20 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN J).....	Engine Harness, approx. 20 cm from Breakout to Fuel Injector Breakout toward Taillamp Extension			
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve			
S111 (Diesel) .....	Engine Harness, approx. 10.5 cm from Breakout to BPMV toward Glow Plugs			
S111 (W, M, R) .....	Engine harness, approx. 3 cm from Breakout to Taillamp Harness toward EGR Valve			



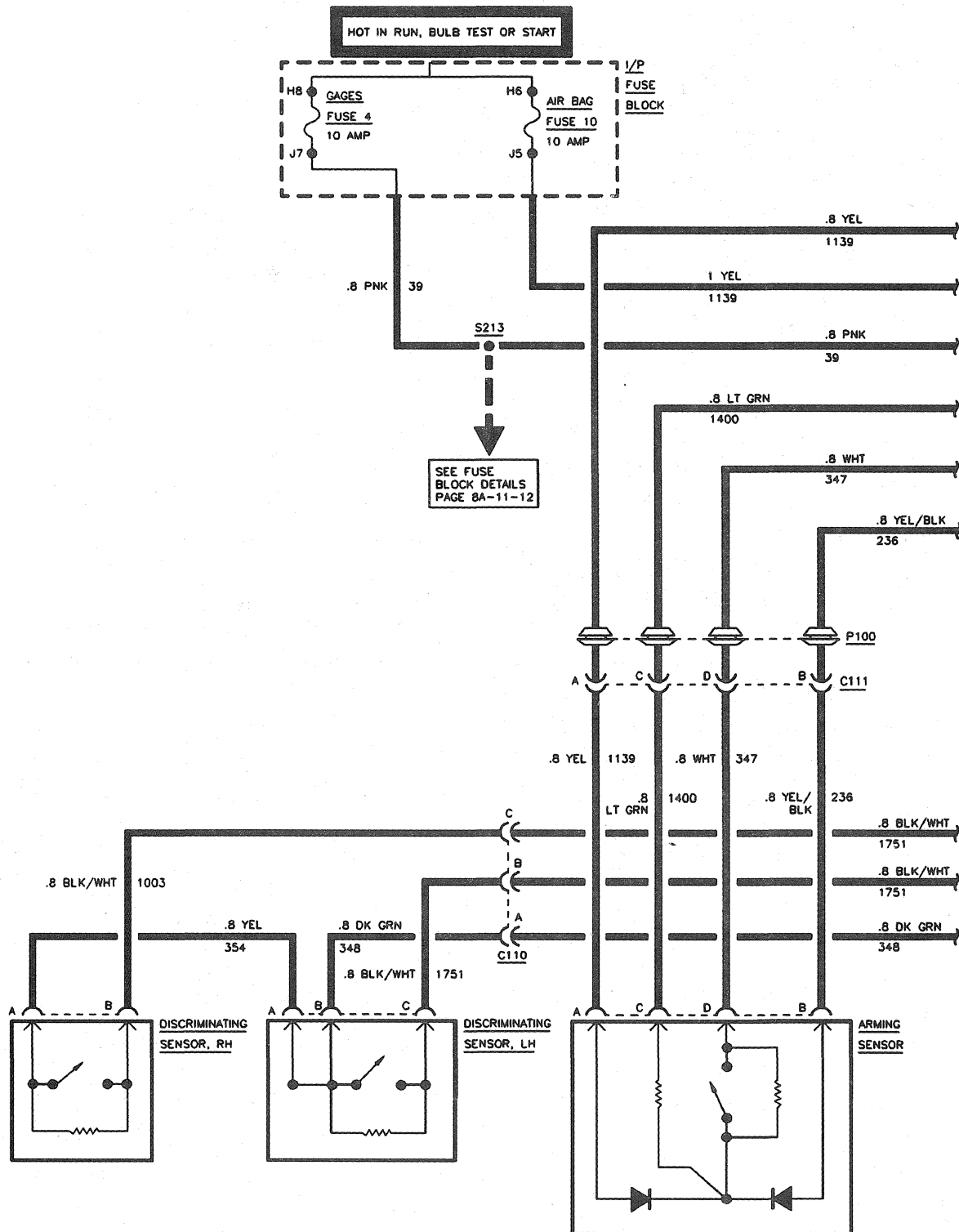
**ANTILOCK BRAKES**

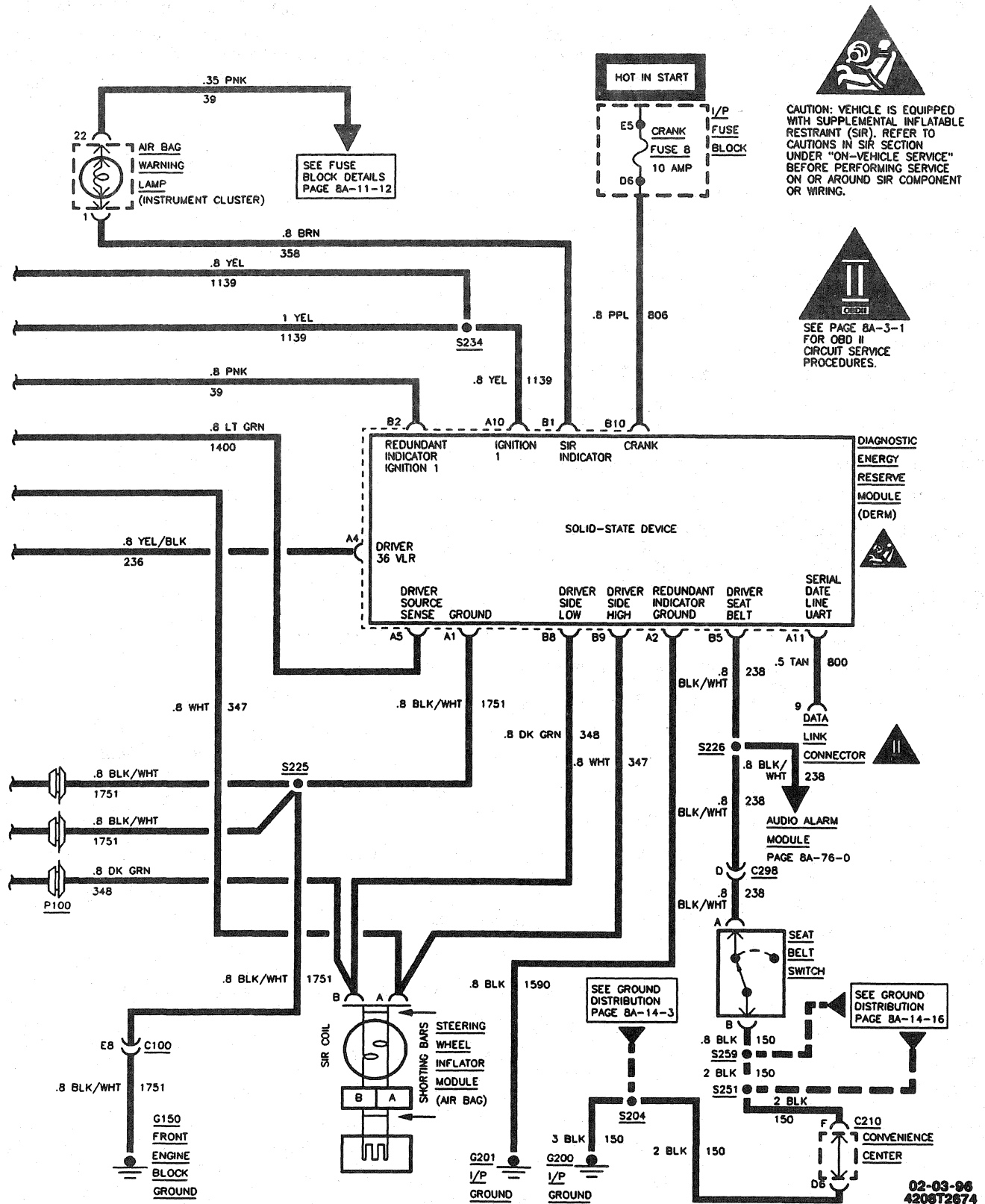
<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG FIG. CONN</b>
S111 (VIN J) .....	Engine Harness, approx. 6.5 cm from Breakout to Fuse-Relay Center toward Taillamp Harness	
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout toward Taillamp Extension Harness Breakout	
S147 (VIN J) .....	Engine Harness, approx. 5 cm from Fuel Injector Breakout toward Taillamp Harness Breakout	
S147 (Diesel) .....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH Side)	
S150 .....	Engine Harness approx. 13 cm into BPMV Breakout	
S151 .....	Engine Harness, approx. 6.5 cm into BPMV Breakout	
S152 (Diesel) .....	Engine Harness approx. 4 cm from I/P Harness Breakout toward P101	
S152 (Gas) .....	Engine Harness, approx. 6.5 cm from Underhood Fuse-Relay Center Breakout toward VCM	
S157 (Diesel) .....	Engine Harness approx. 22 cm into BPMV Breakout	
S157 (Gas) .....	Engine Harness approx. 20 cm into BPMV Breakout	
S162 (VIN W, M, R) .....	Engine Harness, approx. 12.5 cm from Starter Solenoid Breakout toward LH Oxygen Sensor Breakout	
S162 (VIN J) .....	Engine Harness, approx. 10 cm from Starter Solenoid Breakout toward LH Oxygen Sensor Breakout	

**CIRCUIT OPERATION**

This Manual contains Circuit Diagrams and Component Locations only. Circuit Operation, Diagnosis and Repair procedures are contained in Service Manual SECTION 5E.

## SUPPLEMENTAL INFLATABLE RESTRAINT





## 8A - 47 - 2 ELECTRICAL DIAGNOSIS

### SUPPLEMENTAL INFLATABLE RESTRAINT

**CAUTION:** This vehicle is equipped with Supplemental Inflatable Restraint (SIR). Refer to **CAUTIONS** in Section 9J under "ON-VEHICLE SERVICE" and the SIR Component and Wiring Location view in Section 9J before performing service on or around SIR components or wiring. Failure to follow **CAUTIONS** could result in possible air bag deployment, personal injury, or otherwise unneeded SIR system repairs.

COMPONENT	LOCATION	201-PG	FIG.	CONN
Arming Sensor.....	Inside LH Frame Rail, below Drivers Door			
Convenience Center - I/P				
Harness .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
Data Link Connector (DLC) .....	Under LH side of I/P .....	26 .....	41.....	202-16
Diagnostic Energy Reserve Module (DERM).....	Behind center of I/P.....	25 .....	39	
Discriminating Sensor, LH .....	Front outside of LH Frame Rail			
Discriminating Sensor, RH .....	Front outside of RH Frame Rail			
Driver Inflator Module, Air Bag .....	At top of Steering Column.....	28 .....	44	
I/P Fuse Block .....	Lower LH side of I/P.....	23 .....	35	
Instrument Cluster .....	LH upper end of I/P			
Seat Belt Switch.....	At Driver's Stationery Belt Connector .....	33 .....	52	
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C110.....	LH rear of Engine Compartment, near C100 .....	22 .....	34.....	202-35
C111 .....	LH rear of Engine Compartment, below Master Cylinder .....	22 .....	34.....	202-36
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap .....	24 .....	38.....	202-4, 5
C210.....	At Convenience Center.....	23 .....	36.....	202-37
C211 .....	Under Driver's Seat			
C298.....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
<b>GROMMETS:</b>				
P100 .....	LH rear of Engine Compartment, at Bulkhead.....	3 .....	7	
<b>GROUND:</b>				
G150 ( VIN M, R, J).....	RH front of Engine, near thermostat housing.....	10 .....	16	
G200.....	Behind LH side of I/P, below Fuse Block			
G201.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S213 .....	I/P Harness approx. 8 cm from Headlamp Dimmer Switch Breakout toward Cluster			

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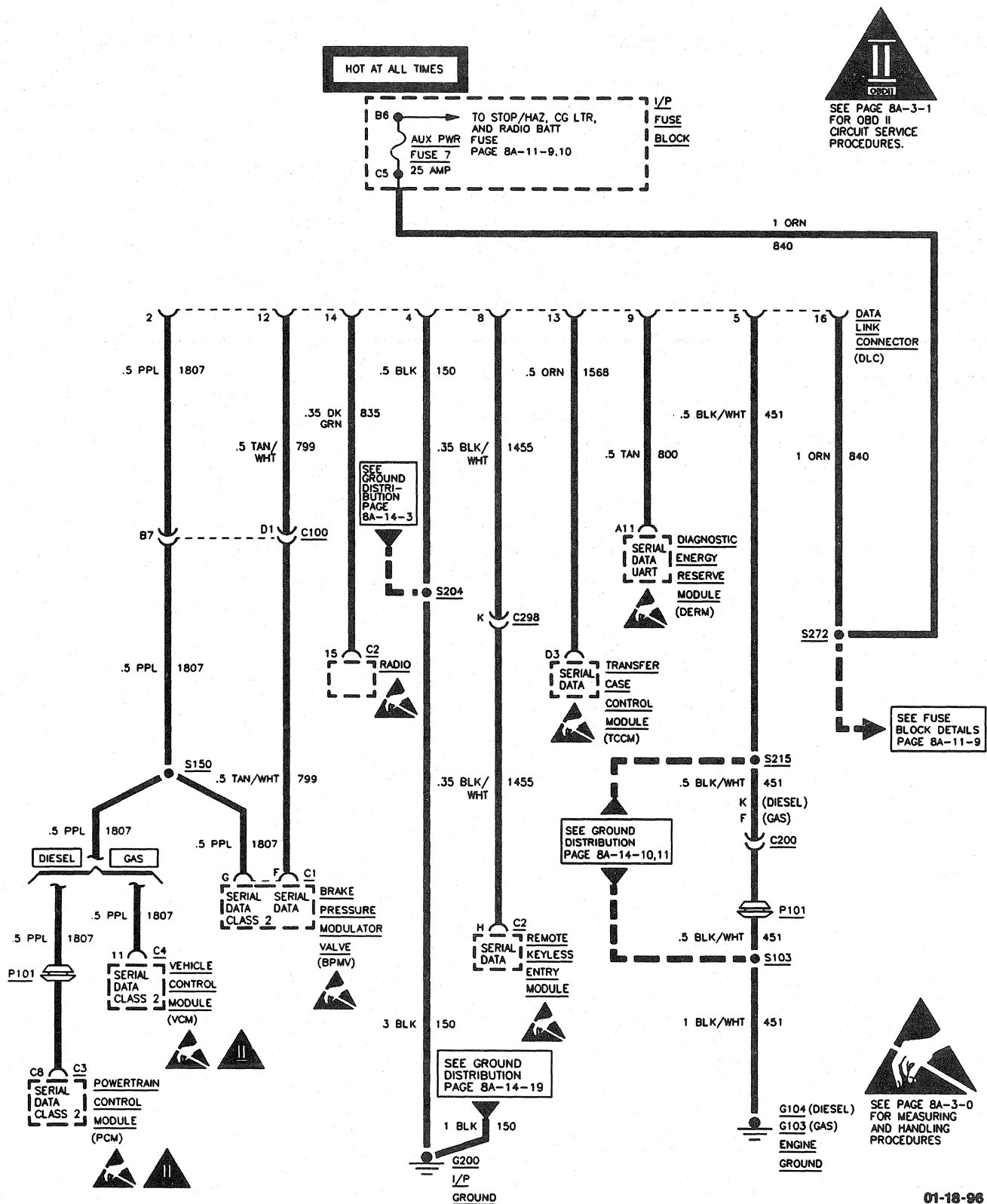
**SUPPLEMENTAL INFLATABLE RESTRAINT**

COMPONENT	LOCATION	201-PG	FIG.	CONN
S225 .....	I/P Harness, approx. 6 cm left of Steering Column Connector Breakout			
S226 .....	Approx. 41 cm from DERM Connector			
S234 .....	I/P Harness, approx. 10 cm left of Breakout for Crossbody Harness Breakout toward P100			
S251 .....	Crossbody Harness, approx. 12.5 cm front of LH Door Harness Breakout toward I/P Harness Breakout			
S259 (Utility/Crew Cab/Pickup/Extended Cab).....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout			

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**CIRCUIT OPERATION**

This manual contains circuit diagrams and Component Locations only. Circuit operation, diagnosis and repair procedures are contained in Service Manual SECTION 9J.



COMPONENT	LOCATION	201-PG	FIG.	CONN
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse.....	22 .....	33	
Data Link Connector (DLC) .....	Under LH side of I/P.....	26 .....	41.....	202-16
Diagnostic Energy Reserve Module (DERM).....	Behind center of I/P.....	25 .....	39	
Powertrain Control Module (PCM).....	Under RH end of I/P, above Blower Motor .....	24 .....	38	
Radio .....	Center of I/P .....	29 .....	46.....	202-29
Remote Control Door Lock Receiver.....	Behind center portion of I/P .....	25 .....	39	
Transfer Case Control Module (TCCM).....	On Steering Column Support Bracket.....	.....	.....	202-32
Vehicle Control Module (VCM) .....	Engine Compartment, near BPMV Module .....	24 .....	37	
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24 .....	38.....	202-36
C298.....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
<b>GROUND:</b>				
G103 (Gas) .....	RH front of Engine near Thermostat Housing .....	10 .....	16	
G104 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
G200.....	Behind LH side of I/P, below Fuse Block			
<b>GROMMETS:</b>				
P101 .....	RH rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S103 (VIN W, M, R) .....	Engine Harness, approx. 11 cm from Breakout to EGR Valve toward Tail lamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, approx. 35 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S103 (Diesel).....	Engine Harness, approx. 11.5 cm from Breakout to Glow Plugs (RH side) toward P101			
S150 .....	Engine Harness approx. 13 cm into BPMV Breakout			
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S215 .....	I/P Harness, approx. 8 cm from of I/P Cluster Breakout toward Radio			
S272 .....	I/P Harness, approx. 4 cm into Auxiliary Power Outlet Breakout			

**DATA LINK CONNECTOR (DLC) PIN ASSIGNMENT****DIAGNOSIS - DLC PIN ASSIGNMENT****TROUBLESHOOTING HINTS:**

1. CHECK condition of AUX PWR Fuse. If Fuse is open, LOCATE and REPAIR source of overload. REPLACE Fuse.
2. CHECK Grounds G103, G104, and G200 are clean and tight.
3. CHECK for 12 volts at terminal 16 (CKT 840) of the DATA LINK CONNECTOR. REPAIR if necessary.
4. CHECK terminal 4, CKT 150 and terminal 5, CKT 451 for continuity to ground. REPAIR if necessary.

**DATA LINE(S)**

1. Check for proper connection of Scan Tool to Data Link Connector (DLC).
2. Check for loose or missing terminals at DLC.
3. If VCM/PCM is not accessible with a Scan Tool, check for an open in PPL (1807) wire between component and DLC terminal 2.
4. If Brake Pressure Modulator Valve is not accessible with a Scan Tool, check for an open in TAN/WHT (799) wire between component and DLC terminal 12.

5. If Diagnostic Energy Reserve Module (DERM) not accessible with a Scan Tool, check for an open in TAN (800) wire between component and DLC terminal 9.
6. If Transfer Case Control Module is not accessible with a Scan Tool, check for an open in ORN (1568) wire between component and DLC terminal 13.
7. Check for proper installation of aftermarket electronic equipment that may affect the integrity of other systems.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures", page 8A-4-0).

**SCAN TOOL WILL NOT COMMUNICATE WITH COMPONENTS ON UART DATA LINE (CKT 800)**

TEST	RESULT	ACTION
1. Disconnect Scan Tool from vehicle. Obtain same model year vehicle with same systems. Connect Scan Tool to Data Link Connector (DLC). Ignition Switch to "RUN." Attempt to establish communications.	Communications can be established.	GO to Step 2.
	Communications could not be established.	Scan Tool may be malfunctioning. Refer to Scan Tool instruction manual.
2. Reconnect Scan Tool to original vehicle. Ignition Switch to "RUN". Attempt to establish communications with Diagnostic Energy Reserve Module (DERM).	Communications can be established.	GO to Step 7.
	Communications could not be established.	GO to Step 3.
3. Ignition Switch "OFF". Disconnect all modules connected to DLC terminal 9. With a DVM, measure resistance on DLC from terminal 9 to terminal 4 (ground).	Resistance greater than 10M ohms.	GO to Step 4.
	Resistance less than 10M ohms.	LOCATE and REPAIR short to ground in TAN (800) wire.
4. Ignition Switch to "RUN". With a DVM, measure voltage on DLC from terminal 9 to terminal 4 (ground).	Voltage less than 1.0 VDC.	GO to step 5.
	Voltage greater than 1.0 VDC.	Ignition Switch "OFF". LOCATE and REPAIR short to voltage in TAN (800) wire.



TEST	RESULT	ACTION
5. Ignition Switch "OFF". With a DVM measure resistance from DLC terminal 9 to terminal A11 on the Diagnostic Energy Reserve Module (DERM).	Resistance less than 5.0 ohms.	GO to Step 6.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in TAN (800) wire.
6. Ensure the Ignition Switch is "OFF". Reconnect the Diagnostic Energy Reserve Module (DERM). Ignition Switch to "RUN". Attempt to establish communications.	Communications can be established.	CHECK ALL connector(s) at the DERM and DLC for poor connections. System is operating properly.
	Communications cannot be established.	CHECK for power and ground to module. If OK, REPLACE the Diagnostic Energy Reserve Module (DERM).
7. Ignition Switch "OFF." Disconnect Diagnostic Energy Reserve Module. With a DVM measure resistance from DLC terminal 9 to Diagnostic Energy Reserve Module Connector UART data line (CKT 800) terminal.	Resistance less than 5.0 ohms.	CHECK for power and ground to module. CHECK TAN (800) wire for an intermittent open or short. If OK, REPLACE module.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in TAN (800) wire between module and DLC.

### SCAN TOOL WILL NOT COMMUNICATE WITH COMPONENT ON CLASS-2 DATA LINE (CKT 1807)

TEST	RESULT	ACTION
1. Disconnect Scan Tool from vehicle. Obtain same model year vehicle with same systems. Connect Scan Tool to Data Link Connector (DLC). Ignition Switch to "RUN." Attempt to establish communications.	Communications can be established.	GO to Step 2.
	Communications cannot be established.	Scan Tool may be malfunctioning. Refer to Scan Tool instruction manual.
2. Reconnect Scan Tool to original vehicle. Ignition Switch to "RUN." Attempt to establish communications with Vehicle Control Module (VCM) / PowerTrain Control Module (PCM).	Communications can be established.	CHECK PPL (1807) wire for an intermittent open or short.
	Communications cannot be established.	GO to Step 3.
3. Ignition Switch "OFF." Disconnect the VCM / PCM. With a DVM, measure resistance on DLC from terminal 2 to terminal 4 (ground).	Resistance greater than 10M ohms.	GO to Step 5.
	Resistance less than 10M ohms.	GO to Step 4.
4. Disconnect the Brake Pressure Modulator Valve. With a DVM, measure resistance on DLC from terminal 2 to terminal 4 (ground).	Resistance greater than 10M ohms.	REPLACE the Brake Pressure Modulator Valve.
	Resistance less than 10M ohms.	LOCATE and REPAIR short to ground PPL (1807) wire.
5. Ignition Switch to "RUN." With a DVM, measure voltage on DLC from terminal 2 to terminal 4 (ground).	Voltage less than 1.0 VDC.	GO to Step 6.
	Voltage greater than 1.0 VDC.	LOCATE and REPAIR short to voltage in PPL (1807) wire.

**8A - 50 - 4 ELECTRICAL DIAGNOSIS****DATA LINK CONNECTOR (DLC) PIN ASSIGNMENT**

TEST	RESULT	ACTION
6. Ignition Switch "OFF." With a DVM measure resistance from DLC terminal 2 to terminal 11 of C4 on the VCM connector, or terminal C8 of C3 on the PCM Connector.	Resistance less than 5.0 ohms.	GO to Step 7.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in PPL (1807) wire.
7. Check for power and ground to VCM / PCM. Check for proper connections at VCM / PCM connector.	Circuits are not suspect.	GO to Step 8.
	Circuits are suspect.	LOCATE and REPAIR suspect circuits. GO to Step 7.
8. Reconnect the VCM / PCM. Ignition Switch to "RUN." Attempt to establish communications with VCM.	Communications can be established.	Check PPL (1807) wire for an intermittent open or short.
	Communications cannot be established.	VCM / PCM is suspect, refer to SECTION 3B or 3C for further diagnosis.

**SCAN TOOL WILL NOT COMMUNICATE WITH BRAKE PRESSURE MODULATOR VALVE (BPMV) (CKT 799)**

TEST	RESULT	ACTION
1. Disconnect Scan Tool from vehicle. Obtain same model year vehicle with same systems. Connect Scan Tool to Data Link Connector (DLC). Ignition Switch to "RUN." Attempt to establish communications.	Communications can be established.	GO to Step 2.
	Communications could not be established.	Scan Tool may be malfunctioning. Refer to Scan Tool instruction manual.
2. Reconnect Scan Tool to original vehicle. Ignition Switch to "RUN." Attempt to establish communications with Brake Pressure Modulator Valve (BPMV).	Communications can be established.	GO to Step 7 .
	Communications could not be established.	GO to Step 3.
3. Ignition Switch "OFF." Disconnect all modules connected to DLC terminal 12. With a DVM, measure resistance on DLC from terminal 12 to terminal 4 (ground).	Resistance greater than 10M ohms.	GO to Step 4.
	Resistance less than 10M ohms.	LOCATE and REPAIR short to ground in TAN/WHT (799) wire.
4. Ignition Switch to "RUN." With a DVM, measure voltage on DLC from terminal 12 to terminal 4 (ground).	Voltage less than 1.0 VDC.	GO to step 5.
	Voltage greater than 1.0 VDC.	Ignition Switch "OFF." LOCATE and REPAIR short to voltage in TAN/WHT (799) wire.
5. Ignition Switch "OFF." With a DVM measure resistance from DLC terminal 12 to terminal F of C1 on the Brake Pressure Modulator Valve (BPMV).	Resistance less than 5.0 ohms.	GO to Step 6.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in TAN/WHT (799) wire.

TEST	RESULT	ACTION
6. Ensure the Ignition Switch is "OFF." Reconnect the Brake Pressure Modulator Valve (BPMV). Ignition Switch to "RUN." Attempt to establish communications.	Communications can be established.	CHECK ALL connector(s) at the BPMV and DLC for poor connections. System is operating properly.
	Communications cannot be established.	Check for power and ground to module. If OK, REPLACE the Brake Pressure Modulator Valve (BPMV).
7. Ignition Switch "OFF." Disconnect Brake Pressure Modulator Valve (BPMV). With a DVM measure resistance from DLC terminal 12 to Brake Pressure Modulator Valve (BPMV) terminal F of C1.	Resistance less than 5.0 ohms.	Check for power and ground to module. If OK, REPLACE module.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in TAN/WHT (799) wire between module and DLC.

### SCAN TOOL WILL NOT COMMUNICATE WITH TRANSFER CASE CONTROL MODULE (TCCM) (CKT 1568)

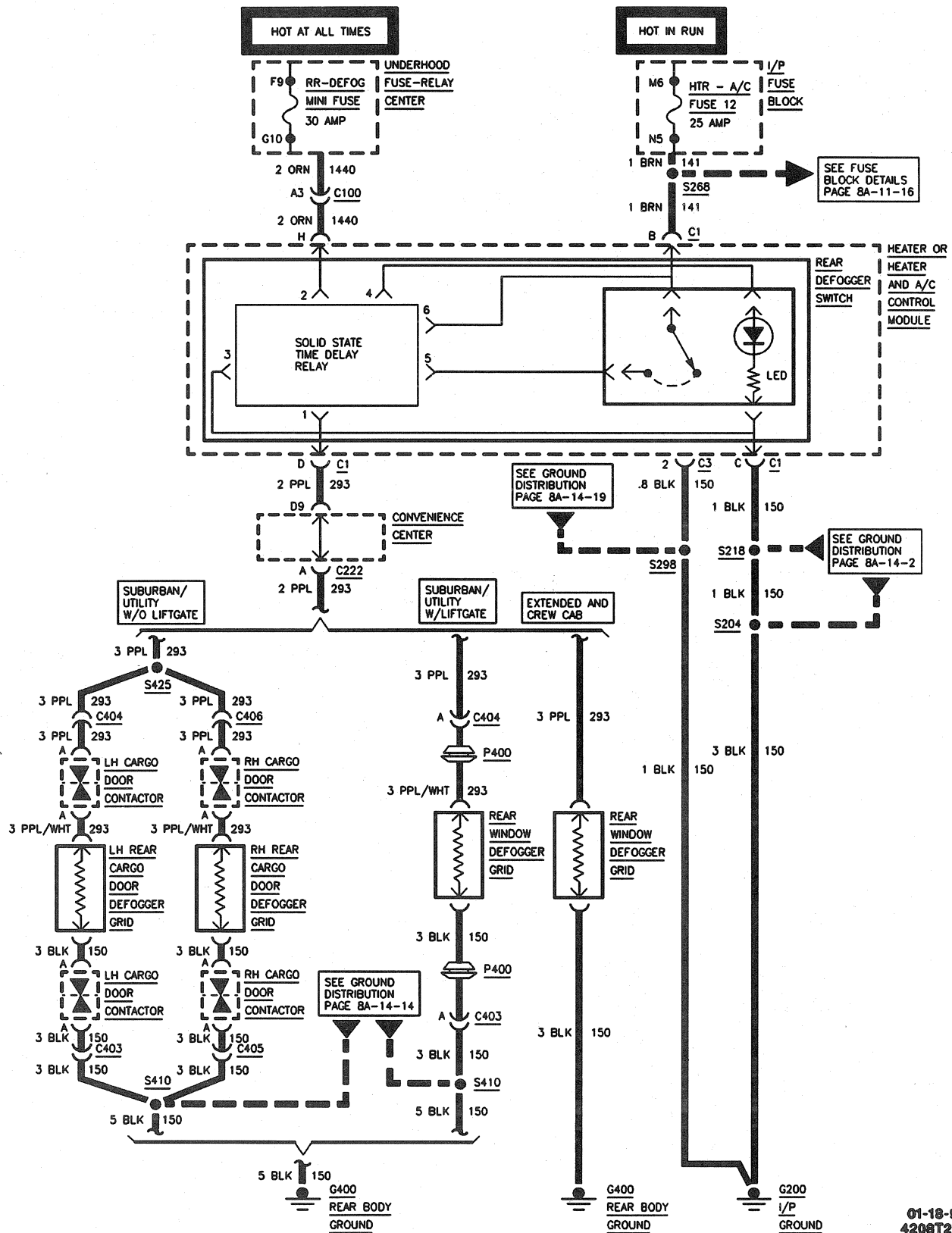
TEST	RESULT	ACTION
1. Disconnect Scan Tool from vehicle. Obtain same model year vehicle with same systems. Connect Scan Tool to Data Link Connector (DLC). Ignition Switch to "RUN." Attempt to establish communications.	Communications can be established.	GO to Step 2.
	Communications could not be established.	Scan Tool may be malfunctioning. Refer to Scan Tool instruction manual.
2. Reconnect Scan Tool to original vehicle. Ignition Switch to "RUN." Attempt to establish communications with Transfer Case Control Module (TCCM).	Communications can be established.	GO to Step 7.
	Communications could not be established.	GO to Step 3.
3. Ignition Switch "OFF." Disconnect all modules connected to DLC terminal 13. With a DVM, measure resistance on DLC from terminal 13 to terminal 4 (ground).	Resistance greater than 10M ohms.	GO to Step 4.
	Resistance less than 10M ohms.	LOCATE and REPAIR short to ground in ORN (1568) wire.
4. Ignition Switch to "RUN." With a DVM, measure voltage on DLC from terminal 13 to terminal 4 (ground).	Voltage less than 1.0 VDC.	GO to step 5.
	Voltage greater than 1.0 VDC.	Ignition Switch "OFF." LOCATE and REPAIR short to voltage in ORN (1568) wire.
5. Ignition Switch "OFF." With a DVM measure resistance from DLC terminal 13 to terminal D3 on the Transfer Case Control Module (TCCM).	Resistance less than 5.0 ohms.	GO to Step 6.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in ORN (1568) wire.
6. Ensure the Ignition Switch is "OFF." Reconnect the Transfer Case Control Module (TCCM). Ignition Switch to "RUN." Attempt to establish communications.	Communications can be established.	CHECK ALL connector(s) at the TCCM and DLC for poor connections. System is operating properly.
	Communications cannot be established.	Check for power and ground to module. If OK, REPLACE the Transfer Case Control Module (TCCM).
7. Ignition Switch "OFF." Disconnect Transfer Case Control Module. With a DVM measure resistance from DLC terminal 13 to Transfer Case Control Module Connector data line (1568) terminal.	Resistance less than 5.0 ohms.	Check for power and ground to module. If OK, REPLACE module.
	Resistance greater than 5.0 ohms.	LOCATE and REPAIR open in ORN (1568) wire between module and DLC.

**DATA LINK CONNECTOR (DLC) PIN ASSIGNMENT**

A Scan Tool can be connected to the Data Link Connector (DLC), this allows the Scan Tool to communicate with the Diesel Powertrain Control Module (PCM) , Gasoline Vehicle Control Module (VCM) , the Diagnostic Energy Reserve Module (DERM), the Transfer Case Control Module, or the Brake Pressure Modulator Valve. System operations can then be monitored for diagnostic purposes.

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## DEFOGGER



COMPONENT	LOCATION	201-PG	FIG.	CONN
Contact Switch, LH Door.....	Upper LH rear Body Opening and Door			
Contact Switch, RH Door .....	Upper RH rear Body Opening and Door			
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	.....	36
HVAC Controls Module .....	Center of I/P			
I/P Fuse Block.....	Lower LH side of I/P .....	23	.....	35
Rear Cargo Door Defogger Grid, LH.....	On LH rear Cargo Door Glass			
Rear Cargo Door Defogger Grid, RH.....	On RH rear Cargo Door Glass			
Rear Defogger Switch.....	LH side of I/P			
Rear Window Defogger Grid ....	On rear Window			
Underhood Fuse-Relay Center...	LH rear of Engine Compartment, on Fender.....	4	.....	8
<b>CONNECTORS:</b>				
C100 .....	LH rear of Engine Compartment at Bulkhead.....	22	.....	33..... 202-0
C222 .....	At Convenience Center .....	28	.....	45
C403 .....	LH "D" Pillar, top .....	45	.....	74
C404 .....	LH "D" Pillar, top .....	45	.....	74
C405 .....	RH "D" Pillar, top			
C406 .....	RH "D" Pillar, top			
<b>GROMMETS:</b>				
P400 .....	Top rear of body, at RH lift Gate Hinge			
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34	.....	54
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S218 .....	I/P Harness, approx. 4 cm right of Steering Column Connector Breakout			
S268 .....	I/P Harness, approx. 25 cm from Heater and A/C Control Module Connector			
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout			
S410 (2-Door Utility).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout			
S410 (4-Door Utility).....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout			
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout			

**DEFOGGER**

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<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG FIG. CONN</b>
S425 (Suburban).....	Front to rear Body Harness, approx. 14 cm from LH Rear Speaker Breakout	
S425 (4 Door Utility).....	Front to rear Body Harness, approx. 11 cm from rear Dome Lamp Breakout	

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**DIAGNOSIS - REAR WINDOW DEFOGGER****TROUBLESHOOTING HINTS:**

1. CHECK to see that RR DEFOG and HTR A/C Fuses are not open. If open, LOCATE and REPAIR source of overload, then REPLACE fuse(s).
  2. CHECK that Grounds G200 and G400 are clean and tight.
  3. CHECK that Rear Defogger Grid(s) is continuous and free from damage. REFER to SECTION 10A3.
  4. If vehicle is not equipped with a Liftgate, then CHECK that LH/RH Door Contact Switch contacts are clean and free from obstructions.
  5. If the Rear Defogger Grid(s) do not automatically shut OFF after 10 minutes, then the Solid State Time Delay Relay for the Rear Defogger Switch may have failed.
  6. If the Rear Defogger Switch ON indication Light Emitting Diode (LED) does not illuminate but the Defogger Grid(s) Defog, than the (LED) may have failed.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," SECTION 8A-4-0).



**DEFOGGER****REAR WINDOW DEFOGGER DOES NOT DEFOG BUT GRID TEST GOOD**

TEST	RESULT	ACTION
1. Is this a Suburban or Utility equipped with Cargo Doors?	Yes.	GO to step 2.
	No.	GO to step 4.
2. Does one Cargo Door Defogger Grid not work while the other does?	Yes.	GO to step 3.
	No.	GO to step 4.
3. Disconnect Connector C222 at Convenience Center. Using a self-powered test lamp or ammeter. CHECK for Continuity from Connector C222 Cavity "A" to the inoperative Cargo Door Defogger Grid. Cargo Doors must be closed.	No Continuity.	LOCATE and REPAIR open in PPL (293) wire between Splice S425 to the inoperative Cargo Door Defogger Grid. CHECK contact resistance at Door Contact Switch.
	Continuity.	LOCATE and REPAIR open in BLK (150) wire between inoperative Cargo Door Defogger Grid and Splice S410. CHECK contact resistance at Door Contact Switch.
4. Disconnect Heater/HVAC Control Module Connector C1. Using an un-powered test lamp, connect from Heater/HVAC Control Module Connector C1 Cavity "A" to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1440) wire between Underhood Fuse Relay Center and Heater/HVAC Control Module.
5. Using an un-powered test lamp, connect from Heater/HVAC Control Module Connector C1 Cavity "B" to ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Heater/HVAC Control Module.
6. Using a self-powered test lamp or ohmmeter, CHECK for Continuity from Heater/HVAC Control Module Connector C1 Cavity "C" to ground.	Continuity.	GO to step 7.
	No Continuity.	LOCATE and REPAIR open in BLK (150) wire between Heater/HVAC Control Module and Ground G200.
7. Disconnect Connector C222 at Convenience Center. Using a self-powered test lamp or ohmmeter, CHECK for Continuity between Convenience Center Pin "A" for Connector C222 and Heater/HVAC Control Module Connector C1 Cavity "D".	Continuity.	GO to step 8.
	No Continuity.	LOCATE and REPAIR open in PPL (293) wire between Heater/HVAC Control Module and Convenience Center.
8. Reconnect Heater/HVAC Control Module Connector C1. Place Ignition Switch in ON. Depress R. DEF push button on Heater/HVAC Control Module. Connect un-powered test lamp from Convenience Center Pin "A" for Connector C222 to ground. Note that the R. DEF light emitting Diode (LED) should be illuminated on the Heater/HVAC Control Module.	Test lamp lights.	GO to step 9.
	Test lamp does not light.	REPLACE Heater/HVAC Control Module (or Rear Defogger Switch).

## 8A - 61 - 4 ELECTRICAL DIAGNOSIS

### DEFOGGER

TEST	RESULT	ACTION
9. Reconnect Connector C222 at Convenience Center. Ensure that the R. DEF (LED) is extinguished. Depress the R. DEF push button on the Heater/HVAC Control Module. Using an un-powered test lamp, LOCATE the side of the Defogger Grid which lights the test lamp when probed to ground.	Test lamp does not light.	LOCATE and REPAIR open in PPL (293) wire between Convenience Center Connector C222 and Cargo Door/Rear Window Defogger Grid.
	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire between Cargo Door/RearWindow Defogger Grid and Ground G400.

### CIRCUIT OPERATION

With the Ignition Switch in RUN, Voltage is supplied to the Rear Defogger Switch at the Heater/HVAC Control Module. When the Rear Defogger Switch (R. DEF) is depressed, the contact closes, which provides Voltage to the ON Indicator Light Emitting Diode (LED) and the Rear Defogger Grid. The Rear Windows will become warm to remove fog from the surface of the window.

The Solid State Time Delay will automatically turn-off the Defogger Grids and the LED at the end of approx. 10 minutes. The Defogger Grids are also automatically turned off if the D. Fog Switch is depressed again or the Ignition Switch is placed in OFF.

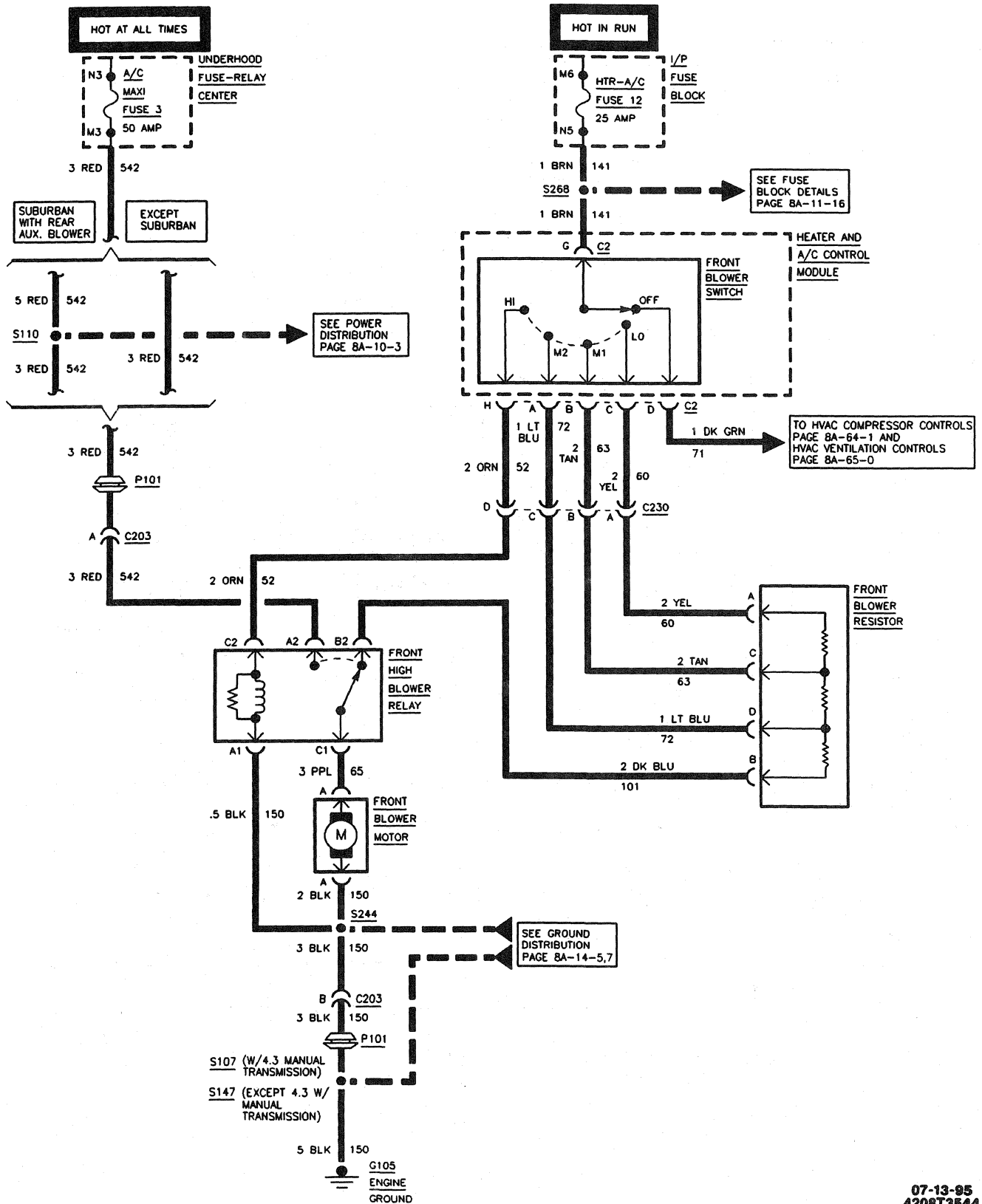
For the Suburban or Utility with Cargo Doors, the Defogger Grids can only be energized with the Cargo Doors closed.

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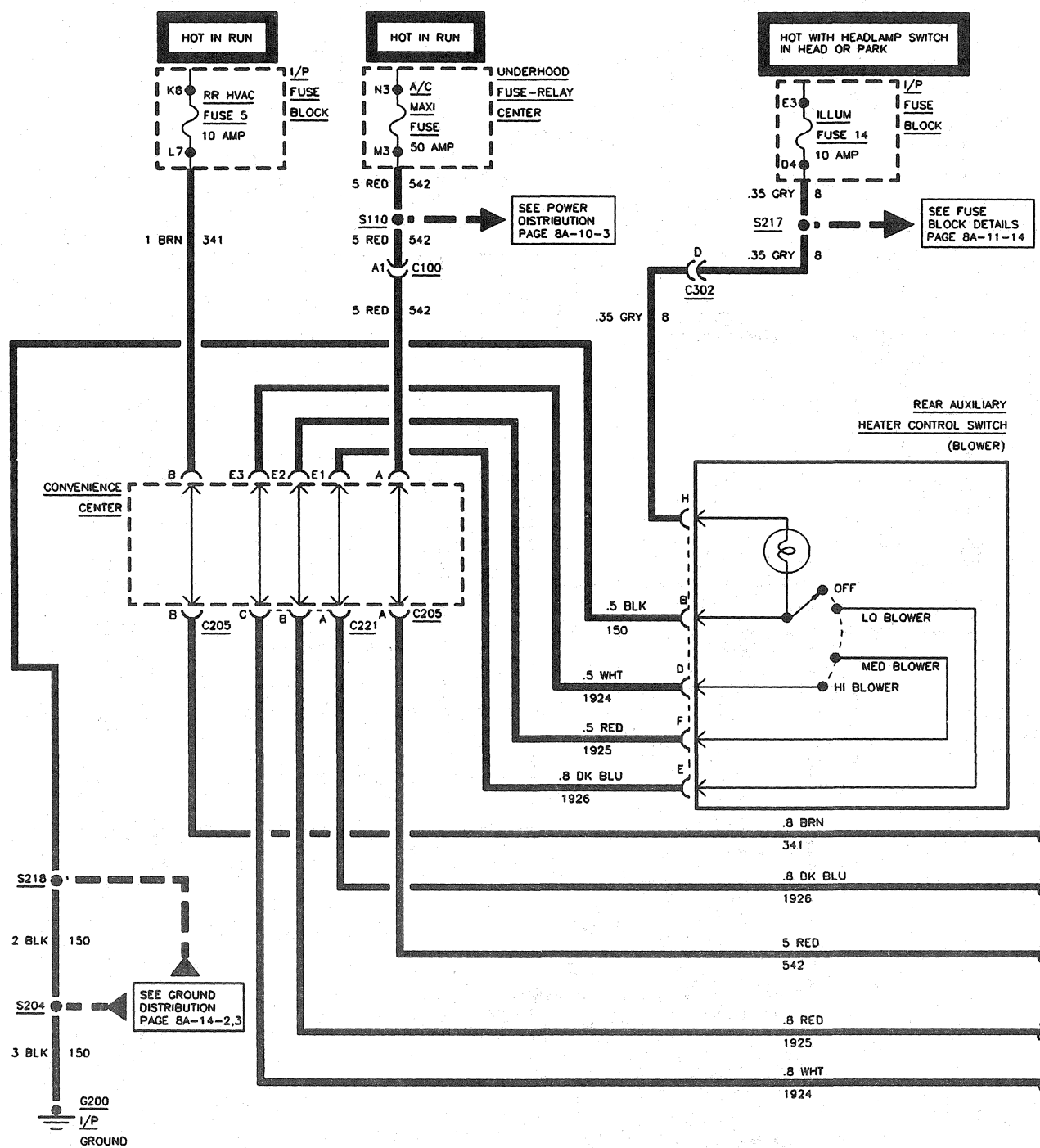


# HVAC BLOWER CONTROL

## FRONT HEATER BLOWER, W/ A/C

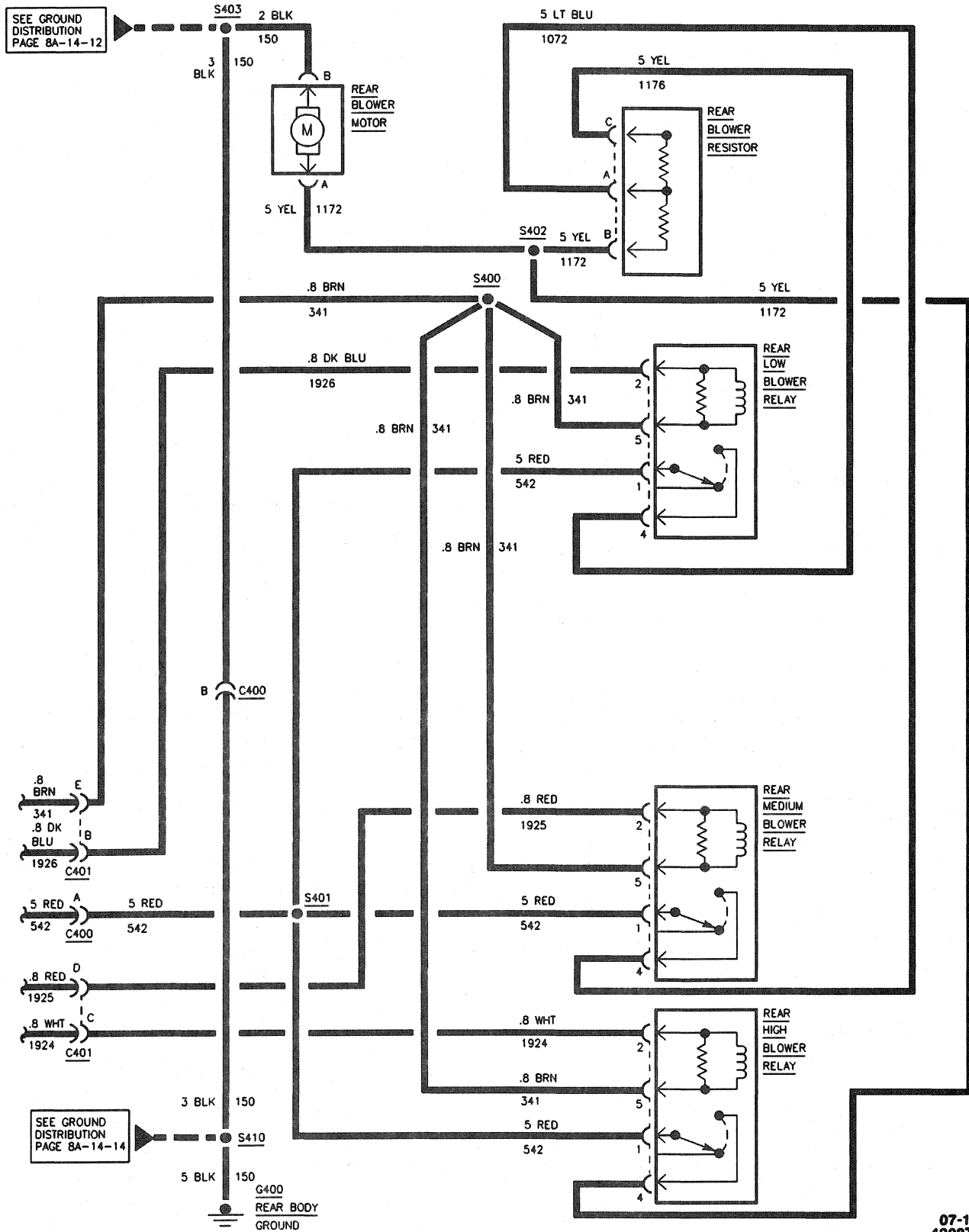


# HVAC BLOWER CONTROL REAR AUXILIARY HEATER BLOWER, W/O A/C



# HVAC BLOWER CONTROL

## REAR AUXILIARY HEATER BLOWER, W/O A/C



## HVAC BLOWER CONTROL

### REAR AUXILIARY BLOWER, W/ A/C W/O HEATER (C69)







## HVAC BLOWER CONTROL

COMPONENT	LOCATION	201-PG	FIG.	CONN
Auxiliary Heater and A/C Control Switch/Module, Front .....	Front of Overhead Console .....	31	49.....	202-13
Auxiliary Heater and A/C Control Switch/Module Rear .....	Rear of Overhead Console Molding, in Headliner.....	31	49.....	202-14
Auxiliary Heater and A/C Logic Module.....	Rear of Overhead Console Molding, in Headliner.....	37	60.....	202-12
Blower Motor, Front .....	Under RH side of I/P .....	30	47	
Blower Motor, Rear .....	Behind RH rear Wheelwell			
Blower Resistor, Front.....	Under RH side of I/P, on HVAC Plenum, center area .....	30	47	
Blower Resistor, Rear (Auxiliary HVAC) .....	On underside of Auxiliary HVAC Blower Case, behind RH rear Wheelhouse.....	37	60	
Blower Switch, Front.....	At Heater Control			
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	36	
Heater and A/C Control Module .....	Center of I/P at Heater Control			
High Blower Relay .....	Under I/P, on top of HVAC Plenum .....	30	47.....	202-41
High Blower Relay, Rear (Auxiliary Heater or HVAC).....	On Auxiliary HVAC Plenum, forward of LH rear Wheelhouse			
I/P Fuse Block .....	Lower LH Side of I/P .....	23	35	
Low Blower Relay, Rear.....	On Auxiliary Heater and A/C Module.....	37	60	
Medium Blower Relay, Rear (Auxiliary Heater or HVAC) .	On Auxiliary Heater and A/C Module.....	37	60	
Rear Auxiliary Heater Control Switch.....	Rear of Overhead Console, in Headliner			
Underhood Fuse-Relay Center ..	LH rear of Engine Compartment, on fender.....	4	8	
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22	33.....	202-0
C203 .....	Behind RH Portion of I/P, near Heater Motor, in Foam Wrap .....	24	38	
C205 .....	At Convenience Center			
C221 .....	At Convenience Center .....	23	36	
C230 .....	Behind RH Side of I/P, above HVAC Evaporator Housing ....	27	42.....	202-38
C300 .....	In Overhead Console.....	34	55.....	202-38
C400 .....	RH rear of vehicle, above Auxiliary Blower Motor			
C401 .....	RH rear of vehicle, above Auxiliary Blower Motor			

COMPONENT	LOCATION	201-PG	FIG.	CONN
<b>GROUNDS:</b>				
G105 (Gas) .....	RH front of Engine Block.....	9 .....	15	
G105 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
G200.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34 .....	54	
<b>GROMMETS:</b>				
P101 .....	RH rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN M, R).....	Engine Harness, approx. 20 cm from Breakout to EGR Valve, toward Taillamp Extension			
S107 (VIN J).....	Engine Harness, approx. 20 cm from Breakout to Fuel Injector Breakout toward Taillamp Extension			
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve			
S110 (VIN M, R Suburban/Utility).....	Engine Harness, approx. 5 cm from Fuse - Relay Center toward Taillamp Harness			
S110 (VIN J).....	Engine Harness, approx. 13 cm from Fuse - Relay Center Breakout near Taillamp Harness Breakout			
S110 (Diesel).....	Engine Harness, approx. 7.5 cm from Fuel Heater Breakout toward Glow Plug Controller			
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout toward Taillamp Extension Breakout			
S147 (VIN J).....	Engine Harness, approx. 5 cm from Fuel Injector Breakout toward Taillamp Harness Breakout			
S147 (Diesel).....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH Side)			
S162 (VIN W, M, R) .....	Engine Harness, approx. 12.5 cm from Starter Solenoid Breakout, toward LH Oxygen Sensor Breakout			
S162 (VIN J).....	Engine Harness, approx. 10 cm from Starter Solenoid Breakout, toward Oxygen Sensor Harness Breakout			
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S217 .....	I/P Harness, approx. 5 cm from Headlamp Dimmer Switch Breakout Toward I/P Cluster			
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets			

## HVAC BLOWER CONTROL

COMPONENT	LOCATION	201-PG FIG. CONN
S244 .....	HVAC Harness, 14 cm from Recirc Door Breakout toward Blower Motor	
S268 .....	I/P Harness, approx. 25 cm from Heater A/C Control Connector	
S305 (Suburban).....	Rear HVAC Control Harness, 25 cm forward of HVAC Logic Module Breakout	
S306 (Suburban).....	Rear HVAC Control Harness, 19 cm forward of HVAC Logic Module Breakout	
S307 (Suburban).....	Rear HVAC Control Harness, 10 cm forward of HVAC Logic Module Breakout	
S309 (Suburban).....	Rear HVAC Control Harness, 12 cm rear of HVAC Logic Module Breakout	
S400 (Rear A/C) .....	Rear A/C Harness, 17 cm from Blower Motor Relays	
S400 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, approx. 7 cm from Blower Motor Relays Breakout	
S401 (Rear A/C) .....	Rear A/C Harness, 23 cm from Blower Motor Relays	
S401 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, approx. 18 cm from Blower Motor Relays Breakout	
S402 (Rear A/C) .....	Rear A/C Harness, approx. 7 cm from Blower Motor Resistor Breakout	
S402 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, approx. 7 cm from Blower Motor Resistor Breakout	
S403 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, 7 cm from Blower Motor Resistor Breakout toward Blower Motor	
S410 (2-Door Utility) .....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout	
S410 (4-Door Utility) .....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout	
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout Toward CHMSL Harness Breakout	

## DIAGNOSIS - HVAC BLOWER CONTROL

TROUBLESHOOTING HINTS:  
(FRONT BLOWER)

1. CHECK that A/C MAXI FUSE 3 and HTR-A/C FUSE 12 are not open. If either fuse is open, LOCATE and REPAIR source of overload and REPLACE the Fuse(s).
2. CHECK that Ground G105 is clean and tight.
3. CHECK that Front High Blower Relay is properly mated to its Connector.
4. Heater Blower operations at Single Speed independent of Switch setting or variations in Blower speed while

driving may indicate that the Front Blower Resistor Coils are contacting one another.

5. Cyclic or periodic Blower operations at reduced speeds may be caused by operation of the Therm Limit in the Front Blower Resistor, if provided.

TROUBLESHOOTING HINTS: (REAR  
AUXILIARY BLOWER)

1. CHECK that RR HVAC FUSE 5, A/C MAXI FUSE 3, and ILLUM FUSE 14 are not open. If either fuse is open, LOCATE and REPAIR source of overload and REPLACE the Fuse(s).

2. CHECK that Ground G200 and G400 (Heater without A/C) or G400 (Heater with A/C) are clean and tight.
3. CHECK that Rear High Blower Relay, Rear Medium Blower Relay, and Rear Low Blower Relay are properly mated to their Connectors.
4. Heater Blower operations at Single Speed independent of Switch setting or variations in Blower speed while driving may indicate that the Rear Blower Resistor Coils are contacting one another.

### TROUBLESHOOTING HINTS: (GENERAL)

1. See SECTION 8A-65 for diagnosis of ventilation system controls.
2. See SECTION 8A-64 for diagnosis of Compressor Controls.
3. See SECTION 8A-61 for diagnosis of the Rear Window Defogger controls.
4. See SECTION 8A-117 for diagnosis of the Instrument Panel Dimming System.
5. CHECK for broken (or partially broken) wire inside of insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
6. CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," SECTION 8A-4-0).

### FRONT HEATER BLOWER MOTOR DOES NOT OPERATE AT ANY SPEED (HEATER WITH A/C)

TEST	RESULT	ACTION
1. Disconnect Connector for PPL (65) wire at Front Blower Motor. Place Ignition Switch in RUN. Place Front Blower Switch in HI. Connect un-powered test lamp from Front Blower Motor PPL (65) wire Connector Cavity "A" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light	GO to step 3.
2. Disconnect Front Blower Motor Connector for the BLK (150) wire. Connect self-powered test lamp between Front Blower Motor BLK (150) wire Connector Cavity "A" to ground.	Test lamp lights.	REPLACE Front Blower Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Blower Motor and Ground G105.
3. Remove Front High Blower Relay from its socket. Connect self-powered test lamp from Front High Blower Relay socket Cavity "C1" to Front Blower Motor PPL (65) wire Connector Cavity "A."	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in PPL (65) wire between Front High Blower Relay and Front Blower Motor.
4. Connect un-powered test lamp from Front High Blower Relay socket Cavity "C2" to ground.	Test lamp lights.	REPLACE Front High Blower Relay.
	Test lamp does not light.	GO to step 5.
5. Disconnect Connector C2 (center) at Heater and A/C Control Module. Connect un-powered test lamp between Heater and A/C Control Module Connector C2 Cavity "G" to ground.	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Heater and A/C Control Module.

## HVAC BLOWER CONTROL

**FRONT HEATER BLOWER MOTOR DOES NOT OPERATE AT ANY SPEED  
(HEATER WITHOUT A/C)**

TEST	RESULT	ACTION
1. Disconnect Connector at Front Blower Motor. Place Ignition Switch in RUN. Place Front Blower Switch in HI. Connect un-powered test lamp from Front Blower Motor Connector Cavity "A" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect self-powered test lamp between Front Blower Motor Connector Cavity "B" to ground.	Test lamp lights.	REPLACE Front Blower Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Blower Motor and Ground G105.
3. Remove Front High Blower Relay from its socket. Connect self-powered test lamp from Front High Blower Relay socket Cavity "C1" to Front Blower Motor Connector Cavity "A."	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in PPL (65) wire between Front High Blower Relay and Front Blower Motor.
4. Connect un-powered test lamp from Front High Blower Relay socket Cavity "C2" to ground.	Test lamp lights.	REPLACE Front High Blower Relay.
	Test lamp does not light.	GO to step 5.
5. Disconnect Connector C2 at Heater Control Module. Connect un-powered test lamp between Heater Control Module Connector C2 Cavity "G" to ground.	Test lamp lights.	REPLACE Heater Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Heater Control Module.

### FRONT BLOWER MOTOR DOES NOT OPERATE IN HIGH (HEATER WITH OR WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in HI. Remove Front High Blower Relay from its socket. Connect un-powered test lamp between Front High Blower Relay socket Cavity "C2" to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector C2 at Heater Control Module or Heater and A/C Control Module. Connect self-powered test lamp between Heater Control Module or Heater and A/C Control Module Connector C2 Cavity "H" and Front High Blower Relay socket Cavity "C2."	Test lamp lights.	REPLACE Heater Control Module or Heater and A/C Control Module.
	Test lamp does not light.	LOCATE an REPAIR open in ORN (52) wire between Heater Control Module or Heater and A/C Control Module and Front High Blower Relay.
3. Connect un-powered test lamp between Front High Blower Relay socket Cavity "A2" and ground.	Test lamp lights.	LOCATE and REPAIR open in RED (542) wire between Underhood Fuse-Relay Center and Front High Blower Relay.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Front High Blower Relay socket Cavity "A1" and ground.	Test lamp lights.	REPLACE Front High Blower Relay.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front High Blower Relay and Ground G105.

### FRONT BLOWER MOTOR DOES NOT OPERATE IN M2 (HEATER WITH OR WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in M2 position (next to HI). Disconnect Connector at Front Blower Resistor. Connect un-powered test lamp between Front Blower Resistor Connector Cavity "D" and ground.	Test lamp lights.	REPLACE Front Blower Resistor.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector C2 at Heater Control Module or Heater and A/C Control Module. Connect self-powered test lamp between Connector C2 Cavity "A" and Front Blower Resistor Connector Cavity "D."	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (72) wire between Heater Control Module or Heater and A/C Control Module and Front Blower Resistor.
	Test lamp lights.	REPLACE Heater Control Module or Heater and A/C Control Module.

## HVAC BLOWER CONTROL

### FRONT BLOWER MOTOR DOES NOT OPERATE IN M1 (HEATER WITH OR WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in M1 position (next to LO). Disconnect Connector at Front Blower Resistor. Connect un-powered test lamp between Front Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	REPLACE Front Blower Resistor.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector C2 at Heater Control Module or Heater and A/C Control Module. Connect self-powered test lamp between Connector C2 Cavity "B" and Front Blower Resistor Connector Cavity "C."	Test lamp does not light.	LOCATE and REPAIR open in TAN (63) wire between Heater Control Module or Heater and A/C Control Module and Front Blower Resistor.
	Test lamp lights.	REPLACE Heater Control Module or Heater and A/C Control Module.

### FRONT BLOWER MOTOR DOES NOT OPERATE IN LO (HEATER WITH OR WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in LO. Disconnect Connector at Front Blower Resistor. Connect un-powered test lamp between Front Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	REPLACE Front Blower Resistor.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector C2 at Heater Control Module or Heater and A/C Control Module. Connect self-powered test lamp between Connector C2 Cavity "C" and Front Blower Resistor Connector Cavity "A."	Test lamp does not light.	LOCATE and REPAIR open in YEL (60) wire between Heater Control Module or Heater and A/C Control Module and Front Blower Resistor.
	Test lamp lights.	REPLACE Heater Control Module or Heater and A/C Control Module.

### FRONT BLOWER MOTOR ONLY OPERATES IN HI (HEATER WITH OR WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in LO. Remove Front High Blower Relay from its socket. Connect un-powered test lamp between Front High Blower Relay socket Cavity "B2" and ground.	Test lamp lights.	REPLACE Front High Blower Relay.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Blower Resistor. Connect self-powered test lamp between Front Blower Resistor Connector Cavity "B" and Front High Blower Relay socket cavity "B2."	Test lamp lights.	REPLACE Front Blower Resistor.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (101) wire between Front Blower Resistor and Front High Blower Relay.



**FRONT BLOWER MOTOR OPERATES CONTINUOUSLY AT ANY SPEED  
(HEATER WITH OR WITHOUT A/C)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in OFF. Remove Front High Blower Relay from its socket. Does the Front Blower Motor operate?	Test lamp lights.	LOCATE and REPAIR short to Voltage in PPL (65) wire between Front High Blower Relay and Front Blower Motor.
	Test lamp does not light.	GO to step 2.
2. Connect un-powered test lamp between Front High Blower Relay Connector Cavity "C2" and ground.	Yes.	GO to step 3.
	No.	GO to step 4.
3. Disconnect Connector C2 at Heater Control Module or Heater and A/C control Module. Connect un-powered test lamp between Front High Blower Relay socket Cavity "C2" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in ORN (52) wire between Heater Control Module or Heater and A/C Control Module and Front High Blower Relay.
	Test lamp does not light.	REPLACE Heater Control Module or Heater and A/C Control Module.
4. Connect un-powered test lamp between Front High Blower Relay socket Cavity "B2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPLACE Front High Blower Relay.
5. Disconnect Connector at Front Blower Resistor. Connect un-powered test lamp between Front High Blower Relay socket Cavity "B2" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in DK BLU (101) wire between Front Blower Resistor and Front High Blower Relay.
	Test lamp does not light.	GO to step 6.
6. Disconnect Connector C2 at Heater Control Module or Heater and A/C Control Module. Connect un-powered test lamp from Front Blower Resistor Connector Cavity "A" to ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in YEL (60) wire between Heater Control Module or Heater and A/C Control Module an Front Blower Resistor.
	Test lamp does not light.	GO to step 7.
7. Connect un-powered test lamp from Front Blower Resistor Connector Cavity "C" to ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in TAN (63) wire between Heater Control Module or Heater and A/C Control Module an Front Blower Resistor.
	Test lamp does not light.	GO to step 8.
8. Connect un-powered test lamp from Front Blower Resistor Connector Cavity "D" to ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage in LT BLU (72) wire between Heater Control Module or Heater and A/C Control Module an Front Blower Resistor.
	Test lamp does not light.	REPLACE Heater Control Module or Heater and A/C Control Module.

## HVAC BLOWER CONTROL

## REAR BLOWER MOTOR DOES NOT OPERATE AT ANY SPEED (HEATER WITHOUT A/C)

TEST	RESULT	ACTION
1. Disconnect Connector at Rear Blower Motor. Place Ignition Switch in RUN. Place Rear Auxiliary Heater Control Switch in HI. Connect un-powered test lamp from Rear Blower Motor Connector Cavity "A" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect self-powered test lamp between Rear Blower Motor Connector Cavity "B" to ground.	Test lamp lights.	REPLACE Rear Blower Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Blower Motor and Ground G400.
3. Remove Rear High Blower Relay from its socket. Connect un-powered test lamp from Rear High Blower Relay socket Cavity "1" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Underhood Fuse-Relay Center and Splice S401.
4. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "5" to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between I/P Fuse Block and Splice S400.
5. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "4" and Rear Blower Motor Connector Cavity "A."	Test does lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Splice S402 and Rear Blower Motor.
6. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect self-powered test lamp between Rear Auxiliary Heater Control Switch Connector Cavity "B" and ground.	Test lamp lights.	REPLACE Rear Auxiliary Heater Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Auxiliary Heater Control Switch and Ground G200.

**REAR BLOWER MOTOR DOES NOT OPERATE IN HI (HEATER WITHOUT A/C)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Rear Auxiliary Heater Control Switch in HI. Remove Rear High Blower Relay from its socket. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect a self-powered test lamp between Rear Auxiliary Heater Control Switch Connector Cavity "D" and Rear High Blower Relay Connector Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary Heater Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (1924) wire between Rear Auxiliary Heater Control Switch and Rear High Blower Relay.
3. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "5" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear High Blower Relay.
4. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "1" to ground.	Test Lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear High Blower Relay.
5. Disconnect Connector at Rear Blower Motor. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "4" and Rear Blower Motor Connector Cavity "A."	Test lamp lights.	REPLACE Rear High Blower Relay.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Rear High Blower Relay and Splice S402.

## HVAC BLOWER CONTROL

## REAR BLOWER MOTOR DOES NOT OPERATE IN MED (HEATER WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Rear Auxiliary Heater Control Switch in MED. Remove Rear Medium Blower Relay from its socket. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect a self-powered test lamp between Rear Auxiliary Heater Control Switch Connector Cavity "F" and Medium High Blower Relay Connector Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary Heater Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in RED (1925) wire between Rear Auxiliary Heater Control Switch and Rear Medium Blower Relay.
3. Connect un-powered test lamp between Medium High Blower Relay socket Cavity "5" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Medium Blower Relay.
4. Connect un-powered test lamp between Medium High Blower Relay socket Cavity "1" to ground.	Test Lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Medium High Blower Relay.
5. Disconnect Connector at Rear Blower Resistor. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "4" and Rear Blower Resistor Connector Cavity "A."	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (1072) wire between Rear Medium Blower Relay and Rear Blower Resistor.
6. Insert Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	REPLACE Rear Medium Blower Relay.

**REAR BLOWER MOTOR DOES NOT OPERATE IN LO (HEATER WITHOUT A/C)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Rear Auxiliary Heater Control Switch in LO. Remove Rear Low Blower Relay from its socket. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect a self-powered test lamp between Rear Auxiliary Heater Control Switch Connector Cavity "E" and Rear Low Blower Relay to Connector Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary Heater Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (1926) wire between Rear Auxiliary Heater Control Switch and Rear Low Blower Relay.
3. Connect un-powered test lamp between Rear Low Blower Relay socket Cavity "5" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Low Blower Relay.
4. Connect un-powered test lamp between Rear Low Blower Relay socket Cavity "1" to ground.	Test Lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear Low Blower Relay.
5. Disconnect Connector at Rear Blower Resistor. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "4" and Rear Blower Resistor Connector Cavity "C."	Test lamp lights.	Go to Step 6.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1176) wire between Rear Low Blower Relay and Rear Blower Resistor.
6. Insert Rear Low Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	REPLACE Rear Low Blower Relay.

**REAR BLOWER MOTOR ONLY OPERATES IN HI (HEATER AND/OR A/C)**

TEST	RESULT	ACTION
1. Disconnect Connector at Rear Blower Resistor. Disconnect Connector at Rear Blower Motor. Connect self-powered test lamp between Rear Blower Resistor Connector Cavity "B" to Rear Blower Motor Connector Cavity "A."	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Rear Blower Resistor and Splice S402.

## HVAC BLOWER CONTROL

### REAR BLOWER MOTOR OPERATES CONTINUOUSLY AT ANY SPEED (HEATER WITHOUT A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Rear Auxiliary Heater Control Switch OFF. Disconnect Connector at Rear Blower Resistor. Remove Rear High Blower Relay from its socket. Does the Rear Blower Motor operate?	Yes.	LOCATE and REPAIR short to Voltage in YEL (1172) wire between Rear Blower Resistor, Rear High Blower Relay, and Rear Blower Motor.
	No.	GO to step 2.
2. Reconnect Connector at Rear Blower Resistor. Place the Ignition Switch in RUN. Does the Rear Blower Motor operate?	Yes.	GO to step 3.
	No.	GO to step 10.
3. Reinstall the Rear High Blower Relay in its socket. Remove the Rear Low Blower Relay from its socket. Remove the Rear Medium Blower Relay from its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (1072) wire between Rear Medium Blower Relay and Rear Blower Resistor.
	Test lamp does not light.	GO to step 4.
4. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on YEL (1176) wire between Rear Low Blower Relay and Rear Blower Resistor.
	Test lamp does not light.	GO to step 5.
5. Reinstall Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	GO to step 8.
6. Remove Rear Medium Blower Relay in its socket. Connect self-powered test lamp from Rear Medium Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	REPLACE Rear Medium Blower Relay.
7. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect un-powered test lamp from Rear Auxiliary Heater Control Switch Connector Cavity "F" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground on RED (1925) wire between Rear Auxiliary Heater Control Switch and Rear Medium Blower Relay.
	Test lamp does not light.	REPLACE Rear Auxiliary Heater Control Switch.
8. Connect self-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 9.
	Test lamp does not light.	REPLACE Rear Low Blower Relay.
9. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect un-powered test lamp from Rear Auxiliary Heater Control Switch Connector Cavity "E" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground on DK BLU (1926) wire between Rear Auxiliary Heater Control Switch and Rear Low Blower Relay.
	Test lamp does not light.	REPLACE Rear Auxiliary Heater Control Switch.

TEST	RESULT	ACTION
10. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 11.
	Test Lamp does not light.	REPLACE Rear High Blower Relay.
11. Disconnect Connector at Rear Auxiliary Heater Control Switch. Connect self-powered test lamp between Rear Auxiliary Heater Control Switch Connector Cavity "D" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on WHT (1924) wire between Rear Auxiliary Heater Control Switch and Rear High Blower Relay.
	Test lamp does not light.	REPLACE Rear Auxiliary Heater Control Switch.

**REAR BLOWER MOTOR DOES NOT OPERATE AT ANY SPEED (HEATER WITH A/C)**

TEST	RESULT	ACTION
1. Disconnect Connector at Rear Blower Motor. Place Ignition Switch in RUN. Place Rear Blower Switch at the Front Auxiliary Heater and A/C Control Module in HI. Place Rear Blower Switch at the Rear Auxiliary Heater and A/C Control Module in OFF. Connect un-powered test lamp from Rear Blower Motor Connector Cavity "A" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect self-powered test lamp between Rear Blower Motor Connector Cavity "B" to ground.	Test lamp lights.	REPLACE Rear Blower Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Blower Motor and Ground G400.
3. Remove Rear High Blower Relay from its socket. Connect un-powered test lamp from Rear High Blower Relay socket Cavity "1" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Underhood Fuse-Relay Center and Splice S401.
4. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "5" to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between I/P Fuse Block and Splice S400.
5. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "4" and Rear Blower Motor Connector Cavity "A."	Test does lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Splice S402 and Rear Blower Motor.
6. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "B" and ground.	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Auxiliary Heater and A/C Control Module and Ground G400.

## HVAC BLOWER CONTROL

## REAR BLOWER MOTOR DOES NOT OPERATE IN HI (HEATER WITH A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Remove Rear High Blower Relay from its socket. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in HI. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in OFF. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "D" and Rear High Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (1924) wire between Front Auxiliary Heater and A/C Control Module and Rear High Blower Relay.
3. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in OFF. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in HI. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "D" and Rear High Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (1924) wire between Rear Auxiliary Heater and A/C Control Module and Splice S309.
5. Connect an un-powered test lamp between Rear High Blower Relay socket Cavity "5" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear High Blower Relay.
6. Connect an un-powered test lamp between Rear High Blower Relay socket Cavity "1" and ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear High Blower Relay.
7. Disconnect Connector at Rear Blower Motor. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "4" and Rear Blower Motor Connector Cavity "A."	Test lamp lights.	Replace Rear High Blower Relay.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Rear High Blower Relay and Splice S402.



**REAR BLOWER MOTOR DOES NOT OPERATE IN MED (HEATER WITH A/C)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Remove Rear Medium Blower Relay from its socket. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in MED. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in OFF. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "E" and Rear Medium Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in RED (1925) wire between Front Auxiliary Heater and A/C Control Module and Rear Medium Blower Relay.
3. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in OFF. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in MED. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "E" and Rear Medium Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in RED (1925) wire between Rear Auxiliary Heater and A/C Control Module and Splice S305.
5. Connect an un-powered test lamp between Rear Medium Blower Relay socket Cavity "5" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Medium Blower Relay.
6. Connect an un-powered test lamp between Rear Medium Blower Relay socket Cavity "1" and ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear Medium Blower Relay.

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TEST	RESULT	ACTION
7. Disconnect Connector at Rear Blower Resistor. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "4" and Rear Blower Resistor Connector Cavity "A."	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (1072) wire between Rear Medium Blower Relay and Rear Blower Resistor.
8. Reinsert Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	REPLACE Rear Medium Blower Relay.

**REAR BLOWER MOTOR DOES NOT OPERATE IN LO (HEATER WITH A/C)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Remove Rear Low Blower Relay from its socket. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in LO. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in OFF. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "C" and Rear Low Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (1926) wire between Front Auxiliary Heater and A/C Control Module and Rear Low Blower Relay.
3. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in OFF. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in LO. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "C" and Rear Low Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (1926) wire between Rear Auxiliary Heater and A/C Control Module and Splice S306.

TEST	RESULT	ACTION
5. Connect an un-powered test lamp between Rear Low Blower Relay socket Cavity "5" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Low Blower Relay.
6. Connect an un-powered test lamp between Rear Low Blower Relay socket Cavity "1" and ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear Low Blower Relay.
7. Disconnect Connector at Rear Blower Resistor. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "4" and Rear Blower Resistor Connector Cavity "C."	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1176) wire between Rear Low Blower Relay and Rear Blower Resistor.
8. Reinsert Rear Low Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	REPLACE Rear Low Blower Relay.

### REAR BLOWER MOTOR OPERATES CONTINUOUSLY AT ANY SPEED (HEATER WITH A/C)

TEST	RESULT	ACTION
1. Place Ignition Switch OFF. Place Rear Blower Switch at the Front Auxiliary Heater and A/C Control Module in OFF. Place Rear Blower Switch at the Rear Auxiliary Heater and A/C Control Module in OFF. Disconnect Connector at Rear Blower Resistor. Remove Rear High Blower Relay from its socket. Does the Rear Blower Motor operate?	Yes.	LOCATE and REPAIR short to Voltage in YEL (1172) wire between Rear Blower Resistor, Rear High Blower Relay, and Rear Blower Motor.
	No.	GO to step 2.
2. Reconnect Connector at Rear Blower Resistor. Place the Ignition Switch in RUN. Does the Rear Blower Motor operate?	Yes.	GO to step 3.
	No.	GO to step 12.
3. Reinstall the Rear High Blower Relay in its socket. Remove the Rear Low Blower Relay from its socket. Remove the Rear Medium Blower Relay from its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (1072) wire between Rear Medium Blower Relay and Rear Blower Resistor.
	Test lamp does not light.	GO to step 4.
4. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on YEL (1176) wire between Rear Low Blower Relay and Rear Blower Resistor.
	Test lamp does not light.	GO to step 5.

## HVAC BLOWER CONTROL

TEST	RESULT	ACTION
5. Reinstall Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	GO to step 9.
6. Remove Rear Medium Blower Relay in its socket. Connect self-powered test lamp from Rear Medium Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	REPLACE Rear Medium Blower Relay.
7. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect un-powered test lamp from Front Auxiliary Heater and A/C Control Module Connector Cavity "D" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground on RED (1925) wire between Rear Medium Blower Relay, Front Auxiliary Heater and A/C Control Module, and Rear Heater and A/C Control Module.
	Test lamp does not light.	GO to step 8.
8. Reconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect un-powered test lamp from Rear Medium Blower Relay socket Cavity "2" to ground.	Test lamp lights.	REPLACE Front Heater and A/C Control Module.
	Test lamp does not light.	REPLACE Rear Heater and A/C Control Module.
9. Connect self-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 10.
	Test lamp does not light.	REPLACE Rear Low Blower Relay.
10. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect un-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground on DK BLU (1926) wire between Rear Low Blower Relay, Front Auxiliary Heater and A/C Control Module, and Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	GO to step 11.
11. Reconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect un-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	REPLACE Rear Auxiliary Heater and A/C Control Module.
12. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 13.
	Test Lamp does not light.	REPLACE Rear High Blower Relay.
13. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on WHT (1924) wire between Rear High Blower Relay, Front Auxiliary Heater and A/C Control Switch, and Rear Auxiliary Heater and A/C Control Switch.
	Test lamp does not light.	GO to step 14.

TEST	RESULT	ACTION
14. Reconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	REPLACE Rear Auxiliary Heater and A/C Control Module.

**REAR BLOWER SWITCH AT REAR AUXILIARY HEATER AND A/C CONTROL MODULE  
FUNCTIONS WHEN REAR BLOWER SWITCH AT FRONT AUXILIARY HEATER AND A/C  
CONTROL MODULE IS NOT IN THE REAR POSITION (HEATER WITH A/C)**

TEST	RESULT	ACTION
1. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in OFF. Place Rear Blower Switch at Rear Auxiliary Heater and A/C Control Module in OFF. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "N" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "F" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in ORN (1923) wire between Auxiliary Heater and A/C Control Logic Module and Front Heater and A/C Control Module.
	Test lamp does not light.	REPLACE Front Auxiliary Heater and A/C Control Module.
3. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "F" and Auxiliary Heater and Control Logic Module Connector Cavity "N."	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1923) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and Control Logic Module. Then, GO to step 4.
4. Reconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "F" and ground.	Test lamp lights.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 5.
5. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "F" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in DK BLU (77) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	REPLACE Rear Auxiliary Heater and A/C Control Module.

## HVAC BLOWER CONTROL

### REAR BLOWER SWITCH AT REAR AUXILIARY HEATER AND A/C CONTROL MODULE DOES NOT CONTROL THE REAR BLOWER WHEN SELECTED (HEATER WITH A/C)

TEST	RESULT	ACTION
1. Place Rear Blower Switch at Front Auxiliary Heater and A/C Control Module in REAR. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Pins "B" and "F."	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE Front Auxiliary Heater and A/C Control Module.
2. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "B" and Auxiliary Heater and A/C Control Logic Module Connector Cavity "N."	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1923) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
3. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Pins "N" and "L." Observe the indication. Then, reverse the leads and observe the indication.	Test lamp does not light in either direction.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	Test lamp lights for one direction only.	GO to step 4.
	Test lamp lights for both directions.	REPLACE Auxiliary Heater and A/C Control Logic Module for shorted diode. Then, GO to step 4.
4. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "L" and Rear Auxiliary Heater and A/C Control Module Connector Cavity "F."	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (77) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Heater and A/C Control Module.

**REAR BLOWER MOTOR DOES NOT OPERATE AT ANY SPEED (A/C WITHOUT HEATER)**

TEST	RESULT	ACTION
1. Disconnect Connector at Rear Blower Motor. Place Ignition Switch in RUN. Place Front Auxiliary A/C Control Switch in HI. Place Rear Auxiliary A/C Control Switch in OFF. Connect un-powered test lamp from Rear Blower Motor Connector Cavity "A" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect self-powered test lamp between Rear Blower Motor Connector Cavity "B" to ground.	Test lamp lights.	REPLACE Rear Blower Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Blower Motor and Ground G400.
3. Remove Rear High Blower Relay from its socket. Connect un-powered test lamp from Rear High Blower Relay socket Cavity "1" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Underhood Fuse-Relay Center and Splice S401.
4. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "5" to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between I/P Fuse Block and Splice S400.
5. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "4" and Rear Blower Motor Connector Cavity "A."	Test does lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Splice S402 and Rear Blower Motor.
6. Disconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Front Auxiliary A/C Control Switch Connector Cavity "B" and ground.	Test lamp lights.	REPLACE Front Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Auxiliary A/C Control Switch and Ground G400.

## HVAC BLOWER CONTROL

## REAR BLOWER MOTOR DOES NOT OPERATE IN HI (A/C WITHOUT HEATER)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Remove Rear High Blower Relay from its socket. Place Front Auxiliary A/C Control Switch in HI. Place Rear Auxiliary A/C Control Switch in OFF. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Front Auxiliary A/C Control Switch Connector Cavity "D" and Rear High Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Front Auxiliary A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (1924) wire between Front Auxiliary A/C Control Switch and Rear High Blower Relay.
3. Place Front Auxiliary A/C Control Switch in OFF. Place Rear Auxiliary A/C Control Switch in HI. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear Auxiliary A/C Control Switch Connector Cavity "D" and Rear High Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (1924) wire between Rear Auxiliary A/C Control Switch and Splice S309.
5. Connect an un-powered test lamp between Rear High Blower Relay socket Cavity "5" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear High Blower Relay.
6. Connect an un-powered test lamp between Rear High Blower Relay socket Cavity "1" and ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear High Blower Relay.
7. Disconnect Connector at Rear Blower Motor. Connect un-powered test lamp between Rear High Blower Relay socket Cavity "4" and Rear Blower Motor Connector Cavity "A."	Test lamp lights.	REPLACE Rear High Blower Relay.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1172) wire between Rear High Blower Relay and Splice S402.



**REAR BLOWER MOTOR DOES NOT OPERATE IN MED (A/C WITHOUT HEATER)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Remove Rear Medium Blower Relay from its socket Place Front Auxiliary A/C Control Switch in MED. Place Rear Auxiliary A/C Control Switch in OFF. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Front Auxiliary A/C Control Switch Connector Cavity "E" and Rear Medium Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Front Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in RED (1925) wire between Front Auxiliary A/C Control Switch and Rear Medium Blower Relay.
3. Place Front Auxiliary A/C Control Switch in OFF. Place Rear Auxiliary A/C Control Switch in MED. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear Auxiliary A/C Control Switch Connector Cavity "E" and Rear Medium Blower Relay socket Cavity "2."	Test Lamp lights.	REPLACE Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in RED (1925) wire between Rear Auxiliary A/C Control Switch and Splice S305.
5. Connect un-powered test lamp between Rear Medium Blower Relay socket Cavity "5" and ground.	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Medium Blower Relay.
6. Connect an un-powered test lamp between Rear Medium Blower Relay socket Cavity "1" and ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear Medium Blower Relay.
7. Disconnect Connector at Rear Blower Resistor. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "4" and Rear Blower Resistor Connector Cavity "A."	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (1072) wire between Rear Medium Blower Relay and Rear Blower Resistor.
8. Reinsert Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	REPLACE Rear Medium Blower Relay.

## HVAC BLOWER CONTROL

## REAR BLOWER MOTOR DOES NOT OPERATE IN LO (A/C WITHOUT HEATER)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Remove Rear Low Blower Relay from its socket Place Front Auxiliary A/C Control Switch in LO. Place Rear Auxiliary A/C Control Switch in OFF. Connect self-powered test lamp between Rear Medium Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Front Auxiliary A/C Control Switch Connector Cavity "C" and Rear Low Blower Relay socket Cavity "2."	Test lamp lights.	REPLACE Front Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (1926) wire between Front Auxiliary A/C Control Switch and Rear Low Blower Relay.
3. Place Front Auxiliary A/C Control Switch in OFF. Place Rear Auxiliary A/C Control Switch in LO. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear Auxiliary A/C Control Switch Connector Cavity "C" and Rear Low Blower Relay socket Cavity "2."	Test Lamp lights.	REPLACE Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (1926) wire between Rear Auxiliary A/C Control Switch and Splice S306.
5. Connect un-powered test lamp between Rear Low Blower Relay socket Cavity "5" and ground.	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Low Blower Relay.
6. Connect an un-powered test lamp between Rear Medium Blower Relay socket Cavity "1" and ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in RED (542) wire between Splice S401 and Rear Low Blower Relay.
7. Disconnect Connector at Rear Blower Resistor. Connect self-powered test lamp between Rear Low Blower Relay socket Cavity "4" and Rear Blower Resistor Connector Cavity "C."	Test lamp lights.	GO to step 8.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (1176) wire between Rear Low Blower Relay and Rear Blower Resistor.
8. Reinsert Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	REPLACE Rear Blower Resistor.
	Test lamp does not light.	REPLACE Rear Low Blower Relay.

**REAR BLOWER MOTOR OPERATES CONTINUOUSLY AT ANY SPEED  
(A/C WITHOUT HEATER)**

TEST	RESULT	ACTION
1. Place Ignition Switch OFF. Place Front Auxiliary A/C Control Switch in OFF. Place Rear Auxiliary A/C Control Switch in OFF. Disconnect Connector at Rear Blower Resistor. Remove Rear High Blower Relay from its socket. Does the Rear Blower Motor operate?	Yes.	LOCATE and REPAIR short to Voltage in YEL (1172) wire between Rear Blower Resistor, Rear High Blower Relay, and Rear Blower Motor.
	No.	GO to step 2.
2. Reconnect Connector at Rear Blower Resistor. Place the Ignition Switch in RUN. Does the Rear Blower Motor operate?	Yes.	GO to step 3.
	No.	GO to step 12.
3. Reinstall the Rear High Blower Relay in its socket. Remove the Rear Low Blower Relay from its socket. Remove the Rear Medium Blower Relay from its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (1072) wire between Rear Medium Blower Relay and Rear Blower Resistor.
	Test lamp does not light.	GO to step 4.
4. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "C" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on YEL (1176) wire between Rear Low Blower Relay and Rear Blower Resistor.
	Test lamp does not light.	GO to step 5.
5. Reinstall Rear Medium Blower Relay in its socket. Connect un-powered test lamp between Rear Blower Resistor Connector Cavity "A" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	GO to step 9.
6. Remove Rear Medium Blower Relay in its socket. Connect self-powered test lamp from Rear Medium Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	REPLACE Rear Medium Blower Relay.
7. Disconnect Connector at Front Auxiliary A/C Control Switch. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect un-powered test lamp from Front Auxiliary A/C Control Switch Connector Cavity "D" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground on RED (1925) wire between Rear Medium Blower Relay, Front Auxiliary A/C Control Switch, and Rear A/C Control Switch.
	Test lamp does not light.	GO to step 8.

**8A - 63 - 32 ELECTRICAL DIAGNOSIS****HVAC BLOWER CONTROL**

TEST	RESULT	ACTION
8. Reconnect Connector at Front Auxiliary A/C Control Switch. Connect un-powered test lamp from Rear Medium Blower Relay socket Cavity "2" to ground.	Test lamp lights.	REPLACE Front A/C Control Switch.
	Test lamp does not light.	REPLACE Rear A/C Control Switch.
9. Connect self-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	GO to step 10.
	Test lamp does not light.	REPLACE Rear Low Blower Relay.
10. Disconnect Connector at Front Auxiliary A/C Control Switch. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect un-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground on DK BLU (1926) wire between Rear Low Blower Relay, Front Auxiliary A/C Control Switch, and Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	GO to step 11.
11. Reconnect Connector at Front Auxiliary A/C Control Switch. Connect un-powered test lamp from Rear Low Blower Relay socket Cavity "2" to ground.	Test lamp lights.	REPLACE Front Auxiliary A/C Control Switch.
	Test lamp does not light.	REPLACE Rear Auxiliary A/C Control Switch.
12. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	GO to step 13.
	Test Lamp does not light.	REPLACE Rear High Blower Relay.
13. Disconnect Connector at Front Auxiliary A/C Control Switch. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on WHT (1924) wire between Rear High Blower Relay, Front Auxiliary A/C Control Switch, and Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	GO to step 14.
14. Reconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear High Blower Relay socket Cavity "2" and ground.	Test lamp lights.	REPLACE Front Auxiliary A/C Control Switch.
	Test lamp does not light.	REPLACE Rear Auxiliary A/C Control Switch.

**REAR AUXILIARY A/C CONTROL SWITCH FUNCTIONS WHEN THE FRONT AUXILIARY A/C CONTROL SWITCH IS NOT IN THE REAR POSITION (A/C WITHOUT HEATER)**

TEST	RESULT	ACTION
1. Place Front Auxiliary A/C Control Switch in OFF. Place Rear Auxiliary A/C Control Switch in OFF. Disconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Front Auxiliary A/C Control Switch Pins "B" and "F."	Test lamp lights.	REPLACE Front Auxiliary A/C Control Switch.
	Test lamp does not light.	GO to step 2.
2. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear Auxiliary A/C Control Switch Connector Cavity "F" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in ORN (1923) wire between Front Auxiliary A/C Control Switch and Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	REPLACE Rear Auxiliary A/C Control Switch.

**REAR AUXILIARY A/C CONTROL SWITCH DOES NOT OPERATE THE REAR BLOWER WHEN SELECTED (A/C WITHOUT HEATER)**

TEST	RESULT	ACTION
1. Place Front Auxiliary A/C Control Switch in REAR. Disconnect Connector at Front Auxiliary A/C Control Switch. Connect self-powered test lamp between Front Auxiliary A/C Control Switch Pins "B" and "F."	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE Front Auxiliary A/C Control Switch.
2. Disconnect Connector at Rear Auxiliary A/C Control Switch. Connect self-powered test lamp between Rear Auxiliary A/C Control Switch Connector Cavity "F" and Front Auxiliary A/C Control Switch Connector Cavity "F."	Test lamp lights.	REPLACE Rear Auxiliary A/C Control Switch.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1923) wire between Front Auxiliary A/C Control Switch and Rear Auxiliary A/C Control Switch.

**HVAC BLOWER CONTROL****CIRCUIT OPERATION****FRONT BLOWER CONTROLS**

Battery Voltage is supplied at all times to Front High Blower Relay Pin A2 through the RED (542) wire. When the Ignition Switch is OFF or the Front Blower Switch at the Heater Control Module or Heater and A/C Control Module is OFF, no Voltage is applied to the Relay Coil through the ORN (52) wire and the Relay remains de-energized. Similarly, no Voltage is applied to the normally closed contact at Pin B2 of the Relay. Battery Voltage is not applied to the Front Blower Motor and it does not operate at any speed.

When the Ignition Switch is in RUN and the Front Blower Switch is in LO, Voltage is applied through all three Blower Resistors to the normally closed contact in the Relay. The Relay remains de-energized. Reduced Voltage is applied to the Front Blower Motor through the PPL (65) wire and the Motor operates at its slowest speed. With the Front Blower Switch in either M1 or M2, current flows through fewer resistors in the Front Blower Resistor and the Front Blower Motor runs faster.

With the Front Blower Switch in HI, the Blower Resistors are bypassed by the energization of the Front High Blower Relay. The contacts change state and Battery Voltage from the Underhood Fuse-Relay Center is applied directly to the Motor. The Front Blower Motor then operates at its fastest speed.

**REAR AUXILIARY BLOWER CONTROLS  
(HEATER WITHOUT A/C)**

Battery Voltage is supplied when the Ignition Switch is in RUN to Relay Coil Pin 5 of each of the three Rear Blower Relays through the BRN (341) wire. Battery Voltage is also supplied when the Ignition Switch is in RUN to Pin 1 of each of the three Rear Blower Relays through the RED (542) wire. With the Rear Auxiliary Heater Control Switch in OFF, no grounding path is

provided for the Relay Coils and the Relays remain de-energized. The Relay contacts remain open and no Voltage is supplied to the Rear Blower Motor.

When the Ignition Switch is in RUN and the Rear Auxiliary Heater Control Switch is in LO, a ground path is provided for the Rear Low Blower Relay Coil through the DK BLU (1926) wire to the Control Switch then through BLK (150) wire to Ground G200. The Relay Coil energizes and the Relay contacts close. This applies Battery Voltage to the Rear Blower Resistor through the YEL (1176) wire. Current flows through two resistors and to the Rear Blower Motor through the YEL (1172) wire. The Motor operates at its slowest speed.

When the Rear Auxiliary Heater Control Switch is in MED, the Rear Medium Blower Relay is energized. Current flows to the Motor through one resistor and the Motor operates at an intermediate speed. When the Rear Auxiliary Heater Control Switch is in HI, the Rear High Blower Relay is energized. Current bypasses both resistors and the Motor operates at its highest speed.

An illumination lamp is provided at the Rear Auxiliary Heater Control Switch to facilitate Switch operations. The lamp is powered by the Instrument Panel Dimming system described in Section 8A-117.

**REAR AUXILIARY BLOWER CONTROLS  
(HEATER WITH A/C)**

The Rear Blower Motor is controlled by either of two Rear Blower Switches when optional rear auxiliary heating and air conditioning is provided. Both Switches are located in overhead modules, one over the Instrument Panel and the other in the center of the vehicle. The Rear Blower Motor will operate from the Rear Blower Switch at the Rear Auxiliary Heater and A/C Control Module only when the Rear Blower Switch at the Front Auxiliary Heater and A/C Control Module is in the REAR position. See Section 8A-65 for a description of the control priorities for the ventilation modes.

Battery Voltage is supplied when the Ignition Switch is in RUN to Relay Coil Pin 5 of each of the three Rear Blower Relays through the BRN (341) wires. Battery Voltage is also supplied when the Ignition Switch is in RUN to contact Pin 1 of each of the three Rear Blower Relays through the RED (542) wires. With the Rear Blower Switch at the Front Auxiliary Heater and A/C Control Module in OFF and with the Rear Blower Switch at the Rear Auxiliary Heater and A/C Control Module in OFF, no grounding path is provided for the Relay Coils and the Relays remain de-energized. The Relay contacts remain open and no Voltage is supplied to the Rear Blower Motor.

When the Ignition Switch is in RUN and the Blower Switch at the Front Module is in LO, a ground path is provided for the Rear Low Blower Relay through the DK BLU (1925) wire to the Front Blower Switch then through BLK (150) wire to Ground G400. The Relay Coil energizes and the Relay contacts close. This applies Battery Voltage to the Rear Blower Resistor through the YEL (1176) wire. Current flows through two resistors and to the Rear Blower Motor through the YEL (1172) wire. The Motor operates at its slowest speed.

When the Rear Blower Switch at the Front Heater and A/C Control Module is in REAR and the Rear Blower

Switch at the Rear Heater and A/C Control Module is in LO, the grounding path is different. The ground path is through the DK BLU (1925) wire to the Rear Auxiliary Heater and A/C Control Module. The DK BLU (77) wire continues the ground path to the Auxiliary and Heater and A/C Control Logic Module. ORN (77) wire continues the ground path to the Front Auxiliary Heater and A/C Control Module where it continues to Ground G400.

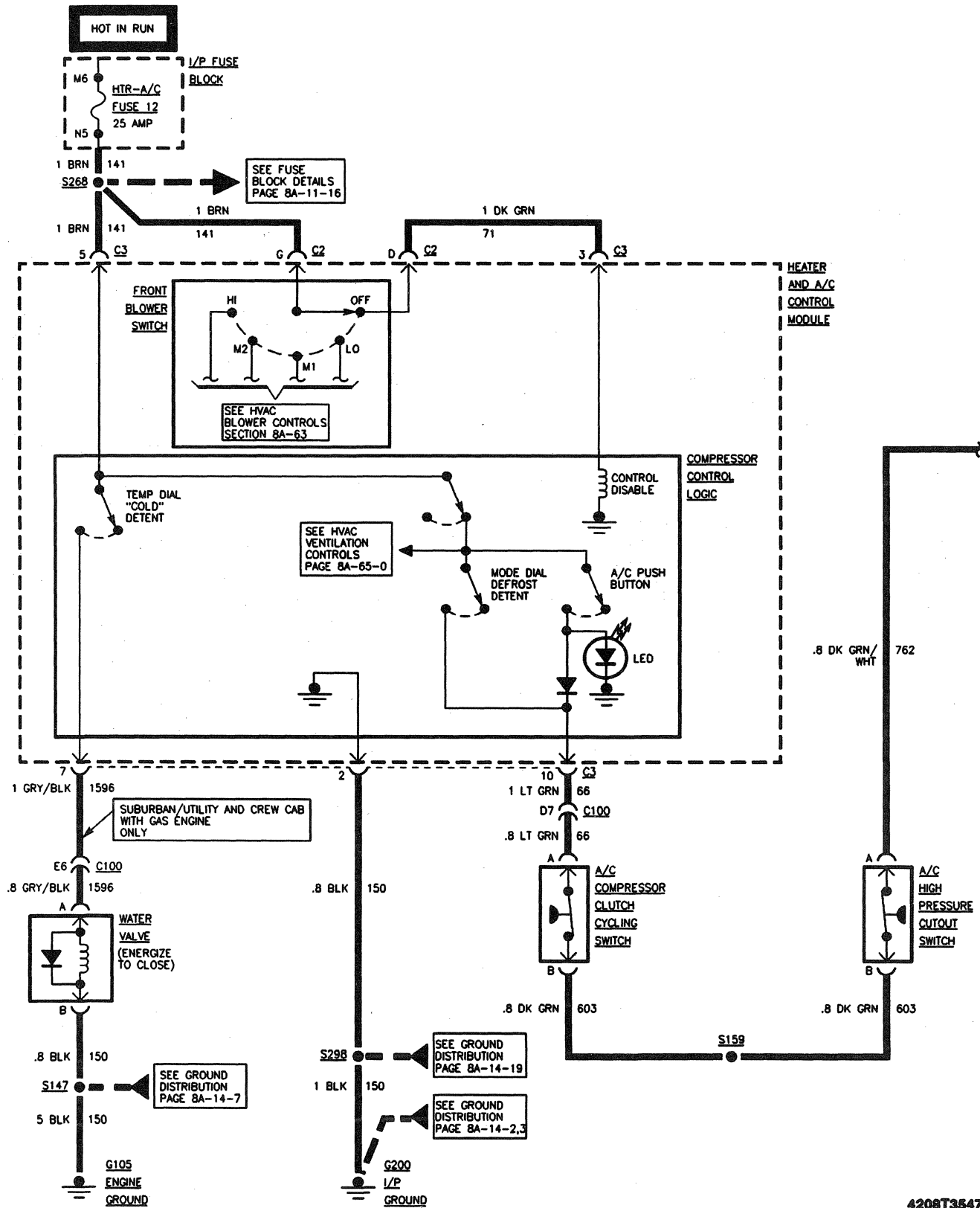
When the Rear Blower Switch is in MED, the Rear Medium Blower Relay is energized. Current flows to the Motor through one resistor and the Motor operates at an intermediate speed. When the Rear Blower Switch is in HI, the Rear High Blower Relay is energized. Current bypasses both resistors and the Motor operates at its highest speed.

An illumination lamp is provided at each Heater and A/C Control Module to facilitate Switch operations. The lamps are powered by the Instrument Panel Dimming system described in SECTION 8A-117.

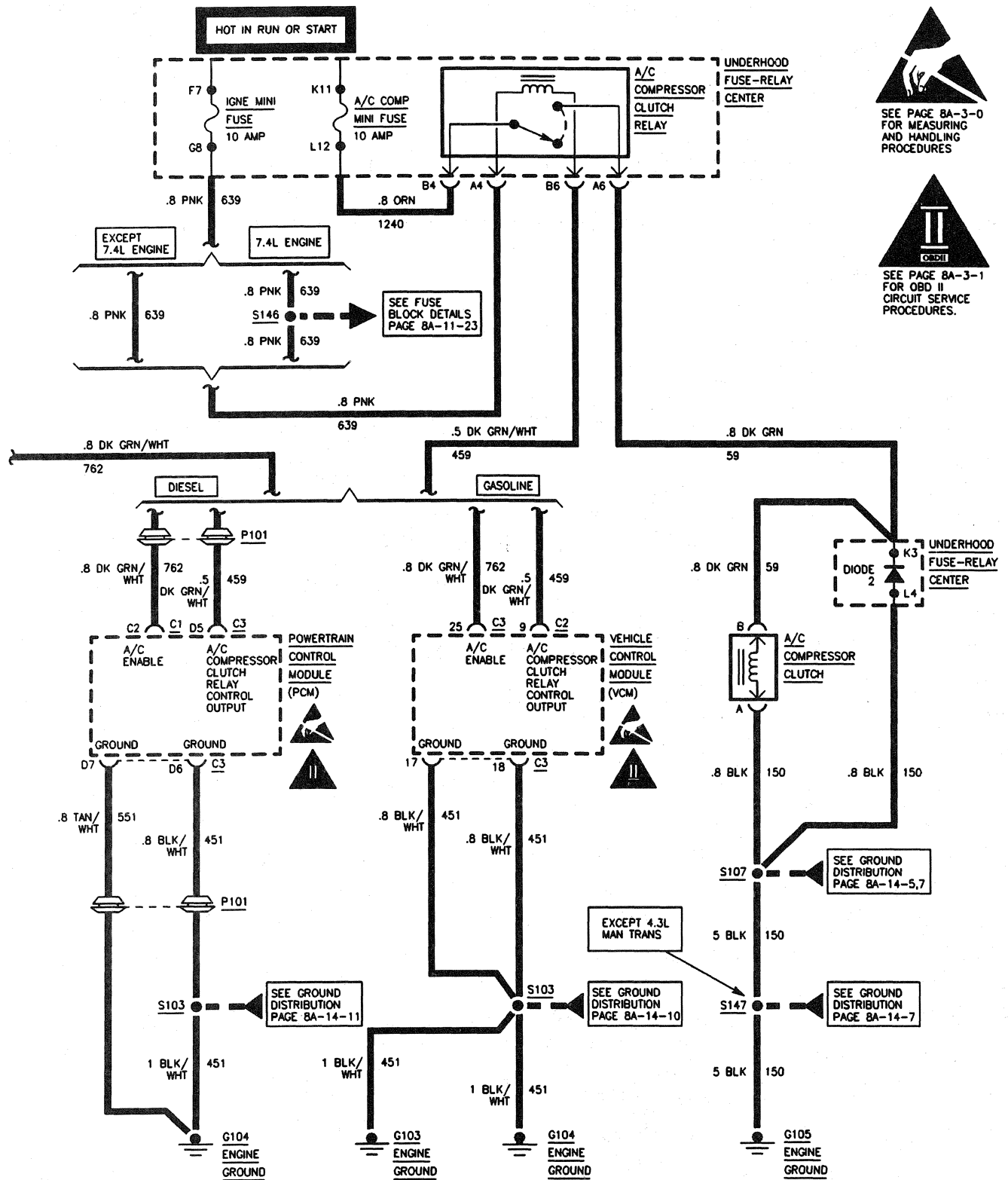
### **REAR AUXILIARY BLOWER CONTROLS (A/C WITHOUT HEATER)**

The Circuit operation for the optional Rear Auxiliary Air Conditioning system is similar to that for the optional Rear Auxiliary Heating and Air Conditioning option.

# HVAC COMPRESSOR CONTROL







## 8A - 64 - 2 ELECTRICAL DIAGNOSIS

### HVAC COMPRESSOR CONTROL

COMPONENT	LOCATION	201-PG	FIG.	CONN
A/C Compressor Clutch.....	Front of A/C Compressor			
A/C Compressor Clutch Relay.....	In Underhood Fuse-Relay Center.....	4.....	9	
A/C Compressor Clutch Cycling Switch .....	In Low Pressure Refrigerant Line, near Compressor .....	10.....	16	
A/C High Pressure Cutout Switch.....	On rear portion of A/C Compressor.....	6.....	12	
I/P Fuse Block .....	Lower LH side of I/P .....	23.....	35	
Powertrain Control Module (PCM).....	Under RH end of I/P, above Blower Motor .....	24.....	38	
Underhood Fuse-Relay Center .....	LH rear of Engine Compartment, on Fender.....	4.....	8	
Vehicle Control Module (VCM) .....	Engine Compartment, near BPMV Valve.....	24.....	37	
Water Valve (Suburban Utility).....	Engine Compartment, RH rear side of Inner Fender			
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22.....	33.....	202-0
C200.....	Behind RH prtion of I/P, near Heater Motor, in Foam Wrap.	24.....	38.....	202-4
<b>DIODES:</b>				
DIODE 2 .....	In Underhood Fuse-Relay Center			
<b>GROMMETS:</b>				
P101 .....	RH rear of Engine Compartment at Bulkhead			
<b>GROUNDS:</b>				
G103 (Gas) .....	RH front of Engine, near Thermostat Housing .....	10.....	16	
G104 (Gas) .....	RH top of Cylinder Head, near center.....	12.....	18	
G104 (Diesel) .....	RH top of Cylinder Head.....	15.....	21	
G105 (Gas) .....	RH front of Engine Block.....	9.....	15	
G105 (Diesel) .....	RH top of Cylinder Head.....	15.....	21	
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S103 (VIN W, M, R) .....	Engine Harness, approx. 11 cm from Breakout to EGR Valve toward Taillamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, approx. 35 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S103 (Diesel).....	Engine Harness, approx. 11.5 cm from Breakout to Glow Plugs (RH Side) Toward P101			
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve, toward Taillamp Extension			

COMPONENT	LOCATION	201-PG FIG.	CONN
S107 (VIN M, R).....	Engine Harness, approx. 20 cm from Breakout to EGR Valve, toward Taillamp Extension		
S107 (VIN J).....	Engine Harness, approx. 20 cm from Breakout to Fuel Injector Breakout, toward Taillamp Extension		
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPVM toward EGR Valve		
S146 (VIN J).....	Engine Harness, approx. 22 cm into Underhood Fuse - Relay Center Breakout		
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout, toward Taillamp Extension Breakout		
S147 (VIN J).....	Engine Harness, approx. 5 cm from Fuel Injector Breakout, toward Taillamp Harness Breakout		
S147 (Diesel).....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH side)		
S159 (Gas).....	Engine Harness, approx. 21.5 cm from Underhood Lamp Breakout toward Generator Breakout		
S159 (Diesel).....	Engine Harness, approx. 10 cm from Glow Plug Breakout		
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout		
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets		
S268 .....	I/P Harness, approx. 25 cm from Heater A/C Control Connector		
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout		

## DIAGNOSIS - AIR CONDITIONING COMPRESSOR CONTROLS

### TROUBLESHOOTING HINTS:

- CHECK A/C Compressor operations as per Heating, Ventilation, and Air Conditioning SECTION 1B.
- CHECK that HTR-A/C Fuse 12, IGN E MINI FUSE, and A/C COMP FUSE are not open. If any Fuse is open, LOCATE and REPAIR source of overload and REPLACE the Fuse(s).
- CHECK that Grounds G104 and G105 (Diesel) or Grounds G103, G104, and G105 (Gasoline) are clean and tight.
- CHECK that A/C Compressor Clutch Relay is properly mated to its connector.
- CHECK condition of Diode 2 at the Underhood Fuse-Relay Center. REPLACE if either opened or shorted.
- If the A/C Compressor is operating continuously, CHECK for short to ground on DK GRN/WHT (459) wire. If shorted to ground, LOCATE and REPAIR source of short.
  - CHECK for broken (or partially broken) wire inside of insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check, with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting procedures," page 8A-4-0).

**8A - 64 - 4 ELECTRICAL DIAGNOSIS****HVAC COMPRESSOR CONTROL****A/C COMPRESSOR CLUTCH DOES NOT ENGAGE**

TEST	RESULT	ACTION
1. Perform C.C.O.T. System Air Conditioning Diagnosis: Insufficient Cooling as per Heating, Ventilation and Air Conditioning SECTION 1B.	Problem is resolved.	End.
	Problem remains.	GO to Step 2.
2. Disconnect connector at A/C Compressor Clutch. Start the engine. Adjust the mode control dial at the Heater and A/C Control Module to center "Floor" position. Adjust the temperature control dial on Heater and A/C Control Module to maximum cooling. Place the Front Blower Switch in HI. Depress the A/C pushbutton on Heater and A/C Control Module. Observe that the LED illuminates. Connect self-powered test lamp from A/C Compressor Clutch connector Cavity "A" to ground.	Test lamp lights.	GO to Step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between A/C Compressor Clutch and Ground G105.
3. Remove A/C Compressor Clutch Relay from its socket. Connect self-powered test lamp between A/C Compressor Clutch Relay socket Cavity "A6" and A/C Compressor Clutch Connector Cavity "B."	Test lamp lights.	GO to Step 4.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (59) wire between Underhood Fuse-Relay Center and A/C Compressor Clutch.
4. Connect unpowered test lamp from A/C Compressor Clutch Relay socket Cavity "B4" to ground.	Test lamp lights.	GO to Step 5.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1240) wire from A/C Comp Fuse to A/C Compressor Clutch Relay in Underhood Fuse-Relay Center.
5. Connect unpowered test lamp from A/C Compressor Clutch socket Cavity "A4" to ground.	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (639) wire from IGN E Mini Fuse to A/C Compressor Clutch Relay in Underhood Fuse-Relay Center.
6. Disconnect Connector C3 at Powertrain Control Module (PCM) (Diesel only) or Connector C2 at Vehicle Control Module (VCM) (Gasoline only). Connect unpowered test lamp between A/C Compressor Clutch Relay socket Cavity "B6" and PCM Connector C3 Cavity "D5" (Diesel) or VCM Connector C2 Cavity "9" (Gasoline).	Test lamp lights.	GO to Step 7.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (459) wire between A/C Compressor Clutch Relay and Powertrain Control Module or Vehicle Control Module.

**HVAC COMPRESSOR CONTROL**

TEST	RESULT	ACTION
7. Replace A/C Compressor Clutch Relay in its socket. Connect fused jumper wire between Powertrain Control Module Connector C3 Cavity "D5" (Diesel) or Vehicle Control Module Connector C2 Cavity "9" (Gasoline) to ground. Connect unpowered test lamp from A/C Compressor Clutch Connector "B" to ground.	Test lamp lights.	GO to Step 8.
	Test lamp does not light.	REPLACE A/C Compressor Clutch Relay.
8. Is this a gasoline vehicle?	Yes.	GO to Step 9.
	No.	GO to Step 11.
9. Disconnect Connector C3 at Vehicle Control Module. Connect a self-powered test lamp between Connector C3 Cavity "17" and ground.	Test lamp lights.	GO to Step 10.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Vehicle Control Module Connector C3 Cavity "17" and Grounds G104 and G105.
10. Connect a self-powered test lamp between Vehicle Control Module Connector C3 Cavity "18" and ground.	Test lamp lights.	GO to Step 13.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Vehicle Control Module Connector C3 Cavity "18" and Grounds G104 and G105.
11. Connect a self-powered test lamp between Powertrain Control Module Connector C3 Cavity "D7" and ground.	Test lamp lights.	GO to Step 12.
	Test lamp does not light.	LOCATE and REPAIR open in TAN/WHT (551) wire between Powertrain Control Module Connector C3 Cavity "D7" and Ground G104.
12. Connect a self-powered test lamp between Powertrain Control Module Connector C3 Cavity "D6" and ground.	Test lamp lights.	GO to Step 14.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between PCM Connector C3 Cavity "D6" and Ground G104.
13. Connect unpowered test lamp between Vehicle Control Module Connector C3 Cavity "25" and ground.	Test lamp does not light.	GO to Step 15.
	Test lamp lights.	REPLACE Vehicle Control Module.
14. Disconnect Connector C1 at Powertrain Control Module. Connect unpowered test lamp between PCM Connector C1 Cavity "C2" and ground.	Test lamp does not light.	GO to Step 15.
	Test lamp lights.	REPLACE Powertrain Control Module.
15. Disconnect connector at A/C High Pressure Cutout Switch. Connect a self-powered test lamp between Powertrain Control Module Connector C1 Cavity "C2" (Diesel) or Vehicle Control Module Connector C3 Cavity "25" and A/C High Pressure Cutout Switch Connector Cavity "A."	Test lamp lights.	GO to Step 16.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (762) wire between A/C High Pressure Switch and PCM or VCM.

## 8A - 64 - 6 ELECTRICAL DIAGNOSIS

### HVAC COMPRESSOR CONTROL

TEST	RESULT	ACTION
16. Connect self-powered test lamp between Pins "A" and "B" of A/C High Pressure Cutout Switch.	Test lamp lights.	GO to Step 17.
	Test lamp does not light.	REPLACE A/C High Pressure Cutout Switch.
17. Disconnect connector at A/C Compressor Cycling Switch. Connect self-powered test lamp from A/C Compressor Cycling Switch connector Cavity "B" and A/C High Pressure Cutout Switch Connector Cavity "B."	Test lamp lights.	GO to Step 18.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (603) wire between A/C Compressor Cycling Switch and A/C High Pressure Cutout Switch.
18. Reconnect connectors at Powertrain Control Module (Diesel) or Vehicle Control Module (Gasoline). Reconnect connector at A/C Compressor Clutch. Connect fused jumper wire from A/C Compressor Cycling Switch Connector Cavity "B" and Battery Voltage. Connect self-powered test lamp at Pins "A" and "B" of A/C Compressor Cycling Switch. Monitor for Compressor Cycling. Reference Heater, Ventilation, and Air Conditioning SECTION 1B.	Test lamp lights periodically.	GO to Step 19.
	Test lamp does not light periodically.	REPLACE A/C Compressor Cycling Switch.
19. Remove jumper wire from Battery Voltage to A/C Compressor Cycling Switch connector Cavity "B." Disconnect Connector C3 at Heater and A/C Control Module. Connect self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "10" and A/C Compressor Cycling Switch Connector Cavity "A."	Test lamp lights.	GO to Step 20.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (66) wire between Heater and A/C Control Module and A/C Compressor Cycling Switch.
20. Reconnect connector at A/C Compressor Cycling Switch. Connect unpowered test lamp between Heater and A/C Control Module Connector C3 Cavity "5" and ground.	Test lamp lights.	GO to Step 21.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Heater and A/C Control Module Connector C3.
21. Connect an unpowered test lamp between Heater and A/C Control Module Connector C3 Cavity "2" and ground.	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Heater and A/C Control Module and Ground G200.

## HVAC COMPRESSOR CONTROL

### CIRCUIT OPERATION

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.

When the Ignition Switch is in RUN, Battery Voltage is supplied to the Heater and A/C Control Module, the A/C Compressor Clutch Relay Coil, and the normally open A/C Compressor Clutch Relay contact. In the Heater and A/C Control Module, Battery Voltage is also applied to a detent contact on the temperature control dial for operation of the Water Valve (Suburban/Utility with gasoline engines only).

The A/C Compressor Clutch Coil must be energized to drive the A/C Compressor. The Clutch Coil is energized when the Clutch Relay is energized. Voltage is applied from the relay's contact on DK GRN (59) wire to the Clutch Coil. Diode 2 in the Underhood Fuse-Relay Center is reverse-biased and prevents current flow bypassing the Clutch Coil to ground. When the Relay Coil is de-energized, the collapsing magnetic field of the Clutch Coil forward-biases the Diode and dissipates the energy from the magnetic field.

The A/C Compressor Clutch Relay is energized when a ground path is provided for the relay coil on the DK GRN/WHT (459) wire. The Powertrain Control Module (PCM) (Diesel only) or the Vehicle Control Module (VCM) (Gasoline only) provides this ground path through contact-equivalents in the module. These modules may stop compressor operations while otherwise enabled under certain operating conditions as described in the Driveability and Emissions sections of this manual.

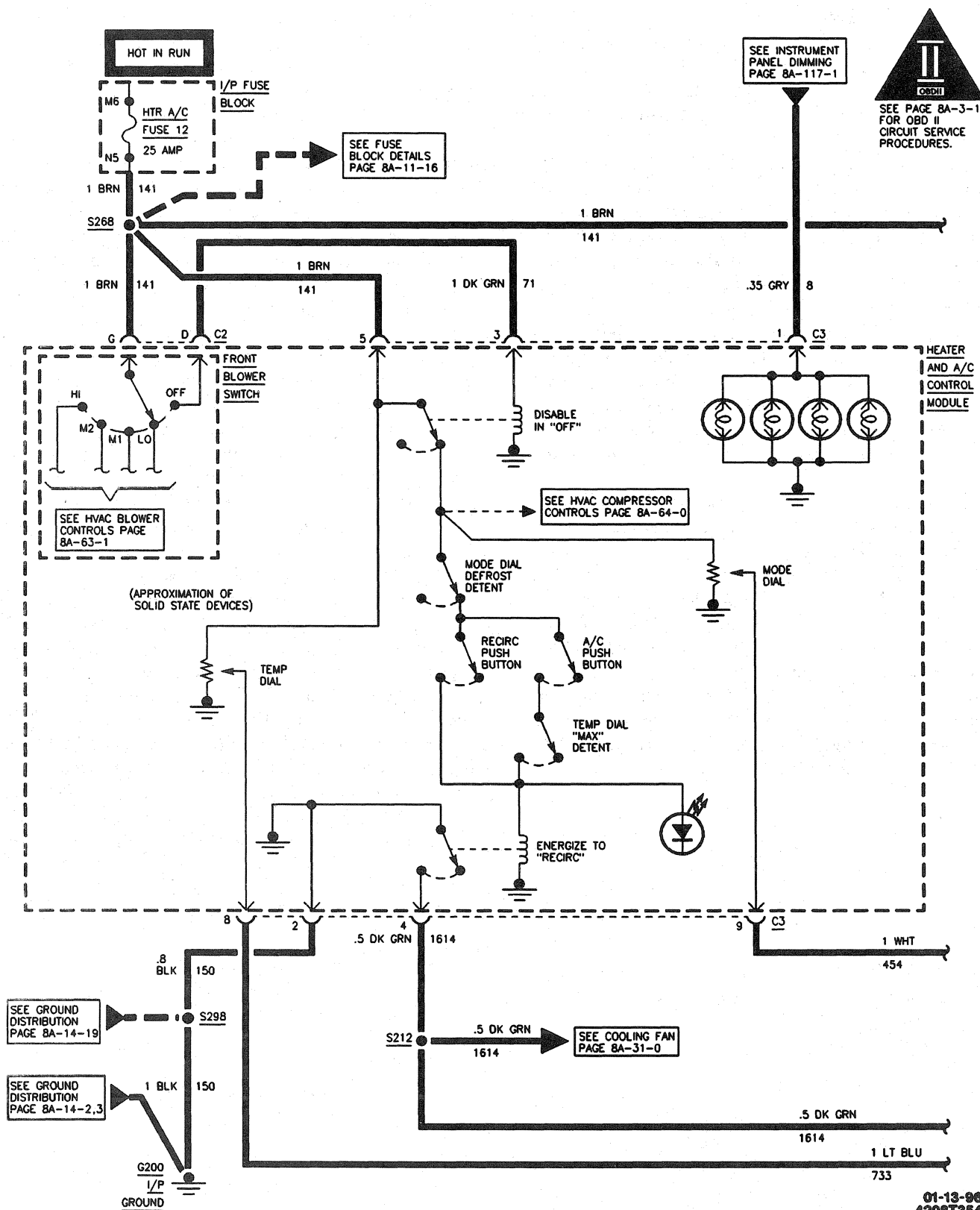
The VCM or PCM modules enable A/C Compressor operations when a Voltage input is received from the Heater and A/C Control Module on the DK GRN/WHT (762) wire. Two switch contacts in series between the Heater and A/C Control Module and the VCM/PCM module can isolate this Voltage. The A/C High Pressure Cutout Switch monitors the compressor high side pressure. When this pressure exceeds a limit, the switch contacts open to stop the compressor and reduce the pressure. This switch does not operate unless conditions are unusual. The A/C Compressor Cycling Switch monitors compressor low side pressure to provide freeze protection. When the low side pressure reaches a limit, the switch contacts open. When the low side pressure reaches a limit, the switch contacts open. When the pressure recovers, the contacts close. This switch operates normally to cycle the compressor while operating.

The Heater and A/C Control Module places Voltage on the LT GRN (66) wire when the Ignition Switch is in Run, the Front Blower Switch is not in OFF, and either the A/C Pushbutton Switch has been depressed or the mode Control Dial on the module is at the defrost detent. The A/C Pushbutton Switch is a latching switch which allows a light emitting Diode (LED) on the switch to be illuminated when the module enables compressor operations from the switch. The mode control Dial Detent Switch does not light the LED but does operate the compressor during defrosting operations to dry the air and prevent fogging.

The Heater and A/C Control Module's temperature control dial detent switch operates the Water Valve (Suburban/Utility with gasoline engines only). With the Ignition Switch in RUN, adjusting the dial to a low temperature setting applies a Voltage on the GRY/BLK (1596) wire and energizes the valve's solenoid. This closed the valve which isolates Coolant Flow to the Heater Core.

# HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## FRONT VENTILATION CONTROLS

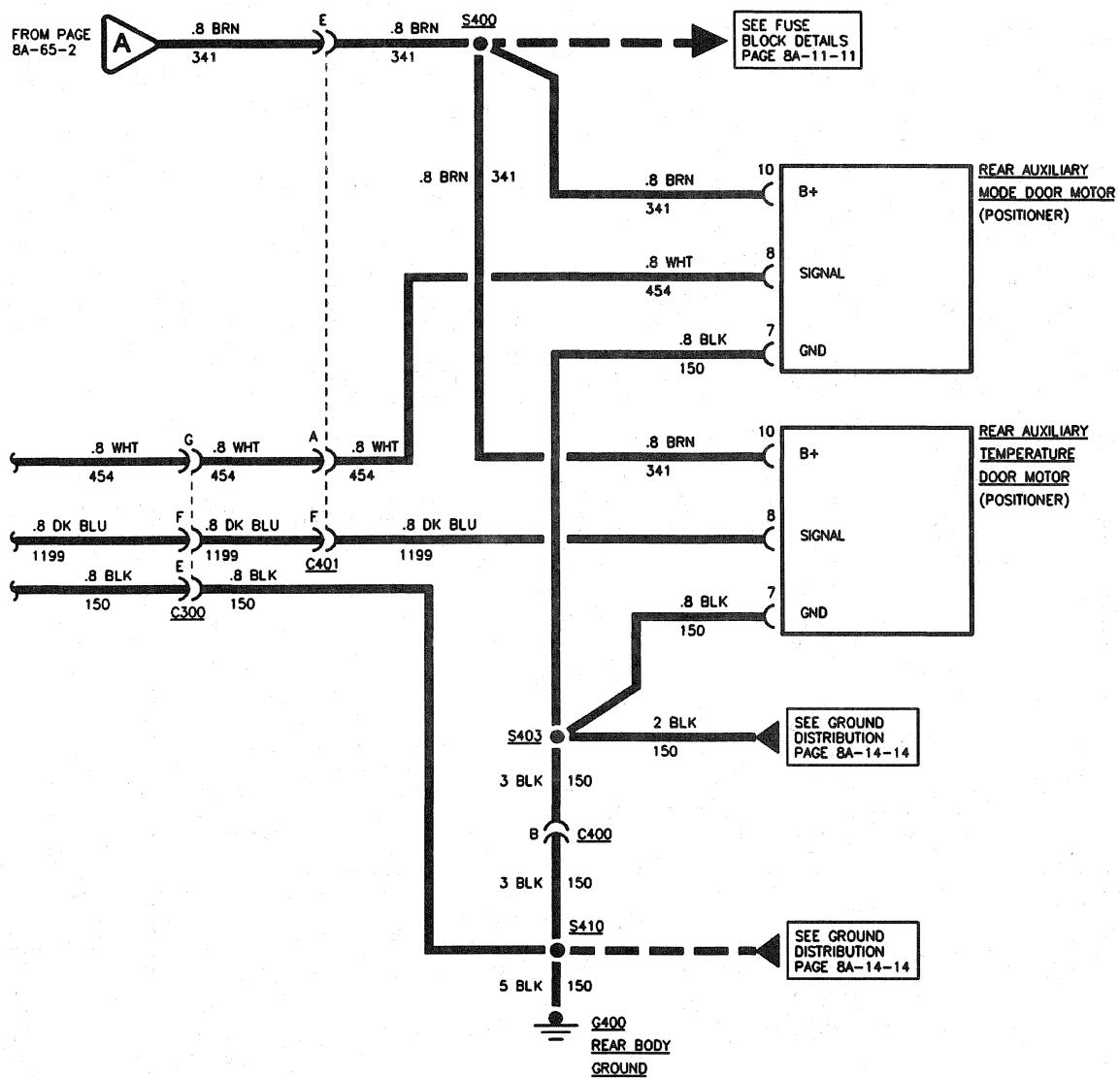




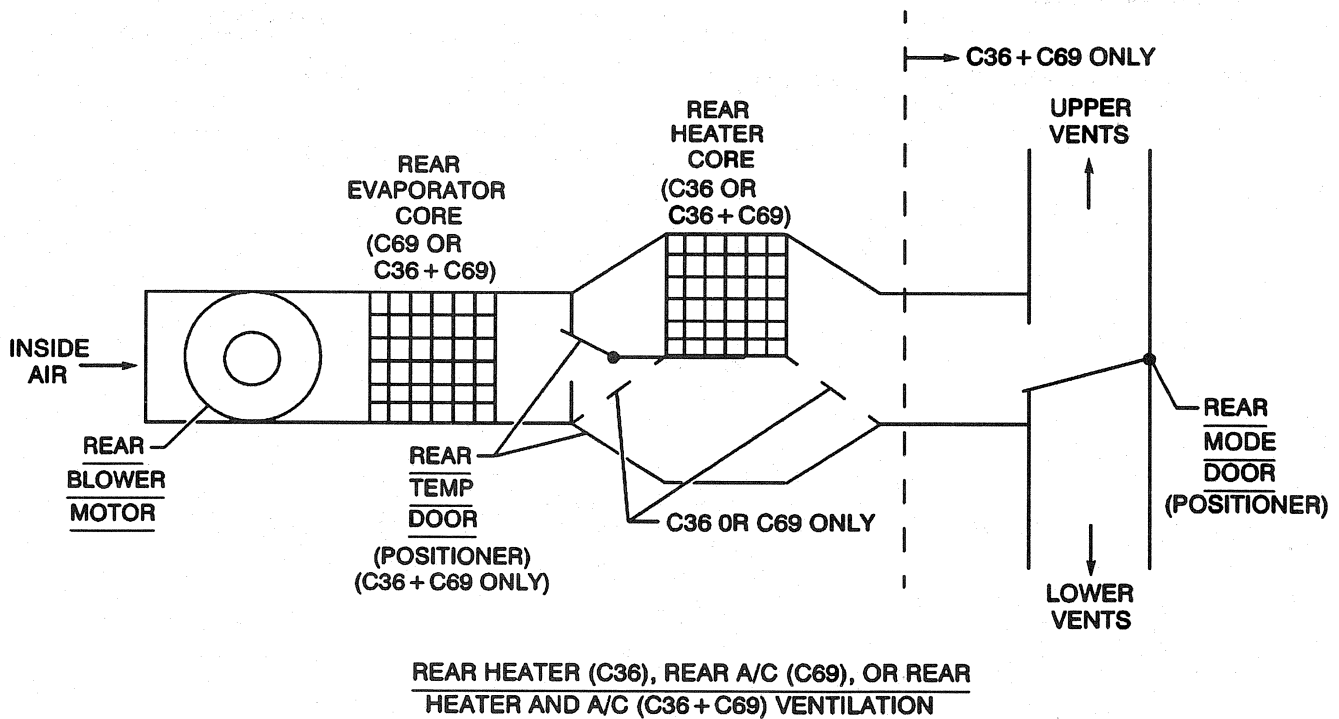
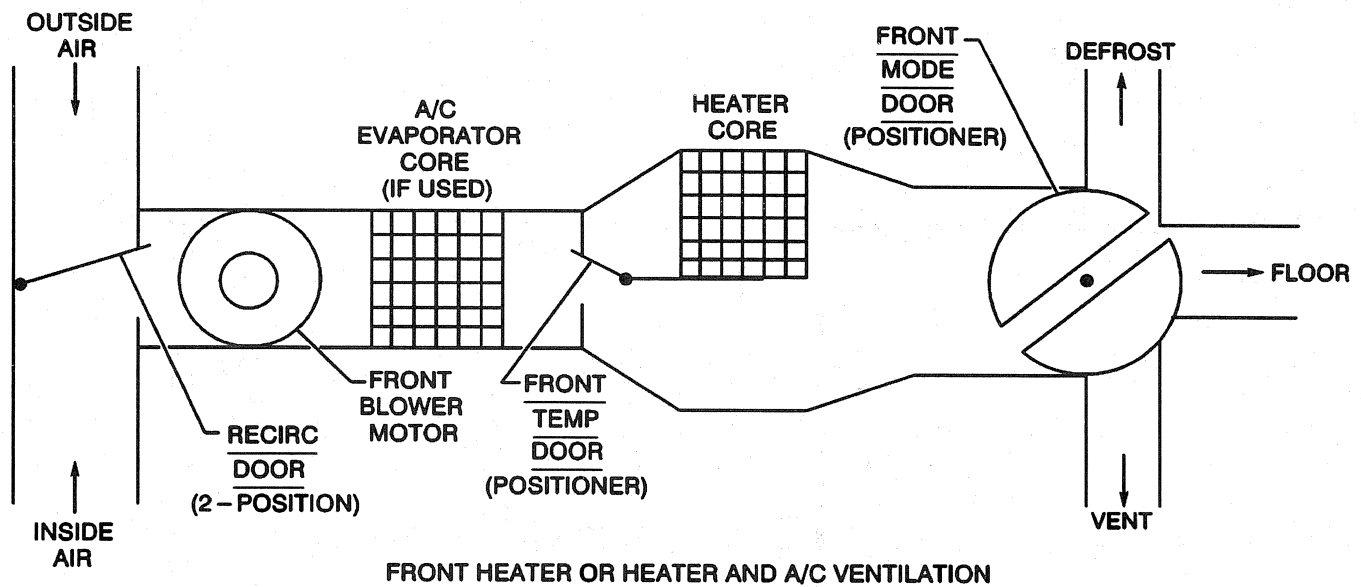




# HVAC AIR DELIVERY AND TEMPERATURE CONTROLS REAR VENTILATION CONTROLS (W/ AUXILIARY HEAT and A/C)



# HVAC AIR DELIVERY AND TEMPERATURE CONTROLS VENTILATION FLOW SELECTION



**HVAC AIR DELIVERY AND TEMPERATURE CONTROLS**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Auxiliary Heater and A/C Logic Module.....	Rear of Overhead Console Molding, in Headliner .....	37 .....	60.....	202-12
Auxiliary Heater and A/C Control Module/Switch, Front.....	Front of Overhead Console .....	31 .....	49.....	202-13
Auxiliary Heater and A/C Control Module/Switch, Rear .....	Rear of Overhead Console Molding, in Headliner .....	31 .....	49.....	202-14
Blower Switch Front.....	At Heater Control			
Convenience Center .....	Under LH Side of I/P, on Bulkhead.....	23 .....	36	
Heater and A/C Control Module.....	Center of I/P at Heater Control			
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Mode Door Motor Front.....	Under I/P, on Heater-A/C Plenum, LH side .....	30 .....	47.....	202-43
Rear Auxiliary Mode Door Motor.....	In Auxiliary Heater - A/C Module, forward of LH rear Wheelhouse			
Rear Auxiliary Temperature Door Motor .....	In Auxiliary Heater - A/C Module, forward of LH rear Wheelhouse			
Recirculation Door Motor.....	Under I/P on Heater - A/C Plenum			
<b>CONNECTORS:</b>				
C203 .....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24 .....	38	
C205 .....	At Convenience Center			
C230 .....	Behind RH side of I/P, above HVAC Evaporator Housing .....	27 .....	42.....	202-38
C300 .....	In Overhead Console.....	34 .....	55.....	202-38
C400 .....	RH rear of vehicle, above Auxiliary Blower Motor			
C401 .....	RH rear of vehicle, above Auxiliary Blower Motor			
<b>GROUND:</b>				
G105 (Gas) .....	RH front of Engine Block.....	9 .....	15	
G105 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
G200.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34 .....	54	
<b>GROMMETS:</b>				
P101 .....	RH rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve, toward Taillamp Extension			

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

COMPONENT	LOCATION	201-PG FIG. CONN
S107 (VIN M, R) .....	Engine Harness, approx. 20 cm from Breakout to EGR Valve, toward Taillamp Extension	
S107 (VIN J).....	Engine Harness, approx. 20 cm from Breakout to Fuel Injector Breakout, toward Taillamp Extension	
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPVM toward EGR Valve	
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout	
S212 .....	I/P Harness, approx. 4 cm from I/P Cluster Breakout toward Radio	
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets	
S243 .....	HVAC Harness, 4 cm from Recirculation Door Breakout toward Blower Motor Relay	
S244 .....	HVAC Harness, 14 cm from Recirculation Door Breakout toward Blower Motor	
S268 .....	I/P Harness, approx. 25 cm from Heater A/C Control Connector	
S307 (Suburban).....	Rear HVAC Control Harness, 10 cm forward of HVAC Logic Module Breakout	
S308 (Suburban).....	Rear HVAC Control Harness, 5 cm rear of HVAC Logic Module Breakout	
S310 (Suburban).....	Front to rear Body Harness, 6 cm from front Dome Lamp Breakout	
S400 (Rear A/C) .....	Rear A/C Harness, 17 cm from Blower Motor Relays	
S400 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, approx. 7 cm from Blower Motor Relays Breakout	
S403 (Rear Heat & A/C) .....	Rear Heat and A/C Harness, 7 cm from Blower Motor Resistor Breakout toward Blower Motor	
S410 (2-Door Utility) .....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout	
S410 (4-Door Utility) .....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout	
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout toward CHMSL Harness Breakout	

**HVAC AIR DELIVERY AND TEMPERATURE CONTROLS****DIAGNOSIS—HVAC AIR DELIVERY AND TEMPERATURE CONTROLS****TROUBLESHOOTING HINTS: FRONT**

1. CHECK condition of HTR-A/C FUSE. If Fuse is open, LOCATE and REPAIR cause of overload and REPLACE Fuse.
2. CHECK that Grounds G105 and G200 are clean and tight.

**TROUBLESHOOTING HINTS: REAR AUXILIARY**

1. CHECK condition of RR HVAC FUSE 5. If Fuse is open, LOCATE and REPAIR cause of overload and REPLACE Fuse.
2. CHECK that Ground G400 is clean and tight.

**TROUBLESHOOTING HINTS: GENERAL**

1. See SECTION 8A-117 for diagnosis of the Instrument Panel Dimming Illumination lamp circuits.
2. If the Mode or Temperature Doors do not operate smoothly in response to control Dial changes, the rheostat in the Module may be bad or a ground connection from the Module may be open.
  - CHECK for a broken (or partially broken) wire inside the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures," page 8A-4-0).

**FRONT VENTILATION CONTROLS DO NOT OPERATE**

TEST	RESULT	ACTION
1. Place Ignition Switch in Run. Disconnect Connector at front Mode Door Motor. Connect un-powered test lamp between Front Mode Door Motor Connector Cavity "10" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Splice S243.
2. Connect self-powered test lamp between Front Mode Door Motor Connector Cavity "7" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Splice S244 and Ground G105.
3. Disconnect Connector C3 at Heater and A/C Control Module. Connect un-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "5" and ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Heater and A/C Control Module.
4. Connect self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "2" and ground.	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Heater and A/C Control Module and Ground G200.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## FRONT MODE DOOR MOTOR DOES NOT OPERATE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Front Mode Door Motor. Place Front Blower Switch on the Heater and A/C Control Panel in LO. Observe that the Front Blower Motor is operating. Connect a Voltmeter from Front Mode Door Motor Connector Cavity "8" to ground. Adjust the position of the Mode Control Dial on the Heater and A/C Control Module while observing Voltmeter response.	Smooth variable Voltage observed.	GO to step 5.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 2.
2. Disconnect Connector C3 at Heater and A/C Control Module. Connect un-powered test lamp from Heater and A/C Control Module Connector C3 Cavity "9" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on WHT (454) wire between Heater and A/C Control Module and Front Mode Door Motor.
	Test lamp does not light.	GO to step 3.
3. Connect self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "9" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on WHT (454) wire between Heater and A/C Control Module and Front Mode Door Motor.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "9" and Front Mode Door Motor Connector Cavity "8".	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open on WHT (454) wire between Heater and A/C Control Module and Front Mode Door Motor.
5. Connect un-powered test lamp between Front Mode Door Motor Connector Cavity "10" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between Splice S243 and Front Mode Door Motor.
6. Connect self-powered test lamp between Front Mode Door Motor Connector Cavity "7" and ground.	Test lamp lights.	REPLACE Front Mode Door Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Mode Door Motor and Splice S244.



**HVAC AIR DELIVERY AND TEMPERATURE CONTROLS****FRONT TEMPERATURE DOOR MOTOR DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Front Temperature Door Motor. Connect a Voltmeter from Front Temperature Door Motor Connector Cavity "8" and ground. Adjust the position of the Mode Control Dial on the Heater and A/C Control Module while observing Voltmeter response.	Smooth variable Voltage observed.	GO to step 5.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 2.
2. Disconnect Connector C3 at Heater and A/C Control Module. Connect un-powered test lamp from Heater and A/C Control Module Connector C3 Cavity "8" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (733) wire between Heater and A/C Control Module and Front Temperature Door Motor.
	Test lamp does not light.	GO to step 3.
3. Connect self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "8" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on LT BLU (733) wire between Heater and A/C Control Module and Front Temperature Door Motor.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "8" and Front Temperature Door Motor Connector Cavity "8".	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open on LT BLU (733) wire between Heater and A/C Control Module and Front Temperature Door Motor.
5. Connect un-powered test lamp between Front Temperature Door Motor Connector Cavity "10" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between Splice S243 and Front Temperature Door Motor.
6. Connect self-powered test lamp between Front Temperature Door Motor Connector Cavity "7" and ground.	Test lamp lights.	REPLACE Front Temperature Door Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Temperature Door Motor and Splice S244.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## RECIRCULATION DOOR MOTOR FAILS IN THE VENT POSITION

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Recirculation Door Motor. Connect un-powered test lamp between Recirculation Door Motor Connector Cavity "5" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between Splice S243 and Recirculation Door Motor.
2. Connect self-powered test lamp between Recirculation Door Motor Connector Cavity "7" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Recirculation Door Motor and Splice S244.
3. Connect un-powered test lamp between Recirculation Door Motor Connector Cavity "6" and ground. Place the Front Blower Switch on the Heater and A/C Control Module in LO. Observe that the Front Blower Motor is operating. Actuate the Recirculation Push-button on the Heater and A/C Control Module.	Test lamp lights.	REPLACE Recirculation Door Motor.
	Test lamp does not light.	GO to step 4.
4. Disconnect Connector C3 at Heater and A/C Control Module. Connect a self-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "4" and Recirculation Door Motor Connector Cavity "6".	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN 1614 wire between Heater and A/C Control Module and Recirculation Door Motor.
5. Is this vehicle equipped with Auxiliary Cooling Fan?	No.	REPLACE Heater and A/C Control Module.
	Yes.	GO to step 6.
6. Disconnect Connector at Auxiliary Cooling Fan A/C Pressure Switch (See Section 8A-31). Connect self-powered test lamp between Auxiliary Cooling Fan A/C Pressure Switch Connector Cavity "A" and Recirculation Door Motor Connector Cavity "6".	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (1614) wire between Auxiliary Cooling Fan A/C Pressure Switch and Splice S212. Note that Diode D101 (Page 8A-31-0) may be open.

**HVAC AIR DELIVERY AND TEMPERATURE CONTROLS****RECIRCULATION DOOR MOTOR FAILS IN THE RECIRCULATION POSITION**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in HI at the Heater and A/C Control Module. Disconnect Connector at Recirculation Door Motor. Is the Recirculation Door still in the recirculation position?	Yes.	REPLACE Recirculation Door Motor.
	No.	GO to step 2.
2. Disconnect Connector C3 at Heater and A/C Control Module. Connect self-powered test lamp from Heater and A/C Control Module Connector C3 Cavity "4" to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE Heater and A/C Control Module.
3. Is this an air conditioned vehicle with a 7.4 Liter Gasoline Engine.	No.	LOCATE and REPAIR short to ground in DK GRN (1614) wire between Heater and A/C Control Module and Recirculation Door Motor.
	Yes.	GO to step 4.
4. Disconnect Connector at Auxiliary Cooling Fan A/C Pressure Switch. Disconnect Connector at Auxiliary Cooling Fan Temperature Switch. Remove Auxiliary Cooling Fan Relay from its socket. Connect self-powered test lamp from Auxiliary Cooling Fan A/C Pressure Switch Connector Cavity "A" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground in DK GRN (1614) wire between Heater and A/C Control Module, Auxiliary Cooling Fan A/C Pressure Switch, and Recirculation Door Motor. If short is not found, then check that Diode D100 has not shorted.
	Test lamp does not light.	REPLACE Auxiliary Cooling Fan A/C Pressure Switch.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## FRONT MODE DOOR MOTOR OPERATES WITH FRONT BLOWER SWITCH OFF

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Front Blower Switch in OFF at Heater and A/C Control Module. Disconnect Connector C3 at Heater and A/C Control Module. Connect un-powered test lamp between Heater and A/C Control Module Connector C3 Cavity "3" and ground.	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test Lamp does not light.	GO to step 2.
2. Disconnect Connector C2 at Heater and A/C Control Module. Connect self-powered test lamp between Heater and A/C Control Module Connector C2 Cavity "D" and Connector C3 Cavity "3".	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (71) wire between Heater and A/C Control Module Connectors C2 and C3.
3. Connect un-powered test lamp between Heater and A/C Control Module Connector C2 Cavity "G" and ground.	Test lamp lights.	REPLACE Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between Splice S268 and Heater and A/C Control Module Connector C2.

## REAR VENTILATION CONTROLS DO NOT OPERATE FROM EITHER CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Rear Auxiliary Mode Door Motor. Connect un-powered test lamp between Rear Auxiliary Mode Door Motor Connector Cavity "10" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between I/P Fuse Block and Splice S400.
2. Connect self-powered test lamp between Rear Auxiliary Mode Door Motor Connector Cavity "7" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Splice S403 and Ground G400.
3. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "G" and ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (141) wire between Splice S310 and Splice S308.
4. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "B" and ground.	Test lamp lights.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Splice S307 and Splice S410.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## REAR AUXILIARY MODE DOOR DOES NOT OPERATE FROM EITHER CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place the Blower Switch at the Front Auxiliary Heater and A/C Control Module in OFF. Disconnect Connector at Rear Auxiliary Mode Door Motor. Connect un-powered test lamp between Rear Auxiliary Mode Door Motor Connector Cavity "10" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Auxiliary Mode Door Motor.
2. Connect self-powered test lamp between Rear Auxiliary Mode Door Motor Connector Cavity "7" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Auxiliary Mode Door Motor and Splice S403.
3. Connect Voltmeter between Rear Auxiliary Mode Door Motor Connector Cavity "8" and ground. Adjust the position of the Mode control Dial at the Front Auxiliary Heater and A/C Control Module while observing Voltmeter response.	Smoothly variable Voltage observed.	REPLACE Rear Auxiliary Mode Door Motor.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 4.
4. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect un-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "F" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on WHT (119) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Mode Door Motor.
	Test lamp does not light.	GO to step 5.
5. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "F" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on WHT (119) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Mode Door Motor.
	Test lamp does not light.	GO to step 6.
6. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "F" and Rear Auxiliary Mode Door Motor Connector Cavity "8".	Test lamp does not light.	LOCATE and REPAIR open in WHT (119) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Mode Door Motor.
	Test lamp lights.	REPLACE Auxiliary Heater and A/C Control Logic Module.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

### REAR AUXILIARY TEMPERATURE DOOR DOES NOT OPERATE FROM EITHER CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Place Blower Switch at Front Auxiliary Heater and A/C Control Module in OFF. Disconnect Connector at Rear Auxiliary Temperature Door Motor. Connect un-powered test lamp between Rear Auxiliary Temperature Door Motor Connector Cavity "10" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S400 and Rear Auxiliary Temperature Door Motor.
2. Connect self-powered test lamp between Rear Auxiliary Temperature Door Motor Connector Cavity "7" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Auxiliary Temperature Door Motor and Splice S403.
3. Connect Voltmeter between Rear Auxiliary Temperature Door Motor Connector Cavity "8" and ground. Adjust the position of the Temperature Control Dial at the Front Auxiliary Heater and A/C Control Module while observing Voltmeter response.	Smoothly variable Voltage observed.	REPLACE Rear Auxiliary Temperature Door Motor.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 4.
4. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect un-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "B" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on DK BLU (1199) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Temperature Door Motor.
	Test lamp does not light.	GO to step 5.
5. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "B" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on DK BLU (1199) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Temperature Door Motor.
	Test lamp does not light.	GO to step 6.
6. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "B" and Rear Auxiliary Temperature Door Motor Connector Cavity "8".	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (1199) wire between Auxiliary Heater and A/C Control Logic Module and Rear Auxiliary Temperature Door Motor.
	Test lamp lights.	REPLACE Auxiliary Heater and A/C Control Logic Module.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## REAR CONTROL MODULE DOES NOT CONTROL REAR AUXILIARY DOORS

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "F" and Auxiliary Heater and A/C Control Logic Module Connector Cavity "M".	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1923) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
2. Connect un-powered test lamp between Auxiliary Heater and A/C Control Logic Module Connector Cavity "J" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S308 and Auxiliary Heater and A/C Control Logic Module.
3. Connect fused jumper wire from Auxiliary Heater and A/C Control Logic Module Pin "M" to ground. Connect fused jumper wire from Auxiliary Heater and A/C Control Logic Module Pin "J" to B+. Connect self-powered test lamp between Auxiliary Heater and A/C Control Logic Module Pins "D" and "B".	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE Auxiliary Heater and A/C Control Logic Module.
4. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "G" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S308 and Rear Auxiliary Heater and A/C Control Module.
5. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "B" and ground.	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Rear Auxiliary Heater and A/C Control Module and Spice S307.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## FRONT CONTROL MODULE DOES NOT CONTROL REAR AUXILIARY DOORS

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "G" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (341) wire between Splice S308 and Front Auxiliary Heater and A/C Control Module.
2. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "B" and ground.	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Front Auxiliary Heater and A/C Control Module and Splice S307.

## REAR AUXILIARY MODE DOOR MOTOR DOES NOT OPERATE FROM FRONT CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect Voltmeter from Auxiliary Heater and A/C Control Logic Module Connector Cavity "E" to ground. Adjust the Mode control Dial at the Front Auxiliary Heater and A/C Control Module while monitoring the Voltmeter indication.	Smooth variable Voltage observed.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 2.
2. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "J" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (919) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 3.
3. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "J" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on LT BLU (919) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "J" and Auxiliary Heater and A/C Control Logic Module Connector Cavity "E".	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (919) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.



## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

### REAR AUXILIARY TEMPERATURE DOOR MOTOR DOES NOT OPERATE FROM FRONT CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect Voltmeter from Auxiliary Heater and A/C Control Logic Module Connector Cavity "A" to ground. Adjust the Temperature Control Dial at the Front Auxiliary Heater and A/C Control Module while monitoring the Voltmeter indication.	Smooth variable Voltage observed.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 2.
2. Disconnect Connector at Front Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "H" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (733) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 3.
3. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "H" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on LT BLU (733) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Front Auxiliary Heater and A/C Control Module Connector Cavity "H" and Auxiliary Heater and A/C Control Logic Module Connector Cavity "A".	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (733) wire between Front Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp lights.	REPLACE Front Auxiliary Heater and A/C Control Module.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## REAR AUXILIARY MODE DOOR MOTOR DOES NOT OPERATE FROM REAR CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect Voltmeter from Auxiliary Heater and A/C Control Logic Module Connector Cavity "D" to ground. Adjust the Mode control Dial at the Rear Auxiliary Heater and A/C Control Module while monitoring the Voltmeter indication.	Smooth variable Voltage observed.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 2.
2. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "J" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (920) wire between Rear Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 3.
3. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "J" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on LT BLU (920) wire between Rear Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "J" and Auxiliary Heater and A/C Control Logic Module Connector Cavity "D".	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (920) wire between Rear Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.

## HVAC AIR DELIVERY AND TEMPERATURE CONTROLS

## REAR AUXILIARY TEMPERATURE DOOR MOTOR DOES NOT OPERATE FROM REAR CONTROL MODULE

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect Connector at Auxiliary Heater and A/C Control Logic Module. Connect Voltmeter from Auxiliary Heater and A/C Control Logic Module Connector Cavity "C" to ground. Adjust the temperature Control Dial at the Rear Auxiliary Heater and A/C Control Module while monitoring the Voltmeter indication.	Smooth variable Voltage observed.	REPLACE Auxiliary Heater and A/C Control Logic Module.
	No Voltage, Erratic Voltage, or Fixed Voltage observed.	GO to step 2.
2. Disconnect Connector at Rear Auxiliary Heater and A/C Control Module. Connect un-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "H" and ground.	Test lamp lights.	LOCATE and REPAIR short to Voltage on LT BLU (1646) wire between Rear Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 3.
3. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "H" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground on LT BLU (1646) wire between Rear Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp does not light.	GO to step 4.
4. Connect self-powered test lamp between Rear Auxiliary Heater and A/C Control Module Connector Cavity "H" and Auxiliary Heater and A/C Control Logic Module Connector Cavity "C".	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (1646) wire between Rear Auxiliary Heater and A/C Control Module and Auxiliary Heater and A/C Control Logic Module.
	Test lamp lights.	REPLACE Rear Auxiliary Heater and A/C Control Module.

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**HVAC AIR DELIVERY AND TEMPERATURE CONTROLS****CIRCUIT OPERATION****FRONT VENTILATION CONTROLS**

The Front Air Delivery and Temperature Controls are provided for vehicles with Heating and Air Conditioning as well as for vehicles with Heater alone. The Heater only option's Heater Control Module operates similarly to the Heater and A/C Control Module except that the A/C Push-button and Temperature Dial MAX Detente features are not provided for the control of the Recirculation Door. For vehicles with Air Conditioning and 7.4 Liter Gasoline Engines, an Auxiliary Cooling Fan is provided. See Cooling Fan SECTION 8A-31 for more information.

The Front Mode Door Motor, the Front Temperature Door Motor, and the Recirculation Door Motor are powered by the BRN (141) wires when the Ignition Switch is in RUN. Grounding for the door motors is through the BLK (150) wires to Ground G105. The Heater and A/C Control Module is powered when the Ignition Switch is in RUN by the BRN (141) wires. Grounding is through the BLK (150) wire to Ground G200 for the I/P.

The Heater and A/C Control Module's ventilation controls for the Front Mode Door and the Recirculation Door are disabled when the Module's Front Blower Switch is in the OFF position. With the Front Blower Switch in the HI, M2, M1, or LO positions, the ventilation controls are enabled. The Front Temperature Door is not dependent on Front Blower Motor operations and can be controlled as long as the Ignition Switch is in RUN.

The Mode and temperature doors are positioned in proportion to the variable Voltage signal received from the Heater and A/C Control Module. Adjusting the Temperature Dial at the control Module adjusts a rheostat which provides a Voltage signal proportional to the Dial position. This Voltage is carried on the LT BLU (733) wire to the Front Temperature Door Motor which then positions in response to the Voltage signal. Adjusting the Mode Dial at the control Module adjusts a rheostat which provides a Voltage signal proportional to the Dial position. This Voltage is carried on the WHT (454) wire to the Front Mode Door Motor which then positions in response to the Voltage signal.

The Recirculation Door is a two-position door and is in the Recirculation position only when the input DK GRN (1614) wire is grounded through the Heater and A/C Control Module. For air conditioned vehicles with 7.4 Liter Gasoline Engines, the Recirculation Door is also grounded when the Auxiliary Cooling Fan A/C Pressure Switch (Section 8A-31) operates the Auxiliary Cooling Fan. The door is normally in the Outside Air position but moves to the Inside Air position when the input wire is grounded. A LED on the control Module is illuminated when the Recirculation Door is grounded through the control Module.

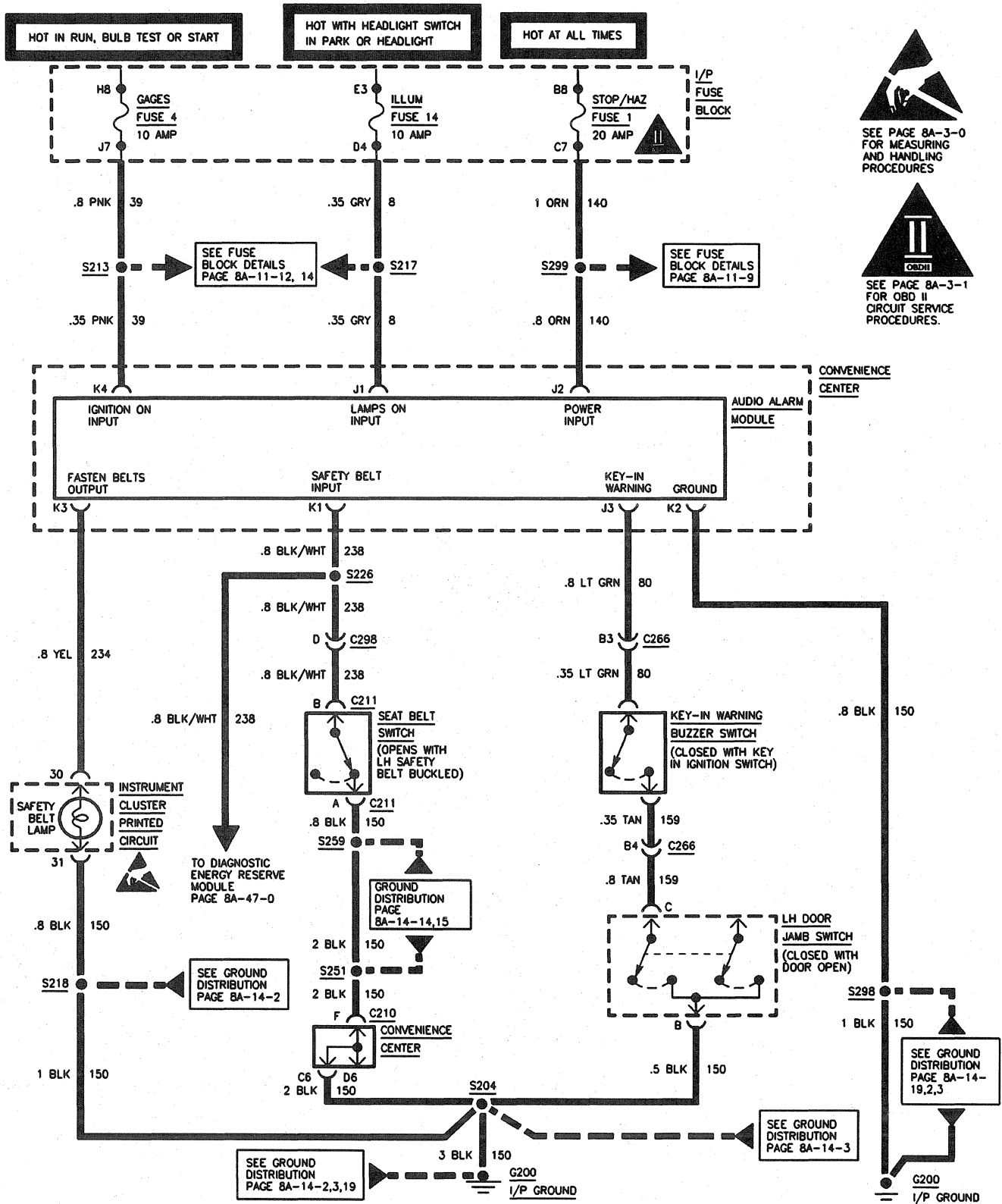
**REAR AUXILIARY VENTILATION CONTROLS**

The Rear Auxiliary Air Delivery and Temperature Controls provided with the combined Rear Auxiliary Heater and Air Conditioner option (C36 + C69) work independently of the ventilation controls used for the front of the vehicle. The front system is provided with a Recirculation Door and door controls but the rear auxiliary system does not have this capability. The Rear Auxiliary Mode Door and the Rear Auxiliary Temperature Door are exclusively controlled from either of two auxiliary control Modules. The front control Module's Blower Switch, located above the I/P, has a permissive position (REAR) which enables control from the rear Module. In the REAR position, if the Ignition Switch is in RUN, relay contacts in the Auxiliary Heater and A/C Control Logic Module change state to enable control input from the ventilation controls at the Rear Auxiliary Heater and A/C Control Module. When the Front Auxiliary Heater and A/C Control Module's Blower Switch is not in the REAR position, the Logic Module's relay is de-energized and control inputs from the front control Module control the doors.

Each control Module produces a variable Voltage signal to the door motor. Each door motor is powered from the BRN (341) wires when the Ignition Switch is in the RUN position. Door grounding is through the BLK (150) wires to Ground G400. The variable Voltage signal causes the door motor to operate to a position consistent with the signal's Voltage. The Voltage corresponds to the control Dial selection on the selected Control Module.

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AUDIBLE WARNINGS



COMPONENT	LOCATION	201-PG	FIG.	CONN
Audio Alarm Module.....	Under LH side of I/P, on Convenience Center (RH portion)..	23 .....	36	
Convenience Center .....	Under LH side of I/P on Bulkhead .....	23 .....	36	
Door Jamb Switch, LH Front ...	At LH end of I/P			
Instrument Cluster .....	On Instrument Cluster			
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Key-In Warning Buzzer Switch.....	In Steering Column			
Seat Belt Switch.....	At Driver's Stationery Belt Connector .....	33 .....	52	
<b>CONNECTORS:</b>				
C210.....	At Convenience Center .....	23 .....	36.....	202-37
C211 .....	Under Driver's Seat			
C266.....	LH side of Steering Column, near Bulkhead.....	27 .....	43.....	202-8
C298.....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx., 4 cm left of Steering Column Connector Breakout			
S213 .....	I/P Harness, 8 cm from Headlamp Dimmer Switch Breakout toward Cluster			
S217 .....	I/P harness, approx. 5 cm from Headlamp Dimmer Switch Breakout toward I/P Cluster			
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets			
S226 .....	Approx. 41 cm from DERM Connector			
S251 .....	Crossbody Harness, approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout			
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout			
S299 .....	I/P Harness, Approx. 4 cm into Steering Column Harness Breakout			

## AUDIBLE WARNINGS

## DIAGNOSIS - AUDIO ALARM MODULE

## TROUBLESHOOTING HINTS:

1. CHECK that GAGES FUSE 4, ILLUM FUSE 14 and STOP/HAZ FUSE 1 are not open. If Fuse(s) is open, then LOCATE and REPAIR source of overload and REPLACE Fuse(s).
2. CHECK that Ground G200 is clean and tight.
3. CHECK Fasten Safety Belts Indicator for an open filament.
4. CHECK that Audio Alarm Module is securely mounted in Convenience Center.
5. CHECK that the LH Door Jamb Switch operates freely.
6. If the Lamps-On Warning Alarm is inoperative CHECK to see that the Panel Dimmer Switch is not in the fully dim position.
7. If the Fasten Safety Belts Warning Alarm remains present after 5 seconds, then the Audio Alarm Module may have failed.

8. Failure of two of the three Alarm Functions may indicate Audio Alarm Module failure.
9. REFER to SECTION 8A-117 for diagnosis of Instrument Panel Dimming System.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).

## NO AUDIBLE WARNING ALARM FUNCTIONS

TEST	RESULT	ACTION
1. REMOVE Audio Alarm Module from Convenience Center. Connect a test lamp from Audio Alarm Module socket Cavity "J2" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (140) wire between I/P Fuse Block and Convenience Center.
2. Using a self-powered test lamp or ohmmeter, test Continuity for BLK (150) wire from Audio Alarm Module socket Cavity "K2" to Ground G200.	Continuity.	GO to step 3.
	No Continuity.	LOCATE and REPAIR open in BLK (150) wire between Audio Alarm Module and Ground G200.
3. Connect a test lamp from Audio Alarm Module socket Cavity "K4" to ground.	Test lamp lights.	REPLACE Audio Alarm Module.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between I/P Fuse Block and Convenience Center.

## FASTEN BELTS WARNING ALARM FAILS ON

TEST	RESULT	ACTION
1. Place Ignition Switch in "RUN". fasten LH Seat Belt. Is the Fasten Safety Belts Warning Alarm present?	Alarm is present.	GO to step 2.
	Alarm is not present.	System is operating properly .
2. Disconnect the LH Seat Belt connector (C211). Is the Fasten Safety Belts Warning Alarm present?	Alarm is present.	LOCATE and REPAIR short to ground in BLK/WHT (238) wire between Convenience Center, Diagnostic Energy Reserve Module (DERM), and Seat Belt Switch. If wire is good, REPLACE Audio Alarm Module.
	Alarm is not present.	Replace the Seat Belt Switch.



**AUDIBLE WARNINGS****THE FASTEN SAFETY BELTS WARNING ALARM FAILS OFF**

TEST	RESULT	ACTION
1. With Ignition Switch in RUN and Audio Alarm Module removed, connect a test lamp from Convenience Center Cavity "K4" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between Convenience Center and I/P Fuse Block.
2. Ensure Seat Belt is unfastened. Connect test lamp from Convenience Center Cavity "K1" to B+.	Test lamp lights.	REPLACE Audio Alarm Module.
	Test lamp does not light	GO to step 3.
3. Disconnect Seat Belt Switch Connector, (C211). Connect a test lamp from Cavity "A" of the Seat Belt Switch Connector, (C211) and B+.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Seat Belt Switch Connector and ground.
4. Connect a jumper wire between cavity "A" and "B" of Seat Belt Switch Connector, (C211). Connect a self-powered test lamp from Audio Alarm Module socket "K1" to ground.	Test lamp lights.	REPLACE Seat Belt Switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (238) wire between Seat Belt Switch and Audio Alarm Module.

**LAMPS-ON WARNING ALARM FAILS ON**

TEST	RESULT	ACTION
1. Place Ignition Switch in OFF or LOCK. Place Headlamp Switch in OFF position. Is the Lamps -On Warning Alarm present?	Alarm is present.	GO to step 2.
	Alarm is not present.	System operating properly.
2. REMOVE Audio Alarm Module from Convenience Center. Connect Voltmeter from Convenience Center Cavity "J1" to ground.	Battery Voltage is present.	LOCATE and REPAIR short to Voltage in GRY (8) wire between I/P Fuse Block and Convenience Center. If short to Voltage is not found, then GO to Instrument Panel Dimming, SECTION 8A-117.
	Battery Voltage is not present.	REPLACE Audio Alarm Module.

**LAMPS-ON WARNING ALARM FAILS OFF**

TEST	RESULT	ACTION
1. REMOVE Audio Alarm Module from Convenience Center Socket. Place Ignition Switch in RUN. Place Headlamp Switch in HEAD or PARK. Adjust Dimmer Switch to maximum brightness. Connect voltmeter from Convenience Center Cavity "K4" to ground.	No Voltage.	LOCATE and REPAIR open in PNK (39) wire between Convenience Center and I/P Fuse Block
	Battery Voltage.	GO to step 2.
2. Connect voltmeter from Convenience Center Cavity "J1" to ground.	Battery Voltage.	REPLACE Audio Alarm Module.
	No Voltage.	LOCATE and REPAIR open in GRY (8) wire between Convenience Center and I/P Fuse Block. If required GO to Instrument Panel Dimming SECTION 8A-117 to LOCATE open Circuit.

**AUDIBLE WARNINGS****FASTEN SAFETY BELTS INDICATOR FAILS OFF**

TEST	RESULT	ACTION
1. REMOVE Audio Alarm Module from the Convenience Center. Connect a fused jumper from Audio Alarm Module Cavity "K3" in the Convenience Center to B+.	Fasten Safety Belts Indicator lights.	REPLACE Audio Alarm Module.
	Fasten Safety Belts Indicator does not light.	GO to step 2.
2. Backprobe Instrument Cluster Connector with a fused jumper from Cavity "30" to B+.	Fasten Safety Belts Indicator lights.	LOCATE and REPAIR open in YEL (234) wire between Convenience Center and Instrument Cluster.
	Fasten Safety Belts Indicator does not light.	CHECK for an open in BLK (150) wire between Instrument Cluster and Ground G200. If OK, REPLACE Instrument Cluster.

**FASTEN SAFETY BELTS INDICATOR FAILS ON**

TEST	RESULT	ACTION
1. Remove Audio Alarm Module from Convenience Center. Place Ignition Switch in "RUN" position.	Fasten Safety Belts Indicator goes out.	REPLACE Audio Alarm Module.
	Fasten Safety Belts Indicator remains illuminated.	CHECK for a short to Voltage in YEL (234) wire between Convenience Center and Instrument Cluster. If OK, REPLACE Instrument Cluster.

**KEY-IN WARNING ALARM FAILS OFF**

TEST	RESULT	ACTION
1. Remove Audio Alarm Module from Convenience Center. Disconnect Steering Column Harness Connector C266. Using a self-powered test meter or ohmmeter, test Continuity between Convenience Center Cavity "J3" to Connector C266 Pin "B3".	Continuity.	GO to step 2.
	No Continuity.	LOCATE and REPAIR open in LT GRN (80) wire between Convenience Center and Connector C266.
2. Place ignition key in the Ignition Switch. Test Continuity between Connector 266 Cavities "B3" and "B4".	Continuity.	GO to step 3.
	No Continuity.	REPLACE Key-In Warning Buzzer Switch.
3. Disconnect Connector at LH Door Jamb Switch. Test Continuity between connector C266 Cavity "B4" and LH Door Jamb Switch Connector Cavity "C".	Continuity.	GO TO step 4.
	No Continuity.	LOCATE and REPAIR open in TAN (159) wire between Connector C266 and LH Door Jamb Switch.
4. Open LH Door. Test Continuity between Pins "C" and "B" of LH Door Jamb Switch.	Continuity.	GO to step 5.
	No Continuity.	REPLACE LH Door Jamb Switch.
5. Test Continuity from LH Door Jamb Switch Connector Cavity "B" to Ground G200.	Continuity.	REPLACE Audio Alarm Module.
	No Continuity.	LOCATE and REPAIR open in BLK (150) wire between LH Door Jamb Switch and G200.

**AUDIBLE WARNINGS****KEY-IN WARNING ALARM FAILS ON**

<b>TEST</b>	<b>RESULT</b>	<b>ACTION</b>
1. Place Ignition Key in the Ignition Switch and turn the Switch to RUN. Open LH Door. Is the Key-In Warning Alarm present?	Yes.	GO to step 2.
	No.	GO to step 3.
2. Remove Audio Alarm Module from the Convenience Center. Connect a test lamp from Convenience Center Cavity "K4" to ground.	Test lamp lights.	REPLACE Audio Alarm Module.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between I/P fuse block and Convenience Center
3. Place the Ignition Switch in the OFF or LOCK position. Leave the key in the Switch. Observe normal Alarm condition. REMOVE the Audio Alarm Module from the Convenience Center. Disconnect Steering Column Harness Connector C266. Using a self-powered test lamp, test for Continuity between Convenience Center Cavity "J3" and ground.	Continuity to ground.	LOCATE and REPAIR short to ground in LT GRN (80) wire between Convenience Center and Connector C266.
	No Continuity to ground.	GO to step 4.
4. Reinstall the Audio Alarm Module at the Convenience Center. Is the Key-In Warning Alarm present?	Yes.	REPLACE Audio Alarm Module.
	No.	GO to step 5.
5. REMOVE the key from Ignition Switch. Test Continuity in the Steering Column from Connector C266 Cavity "B3" to ground.	Continuity to ground.	REPLACE the Key-In Warning Buzzer Switch.
	No Continuity to ground.	GO to step 6.
6. Test Continuity in the Steering Column from Connector C266 Cavity "B3" to Cavity "B4".	Continuity.	REPLACE the key-In Warning Buzzer Switch.
	No Continuity.	GO to step 7.
7. Test Continuity between Connector C266 Cavity "B4" to ground.	Continuity to ground.	REPLACE the Key-In Warning Buzzer Switch.
	No Continuity to ground.	GO to step 8.
8. Disconnect Connector at LH Door Jamb Switch. Test Continuity between LH Door Switch and Jamb Switch Cavity "C" to ground.	Continuity to ground.	LOCATE and REPAIR open in TAN (159) wire between Connector C266 and LH Door Jamb Switch.
	No Continuity to ground.	REPLACE LH Door Jamb Switch.

**AUDIBLE WARNINGS****CIRCUIT OPERATION****FASTEN SAFETY BELTS WARNING ALARM**

The Fasten Safety Belts Warning Alarm will sound when the following conditions are met simultaneously: The Ignition Switch is in the RUN, BULB TEST or START position and the LH front safety belt is not fastened. When the LH front Safety Belt is not fastened, ground is sensed at the Audio Alarm Module. The alarm will sound for approximately five seconds. The Diagnostic Energy Reserve Module (DERM) also senses ground when the LH Front Safety Belt remains unbuckled. See SECTION 9J. The Audio Alarm Module's Fasten Safety Belt Warning Alarm also incorporates an indicator within the Instrument Cluster. The Fasten Safety Belts Indicator works in conjunction with the Fasten Safety Belts Warning Alarm. When the Audio Alarm Module receives a signal that the LH Front Safety Belt is unfastened, it Connect Voltage to Pin 3 for the Fasten Safety Belts Indicator.

**KEY-IN WARNING ALARM**

The Key-In Warning Alarm will sound if the following conditions are met simultaneously: The ignition key must be in the Ignition Switch with the Ignition Switch in the ACC, LOCK or OFF position and the LH Front Door must

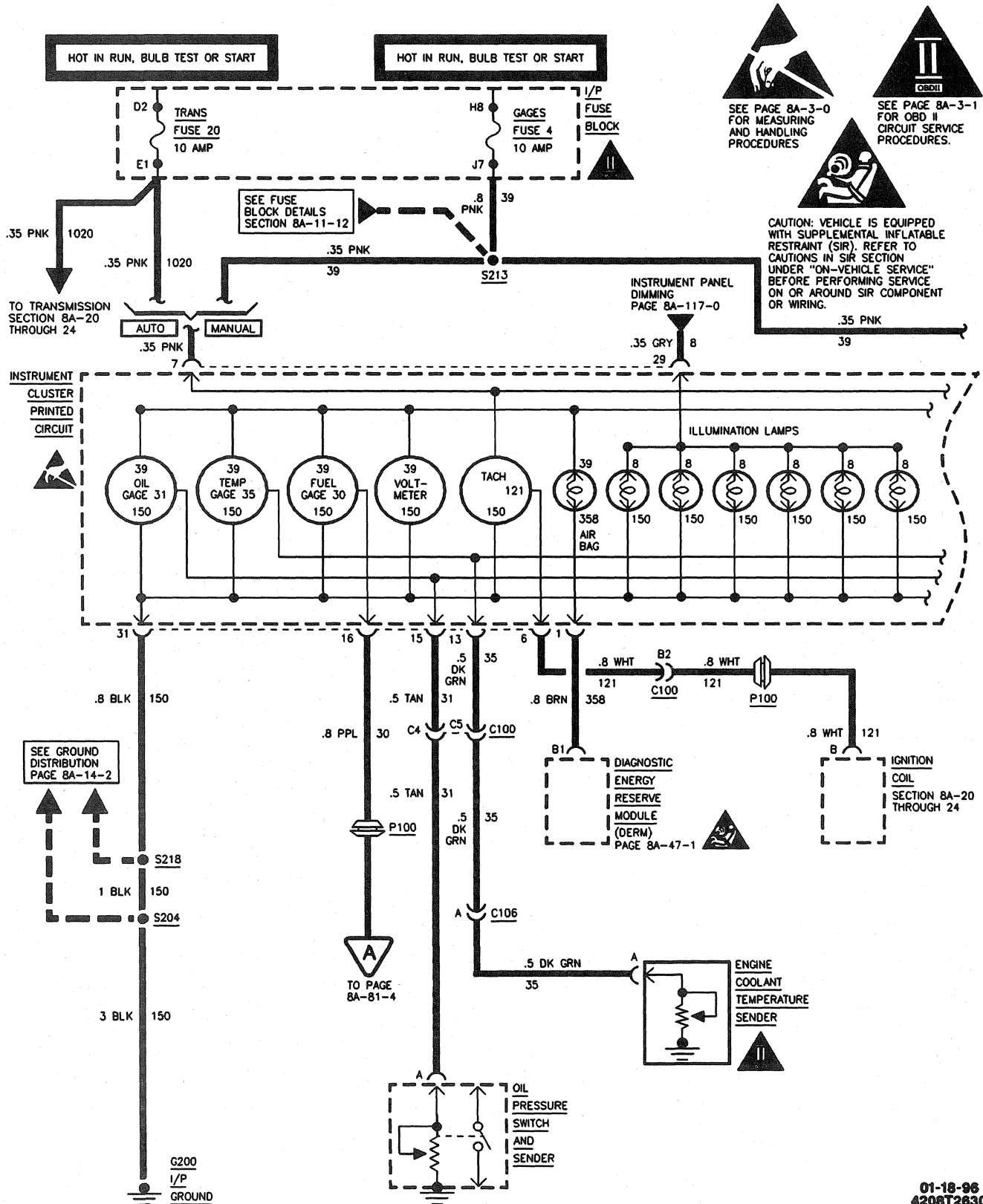
be open. When the ignition key is in the Ignition Switch and the LH Front Door is open, the Key-In Warning Buzzer Switch is closed as is the LH Door Jamb Switch. When both of these switches are closed, ground is sensed at the Audio Alarm Module activating the Key-In Warning Alarm. The Key-In Warning Alarm will stop sounding if the ignition key is removed from the Ignition Switch, the LH front door is closed, or the Ignition Switch is turned to the RUN position.

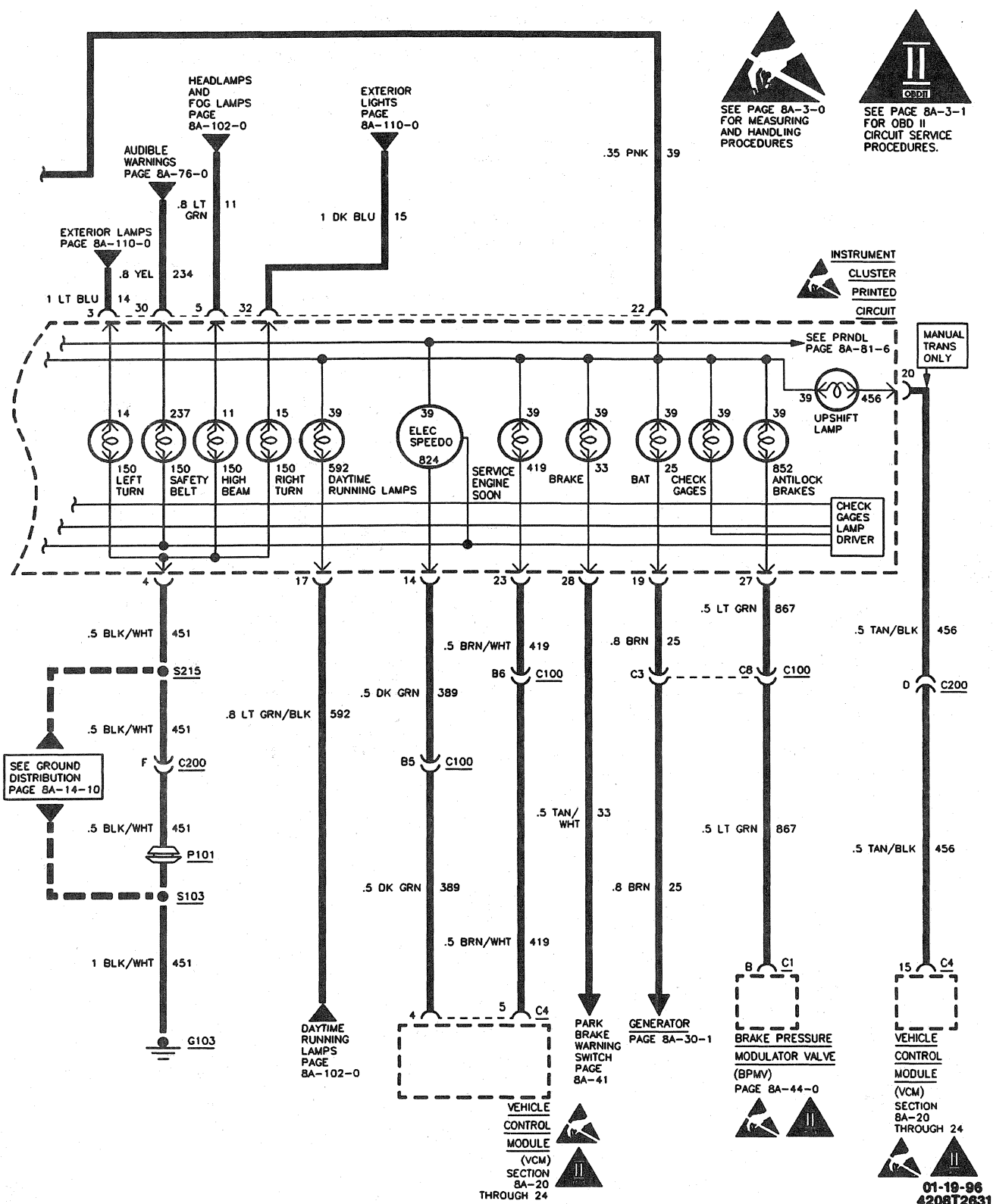
**LAMPS-ON WARNING ALARM**

The Lamps-On Warning Alarm will sound if the following conditions are met simultaneously: The Headlamp and Panel Dimmer Switch is in the HEAD or PARK position, the Panel Dimmer Switch is not in the fully dim position, and the Ignition Switch in the LOCK, ACC or OFF position. When the Headlamp and Panel Dimmer Switch is in the HEAD or PARK position, voltage is applied through the ILLUM FUSE 14 to the Audio Alarm Module. When voltage is sensed at the Lamps On input terminal of the Audio Alarm Module and there is an absence of Voltage at the Ignition On Input terminal, then the Lamps-On Warning Alarm will sound. The Lamps-On Warning Alarm can be silenced by either turning the Headlamp Switch to the OFF position or turning the Ignition Switch to the RUN position.

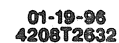
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# INSTRUMENT CLUSTER GASOLINE ENGINES

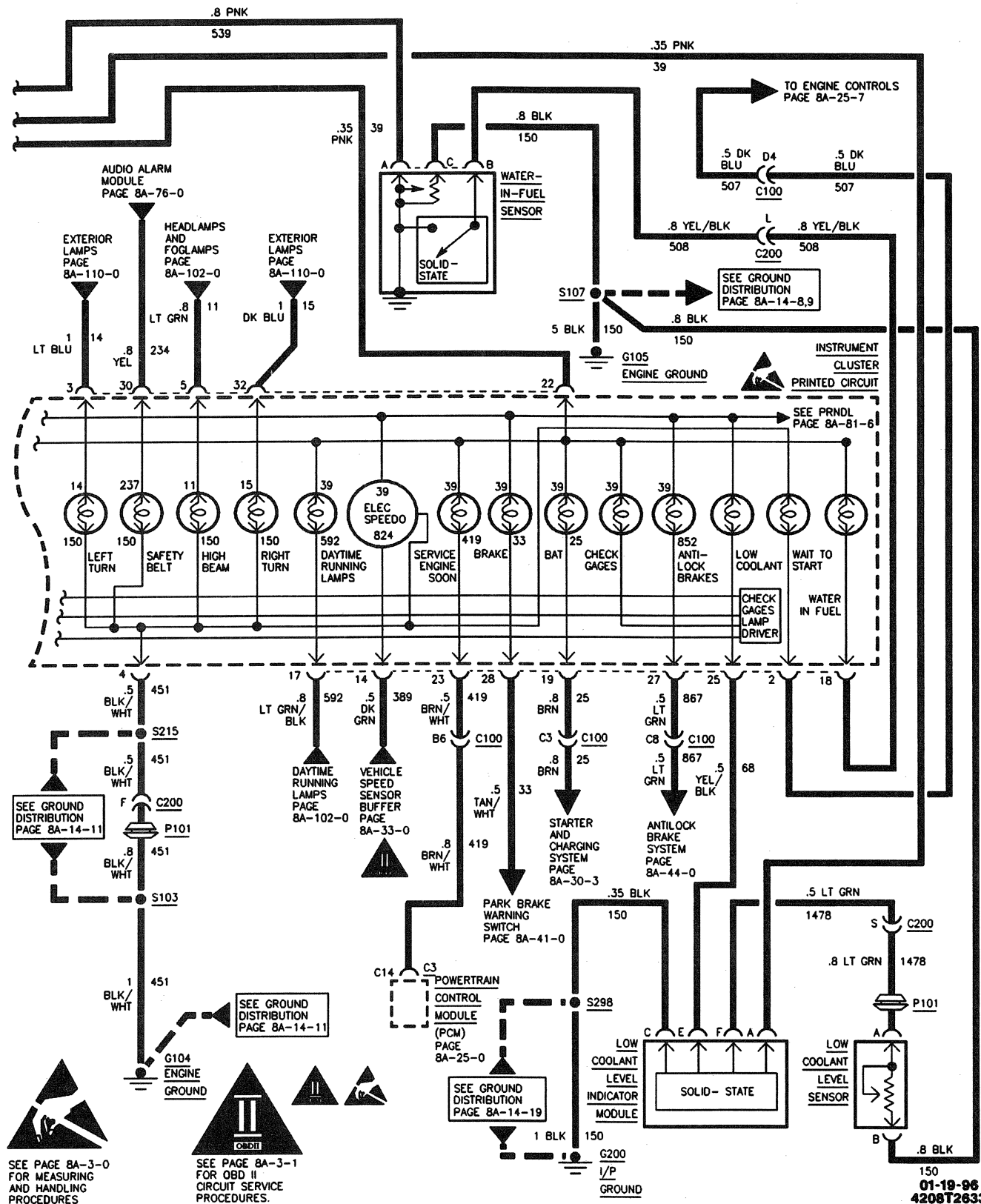


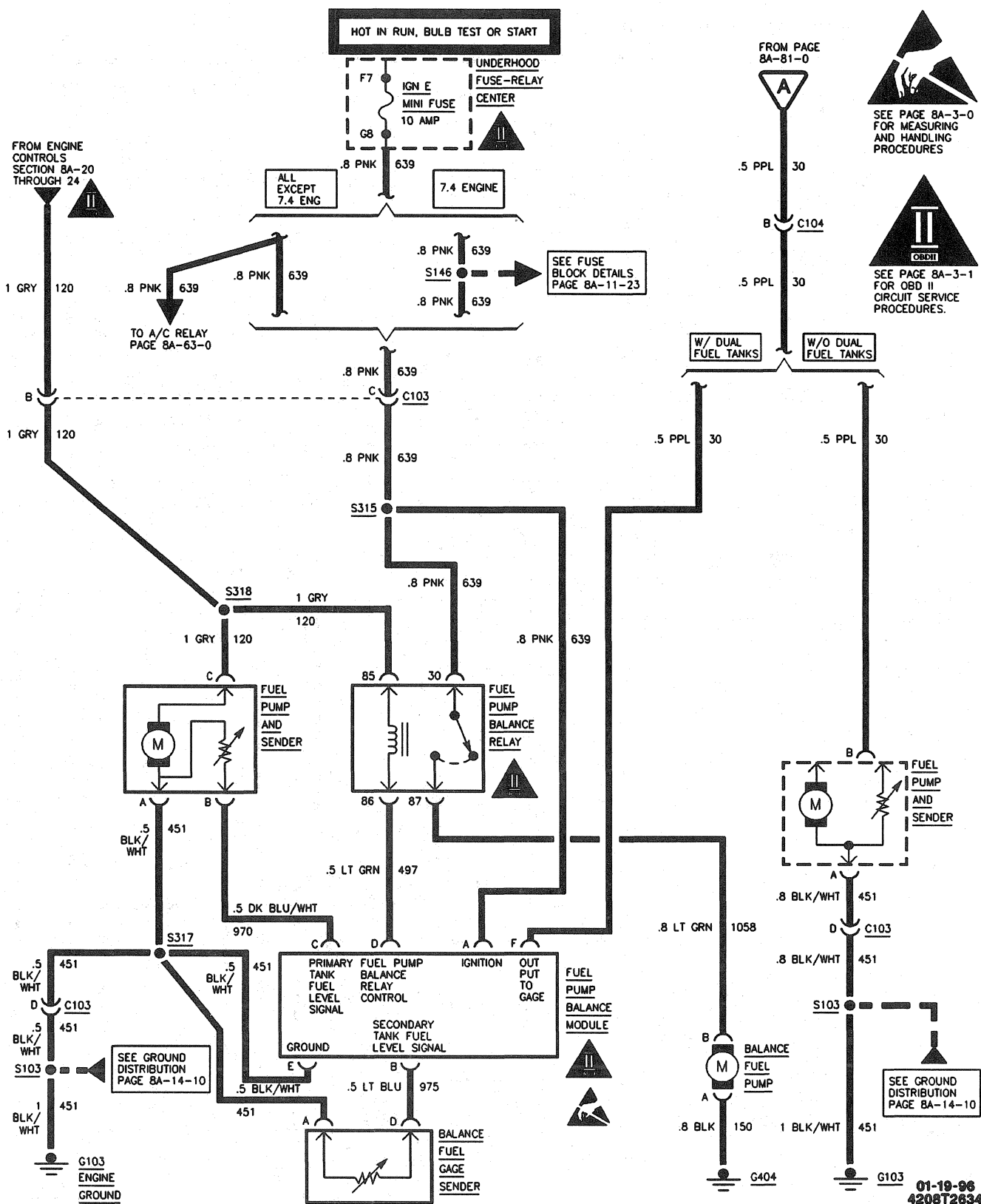


## INSTRUMENT CLUSTER DIESEL ENGINES





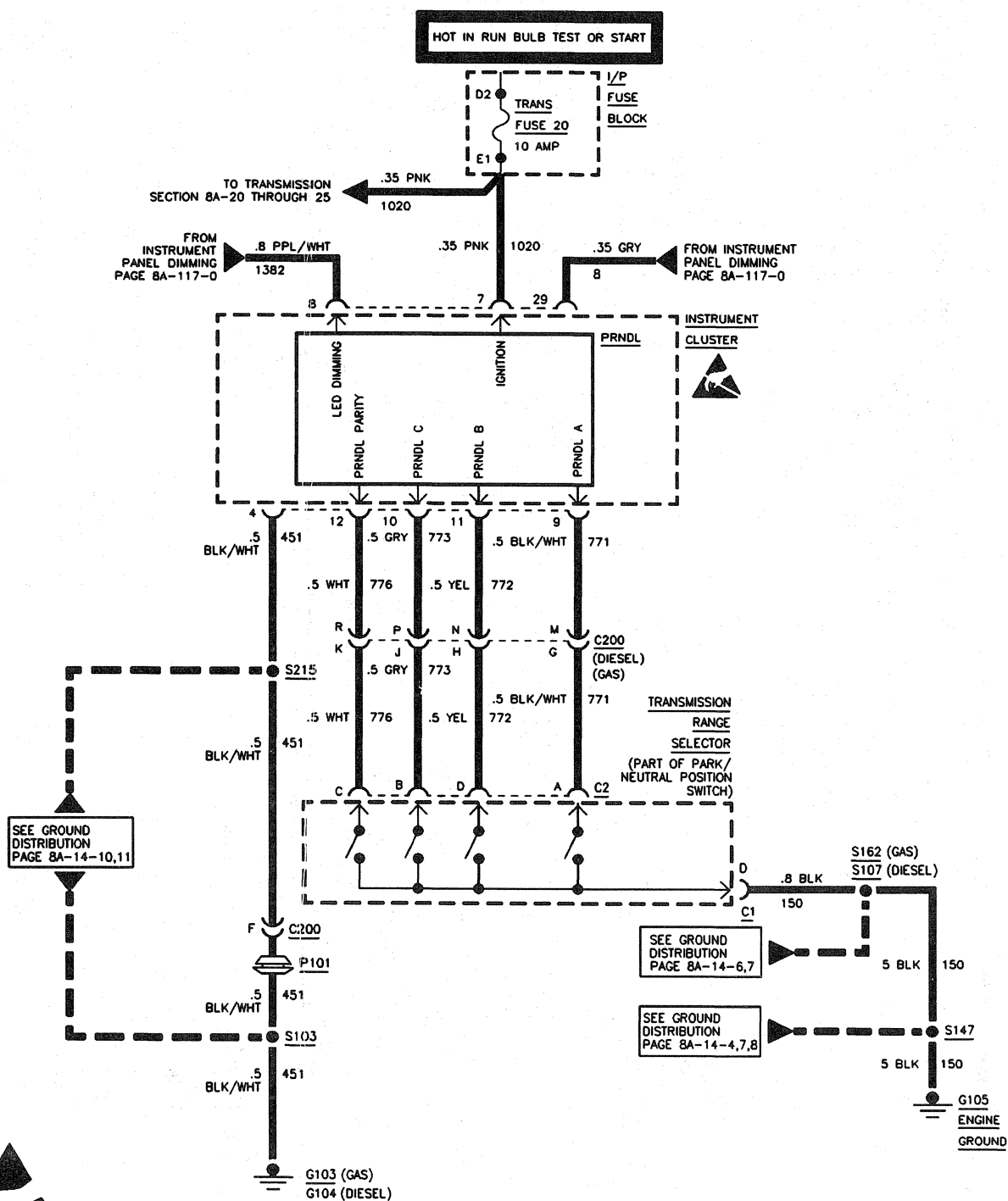






# 8A - 81 - 6 ELECTRICAL DIAGNOSIS

## INSTRUMENT CLUSTER ELECTRONIC PRNDL



SEE PAGE 8A-3-0  
FOR MEASURING  
AND HANDLING  
PROCEDURES

COMPONENT	LOCATION	201-PG	FIG.	CONN
Balance Fuel Gage Sender .....	In rear Fuel Tank			
Balance Fuel Pump .....	On inside LH Frame rail near front of rear Tank			
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse.....	7 .....	10	
Diagnostic Energy Reserve Module (DERM).....	Behind center of I/P			
Engine Coolant Temperature Sender .....	LH Cylinder Head, near # 1 Spark Plug .....	10 .....	16	
Engine Coolant Temperature Sensor (Diesel).....	LH Lower Front of Engine Block .....	16 .....	22	
Fuel Lift Pump (Diesel) .....	Inside LH Frame Rail, below Driver's Door			
Fuel Pump and Sender .....	In Fuel Tank			
Fuel Pump Balance Relay .....	On Fuel Pump Balance Module.....			202-41
Fuel Pump Balance Module.....	Inside LH side of Frame Rail near Transmission Crossmember.....			202-41
Generator.....	LH front of Engine .....	1 .....	3	
Ignition Coil .....	RH side rear of Engine.....	14 .....	20	
Instrument Cluster .....	LH upper end of I/P .....			202-25
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Low Coolant Level Indicator Module (Diesel) .....	Under center of I/P .....	27 .....	42.....	202-42
Low Engine Coolant Level Sensor (Diesel).....	In Coolant Reservoir, RH side of Engine Compartment			
Oil Pressure Switch and Sender .....	LH side of Engine, Rear			
Powertrain Control Module (PCM) .....	Under RH end of I/P, above Blower Motor .....	24 .....	38	
Transmission Range Selector (part of Park/Neutral Position Switch).....	LH side of Transmission .....	17 .....	25	
Underhood Fuse-Relay Center...	LH rear of Engine Compartment, on Fender.....	4 .....	8	
Vehicle Control Module (VCM) .....	Engine Compartment, near BPMV Module .....	24 .....	37	
Water-in-Fuel Sensor (Diesel)				
<b>CONNECTORS:</b>				
C100 .....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C103 .....	LH rear of Engine Compartment, under Brake Master Cylinder .....			202-35
C104 .....	LH rear of Engine Compartment, under Brake Master Cylinder .....	22 .....	34.....	202-35
C106 .....	Top of Engine near LH Valve Cover .....	10 .....	16	

**8A - 81 - 8 ELECTRICAL DIAGNOSIS****INSTRUMENT CLUSTER**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap .....	24.....	38.....	202-4, 5
<b>GROUNDS:</b>				
G103 (Gas).....	RH front of Engine, near Thermostat Housing .....	10.....	16	
G104 (Gas).....	RH top of Cylinder Head, near center.....	12.....	18	
G104 (Diesel).....	RH top of Cylinder Head.....	15.....	21	
G105 (Gas).....	RH front of Engine Block.....	9.....	15	
G105 (Diesel).....	RH top of Cylinder Head.....	15.....	21	
G200.....	Behind LH side of I/P, below Fuse Block			
G404.....	Inside LH Frame rail, near rear Crossmember			
<b>GROMMETS:</b>				
P100 .....	LH rear of Engine Compartment at Bulkhead.....	3 .....	7	
P101 .....	RH rear of Engine Compartment, at Bulkhead			
<b>SPLICES:</b>				
S103 (VIN W, M, R) .....	Engine Harness, approx. 11 cm from Breakout to EGR Valve toward Taillamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, approx. 35 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S103 (Diesel).....	Engine Harness, approx. 11.5 cm from Breakout to Glow Plugs (RH side) toward P101			
S107 (VIN M, R) .....	Engine Harness, approx. 20 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN J).....	Engine Harness, approx. 20 cm from Breakout to Fuel Injector Breakout toward Taillamp Extension			
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve			
S108 (VIN W, M, R) .....	Engine Harness, approx. 11.5 cm from Ignition Coil Breakout toward Starter Solenoid			
S108 (VIN J).....	Engine Harness, approx. 13 cm from Ignition Coil Breakout toward Starter Solenoid			
S108 (Diesel).....	Engine Harness, approx. 5 cm from Backup Lamp Switch Harness Breakout toward EGR Valve			
S146 (VIN J).....	Engine Harness, approx. 22 cm into Underhood Fuse - Relay Center Breakout			
S204.....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout			
S213 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout toward Cluster			

COMPONENT	LOCATION	201-PG FIG. CONN
S215 .....	I/P Harness, approx. 8 cm from I/P Cluster Breakout toward Radio	
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets	
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout	
S315 .....	Taillamp Extension Harness, approx. 65 cm from Fuel Pump Balance Module Breakout toward Engine Harness	
S317 (Gas).....	Taillamp Extension Harness, approx. 10 cm from Fuel Pump and Sender Breakout toward Engine Harness	
S317 (Diesel).....	Taillamp Extension Harness, approx. 10 cm from Fuel Gage Sender Breakout toward Engine Harness	
S318 .....	Taillamp Extension Harness, approx. 10 cm from Fuel Pump Balance Module Breakout toward Engine Harness	
S319 (Gas).....	Taillamp Extension Harness, approx. 20 cm from Fuel Pump and Sender Breakout toward Balance Fuel Pump Breakout	
S319 (Diesel).....	Taillamp Extension Harness, approx. 20 cm from Fuel Gage Sender Breakout toward Balance Fuel Pump	

## DIAGNOSIS - INSTRUMENT CLUSTER

### TROUBLESHOOTING HINTS:

- CHECK condition of TRANS, GAGES, ENG 1, PK LPS, and IGN E FUSE(S). If Fuse is open, LOCATE and REPAIR cause of overload and REPLACE Fuse(s).
- CHECK that Grounds G103, G105, and G200 (Gasoline) or Grounds G103, G104, G105, and G404 (Diesel) are clean and tight.
- If two or more Instrument Cluster indications (gages or lamps) are not operating, CHECK power and grounding Circuits which are common to the indications.
- The CHECK GAGES indication is illuminated when the Ignition Switch is placed in "RUN" it remains illuminated until the Engine Oil Pressure increases to normal operating pressure and the indication extinguishes. If the indicator does not illuminate with the Ignition Switch in "RUN", and the bulb does not have an open filament, then perform the Oil Pressure Gage indicates high pressure at all times diagnosis. If the indicator does not extinguish with the Engine running then perform both the Temperature Gage
- Indicates "HOT" and the Oil Pressure indicates Low diagnosis.
- CHECK for open filaments in inoperative lamps.
- Instrument Cluster gages are sufficiently accurate to provide reasonable indications for vehicle operation. Maintenance measurements are made with test gages of greater accuracy. A static error in indication for an Instrument Cluster gage of 10% of visible scale is normally acceptable dynamic error, as introduced by sloshing of fuel in the Fuel Tank during acceleration or breaking is also acceptable as long as the gage indicates reasonable, during steady state conditions. Errors due to non-linearity as in temperature senders or in Fuel Tank construction are also acceptable. Gage accuracy should be sufficient to avoid false or misleading indications. If the indication are false or misleading, then corrective action is required.
- If the odometer functions, but the speedometer does not function, then REPLACE the Instrument Cluster. If the speedometer is inaccurate in read test but the odometer is accurate, then REPLACE the Instrument Cluster.

## 8A - 81 - 10 ELECTRICAL DIAGNOSIS

### INSTRUMENT CLUSTER

- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may effect the integrity of other system (see "Troubleshooting Procedures" page 8A-4-0).

Electrical Diagnosis for the various indications on the Instrument Cluster is covered in this and in other Sections. The following table indicates where coverage may be found.

### DIAGNOSTIC COVERAGE TABLE

INDICATOR	SECTION 8A SCHEMATIC COVERAGE	DIAGNOSTIC COVERAGE
Oil Gage (Pressure)	8A-81	8A-81
Temp Gage (Coolant)	8A-81	8A-81
Fuel Gage	8A-81	8A-81
Voltmeter	8A-81	8A-81
Tachometer	8A-81 (Gasoline)	8A-30 (Diesel)
	8A-81 (Gasoline)	8A-30 (Diesel)
Air Bag Lamp	8A-47	8A-47, 9J
Illumination Lamps	8A-117	8A-117
Left/Right Turn Lamps	8A-110	8A-110
Safety Belt Lamp	8A-76	8A-76
High Beam Light	8A-100, 104	8A-100, 104
Daytime Running Lights Lamp	8A-104	8A-104
Elec. Speedometer	8A-81	8A-81
Service Engine Soon Lamp	8A-20, 21, 23, 24, 25	Driveability and Emissions (Gasoline or Diesel) Section 6E
Brake Lamp	8A-41	8A-41
Gen (Battery) Lamp	8A-33	8A-33
Check Gages Lamp	8A-81	8A-81
Antilock Brakes Lamp	8A-44	8A-44, 5E1
Upshift Lamp	8A-20, 21, 24	Driveability and Emissions (Gasoline) Section 6E
Service Throttle Soon Lamp	8A-25, 26, 27	Driveability and Emissions (Diesel) Section 6E
Water in Fuel Lamp	8A-81	Driveability and Emissions (Diesel) Section 6E
Low Coolant (Level) Lamp	8A-81	8A-81
Wait to Start Lamp	8A-25	Driveability and Emissions (Diesel) Section 6E
PRNDL (Automatic Transmission) Indicators	8A-81	8A-81



**FUEL GAGE IS INACCURATE (SINGLE TANK)**

TEST	RESULT	ACTION
1. Disconnect connector at Instrument Cluster. Install a fused jumper wire from B+ to Instrument Cluster Pin "22". Install a fused jumper wire from ground to Instrument Cluster Pin "31". Connect one red lead of Tester J33431-B to Instrument Cluster Pin "16". Connect the other lead to ground. Set resistance dial to 0 ohms. Fuel Gage should indicate "E" or below. Set resistance dial to 90 ohms. After a short time, Fuel Gage should indicate "F" or above.	Fuel Gage responds correctly.	GO to step 2.
	Fuel Gage does not respond correctly.	REPLACE Instrument Cluster.
2. REMOVE fused jumper wire from between B+ and Instrument Cluster. Install a fused jumper wire between ground and Instrument Cluster. Reconnect Connector at Instrument Cluster. Disconnect connector at Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel). Connect one red test lead of Tester J33431-B to Fuel Gage Sender Connector Cavity "B". Connect the other lead to ground. Set resistance dial to 0 ohms and then to 90 ohms and observe response.	Fuel Gage responds correctly.	GO to step 3.
	Fuel Gage does not respond correctly.	LOCATE and REPAIR high resistance in PPL (30) wire between Instrument Cluster and Fuel Gage Sender.
3. Reconnect Tester J33431-B between Fuel Gage Sender Cavity "B" and Cavity "A". Set resistance dial at 0 ohms, then at 90 ohms and observe response.	Fuel Gage responds correctly.	REPLACE Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel).
	Fuel Gage does not respond correctly.	LOCATE and REPAIR high resistance in BLK/WHT (451) wire between Fuel Gage Sender and Ground G103.

**8A - 81 - 12 ELECTRICAL DIAGNOSIS****INSTRUMENT CLUSTER****FUEL GAGE INDICATES FULL OR ABOVE FULL AT ALL TIMES (SINGLE TANK)**

TEST	RESULT	ACTION
1. Disconnect connector at Instrument Cluster. Install a fused jumper wire between B+ and Instrument Cluster Pin "22". Install fused jumper wire between Instrument Cluster Pin "16" and engine or chassis ground. Install fused jumper wire between ground and Instrument Cluster Pin "31". Place Ignition Switch in RUN.	Fuel Gage indicates full.	REPLACE Instrument Cluster.
	Fuel Gage indicates empty.	GO to step 2.
2. Remove the fused jumper wires from the Instrument Cluster and reconnect the connector. Disconnect connector at Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel). Connect a fused jumper wire between Fuel Sender Connector Cavity "B" and engine or chassis ground.	Fuel Gage indicates full.	LOCATE and REPAIR open in PPL (30) wire between Instrument Cluster and Fuel Gage Sender.
	Fuel Gage indicates empty.	GO to step 3.
3. What kind of fuel does this vehicle use?	Gasoline.	REPLACE Fuel Pump and Sender.
	Diesel.	GO to step 4.
4. Install a fused jumper wire at Fuel Gage Sender Connector from Cavity "A" to Cavity "B".	Fuel Gage indicates full.	LOCATE and REPAIR open in BLK/WHT (451) wire between Fuel Sender and Ground G103.
	Fuel Gage indicates empty.	REPLACE Fuel Gage Sender.

**FUEL GAGE INDICATES EMPTY WHEN THERE IS FUEL IN THE TANK (SINGLE TANK)**

TEST	RESULT	ACTION
1. Disconnect connector at Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel). Place Ignition Switch in RUN.	Fuel Gage does not indicate empty.	REPLACE Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel).
	Fuel Gage indicates empty.	GO to step 2.
2. Place Ignition Switch in OFF. Disconnect Connector at Instrument Cluster. Connect self-powered test lamp from Instrument Cluster Connector Cavity "16" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground in PPL (30) wire between Instrument Cluster and Fuel Gage Sender.
	Test lamp does not light.	REPLACE Instrument Cluster.

**FUEL GAGE INDICATES EMPTY AT ALL TIMES (DUAL TANKS)**

TEST	RESULT	ACTION
1. Disconnect connector at Fuel Pump Balance Module. Place Ignition Switch in RUN. Allow time to observe response.	Fuel Gage indicates above empty.	GO to step 3.
	Fuel Gage indicates empty.	GO to step 2.
2. Disconnect connector at Instrument Cluster. Connect self-powered test lamp between Instrument Cluster Connector Cavity "16" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in PPL (30) wire between Fuel Pump Balance Module and Instrument Cluster.
	Test lamp does not light.	REPLACE instrument Cluster.
3. Disconnect connector at Balance Fuel Gage Sender. Connect a self-powered test lamp between Fuel Pump Balance Module Connector Cavity "B" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in LT GRN (975) wire between Fuel Pump Balance Module and Balance Fuel Gage Sender. GO to Step 4.
	Test lamp does not light.	GO to step 4.
4. Connect a self-powered test lamp between Fuel Pump Balance Module Connector Cavity "B" and Balance Fuel Gage Sender Connector Cavity "D".	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (975) wire between Fuel Pump Balance Module and Balance Fuel Gage Sender.
5. Connect a self-powered test lamp between Balance Fuel Gage Sender Connector Cavity "A" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Balance Fuel Gage Sender and Ground G103.
6. Connect an ohmmeter between Balance Fuel Gage Sender Pins "A" and "D".	Resistance indication is 110 ohms or less.	GO to step 7.
	Resistance indication is over 100 ohms.	REPLACE Balance Fuel Gage Sender.
7. Reconnect connector at Balance Fuel Gage Sender. Disconnect connector at Fuel Gage Sender (Diesel) or Fuel Pump and Sender (Gasoline). Connect a self-powered test lamp between Fuel Pump Balance Module Connector Cavity "C" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground in DK BLU/WHT (970) wire between Fuel Pump Balance Module and Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel).
	Test lamp does not light.	GO to step 8.
8. Connect a self-powered test lamp between Fuel Pump Balance Module connector Cavity "C" and Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel) Connector Cavity "B".	Test lamp lights.	GO to step 9.
	Test lamp does not light.	LOCATE and REPAIR open in DK BLU/WHT (970) wire between Fuel Pump Balance Module and Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel).
9. Connect a self-powered test lamp between Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel) Connector Cavity "A" and ground.	Test lamp lights.	GO to step 10.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel) and Ground G103.
10. Connect an ohmmeter between Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel) Pins "A" and "D."	Resistance indication is 100 ohms or less.	REPLACE Fuel Pump Balance Module.
	Resistance indication is over 100 ohms.	REPLACE Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel).

## INSTRUMENT CLUSTER

## FUEL GAGE INDICATES FULL AT ALL TIMES (DUAL TANKS)

TEST	RESULT	ACTION
1. Disconnect the connector at Instrument Cluster. Install a fused jumper wire between Instrument Cluster Pin "31" and ground. Install a fused jumper wire between Instrument Cluster Pin "22" and B+. Install a fused jumper wire from Instrument Cluster Pin "16" to engine or chassis ground.	Fuel Gage indicates full.	REPLACE Instrument Cluster.
	Fuel Gage indicates empty.	GO to step 2.
2. Remove the fused jumper wires from the Instrument Cluster. Reconnect connector at Instrument Cluster. Disconnect connector at Fuel Pump Balance Module. Connect a fused jumper wire between Fuel Pump Balance Module Connector Cavity "F" and ground.	Fuel Gage indicates full.	LOCATE and REPAIR open in PPL (30) wire between Instrument Cluster and Fuel Pump Balance Module.
	Fuel Gage indicates empty.	CONNECT connector at Fuel Pump Balance Module. GO to FUEL GAGE IS INACCURATE (DUAL TANKS) Diagnosis Chart.

## FUEL GAGE IS INACCURATE (DUAL TANKS)

TEST	RESULT	ACTION
<p>NOTE: The following testing requires that a fuel tank be full. It is preferred that the customer/owner provide the fuel.</p> <p>1. Disconnect the Connector at Instrument Cluster. Install a fused jumper wire between Instrument Cluster Pin "31" and ground. Install a fused jumper wire between Instrument Cluster Pin "22" and B+. Connect one red lead of Tester J33431-B to Instrument Cluster Pin "16". Connect the other test lead to ground. Set resistance dial on the tester to 1 ohm. The Fuel Gage should indicate empty after a short period of time. Set the resistance dial at 45 ohms. The Fuel Gage should indicate half-full after a period of time. Set the resistance dial to 90 ohms. The Fuel Gage should indicate full after a period of time.</p>	Fuel Gage indicates correctly.	GO to step 2.
	Fuel Gage does not indicate correctly.	REPLACE Instrument Cluster.

TEST	RESULT	ACTION
2. Remove the tester and the jumper wires. Reconnect the Connector at Instrument Cluster. Place Ignition Switch in RUN. Disconnect connector at Balance Fuel Sender. Disconnect connector at Fuel Gage Sender (Diesel) or Fuel Pump and Sender (Gasoline). Connect a J33431-B Tester at Balance Fuel Sender Connector Cavity "D" to ground. Adjust the tester for 45 ohms. Connect a J33431-B Tester at Fuel Sender (Diesel) or Fuel Pump and Sender Connector Cavity "B" to ground. Adjust the tester for 45 ohms.	Fuel Gage indicates 1/2 full approximately.	GO to step 3.
	Fuel Gage indicates much more or much less than half-full.	REPLACE Fuel Pump Balance Module.
3. Ensure that the rear Fuel Tank is full. Connect an ohmmeter at Balance Fuel Sender Pins "A" and "D".	90 Ohms, nominally.	REPLACE Fuel Pump and Sender (Gasoline) of Fuel Gage Sender (Diesel).
	Much less than 90 ohms.	REPLACE Balance Fuel Sender.

**VEHICLE RUNS OUT OF FUEL AT HALF-FULL/REAR TANK IS FULL AT ALL TIMES  
(DUAL TANKS)**

TEST	RESULT	ACTION
1. Disconnect connector at Balance Fuel Pump. Connect a fused jumper wire between ground and Balance Fuel Pump Pin "A". Connect a fused jumper wire between B+ and Balance Fuel Pump Pin "B".	Balance Fuel Pump runs.	GO to step 2.
	Balance Fuel Pump does not run.	REPLACE Balance Fuel Pump.
2. Connect a self-powered test lamp between Balance Fuel Pump Connector Cavity "A" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Balance Fuel Pump and Ground G404.
3. Remove Fuel Pump Balance Relay from its socket. Connect a self-powered test lamp between Fuel Pump Balance Relay Socket Cavity "87" and Balance Fuel Pump Connector Cavity "B".	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (1058) wire between Balance Fuel Pump Relay and Balance Fuel Pump.
4. Connect a test lamp between Fuel Pump Balance Relay Socket Cavity "30" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (639) wire between Underhood Fuse-Relay Center and Fuel Pump Balance Relay.
5. Remove the Fuel Pump Relay from its socket at the Underhood Fuse Relay Center. Connect a test lamp between Fuel Pump Balance Relay Socket Cavity "85" and Fuel Pump Relay Socket Cavity "A3".	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (120) wire between Splice S318 and Fuel Pump Balance Relay.

**INSTRUMENT CLUSTER**

TEST	RESULT	ACTION
6. Disconnect connector at Fuel Pump Balance Module. Connect self-powered test lamp between Fuel Pump Balance Relay Socket Cavity "86" and Fuel Pump Balance Module Connector Cavity "D".	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (497) wire between Fuel Pump Balance Module and Fuel Pump Balance Relay.
7. Replace Fuel Pump Balance Relay in its Socket. Connect fused test jumper between Fuel Pump Balance Module Connector Cavity "D" and ground. Connect a test lamp at Balance Fuel Pump Connector Cavity "B".	Test lamp lights	GO to step 8.
	Test lamp does not light.	REPLACE Fuel Pump Balance Relay.
8. Connect a test lamp between Fuel Pump Balance Module Connector Cavity "A" and ground.	Test lamp lights	GO to step 9.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (639) wire between Fuel Pump Balance Module and Splice S315.
9. Connect self-powered test lamp between Fuel Pump Balance Module Connector Cavity "E" and ground.	Test lamp lights.	REPLACE Fuel Pump Balance Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Balance Fuel Pump Module and Ground G103.

**FUEL GAGE DOES NOT CHANGE POSITION ON SCALE (DUAL TANKS)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect connector at Fuel Pump Balance Module. Connect a test lamp between Fuel Pump Balance Module Connector Cavity "A" and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (639) wire between Underhood Fuse-Relay Center and Fuel Pump Balance Module.
2. Connect self-powered test lamp between Fuel Pump Balance Module Connector Cavity "E" and ground.	Test lamp lights.	REPLACE Fuel Pump Balance Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Fuel Pump Balance Module and Ground G103.

**TEMPERATURE GAGE INDICATES HOT (IN RED ZONE OR CHECK GAGES LAMP IS ILLUMINATED) WITH ENGINE COOLANT BELOW NORMAL OPERATING TEMPERATURE AND IGNITION SWITCH IN RUN**

TEST	RESULT	ACTION
1. Disconnect connector at Engine Coolant Temperature Sender. Place Ignition Switch in RUN.	Temp Gage indicates cold (at or below 100°F for gasoline engines or at or below 160°F for diesel engines).	REPLACE Engine Coolant Temperature Sender.
	Temp Gage does not indicate cold.	LOCATE and REPAIR short to ground in DK GRN (35) wire between Engine Coolant Temperature Sender and Instrument Cluster. If no short is found, REPLACE Instrument Cluster.

**TEMPERATURE GAGE INDICATES COLD ALL THE TIME**

TEST	RESULT	ACTION
1. Disconnect connector at Engine Coolant Temperature Sender. Connect fused jumper wire from Engine Coolant Temperature Sender Connector Cavity "A" to ground. Place Ignition Switch in RUN.	Temp Gage indicates hot.	REPLACE Engine Coolant Temperature Sender.
	Temp Gage does not indicate hot.	LOCATE and REPAIR open in DK GRN (35) wire between Engine Coolant Temperature Sender and Instrument Cluster. If wire is good, REPLACE Instrument Cluster.

**TEMPERATURE GAGE IS NOT ACCURATE**

TEST	RESULT	ACTION
1. Disconnect connector at Engine Coolant Temperature Sender. Connect one red lead from Tester J33431-B to Engine Coolant Temperature Sender Connector Cavity "A." Connect the other lead to ground. Place Ignition Switch in RUN. Adjust resistance dial to 1305 ohms and then to 49.5 ohms. Temp Gage should indicate cold (approximately 100°F for gasoline engine or 160°F for diesel engine) then hot (approximately 260°F).	Temp Gage indicates correctly.	REPLACE Engine Coolant Temperature Gage Sender.
	Temp gages does not indicate correctly.	REPLACE Instrument Cluster.

**OIL PRESSURE GAGE IS NOT ACCURATE UNDER NORMAL OPERATING CONDITIONS**

TEST	RESULT	ACTION
1. Disconnect connector at Fuel Pump Oil Pressure Switch and Sender. Place Ignition Switch in RUN. Connect one red lead of Tester J34431-B to Fuel Pump Oil Pressure Switch and Sender Connector Cavity "A". Connect the other lead to ground. Adjust resistance dial to 0 ohms and then to 90 ohms. The Oil Gage should indicate low pressure (approximately "0") and then high pressure (approximately "80").	Oil Gage indicates correctly.	REPLACE Fuel Pump Oil Pressure Switch and Sender
	Oil Gage does not indicate correctly.	LOCATE and REPAIR open in TAN (31) wire between Fuel Pump Oil Pressure Switch and Sender and Instrument Cluster. If wire is good, REPLACE Instrument Cluster.

**OIL PRESSURE GAGE INDICATES LOW PRESSURE (IN RED ZONE OR AT "0") WHEN OIL PRESSURE IS NORMAL**

TEST	RESULT	ACTION
1. Disconnect connector at Fuel Pump Oil Pressure Switch and Sender. Place Ignition Switch in RUN.	Oil Gage indicates high pressure (approximately "80" or higher).	REPLACE Fuel Pump Oil Pressure Switch and Sender.
	Oil Gage indicates low or no pressure.	LOCATE and REPAIR short to ground in TAN (31) wire between Fuel Pump Oil Pressure Switch and Sender and Instrument Cluster. If wire is good, REPLACE Instrument Cluster.

**INSTRUMENT CLUSTER****OIL PRESSURE GAGE INDICATES HIGH PRESSURE (IN RED ZONE OR "80" WITH NO FLUCTUATION) AT ALL TIMES**

TEST	RESULT	ACTION
1. Disconnect connector at Fuel Pump Oil Pressure Switch and Sender. Place Ignition Switch in RUN. Connect fused jumper wire from Fuel Pump Oil Pressure Switch and Sender Connector Cavity "A" to ground.	Oil Gage indicates low pressure.	REPLACE Fuel Pump Oil Pressure Switch and Sender.
	Oil Gage indicates high pressure.	LOCATE and REPAIR open in TAN (31) wire between Fuel Pump Oil Pressure Switch and Sender and Instrument Cluster. If wire is good, REPLACE Instrument Cluster.

**VOLTMETER IS NOT ACCURATE**

TEST	RESULT	ACTION
1. Start Engine. Connect voltmeter between positive and negative terminals of the battery.	Measured voltage is approximately the same as vehicle's voltage indication.	System operating properly.
	Measured voltage is different from vehicle's voltage indication.	REPLACE Instrument Cluster.

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

TEST	RESULT	ACTION
1. Ensure that coolant level is good. Disconnect connector at Low Coolant Level Sensor. Connect ohmmeter at Low Coolant Level Sensor Pins "A" and "B".	10,000 to 50,000 ohms.	GO to step 2.
	Less than 10,000 ohms.	REPLACE Low Coolant Level Sensor.
2. Disconnect connector at Low Coolant Level Indicator Module. Connect self-powered test lamp from Low Coolant Level Indicator Module Connector Cavity "F" to ground.	Test lamp lights.	LOCATE and REPAIR short to ground in LT GRN (1478) wire between Low Coolant Level Indicator Module and Low Coolant Level Sensor.
	Test lamp does not light.	GO to step 3.
3. Disconnect connector at Instrument Cluster. Connect self-powered test lamp between Instrument Cluster Connector Cavity "25" and Low Coolant Level Indicator Module Connector Cavity "E".	Test lamp does not light.	LOCATE and REPAIR open in YEL/BLK (68) wire between Instrument Cluster and Low Coolant Level Indicator Module.
	Test lamp lights.	GO to step 4.
4. Reconnect connector at Instrument Cluster. Place Ignition Switch in RUN. Connect fused jumper wire between Low Coolant Level Indicator Module Connector Cavity "E" and ground.	Low Coolant indicator lights.	REPLACE Low Coolant Level Indicator Module.
	Low Coolant indicator does not light.	REPLACE Instrument Cluster.



### LOW COOLANT LEVEL INDICATOR LAMP LIGHTS WHEN COOLANT LEVEL IS NOT LOW (DIESEL ONLY)

TEST	RESULT	ACTION
1. Disconnect connector at Low Coolant Level Sensor. Connect an ohmmeter from Low Coolant Level Sensor Pins "A" to "B".	Greater than 50,000 ohms.	REPLACE Low Coolant Level Sensor.
	Less than 50,000 ohms.	GO to step 2.
2. Connect self-powered test lamp between Low Coolant Level Sensor Connector Cavity "B" and Ground G105.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from Low Coolant Level Sensor to Ground G105.
3. Disconnect Connector at Low Coolant Level Indicator Module. Connect a self-powered test lamp between Low Coolant Level Indicator Module Connector Cavity "F" and Low Coolant Level Sensor Connector Cavity "A".	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (1478) wire between Low Coolant Level Indicator Module and Low Coolant Level Sensor.
4. Connect a test lamp between Low Coolant Level Indicator Module Connector Cavity "A" and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between I/P Fuse Block and Low Coolant Level Indicator Module.
5. Connect self-powered test lamp between Low Coolant Level Indicator Module Connector Cavity "C" and ground.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BLK 150 wire between Low Coolant Level Indicator Module and Ground G200.
6. Disconnect connector at Instrument Cluster. Connect self-powered test lamp between Low Coolant Level Indicator Module Connector Cavity "E" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in YEL/BLK (68) wire between Instrument Cluster and Low Coolant Level Indicator Module.
	Test lamp does not light.	GO to step 7.
7. Reconnect connector at Instrument Cluster. Place Ignition Switch in RUN.	Low Coolant indicator lights.	REPLACE Instrument Cluster.
	Low Coolant indicator does not light.	REPLACE Low Coolant Level Indicator Module.

**8A - 81 - 20 ELECTRICAL DIAGNOSIS****INSTRUMENT CLUSTER****ELEC. SPEEDOMETER/ODOMETER DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Perform diagnostic testing as per Antilock Brake Section 5E1 and Driveability and Emissions Sections 3 and 10. This testing will identify problems in the Vehicle Speed Sensor, Vehicle Speed Sensor Buffer (Diesel), or the Vehicle Control Module (Gasoline).	Problem is resolved.	System operating properly.
	Problem persists.	GO to step 2.
2. Disconnect connector at Instrument Cluster. Disconnect Connector C4 at Vehicle Control Module (Gasoline). Disconnect connector at Vehicle Speed Sensor Buffer (Diesel). Connect a self-powered test lamp from Instrument Cluster Connector Cavity "14" to ground.	Test lamp does not light.	GO to step 3.
	Test lamp lights.	LOCATE and REPAIR short to ground in DK GRN (389) wire between the Vehicle Control Module (Gasoline) or the Vehicle Speed Sensor Buffer (Diesel).
3. Connect self-power test lamp between Instrument Cluster Connector Cavity "14" and Vehicle Speed Sensor Buffer Connector Cavity "15" (Diesel) or Vehicle Control Module Connector C4 Cavity "4" (Gasoline).	Test lamp lights.	REPLACE Instrument Cluster.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN (389) wire between Instrument Cluster and Vehicle Control Module (Gasoline) or Vehicle Speed Sensor Buffer (Diesel).

**ELEC. SPEEDOMETER/ODOMETER IS INACCURATE**

TEST	RESULT	ACTION
1. Ensure that the Vehicle Control Module (VCM, gasoline engines) or the Vehicle Speed Sensor Buffer (diesel engines) is correctly calibrated for axle ratio and tire size.	Problem persists or is not resolved.	GO to step 2.
	Problem does not persist.	No additional action is required.
2. Perform a test drive over a known distance. The distance should be 8 kilometers (5 miles) or more. Using a scan tool, compare the indicated speed to the speedometer indication while at speed. Record the initial and final odometer readings and the actual distance driven.	While at speed, the scan tool and speedometer indications are within 6 kph (4 mph) of each other.	Speedometer accuracy is within tolerance. GO to step 3.
	While at speed, the scan tool and speedometer indicators are discrepant by more than 6 kph (4 mph).	REPLACE Instrument Cluster.
3. Divide the actual distance driven by the indicated distance driven. Is the calculated result between 0.96 and 1.04?	Yes.	Odometer accuracy is within tolerance. No action required.
	No.	REPLACE Instrument Cluster.

**TACHOMETER DOES NOT FUNCTION (GASOLINE)**

TEST	RESULT	ACTION
1. Perform Distributor Ignition System Check as per Driveability and Emissions (Gasoline) Section 6A.	Problem does not persist.	System operating properly.
	Problem persists.	GO to step 2.
2. Disconnect connector at Instrument Cluster. Disconnect connector at Ignition Coil. Connect a self-powered test lamp between Instrument Cluster Printed Circuit Connector Cavity "6" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in WHT (121) wire between Ignition Coil and Instrument Cluster.
	Test lamp does not light.	GO to step 3.
3. Connect test lamp from Instrument Cluster Connector Cavity "6" to Ignition Coil Connector Cavity "B".	Test lamp lights.	REPLACE Instrument Cluster.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (121) wire between Instrument Cluster and Ignition Coil.

**TACHOMETER DOES NOT FUNCTION (DIESEL)**

TEST	RESULT	ACTION
1. Disconnect connect at Instrument Cluster. Disconnect connector at Generator. Connect a self-powered test lamp between Generator Connector Cavity "A" and ground.	Test lamp lights.	LOCATE and REPAIR short to ground in WHT (121) wire between Generator and Instrument Cluster.
	Test lamp does not light.	GO to step 2.
2. Connect self-powered test lamp between Instrument Cluster Connector Cavity "6" and Generator Connector Cavity "A".	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (121) wire between Generator and Instrument Cluster.
3. Reconnect connector at Generator. Start the engine. Connect voltmeter or oscilloscope between Instrument Cluster Connector Cavity "6" and ground. Observe for potentially pulsating voltage at or below 14 volts.	Voltage is present.	REPLACE Instrument Cluster.
	Voltage is not present.	REPLACE Generator.

**INSTRUMENT CLUSTER****TACHOMETER IS INACCURATE**

TEST	RESULT	ACTION
1. Disconnect WHT (121) wire connector at Ignition Coil (gasoline engine) or at Generator (diesel engine). Start engine and operate at an indicated 1000 rpm without racing the engine. Record tachometer indication. Disconnect WHT (121) wire connector at Ignition coil (gasoline engine) or at Generator (diesel engine). Connect hand-held tachometer, oscilloscope, or other appropriate test instrument to the Ignition Coil (gasoline engine) or Generator (diesel engine) tachometer output. Record indicated revolutions per minute (rpm). Is the rpm indicated by the test instrument within 250 rpm of the vehicle's tachometer indication?	Yes.	Tachometer accuracy is acceptable. No action is required.
	No.	If no other driveability and emissions problems are present, REPLACE Instrument Cluster.

**PRNDL INDICATIONS ARE INCORRECT OR NOT PRESENT BUT AUTOMATIC TRANSMISSION FUNCTIONS NORMALLY**

TEST	RESULT	ACTION
1. Place Automatic Transmission in Park. Start the Engine. Shift the Transmission to each gear position. Observe indications. Place the Transmission in Park and stop the Engine.	No position indications are illuminated.	GO to step 2.
	Some position indications are illuminated.	GO to step 5.
2. Disconnect connector at Instrument Cluster. Place Ignition Switch in RUN. Connect test lamp from Instrument Cluster Connector Cavity "7" to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (1020) wire between I/P Fuse Block and Instrument Cluster.
3. Connect a self-powered test lamp from Instrument Cluster Connector Cavity "4" to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Instrument Cluster and ground.
4. Disconnect connector C1 at Transmission Range Selector (part of Park/Neutral Position Switch). Connect self-powered test lamp between Transmission Range Selector Connector C1 Cavity "D" and ground.	Test lamp lights.	REPLACE Instrument Cluster.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Transmission Range Selector and Ground G105.

TEST	RESULT	ACTION
5. Place Ignition Switch in OFF. Disconnect connector at Transmission Range Selector (Part of Park/Neutral Position Switch). Disconnect connector at Instrument Cluster. Using a self-powered test lamp, check for continuity from cavity to cavity and from cavity to ground for the following wires: WHT (776), GRY (773), YEL (772), and BLK/WHT (771).	No wires are shorted to ground or are open.	GO to step 6.
	One or more wires are open or are shorted to ground.	LOCATE and REPAIR opens/shorts to ground in WHT (776), GRY (773) YEL (772) and/or BLK/WHT (771) wires between the Transmission Range Selector and the Instrument Cluster.
6. Reconnect Connector at Instrument Cluster. Place Ignition Switch in RUN. Refer to the following PRNDL Module Input Test Table. Connect from two to four fused jumper wires from the listed Transmission Range Selector connector cavities to ground as shown by the "X". Repeat for each transmission range column.	Indications are not correct as tested.	REPLACE Instrument Cluster.
	Indications are correct as tested.	REPLACE Park/Neutral Position Switch.

PRNDL MODULE INPUT TEST TABLE

TRANS RANGE SELECT CAV/WIRE	P	R	N	<u>D</u>	D	2	1	INPUT
C WHT (776)	X		X		X		X	PARITY
B GRY (773)				X	X	X	X	C
D YEL (772)		X	X	X	X			B
A BLK/WHT (771)	X	X			X	X		A

## 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 (empty) and the circuit divides at the opposite end of the coil. One path continues to ground through the F-Coil (full). Another goes to ground through the variable resistance of the level sensor in the Fuel Pump and Sender (Gasoline) or Fuel Gage Sender (Diesel) for vehicles with single fuel tanks. The Fuel Pump Balance Module averages the resistances

for vehicles with two fuel tanks. When the tank is low, the resistance of the level sensor is low. A large current flow passes through the E-Coil and the pointer moves toward "E" on the Fuel Gage. When the tank is full, the level sensor's resistance is high. Less current passes through the E-Coil and the pointer moves toward "F" on the scale. With two coils operating the pointer, the Fuel Gage is not affected by changes in the system's battery voltage. For vehicles with single fuel tanks, the level sensor in the Fuel Sender produces a resistance of about 4 ohms when the tank is empty. The resistance is about 90 ohms when the tank is full.

**INSTRUMENT CLUSTER**

A short to ground in the sender or wiring will provide a fully empty indication. An open in the circuit will produce a fully-full indication. For vehicles with dual fuel tanks, the Fuel Pump Balance Module measures the resistance of both Fuel Senders. The module averages the resistances and produces an equivalent resistance reflecting the average level of both fuel tanks. Both power to the module and a change in the input resistances are required to produce a change in the output resistance to the Fuel Gage. The Fuel Pump Balance Module responds to a very low resistance (short to ground) in one or both fuel sender circuits by considering the affected tank(s) to be empty. A very high resistance (open circuit) in either fuel sender circuit will cause the Fuel Pump Balance Module to produce a zero output (both tanks empty) signal to the Fuel Gage. The Fuel Pump Balance Module equalizes level in the two fuel tanks. Fuel is fed to the Engine from the front (primary) fuel tank. When the level in the front tank decreases to about two gallons less than the level in the rear (secondary) fuel tank, the Fuel Pump Balance Module energizes the Fuel Pump Balance Relay. This starts the Balance Fuel Pump which transfers fuel from the rear tank to the front tank. When the level in the front tank increases to about two gallons greater than the rear tank, the Balance Fuel Pump stopped. This approach tends to empty the rear tank first.

**OIL PRESSURE GAGE**

The Engine Oil Pressure is displayed by the Oil Gage. The pointer of the gage is moved by current flow through two Coils and is similar in operation to the Fuel Gage. The Oil Pressure Switch and Sender senses Engine Oil Pressure. The Oil Sender has a low resistance (approximately 0 ohms) when Oil Pressure is low (0 psi) and a high resistance (approximately 90 ohms) when Oil Pressure is high (80 psi).

**TEMPERATURE GAGE**

The Engine coolant temperature is displayed by the Temp Gage. The pointer of the gage is moved by current flow through two Coils and is similar in operation to the Fuel Gage. The Engine Coolant Temperature Sender has a low resistance at higher temperatures. It has a resistance of approximately 49.5 ohms at 123°C (260°F). Its resistance

increases at lower temperatures and is approximately 1305 ohms at 47°C (100°F). This causes the current through the sensor to increase as the coolant temperature increases and the Temp Gage pointer moves toward the hot end of the scale.

**VOLTMETER**

The Voltmeter measures the electrical system's voltage when the Ignition Switch is in RUN or START. It measures battery voltage as fed to the Instrument Cluster. With the engine running, the normal reading is 14 (12 to 16) volts. The indication may decrease to 9.5 volts in cold weather with the engine stopped.

**LOW ENGINE COOLANT LEVEL INDICATOR**

The Low Coolant level indicator for Diesel Engines only lights to warn the driver when the radiator has a low coolant level. Battery voltage is applied to the Low Coolant Level Indicator Module when the Ignition Switch is in RUN or START. The Low Coolant Level Indicator Module monitors the resistance of the Low Coolant Level Sensor. The level sensor has a high resistance of 50,000 ohms or more when the coolant level is low. This is the setpoint at which the Low Coolant Level Indicator Module grounds the YEL/BLK (68) wire to light the Low Coolant lamp. An increasing coolant level can reduce this resistance to less than 10,000 ohms. The lamp is extinguished below approximately 50,000 ohms.

**SPEEDOMETER AND ODOMETER**

The Vehicle Speed Sensor produces voltage pulses of frequency proportional to vehicle speed. This signal is processed by the Vehicle Speed Sensor Buffer (Diesel) or Vehicle Control Module (Gasoline) to produce a voltage pulse signal to the speedometer and odometer.

**TACHOMETER**

The Tachometer displays Engine speed in rpm. Voltage pulses are taken from the Ignition Control Module (Gasoline) or Generator (Diesel) and sent to the Tachometer. Solid state circuits convert the pulse frequency to drive the pointer of the Tachometer.

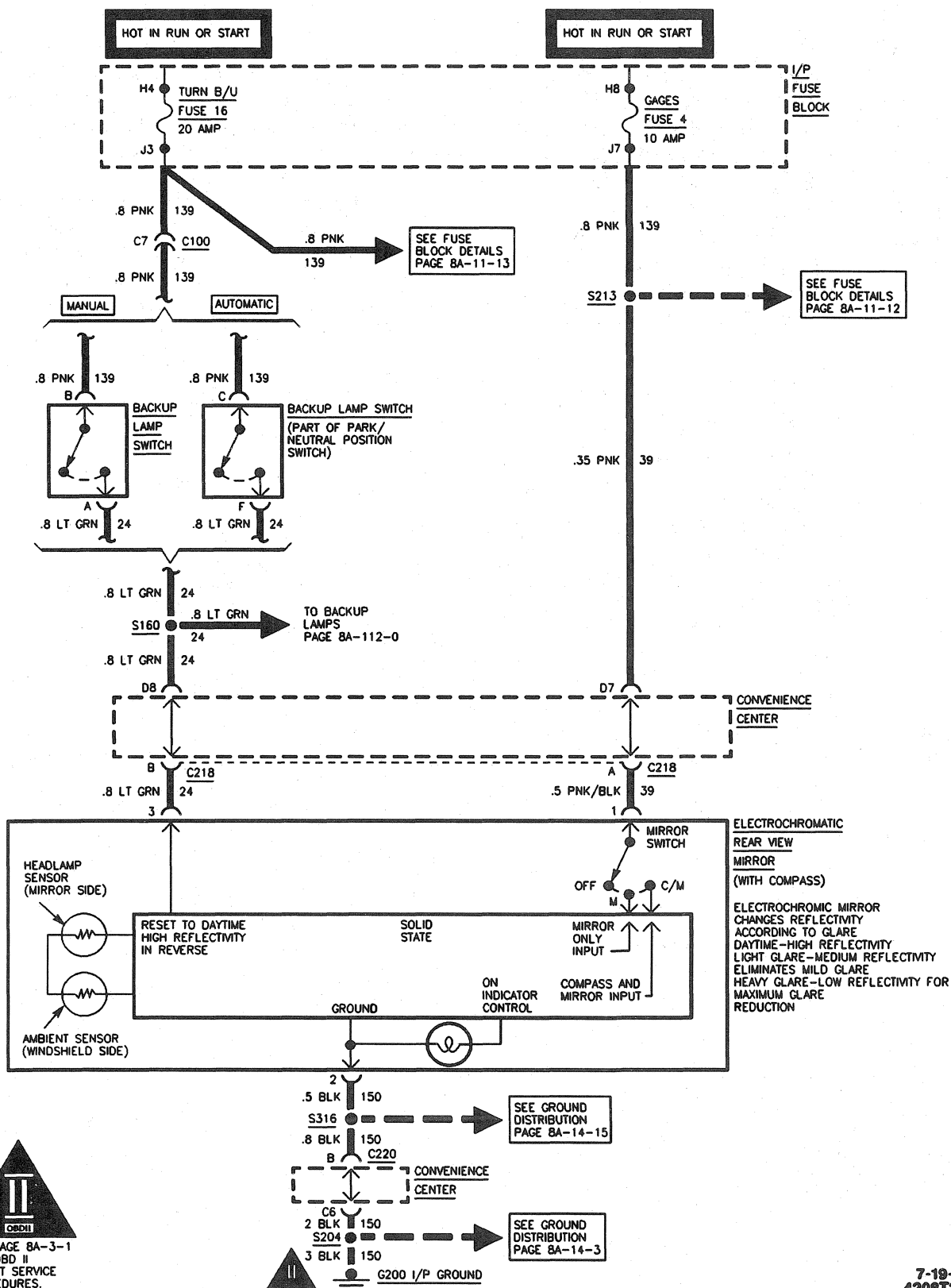
**PRNDL INDICATOR**

The PRNDL Indicator indicates the gear selection for Automatic Transmissions. The PRNDL Indicator receives coded input through four wires from the Transmission Range Selector (part of the Park/Neutral Position Switch). Depending upon which combination of the four wires to the PRNDL Indicator are grounded, a gear selection indication light emitting diode (LED), e.g. Reverse (R), is illuminated. The indications are separate from the Transmission's inputs to the Vehicle Control System (Gasoline) or the Powertrain Control Module (Diesel).

**CHECK GAGES LAMP**

The Check Gages Lamp lights when either the engine oil pressure is low or the engine coolant temperature is high. The Instrument Cluster's Check Gages Lamp Driver solid state logic monitors the input signals to the Oil Gage and the Temp Gage. With the Ignition Switch in RUN or START, the Check Gages Lamp Driver grounds the Check Gages lamp when either of the input signals exceeds its setpoint. This causes the lamp to light. The lamp is normally illuminated when the Ignition Switch is placed in RUN. It extinguishes when the engine is started and oil pressure increases above setpoint.

## ELECTROCHROMATIC REARVIEW MIRROR WITH COMPASS





COMPONENT	LOCATION	201-PG	FIG.	CONN
Backup Lamp Switch (MG5)....	LH side of Transmission, below Shift Tower area.....	21	..... 31	
Backup Lamp Switch (MW3) ...	LH side of Transmission .....	20	..... 29	
Convenience Center .....	Under LH side of I/P, on bulkhead .....	23	..... 36	
Electrochromatic Rear View Mirror with Compass .....	On top side of Windshield .....	32	..... 50	
I/P Fuse Block.....	Lower LH side of I/P .....	23	..... 35	
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22	..... 33.....	202-0
C218.....	At Convenience Center .....	22	..... 36	
C224.....	LH rear of Engine Compartment under Brake Master Cylinder .....	22	..... 34.....	202-38
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S160 (Diesel).....	Engine Harness, approx. 17 cm from Breakout to BPMV toward EGR Valve			
S160 (VIN W, M, R) .....	Engine Harness, approx. 23 cm from Breakout to Underhood Fuse - Relay Center toward Taillamp Harness			
S160 (VIN J).....	Engine Harness, approx. 28.5 cm from Breakout to Underhood Fuse - Relay Center toward Taillamp Harness			
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S213 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout toward Cluster			
S316 .....	In Vanity Mirror Jumper Harness in Roof near Windshield			

## DIAGNOSIS - ELECTROCHROMATIC MIRROR, ELECTRONIC COMPASS

### TROUBLESHOOTING HINTS:

- CHECK GAUGES Fuse 4. If fuse is open, LOCATE and REPAIR source of overload, and REPLACE Fuse.
- CHECK that Ground G200 is clean and tight.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in Continuity/Voltage Check with a system disconnected. These Circuits may

- be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures," page 8A-4-0).

**ELECTROCHROMATIC REARVIEW MIRROR WITH COMPASS****ELECTROCHROMATIC MIRROR/ELECTRONIC COMPASS - INOPERATIVE DISPLAY**

TEST	RESULT	ACTION
1. Disconnect Electrochromatic Rear View Mirror Connector. Place test lamp from PNK/BLK (39) wire at Rear View Mirror Connector Cavity "1" to ground. Place Ignition Switch in RUN.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK/BLK (39) wire between Rear View Mirror Connector and Convenience Center or in PNK (39) wire between Convenience Center and I/P Fuse Block.
2. Place test lamp from PNK/BLK (39) wire Cavity "1" to BLK (150) wire at Cavity "2" Rear View Mirror connector.	Test lamp lights.	REPLACE Electrochromatic Mirror.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire and between Rear View Mirror connector and ground.

**MIRROR DOES NOT RESPOND TO BACK-UP LAMP OPERATIONS**

TEST	RESULT	ACTION
1. Disconnect Connector at Electrochromatic Mirror. With Ignition Switch in RUN, place the Transmission in reverse. Connect a test lamp from Electrochromatic Mirror Connector Cavity "3" to ground.	Test lamp lights.	REPLACE Electrochromatic Mirror.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (24) wire between Splice S160 and the mirror.

**CIRCUIT OPERATION**

The Electrochromatic Rear View Mirror dims to a level required to minimize glare while still maintaining maximum rear vision.

The mirror switch has three positions; OFF, M and C/M. The M position energizes the mirror only while the C/M position energizes both the mirror and the compass.

When a situation requires, the electronic module within the mirror assembly reduces the reflectivity of the Rear View Mirror and automatically dims the LED compass readout. The Automatic Dimming function is inhibited while backing up.

**COMPASS DISPLAY**

The Compass Display circuitry is entirely contained within the Rearview Mirror.

The compass display is located on the mirror. It presents directional displays relative to symbolic horizon lines and road lines.

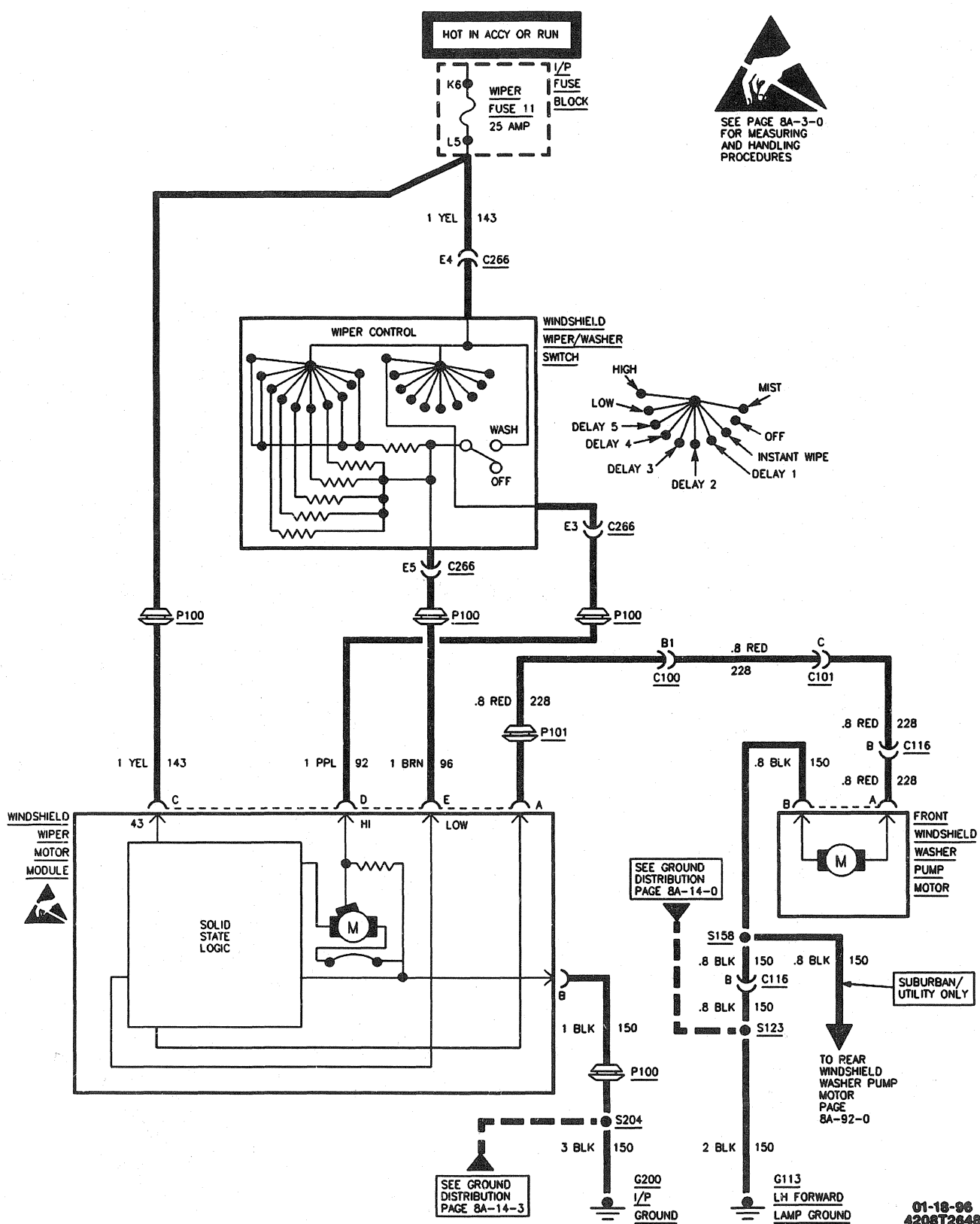
The electronic compass includes a fluxgate magnetic field sensor and a microprocessor. The microprocessor receives inputs from the sensor, processes them and provides outputs to the compass display which indicates the vehicle heading, relative to the Earth's magnet fields.

**SETTING THE COMPASS ZONE**

Refer to SECTION 10A3 for Setting and Calibration Procedures.

**BLANK**

## WIPER/WASHER: PULSE



**WIPER/WASHER: PULSE**

COMPONENT	LOCATION	201-PG	FIG.	CONN
I/P Fuse Block.....	Lower LH side of I/P .....	23	35	
Windshield Washer Pump (front & rear) .....	At Washer Reservoir .....	5	10	
Windshield Wiper Motor and Module.....	Center rear Engine Compartment, at Cowl.....	22	34.....	202-45
Windshield Wiper/Washer Switch.....	At Steering Column, part of Turn Signal Lever			
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22	33.....	202-0
C101.....	LH rear of Engine Compartment near Underhood Fuse - Relay Center.....	3	7.....	202-35
C116.....	LH front of vehicle, near Core Support			
C266.....	LH side of Steering Column, near Bulkhead.....	27	43.....	202-8
<b>GROMMETS:</b>				
P100.....	LH rear of Engine Compartment, at Bulkhead.....	3	7	
P101.....	RH rear of Engine Compartment, at Bulkhead			
<b>GROUND:</b>				
G113.....	On Radiator Support, near LH Headlamp.....	3	7	
G200.....	Behind LH Side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S123.....	Forward Lamps Harness, approx. 20 cm from LH Park Lamp Breakout toward Windshield Washer Pump			
S158.....	In Washer Pump Jumper Harness			
S204.....	In I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout			

**DIAGNOSIS - WIPER/WASHER: PULSE****TROUBLESHOOTING HINTS:**

1. Check condition of FRT WIPER Fuse #11. If Fuse is open, LOCATE and REPAIR source of overload. REPLACE Fuse.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage Check with a system disconnected. These Circuits may be intermittent or resistive when

loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).
2. CHECK for proper mechanical operation. REPAIR binding linkage prior to electrical diagnosis.

**8A - 91 - 2 ELECTRICAL DIAGNOSIS****WIPER/WASHER: PULSE****WIPERS DO NOT OPERATE IN ANY MODE**

TEST	RESULT	ACTION
1. Disconnect Wiper Switch Connector. Connect test lamp from Connector C266 Term "E4" at Wiper/Washer Switch Connector to ground. Place Ignition Switch in RUN.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in CKT (143) wire from Wiper/Washer Switch Connector to Fuse Block.
2. Connect Wiper/Washer Switch Connector. Position Switch in LO. Connect voltmeter from BRN (96) wire at Wiper/Washer Switch Connector to ground.	Battery voltage.	GO to step 3.
	No voltage.	REPLACE Wiper/Washer Switch.
3. Check continuity of BRN (96) wire between Wiper/Washer Switch Connector and Wiper Motor and Module Connector.	Continuity.	GO to step 4.
	No continuity.	LOCATE and REPAIR open in BRN (96) wire between Wiper/Washer Switch Connector and Wiper Motor and Module Connector.
4. Check continuity of BLK (150) wire between Wiper Motor and Module Connector and ground.	Continuity.	REPLACE Wiper Motor and Module.
	No continuity.	LOCATE and REPAIR open in BLK (150) wire between Wiper Motor and Module Connector and ground.

**WIPERS DO NOT OPERATE AT HIGH SPEED**

TEST	RESULT	ACTION
1. Disconnect Wiper Motor and Module Connector. Place Ignition Switch in ACC and Wiper Switch in HI position. Connect test lamp from PPL (92) wire at Wiper Motor and Module Connector to ground.	Test lamp lights.	REPLACE Wiper Motor and Module.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp from PPL (92) Wiper/Washer Switch Connector to ground.	Test lamp lights.	LOCATE and REPAIR open in PPL (92) wire from Wiper/Washer Switch Connector to Wiper Motor and Module Connector.
	Test lamp does not light.	REPLACE Wiper/Washer Switch.

**WIPERS DO NOT OPERATE AT LOW SPEED**

TEST	RESULT	ACTION
1. Disconnect Wiper Motor and Module Connector. Place Ignition Switch in ACC and Wiper/Washer Switch in LO position. Connect voltmeter from BRN (96) wire at Wiper Motor and Module Connector to ground.	Battery voltage.	REPLACE Wiper Motor and Module.
	No voltage.	GO to step 2.
2. Connect voltmeter from BRN (96) wire at Wiper/Washer Switch Connector to ground.	Battery voltage.	LOCATE and REPAIR open in BRN (96) wire from Wiper/Washer Switch Connector to Wiper Motor and Module Connector.
	No voltage.	REPLACE Wiper/Washer Switch.

**NO DELAY IN THE PULSE (DELAY) MODE**

TEST	RESULT	ACTION
1. Disconnect Wiper/Washer Switch Connector. Place Wiper Switch to LO position. Connect ohmmeter from BRN (96) wire Terminal to YEL (143) wire Terminal at Wiper Switch.	A reading of approximately 680 ohms.	GO to step 2.
	A reading of less than or greater than 680 ohms.	REPLACE Wiper/Washer Switch.
2. Move Wiper Switch through delay range to maximum delay position.	Readings increase in steps to approximately 450 k ohms.	LOCATE and REPAIR open in BRN (96) wire or YEL (143) wire from Wiper/Washer Switch Connector to Wiper Motor and Module. If wires are good, REPLACE Wiper/Washer Switch.
	Readings are incorrect.	REPLACE Wiper Switch.

**WIPERS WILL NOT SHUT OFF**

TEST	RESULT	ACTION
1. Disconnect Wiper/Washer Motor Module Connector. Place Ignition Switch in ACC and Wiper Switch to LO position. Connect test lamp from BRN (96) wire at Wiper Motor and Module Connector to ground.	Test lamp lights.	LOCATE and REPAIR a short to voltage in BRN (96) wire from Wiper Motor and Module Connector to Wiper/Washer Switch Connector. If NO short is found, REPLACE Windshield Wiper/Washer Switch
	Test lamp does not light.	GO to step 2.
2. Move Wiper Switch to HI position. Connect test lamp from PPL (92) wire at Wiper Motor and Module Connector to ground.	Test lamp lights.	LOCATE and REPAIR a short to voltage in PPL (92) wire from Wiper Motor and Module Connector to Wiper/Washer Switch Connector. If NO short is found, REPLACE Windshield Wiper/Washer Switch
	Test lamp does not light.	GO to step 3.
3. Connect test lamp from YEL (143) wire at Wiper Motor and Module Connector to ground.	Test lamp lights.	REPLACE Wiper Motor and Module.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (143) wire from Wiper Motor and Module Connector to ground.

**WIPER/WASHER: PULSE****WASHER WILL NOT OPERATE**

TEST	RESULT	ACTION
1. Disconnect Washer Pump Motor Connector. Place Ignition Switch to ACC and Wiper Switch to WASH. Connect test lamp from RED (228) wire at Washer Pump Motor Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	GO to step 3.
2. Connect test lamp from RED (228) wire to BLK (150) wire at Washer Pump Motor Connector.	Test lamp lights.	REPLACE Washer Pump Motor.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from Washer Pump Motor Connector to ground.
3. Connect test lamp from BRN (96) wire at Wiper Motor Module Connector to ground.	Test lamp lights.	REPLACE Wiper Motor and Module.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (96) wire from Wiper Motor Module Connector to Wiper Switch Connector. If wire is good, REPLACE Wiper Switch.

**CIRCUIT OPERATION****WIPERS (PULSE)**

The pulse-type Wiper/Washer System includes an operating mode in which the Wipers make single strokes with an adjustable time interval between strokes. The time interval is controlled by a Solid-State Pulse/Speed/Wash Control in the Wiper Motor Module. The duration of the relay interval is determined by the Pulse Delay Resistance in the Wiper/Washer Switch.

**LOW SPEED**

In the LO position, the Wiper/Washer Switch supplies Voltage to the BRN (96) wire and the Pulse/Speed/Wash Control. The Pulse/Speed/Wash Control provides ground to the Park/Run Relay which is energized and supplies Voltage to the brushes of the Wiper Motor. The wipers run at low speed until they are turned off.

**HIGH SPEED**

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

**PARK**

When the Wipers are turned off, the Wiper Motor runs at low speed until the Wiper Blades reach the PARK position. At that time the Park/Run Relay opens and 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 BRN (96) wire, the Wiper Motor Module and the Solid-State Control Board. Voltage is supplied 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.



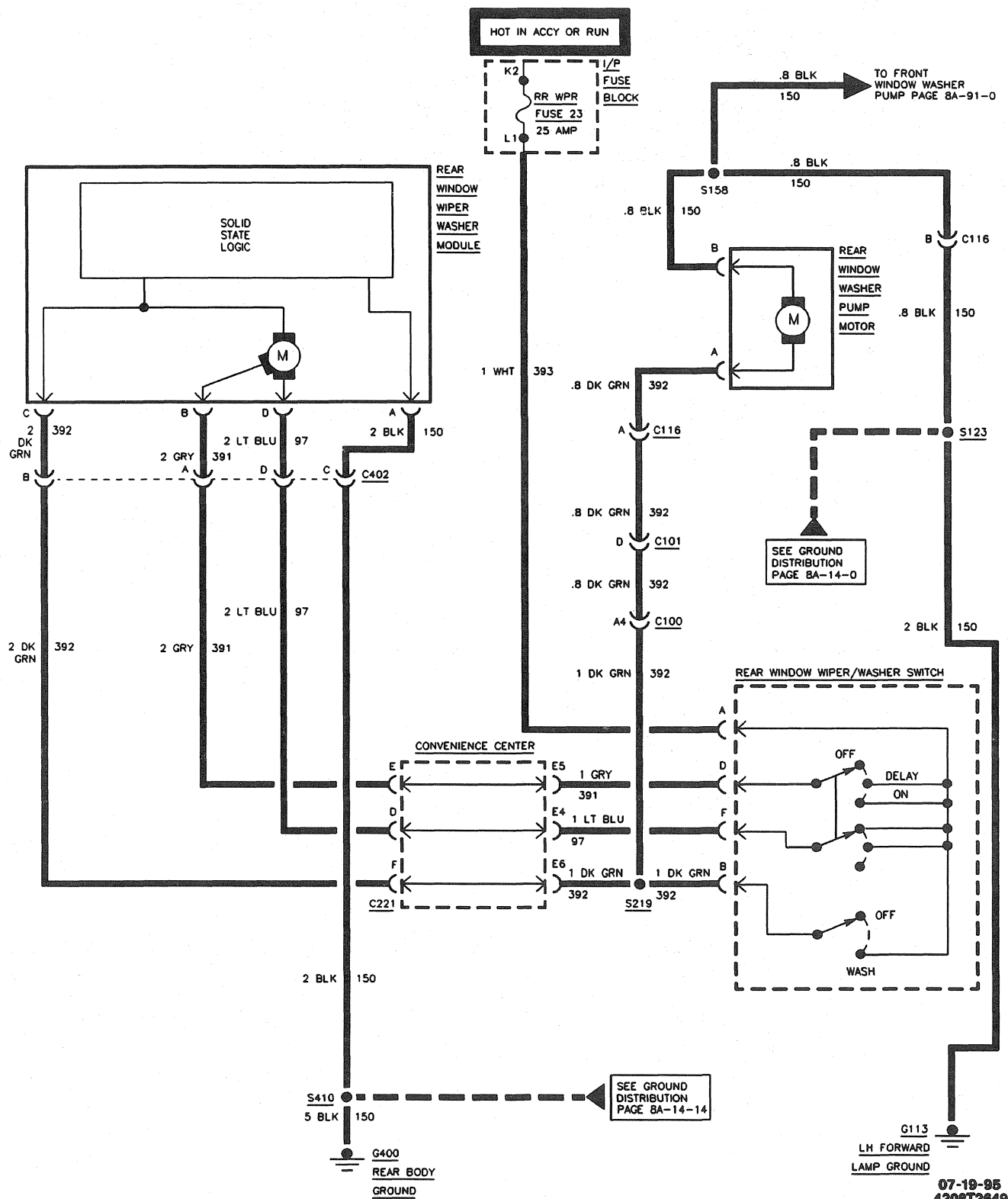
**WIPER/WASHER: PULSE****WASHER (PULSE WIPER)**

When the Washer Switch is depressed, Voltage is supplied to the Solid-State Control Board. The Control Board supplies Battery Voltage to the Washer Motor through the RED (228) 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.

## REAR WIPER/WASHER



**REAR WIPER/WASHER**

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under LH side of I/P.....	23	36	
I/P Fuse Block.....	Lower LH side of I/P .....	23	35	
Rear Window Wiper/Washer Switch.....	Center of I/P.....	29	46.....	202-43
Rear Window Wiper/Washer Module.....	On lower rear Liftgate Glass.....	41	67	
Rear Window Washer Pump Motor .....	At Washer Reservoir			
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22	33.....	202-0
C101 .....	LH rear of Engine Compartment, near Fuse Relay Center .....	3	7.....	202-35
C116 .....	LH front of vehicle, near Core Support			
C221 .....	At Convenience Center .....	23	36	
C402.....	Top center rear of vehicle .....	41	67	
<b>GROUND:</b>				
G113 .....	On Radiator Support near LH Headlamp.....	3	7	
G400.....	RH "B" Pillar.....	34	54	
<b>SPLICES:</b>				
S123 .....	Forward Lamp Harness approx. 20 cm from LH Park Lamp Breakout toward Windshield Washer Pump			
S158 .....	In Washer Pump Jumper Harness			
S219 (Suburban, Utility).....	I/P Harness approx. 6.5 cm into rear Window Release Switch Breakout			
S410 (2-Door Utility).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout			
S410 (4-Door Utility).....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout			
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout towards CHMSC Harness Breakout			

**DIAGNOSIS - REAR WIPER/WASHER****TROUBLESHOOTING HINTS:**

1. CHECK RRWPR Fuse by visual inspection.
2. CHECK for mechanical binding.
  - Refer to Section 8E2 for Rear Window Wiper/Washer System mechanical diagnosis.
  - CHECK for a broken(or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage CHECK with a system

disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).

**8A - 92 - 2 ELECTRICAL DIAGNOSIS****REAR WIPER/WASHER****REAR WIPER DOES NOT OPERATE IN ANY MODE**

TEST	RESULT	ACTION
1. Disconnect Rear Window Wiper/Washer Switch. Place Ignition Switch in "RUN." Connect a test lamp from terminal "A" to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPAIR open in CKT 393.
2. Disconnect Rear Window Wiper Motor Module. Connect a test lamp from terminal "B" with switch "ON".	Test lamp lights.	GO to step 3.
	Test lamp does not light.	CHECK/Repair CKT 391(ON). If OK, replace Rear Window Wiper/Washer Switch.
3. Connect a test lamp at Rear Window Wiper Motor Module terminal "A" to battery positive.	Test lamp lights.	Replace module.
	Test lamp does not light.	REPAIR open in CKT 150.

**REAR WIPER DOES NOT OPERATE AT PULSE SPEED**

TEST	RESULT	ACTION
1. Place ignition switch in "RUN." Connect a test lamp at Rear Window Wiper/Washer Switch terminal "F" and then "D" to ground. Move switch to Delay.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE Rear Wiper/Washer Switch.
2. Disconnect Rear Window Wiper Motor Module. Connect a test lamp from terminal "D" (97) and then to "B" (391) to ground. Move switch to Delay.	Test lamp lights.	REPLACE Rear Wiper/Washer Module.
	Test lamp does not light.	Repair open in CKT (97) "D" or CKT (391) "B".

**REAR WIPER DOES NOT OPERATE AT LOW SPEED**

TEST	RESULT	ACTION
1. Place Ignition Switch in "RUN." Connect a test lamp at Rear Window Wiper/Washer Switch terminal "D" to ground. Move switch to "LO."	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE Rear Wiper Switch.
2. Disconnect Rear Window Wiper Motor Module. Connect a test lamp from terminal "B" to ground. Move wiper switch to "LO."	Test lamp lights.	REPLACE wiper/washer module.
	Test lamp does not light.	Repair open in CKT 391.

**REAR WINDOW WIPER WILL NOT SHUT OFF OR PARK**

TEST	RESULT	ACTION
1. Place ignition switch in "RUN." Connect a test lamp at Rear Window Wiper/Washer switch terminal "D" to ground.	Test lamp lights.	REPLACE rear wiper/washer switch.
	Test lamp does not light.	GO to step 2.
2. Disconnect Rear Window Wiper Motor Module. Connect a test lamp from terminal "A" to battery positive.	Test lamp lights.	REPLACE rear wiper motor and module.
	Test lamp does not light.	REPAIR open in CKT 150.

**REAR WIPER/WASHER****REAR WINDOW WASHER INOPERATIVE**

TEST	RESULT	ACTION
1. Place ignition switch in "RUN." Connect a test lamp at Rear Window Wiper/Washer switch terminal "B" to ground. Press rear Window Washer Switch.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPLACE rear Wiper/Washer Switch.
2. Disconnect Rear Window Washer Pump Motor Connector. CONNECT a test lamp from Terminal "C" to ground. Press rear Window Washer Switch.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPAIR open in CKT 392.
3. Connect test lamp from DK GRN (392) wire to BLK (150) wire at rear Washer Pump Motor connector. Press rear Window Washer Switch.	Test lamp lights.	REPLACE rear Washer Pump.
	Test lamp does not light.	REPAIR open in CKT 150.

**CIRCUIT OPERATION****PULSE REAR WIPER/WASHER**

Voltage to the Rear Wiper/Washer is supplied through the CKT 393 with the Ignition Switch in ACC or RUN.

**WIPER**

In addition to the features of a conventional (non-pulse) Wiper System (MIST, LO and HI speeds), the Rear Pulse Wiper/Washer System includes an operating mode in which the wiper makes 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.

In the ON position, the Wiper/Washer Switch supplies Voltage to the Pulse/Speed/Wash Control through CKT 391. The Pulse/Speed/Wash Control provides ground to the Park/Run Relay which is energized and supplies Voltage to the brushes of the Wiper Motor. The wipers run until they are turned off.

When the wiper is turned off, the Wiper Motor runs at low speed until the wiper blade reaches the PARK position. At that time the Park/Run Relay opens and shunts the Wiper Motor to stop it immediately. The wiper blade remains in the PARK position.

With the Wiper/Washer Switch in PULSE, Voltage is supplied to the Wiper Motor Module through CKT 391. Voltage is supplied to the Park/Run Relay coil which is

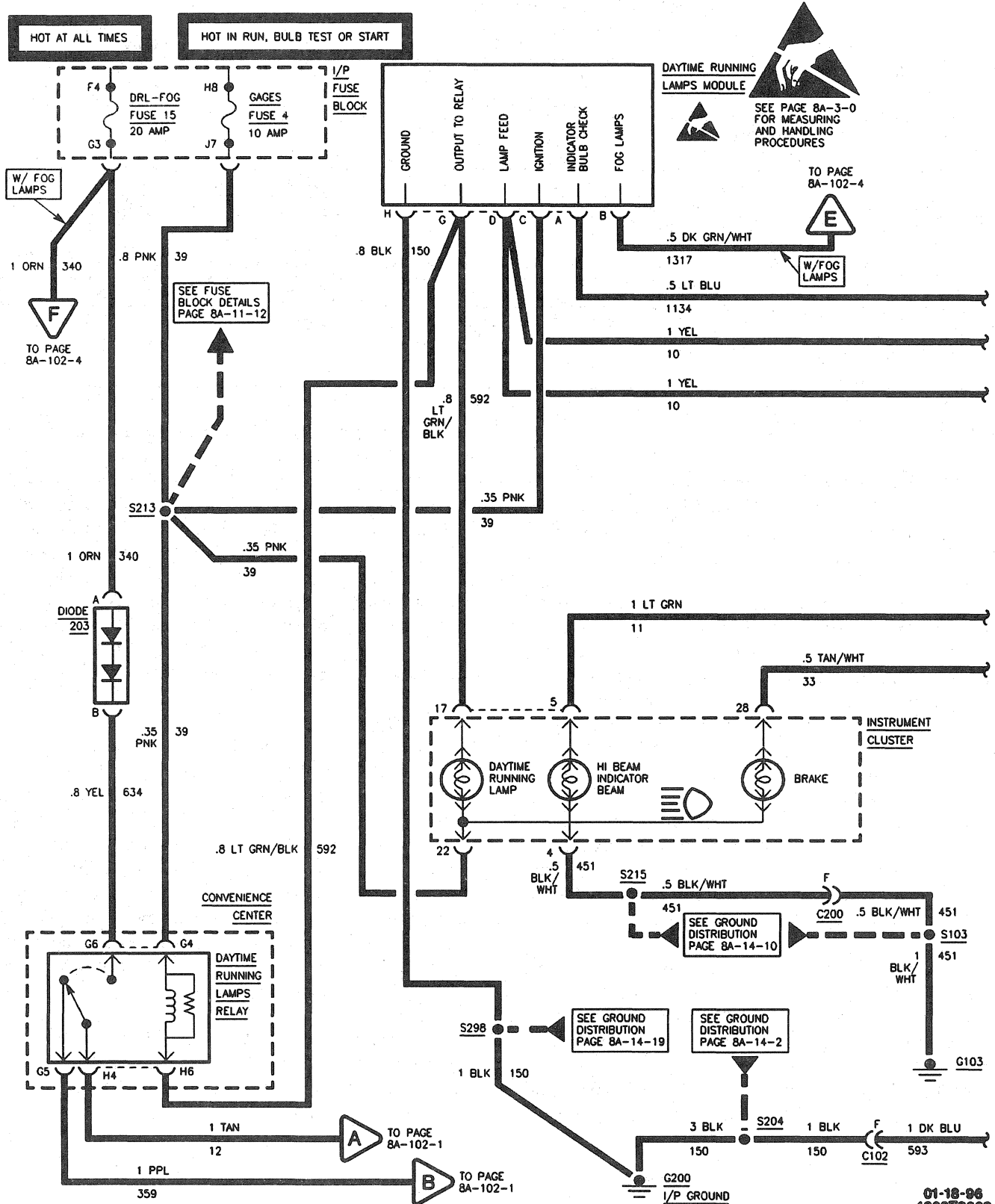
momentarily grounded by the Pulse/Speed/Wash Control circuit and the relay closes. Battery Voltage is supplied by CKT 97 through the closed contacts of the Relay to run the Wiper Motor at LO speed. The relay remains energized as long as the contacts of the Park/Run Switch remain closed. When the wiper blade reaches PARK, the Park/Run Switch opens, de-energizing the Park/Run Relay. The wiper blade remains 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 resistor. The delay is approximately 9 seconds.

**WASHER**

When the Washer Switch is depressed, Voltage is supplied to the Solid-State Control Board in the Wiper Control Module. The Wiper Switch supplies battery Voltage to the Washer Motor through CKT 392. 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. When the wash cycle is completed the Wipers return to the 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.

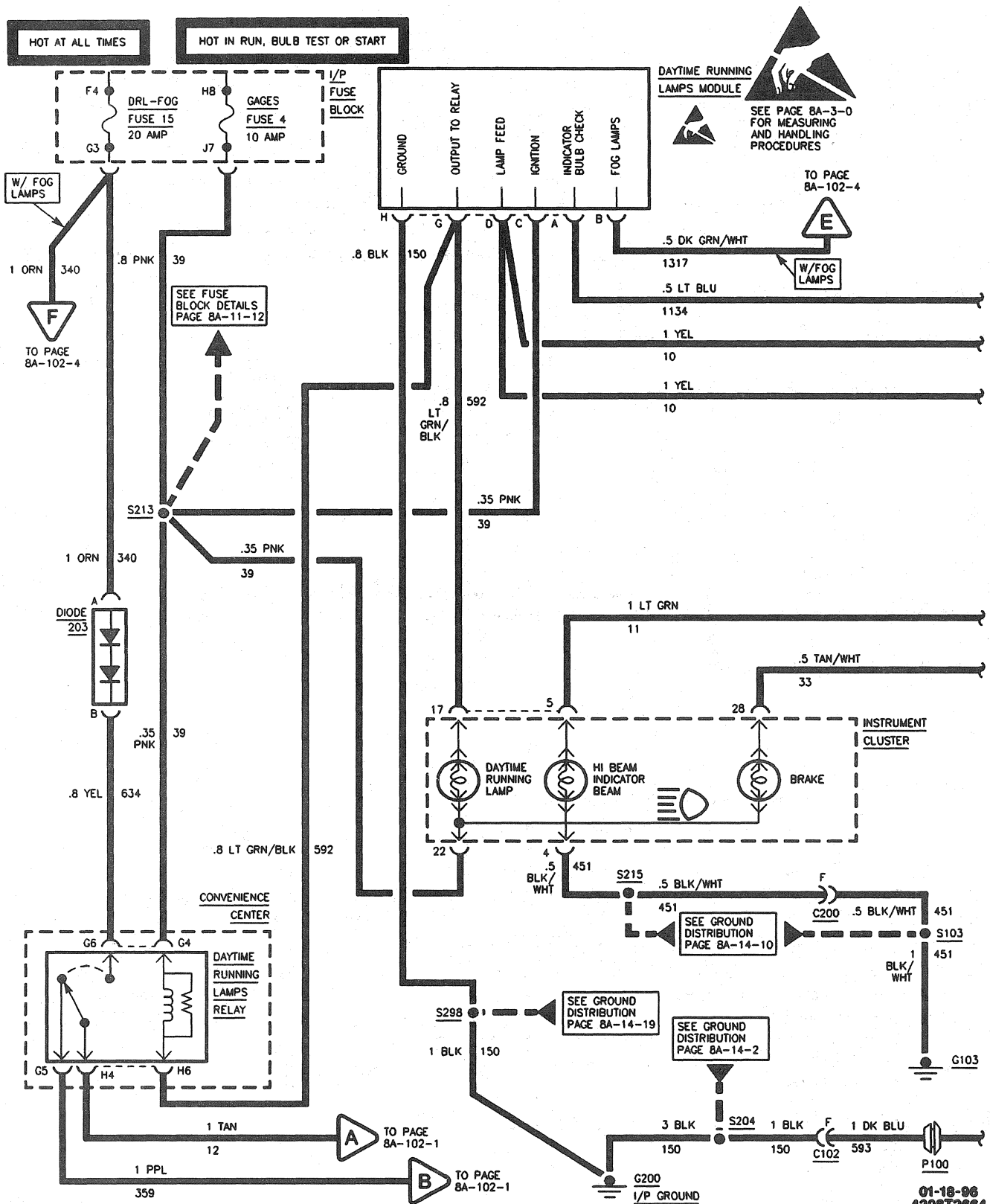
# HEADLAMPS: DAYTIME RUNNING LAMPS BASE HEADLAMPS





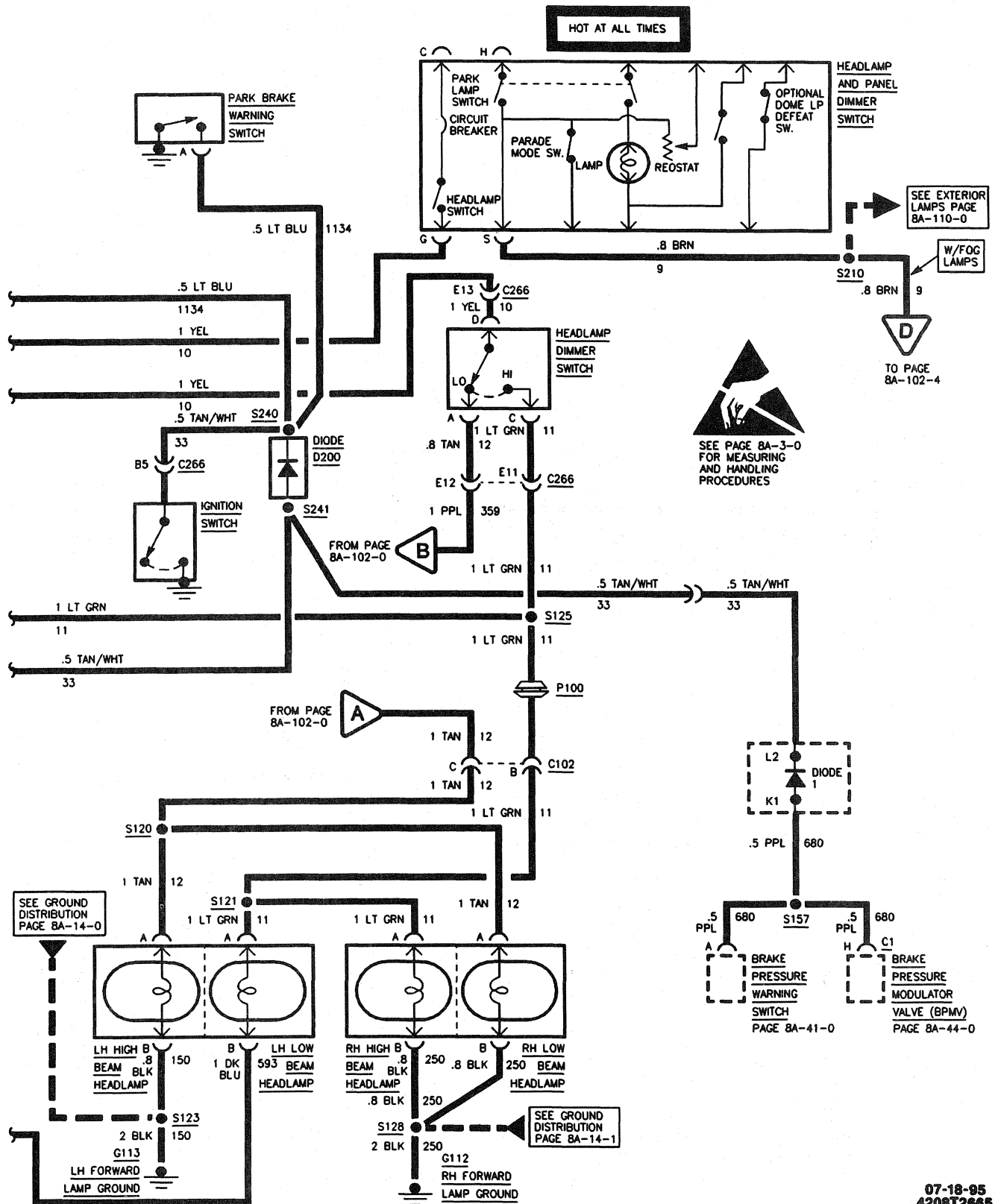
# 8A - 102 - 2 ELECTRICAL DIAGNOSIS

## HEADLAMPS: DAYTIME RUNNING LAMPS QUAD HEADLAMPS



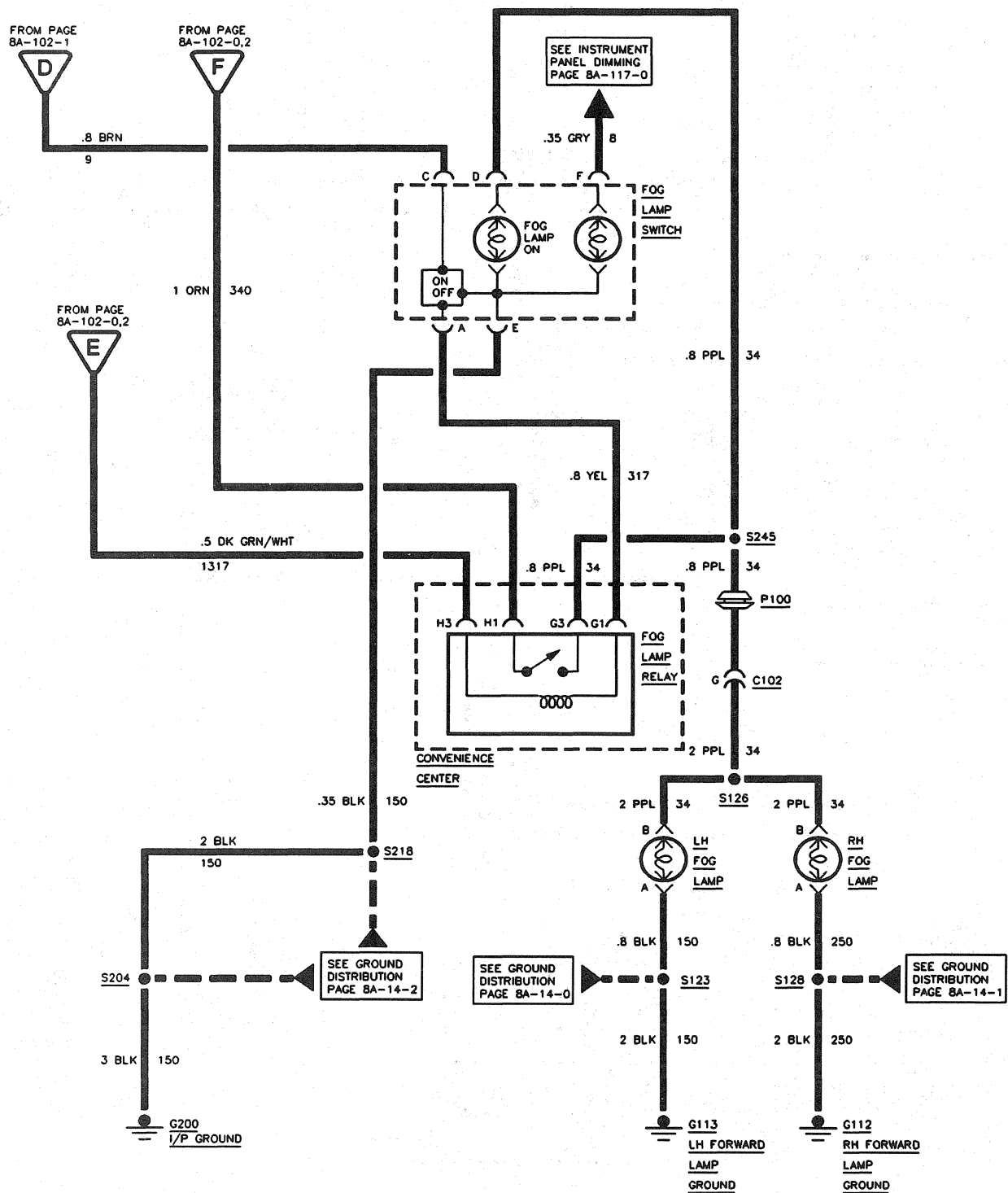


## HEADLAMPS: DAYTIME RUNNING LAMPS



# 8A - 102 - 4 ELECTRICAL DIAGNOSIS

## HEADLAMPS: DAYTIME RUNNING LAMPS



COMPONENT	LOCATION	201-PG	FIG.	CONN
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse.....	22	.....	33
Brake Pressure Warning Switch .....	On rear of Brake Pressure Modulator Valve (BPMV) Casting			
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	.....	36
Daytime Running Lamps (DRL) Module .....	Under LH side of I/P, Taped on I/P Harness .....		.....	202-40
Daytime Running Lamps (DRL) Relay .....	Under LH side of I/P, on lower center portion of Convenience Center .....	23	.....	36
Fog Lamp, LH .....	At LH lower end of front Bumper.....	0	.....	1
Fog Lamp, RH .....	At RH lower end of front Bumper.....	0	.....	1
Fog Lamp Relay.....	Under LH end of I/P, on lower LH Portion of Convenience Center.....	23	.....	36
Fog Lamp Switch.....	Center of I/P area.....	29	.....	46..... 202-40
Headlamp and Panel Dimmer Switch .....	lower LH side of I/P .....	23	.....	35
Headlamp Dimmer Switch.....	Part of Multifunction Switch			
Headlamp, High Beam, LH (Composite) .....	LH front of vehicle			
Headlamp, High Beam, RH (Composite) .....	RH front of vehicle.....	3	.....	6
Headlamp, High/Low Beam, LH.....	LH front of vehicle			
Headlamp, High/Low Beam, RH .....	RH front of vehicle			
Headlamp, Low Beam, LH (Composite) .....	LH front of vehicle			
Headlamp, Low Beam, RH (Composite) .....	RH front of vehicle.....	3	.....	6
Ignition Switch .....	Under I/P, on Steering Column			
Instrument Cluster .....	LH upper end of I/P .....		.....	202-25
I/P Fuse Block.....	Lower LH side of I/P .....	23	.....	35
Park Brake Warning Switch .....	At Park Brake, under LH end of I/P			
<b>CONNECTORS:</b>				
C100 .....	LH rear of Engine Compartment at Bulkhead.....	22	.....	33..... 202-0
C102 .....	LH rear of Engine Compartment near Fuse Relay Center, Mounted on Fender .....	3	.....	7..... 202-35
C200 .....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24	.....	38..... 202-4, 5
C266 .....	LH side of Steering Column, near Bulkhead.....	27	.....	43..... 202-8

## 8A - 102 - 6 ELECTRICAL DIAGNOSIS

### HEADLAMPS: DAYTIME RUNNING LAMPS

COMPONENT	LOCATION	201-PG	FIG.	CONN
<b>DIODES:</b>				
DIODE 1 .....	In Underhood Fuse-Relay Center			
D202.....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout towards Park Brake Switch			
D203.....	I/P Harness, RH side of Steering Column Support, mounted to I/P Support .....	27	.....	43
<b>GROMMETS:</b>				
P100 .....	LH rear of Engine Compartment at Bulkhead.....	3	.....	7
<b>GROUND:</b>				
G103 (Gas) .....	RH front of Engine, near Thermostat Housing .....	10	.....	16
G112.....	RH front of Engine Compartment, below Underhood Reel Lamp.....	3	.....	6
G113.....	On Radiator Support, near LH Headlamp.....	3	.....	7
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S103 (VIN W, M, R) .....	Engine Harness, approx. 11 cm from Breakout to EGR Valve toward Taillamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, approx. 35 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S103 (Diesel).....	Engine Harness, approx. 11.5 cm from Breakout to Glow Plugs (RH side) toward P101			
S120 .....	Forward Lamps Harness, approx. 26 cm from Windshield Washer Pump Breakout toward LH Headlamp			
S121 .....	Forward Lamps Harness, approx. 12 cm from LH Headlamp Breakout toward Windshield Washer Pump			
S123 .....	Forward Lamps Harness, approx. 20 cm from LH Park Lamp Breakout toward Windshield Washer Pump			
S125 .....	Engine Compartment, I/P Harness, approx. 13 cm from P100			
S126 (Pickup Only) .....	Forward Lamps Harness, approx. 5 cm from LH Headlamp Breakout toward LH Horn			
S128 .....	Forward Lamps Harness, approx. 5 cm from RH Headlamp Breakout toward G112			
S157 (Gas).....	Engine Harness, approx. 20 cm into BPMV Breakout			
S157 (Diesel).....	Engine Harness, approx. 22 cm into BPMV Breakout			
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout			
S210 .....	Approx. 15 cm from Headlamp Dimmer Switch Connector			
S213 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout toward Cluster			

COMPONENT	LOCATION	201-PG	FIG.	CONN
S215 .....	I/P Harness, approx. 8 cm from I/P Cluster Breakout toward Radio			
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets			
S240 .....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout toward P100			
S241 .....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout toward P100			
S245 .....	Approx. 20 cm from Cargo Lamp Switch			
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout			

## DIAGNOSIS - HEADLAMPS: DAYTIME RUNNING LAMPS

### TROUBLESHOOTING HINTS:

- CHECK the condition of the DRL-FOG FUSE 15 and the GAGES FUSE 4. If either Fuse is open, LOCATE and REPAIR source of overload.
- CHECK that Grounds G112, G113 (with Fog Lamps or with QUAD Headlamps) and G200 are clean and tight.
- CHECK that the Fog Lamp Relay is securely mounted in the Convenience Center.
- CHECK the LH and RH Low and High Beam filaments.
- CHECK the High Beam Indicator filament.
- CHECK the LH and RH Fog Lamp filaments.
- CHECK the Daytime Running Lamps (DRL) indicator filament.
- CHECK that Daytime Running Lamps (DRL) Relay is securely mounted in Convenience Center.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may effect the integrity of other system (see "Troubleshooting Procedures" page 8A-4-0).

**HEADLAMPS: DAYTIME RUNNING LAMPS****LOW AND HIGH BEAM HEADLAMPS ARE INOPERATIVE**

TEST	RESULT	ACTION
1. Turn Headlamp Switch to ON. Backprobe Headlamp and Panel Dimmer Switch Connector with a test lamp from Cavity "G" to ground.	Test lamp does not light.	REPLACE Headlamp and Panel Dimmer Switch.
	Test lamp lights.	GO to step 2.
2. Disconnect Headlamp Dimmer Switch Connector. Connect a test lamp from Headlamp Dimmer Switch Connector Cavity "D" to ground	Test lamp does not light.	LOCATE and REPAIR open in YEL (10) wire between Headlamp and Panel Dimmer Switch.
	Test lamp lights.	REPLACE Headlamp Dimmer Switch.

**LOW BEAM HEADLAMPS ARE INOPERATIVE**

TEST	RESULT	ACTION
1. Turn Headlamp and Panel Dimmer Switch to ON. Move Headlamp Dimmer Switch to LO position. Backprobe Headlamp Dimmer Switch Connector with a test lamp from Cavity "A" to ground.	Test lamp does not light.	REPLACE Headlamp Dimmer Switch.
	Test lamp lights.	GO to step 2.
2. With Headlamp Dimmer Switch in LO, REMOVE Daytime Running Lamp Relay and Connect a test lamp at Cavity "G5" to ground.	Test lamp does not light.	LOCATE and REPAIR open in PPL (359) wire between Headlamp Dimmer Switch. and Daytime Running Lamp Relay.
	Test lamp lights.	GO to step 3.
3. RE-INSTALL Daytime Running Lamp Relay. Backprobe Cavity "B" at HIGH/LOW Beam Headlamp with Headlamp Dimmer Switch in LO position.	Test Lamp does not light.	LOCATE and REPAIR open in TAN (12) wire between Daytime Running Lamp Relay and HIGH/LOW Beam Headlamp. If OK REPLACE Daytime Running Lamp Relay.
	Test lamp lights.	REPLACE HIGH/LOW Beam Headlamps.

**HIGH BEAM HEADLAMPS ARE INOPERATIVE**

TEST	RESULT	ACTION
1. Turn Headlamp and Panel Dimmer Switch to ON. Move Headlamp Dimmer Switch to HI position. Backprobe Headlamp Dimmer Switch Connector with a test lamp from Cavity "C" to ground.	Test lamp does not light.	REPLACE Headlamp Dimmer Switch.
	Test lamp lights.	LOCATE and Repair open in LT GRN (11) wire between Headlamp Dimmer Switch and Headlamp.

**HEADLAMPS: DAYTIME RUNNING LAMPS****ONE LOW BEAM OR HIGH BEAM HEADLAMP INOPERATIVE**

TEST	RESULT	ACTION
1. Connect a test lamp from LH/RH Headlamp Connector Cavity "B" (QUAD Headlamps) or Cavity "A" (BASE Headlamps) to B+	Test lamp does not light.	LOCATE and REPAIR open in the wiring between affected Headlamp and ground.
	Test lamp lights.	Check for an open in the wiring between affected Headlamp and Splice S120 (for inoperative low beam) or Splice S121 (for inoperative high beam) If OK, REPLACE affected Headlamp.

**HI BEAM INDICATOR INOPERATIVE**

TEST	RESULT	ACTION
1. Disconnect Instrument Cluster Printed Circuit connector. Turn Headlamp and Panel Dimmer Switch to ON. Move Headlamp Dimmer Switch to HI position. Connect a test lamp from Instrument Cluster Printed Circuit Connector Cavity "4" to B+.	Test lamp does not light.	LOCATE and REPAIR open in BLK/WHT (451) wire between Instrument Cluster Connector and Ground G103.
	Test lamp lights.	GO to step 2.
2. With Instrument Cluster Printed Circuit Connector disconnected and Headlamp and Panel Dimmer Switch ON. Move Headlamp Dimmer Switch to HI. Connect a test lamp from the Instrument Cluster Printed Circuit Connector Cavity "5" to ground.	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (11) wire between Instrument Cluster Connector and Splice S125.
	Test lamp lights.	CHECK for inoperative HI Beam Indicator Beam bulb. If OK REPLACE Instrument Cluster Printed Circuit.

**HIGH BEAM HEADLAMPS ON WITH HEADLAMP AND PANEL DIMMER SWITCH OFF**

TEST	RESULT	ACTION
1. Disconnect Headlamp Dimmer Switch Connector. Do High Beam Headlamps turn OFF?	Yes	GO to step 2.
	No	LOCATE and REPAIR short to Voltage in LT GRN (11) wire between Headlamp Dimmer Switch and LH High Beam Headlamp and /or RH High Beam Headlamp.
2. Reconnect Headlamp Dimmer Switch Connector. Disconnect Headlamp and Panel Dimmer Switch Connector.	High Beam Headlamps turn OFF.	REPLACE Headlamp and Panel Dimmer Switch.
	High Beam Headlamps remain ON.	LOCATE and REPAIR short to Voltage in YEL (10) wire between Headlamp and Panel Dimmer Switch and Headlamp Dimmer Switch.

**8A - 102 - 10 ELECTRICAL DIAGNOSIS****HEADLAMPS: DAYTIME RUNNING LAMPS****FOG LAMPS ARE INOPERATIVE**

TEST	RESULT	ACTION
1. Remove Fog Lamp Relay from Convenience Center. Turn Ignition Switch to RUN. Press Park Lamp Switch to ON. Turn Fog Lamp Switch to ON. Connect a Digital Multimeter from Fog Lamp Relay Cavity "G1" to ground. Measure Voltage.	Less than 10.0 Volts.	GO to step 2.
	More than 10.0 Volts.	GO to step 6.
2. Backprobe Fog Lamp Switch Connector with a Digital Multimeter from Cavity "A" to ground. Measure Voltage.	More than 10.0 Volts	LOCATE and REPAIR open in YEL (317) wire between Fog Lamp Switch and Convenience Center.
	Less than 10.0 Volts.	GO to step 3.
3. Backprobe Fog Lamp Switch Connector with a Digital Multimeter from Cavity "C" to ground. Measure Voltage.	More than 10.0 Volts	GO to step 4.
	Less than 10.0 Volts.	GO to step 5.
4. Backprobe Fog Lamp Switch Connector with a test lamp from Cavity "C" to "E".	Test lamp lights.	REPLACE Fog Lamp Switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Splice S218 and Fog Lamp Switch.
5. Backprobe Headlamp and Panel Dimmer Switch Connector with a test lamp from Cavity "S" to ground.	Test lamp lights.	LOCATE and REPAIR open in BRN (9) wire between Fog Lamp Switch and Headlamp and Panel Dimmer Switch.
	Test lamp does not light.	REPLACE Headlamp and Panel Dimmer Switch.
6. Connect a test lamp from Fog Lamp Relay Cavity "G1" to "H3".	Test lamp does not light.	CHECK for an open in DK GRN/WHT (1317) wire between Daytime Running Lamps (DRL) Module and Convenience Center. If OK, REPLACE DRL Module.
	Test lamp lights.	GO to step 7.
7. Connect a test lamp from Fog Lamp Relay Cavity "H1" to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (340) wire between I/P Fuse Block and Convenience Center.
	Test lamp lights.	GO to step 8.
8. Connect a Fused Jumper from Fog Lamp Relay Cavities "H1" to "G3".	Fog Lamps light.	REPLACE Fog Lamp Relay.
	Fog Lamps do not light.	LOCATE and REPAIR open in PPL (34) wire between Convenience Center and Splice S126.

**ONE FOG LAMP INOPERATIVE**

TEST	RESULT	ACTION
1. Connect a test lamp from inoperative Fog Lamp Connector Cavity "A" to B+.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150/LH, 250/RH) wire between ground (G113/LH, G112/RH) and inoperative Fog Lamp.
	Test lamp lights.	CHECK for an open in PPL (34) wire between Splice S126 and affected Fog Lamp. If OK, REPLACE inoperative Fog Lamp.



**HEADLAMPS: DAYTIME RUNNING LAMPS****FOG LAMP INDICATOR INOPERATIVE**

TEST	RESULT	ACTION
1. Disconnect Fog Lamp Switch Connector. Connect a test lamp from Fog Lamp Switch Connector Cavity "E" to B+.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Fog Lamp Switch and G200.
	Test lamp lights.	CHECK for an open in PPL (34) wire between Fog Lamp Switch and S245. If OK, REPLACE Fog Lamp Switch.

**FOG LAMPS REMAIN LIT WITH FOG LAMP SWITCH OFF**

TEST	RESULT	ACTION
1. Remove Fog Lamp Relay. Do Fog Lamps turn OFF?	No	LOCATE and REPAIR short to Voltage in PPL (34) wire between Fog Lamp Switch, LH Fog Lamp, RH Fog Lamp and Convenience Center.
	Yes	GO to step 2.
2. Disconnect Fog Lamp Switch Connector. Do Fog Lamps turn OFF?	Yes	REPLACE Fog Lamp Switch.
	No	LOCATE and REPAIR short to Voltage in YEL (317) wire between Fog Lamp Switch and Convenience Center.

**DAYTIME RUNNING LAMPS (DRL) ARE INOPERATIVE**

TEST	RESULT	ACTION
1. Insure Park Brake is OFF. Turn Ignition Switch to RUN. Is "BRAKE" Indicator lit.	Yes	REFER to SECTION 8A-41 for diagnosis of the Brake Warning System.
	No	GO to step 2.
2. Turn Ignition Switch to "LOCK." Disconnect Daytime Running Lamps (DRL) Module Connector. Turn Ignition Switch to RUN. Connect a test lamp from DRL Module Connector Cavity "C" to ground.	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between I/P Fuse Block and DRL Module.
	Test lamp lights.	GO to step 3.
3. Connect a test lamp from DRL Module Connector Cavity "C" to "H".	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between DRL Module and G200.
	Test lamp lights.	GO to step 4.
4. Remove Daytime Running Lamps (DRL) Relay from Convenience Center. Connect a test lamp from DRL Relay Cavity "G6" to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (340) wire between I/P Fuse Block and Diode 203. If OK, LOCATE and REPAIR open in YEL (634) wire between Diode 203 and Convenience Center.
	Test lamp lights.	GO to step 5.
5. Connect a test lamp from DRL Relay Cavity "G4" to ground.	Test lamp does not light.	LOCATE and REPAIR open in PNK (39) wire between S213 and Convenience Center.
	Test lamp lights.	GO to step 6.

**8A - 102 - 12 ELECTRICAL DIAGNOSIS****HEADLAMPS: DAYTIME RUNNING LAMPS**

TEST	RESULT	ACTION
6. Turn Ignition Switch to "LOCK." Reconnect DRL Module Connector. Turn Ignition Switch to RUN. Is Daytime Running Lamps (DRL) Indicator lit?	No	CHECK for a poor connection or damaged Terminals at DRL Module Connector. If OK, REPLACE DRL Module.
	Yes	GO to step 7.
7. Connect a Digital Multimeter from DRL Relay Cavity "H6" to B+. Measure Voltage.	Less than 10.0 Volts.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between DRL Module and Convenience Center.
	More than 10.0 Volts.	GO to step 8.
8. Connect a Fused Jumper from DRL Relay Cavity "G6" to "H4".	Low Beam Headlamps light at low intensity.	REPLACE DRL Relay.
	Low beam Headlamps do not light.	GO to step 9.
9. Re-install DRL Relay. Turn Ignition Switch to RUN and disconnect a Headlamp Connector. Connect a test lamp from Cavity "B" to ground.	Test lamp does not light.	LOCATE and REPAIR open in TAN (12) wire between DRL Relay and LH HI/LO Beam Headlights.
	Test lamp lights.	GO to step 10.
10. Using a self-powered test lamp, Connect between Cavity "A" and ground.	Test lamp does not light.	LOCATE and REPAIR open in DK BLU (593) wire between LH HI/LO Beam Headlamp to Splice S204 and/or LOCATE and REPAIR open in BLK (250) wire between RH HI/LO Beam Headlamp and ground.
	Test lamp lights.	REPLACE LH and/or RH HI/LO Beam Headlamp.

**DAYTIME RUNNING LAMPS (DRL) DO NOT DISABLE WITH PARKING BRAKE ENGAGED**

TEST	RESULT	ACTION
1. Turn Ignition Switch to RUN. Engage parking Brake. Does "BRAKE" Indicator light?	No	Refer to SECTION 8A-41 for diagnosis of the Brake Warning System.
	Yes	GO to step 2.
2. Turn Ignition Switch to "LOCK." Disconnect Daytime Running Lamps (DRL) Module Connector. Connect a test lamp from DRL Module Connector Cavity "A" to B+.	Test lamp lights.	REPLACE DRL module.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (1134) wire between Splice S240 and DRL Module.

**HEADLAMPS: DAYTIME RUNNING LAMPS****DAYTIME RUNNING LAMPS (DRL) ARE OPERATIONAL AT ALL TIMES**

TEST	RESULT	ACTION
1. Turn Ignition Switch to RUN. Is Daytime Running Lamps (DRL) indicator lit?	Yes	GO to step 2.
	No	GO to step 4.
2. Disconnect Daytime Running Lamps (DRL) Module. Is DRL indicator lit?	No	REPLACE DRL Module.
	Yes	GO to step 3.
3. Disconnect Instrument Cluster Printed Circuit Connector. Does DRL disable?	Yes	REPLACE Instrument Cluster Printed Circuit.
	No	LOCATE and REPAIR short to ground in LT GRN/BLK (592) wire between Instrument Cluster Printed Circuit and Convenience Center.
4. Remove Daytime Running Lamps (DRL) Relay from Convenience Center. Does DRL disable?	Yes	REPLACE DRL Relay.
	No	LOCATE and REPAIR short to Voltage in TAN (12) wire between Convenience Center and LH HI/LO Beam Headlamp (BASE Headlamps) and LH High Beam Headlamp (QUAD Headlamps).

**DAYTIME RUNNING LAMPS (DRL) INDICATOR IS INOPERATIVE**

TEST	RESULT	ACTION
1. Turn Ignition Switch to "LOCK." Disconnect Instrument Cluster Printed Circuit Connector. Connect a test lamp from Instrument Cluster Printed Circuit Connector Cavity "4" to B+.	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Instrument Cluster Printed Circuit and Splice S204.
	Test lamp lights.	GO to step 2.
2. Turn Ignition Switch to RUN. Connect a test lamp from Instrument Cluster Printed Circuit Connector Cavity "17" to ground.	Test lamp does not light.	LOCATE and REPAIR open in LT GRN/BLK (592) wire between Instrument Cluster Printed Circuit and Daytime Running Lamps (DRL) Module.
	Test lamp lights.	Replace Instrument Cluster Printed Circuit.

**HEADLAMPS: DAYTIME RUNNING LAMPS****CIRCUIT OPERATION****HEADLAMPS**

Voltage is supplied to the Headlamp and Panel Dimmer Switch at all times. The Headlamp and Panel Dimmer Switch includes a Self-Resetting Circuit Breaker. The Circuit Breaker opens when the Headlamp and Panel Dimmer Switch 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 and Panel Dimmer Switch is in HEAD, the Headlamp Dimmer Switch directs Voltage to either the Low Beam or High Beam Headlamps (depending on Headlamp Dimmer Switch position). When the Headlamp and Panel Dimmer Switch is in the HEAD position, not only is Voltage supplied for the Headlamps, but the Daytime Running Lamps (DRL) Module receives a "Headlamps ON" signal. When the DRL Module receives this signal, it disables DRL operation (if Ignition Switch is RUN, BULB TEST or START positions).

When the Headlamp and Panel Dimmer Switch is in HEAD and the Headlamp Dimmer Switch is in the LO position, Voltage is applied through the closed contacts of the Headlamp and Panel Dimmer Switch and the Headlamp Dimmer Switch to the LH and RH Low Beam Headlamps. Ground is supplied from Ground G112 to the RH Low Beam Headlamp. Ground is supplied from Ground G200, to the LH Low Beam Headlamp (BASE Headlamps) or from Ground G113 to the LH Low Beam Headlamp (QUAD Headlamps). Since both power and ground are applied to the Low Beam Headlamps, they light.

When the Headlamp Dimmer Switch is moved to the HI position with the Headlamp and Panel Dimmer Switch in HEAD, Voltage is applied through the closed contacts of the Headlamp and Panel Dimmer Switch and the Headlamp Dimmer Switch to the DRL Module, LH High Beam Headlamp and the RH High Beam Headlamp. With the Headlamp Dimmer Switch in the HI position, Voltage is supplied to the High Beam Indicator. Since the High Beam Indicator is supplied with a ground from Ground G103, it lights. Ground is supplied from G112 for the RH High Beam Headlamp. Ground is supplied from G200 to the LH High Beam Headlamp. With both power and ground applied to the High Beam Headlamps, they light at full intensity.

**FOG LAMPS**

Fog Lamp operation is possible with the Headlamp and Panel Dimmer Switch in the PARK or HEAD position, but if the Headlamp and Panel Dimmer Switch is in the HEAD position the Fog Lamps are only operational if the Headlamp Dimmer Switch is in the LO position.

With the Headlamp and Panel Dimmer Switch in the PARK or HEAD position (if in the HEAD position, Headlamp Dimmer Switch must be in LO position) Voltage is applied through the closed contacts of the Park Lamp Switch to the Fog Lamp Switch. With the Fog Lamp Switch in the ON position, Voltage is applied through the closed contacts of the Fog Lamp Switch to the coil (power side) of the Fog Lamp Relay. Voltage is applied to the contact side of the relay through the DRL-FOG FUSE 15. Ground is supplied from the Daytime Running Lamps (DRL) Module to the coil (ground side) of the Fog Lamp Relay (provided that the Headlamp Dimmer Switch is in the LO position if the Headlamp and Panel Dimmer Switch is ON). With both power and ground applied to the coil of the Fog Lamp Relay, the relay energizes and Voltage is applied through the closed contacts of the relay to the Fog Lamp ON indicator, the LH Fog Lamp and the RH Fog Lamp. With both power and ground applied to the Fog Lamp ON indicator, the LH Fog Lamp and the RH Fog Lamp, they light. If the Headlamp Dimmer Switch is switched to the HI position when the Headlamp and Panel Dimmer Switch is in HEAD and the Fog Lamp Switch ON, then the DRL Module receives a "High Beam Headlamp" operation signal and disables the Fog Lamp Relay, turning the Fog Lamps OFF.

**DAYTIME RUNNING LAMPS (DRL)**

Daytime Running Lamp (DRL) operation is automatic provided that the Ignition Switch is in the RUN, BULB TEST or START positions, the Parking Brake is disengaged and the Headlamp and Panel Dimmer Switch is in OFF. When DRL is operating, the LO Beam Headlamps are on.

Voltage is applied through the GAGES FUSE 4 when the Ignition Switch is in the RUN, BULB TEST or START positions to the Daytime Running Lamps (DRL) Module and to the Coil (power side) of the Daytime Running Lamps (DRL) Relay. If the Parking Brake is disengaged and the Headlamp and Panel Dimmer Switch is in the OFF position, then the DRL Module supplies ground to the Coil

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**HEADLAMPS: DAYTIME RUNNING LAMPS**

(ground side) of the DRL Relay. With both power and ground applied to the Coil of the DRL Relay, it energizes, and the contacts close. Voltage is applied through the DRL-FOG FUSE 15 and the closed contacts of the DRL Relay to the LH and RH LO Beam Headlamps. When DRL is operating, the DRL Module will also supply ground to the Daytime Running Lamps (DRL) indicator. Voltage is applied through the GAGES FUSE 4 with the Ignition Switch in the RUN, BULB TEST or START positions to the DRL indicator. With both power and ground applied to

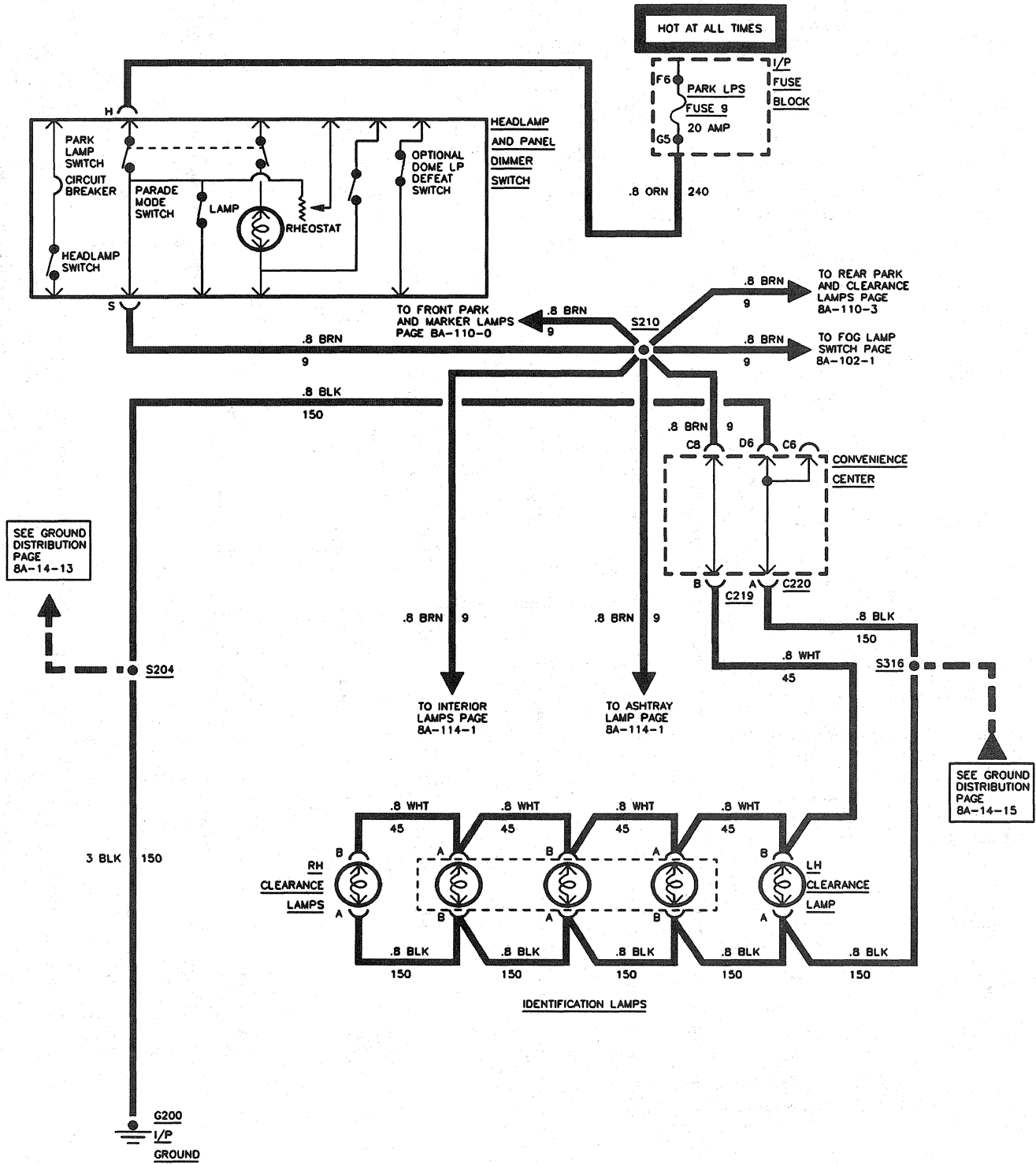
the DRL indicator, it lights. If the Parking Brake is engaged, a ground signal is sensed at the DRL Module. When the DRL Module receives this signal, it disables DRL operation by removing ground from the Coil of the DRL Relay. The DRL Module will also disable DRL operation if the Headlamp and Panel Dimmer Switch is ON or the Ignition Switch is turned to the OFF, "LOCK" or ACCY positions (also, by removing ground from the coil of the DRL Relay).





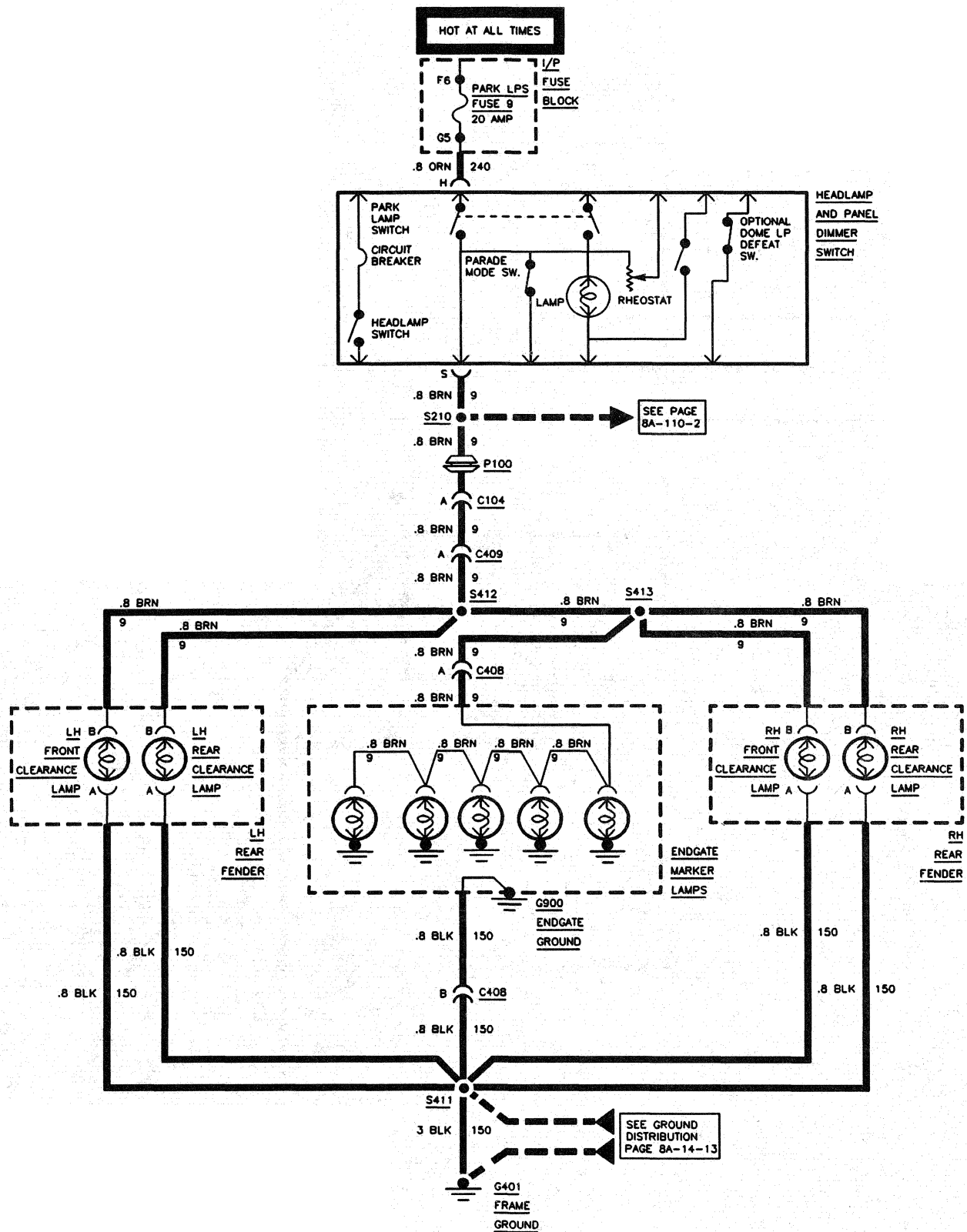
# 8A - 110 - 2 ELECTRICAL DIAGNOSIS

## EXTERIOR LIGHTS ROOF MARKER LAMPS



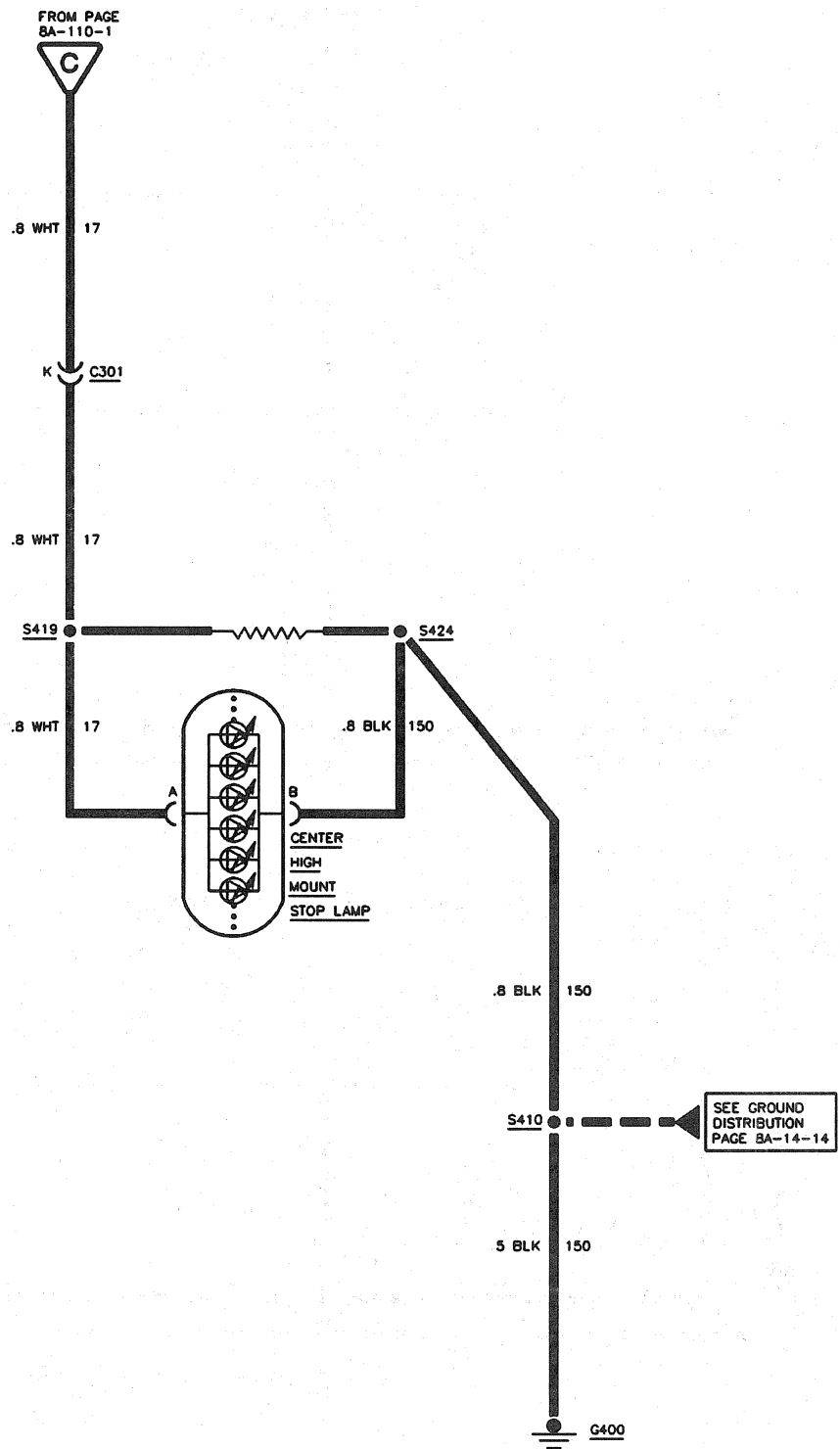


**EXTERIOR LIGHTS**  
**CLEARANCE LAMPS (PICKUP WITH DUAL REAR WHEELS)**



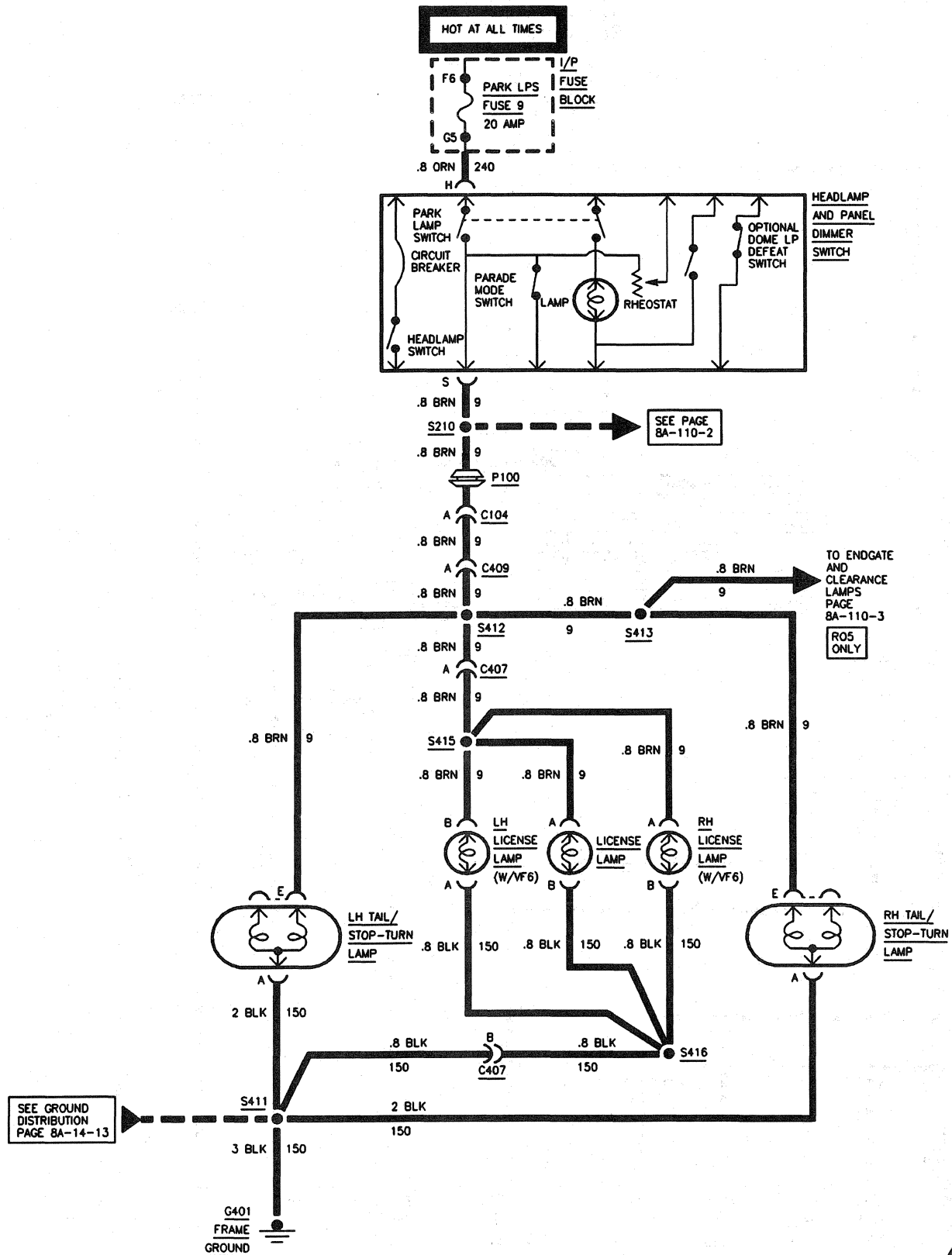
8A - 110 - 4 ELECTRICAL DIAGNOSIS

EXTERIOR LIGHTS  
CHMSL (SUBURBAN-UTILITY)

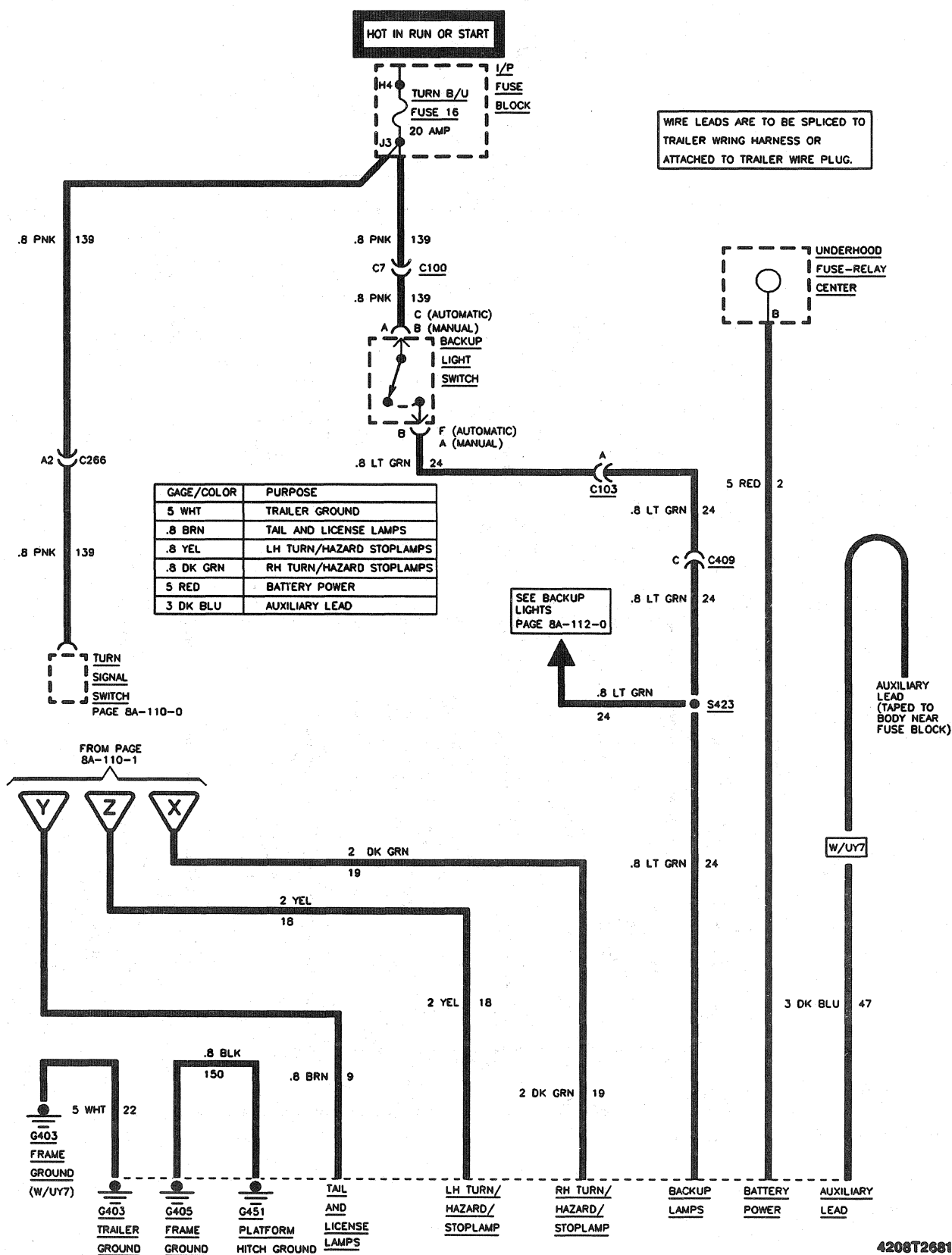


# EXTERIOR LIGHTS

## REAR PARK/MARKER AND LICENSE LAMPS

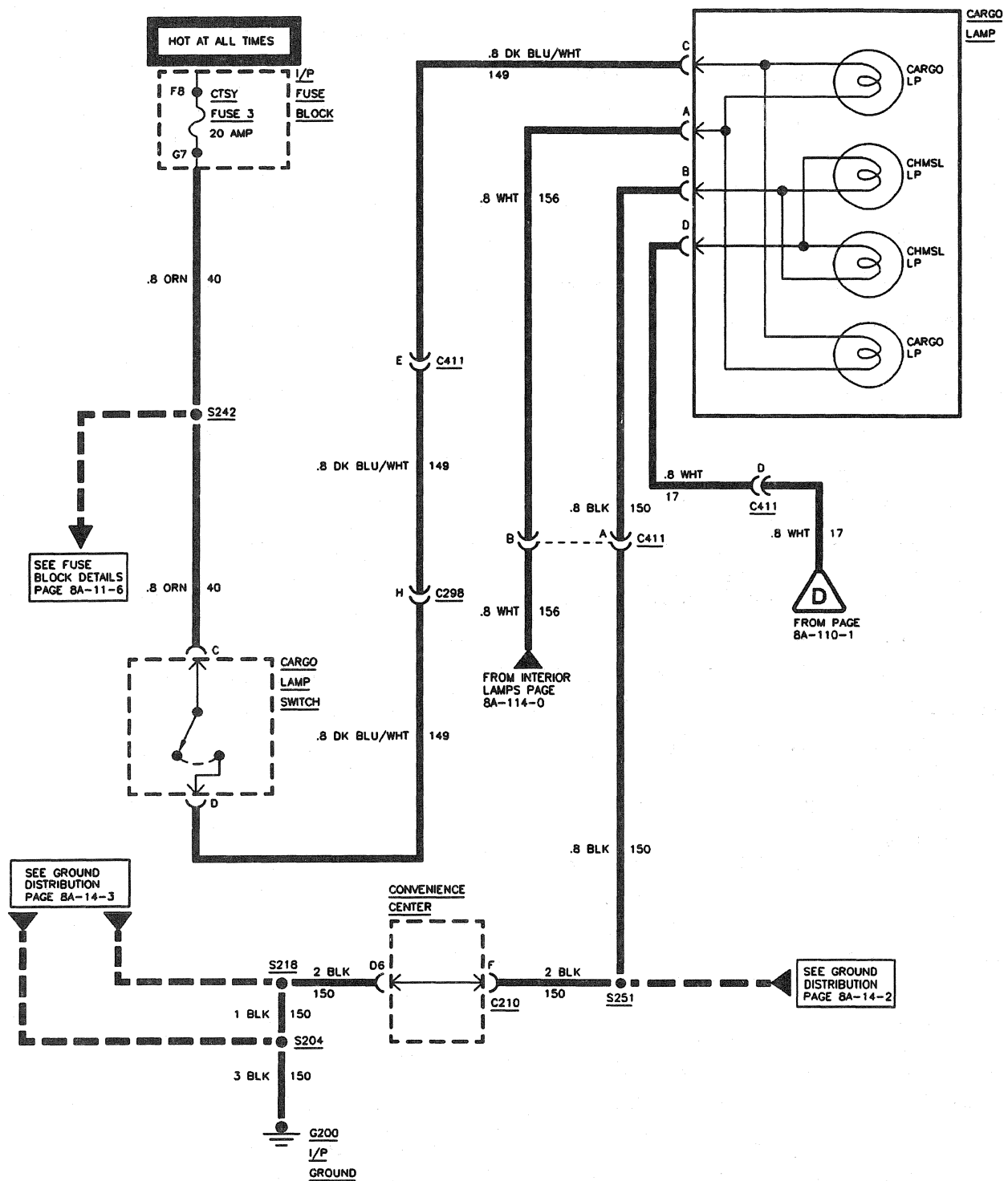


**EXTERIOR LIGHTS**  
**TRAILER TOW**



4208T2681

# EXTERIOR LIGHTS CARGO/CHMSL LAMPS (EXCEPT SUBURBAN/UTILITY)



## EXTERIOR LIGHTS

COMPONENT	LOCATION	201-PG	FIG.	CONN
Backup Light Switch, (MG5)....	LH side of Transmission, below Shift Tower Area .....	21	.....	31
Backup Lamp Switch (MW3)...	LH top of Transmission.....	20	.....	29
Cargo Lamp .....	Rear center of Cab, above rear Window.....	39	.....	64
Cargo Lamp Switch .....	Center of I/P .....	29	.....	46
Center High Mount Stoplight (CHMSL) - Pickup.....	Back, top of Cab.....	40	.....	65
Center High Mount Stoplight (CHMSL) - Suburban, Utility .....	At top rear center of vehicle.....	40	.....	66
Clearance Lamp Front, LH .....	Front of LH rear Fender.....	39	.....	63
Clearance Lamp Front, RH .....	Front of RH rear Fender .....	39	.....	63
Clearance Lamp Rear, LH.....	Rear of LH rear Fender.....	39	.....	63
Clearance Lamp Rear, RH .....	Rear of RH rear Fender.....	39	.....	63
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	.....	36
Endgate Marker Lamps.....	On Endgate .....	41	.....	68
I/P Fuse Block .....	Lower LH side of I/P .....	23	.....	35
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P .....	23	.....	35
Instrument Cluster.....	LH upper end of I/P .....	.....	.....	202-25
License Lamps.....	Rear of vehicle at License Holder.....	43	.....	71
Marker Lamp, LH.....	On Roof above Windshield .....	3	.....	6
Marker Lamp, RH.....	On Roof above Windshield			
Park and Turn Lamp, LH Front .....	LH front Corner of vehicle .....	3	.....	7
Park and Turn Lamp, RH Front .....	RH front corner of vehicle .....	3	.....	6
Stoplamp Relay .....	In Underhood Fuse-Relay Center			
Tail, Stop, Turn Signal and Backup Lamp Assembly, LH.....	LH rear of vehicle			
Tail, Stop, Turn Signal and Backup Lamp Assembly, RH .....	RH rear of vehicle			
TCC/Stoplamp Switch .....	Top of Brake Pedal.....	27	.....	43
Turn/Hazard Flasher.....	Convenience Center.....	23	.....	36
Turn/Hazard Switch.....	Part of Multifunction Switch, LH upper Steering Column			
Underhood Fuse-Relay Center .....	LH rear of Engine Compartment, on Fender.....	4	.....	8

COMPONENT	LOCATION	201-PG	FIG.	CONN
<b>CONNECTORS</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22	33.....	202-0
C102.....	LH rear of Engine Compartment near Fuse-Relay Center, Mounted on Fender .....	3	7.....	202-35
C103.....	LH rear of Engine Compartment, under Brake Master Cylinder .....	22	33.....	202-35
C104.....	LH rear of Engine Compartment, under Brake Master Cylinder .....	22	34.....	202-35
C210.....	At Convenience Center .....	23	36.....	202-37
C219.....	At Convenience Center .....	32	50	
C220.....	At Convenience Center			
C227.....	Under LH side of I/P, near Stoplamp Switch.....	27	43.....	202-38
C266.....	LH side of Steering Column, near Bulkhead.....	27	43.....	202-8
C298.....	Behind LH side of I/P, near Convenience Center .....	23	35.....	202-7
C301.....	LH front Kick Panel .....	28	45.....	202-11
C407.....	Beneath LH rear Edge of Bed .....	43	71	
C408 (03,53).....	Beneath center rear edge of Bed .....	41	68	
C408 (06,16).....	Lower center inside portion of Endgate.....	43	72	
C409.....	Beneath rear center of Bed, near Bumper.....	43	72.....	202-39
C411.....	LH Rear of Cab .....	40	65.....	202-39
<b>GROUND:</b>				
G105 (Gas).....	RH front of Engine Block.....	9	15	
G105 (Diesel).....	RH top of Cylinder Head.....	15	21	
G112.....	RH front of Engine Compartment, below Underhood Reel Lamp.....	3	6	
G113.....	On Radiator Support, near LH Headlamp.....	3	7	
G200.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34	54	
G401.....	Rear of LH Framerrail, behind Bumper .....	42	69	
G403.....	Rear of Framerrail, behind Bumper .....	42	69	
G405.....	Frame Ground, at rear of vehicle			
G451.....	At Platform Hitch			
<b>GROMMETS:</b>				
P100.....	LH rear of Engine Compartment at Bulkhead.....	3	7	

## EXTERIOR LIGHTS

COMPONENT	LOCATION	201-PG FIG. CONN
<b>SPLICES:</b>		
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension Harness	
S107 (VIN M, R) .....	Engine Harness, approx. 20 cm from Breakout to EGR Valve toward Taillamp Extension Harness	
S107 (VIN J).....	Engine Harness, approx. 20 cm from Fuel Injector Breakout toward Taillamp Extension Harness	
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve	
S119 .....	Forward Lamps Harness, approx. 20 cm from Windshield Washer Pump Breakout Toward LH Headlamp	
S122 .....	Forward Lamps Harness, approx. 6.5 cm from LH Headlamp Breakout Toward Windshield Washer Pump	
S123 .....	Forward Lamps Harness, approx. 20 cm from LH Park Lamp Breakout Toward Windshield Washer Pump	
S127 .....	Forward Lamps Harness, approx. 5 cm from RH Headlamp Breakout Toward RH Horn	
S128 .....	Forward Lamps Harness, approx. 5 cm from RH Headlamp Breakout Toward G112	
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout toward Taillamp Extension Harness Breakout	
S147 (VIN J).....	Engine Harness, approx. 5 cm from Fuel Injector Breakout toward Taillamp Extension Harness Breakout	
S147 (Diesel).....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH Side)	
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout	
S210 .....	Approx. 15 cm from Headlamp Dimmer Switch Connector	
S214 .....	Approx. 23 cm from I/P Cluster Connector	
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout Toward Auxiliary Power Outlets	
S220 .....	I/P Harness, approx. 12 cm from TCC Stop Lamp Switch Connector	
S251 .....	Crossbody Harness, approx. 12.5 cm Right of LH Door Harness Breakout Toward I/P Harness Breakout	
S267 .....	Approx. 4 cm into I/P Cluster Breakout	
S299 .....	I/P Harness, approx. 4 cm into Steering Column Harness Breakout	
S316 .....	In Vanity Mirror Jumper Harness, in Roof near Windshield	
S410 (2-Door Utility) .....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout	



COMPONENT	LOCATION	201-PG FIG.	CONN
S410 (4-Door Utility).....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout		
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout Toward CHMSL Harness Breakout		
S411 (Chassis Cab).....	Rear Lamps Harness, approx. 33 cm Right of Taillamps Extension Breakout		
S411 (Fleetside/Sportside).....	Rear Lamps Harness, approx. 17 cm Left of Taillamps Extension Breakout		
S412 (Chassis Cab).....	Rear Lamps Harness, approx. 23 cm Right of Taillamps Extension Breakout		
S412 (Fleetside/Sportside) .....	Rear Lamps Harness, approx. 23 cm Left of Taillamps Extension Breakout		
S413 .....	Rear Lamps Harness, approx. 24 cm from Taillamps Extension Breakout		
S415 .....	In License Lamps Harness, approx. 14.5 cm from LH License Lamp		
S416 .....	In License Lamps Harness, approx. 4 cm from Breakout to Taillamp Harness Toward RH License Lamp		
S419 (Suburban/Utility) .....	Front to rear Body Harness, 5 cm from CHMSL Breakout		
S420 .....	Rear Lamp Harness, approx. 6.5 cm from License Lamp Breakout		
S421 .....	Rear Lamp Harness, approx. 6.5 cm from License Lamp Breakout		
S422 .....	Rear Lamp Harness, approx. 11 cm from License Lamp Breakout		
S424 (Suburban/4-Door Utility) .....	Front to rear Body Harness, 5 cm from CHMSL Breakout		

## DIAGNOSIS - EXTERIOR LIGHTS

### TROUBLESHOOTING HINTS:

1. Rear Lamp systems (Taillamps, Clearance Lamps, Endgate Lamps and License Plate Lamps) all receive Voltage from the same wire Circuit BRN (9) and share the same ground Terminal G401. If only one system is not working, LOCATE and REPAIR open in wiring and/or bulbs that pertain to that system.
2. CHECK condition of STOP/HAZARD, PARK LP, TURN-B/U and MAX1 Fuse 2 (Pickup only) Fuse(s). If Fuse(s) is open, LOCATE and REPAIR source of overload. REPLACE fuse(s).

- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures" page 8A-4-0).

**8A - 110 - 12 ELECTRICAL DIAGNOSIS****EXTERIOR LIGHTS****BOTH STOPLAMPS DO NOT OPERATE (SUBURBAN/UTILITY)**

TEST	RESULT	ACTION
1. Connect test lamp from ORN (140) wire at TCC/Stoplamp Switch Connector to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	GO to step 2.
2. Place Hazard Flasher Switch to ON position.	Hazard Flashers operate.	LOCATE and REPAIR open in ORN (140) wire between Splice S299 and TCC/Stoplamp Switch Connector.
	Hazard Flashers do not operate.	LOCATE and REPAIR open in ORN (140) wire between Fuse Block and Splice S299.
3. Connect test lamp from WHT (17) wire at TCC/Stoplamp Switch Connector to ground. Depress Brake Pedal.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	REPLACE TCC/Stoplamp Switch.
4. Connect test lamp from WHT (17) wire at Connector C266 to ground. Depress Brake Pedal.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (17) wire between TCC/Stoplamp Switch Connector and Connector C266.
5. Connect test lamp from YEL (18) or DK GRN (19) wire at Connector C266 to ground. Depress Brake Pedal.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	REPLACE Turn/Hazard Switch.
6. Connect a self-powered test lamp to Terminal "A" of LH or RH Rear Tail/Stop-Turn Lamp Connector.	Test lamp lights	VERIFY condition of Connectors C104 and C409. If OK, LOCATE and REPAIR open in YEL (18) and DK GRN (19) wires between Connector C266 and Lamp Connectors.
	Test lamp does not light.	LOCATE and REPAIR open BLK (150) wire, between Lamp Connector and ground.

**BOTH STOPLAMPS DO NOT OPERATE (PICKUP)**

TEST	RESULT	ACTION
1. Connect test lamp from ORN (140) wire at TCC/Stoplamp Switch Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (140) wire between I/P Fuse Block and TCC/Stoplamp Switch.
2. Connect test lamp from WHT (17) wire at TCC/Stoplamp Switch Connector and ground. Depress Brake Pedal.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE TCC/Stoplamp Switch.
3. Connect a test lamp from LT BLU (20) wire at Connector C266 Terminal E2 and ground. Depress Brake Pedal.	Test lamp lights.	REPLACE Turn/Hazard Switch.
	Test lamp does not light.	GO to step 4.
4. Remove Stoplamp Relay. Connect test lamp from Terminal "E7" at Stoplamp Relay and ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	LOCATE and REPAIR open in RED (642) wire between Max Fuse 2 and Stoplamp Relay.

**EXTERIOR LIGHTS**

TEST	RESULT	ACTION
5. Connect test lamp from Terminal "E7" to Terminal "E9" at Stoplamp Relay.	Test lamp lights.	GO to step 6.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Stoplamp Relay and ground.
6. Connect test lamp from Terminal "D7" at Stoplamp Relay to ground. Depress Brake Pedal.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (17) wire between TCC/Stoplamp Switch and Stoplamp Relay.
7. Connect a Fused Jumper wire between Terminal "E7" and "D9" at Stoplamp Relay. Connect test lamp from LT BLU (20) wire at Connector C266 Terminal "E2" to ground.	Test lamp lights.	REPLACE Stoplamp Relay.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (20) wire between Stoplamp Relay and Connector C266.

**STOPLAMPS DO NOT OPERATE ON ONE SIDE**

TEST	RESULT	ACTION
1. Connect test lamp from YEL (18) or DK GRN (19) wire at affected stoplamp Connector to ground. Depress Brake Pedal.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	GO to step 2.
2. Connect test lamp from YEL (18) or DK GRN (19) wire (depending on side with failure) at Connector C409 to ground. Depress Brake Pedal.	Test lamp lights.	LOCATE and REPAIR open in YEL (18) or DK GRN (19) wire between Connector C409 and affected Stoplamp.
	Test lamp does not light.	GO to step 3.
3. Connect test lamp from YEL (18) or DK GRN (19) wire (depending on side with failure) at Connector C104 to ground. Depress Brake Pedal.	Test lamp lights.	LOCATE and REPAIR open in YEL (18) or DK GRN (19) wire between Connector C104 and Connector C409.
	Test lamp does not light.	LOCATE and REPAIR open in YEL (18) or DK GRN (19) wire between Connector C104 and Connector C266. If no open is found, REPLACE Turn/Hazard Switch.
4. Connect self-powered test lamp from BLK (150) wire at affected Stoplamp to ground.	Test lamp lights.	REPLACE Stoplamp.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Stoplamp and Ground G401.

**8A - 110 - 14 ELECTRICAL DIAGNOSIS****EXTERIOR LIGHTS****PARK LAMP SYSTEM DOES NOT OPERATE**

<b>TEST</b>	<b>RESULT</b>	<b>ACTION</b>
1. Place Headlamp and Panel Dimmer Switch in PARK. Observe Front Park and Marker Lamps.	Front Park and Marker Lamps operate.	GO to step 3.
	Front Park and Marker Lamps do not operate.	GO to step 2.
2. Connect Test lamp From ORN (240) wire at Terminal "H" of Headlamp and Panel Dimmer Switch to ground.	Test lamp lights.	LOCATE and REPAIR open in BRN (9) wire between Splice S210 and Headlamp and Panel Dimmer Switch Connector. If no open is found, REPLACE Headlamp and Panel Dimmer Switch.
	Test lamps does not light.	LOCATE and REPAIR open in ORN (240) wire between Fuse Block and Headlamp and Panel Dimmer Switch.
3. Connect test lamp from BRN (9) wire at LH Tail/Stop-Turn Lamp Connector to ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire between Splice S411 and Ground G401.
	Test lamp does not light.	GO to step 4.
4. Connect test lamp from BRN (9) wire at Connector C409 to ground.	Test lamp lights.	LOCATE and REPAIR open in BRN (9) wire between Connector C409 and Splice S412.
	Test lamp does not light.	GO to step 5.
5. Connect test lamp from BRN (9) wire at Connector C104 to ground.	Test lamp lights.	LOCATE and REPAIR open in BRN (9) wire between Connector C104 and Connector C409.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between Splice S210 and Connector C104.

**BOTH TURN SIGNALS AND/OR HAZARD FLASHERS DO NOT OPERATE**

<b>TEST</b>	<b>RESULT</b>	<b>ACTION</b>
1. Place Ignition Switch in the RUN position. Place Turn signal "ON".	Turn Signal operates.	GO to step 7.
	Turn Signal does not operate.	GO to step 2.
2. Connect a test lamp from PNK (139) wire at Connector C266 Terminal "A2" and ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (139) wire between I/P Fuse Block and Connector C266.
3. Ensure that Turn signal is "ON". Connect a test lamp from LT BLU (1508) wire at Connector C266 Terminal "A3" and ground.	Test lamp does not light.	REPLACE Turn/Hazard Switch.
	Test lamp lights.	GO to step 4.
4. Connect a test lamp from LT BLU (1508) and BLK (150) wires at Turn/Hazard Flasher Terminals "H9" and "G8".	Test lamp lights.	GO to step 6.
	Test lamp does not light.	GO to step 5.

TEST	RESULT	ACTION
5. Ensure Turn Signal is "ON". Connect a test lamp from LT BLU (1508) wire at Turn/Hazard Flasher Terminal "H9" and ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire between Turn/Hazard Flasher and ground.
	Test lamp does not light.	LOCATE and REPAIR open in LT BLU (1508) wire between Turn/Hazard Flasher and ground.
6. Turn Signal "OFF". Connect a self-powered test lamp from PPL (1697) wire from Turn/Hazard Flasher Terminal "H7" and Connector C266 Terminal "E9".	Test lamp lights.	GO to step 10.
	Test lamp does not light.	LOCATE and REPAIR open in PPL (1697) wire between Turn/Hazard Flasher and Connector C266.
7. Connect a test lamp from ORN (140) wire at Connector C266 Terminal "E8" and ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (139) wire between Connector C266 and I/P Fuse Block.
	Test lamp lights.	GO to step 8.
8. Place Hazard Switch "ON". Connect a test lamp from GRY (1696) wire at Connector C266 Terminal "E1" and ground.	Test lamp does not light.	REPLACE Turn/Hazard Switch.
	Test lamp lights.	GO to step 9.
9. Connect a test lamp from GRY (1696) wire at Turn/Hazard Flasher Terminal "H8" and ground.	Test lamp lights.	REPLACE Turn/Hazard Flasher.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (1696) wire between Turn/Hazard Flasher and Connector C266.
10. Ensure Hazard Switch is "ON". Reconnect Turn/Hazard Flasher. Connect a test lamp from PPL (1697) wire at Connector C266 Terminal "E9" and ground.	Test lamp lights.	REPLACE Turn/Hazard Switch.
	Test lamp does not light.	REPLACE Turn/Hazard Flasher.

## TURN SIGNALS DO NOT OPERATE ON ONE SIDE

TEST	RESULT	ACTION
1. Turn hazard flasher "ON". Observe lights on side of Turn Signals that does not work.	All lights flash.	GO to step 2.
	All lights do not flash.	GO to step 3.
2. Turn Hazard Warning system "OFF". Place Ignition Switch in RUN and Turn Signal Switch 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 Connector C266 to ground.	Test lamp flashes.	System operating normally.
	Test lamp does not flash.	REPLACE Turn/Hazard Switch.
3. Connect test lamp from LT BLU (14) or DK BLU (15) wire (depending on which side does not work) at LH or RH Park Lamp Connector to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in either LT BLU (14) or DK BLU (15) wires between affected park lamp and Connector C102 or Connector C102 and Connector C266.
4. Connect test lamp from LT BLU (14) or DK BLU (15) wire to BLK (150 or 250) wire at LH or RH park lamp.	Test lamp lights.	CHECK condition of Bulb Sockets.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150 or 250) wire between affected Park Lamp and Ground G113 or G112.

**EXTERIOR LIGHTS****DIAGNOSIS - CARGO LAMP****TROUBLESHOOTING HINTS:**

1. CHECK condition of CTSY Fuse. If Fuse is open, LOCATE and REPAIR source of overload. REPLACE Fuse.
2. CHECK operation of Dome and Courtesy Lamps, if inoperative, REPAIR before proceeding with Cargo Lamp diagnosis.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a

Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).

**CARGO LAMP DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Place Cargo Switch and Dome Lamp Switch to "ON". Connect test lamp from DK BLU/WHT (149) wire at Cargo 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 DK BLU/WHT (149) wire to BLU (156) wire at Cargo Lamp Connector.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BLU (156) wire from Cargo Lamp to Splice S322.
3. Connect test lamp from ORN (40) wire at Cargo Lamp Switch Connector to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between Cargo Switch Connector and Splice S242.
4. Connect test lamp from DK BLU/WHT (149) wire at Cargo Lamp Switch Connector to ground.	Test lamp lights.	LOCATE and REPAIR open in DK BLU/WHT (149) wire from Cargo Lamp Switch Connector to Cargo Lamp Connector.
	Test lamp does not light.	REPLACE Cargo Lamp Switch.

**CIRCUIT OPERATION****TAIL, MARKER, ENDGATE CLEARANCE AND LICENSE LAMPS**

Voltage is supplied through the PARK LP Fuse to the Headlamp and Panel Dimmer Switch at all times. With the Headlamps and Panel Dimmer Switch in PARK or HEAD, Voltage is supplied to the Tail, Marker, Endgate Clearance and License Lamps.

**STOPLAMPS**

Voltage is supplied at all times through the STOP/HAZ Fuse to the TCC/Stoplamp Switch. When the Brake Pedal is depressed, the contacts in the TCC/Stoplamp Switch close. Voltage is supplied (from the Stoplamp Relay on

Pickup, TCC/Stoplamp Switch -all except Pickup) through the Turn/Hazard Switch to the LH and RH Stoplamp, and the Stoplamp lights. If a Turn Signal is on, the Stoplamp on that side will flash as a Turn Signal. The other Stoplamp will serve as a Stoplamp.

**TURN SIGNAL LAMPS**

With the Ignition Switch in RUN or START, Voltage is supplied through the TURN-B/U Fuse and Turn/Hazard Flasher to the normally closed contact of the Hazard Flasher Switch in the Turn/Hazard Switch.

With the Turn Signal Switch in LH Turn position, Voltage is supplied to both the LH Turn Indicator and the LH Front Park/Turn Lamp LT BLU (14) wire. Voltage is supplied to the LH Rear Turn Lamp YEL (18) wire.

## **EXTERIOR LIGHTS**

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 supplied to the LH Front Park/Turn Lamp will also be supplied to the LH Front Marker Lamp. If the Headlamp and Panel Dimmer Switch is in the OFF position, the LH Front Marker Lamp will find a path to ground through Splice S122 and the many Lamps connected in parallel to ground. These Lamps provide low resistance paths to ground. The Marker Lamp will Flash with the Turn Lamps. The Lamps used for the ground path will not flash, however, since the Voltage drop across the Marker Lamp is much higher than that across the other Lamps.

When the Headlamp and Panel Dimmer Switch is in either PARK or HEAD, Voltage is supplied through the PARK LP Fuse, Headlamp and Panel Dimmer Switch and Splice 122 to the Marker and Park Lamps. If the Turn/Hazard 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 Turn Lamp, the Marker Lamp will be grounded through the Turn Lamp and will go on. In this way, the LH Front Marker Lamp will Flash on when the LH Front Park/Turn Lamp goes off, and off when the Turn Lamp goes on.

With the Turn/Hazard Switch in TURN RIGHT, Voltage will be supplied to the RH Lamps in the same way.

### **HAZARD LAMPS**

Voltage is supplied at all times, through the STOP Fuse and the Turn/Hazard Flasher to the normally open contact of the Hazard Switch in the Turn/Hazard Switch.

With the Hazard Switch in HAZARD FLASH., Voltage is supplied to both Front and Rear Turn Lamps. All of the Turn Lamps and Turn Indicators Flash on and off.

The Front Marker Lamps flash in HAZARD FLASH just as they did in TURN RIGHT and TURN LEFT. If the Headlamp and Panel Dimmer Switch is in "OFF", they Flash on when the Hazard Lamps are on. If the Headlamp and Panel Dimmer 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 Turn/Hazard Flasher controls the Lamps.

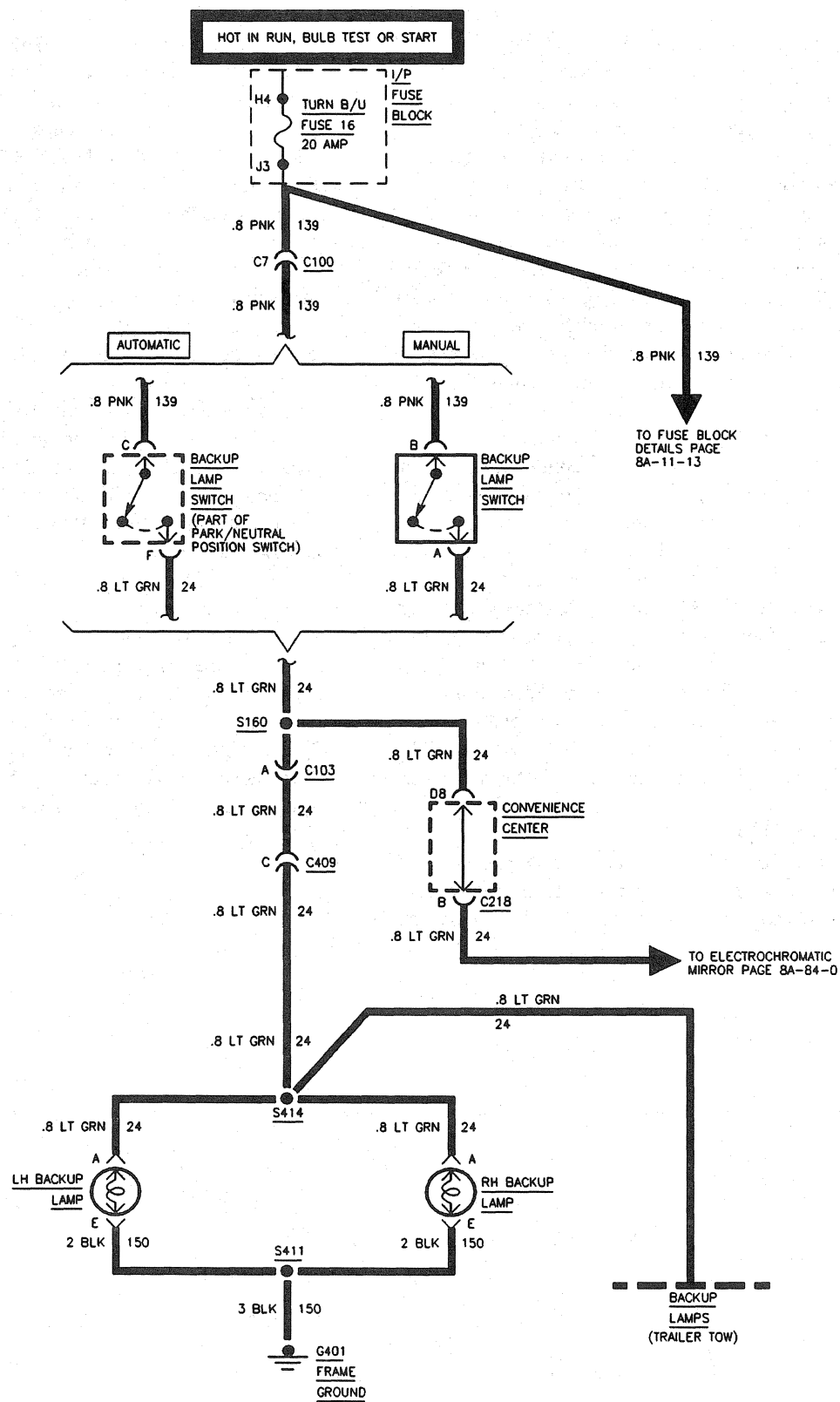
### **PARK AND MARKER LAMPS**

Voltage is supplied through the PARK LP Fuse to the Headlamp and Panel Dimmer Switch at all times. With the Headlamp and Panel Dimmer Switch in PARK or HEAD, Voltage is supplied to the Park, Tail, Marker, Roof Marker and License Lamps.

### **CARGO LAMP**

Voltage is supplied at all times through the CTSY Fuse 3 to the Cargo Lamp Switch. When the Cargo Lamp Switch is turned on, Voltage flows through the Switch to the Lamp. Ground is supplied by the Courtesy Lamp Switch, (part of Headlamp and Panel Dimmer Switch), Illuminated Entry Module, or the Remote Keyless Entry Module through the Door Jamb Switch(s).

## BACKUP LIGHTS





**BACKUP LIGHTS**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Backup Lamp .....	Rear of vehicle, part of RH and LH Taillamp			
Backup Lamp Switch (MG5)....	LH side of Transmission, below Shift Tower area.....	21 .....	31	
Backup Lamp Switch (MW3) ...	LH top of Transmission.....	20 .....	29	
Convenience Center .....	Under LH side of I/P on Bulkhead.....	23 .....	36	
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Park/Neutral Position Switch.....	LH side center of Transmission.....	17 .....	25	
Turn/Hazard Flasher.....	Convenience Center.....	23 .....	36	
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C103.....	LH rear of Engine Compartment, under Brake Master Cylinder .....	.....	.....	202-35
C218.....	At Convenience Center .....	23 .....	36	
C409.....	Beneath rear center of Bed, near Bumper.....	43 .....	72.....	202-39
<b>GROUND:</b>				
G401.....	Rear of LH Framerrail, behind Bumper .....	42 .....	69	
<b>SPLICES:</b>				
S160 (VIN W, M, R) .....	Engine Harness, approx. 23 cm from Breakout to Underhood Fuse - Relay Center toward Taillamp Harness			
S160 (VIN J).....	Engine Harness, approx. 28.5 cm from Breakout to Underhood Fuse - Relay Center toward Taillamp Harness			
S160 (Diesel).....	Engine Harness, approx. 17 cm from Breakout to BPMV toward EGR Valve			
S411 (Chassis Cab).....	Rear Lamps Harness, approx. 33 cm left of Taillamps Extension Breakout			
S411 (Fleetside/Stepside) .....	Rear Lamp Harness, approx. 17 cm left of Taillamps Extension Breakout			
S414 .....	Rear Lamp Harness, approx. 10 cm from License Lamp Breakout			

**BACKUP LIGHTS****DIAGNOSIS - BACKUP LIGHTS****TROUBLESHOOTING HINTS:****(Perform before beginning System Diagnosis)**

1. CHECK Condition of TURN B/U Fuse 16. If Fuse is open, LOCATE and REPAIR source of overload and REPLACE Fuse.
2. CHECK Back Up Lamps for damage to filament or corrosion between bulb and socket.
3. CHECK adjustment of Back Up Lamps Switch.
4. CHECK that Ground G401 is clean and tight.
  - REFER to SECTION 8B for Back Up Lamp access.
  - REFER to SECTION 7A for Park/Neutral Position and Backup Switch access.

- REFER to SECTION 7B for Backup Switch access for Manual Transmission.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but prove "GOOD" in a Continuity/Voltage CHECK with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring Fuse Voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).

**LH AND RH BACK UP LAMPS ARE INOPERATIVE**

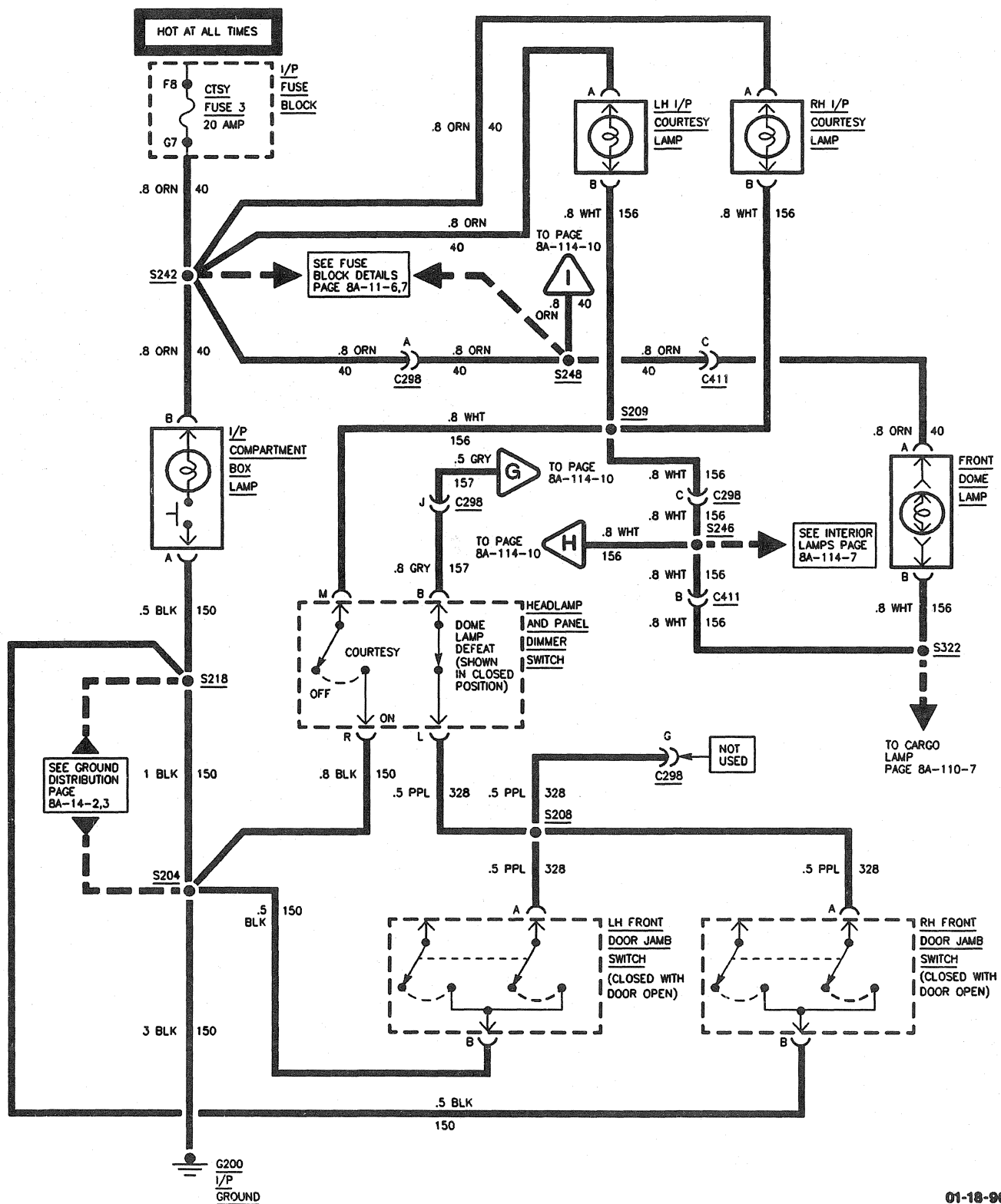
TEST	RESULT	ACTION
1. Disconnect Backup Lamp Switch Connector. Place Ignition Switch in "RUN." Connect a test lamp from Cavity "C" (Automatic) or Cavity "B" (Manual) to ground.	Lamp does not light.	LOCATE and REPAIR open in PNK (139) wire between I/P Fuse Block and Backup Lamp Switch.
	Lamp lights.	GO to step 2.
2. Connect a test lamp from BACKUP Lamp Switch Connector Cavity "F" (Automatic) or Cavity "A" (Manual) to B+.	Backup Lamp Lights.	REPLACE Backup Lamp Switch (Manual) or Park/Neutral Position and Backup Lamp Switch (Automatic).
	Backup Lamp does not light.	LOCATE and REPAIR open in LT GRN (24) wire between Backup Lamp Switch and Backup Lamps. If OK LOCATE and REPAIR open in BLK (150) wire between Backup Lamps and Ground G401.

**CIRCUIT OPERATION****BACKUP LAMPS**

When the Ignition Switch in "RUN," Voltage is applied through the TURN/BU Fuse to the Backup Lamp Switch. With the Transaxle in "REVERSE," Voltage is applied to the LH and RH Backup Lamps, which are permanently grounded. When voltage is applied to CKT 24, the Backup Lamps are on. CKT 24 also supplies input to the Electrochromatic Rearview Mirror Dimming function. Connection is also provided for the Trailer-Tow capability.

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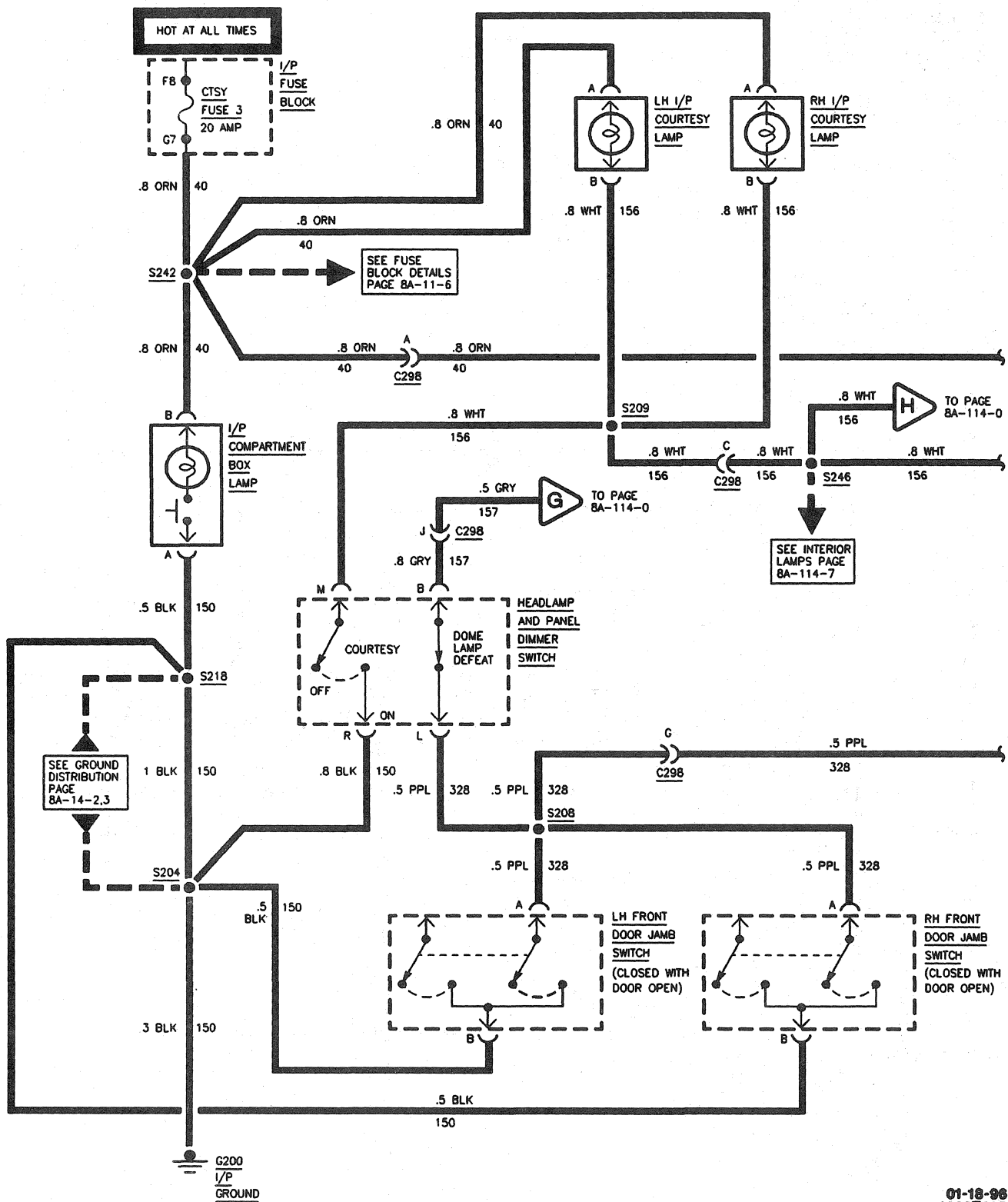
# INTERIOR LIGHTS REGULAR CAB/EXTENDED CAB



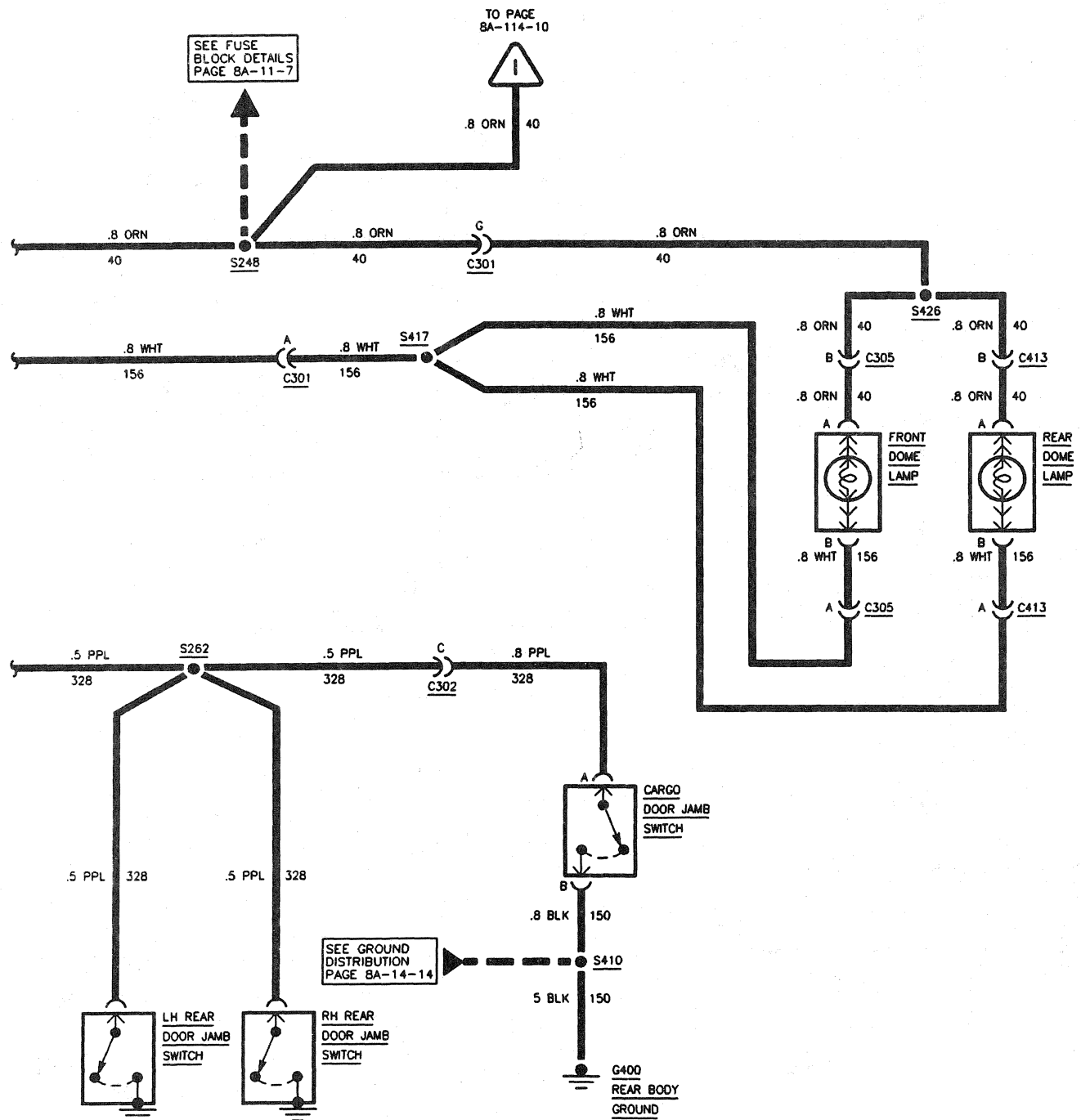


INTERIOR LIGHTS

SUBURBAN/UTILITY/CREW CAB BASE



# INTERIOR LIGHTS SUBURBAN/UTILITY/CREW CAB BASE



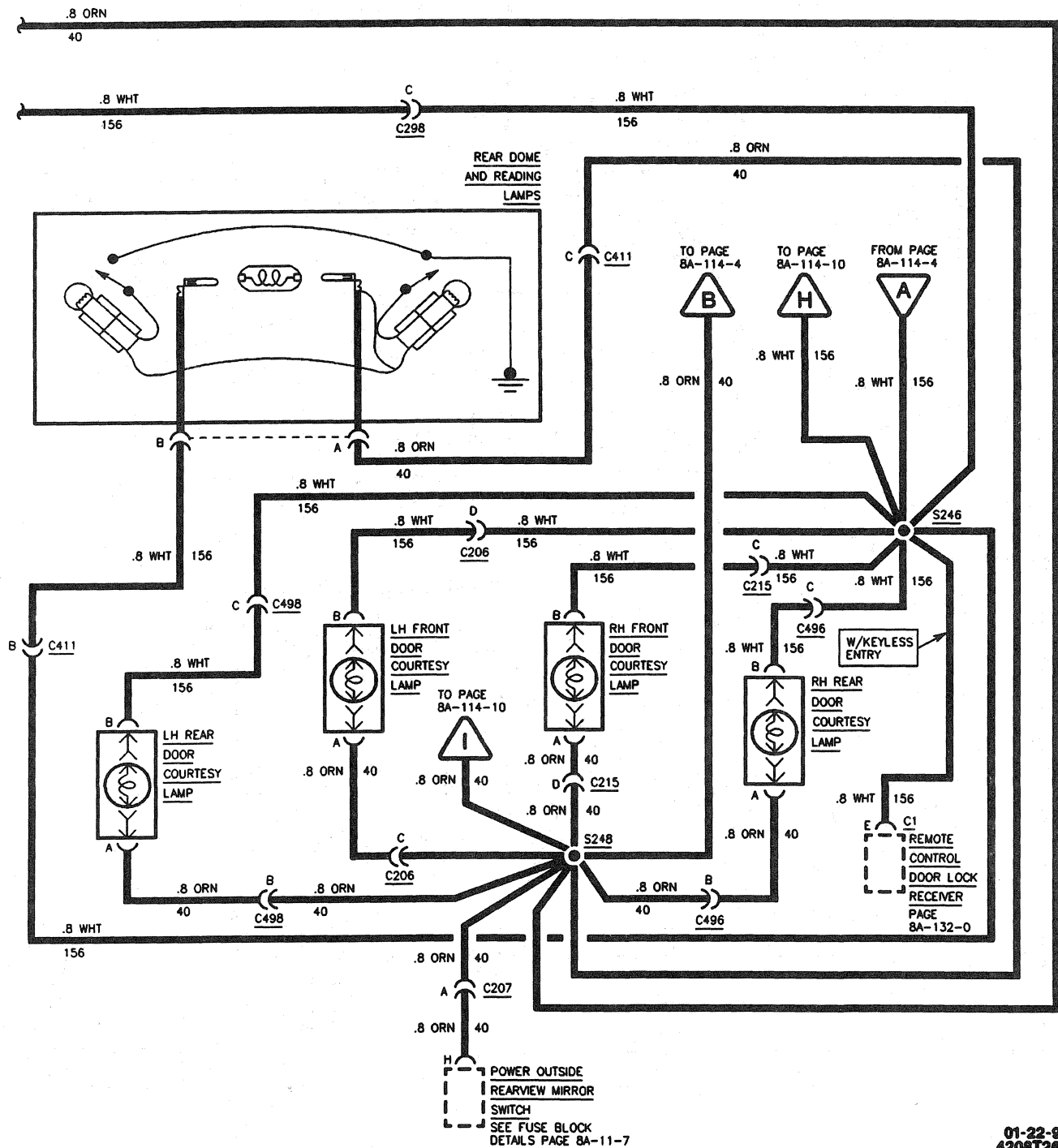
## INTERIOR LIGHTS

### CREW CAB W/AUXILIARY LIGHTING



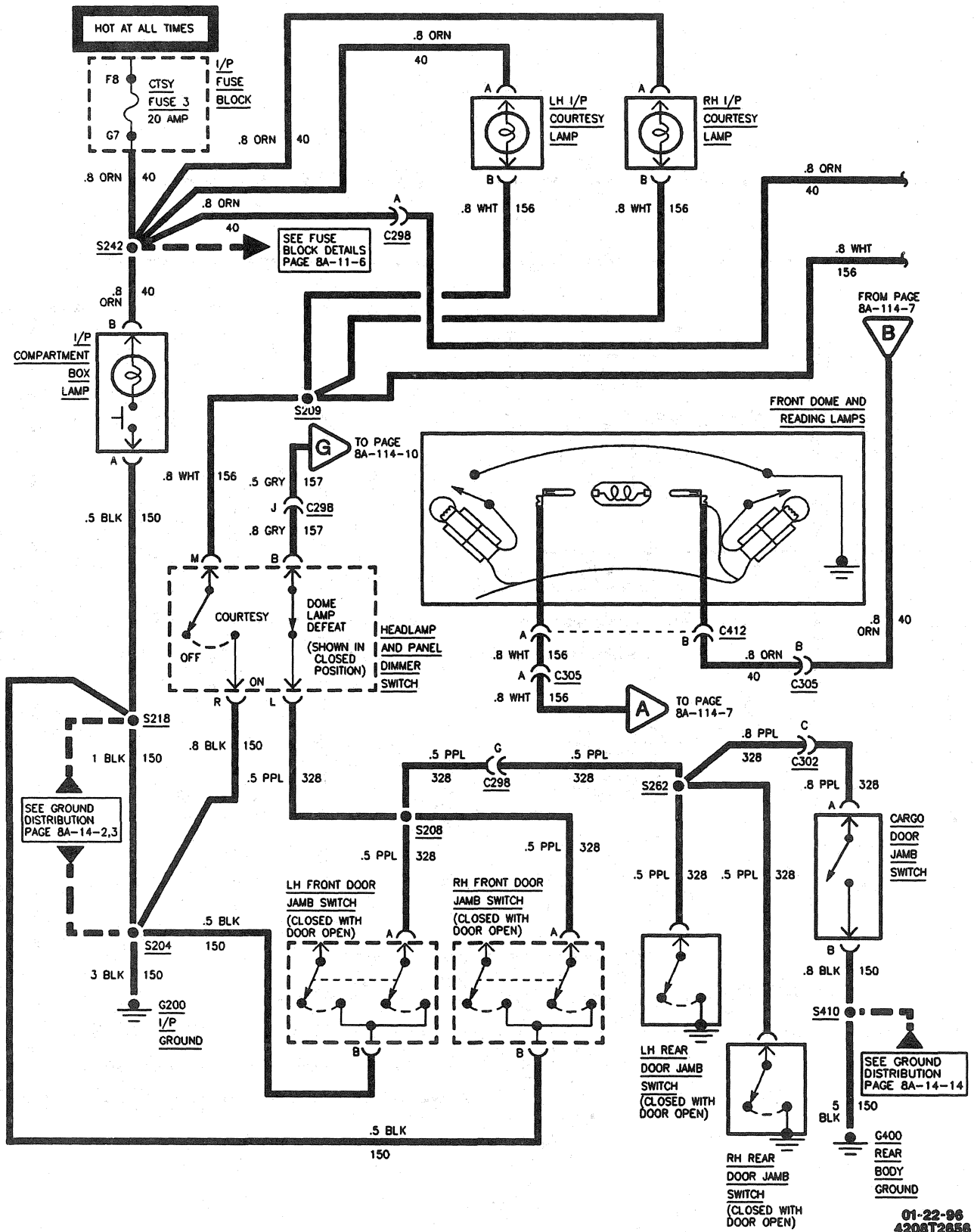


# INTERIOR LIGHTS CREW CAB W/AUXILIARY LIGHTING



# INTERIOR LIGHTS

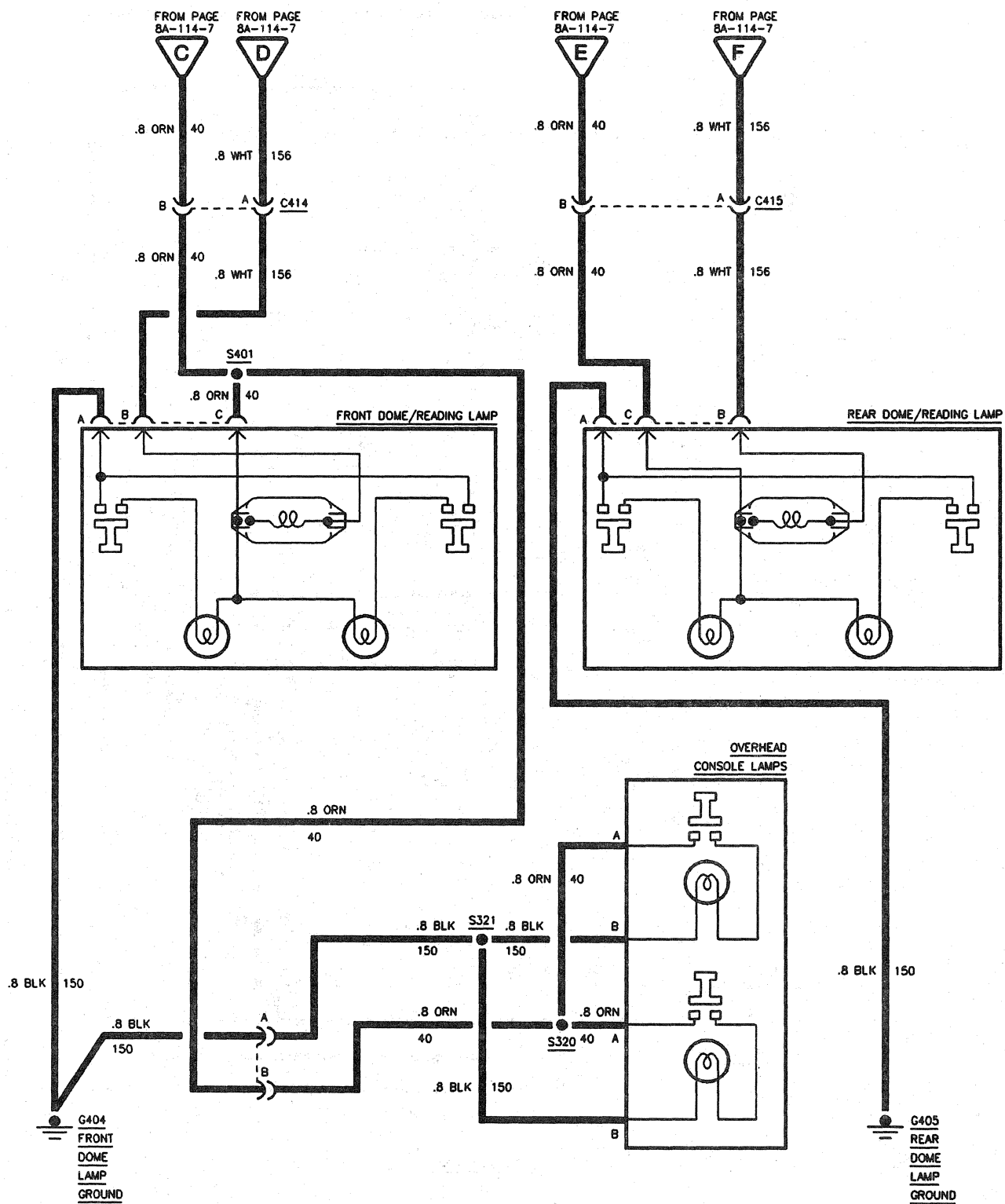
## SUBURBAN W/AUXILIARY LIGHTING





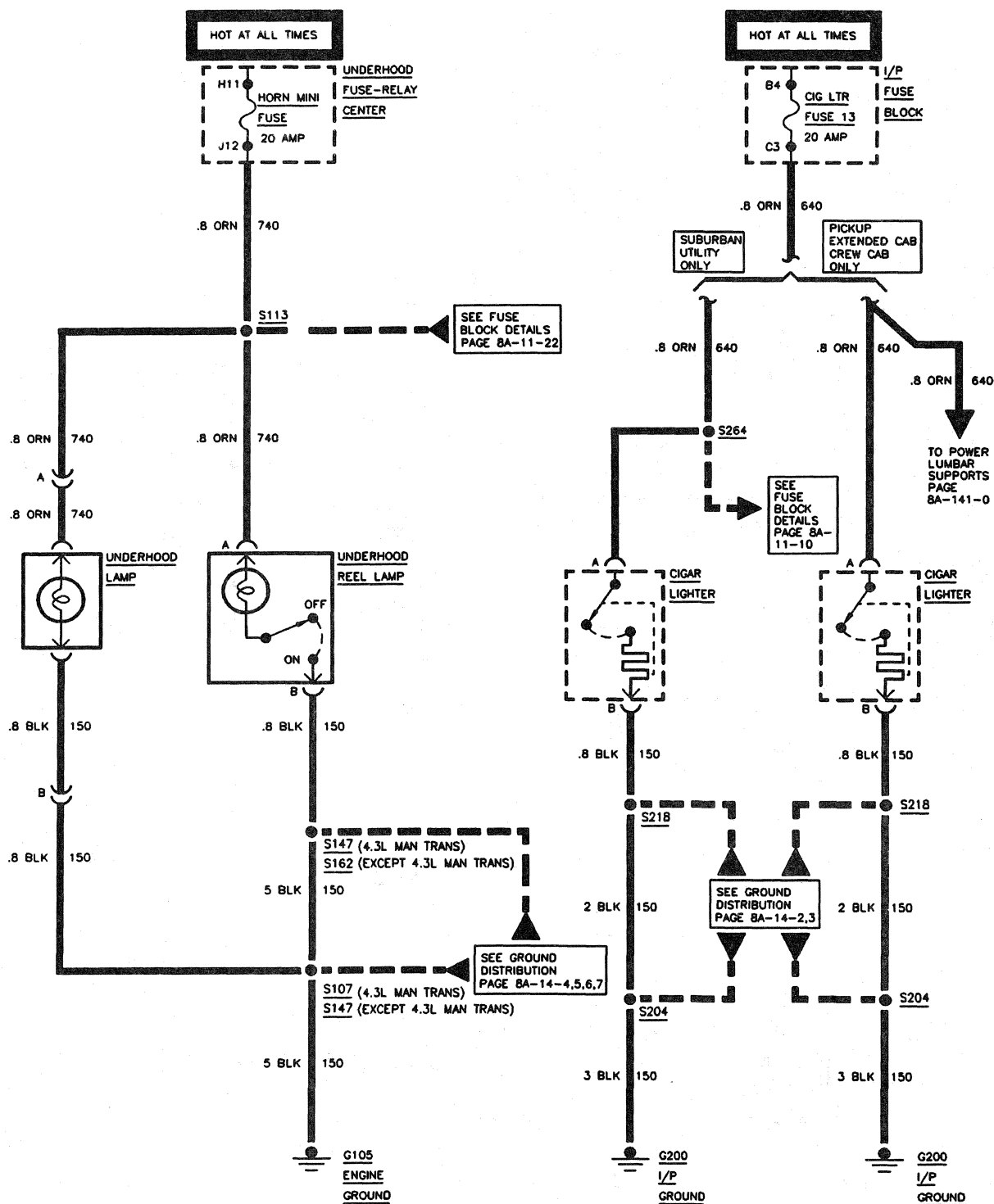
# 8A - 114 - 8 ELECTRICAL DIAGNOSIS

## INTERIOR LIGHTS OVERHEAD CONSOLE

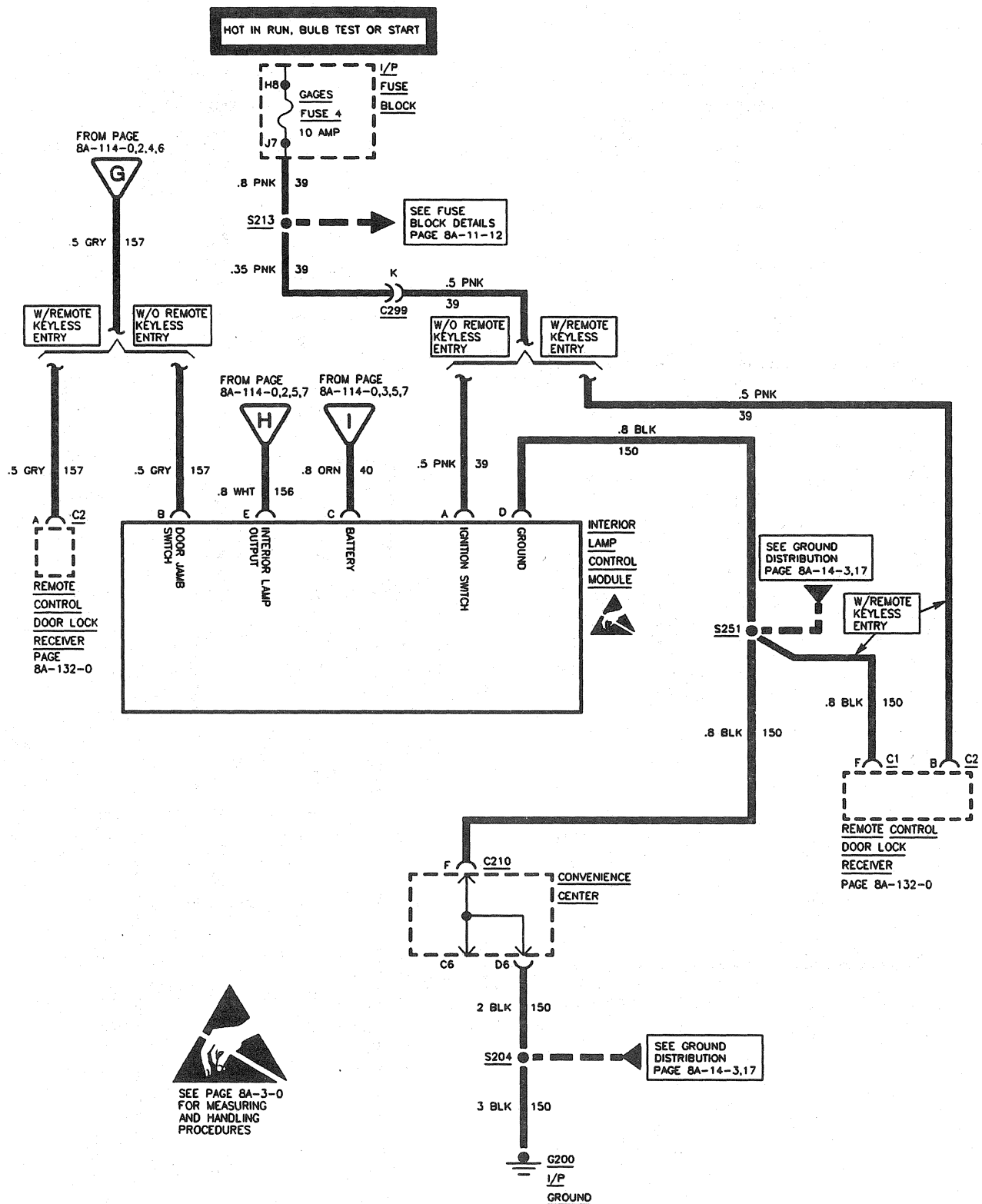


## INTERIOR LIGHTS

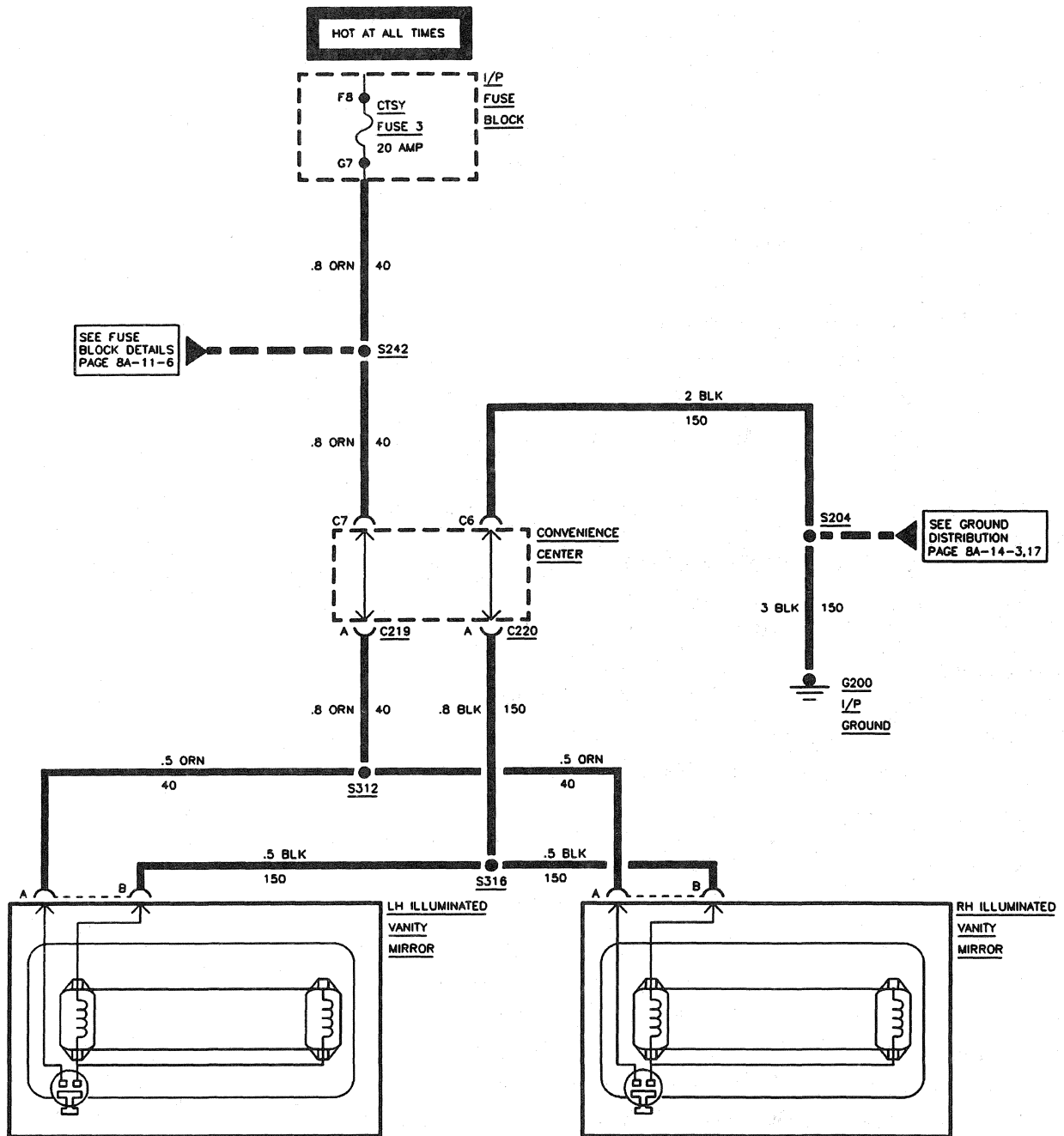
## UNDERHOOD AND REEL LAMP/CIGAR LIGHTER/AUXILIARY POWER FEED



# INTERIOR LIGHTS W/INTERIOR LAMP CONTROL MODULE



# INTERIOR LIGHTS ILLUMINATED VANITY MIRRORS



## INTERIOR LIGHTS

COMPONENT	LOCATION	201-PG	FIG.	CONN
Ash Tray Lamp .....	At Ash Tray			
Cargo Door Jamb Switch .....	On RH rear Cargo Door			
Cigar Lighter .....	Center of I/P, at Ashtray			
Convenience Center .....	Under LH side of I/P on Bulkhead.....	23	36	
Courtesy Lamp, LH .....	Under LH side of I/P			
Courtesy Lamp , RH .....	Under RH side of I/P			
Dome/Reading Lamp, Front .....	Inside on Roof			
Dome/Reading Lamp, Rear .....	Inside on Roof			
Door Jamb Switch, LH Front ...	At LH end of I/P			
Door Jamb Switch, RH Front ...	At RH end of I/P			
Door Jamb Switch, LH Rear ....	Center of LH "B" Pillar			
Door Jamb Switch, RH Rear ....	Center of RH "B" Pillar			
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P .....	23	35	
Interior Lamp Control Module .....	Under Center of I/P .....	25	39	202-41
Illuminated Vanity Mirror, LH.....	Part of LH Sunvisor Assembly			
Illuminated Vanity Mirror, RH .....	Part of RH Sunvisor Assembly			
I/P Compartment Box Lamp.....	In I/P Compartment Box			
Overhead Console Lamps.....	In Roof Console			
Remote Control Door Lock Receiver.....	Under center portion of I/P.....	25	39	
Remote Outside Rearview Mirror Switch .....	On front LH Door, Arm Rest			
Underhood Fuse-Relay Center ..	LH rear of Engine Compartment, on Fender.....	4	8	
Underhood Lamp.....	Under Hood, RH side .....	5	11	
Underhood Reel Lamp.....	RH side of Hood at rear of Bulkhead			
Window Lockout Switch, Rear .....	LH front Door, forward portion of Arm Rest area .....	35	56	
Window Switch, LH Front.....	On LH front Trim Panel .....	35	57	
Window Switch, LH Rear.....	On LH rear Trim Panel .....	36	58	
Window Switch, RH Front.....	On RH front Trim Panel .....	35	57	
Window Switch, RH Rear.....	On RH rear Trim Panel.....	36	58	



COMPONENT	LOCATION	201-PG	FIG.	CONN
<b>CONNECTORS</b>				
C206.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-36
C207.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-36
C209.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-37
C210.....	At Convenience Center .....	23 .....	36.....	202-37
C215.....	Inside RH "A" Pillar, lower portion .....	35 .....	56.....	202-37
C219.....	At Convenience Center .....	32 .....	50	
C220.....	At Convenience Center			
C298.....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
C299.....	Behind RH side of I/P, above HVAC Evaporator Housing .....	27 .....	42.....	202-10
C301.....	LH front Kick Panel .....	28 .....	45.....	202-11
C302.....	LH front Kick Panel .....	28 .....	45.....	202-39
C305.....	In Headliner at #1 Roof Bow			
C411.....	LH rear of Cab.....	40 .....	65.....	202-39
C413.....	LH rear of Cab			
C414.....	In line to front Dome Lamp			
C415.....	In line to rear Dome Lamp			
C496.....	RH "B" Pillar.....	36 .....	58.....	202-39
C498.....	LH "B" Pillar .....	36 .....	58.....	202-44
<b>GROUND:</b>				
G105 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
G105 (Gas) .....	RH front Engine Block.....	9 .....	15	
G200.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34 .....	54	
G404.....	Inside LH Framerrail, near rear Crossmember			
G405.....	Frame Ground, at rear of vehicle			
<b>SPLICES:</b>				
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN M, R).....	Engine Harness, approx. 20 cm from Breakout to EGR Valve toward Taillamp Extension Harness			
S107 (VIN J).....	Engine Harness, approx. 20 cm from Fuel Injector Breakout toward Taillamp Extension Harness			
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve			
S113 (Diesel).....	Engine Harness, 18 cm into Underhood Fuse - Relay Center Breakout			

## INTERIOR LIGHTS

COMPONENT	LOCATION	201-PG FIG. CONN
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout	
S208 .....	Approx. 25 cm from Headlamp Dimmer Switch Connector	
S209 .....	Approx. 20 cm from Headlamp Dimmer Switch Connector	
S210 .....	Approx. 15 cm from Headlamp Dimmer Switch Connector	
S213 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout Toward Cluster	
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout Toward Auxiliary Power Outlets	
S242 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout Toward I/P Cluster	
S246 .....	Crossbody Harness, approx. 41.5 cm from LH Door Harness Breakout Toward rear Speaker Breakout	
S247 .....	Crossbody Harness, 6 cm right of LH rear Speaker Breakout	
S248 .....	Crossbody Harness, approx. 13 cm from rear Speaker Breakout toward LH Door Harness	
S251 .....	Crossbody Harness, approx. 12.5 cm Right of LH Door Harness Breakout Toward I/P Harness Breakout	
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout	
S262 .....	Crossbody Harness, approx. 18.5 cm from Seat Belt Switch Breakout Toward I/P Harness Breakout	
S316 .....	In Vanity Mirror Jumper Harness in Roof near Windshield	
S320 .....	Dome Lamp Harness, approx. 11.5 cm from C411 toward Dome Lamp	
S320 (Crew Cab) .....	Dome Lamp Harness, approx. 10 cm from C411 toward Dome Lamp	
S321 .....	Dome Lamp Harness	
S322 .....	Dome Lamp Harness, approx. 11.5 cm from C411 toward Dome Lamp	
S401 (rear A/C).....	Rear A/C Harness, 23 cm from Blower Motor Relays	
S401 (rear Heat & A/C).....	Rear Heat and A/C Harness, approx. 18 cm from Blower Motor Relays Breakout	
S410 (2-Door Utility) .....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout	
S410 (4-Door Utility) .....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout	
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout Toward CHMSL Harness Breakout	
S417 (2-Door Utility) .....	Front to rear Body Harness, 34 cm from front Dome Lamp Breakout	

COMPONENT	LOCATION	201-PG	FIG.	CONN
S417 (4-Door Utility).....	Front to rear Body Harness, 230 cm into Crossbody Harness Breakout			
S417 (Suburban).....	Front to rear Body Harness, 23 cm into Crossbody Harness Breakout			
S426 (2 and 4-Door utility) .....	Front to rear Body Harness, 13 cm from rear Dome Lamp Breakout			
S426 (Suburban).....	Front to rear Body Harness, approx. 36 cm from rear Dome Lamp Breakout			
S500 .....	Inside left front Door Harness, near Tweeter.....	35	.....	56
S502 .....	Inside left front Door Harness, near Tweeter.....	35	.....	56

## DIAGNOSIS - INTERIOR LIGHTS

### TROUBLESHOOTING HINTS:

1. CHECK the condition of the CIG LTR FUSE 13, CTSY FUSE 3, HORN MINI FUSE and the PARK LPS FUSE 9. If any Fuse(s) is open, then LOCATE and REPAIR source of overload and REPLACE fuse(s).
2. CHECK that Grounds G105, G200, G400 (Suburban, Utility and Crew Cab), and G404/G405 (Suburban W/Auxiliary Lighting) are clean and tight.
3. CHECK for open filaments in inoperative Lamps. If I/P Compartment Box Lamp remains ON with the Switch OFF, then REPLACE the I/P Compartment Box Lamp Assembly. If Underhood Reel Lamp

remains ON with the Switch OFF, then REPLACE the Underhood Reel Lamp Assembly.

- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," Page 8A-4-0).

## INTERIOR LIGHTS

## COURTESY LAMP(S)/DOME LAMP(S) ARE INOPERATIVE

TEST	RESULT	ACTION
1. Move Courtesy Lamp Switch to the "ON" position.	All Courtesy Lamps/Dome Lamp(s) light.	GO to step 2.
	All Courtesy Lamps and Dome Lamp(s) are inoperative.	GO to step 3.
	One or more Courtesy Lamps/Dome Lamp(s) are inoperative.	CHECK for an open in ORN (40) wire between Splice and affected Lamp(s) or in WHT (156) wire between Splice and affected Lamp(s). If only one Lamp is inoperative and wiring is "GOOD", then REPLACE Lamp.
2. Move Courtesy Lamp Switch to the "OFF" position. Make sure that the Dome Lamp Defeat Switch is off. Open and close each door and note whether or not the Courtesy Lamps/Dome Lamp(s) light.	All Courtesy Lamps/Dome Lamp(s) light.	System is operating correctly.
	All Courtesy Lamps/Dome Lamp(s) are completely inoperative.	GO to step 5.
	Courtesy Lamps/Dome Lamp(s) are inoperative through one or more of the vehicle's Door Jamb Switches.	CHECK for an open in PPL (328) wire between Splice and affected Door Jamb Switch (or Switches) or in BLK (150) wire between Splice and affected Door Jamb Switch or Switches (if applicable). If OK, REPLACE affected Door Jamb Switch.
3. Backprobe Front Dome Lamp Connector with a test Lamp from ORN (40) wire to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between Splice S242 and I/P Fuse Block.
	Test lamp lights.	GO to step 4.
4. Backprobe Headlamp and Panel Dimmer Switch Connector with a test Lamp from Cavity "M" to B+.	Test lamp lights.	LOCATE and REPAIR open in WHT (156) wire between Headlamp and Panel Dimmer Switch and Splice S209.
	Test lamp does not light.	CHECK for an open in BLK (150) wire between Headlamp and Panel Dimmer Switch and Ground G200. If OK, REPLACE Headlamp and Panel Dimmer Switch.
5. With door open, disconnect Interior Lamp Control Module Connector. Connect a self-powered test lamp from Interior Lamp Control Module Connector Cavity "B" to ground (ensure that the Dome Lamp Defeat Switch is OFF - CLOSED).	Test lamp lights.	GO to step 8.
	Test lamp does not light.	GO to step 6.
6. Disconnect Headlamp and Panel Dimmer Switch Connector and connect a self-powered test Lamp at Cavity "B" to Interior Lamp Control Module Connector Cavity "B."	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (157) wire between Headlamp and Panel Dimmer Switch and Interior Lamp Control Module.

TEST	RESULT	ACTION
7. Reconnect Headlamp and Panel Dimmer Switch Connector. Using a self-powered test Lamp, backprobe Cavity "B" to Cavity "L."	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire between Switch and Ground G200.
	Test lamp does not light.	REPLACE Headlamp and Panel Dimmer Switch.
8. With Interior Lamp Control Module Connector disconnected, connect a test Lamp from Cavity "E" to ground.	Test lamp lights.	GO to step 9.
	Test lamp does not light.	LOCATE and REPAIR open in WHT (156) wire between Interior Lamp Control Module and Splice S246.
9. Connect a test Lamp between Cavity "C" and ground.	Test lamp lights.	GO to step 10.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire between Interior Lamp Control Module and Splice S248.
10. Connect a self-powered test Lamp between Cavity "D" and ground.	Test lamp lights.	REPLACE Interior Lamp Control Module.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Interior Lamp Control Module and Ground G200.

**COURTESY LAMP(S) DOME LAMP(S) REMAIN ON**

TEST	RESULT	ACTION
1. Disconnect Headlamp and Panel Dimmer Switch Connector.	Lamps remain ON.	LOCATE and REPAIR short to ground in WHT (156) wire.
	Lamps turn OFF.	GO to step 2.
2. Reconnect Headlamp and Panel Dimmer Switch Connector. Move Dome Lamp Defeat Switch to ON.	Lamp remain "ON".	REPLACE Headlamp and Panel Dimmer Switch.
	Lamps turn "OFF".	GO to step 3.
3. Move Dome Lamp Defeat Switch to "OFF". Disconnect each Door Jamb Switch one at a time and note if the Lamps turn "OFF" as each one is disconnected.	Lamps turn OFF with one of the Door Jamb Switches disconnected.	REPLACE affected Door Jamb Switch.
	Lamps remain "ON" after all of the Door Jamb Switches are disconnected.	GO to step 4.
4. Using a self-powered test Lamp, backprobe Cavity "B" of the Interior Lamp Control Module to ground. Ensure jamb Switches are disconnected.	Test lamp lights.	LOCATE and REPAIR short to ground in GRY (157) wire between Interior Lamp Control Module and Headlamp and Panel Dimmer Switch.
	Test lamp does not light.	REPLACE Interior Lamp Control Module.

**ILLUMINATED ENTRY SYSTEM IS INOPERATIVE (DOME LAMPS OPERATIVE)**

TEST	RESULT	ACTION
1. With doors closed and Ignition in "OFF" position, backprobe Cavity "A" of the Interior Lamp Control Module using a test Lamp.	Test lamp lights.	LOCATE and REPAIR short to power in PNK (39) wire to I/P Fuse Block.
	Test lamp does not light.	REPLACE Interior Lamp Control Module.

**INTERIOR LIGHTS****ILLUMINATED VANITY MIRROR INOPERATIVE**

TEST	RESULT	ACTION
1. Connect a test Lamp from ORN (40) wire at LH or RH Vanity Mirror Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (40) wire from LH or RH Vanity Mirror to I/P Fuse Block.
2. Disconnect LH or RH Vanity Mirror Connector and connect a self-powered test Lamp from Cavity "B" to ground.	Test lamp lights.	REPLACE bulb.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire from Vanity Mirror to Ground G200.

**CIGAR LIGHTER IS INOPERATIVE**

TEST	RESULT	ACTION
1. Disconnect Cigar Lighter Connector. Connect a test Lamp from Cigar Lighter Connector Cavity "A" to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (640) wire between I/P Fuse Block and Cigar Lighter.
	Test lamp lights.	CHECK for an open in BLK (150) wire between Cigar Lighter and Ground G200. If OK, REPLACE Cigar Lighter.

**I/P COMPARTMENT BOX LAMP IS INOPERATIVE**

TEST	RESULT	ACTION
1. Disconnect I/P Compartment Box Lamp Connector. Connect a test Lamp from I/P Compartment Box Lamp Connector Cavity "A" to B+.	Test lamp lights.	CHECK for an open in ORN (40) wire between I/P Compartment Box Lamp and I/P Fuse Block. If OK, REPLACE I/P Compartment Box Lamp.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between I/P Compartment Box Lamp and G200.

**UNDERHOOD REEL LAMP IS OPERATIVE**

TEST	RESULT	ACTION
1. Disconnect Underhood Reel Lamp Connector. Connect a test Lamp from Underhood Reel Lamp Connector Cavity "A" to ground.	Test lamp does not light.	LOCATE and REPAIR open in ORN (740) wire between Underhood Reel Lamp and Underhood Fuse-Relay Center.
	Test lamp lights.	CHECK for an open in BLK (150) wire between Underhood Reel Lamp and G105. If OK, REPLACE Underhood Reel Lamp.

**COMPONENT ILLUMINATION LAMPS ARE INOPERATIVE**

TEST	RESULT	ACTION
1. Turn Headlamp and Panel Dimmer Switch to the PARK position.	All Component Illumination Lamps are inoperative.	GO to step 2.
	One or more Component Illumination Lamps are inoperative.	CHECK for an open in BRN (9) wire between Splice and affected Lamp(s) or in BLK (150) wire between Splice and affected Lamp(s). If OK, REPLACE affected Lamp(s).
2. Disconnect Ash Tray Lamp Connector. Connect a test Lamp from Ash Tray Lamp Connector Cavity "A" to ground.	Test lamp lights.	LOCATE and REPAIR open in BLK (150) wire between Component Illumination Lamp and G200.
	Test lamp does not light.	LOCATE and REPAIR open in BRN (9) wire between Headlamp and Panel Dimmer Switch and Component Illumination Lamp.

**CIRCUIT OPERATION**

Voltage is supplied at all times from the CTSY Fuse 3 to the Courtesy Lamps, Dome Lamps and I/P Compartment Box Lamp. The Courtesy and Dome Lamps turn on when a ground path is provided by the Headlight and Panel Dimmer Switch or one of the Door Jamb Switches.

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

**UNDERHOOD REEL LAMP**

Voltage is supplied at all times to the Underhood Reel Lamp from the Horn Mini Fuse. When the Switch is closed a ground path is provided.

**COMPONENT ILLUMINATION LAMPS**

When the Headlamp and Panel Dimmer Switch is turned to the PARK or HEAD position, Voltage is applied through the PARK LPS FUSE 9 and the closed contacts of the Headlamp and Panel Dimmer Switch to the Component Illumination Lamps. Since all of the Component Illumination Lamps are grounded G200, they light.

**ILLUMINATED ENTRY**

When a door is opened, the Illuminated Entry System is activated. After the last door is closed, the Dome Lamps will remain illuminated for 20 seconds or until the Ignition Switch is turned on which cancels this function. Voltage is supplied to the Module at all times through CTSY Fuse 3. The ground path is provided by CKT 150 to Ground G200. The Module senses a ground signal from CKT 157 when a door is opened. The Module then provides a ground path to CKT 156 which allows the Lamps to illuminate.

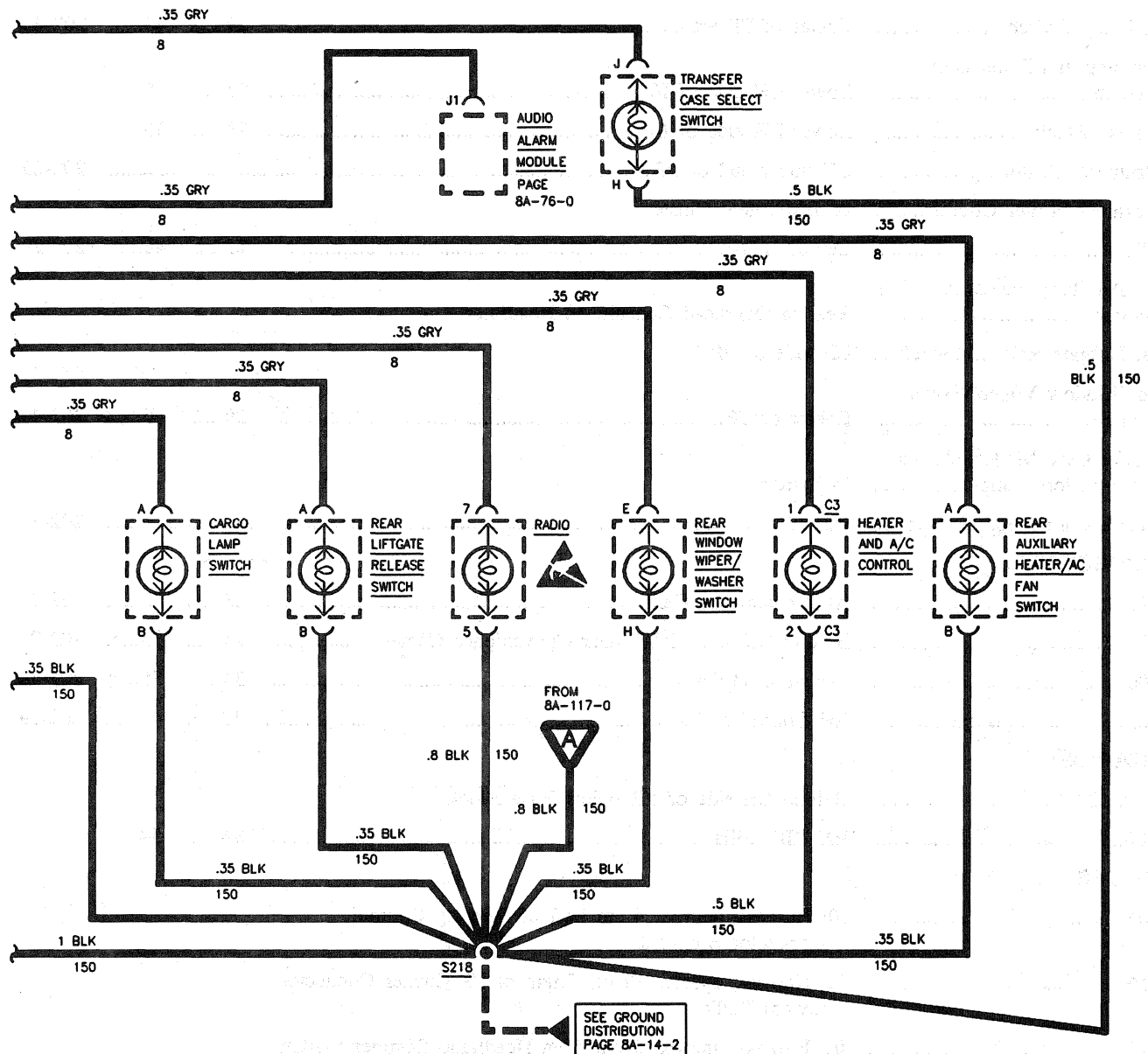
## INSTRUMENT PANEL DIMMING







SEE PAGE 8A-3-4-0  
FOR MEASURING  
AND HANDLING  
PROCEDURES



## INSTRUMENT PANEL DIMMING

COMPONENT	LOCATION	201-PG	FIG.	CONN
Audio Alarm Module.....	Under LH side of I/P, on Convenience Center (RH) portion..	23 .....	36	
Auxiliary A/C - Heater front Control Lamp.....	Part of Controls			
Auxiliary A/C - Heater rear Control Lamp.....	Part of Controls			
Cargo Lamp Switch.....	Center of I/P.....	29 .....	46	
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
Fog Lamp Switch.....	Center of I/P area.....	29 .....	46.....	202-40
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P .....	23 .....	35	
I/P Fuse Block .....	Lower LH side of I/P .....	23 .....	35	
Instrument Cluster.....	LH upper end of I/P.....			202-25
Instrument Printer Circuit.....	At Instrument Cluster			
Radio.....	Center of I/P.....	29 .....	46.....	202-29
Rear Auxiliary Heater/A/C Fan Switch.....	Rear of Overhead Console, in Headliner			
Rear Liftgate Release Switch....	LH side of I/P			
Rear Window Wiper/Washer Switch.....	Center of I/P.....	29 .....	46.....	202-43
Transfer Case Mode Selector Illumination Lamp .....	In Switch			
Transfer Case Select Switch.....	On I/P.....			202-31
<b>CONNECTORS:</b>				
C210.....	At Convenience Center .....	23 .....	36.....	202-37
C298.....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
C300.....	In Overhead Console.....	34 .....	55.....	202-38
C302.....	LH front Kick Panel.....	28 .....	45.....	202-39
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
G400.....	RH "B" Pillar.....	34 .....	54	
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout			
S216 .....	I/P Harness, approx. 12 cm Right of I/P Cluster Connector toward Radio			
S217 .....	I/P Harness, approx. 5 cm from Headlamp Dimmer Switch Breakout toward I/P Cluster			
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets			

**INSTRUMENT PANEL DIMMING**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
S251 .....	Crossbody Harness, approx. 12.5 cm Right of LH Door Harness Breakout toward I/P Harness Breakout			
S253 (Suburban).....	Crossbody Harness, 6.5 cm from I/P Harness Breakout toward Door Lock Relay Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout			
S304 (Suburban).....	Rear HVAC Control Harness, 31 cm forward of HVAC Logic Module Breakout			
S307 (Suburban).....	Rear HVAC Control Harness, 10 cm forward of HVAC Logic Module Breakout			
S410 (2-Door Utility).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout			
S410 (4-Door Utility).....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout			
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout toward CHMSL Harness Breakout			

**DIAGNOSIS - INSTRUMENT PANEL DIMMING****TROUBLESHOOTING HINTS:**

1. CHECK the condition of the PARK LPS FUSE 9 and the ILLUM FUSE 14. If either Fuse is open, then LOCATE and REPAIR source of overload and REPLACE Fuse.
2. CHECK that G200 and G400 are clean and tight.
3. CHECK for open filaments in any inoperative lamps. If Radio illumination is inoperative, then remove Radio for REPAIR. If Instrument Cluster Printed Circuit illumination lamps are inoperative and the wiring is OK, then REPLACE the Instrument Cluster Printed Circuit.

- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," page 8A-4-0).

## 8A - 117 - 4 ELECTRICAL DIAGNOSIS

### INSTRUMENT PANEL DIMMING

#### INSTRUMENT PANEL LAMP(S) ARE INOPERATIVE

TEST	RESULTS	ACTION
1. Turn Headlamp and Panel Dimmer Switch to the PARK position. Move Dimmer Switch to the Dimmest position and rotate the switch to the brightest position.	All Instrument Panel Lamps are inoperative.	GO TO step 2.
	Instrument Panel Lamps are lit, but their intensity is not adjustable with the Dimmer Switch.	REPLACE Headlamp and Panel Dimmer Switch.
	One or more Instrument Panel Lamps are inoperative.	CHECK for an open in GRY(8) wire between Splice and affected lamp(s) or in BLK (150) wire between Splice and affected lamp(s). If OK, REPLACE affected lamp(s).
2. Move Dimmer Switch to the brightest position. Backprobe Fog Lamp Switch Connector with a DVOM from Cavity "F" to ground. Measure Voltage.	Less than 10.0 volts.	CHECK for an open or high resistance in DK GRN (44) or GRY (8) wire between Headlamp and Panel Dimmer Switch and Splice S217. If OK, REPLACE Headlamp and Panel Dimmer Switch.
	More than 10.0 Volts.	LOCATE and REPAIR open in BLK (150) wire to Ground G200.

#### INSTRUMENT PANEL LAMPS REMAIN LIT WITH HEADLAMP AND PANEL DIMMER SWITCH IN THE OFF POSITION

TEST	RESULTS	ACTION
1. Disconnect Headlamp and Panel Dimmer Switch Connector.	Instrument Panel Lamps turn OFF.	REPLACE Headlamp and Panel Dimmer Switch.
	Instrument Panel Lamps remain lit.	LOCATE and REPAIR short to Voltage in GRY (8) or DK GRN (44) wire between Headlamp and Panel Dimmer Switch and Instrument Panel Lamps.

### CIRCUIT OPERATION

#### INTERIOR LAMPS DIMMING

With the Headlamp and Panel Dimmer Switch in PARK or HEAD, Voltage is supplied to the Instrument Panel Dimmer Switch. This Voltage goes through the ILLUM FUSE 14 to the illumination lamps. All of the lamps are permanently grounded, so they light. The intensity of the illumination lamps is controllable Via the Dimmer Switch. The Rheostat in the Dimmer Switch varies Voltage to the lamps, which in turn, also varies lamp intensity.

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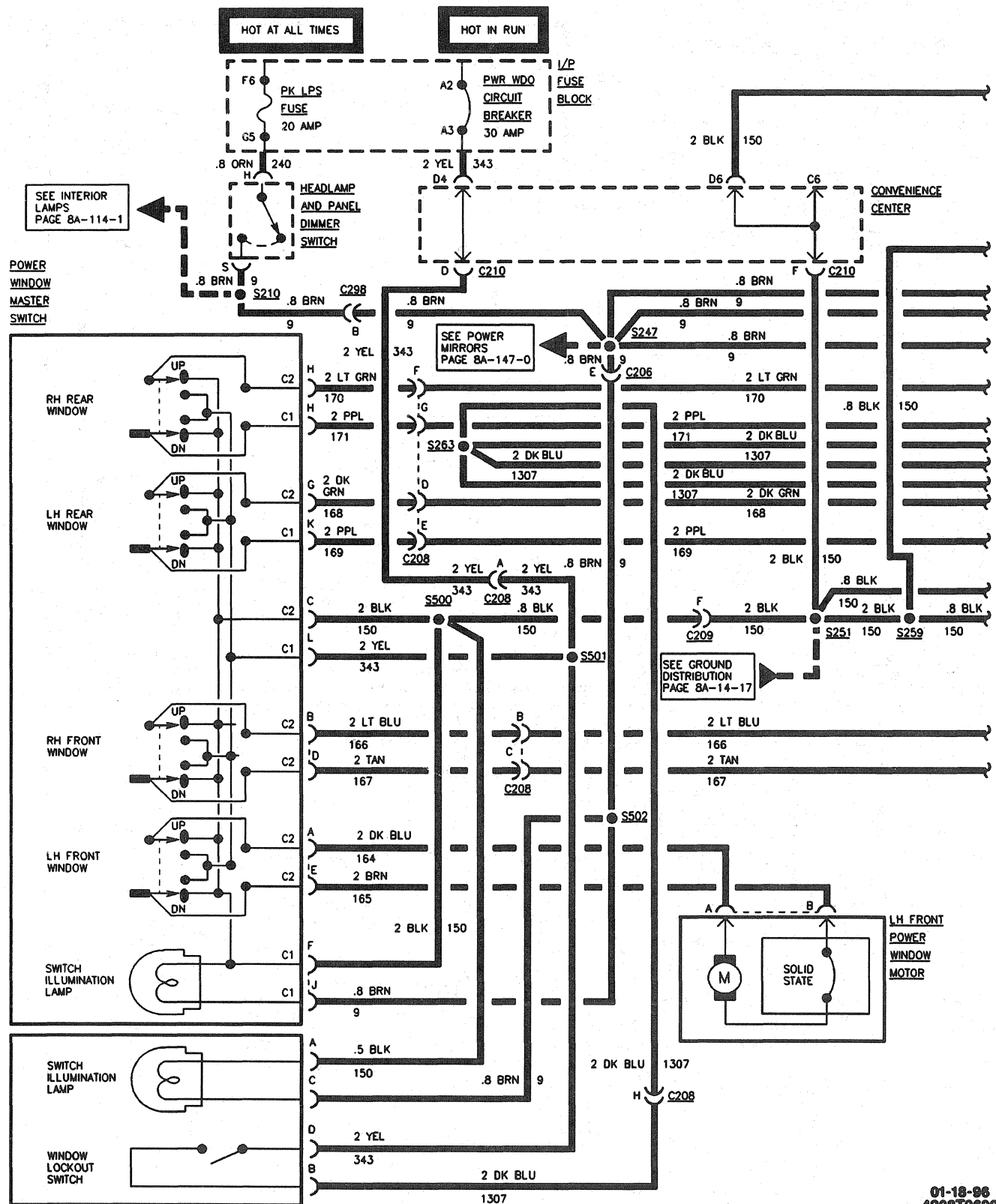




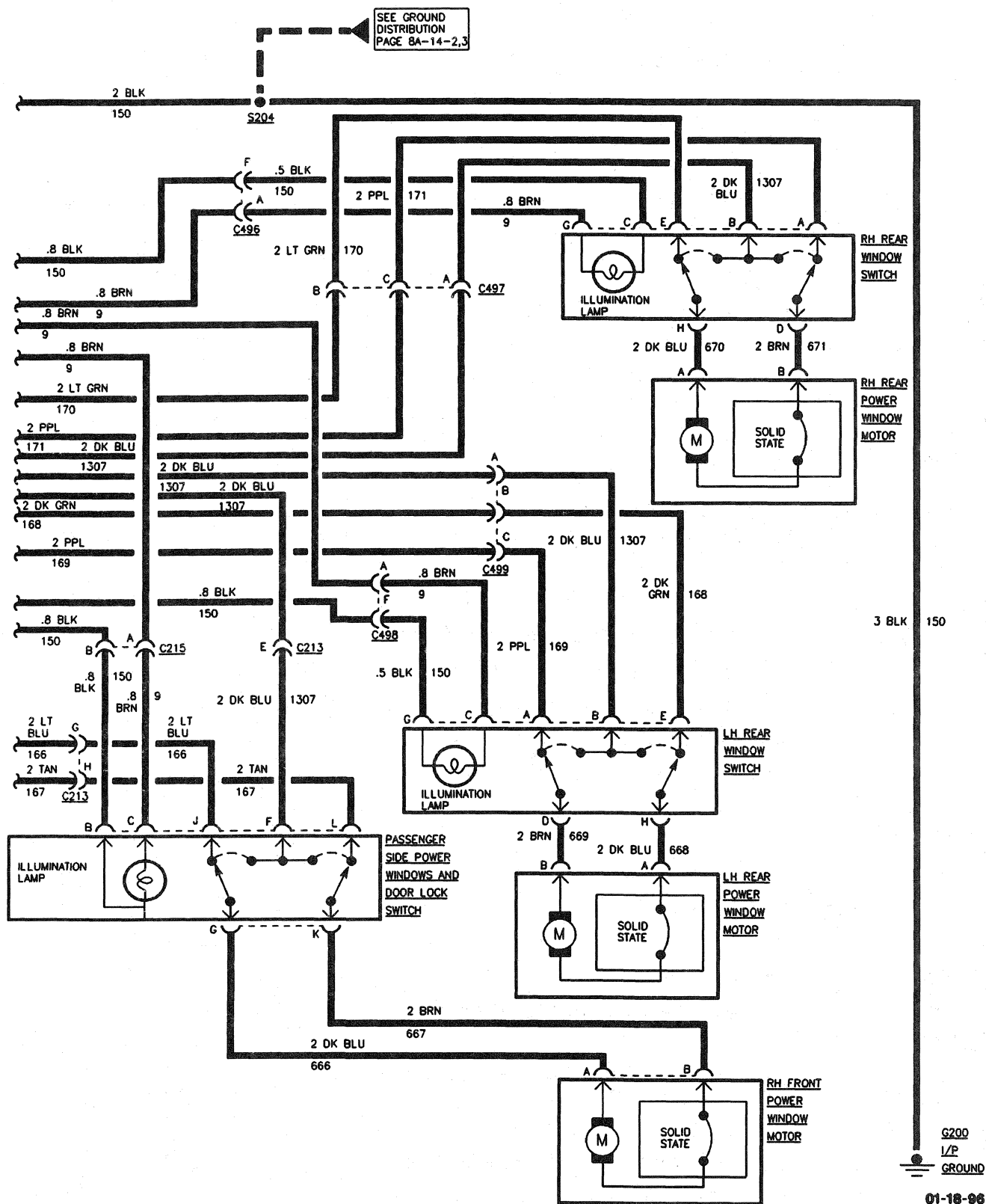
# 8A - 120 - 2 ELECTRICAL DIAGNOSIS

## POWER WINDOWS

4 DOOR (CREW CAB/SUBURBAN/UTILITY)







**8A - 120 - 4 ELECTRICAL DIAGNOSIS****POWER WINDOWS**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
I/P Fuse Block .....	Lower LH side of I/P .....	23 .....	35	
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P.....	23 .....	35	
Power Window Master Switch.....	On LH front Door.....	.....	.....	202-42
Power Window Motor, LH Front .....	In LH front Door .....	35 .....	56	
Power Window Motor, RH Front .....	In Door.....	35 .....	56	
Power Window Motor, LH Rear .....	In Door.....	36 .....	58	
Power Window Motor, RH Rear .....	In Door.....	36 .....	58	
Power Window Switch, RH Front .....	On Door Trim Panel			
Power Window Switch, LH/RH.....	On Door Trim Panel.....	.....	.....	202-27
<b>CONNECTORS:</b>				
C206.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-36
C208.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-36
C209.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-37
C210.....	At Convenience Center .....	23 .....	36.....	202-37
C213.....	Inside RH "A" Pillar, lower portion.....	35 .....	56.....	202-37
C215.....	Inside RH "A" Pillar, lower portion.....	35 .....	56.....	202-37
C298.....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
C496.....	RH "B" Pillar .....	36 .....	58.....	202-39
C497.....	RH "B" Pillar .....	36 .....	58.....	202-44
C498.....	LH "B" Pillar.....	36 .....	58.....	202-44
C499.....	LH "B" Pillar.....	36 .....	58.....	202-44
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S210 .....	Approx. 15 cm from Headlamp Dimmer Switch Connector			
S247 .....	Crossbody Harness, 6 cm right of LH rear Speaker Breakout			

COMPONENT	LOCATION	201-PG	FIG.	CONN
S251 .....	Crossbody Harness, approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch breakout			
S263 (Suburban/Crew Cab) .....	Crossbody Harness, approx. 6.5 cm from I/P Harness Breakout toward RH rear Door Breakout			
S266 (Utility/Pickup/Extended Cab) .....	Crossbody Harness, approx. 8 cm right of I/P Harness Breakout toward Door Lock Relay Breakout			
S500 .....	Inside left front Door Harness, near Tweeter.....	35	.....	56
S501 .....	Inside left front Door Harness, near Tweeter.....	35	.....	56
S502 .....	Inside left front Door Harness, near Tweeter.....	35	.....	56

## DIAGNOSIS - POWER WINDOW

### TROUBLESHOOTING HINTS:

- CHECK condition of PWR WDO Circuit Breaker. If Circuit Breaker is in good condition, use the following diagnostic procedures.
- CHECK condition of PK LPS Fuse, if Fuse is open, LOCATE and REPAIR source of overload. REPLACE Fuse.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected.

These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures,") page 8A-4-0.
- CHECK for mechanical failures or binding.
  - If the Auto Down feature does not operate, REPLACE the LH Window Master Switch.

### POWER WINDOW SWITCH ILLUMINATION LAMP(S) DO NOT LIGHT

TEST	RESULT	ACTION
1. Place Headlamp and Panel Dimmer Switch in " PARK." Disconnect suspect Window Switch. Connect test lamp from CKT 9 to ground.	Test lamp does not light.	REPAIR open in CKT 9.
	Test lamp lights.	GO to Step 2.
2. Connect test lamp from CKT 150 to CKT 9.	Test lamp does not light.	REPAIR open in CKT 150.
	Test lamp lights.	REPLACE Suspect Switch.

### POWER WINDOWS ONLY OPERATE FROM DRIVER'S WINDOW SWITCH (4 DOOR)

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Connect test lamp from CKT 1307 at affected Window Switch to ground.	Test lamp lights.	REPLACE respective Window Switch.
	Test lamp does not light.	REPAIR open in CKT 1307.

**8A - 120 - 6 ELECTRICAL DIAGNOSIS****POWER WINDOWS****POWER WINDOWS DO NOT OPERATE FROM DRIVER'S WINDOW SWITCH (4 DOOR)**

TEST	RESULT	ACTION
1. Place Ignition Switch in RUN. Disconnect LH Master Window Switch. Connect test lamp from CKT 343 to ground.	Test lamp lights.	REPLACE Master Window Switch.
	Test lamp does not light.	REPAIR open in CKT 343.

**NONE OF THE POWER WINDOWS OPERATE**

TEST	RESULT	ACTION
1. Place Ignition Switch in "RUN." Disconnect LH Master Window Switch. Connect test lamp from CKT 343 at Switch to ground.	Test lamp does not light.	REPAIR open in CKT 343.
	Test lamp lights.	GO to Step 2.
2. Connect test lamp CKT 343 to CKT 150 at Switch.	Test lamp does not light.	REPAIR open in CKT 150.
	Test lamp lights.	REPLACE LH Master Window Switch.

**LH FRONT WINDOW DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Disconnect LH Front Window Motor. Ignition Switch in "RUN." Press LH Front Window Switch in "UP" position. Connect test lamp from CKT 164 at LH Front Window Motor to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	CHECK/REPAIR open in CKT 164. If OK, REPLACE the LH Window Master Switch.
2. Connect test lamp from CKT 164 to CKT 165 at the LH Front Window Motor.	Test lamp lights.	REPLACE LH Front Window Motor.
	Test lamp does not light.	CHECK/REPAIR open in CKT 165. If OK, REPLACE the LH Window Master Switch.

**RH POWER WINDOW ONLY OPERATES FROM DRIVER'S SIDE WINDOW SWITCH (2 DOOR)**

TEST	RESULT	ACTION
1. Place Ignition Switch in ACC position. Connect test lamp from CKT 343 at RH Window Switch Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in CKT 343 from RH Window Switch Connector to splice S266.
2. Move RH Window Switch to UP position. Connect test lamp from CKT 666 at RH Window Switch Connector to ground.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	REPLACE RH Window Switch.
3. Move RH Window Switch to DOWN position. Connect test lamp from CKT 667 at RH Window Switch Connector to ground.	Test lamp does not light.	REPLACE RH Window Switch.

**RH POWER WINDOW DOES NOT OPERATE FROM EITHER SWITCH (2 DOOR)**

TEST	RESULT	ACTION
1. Place Ignition Switch in ACC position. Position and hold RH Window Switch to UP. Connect test lamp from CKT 666 at RH Window Switch Connector to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	GO to Step 3.
2. Connect test lamp from CKT 667 to CKT 666 at RH Window motor Connector.	Test lamp lights.	REPLACE RH Window Motor.
	Test lamp does not light.	GO to Step 4.
3. Connect test lamp from CKT 343 at LH Window Switch Connector to ground.	Test lamp lights.	GO to Step 4.
	Test lamp does not light.	LOCATE and REPAIR open in CKT 343 from LH Window Switch Connector to splice S266.
4. Connect test lamp from CKT 343 to CKT 166 at LH Window Switch Connector.	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	GO to Step 5.
5. Connect test lamp from CKT 343 to CKT 150 at LH Window Switch Connector.	Test lamp lights.	REPLACE LH Window Switch.
	Test lamp does not light.	LOCATE and REPAIR open in CKT 150 from LH Window Switch Connector.
6. Connect test lamp from CKT 343 to CKT 167 at LH Window Switch Connector.	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	REPLACE LH Window Switch.
7. Connect test lamp from CKT 343 to CKT 166 and then to CKT 167 at RH Window Switch Connector.	Test lamp lights at both wires (166 and 167).	REPLACE LH Window Switch.
	Test lamp lights at only one wire or not at all.	LOCATE and REPAIR open wires (166 and 167) from RH Window Switch Connector to master Switch Connector.

## **POWER WINDOWS**

### **CIRCUIT OPERATION**

#### **PICK-UP, CREW CAB, SUBURBAN, UTILITY**

A permanent Magnet Motor operates each of the Power Windows. Each Motor raises or lowers the glass when Voltage is supplied to it. The direction of the Motor turns depends on the polarity of the supply Voltage provided through the Switch.

The LH Master Window Switch controls all of the Window Motors. Each Window also has its own control Switch.

Each Motor is protected by a built-in Circuit Breaker. If a Window Switch is held too long with the Window obstructed or after the Window is fully up or down, the Circuit Breaker opens the Circuit. The Circuit Breaker resets automatically as it cools.

When the Ignition Switch is in RUN or ACC, Battery Voltage is supplied to the LH Master Window Switch and Window Lockout Switch through CKT 343.

When any of the UP Switches are operated, Battery Voltage is supplied to the Window Motor and is grounded through the DN contact. The Motor runs to drive the Window up. When Battery Voltage is supplied to the DN

Window Switch, the Window Motor runs in the opposite direction. The Window Motor is grounded through the UP contact. The Motor runs to drive the Window down.

#### **MASTER WINDOW SWITCH OPERATION**

When the Ignition Switch is in RUN or ACC, Battery Voltage is supplied to the Window Switch through the PWR WDO Circuit Breaker and the YEL (343) wire. When the UP Switch in the Window Switch is operated, Battery Voltage is supplied to the Window Motor through the DK BLU (164) wire. The Motor is grounded through the BRN (165) wire, DN contact in the Window Switch. The Motor runs to drive the Window up. When the DN Switch in the Window Switch is operated, Battery Voltage is supplied to the Window Motor in the opposite direction through the BRN (165) wire. The Window Motor is grounded through the DK BLU (164) wire, the UP contact in the Window Switch. The Motor runs to drive the Window down.

#### **FRONT DOOR WINDOW SWITCH LAMPS**

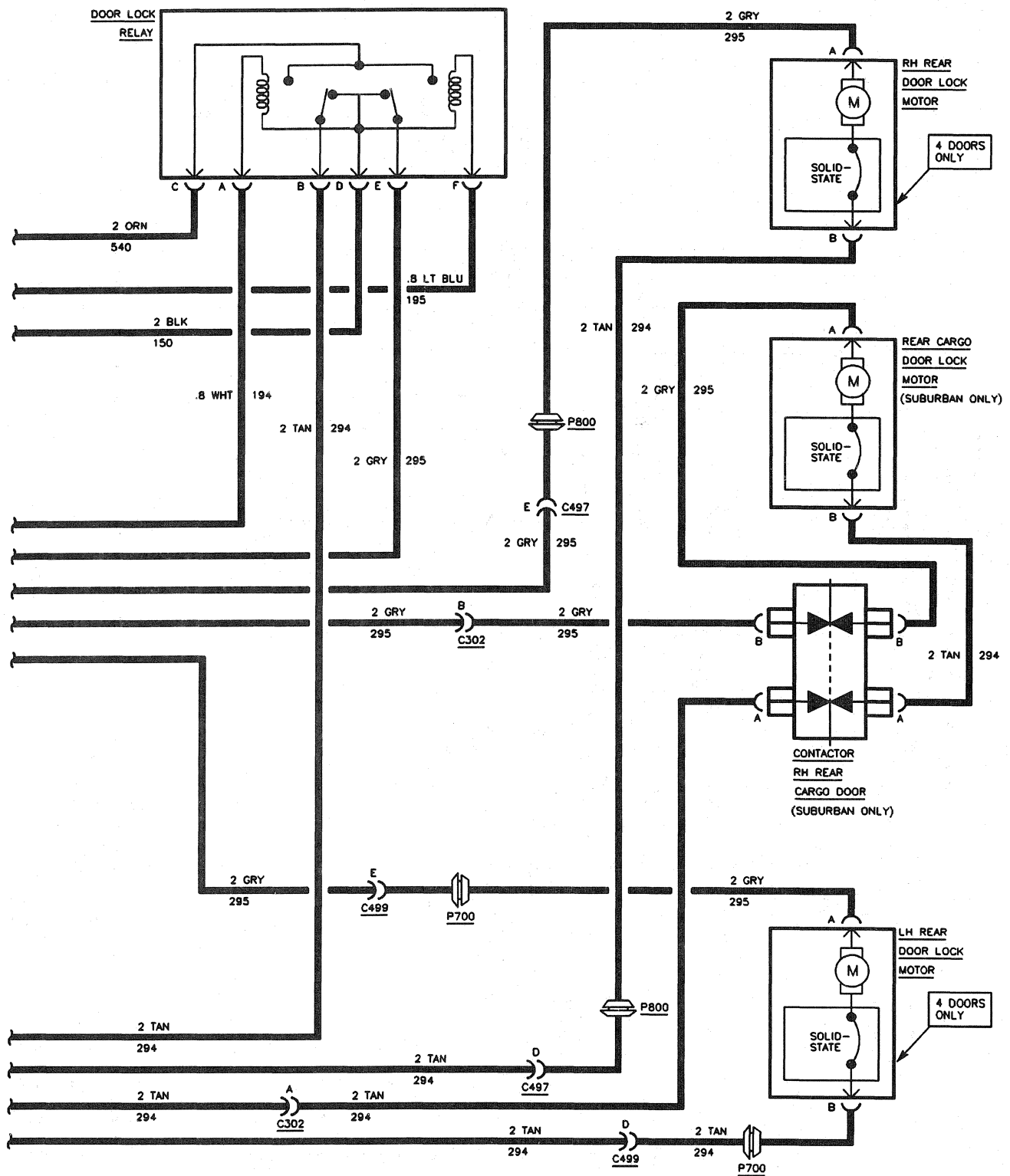
The Front Door Power Window Switches have illumination lamps built into the Switches. When the Headlamps or Park lamps are turned "ON," Voltage is supplied to the Switches through CKT 9.

**BLANK**





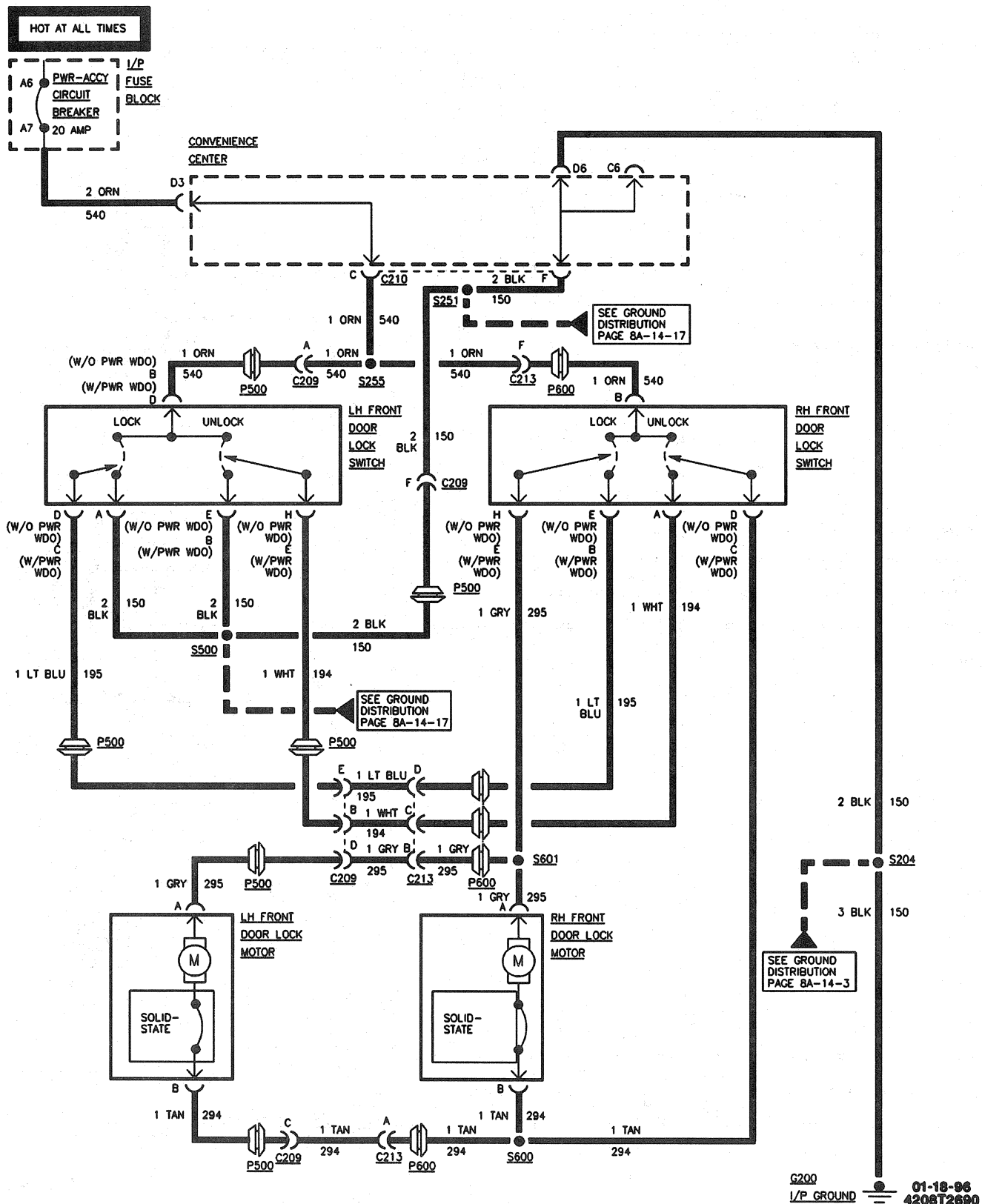
## POWER DOOR LOCKS



# 8A - 130 - 2 ELECTRICAL DIAGNOSIS

## POWER DOOR LOCKS

### 2 DOOR PICKUP AND EXTENDED CAB



COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	36	
Door Contact Switch, RH .....	Upper RH Rear Body Opening and Door			
Door Lock Motor, Rear Cargo .....	Inside Door .....	45	75	
Door Lock Motor, LH Front.....	Inside Door, near Free Edge Latch.....	35	56	
Door Lock Motor, RH Front.....	Inside Door, near Free Edge Latch.....	35	56	
Door Lock Motor, LH Rear .....	Inside Door, near Free Edge Latch.....	36	58	
Door Lock Motor, RH Rear.....	Inside Door, near Free Edge Latch.....	36	58	
Door Lock Switch, LH Front and Rear .....	On Door Trim Panel .....	35	56.....	202-27
Door Lock Switch, RH, Front and Rear .....	On Door Trim Panel .....	35	56.....	202-28
Door Lock Relay.....	Under Center Portion of I/P, near Remote Control Door Lock Reciver.....	32	51.....	202-40
I/P Fuse Block.....	Lower LH side of I/P .....	23	35	
<b>CONNECTORS:</b>				
C209 .....	Inside LH "A" Pillar, Lower Portion.....	35	56.....	202-37
C210 .....	At Convenience Center .....	23	36.....	202-37
C213 .....	Inside RH "A" Pillar, Lower Portion .....	35	56.....	202-37
C302 .....	LH Front Kick Panel .....	28	45.....	202-39
C497 .....	At RH "B" Pillar.....	36	58.....	202-44
C499 .....	LH "B" Pillar.....	36	58.....	202-44
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, Below Fuse Block			
<b>GROMMETS:</b>				
P500 .....	At LH Front door			
P600 .....	At RH Front door			
P700 .....	At LH Rear door			
P800 .....	At RH Rear door			
<b>SPLICES:</b>				
S204 .....	I/P Harness, 4 cm left of Steering Column Connector Breakout			
S251 .....	Crossbody Harness, Approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S255 .....	Crossbody Harness, 24 cm right of I/P Harness Breakout			
S256 .....	Crossbody Harness, Approx. 18.5 cm from Door Lock Relay Breakout toward I/P Harness Breakout			

## 8A - 130 - 4 ELECTRICAL DIAGNOSIS

### POWER DOOR LOCKS

COMPONENT	LOCATION	201-PG	FIG.	CONN
S257 .....	Crossbody Harness, 6 cm left from Door Lock Relay Breakout toward I/P Harness Breakout			
S258 (Suburban & Crew Cab) .....	Crossbody Harness, Approx. 3 cm from Seat Belt Switch Breakout			
S260 .....	Crossbody Harness, 6 cm from, Seat Belt Switch Breakout			
S261 .....	Crossbody Harness, 12 cm from Seat Belt Switch Breakout			
S264 (Suburban/Utility) .....	I/P Harness, Approx. 16 cm from I/P Cluster Breakout toward Radio			
S500 .....	Inside Left Front Door Harness, near Tweeter .....	35	.....	56
S600 .....	Inside RH Front Door Harness			
S601 .....	Inside RH Front Door Harness			

## DIAGNOSIS - POWER DOOR LOCKS

### TROUBLESHOOTING HINTS:

1. CHECK to see that PWR - ACCY Circuit Breaker and CIG LTR Fuse 13 are not open. If Fuse is open, LOCATE and REPAIR source of overload, then REPLACE Fuse. If Circuit Breaker is open, LOCATE and REPAIR source of overload, then CHECK Breaker for proper operation. If Breaker does not reset, REPLACE Breaker.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system

malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures,") page 8A-4-0.

Refer to Section 8A-132 for vehicles equipped with Remote Keyless Entry.

### POWER DOOR LOCKS DO NOT OPERATE FROM EITHER SWITCH (2-DOOR)

TEST	RESULT	ACTION
1. Connect test lamp from ORN (540) wire at LH Lock Switch Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (540) wire between Splice S255 and the Convenience Center Connector or from Convenience Center Connector to Fuse Block.
2. Connect test lamp from ORN (540) wire to BLK (150) wire(s) at LH lock switch Connector.	Test lamp lights.	REPLACE LH lock switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire(s) from Lock Switch Connector to Splice S500 or from Splice S500 to Connector C209 or from Connector C209 to Splice S251 or from Splice S251 to Convenience Center Connector C210 or from Convenience Center to Ground G200.

**BOTH SWITCHES ONLY OPEN ONE DOOR LOCK (2 DOOR)**

TEST	RESULT	ACTION
1. Move one of the Lock Switches to UNLOCK position. Disconnect Connector at Motor that is not working. Connect test lamp from TAN (294) wire at Lock Motor Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (294) wire from Lock Motor Connector to Splice S600.
2. Connect test lamp from GRY (295) wire to TAN (294) wire at inoperative Lock Motor Connector.	Test lamp lights.	REPLACE Lock Motor.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (295) wire from Lock Motor Connector to Splice S601.

**NONE OF THE DOOR LOCK MOTORS LOCK OR UNLOCK (4 DOOR)**

TEST	RESULT	ACTION
1. Connect test lamp from ORN (540) wire at LH Door Lock Switch Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (540) wire between Door Lock Relay Connector and Convenience Center Connector of from ORN (640) wire at Convenience Center to Fuse Block.
2. Connect test lamp from ORN (540) wire to BLK (150) wire at Door Lock Relay Connector.	Test lamp lights.	REPLACE LH door lock switch.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Door Lock Relay Connector and Splice S251 or between Splice S251 and Convenience Center Connector. Also check BLK (150) wire from Convenience Center to I/P Ground G200.
3. Connect test lamp from TAN (294) or GRY (295) wire(s) at Door Lock Relay Connector to ground. Move either Door Lock Switch to the lock or unlock position.	Test lamp lights on both wires.	LOCATE and REPAIR open in TAN (294)/GRY (295) wire(s) between Door Lock Relay Connector and Splice S260 or S258.
	Test lamp does not light on one or both wires.	REPLACE Door Lock Relay.

**BOTH SWITCHES ONLY OPEN ONE DOOR LOCK (4 DOOR)**

TEST	RESULT	ACTION
1. Move one of Lock Switches to UNLOCK position. Disconnect Door Lock Motor Connector at motor that is not working. Connect test lamp from TAN (294) wire at Lock Motor Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (294) wire from Lock Motor Connector to Splice S258.
2. Connect test lamp from GRY (295) wire to TAN (294) wire at inoperative Lock Motor Connector.	Test lamp lights.	REPLACE Door Lock Motor.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (295) wire from Lock Motor Connector to Splice S260.

**POWER DOOR LOCKS****POWER DOOR LOCKS ONLY WORK FROM ONE LOCK SWITCH (4 DOOR)**

TEST	RESULT	ACTION
1. Disconnect inoperative switch. Connect a test lamp from ORN (640) wire between inoperative switch and ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (640) wire between inoperative switch and Splice S256.
2. Connect fused jumper from inoperative Door Lock Switch Term. "D" to Term. "E," then to Term. "C."	Doors lock and unlock.	Replace Switch.
	Doors do not lock and unlock.	Check CKT 194 and CKT 195 for opens. REPAIR as necessary.

**POWER DOOR LOCKS ONLY WORK FROM ONE LOCK SWITCH (2 DOOR)**

TEST	RESULT	ACTION
1. Connect test lamp from ORN (540) wire at inoperative Lock Switch Connector to ground.	Test lamp lights.	REPLACE inoperative Lock Switch.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (540) wire from Lock Switch to Splice S255.

**CARGO DOOR LOCK MOTOR DOES NOT LOCK AND/OR UNLOCK (SUBURBAN)**

TEST	RESULT	ACTION
1. Open rear cargo doors. Connect test lamp from TAN (294) or GRY (295) wire(s) at Cargo Door contact button Connector to ground. Move either Door Lock Switch to the lock or unlock position.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in TAN (294) or GRY (295) wire(s) from Contact Button Connector to Splice(s) S260 or S258.
2. Close Cargo Doors. Connect test lamp from GRY (295) wire at Door Lock Motor Connector to ground. Move one Lock Switch to UNLOCK position.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (295) wire from Door Lock Motor Connector to Door Mounted Contact Button Connector.
3. Connect test lamp from GRY (295) wire to TAN (294) wire at Door Lock Motor Connector. Move one Lock Switch to LOCK and UNLOCK positions.	Test lamp lights in both positions.	REPLACE Cargo Door Lock Motor.
	Test lamp does not light in one or both positions.	LOCATE and REPAIR open in TAN (294) wire from Door Lock Motor Connector to Door Mounted Contact Button Connector.

## **CIRCUIT OPERATION**

When a Door Lock Switch is operated, all of the doors will LOCK or UNLOCK. Each lock can also be operated manually. The Locks are operated by Reversible Motors that receive Voltage from the PWR-ACCY Circuit Breaker. The Door Lock Switches operate to turn the Motors on by supplying Battery Voltage to one of the terminals and ground the other terminal.

When either Door Lock Switch is moved to the LOCK position, it completes the Circuit to the Motors. Voltage is supplied to the GRY (295) wire and to the Door Lock Motors, which are grounded by the TAN (294) wire from the other terminal of the Motor through the other switch contact and through the Door Lock Relay to the BLK (150) wire and Ground G200. The Motor in each door runs to operate the Door Locks. When the Door Lock Switch is released, the Circuit is opened and the Motors turn off.

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

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

## **CREW CAB AND SUBURBAN**

When a Door Lock Switch is operated, all of the Doors will LOCK or UNLOCK. Each lock can also be operated manually. The locks are operated by reversible

motors that receive voltage from the PWR-ACCY Circuit Breaker. The Door Lock Switches operate to turn the Motors on by supplying Battery voltage to one of the terminals and ground the other terminal.

When either Door Lock Switch is moved to the LOCK position, it completes the Circuit to the Motors. Voltage is supplied to the GRY (295) wire and to the Door Lock Motors, which are grounded by the TAN (294) wire from the other terminal of the Motor through the other switch contact and through the Door Lock Relay to the BLK (150) wire and Ground G200. The Motor in each door runs to operate the Door Locks. When the Door Lock Switch is released, the Circuit is opened and the Motors turn off.

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

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

## **REAR CARGO DOORS (SUBURBAN)**

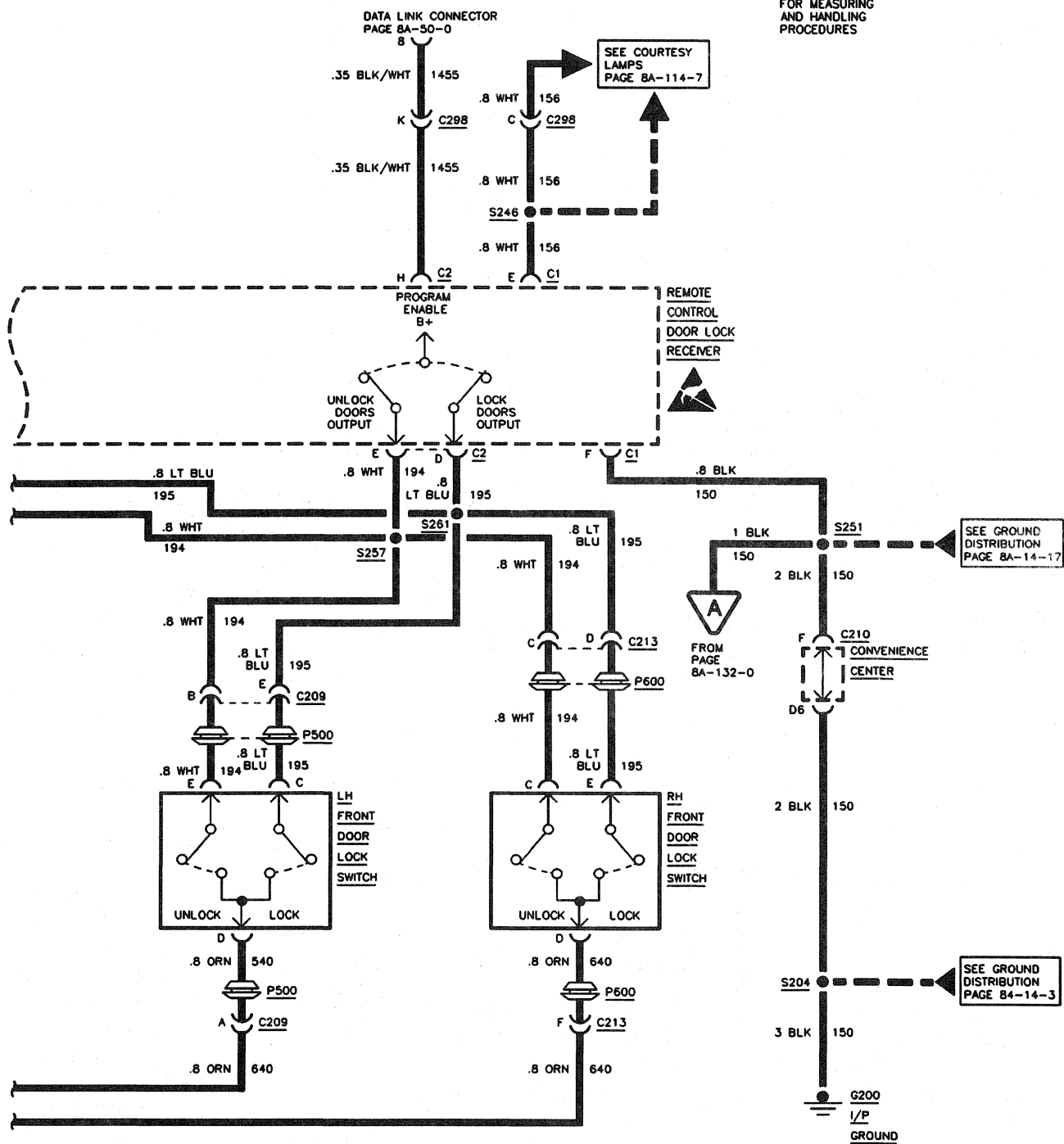
The Rear Cargo Doors must be fully closed for the Door Lock Motor to operate. The Door Lock Motor is located in the right rear Cargo Door. Contact Buttons are located on the Cargo Door opening on the body and also on the right rear Cargo Door.







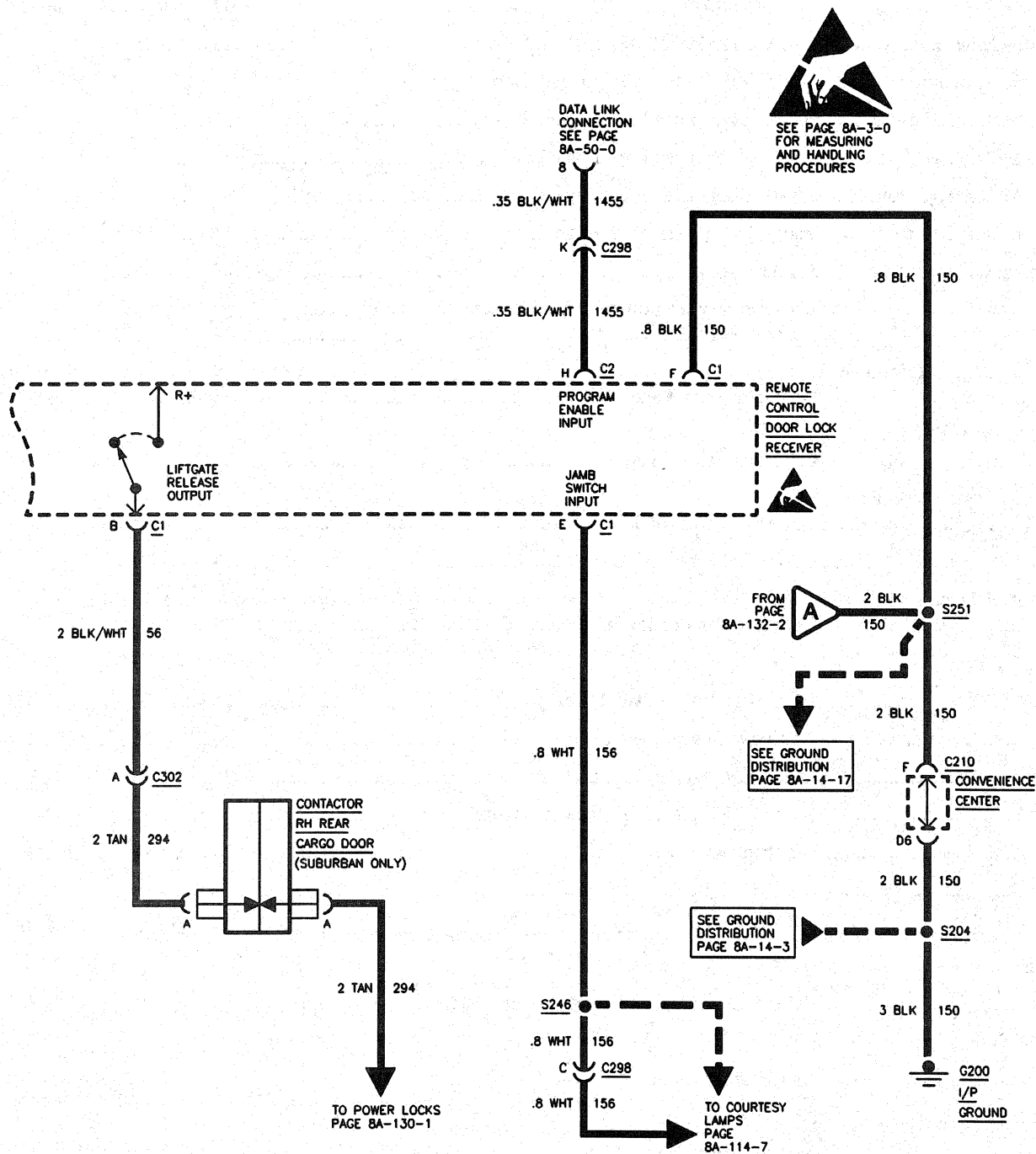
SEE PAGE 8A-3-0  
FOR MEASURING  
AND HANDLING  
PROCEDURES



## REMOTE KEYLESS ENTRY 4-DOOR VEHICLES



07-18-95  
4208T2686



## REMOTE KEYLESS ENTRY

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	36	
Cargo Door Contractor, RH .....	Under RH Body Opening and Door			
Door Lock Motor, LH front.....	Inside Door, near Free Edge Latch.....	35	56	
Door Lock Motor, LH rear .....	Inside Door, near Free Edge Latch.....	36	58	
Door Lock Motor, RH front .....	Inside Door, near Free Edge Latch.....	35	56	
Door Lock Motor, RH rear .....	Inside Door, near Free Edge Latch.....	36	58	
Door Lock Motor, rear Cargo...	Inside Door .....	45	75	
Door Lock Relay.....	Under center portion of I/P, near Remote Control Door Lock Receiver.....	32	51	202-40
Door Lock Switch, LH front & rear.....	On Door Trim Panel.....	35	56	202-27
Door Lock Switch, RH front & rear.....	On Door Trim Panel.....	35	56	202-28
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P .....	23	35	
I/P Fuse Block .....	Lower LH side of I/P .....	23	35	
Remote Control Door Lock Receiver.....	Under center portion of I/P .....	25	39	
<b>CONNECTORS:</b>				
C209.....	Inside LH "A" Pillar, lower portion .....	35	56	202-37
C210.....	At Convenience Center .....	23	36	202-37
C213.....	Inside RH "A" Pillar, lower portion.....	35	56	202-37
C298.....	Behind LH side of I/P, near Convenience Center .....	23	35	202-7
C302.....	LH front Kick Panel .....	28	45	202-39
C497.....	RH "B" Pillar.....	36	58	202-44
C499.....	LH "B" Pillar .....	36	58	202-44
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
<b>GROMMETS:</b>				
P500 .....	At LH front Door			
P600 .....	At RH front Door			
P700 .....	At LH rear Door			
P800 .....	At RH rear Door			
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S213 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout toward cluster			

COMPONENT	LOCATION	201-PG	FIG.	CONN
S246 .....	Crossbody Harness, approx. 41.5 cm from LH Door Harness Breakout toward rear Speaker Breakout			
S251 .....	Crossbody Harness, approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S255 .....	Crossbody Harness, 24 cm right of I/P Harness Breakout			
S256 .....	Crossbody Harness, approx. 18.5 cm from Door Lock Relay Breakout toward I/P Harness Breakout			
S257 .....	Crossbody Harness, 6 cm left of Door Lock Relay Breakout toward I/P Harness Breakout			
S258 (Suburban & Crew Cab)..	Crossbody Harness, 3 cm from Seat Belt Switch Breakout			
S260 .....	Crossbody Harness, 6 cm from Seat Belt Switch Breakout			
S261 .....	Crossbody Harness, 12 cm from Seat Belt Switch Breakout			
S264 (Suburban/Utility) .....	I/P Harness, approx., 16 cm from I/P Cluster Breakout toward Radio			

## DIAGNOSIS - REMOTE KEYLESS ENTRY

### TROUBLESHOOTING HINTS:

1. CHECK that Ground G200 is clean and tight.
2. CHECK the GAGE Fuse by observing the Instrument Cluster Gages.
3. CHECK CIG LTR Fuse by operating the CIGAR LIGHTER.
4. CHECK condition of PWR ACCY Circuit Breaker for an open condition. If breaker is open, LOCATE and REPAIR source of overload.
5. Always check Terminal contact before replacing any Component.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring Fuse Voltage drop with the system operational (under load).
6. If a second Transmitter is available, try it. If it works, change the Batteries in the first Transmitter and try again. If it still doesn't work, it is defective.
7. CHECK Portable Transmitter Battery Terminals. They should be clean and make good contacts with the Battery.
8. If in doubt as to the condition of the Transmitter Batteries, REPLACE them with new ones. CHECK Battery Voltage with a DVOM may give results. REFER to SECTION 9K for Remote Control Door Lock Receiver access and additional information. CHECK for a broken (or partially broken) wire inside of the insulation which could cause system failure but prove "GOOD" in Continuity /Voltage check (see "Troubleshooting Procedure," page 8A-4-0).

**8A - 132 - 6 ELECTRICAL DIAGNOSIS****REMOTE KEYLESS ENTRY****KEYLESS ENTRY DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Does the RH Door Lock operate from either of the vehicle's Power Door Lock Switches?	Yes	GO to step 2.
	No	REFER to 8A-130 for diagnosis of Power Door Locks.
2. Does the Rear Window operate from vehicle's Rear Window Release Switch?	Yes	GO to step 3.
	No	REFER to Rear Window Release in 8A-134.
3. Does LH Power Door Lock operate from either of vehicle's Power Door Lock Switches?	Yes	GO to step 8.
	No	GO to step 4.
4. Jumper Remote Control Door Lock Receiver Connector C1 Terminal D to ground. Does LH Power Door Lock now lock from either Power Door Lock Switch?	Yes	GO to step 5.
	No	GO to step 6.
5. Connect ohmmeter between BLK (150) wire at Remote Control Door Lock Receiver Connector C1 and ground. Is ground okay?	Yes	REPLACE Remote Control Door Lock Receiver and reprogram replacement module.
	No	REPAIR open in BLK (150) wire.
6. Measure Voltage at Terminal A GRY (295) wire of LH Front Door Lock motor with either Power Door Lock Switch held in lock. Is Battery Voltage present?	Yes	GO to step 7.
	No	REPAIR open GRY (295) wire.
7. Measure Voltage between Terminal B TAN (694) wire and A GRY (295) wire at LH Front Door Lock motor with either Power Door Lock Switch held in lock. Is Battery Voltage present?	Yes	REPLACE LH Door Lock motor.
	No	REPAIR open in TAN (294 or 694) wire from Motor Connector to Remote Control Door Lock Receiver Connector.
8. Is Luggage Compartment release function not operating?	Yes	GO to "Rear Window Release Function Not Operating, All Other Functions Operate" Troubleshooting chart.
	No	GO to step 9.
9. Do any Transmitter functions operate?	Yes	GO to step 10.
	No	GO to "Transmitter Functions Do Not Operate" Troubleshooting chart.
10. Obtain known good Transmitter. Jumper program Connector. Operate Transmitter by pressing a single button once. Disconnect Jumper from Program Connector. Does known good Transmitter operate all Remote Keyless Entry functions?	Yes	GO to step 12.
	No	REPAIR open in WHT (194) wire and reprogram Remote Control Door Lock Receiver.
11. Measure Voltage at Terminal E WHT (194) wire at Remote Control Door Lock Receiver Connector C2 while pressing either of Power Door Lock Switches in unlock position. Is Battery Voltage present?	Yes	GO to step 12.
	No	REPAIR open in WHT (194) wire and reprogram Remote Control Door Lock Receiver.

TEST	RESULT	ACTION
12. Measure Voltage at Terminal D LT BLU (195) wire at Remote Control Door Lock Receiver Connector C2 while pressing either of Power Door Lock Switches in lock position. Is Battery Voltage present?	Yes	REPLACE Remote Control Door Lock Receiver. Reprogram replacement Remote Control Door Lock Receiver to portable Transmitter.
	No	REPAIR open in LT BLU (195) wire and reprogram Remote Control Door Lock Receiver.

**KEYLESS ENTRY DOES NOT OPERATE PROPERLY**

TEST	RESULT	ACTION
1. Place Ignition Switch in "RUN." Disconnect Remote Control Door Lock Receiver. Test lamp CKT 39 to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	REPAIR open in CKT 39.
2. Test lamp CKT 540 at Connector C1 Terminal "A" to ground.	Test lamp lights.	GO to Step 3.
	Test lamp does not light	REPAIR open in CKT 540. Reprogram Remote Control Door Lock Receiver.
3. Test lamp CKT 39 to CKT 150.	Test lamp lights.	GO to Step 4.
	Test lamp does not light.	REPAIR open in CKT 150.
4. Test lamp CKT 694 to Battery.	Test lamp lights.	GO to Step 5.
	Test lamp does not light.	REPAIR open in CKT 694.
5. Place RH Front Door Lock Switch in "LOCK" position. Test lamp CKT 195 to ground.	Test lamp lights.	GO to Step 6.
	Test lamp does not light.	REPAIR open in CKT 195.
6. Place RH Front Door Lock Switch in "UNLOCK" position. Test lamp CKT 194 to ground.	Test lamp lights.	GO to Step 7.
	Test lamp does not light.	REPAIR open in CKT 194.
7. Replace Transmitter Batteries with fresh ones if condition of Batteries is unknown.	System operates normal.	System is OK.
	System does not operate normal.	GO to Step 8.
8. Jumper Remote Keyless Entry CKT 1455 Program wire to CKT 150.	Doors lock and unlock.	GO to Step 9.
	Doors do not lock and unlock.	GO to Step 10.
9. Leave jumper connected. Obtain known good Transmitter. Operate Transmitter by pressing a single button once. disconnect Jumper from CKT 1455.	System operates normal.	REPLACE inoperative Transmitter. Reprogram Remote Control Door Lock Receiver to replacement Transmitter.
	System does not operate normal.	REPLACE Remote Control Door Lock Receiver. Reprogram replacement Remote Control Door Lock Receiver to Transmitter.
10. Disconnect program Connector jumper. Test lamp CKT 1455 to Battery.	Test lamp lights.	REPAIR short to ground in CKT 1455. Reprogram Remote Control Door Lock Receiver.
	Test lamp does not light.	REPLACE Remote Control Door Lock Receiver. Reprogram replacement Remote Control Door Lock Receiver to Transmitter.

**8A - 132 - 8 ELECTRICAL DIAGNOSIS****REMOTE KEYLESS ENTRY****ONLY REAR WINDOW CARGO DOOR RELEASE FUNCTION DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Place transmission in PARK. Press Rear Window Release Switch on I/P.	Endgate opens.	GO to Step 2.
	Endgate does not open.	GO to Rear Window Release SECTION 8A-134.
2. Use a known good Transmitter. Disconnect Remote Control Door Lock Receiver. Test lamp CKT 640 (Utility w/ Liftgate) or CKT 540 (Utility w/ Cargo Doors, Crew Cab, Suburban) to ground.	Test lamp lights.	GO to Step 3.
	Test lamp does not light.	REPAIR open in CKT 540 or CKT 640 respectively.
3. Test lamp CKT 294 to Battery.	Test lamp lights.	Replace Remote Control Door Lock Receiver. Reprogram module to Transmitter.
	Test lamp does not light.	REPAIR open in CKT 294.
4. Connect Voltmeter at Terminal B of Remote Control Door Lock Receiver Connector C1. Press Transmitter to open Rear Window. Is there Battery Voltage?	Yes.	LOCATE and REPAIR open in BLK (56) wire from Module Connector C1 to Liftgate Glass Release Motor.
	No.	REPLACE Remote Control Door Lock Receiver REPROGRAM Module to Transmitter.

**TRANSMITTER FUNCTIONS DO NOT OPERATE**

TEST	RESULT	ACTION
1. Replace Transmitter Batteries with fresh ones if condition of Batteries is unknown. Does Transmitter now operate all remote central functions?	Yes	Return vehicle to customer.
	No	GO to step 2.
2. Jumper Remote Keyless Entry BLK/WHT (1455) Program wire to ground BLK (150) wire at Keyless Entry Programming Connector. Do all Power Doors lock and unlock?	Yes	GO to step 3.
	No	GO to step 4.
3. Leave jumper connected. Obtain known good Transmitter. Operate Transmitter by pressing a single button once. Disconnect jumper from Program Connector. Does known good Transmitter now operate all remote central functions?	Yes	REPLACE inoperative Transmitter. Reprogram Remote Control Door Lock Receiver to replacement Transmitter.
	No	REPLACE Remote Control Door Lock Receiver. Reprogram replacement Remote Control Door Lock Receiver to Transmitter.
4. Disconnect program Connector jumper. CHECK BLK/WHT (1455) wire for short to ground. Is wire shorted to ground?	Yes	REPAIR BLK/WHT (1455) wire and reprogram Remote Control Door Lock Receiver.
	No	GO to step 5.
5. Measure Voltage at Remote Control Door Lock Receiver Connector C1 Terminal A ORN (540) wire. Is Battery Voltage present?	Yes	REPAIR ORN (540) wire and reprogram Remote Control Door Lock Receiver.
	No	REPLACE Remote Control Door Lock Receiver. Reprogram replacement Remote Control Door Lock Receiver to Transmitter.



## **CIRCUIT OPERATION**

### **POWER DOOR LOCKS/REMOTE KEYLESS ENTRY**

The Power Door Locks/Remote Keyless Entry control system allows the driver to operate the vehicle Door Locks and Rear Window Release from outside the vehicle using a hand-held radio Transmitter. The Transmitter operates in the UHF band; it sends coded signals to the Remote Control Door Lock Receiver. The Remote Control Door Lock Receiver detects and decodes the signal and issues signals to control the Door Locks and Rear Window Release. These systems can also be operated in the usual manner; for instance, the Door Locks will respond to the Power Door Lock Switches. For information on the operation of the Rear Window Release System, REFER to Page 8A-134-0.

### **DOOR LOCK OPERATION - SWITCHES**

#### **LOCK**

When either the LH or RH Front Power Door Lock Switches are pressed to the LOCK position, Voltage is supplied from the PWR ACC Circuit Breaker, through the ORN (540) wire, through the Door Lock Switch to Terminal F of the Door Lock Relay Assembly. This Voltage energizes the Lock Relay Coil, allowing Voltage to flow through the relay to the Door Lock Motors, locking all doors. Ground for the LH Front Door Lock Motor is supplied through the Remote Control Door Lock Receiver. Ground for the other three motors is supplied through the Door Lock Relay Assembly.

#### **UNLOCK**

When either of the Front Door Lock Switches is pressed to the UNLOCK position, Voltage is supplied from PWR ACC unlocking the doors. Ground for the Motors is supplied through the Door Lock Relay.

### **DOOR LOCK OPERATION - REMOTE KEYLESS ENTRY**

#### **LOCK**

When the LOCK button is pressed on the Transmitter and the Remote Control Door Lock Receiver receives a signal with a valid Vehicle Access Code (VAC), the lock function sequence is performed. The Remote Control Door Lock Receiver will lock all doors.

The Remote Control Door Lock Receiver supplies Battery Voltage from Connector C2 Terminal D to the coil of the Lock Relay (part of the Door Lock Relay Assembly)

through the CKT 195 wire. The Lock Relay is energized, and Battery Voltage is supplied to the Door Lock Motors. Ground for the LH Door Lock Motor is provided at the Remote Control Door Lock Receiver Connector C1 Terminal D through internal contacts. Ground for the other Door Lock motors is provided through the contacts of the UNLOCK Switch, inside the Door Lock Relay Assembly. All Door Lock motors run to Lock all Doors.

#### **UNLOCK**

The unlock function is separated into two operations depending on how the UNLOCK button is pressed on the Transmitter. If the UNLOCK button is pressed once, only the LH Door is unlocked. If the UNLOCK button is pressed twice within one to five seconds, the other doors will be unlocked.

When the UNLOCK button is pressed once on the Transmitter and the Remote Control Door Lock Receiver receives a valid VAC, the unlock function sequence is performed. The Remote Control Door Lock Receiver supplies Battery Voltage to the LH Front Door Lock Motor through the CKT 694 wire. The motor is grounded through the contacts of the Lock Switch inside the Door Lock Relay Assembly. The LH Door Lock Motor runs to unlock the LH Front Door.

If the UNLOCK button on the Transmitter is pressed twice to UNLOCK all doors, the Remote Control Door Lock Receiver activates the door UNLOCK output at Connector C2 Terminal E. The Remote Control Door Lock Receiver supplies Battery Voltage to the coil of the unlock relay in the Door Lock Relay Assembly. The unlock relay is energized and closes its contacts. Battery Voltage is supplied to the RH Front, LH Rear and RH Rear Door Lock Motors. The motors are grounded through contacts of the Lock Switch, inside the Door Lock Relay Assembly. The Motors run to unlock the RH Front, LH Rear and RH Rear doors.

### **REAR WINDOW RELEASE**

When the Rear Window Release button is pressed on the Transmitter and the Remote Control Door Lock Receiver receives a valid VAC, the Remote Control Door Lock Receiver supplies Battery Voltage at its Connector C1 Terminal B. This Battery Voltage is then applied to the Liftgate Glass Release Motor.

### **WITH AUTO TRANSMISSION**

Ground for the Liftgate Glass Release Motor is supplied through the Park/Neutral Position Switch only in the PARK or NEUTRAL position. This prevents the window from being opened while the vehicle is being driven.

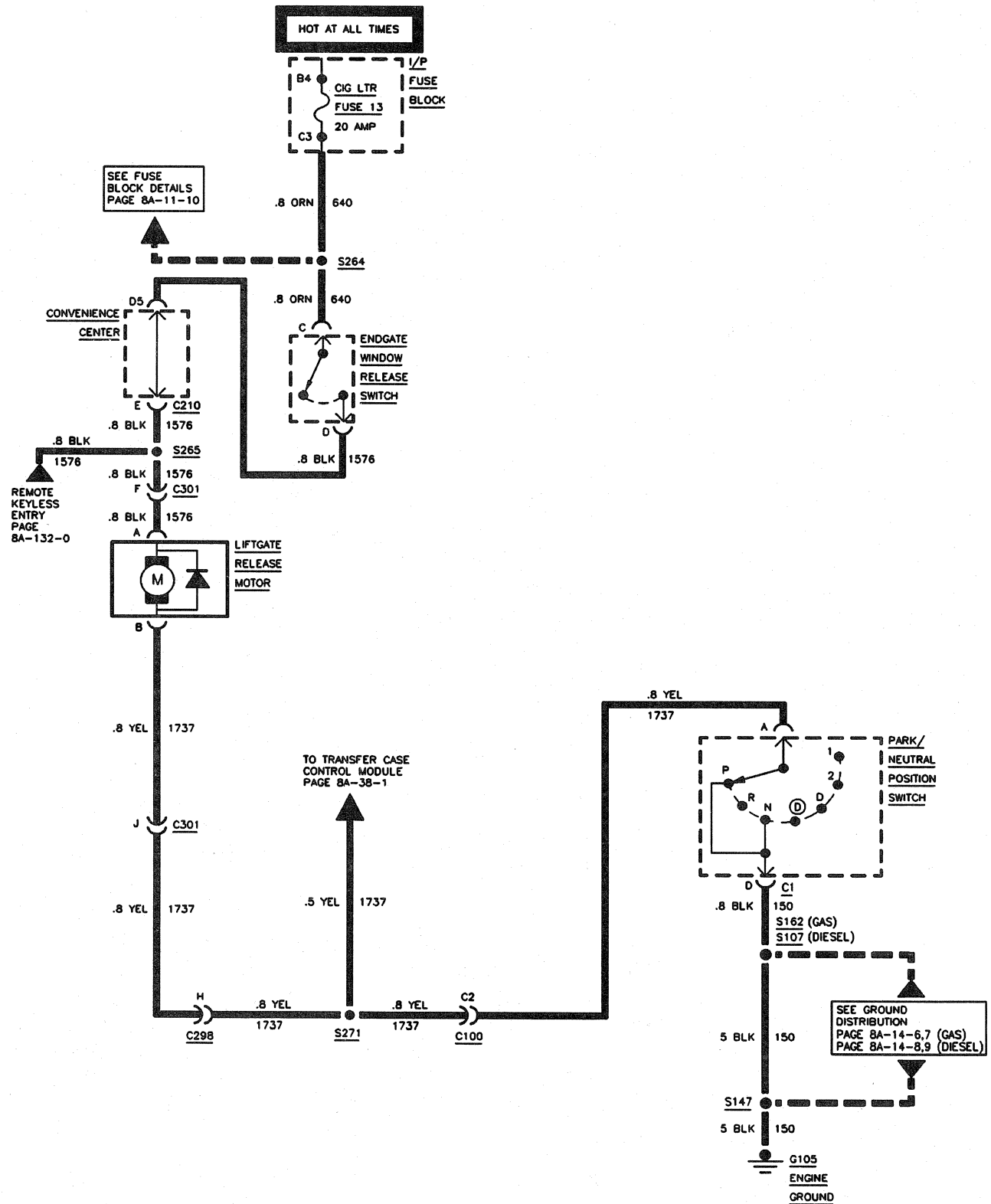
**REMOTE KEYLESS ENTRY**

**WITH MANUAL TRANSMISSION**

Ground for the Liftgate Glass Release Motor is supplied through the Park Brake Switch. This prevents the window from being opened while the vehicle is being driven.

**BLANK**

## REAR LIFTGATE WINDOW RELEASE



**REAR LIFTGATE WINDOW RELEASE**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
Endgate Window Release Switch.....	Center of I/P			
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
Liftgate Release Motor .....	In Liftgate .....	38 .....	61	
Park/Neutral Position Switch.....	On LH side center of Transmission.....	17 .....	25	
<b>CONNECTORS:</b>				
C100 .....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C210 .....	At Convenience Center .....	23 .....	36.....	202-37
C298 .....	Behind LH side of I/P, near Convenience Center .....	23 .....	35.....	202-7
C301 .....	LH front Kick Panel .....	28 .....	45.....	202-11
<b>GROUND:</b>				
G105 (Gas) .....	RH Front of Engine Block.....	9 .....	15	
G105 (Diesel) .....	RH top of Cylinder Head.....	15 .....	21	
<b>SPLICES:</b>				
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout toward Taillamp Extension Breakout			
S147 (VIN J).....	Engine Harness, approx. 5 cm from Fuel Injector Breakout toward Taillamp Harness Breakout			
S147 (Diesel).....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH side)			
S264 (Suburban/Utility) .....	I/P Harness, approx. 16 cm from I/P Cluster Breakout toward Radio			
S265 (Suburban/Utility) .....	Crossbody Harness, 6 cm left of LH Door Breakout			
S271 (Suburban/Utility) .....	I/P Harness, approx. 5 cm into Crossbody Harness Breakout			

**DIAGNOSIS - REAR LIFTGATE WINDOW RELEASE****TROUBLESHOOTING HINTS:**

1. CHECK to see that CIG LTR Fuse is not open. If Fuse is open, LOCATE and REPAIR source of overload, then REPLACE Fuse.
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when

loaded and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures" page 8A-4-0.)
2. CHECK for mechanical binding of linkage.

## 8A - 134 - 2 ELECTRICAL DIAGNOSIS

### REAR LIFTGATE WINDOW RELEASE

#### REAR WINDOW RELEASE DOES NOT OPERATE

TEST	RESULT	ACTION
1. With Transmission in Park or Neutral, press and hold Rear Liftgate Release Switch. Test lamp Term "D" to ground of Switch.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	CHECK/REPAIR open in CKT 640. If OK, REPLACE Rear Liftgate Release Switch.
2. Disconnect Liftgate Release Motor. Test lamp Term "B" to Battery. Press and hold Switch.	Test lamp lights.	CHECK/REPAIR open in CKT 1576. If OK, REPLACE Liftgate Release Motor.
	Test lamp does not light.	GO to Step 3.
3. Disconnect Park/Neutral Position Switch. Press and hold Switch. Test lamp Park/Neutral Position Switch Term "A" to ground.	Test lamp lights.	CHECK/REPAIR CKT 150. If OK, REPLACE Park/Neutral Position Switch.
	Test lamp does not light.	REPAIR open in CKT 1737.

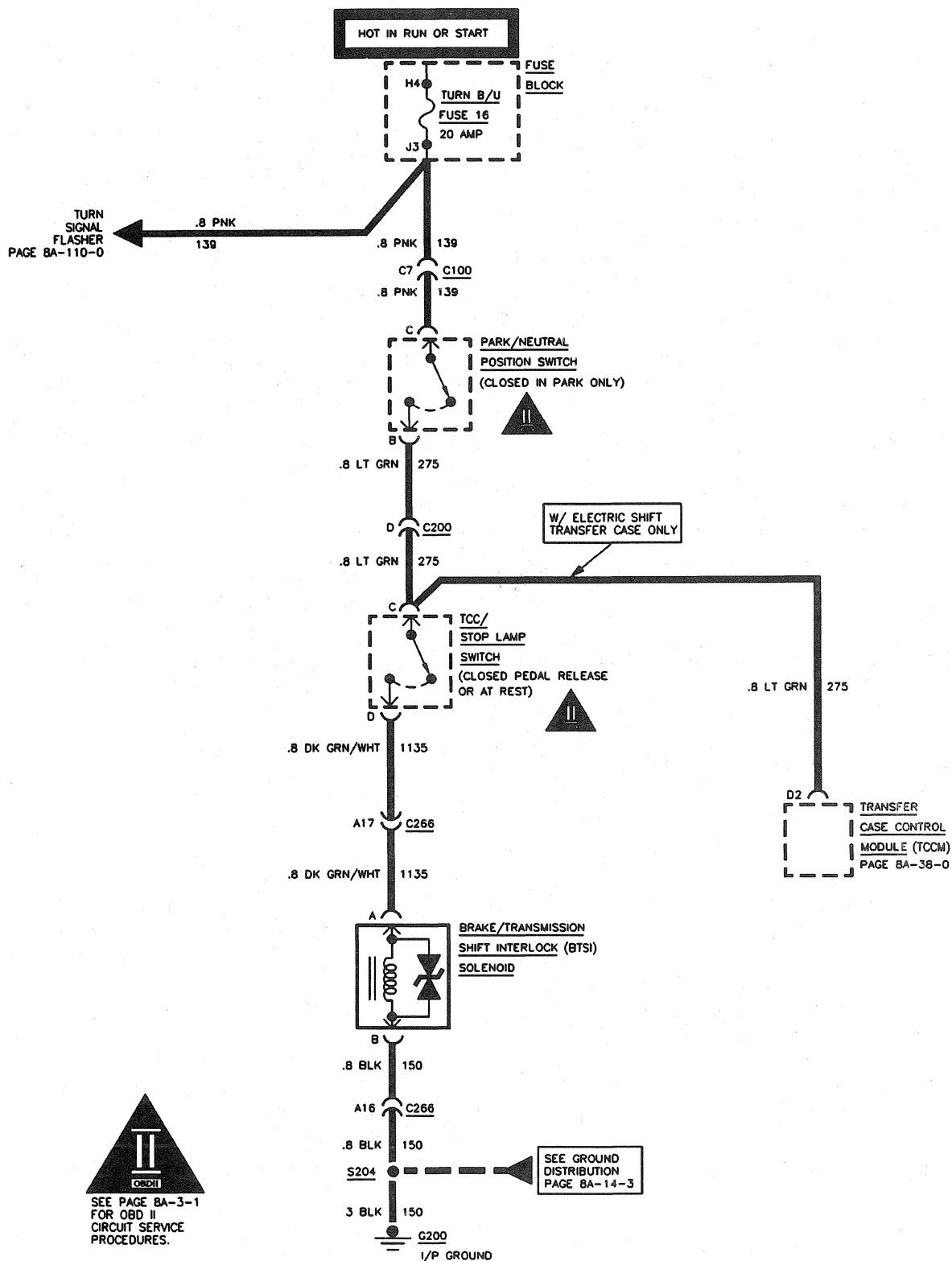
#### CIRCUIT OPERATION

Voltage to the Rear Window Release system is available at all times through the CIG LTR Fuse and CKT 640. Ground for the Rear Window Release Motor is provided through CKT 1737 through the Park/Neutral Position Switch on Automatic Transmissions.

This Switch is closed to ground with the Transmission in PARK or NEUTRAL. Closing the Rear Liftgate Window Release Switch allows current to flow through the Switch and CKT 1576 to the Rear Liftgate Window Release Motor.

**BLANK**

BRAKE TRANSMISSION SHIFT INTERLOCK (BTSI)





COMPONENT	LOCATION	201-PG	FIG.	CONN
Brake/Transmission Shift Interlock (BTSI) Solenoid.....	RH side of Steering Column, under Support Bracket			
I/P Fuse Block.....	Lower LH side of I/P.....	23	35	
Park/Neutral Position Switch.....	On LH side center of Transmission.....	17	25	
TCC/Stoplamp Switch.....	Top of Brake Pedal.....	27	43	
<b>CONNECTORS:</b>				
C100.....	LH Rear of Engine Compartment at Bulkhead.....	22	33	202-0
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24	38	202-4, 5
C266.....	LH side of Steering Column, near Bulkhead.....	27	43	202-8
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse block			
<b>SPLICES:</b>				
S204.....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			

## DIAGNOSIS - BRAKE TRANSMISSION SHIFT INTERLOCK (BTSI)

### TROUBLESHOOTING HINTS:

1. The shift lever should lock in "PARK" with the key in the "RUN" position and the Brake Pedal in the rest position. If the shift lever can be moved from the "PARK" position, with the key in the "RUN" position and without depressing the Brake Pedal, check Turn Signal operation. If the Turn Signals do not operate correctly, check Fuse #16 (Turn/Back-up) to see if it is open (the Turn Signal Flasher is on the same circuit as BTSI). If the Fuse is open, find and the repair source of the overload, then replace Fuse. If the Fuse is good (Turn Signals operate correctly), continue with diagnostics.
- CHECK for a broken (or partially broken ) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket Electronic Equipment which may affect the integrity of other systems. (see "Troubleshooting Procedures" 8A-4-0).
2. With the key in the "OFF" position, the Shift Lever should not move from the "Park" position. If it does, the problem may be with the BTSI Solenoid, or the Shift Linkage itself. If the shift linkage is binding, refer to SECTION 7A14D, page 4 (4L60E Transmission), or 7A17D, page 4 (4L80E Transmission), in the C/K Truck Service Manual. If the shift linkage does not appear to be binding, continue with BTSI Diagnostics.
3. If the Park/Neutral Position (PNP) Switch needs Adjustment or Replacement, refer to SECTION 7A14D, page 5 (4L60E Transmission), or 7A17D, page 5 (4L80E Transmission), in the C/K Truck Service Manual.
4. To REMOVE, Disconnect, or Adjust the BTSI Solenoid assembly, refer to SECTION 3F4, page 12, of the C/K Truck Service Manual.

**8A - 138 - 2 ELECTRICAL DIAGNOSIS****BRAKE TRANSMISSION SHIFT INTERLOCK (BTSI)****TRANSMISSION SELECTOR LEVER IS LOCKED IN PARK WITH KEY ON AND BRAKE PEDAL DEPRESSED**

TEST	RESULT	ACTION
1. With key in RUN position, Shift Lever in Park, disconnect BTSI Solenoid Connector.	Shift Linkage unlocks.	GO to step 2.
	Shift Linkage stays locked.	GO to step 3.
2. Check Continuity through BTSI portion of TCC/Stoplamp Switch (Pins C & D) with Brake Pedal depressed.	Continuity	REPLACE TCC/Stoplamp Switch.
	No Continuity	LOCATE and REPAIR short to B+ in DK GRN/WHT (1135) wire between TCC/Stoplamp Switch and BTSI solenoid.
3. REMOVE BTSI Solenoid assembly. Refer to SECTION 3F4, page 12, of the C/K Truck Service Manual.	Shift Linkage unlocks.	REPLACE BTSI Solenoid.
	Shift Linkage stays locked.	Shift Linkage is binding. Refer to SECTIONS 7A14D, page 4 (4L60E Transmission), or 7A17D, page 4 (4L80E Transmission), in the C/K Truck Service Manual.

**SHIFT LEVER WILL NOT LOCK IN PARK POSITION**

TEST	RESULT	ACTION
1. CHECK Fuse # 16 (Turn-B/U) to see if it is open.	Fuse # 16 is open.	LOCATE and REPAIR source of overload. REPLACE Fuse.
	Fuse # 16 is OK.	GO to step 2.
2. With key in the RUN position and Shift Lever in PARK, CHECK for B+ Voltage at Fuse # 16.	No Voltage	GO to step 3.
	B+ Voltage	GO to step 4.
3. Disconnect Connector C266. Check for Continuity between Pins C5 and D5 of the Ignition Switch side of Connector C266 with key in RUN position.	If Continuity.	LOCATE and REPAIR open in PNK (3) wire between Connector C266 and Fuse Block.
	If no Continuity.	REPLACE Ignition Switch. Refer to SECTION 3F4, page 8, of C/K Truck Service Manual.
4. With key in the RUN position and Shift Lever in PARK, connect test lamp from LT GRN (275) to ground, at Park/Neutral Position (PNP) Switch Connector.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	GO to step 6.
5. Connect test lamp from LT GRN (275) to ground, at TCC/Stoplamp Switch Connector.	Test lamp lights.	GO to step 7.
	Test lamp does not light.	LOCATE and REPAIR open in LT GRN (275) wire between PNP Switch and TCC/Stoplamp Switch.
6. Connect test lamp from PNK (139) wire to ground at PNP Switch Connector.	Test lamp lights.	Adjust PNP Switch and repeat step 4 until test lamp lights. Refer to SECTION 7A14D, page 5 (4L60E Trans) or 7A17D, page 5 (4L80E Trans), in the C/K Truck Service Manual. If adjustment doesn't help, REPLACE PNP Switch.
	Test lamp does not light.	LOCATE and REPAIR open in PNK (139) wire between Fuse Block and PNP Switch.

**BRAKE TRANSMISSION SHIFT INTERLOCK (BTSI)**

TEST	RESULT	ACTION
7. Connect test lamp from DK GRN/WHT (1135) wire to ground at TCC/Stoplamp Switch Connector.	Test lamp lights.	GO to step 8.
	Test lamp does not light.	REPLACE TCC/Stoplamp Switch assembly.
8. Connect test lamp from DK GRN/WHT (1135) wire to ground at BTSI Solenoid Connector.	Test lamp lights.	GO to step 9.
	Test lamp does not light.	LOCATE and REPAIR open in DK GRN/WHT (1135) wire between TCC/Stoplamp Switch and BTSI Solenoid Connectors.
9. Connect test lamp from DK GRN/WHT (1135) wire to BLK (150) wire at BTSI Solenoid Connector.	Test lamp lights.	REPLACE BTSI Solenoid assembly. Refer to SECTION 3F4, page 12, of the C/K Truck Service Manual.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between BTSI Connector and Ground G202.

**CIRCUIT OPERATION**

When the Brake Transmission Shift Interlock (BTSI) is energized, the Solenoid locks the Shift Lever mechanism in "PARK". When not energized, the BTSI Solenoid returns to the unlocked position.

The Components involved in the BTSI Circuit are as follows:

- Park/Neutral Position Switch
- TCC/Stop Lamp Switch
- BTSI Solenoid

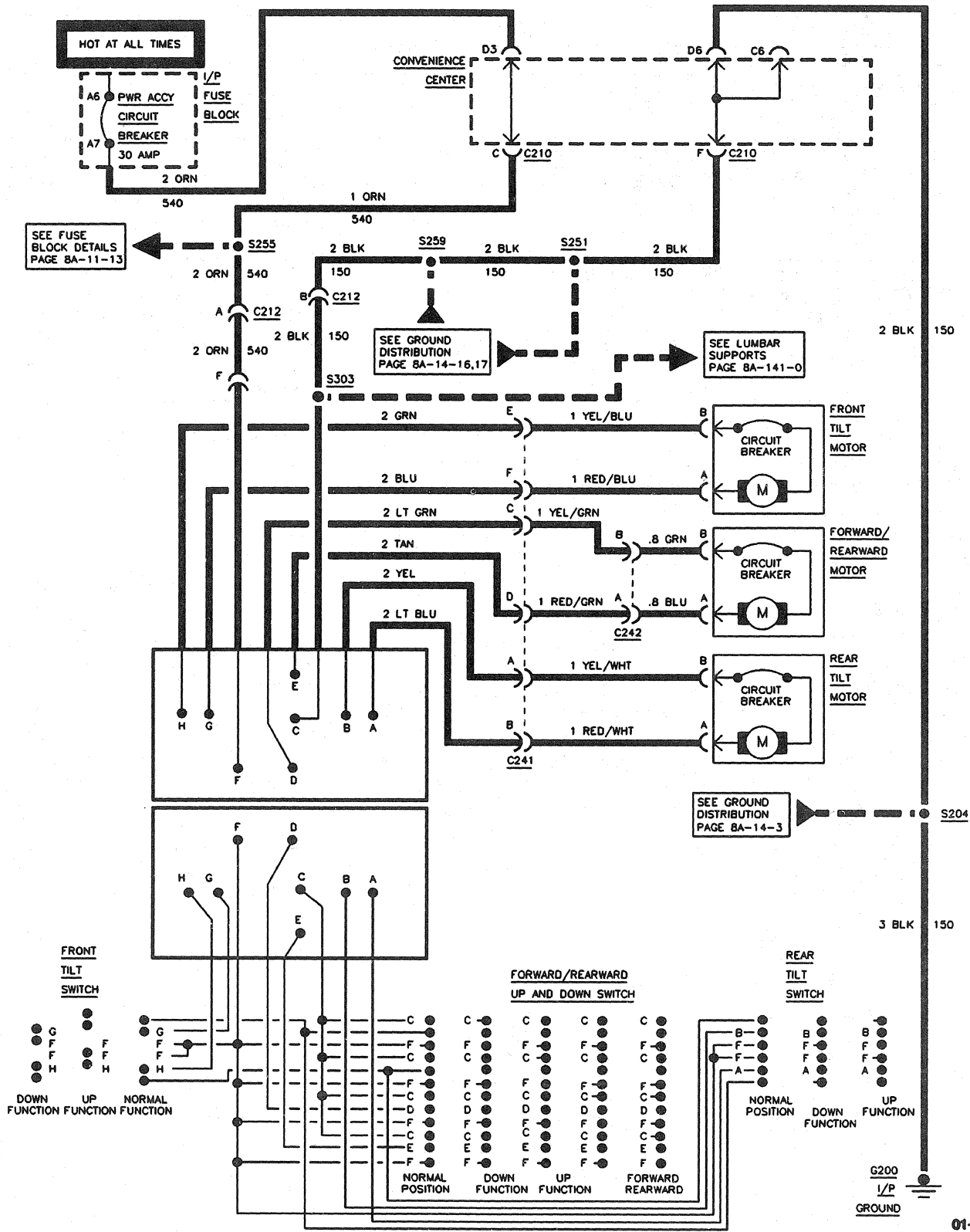
Fuse #16 (Turn/Back-Up) supplies B+ (12V), after the Ignition Switch, to the BTSI Solenoid via the Park/Neutral Position (PNP) Switch and the TCC/Stop Lamp Switch. With the key in the "RUN" or "START" position, the

Shifter in "PARK", and the Brake Pedal released, the Solenoid is energized. This locks the Shift Lever in "PARK".

**Important:**

- Note the BTSI portion of the TCC/Stoplamp Switch (Pins C & D) is CLOSED with the Brakes released. Depressing the Brake Pedal OPENS the Switch causing the Solenoid to de-energize, unlocking the Shift Lever. The BTSI portion of the PNP Switch (Pins B & C) is closed in "PARK" only. The Circuit is not active with the key "OFF".

POWER DRIVER'S SEAT



**POWER DRIVER'S SEAT**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
I/P Fuse Block.....	Lower LH side of I/P .....	23 .....	35	
<b>CONNECTORS:</b>				
C210 .....	At Convenience Center .....	23 .....	36 .....	202-37
C212 .....	Under Driver's Seat.....	.....	.....	202-37
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm left of Steering Column Connector Breakout			
S251 .....	Cross Body Harness approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S255 .....	Crossbody Harness, 24 cm right of I/P Harness Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Belt Switch seat breakout			

**DIAGNOSIS - POWER DRIVER'S SEAT****TROUBLESHOOTING HINTS:**

1. CHECK to see that the PWR ACCY Circuit Breaker is resetting. Replace if necessary.
2. CHECK that G200 is clean and tight.
3. CHECK that there are not any obstructions under the seat or in the carriages which may affect Power Seat Operation.
4. Refer to SECTION 10A2 for diagnosis and repair of all non-electrical system components.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction "GOOD" in a Continuity /Voltage

Check with a system disconnected. These circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures," SECTION 8A-4).

**8A - 140 - 2 ELECTRICAL DIAGNOSIS****POWER DRIVER'S SEAT****POWER SEAT DOES NOT OPERATE IN ANY DIRECTION**

TEST	RESULT	ACTION
1. Remove Power Seat Switch Assembly from its Connector. Connect test lamp from ORN (540) wire at Power Seat switch Connector to ground.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (540) wire between Seat Switch Connector and I/P Fuse Block.
2. Connect test lamp from BLK (150) wire to ORN (540) wire at Seat Switch Connector.	Test lamp lights.	REPLACE Power Seat Switch Assembly.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Seat Switch Assembly and G200.

**POWER SEAT FRONT TILT MOTOR IS INOPERATIVE**

TEST	RESULT	ACTION
1. Using a Fused Jumper lead, connect YEL (282) wire to BLK (150) wire Cavity at Seat Switch Assembly Connector. Connect a Fused Jumper momentarily from LT BLU (283) wire to ORN (540) wire Cavity at Seat Switch Assembly Connector.	Motor moves.	REPLACE Seat Switch Assembly.
	Motor does not move.	GO to step 2.
2. Connect LT BLU (283) wire to BLK (150) wire at Power Seat Switch Assembly Connector with a Fused Jumper lead. Momentarily connect YEL (282) wire Cavity to ORN (540) wire Cavity with a Fused Jumper lead at Seat Switch Assembly Connector.	Motor moves.	REPLACE Seat Switch Assembly.
	Motor does not move.	GO to step 3.
3. Using a digital multimeter, CHECK for Continuity in the YEL (282) wire and the LT BLU (283) wire between the Seat Switch Assembly and the Front Tilt Motor.	Continuity.	REPLACE Front Tilt Motor.
	No Continuity.	LOCATE and REPAIR open YEL (282) wire and/or LT BLU (283) wire between front Tilt Motor and Power Seat Switch Assembly.

**POWER DRIVER'S SEAT****POWER SEAT REAR TILT MOTOR IS INOPERATIVE**

TEST	RESULT	ACTION
1. Connect DK GRN (286) wire to BLK (150) wire at Seat Switch Assembly Connector with a Fused Jumper lead. Momentarily connect DK BLU (287) wire Cavity to ORN (540) wire Cavity with a Fused Jumper lead at Seat Switch Assembly Connector.	Motor moves.	REPLACE Power Seat Switch Assembly.
	Motor does not move.	GO to step 2.
2. Connect DK BLU (287) wire to BLK (150) wire at Seat Switch Assembly Connector with a Fused Jumper lead. Momentarily connect DK GRN (286) wire Cavity to ORN (540) wire Cavity with a Fused Jumper lead at Seat Switch Assembly Connector.	Motor moves.	REPLACE Power Seat Switch Assembly.
	Motor does not move.	GO to step 3.
3. Using a digital multimeter, CHECK for Continuity in the DK BLU (287) wire and the DK GRN (286) wire between the Seat Switch Assembly and the Rear Tilt Motor.	Continuity.	REPLACE rear Tilt motor.
	No Continuity.	LOCATE and REPAIR open in DK GRN (286) wire and/or DK BLU (287) wire from Rear Tilt Motor Connector to Seat Switch Assembly Connector.

**POWER SEAT DOES NOT MOVE FORWARD/REARWARD**

TEST	RESULT	ACTION
1. Connect DK BLU (284) wire to BLK (150) wire at Seat switch Assembly Connector with a Fused Jumper lead. Momentarily connect TAN (285) wire Cavity to ORN (540) wire Cavity with a Fused Jumper lead at Seat Switch Assembly Connector.	Motor moves.	REPLACE Power Seat Switch Assembly.
	Motor does not move.	GO to step 2.
2. Connect TAN (285) wire to BLK (150) wire Cavity at Seat Switch Assembly Connector with a Fused Jumper lead. Momentarily connect DK BLU (284) wire Cavity to ORN (540) wire Cavity with a Fused Jumper lead at Seat Switch Assembly Connector.	Motor moves.	REPLACE Seat Switch Assembly.
	Motor does not move.	GO to step 3.
3. Using a digital multimeter, CHECK for Continuity in the TAN (285) wire and the DK BLU (284) wire between Seat Switch Assembly and Forward/Rear Motor.	Continuity.	REPLACE Forward/Rearward Motor.
	No Continuity.	LOCATE and REPAIR open in TAN (285) wire and/or DK BLU (284) wire from forward/rearward motor Connector to Seat switch Assembly Connector.

## **POWER DRIVER'S SEAT**

### **CIRCUIT OPERATION**

Three reversible motors operate the power seat. One motor raises or lowers the front of the seat. One motor raises or lowers the rear of the seat. The third motor moves the seat forward or back.

Moving the Front Tilt Switch UP supplies Voltage to the Front Tilt Motor through the YEL wire (282). The motor is grounded through the Front Tilt Switch to Ground G200 and the front of the seat is raised. Moving the Front Tilt Switch to the DOWN position reverses the polarity and the front of the seat is lowered.

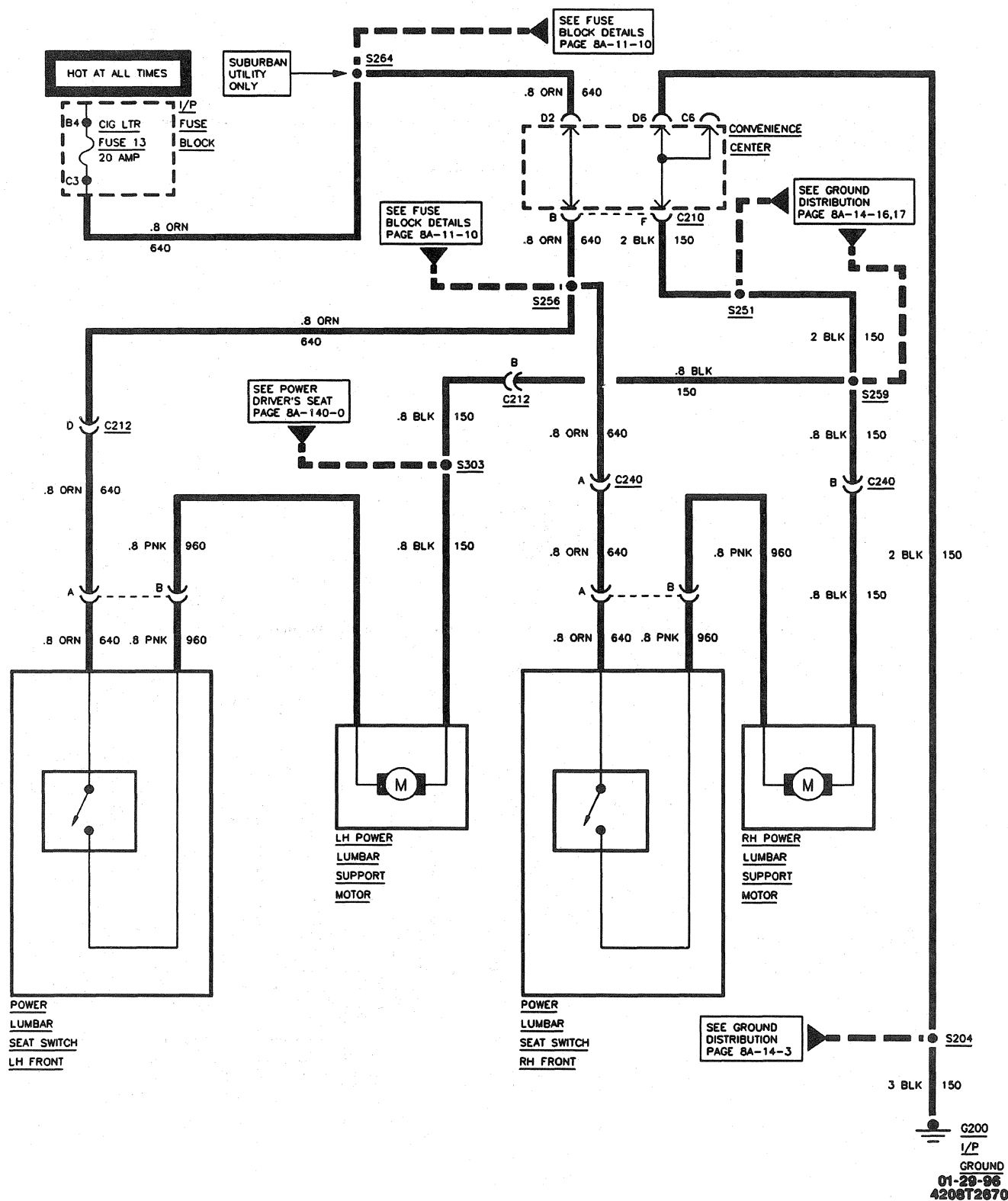
The Rear Tilt Motor is operated in the same manner through the Rear Tilt Switch.

Moving the Forward/Rearward, UP and DOWN Switch up or down operates the Front Tilt Motor and Rear Tilt Motor at the same time.

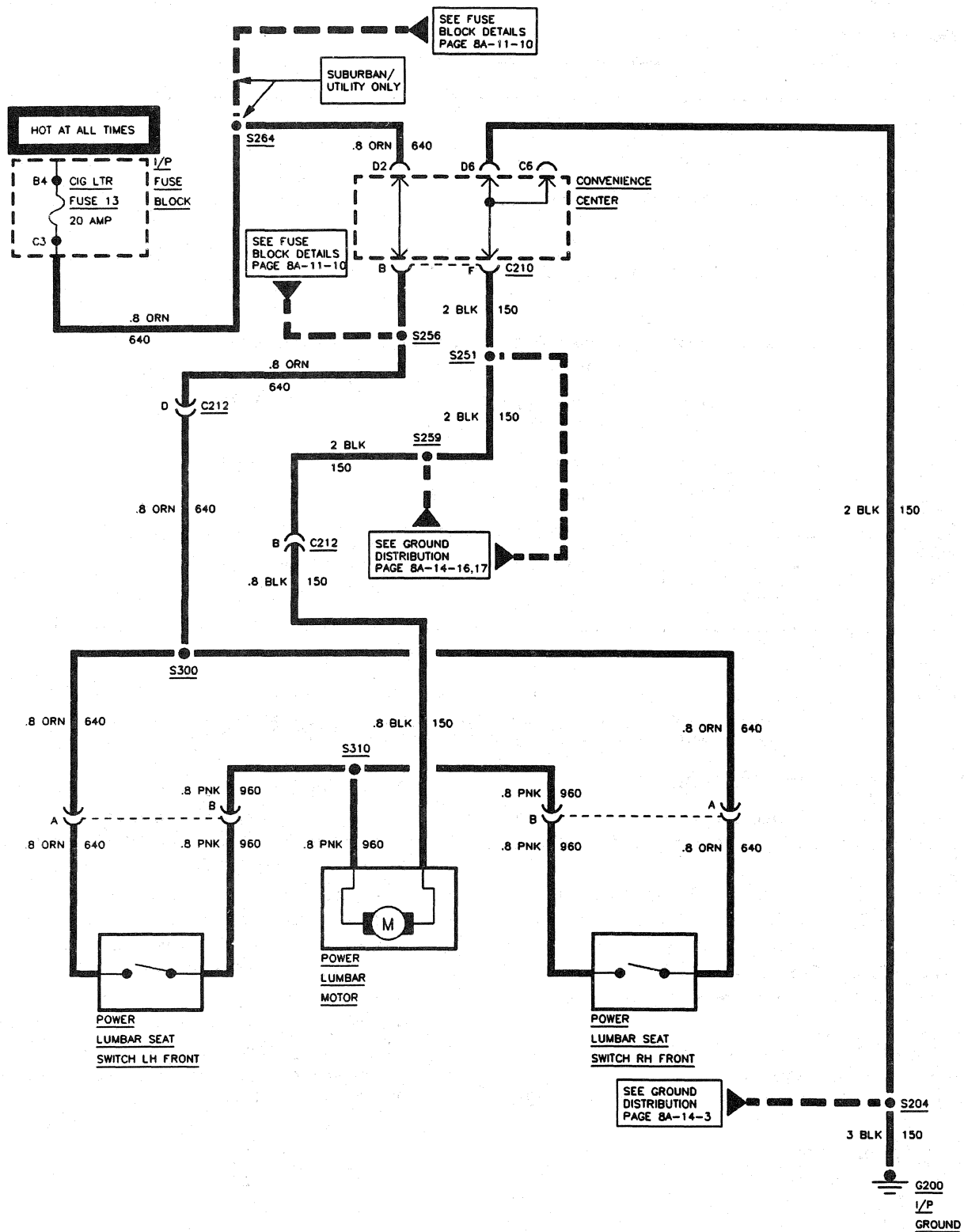
Moving the Forward/Rearward, UP and DOWN Switch forward or backwards operates the Fore/Aft motors and the seat moves forward or backward.



**BLANK**



# LUMBAR SUPPORTS BENCH SEAT



**LUMBAR SUPPORTS**

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center - I/P				
Harness .....	Under LH side of I/P, on Bulkhead .....	23	36	
I/P Fuse Block .....	Lower LH side of I/P .....	23	35	
<b>CONNECTORS:</b>				
C210 .....	At Convenience Center .....	23	36	202-37
C212 .....	Under Driver's Seat .....			202-37
<b>GROUNDS:</b>				
G200 .....	Behind LH side of I/P, Below Fuse Block			
<b>SPLICES:</b>				
S251 .....	Crossbody Harness, approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S256 .....	Crossbody Harness, approx. 18.5 cm from Door Lock Relay Breakout toward I/P Harness Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout			
S300 .....	Inside Power Lumbar Seat Jumper			
S303 .....	Inside Power Lumbar Seat Jumper			
S310 .....	Front to rear Body Harness, 6 cm from front Dome Lamp Breakout			

**DIAGNOSIS - LUMBAR SUPPORTS****TROUBLESHOOTING HINTS:**

1. Check condition of CIG LTR Fuse. If Fuse is open LOCATE and REPAIR source of overload. REPLACE Fuse.
2. If both driver and passenger Lumbar Supports are inoperative, CHECK Circuit 640 between Splice S300 and Fuse Block and/or ground Circuit 150 between Splice S303 and Ground G200.
3. If one Seat Lumbar Support is inoperative, CHECK for:
  - pinched or punctured bladder tubing
  - punctured bladder
  - evidence of motor overheating, pinched or broken wires
  - replace or repair as necessary

4. Refer to SECTION 10A2 for diagnosis and repair of all not-electrical system components.
  - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction "GOOD" in Continuity/Voltage check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
  - CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other systems (see "Troubleshooting Procedures." SECTION 8A-4).

**LUMBAR SUPPORTS****LUMBAR SUPPORTS - POWER LUMBAR INOPERATIVE**

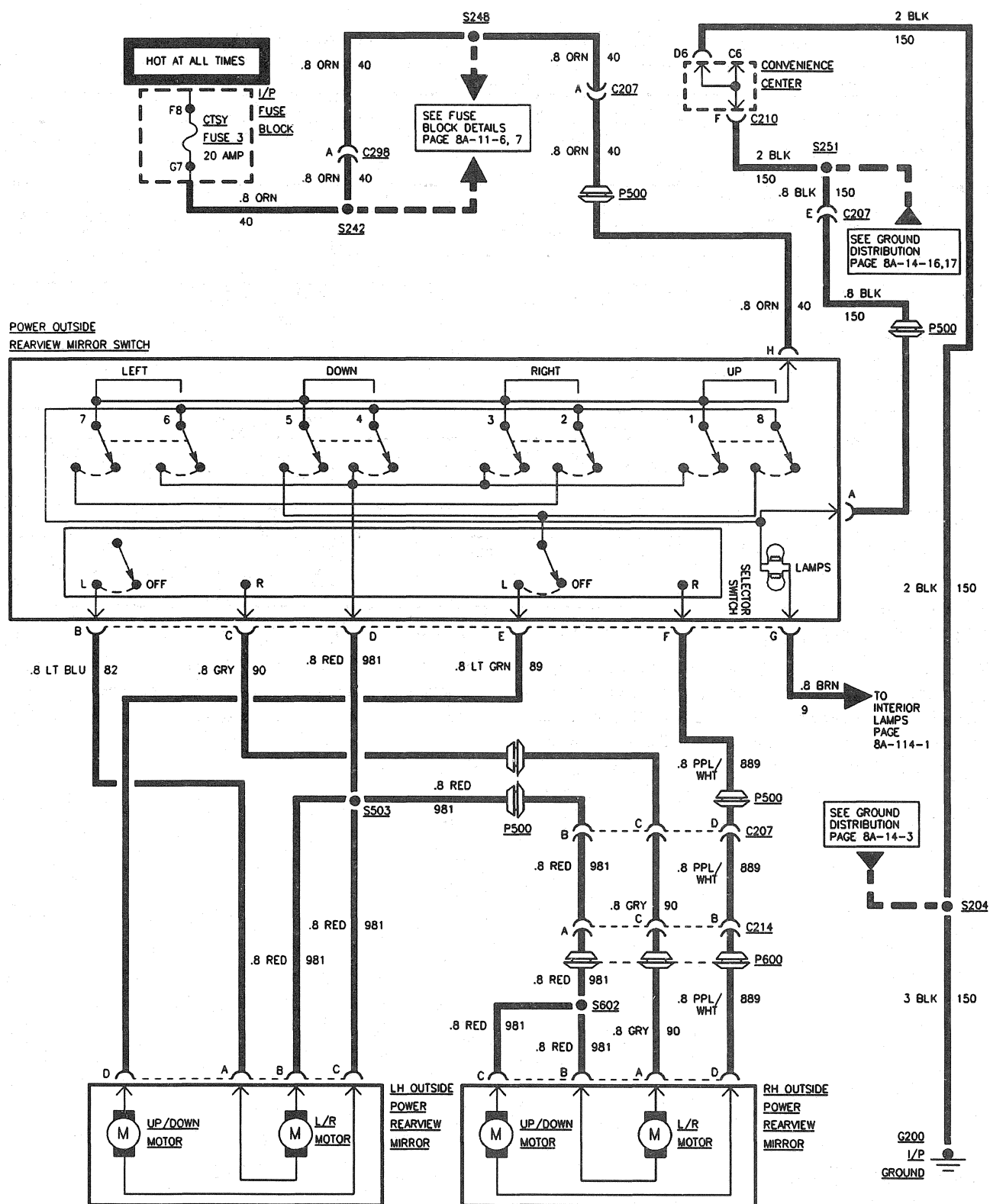
TEST	RESULT	ACTION
1. Disconnect Power Lumbar Connector C212. Connect test lamp from Power Lumbar Harness Connector Terminal "B" to B+.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	REPAIR open in BLK (150).
2. Connect test lamp from Power Lumbar Harness Connector C212 Terminal "C" to ground.	Test lamp lights.	Go to step 3.
	Test lamp does not light.	REPAIR open in ORN (640).
3. Disconnect Power Lumbar Support Switch. Connect a Jumper Wire from one end of Pump Motor to ground. Connect a Fused Jumper wire to other end of Pump Motor. Momentarily connect Jumper to B+.	Motor runs.	GO to step 4.
	Motor does not run.	REPLACE Power Lumbar Pump Motor.
4. Connect test lamp from Switch Connector Terminal "A" to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPAIR open in ORN(640) wire between Switch Connector and Connector C212 Terminal "C."
5. Connect test lamp from Switch Connector Terminal "B" to B+.	Test lamp lights.	REPLACE Lumbar Support Switch.
	Test lamp does not light.	REPAIR open in BLK(150) wire between Switch Connector and C212 Terminal.

**CIRCUIT OPERATION**

With bucket and split bench seat combinations, each seat incorporates a power inflate/deflate pneumatic system for changing the contour of the seat. Ground is supplied at all times to both Power Lumbar Support Switches. When the Power Lumbar Support Switch is closed, Voltage is applied and current flows in the corresponding direction through the Pump Motor.

With a bench seat, one pump and pneumatic system is used to supply the RH and LH seat lumbar supports. Individual Control Switches are incorporated into the left and right side of the seat to change the seat contour.

## POWER MIRRORS



## POWER MIRRORS

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23	.....	36
I/P Fuse Block.....	Lower LH side of I/P .....	23	.....	35
Power Outside Rearview Mirror Switch.....	On LH Door Trim Panel			
Power Outside Rearview Mirror, LH.....	On Outside of LH Front Door			
Power Outside Rearview Mirror, RH .....	On Outside of RH Front Door			
<b>CONNECTORS:</b>				
C207 .....	Inside LH "A" Pillar, Lower Portion.....	35	.....	56..... 202-36
C210 .....	At Convenience Center .....	23	.....	36..... 202-37
C214 .....	Inside RH "A" pillar, Lower Portion.....	35	.....	56..... 202-37
C298 .....	Behind LH side of I/P, near Convenience Center .....	23	.....	35..... 202-7
<b>GROMENTS:</b>				
P500 .....	At LH Front Door			
P600 .....	At RH Front Door			
<b>GROUND:</b>				
G200.....	Behind LH side of I/P, Below Fuse Block			
<b>SPLICES:</b>				
S204 .....	I/P Harness, Approx. 4 cm left of Steering Column Connector Breakout			
S242 .....	I/P Harness, Approx. 8 cm from Headlamp Dimmer Switch Breakout			
S248 .....	Crossbody Harness, Approx. 13 cm from Rear Speaker Breakout toward LH Door Harness			
S251 .....	Crossbody Harness, Approx. 12.5 cm right of LH Door Harness breakout toward I/P Harness Breakout			
S503 .....	Inside LH Front Door Harness			
S602 .....	Inside RH Front Door Harness			

## DIAGNOSIS - POWER MIRRORS

### TROUBLESHOOTING HINTS:

- CHECK to see that the CTSY Fuse is not open.
    - CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage check with a system disconnected.
- These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by monitoring for a Voltage drop with the system operational (under load).
- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system (see "Troubleshooting Procedures,") page 8A-4-0.

**8A - 147 - 2 ELECTRICAL DIAGNOSIS****POWER MIRRORS****LH MIRROR WILL NOT ADJUST UP AND DOWN**

TEST	RESULT	ACTION
1. Disconnect LH Outside Power Mirror. Press switch in "UP" position. Test lamp CKT 981 to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	CHECK/REPAIR open in CKT 981. If OK, REPLACE Power Outside Mirror Switch.
2. Press switch in "DOWN" position. Test lamp CKT 89 to ground.	Test lamp lights.	REPLACE LH Outside Power Mirror.
	Test lamp does not light.	CHECK/REPAIR open in CKT 89. If OK, REPLACE Power Outside Mirror Switch.

**RH MIRROR WILL NOT ADJUST UP AND DOWN**

TEST	RESULT	ACTION
1. Disconnect RH Outside Power Mirror. Press switch in "UP" position. Test lamp CKT 981 to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	CHECK/REPAIR open in CKT 981. If OK, REPLACE Power Outside Mirror Switch.
2. Press switch in "DOWN" position. Test lamp CKT 889 to ground.	Test lamp lights.	REPLACE RH Outside Power Mirror.
	Test lamp does not light.	CHECK/REPAIR open in CKT 889. If OK, REPLACE Power Outside Mirror Switch.

**LH MIRROR WILL NOT ADJUST LEFT AND RIGHT**

TEST	RESULT	ACTION
1. Disconnect LH Outside Power Mirror. Press switch in "LEFT" position. Test lamp CKT 981 (Term. B) to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	CHECK/REPAIR open in CKT 981. If OK, REPLACE Power Outside Mirror Switch.
2. Press switch in "RIGHT" position. Test lamp CKT 82 to ground.	Test lamp lights.	REPLACE LH Outside Power Mirror.
	Test lamp does not light.	CHECK/REPAIR open in CKT 82. If OK, REPLACE Power Outside Mirror Switch.

**RH MIRROR WILL NOT ADJUST LEFT AND RIGHT**

TEST	RESULT	ACTION
1. Disconnect RH Outside Power Mirror. Press switch in "RIGHT" position. Test lamp CKT 981 (Term. B) to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	CHECK/REPAIR open in CKT 981. If OK, REPLACE Power Outside Mirror Switch.
2. Press switch in "LEFT" position. Test lamp CKT 90 to ground.	Test lamp lights.	REPLACE RH Outside Power Mirror.
	Test lamp does not light.	CHECK/REPAIR open in CKT 981. If OK, REPLACE Power Outside Mirror Switch.



**POWER MIRRORS****NEITHER MIRROR IS OPERATIONAL**

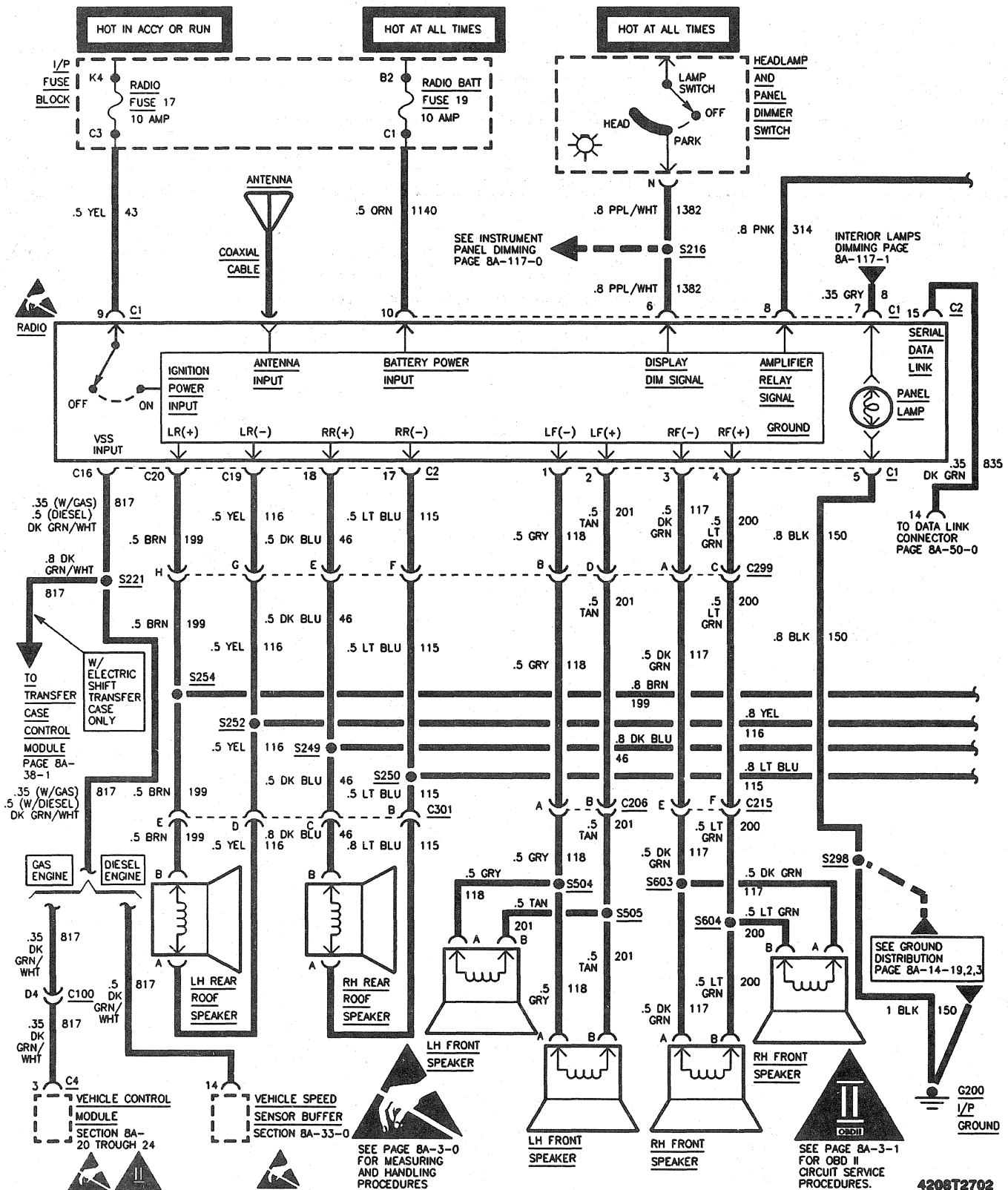
TEST	RESULT	ACTION
1. Disconnect Power Outside Mirror Switch. Test lamp CKT 40 to ground.	Test lamp lights.	GO to Step 2.
	Test lamp does not light.	REPAIR open in CKT 40.
2. Test lamp CKT 40 to CKT 150.	Test lamp lights.	CHECK/REPAIR open in CKT 981. If OK, REPLACE Power Mirror Switch.
	Test lamp does not light.	REPAIR open in CKT 150.

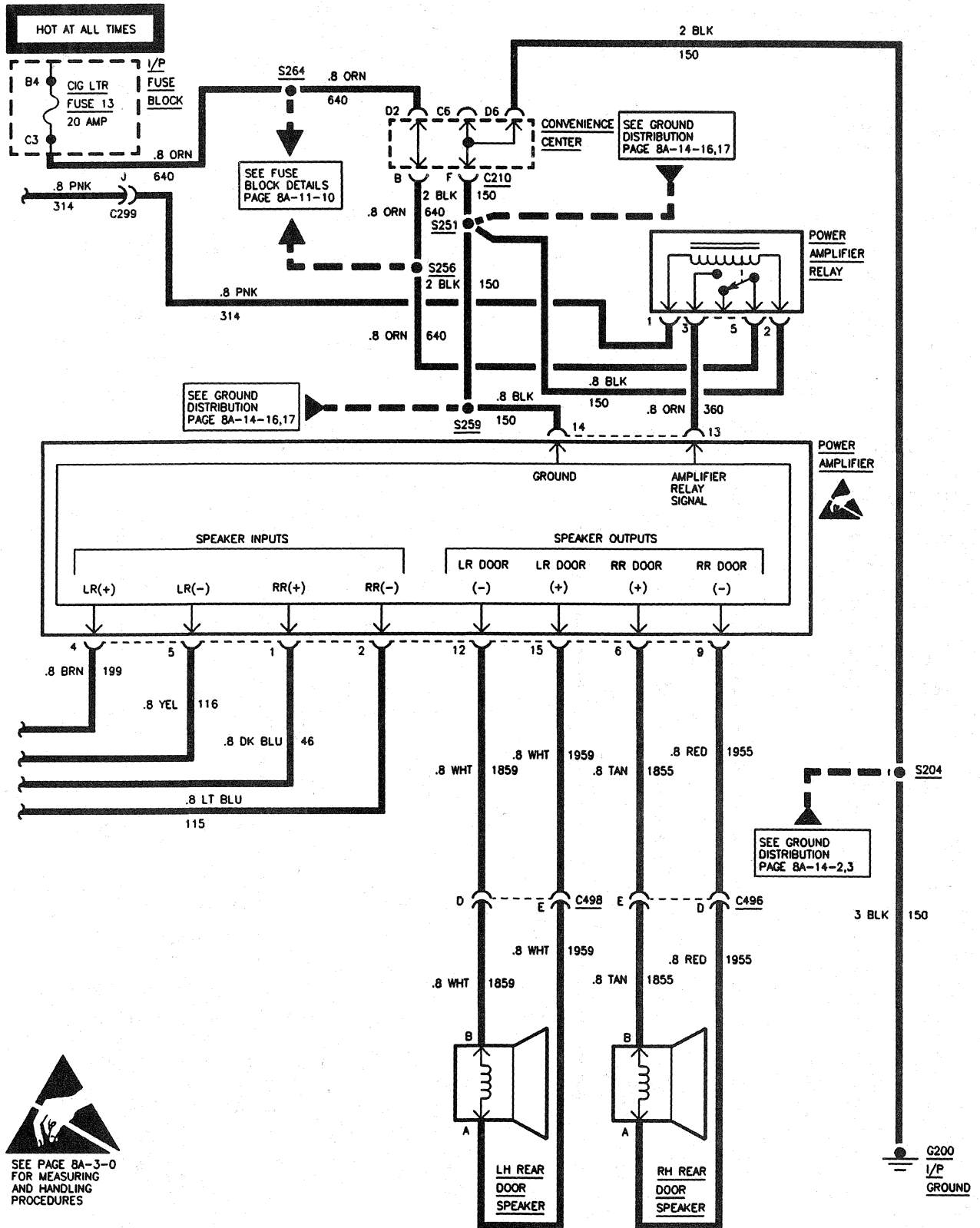
**CIRCUIT OPERATION****POWER MIRRORS**

Voltage is supplied at all times to the Power Outside Mirror Switch through the CTSY 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.

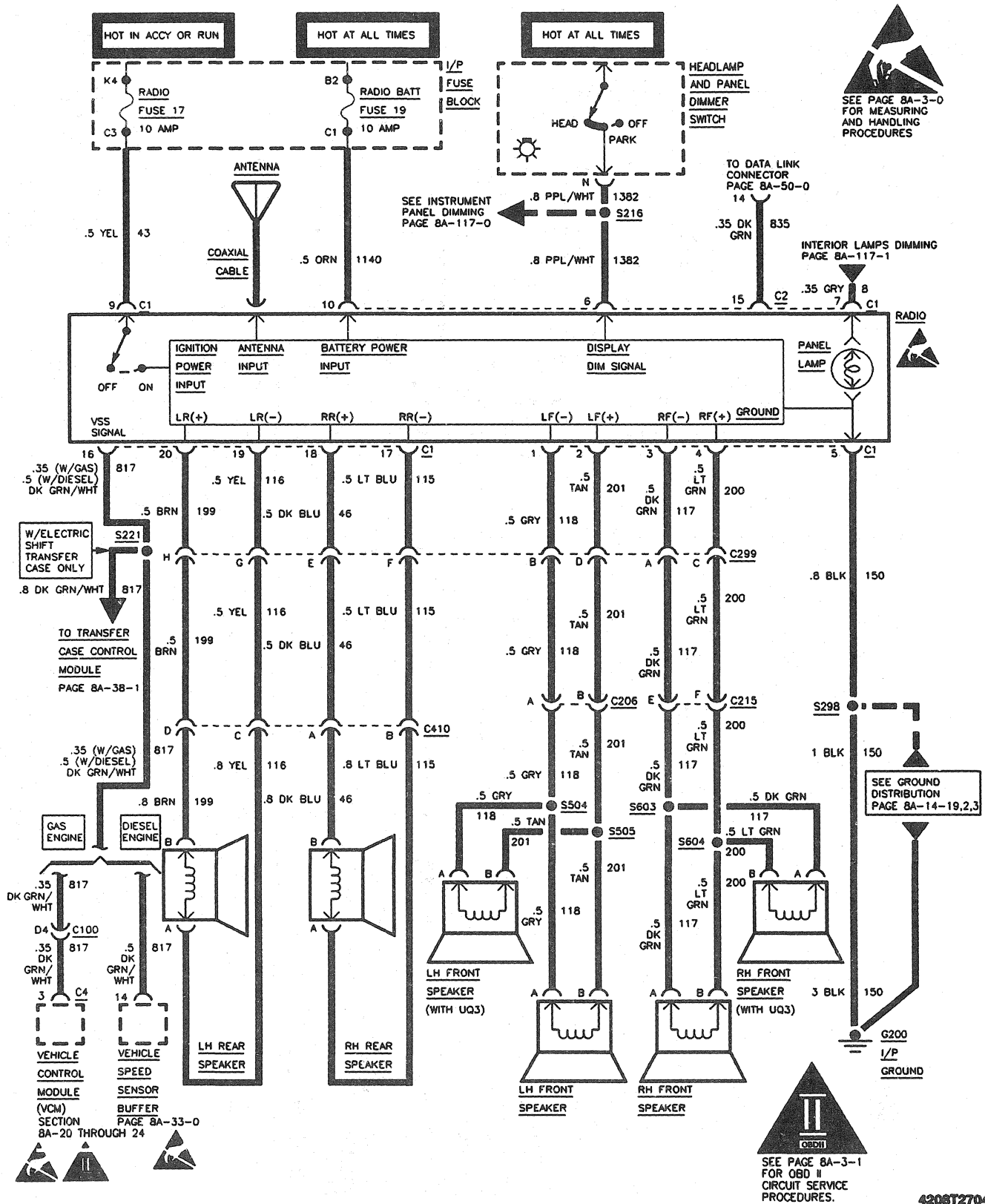
# RADIO AND POWER AMPLIFIER WITH POWER AMPLIFIER



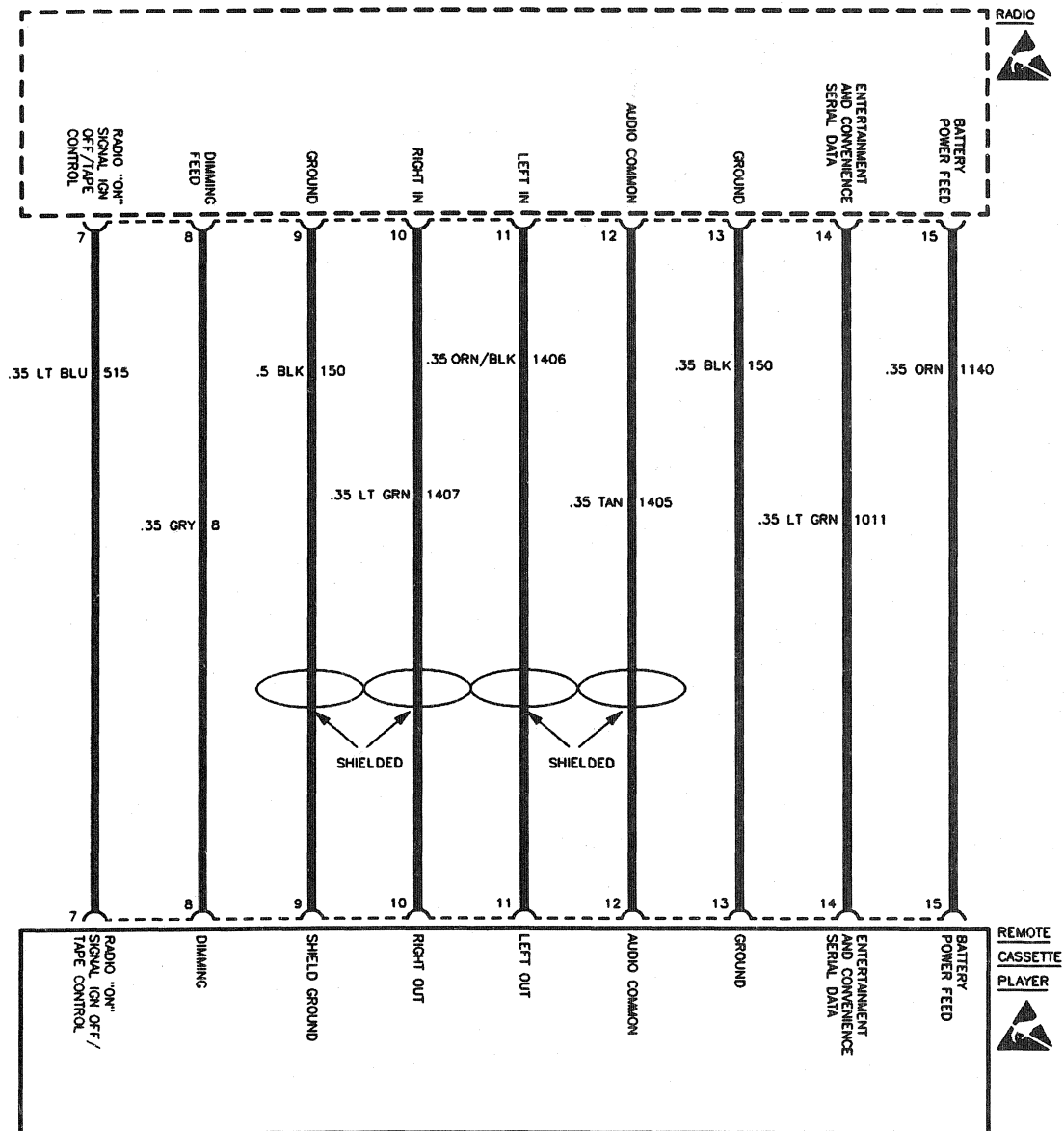


# 8A - 150 - 2 ELECTRICAL DIAGNOSIS

## RADIO AND POWER AMPLIFIER WITHOUT POWER AMPLIFIER



# RADIO AND POWER AMPLIFIER WITH REMOTE CASSETTE PLAYER



SEE PAGE 8A-3-0  
FOR MEASURING  
AND HANDLING  
PROCEDURES

## RADIO AND POWER AMPLIFIER

COMPONENT	LOCATION	201-PG	FIG.	CONN
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23 .....	36	
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P .....	23 .....	35	
I/P Fuse Block .....	Lower LH side of I/P .....	23 .....	35	
Power Amplifier .....	Under Driver's Seat			
Power Amplifier Relay .....	Under I/P, RH side of Brake Pedal Bracket.....	.....	.....	202-43
Radio .....	Center of I/P.....	29 .....	46.....	202-29
Remote Cassette Player .....	In center of I/P, under HVAC Controls.....	29 .....	46	
Speaker, LH rear .....	In rear, behind LH Seat.....	33 .....	53	
Speaker, RH rear .....	In rear, behind RH Seat.....	33 .....	53	
Speaker, LH front .....	In front LH Door			
Speaker, RH front .....	In front RH Door			
Vehicle Control Module (VCM) .....	Engine Compartment, near BPMV Module .....	24 .....	37	
Vehicle Speed Sensor Buffer (Diesel) .....	Under RH side of I/P .....	26 .....	40.....	202-45
<b>CONNECTORS:</b>				
C100.....	LH rear of Engine Compartment at Bulkhead.....	22 .....	33.....	202-0
C206.....	Inside LH "A" Pillar, lower portion .....	35 .....	56.....	202-36
C210.....	At Convenience Center.....	23 .....	36.....	202-37
C215.....	Inside RH "A" Pillar, lower portion.....	35 .....	56.....	202-37
C299.....	Behind RH side of I/P, above HVAC Evaporator Housing.....	27 .....	42.....	202-10
C301.....	LH front Kick Panel .....	28 .....	45.....	202-11
C410.....	Top center rear of vehicle .....	33 .....	53.....	202-39
C496.....	RH "B" Pillar.....	36 .....	58.....	202-39
C498.....	LH "B" Pillar .....	36 .....	58.....	202-44
<b>GROUNDS:</b>				
G200.....	Behind LH side of I/P, below Fuse Block			
<b>SPLICES:</b>				
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout			
S216 .....	I/P Harness, approx. 12 cm right of I/P Cluster Connector			
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets			
S221 .....	I/P Harness, approx. 16 cm from I/P Cluster Breakout toward Radio			
S249 (Suburban).....	Crossbody Harness, 4 cm from LH Door Breakout toward I/P Harness Breakout			

COMPONENT	LOCATION	201-PG FIG. CONN
S250 (Suburban).....	Crossbody Harness, 8 cm right of LH Door Breakout	
S251 .....	Crossbody Harness, approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout	
S252 (Suburban).....	Crossbody Harness, 4 cm right of I/P Harness Breakout	
S254 (Suburban).....	Crossbody Harness, approx. 4 cm from Power Amplifier Breakout toward C210 Breakout	
S256 .....	Crossbody Harness, approx. 18.5 cm from Door Lock Relay Breakout toward I/P Harness Breakout	
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout	
S264 (Suburban/Utility) .....	I/P Harness, approx. 16 cm from I/P Cluster Breakout toward Radio	
S504 .....	Inside LH front Door Harness	
S505 .....	Inside LH front Door Harness	
S603 .....	Inside RH front Door Harness	
S604 .....	Inside RH front Door Harness	

## DIAGNOSIS - RADIO AND POWER AMPLIFIER

### TROUBLESHOOTING HINTS:

1. CHECK condition of RADIO #17, RADIO #19, PNL LPS Fuse(s). If Fuse(s) is open, LOCATE and REPAIR source of overload. REPLACE Fuse(s).
- CHECK for a broken (or partially broken) wire inside of the insulation which could cause system malfunction but prove "GOOD" in a Continuity/Voltage Check with a system disconnected. These Circuits may be intermittent or resistive when loaded, and if possible, should be checked by

monitoring for a Voltage drop with the system operational (under load).

- CHECK for proper installation of aftermarket electronic equipment which may affect the integrity of other system ( see "Troubleshooting Procedures," page 8A-4-0.)
2. Observe Instrument Panel Lamps. If inoperative, REPAIR before proceeding with Radio Lamp diagnosis.

**RADIO AND POWER AMPLIFIER**

**AUDIO SYSTEM DIAGNOSTIC OVERVIEW**

1. Verify customer complaint.
2. Refer to: Delco Sound Service Guide (DE SSG) and Dealer Service Manuals; fill out the Service Writer Form provided in the Delco Sound Service Guide (DE SSG).
3. Follow radio service procedures.
4. If technical assistance is required, have all the pertinent information available before placing the call.
5. For a more complete diagnostic overview, consult the DE SSG.

**IDENTIFYING CONCERNS**

- CHECK for technical service bulletins. Check the Dealer Communication System for any applicable Preliminary Information (P/I) for customer concerns.
- CHECK for stored diagnostic trouble codes. Refer to SECTION 3 of the Driveability, Emissions, and Electrical Diagnosis Manual.
- For reception concerns, determine if the station is obtainable in the customer's listening area.
- For an FM reception concern, refer to the FM reception section in the DE SSG.
- For an AM reception concern, refer to the AM reception section in the DE SSG.
- To test for audio reception/noise, position the vehicle outside of the building with the hood down.
- Duplicate the customer's complaint before trying to diagnose the system. Have the customer demonstrate the condition. Test drive the vehicle with the customer and then test drive another similar model vehicle (with a similar audio system) to do a comparison of the two vehicles to determine if the condition is abnormal.
- Before diagnosing, identify components, their features and the customer's complaint.
- Determine if any aftermarket equipment is installed on the vehicle. Disconnect the aftermarket equipment and determine if the customer's complaint still exists. Follow GM guidelines for installation of aftermarket components. Refer to the DE SSG.
- Perform the following steps to identify a noisy component:
  1. Identify ignition key switch position in which the noise appears, such as: accessory, key ON engine not running, and key ON engine running.
  2. REMOVE fuses one at a time until the complaint condition has been eliminated.
  3. Mark the complaint fuse(s) and reinstall all fuses and circuit breakers.
  4. Refer to SECTION 8A-10 and SECTION 8A-11 to identify all systems and components powered by the complaint fuse(s).
  5. Disconnect the components powered by the complaint fuse(s) one at a time until the complaint condition has been eliminated and the noisy component is identified.
  6. CHECK the ground integrity of the complaint causing component.
- An interference condition is NOT necessarily an audible noise.
- Most noises can be found on weak stations near the low end of the band and are considered to be a normal condition.
- Ignition noise on FM could indicate a possible defective ignition system.
- Malfunctioning and marginal components, relays, and solenoids may induce noise and/or poor reception.



## CORRECTIVE ACTION

- Use proper tools for diagnostics and repairs.
- Follow ESD guidelines.
- Use available noise suppression devices:
  - 220 mF (50V) capacitor GM P/N 1227895
  - 0.47 mF capacitor GM P/N 1227894
  - Fuse block capacitor GM P/N 469328
  - Feed through capacitor GM P/N 477371
  - Filter package GM P/N 1224205
  - Turn signal suppression GM P/N 3861565
  - Fuel pump suppresser GM P/N 25027405
  - 21 inch braided ground strap GM P/N 8910791
  - 19 inch braided ground strap GM P/N 6286800
  - 10.5 inch braided ground strap GM P/N 6287160
  - 8.5 inch braided ground strap GM P/N 12091511
- Utilize the test tape/CD Diagnostic Kit GM P/N J 39916-A to optimize proper audio diagnostics.
- If the condition requires the radio to be sent to the service center, describe the symptoms on the warranty form accurately. Along with the warranty form, send a copy of the Service Writer Check List with the unit.
- Do not leave a CD disc or tape in the car. Extreme heat could cause permanent damage.
- Cassette tapes could be damaged if not stored in the case. The vibration in the vehicle can cause the tape to unwind inside the cartridge.
- Use trouble trees/noise charts in the DE SSG.
- Before removing speaker(s), check all connectors and wiring to the speaker(s). Examine the connectors for bent or loose pins. Refer to Troubleshooting Procedures in SECTION 8A-4.
- If a test antenna is used in diagnostics, ground the antenna base to the vehicle body and do not hold the mast.



### Important:

- CHECK the antenna coax connectors for corrosion or bad connections/crimps. Route coax separately from the other wires. Shield antenna coax interconnections with aluminum or nickel tape as described in the DE SSG.
- CHECK all vehicle grounds, NOT just radio and antenna grounds. Refer to the antenna diagnostic section.
- Coated screws or bolts can act as poor grounds.
- Always use a braided ground strap when applying grounds. Keep the ground strap as short as possible, the shorter the ground strap the better.
- When shielding the dash, wires, hoses (most hoses are conductive unless they have a white stripe), etc., use aluminum foil tape or nickel tape to shield against magnetically induced interference. For optimum results, try varying the following ground techniques:
  - Add a ground at both ends of the tape.
  - Add a ground to just one end of the tape.
  - Do not add ground to the tape.
- When shielding a harness with tape, attach a ground strap to the end of the tape and then wrap the strap 360° around the tape securing the other end of the strap to a known good chassis ground.
- Any interference is best corrected by suppression at the source of the interference, if possible.
- Care should be used when applying suppression. Signal wires (such as sensor outputs, clock, and communication circuits) CANNOT be suppressed. Battery and ignition wires can be suppressed. After adding any suppression, all vehicle systems (even those not related to the audio system) should be checked for proper operation and function.
- Interference can usually be eliminated by shielding/grounding or suppressing.
- Capacitors work best on switch pops and low frequency noise. Filters work best on high frequency whines and static.
- Whenever possible, make a test harness that includes filters and capacitors. Always check the effectiveness and operation before permanently installing a FIX.
- Recommended capacitor application for an audible pop induced from a switching operation is:
  - Add a capacitor across the contacts of the switch.
  - Add a capacitor from the hot side of the switch to ground.
  - Add a capacitor to each side of the switch to ground.
- If a complaint condition is only present with the ignition key in the RUN position and the engine running, perform the following checks:
  - CHECK the integrity of the ignition system (proper spark plug wire routing, no misfiring, etc.), refer to SECTION 6D4.
  - CHECK the integrity of the engine compartment grounds.
  - CHECK for malfunctioning relays, solenoids, or other components which may be inducing “noise” or poor reception.
  - CHECK the ground integrity of the complaint causing component.
- For noise and/or poor reception, perform the Antenna System Test and make the necessary repairs.

## RADIO AND POWER AMPLIFIER

### GENERATOR WHINE CONCERNS



#### Inspect:

- CHECK the ground terminal on the battery.
- CHECK for coated mounting bolts on the generator bracket.
- CHECK for a faulty mounting of the generator to the engine.
- Make sure all ground straps between the engine and the frame are clean and tight.
- Try the following fixes:
  1. If noise is still present, check the charging system. Refer to SECTION 6D3.
  2. If the charging system is functioning normally, check for technical service bulletins on generator whine.
  3. Install a filter GM P/N 1224205 in the battery feed to the radio.

4. Try installing the filter with the following variations if noise is not eliminated.

- INSTALL the filter with the single wire side toward the radio and the ground wire attached to a good ground.
- REMOVE the ground to the filter.
- REVERSE the filter so the two wire side is toward the radio with the ground wire attached to a good ground.
- REMOVE the ground from the filter.

5. If noise is still present, install another filter GM P/N 1224205 in the ignition feed to the radio. Install using the same variations as the first filter. If the installation of this filter causes turn ON or turn OFF delays or other noticeable performance concerns, REMOVE it and INSTALL a 0.47 mF capacitor to ground in its place.

6. REMOVE any unneeded filters after REPAIR, before reassembling the vehicle.

**RADIO DOES NOT RETAIN STATIONS IN MEMORY OR CLOCK DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Disconnect Radio Connector. Connect test lamp from ORN (1140) wire at Radio Connector to ground.	Test lamp lights.	REMOVE Radio and send in for REPAIR.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (1140) wire between Radio Connector and Fuse Block.

**RADIO ILLUMINATION LAMPS DO NOT COME ON**

TEST	RESULT	ACTION
1. Disconnect Radio Connector. Place Headlamp Switch to PARK and Panel Dimmer Switch to HI (full intensity). Connect test lamp from GRY (8) wire to ground.	Test lamp lights.	REMOVE Radio and send in for REPAIR.
	Test lamp does not light.	LOCATE and REPAIR open in GRY (8) wire between Radio Connector and Fuse Block.

**DISPLAY DIMMING FUNCTION WILL NOT OPERATE**

TEST	RESULT	ACTION
1. Disconnect Radio Connector. Place Headlamp Switch in PARK. Connect test lamp from PPL/WHT (1382) wire at Radio Connector to ground.	Test lamp lights.	REMOVE Radio and send in for REPAIR.
	Test lamp does not light.	LOCATE and REPAIR open in PPL/WHT (1382) wire between Radio Connector and Fuse Block.

**DISPLAY IS INOPERATIVE, NO SOUND FROM ANY SPEAKER**

TEST	RESULT	ACTION
1. Disconnect Radio Connector. Place Ignition switch in RUN. With a DVM, measure Voltage at Radio Connector between Terminal "10" and ground.	Voltage is approx. equal to Battery Voltage.	GO to step 2.
	Voltage is not approx. equal to Battery Voltage.	LOCATE and REPAIR poor connection or open in ORN (1140) wire between Radio Connector and I/P Fuse Block.
2. With a DVM, measure Voltage at Radio Connector between Terminal "10" and Terminal "5."	Voltage is approx. equal to Battery Voltage.	GO to step 3.
	Voltage is not approx. equal to Battery Voltage.	REPAIR poor connection or open in BLK (150) wire between Radio Connector Terminal "5" and G200.
3. With a DVM, measure Voltage at Radio Connector between Terminal "9" and Terminal "5."	Voltage is approx. equal to Battery Voltage.	CHECK Radio Connector for Terminals shorted together, check for poor connections. If OK, service Radio.
	Voltage is not approx. equal to Battery Voltage.	REPAIR poor connection or open in YEL CKT 43 between Radio Connector Terminal "9" and I/P Fuse Block.

**8A - 150 - 10 ELECTRICAL DIAGNOSIS****RADIO AND POWER AMPLIFIER****NO SOUND FORM ONE SPEAKER**

TEST	RESULT	ACTION
1. Ignition switch "OFF." Disconnect Speaker Connector. With a DVM, measure resistance of Speaker.	Resistance is between 4 ohms and 15 ohms.	GO to step 2.
	Resistance is NOT between 4 ohms and 15 ohms.	REPLACE Speaker.
2. Disconnect Radio Connectors. With a DVM, measure the resistance at the Speaker Connector from Terminal "A" and ground.	Resistance is infinite.	GO to step 3.
	Resistance is not infinite.	REPAIR short to ground in Speaker Feed Circuit.
3. With a DVM, measure resistance at Speaker Connector from Terminal "B" and ground.	Resistance is infinite.	GO to step 4.
	Resistance is NOT infinite.	REPAIR short to ground in Speaker Feed Circuit.
4. Reconnect Speaker. With a DVM, measure a resistance at Radio Connector of Speaker Feed Circuits.	Resistance is between 4 ohms and 15 ohms.	CHECK for poor connections at Radio or Speaker. If OK, service Radio.
	Resistance is NOT between 4 ohms and 15 ohms.	CHECK for poor connections at Speaker or in-line Connectors or for open in Speaker Feed Circuits.

**TAPE PLAYER IS INOPERATIVE**

TEST	RESULT	ACTION
1. CHECK Tape Player for obstruction through Tape Door.	Obstruction observed.	GO to step 2.
	No obstruction observed.	Service Radio.
• 2. Remove obstruction. <b>NOTICE:</b> Improper removal may damage Tape Player. Inspect and clean moving parts and Tape Head or use cleaning cassette. Insert diagnostic test Tape from J 39916 as described in Section 9A.	Test Tape operates.	Fault was corrected.
	Test Tape inoperative.	Service Radio.

**TAPE PLAYS WEAK, SLOW OR GARBLED**

TEST	RESULT	ACTION
1. Inspect and clean moving parts and Tape Head or use cleaning cassette.	Does not play back.	GO to step 2.
	Plays OK.	Advise periodic cleaning.
2. Perform Motor Speed test with diagnostic test Tape from J 39916 as described in SECTION 9A.	Motor Speed not OK.	Service Radio.
	Motor Speed OK.	Fault was with Tape.

**COMPACT DISC PLAYER DOES NOT OPERATE PROPERLY**

TEST	RESULT	ACTION
1. Observe operation of Compact Disc Player.	CD Player skipping or muting.	CHECK for proper insertion, scratches, dirt or finger prints and clean if necessary. Is usual route over rough (or dirt) road? If so, condition may be normal. Attempt to duplicate on good road surface. Test with known "good" Disc (preferably new disc). Some Discs may contain marks not readily visible that may make one track or the entire Disc unplayable. If previous steps fail, service Radio.
	Displaying "ERR" or Disc ejected.	"ERR" appears if disc is inserted upside down, dirty, badly scratched or wet. "ERR" appears if moisture has condensed on the Disc (if a Cold Disc is inserted into a Hot Player or visa versa). Allow up to an hour to evaporate condensation. Check with known good Disc - verify with customer. Very High Internal Instrument Panel temperatures may cause the Disc to eject. If previous tests fail, service Radio.

**NOISE AND/OR POOR RECEPTION**

TEST	RESULT	ACTION
1. Attempt to duplicate complaint condition in each Ignition Switch Key Position.	Complaint condition verified.	GO to step 2.
	Complaint condition NOT verified.	Contact customer for explanation of complaint condition.
2. CHECK for technical service bulletins. Perform "Antenna System Test," make any necessary REPAIRS and then return to this chart. attempt to duplicate the complaint condition again.	Complaint condition duplicated again.	GO to step 3.
	Complaint condition NOT duplicated.	Complaint condition corrected, no further action required.
3. Ignition Switch to "RUN," start engine.	Is the complaint condition duplicated only in this position.	GO to step 4.
	Is the complaint condition NOT duplicated only in this position.	GO to step 4.
4. Is the Vehicle equipped with aftermarket electronic equipment.	Aftermarket equipment is present.	GO to step 5.
	Aftermarket equipment is NOT present.	CHECK for stored diagnostic trouble codes (DTC's) (Refer to SECTION 6E). check the integrity of the Ignition System (proper spark plug wire routing, no misfiring, etc. (Refer to SECTION 6D4). check the integrity of the Engine Compartment grounds. check for malfunctioning Relays, Solenoids or other Components which may be including "NOISE" or poor reception. If OK, REFER to Sound Service Guide.

**8A - 150 - 12 ELECTRICAL DIAGNOSIS****RADIO AND POWER AMPLIFIER**

TEST	RESULT	ACTION
5. CHECK for proper installation of aftermarket electronic equipment (refer to SECTION 8A-4).	Were the GM guidelines followed.	GO to step 6.
	Were the GM guidelines NOT followed.	Correct the installation and retest for complaint condition.
6. Remove Fuses and Circuit Breakers (one at a time) until the complaint condition has been eliminated.	Complain condition is eliminated.	GO to step 7.
	Complaint condition is NOT eliminated.	REFER to Sound Service Guide for further instructions.
7. Mark the complaint Fuse(s) and re-install all Fuses and Circuit Breakers. Refer to SECTION 8A-10 and 8A-11 identify all systems and components powered by the complaint fuse(s)/Circuit Breakers(s).	Complaint causing component is identified.	CHECK the ground integrity of the complaint causing component. If OK, REFER to Sound Service Guide for further instructions.
	Complaint causing component is not identified.	REFER to Sound Service Guide for further instructions.

**POWER AMPLIFIER DOES NOT OPERATE**

TEST	RESULT	ACTION
1. Place Ignition switch in ACC or RUN position. Connect test lamp from PNK (314) wire at Power Amplifier Relay Connector to ground. Turn Radio Control Head to ON position.	Test lamp lights.	GO to step 2.
	Test lamp does not light.	LOCATE and REPAIR open in PNK 314 wire between Power Amplifier Relay Connector and Radio Receiver Connector. If wire is good, REMOVE Receiver and send in for REPAIR.
2. Connect test lamp from PNK 314 wire to BLK (150) wire at Power Amplifier Relay Connector.	Test lamp lights.	GO to step 3.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Power Amplifier Relay Connector and I/P Ground G200.
3. Connect test lamp from ORN (640) wire at Power Amplifier Relay Connector to ground.	Test lamp lights.	GO to step 4.
	Test lamp does not light.	LOCATE and REPAIR open in ORN (640) wire between Power Amplifier Relay Connector C210 and I/P Fuse Block.
4. Connect test lamp from ORN (360) wire at Power Amplifier Relay Connector to ground.	Test lamp lights.	GO to step 5.
	Test lamp does not light.	REPLACE Power Amplifier Relay.
5. Connect test lamp from ORN (360) wire to BLK (150) wire at Power Amplifier Connector.	Test lamp lights.	REMOVE Power Amplifier and send in for REPAIR.
	Test lamp does not light.	LOCATE and REPAIR open in BLK (150) wire between Power Amplifier Connector I/P Ground G200.

**NO SOUND OR DISTORTED SOUND FROM REAR SPEAKERS**

TEST	RESULT	ACTION
1. Disconnect suspect Speaker Connector. Set ohmmeter on Rx1 scale. Connect ohmmeter across Terminals of suspect Speaker.	Speaker pops.	GO to step 2.
	No noise.	REPLACE Speaker.
2. Place Ignition Switch in ACC or RUN position and turn Radio ON. Tune Radio to a strong signal. Connect Voltmeter across suspect Speaker.	Varying around 1 Volt AC.	LOCATE and REPAIR open or short in YEL (116), BRN (199), DK BLU (46), LT BLU (115) between Radio Connector and Power Amplifier Connector WHT (1859), WHT (1959), TAN (1855), RED (1955) between suspected Speaker Connector and Power Amplifier Connector.
	No Voltage or Voltage greater than 1 Volt AC.	REMOVE Power Amplifier and send in for REPAIR.

**ANTENNA SYSTEM TEST**

TEST	RESULT	ACTION
1. Disconnect negative Battery Cable. Disconnect Antenna Lead in connector at the Radio Receiver. With a DVM, measure resistance between the coax (outer conductor) Radio Connector and the negative Battery Cable. <b>NOTICE:</b> To avoid misdiagnosis be sure to "zero" meter before taking measurements.	The resistance is LESS than 0.15 ohms.	GO to step 2.
	The resistance value is GREATER than 0.15 ohms.	CHECK the base of the Antenna for a good connection to body ground. Check the Coaxial Cable interconnects for a poor connection or corrosion. Check the ground connection from the Battery negative Cable to the body. REPAIR the Antenna ground Circuit as necessary.
2. GRASP the Antenna mast. While observing the DVM, wiggle the Antenna.	The DVM indicates NO intermittent Continuity.	GO to step 3.
	The DVM indicates intermittent Continuity.	CHECK the base of the Antenna for a good connection to body ground. Check the Coaxial Cable interconnects for a poor connection or corrosion. Check the ground connection from the Battery negative Cable to the body. REPAIR the Antenna ground Circuit as necessary.

## RADIO AND POWER AMPLIFIER

TEST	RESULT	ACTION
3. With a DVM, measure resistance between the Radio Coaxial Lead-In Connector (center conductor) and the Antenna mast. <b>NOTICE:</b> To avoid misdiagnosis be sure to "zero" DVM before taking measurements.	The measured resistance approximately equals less than: - 2 ohms for coax type RG-58 or RG-59- 3.5 ohms for coax type RG-62 or RG-62M.	GO to step 4.
	The measured resistance approximately equals NOT less than: - 2 ohms for coax type RG-58 or RG-59. - 3.5 ohms for coax type RG-62 or RG-62M.	CHECK the Coaxial Cable interconnects for a poor connection or corrosion. REPAIR/REPLACE the Antenna Coaxial Circuit as necessary and return to the NOISE AND/OR POOR RECEPTION CHART.
4. While observing the DVM, wiggle the Antenna Coax.	The DVM indicates intermittent Continuity.	CHECK the Coaxial Cable interconnects for a poor connection or corrosion. REPAIR/REPLACE the Antenna Coaxial Circuit as necessary and the return to the NOISE AND/OR POOR RECEPTION CHART.
	The DVM indicates NO intermittent Continuity.	RETURN to the NOISE AND/OR POOR RECEPTION CHART.

## USE AND CONSTRUCTION OF A NOISE "SNIFFER"

The Noise Sniffer can be used along with the vehicle's Radio to LOCATE "HOT SPOTS" which are generating Radio noise interference. These "HOT SPOTS" can be found in the Harnesses, in the upper part of the dash or even between the hood and the windshield. The Sniffer can be made from an old piece of Antenna Lead-In from a mast or Power Antenna. The longer the Lead-In the better. Make the Noise Sniffer as shown in Figure 1. The 2" SECTION with the black coating and braided shield stripped back becomes the Antenna when the Sniffer is plugged into the Radio's Antenna socket. It can then be used to probe and search out "HOT SPOTS."

1. While listening to the complaint noise, disconnect the Antenna and plug the sniffer into the Antenna socket.
2. Turn the Radio Volume up.
3. Search for the noise source, keeping fingers off the 2" probe. When checking for noise on wire, the best results will be achieved when the sniffer is placed parallel to the wire, see Figure 2.

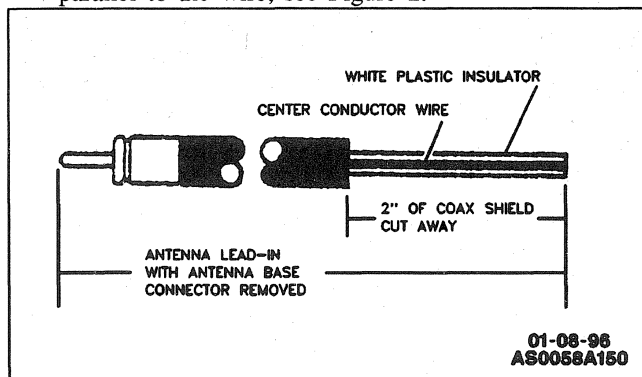


Figure 1—Noise Sniffer

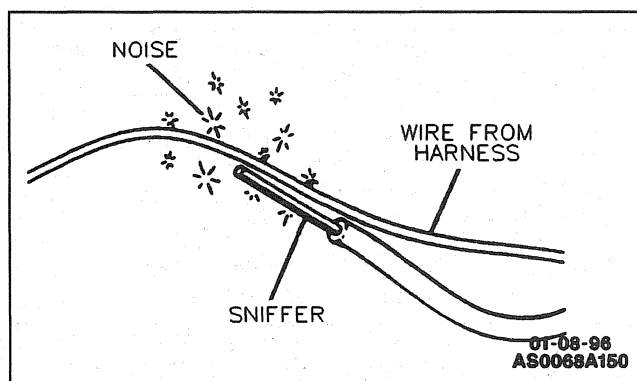


Figure 2—Checking for Noise on a Wire

## CUSTOMER'S TIPS

## HOW TO ENJOY FM STEREO

1. Select Stations Within Range - The best FM fidelity will be obtained from stations within the 10-40 mile range. Beyond that, "noise" or "flutter" may begin to appear due to the "line of sight" range limitations of FM signals. SOLUTION: Reduce treble response by moving the treble control down (or to the left) in fringe areas. On EQ Radios, slowly slide the 10K control down.
2. Realize Tall Structures Can Interfere - Tall buildings or hills may cause "shadows" or cancellation of FM signals (this is similar to the "ghost" or "flutter" effect seen on television sometimes when airplanes are flying in the vicinity). It will sound like a "pop" or monetary "hiss". SOLUTION: Reduce the treble or 10K setting to a lower volume.



3. Interference From Another Station - Although the Circuits in DELCO receivers are the most advanced available, there are rare instances where a station being listened to will be interfered with by another station. This only happens when the stations are on almost the same frequency and certain geographical criteria are present. SOLUTION: Select another station or switch to a Tape or CD.

## **HOW TO ENJOY AM**

### **Reception Characteristics**

AM does not have the flutter characters of FM (caused by tall buildings, hills, etc.) However, it is subject to interference from powerlines, neon signs, atmospheric conditions and unwanted stations.

## **WAYS TO REDUCE NOISE**

1. Move Treble Control down.
2. Tune to a stronger station.

## **CIRCUIT OPERATION**

### **RADIO**

Voltage to the Radio is available at all times through the ORN (1140) wire. This Circuit provides Voltage for Radio Station Memory Storage. It also provides Voltage for the Clock Memory. With the Ignition Switch in ACC or RUN, Voltage is supplied to the Radio through the RADIO Fuse and the YEL (43) wire. Each Speaker has its own pair of leads. The Radio/Clock Display brightness is at full intensity with the Ignition Switch in ACC or RUN; Voltage is supplied by the YEL (43) wire. When the Park or Headlamps are turned on, Voltage is supplied to the Radio through the PPL/WHT (1382). When the Radio senses this

signal, the Radio switches Voltage for the display from the YEL (43) wire to the GRY (8) wire. The display brightness is then controlled by the Panel and Interior Lamps Control Switch. The Radio illumination bulb Voltage is supplied by the GRY (8) wire.

## **POWER AMPLIFIER (SUBURBAN ONLY)**

The optional amplifier boosts the sound of the Four Rear Speakers in the SUBURBAN when equipped with the premium sound system.

With the Ignition Switch in ACC or RUN position and the Radio Control Head ON, Battery Voltage is supplied to the Power Amplifier Relay through the PNK/BLK (143) and ORN (40) wires. The Relay is grounded through the BLK (150) wire at the I/P Ground G200. When the relay contacts close, Battery Voltage is supplied to the Power Amplifier through the ORN (140) wire, the ground is completed through the BLK (150) wire at the I/P Ground G200.

## **REMOTE CASSETTE TAPE PLAYER (OPTIONAL)**

With the Ignition Switch in RUN and the Radio Control Head ON, Voltage is supplied to the Cassette Tape Player through the Radio.

With the Remote Cassette Tape Player in PLAY, the Tape Player returns a Tape ON signal and the Stereo Audio signals to the Radio. The Tape ON signal causes the Receiver Circuitry to ignore the signals from the Tuner and to send the audio signals from the Tape Player to the Speakers. With a Cassette Tape in FWD, REV, or SEEK, the Tape Player applies a mute signal to the Radio to prohibit the Audio sound of these functions from being heard. When the EJECT Button is pushed on the Tape Player, the Tape ON signal is terminated and the Radio returns to normal operation.

**8A - 200 - 0 ELECTRICAL DIAGNOSIS****MASTER COMPONENT TABLE**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
A/C Compressor Clutch.....	Front of A/C Compressor			
A/C Compressor Clutch Cycling Switch .....	In Low Pressure Refrigerant Line.....	10.....	16	
A/C Compressor Clutch Relay.....	In Underhood Fuse-Relay Center.....	4.....	9	
A/C High Pressure Cutout Switch.....	On rear portion of A/C compressor.....	6.....	12	
Air Injection Reaction (Secondary) Clutch .....	On front of Pump			
Air Injection Reaction (Secondary) Pump .....	Front of Engine			
Air Injection Reaction econdary) Relay .....	Underhood Fuse-Relay center			
Antenna.....	RH side Fender			
Arming Sensor.....	Inside LH Frame Rail, below Driver's Door			
Ash Tray Lamp.....	At Ash Tray			
Audio Alarm Module.....	Under LH side of I/P, on Convenience Center (RH) portion..	23.....	36	
Auxiliary A/C - Heater Rear Control Lamp.....	Part of Controls			
Auxiliary A/C - Heater Front Control Lamp.....	Part of controls			
Auxiliary Battery.....	LH front of Engine Compartment .....	1.....	4	
Auxiliary Battery Relay .....	LH rear of Engine Compartment, at Fender, next to Relay Center .....	4.....	8	
Auxiliary Cooling Fan A/C Pressure Switch.....	Front of Engine Compartment, on Condenser Manifold Tubing			
Auxiliary Cooling Fan Relay ....	LH rear side of Engine Compartment.....	4.....	9	
Auxiliary Cooling Fan Switch ..	RH Cylinder Head near center of Engine			
Auxiliary Cooling Fan Temperature Switch (VIN H, K) .....	RH Cylinder Head, above Starter Solenoid .....	12.....	18	
Auxiliary Cooling Fan Motor ...	In front of Radiator.....	0.....	2	
Auxiliary Heater Control Switch, rear.....	I/P, Right of Steering Column			
Auxiliary Heater and A/C Control Switch/Module, front .....	Front of Overhead Console .....	31.....	49.....	202-13
Auxiliary Heater and A/C Control Switch/Module, rear.....	Rear of Overhead Console Molding, in Headliner.....	31.....	49.....	202-14
Auxiliary Heater and A/C Logic Module.....	Rear of Overhead Console Molding, in Headliner.....	37.....	60.....	202-12

COMPONENT	LOCATION	201-PG	FIG.	CONN
Auxiliary Blower Motor .....	RH rear side of Cabin area, behind rear Wheel House			
Auxiliary Power Connectors.....	Center of I/P area, in Ash Tray			
Backup Lamp .....	Rear of vehicle, part of RH and LH Taillamp			
Backup Lamp Switch (MG5)....	LH side of Transmission, below Shift Tower area.....	21	.....	31
Backup Lamp Switch (MW3)...	LH top of Transmission.....	20	.....	29
Balance Fuel Gage Sender .....	In rear Fuel Tank			
Balance Fuel Pump .....	On Inside LH Framerail near front of rear Tank			
Balance Fuel Pump Relay .....	On Fuel Pump Balance Module			
Barometric Pressure Sensor (VIN S) .....	Upper LH side of Cowl, next to Wiper Motor			
Battery, RH (Diesel) .....	Front RH side of Engine Room.....	1	.....	3
Blower Motor Front.....	Under RH side of I/P .....	30	.....	47
Blower Motor, rear.....	Behind RH rear Wheelwell			
Blower Motor Relay, High front .....	Behind I/P Compartment Box on HVAC Plenum			
Blower Resistor, front.....	Under RH side of I/P, on HVAC Plenum, center area .....	30	.....	47
Blower Resistor, rear (Auxiliary HVAC).....	On underside of Auxiliary HVAC Blower Case, behind RH rear Wheelhouse.....	37	.....	60
Blower Switch, Front.....	At Heater Control			
Brake Lamp Relay .....	In Underhood Fuse-Relay Center.....	4	.....	9
Brake Pressure Modulator Valve (BPMV) .....	Near Brake Master Cylinder, at LH front Wheelhouse.....	22	.....	33
Brake Pressure Warning Switch.....	On rear of Brake Pressure Modulator Valve (BPMV) Casting			
Brake/Transmission Shift Interlock (BTSI) Solenoid.....	RH side of Steering Column, under Support Bracket			
Camshaft Position Sensor.....	In Distributor .....	7	.....	13
Canister Purge Solenoid (VIN H, K) .....	Front center of Intake Manifold, behind LH side of Thermostat			
Cargo Door Contractor, LH.....	Upper LH Body Opening and Door.....	45	.....	74
Cargo Door Contractor, RH .....	Upper RH Body Opening and Door			
Cargo Door Defogger Grid, LH rear.....	On LH rear Cargo Door Glass			
Cargo Door Defogger Grid, RH rear.....	On RH rear Cargo Door Glass			
Cargo Door Jamb Switch .....	On RH rear Cargo Door			
Cargo Lamp .....	Rear Center of Cab, above rear Window .....	39	.....	64

## 8A - 200 - 2 ELECTRICAL DIAGNOSIS

### MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG	FIG.	CONN
Cargo Lamp Switch.....	Center of I/P.....	29.....	46	
Center High Mount Stoplamp (CHMSL) - Pickup.....	Back, top of Cab.....	40.....	65	
Center High Mount Stoplamp (CHMSL) - Suburban, Utility .....	At top rear center of vehicle.....	40.....	66	
Center High Mount Stoplamp Relay (Pickup) .....	In Underhood Fuse - Relay Center			
Cigar Lighter .....	Center of I/P, at Ashtray			
Clearance Lamp front, LH .....	Front of LH rear Fender.....	39.....	63	
Clearance Lamp front, RH.....	Front of RH rear Fender .....	39.....	63	
Clearance Lamp rear, LH .....	Rear of LH rear Fender.....	39.....	63	
Clearance Lamp rear, RH.....	Rear of RH rear Fender.....	39.....	63	
Clutch Pedal Switch.....	At top of Clutch Pedal			
Convenience Center .....	Under LH side of I/P, on Bulkhead .....	23.....	36	
Courtesy Lamp, LH .....	Under LH side of I/P			
Courtesy Lamp, RH.....	Under RH side of I/P			
Courtesy Lamp, LH front Door.....	Inside Mid-Portion of Door near Free Edge.....	35.....	57	
Courtesy Lamp, RH front Door.....	Inside Mid-Portion of Door, near Free Edge.....	35.....	57	
Courtesy Lamp, LH rear Door.....	Inside near center rear of Door			
Courtesy Lamp, RH rear Door.....	Inside near center rear of Door			
Crankshaft Position Sensor.....	Lower RH front portion of Engine Block, near Crankshaft....	7.....	13	
Cruise Control Module .....	LH rear side of Engine Compartment, on Bulkhead .....	22.....	34.....	202-15
Cruise Control Switch .....	In Turn Signal Lever			
Data Link Connector (DLC) .....	Under LH side of I/P .....	26.....	41.....	202-16
Daytime Running Lamp (DRL) Relay.....	Under LH side of I/P, on lower center portion of Convenience Center .....	23.....	36	
Daytime Running Lamps (DRL) Module .....	Under LH side of I/P, taped on I/P Harness .....			202-40
Diagnostic Energy Reserve Module (DERM).....	Behind Center of I/P.....	25.....	39	
Discriminating Sensor, LH .....	Front outside of LH Frame Rail			
Discriminating Sensor, RH.....	Front outside of RH Frame Rail			
Distributor .....	Top of Engine, at rear, near Bulkhead			
Dome Lamp Defeat Switch.....	On center of I/P			

COMPONENT	LOCATION	201-PG	FIG.	CONN
Dome/Reading Lamp, front.....	Inside on Roof			
Dome/Reading Lamp, rear.....	Inside on Roof			
Door Contact Switch, LH.....	Upper LH rear Body Opening and Door			
Door Contact Switch, RH .....	Upper RH rear Body Opening and Door			
Door Jamb Switch, Cargo .....	Upper RH Body Opening incorporated in Cargo Door Contractor			
Door Jamb Switch, LH front ....	At LH end of I/P			
Door Jamb Switch, RH front....	At RH end of I/P			
Door Jamb Switch, LH rear.....	Center of LH "B" Pillar			
Door Jamb Switch, RH rear.....	Center of RH "B" Pillar			
Door Lock Motor, LH front.....	Inside Door, near Free Edge Latch.....	35	56	
Door Lock Motor, LH rear .....	Inside Door, near Free Edge Latch.....	36	58	
Door Lock Motor, RH front.....	Inside Door, near Free Edge Latch.....	35	56	
Door Lock Motor, RH rear .....	Inside Door, near Free Edge Latch.....	36	58	
Door Lock Motor, rear Cargo ...	Inside Door .....	45	75	
Door Lock Relay.....	Under center portion of I/P, near Remote Control Door Lock Reciver.....	32	51	202-40
Door Lock Switch, LH front & rear.....	On Door Trim Panel .....	35	56	202-27
Door Lock Switch, RH front & rear.....	On Door Trim Panel .....	35	56	202-28
Driver Inflator Module, Air Bag.....	At top of Steering Column.....	28	44	
Electrochromatic Rearview Mirror with Compass .....	On top Inside of Windshield.....	32	50	
Electronic 4-speed Automatic Overdrive Transmission.....	Attached to rear of Engine			
Electronic Accelerator Pedal Module (Diesel) .....	Includes Accelerator Pedal.			
Electronic Injection Pump .....	Top front of Engine			
Endgate Marker Lamp .....	On Endgate .....	41	68	
Endgate Window Release Switch.....	Center of I/P			
Engine Coolant Temperature Sender.....	LH Cylinder Head, near # 1 Spark Plug .....	10	16	
Engine Coolant Temperature Sensor (Diesel).....	LH Lower Front of Engine Block .....	16	22	
Engine Coolant Temperature Sensor (Gas).....	RH top front of Engine, near Thermostat Housing.....	6	12	
Evaporative Emissions Canister Purge Solenoid.....	RH side of Engine .....	9	15	

## MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG	FIG.	CONN
Evaporative Emission Purge Solenoid Vacuum Switch .....	Top of Engine.....	7.....	13	
Exhaust Gas Recirculation (EGR) Boost Pulse width Modulation Solenoid Valve, VIN S .....	LH rear top of Engine, above Valve Cover.....	16.....	22	
Exhaust Gas Recirculation Pulse width Modulation Solenoid Valve.....	Left rear top of Engine.....	16.....	22	
Exhaust Gas Recirculation Valve Solenoid.....	Top of Engine.....	16.....	22	
Fog Lamp Relay .....	Under LH end of I/P, on lower LH portion of Convenience Center .....	23.....	36	
Fog Lamp Switch.....	Center of I/P area.....	29.....	46.....	202-40
Fog Lamp, LH .....	At LH lower end of front Bumper.....	0.....	1	
Fog Lamp, RH .....	At RH lower end of front Bumper.....	0.....	1	
Forward/Rearward up and down Switch .....	On lower LH side of Driver Seat			
Four-Wheel Drive Indicator Lamp.....	Center Floor Console.....	31.....	48	
Front Axle Actuator.....	RH rear side of front Drive Axle.....	17.....	24	
Front Axle Switch.....	RH rear side of front Drive Axle.....	17.....	24	
Front Dome Lamp .....	Inside on Roof			
Front Tilt Switch.....	On Seat			
Fuel Gage Sender.....	Behind RH side of I/P, near PCM.....	.....	.....	202-40
Fuel Heater .....	Top rear of Engine			
Fuel Injectors #1 through #8 (VIN W, M, R).....	In Intake Manifold .....	.....	.....	202-18
Fuel Lift Pump (Diesel) .....	Inside LH Frame Rail, below Driver's Door			
Fuel Pump and Sender .....	In Fuel Tank			
Fuel Pump Balance Module.....	Inside LH side of Frame Rail near Transmission Crossmember.....	.....	.....	202-41
Fuel Pump Balance Relay .....	On Fuel Pump Balance Module.....	.....	.....	202-41
Fuel Pump Oil Pressure Switch and Sender .....	Rear top center of Engine, behind Distributor .....	8.....	14.....	202-40
Fuel Pump Oil Pressure Switch and Sender (Diesel) .....	Rear of Engine under Intake Manifold .....	16.....	23.....	202-40
Fuel Pump Prime Connector .....	I/P Harness, approx. 20 cm into Fuse - Relay Center Breakout			
Fuel Pump Relay .....	In Underhood Fuse and Relay Center			
Generator.....	LH front of Engine .....	1.....	3	

COMPONENT	LOCATION	201-PG	FIG.	CONN
Glow Plug Control Module.....	LH rear of Engine, near Bulkhead .....	.....	.....	202-41
Glow Plug Relay.....	LH rear of Engine, near Bulkhead			
Glove Box Lamp.....	In Glove Box			
Headlamp and Panel Dimmer Switch.....	Lower LH side of I/P .....	23	.....	35
Headlamp Dimmer Switch.....	Part of Multifunction Switch.....	.....	.....	202-20
Headlamp, High Beam, LH (Composite).....	LH front of vehicle			
Headlamp, High Beam, RH (Composite).....	RH front of vehicle.....	3	.....	6
Headlamp, High/Low Beam, LH.....	LH front of vehicle			
Headlamp, High/Low Beam, RH .....	RH front of vehicle			
Headlamp, Low Beam, LH (Composite).....	LH front of vehicle			
Headlamp, Low Beam, RH (Composite).....	RH front of vehicle.....	3	.....	6
Heated Oxygen Sensors #1 through #4.....	In Exhaust Pipe, in front and back of Catalytic Converters ...	18	.....	26
Heater and A/C Control Lamp.....	At Controller			
Heater and A/C Control Module.....	Center of I/P at Heater Control			
Heater and A/C Control Switch.....	Center of I/P .....	.....	.....	202-21
High Blower Relay .....	Under I/P, on top of HVAC Plenum .....	30	.....	47..... 202-41
High Blower Relay, rear (Auxiliary HVAC).....	On Auxiliary HVAC Plenum, forward of LH rear Wheelhouse			
Horn, LH .....	At front of Vehicle			
Horn Relay .....	On Convenience Center .....	4	.....	9
Horn, RH .....	At front of vehicle .....	3	.....	6
Horn Switch.....	Top of Steering Column under Steering Wheel			
HVAC Control Module.....	Center of I/P			
I/P Compartment Box Lamp.....	In I/P Compartment Box			
I/P Fuse Block.....	Lower LH side of I/P .....	23	.....	35
Identification Lamps				
Idle Air Control (IAC) Valve Motor.....	Attached to RH rear of Throttle Body.....	6	.....	12
Ignition Coil .....	RH side rear of Engine.....	14	.....	20
Ignition Coil Driver .....	RH side rear of Engine.....	7	.....	13..... 202-41

**8A - 200 - 6 ELECTRICAL DIAGNOSIS****MASTER COMPONENT TABLE**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
Ignition Switch .....	Under I/P, on Steering Column			
Interior Lamp Control Module .....	Under center of I/P .....	25 .....	39 .....	202-41
Illuminated Vanity Mirror, LH .....	Part of LH Sunvisor Assembly .....	32 .....	50	
Illuminated Vanity Mirror, RH .....	Part of RH Sunvisor Assembly .....	32 .....	50	
Input Speed Sensor, Transmission (MT1) .....	LH side of Transmission, near front .....	19 .....	28	
Instrument Cluster .....	LH Upper End of I/P .....			202-25
Instrument Cluster Printed Circuit .....	At Instrument Cluster			
Intake Air Temperature Sensor (Gas) .....	In Air Intake Duct .....	13 .....	19	
Intake Manifold Air Temperature Sensor (Diesel) .....	At front of Engine			
Key-In Warning Buzzer Switch .....	In Steering Column			
Knock Sensor (VIN J) .....	LH side rear of Engine Mount			
Knock Sensor (VIN J, M, R) ...	LH side of Engine Block, below Exhaust Manifold, forward of Starter .....	11 .....	17 .....	202-42
Knock Sensor (VIN W) .....	Rear of Engine on Engine Block .....	8 .....	14	
License Lamps .....	Rear of vehicle at License Holder .....	43 .....	71	
Liftgate Release Motor .....	In Liftgate .....	38 .....	61	
Linear Exhaust Gas Recirculation (EGR) Valve Solenoid (VIN J) .....	LH top center of Engine, above Valve Cover .....	13 .....	19	
Linear Exhaust Gas Recirculation (EGR) Valve Solenoid (VIN W, M, R) .....	Front of Engine near Thermostat Housing .....	7 .....	13	
Linear EGR Pulse Width Modulation Solenoid Valve ....	LH top rear of Engine, above Valve Cover .....			202-42
Lock Motor, rear Cargo Door ...	Inside Door, lower portion, near Free Edge			
Low Blower Relay, rear .....	On Auxiliary Heater and A/C Module .....	37 .....	60	
Low Coolant Level Indicator Module (Diesel) .....	Under center of I/P .....	27 .....	42 .....	202-42
Low Engine Coolant Level Sensor (Diesel) .....	In Coolant Reservoir, RH side of Engine Compartment			
Manifold Absolute Pressure (MAP) Sensor (Diesel) .....	On Bulkhead, RH of Steering Column			



COMPONENT	LOCATION	201-PG	FIG.	CONN
Manifold Absolute Pressure (MAP) Sensor .....	Top RH center of Intake Manifold near Fuel Injectors .....	7 .....	13	
Mass Air Flow Sensor .....	Air Intake Duct near Air Filter .....	13 .....	19	
Marker Lamp, LH .....	LH side of vehicle .....	3 .....	6	
Marker Lamp, RH .....	RH side of vehicle			
Medium Blower Relay, rear (Auxiliary Heater or HVAC) .....	On Auxiliary Heater and A/C Module .....	37 .....	60	
Mode Door Motor, front .....	Under I/P, on Heater-A/C Plenum, LH side .....	30 .....	47 .....	202-43
Oil Pressure Switch and Sender .....	LH side of Engine, rear			
Outside Power Mirror, LH .....	LH front Door			
Outside Power Mirror, RH .....	RH front Door			
Overhead Console Lamps .....	In Roof Console			
Park and Turn Lamp, LH, front .....	LH front corner of vehicle .....	3 .....	7	
Park and Turn Lamp, RH, front .....	RH front corner of vehicle .....	3 .....	6	
Park Brake Warning Switch .....	At Park Brake, under LH end of I/P			
Park/Neutral Position Switch .....	On LH side center of Transmission .....	17 .....	25	
Passenger side Power Windows and Door Lock Switch .....	On LH Door Trim Panel			
Power Amplifier .....	Under Driver's Seat			
Power Amplifier Relay .....	Under I/P, RH side of Brake Pedal Bracket .....			202-43
Power Lumbar Seat Switch, LH front .....	Under Driver's Seat			
Power Lumbar Seat Switch, RH front .....	Under Passenger's Seat			
Power Outside Rearview Mirror Switch .....	On LH Door Trim Panel			
Power Outside Rearview Mirror, LH .....	On outside of LH front Door			
Power Outside Rearview Mirror, RH .....	On outside of RH front Door			
Power Seat, LH .....	Under Driver's Seat			
Power Window Master Switch .....	On LH front Door .....			202-42
Power Window Motor, LH front .....	In LH front Door .....	35 .....	56	
Power Window Motor, RH front .....	In Door .....	35 .....	56	

## 8A - 200 - 8 ELECTRICAL DIAGNOSIS

### MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG	FIG.	CONN
Power Window Motor, LH rear.....	In Door.....	36	58	
Power Window Motor, RH rear.....	In Door.....	36	58	
Power Window Switch, RH front .....	On Door Trim Panel			
Power Window Switch, RH/LH.....	On Door Trim Panel.....			202-27
Powertrain Control Module (PCM).....	Under RH end of I/P, above Blower Motor .....	24	38	
PRNDL Module .....	Behind Radio, in center of I/P area			
Radio .....	Center of I/P .....	29	46	202-29
Rear Auxiliary Heater/A/C Fan Switch.....	Rear of Overhead Console, in Headliner			
Rear Auxiliary Heater Control Switch.....	Rear of Overhead Console, in Headliner			
Rear Auxiliary Mode Door Motor.....	In Auxiliary Heater - A/C Module, forward of LH rear Wheelhouse			
Rear Auxiliary Temperature Door Motor.....	In Auxiliary Heater - A/C Module, forward of LH rear Wheelhouse			
Rear Defogger Switch.....	LH side of I/P			
Rear Dome Lamp.....	Rear Inside Roof area.....	34	55	
Rear Door Jamb Switch .....	RH rear Body Opening Frame.....	38	62	
Rear Liftgate Defogger Grid ....	On rear Liftgate Glass			
Rear Liftgate Release Switch....	LH side of I/P			
Rear Window Defogger Grid ....	On rear Window			
Rear Window Release Switch...	LH side of I/P			
Rear Window Washer Pump Motor.....	In Washer Reservoir			
Rear Window Wiper Washer Module .....	On lower rear Liftgate Glass.....	41	67	
Rear Window Wiper/Washer Switch.....	Center of I/P .....	29	46	202-43
Recirculation Door Motor.....	Under I/P on Heater - A/C Plenum			
Remote Battery Stud.....	At Underhood Fuse-Relay Center			
Remote Cassette Player .....	In center of I/P, under HVAC Controls.....	29	46	
Remote Control Door Lock Reciver.....	Under center portion of I/P .....	25	39	

COMPONENT	LOCATION	201-PG	FIG.	CONN
Remote Outside Rearview Mirror Switch.....	On front LH Door, Arm Rest			
Seat Belt Switch.....	At Driver's Stationary Belt Connector .....	33	.....	52
Spare Power Source (Convenience Center) .....	Under LH side of I/P, on Bulkhead			
Speaker, LH front.....	In front LH Door			
Speaker, LH rear .....	In rear, behind LH Seat.....	33	.....	53
Speaker, LH rear Door .....	In rear LH Door			
Speaker, LH rear Roof.....	In rear Headliner, LH side			
Speaker, RH front .....	In front RH Door			
Speaker, RH rear .....	In rear, behind RH Seat.....	33	.....	53
Speaker, RH rear Door .....	In rear RH Door			
Speaker, RH rear Roof .....	In rear Headliner, RH side			
Starter Motor .....	Rear of Engine, RH side, lower			
Starter Relay .....	In Underhood Fuse - Relay Center			
Starter Solenoid .....	On Starter Motor			
Steering Wheel Inflator Module.....	Center of Steering Wheel			
Stoplamp Relay .....	In Underhood Fuse-Relay Center			
Tail/Stop - Turn Lamp, LH.....	LH rear corner of vehicle.....	42	.....	70
Tail/Stop - Turn Lamp, RH.....	RH rear corner of vehicle.....	42	.....	70
Tail, Stop, Turn Signal and Backup Lamp Assembly, LH.....	LH rear corner of vehicle			
Tail, Stop, Turn Signal and Backup Lamp Assembly, RH .....	RH rear corner of vehicle			
TCC/Stoplamp Switch.....	Top of Brake Pedal .....	27	.....	43
Temperature Door Motor (Module), front.....	Under I/P, on Heater - A/C Plenum, center area.....	30	.....	47
Throttle Position (TP) Sensor....	On side of Throttle Body .....	6	.....	12
Transfer Case Control Module (TCCM) .....	Under I/P on Steering Column Support Bracket.....		.....	202-32
Transfer Case Encoder Motor ...	RH side center of Transfer Case			
Transfer Case Mode Selector Illumination Lamp .....	In Switch			
Transfer Case Relay .....	RH rear of Engine Compartment, near center of Cowl.....	17	.....	24
Transfer Case Select Switch.....	On I/P.....		.....	202-31
Transfer Case Shift Illumination Lamp .....	At Transfer Case Selector Lever.....	31	.....	48

## MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG	FIG.	CONN
Transfer Case Switch (M30) .....	LH top of Transfer Case .....	18 .....	26	
Transfer Case Switch (MG5) ....	LH top of Transfer Case .....	21 .....	32	
Transfer Case Switch (MT1) .....	LH top of Transfer Case .....	19 .....	28	
Transfer Case Switch (MW3) ...	LH top of Transfer Case .....	20 .....	30	
Transfer Case Synchronizer .....	Top of Transfer Case .....	19 .....	28	
Transmission .....	Under center of vehicle, attached to rear of Engine			
Transmission Input Speed Sensor .....	LH side front of Transmission .....	19 .....	27	
Transmission Range Selector .....	LH side of Transmission .....			
Turn/Hazard Flasher .....	Convenience Center .....	23 .....	36	
Turn/Hazard Switch .....	Part of Multi-Function Switch, LH upper Steering Column			
Turn Signal Switch .....	Part of Multi-Function Switch, LH upper Steering Column			
Underhood Fuse-Relay Center ..	LH rear of Engine Compartment, on Fender .....	4 .....	8	
Underhood Reel Lamp .....	RH side of Hood at rear of Bulkhead			
Underhood Lamp .....	Under Hood, RH side of Hood .....	5 .....	11	
Vehicle Control Module (VCM) .....	Engine Compartment, near BPMV Module .....	24 .....	37	
Vehicle Speed Sensor .....	LH rear side of Transmission (LH side of Transfer Case w/4WD) .....	18 .....	26	
Vehicle Speed Sensor Buffer (Diesel) .....	Under RH side of I/P .....	26 .....	40 .....	202-45
Water Valve (Suburban/Utility Only) .....	Engine Compartment, RH rear side of Inner Fender			
Water-in-Fuel Sensor (Diesel) ...	Top rear of Engine			
Wheel Speed Sensor, LH front .....	At LH front Wheel			
Wheel Speed Sensor, RH front .....	At RH front Wheel			
Window Lockout Switch, rear ..	LH Front Door, forward portion of Arm Rest area .....	35 .....	56	
Window Switch, LH front .....	On LH front Trim Panel .....	35 .....	57	
Window Switch, LH rear .....	On LH rear Trim Panel .....	36 .....	58	
Window Switch, RH front .....	On RH front Trim Panel .....	35 .....	57	
Window Switch, RH rear .....	On RH rear Trim Panel .....	36 .....	58	
Windshield Washer Pumps (front & rear) .....	At Washer Reservoir .....	5 .....	10	
Windshield Wiper Motor Module .....	Center rear Engine Compartment, at Cowl .....	22 .....	34 .....	202-45
Windshield Wiper/Washer Switch .....	At Steering Column, part of Turn Signal Lever			

COMPONENT	LOCATION	201-PG	FIG.	CONN
C100.....	LH rear of Engine Compartment at Bulkhead.....	22.....	33.....	202-0
C101.....	LH rear of Engine Compartment near Fuse Relay Center.....	3.....	7.....	202-35
C102.....	LH rear of Engine Compartment near Fuse Relay Center, Mounted on Fender.....	3.....	7.....	202-35
C103.....	LH rear of Engine Compartment, under Brake Master Cylinder.....	.....	.....	202-35
C104.....	LH rear of Engine Compartment, under Brake Master Cylinder.....	22.....	34.....	202-35
C105 (VIN J).....	Rear of Intake Manifold, near Center.....	14.....	20.....	202-2
C106.....	Top of Engine near LH Valve Cover.....	10.....	16	
C107.....	LH front side of Transmission.....	18.....	26.....	202-35
C108 (VIN J).....	RH side of Intake Manifold, near Throttle Body.....	12.....	18	
C110.....	LH rear of Engine Compartment, near C100.....	22.....	34.....	202-35
C111.....	LH rear of Engine Compartment, below Master Cylinder.....	22.....	34.....	202-36
C112 (Diesel).....	Engine Harness, in line to Engine Sensors.....	.....	.....	202-36
C113 (Diesel).....	Engine Harness, in line to Engine Sensors.....	.....	.....	202-3
C114.....	At Convenience Center.....	16.....	22	
C116.....	LH front of vehicle, near Core Support			
C120.....	Rear of Engine, near Transmission.....	18.....	26.....	202-36
C200.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24.....	38.....	202-4, 5
C202.....	Under Steering Column.....	27.....	43	
C203.....	Behind RH portion of I/P, near Heater Motor, in Foam Wrap.....	24.....	38	
C204.....	Behind RH portion of I/P.....	27.....	42.....	202-6
C205.....	At Convenience Center			
C206.....	Inside LH "A" Pillar, lower portion.....	35.....	56.....	202-36
C207.....	Inside LH "A" Pillar, lower portion.....	35.....	56.....	202-36
C208.....	Inside LH "A" Pillar, lower portion.....	35.....	56.....	202-36
C209.....	Inside LH "A" Pillar, lower portion.....	35.....	56.....	202-37
C210.....	At Convenience Center.....	23.....	36.....	202-37
C211.....	Under Driver's Seat			
C212.....	Under Driver's Seat.....	.....	.....	202-37
C213.....	Inside RH "A" Pillar, lower portion.....	35.....	56.....	202-37
C214.....	Inside RH "A" Pillar, lower portion.....	35.....	56.....	202-37
C215.....	Inside RH "A" Pillar, lower portion.....	35.....	56.....	202-37
C218.....	At Convenience Center.....	23.....	36	

## MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG	FIG.	CONN
C219.....	At Convenience Center.....	32.....	50	
C220.....	At Convenience Center			
C221.....	At Convenience Center.....	23.....	36	
C222.....	At Convenience Center.....	28.....	45	
C224.....	LH rear of Engine Compartment, under Brake Master Cylinder.....	22.....	34.....	202-38
C225.....	LH rear of Engine Compartment, under Brake Master Cylinder.....	22.....	34.....	202-88
C227.....	Under LH side of I/P, near Stoplamp Switch.....	27.....	43.....	202-38
C230.....	Behind RH side of I/P, above HVAC Evaporator Housing.....	27.....	42.....	202-38
C240.....	In cross body harness, 100 cm into Seat Belt Switch Breakout			
C241.....	Seat jumper harness under LH Front Seat			
C266.....	LH side of Steering Column, near Bulkhead.....	27.....	43.....	202-8
C298.....	Behind LH side of I/P, near Convenience Center.....	23.....	35.....	202-7
C299.....	Behind RH side of I/P, above HVAC Evaporator Housing.....	27.....	42.....	202-10
C300.....	In Overhead Console.....	34.....	55.....	202-38
C301.....	LH front Kick Panel.....	28.....	45.....	202-11
C302.....	LH front Kick Panel.....	28.....	45.....	202-39
C304.....	Under Driver's Seat			
C305.....	In Headliner at #1 Roof Bow			
C306.....	Under front Seat			
C400.....	RH rear of vehicle, above Auxiliary Blower Motor			
C401.....	RH rear of vehicle, above Auxiliary Blower Motor.....	.....	.....	202-39
C402.....	Top center rear of vehicle.....	41.....	67	
C403.....	LH "D" Pillar, top.....	45.....	74	
C404.....	LH "D" Pillar, top.....	45.....	74	
C405.....	RH "D" Pillar, top			
C406.....	RH "D" Pillar, top			
C407.....	Beneath LH rear Edge of Bed.....	43.....	71	
C408 (03, 53).....	Beneath center rear Edge of Bed.....	41.....	68	
C408 (06, 16).....	Lower center outside portion of Endgate.....	43.....	72	
C409.....	Beneath rear center of Bed, near Bumper.....	43.....	72.....	202-39
C410.....	Top center rear of vehicle.....	33.....	53.....	202-39
C411.....	LH rear of Cab.....	40.....	65.....	202-39
C413.....	LH rear of Cab			
C414.....	In line to front Dome Lamp			

COMPONENT	LOCATION	201-PG	FIG.	CONN
C415 .....	In line to rear Dome Lamp			
C496 .....	RH "B" Pillar .....	36 .....	58 .....	202-39
C497 .....	RH "B" Pillar .....	36 .....	58 .....	202-44
C498 .....	LH "B" Pillar .....	36 .....	58 .....	202-44
C499 .....	LH "B" Pillar .....	36 .....	58 .....	202-44
DIODE 1 .....	In Underhood Fuse - Relay Center			
DIODE 2 .....	In Underhood Fuse - Relay Center			
D100 (VIN J) .....	Engine Harness, approx. 25 cm from Underhood Lamp			
D101 .....	Engine Harness, approx. 8 cm from C101 Breakout			
D202 .....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout towards Park Brake Switch			
D203 .....	I/P Harness, RH side of Steering Column Support .....	27 .....	43	
G100 (VIN J, F) .....	RH front of Intake Manifold .....	1 .....	4	
G101 .....	Sheet Metal at RH front Wheelhouse .....	2 .....	5	
G102 (Gas) .....	RH front of Engine Block, near Damper Pulley .....	2 .....	5	
G102 (Diesel) .....	LH front of Intake Manifold .....	1 .....	4	
G103 (Gas) .....	RH front of Engine, near Thermostat Housing .....	10 .....	16	
G104 (Gas) .....	RH top of Cylinder Head, near center .....	12 .....	18	
G104 (Diesel) .....	RH top of Cylinder Head .....	15 .....	21	
G105 (Gas) .....	RH front of Engine Block .....	9 .....	15	
G105 (Diesel) .....	RH top of Cylinder Head .....	15 .....	21	
G106 (Diesel) .....	LH Battery Ground to Engine			
G107 .....	LH front Fender (Auxiliary Battery Ground)			
G110 .....	RH rear of Engine Compartment, below Heater Lines			
G111 .....	RH rear of Engine			
G112 .....	RH front of Engine Compartment, below Underhood Reel Lamp .....	3 .....	6	
G113 .....	On Radiator Support, near LH Headlamp .....	3 .....	7	
G150 (VIN M, R, J) .....	RH front of Engine, near Thermostat Housing .....	10 .....	16	
G200 .....	Behind LH side of I/P, below Fuse Block			
G201 .....	Behind LH side of I/P, below Fuse Block			
G400 .....	RH "B" Pillar .....	34 .....	54	
G401 .....	Rear of LH Framerrail, behind Bumper .....	42 .....	69	
G403 .....	Rear of Framerrail, behind Bumper .....	42 .....	69	
G404 .....	Inside LH Framerrail, near rear Crossmember			
G405 .....	Frame Ground, at rear of vehicle			
G410 .....	LH Inside of Framerrail, near rear Bumper .....	42 .....	70	

**8A - 200 - 14 ELECTRICAL DIAGNOSIS****MASTER COMPONENT TABLE**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
G451.....	At Platform Hitch			
G900.....	At Endgate			
P100 .....	LH rear of Engine Compartment at Bulkhead.....	3 .....	7	
P101 .....	RH rear of Engine Compartment, at Bulkhead			
P400 .....	Top rear of Body, at RH Lift Gate Hinge			
P500 .....	At LH front Door			
P600 .....	At RH front Door			
P700 .....	At LH rear Door			
P800 .....	At RH rear Door			
S100 (VIN M, R) .....	Engine Harness, approx. 16.5 cm from Breakout to Fuse - Relay Center toward Taillamp Harness			
S100 (VIN W, J).....	Engine Harness, approx. 23 cm from Breakout to Fuse - Relay Center toward Taillamp Harness			
S100 (Diesel).....	Engine Harness, approx. 37.5 cm from Breakout to Fuse - Relay Center toward Taillamp Harness			
S101 (Gas).....	Engine Harness, approx. 10 cm into Underhood Fuse - Relay Center Breakout			
S101 (Diesel).....	Engine Harness, approx. 3 cm from Breakout to RH Glow Plugs toward P101			
S103 (VIN W, M, R) .....	Engine Harness, approx. 11 cm from Breakout to EGR Valve toward Taillamp Extension Harness Breakout			
S103 (VIN J).....	Engine Harness, approx. 35 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S103 (Diesel).....	Engine Harness, approx. 11.5 cm from Breakout to Glow Plugs (RH side) toward P101			
S104 (VIN J).....	Engine Harness, approx. 29.5 cm to Fuel Injector Connector C105			
S104 (VIN M, R, W) .....	Engine Harness, approx. 6.5 cm into Breakout to Fuel Injector Connector			
S106 (VIN W, M, R) .....	Engine Harness, approx. 4.5 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S106 (VIN J).....	Engine Harness, approx. 6.5 cm from Breakout to EGR Valve toward Fuel Injector Breakout			
S107 (VIN M, R) .....	Engine Harness, approx. 20 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN W).....	Engine Harness, approx. 30 cm from Breakout to EGR Valve toward Taillamp Extension			
S107 (VIN J).....	Engine Harness, approx. 20 cm from Breakout to Fuel Injector Breakout toward Taillamp Extension			
S107 (Diesel).....	Engine Harness, approx. 31 cm from Breakout to BPMV toward EGR Valve			



COMPONENT	LOCATION	201-PG	FIG.	CONN
S108 (VIN W, M, R) .....	Engine Harness, approx. 11.5 cm from Ignition Coil Breakout toward Starter Solenoid			
S108 (VIN J) .....	Engine Harness, approx. 13 cm from Ignition Coil Breakout toward Starter Solenoid			
S108 (Diesel) .....	Engine Harness, approx. 5 cm from Backup Lamp Switch Harness Breakout toward EGR Valve			
S109 (Diesel) .....	Engine Harness, approx. 11.5 cm into Fuse - Relay Center Breakout			
S110 (VIN M, R Suburban/Utility) .....	Engine Harness, approx. 5 cm from Fuse - Relay Center toward Taillamp Harness			
S110 (VIN J) .....	Engine Harness, approx. 13 cm from Fuse - Relay Center Breakout near Taillamp Harness Breakout			
S111 (VIN W, M, R) .....	Engine Harness, approx. 3 cm from Breakout to Taillamp Harness toward EGR Valve			
S111 (VIN J) .....	Engine Harness, approx. 6.5 cm from Breakout to Fuse - Relay Center toward Taillamp Harness			
S111 (Diesel) .....	Engine Harness, approx. 10.5 cm from Breakout to BPMV toward Glow Plugs			
S113 .....	Engine Harness, 18 cm into Underhood Fuse - Relay Center Breakout			
S114 .....	Engine Harness, approx. 16 cm into Fuse - Relay Center Breakout			
S117 (Diesel) .....	Engine Harness, approx. 16 cm from Remote Battery Stud toward Glow Plugs Control Module			
S119 .....	Forward Lamps Harness, approx. 20 cm from Windshield Washer Pump Breakout toward LH Headlamp			
S120 .....	Forward Lamps Harness, approx. 26 cm from Windshield Washer Pump Breakout toward LH Headlamp			
S121 .....	Forward Lamps Harness, approx. 12 cm from LH Headlamp Breakout toward Windshield Washer Pump			
S122 .....	Forward Lamps Harness, approx. 6.5 cm from LH Headlamp Breakout toward Windshield Washer Pump			
S123 .....	Forward Lamps Harness, approx. 20 cm from LH Park Lamp Breakout toward Windshield Washer Pump			
S124 .....	Forward Lamps Harness, approx. 26.5 cm from LH Headlamp Breakout toward Windshield Washer Pump			
S125 .....	Engine Compartment, I/P Harness, approx. 13 cm from P100			
S126 (Pickup Only) .....	Forward Lamps Harness, approx. 5 cm from LH Headlamp Breakout toward LH Horn			
S127 .....	Forward Lamps Harness, approx. 5 cm from RH Headlamp Breakout toward RH Horn			

## MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG	FIG.	CONN
S128 .....	Forward Lamps Harness, approx. 5 cm from RH Headlamp Breakout toward G112			
S129 (VIN J).....	Engine Harness, at Starter Breakout			
S130 (VIN J).....	Engine Harness, at Starter Breakout			
S131 (VIN J).....	Underhood Fuse Relay Center Breakout, approx. 8 cm from Engine Harness			
S132 (VIN J).....	Underhood Fuse Relay Center Breakout, approx. 10 cm from Engine Harness			
S135 (Diesel).....	Engine Harness, at Glow Plug Controller			
S136 (Diesel)	Engine Harness, at Glow Plug Controller			
S137 (Diesel).....	Engine Harness, 23 cm from Glow Plug Controller Breakout			
S138 (Diesel).....	Engine Harness, 7 cm into Generator Breakout			
S139 (Diesel).....	Engine Harness, 7 cm into Generator Breakout			
S140 (VIN S).....	In Engine Sensor Harness			
S141 .....	Auxiliary Battery Harness, 18 cm from Underhood Fuse Relay Center			
S142 .....	Auxiliary Battery Harness, 18 cm from Underhood Fuse Relay Center			
S145 (VIN J).....	Engine Harness, approx. 11 cm from Breakout to Crankshaft Position Sensor toward EGR Valve			
S146 (VIN J).....	Engine Harness, approx. 22 cm into Underhood Fuse - Relay Center Breakout			
S147 (VIN W, M, R) .....	Engine Harness, approx. 6.5 cm from EGR Breakout toward Taillamp Extension Breakout			
S147 (VIN J).....	Engine Harness, approx. 5 cm from Fuel Injector Breakout toward Taillamp Harness Breakout			
S147 (Diesel).....	Engine Harness, approx. 4 cm from Breakout to Glow Plugs (RH side)			
S148 .....	Oxygen Sensor Jumper Harness approx. 17 cm into Harness			
S149 .....	Oxygen Sensor Jumper Harness approx. 22 cm into Harness			
S150 .....	Engine Harness, approx. 13 cm into BPMV Breakout			
S151 .....	Engine Harness, approx. 6.5 cm into BPMV Breakout			
S152 (Gas).....	Engine Harness, approx. 6.5 cm from Underhood Fuse - Relay Center Breakout toward VCM			
S152 (Diesel).....	Engine Harness, approx. 4 cm from I/P Harness Breakout toward P101			
S153 .....	I/P Harness, approx. 17.5 cm from Cruise Control Module toward P100			
S154 (VIN J Only) .....	In Injector Harness Jumper			
S155 (VIN J Only) .....	In Injector Harness Jumper			

COMPONENT	LOCATION	201-PG FIG. CONN
S156 (VIN W).....	Engine Harness, approx. 16 cm into Vehicle Speed Sensor Breakout	
S157 (Gas).....	Engine Harness, approx. 20 cm into BPMV Breakout	
S157 (Diesel).....	Engine Harness, approx. 22 cm into BPMV Breakout	
S158 .....	In Washer Pump Jumper Harness	
S159 (Gas).....	Engine Harness, approx. 21.5 cm from Underhood Lamp Breakout toward Generator Breakout	
S159 (Diesel).....	Engine Harness, approx. 10 cm from Glow Plug Breakout	
S160 (Diesel).....	Engine Harness, approx. 17 cm from Breakout to BPMV toward EGR Valve	
S160 (VIN W, M, R) .....	Engine Harness, approx. 23 cm from Breakout to Underhood Fuse - Relay Center toward Taillamp Harness	
S160 (VIN J).....	Engine Harness, approx. 28.5 cm from Breakout to Underhood Fuse - Relay Center toward Taillamp Harness	
S161 (VIN M, R).....	Engine Harness, approx. 7.5 cm from EGR Breakout toward Injector Harness Breakout	
S161 (VIN W).....	Engine Harness, approx. 10 cm from Fuel Injector Harness Breakout toward EGR Breakout	
S162 (VIN W, M, R) .....	Engine Harness, approx. 12.5 cm from Starter solenoid Breakout, toward LH Oxygen Sensor Breakout	
S162 (VIN J).....	Engine Harness, approx. 10 cm from Starter solenoid Breakout, toward LH Oxygen Sensor Breakout	
S170 (Diesel).....	Engine Harness, approx. 7.5 cm from Fuel Heater Breakout toward Glow Plug Controller	
S199 (Diesel).....	In the Engine Jumper Harness	
S200 .....	I/P Harness, approx. 4 cm Left of Cruise Control Harness Breakout	
S201 .....	I/P Harness, approx. 23 cm from TCC Stop Lamp Switch Connector	
S202 .....	I/P Harness, approx. 27 cm from TCC Stop Lamp Switch Connector	
S204 .....	I/P Harness, approx. 4 cm Left of Steering Column Connector Breakout	
S205 .....	I/P Harness, approx. 4 cm Right of Steering Column Connector Breakout	
S206 .....	I/P Harness, approx. 6 cm Right of Steering Column Connector Breakout	
S207 .....	I/P Harness, approx. 8 cm Right of Steering Column Connector Breakout	
S208 .....	Approx. 25 cm from Headlamp Dimmer Switch Connector	
S209 .....	Approx. 20 cm from Headlamp Dimmer Switch Connector	
S210 .....	Approx. 15 cm from Headlamp Dimmer Switch Connector	

## MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG FIG. CONN
S211 .....	I/P Harness, approx. 4 cm from Engine Harness Breakout (C200)	
S212 .....	I/P Harness, approx. 4 cm from I/P Cluster Breakout toward Radio	
S213 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout toward Cluster	
S214 .....	Approx. 23 cm from I/P Cluster Connector	
S215 .....	I/P Harness, approx. 8 cm from I/P Cluster Breakout toward Radio	
S216 .....	I/P Harness, approx. 12 cm Right of I/P Cluster Connector toward Radio	
S217 .....	I/P Harness, approx. 5 cm from Headlamp Dimmer Switch Breakout toward I/P Cluster	
S218 .....	I/P Harness, approx. 4 cm from Heater A/C Control Breakout toward Auxiliary Power Outlets	
S219 (Suburban/Utility) .....	I/P Harness, approx. 6.5 cm into rear Window Release Switch Breakout	
S220 .....	I/P Harness, approx. 12 cm from TCC Stop Lamp Switch Connector	
S221 .....	I/P Harness, approx. 16 cm from I/P Cluster Breakout toward Radio	
S222 .....	I/P Harness, approx. 20 cm right of Heater and A/C Control Breakout	
S225 .....	I/P Harness, approx. 6 cm left of Steering Column Connector Breakout	
S226 .....	Approx. 41 cm from DERM Connector	
S230 (VIN S) .....	Engine Harness, approx. 43 cm from Breakout to BPMV Module	
S231 (VIN W, M, R) .....	Engine Harness, approx. 15.5 cm from Breakout to EGR Valve toward Taillamp Harness	
S231 (VIN J) .....	Engine Harness, approx. 17.5 cm from Breakout to Map Sensor toward Taillamp Harness	
S232 (VIN W, M, R) .....	Engine Harness, approx. 7.5 cm in Breakout to EGR Valve	
S232 (VIN J) .....	Engine Harness, approx. 4.5 cm in Breakout to EGR Valve	
S234 .....	I/P Harness, approx. 10 cm from Crossbody Harness Breakout toward P100	
S235 .....	I/P Harness, approx. 8 cm from Crossbody Harness Breakout toward P100	
S240 .....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout toward P100	
S241 .....	I/P Harness, approx. 11 cm from Crossbody Harness Breakout toward P100	

COMPONENT	LOCATION	201-PG	FIG.	CONN
S242 .....	I/P Harness, approx. 8 cm from Headlamp Dimmer Switch Breakout toward I/P Cluster			
S243 .....	HVAC Harness, 4 cm from Recirculation Door Breakout toward Blower Motor Relay			
S244 .....	HVAC Harness, 14 cm from Recirculation Door Breakout toward Blower Motor			
S245 .....	Approx. 20 cm from Cargo Lamp Switch			
S246 .....	Crossbody Harness, approx. 41.5 cm from LH Door Harness Breakout toward rear Speaker Breakout			
S247 .....	Crossbody Harness, 6 cm right of LH rear Speaker Breakout			
S248 .....	Crossbody Harness, approx. 13 cm from rear Speaker Breakout toward LH Door Harness			
S249 (Suburban).....	Crossbody Harness, 4 cm from LH Door Breakout toward I/P Harness Breakout			
S250 (Suburban).....	Crossbody Harness, 8 cm right of LH Door Breakout			
S251 .....	Crossbody Harness, approx. 12.5 cm right of LH Door Harness Breakout toward I/P Harness Breakout			
S252 (Suburban).....	Crossbody Harness, 4 cm right of I/P Harness Breakout			
S253 (Suburban).....	Crossbody Harness, 6.5 cm from I/P Harness Breakout toward Door Lock Relay Breakout			
S254 (Suburban).....	Crossbody Harness, approx. 4 cm from Power Amplifier Breakout toward C210 Breakout			
S255 .....	Crossbody Harness, 24 cm right of I/P Harness Breakout			
S256 .....	Crossbody Harness, approx. 18.5 cm from Door Lock Relay Breakout toward I/P Harness Breakout			
S257 .....	Crossbody Harness, 6.0 cm left of Door Lock Relay Breakout toward I/P Harness Breakout			
S258 (Suburban/Crew Cab).....	Crossbody Harness, approx. 3 cm from Seat Belt Switch Breakout			
S259 .....	Crossbody Harness, 6.5 cm into Seat Belt Switch Breakout			
S260 .....	Crossbody Harness, 6 cm from Seat Belt Switch Breakout			
S261 .....	Crossbody Harness, 12 cm from Seat Belt Switch Breakout			
S262 .....	Crossbody Harness, approx. 18.5 cm from Seat Belt Switch Breakout toward I/P Harness Breakout			
S263 (Suburban/Crew Cab).....	Crossbody Harness, approx. 6.5 cm from I/P Harness Breakout toward RH rear Door Breakout			
S264 (Suburban/Utility) .....	I/P Harness, approx. 16 cm from I/P Cluster Breakout toward Radio			
S265 (Suburban/Utility) .....	Crossbody Harness, 6 cm left of LH Door Breakout			

## MASTER COMPONENT TABLE

COMPONENT	LOCATION	201-PG FIG. CONN
S266 (Utility/Pickup/Extended Cab) .....	Crossbody Harness, approx. 8 cm right of I/P Harness Breakout toward Door Lock Relay Breakout	
S267 .....	Approx. 4 cm into I/P Cluster Breakout	
S268 .....	I/P Harness, approx. 25 cm from Heater A/C Control Connector	
S269 (Diesel).....	Engine Harness, approx. 34 cm from P101, inside Passenger Compartment	
S270 .....	I/P Harness, 5 cm into Transfer Case Control Module Breakout	
S271 (Suburban/Utility) .....	I/P Harness, approx. 5 cm into Crossbody Harness Breakout	
S272 .....	I/P Harness, approx. 4 cm into Auxiliary Power Outlet Breakout	
S298 .....	I/P Harness, Approx. 24 cm from Instrument Cluster Breakout toward Radio Breakout	
S299 .....	I/P Harness, approx. 4 cm into Steering Column Harness Breakout	
S300 .....	Inside Power Lumbar Seat Jumper	
S302 (K100/200 w/Manual or LD Auto Trans).....	4WD Harness, 10 cm right of Engine Harness Breakout	
S302 (K300 w/7.4L) .....	4WD Harness, approx. 5 cm from Transfer Case Relay Breakout	
S302 (K300 w/o 7.4L) .....	4WD Harness, 10 cm from Transfer Case Relay Breakout	
S303 .....	Inside Power Lumbar Seat Jumper	
S304 (Suburban).....	Rear HVAC Control Harness, 31 cm forward of HVAC Logic Module Breakout	
S305 (Suburban).....	Rear HVAC Control Harness, 25 cm forward of HVAC Logic Module Breakout	
S306 (Suburban).....	Rear HVAC Control Harness, 19 cm forward of HVAC Logic Module Breakout	
S307 (Suburban).....	Rear HVAC Control Harness, 10 cm forward of HVAC Logic Module Breakout	
S308 (Suburban).....	Rear HVAC Control Harness, 5 cm rear of HVAC Logic Module Breakout	
S309 (Suburban).....	Rear HVAC Control Harness, 12 cm rear of HVAC Logic Module Breakout	
S310 (Suburban).....	Front to rear Body Harness, 6 cm from front Dome Lamp Breakout	
S312 .....	In Vanity Mirror Jumper Harness in Roof near Windshield	
S313 .....	4WD Harness, 79 cm from Engine Harness Breakout toward front Axle Switch	
S314 (K300 w/o 7.4L) .....	4WD Harness, 5 cm from Transfer Case Relay Breakout	

COMPONENT	LOCATION	201-PG FIG. CONN
S315 .....	Taillamp Extension Harness, approx. 65 cm from Fuel Pump Balance Module Breakout toward Engine Harness	
S316 .....	In Vanity Mirror Jumper Harness in Roof near Windshield	
S317 (Gas).....	Taillamp Extension Harness, approx. 10 cm from Fuel Pump and Sender Breakout toward Engine Harness	
S317 (Diesel).....	Taillamp Extension Harness, approx. 10 cm from Fuel Gage Sender Breakout toward Engine Harness	
S318 .....	Taillamp Extension Harness, approx. 10 cm from Fuel Pump Balance Module Breakout toward Engine Harness	
S319 (Gas).....	Taillamp Extension Harness, approx. 20 cm from Fuel Pump and Sender Breakout toward Balance Fuel Pump Breakout	
S319 (Diesel).....	Taillamp Extension Harness, approx. 20 cm from Fuel Gage Sender Breakout toward Balance Fuel Pump	
S320 .....	Dome Lamp Harness, approx. 11.5 cm from C411 toward Dome Lamp	
S320 (Crew Cab) .....	Dome Lamp Harness, approx. 10 cm from C411 toward Dome Lamp	
S321 .....	Dome Lamp Harness	
S322 .....	Dome Lamp Harness, approx. 11.5 cm from C411 toward Dome Lamp	
S400 (rear A/C).....	Rear A/C Harness, 17 cm from Blower Motor Relays	
S400 (rear Heat & A/C).....	Rear Heat and A/C Harness, approx. 7 cm from Blower Motor Relays Breakout	
S401 (rear A/C).....	Rear A/C Harness, 23 cm from Blower Motor Relays	
S401 (rear Heat & A/C).....	Rear Heat and A/C Harness, approx. 18 cm from Blower Motor Relays Breakout	
S402 (rear A/C).....	Rear A/C Harness, approx. 7 cm from Blower Motor Resistor Breakout	
S402 (rear Heat & A/C).....	Rear Heat and A/C Harness, approx. 7 cm from Blower Motor Resistor Breakout	
S403 (rear Heat & A/C).....	Rear Heat and A/C Harness, 7 cm from Blower Motor Resistor Breakout toward Blower Motor	
S410 (2-Door Utility).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout	
S410 (4-Door Utility).....	Front to rear Lamps Harness, 22 cm from RH rear Door Speaker Breakout	
S410 (Suburban).....	Front to rear Lamps Harness, 12 cm from RH rear Door Speaker Breakout toward CHMSL Harness Breakout	
S411 (Chassis Cab).....	Rear Lamps Harness, approx. 33 cm right of Taillamps Extension Breakout	
S411 (Fleetside/Stepside).....	Rear Lamps Harness, approx. 17 cm Left of Taillamps Extension Breakout	

**MASTER COMPONENT TABLE**

<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
S412 (Chassis Cab).....	Rear Lamps Harness, approx. 23 cm right of Taillamps Extension Breakout			
S412 (Fleetside/Stepside).....	Rear Lamps Harness, approx. 23 cm Left of Taillamps Extension Breakout			
S413 (Fleetside).....	Rear Lamps Harness, approx. 24 cm from Taillamps Extension Breakout			
S414 .....	Rear Lamp Harness, approx. 10 cm from License Lamp Breakout			
S415 .....	In License Lamps Harness, approx. 14.5 cm from LH License Lamp			
S416 .....	In License Lamps Harness, approx. 4 cm from Breakout to Taillamp Harness toward RH License Lamp			
S417 (2-Door Utility) .....	Front to rear Body Harness, 34 cm from Front Dome Lamp Breakout			
S417 (4-Door Utility) .....	Front to rear Body Harness, 230 cm into Crossbody Harness Breakout			
S417 (Suburban).....	Front to rear Body Harness, 23 cm into Crossbody Harness Breakout			
S419 (Suburban/Utility).....	Front to rear Body Harness, 5 cm from CHMSL Breakout			
S420 .....	Rear Lamp Harness, approx. 6.5 cm from License Lamp Breakout			
S421 .....	Rear Lamp Harness, approx. 6.5 cm from License Lamp Breakout			
S422 .....	Rear Lamp Harness, approx. 11 cm from License Lamp Breakout			
S424 (Suburban/4-Door Utility) .....	Front to rear Body Harness, 5 cm from CHMSL Breakout			
S425 (Suburban).....	Front to rear Body Harness, approx. 14 cm from LH rear Speaker Breakout			
S425 4-Door Utility .....	Front to rear Body Harness, approx. 11 cm from rear Dome Lamp Breakout			
S426 (2 and 4-Door Utility) .....	Front to rear Body Harness, 13 cm from rear Dome Lamp Breakout			
S426 (Suburban).....	Front to rear Body Harness, approx. 36 cm from rear Dome Lamp Breakout			
S500 .....	Inside left front Door Harness, near Tweeter .....	35 .....	56	
S501 .....	Inside left front Door Harness, near Tweeter .....	35 .....	56	
S502 .....	Inside left front Door Harness, near Tweeter .....	35 .....	56	
S503 .....	Inside LH front Door Harness			
S504 .....	Inside LH front Door Harness			
S505 .....	Inside LH front Door Harness			
S600 .....	Inside RH front Door Harness			



<b>COMPONENT</b>	<b>LOCATION</b>	<b>201-PG</b>	<b>FIG.</b>	<b>CONN</b>
S601 .....	Inside RH front Door Harness			
S602 .....	Inside RH front Door Harness			
S603 .....	Inside RH front Door Harness			
S604 .....	Inside RH front Door Harness			

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COMPONENT LOCATION VIEWS

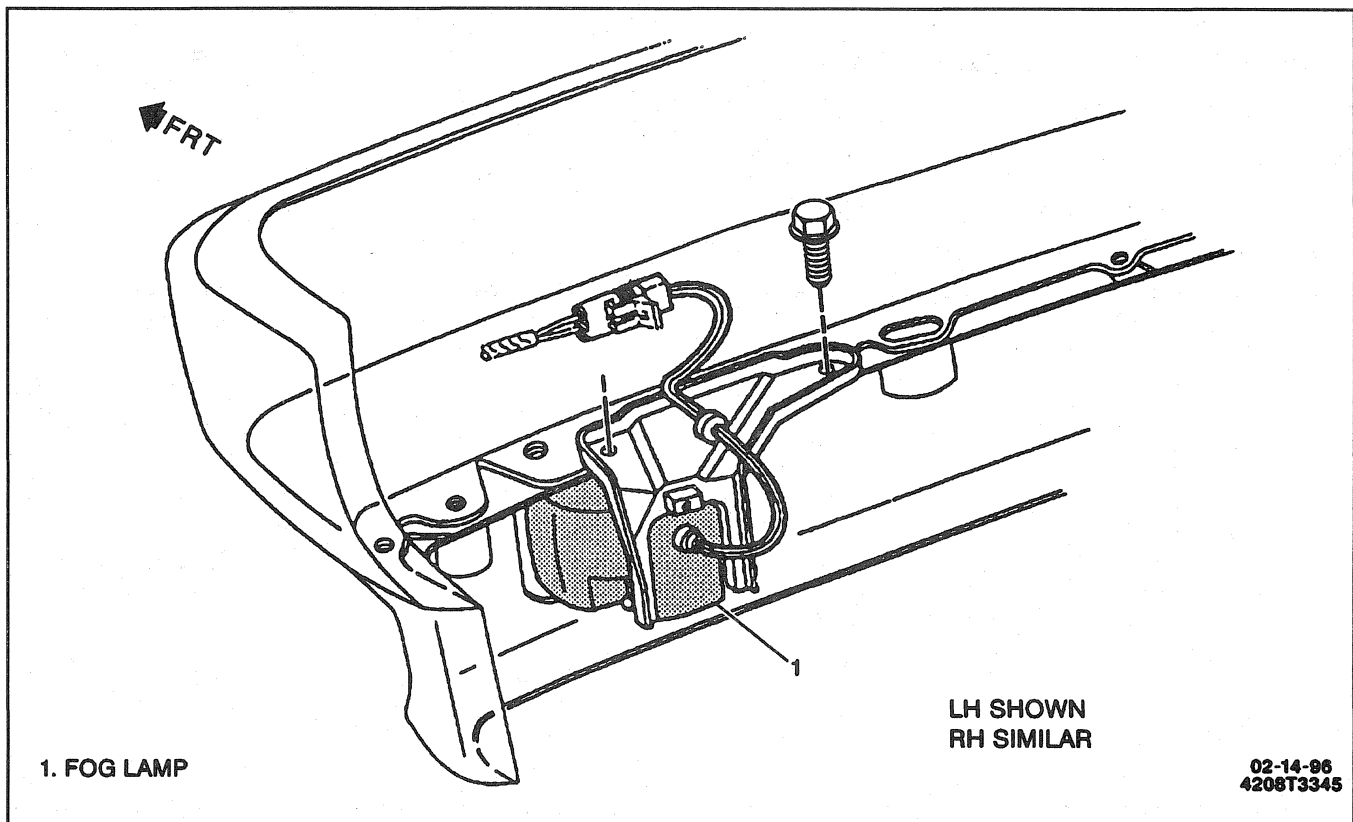


Figure 1—Fog Lamps

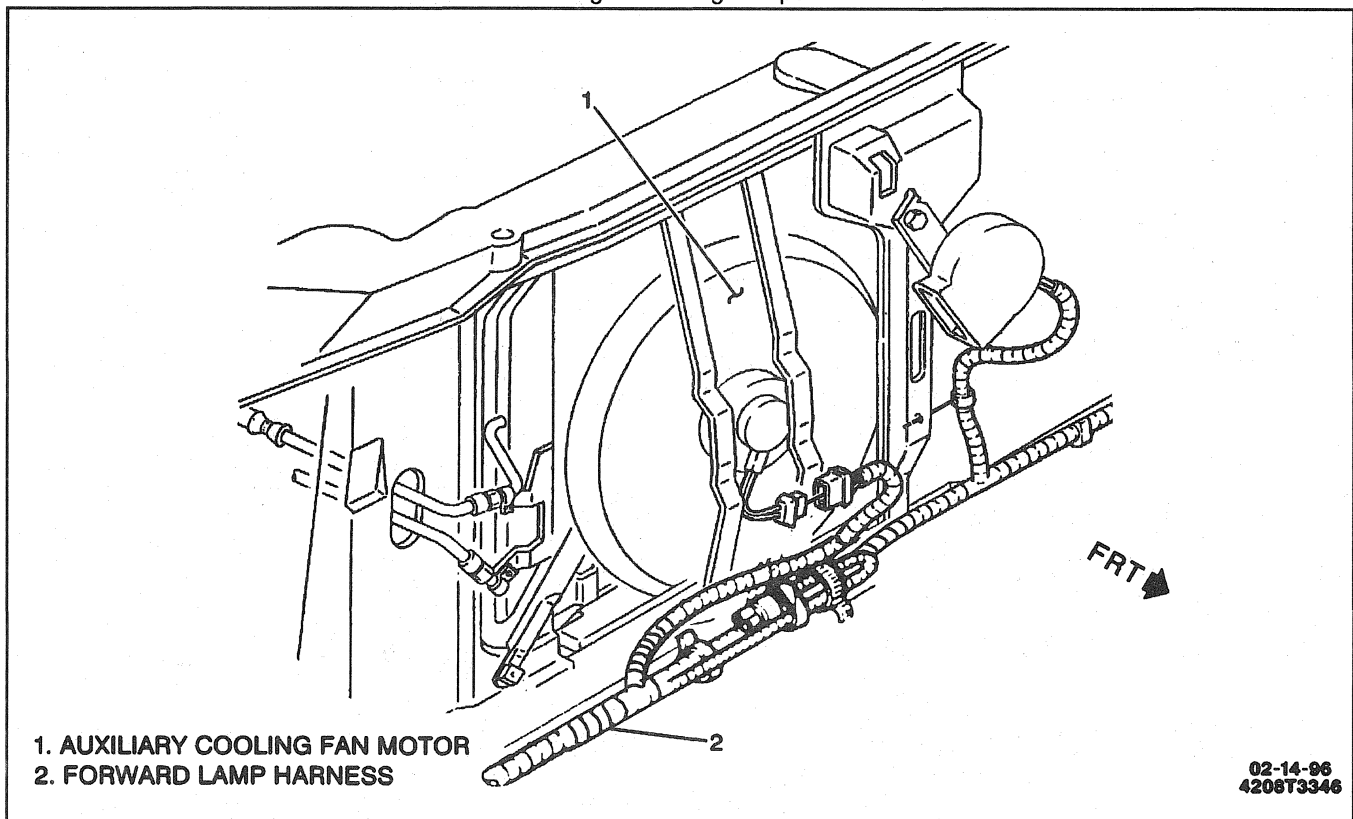


Figure 2—Auxiliary Cooling Fan

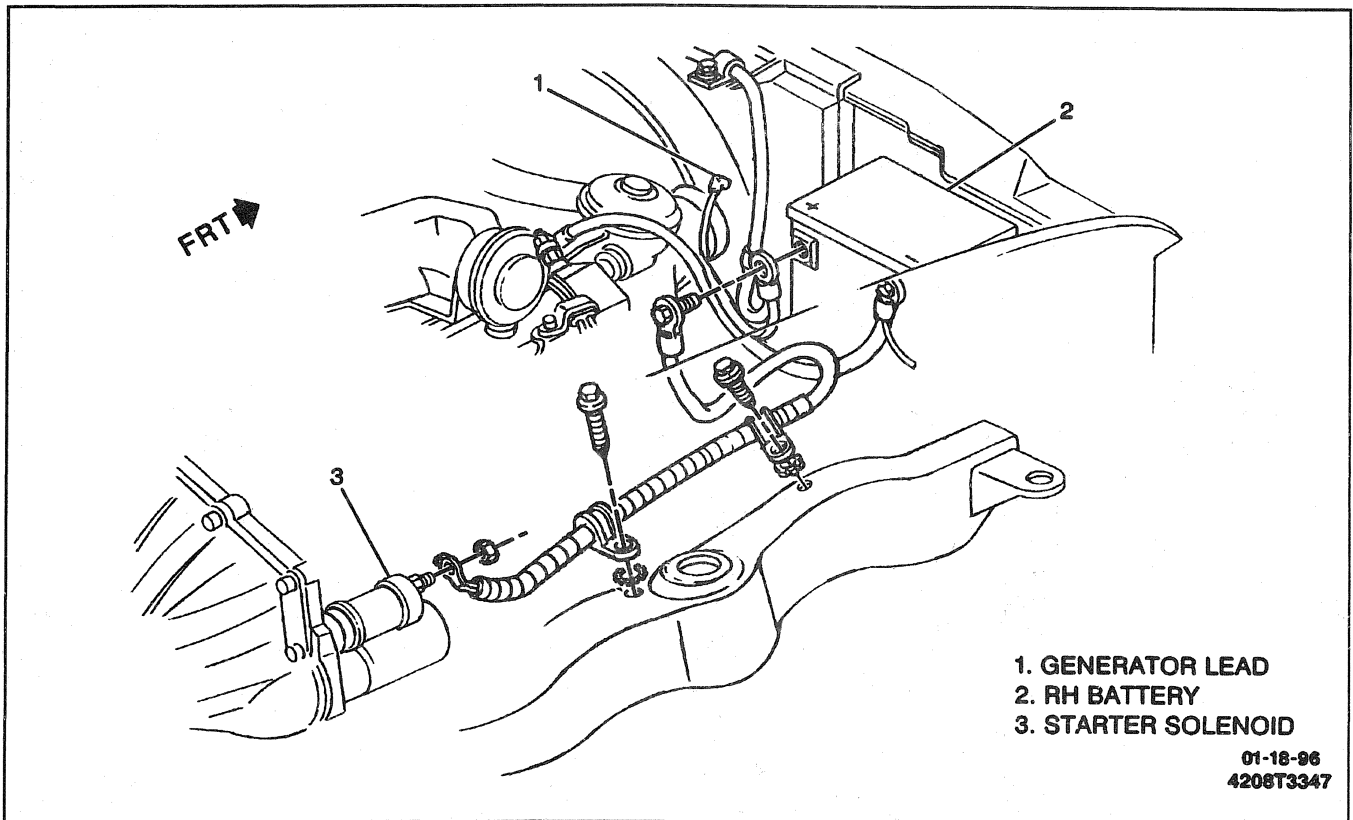


Figure 3—Battery Wiring, (Typical)

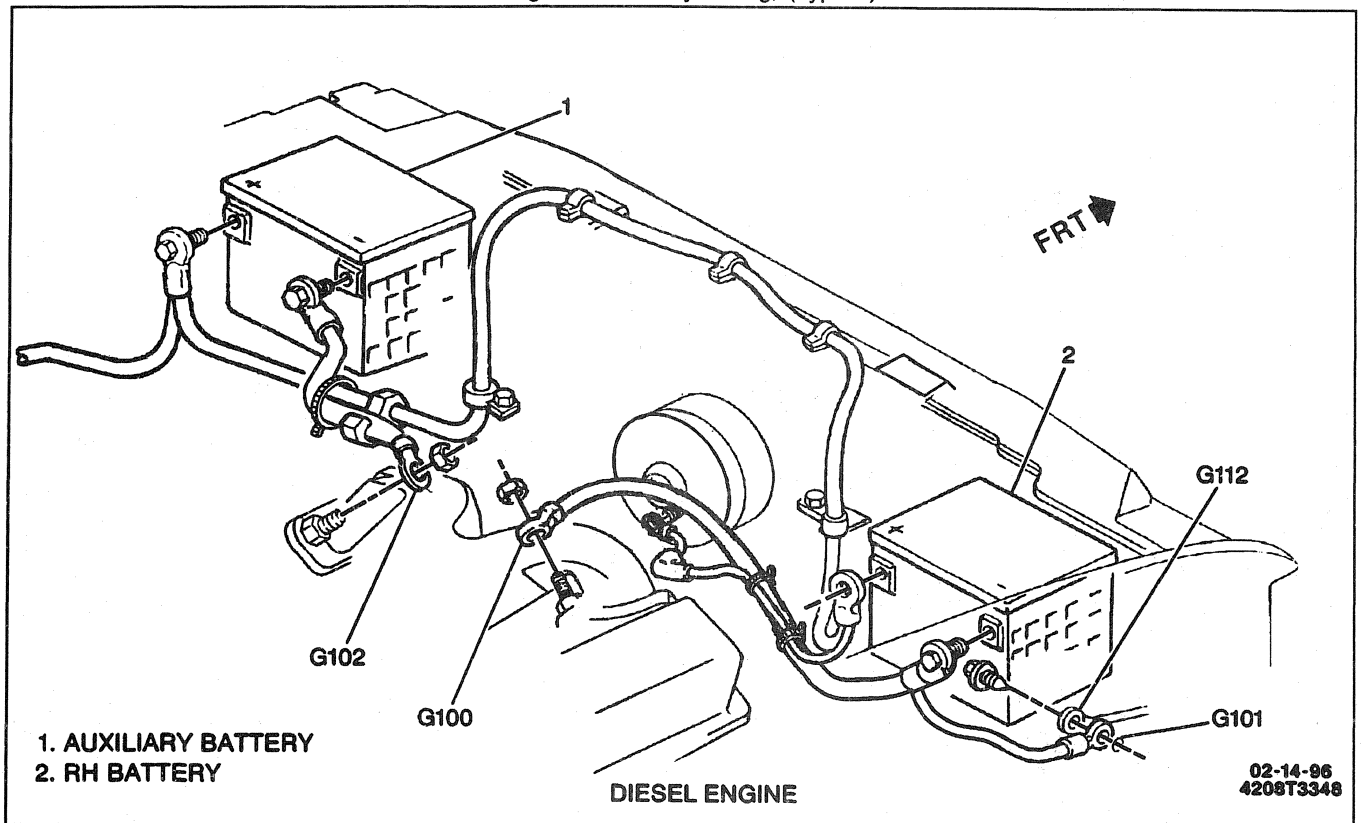


Figure 4—Battery Wiring, Diesel Engines

COMPONENT LOCATION VIEWS

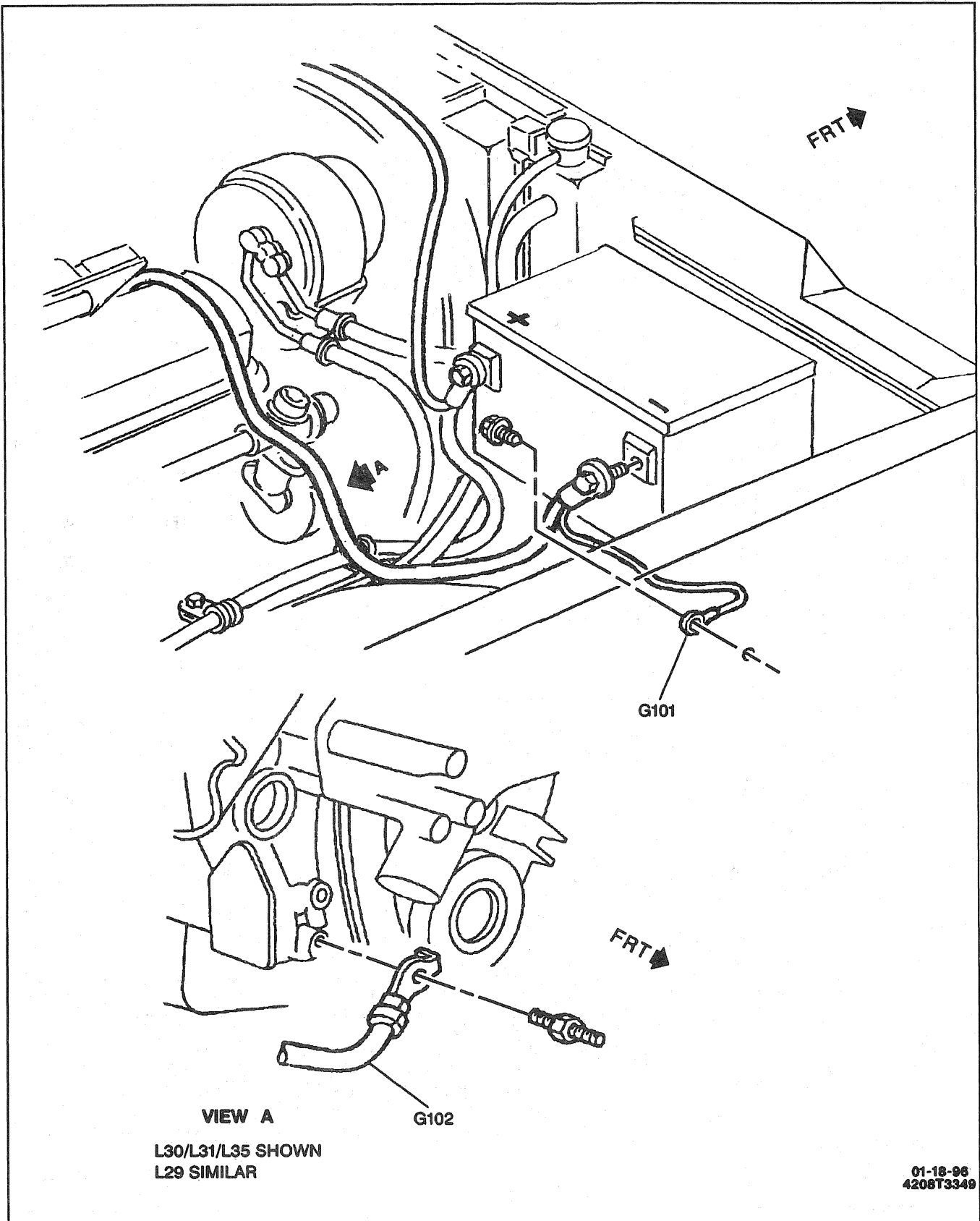


Figure 5—Negative Battery Cable Routing, Gasoline Engines

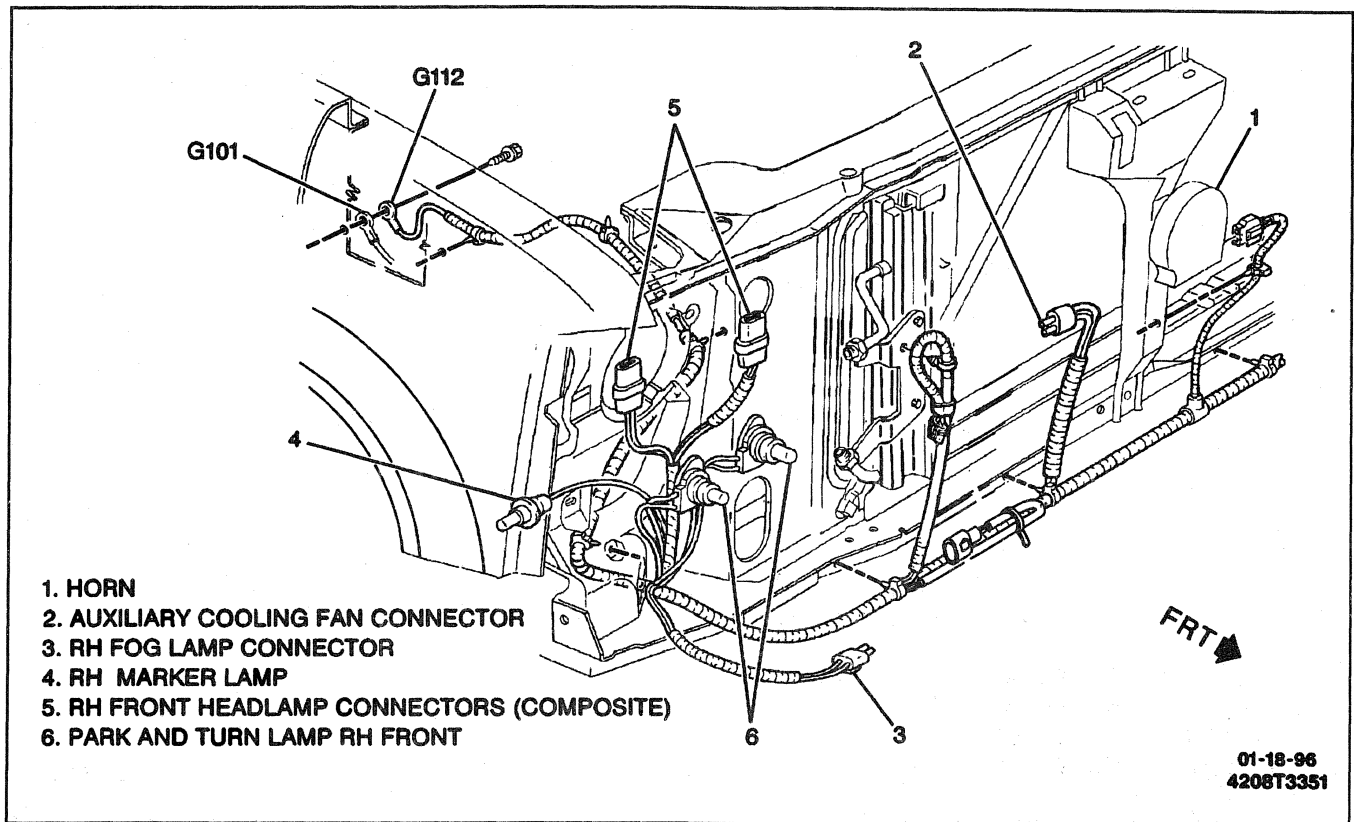


Figure 6—Forward Lamps Harness, RH Side

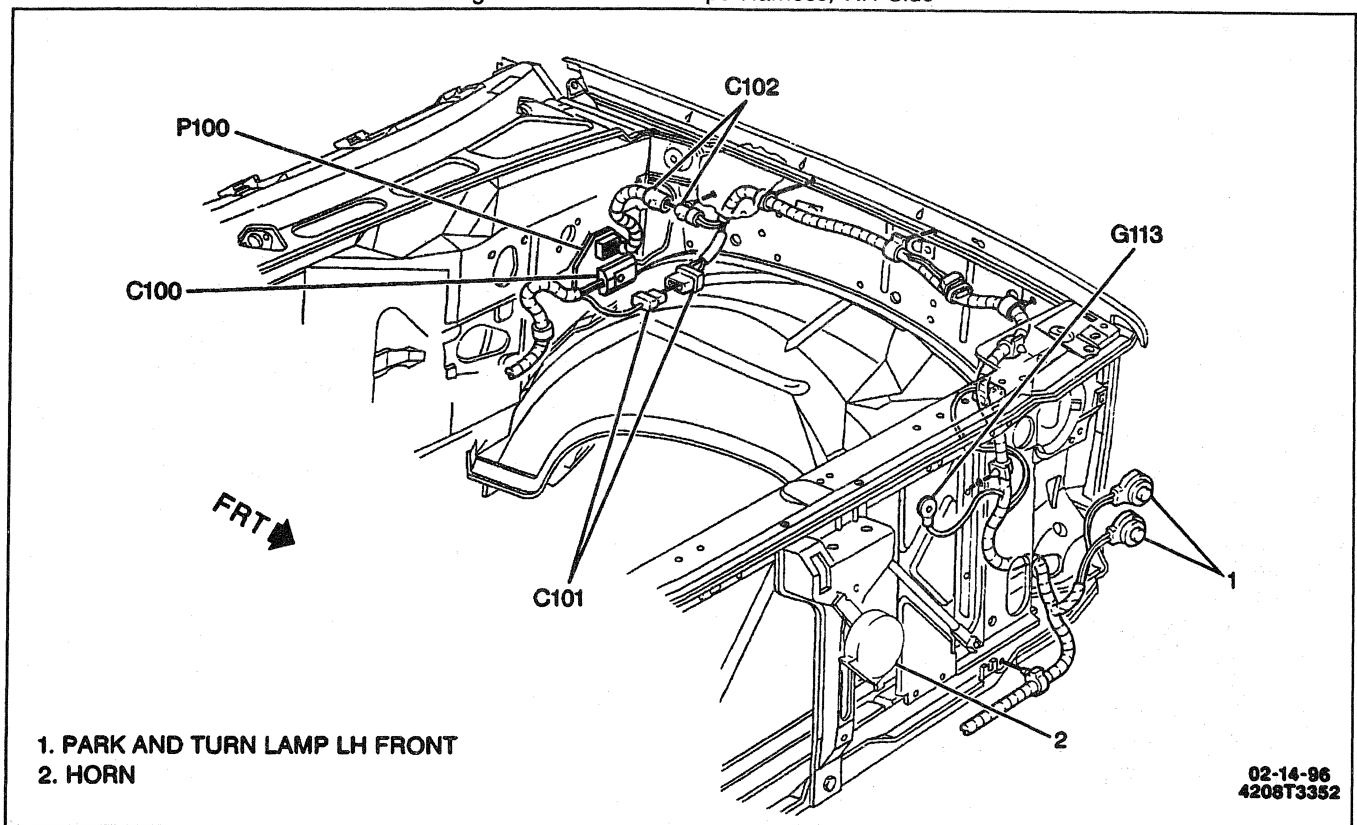


Figure 7—Forward Lamps Harness, LH Side

COMPONENT LOCATION VIEWS

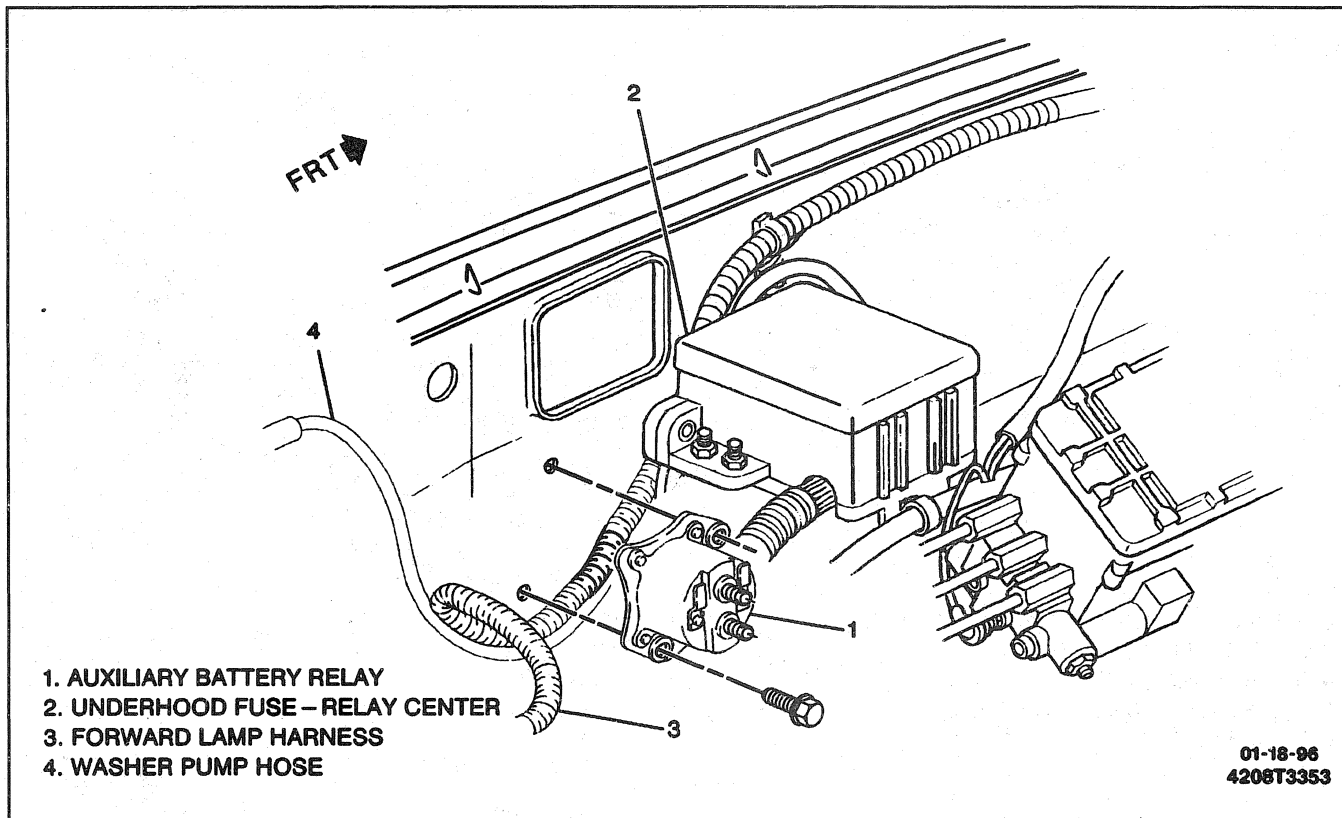


Figure 8—Auxiliary Battery Wiring

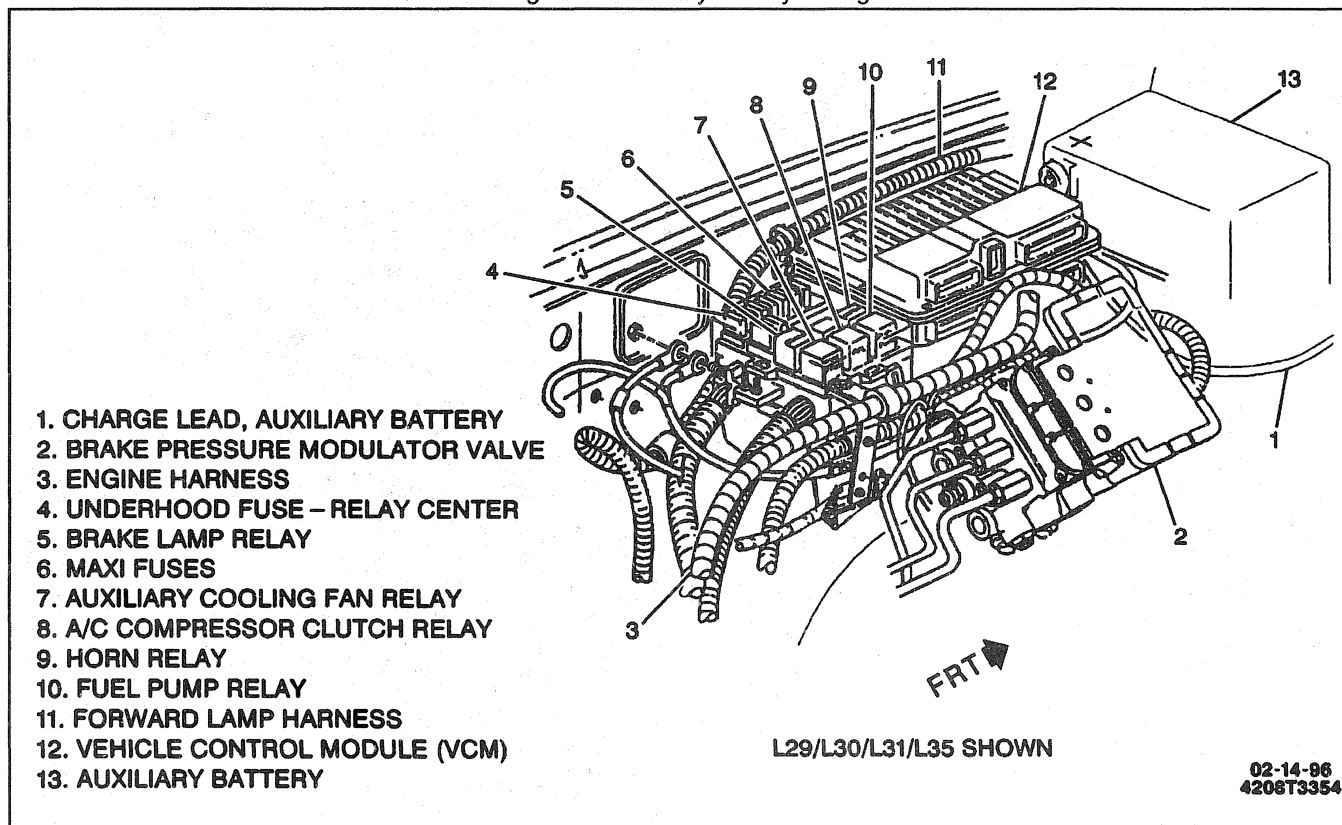


Figure 9—Underhood Fuse-Relay Center

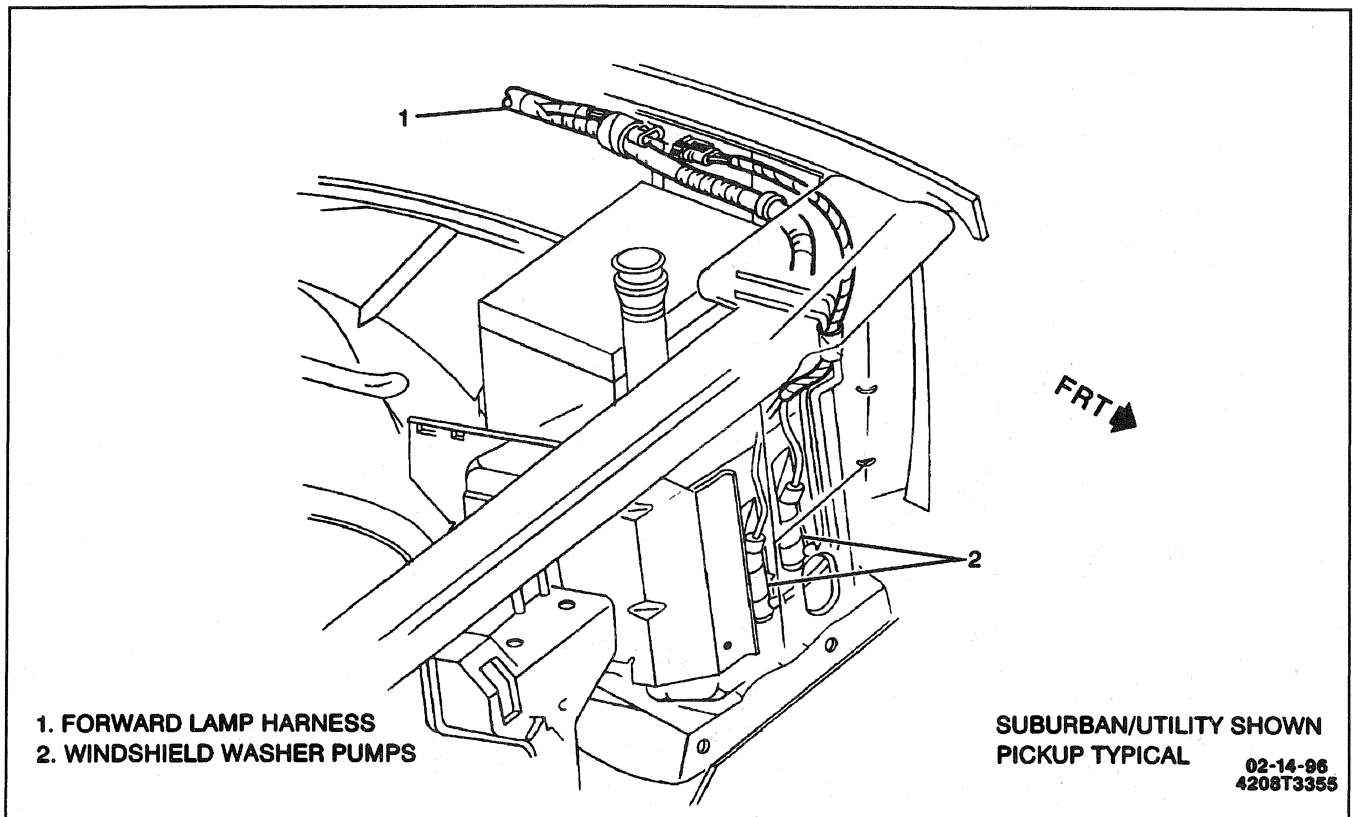


Figure 10—Wiper/Washer Reservoir (Suburban/Utility)

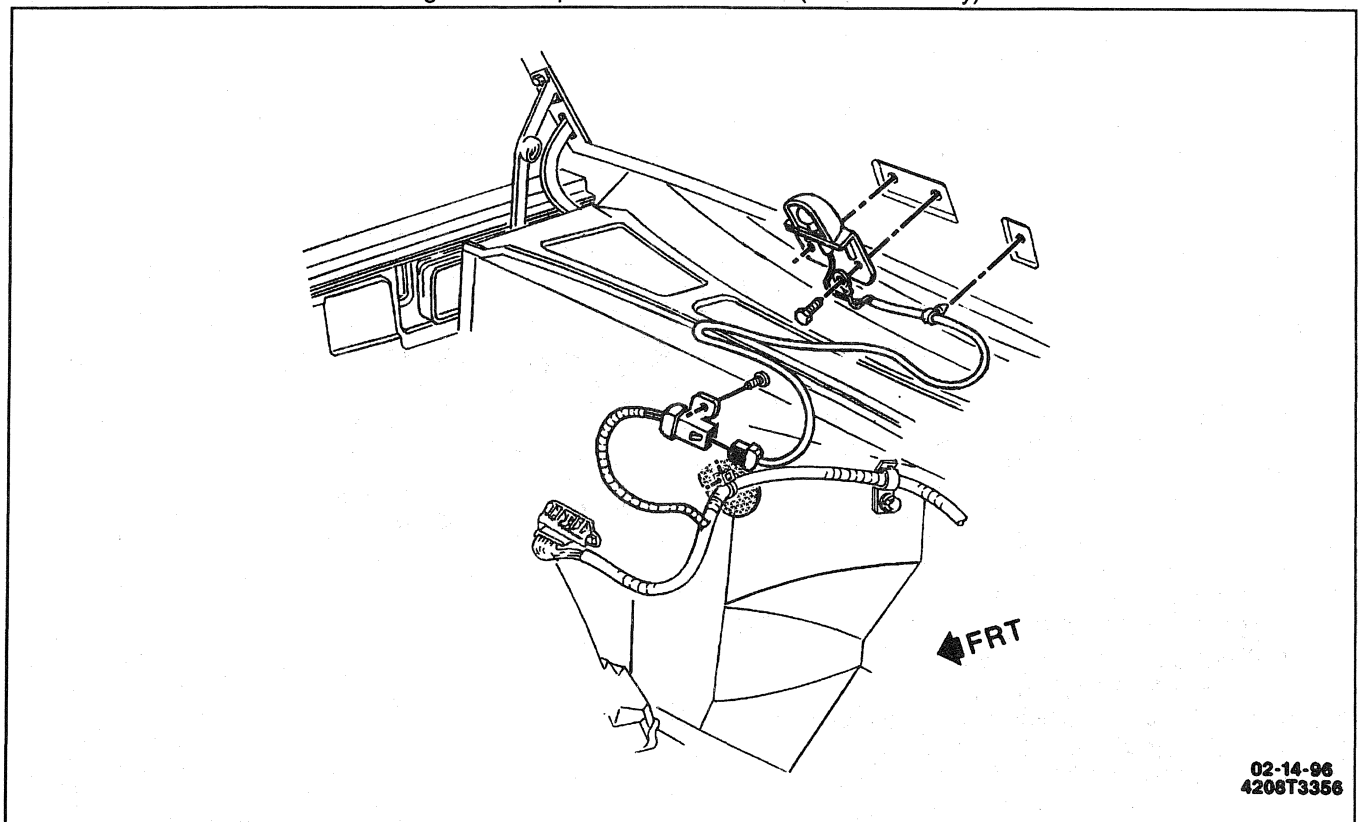
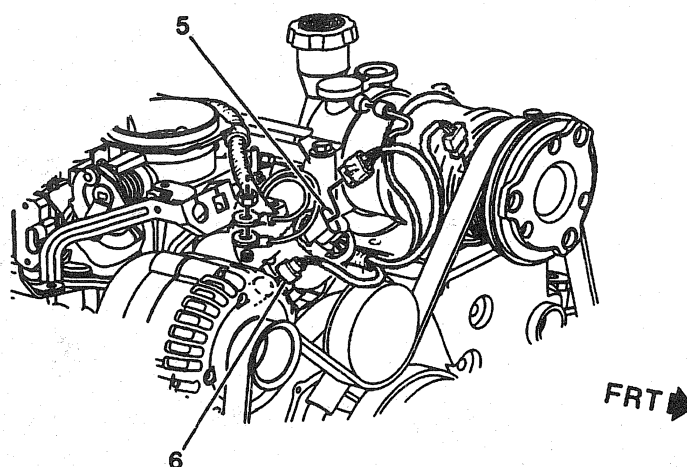
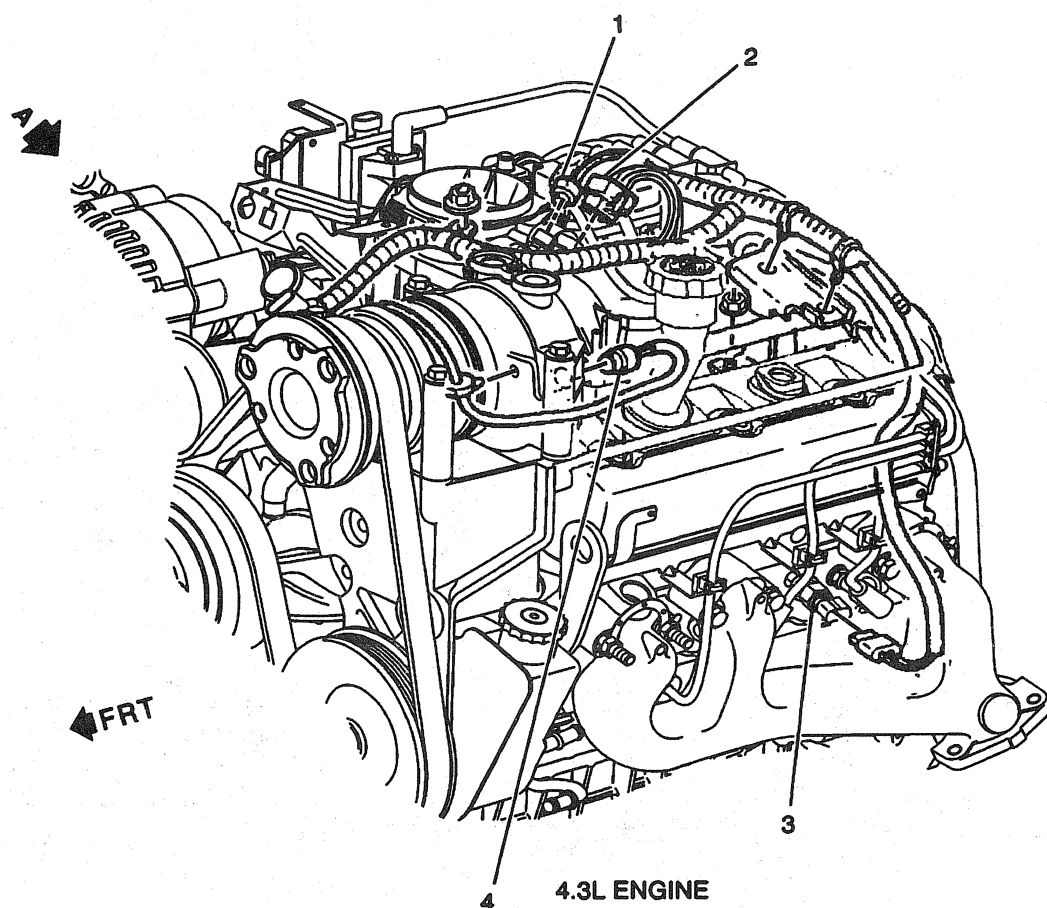


Figure 11—Underhood Lamp

COMPONENT LOCATION VIEWS

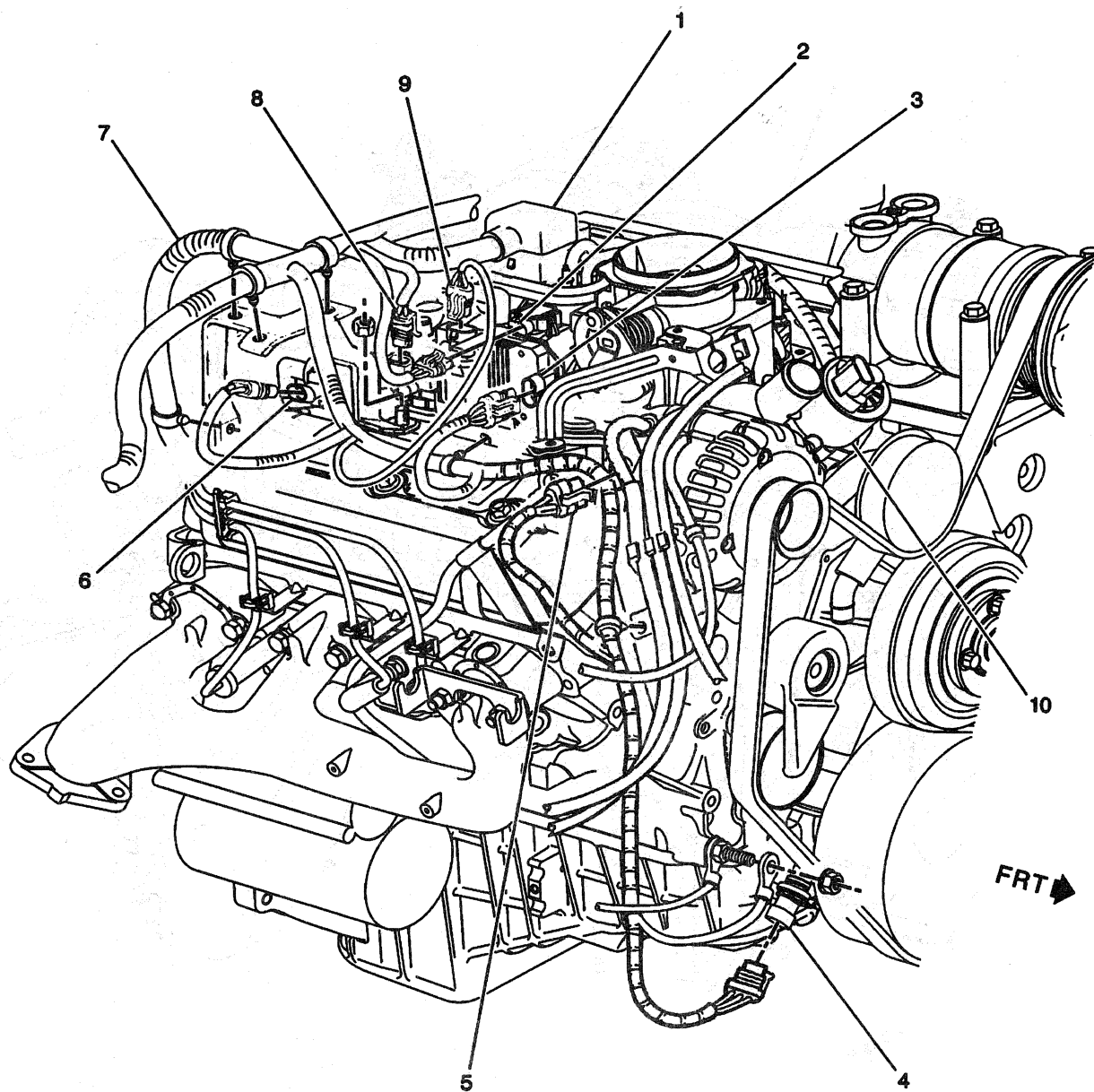


1. THROTTLE POSITION SENSOR
2. IDLE AIR CONTROL VALVE MOTOR
3. ENGINE TEMPERATURE SWITCH
4. AIR CONDITIONER HIGH PRESSURE CUT OFF SWITCH
5. LINEAR EGR VALVE
6. ENGINE COOLANT TEMPERATURE SENSOR

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Figure 12—4.3L Engine, LH Side



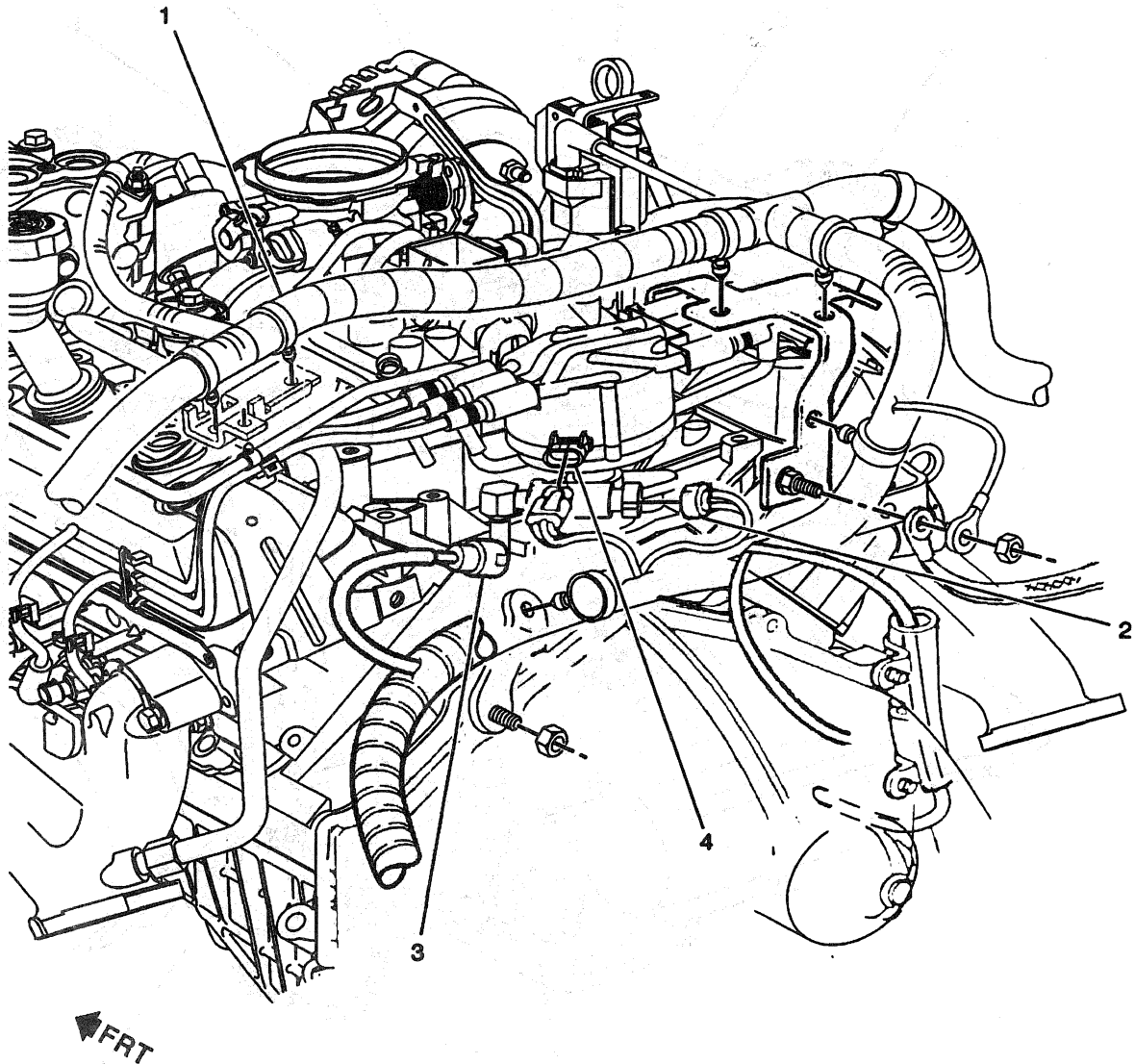


1. FUEL INJECTOR CONNECTOR
2. M.A.P. SENSOR
3. IGNITION COIL DRIVER
4. CRANKSHAFT POSITION SENSOR
5. GENERATOR CONNECTOR
6. EVAPORATIVE EMISSIONS PURGE SOLENOID VACUUM SWITCH
7. ENGINE HARNESS
8. EVAPORATIVE EMISSIONS CANISTER PURGE SOLENOID
9. IGNITION COIL CONNECTOR
10. LINEAR EGR VALVE

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Figure 13—4.3L Engine, RH Side

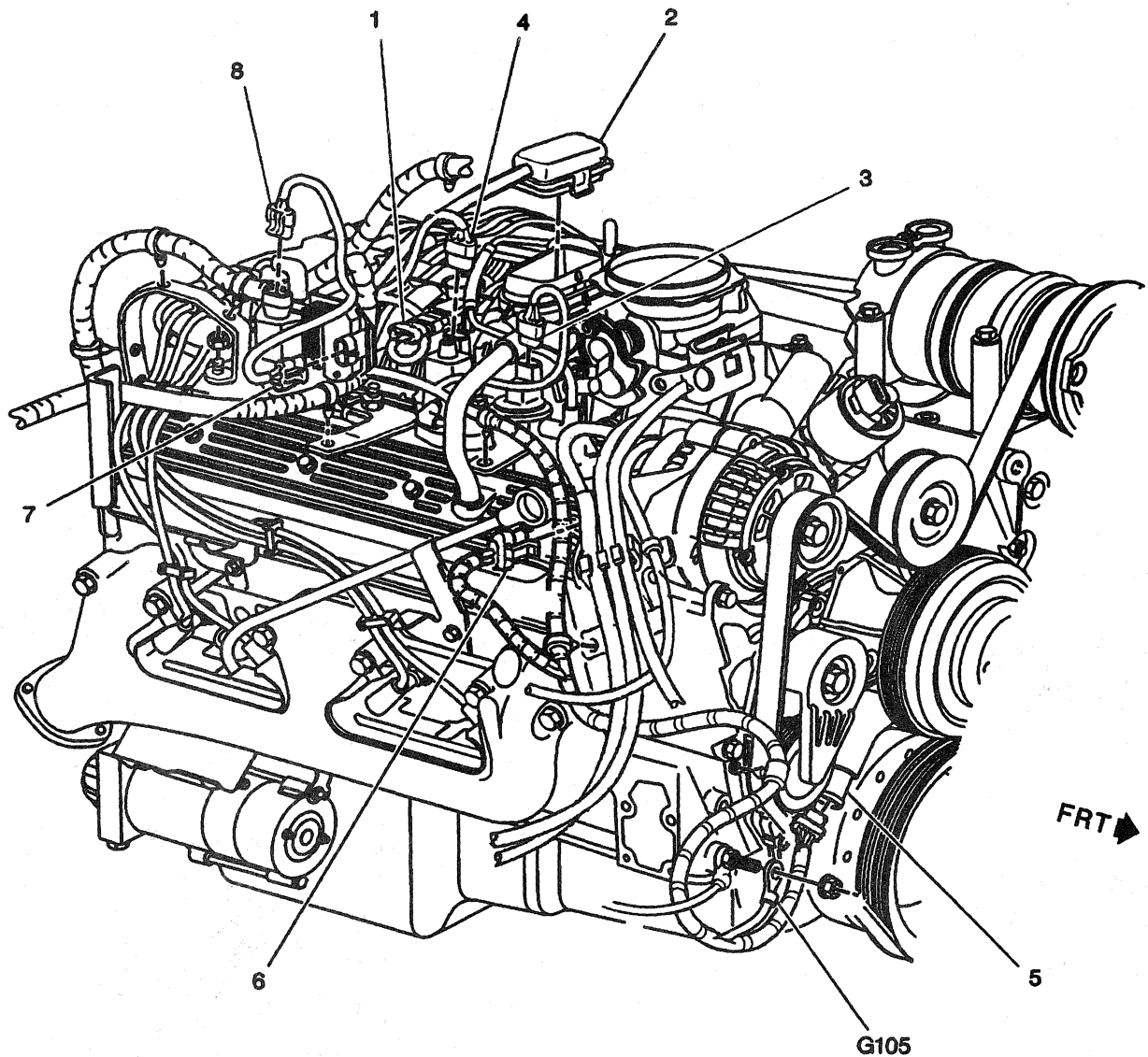
COMPONENT LOCATION VIEWS



1. ENGINE HARNESS
2. FUEL PUMP OIL PRESSURE SWITCH AND SENDER
3. KNOCK SENSOR CONNECTOR
4. CAMSHAFT POSITION SENSOR

4208T3359

Figure 14—4.3L Engine, Rear View



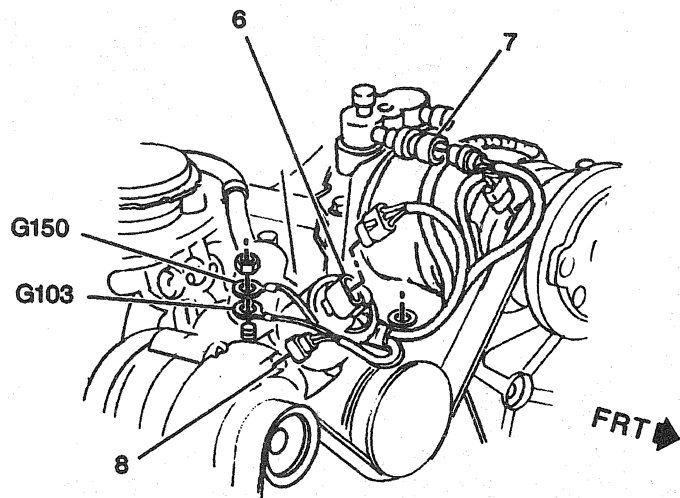
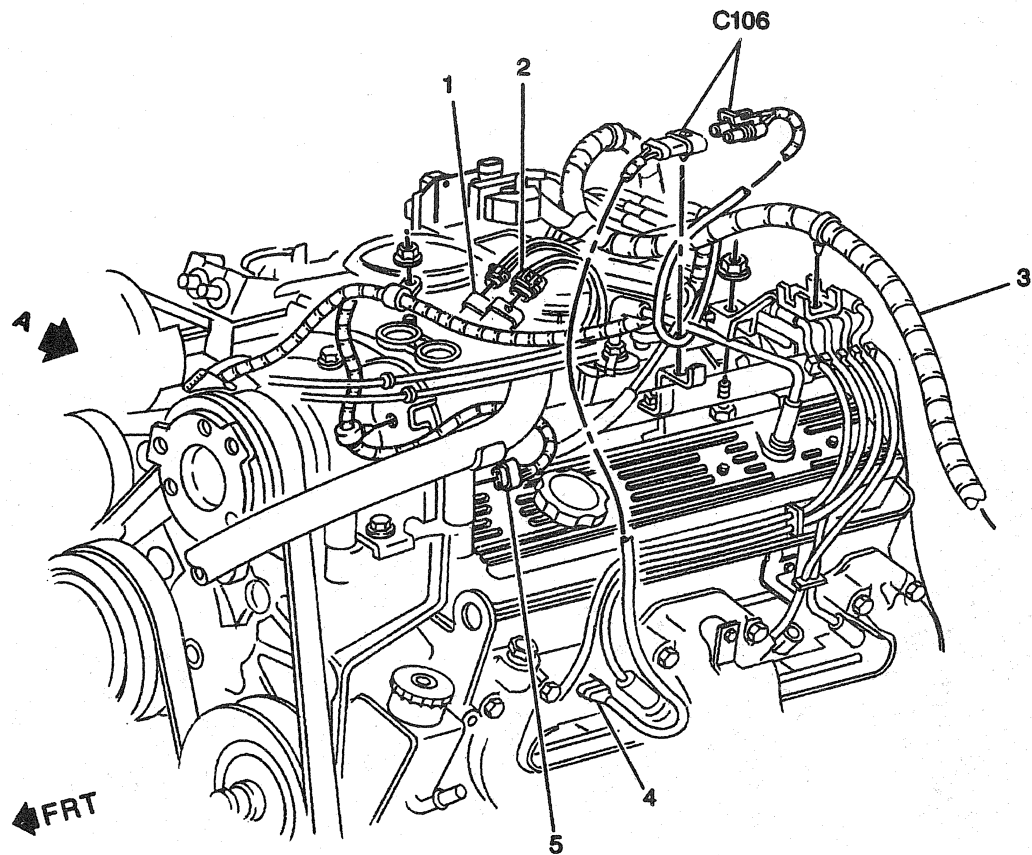
5.0L, 5.7L ENGINE

1. M.A.P. SENSOR
2. FUEL INJECTORS CONNECTOR
3. EVAPORATOR EMISSIONS CANISTER PURGE VACUUM SWITCH
4. EVAPORATOR EMISSIONS CANISTER PURGE VALVE SOLENOID
5. CRANKSHAFT POSITION SENSOR
6. GENERATOR CONNECTOR
7. IGNITION COIL DRIVER
8. IGNITION COIL CONNECTOR

4208T3360

Figure 15—5.0L &amp; 5.7L Engines, RH Side

COMPONENT LOCATION VIEWS

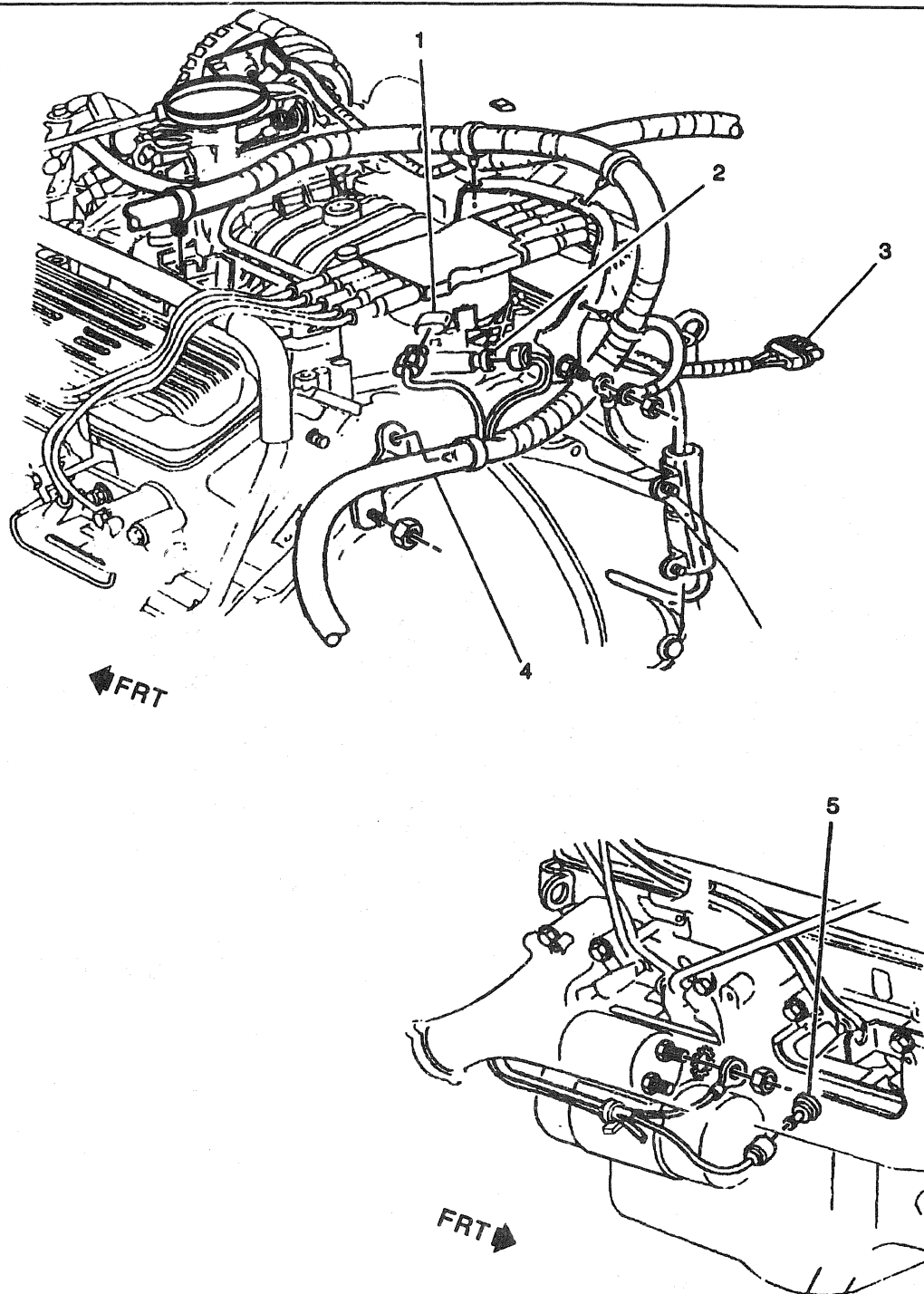


VIEW A

1. THROTTLE POSITION SENSOR
2. IDLE AIR CONTROL VALVE MOTOR
3. ENGINE HARNESS
4. ENGINE COOLANT TEMPERATURE SENDER
5. A/C HIGH PRESSURE CUT - OFF SWITCH
6. LINEAR EGR VALVE
7. A/C COMPRESSOR CYCLING SWITCH
8. ENGINE COOLANT TEMPERATURE SENSOR

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Figure 16—5.0L & 5.7L Engines, LH Side

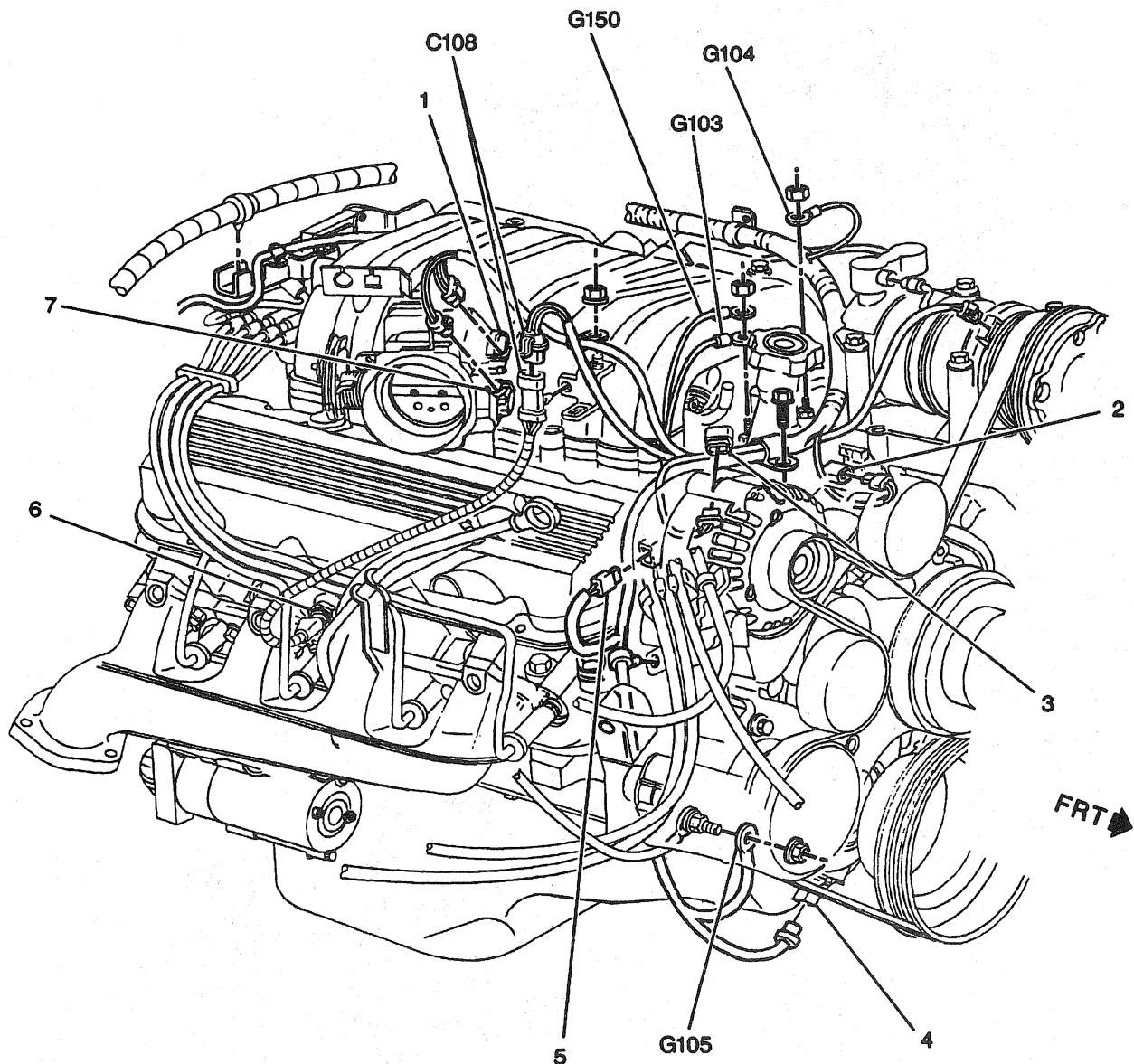


1. CAMSHAFT POSITION SENSOR
2. FUEL PUMP OIL PRESSURE SWITCH AND SENDER
3. HEATED OXYGEN SENSOR CONNECTOR
4. ENGINE HARNESS
5. KNOCK SENSOR

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Figure 17—5.0L &amp; 5.7L Engines, Rear View

COMPONENT LOCATION VIEWS



7.4L ENGINE

1. IDLE AIR CONTROL VALVE MOTOR
2. ENGINE COOLANT TEMPERATURE SENDER
3. M.A.P. SENSOR
4. CRANKSHAFT POSITION SENSOR
5. GENERATOR CONNECTOR
6. AUXILIARY COOLING FAN TEMPERATURE SWITCH
7. THROTTLE POSITION SENSOR

4208T3363

Figure 18—7.4L Engine, RH Side

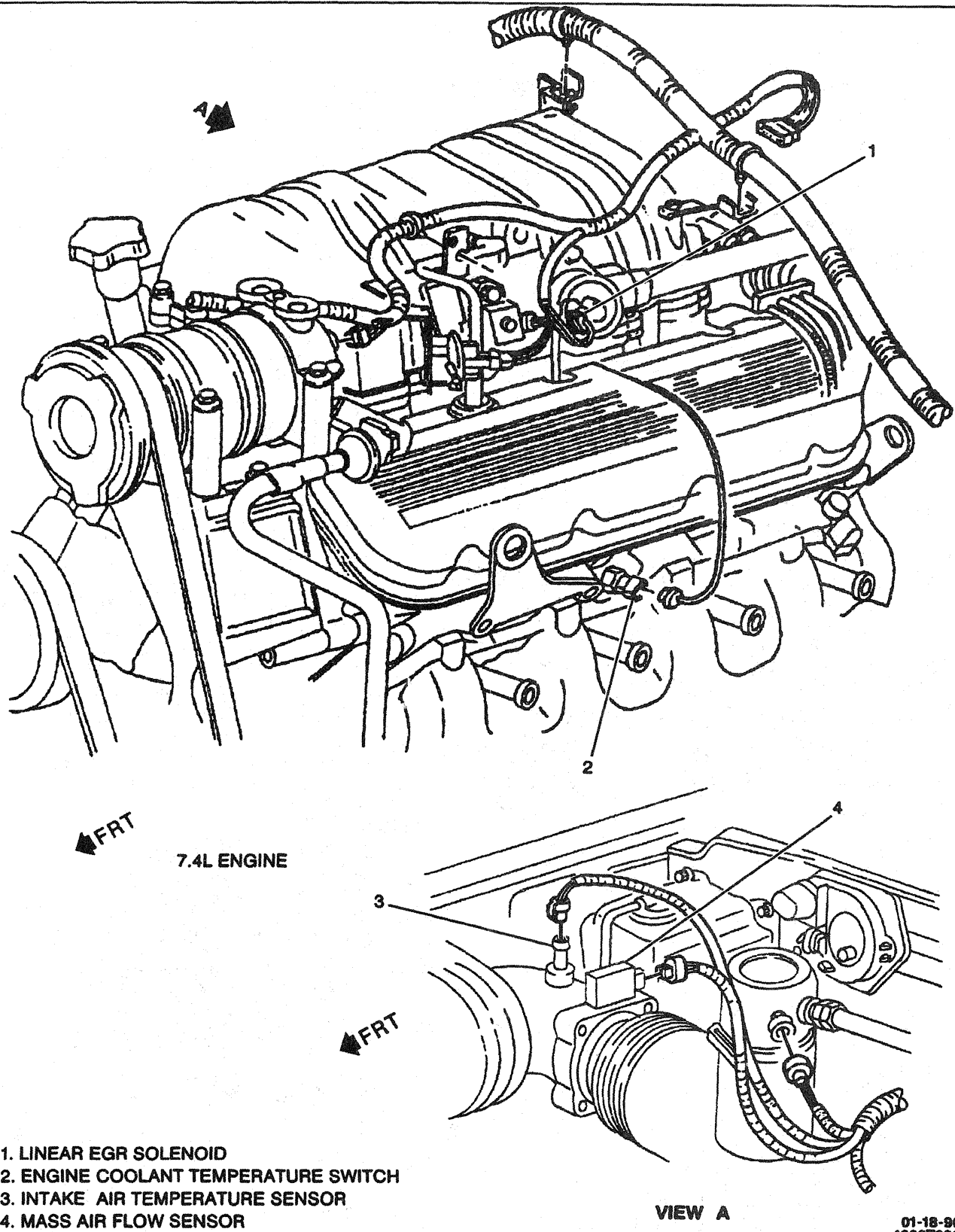


Figure 19—7.4L Engine, LH Side

COMPONENT LOCATION VIEWS

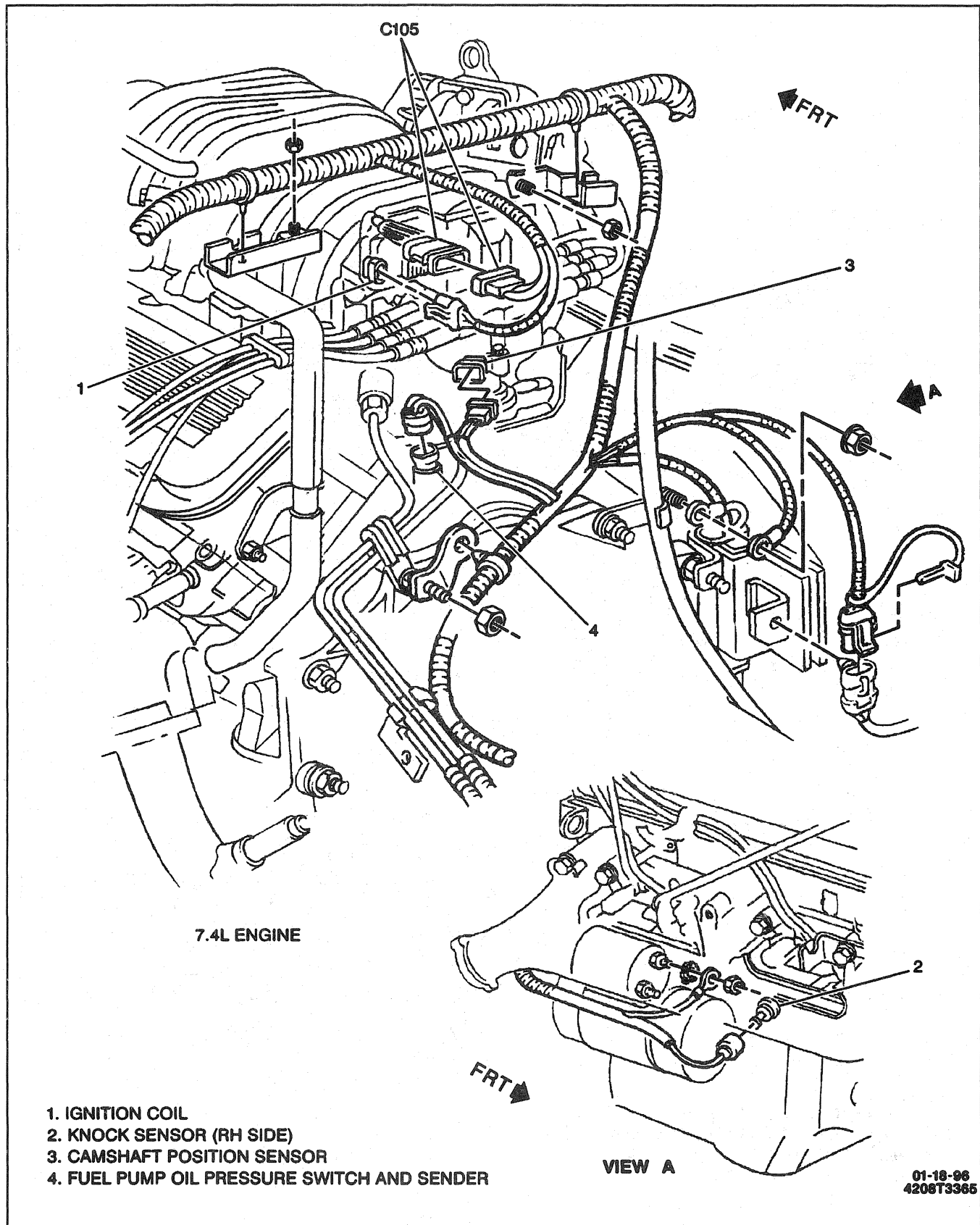
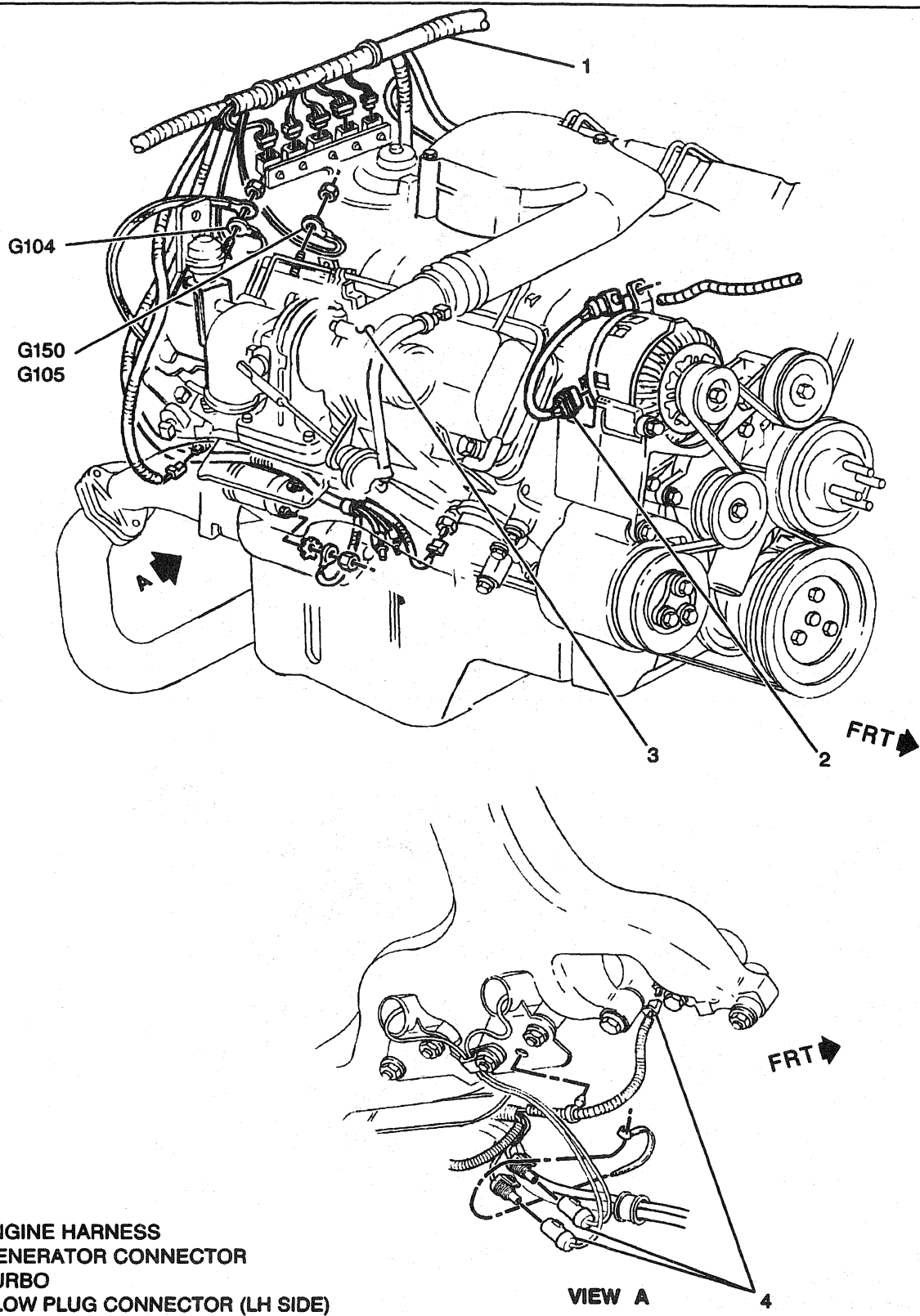


Figure 20—7.4L Engine, Rear View

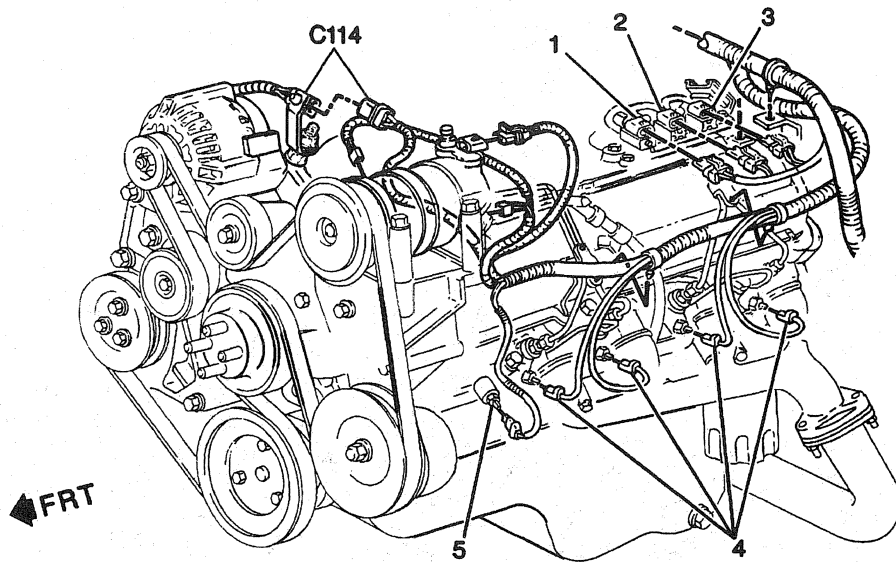




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Figure 21—6.5L Diesel Engine, RH Side

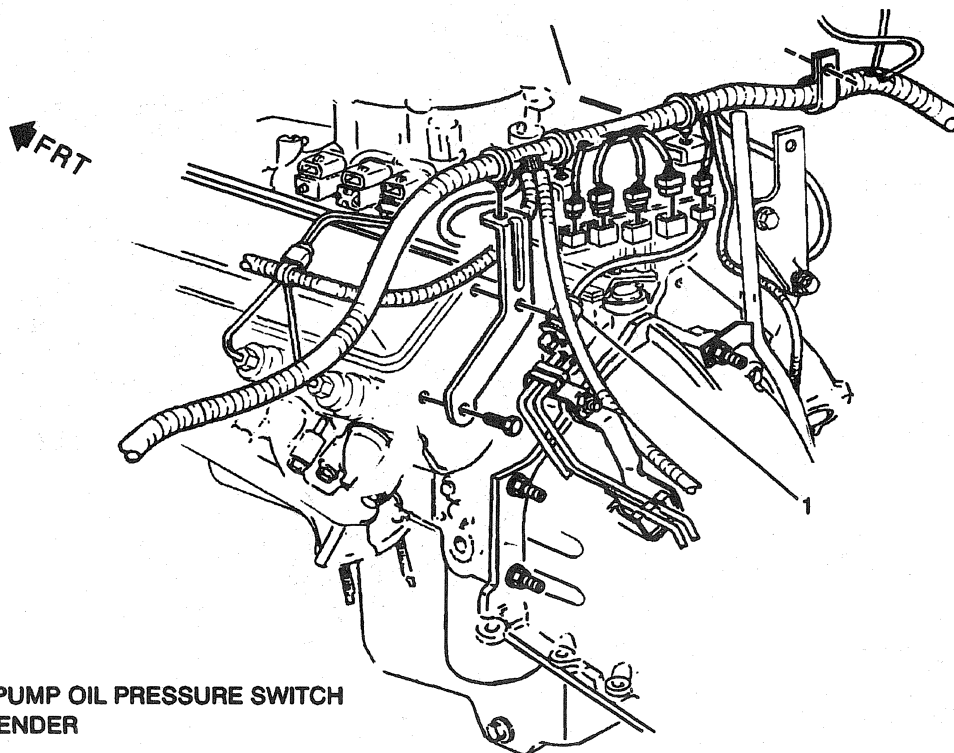
## COMPONENT LOCATION VIEWS



1. EXHAUST GAS RECIRCULATION BOOST PULSE WIDTH MODULATION SOLENOID VALVE (W/L65)
2. EXHAUST GAS RECIRCULATION VALVE SOLENOID
3. EXHAUST GAS RECIRCULATION PULSE WIDTH MODULATION SOLENOID VALVE
4. ENGINE GLOW PLUGS
5. ENGINE COOLANT TEMPERATURE SENDER

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Figure 22—6.5L Diesel Engine, LH Side



1. FUEL PUMP OIL PRESSURE SWITCH AND SENDER

02-14-96  
4208T3368

Figure 23—6.5L Diesel Engine, Rear View

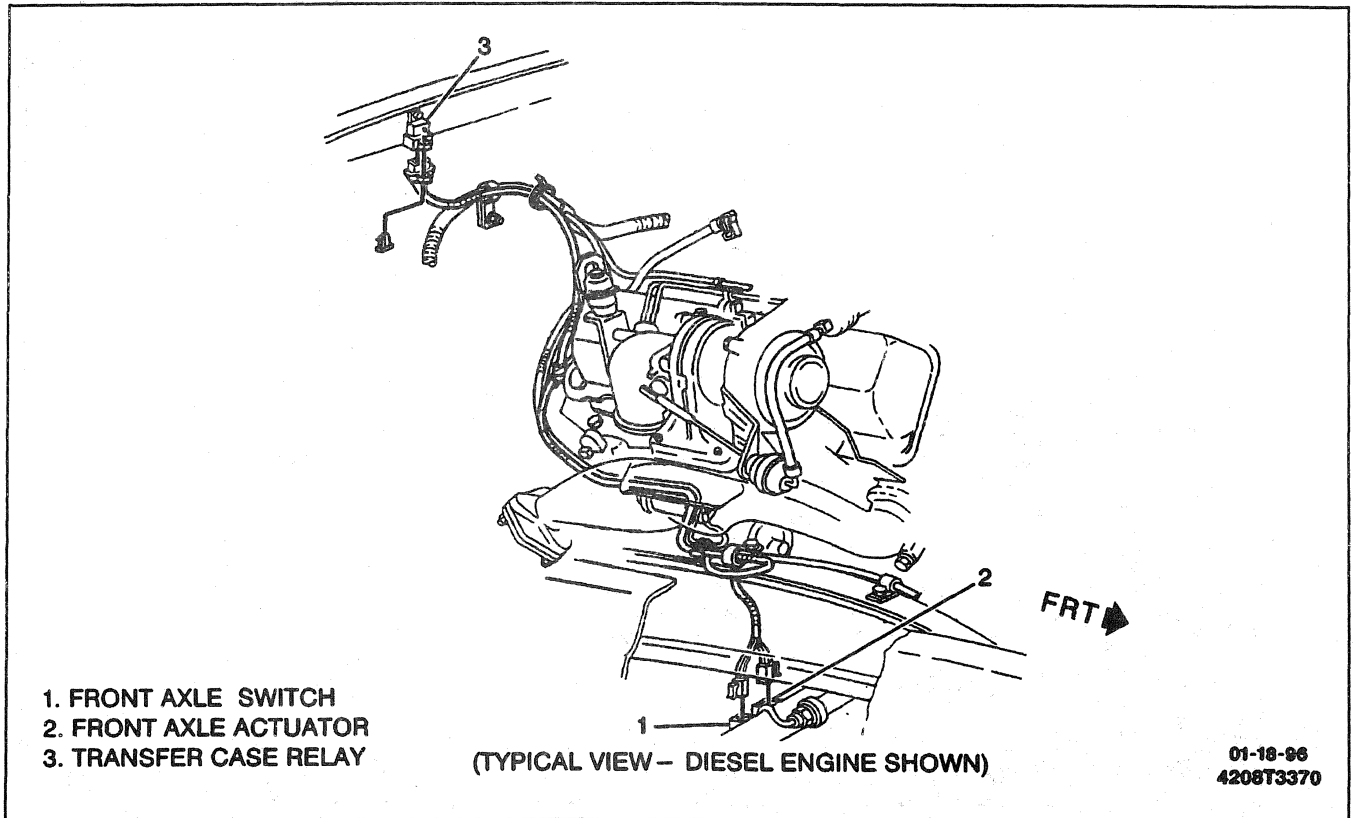


Figure 24—Transfer Case Relay

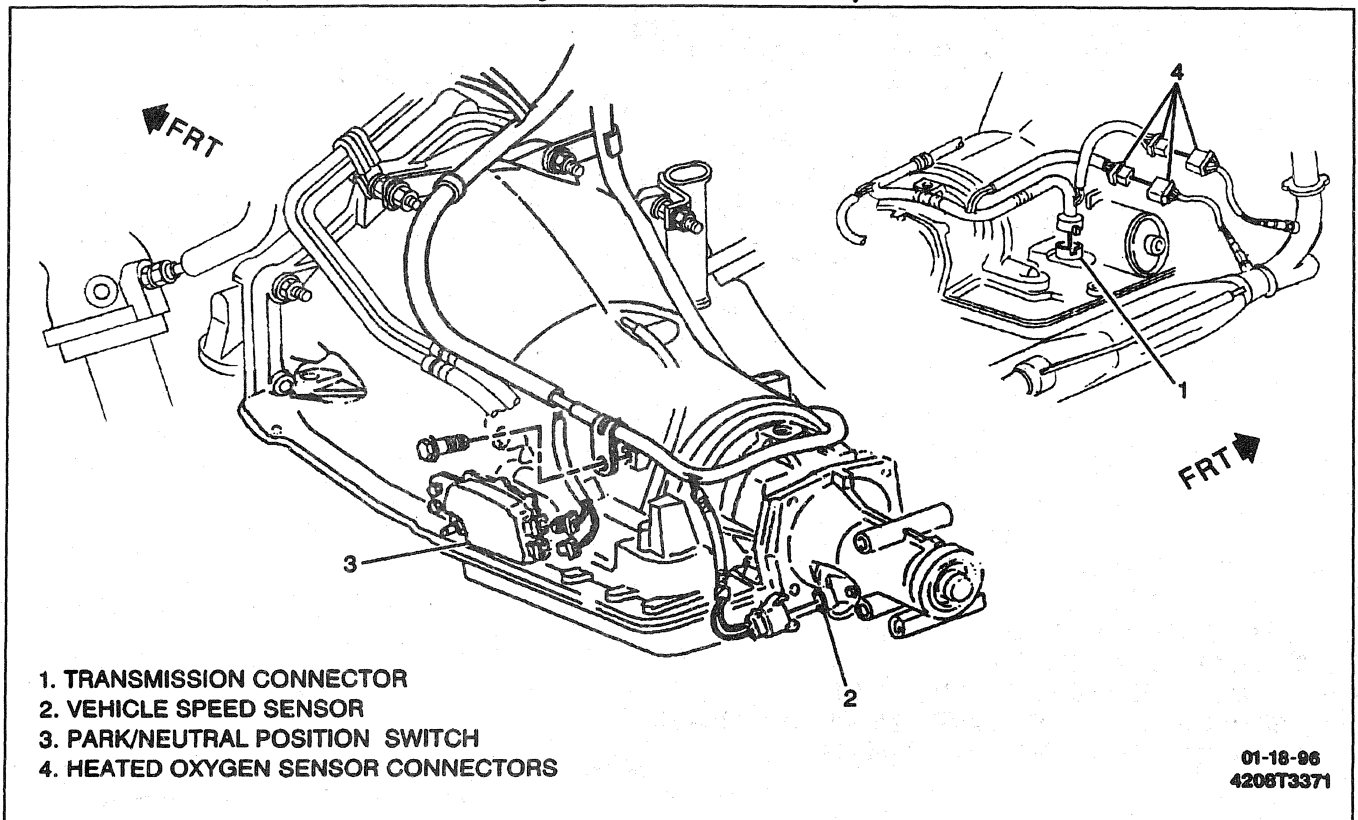
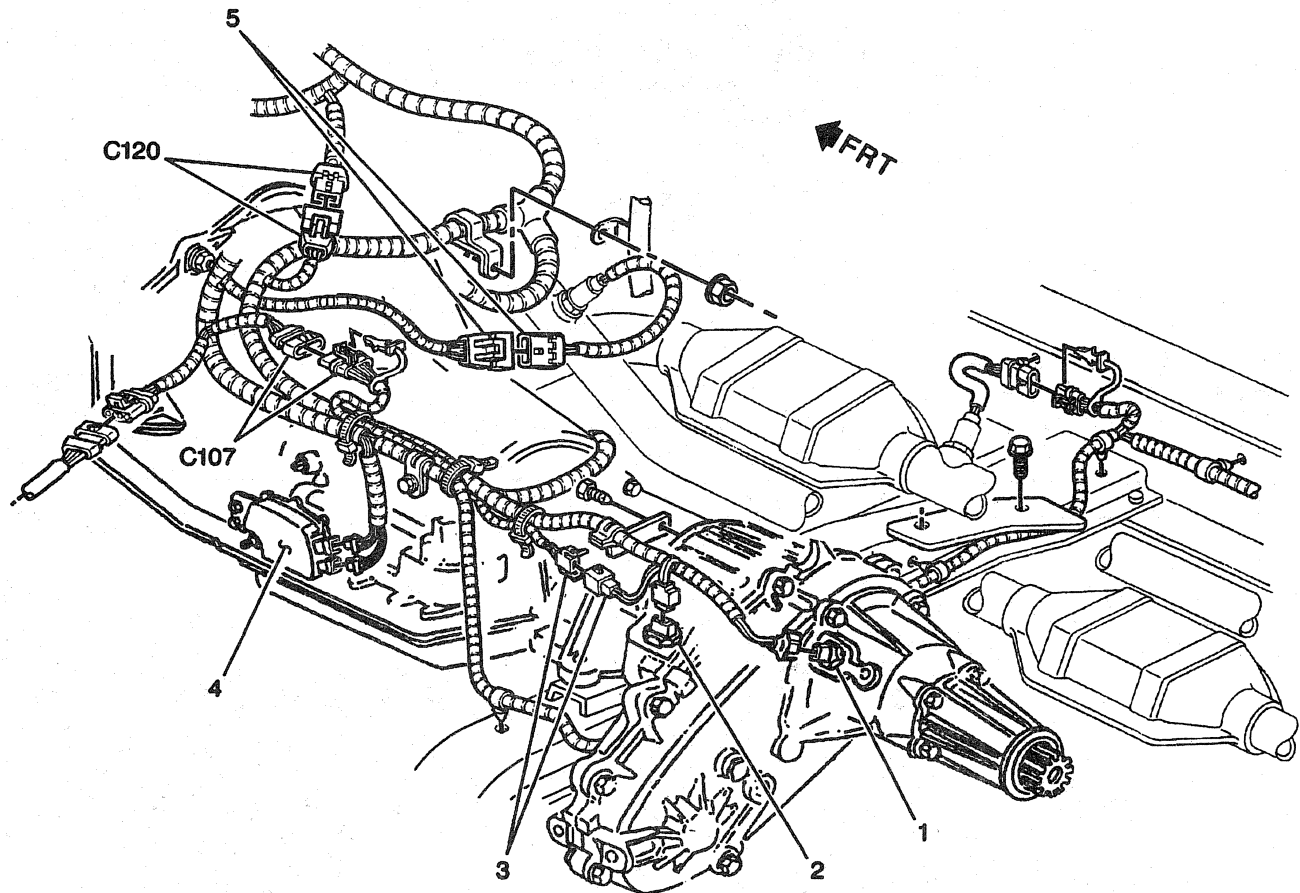


Figure 25—Electronic 4-Speed Automatic Overdrive Transmission (4L60E)

COMPONENT LOCATION VIEWS



- 1. VEHICLE SPEED SENSOR
- 2. TRANSFER CASE SWITCH
- 3. VEHICLE SPEED SENSOR CONNECTOR
- 4. PARK/NEUTRAL POSITION AND BACKUP LAMP SWITCH
- 5. HEATED OXYGEN SENSOR CONNECTOR

4208T3372

Figure 26—Electronic 4-Speed Automatic Overdrive Transmission W/4WD (4L60E)

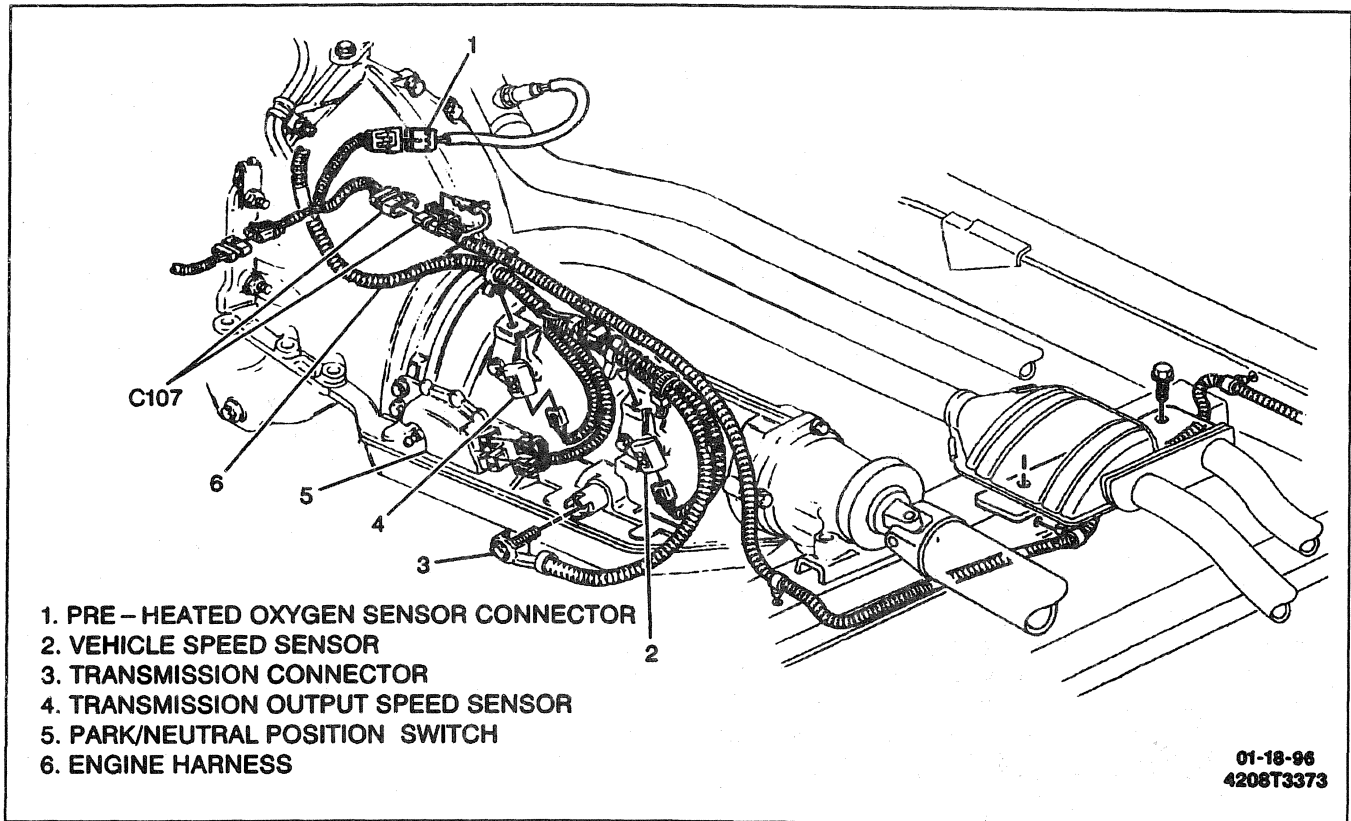


Figure 27—Electronic 4-Speed Automatic Overdrive Transmission (4L80E)

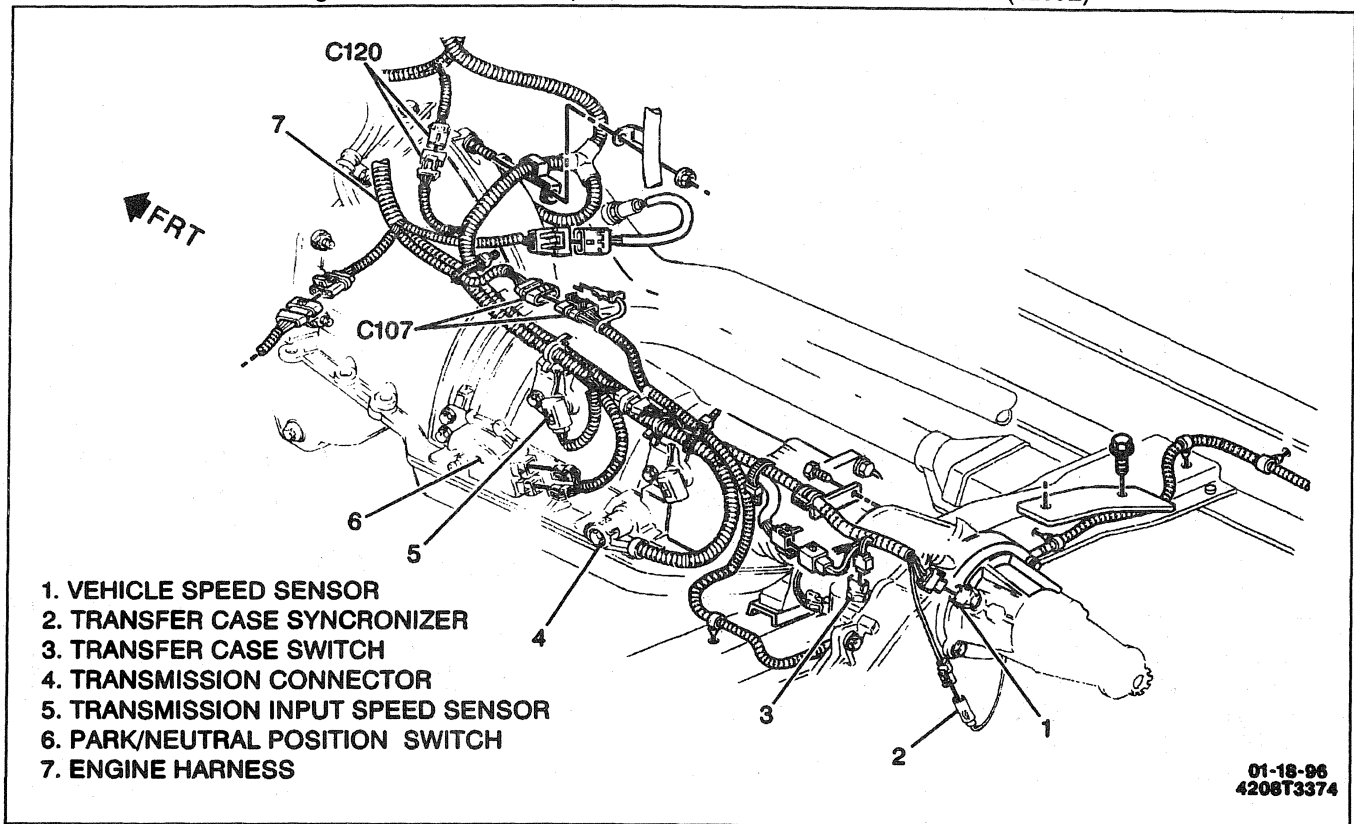


Figure 28—Electronic 4-Speed Automatic Overdrive Transmission W/4WD (4L80E)

# COMPONENT LOCATION VIEWS

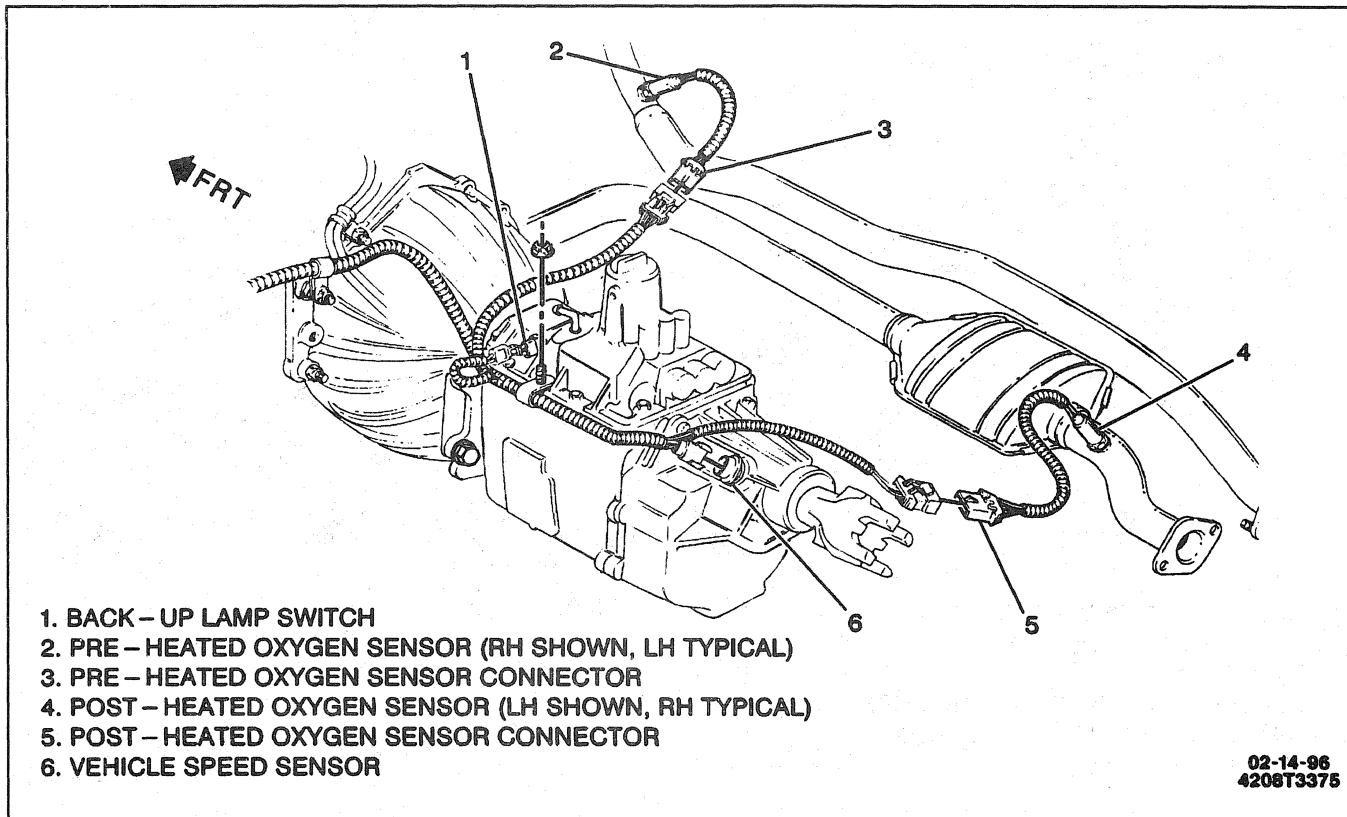


Figure 29—5-Speed Manual Transmission (MW3)

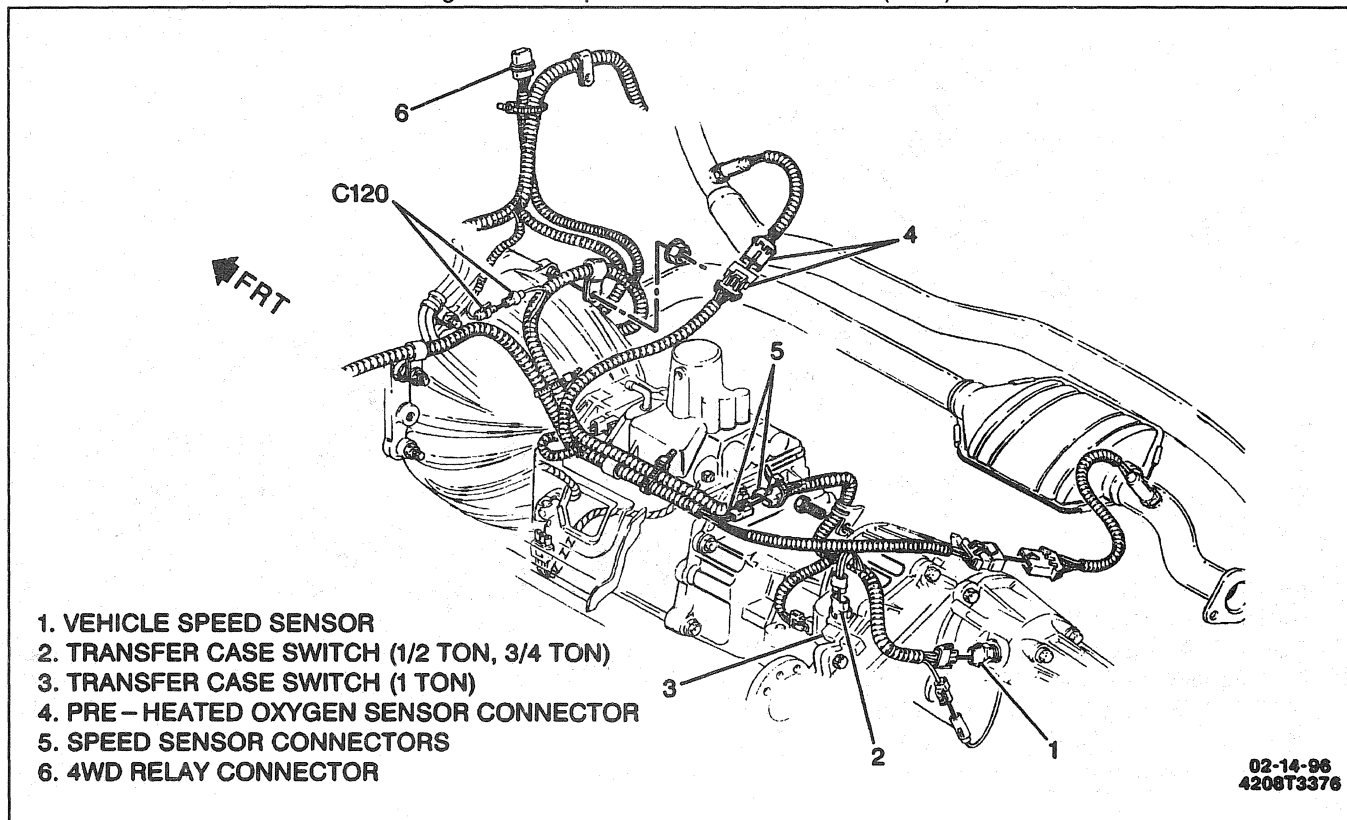


Figure 30—5-Speed Manual Transmission W/4WD (MW3)

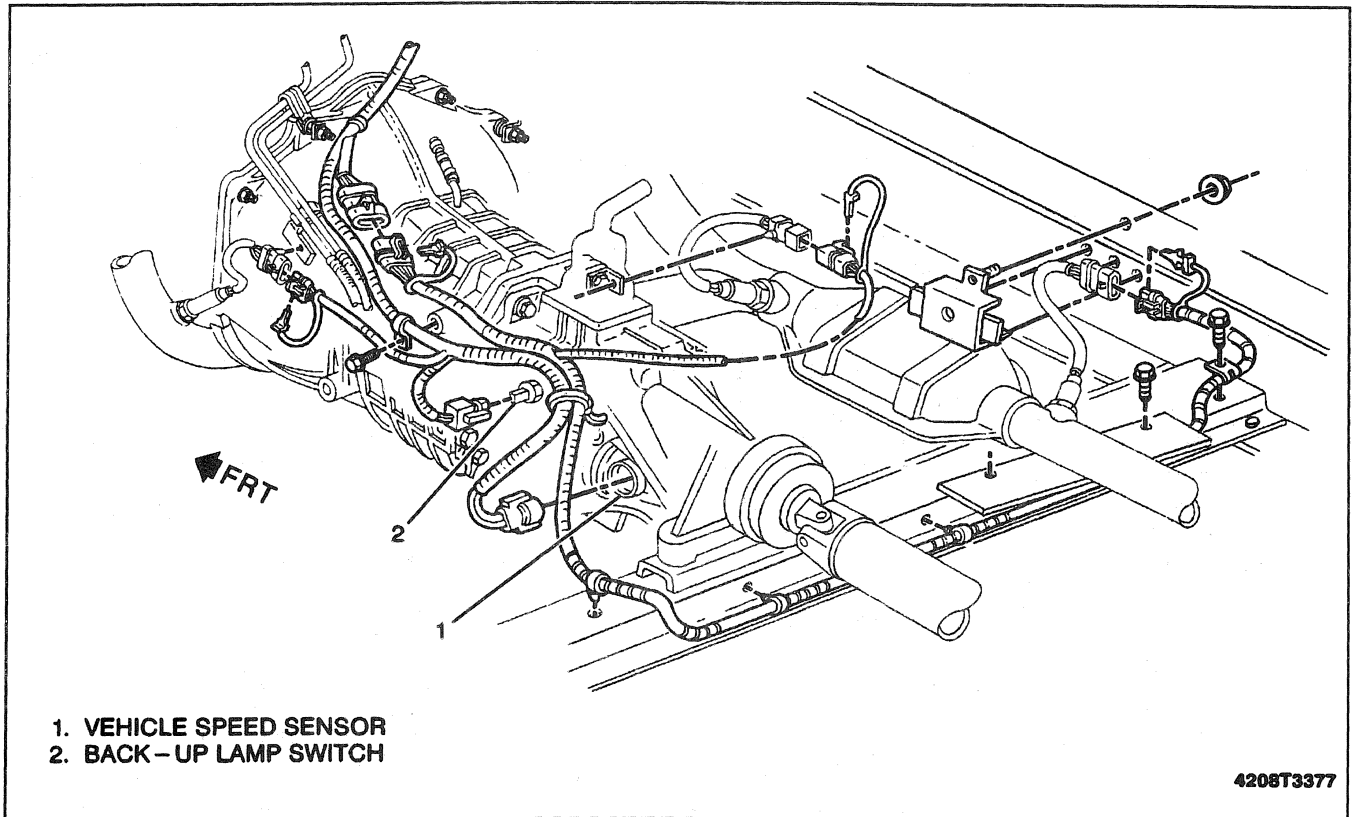


Figure 31—5-Speed Manual Transmission (MG5)

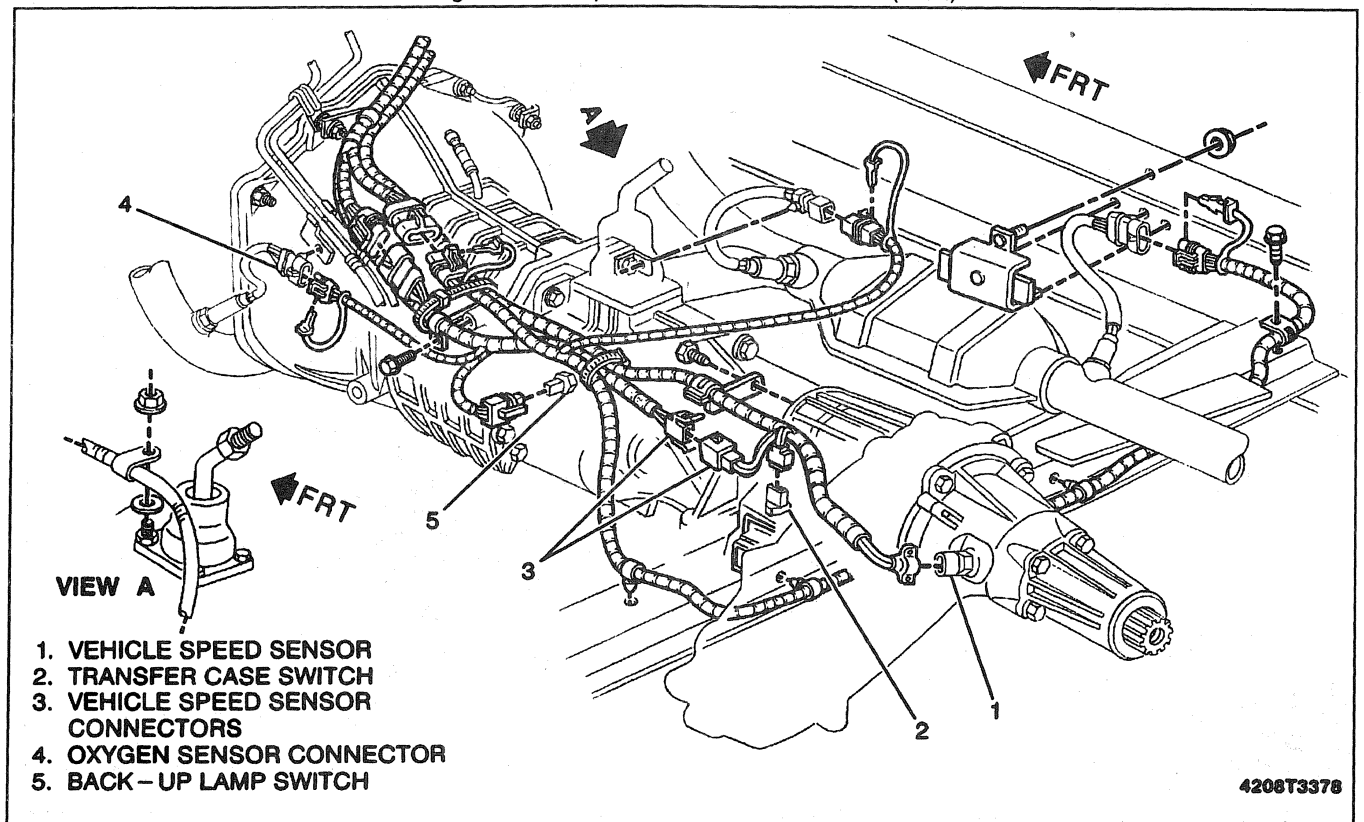


Figure 32—5-Speed Manual Transmission W/4WD (MG5)

COMPONENT LOCATION VIEWS

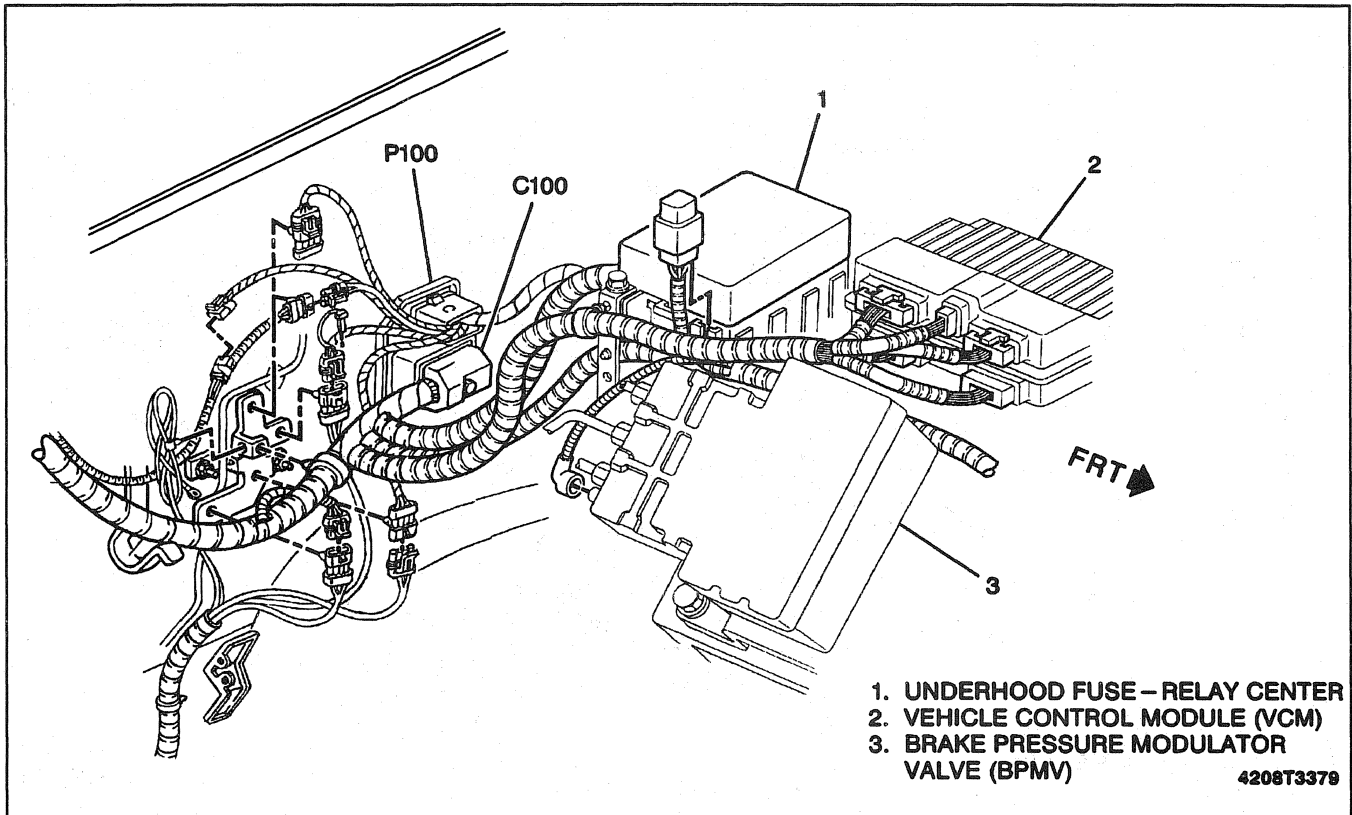


Figure 33—Brake Pressure Modulator Valve

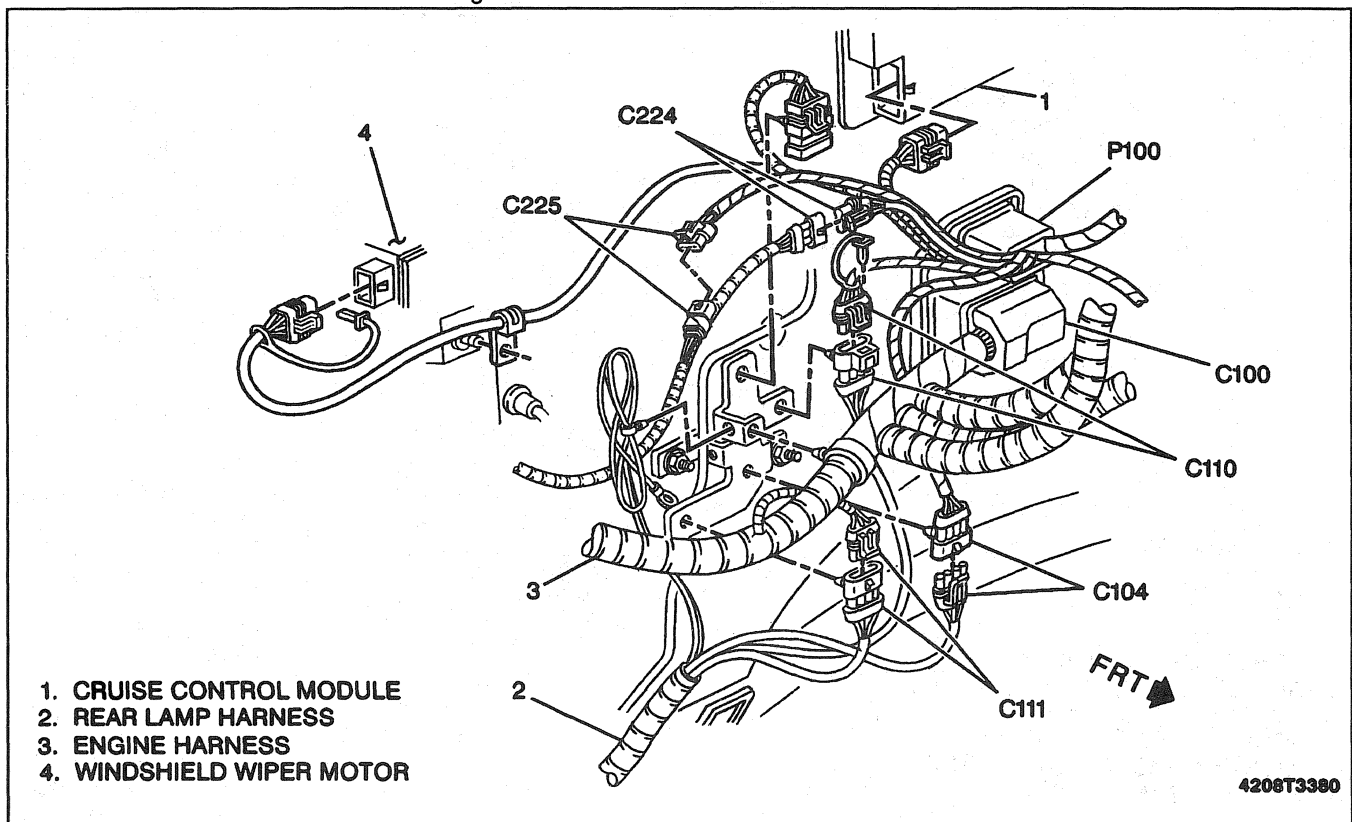


Figure 34—Cruise Control Module



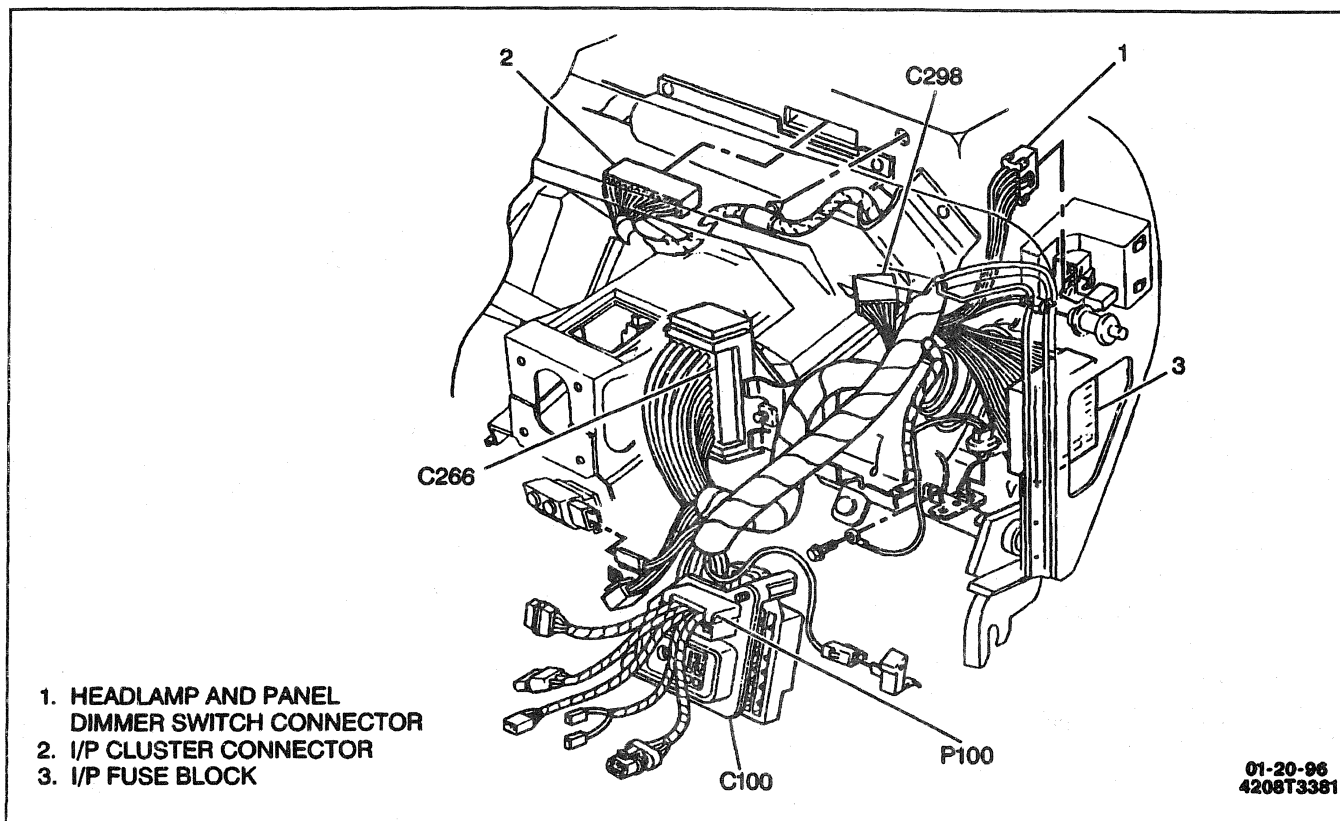


Figure 35—Instrument Panel Wiring, LH Side

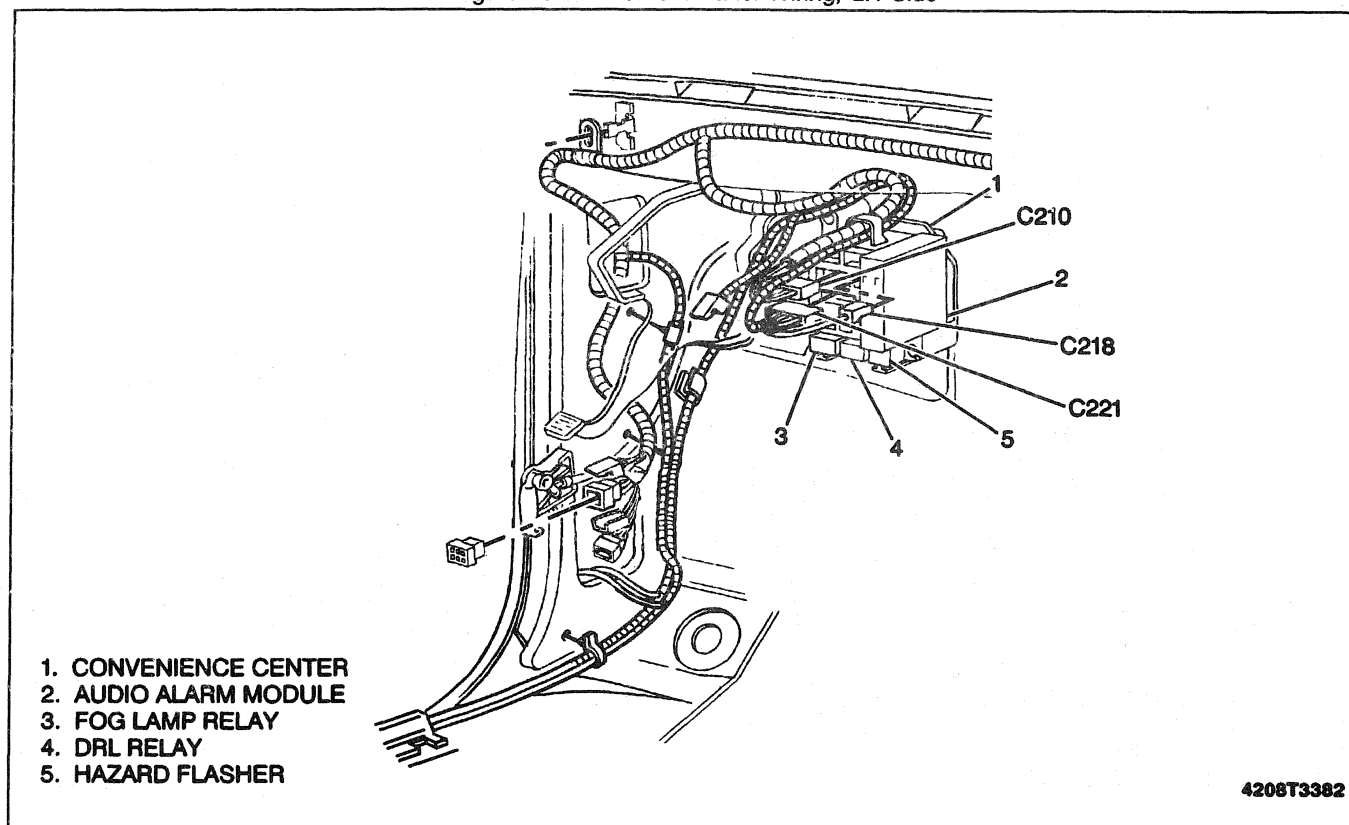


Figure 36—Convenience Center

# COMPONENT LOCATION VIEWS

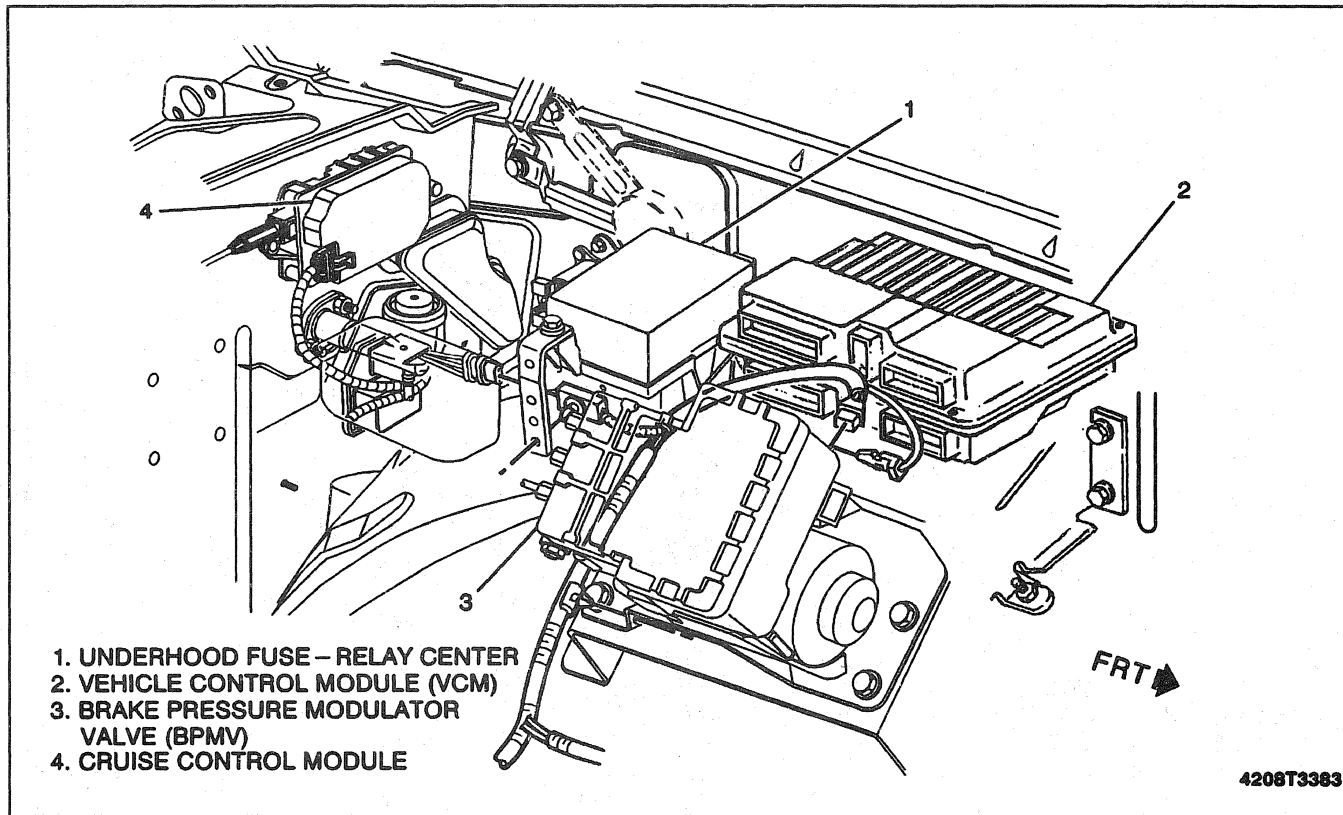


Figure 37—Vehicle Control Module (VCM) Gasoline

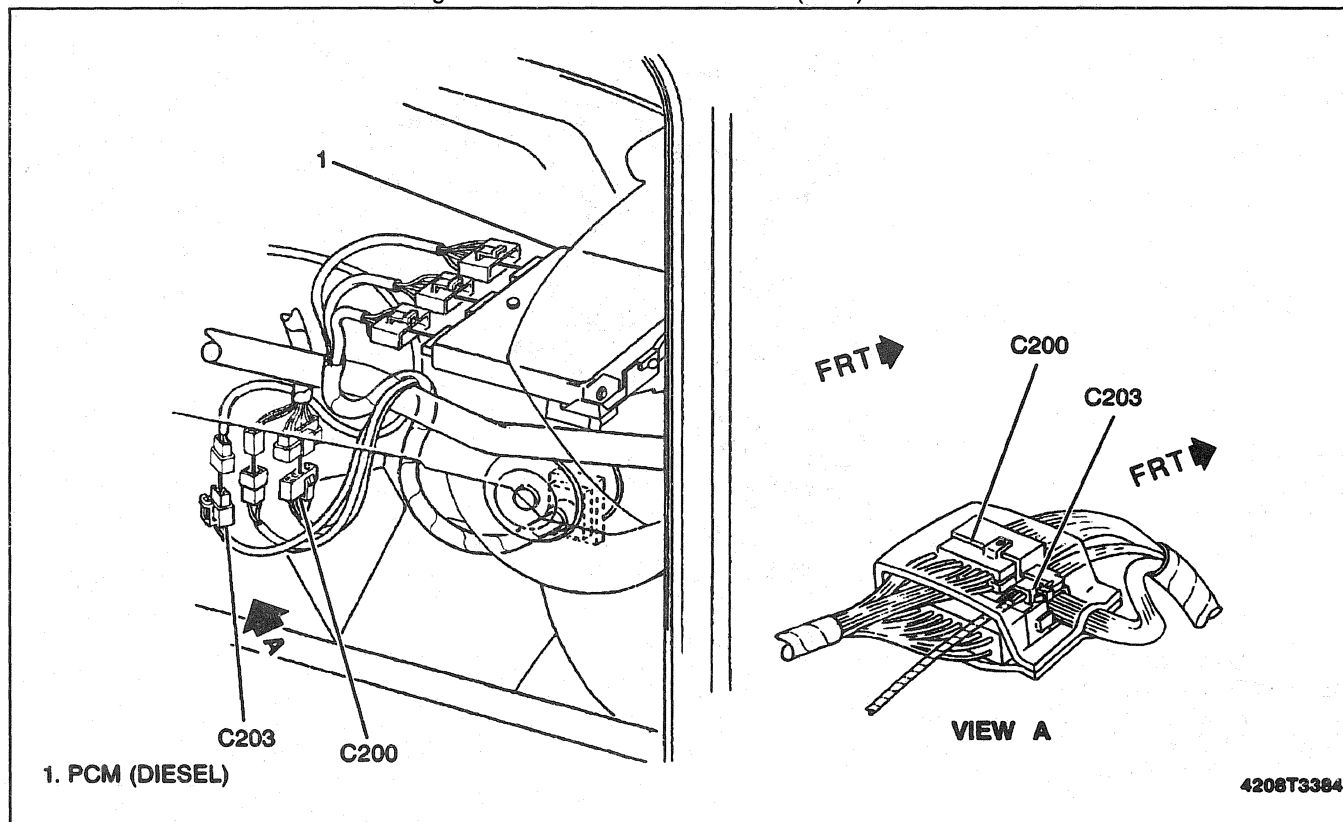
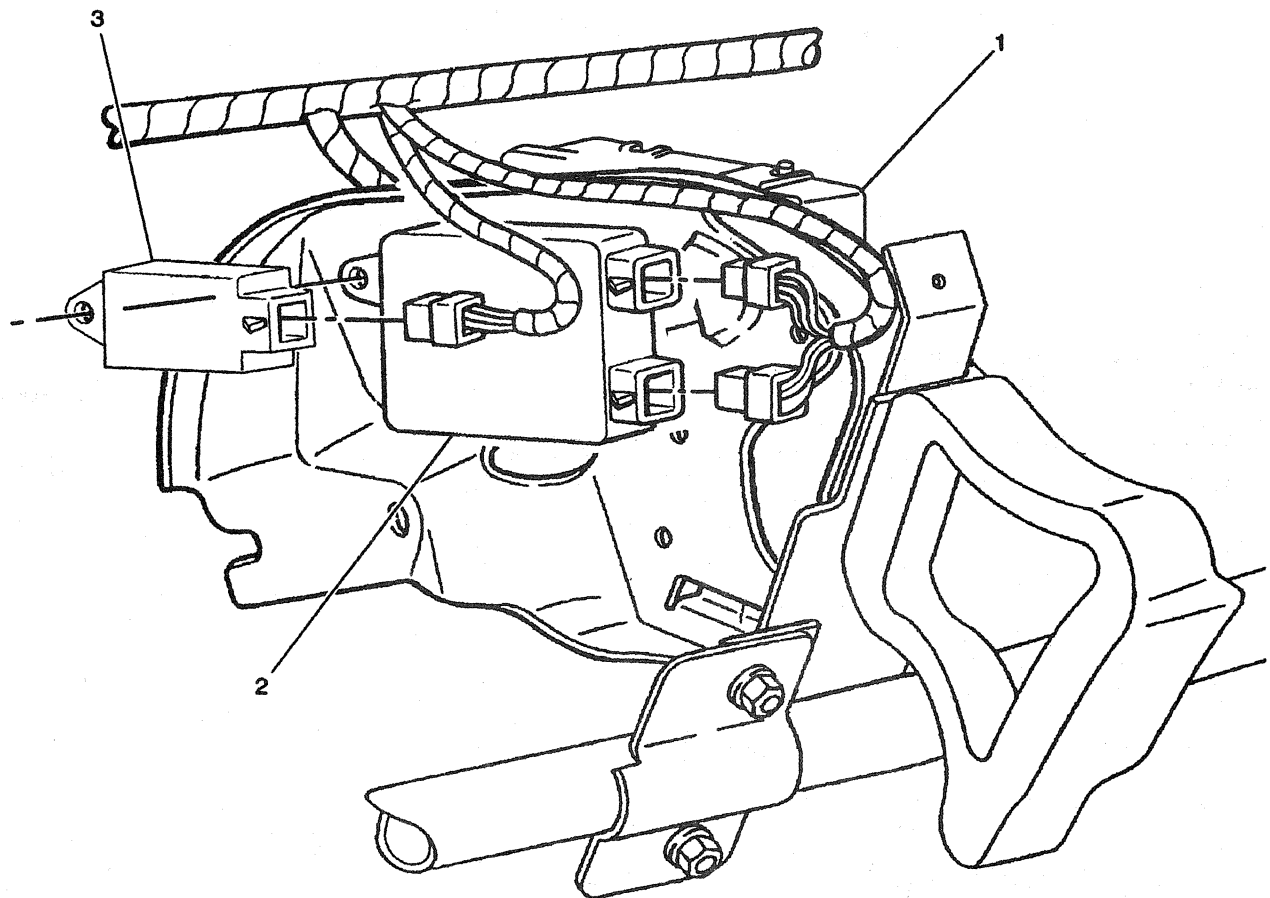


Figure 38—Powertrain Control Module (PCM) Diesel



- 1. DIAGNOSTIC ENERGY RESERVE MODULE
- 2. REMOTE CONTROL DOOR LOCK RECEIVER
- 3. INTERIOR LAMP CONTROL MODULE

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Figure 39—Interior Lamp Control, Remote Control Door Lock Receiver and DERM Modules

COMPONENT LOCATION VIEWS

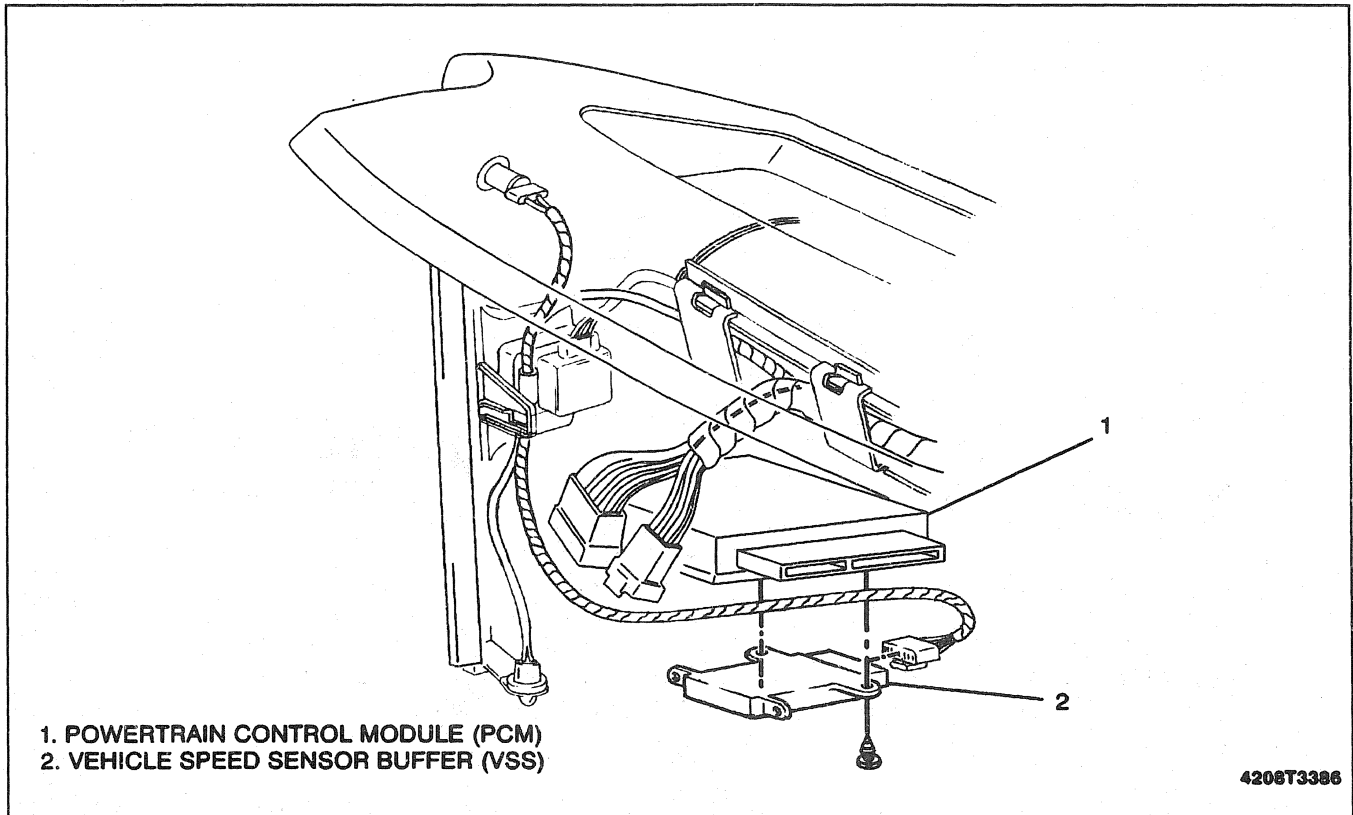


Figure 40—Vehicle Speed Sensor Buffer -Diesel Only

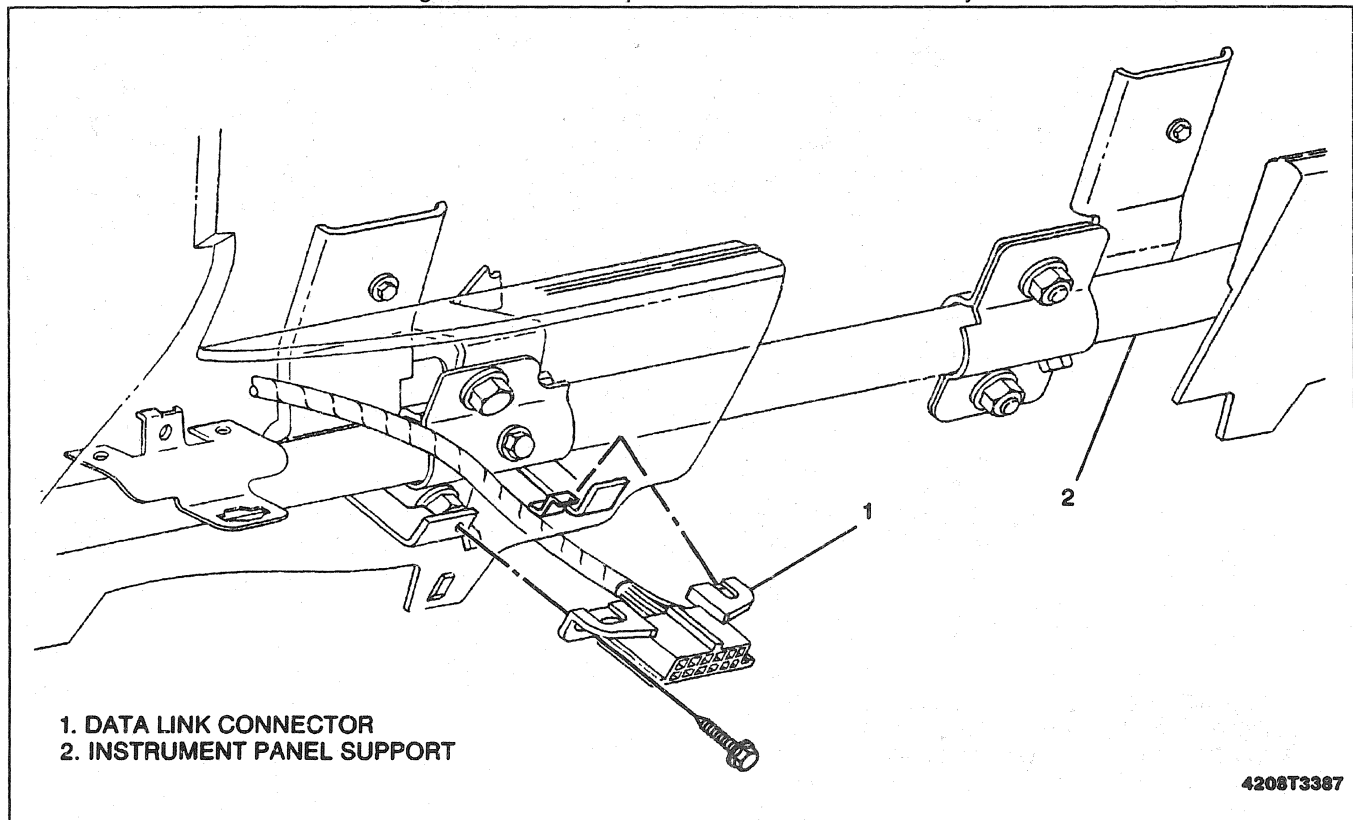


Figure 41—Data Link Connector (DLC)

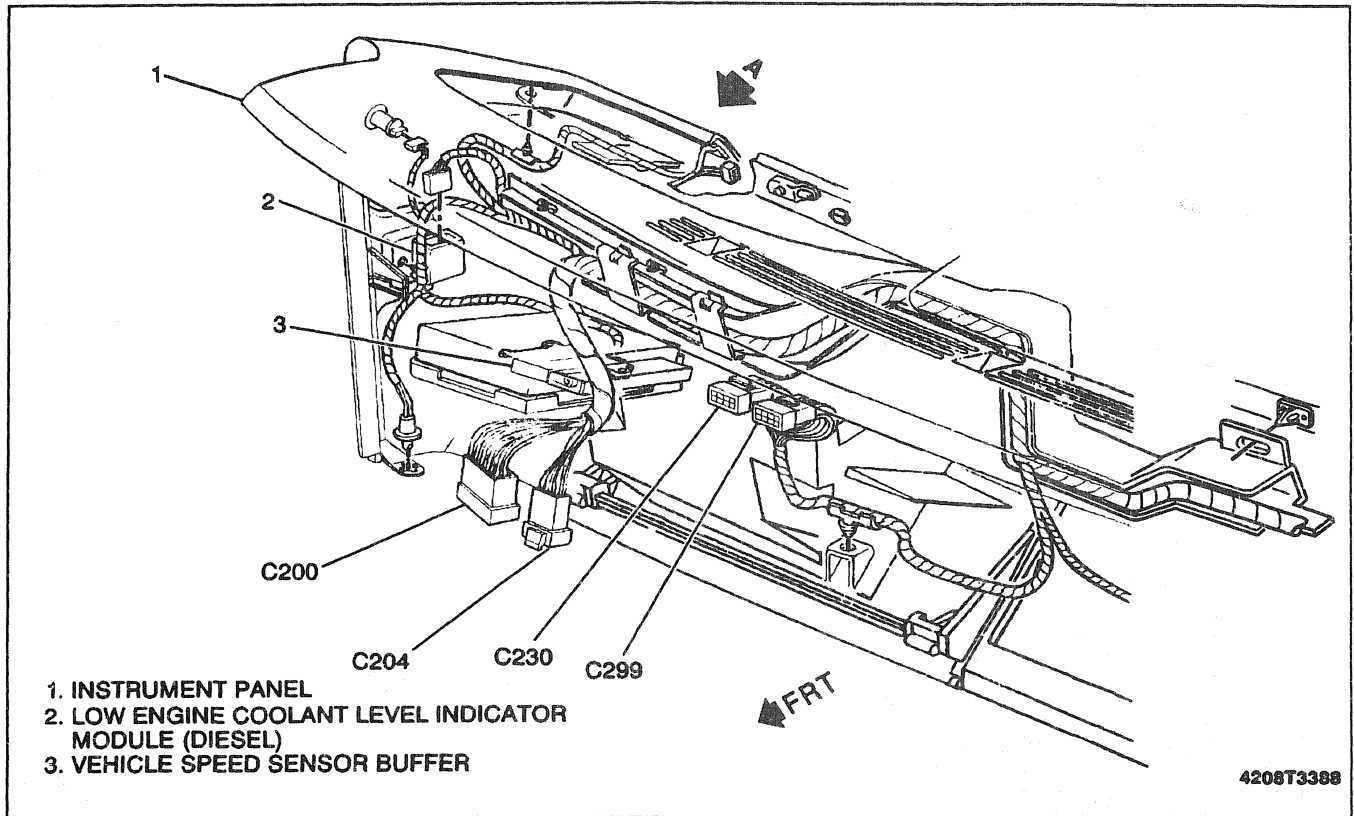


Figure 42—Instrument Panel Wiring, RH Side

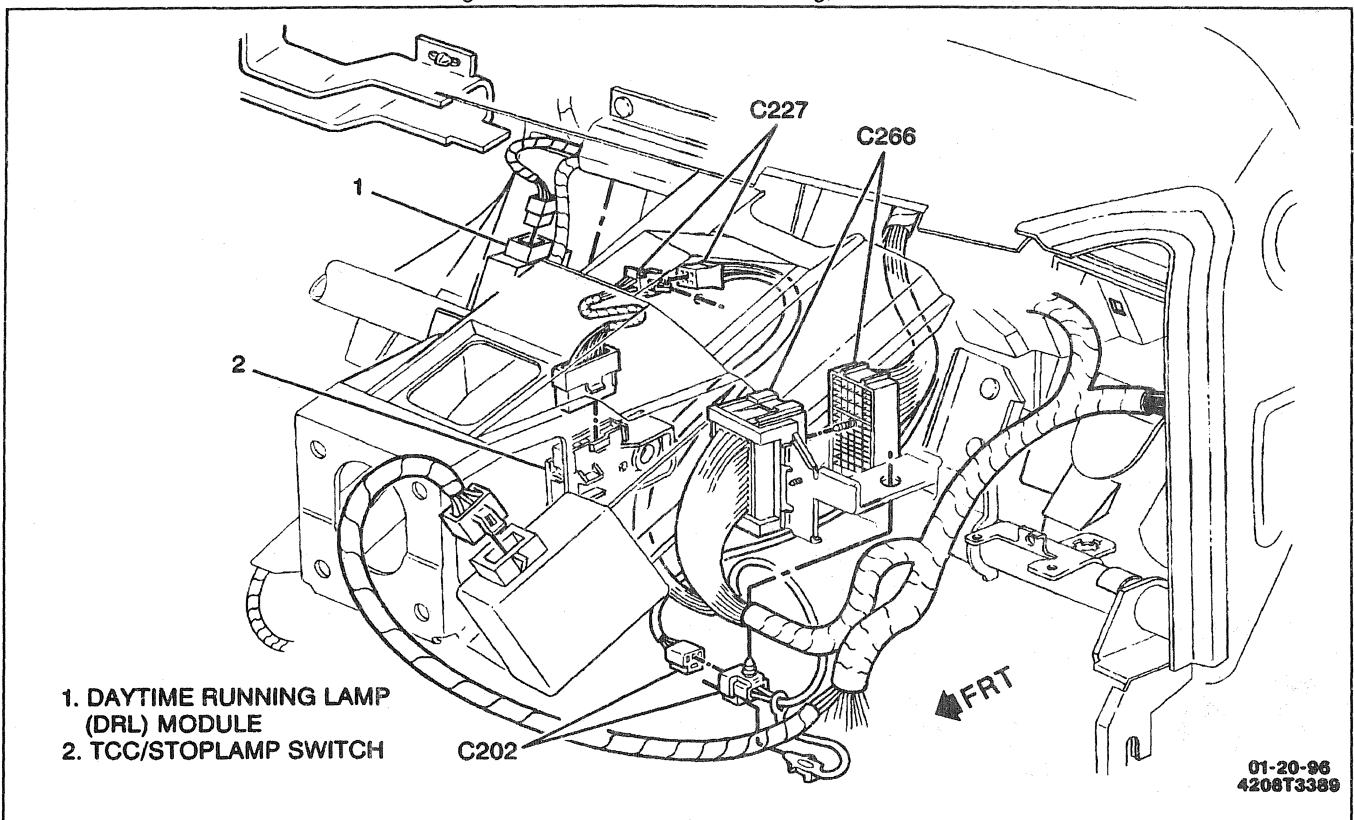


Figure 43—Instrument Panel Wiring, LH Side

COMPONENT LOCATION VIEWS

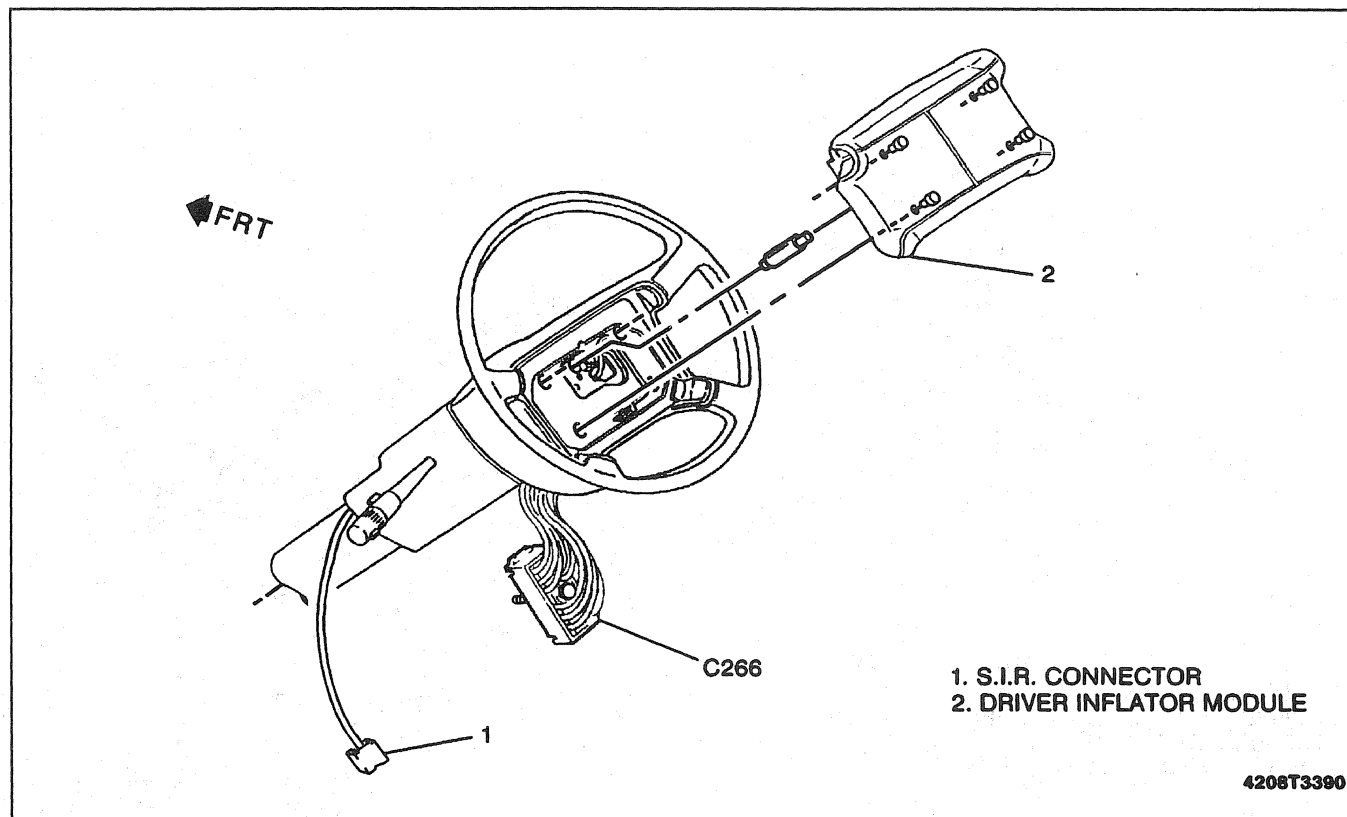


Figure 44—Steering Column Wiring

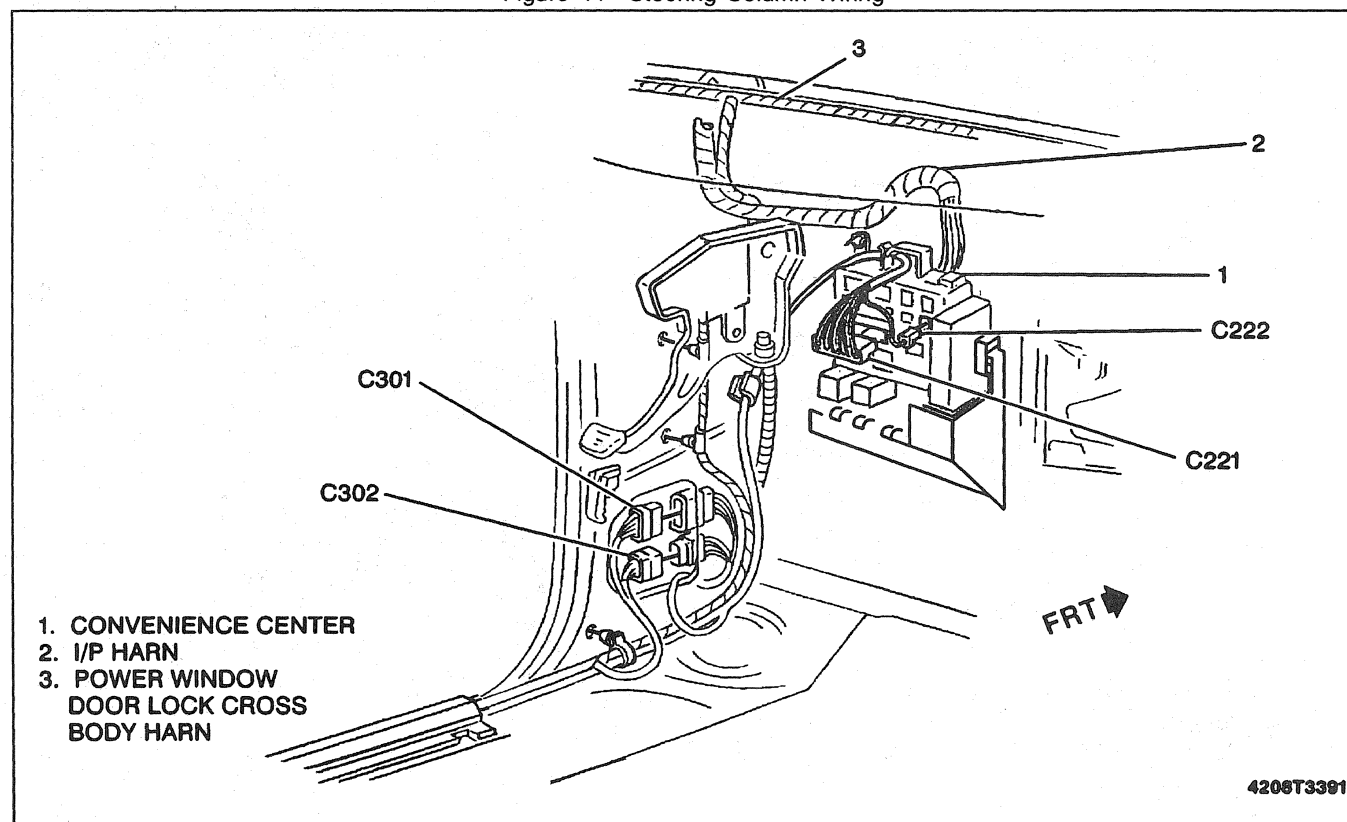


Figure 45—LH A-Pillar Wiring



Figure 46—Cargo Lamp Switch Wiring



Figure 47--Heater and Air Conditioning Wiring



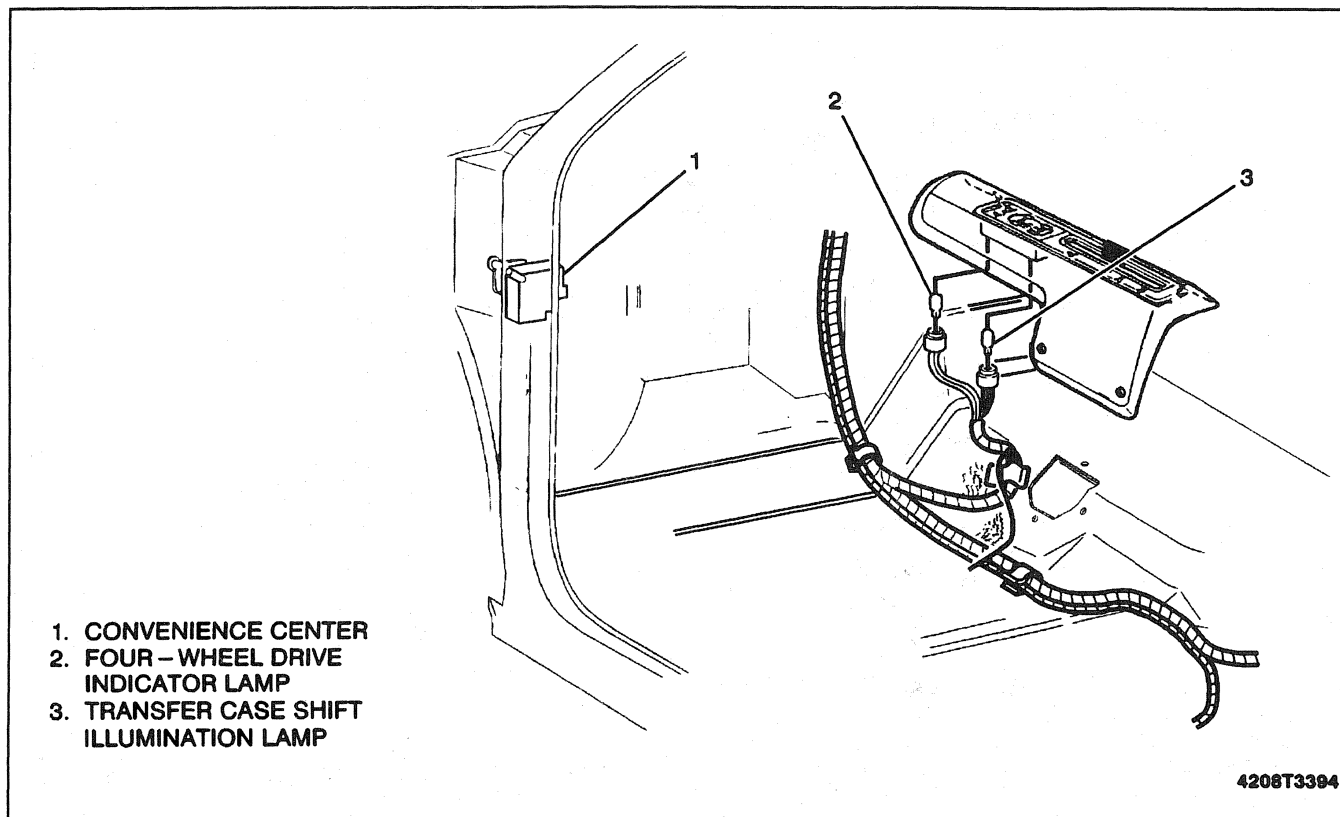


Figure 48—Four-Wheel Indicator Wiring

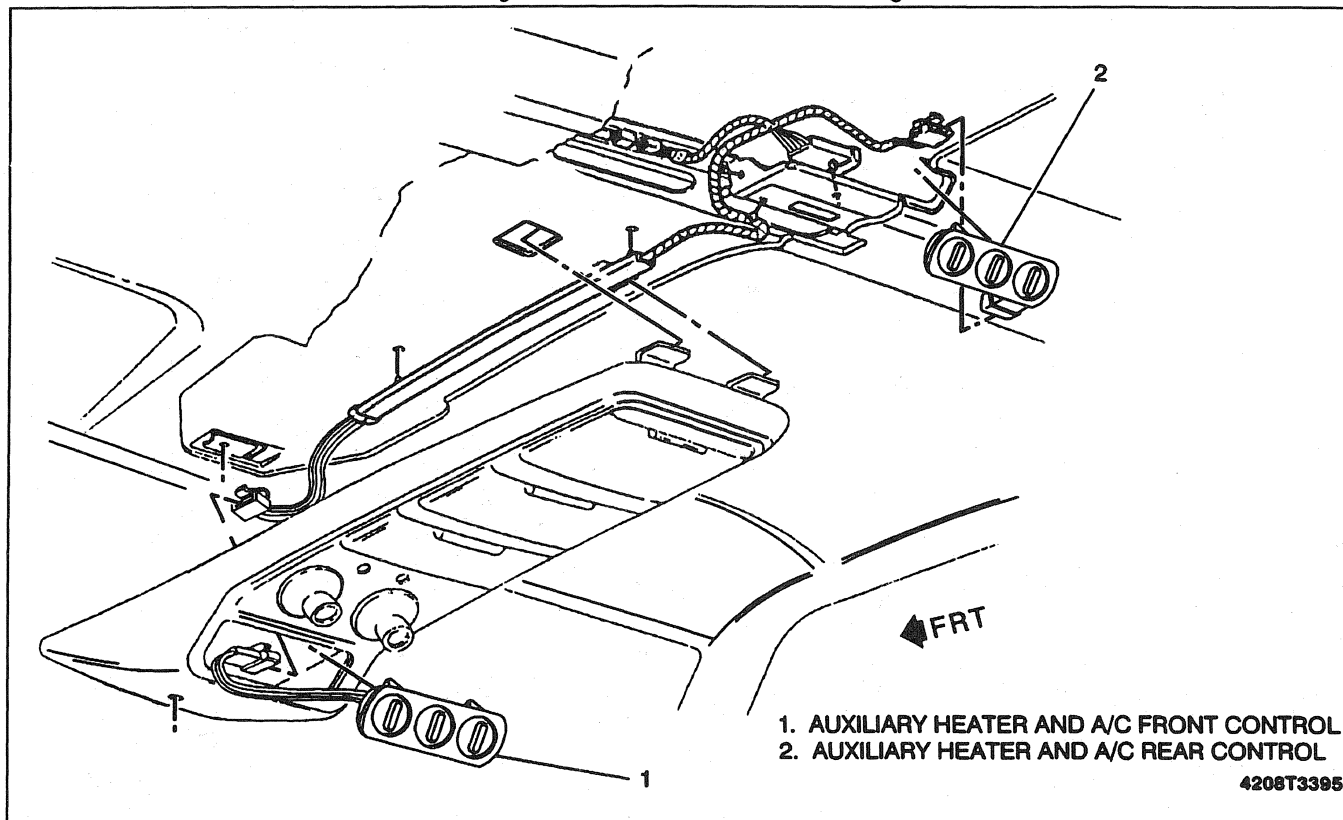


Figure 49—Auxiliary Heater and Air Conditioning Controls

# COMPONENT LOCATION VIEWS

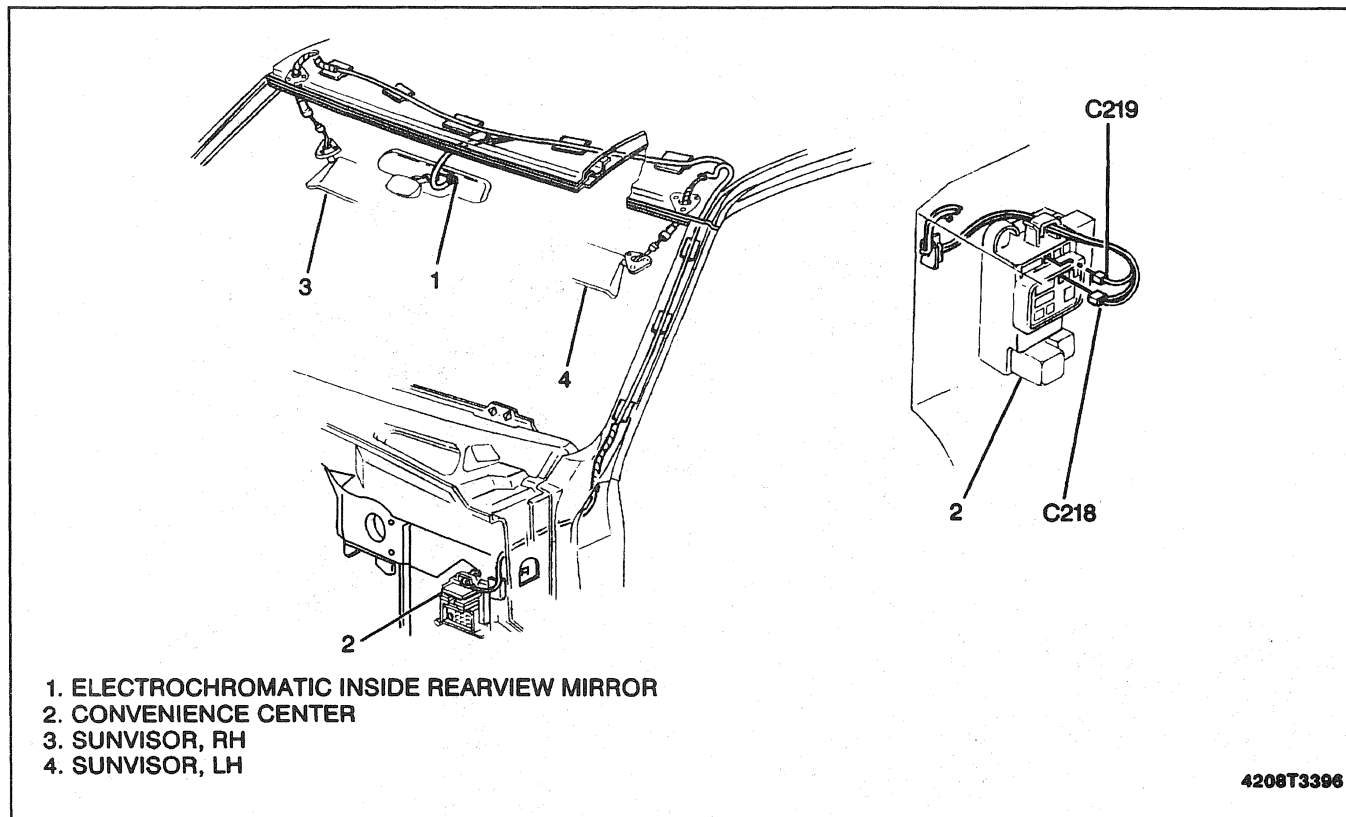


Figure 50—Electrochromatic Inside Rearview Mirror with Compass

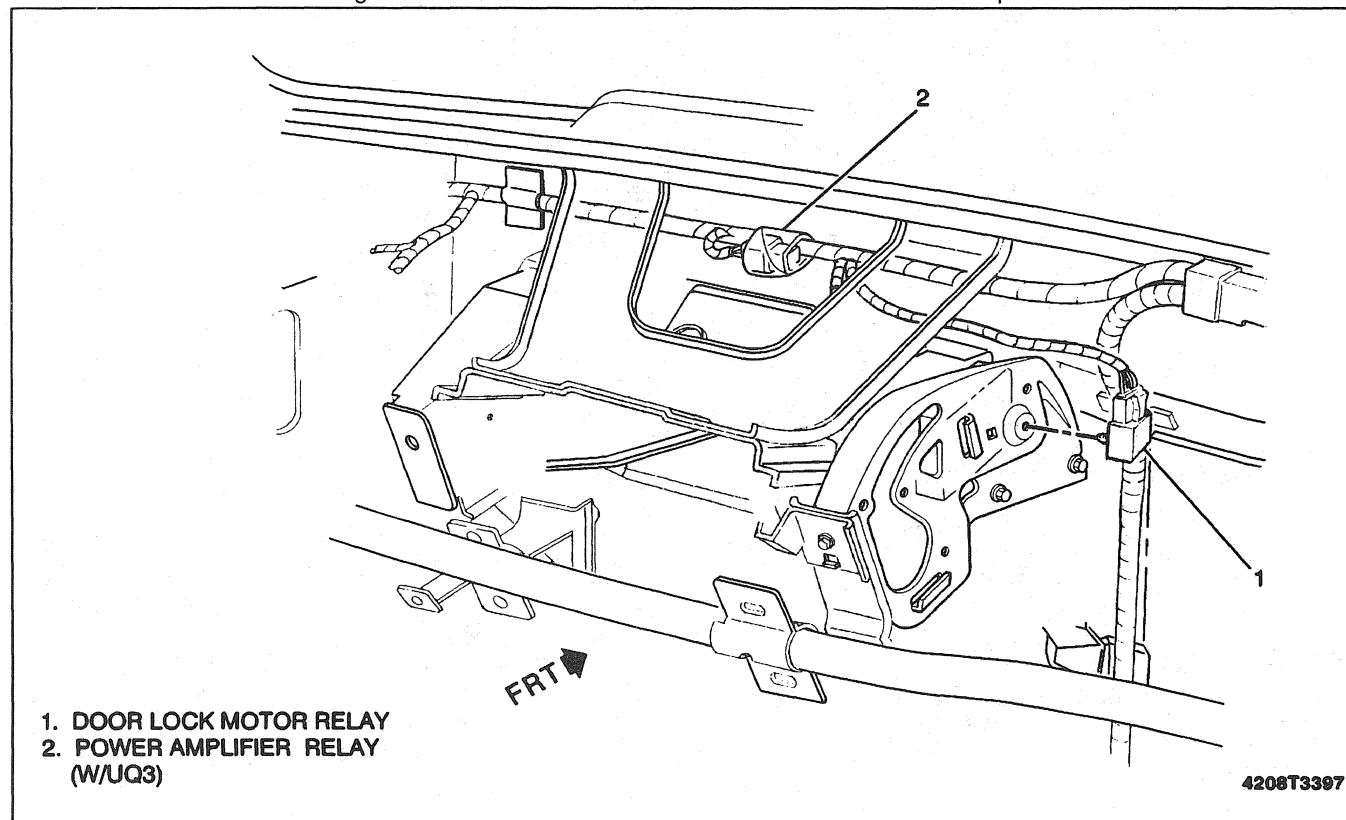


Figure 51—Power Door Lock Relay

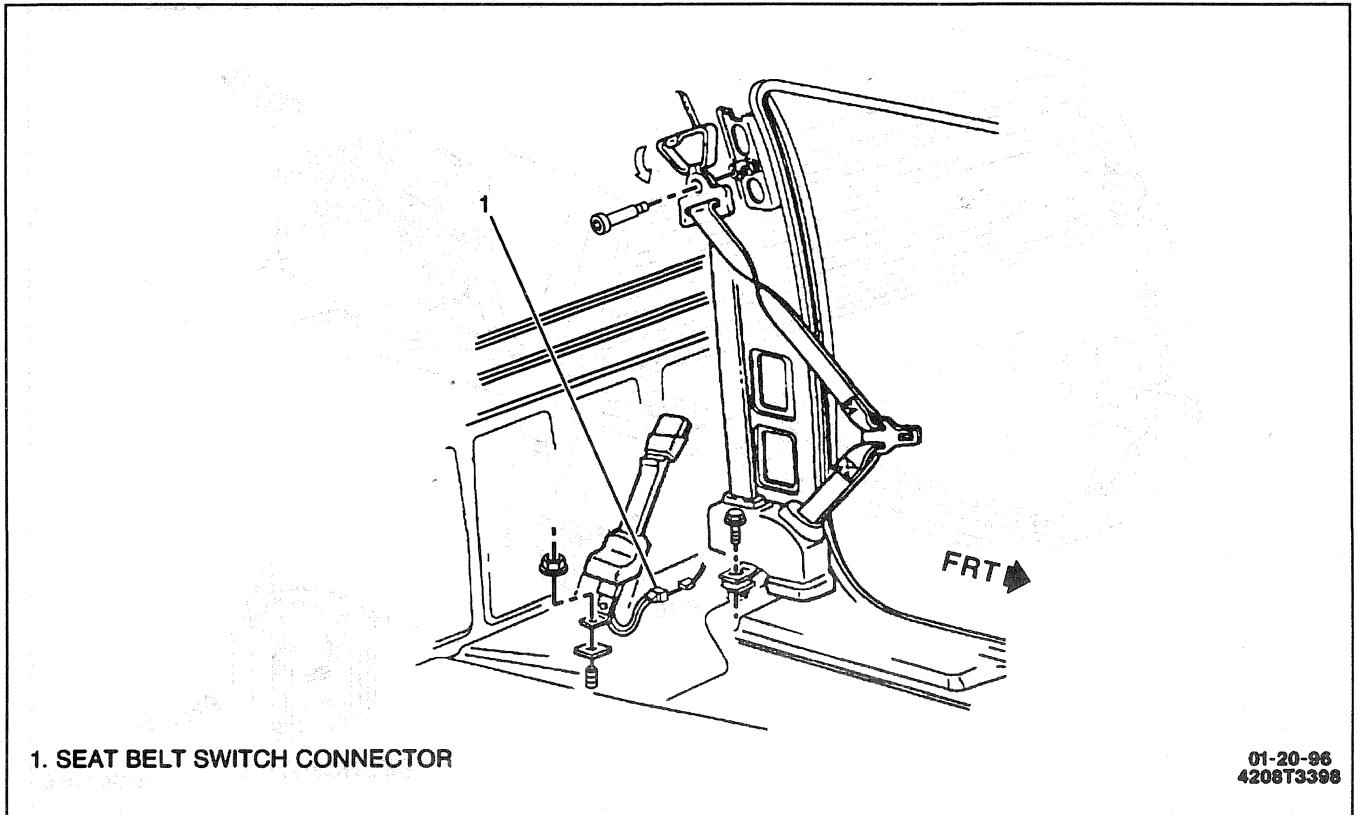


Figure 52—Seat Belt Switch Wiring

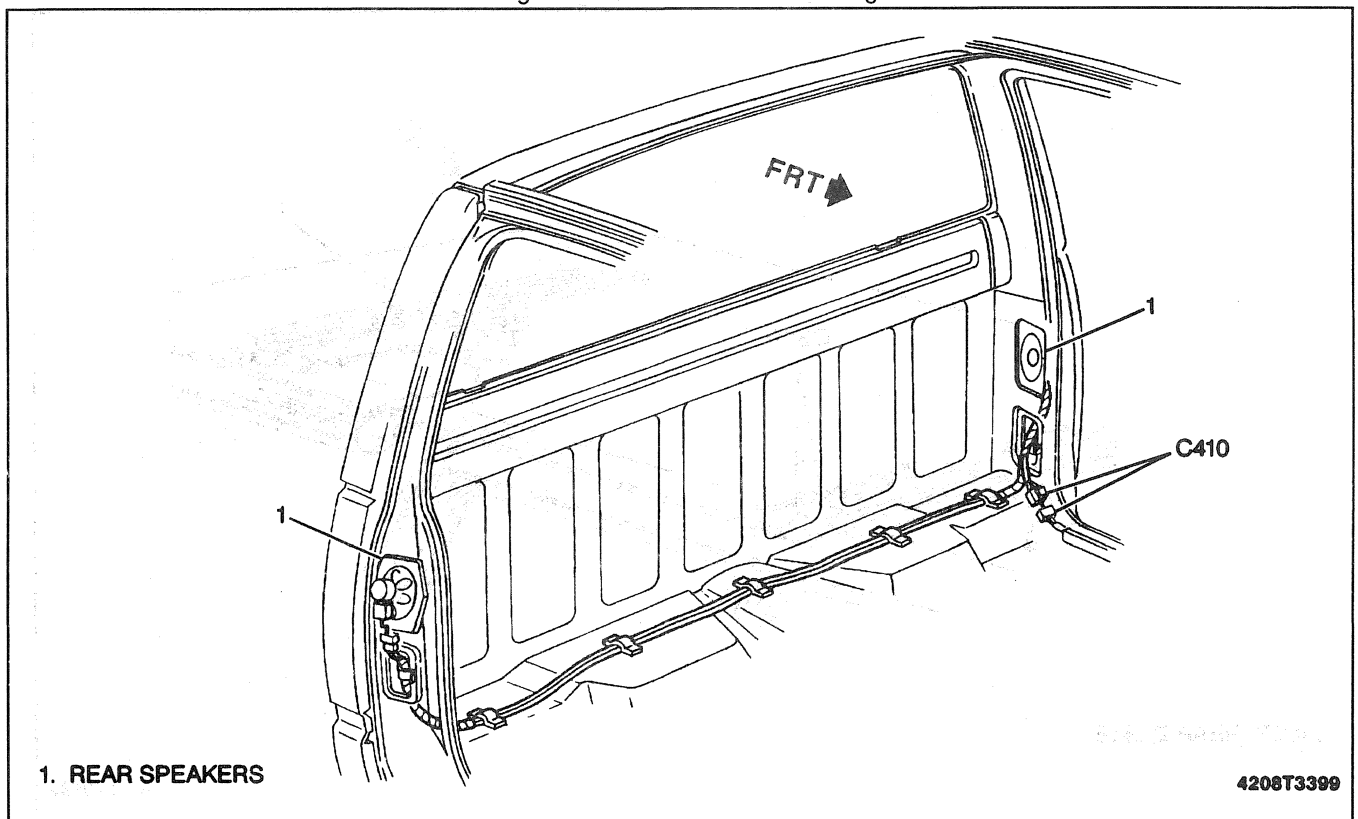


Figure 53—Rear Speakers

COMPONENT LOCATION VIEWS

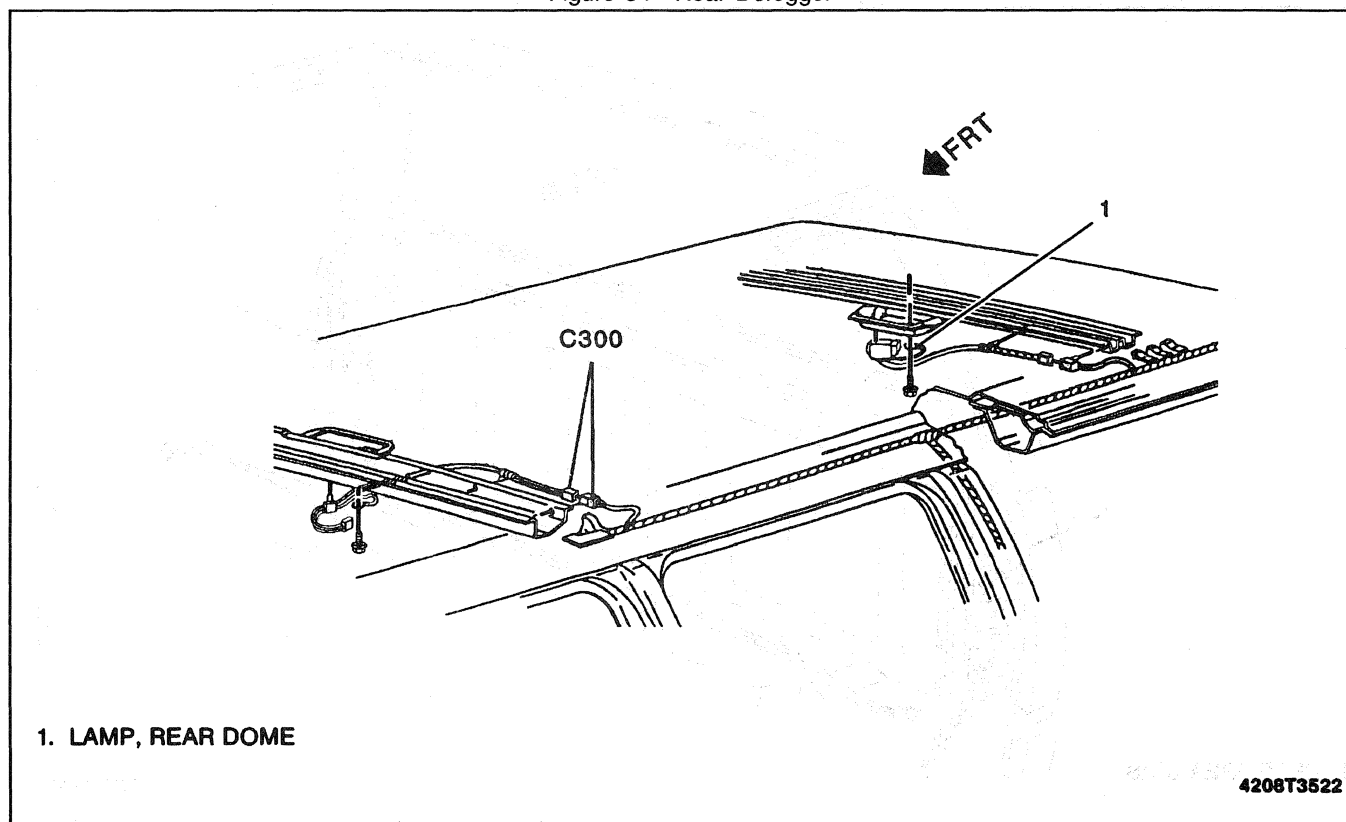
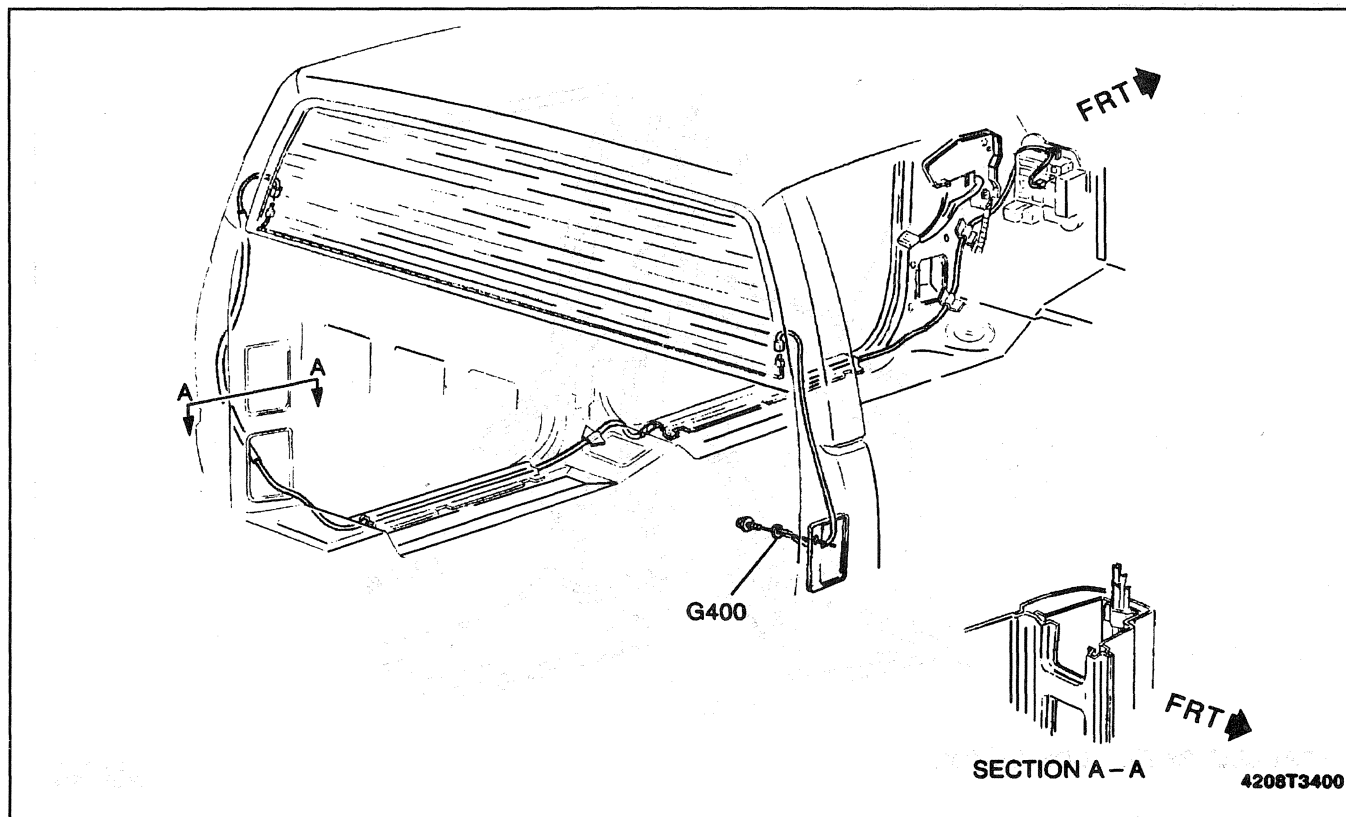


Figure 55—Rear Dome Lamp

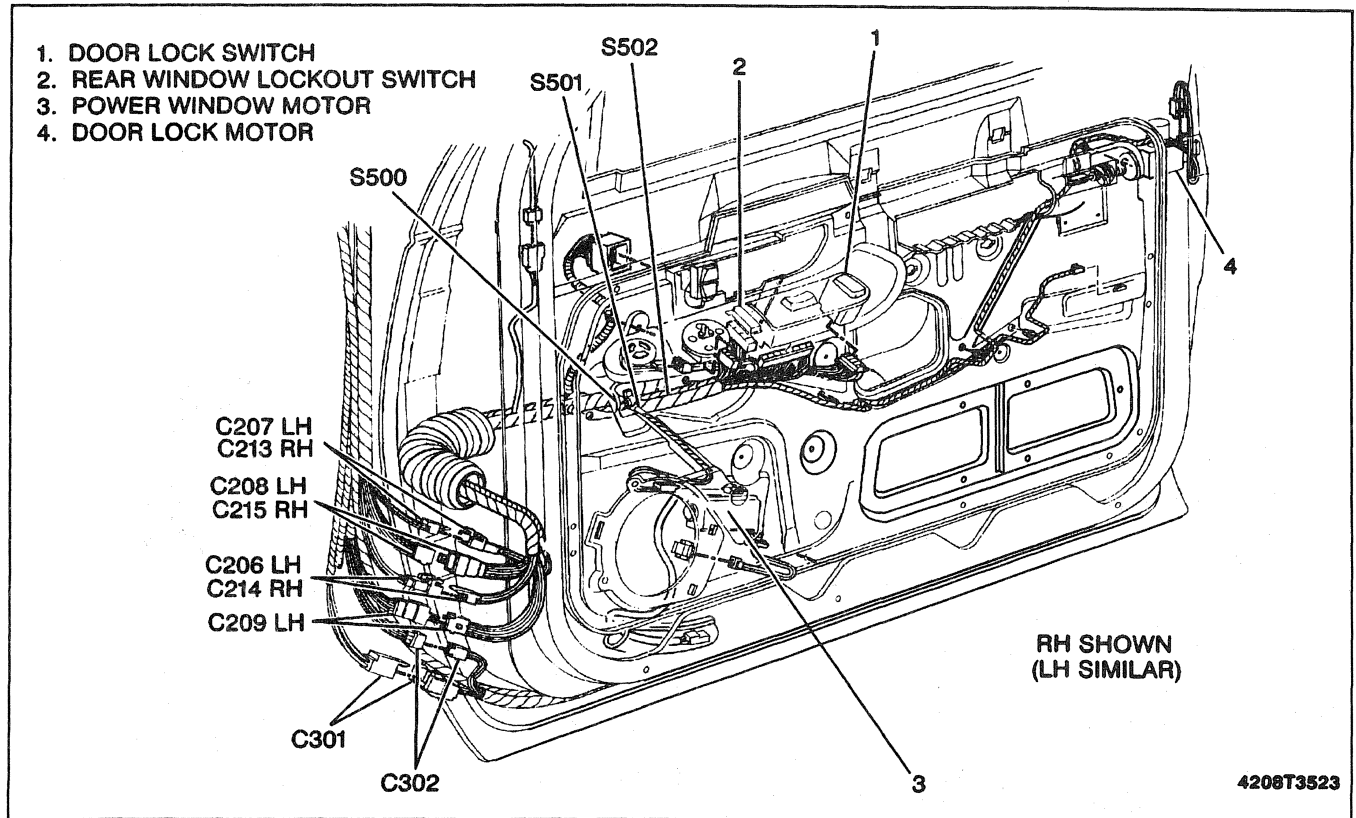


Figure 56—Front Door Wiring

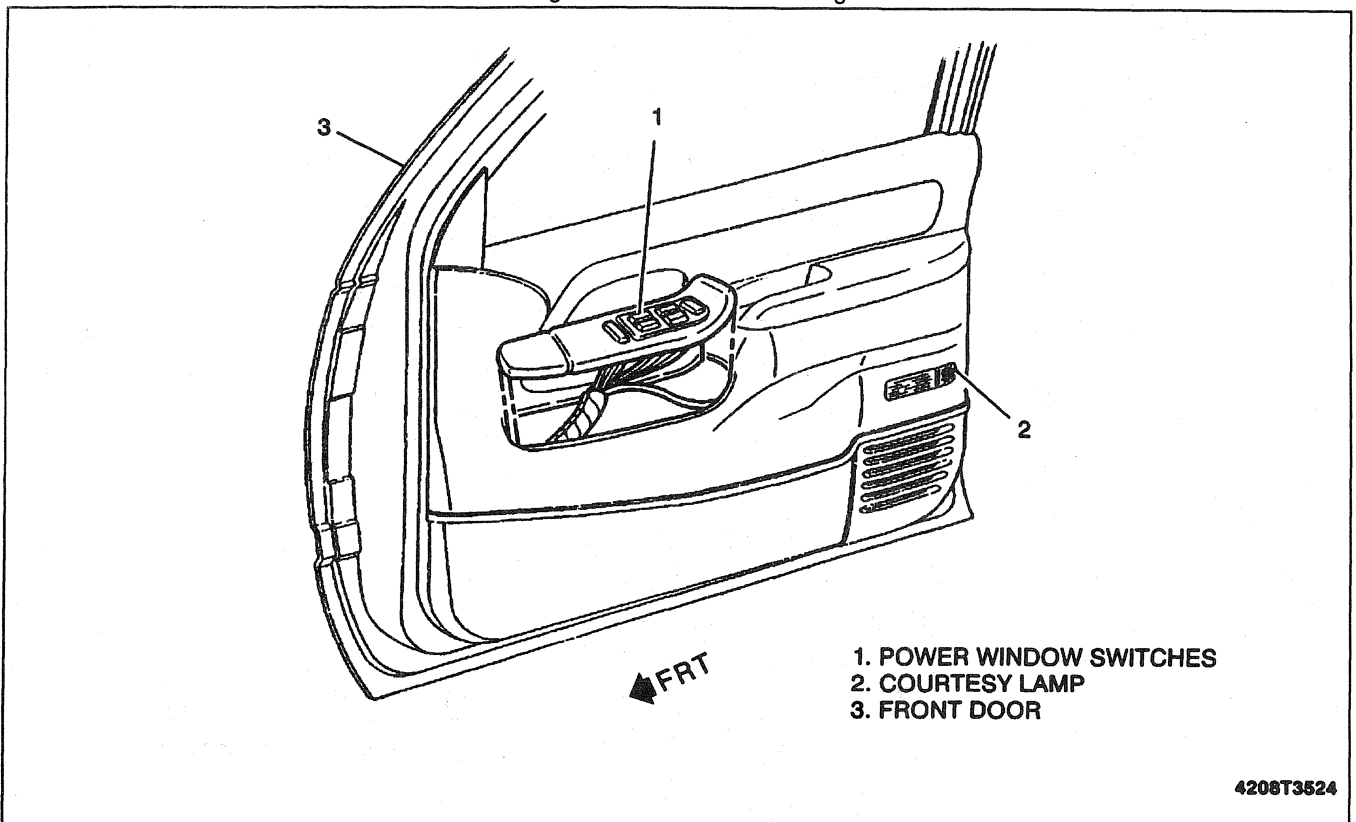


Figure 57—Power Window Switches

COMPONENT LOCATION VIEWS

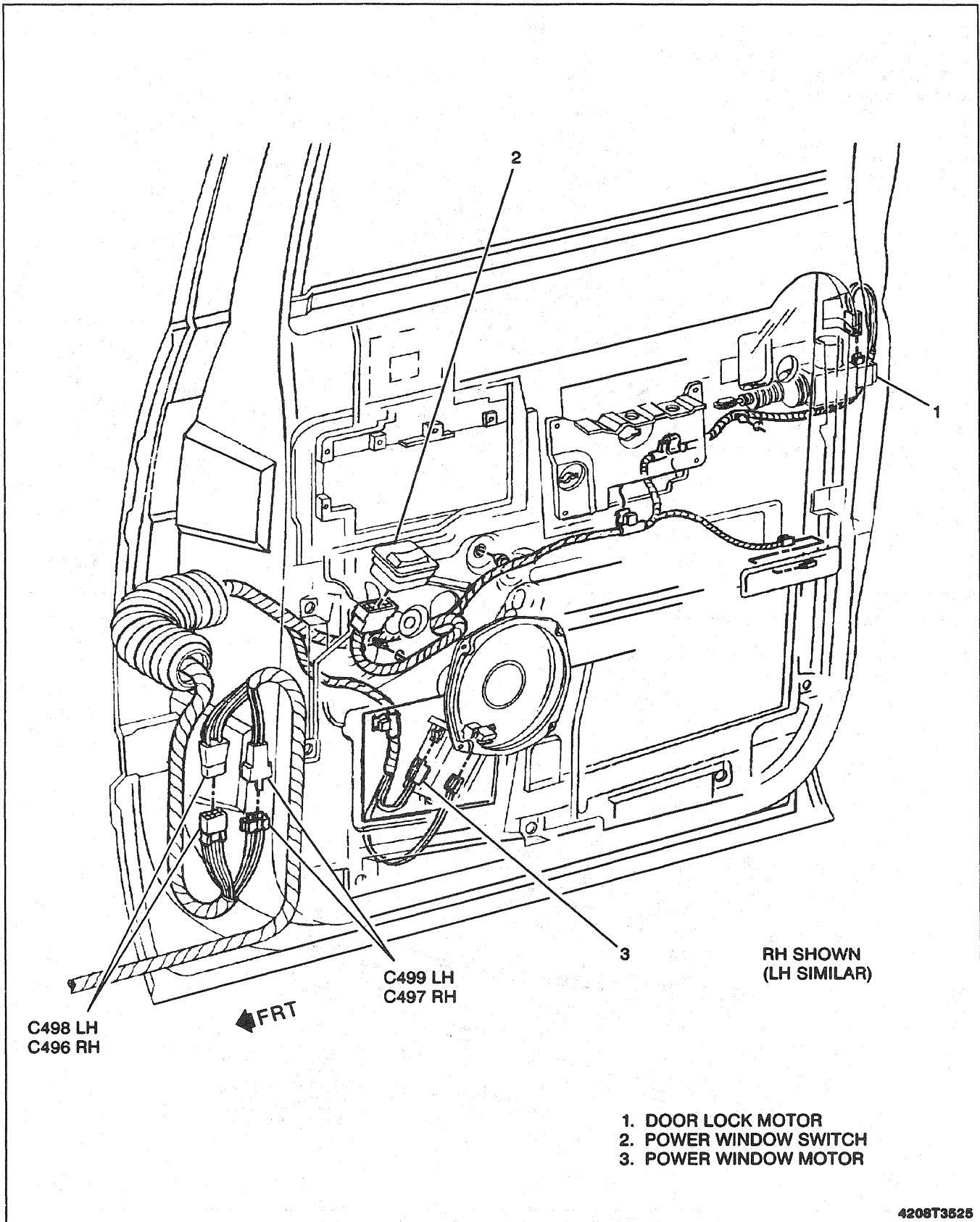


Figure 58—Rear Door Wiring

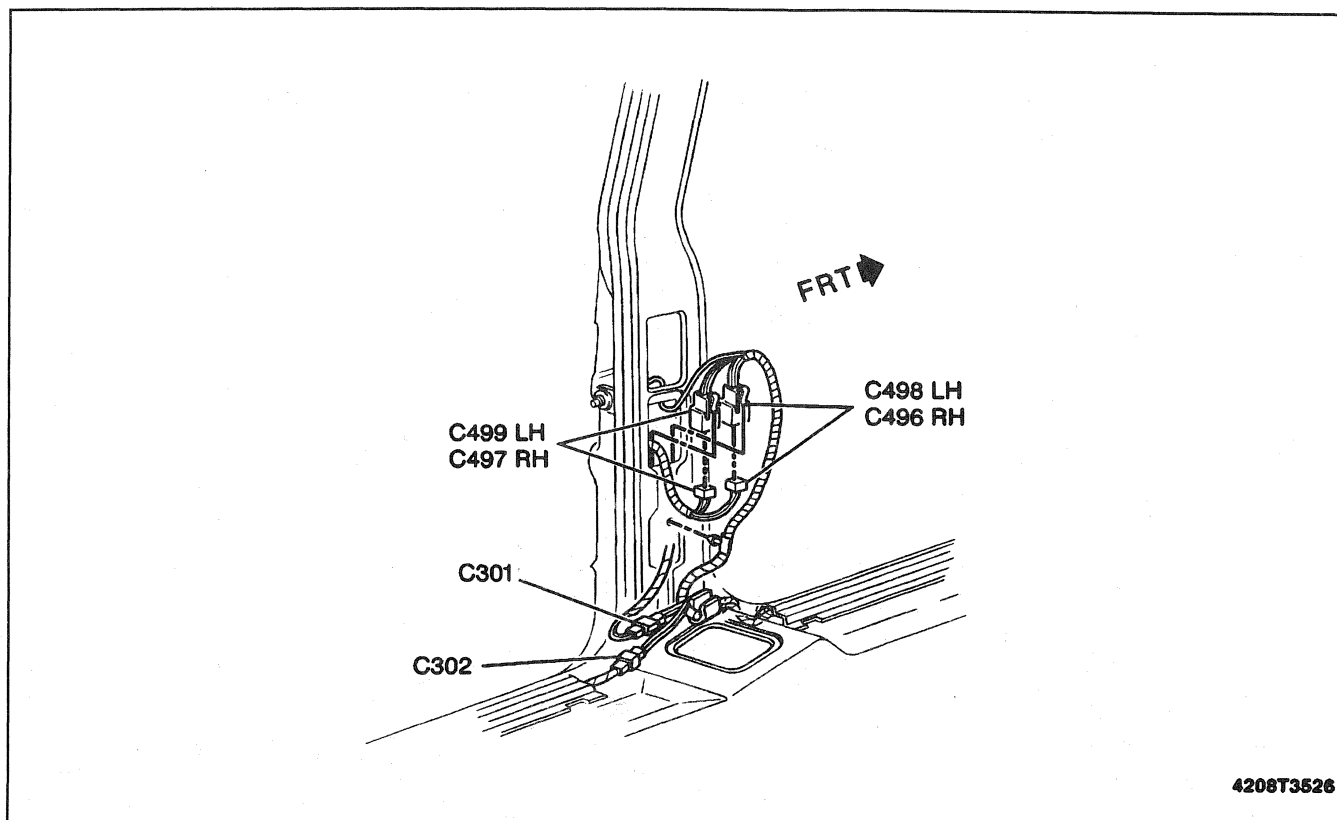


Figure 59—B-Pillar Wiring

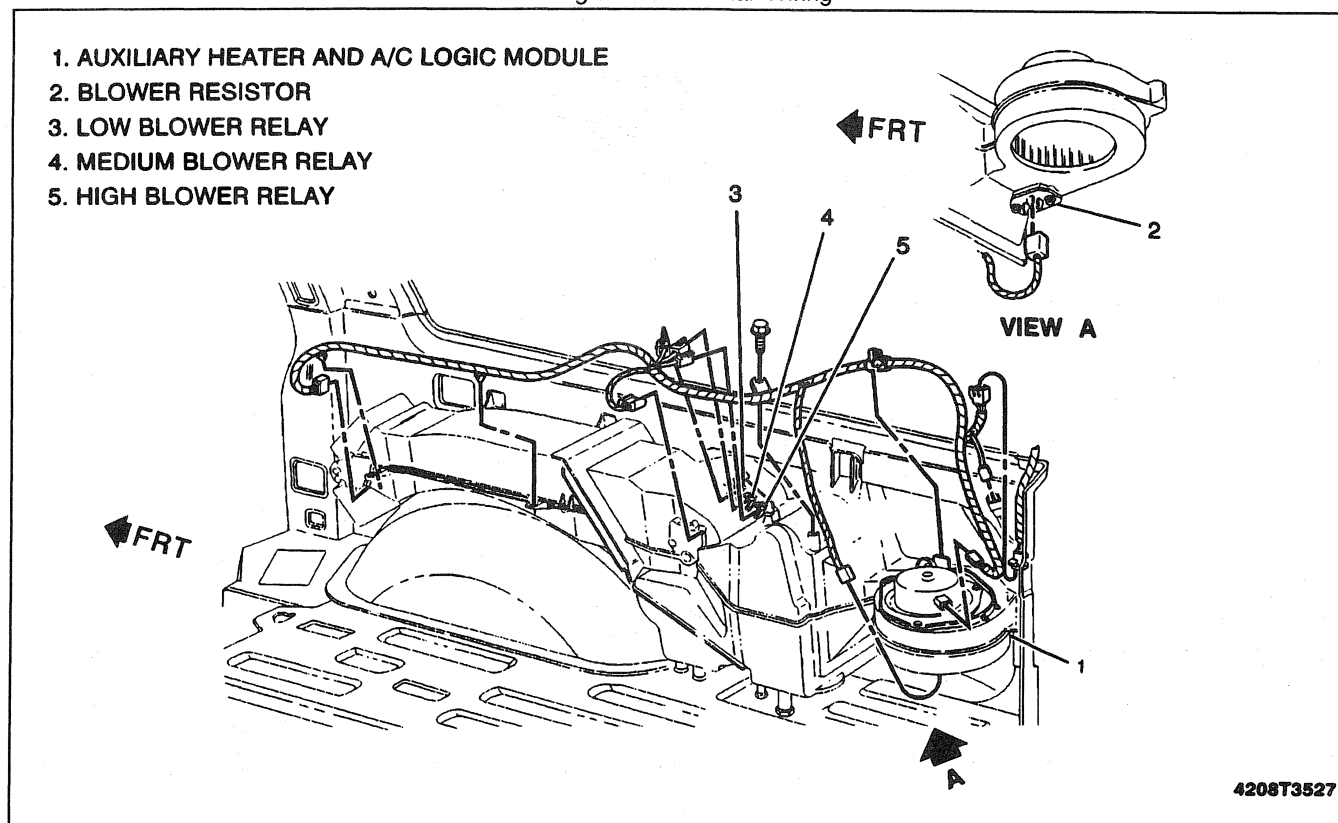


Figure 60—Auxiliary Heater and Air Conditioning Wiring, Rear

COMPONENT LOCATION VIEWS

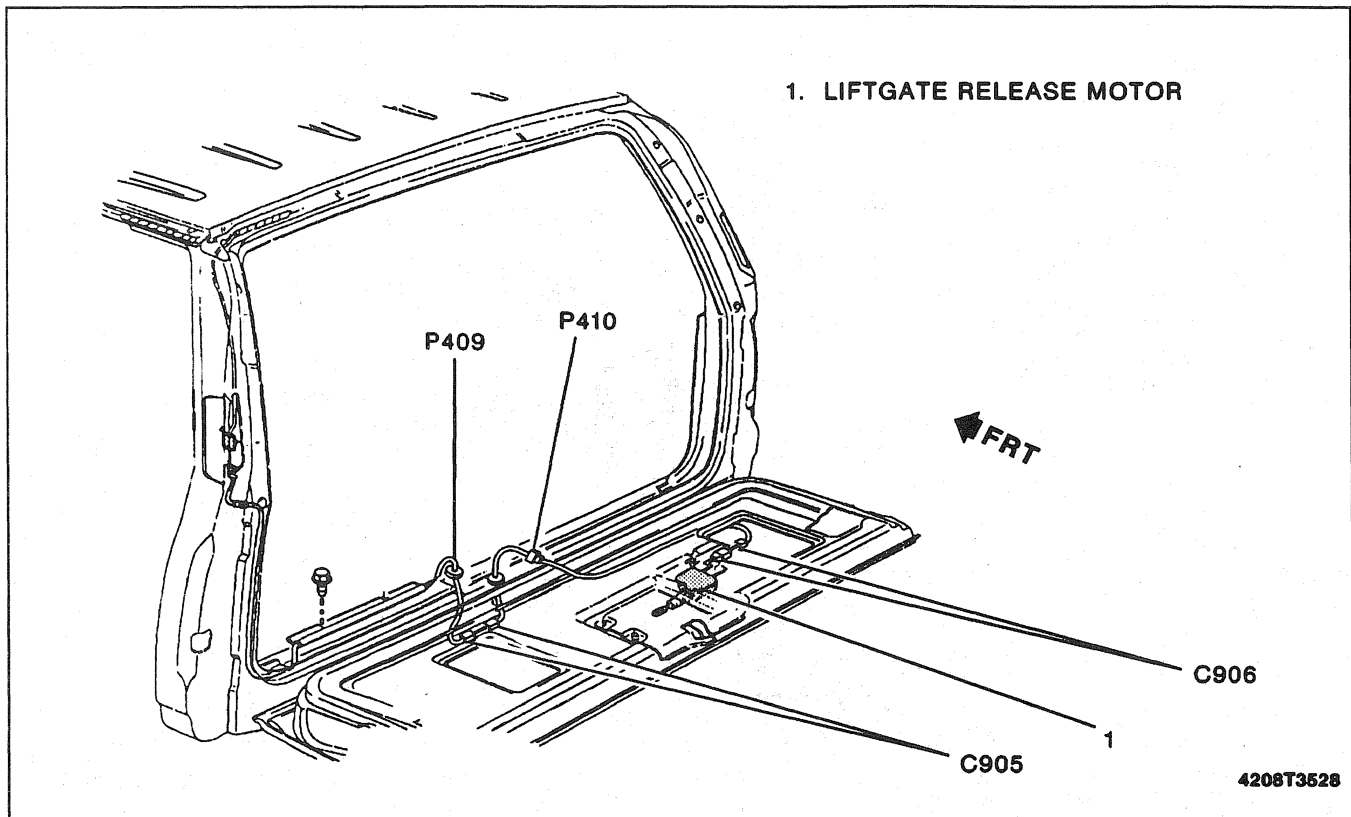


Figure 61—Liftgate Release Motor

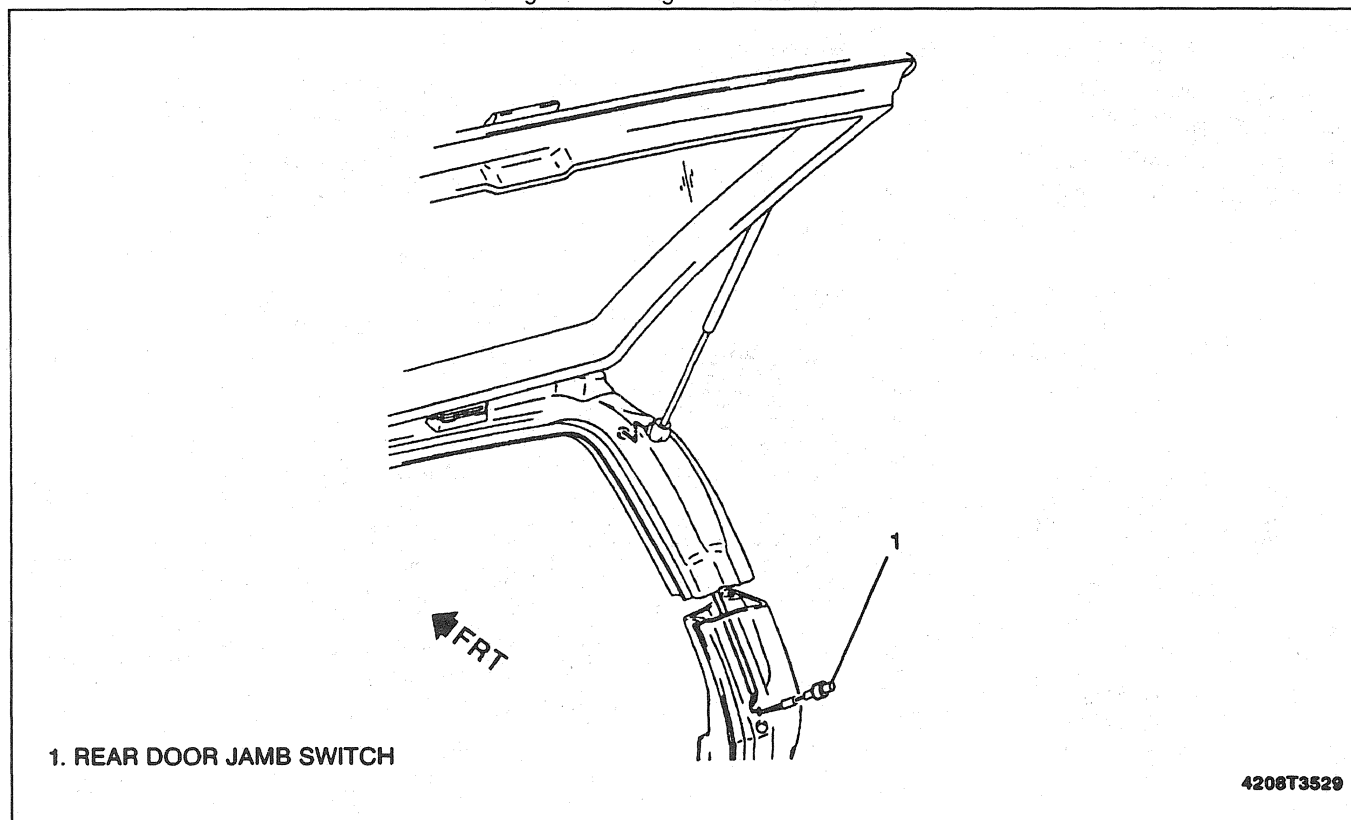


Figure 62—Rear Door Jamb Switch Wiring



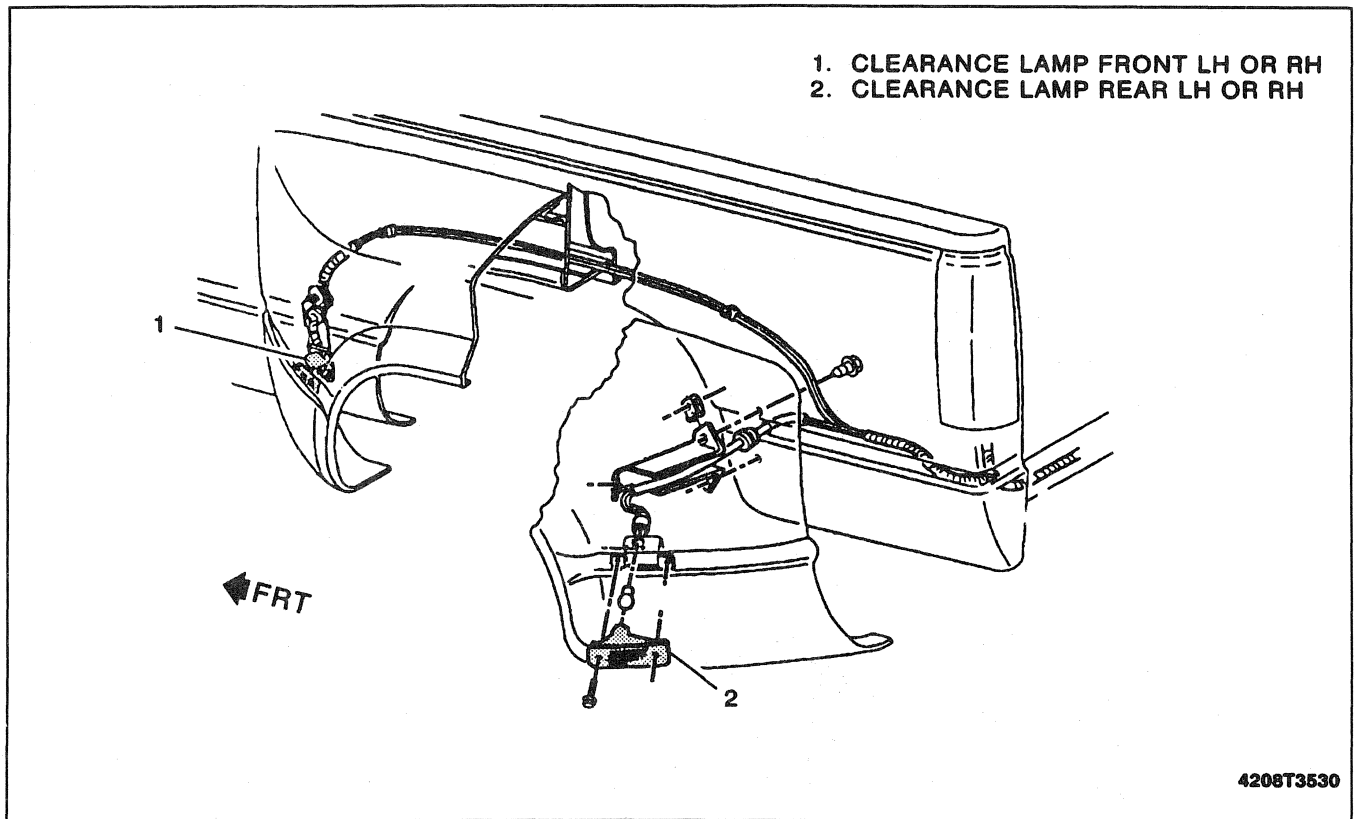


Figure 63—Rear Clearance Lamps (With Dual Rear Wheels)

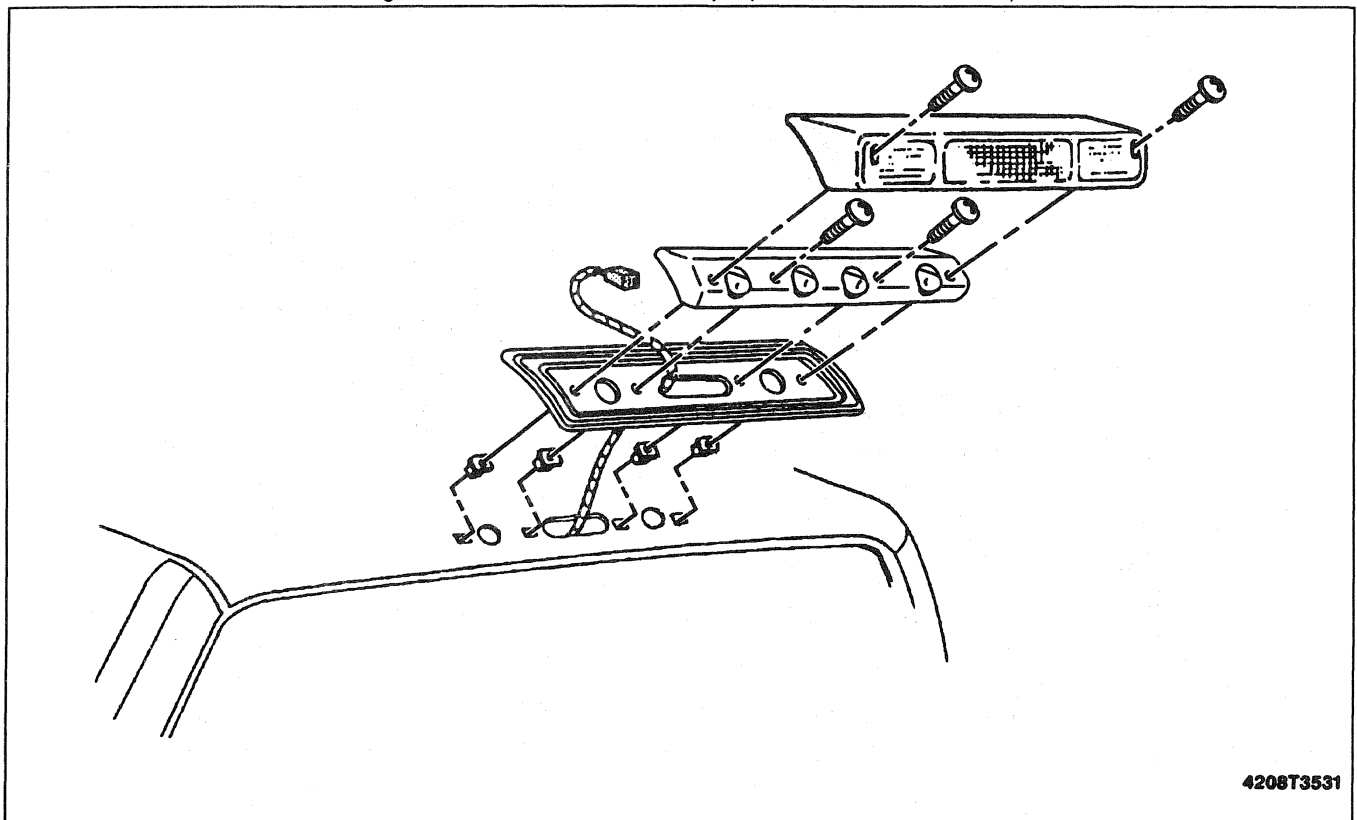


Figure 64—CHMSL and Cargo Lamp (Except Suburban/Utility)

COMPONENT LOCATION VIEWS

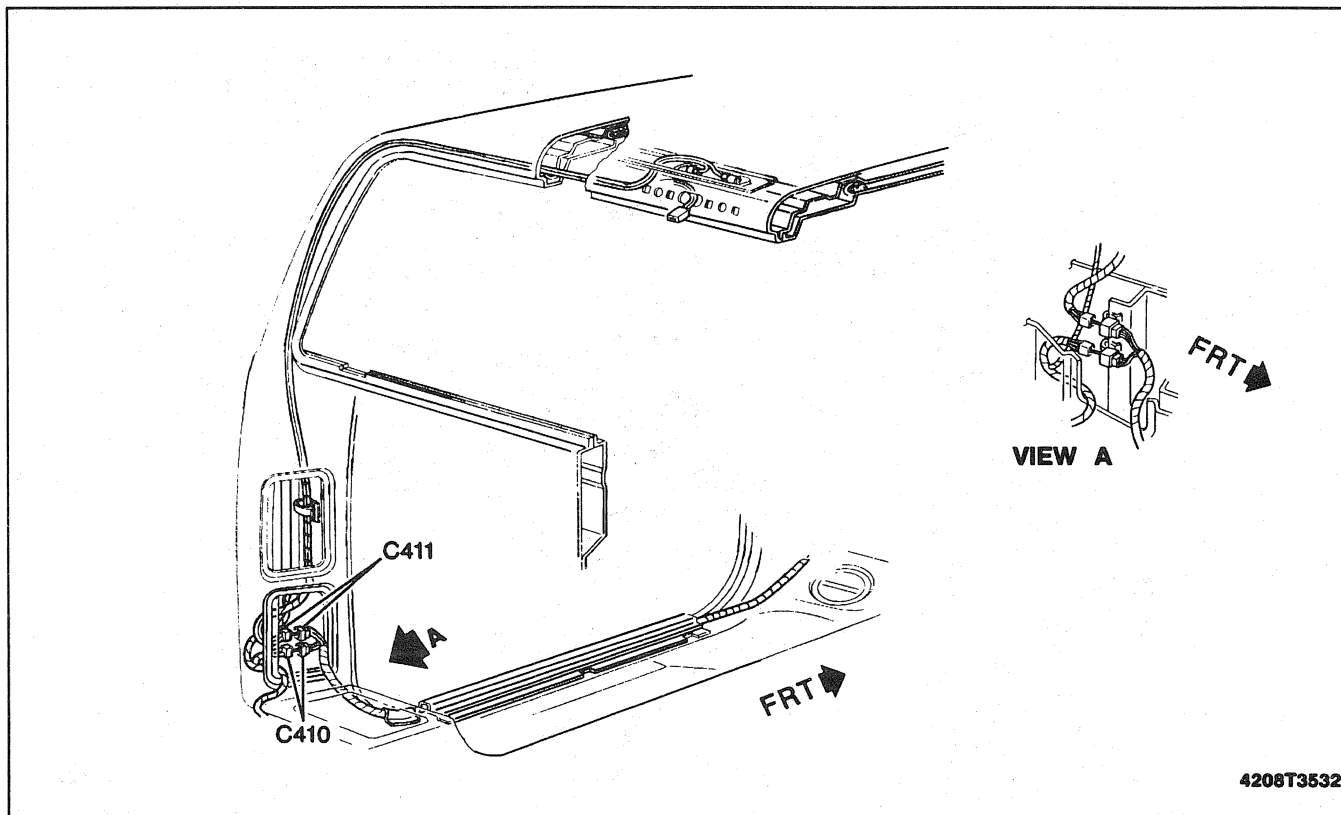


Figure 65—CHMSL and Cargo Lamp Wiring (Except Suburban/Utility)

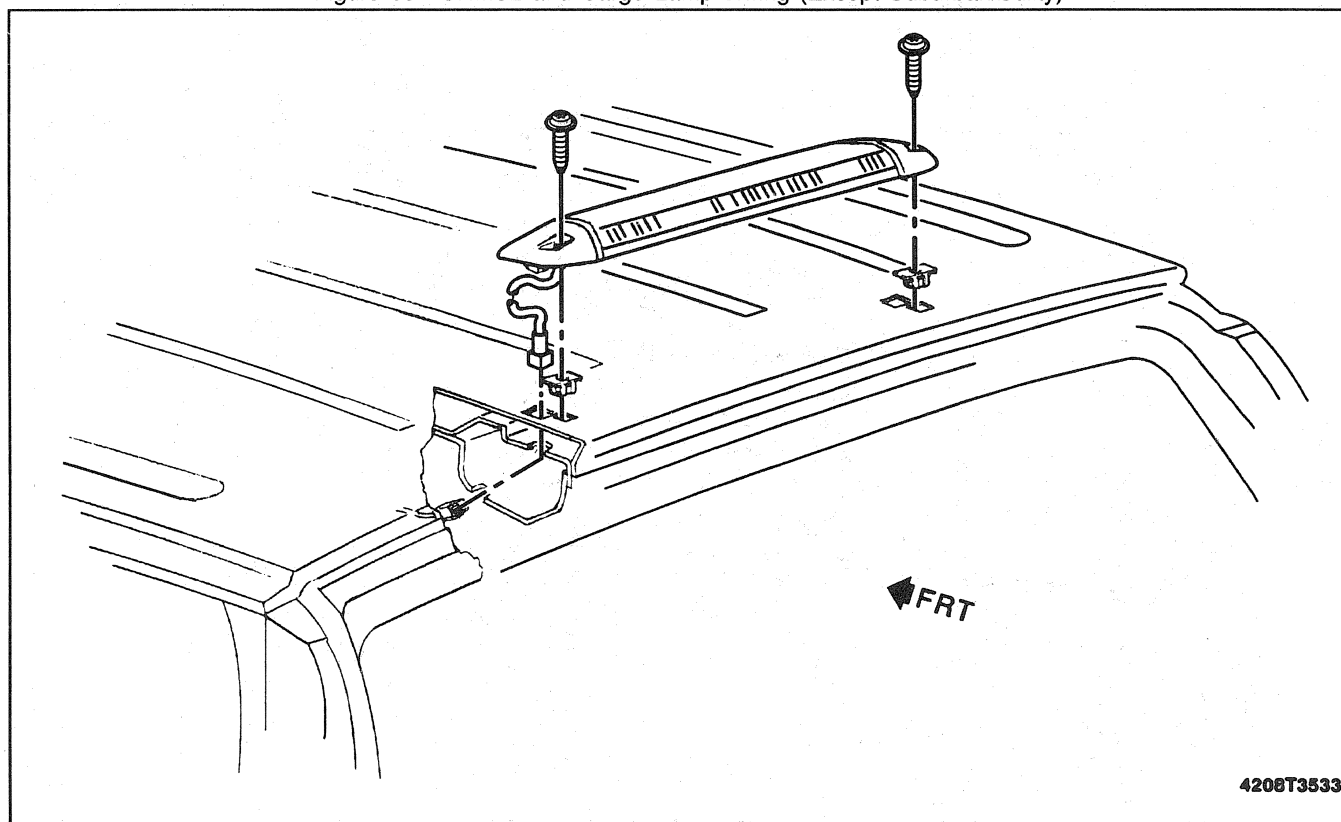


Figure 66—CHMSL and Cargo Lamp Wiring (Suburban/Utility)

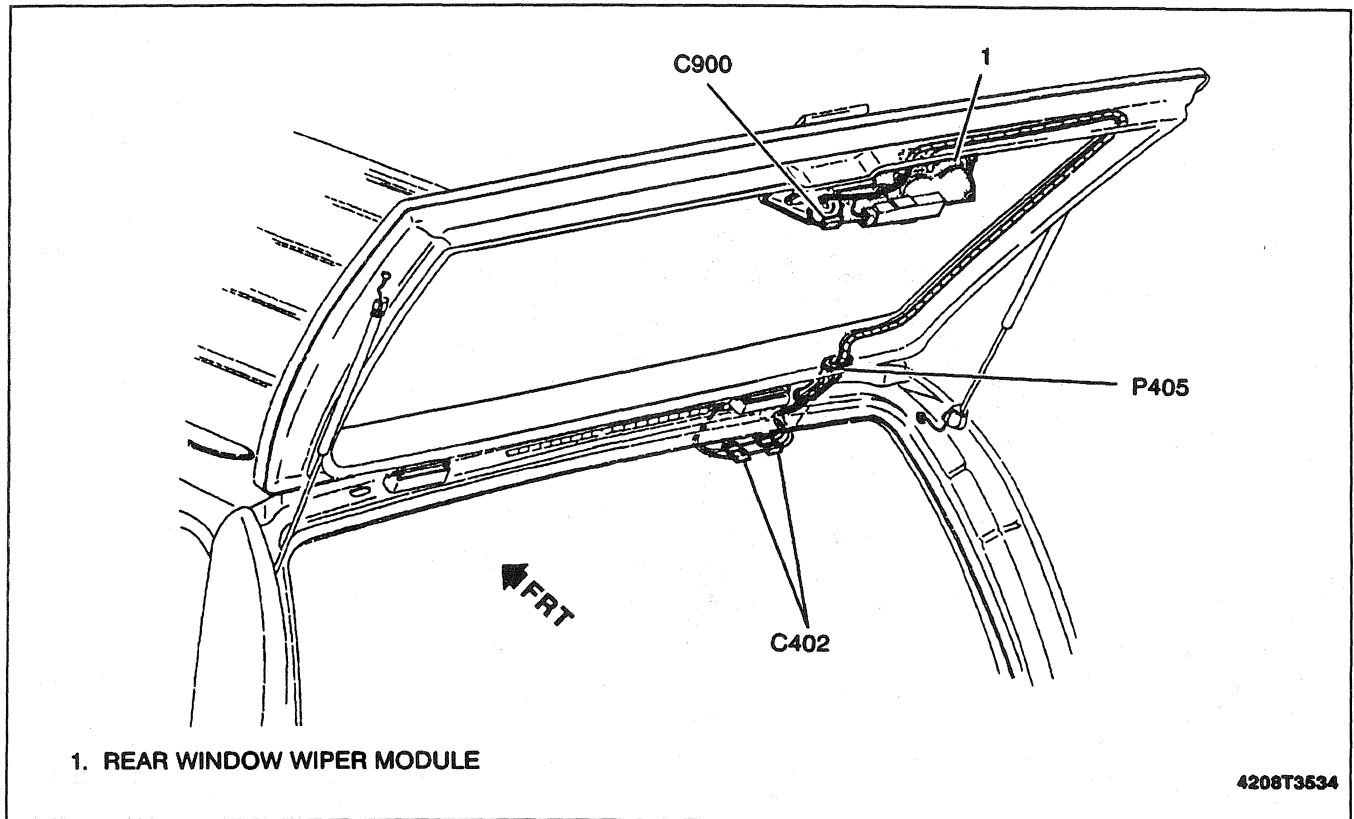


Figure 67—Rear Wiper/Washer

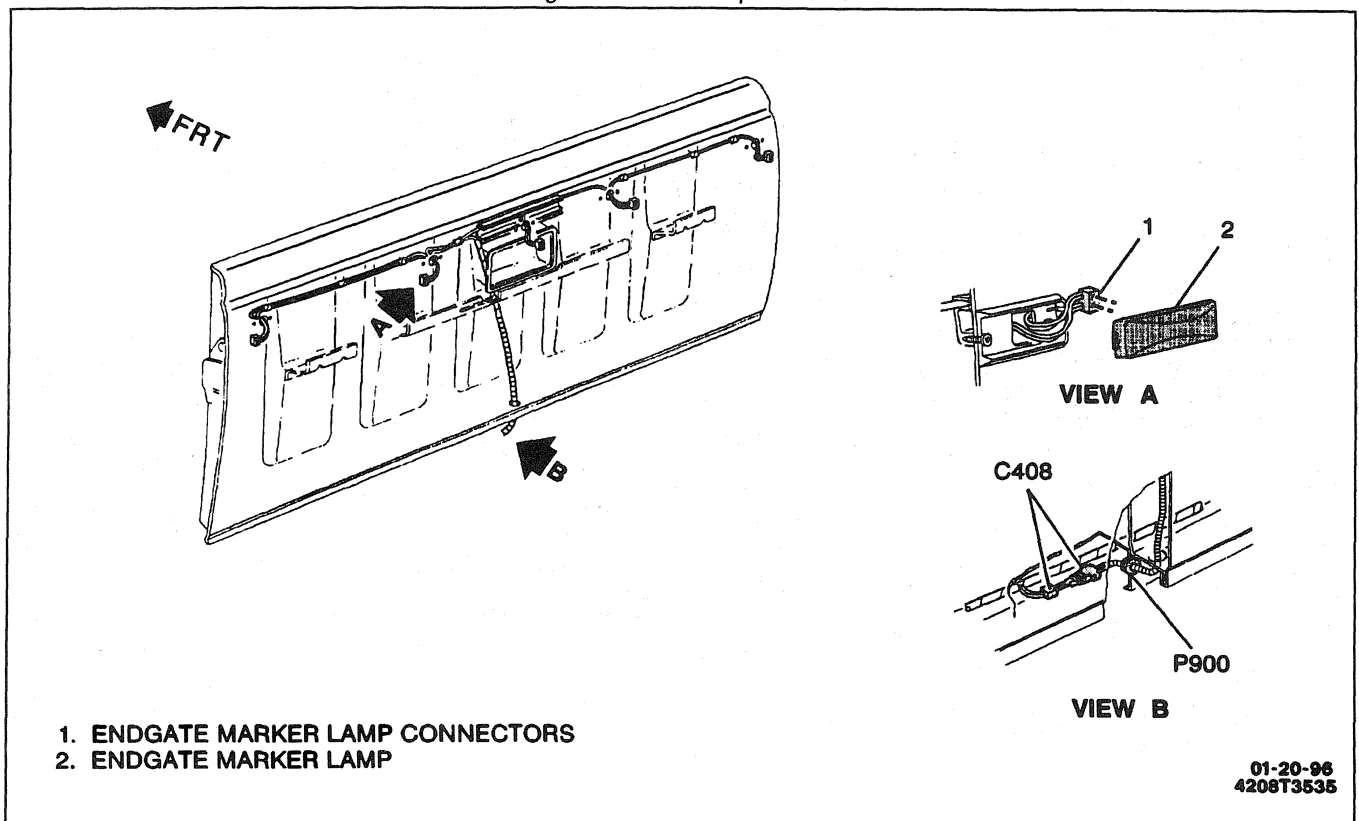


Figure 68—Engate Marker Lamps

COMPONENT LOCATION VIEWS

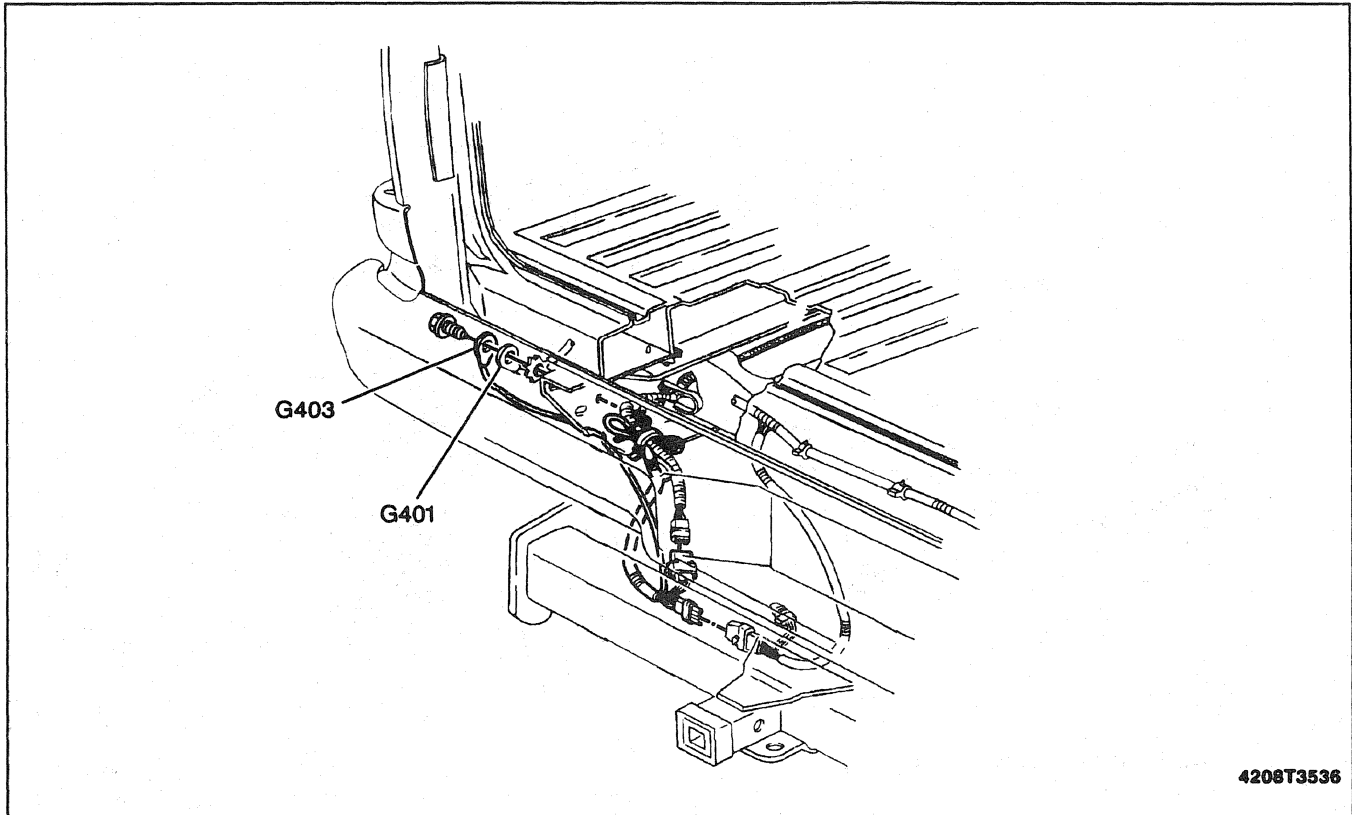


Figure 69—Trailer Wiring

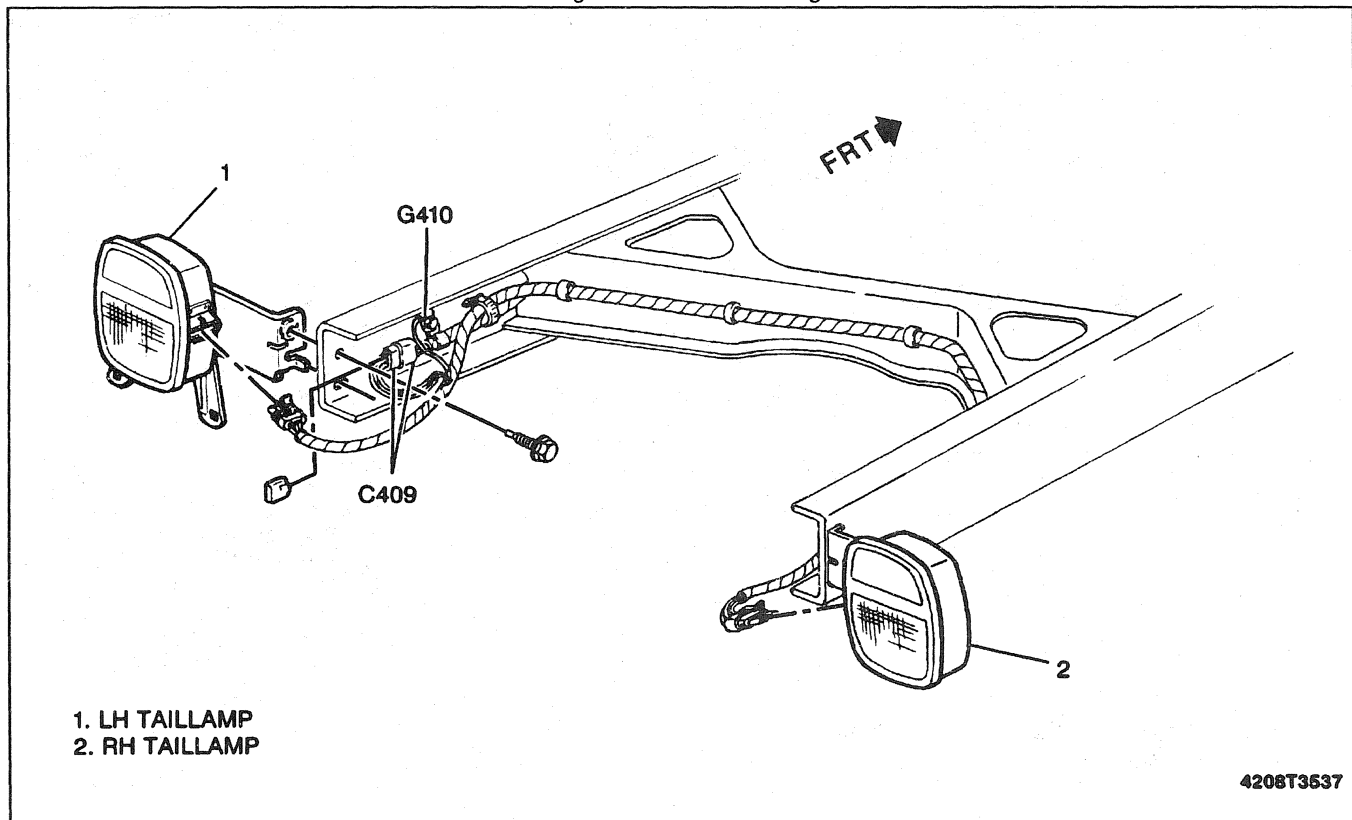


Figure 70—Rear Lamps Wiring (Chassis Cab)

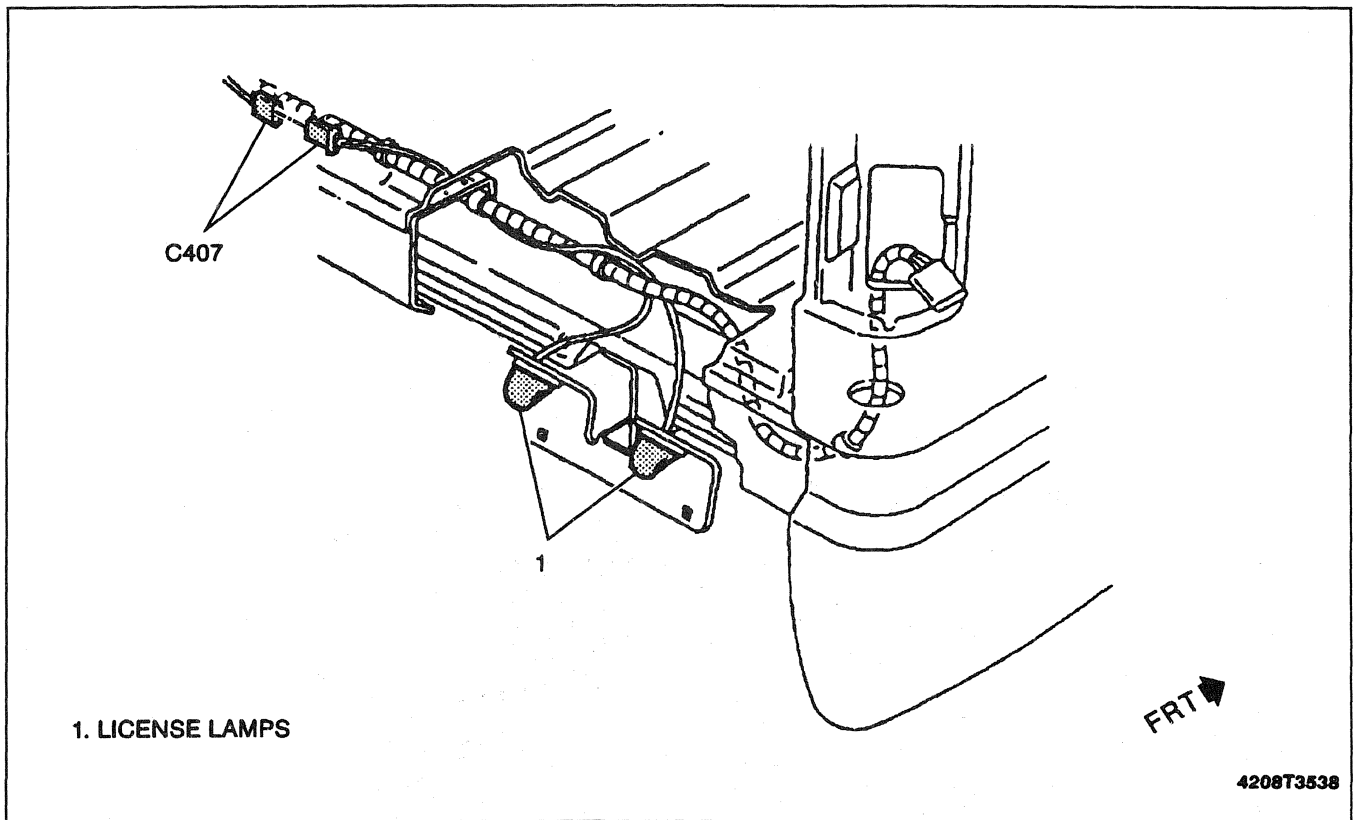


Figure 71—License Lamps (Pickup, Without Rear Bumper)

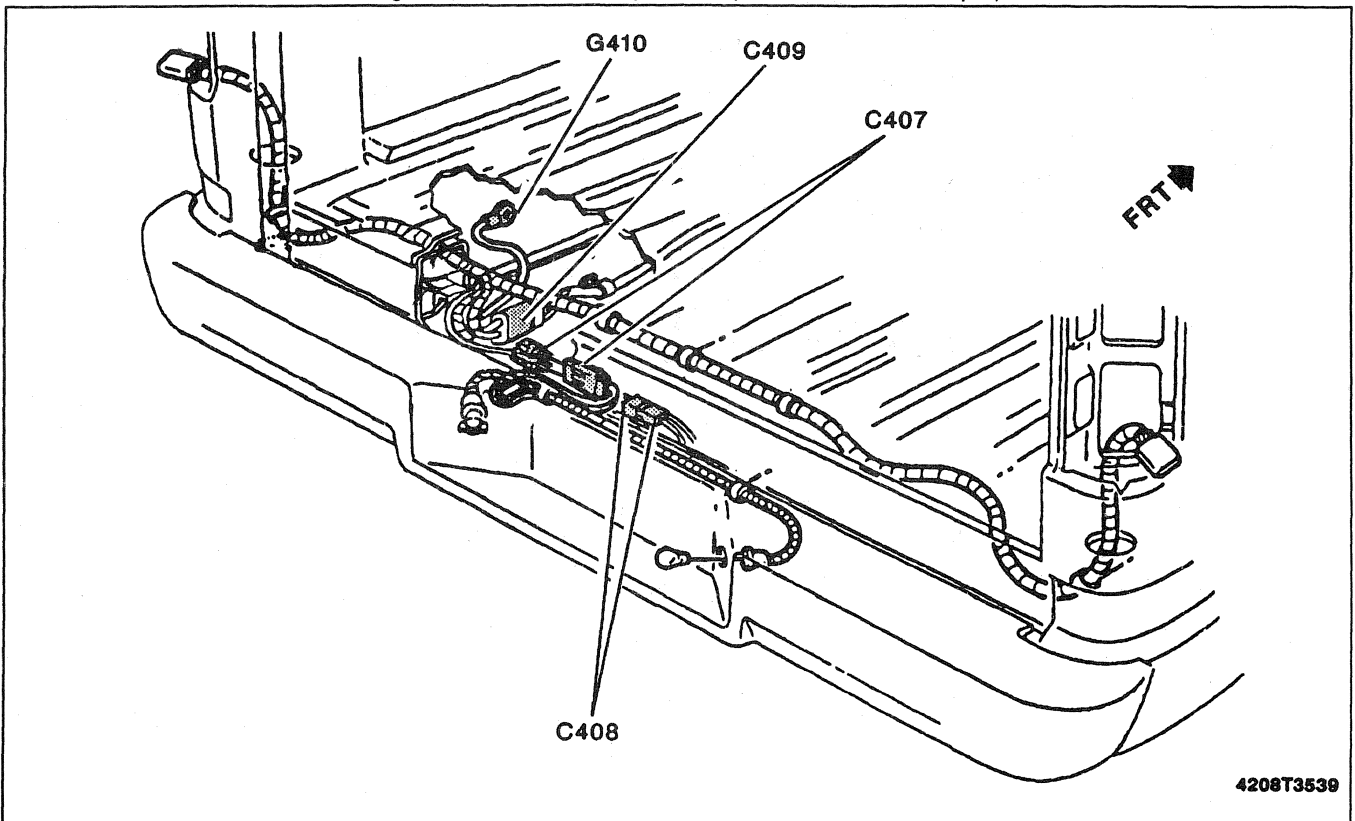
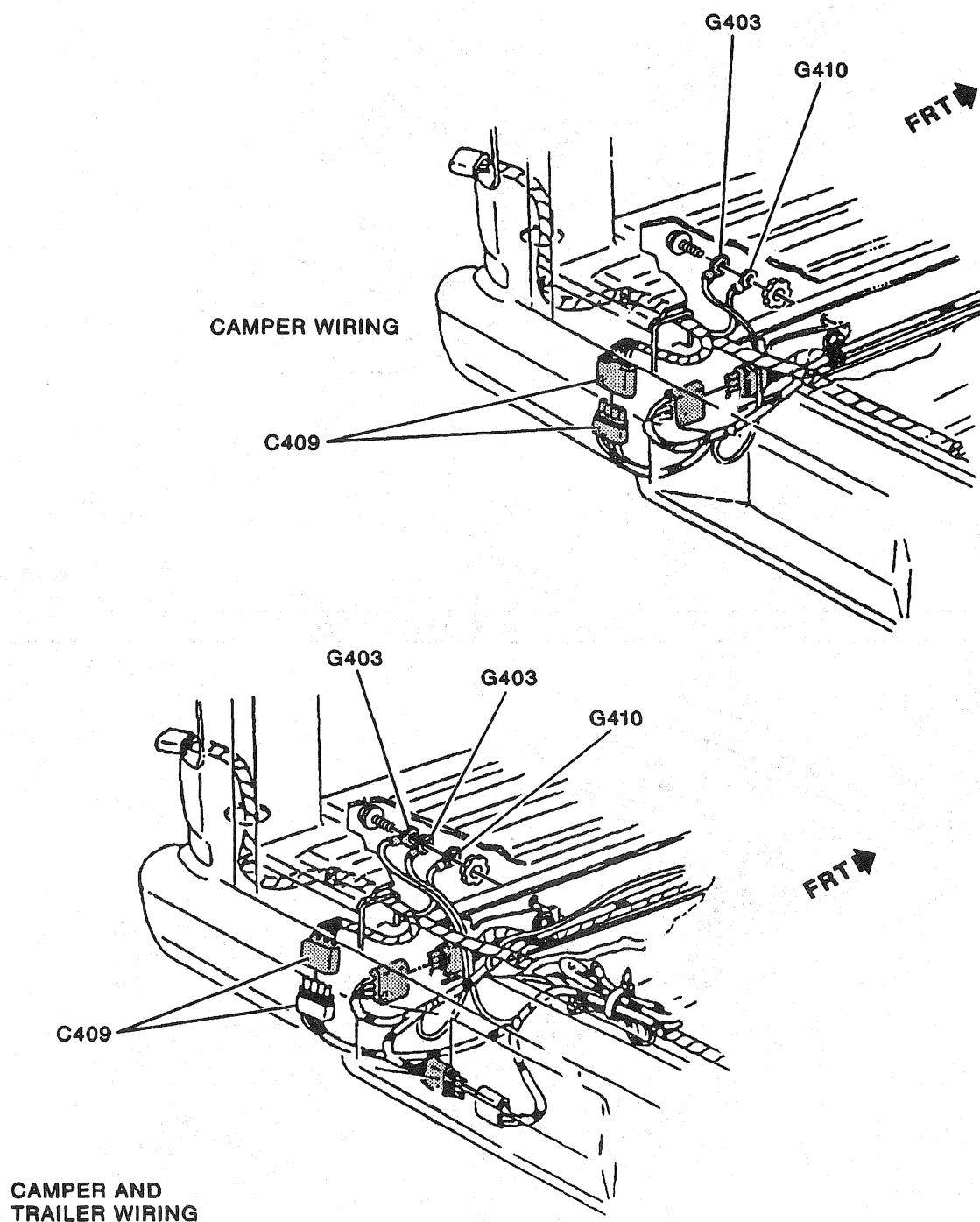


Figure 72—Tail and Stoplamp Harness

COMPONENT LOCATION VIEWS



4208T3540

Figure 73—Camper and Trailer Wiring

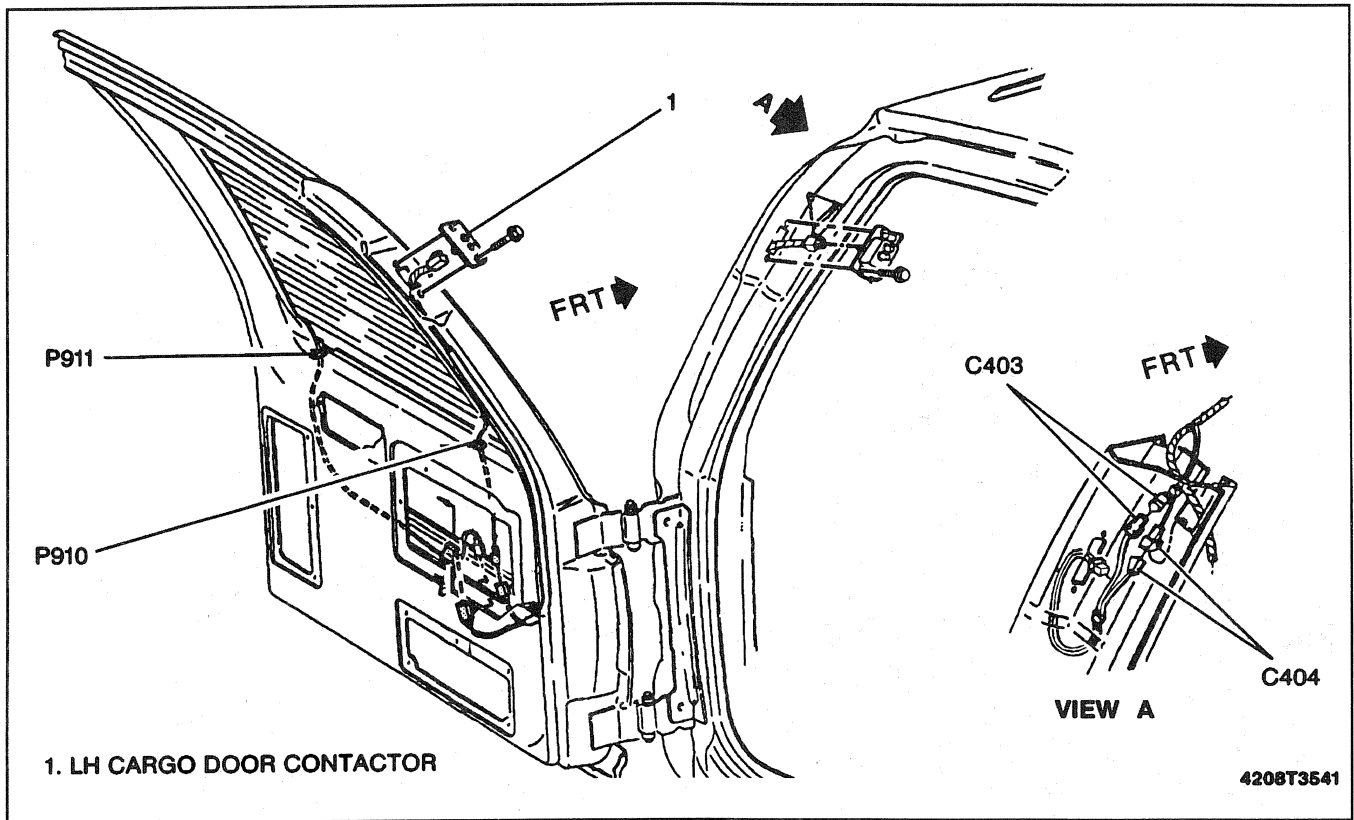


Figure 74—LH Cargo Door

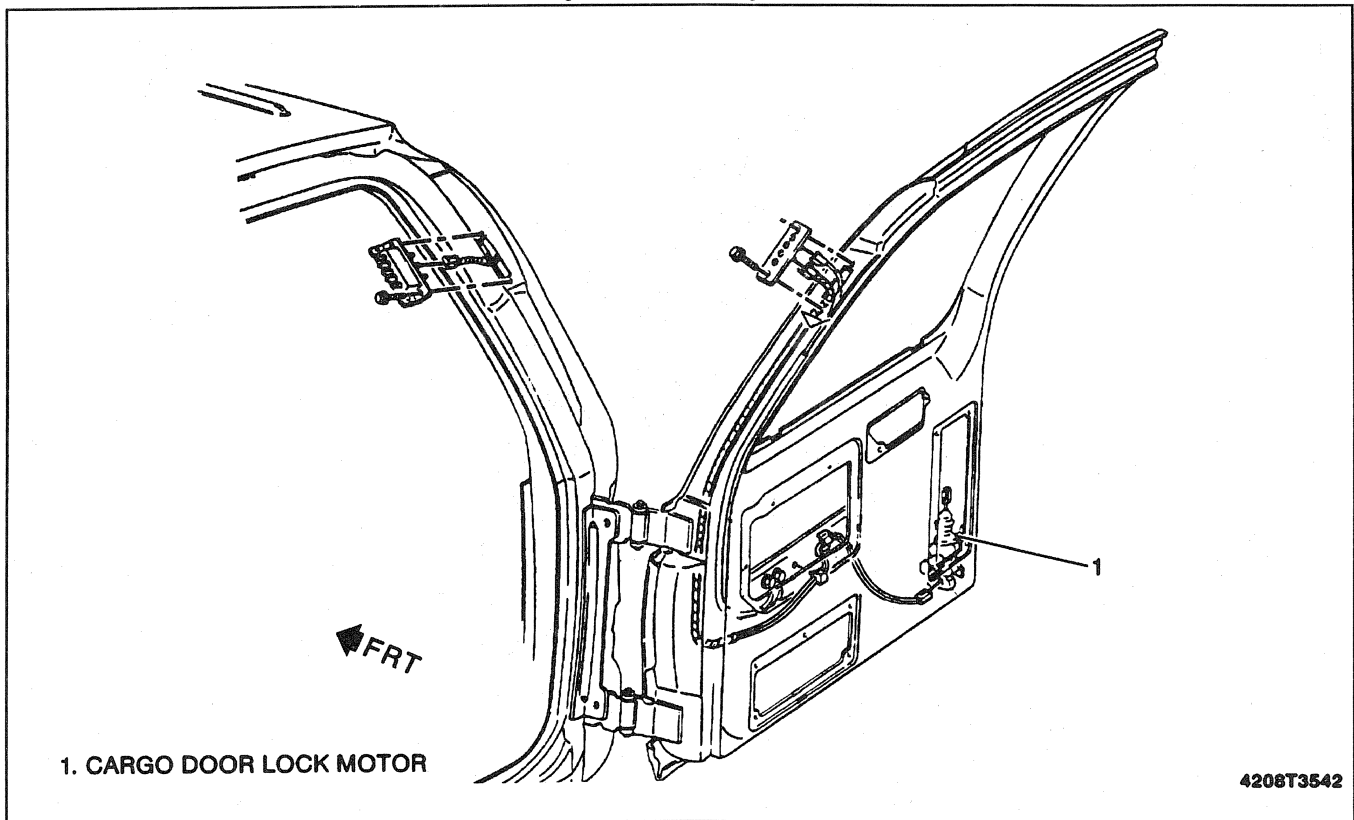


Figure 75—RH Cargo Door

COMPONENT LOCATION VIEWS

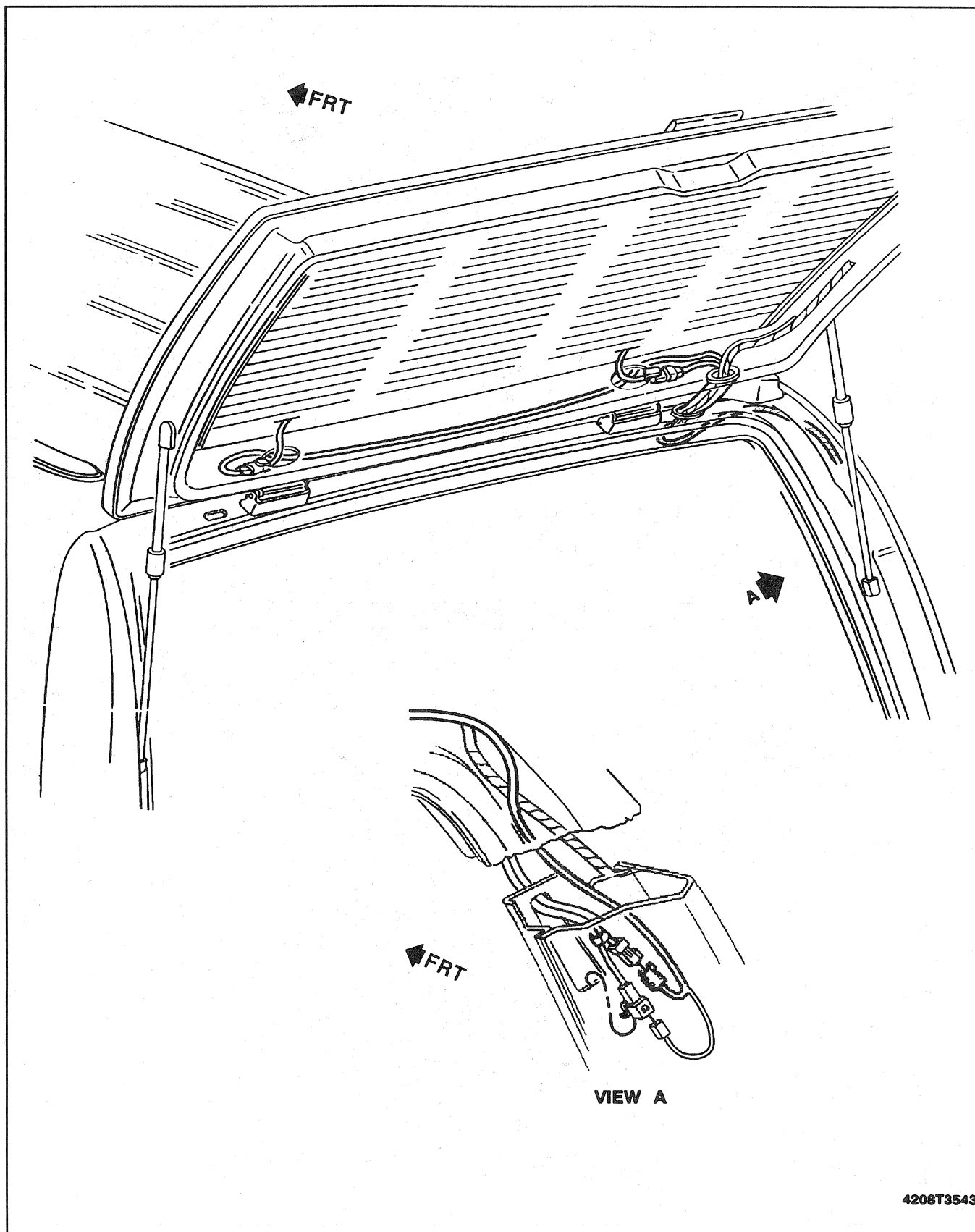
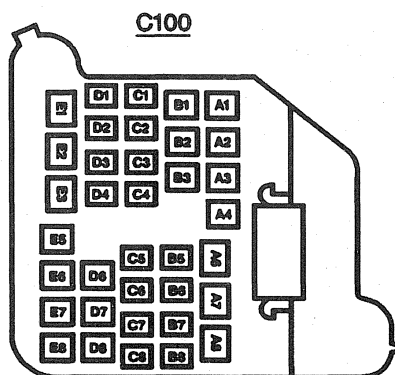


Figure 76—Rear Window Defogger Wiring



**BLANK**

## HARNESS CONNECTOR FACES



12146331  
36 - WAY F METRI - PACK  
150, 180, 630 - SERIES  
LT GRY

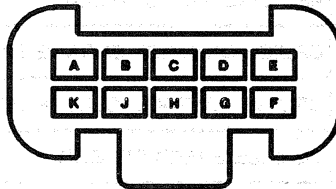
CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A1	WHT	.8	17	TCC/STOPLAMP SWITCH OUTPUT (GAS ONLY)
A1	RED	5	542	BATTERY FUSED FEED (DIESEL ONLY)
A2	PNK	.35	1020	IGNITION FEED - OFF, RUN, CRANK
A3	ORN	2	1440	BATTERY FUSED FEED
A4	LT BLU	2	20	STOPLAMP FEED (GAS ONLY)
A4	DK GRN	1	392	REAR WINDOW WASHER PUMP MOTOR FEED (DIESEL ONLY)
A6	RED	5	42	BATTERY FUSED FEED
A7	RED	5	142	BATTERY FUSED FEED
A8	RED	3	242	BATTERY FUSED FEED
B1	RED	.8	228	WINDSHIELD WASHER PUMP MOTOR FEED
B2	WHT	.8	121	TACHOMETER SIGNAL
B5	DK GRN	.5	389	VEHICLE SPEED SIGNAL (GAS ONLY)
B6	BRN/WHT	.5	419	CHECK ENGINE INDICATOR LAMP OUTPUT
B7	PPL	.5	1807	SERIAL DATA
B8	DK GRN/WHT	.5	1614	AIR INLET VALVE MOTOR FEED
C1	BLK	.5	28	HORN RELAY OUTPUT - COIL
C2	YEL	.5	1737	NEUTRAL SAFETY SWITCH OUTPUT - PARK/NEUTRAL POSITION
C3	BRN	.8	25	CHARGE INDICATOR LAMP OUTPUT
C4	TAN	.5	31	OIL PRESSURE INDICATOR LAMP OUTPUT
C5	DK GRN	.5	35	COOLANT TEMPERATURE INDICATOR LAMP OUTPUT
C6	TAN/WHT	.5	33	BRAKE WARNING INDICATOR LAMP OUTPUT

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
C7	PNK	.8	139	IGNITION FEED (FUSED)
C8	LT GRN	.5	867	ABS FAILURE INDICATOR OUTPUT
D1	TAN/WHT	.5	799	ABS DIAGNOSTIC SIGNAL
D2	LT BLU/BLK	.5	396	CRUISE CONTROL ENGAGE SIGNAL (GAS ONLY)
D2	BRN/WHT	.5	379	CRUISE CONTROL, CLUTCH PEDAL SWITCH OUTPUT
D2	WHT	.5	696	VEHICLE SPEED SENSOR
D3	LT GRN	.8	24	BACKUP LAMP FEED
D4	DK GRN/WHT	.35	817	VEHICLE SPEED SIGNAL
D4	DK BLU	.35	507	WAIT LAMP (DIESEL ONLY)
D6	BLK/WHT	1	1695	FOUR WHEEL DRIVE FRONT WHEEL LOCK INDICATOR
D7	LT GRN	1	66	AIR CONDITIONING SWITCH OUTPUT
D8	BRN	.35	441	IGNITION FUSED FEED
E1	PPL	3	1035	STARTER RELAY FEED (MANUAL TRANSMISSION ONLY)
E1	YEL	3	5	IGNITION FEED - CRANK (AUTOMATIC TRANSMISSION ONLY)
E2	PNK	3	3	IGNITION FEED
E3	RED	5	342	BATTERY FUSED FEED
E5	BRN	1	241	IGNITION FUSED FEED
E6	GRY/BLK	1	1596	HEATER WATER CONTROL SOLENOID OUTPUT
E6	PPL/WHT	.8	821	VEHICLE SPEED SENSOR (VSS) - SIGNAL
E7	LT GRN/BLK	.8	822	VEHICLE SPEED SENSOR (VSS) - RETURN
E8	BLK/WHT	.8	1751	SIR GROUND

## 8A - 202 - 2 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES

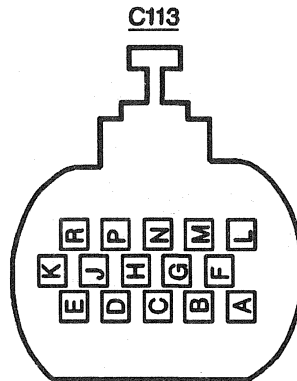
**C105**  
**FUEL INJECTORS**  
**7.4L ENGINE**



**12065425**

**10 – WAY F METRI – PACK 150 SERIES**  
**BLK**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	BLK	.5	1744	FUEL INJECTOR #1 CONTROL
B	DK BLU/WHT	.5	878	FUEL INJECTOR #8 CONTROL
C	LT BLU/BLK	.5	844	FUEL INJECTOR #4 CONTROL
D	PNK/BLK	.5	1746	FUEL INJECTOR #3 CONTROL
E	YEL/BLK	.5	846	FUEL INJECTOR #6 CONTROL
F	BLK/WHT	.5	845	FUEL INJECTOR #5 CONTROL
G	RED/BLK	.5	877	FUEL INJECTOR #7 CONTROL
H	LT GRN/BLK	.5	1745	FUEL INJECTOR #2 CONTROL
J	PNK	.8	439	IGNITION FUSED FEED
K	PNK	.8	439	IGNITION FUSED FEED



12110779

METRI - PACK 280

BLK

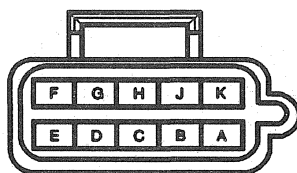
IN LINE TO FUEL INJECTION PUMP - DIESEL

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	DK BLU/WHT	.8	259	A/C COMPRESSOR DISABLE RELAY COIL
B	LT BLU	.8	1030	SINGLE POINT GROUND
C	DK BLU	.8	1031	SINGLE POINT GROUND
D	BLK	.8	1032	GROUND
E	BLK	.8	1033	GROUND
F	PNK		339	IGNITION FUSED FEED
G	BRN/WHT	.8	633	CAMSHAFT POSITION SENSOR SIGNAL
H	ORN	.8	1799	CAMSHAFT POSITION SENSOR SIGNAL - HIGH RESOLUTION
J	PNK/BLK	.8	632	CAMSHAFT POSITION SENSOR RETURN
K	YEL	.8	1578	FUEL TEMPERATURE SIGNAL
L	LT GRN	.8	260	HOOD SWITCH
M	LT GRN	.8	260	HOOD SWITCH
N	GRY	.8	474	REFERENCE VOLTAGE FEED - 5 VOLT REFERENCE
P	RED	.8	313	OIL PRESSURE SENDER ANALOG SIGNAL
R	PPL	.8	574	CRANKSHAFT POSITION SENSOR RETURN

## 8A - 202 - 4 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES

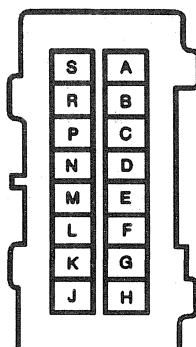
C200 (GAS)



12064770

10 - WAY M METRI - PACK 150  
NAT

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
D	LT GRN	.8	275	PARK/NEUTRAL POSITION SWITCH OUTPUT - PARK
E	PPL	.5	420	TCC/STOPLAMP SWITCH OUTPUT, TORQUE CONVERTER CLUTCH
F	BLK/WHT	.5	451	VEHICLE CONTROL MODULE GROUND
G	BLK/WHT	.5	771	TRANSMISSION POSITION SWITCH SIGNAL - BIT 1
H	YEL	.5	772	TRANSMISSION POSITION SWITCH SIGNAL - BIT 2
J	GRY	.5	773	TRANSMISSION POSITION SWITCH SIGNAL - BIT 3
K	WHT	.5	776	TRANSMISSION POSITION SWITCH SIGNAL - PARITY BIT

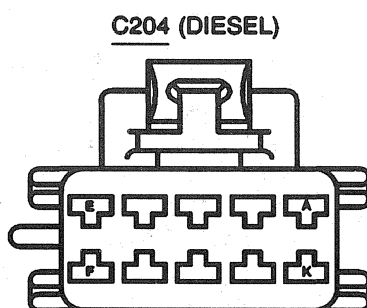
**C200 (DIESEL)****12129429**

**16 - WAY M METRI - PACK ACT 280 SERIES**  
**WHT**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	WHT	.8	17	TCC/STOPLAMP SWITCH OUTPUT
B	DK BLU	.35	84	CRUISE CONTROL SET/COAST SWITCH SIGNAL
C	GRY/BLK	.35	87	CRUISE CONTROL RESUME/ACCEL SWITCH SIGNAL
E	WHT/BLK	.35	176	FORE
F	LT GRN	.8	275	PARK/NEUTRAL POSITION SWITCH OUTPUT - PARK
G	DK GRN	.5	389	VEHICLE SPEED SIGNAL
H	PPL	.5	420	TCC/STOPLAMP SWITCH OUTPUT - TORQUE CONVERTER CLUTCH
J	BRN	.5	437	VEHICLE SPEED SIGNAL
K	BLK/WHT	.5	451	POWERTRAIN CONTROL MODULE GROUND
L	YEL/BLK	.8	508	"WATER-IN-FUEL" INDICATOR SWITCH GROUND
M	BLK/WHT	.5	771	TRANSMISSION POSITION SWITCH SIGNAL - BIT 1
N	YEL	.5	772	TRANSMISSION POSITION SWITCH SIGNAL - BIT 2
P	GRY	.5	773	TRANSMISSION POSITION SWITCH SIGNAL - BIT 3
R	WHT	.5	776	TRANSMISSION POSITION SWITCH SIGNAL - PARITY BIT
S	LT GRN	.5	1478	LOW COOLANT SENSOR SIGNAL

## 8A - 202 - 6 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES

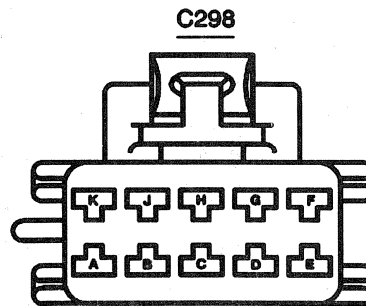


**12064770**

**10 – WAY F METRI – PACK 150 SERIES  
NAT  
ENGINE TO I/P**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	GRY	.5	598	TPS #1 REF VOLTAGE
B	DK BLU	.5	485	TPS #1 SIGNAL
C	LT BLU	.5	486	TPS #2 SIGNAL
D	BRN	.5	718	TPS #1 GROUND
E	GRY	.5	597	TPS #2 REF VOLTAGE
F	GRY	.5	546	TPS #3 REF VOLTAGE
G	DK GRN	.5	487	TPS #3 SIGNAL
H	PPL	.5	719	TPS #2 GROUND
J	GRY	.5	720	TPS #3 GROUND
K	GRY		397	CRUISE CONTROL ON SWITCH OUTPUT



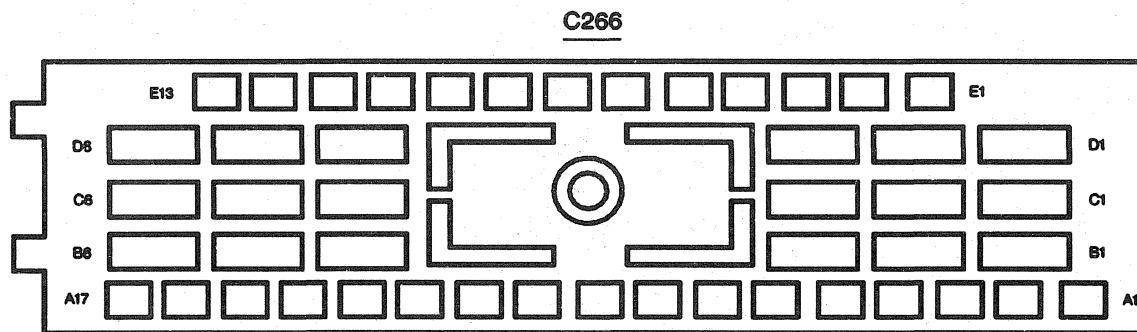


**12064769**  
**10 - WAY F METRI - PACK 150 SERIES**  
**NAT**  
**I/P TO X - BODY**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	ORN	.8	40	BATTERY FUSED FEED
B	BRN	.8	9	PARK LAMP FEED
C	WHT	.8	156	COURTESY LAMP
D	BLK/WHT	.8	238	SEAT BELT SWITCH SIGNAL
E	GRY	.35	8	INSTRUMENT PANEL LAMP FEED
F	WHT	.8	17	TCC/STOPLAMP SWITCH OUTPUT
G	PPL	.5	328	INTERIOR LAMP DEFEAT SWITCH
H	DK BLU/WHT	.8	149	COURTESY LAMP
H	TAN/WHT	.5	33	BRAKE WARNING INDICATOR
H	YEL	.8	1737	PARK/NEUTRAL - POSITION SWITCH OUTPUT
J	GRY	.5	157	INTERIOR LAMP OUTPUT
K	BLK/WHT	.35	1455	KEYLESS ENTRY PROGRAM ENABLE

## 8A - 202 - 8 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES



12077822

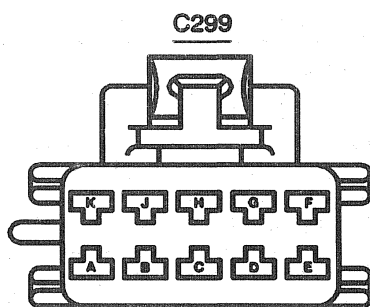
**48 - WAY M METRI - PACK MIXED SERIES  
BLK  
I/P HARNESS TO STEERING COLUMN HARNESS**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A1	WHT	.8	17	TCC/STOP LAMP SWITCH OUTPUT
A2	PNK	.8	139	IGNITION FUSED OUTPUT
A3	BLK	3	150	GROUND
A6	DK BLU	1	15	TURN SIGNAL LAMP FEED - RIGHT FRONT
A7	LT BLU	1	14	TURN SIGNAL FEED - LEFT FRONT
A11	BLK	.5	28	HORN RELAY OUTPUT - COIL
A12	GRY	.35	397	CRUISE CONTROL ON SWITCH OUTPUT
A13	BRN	.35	41	IGNITION FUSED FEED
A14	DK BLU	.35	84	CRUISE CONTROL SET/COAST SWITCH SIGNAL
A15	GRY/BLK	.35	87	CRUISE CONTROL RESUME/ACCEL SWITCH SIGNAL
A16	BLK	.8	150	GROUND
A17	DK GRN/WHT	.8	1135	BRAKE TRANSMISSION SHIFT INTERLOCK SOLENOID FEED
B2	BLK	.8	150	GROUND
B3	LT GRN	.8	80	KEY REMINDER SWITCH SIGNAL
B4	TAN	.5	159	KEY REMINDER SWITCH OUTPUT
B5	LT BLU	.5	1134	PARK BRAKE SWITCH SIGNAL
C1	WHT	3	1390	IGNITION SWITCH OUTPUT, OFF, RUN, CRANK
C2	BLK	.8	150	GROUND
C5	PNK	3	3	IGNITION FEED
C6	ORN	5	300	IGNITION FEED

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
D1	YEL	3	5	IGNITION SWITCH OUTPUT - CRANK
D2	RED	5	342	BATTERY FEED
D5	RED	3	242	BATTERY FEED
D6	BRN	5	4	IGNITION SWITCH OUTPUT - ACCESSORY
E1	GRY	1	1696	TURN/HAZARD FLASHER FEED
E2	LT BLU	2	20	STOPLAMP FEED (GAS)
E3	PPL	1	92	WINDSHIELD WIPER MOTOR FEED - HIGH SPEED
E4	YEL	1	143	ACCESSORY FEED
E5	BRN	1	96	WINDSHIELD WIPER SWITCH SIGNAL - PULSE DELAY
E6	DK GRN	2	19	STOP, TURN LAMP FEED - RIGHT REAR
E7	YEL	2	18	STOP, TURN LAMP FEED - LEFT REAR
E8	ORN	1	140	BATTERY FEED
E9	PPL	1	1697	TURN/HAZARD FLASHER OUTPUT
E11	LT GRN	1	11	HIGH BEAM HEADLAMP FEED
E12	PPL	1	359	DRL RELAY OUTPUT (LOW BEAM)
E13	YEL	1	10	HEADLAMP SWITCH OUTPUT

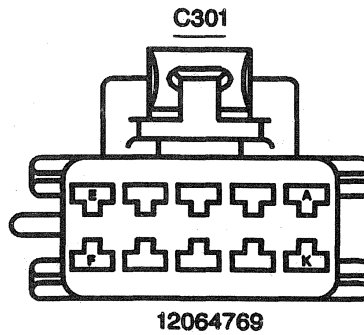
## 8A - 202 - 10 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES



10 - WAY F METRI - PACK 150 SERIES  
NAT  
I/P TO X - BODY HARN

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	DK GRN	.5	117	SPEAKER RETURN - RH FRONT
B	GRY	.5	118	SPEAKER RETURN - LH FRONT
C	LT GRN	.5	200	SPEAKER FEED - RH FRONT
D	TAN	.5	201	SPEAKER FEED - LH FRONT
E	DK BLU	.5	46	SPEAKER FEED - RH REAR
F	LT BLU	.5	115	SPEAKER RETURN - RH REAR
G	YEL	.5	116	SPEAKER RETURN - LH REAR
H	BRN	.5	199	SPEAKER FEED - LH REAR
J	PNK	.8	314	RADIO SIGNAL ON
K	PNK	.35	39	IGNITION FUSED FEED

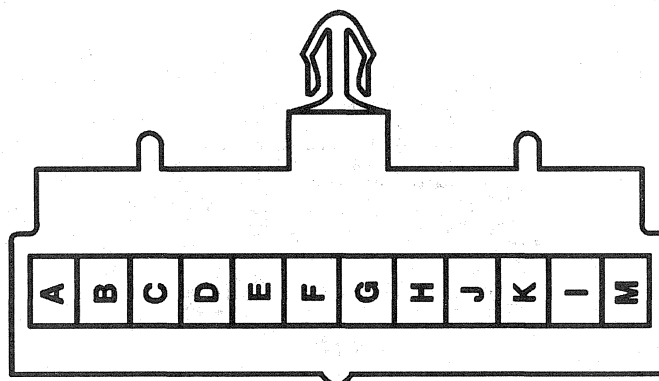


**10 – WAY F METRI – PACK 150 SERIES  
NAT  
REAR BODY TO X – BODY**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	WHT	.8	156	COURTESY LAMPS
B	LT BLU	.5	115	SPEAKER RETURN - RH REAR
C	DK BLU	.5	46	SPEAKER RETURN - LH REAR
D	YEL	.5	116	SPEAKER RETURN - LH REAR
E	BRN	.5	199	SPEAKER FEED - LH REAR
F	BLK	.8	1576	TRUNK RELEASE SWITCH OUTPUT
G	ORN	.8	40	BATTERY FUSED FEED
H	BLK	.8	150	GROUND (UTILITY ONLY)
J	YEL	.8	1737	PARK/NEUTRAL POSITION SWITCH OUTPUT- PARK/NEUTRAL
K	WHT	.8	17	STOP LAMP SWITCH

## HARNESS CONNECTOR FACES

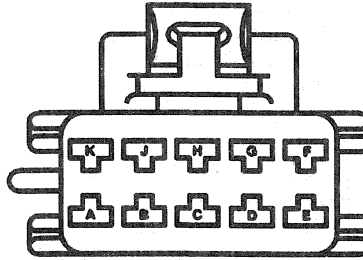
## AUXILIARY HEATER AND A/C CONTROL LOGIC MODULE



12047887

12 - WAY PRINTED CIRCUIT  
EDGE BOARD SERIES

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	LT BLU	.8	733	AIR TEMPERATURE DOOR POSITION SIGNAL
B	DK BLU	.8	1199	AIR TEMPERATURE DOOR MOTOR - FEED
C	DK BLU	.8	1646	AIR TEMPERATURE DOOR POSITION SIGNAL - REAR
D	LT BLU	.8	920	REAR CONTROL OUTPUT
E	LT BLU	.8	919	FRONT CONTROL HEAT INPUT
F	WHT	.8	454	GROUND
H	BLK	.8	150	GROUND
J	BRN	.8	341	IGNITION FUSED FEED
L	DK BLU	.8	77	A/C SELECT SWITCH - REAR
M	ORN	.8	1923	A/C SELECT SWITCH FRONT

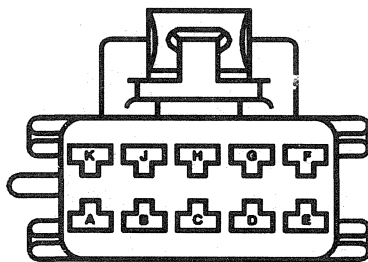


**12064769**  
**10 – WAY F METRI – PACK 150 SERIES**  
**NAT**

**AUXILIARY HEATER AND A/C**  
**CONTROL MODULE (FRONT)**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	GRY	.5	8	I/P LAMP FEED
B	BLK	.8	150	GROUND
C	DK BLU	.8	1926	AUXILIARY HVAC SWITCH OUTPUT - LOW
D	WHT	.8	1924	AUXILIARY HVAC SWITCH OUTPUT - HIGH
E	RED	.8	1925	AUXILIARY HVAC SWITCH OUTPUT - MEDIUM
F	ORN	.8	1923	AUXILIARY HVAC SWITCH FEED
G	BRN	.8	341	IGNITION FEED - FUSED
H	LT BLU	.8	733	AIR TEMP DOOR POSITION SENSOR SIGNAL
J	LT BLU	.8	919	FRONT CONTROL HEAT INPUT

## HARNESS CONNECTOR FACES

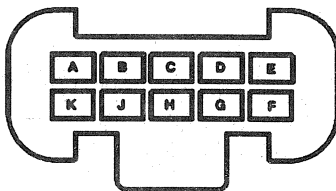


12064769  
10 – WAY F METRI – PACK 150 SERIES  
NAT

AUXILIARY HEATER AND A/C  
CONTROL MODULE (REAR)

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	GRY	.8	8	I/P LAMP FEED
B	BLK	.8	150	GROUND
C	DK BLU	.8	1926	AUXILIARY HVAC SWITCH OUTPUT - LOW
D	WHT	.8	1924	AUXILIARY HVAC SWITCH OUTPUT - HIGH
E	RED	.8	1925	AUXILIARY HVAC SWITCH OUTPUT - MEDIUM
F	DK BLU	.8	77	AUXILIARY HVAC SWITCH FEED (WITH C36 ONLY)
G	BRN	.8	341	IGNITION FEED - FUSED
H	DK BLU	.8	1646	AIR TEMP DOOR POSITION SENSOR SIGNAL - PASSENGER
J	LT BLU	.8	920	MODE DOOR OUTPUT

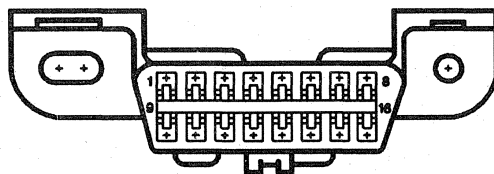




12065425  
 10 - WAY F METRI - PACK 150 SERIES  
 BLK  
 CRUISE CONTROL MODULE

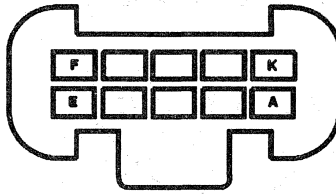
CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	GRY	.35	397	CRUISE CONTROL SWITCH - ON
B	DK BLU	.35	84	CRUISE CONTROL SWITCH - SET/COAST
C	GRY/BLK	.35	87	CRUISE CONTROL SWITCH - RESUME/ACCEL
D	PPL	.5	420	TCC/STOPLAMP SWITCH OUTPUT
E	BLK/WHT	.5	451	GROUND
F	BRN	.35	41	IGNITION FUSED FEED
G	WHT	.8	17	TCC/STOPLAMP SWITCH OUTPUT
J	LT BLU/WHT	.5	396	CRUISE CONTROL SIGNAL - ENGAGED
K	DK GRN/WHT	.5	817	VEHICLE SPEED SENSOR (VSS) - 4000 PULSES

## HARNESS CONNECTOR FACES



12110250  
10 – WAY F METRI – PACK 150 SERIES  
BLK  
DATA LINK CONNECTOR

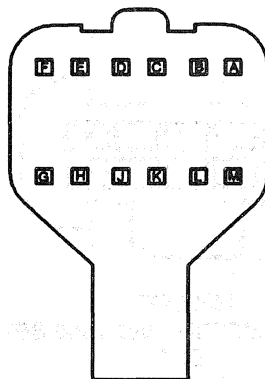
CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
1				NOT USED
2	PPL	.5	1807	SERIAL DATA
3				NOT USED
4	BLK	.5	150	GROUND
5	BLK/WHT	.5	451	GROUND
6				NOT USED
7				NOT USED
8	BLK/WHT	.35	1455	KEYLESS ENTRY PROGRAM ENABLE SIGNAL
9	TAN	.5	800	SERIAL DATA SIGNAL - UART 8192 BAUD PRIMARY
10				NOT USED
11				NOT USED
12	TAN/WHT	.5	799	DIAGNOSTIC SIGNAL - ABS
13	ORN	.5	1568	TRANSFER CASE CONTROL MODULE DIAGNOSTIC ENABLE
14	DK GRN	.35	835	E AND C DIAGNOSTIC SIGNAL
15				NOT USED
16	ORN	1	840	BATTERY FUSED OUTPUT



12065425  
 10-WAY F METRI-PACK 150 SERIES  
 BLK  
 ELECTRONIC THROTTLE ACTUATOR  
 MOTOR - DIESEL ENGINES

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	BRN	.5	718	TPS #1 GROUND
B	PPL	.5	719	TPS #2 GROUND
C	LT BLU	.5	486	TPS #2 SIGNAL
D	GRY	.5	597	TPS #2 REF VOLTAGE
E	GRY	.5	596	TPS #3 REF VOLTAGE
F	DK BLU	.5	485	TPS #1 SIGNAL
G	GRY	.5	598	TPS #1 REF VOLTAGE
J	GRY	.5	720	TPS #3 GROUND
K	DK GRN	.5	487	TPS #3 SIGNAL

## HARNESS CONNECTOR FACES

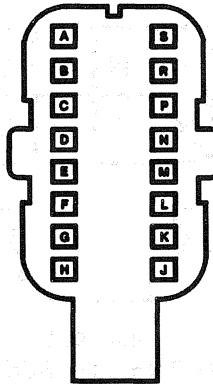


12160683

12-WAY F MICRO - PACK 100 - SERIES  
BLK  
FUEL INJECTORS (4.3L ENGINE)

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	BLK/WHT	.5	845	FUEL INJECTOR #5 CONTROL
B	PNK	.8	439	IGNITION FUSED FEED
C	PNK/BLK	.5	1746	FUEL INJECTOR #3 CONTROL
D	PNK	.8	439	IGNITION FUSED FEED
E	PNK	.8	439	IGNITION FUSED FEED
F	BLK	.5	1744	FUEL INJECTOR #1 CONTROL
G	LT GRN/BLK	.5	1745	FUEL INJECTOR #2 CONTROL
H	PNK	.8	439	IGNITION FUSED FEED
J	PNK	.8	439	IGNITION FUSED FEED
K	LT BLU/BLK	.5	844	FUEL INJECTOR #4 CONTROL
L	PNK	.8	439	IGNITION FUSED FEED
M	YEL/BLK	.5	846	FUEL INJECTOR #6 CONTROL

**FUEL INJECTORS  
(5.0L AND 5.7L ENGINES)**

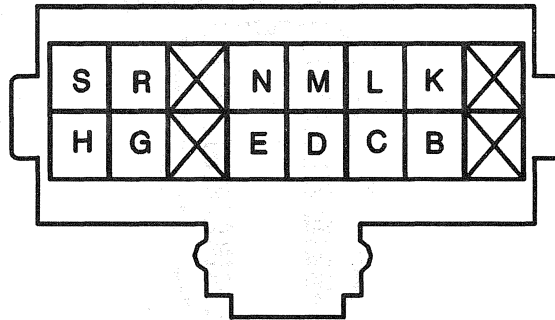


**12160688  
16-WAY F MICO - PACK 100 - SERIES  
BLK**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	BLK	.5	1744	FUEL INJECTOR #1 CONTROL
B	PNK	.8	439	IGNITION FUSED FEED
C	PNK	.8	439	IGNITION FUSED FEED
D	PNK/BLK	.5	1746	FUEL INJECTOR #3 CONTROL
E	LT BLU/BLK	.5	844	FUEL INJECTOR #4 CONTROL
F	PNK	.8	439	IGNITION FUSED FEED
G	PNK	.8	439	IGNITION FUSED FEED
H	LT GRN/BLK	.5	1745	FUEL INJECTOR #2 CONTROL
J	DK BLU/WHT	.5	878	FUEL INJECTOR #8 CONTROL
K	PNK	.8	439	IGNITION FUSED FEED
L	PNK	.8	439	IGNITION FUSED FEED
M	YEL/BLK	.5	846	FUEL INJECTOR #6 CONTROL
N	BLK/WHT	.5	845	FUEL INJECTOR # 5 CONTROL
P	PNK	.8	439	IGNITION FUSED FEED
R	PNK	.8	439	IGNITION FUSED FEED
S	RED/BLK	.5	877	FUEL INJECTOR #7 CONTROL

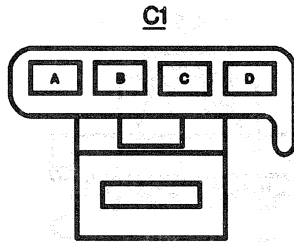
## 8A - 202 - 20 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES



12146952  
12 – WAY F METRI – PACK 280 SERIES  
BLK  
HEADLAMP DIMMER SWITCH

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
B	GRY	.5	157	COURTESY LAMP
C	RED	3	42	BATTERY FUSED FEED
D	PNK	.35	39	IGNITION FUSED FEED
E	DK GRN	.8	44	INSTRUMENT PANEL LAMPS DIMMER SWITCH
G	YEL	1	10	HEADLAMP SWITCH OUTPUT
H	ORN	.8	240	BATTERY FUSED FEED
L	PPL	.5	328	INTERIOR LAMP DEFEAT SWITCH
M	WHT	.8	156	COURTESY LAMP
N	PPL/WHT	.8	1382	LED DIMMING SIGNAL
R	BLK	.8	150	GROUND
S	BRN	.8	9	PARK LAMP FEED



12052856

4 - WAY F METRI - PACK 280 SERIES

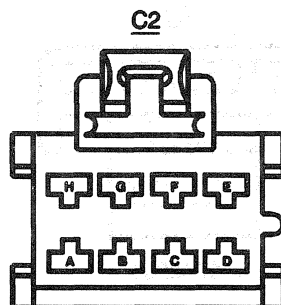
BLK

HEATER AND A/C CONTROL SWITCH

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	ORN	2	1440	BATTERY FUSED FEED
B	BRN	1	141	IGNITION FUSED FEED
C	BLK	1	150	GROUND
D	PPL	2	293	REAR DEFOGGER ELEMENT FEED

## 8A - 202 - 22 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES



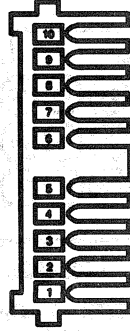
12064998

8 - WAY F METRI - PACK SERIES 280  
BLK  
HEATER BLOWER SWITCH

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	LT BLU	1	72	BLOWER SWITCH OUTPUT - MEDIUM 2
B	TAN	1	63	BLOWER SWITCH OUTPUT - MEDIUM 1
C	YEL	1	60	BLOWER SWITCH OUTPUT - LOW
D	DK GRN	1	71	A/C SELECT SWITCH OUTPUT
E				NOT USED
F				NOT USED
G	BRN	1	141	IGNITION FUSED FEED
H	ORN	1	52	BLOWER SWITCH OUTPUT - HIGH



C3  
HEATER AND A/C CONTROL SWITCH

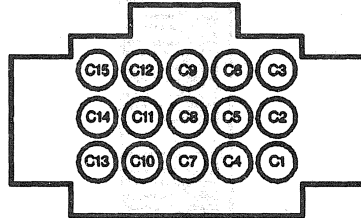


10-WAY PRINTED CIRCUIT  
BLK

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
1	GRY	.35	8	INSTRUMENT PANEL LAMP FEED
2	BLK	.8	150	GROUND
3	DK GRN	1	71	A/C SELECT SWITCH OUTPUT
4	DK GRN	.5	1614	AUX COOLING FAN RELAY CONTROL
5	BRN	1	141	IGNITION FUSED FEED
6				NOT USED
7	GRY/BLK	1	1596	WATER VALVE CONTROL
8	LT BLU	1	733	AIR TEMPERATURE DOOR POSITION SENSOR SIGNAL
9	WHT	1	454	GROUND
10	LT GRN	1	66	AIR CONDITIONING SWITCH OUTPUT

## 8A - 202 - 24 ELECTRICAL DIAGNOSIS

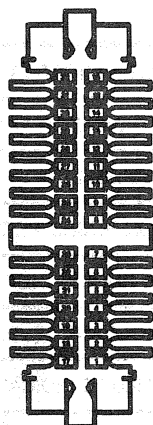
### HARNESS CONNECTOR FACES



12034325

15 - WAY F METRI - PACK 280 SERIES  
NAT  
POWER AMPLIFIER

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
1	DK BLU	.5	46	SPEAKER FEED - RIGHT REAR
2	LT BLU	.8	115	SPEAKER RETURN - RIGHT REAR
4	BRN	.8	199	SPEAKER FEED - LEFT REAR
5	YEL	.8	116	SPEAKER RETURN - LEFT REAR
6	TAN	.8	1855	SPEAKER FEED - RIGHT REAR MIDRANGE
9	RED	.8	1955	SPEAKER RETURN - RIGHT REAR MIDRANGE
12	TAN	.8	1859	SPEAKER FEED - LEFT REAR MIDRANGE
13	ORN	.8	360	AMPLIFIER FEED
14	BLK	.8	150	GROUND
15	WHT	.8	1959	SPEAKER RETURN - LEFT REAR MIDRANGE

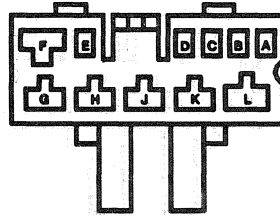


**32 - WAY PRINTED CIRCUIT  
BOW SERIES  
INSTRUMENT CLUSTER**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
1	BRN	.8	358	SIR INDICATOR LAMP
2	DK BLU	.35	507	WAIT LAMP
3	LT BLU	1	14	TURN SIGNAL LAMP FEED - LEFT FRONT
4	BLK/WHT	.5	451	GROUND
5	WHT	.5	629	HIGH BEAM INDICATOR
5	LT GRN	1	11	HIGH BEAM HEADLAMP FEED
6	WHT	.8	121	TACHOMETER SIGNAL
7	PNK	.35	39	IGNITION FUSED FEED
7	PNK	.35	1020	IGNITION FEED - OFF, RUN, CRANK
8	PPL/WHT	.8	1382	LED DIMMING SIGNAL
9	BLK/WHT	.5	771	TRANSMISSION POSITION SWITCH SIGNAL - BIT 1
10	GRY	.5	773	TRANSMISSION POSITION SWITCH - BIT 3
11	YEL	.5	772	TRANSMISSION POSITION SWITCH - BIT 2
12	WHT	.5	776	TRANSMISSION POSITION SWITCH SIGNAL - PARITY BIT
13	DK GRN	.5	35	COOLANT TEMPERATURE INDICATOR LAMP OUTPUT
14	DK GRN	.5	389	VEHICLE SPEED SIGNAL - 4000 PULSES PER MILE
15	TAN	.5	31	OIL PRESSURE INDICATOR LAMP OUTPUT
16	PPL	.8	30	FUEL GAGES SENSOR SIGNAL
17	LT GRN/BLK	.8	592	DAYTIME RUNNING LIGHT RELAY OUTPUT - COIL
18	YEL/BLK	.8	508	"WATER-IN-FUEL" INDICATOR SWITCH GROUND

**8A - 202 - 26 ELECTRICAL DIAGNOSIS****HARNESS CONNECTOR FACES**

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
19	BRN	.8	25	CHARGE INDICATOR LAMP OUTPUT
20	TAN/BLK	.5	456	SHIFT INDICATOR LAMP OUTPUT (MANUAL TRANSMISSION ONLY)
21	WHT/BLK	.35	176	FORE (DIESEL)
22	PNK	.35	39	IGNITION FUSED FEED
23	BRN/WHT	.5	419	CHECK ENGINE INDICATOR LAMP OUTPUT
25	YEL/BLK	.5	68	LOW COOLANT LEVEL INDICATOR LAMP OUTPUT (DIESEL)
27	LT GRN	.5	867	ABS FAILURE INDICATOR LAMP OUTPUT
28	TAN/WHT	.5	33	BRAKE WARNING INDICATOR LAMP OUTPUT
29	GRY	.35	8	INSTRUMENT PANEL LAMP FEED
30	YEL	.8	234	SEAT BELT INDICATOR LAMP OUTPUT
31	BLK	.8	150	GROUND
32	DK BLU	1	15	TURN SIGNAL LAMP FEED - RIGHT FRONT



12084617

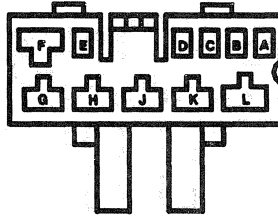
11 - WAY F METRI - PACK MIXED SERIES  
BLK

POWER WINDOW AND DOOR LOCK SWITCH, LH

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	BLK	1	150	GROUND
B	BLK	1	150	GROUND
C	LT BLU	1	195	POWER DOOR LOCK RELAY FEED - LOCK COIL
D	ORN	1	540	FUSE OUTPUT BATTERY TYPE III FUSE
E	WHT	1	194	POWER DOOR LOCK RELAY FEED - UNLOCK COIL
F	BLK	.8	150	GROUND
J	BRN	.8	9	PARK LAMP FEED
L	YEL	2	343	FUSE OUTPUT - ACCESSORY - TYPE III FUSE

## 8A - 202 - 28 ELECTRICAL DIAGNOSIS

### HARNESS CONNECTOR FACES



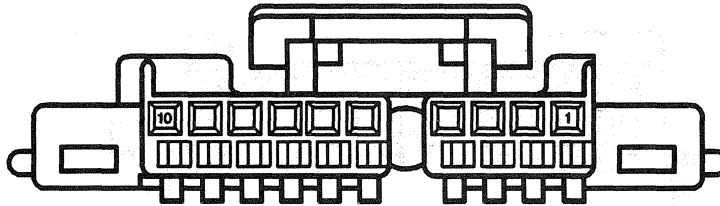
12084617

11 – WAY F METRI – PACK MIXED SERIES  
BLK

POWER WINDOW AND DOOR LOCK SWITCH, RH

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	WHT	1	194	POWER DOOR LOCK RELAY FEED - UNLOCK COIL
B	LT BLU	1	195	POWER DOOR LOCK RELAY FEED - LOCK COIL
C	TAN	1	294	POWER DOOR LOCK MOTOR FEED - UNLOCK
C	WHT	.8	194	POWER DOOR LOCK RELAY FEED - UNLOCK COIL
D	ORN	.8	640	FUSE OUTPUT - BATTERY TYPE III FUSE
D	ORN	1	540	FUSE OUTPUT - BATTERY TYPE III FUSE
E	LT BLU	.8	195	POWER DOOR LOCK RELAY FEED - LOCK COIL
E	GRY	1	295	POWER DOOR LOCK MOTOR FEED - LOCK
F	YEL	2	343	FUSE OUTPUT - ACCESSORY - TYPE III FUSE
G	DK BLU	2	666	POWER WINDOW MOTOR FEED RIGHT FRONT WINDOW - UP
J	LT BLU	2	166	POWER WINDOW MASTER SWITCH OUTPUT - RIGHT FRONT WINDOW - UP
K	BRN	2	667	POWER WINDOW MOTOR FEED RIGHT FRONT WINDOW - DOWN
L	TAN	2	167	POWER WINDOW MASTER SWITCH OUTPUT - RIGHT FRONT WINDOW - DOWN

C1  
RADIO

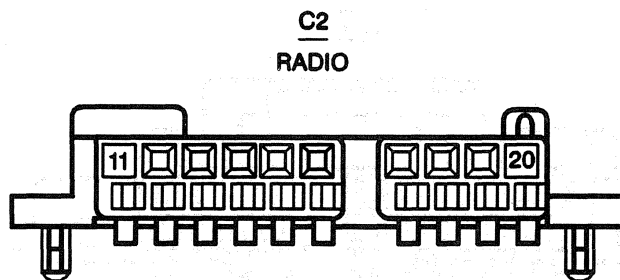


12047531

10 - WAY F MICRO - PACK SERIES 100  
BLK

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
1	GRY	.5	118	SPEAKER RETURN - LEFT FRONT
2	TAN	.5	201	SPEAKER FEED - LEFT FRONT
3	DK GRN	.5	117	SPEAKER RETURN - RIGHT FRONT
4	LT GRN	.5	200	SPEAKER FEED - RIGHT FRONT
5	BLK	.8	150	GROUND
6	PPL/WHT	.8	1382	LED DIMMING SIGNAL
7	GRY	.35	8	INSTRUMENT PANEL LAMP FEED
8	PNK	.5	314	RADIO ON SIGNAL (SUBURBAN/UTILITY)
9	YEL	.5	43	FUSE OUTPUT- ACCESSORY - TYPE III FUSE
10	ORN	.5	1140	FUSE OUT - BATTERY - TYPE III FUSE

## HARNESS CONNECTOR FACES



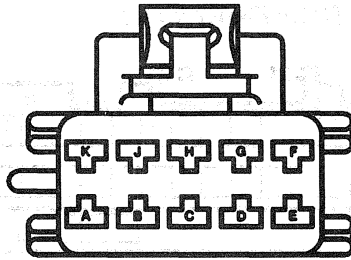
12065785

10 - WAY F MICRO - PACK  
GRY

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
11				NOT USED
12				NOT USED
13				NOT USED
14				NOT USED
15	DK GRN	.35	835	E AND C DIAGNOSTIC SIGNAL
16	DK GRN/WHT	.35	817	VEHICLE SPEED SIGNAL
17	LT BLU	.5	115	SPEAKER RETURN - RH REAR
18	DK BLU	.5	46	SPEAKER FEED - RH REAR
19	YEL	.5	116	SPEAKER RETURN - LH REAR
20	BRN	.5	199	SPEAKER - LH REAR



## TRANSFER CASE SELECT SWITCH

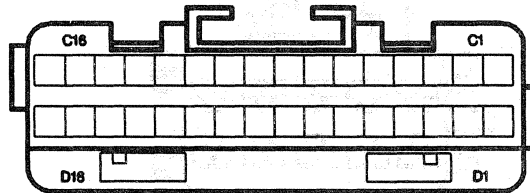


12064769

10-WAY F METRI-PACK 150 SERIES  
NAT

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	PNK	.35	39	IGNITION FUSED FEED
B	WHT	.5	900	TRANSFER CASE SELECT SWITCH OUTPUT - 2 HIGH
C	GRY/BLK	.5	1564	TRANSFER CASE SELECT SWITCH OUTPUT - 4 HIGH
D	DK GRN/WHT	.5	1559	TRANSFER CASE SELECT SWITCH OUTPUT - 4 LOW
E	PPL/WHT	.5	1565	INDICATOR LAMP OUTPUT - 4 LOW
F	TAN/BLK	.5	1566	INDICATOR LAMP OUTPUT - 4 HIGH
G	PNK	.5	901	INDICATOR LAMP OUTPUT - 2 HIGH
H	BLK	.5	150	GROUND
J	GRY	.35	8	INSTRUMENT PANEL LAMP FEED
K				

## HARNESS CONNECTOR FACES

TRANSFER CASE CONTROL MODULE  
(WIRE ENTRY VIEW)

12045470

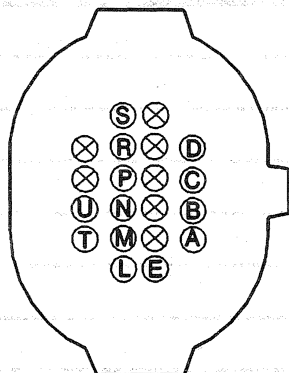
32 - WAY F MICRO - PACK 100 SERIES  
NATURAL

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
C1	BLK/WHT	1	1695	FRONT AXLE SWITCH
C2	ORN	.5	940	5V REFERENCE VOLTAGE
C3	DK GRN/WHT	.5	1559	TRANSFER CASE SELECT SWITCH OUTPUT - 4 LOW
C4	WHT	.5	900	TRANSFER CASE SELECT SWITCH OUTPUT - 2 HIGH
C5	GRY/BLK	.5	1564	TRANSFER CASE SELECT SWITCH OUTPUT - 4 HIGH
C6	ORN	1	1640	BATTERY FUSED FEED
C7				NOT USED
C8	PNK	.35	39	IGNITION FUSED FEED
C9	BLK/WHT	.5	1554	ENCODER GROUND
C10	BLK	.8	150	GROUND
C11	PNK	.5	901	INDICATOR LAMP OUTPUT - 2 HIGH
C12	TAN/BLK	.5	1566	INDICATOR LAMP OUTPUT - 4 HIGH
C13				NOT USED
C14	PPL/WHT	.5	1565	INDICATOR LAMP OUTPUT - 4 LOW
C15				NOT USED
C16	BLK	1	1552	TRANSFER CASE MOTOR FEED CW
D1	RED	1	1553	TRANSFER CASE MOTOR FEED CCW
D2	LT GRN	.8	275	PARK/NEUTRAL POSITION SWITCH OUTPUT - PARK
D3	ORN	.5	1568	TRANSFER CASE CONTROL MODULE DIAGNOSTICS ENABLE
D4	BRN/WHT	.5	1555	ENCODER CHANNEL P

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
D5	RED/WHT	.5	1556	ENCODER CHANNEL C
D6	DK BLU/WHT	.5	1557	ENCODER CHANNEL A
D7	YEL/BLK	.5	1558	ENCODER CHANNEL B
D8	DK GRN/WHT	.35	817	VEHICLE SPEED SIGNAL
D9				NOT USED
D10	BLK	.8	150	GROUND
D11				NOT USED
D12	BLK	1	150	GROUND
D13	BLK	1	150	GROUND
D14	ORN	1	1640	BATTERY FUSED FEED
D15	ORN	1	1640	BATTERY FUSED FEED
D16	YEL	.5	1737	PARK/NEUTRAL POSITION SWITCH OUTPUT - PARK/NEUTRAL

## HARNESS CONNECTOR FACES

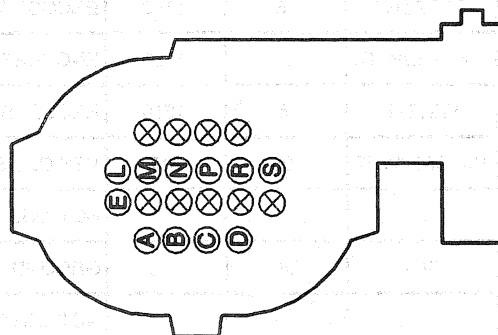
LIGHT DUTY TRANSMISSION



12160492

13 - WAY F MICRO - PACK 100W SERIES  
SEALED  
GRY

HEAVY DUTY TRANSMISSION



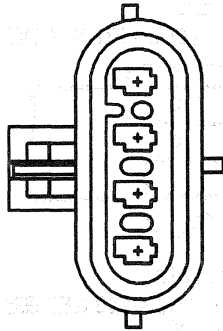
12160490

11 - WAY F MICRO - PACK 100 SERIES  
GRY

CAVITY	WIRE COLOR	WIRE SIZE	CKT	DESCRIPTION
A	LT GRN	.5	1222	1-2 SHIFT SOLENOID CONTROL CIRCUIT
B	YEL/BLK	.5	1223	2-3 SHIFT SOLENOID CONTROL CIRCUIT
C	RED/BLK	.5	1228	PRESSURE CONTROL SOLENOID (HIGH)
D	LT BLU/WHT	.5	1229	PRESSURE CONTROL SOLENOID (LOW)
E	PNK	.5	1020	IGNITION FUSE FEED
L	YEL/BLK	.5	1227	TRANSMISSION FLUID TEMPERATURE (TFT) SIGNAL
M	BLK	.5	452	SENSOR GROUND (DIESEL)
M	BLK	.5	470	SENSOR GROUND (GAS)
N	PNK	.5	1224	PRESSURE SWITCH SIGNAL - BIT 1
P	RED	.5	1226	PRESSURE SWITCH SIGNAL - BIT 3
R	DK BLU	.5	1225	PRESSURE SWITCH SIGNAL - BIT 2
S	WHT	.5	687	SHIFT SOLENOID OUTPUT - 2/3 (LD)
S	BRN	.5	418	TCC SOLENOID OUTPUT - PWN (HD)
T	TAN/BLK	.5	422	TCC SOLENOID OUTPUT
U	BRN	.5	418	TCC SOLENOID OUTPUT - PWM

C101

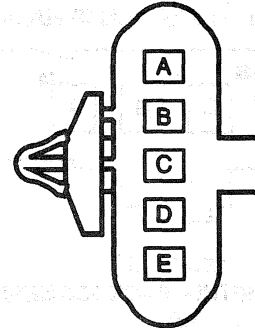
ENGINE HARN TO FORWARD LAMP HARN



12162102

4 - WAY M METRI - PACK 150 SERIES  
SEALED BLKC104

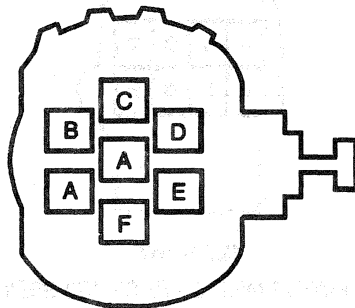
I/P HARN TO REAR HARN



12085037

5 - WAY M METRI - PACK 280  
GRYC102

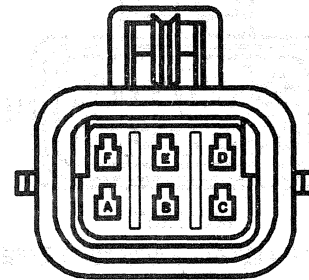
FORWARD LAMP HARN TO I/P HARN



12110751

7 WAY METRI - PACK 280 - SERIES  
BLKC107

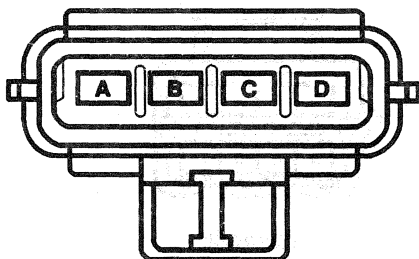
ENGINE HARN TO OXYGEN SENSOR HARN



12124107

6 - WAY M METRI - PACK 150 SERIES  
BLKC103

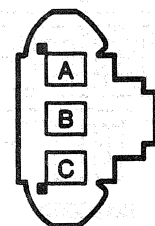
ENGINE HARN TO FUEL PUMP MOTOR



12129565

4 - WAY F METRI - PACK 280 SERIES  
GRYC110

I/P HARN TO ARMING SENSOR



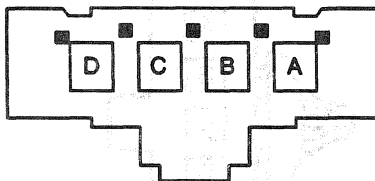
12084993

3 - WAY F METRI - PACK 280  
YEL

HARNESS CONNECTOR FACES

**C111**

I/P HARN TO REAR LAMP HARN

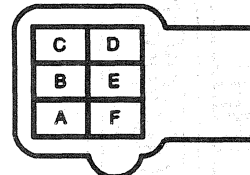


12162450

4-WAY F METRI - PACK 280 SERIES  
YEL

**C206**

CROSS BODY HARN TO LH FRONT DOOR HARN

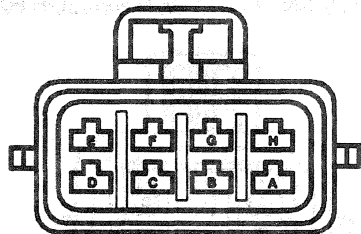


12064763

6-WAY M METRI - PACK 150 SERIES  
GRY

**C112**

ENGINE HARN TO DATA SENSORS  
(DIESEL)

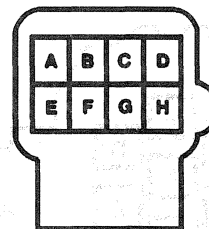


12047937

8-WAY F METRI - PACK 150 SERIES  
BLK

**C207**

CROSS BODY HARN TO LH DOOR HARN

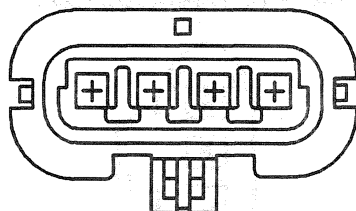


12064767

8-WAY M METRI - PACK 150 SERIES  
BLU

**C120**

ENGINE HARN TO FOUR WHEEL DRIVE INDICATOR  
FRONT AXLE ACTUATOR

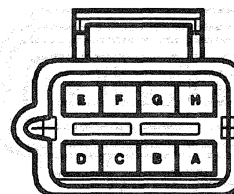


12129600

4-WAY F METRI - PACK 280 SERIES  
SEALED BLK

**C208**

CROSS BODY HARN TO LH DOOR HARN

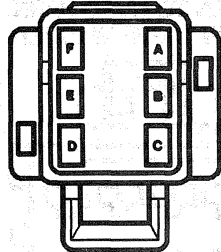


12066195

8-WAY M METRI - PACK 280 SERIES  
BLK

**C209**

CROSS BODY HARN TO LH FRONT DOOR HARN

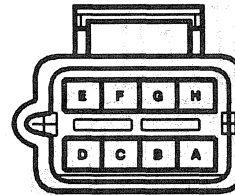


12064754

6 - WAY M METRI - PACK 280 SERIES  
BLK

**C213**

CROSS BODY HARN TO RH DOOR HARN

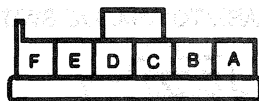


12066195

8 - WAY M METRI - PACK 280 SERIES  
BLK

**C210**

CROSS BODY HARN TO CONVENIENCE CENTER

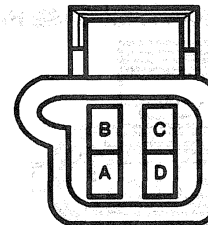


12110747

6 - WAY F METRI - PACK 280  
GRY

**C214**

CROSS BODY HARN TO RH FRONT DOOR HARN

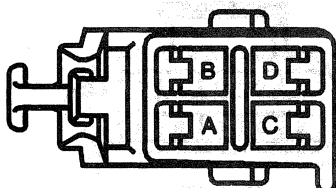


12064761

4 - WAY M METRI - PACK 150 SERIES  
BLK

**C212**

POWER SEAT TO CROSS BODY HARN  
BODY HARN TO CROSS BODY HARN  
CARGO LAMP SWITCH

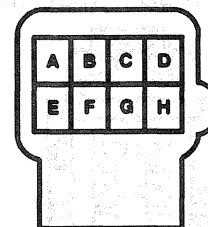


12129136

4 WAY METRI - PACK 280 - SERIES  
BLK

**C215**

CROSS BODY HARN TO RH DOOR HARN



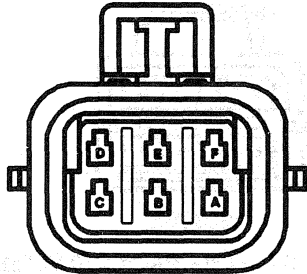
12064767

8 - WAY M METRI - PACK 150 SERIES  
BLU

HARNESS CONNECTOR FACES

C224

I/P HARN TO TRANSFER CASE HARN

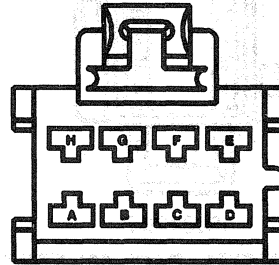


12052848

6 - WAY F METRI - PACK 150 SERIES  
BLK

C230

I/P HARN TO HVAC HARN  
REAR WINDOW WIPER WASHER SWITCH

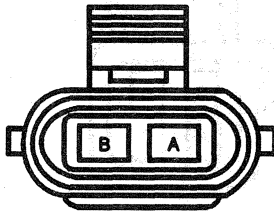


12064998

8 - WAY F METRI - PACK SERIES 280  
BLK

C225

I/P HARN TO TRANSFER CASE HARN

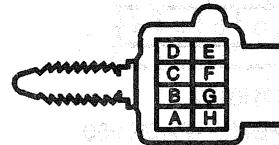


15300027

2 - WAY F METRI - PACK 280 SERIES  
BLK

C300

REAR BODY HARN TO AUX. A/C SWITCH

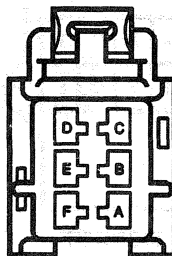


12089906

8 - WAY M METRI - PACK 150  
BLU

C227

TCC/STOP LAMP SWITCH JUMPER  
AUX FAN CONTROL SWITCH

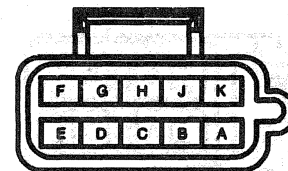


12064752

6 - WAY F METRI - PACK SERIES 280  
BLK

C301

CROSS BODY HARN TO REAR BODY HARN



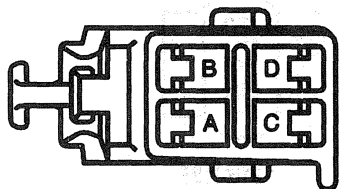
12064770

10 - WAY M METRI - PACK 150 SERIES  
NAT



**C302**

REAR BODY HARN TO CROSS BODY HARN  
END GATE RELEASE SWITCH

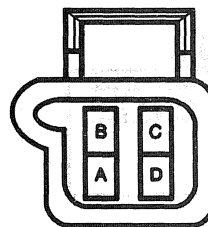


12129136

4 WAY METRI - PACK 280 - SERIES  
BLK

**C410**

CROSS BODY HARN TO REAR SPEAKERS HARN

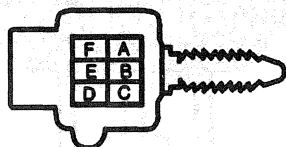


12064761

4 - WAY M METRI - PACK 150 SERIES  
BLK

**C401**

REAR BODY HARN TO AUX A/C SWITCH HARN

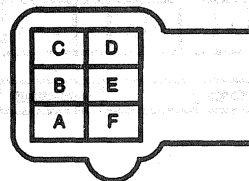


12089892

6 - WAY M METRI - PACT 150  
GRY

**C411**

CROSS BODY HARN TO CARGO LAMP HARN

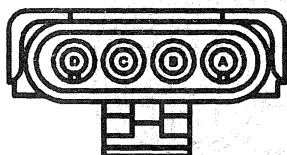


12064763

6 - WAY M METRI - PACK 150 SERIES  
GRY

**C409**

ENGINE HARN TO TAILLAMP EXT HARN

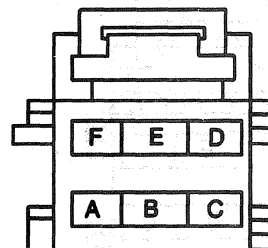


12015797

4 - WAY M/F WEATHER PACK TWR  
BLK

**C496**

RH REAR DOOR HARN TO CROSS BODY HARN

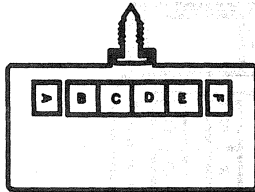


12064762

GRAY  
METRI - PACK 150  
C327

HARNESS CONNECTOR FACES

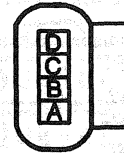
DOOR LOCK RELAY



12059561

6 WAY F METRI - PACK 280, 480  
BLK

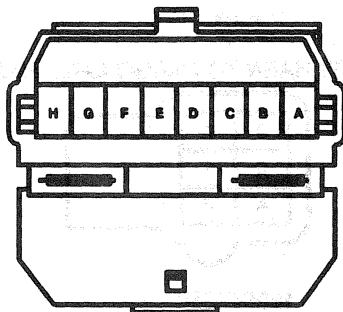
FUEL GAGE SENDER (AUXILIARY FUEL TANK)



12162188

4 WAY F METRI - PACK 150  
BLK

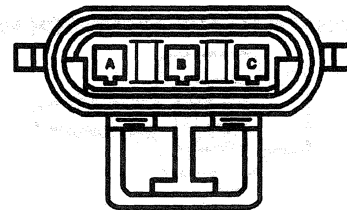
DRL MODULE



12015308

8 - WAY PC EDGEBOARD - STD  
BLK

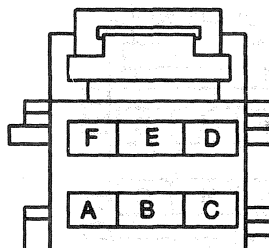
FUEL PUMP OIL PRESSURE SWITCH AND  
SENDER (DIESEL)



12110293

3 - WAY F METRI - PACK 150 SERIES  
BLK

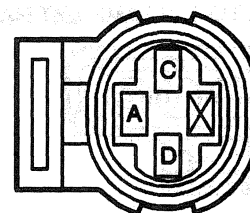
FOG LAMP SWITCH



12064762

METRI - PACK 150  
C327  
GRAY

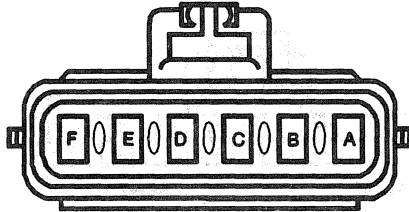
FUEL PUMP OIL PRESSURE SWITCH AND  
SENDER (GAS)



12065401

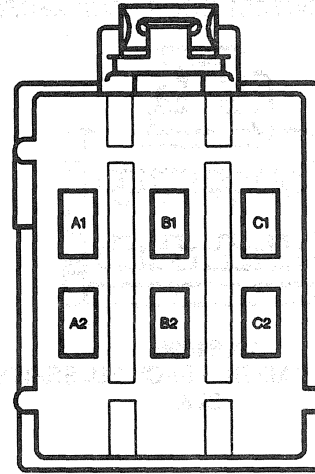
METRI - PACK 150  
GRAY

FUEL PUMP BALANCE MODULE



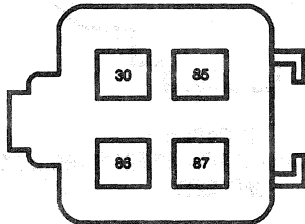
12059573  
6-WAY F METRI - PACK 280 SERIES  
BLK

HIGH BLOWER RELAY



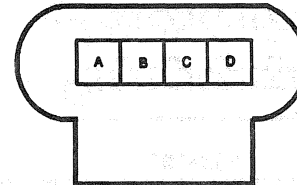
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6-WAY F METRI - PACK 280 FLX LK  
BLK

FUEL PUMP BALANCE RELAY



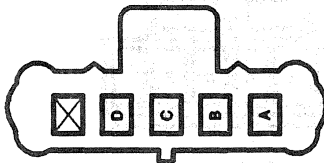
12129716  
4-WAY F METRI - PACK 280 SERIES  
FLEXLOCK, SEALED  
MD GRY

IGNITION COIL DRIVER



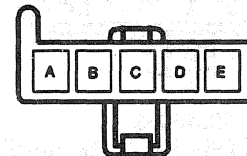
12162189  
4-WAY F METRI - PACK SERIES 150.2 P2S  
BLK

GLOW PLUG CONTROL MODULE



12045636  
4-WAY METRI - PACK 280  
GRY

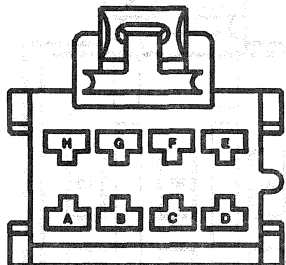
INTERIOR LAMP CONTROL MODULE



12041429  
5-WAY F METRI - PACK SERIES 280  
BLK

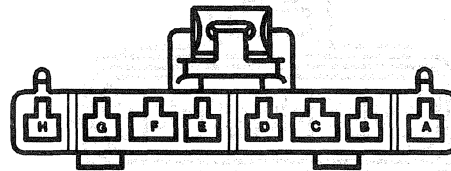
**8A - 202 - 42 ELECTRICAL DIAGNOSIS**  
**HARNESS CONNECTOR FACES**

**REMOTE CONTROL DOOR LOCK RECEIVER**



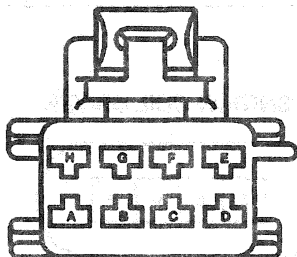
**12064998**  
**8 - WAY F METRI - PACK 280 SERIES**  
**BLK**

**LH DOOR MASTER POWER WINDOW SWITCH**



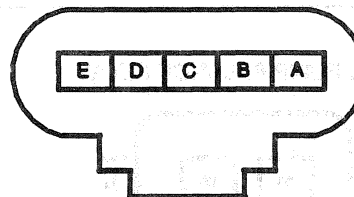
**12084603**  
**8 - WAY F METRI - PACK MIXED SERIES**  
**MED GRY**

**REMOTE CONTROL DOOR LOCK RECEIVER**



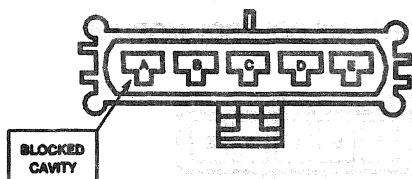
**12064766**  
**8 - WAY F METRI - PACK 150 SERIES**  
**BLU**

**LINEAR EGR VALVE**



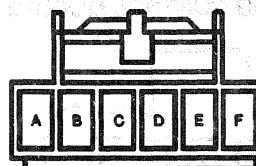
**12124825**  
**5 - WAY F METRI - PACK SERIES 150.2 P2S**  
**MD GRY**

**KNOCK SENSOR MODULE**



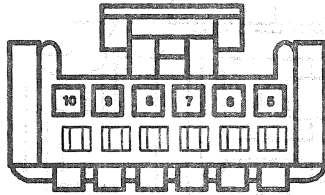
**12015982**  
**4 - WAY F METRI - PACK 280 SERIES**  
**BLK**

**LOW COOLANT LEVEL INDICATOR MODULE**



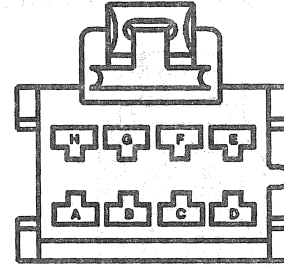
**12004706**  
**6 - WAY PC EDGEBOARD - STUD**  
**BLK**

MODE DOOR MOTOR



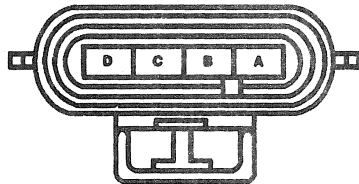
12040953  
6-WAY F MICRO - PACK  
BLK

REAR WINDOW WIPER/WASHER SWITCH



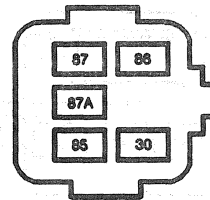
12064998  
8-WAY F METRI - PACK SERIES 280  
BLK

OXYGEN SENSOR RH, LH



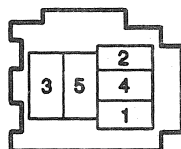
12162144  
4-WAY F METRI - PACK 150 SERIES  
BLK

TRANSFER CASE SHIFT CONTROL RELAY



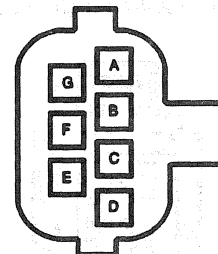
12110539  
5-WAY F METRI - PACK 150 SERIES  
BLK

POWER AMPLIFIER RELAY



12065978  
BLACK  
METRI - PACK 480

TRANSMISSION RANGE SWITCH (C1)

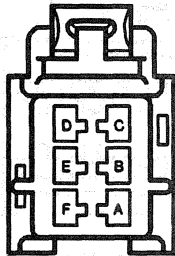


12129840  
7-WAY METRI - PACK 150 SERIES  
GRY

HARNESS CONNECTOR FACES

C497

REAR DOOR HARN TO CROSS BODY HARN

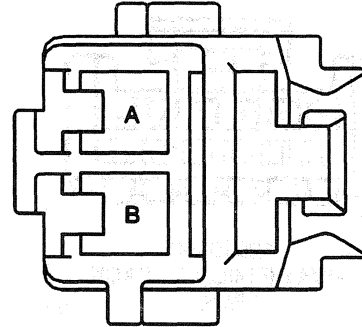


12064752

6-WAY F METRI-PACK SERIES 280  
BLK

C240

CROSS BODY HARN TO POWER  
SEAT, RH

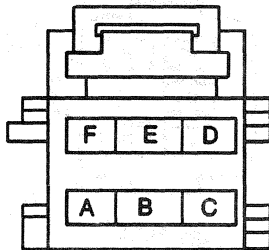


12129081

2-WAY F METRI-PACK 280 SERIES  
FLEXLOCK  
BLK

C498

REAR DOOR HARN TO CROSS BODY HARN

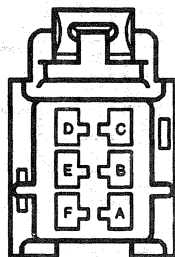


12064762

METRI-PACK 150  
C327  
GRAY

C499

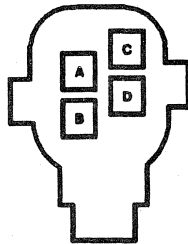
REAR DOOR HARN TO CROSS BODY HARN



12064752

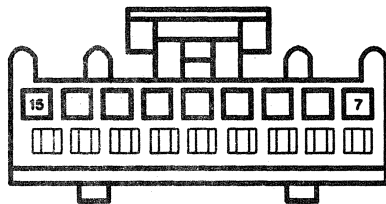
6-WAY F METRI-PACK SERIES 280  
BLK

TRANSMISSION RANGE SWITCH (C2)



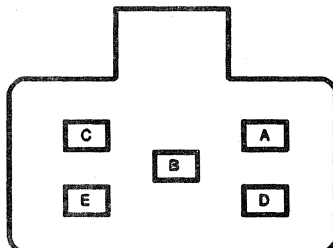
12129804  
4 - WAY METRI - PACK 150 SERIES  
GRY

VEHICLE SPEED SENSOR BUFFER



12066130  
9 - WAY F MICRO - PACK 100 SERIES  
NAT

WINDSHIELD WIPER MOTOR



12124634  
5 - WAY F METRI - PACK 280 SERIES  
BLK