

1989 WIRING DIAGRAMS R-V, P TRUCK MODELS

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

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

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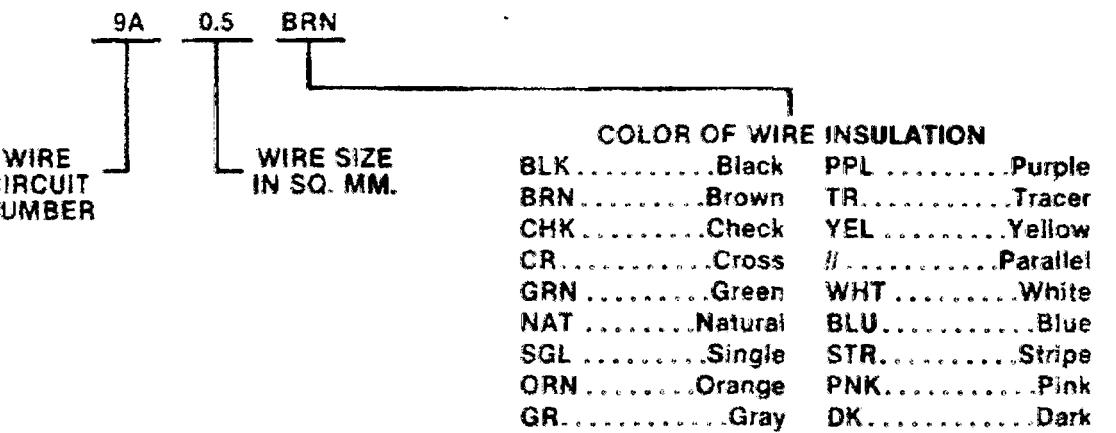
WIRING DIAGRAMS

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P :Chassis	A-1
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DESCRIPTION



F-05975

Figure 1—Wire Coding

- The diagrams are to be traced from the source of electricity (the battery positive post) to ground. The ground may be a chassis ground on a certain component (such as an alternator or a starter), or a wire from a component to a chassis or frame ground (such as used on the electronic control module and instrument panel). All grounds are connected to the negative battery post through body and/or engine ground wires and straps.
- Many times the source of the electricity is shown as the ignition switch or the fuse block. This is done to eliminate the confusion that would occur if the entire power distribution was shown in each circuit. For a detailed outline of the power to the ignition switch or the fuse block, refer to the power distribution circuit.
- The ground portion of the circuit (usually circuit 150 or 151) may be shown entirely, or it may refer to the ground distribution circuit in order to avoid confusion of listing all the grounds in one splice on a single page.
- For ease of diagnosis, all splices and grounds are identified by number, and all the wires on a common splice or ground are identified by circuit number, size (in mm) and color. Each component or circuit common to a spliced wire is called out by the page number of that circuit. This will help identify and diagnose multiple electrical problems that could occur in a truck.
- All connectors are shown with their part numbers to save time when ordering these parts.
- Switches are shown in their at rest positions, unless otherwise marked.

TRACING CIRCUITS

Figures 1 through 3 are examples of how the wiring diagrams are laid out, and will be referred to, throughout this description.

In order to trace a circuit on these diagrams, start from the source, the battery. In figure 2, the battery positive

circuit is a 19.0 mm black wire. This wire runs from the battery to the starter motor, and supplies power to the starter motor post.

Once you have determined the source of power to your component, from the Power Distribution Circuit (figure 2), then refer to the individual circuit you are working on for more detail about that circuit. (Figure 3 shows the starting circuit).

In figure 3, the starter motor circuit is shown. This circuit shows the battery feed coming from the Power Distribution page. The cable comes from the battery to the start@? positive post. At the starter post, other circuits such as the generator, ignition switch, and electronic control module are fed.

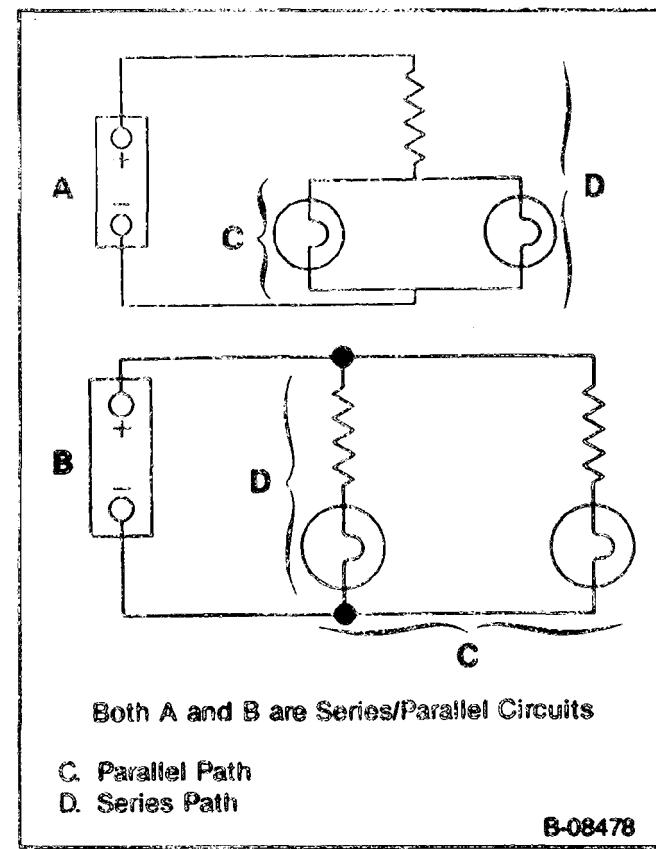
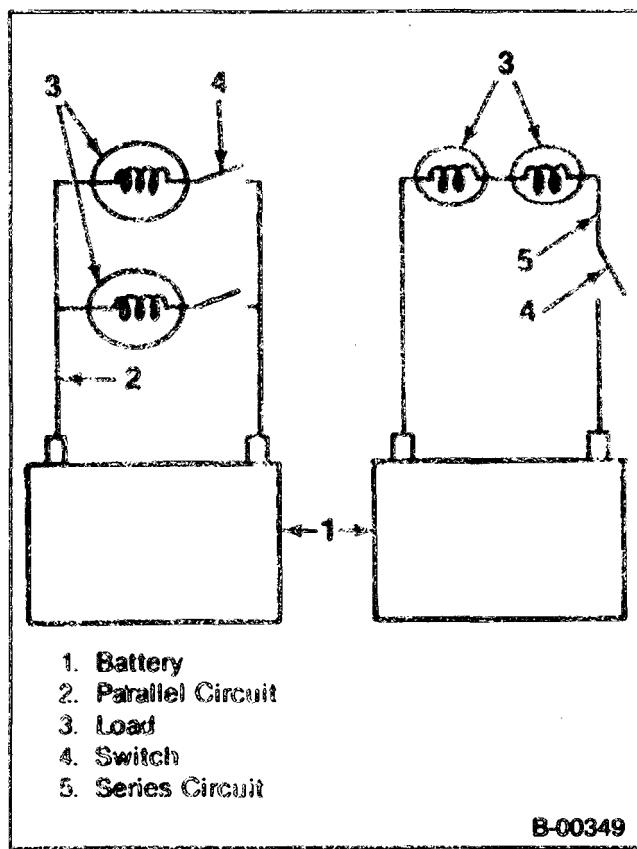
When the ignition switch is in the start position, power flows from circuit #2 through the switch, to circuit #6. Circuit #6 goes through the clutch switch with an automatic transmission. At the clutch switch the circuit is opened, unless the clutch is depressed.

At the solenoid the current flowing from circuit #6 closes the solenoid, allowing current to flow from the battery at circuit #1 to the starter motor. The current flowing to the starter motor, causes the starter motor to spin.

BASIC ELECTRICAL CIRCUITS

An electrical circuit starts from a supply of electricity back to a load and then conducts the electricity back to the supply of electricity. There should be a device to open and close the circuit, and a protective device to open the circuit in case too much current is drawn into the circuit by an overload condition. Electrical circuits can be set up as series circuits, parallel circuits or series/parallel' circuits. The circuits in trucks are usually parallel circuits.

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SERIES CIRCUITS (Figure 4 and 5)

In a series circuit, the electrical devices are connected together to form one current path to and from the power supply. In a series circuit the same current flows through all of the devices.

PARALLEL CIRCUITS (Figure 5)

In a parallel circuit, the electrical devices are connected to form more than one current path to and from the power supply. In a parallel circuit the supply voltage is the same in each current path.

SERIES/PARALLEL CIRCUIT (Figure 5)

A series/parallel circuit consists of a single current path circuit and a circuit with more than one current path to and from the voltage supply.

CIRCUIT COMPONENTS (Figure 6)

The usual circuit path starts at the power supply which is the battery/generator system. Next in the circuits is the circuit protection component which can be a fusible link, a fuse, or a circuit breaker. Then the circuit goes to the circuit controller which can be a switch or a relay. From the circuit controller the circuit goes into the circuit load. The circuit load can be one light or many lights in parallel, an electric motor or a solenoid. After the electricity has passed through the load it must return to the power supply via the ground path. The ground path can be a wire in the harness or it could be through the load housing into the body or frame, thus returning the electricity to the power supply. The body and frame are connected by flexible ground straps.

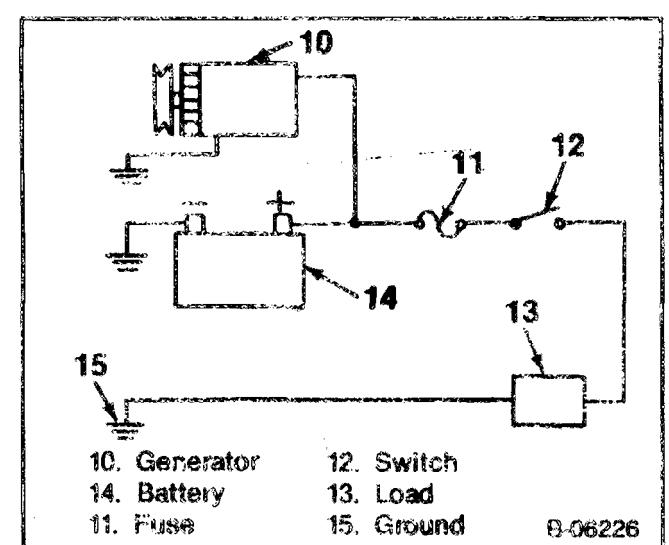


Figure 6—Circuit Components

WIRING DIAGRAMS 6

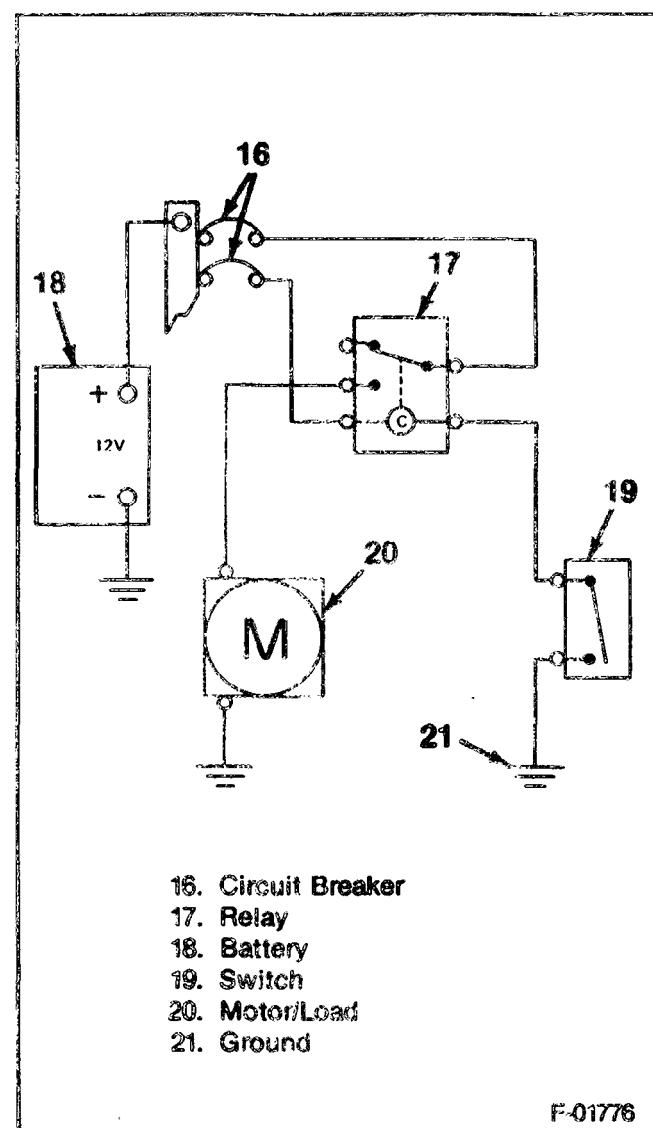


Figure 7—Circuit Controllers

FUSES (Figure 8)

The most common protector in the vehicle circuit is a fuse. A fuse consists of a fine wire or strip of metal inside a glass tube or plastic housing. The strip melts and interrupts the flow of current in the circuit when there is an overload caused by an unwanted short or ground. The fuse is designed to melt before the wiring or electrical components in a circuit can be damaged. Naturally, the cause must be located and corrected before the fuse is replaced or the new fuse will also blow.

Since different circuits handle different amounts of current, fuses of various ratings are used. Fuses are rated in amperes. Be sure to replace a blown fuse with a fuse of the connecting rating.

CIRCUIT CONTROLLERS (Figure 7)

Circuit controllers consist of switches or relays. Switches are usually operated by a mechanical means such as a hand or lever. Switches are usually at the beginning of a circuit but can be used to control a ground

path. For example the switch controlling the headlights is at the power end of the circuit while the door switch controlling the dome light completes the ground path.

Relays are remotely controlled switches. They are used in high current circuits and in circuits controlled by sensors.

Relays are designed so that a small current circuit will be able to control a large current circuit.

CIRCUIT BREAKERS (Figure 7)

Circuit breakers are another form of circuit protector. There are two types of circuit breakers; automatic reset and remote reset.

The automatic reset breaker opens when excess current heats a bimetallic strip, causing the strip to bend and open a set of contacts. Then the strip cools and closes the contacts. So the circuit breaker opens and closes until the excess current condition is corrected or the circuit is disconnected from the power supply.

The remote reset circuit breaker has a heating wire wound around the bimetallic strip. When an excess current happens, the strip heats, bends, and opens the contacts. Then a small current flows through the heating wire, keeping the strip hot and the contacts open. This type of breaker will stay open until either the power supply is disconnected from the circuit or the breaker is removed from the circuit. Then the breaker can cool and reset.

CIRCUIT LOADS (Figure 7)

Circuit loads are the components that use most of the energy in circuit. The energy converts to motion, light, or heat, lights, motors, and engine heaters are the most common loads in circuits.

CIRCUIT DIAGNOSIS

A clear understanding of the circuit and a wiring diagram are needed for effective diagnosis. Use a logical sequence of testing to find the trouble. Use the diagnostic tools. After the trouble is fixed, make sure the circuit works correctly.

CIRCUIT MALFUNCTIONS

There are three electrical conditions that can cause a nonworking circuit; an "Open Circuit", a "Short Circuit", or a "Grounded Circuit".

OPEN CIRCUIT (Figure 8)

An open circuit occurs whenever there is a break in the circuit. The break can be corrosion at the connector, a wire broken off in a device, or a wire that burned open from too much current.

SHORT CIRCUIT (Figure 9)

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

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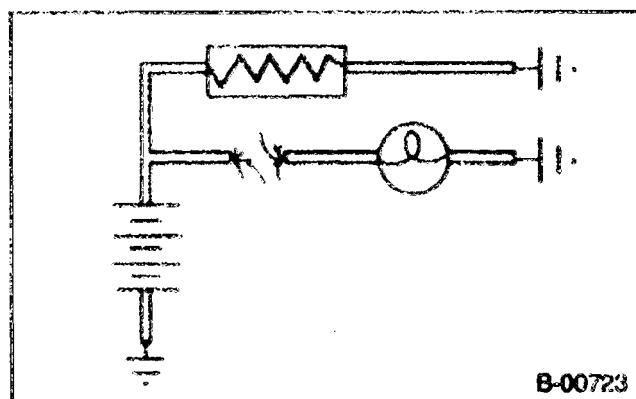


Figure 8 - Open Circuit

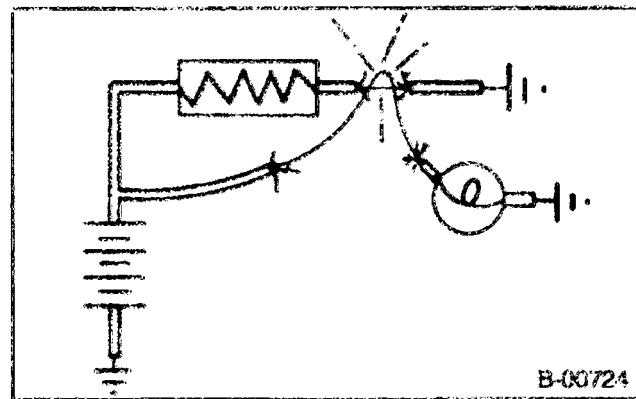


Figure 9—Short Circuit

GROUNDED CIRCUIT(Figure 10)

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

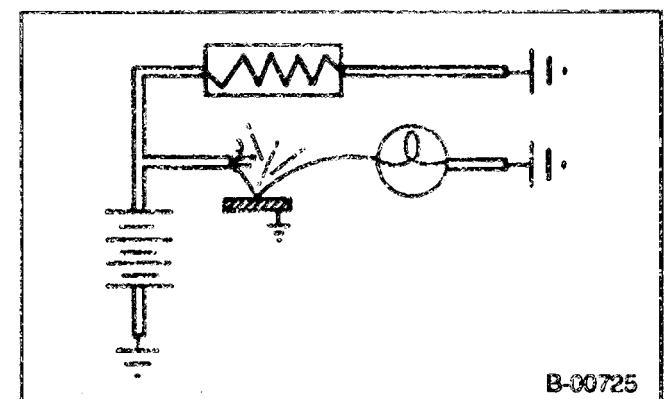


Figure 10—Grounded Circuit

ABBREVIATION LIST

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

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

A --- Ampere
A/C--- Air Conditioner
ACC --Accessory
A.I.R.—Air Injection Reaction
AIR/COND—Air Conditioner
ALDL—Assembly Line Diagnostic link
ALT—Alternator
AMP—Ampere
ANTI—Anticipate
ASM—Assembly
ASSY- -Assembly
ALIO—Audio
AUTO—Automatic
AUX—Auxiliary

BAT—Battery
BATT—Battery
B HLEV—B iLevel
BLK—Black
BUT—Belt
BLU—Blue
BOT--Bottom

BRK—Brake
BRN—Brown
BU—Backup
BUZZ—Buzzer

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

DK—Dark
DIAG—Diagnostic
DIM—Dimmer
DIR—Directional
DISC—Discrete
DIST—Distributor
DIV—Diverter
DM—Dome
DR—Door

ECM—Electronic Control Module

WIRING DIAGRAMS 8

EFE—Early Fuel Evaporation
EGR—Exhaust Gas Recirculation
ELEC—Electric
ELEC—Electronic
CNTRL—Control
MOD—Module
ENG—Engine
EPR—Exhaust Pressure Regulator
ESC—Electronic Spark Control
EST—Electronic Spark Timing
EVRV—Electronic Vacuum Regulator Valve
EXC—Except

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

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

HAND—Handling
HAZ—Hazard
HD—Heavy Duty
HD LP—Headlamp
HEI—High Energy Ignition
HI—High
HTR—Heater

IAC—Idle Air Control
IGN—Ignition
ILLUM—Illumination
IP—Instrument Panel
INC—Increased
IND—Indicator
INJ —Injector
INST PNL Instrument Panel!
INTER—Interior

LD—Light Duty
LH—Left Hand
LO—Low
LP—Lamp
LPS- -Lamps
LT~Light
LTR~Ughter

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

NAT—Natural
NEUT—Neutral
NO—Normally Open
NC—Normailly Closed

ORN—Orange

PK—Park
PLR—Puller
PNKf-Plnk
PNL—Panel
PPL—Purple
PRESS—Pressure
WR—Power

RCVR—Receiver
REF—Reference
RESIST—Resistance
RM—Right Hand
RPO—Regular Production Option

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

TACH—Tachometer
TBI—Throttle Body Injection
TCC—Torque Converter Clutch
TEMP—Temperature
T/L—Tail Lamp
TRANS -Transmission
TYP-- Typical

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

W—With
W/O—Wtmut
W/S—Windshield
W WASHER—Window Washer
WOO—Window
WHT—White
WRG—Wring
YEL—Yellow

DIAGNOSTIC TOOLS

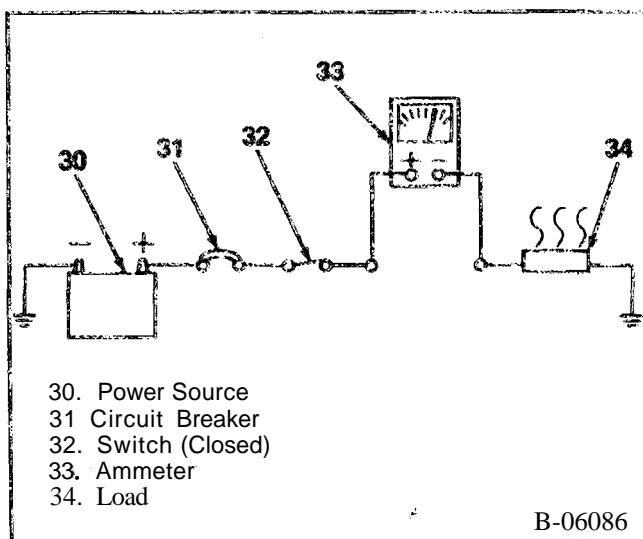


Figure 12—Ammeter

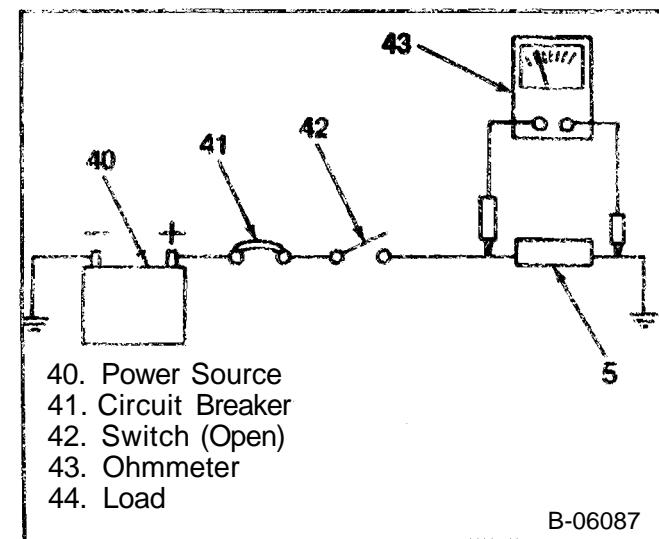


Figure 13 --Ohmmeter

UNPOWERED TEST LIGHT (Figure 12)

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

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

POWERED TEST LIGHT (Figure 11)

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

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

JUMPER

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

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

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

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

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

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

AMMETER (Figure 12 and 15)

Disconnect the circuit from the power source before connecting the ammeter. The ammeter measures the amount of electrical current, amperes, moving through a conductor. The ammeter must be placed in series with the circuit being tested. Be sure that the ammeter's positive terminal is connected to the positive (battery) side of the circuit and is negative terminal to the negative (ground) side of the circuit.

OHMMETER (Figure 13 and 15)

The ohmmeter is an instrument designed to indicate resistance in ohms, it is used to test the condition of a unit disconnected from the circuit.

Ohmmeter Calibration

When the ohmmeter probes are connected together, a circuit is completed causing the meter needle to deflect. The needle should read ZERO ohms, if it does not, rotate the CAL or ADJ knob to ZERO the needle.

When the probes are held apart, the needle moves to the maximum (infinite) resistance side of the scale.

The meter is now ready for use. Refer to figure 14 for a typical application of the ohmmeter.

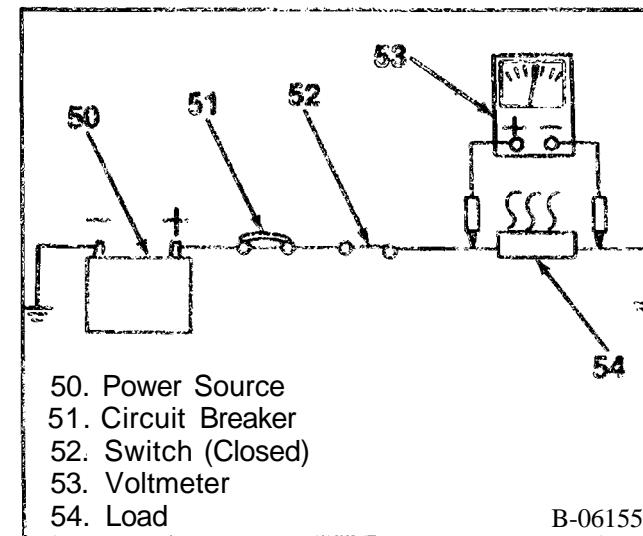


Figure 14—Voltmeter

VOLTMETER (Figures 14 and 15)

The voltmeter (properly observed) will give the technician more information than the ammeter, ohmmeter and test light combined, its application for troubleshooting here is to measure the electrical pressure (voltage) drop in a resistance circuit (figure 14).

To use a voltmeter for troubleshooting an electrical problem, connect it in parallel with the existing circuit (figure 10). If the voltmeter is connected in series with the circuit being tested, the nature of the circuit would be changed and the reading would have no particular value or use. Connect the meter terminals according to polarity as shown in figure 14.

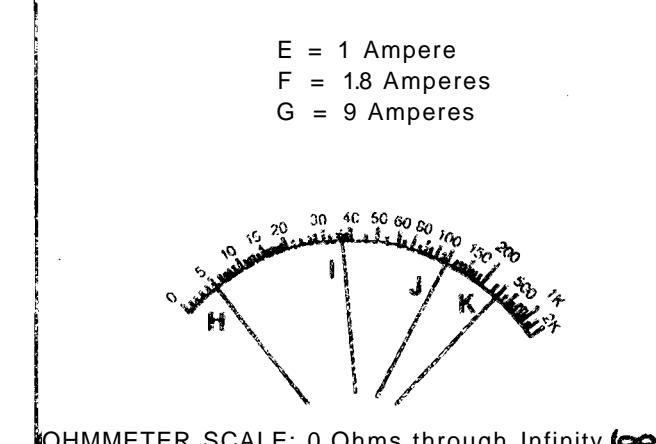
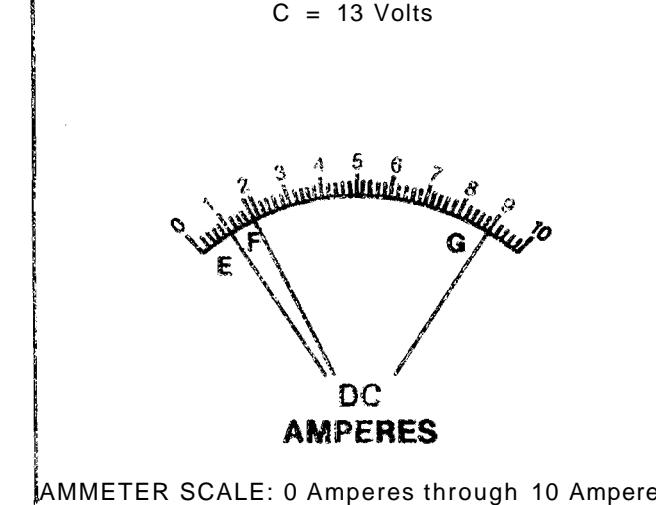
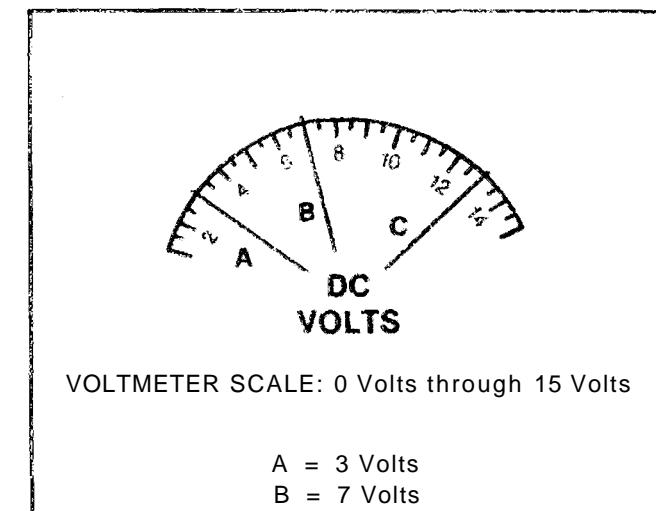
The dash mounted voltmeter (in the vehicle) should also be observed for monitoring proper operation of the generator battery cranking motor, and cranking circuit. In this application, battery voltage drop can be monitored while the engine is cranking; and after the engine is running, generator output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

WIRING HARNESS AND WIRES

Every wire is a specific size with colored or striped insulation that is indicated on the wiring diagrams. Insulation colors help to trace circuits and to make proper connections. Abbreviations and symbols used for indicating wire insulation colors and patterns are as follows:

BIK.....	Black	BLU.....	Blue
BRN.....	Brown	PPL.....	Purple
CHK.....	Check	TR.....	Tracer
CR.....	Cross	YEL.....	Yellow
GRN.....	Green	//.....	Parallel
NAT.....	Natura!	WHT.....	White
SGL.....	Single	STR.....	Stripe
ORN.....	Orange	PNK.....	Pink
GR.....	Gray	DK.....	Dark

Some wires are grouped and taped together or encased in a split plastic casing. This grouping of wires is called a harness. For some purposes, it is more practical to use a single wire protected by a braided tubing called a loom.



F-01778

Figure 15—Meter Scales

WIRING DIAGRAMS 11

Wiring harnesses are joined by using a multiple plug and receptacle connector block, or a terminal post chassis junction block. In the instrument panel area plastic insulated blade-type connectors and screw-type terminals are used.

Each harness or wire must be held securely in place by clips or other holding devices to prevent chafing of the insulation.

WIRE SIZE

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

WIRE SIZE CONVERSION TABLE

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

ON-VEHICLE SERVICE

CIRCUIT MAINTENANCE AND REPAIR

MAINTENANCE AND REPAIR

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

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

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

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

WRING CONNECTOR TERMINAL REPLACEMENT (BLADE TYPE)

[<>] Remove or Disconnect (Figure 10)

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

[><] Install or Connect (Figure 17)

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

WIRING DIAGRAMS 12

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

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

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

METRI-PACK CONNECTORS

The Metri-Pack connectors use a pull-to-seat type terminal, as shown in figure 19. The special tool required to remove the terminal is J-35689-A terminal remover. If removal is attempted with an ordinary pick, there is a good chance that the terminal will be bent or deformed. Refer to figure 19.

[<>] Remove or Disconnect (Figure 19)

Tool Required:

J-28742 Terminal Remover

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

[^] Clean

Terminal barrel (124).

[><] Install or Connect (Figure 19)

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

METRI-PACK CONNECTOR REPLACEMENT

[<>] Remove or Disconnect (Figure 19)

Tool Required:

J-35689-A Terminal Remover

1. Primary lock (121) by lifting.
2. Connector Body (1ST).
3. Connector seat (120) by pulling the seal back onto the wires away from the connector body (137).

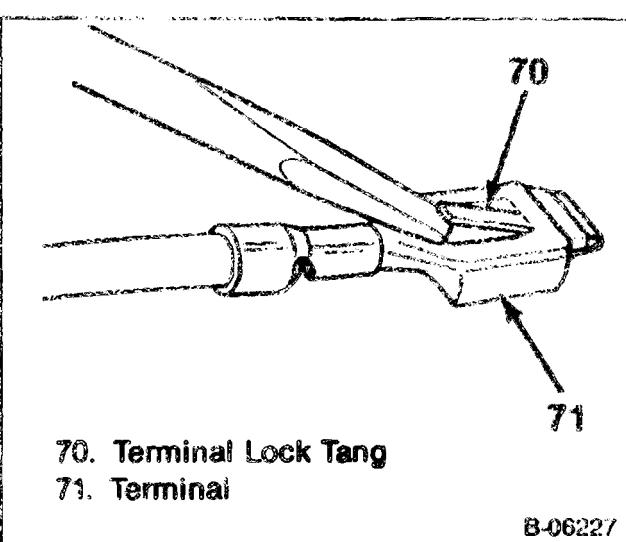


Figure 17—Resetting the Lock Tang

WEATHER-PACK CONNECTORS

Special connectors known as Weather-Pack connectors (figure 19) require a special tool J-28742 for servicing. This special tool is required to remove the pin and sleeve terminals. If removal is attempted with an ordinary pick, there is a good chance that the terminal will be bent or deformed. Unlike standard blade-type terminals, these terminals cannot be straightened once they are bent.

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

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

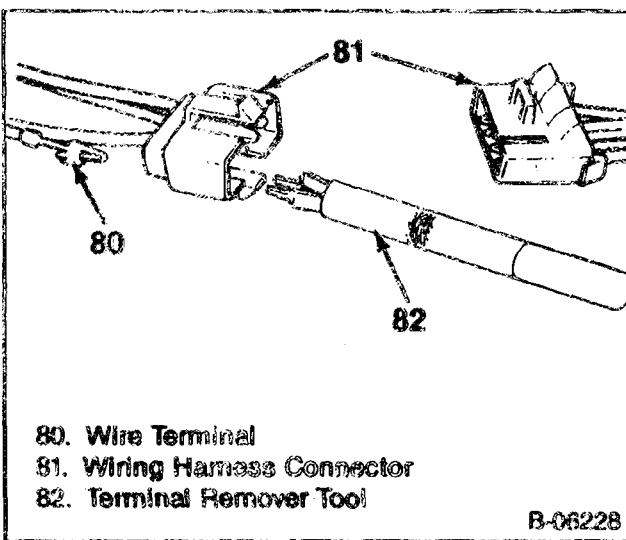


Figure 18—Twin Lock Connector Terminal

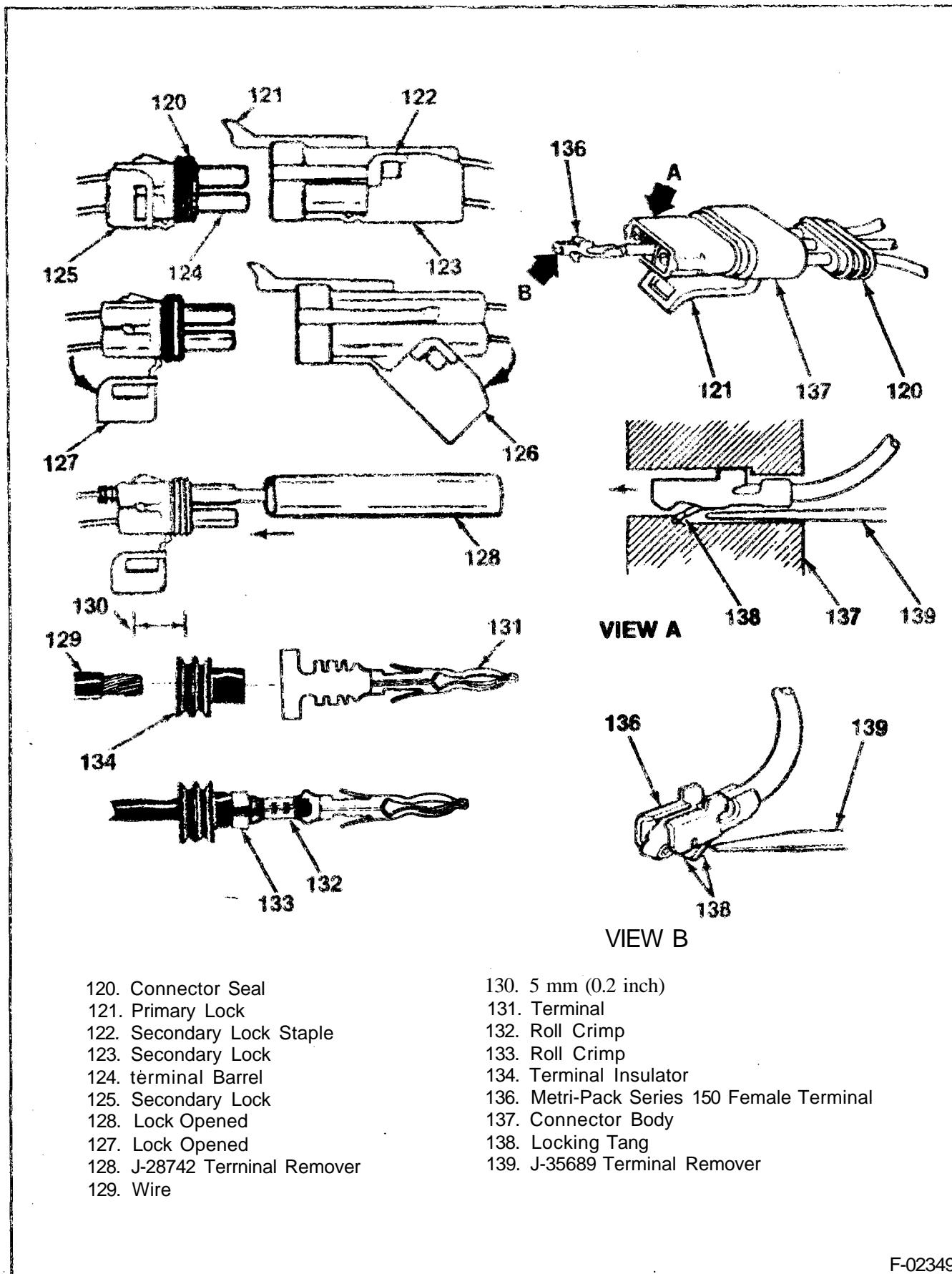


Figure 19—Weather-Pack and Metri-Pack Connectors

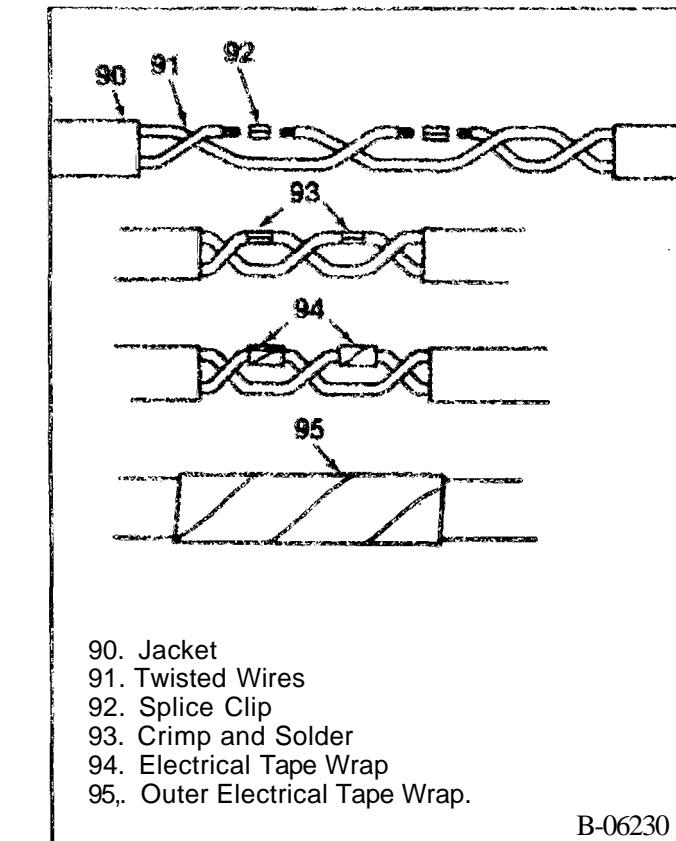


Figure 20 Twisted Wire Repair

4. Terminal (138) by inserting J-35689 (139) into the connector body (137) to depress the locking tang (138), then push the wire and terminal through the connector body (figure 20).
- Snip off the old terminal unless the terminal is to be reused, reshape the locking tang.
5. 5mm (0.2-inch) of the wire insulation (130).

* Terminal cavity of the connector body.

[><] Install or Connect (Figure 19)

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

WIRING REPAIR

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

Twisted Wires (Figure 20)

[<>] Remove or Disconnect

1. Jacket (30).
2. Twisted wires (91).

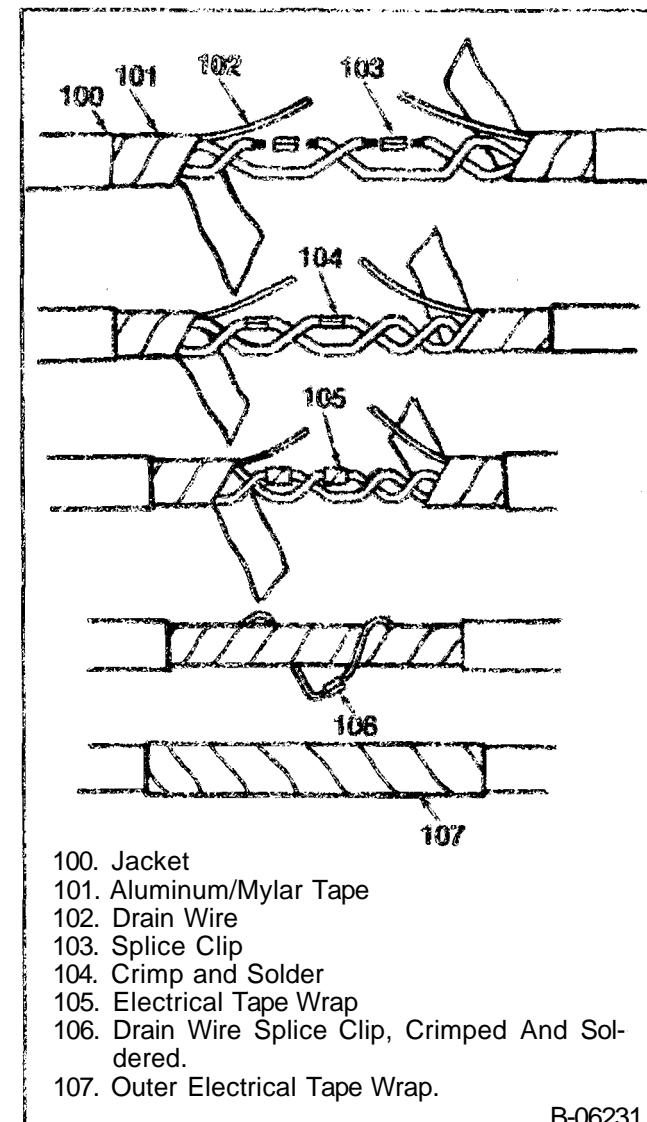


Figure 21—Twisted/Shielded Wire Repair

[<>] Insulation from the wire.

[<>] Install or Connect

1. Splice clip (93).
 - Crimp.
 - Solder.
2. Electrical tape wrap (94) on wires.
3. Outer electrical tape wrap (95).

Twisted Wires/Shielded Cable (Figure 21)

[<>] Remove or Disconnect

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

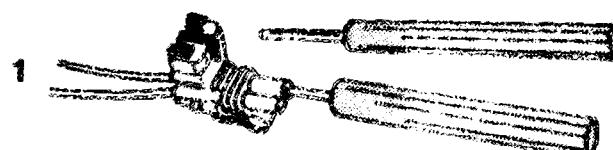
[<>] Install or Connect

1. Splice clips (103).
2. Crimp and solder the splice clips (104).
3. Electrical tape (105) on the splices.

WIRING DIAGRAMS 15

4. Aluminum/mylar tape by wrapping and taping.
5. Drain wire with a splice clip (106). Crimp and solder the splice clip.
6. Outer jacket electrical tape wrap (107).

SPECIAL TOOLS

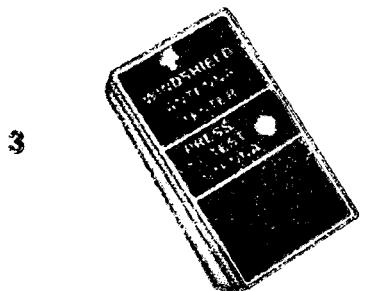


J-28742-A



J-22727

J-23520



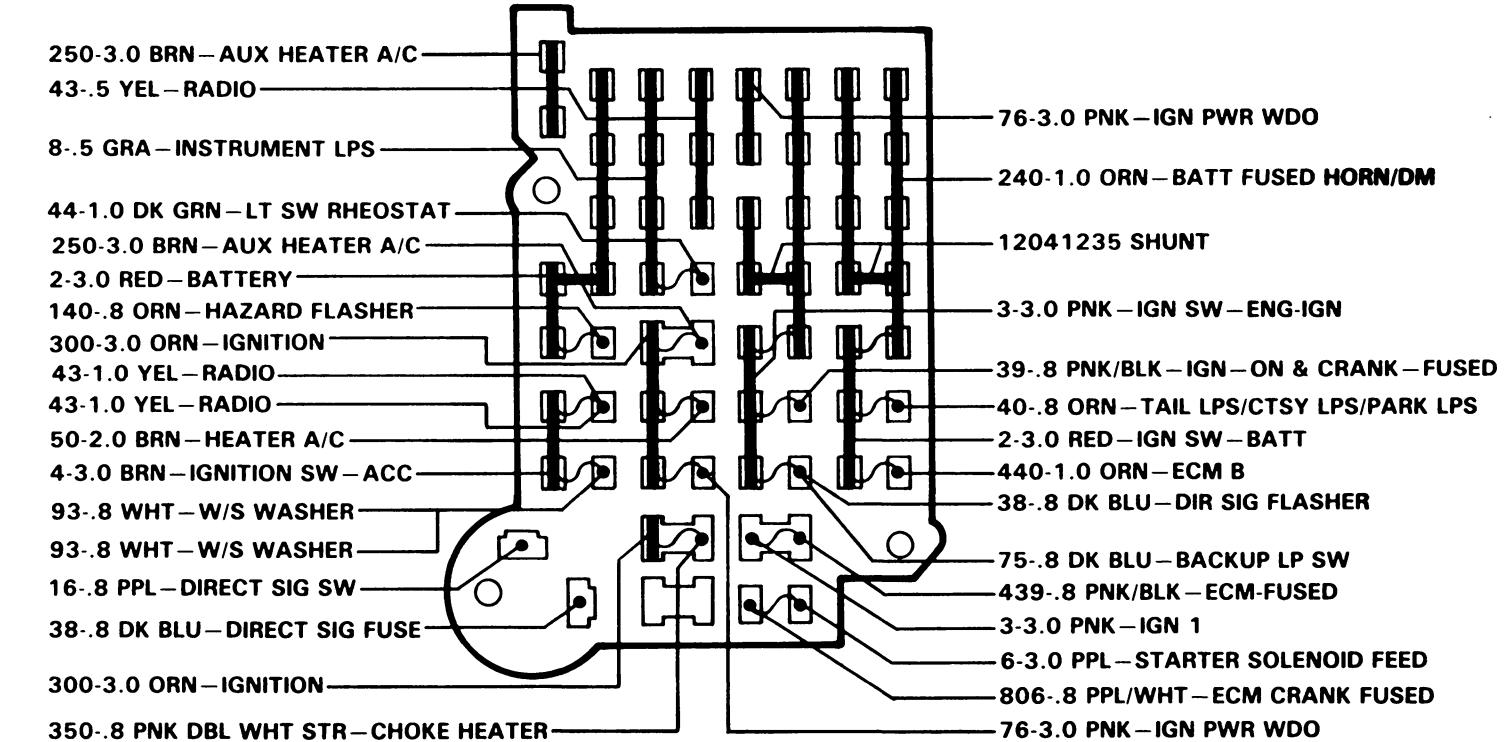
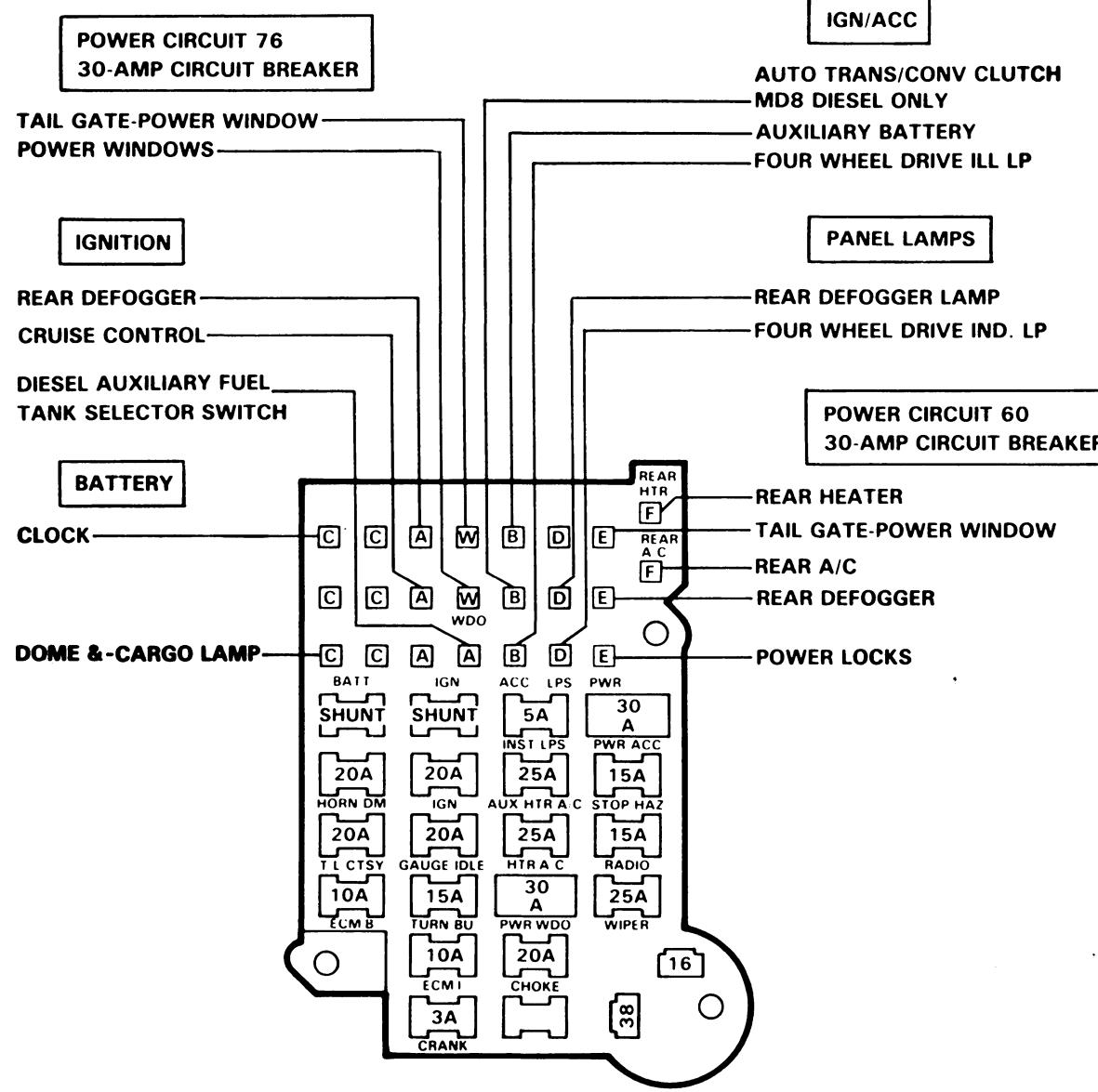
J-23520-B

1. Weather-Pack II Terminal Remover
2. Electrical Terminal Remover
3. Windshield Antenna Tester

F-02438

1989 RV TRUCK

PAGE	DESCRIPTION	PAGE	DESCRIPTION
2	FUSE BLOCK DETAIL	43	ECM CHART (DIESEL)
3-4	POWER DISTRIBUTION (GASOLINE)	44-45	ELECTRONIC CONTROL MODULE (ECM)-OUTPUTS (DIESEL)
5	POWER DISTRIBUTION (DIESEL)	46	ELECTRONIC CONTROL MODULE (ECM)-INPUTS (DIESEL)
6	AUXILIARY BATTERY (TP2)	47	TRANSMISSION CONVERTER CLUTCH DETENT SOLENOID
7-8	HEADLAMPS & PARKING LAMPS	48	AUTOMATIC TRANSMISSION KICKDOWN SOLENOID (M40)
9-10	MARKER LAMPS	49	AIR CONDITIONING (C60)
11	ROOF MARKER LAMPS	50	REAR AIR CONDITIONING (C69)
12-14	HAZARD LAMPS	51	HEATER
15	HORN	52	AUXILIARY HEATER (C36)
16-17	DIRECTIONAL LAMPS	53	INSTRUMENT PANEL LAMPS
18	START (8 CYL.) I.25, (8 CYL.) LE8, LT9	54-55	INSTRUMENT PANEL GAGES
19	START (8 CYL.) LO5, L19	56-57	INDICATOR LAMPS
20	START (DIESEL) LL4, LH5	58	SEAT BELT WARNING BUZZER
21	IGNITION (6 CYL.) L25	59	BRAKE WARNING SYSTEM
22-23	IGNITION (8 CYL.) LE8, LT9	60	FOUR-WHEEL DRIVE INDICATOR LAMP
24	IGNITION (8 CYL.) LO5, LT9	61	CRUISE CONTROL (K34)
25	THROTTLE BODY INJECTION	62	DOME LAMPS
26	HOT FUEL HANDLING	63	CARGO LAMP (UF2)
27-28	GLOW PLUGS (DIESEL)	64	RADIO EQUIPMENT (UM6. UP8)
29-30	ENGINE CONTROLS (DIESEL)	65	RADIO EQUIPMENT (U63)
31	FUEL CONTROL & IDLE AIR CONTROL (8 CYL.,) LO5, L19	66-67	POWER WINDOWS (A31)
32	AUXILIARY COOLANT FAN	68	POWER REAR WINDOW (A33)
33-34	AUXILIARY FUEL TANK (NL2)/FUEL TANK SELECTOR SWITCH	69	REAR DEFOGGER (C49)
35-37	EMISSION CONTROLS	70-71	POWER DOOR LOCKS
38-39	ELECTRONIC CONTROL MODULE (ECM)-INPUTS (8 CYL.) LO5, L19	72	WIPER/WASHER
40-41	ELECTRONIC CONTROL MODULE (ECM)-OUTPUTS (8 CYL.) LO5, L19	73	PULSE WIPER/WASHER (CD4)
42	ECM CHART (8 CYL.)	74-76	BACKUP LAMPS
		77-80	TAIL LAMPS
		81-84	LICENSE LAMPS
		85	CAMPER & TRAILER WIRING



FRONT
12034359 BLOCK-MOLD
12059452 PRINTED BLOCK

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

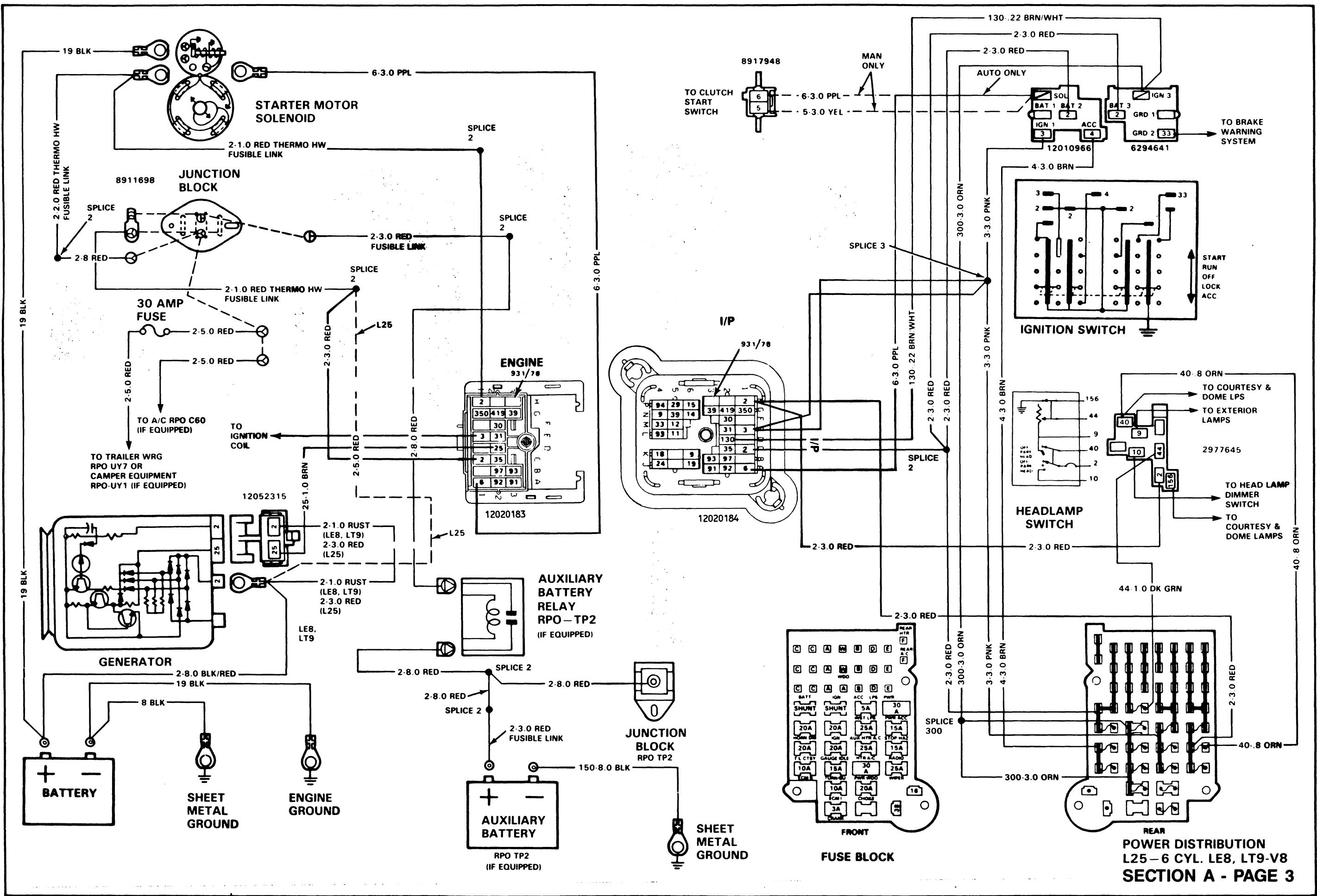
FUSE BLOCK
SECTION A - PAGE 2

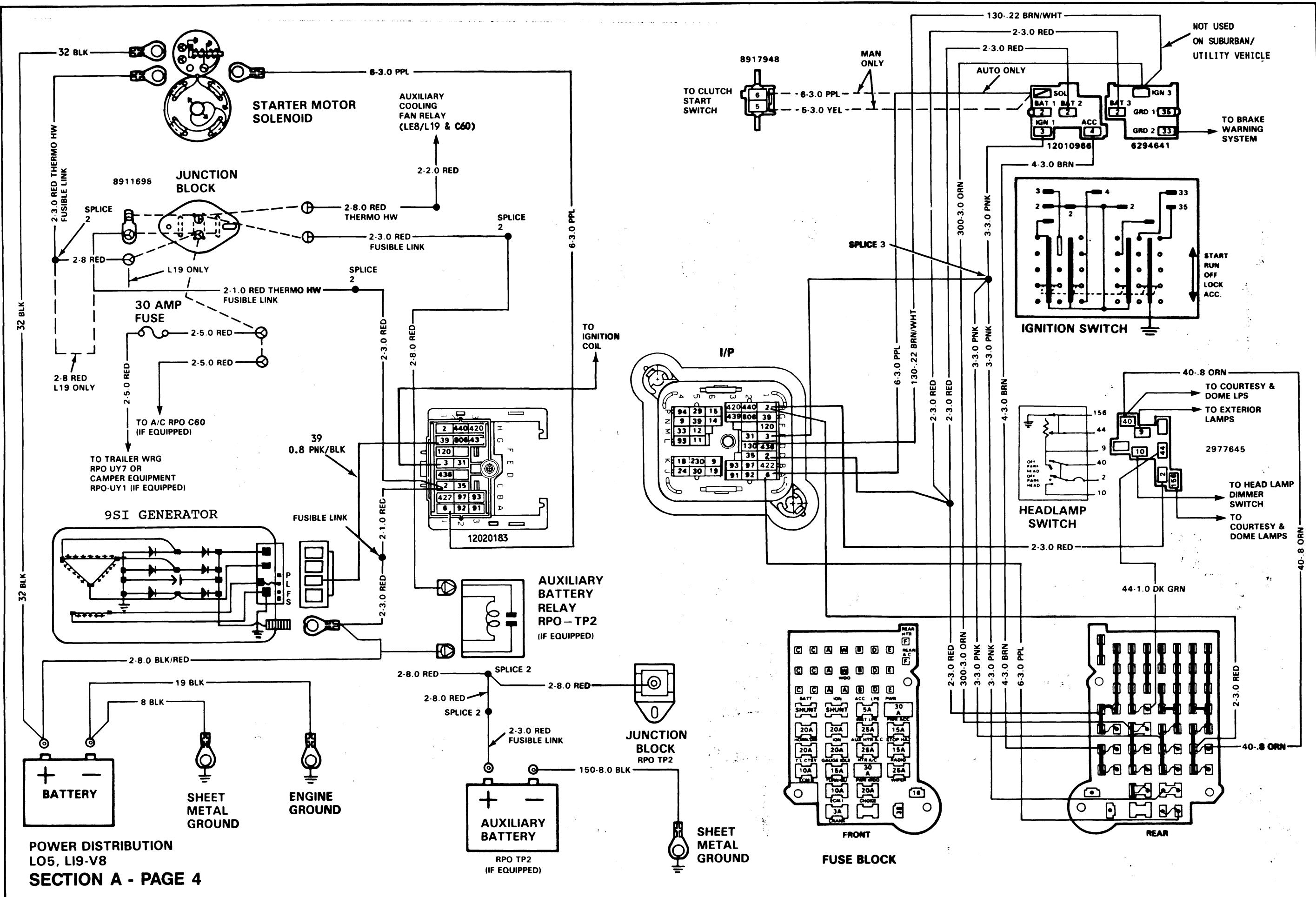
FUSES	AMP	COLOR
12004005	5	TAN
12004007	10	RED
12004008	15	LT BLU
12004009	20	YEL
12004010	25	WHT
12004003	3	VIOLET
12004006	7.5	BROWN
12004011	30	LT GRN

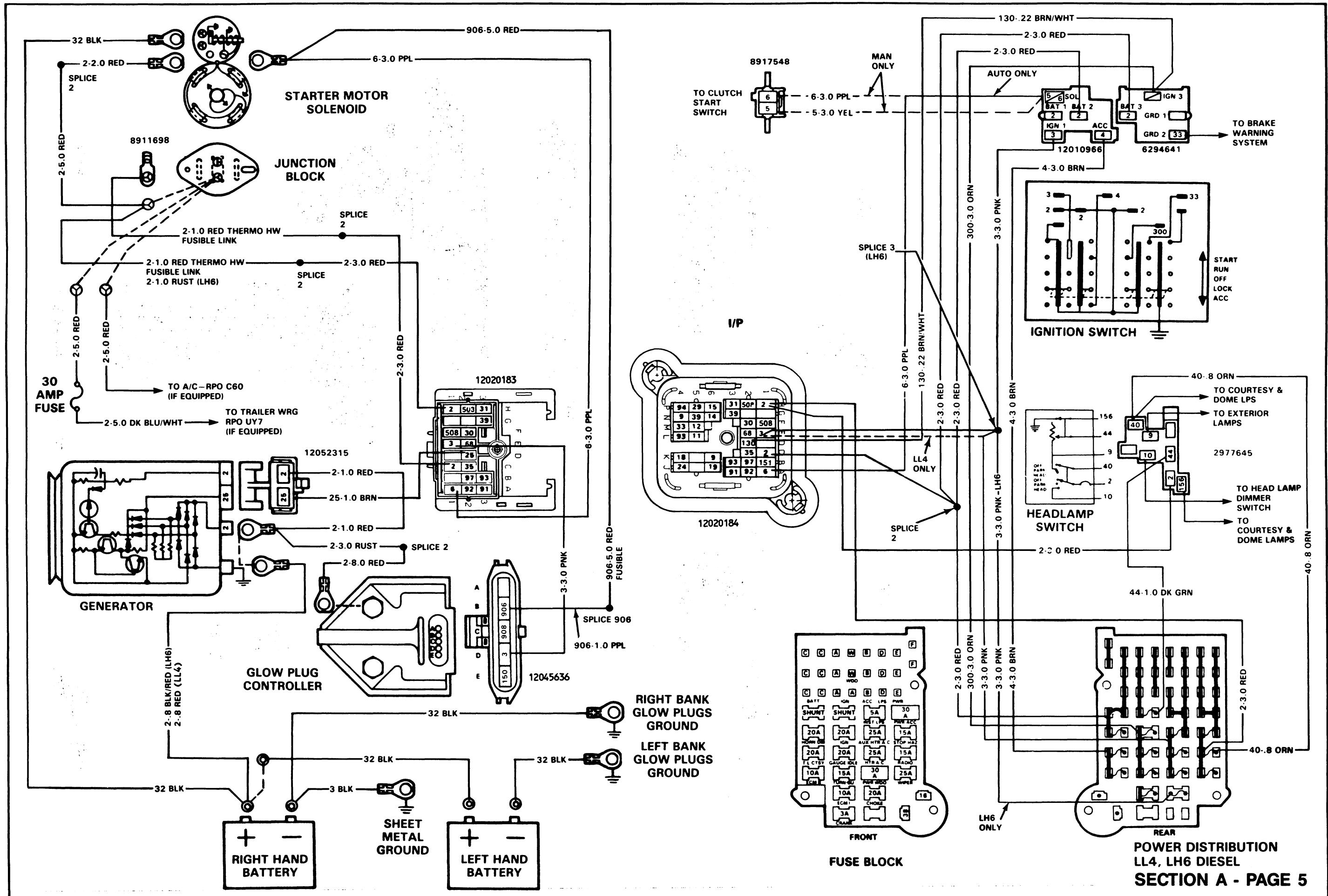
NOTE LL4/LT9/LE8/L25 ENGINES DO NOT
USE THE CRANK ECM I OR ECM B FUSES

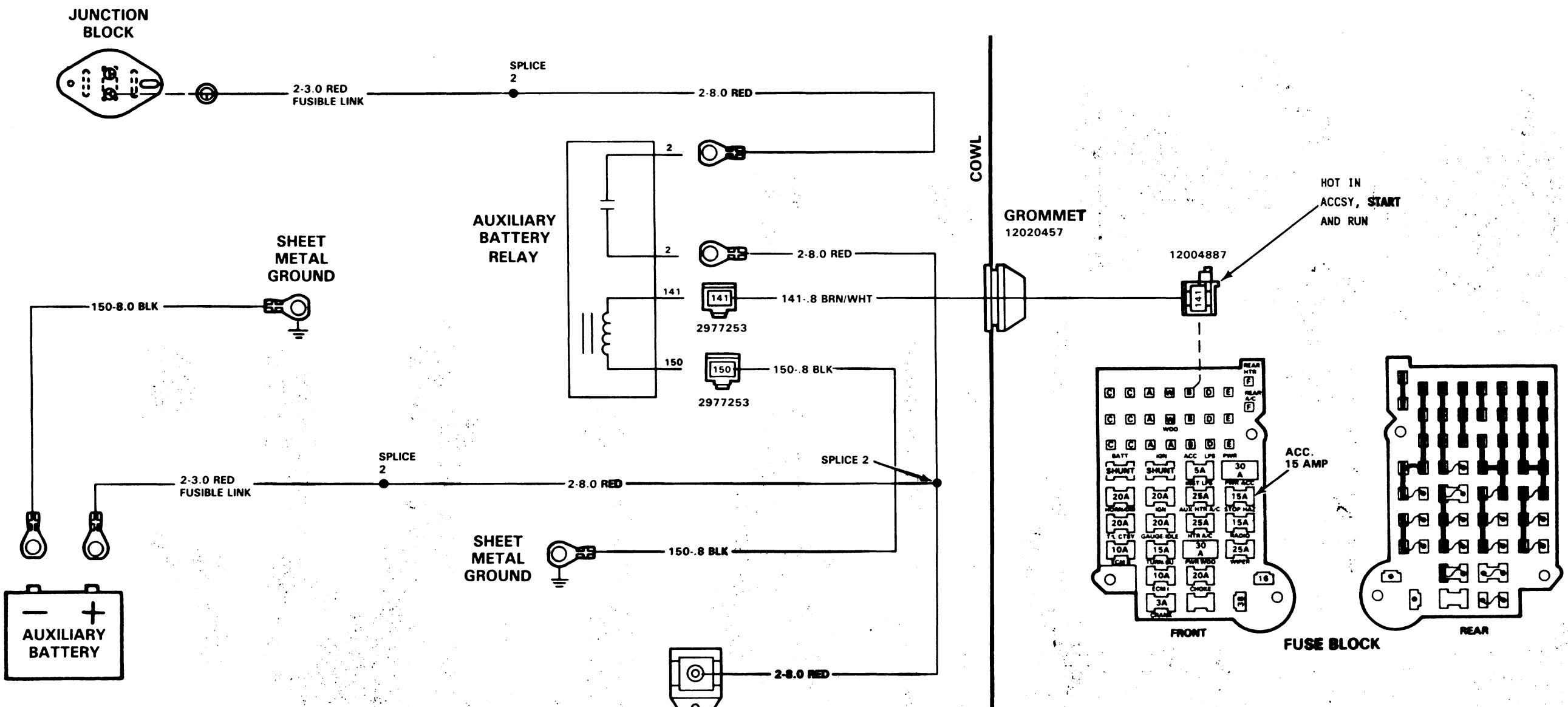
LH6 ENGINES DO NOT USE
THE CRANK FUSE

LO5/L19/LH6/LL4 ENGINES DO NOT
USE THE CHOKE FUSE

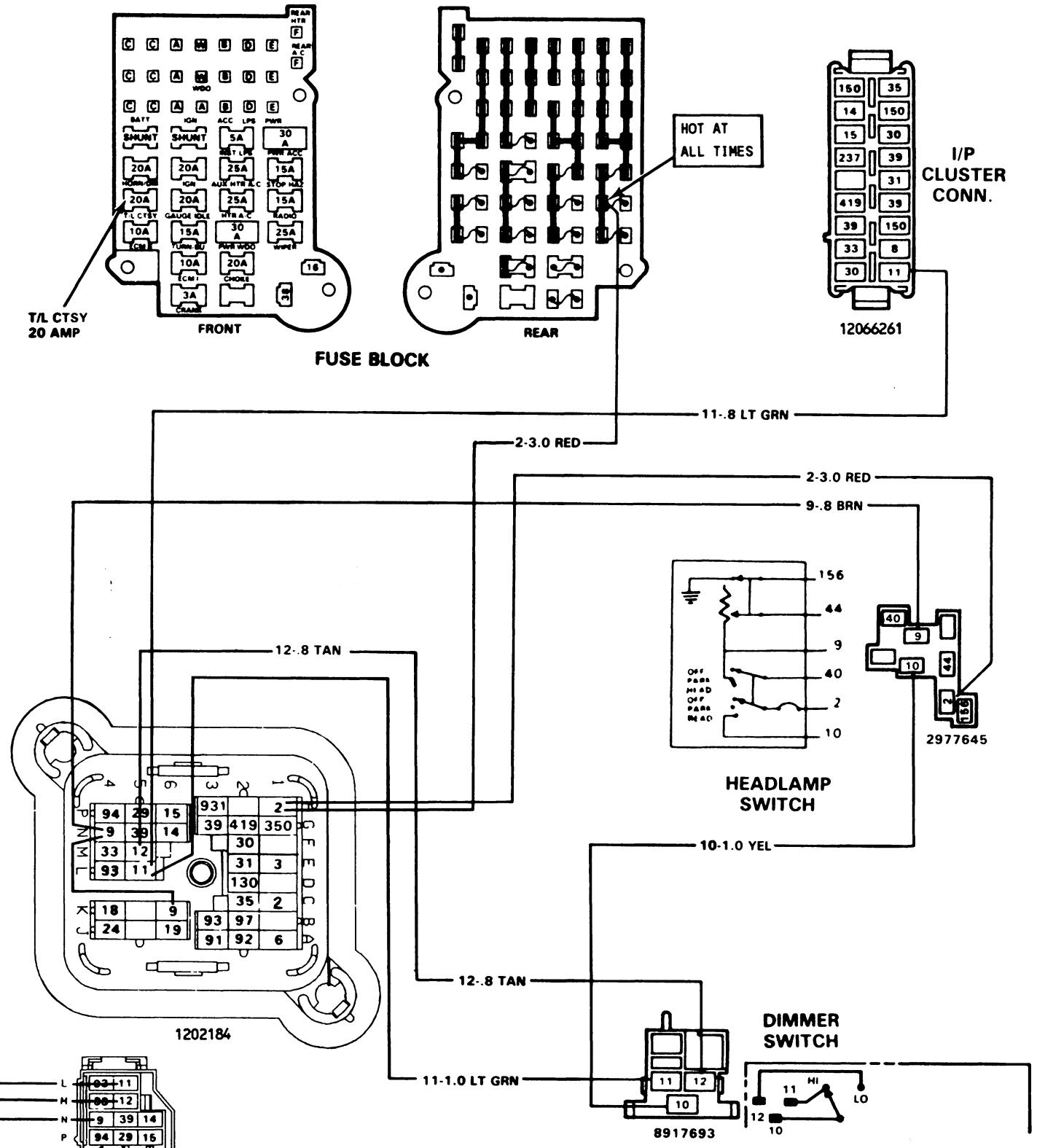
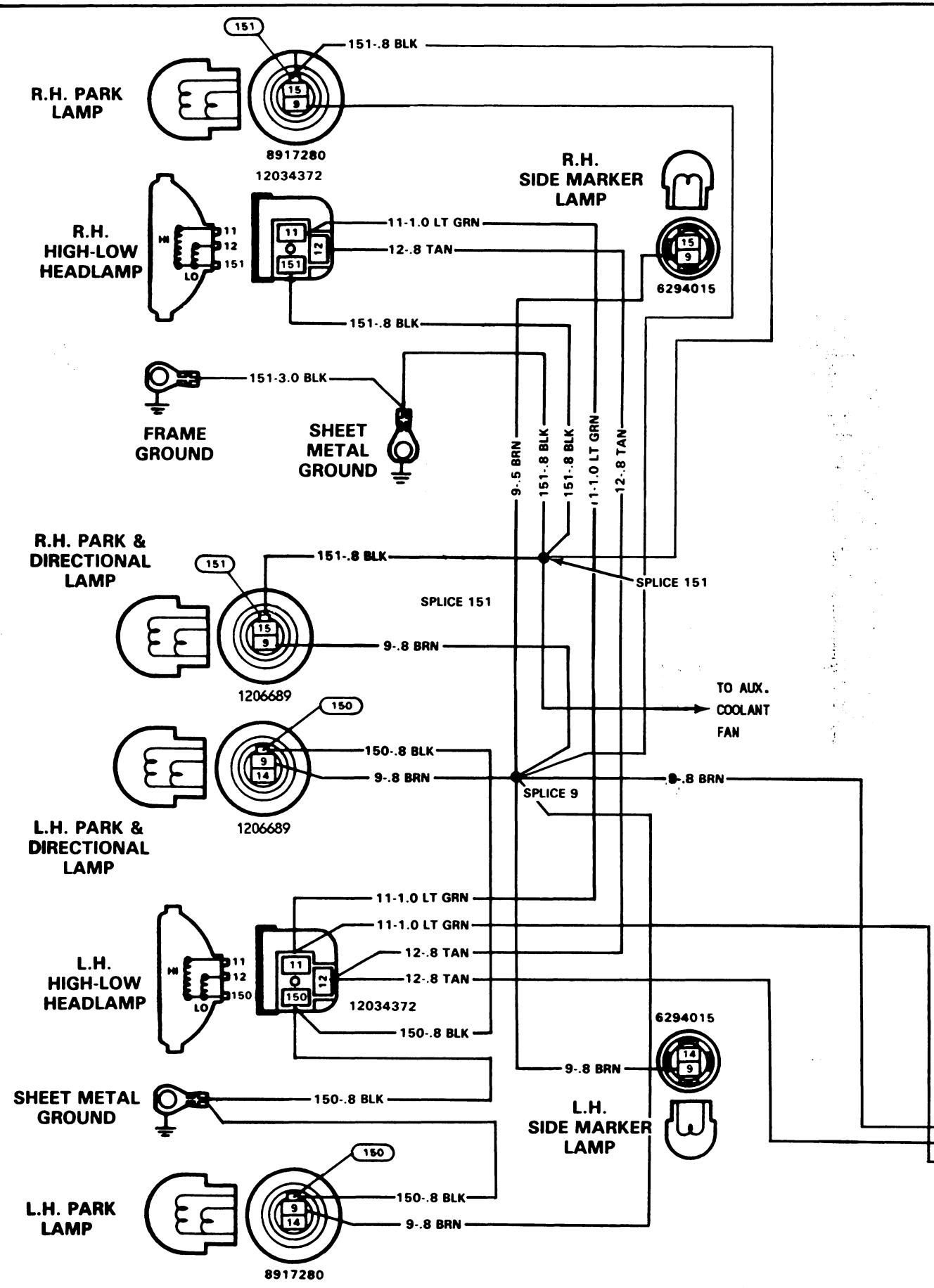


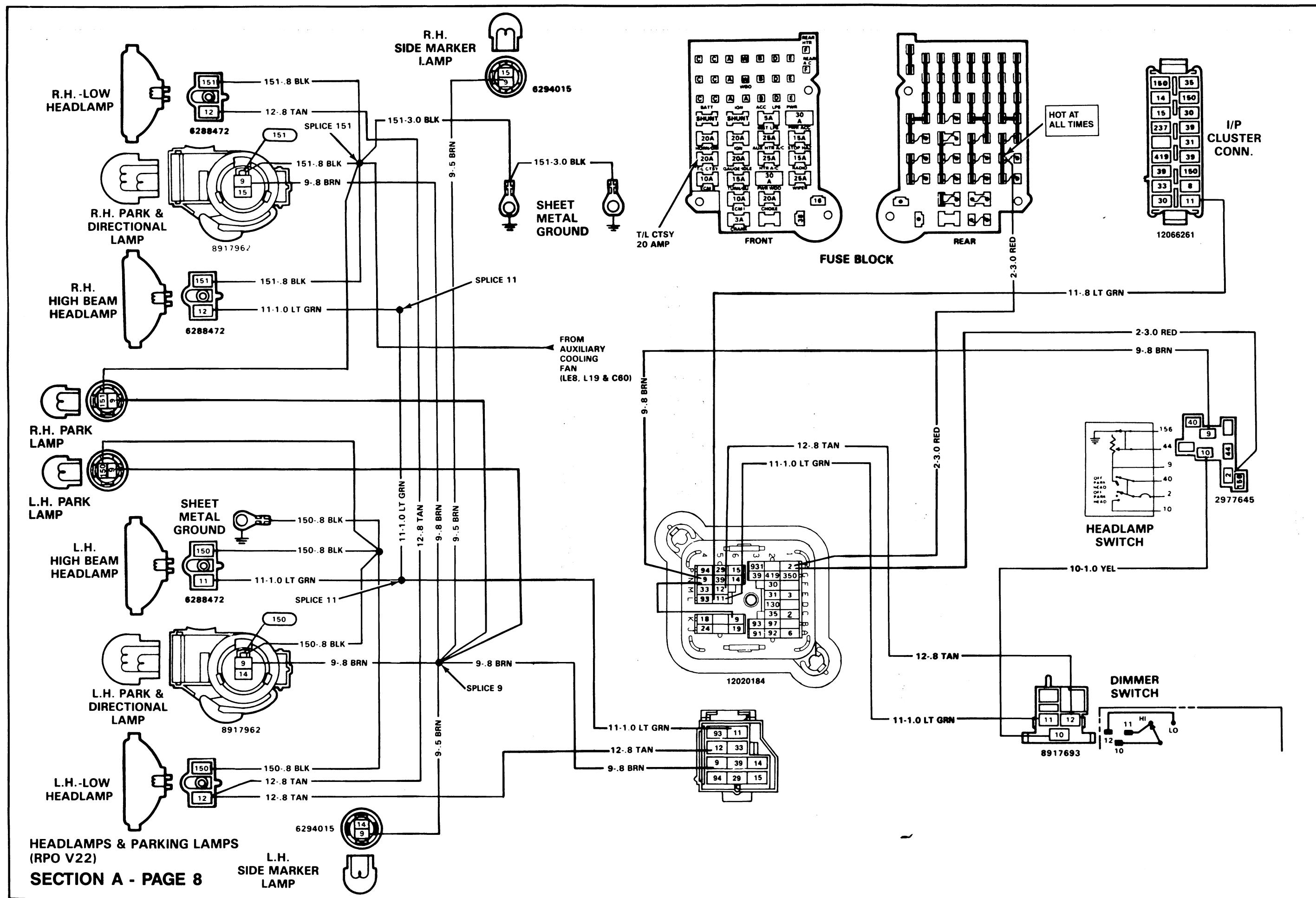


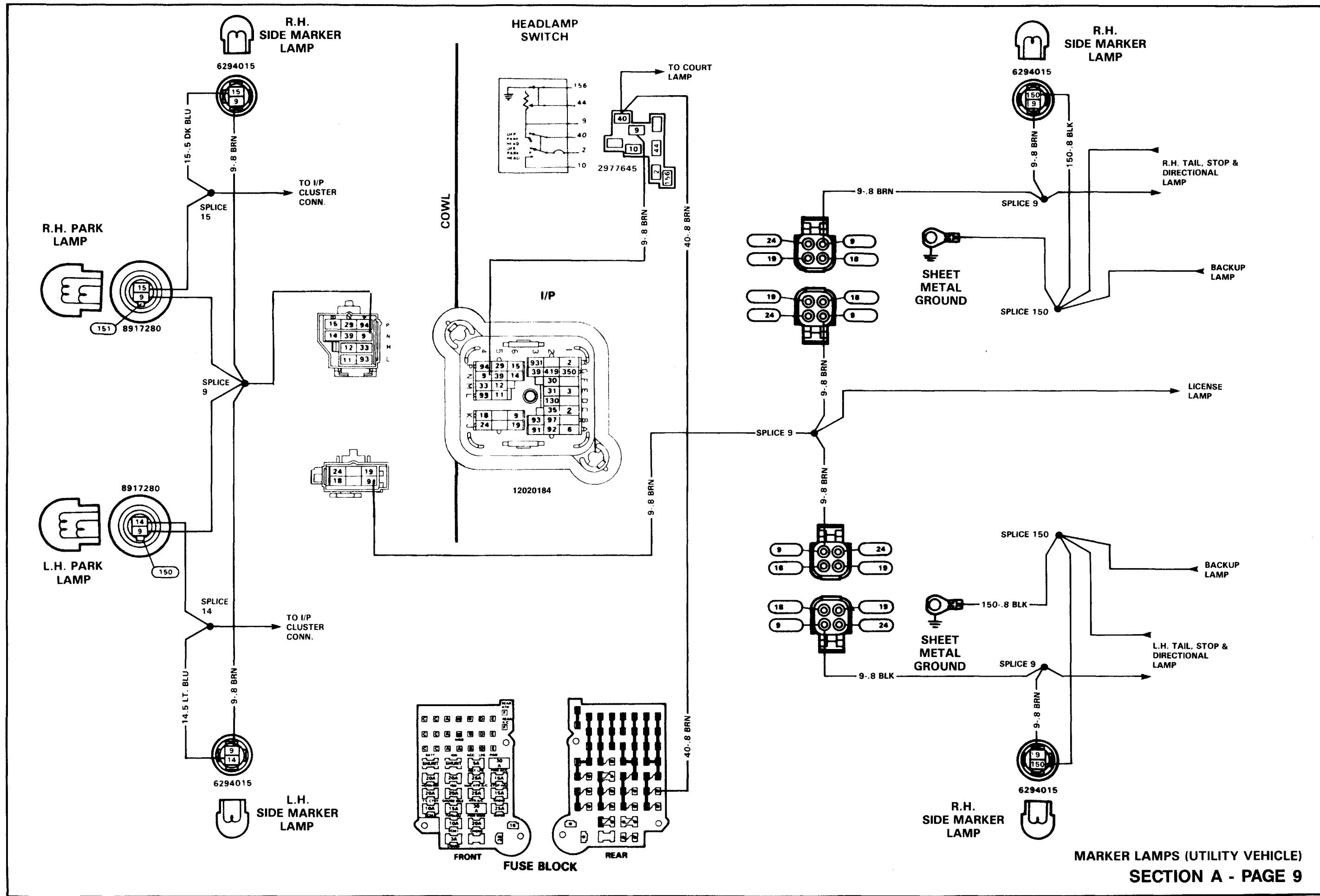


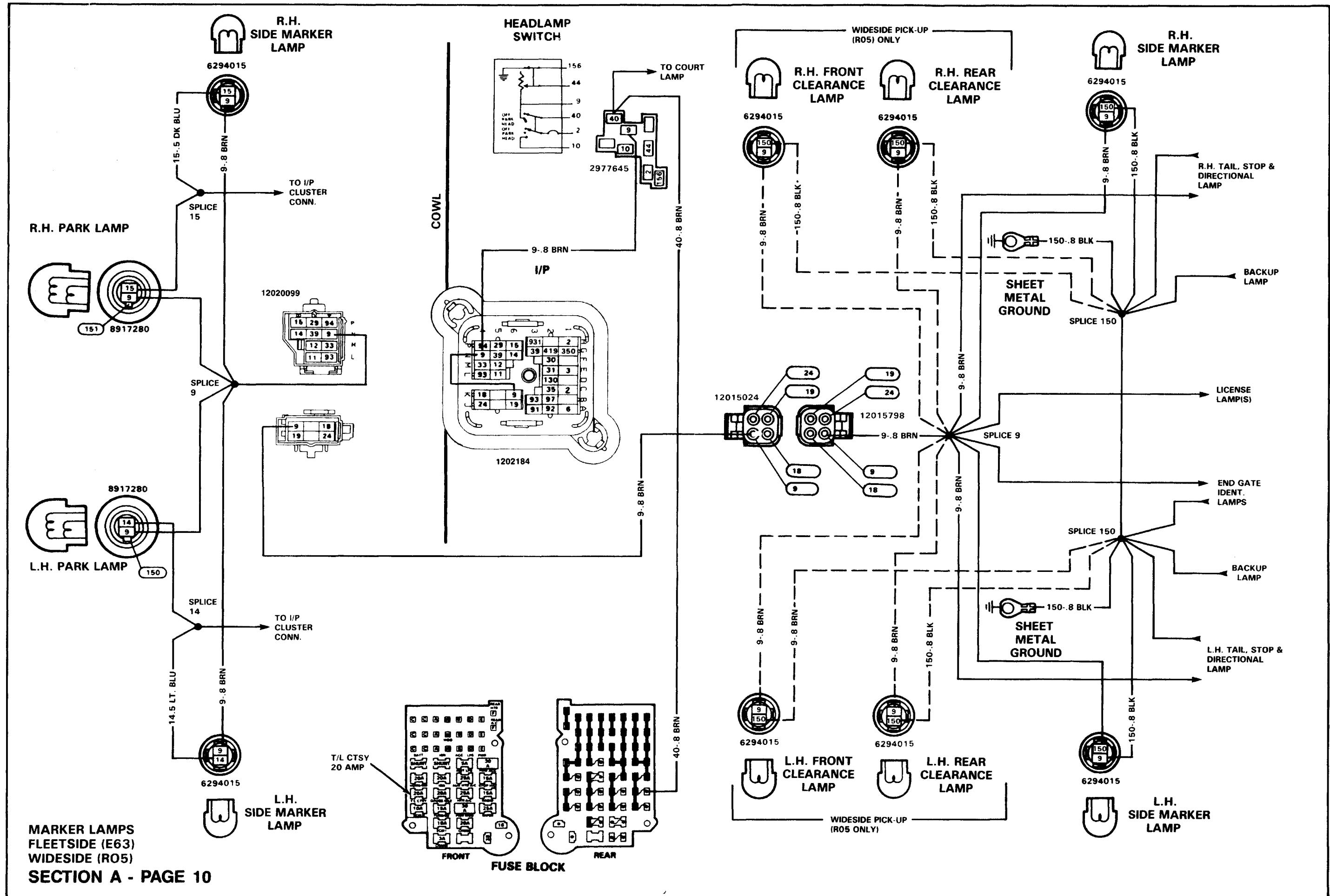


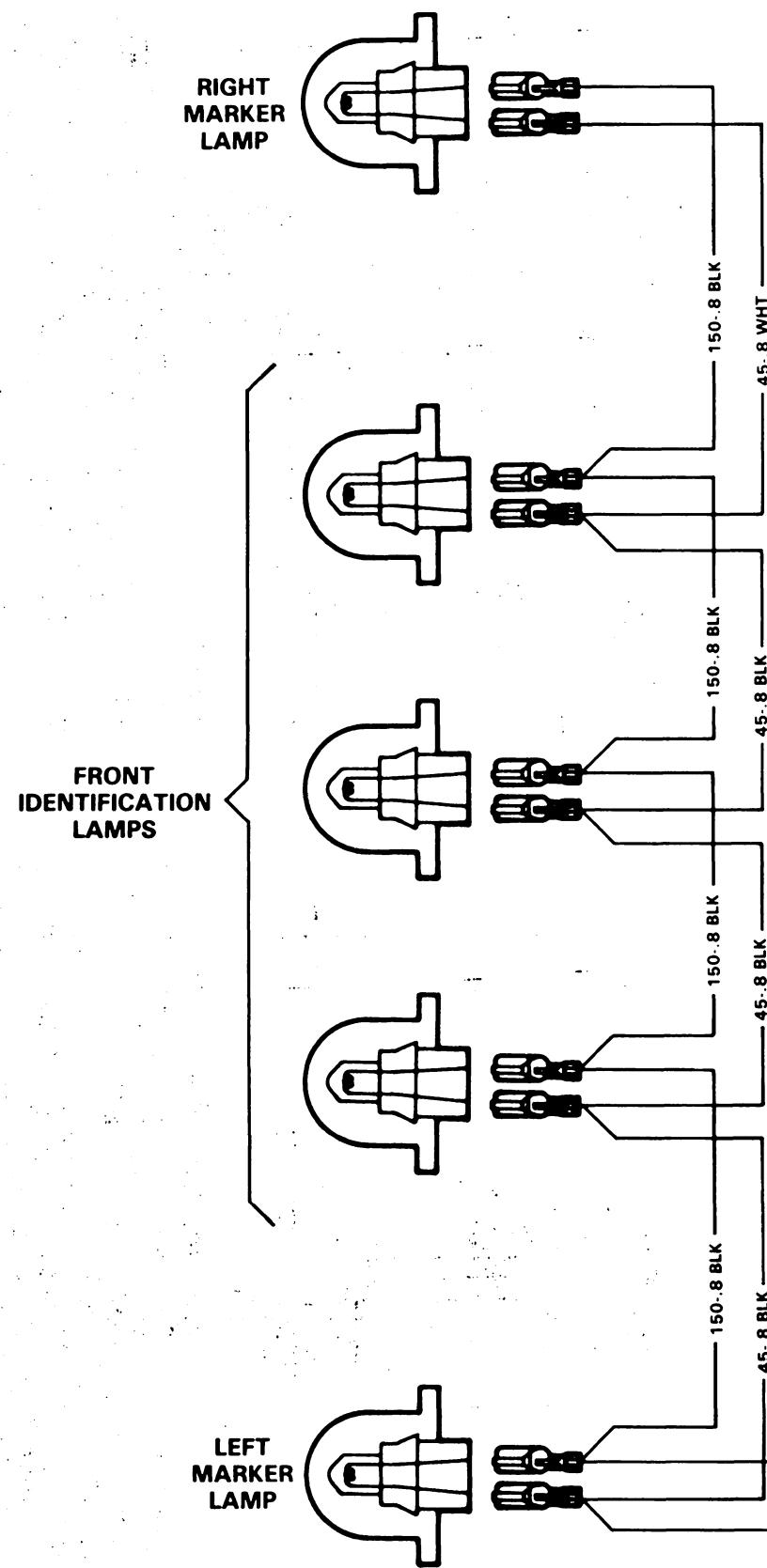
AUXILIARY BATTERY (RPO TP2)
SECTION A - PAGE 6



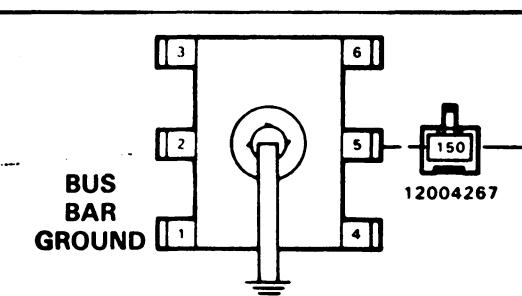
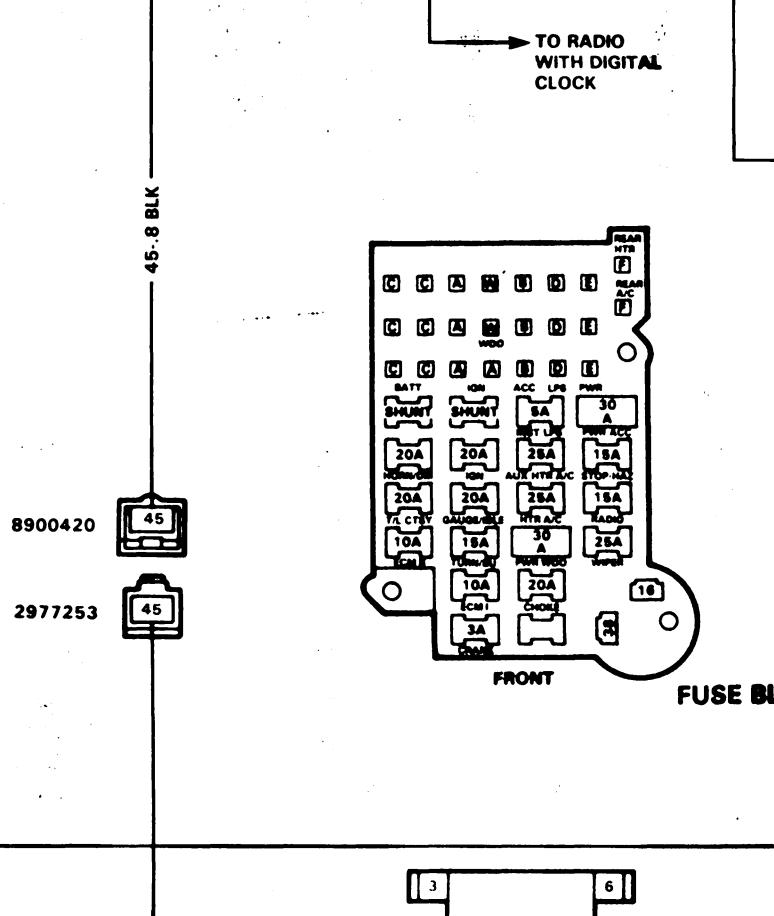
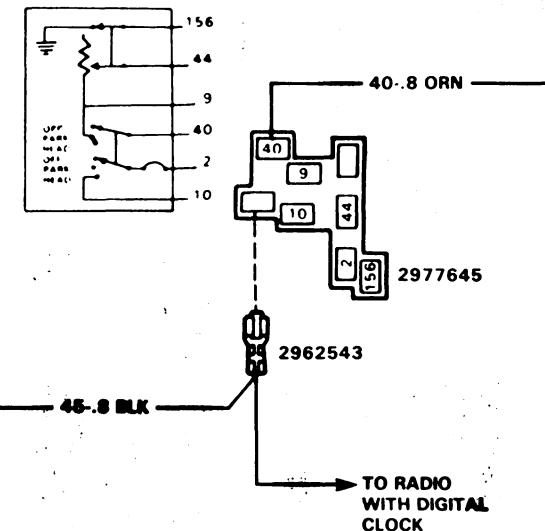




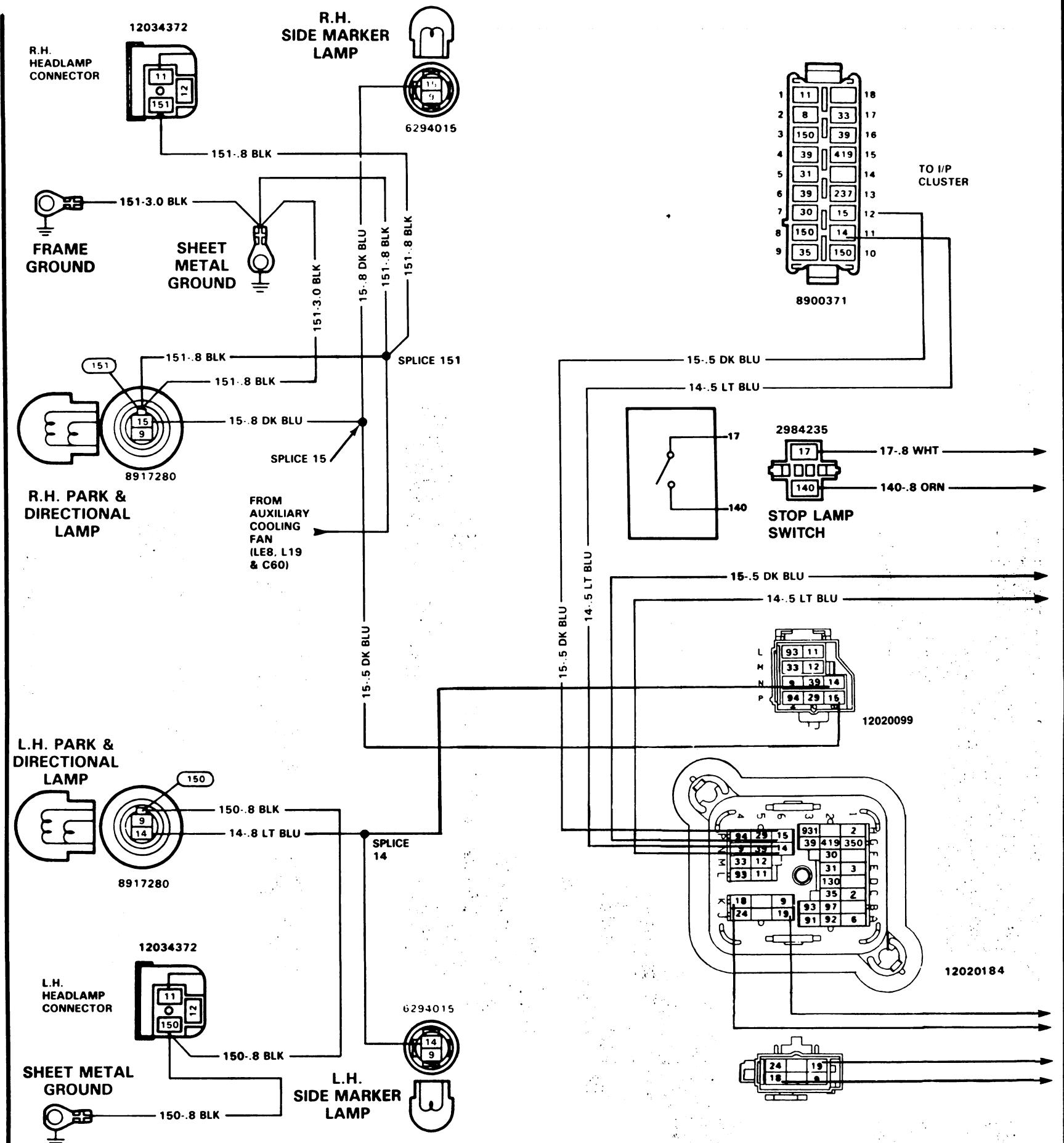
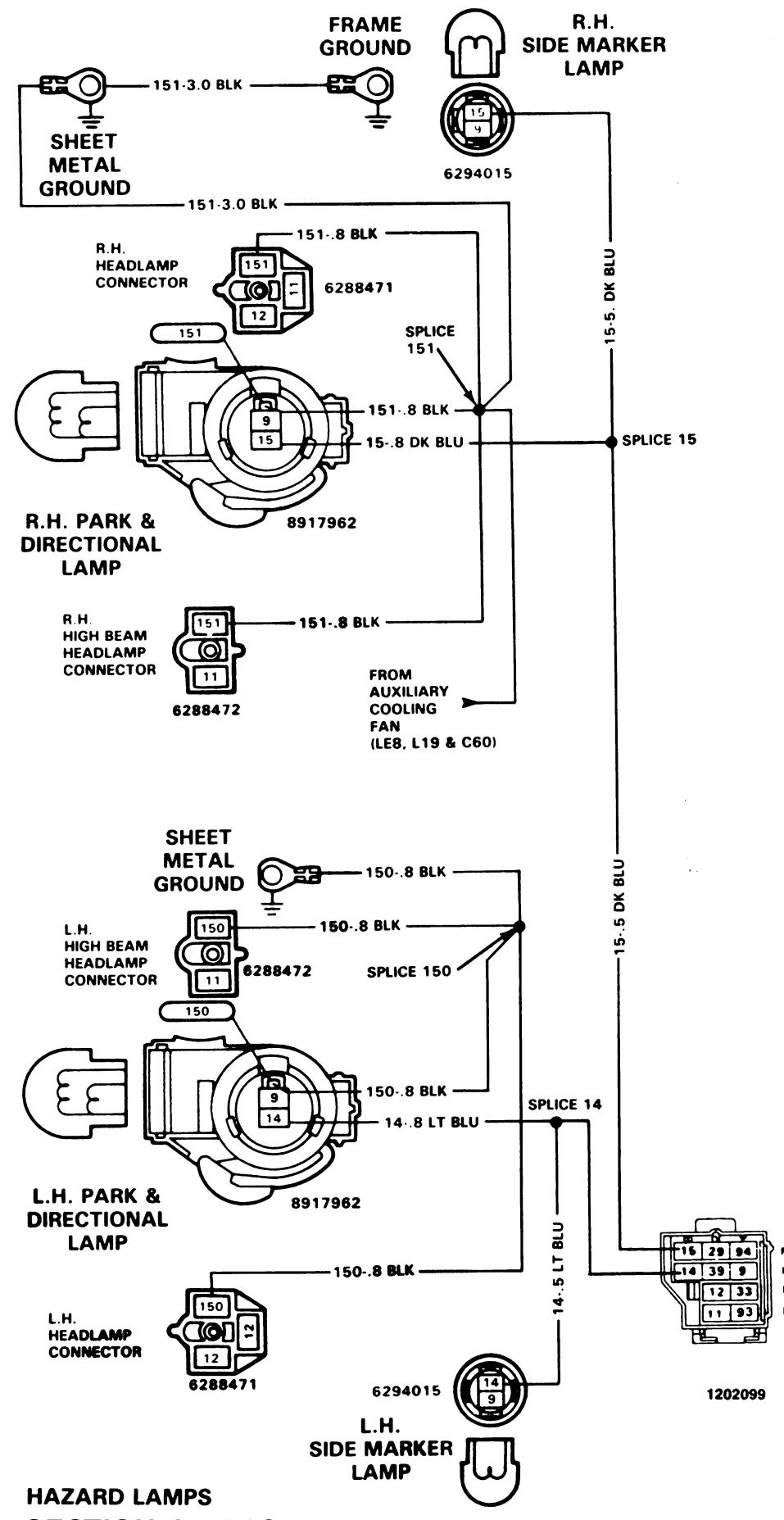


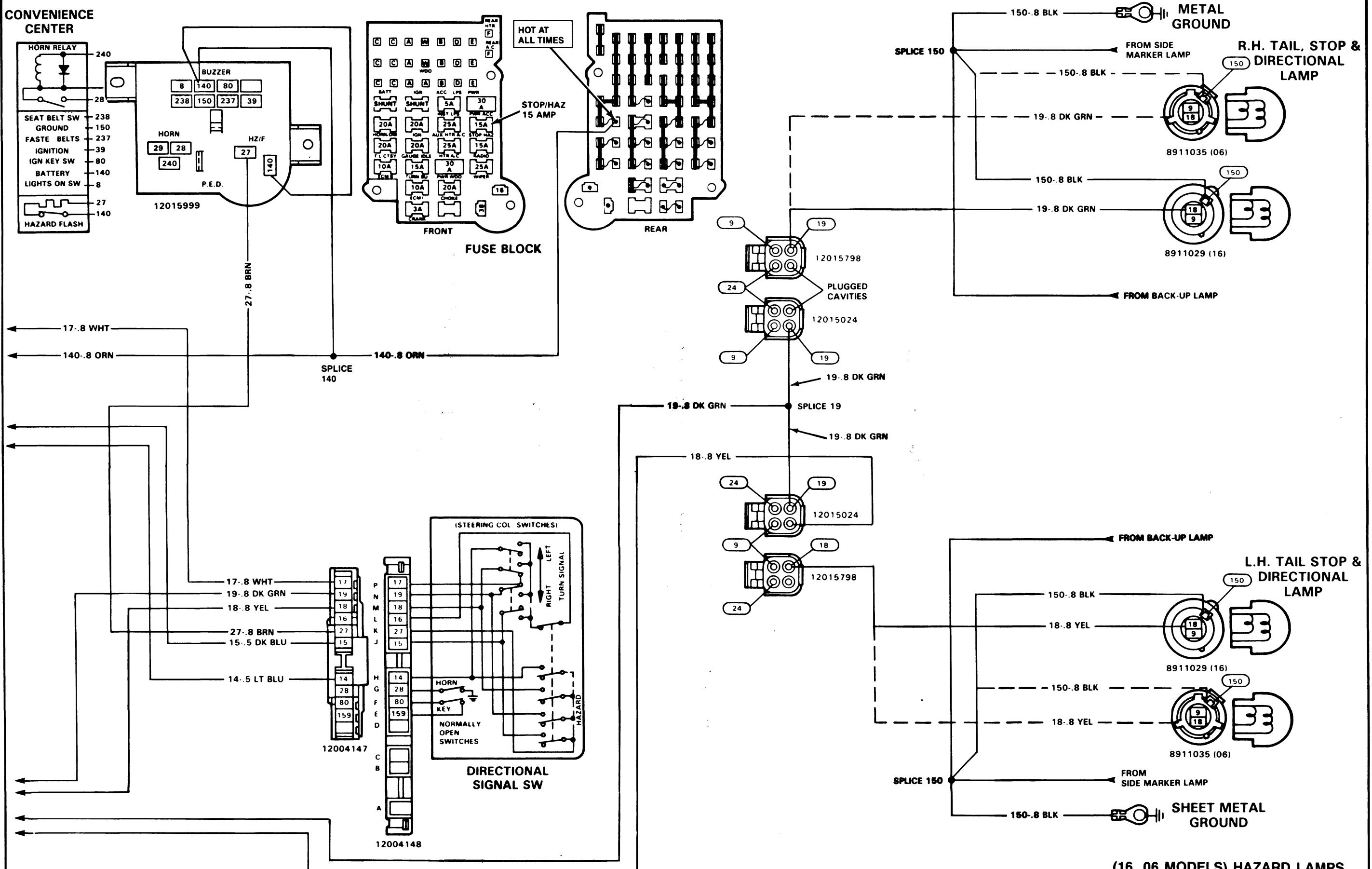


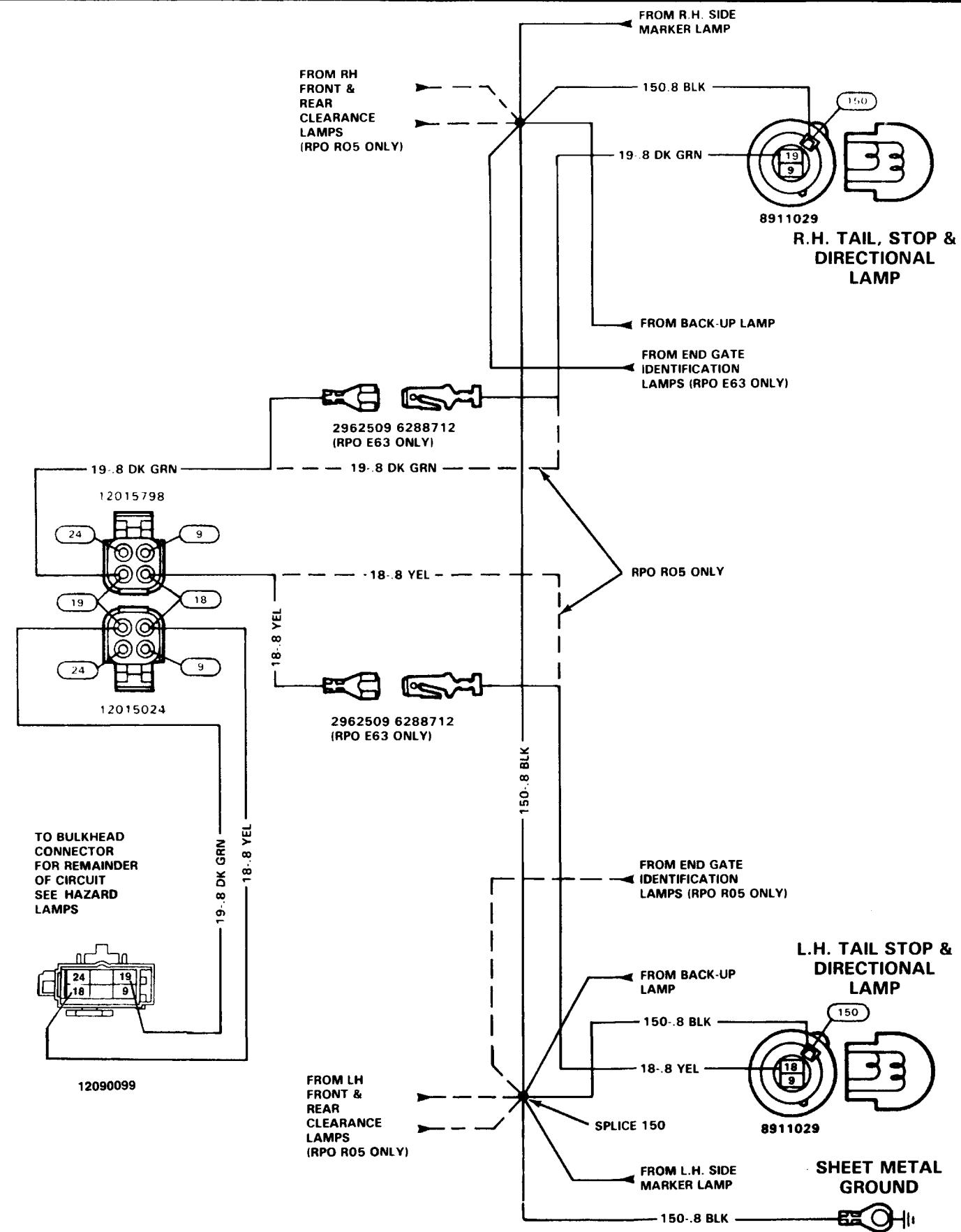
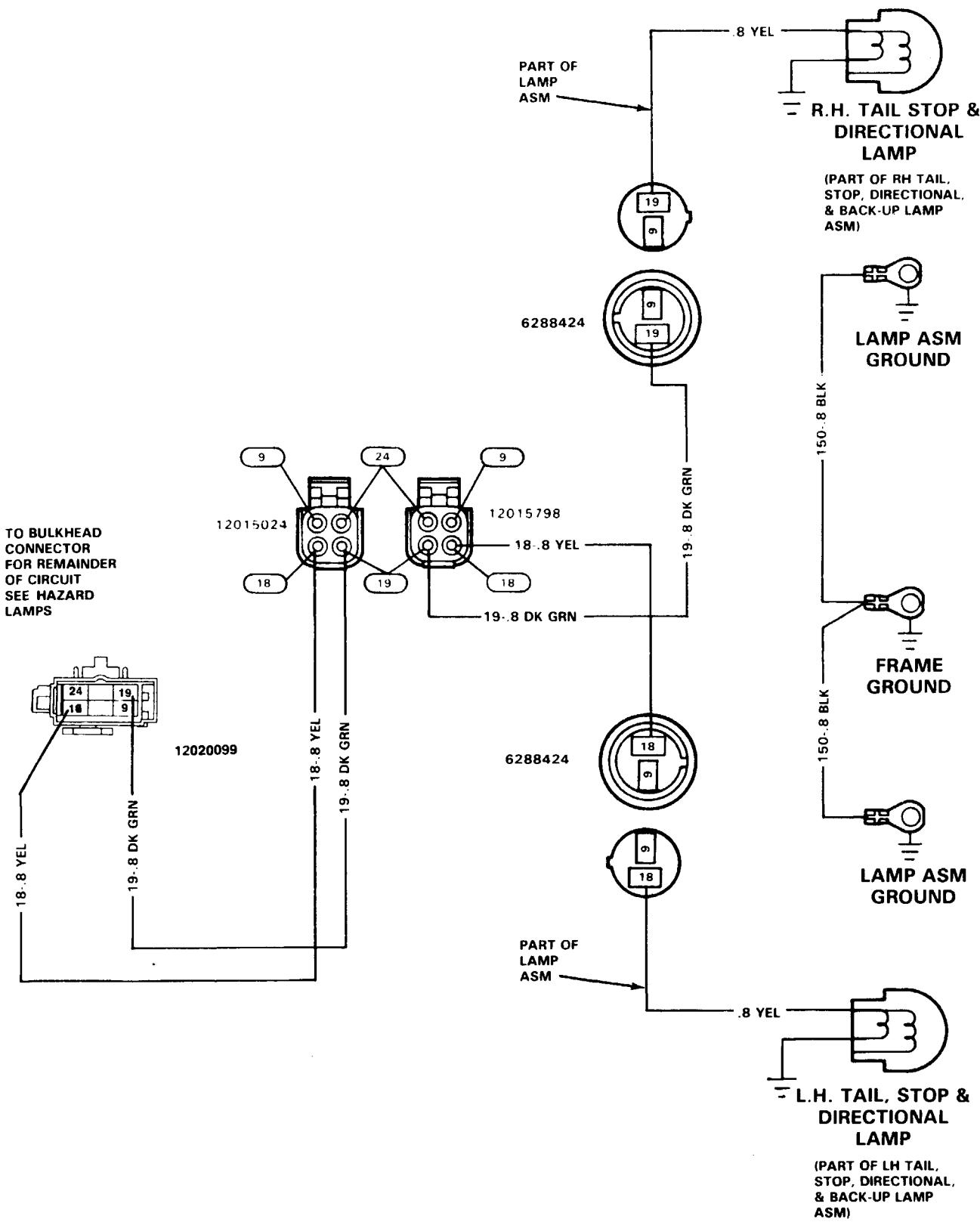
HEADLAMP SWITCH



ROOF MARKER LAMPS (RPO UQ1)
SECTION A - PAGE 11





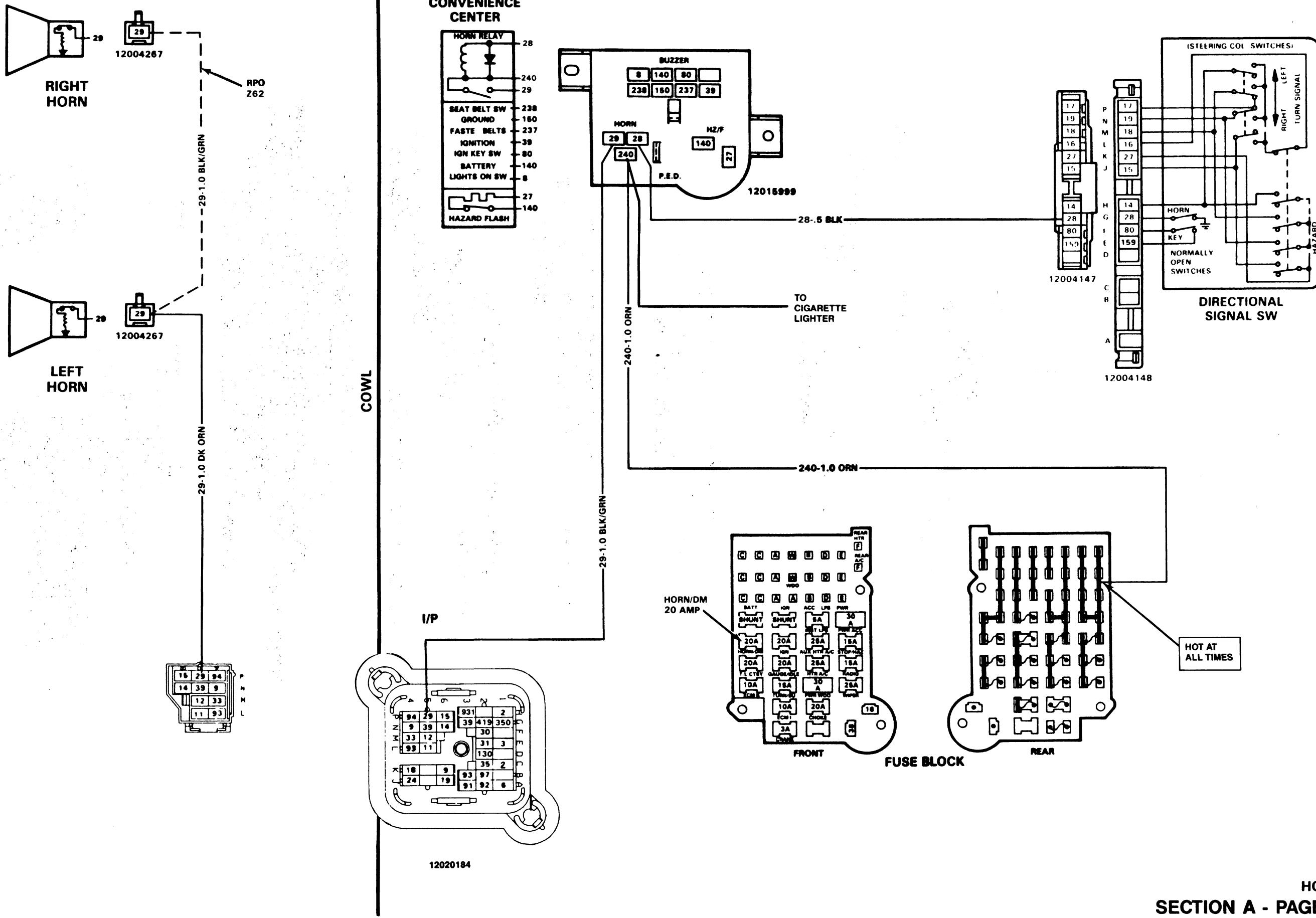


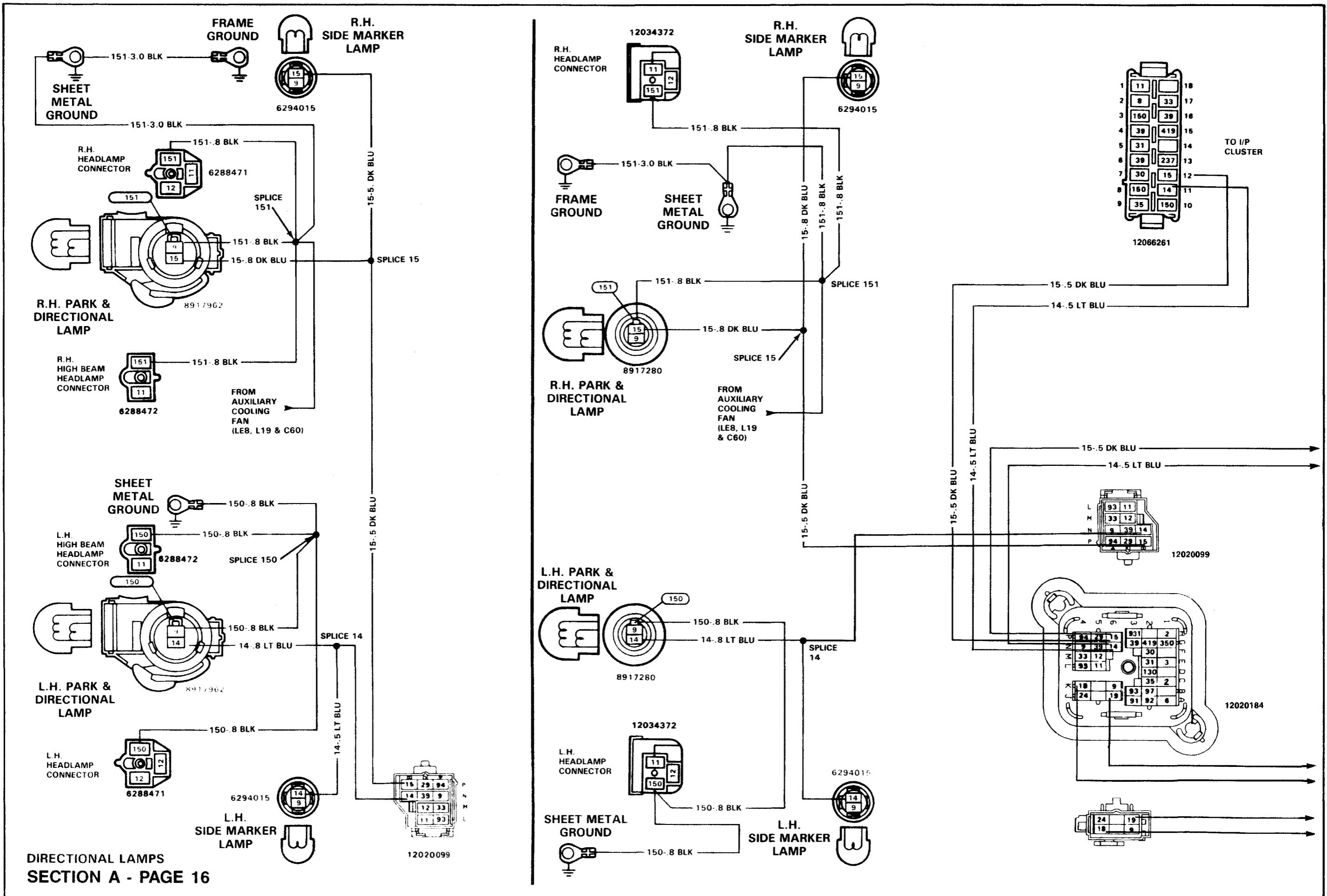
HAZARD LAMPS

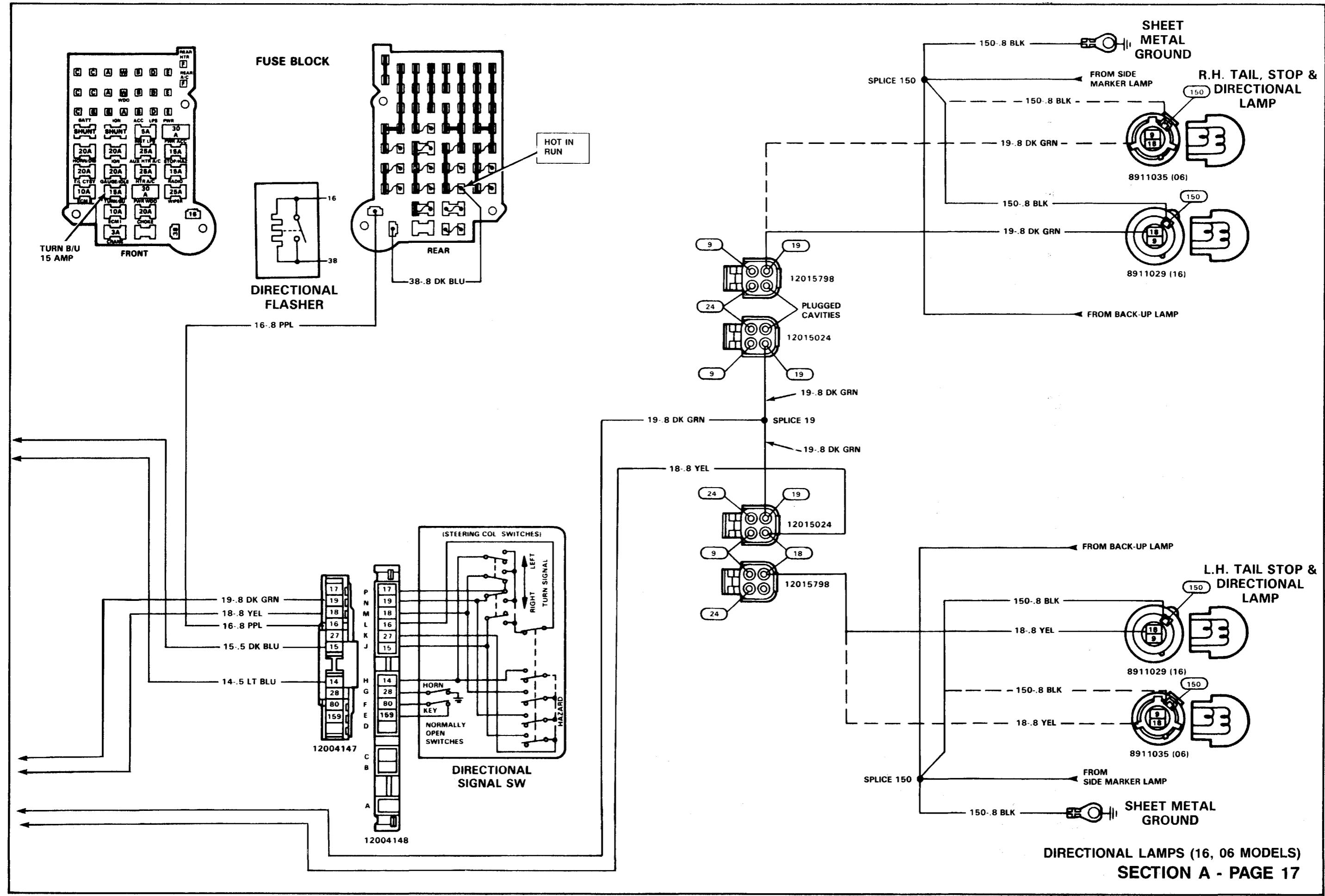
SECTION A - PAGE 14

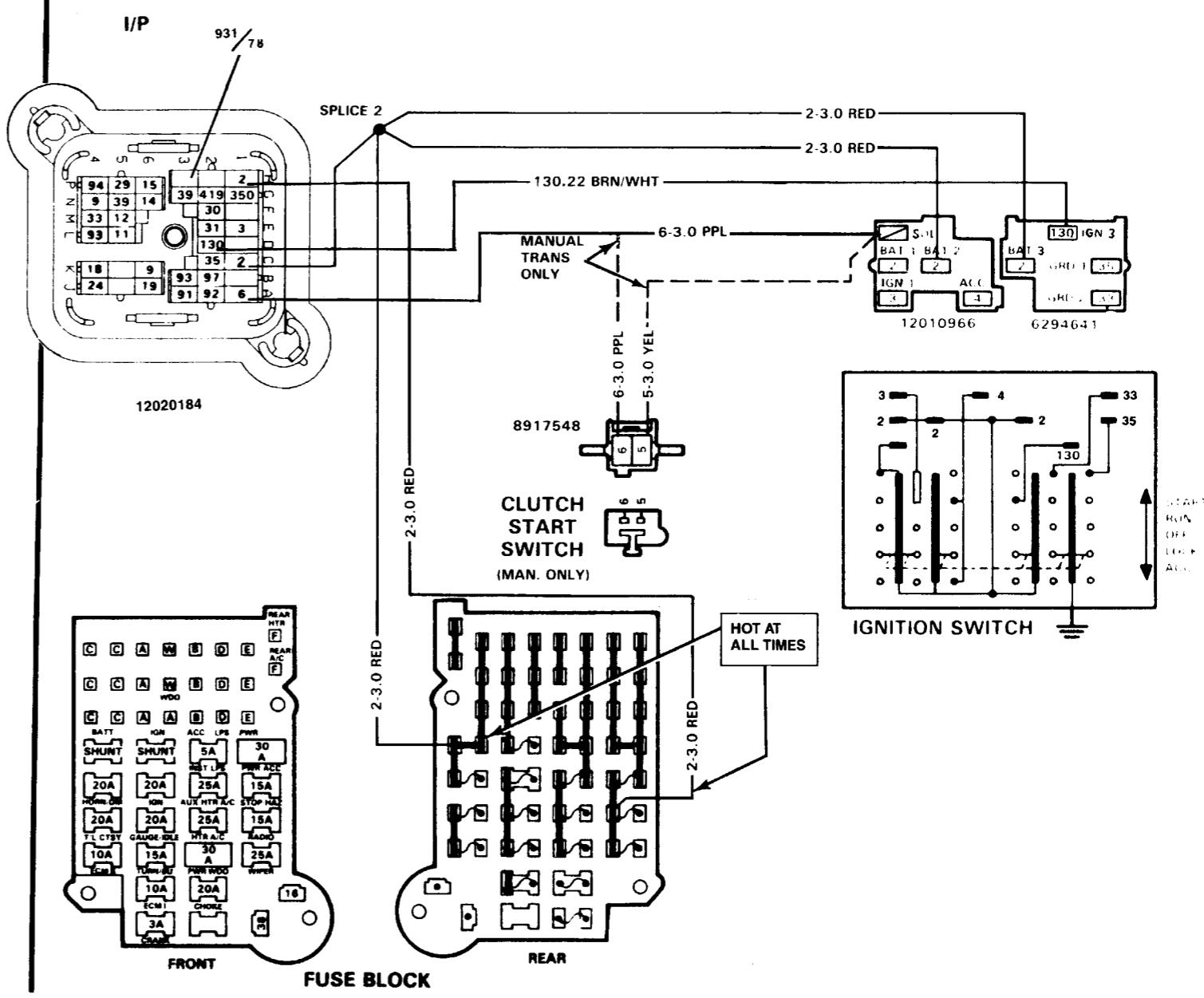
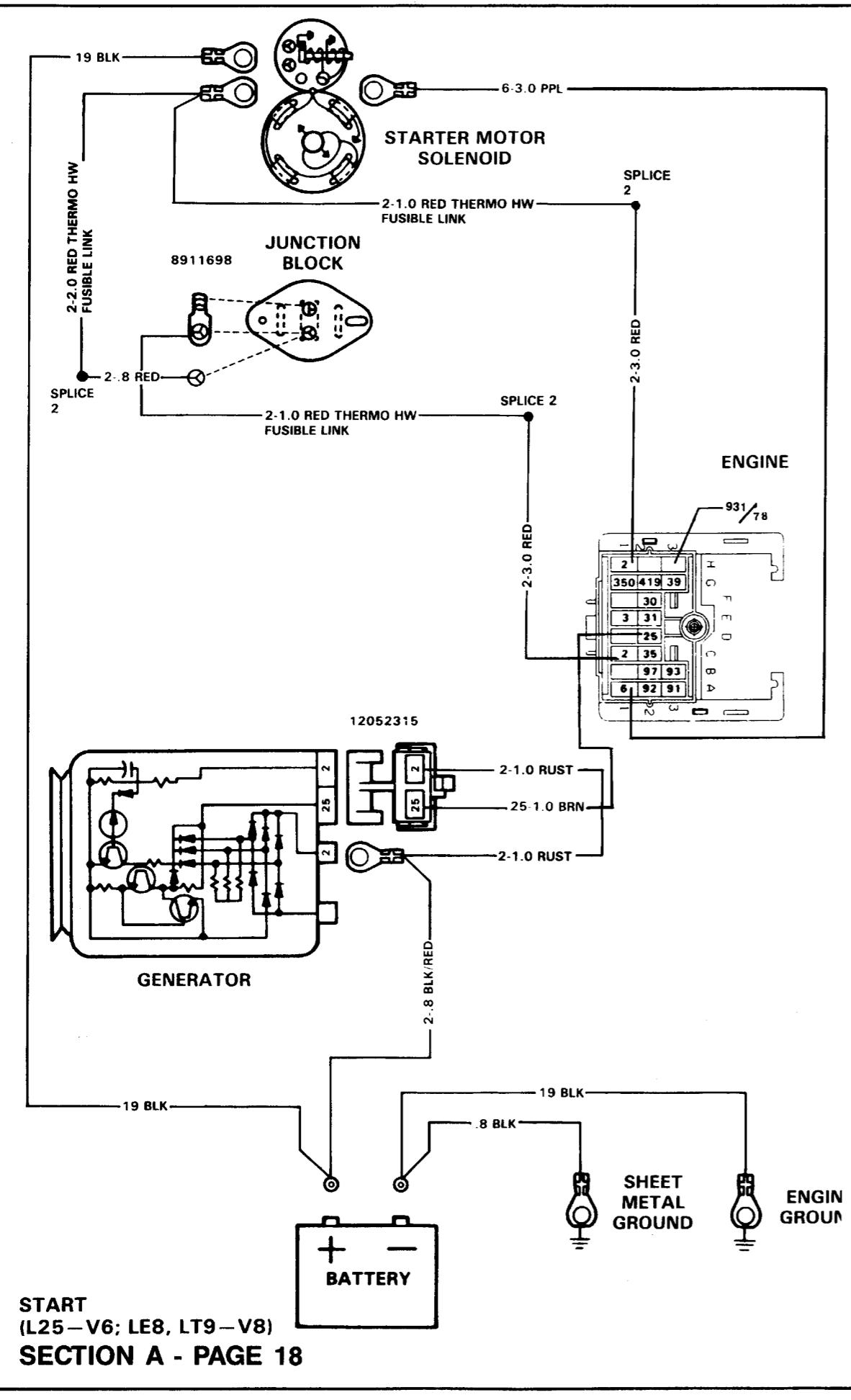
**03 & 43 W/O RPO E62, E63
STEP SIDE PICKUP—RPO E62**

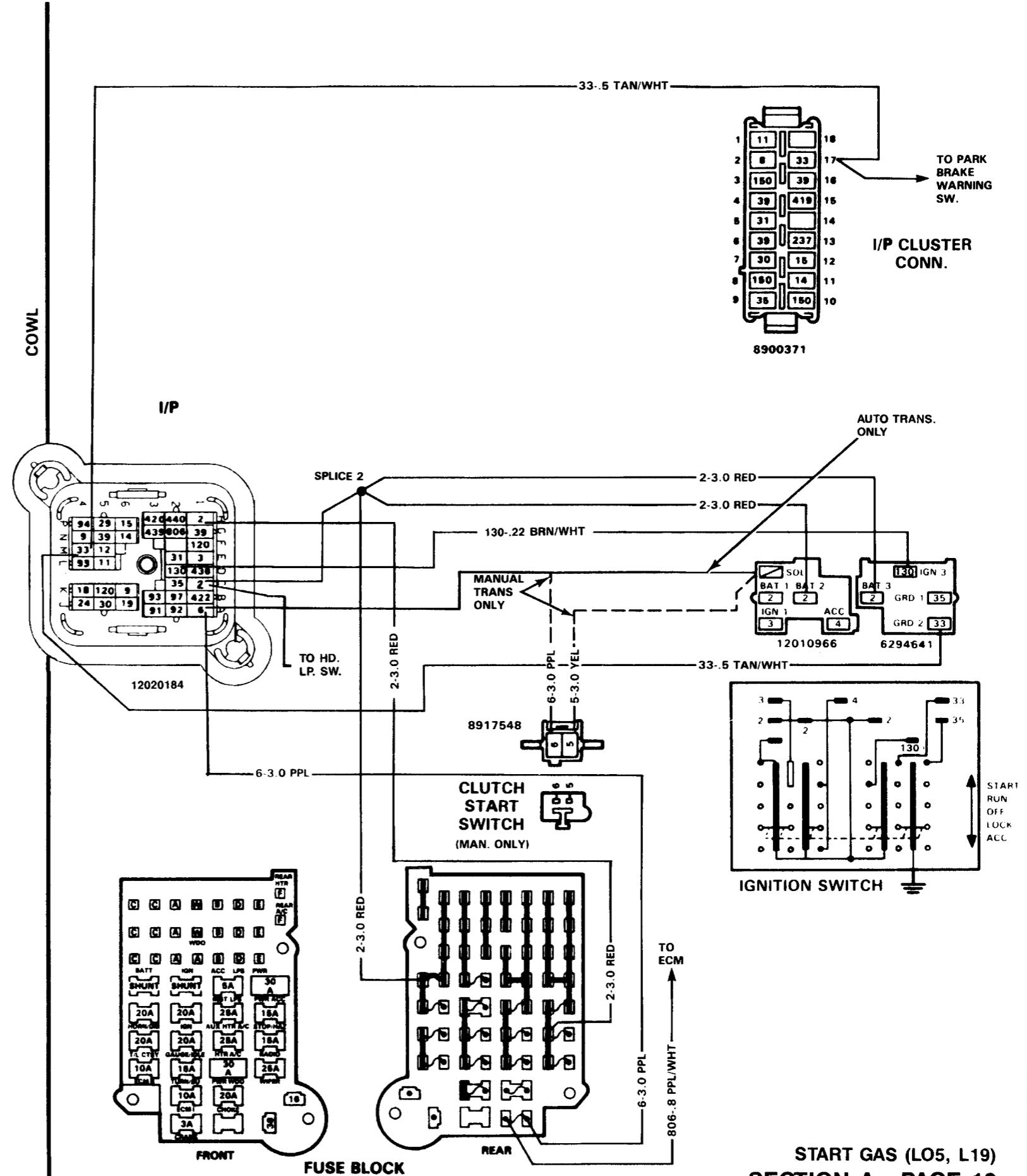
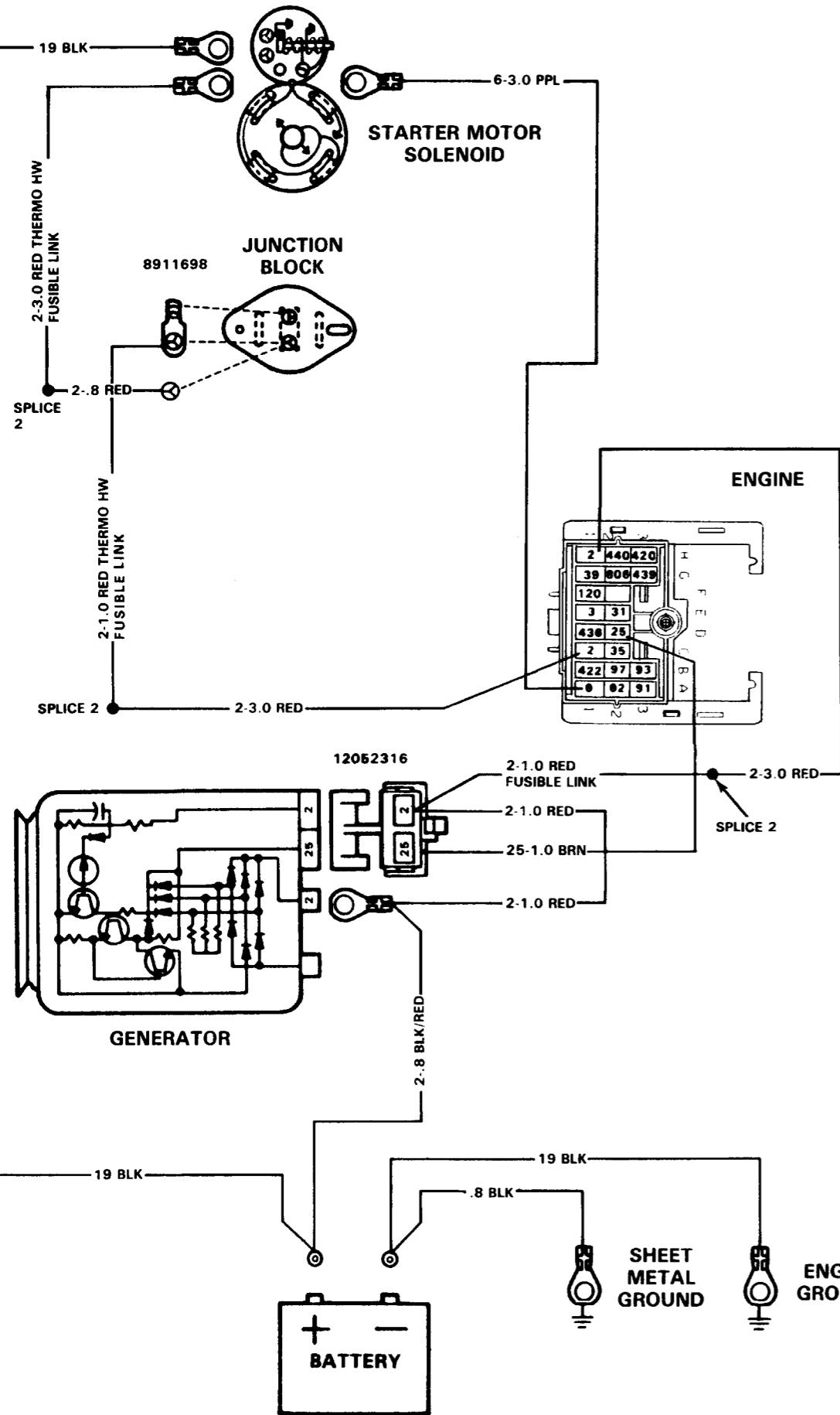
**FLEETSIDE PICKUP—RPO E63
WIDE SIDE PICKUP—RPO R05**



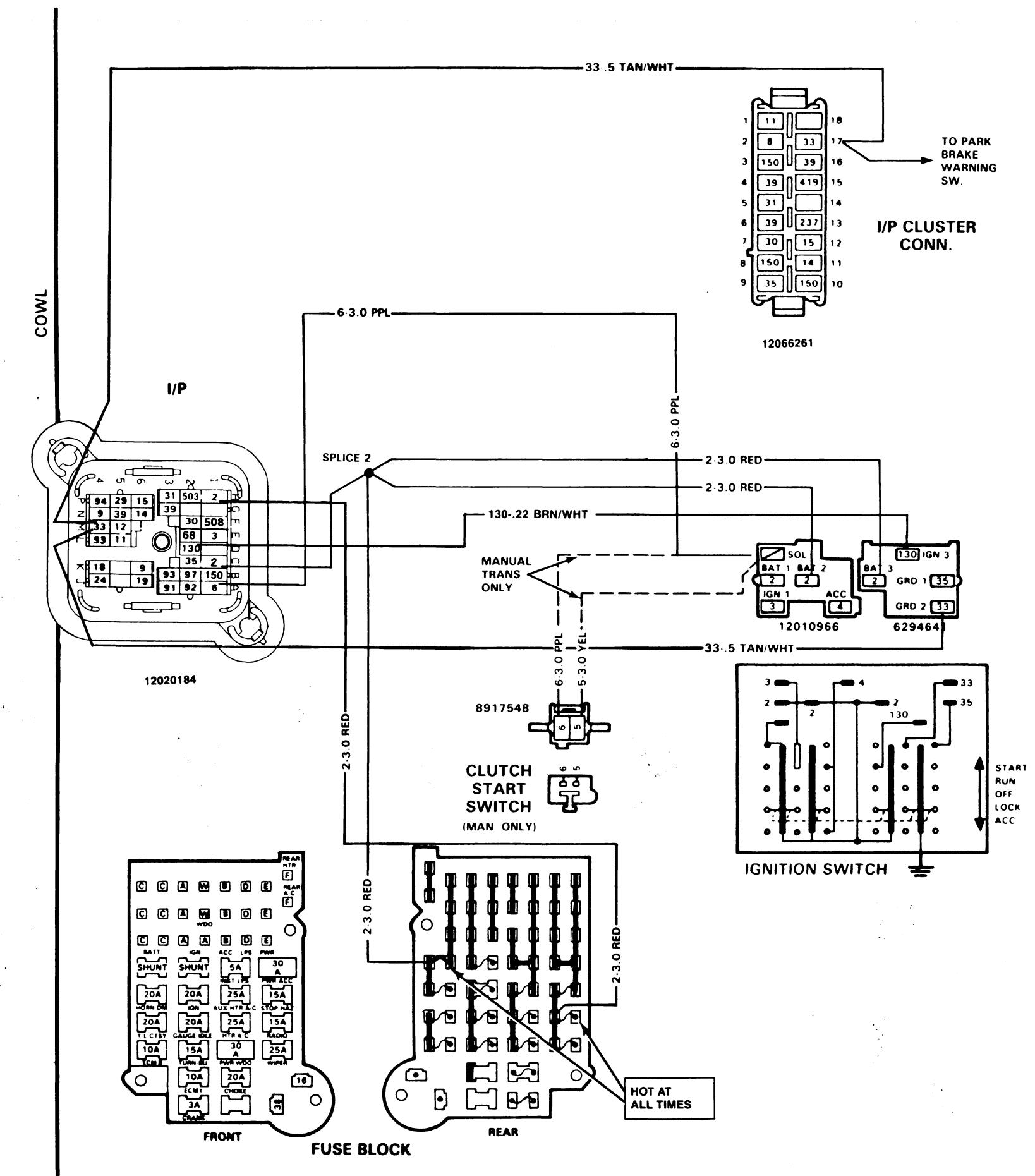
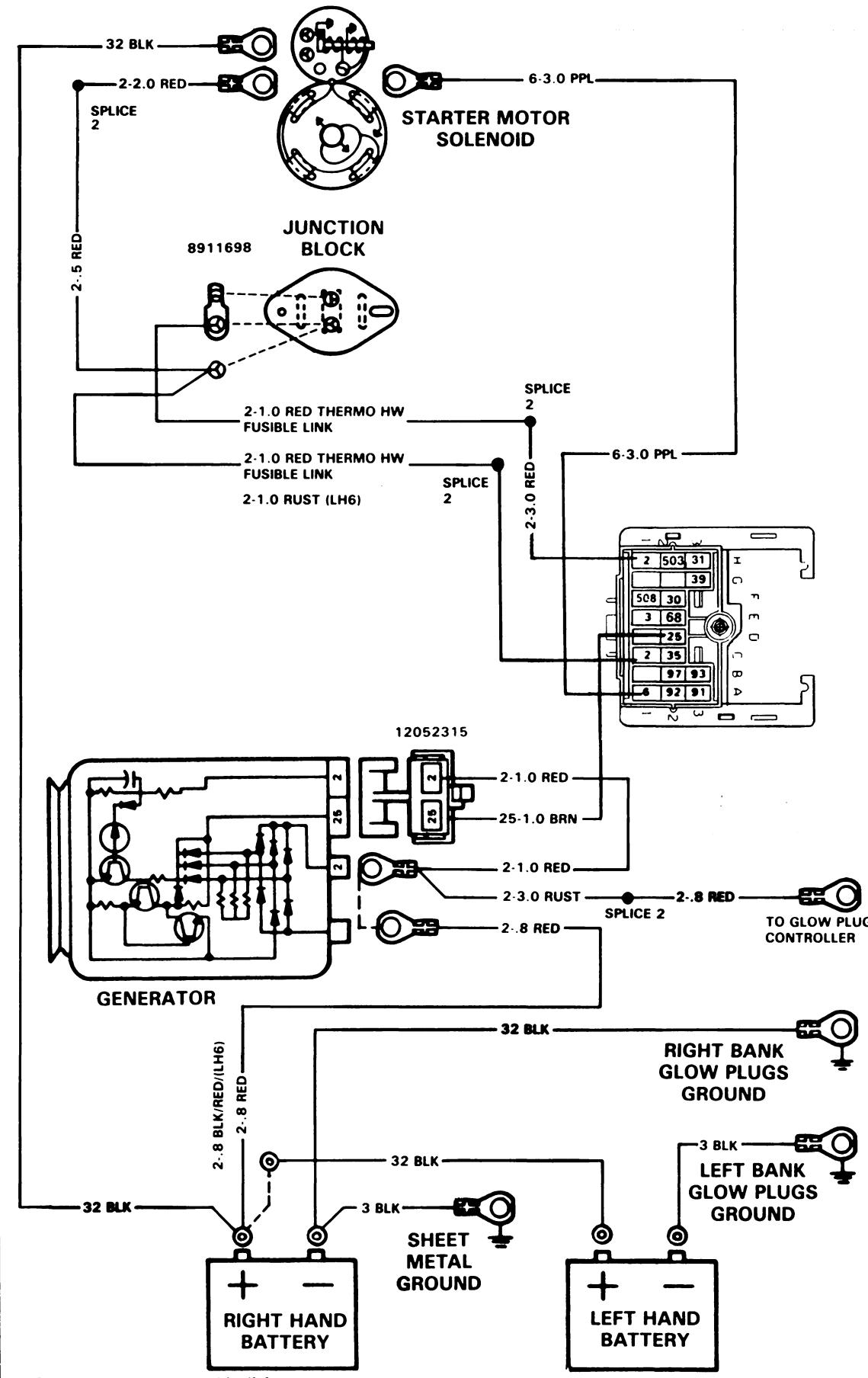


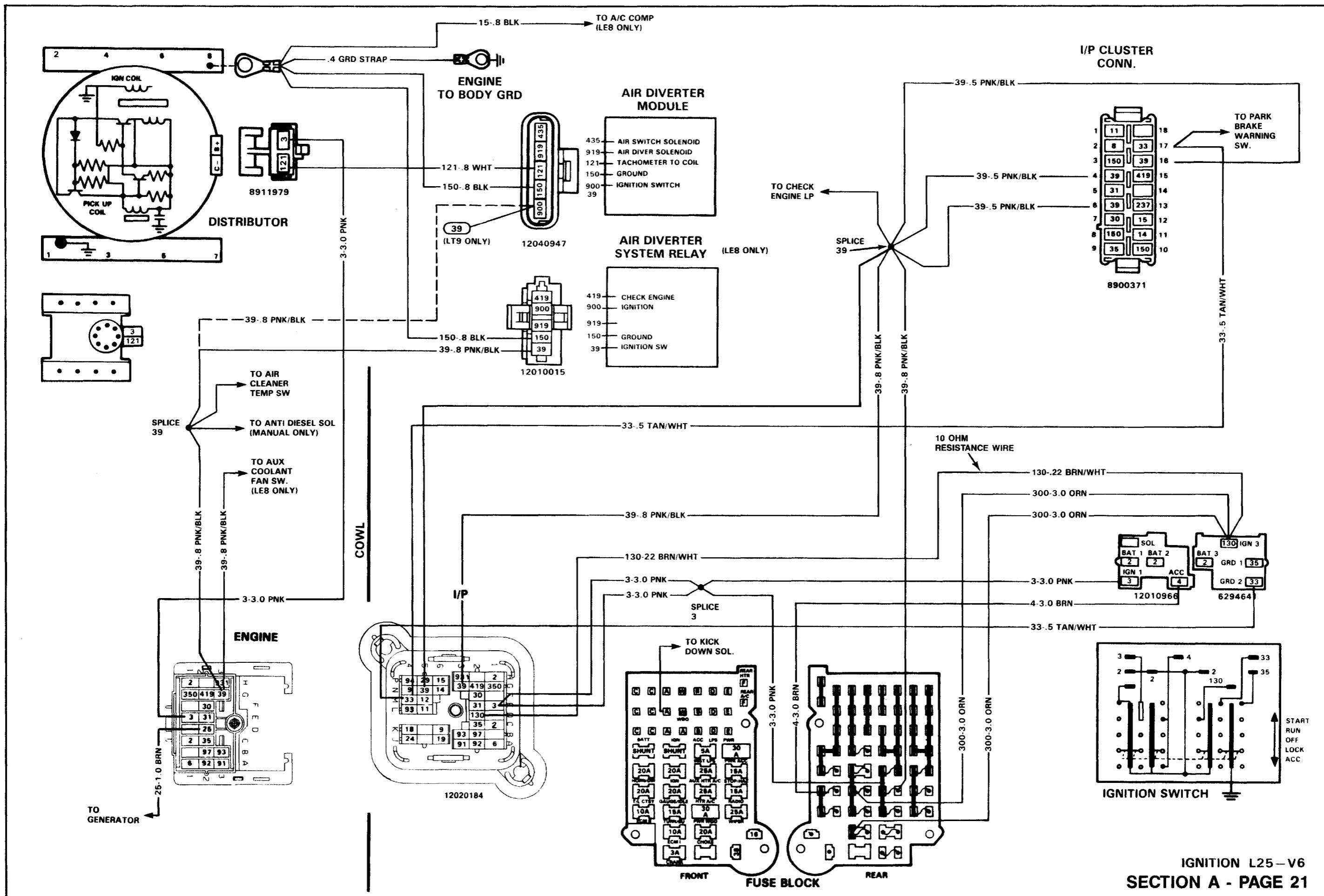


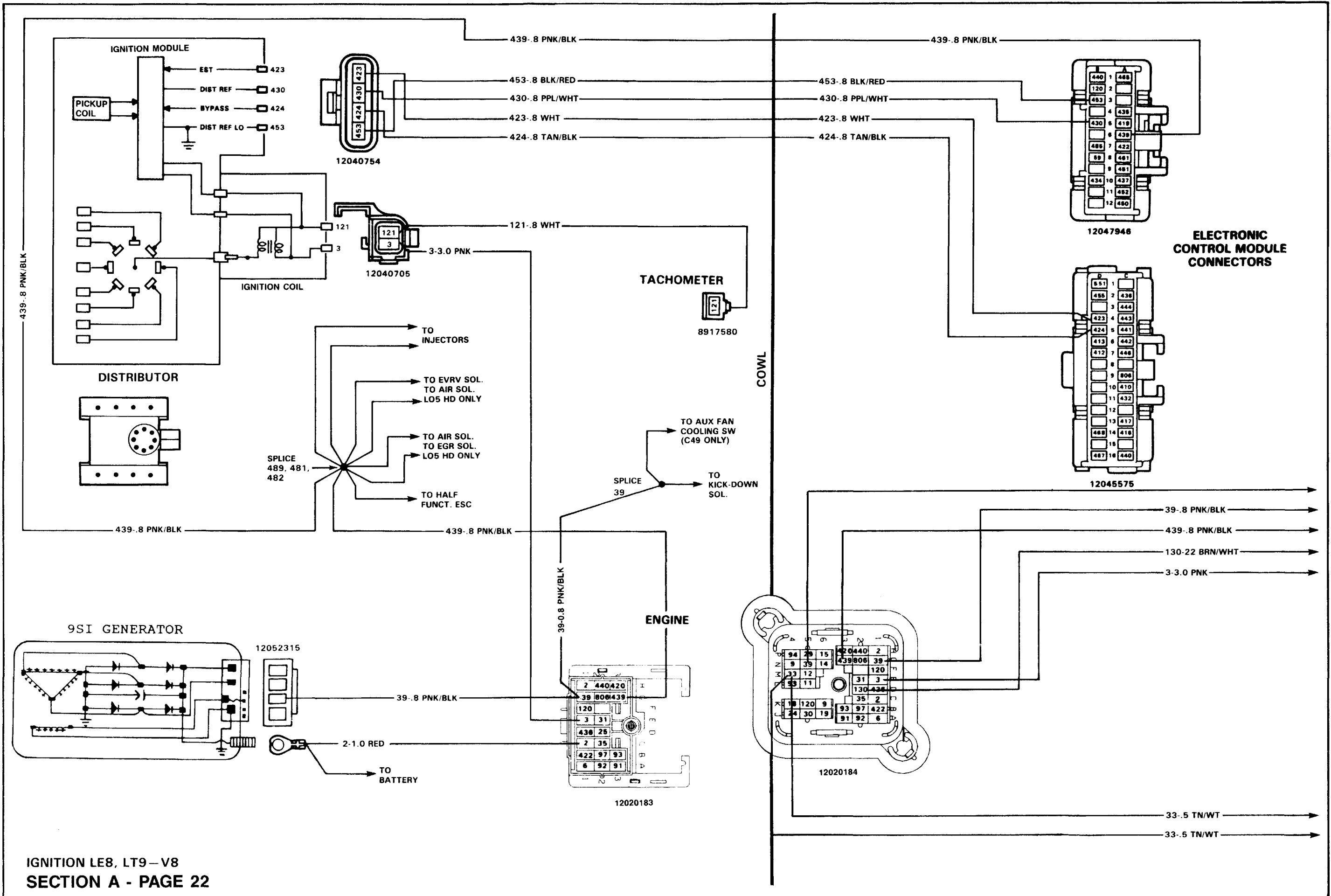




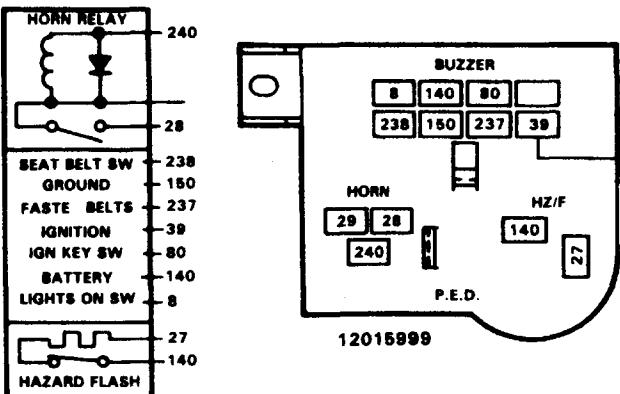
START GAS (LO5, L19)
SECTION A - PAGE 19



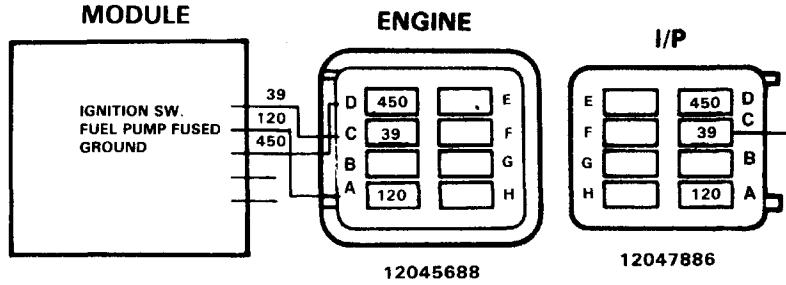




**CONVENIENCE
CENTER**

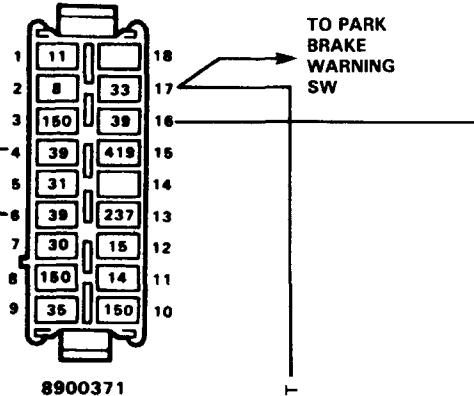


**HOT FUEL HANDLING
MODULE**



TO BRAKE
SWITCH
(MD8 ONLY)

**I/P CLUSTER
CONN.**



SPLICE
39

SPLICE
39

39-8 PNK/BLK

33-5 TAN/WHT

39-8 PNK/BLK

39-5 PNK/BLK

39-5 PNK/BLK

39-5 PNK/BLK

39-8 PNK/BLK

33-5 TAN/WHT

39-8 PNK/BLK

39-8 PNK/BLK

439-8 PNK/BLK

130-22 BRN/WHT

3-3.0 PNK

33-5 TAN/WHT

39-8 PNK/BLK

4-3.0 BRN

33-5 TAN/WHT

300-3.0 ORN

3-3.0 PNK

439-8 PNK/BLK

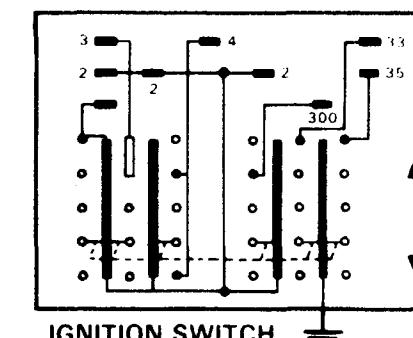
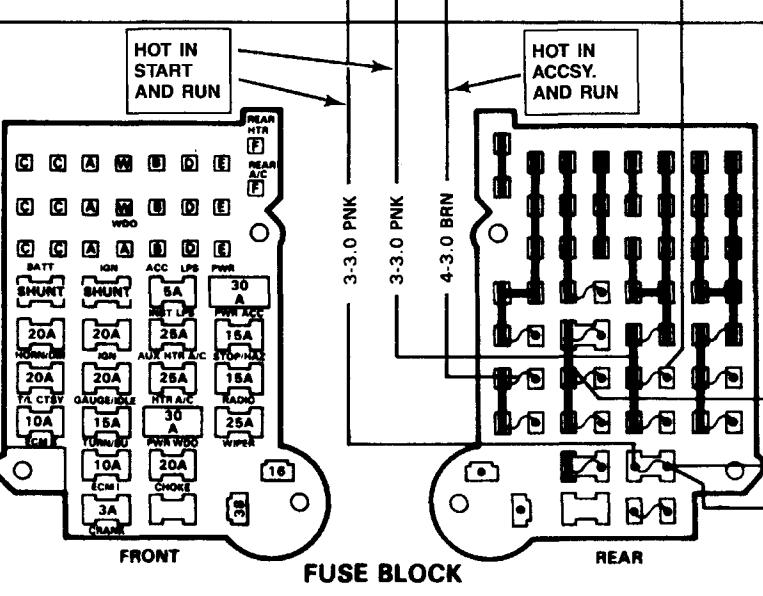
300-3.0 ORN

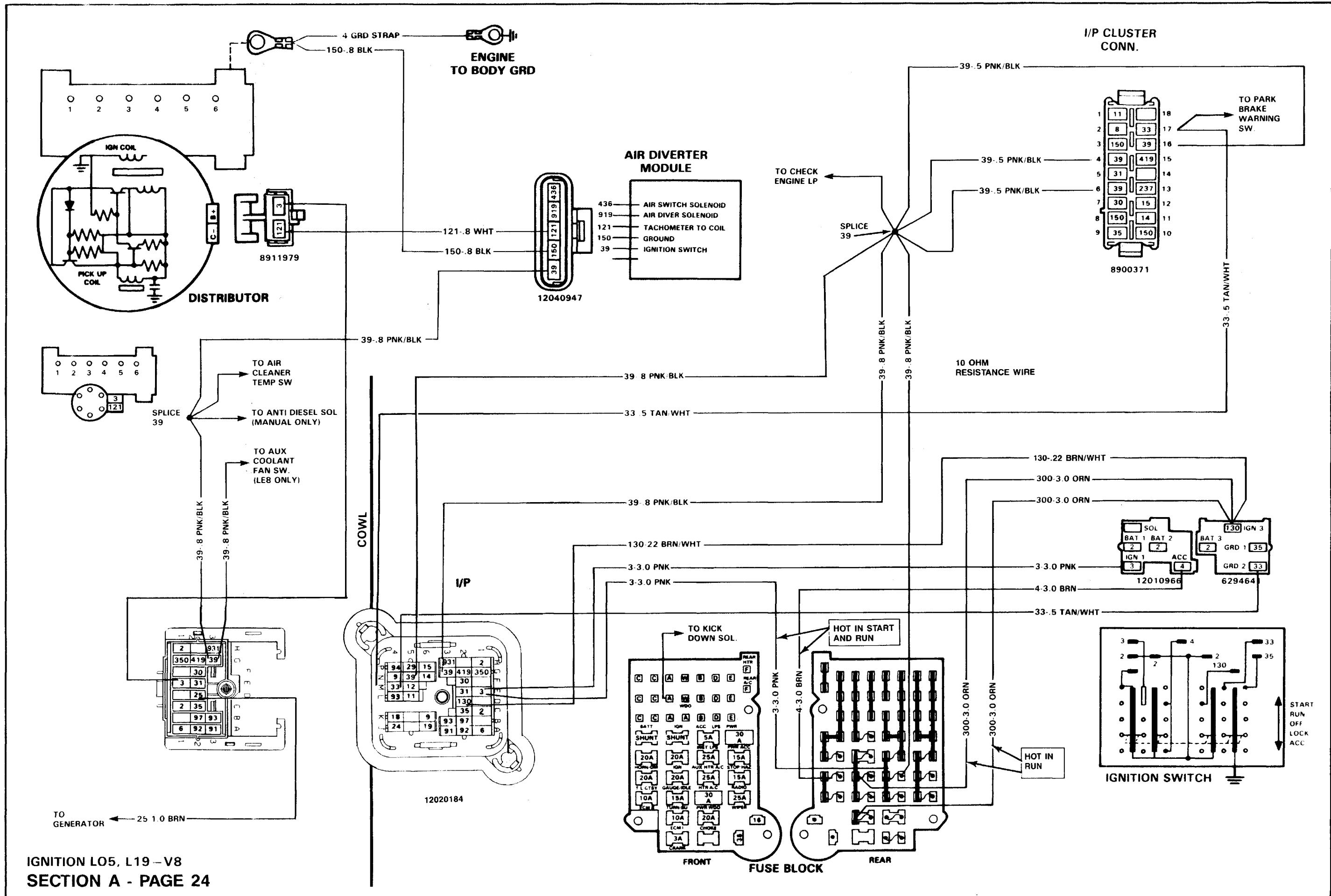
33-5 TAN/WHT

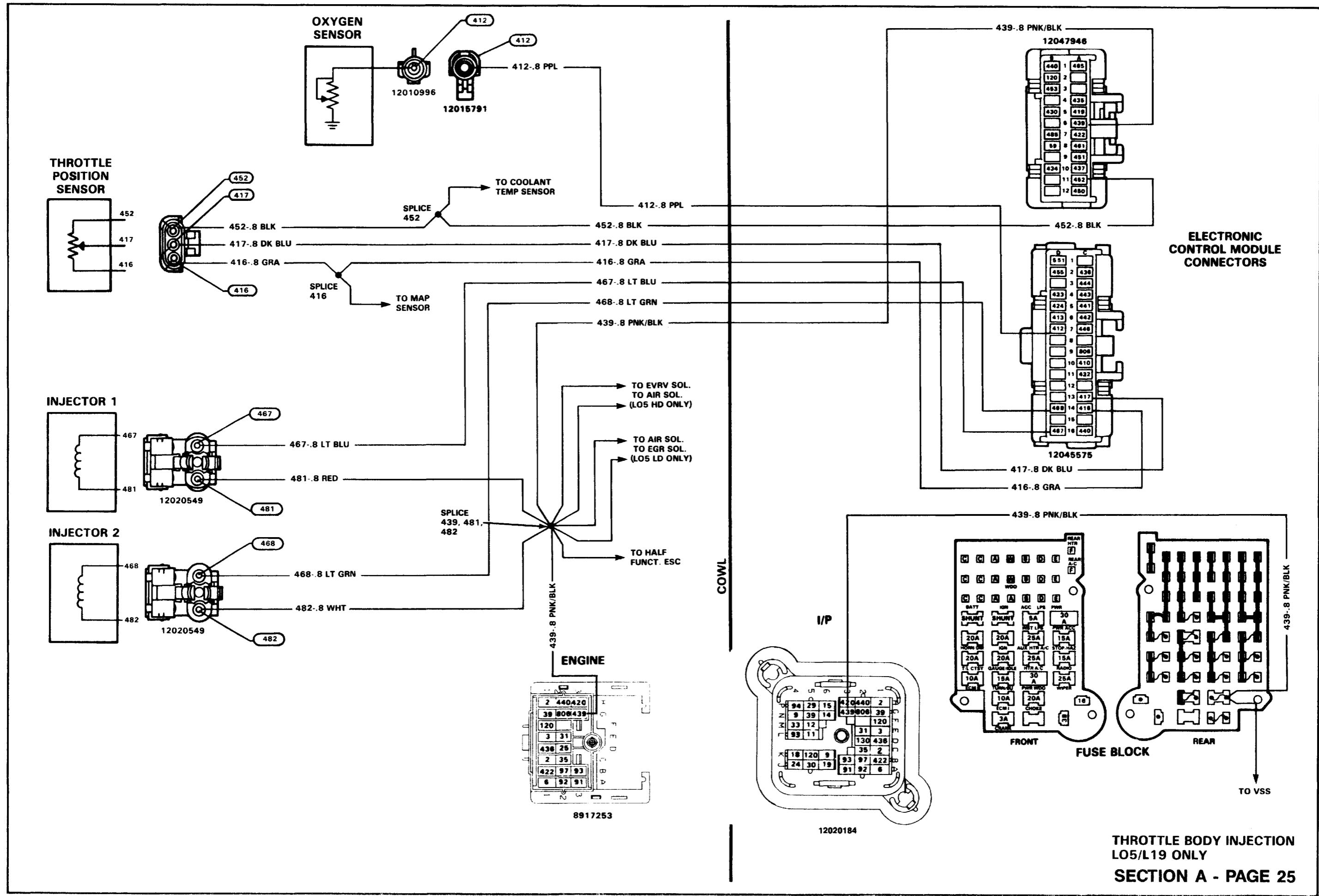
33-5 TAN/WHT

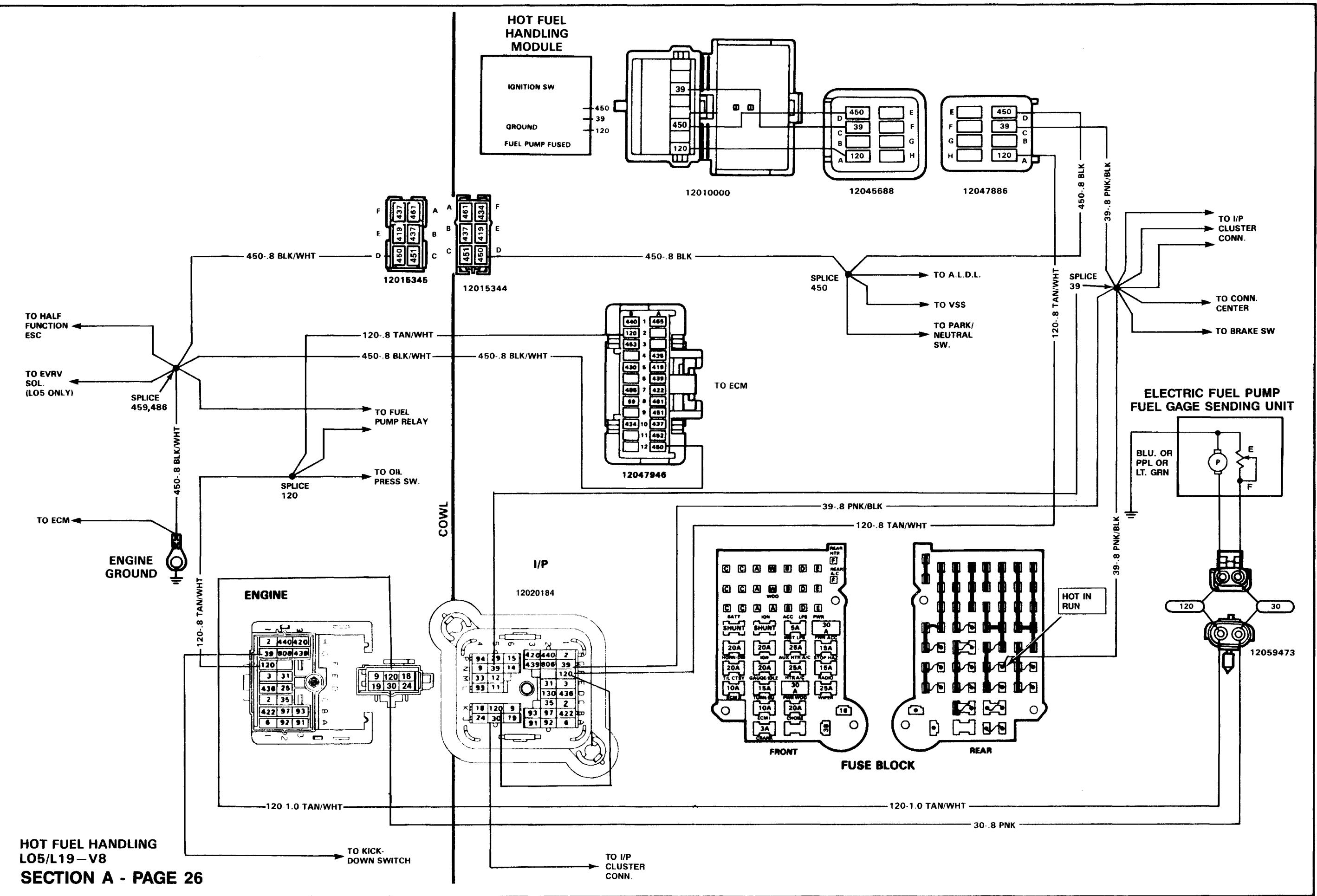
FUSE BLOCK

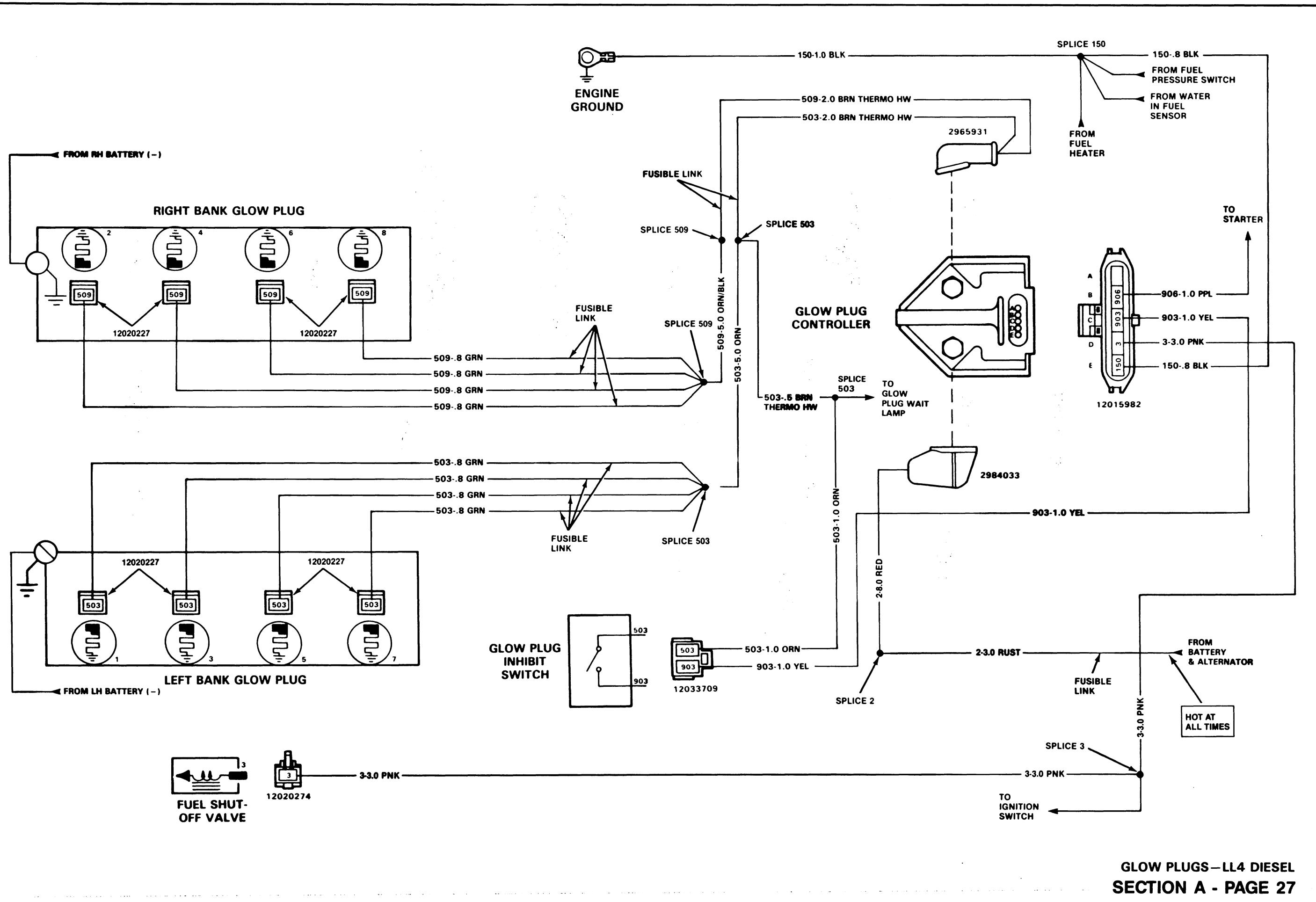
REAR

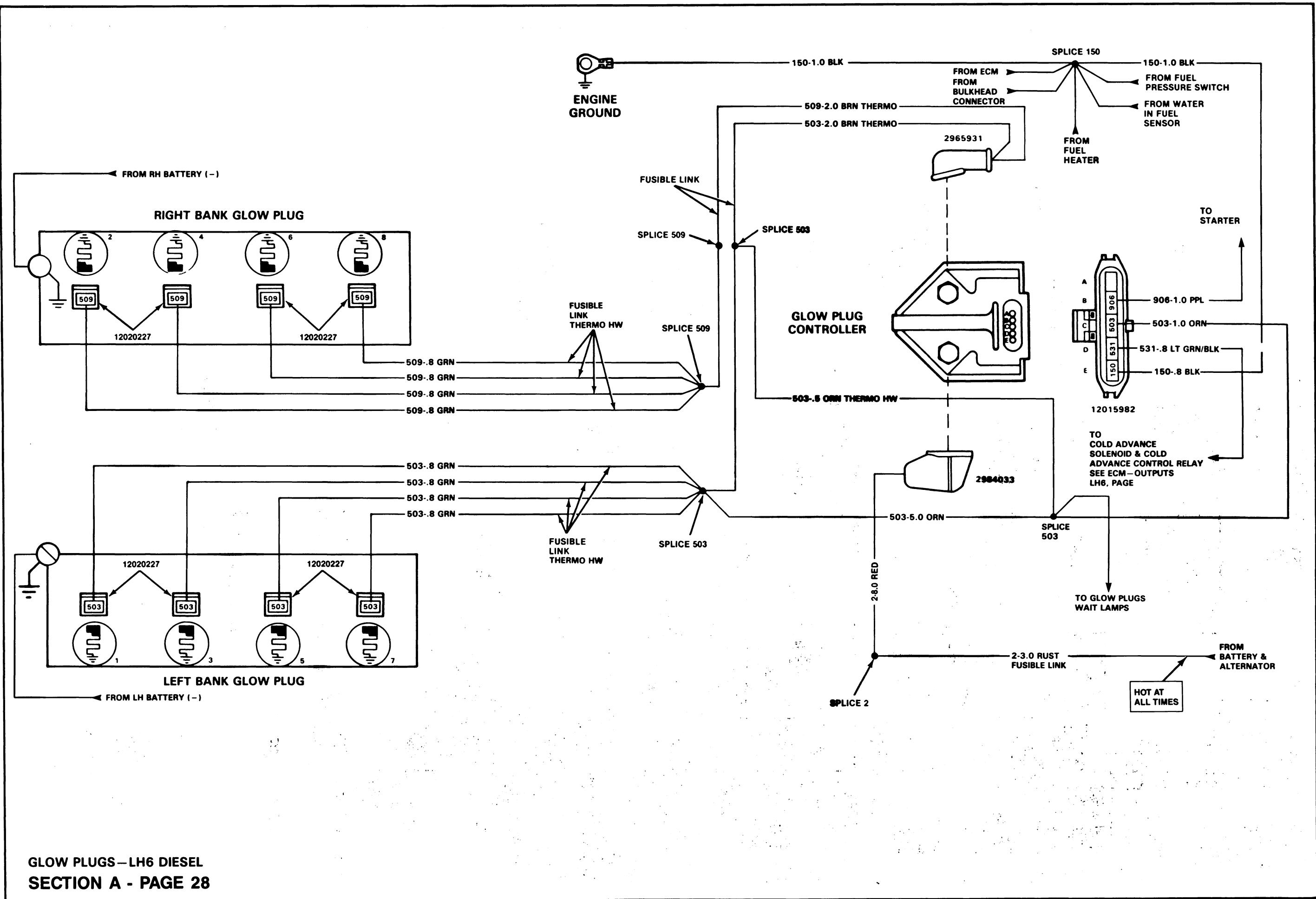


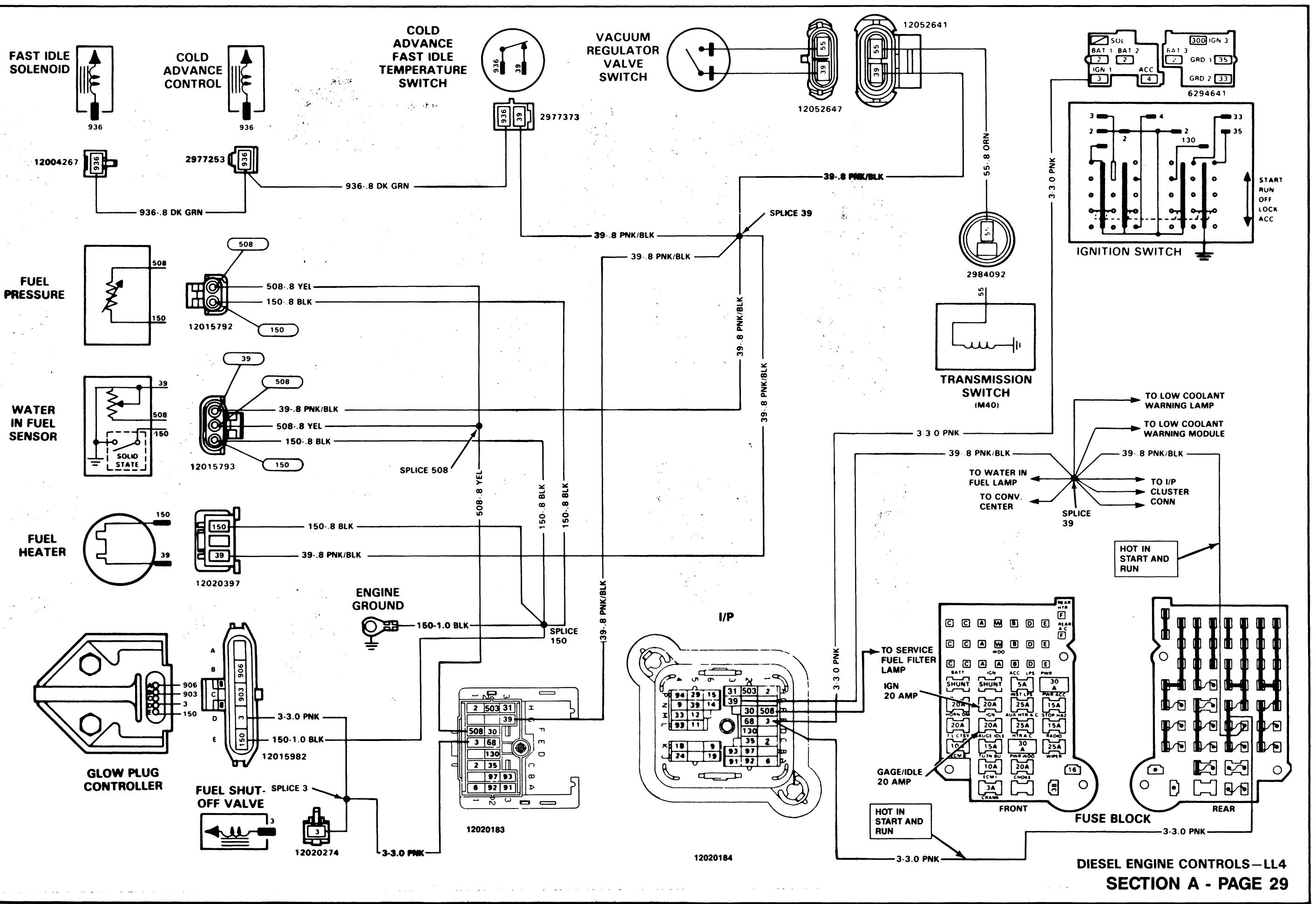


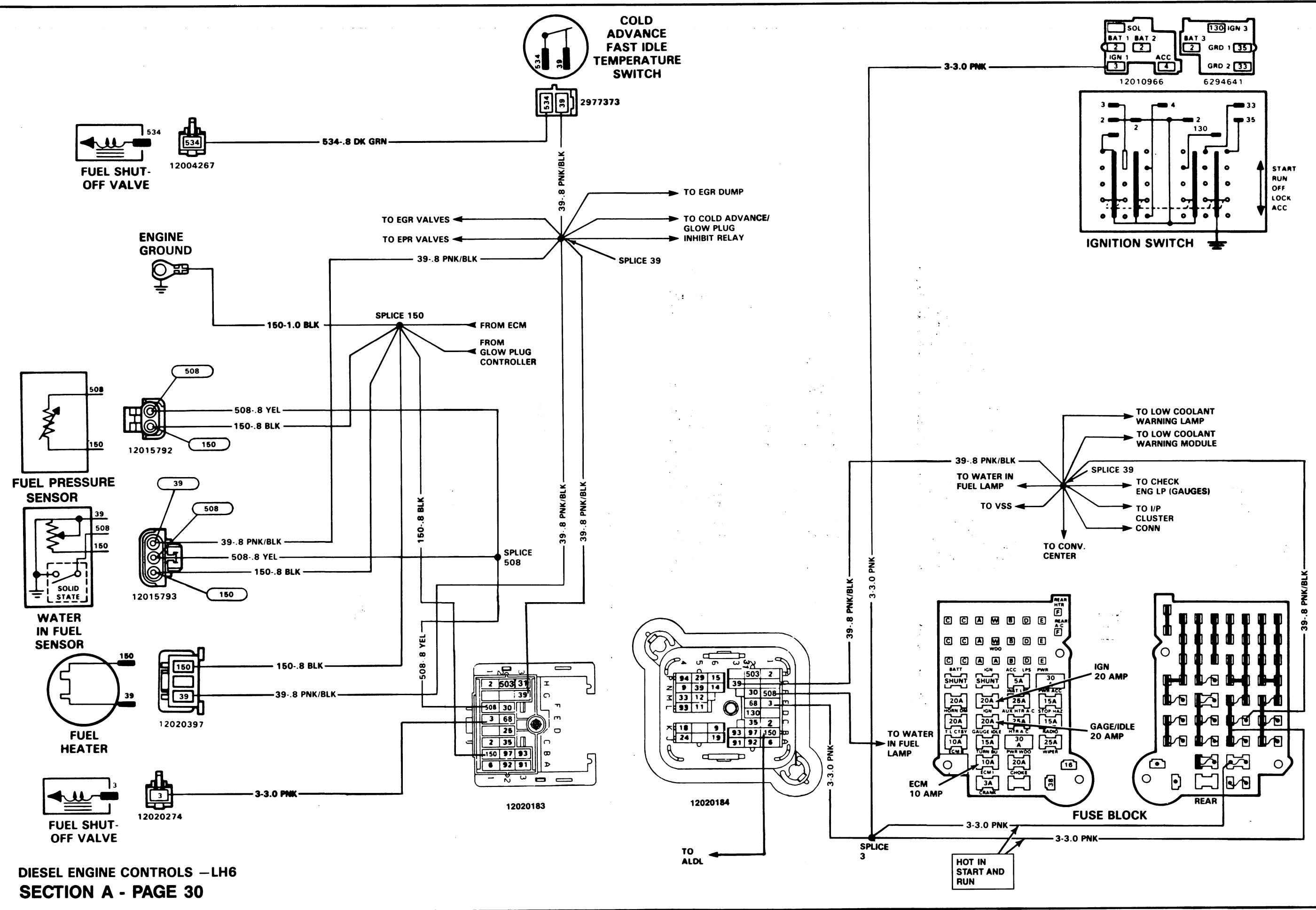


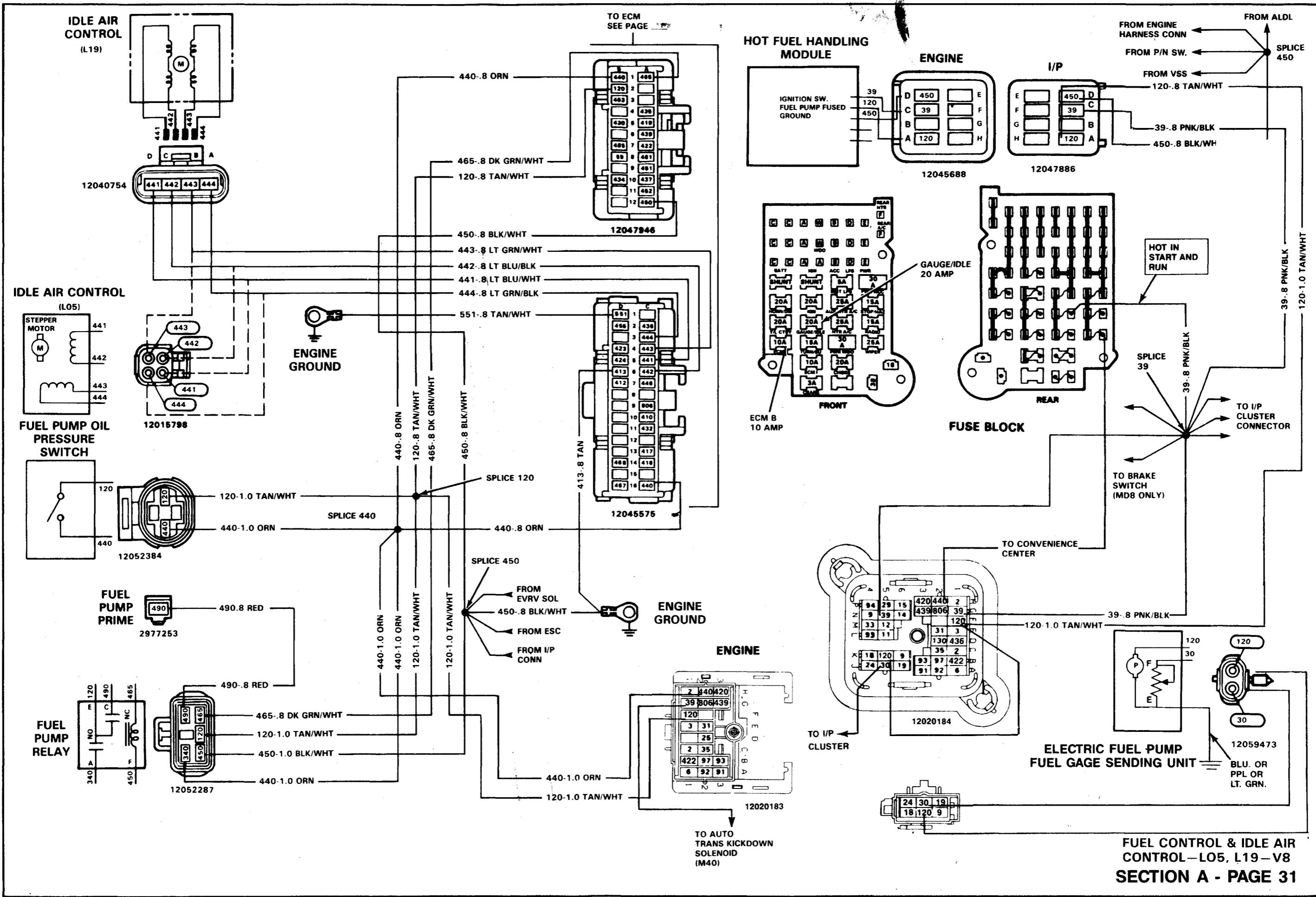


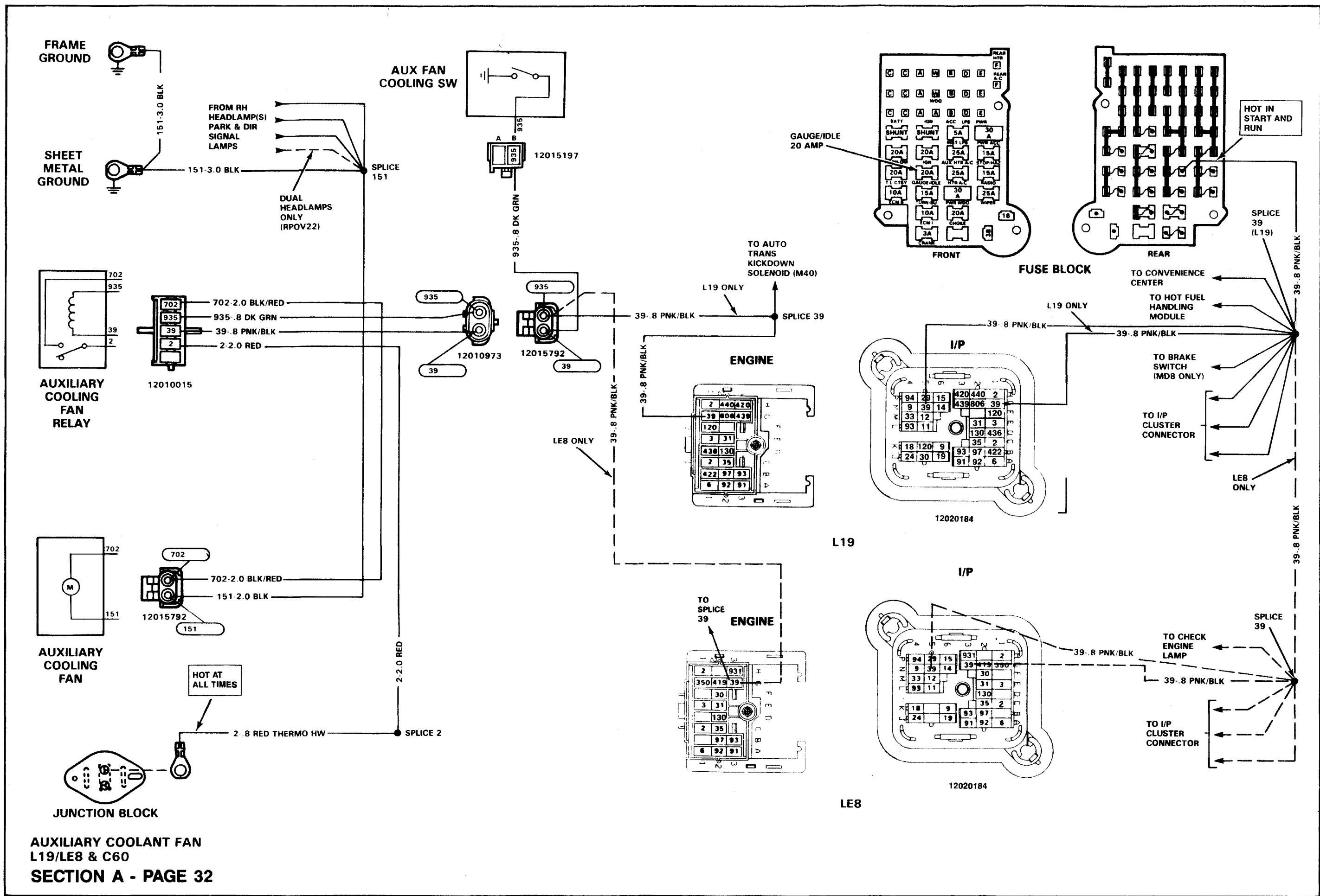


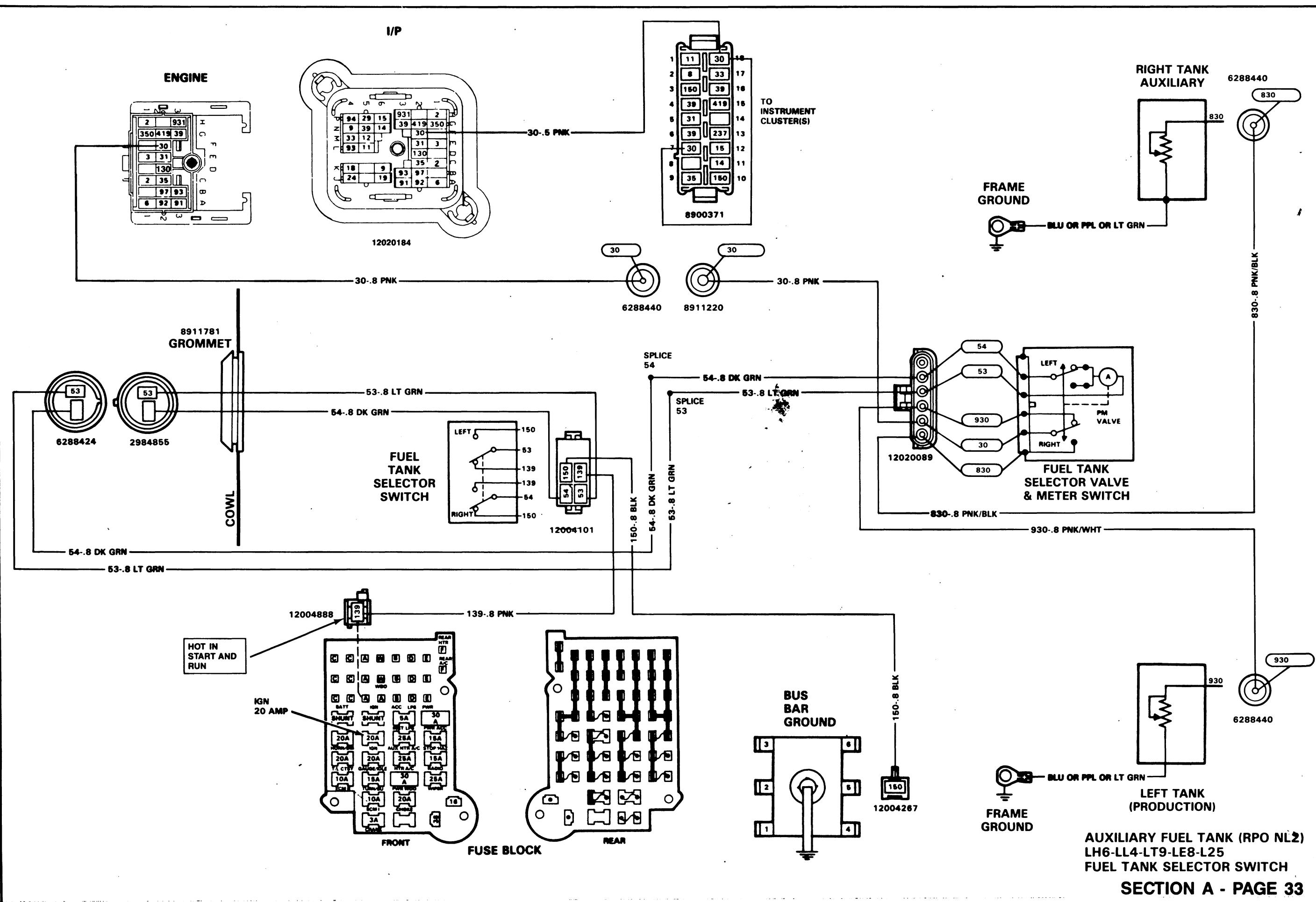


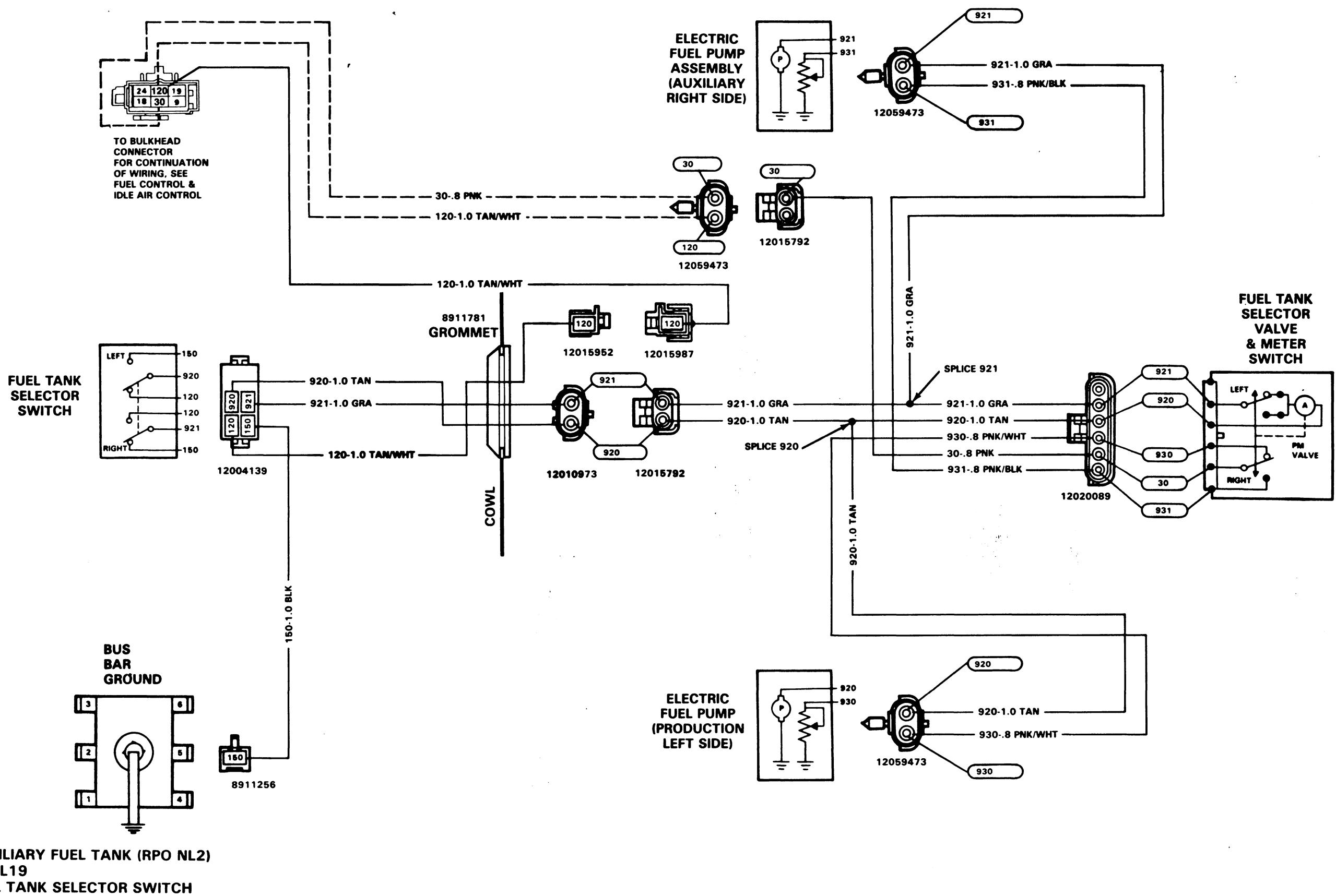


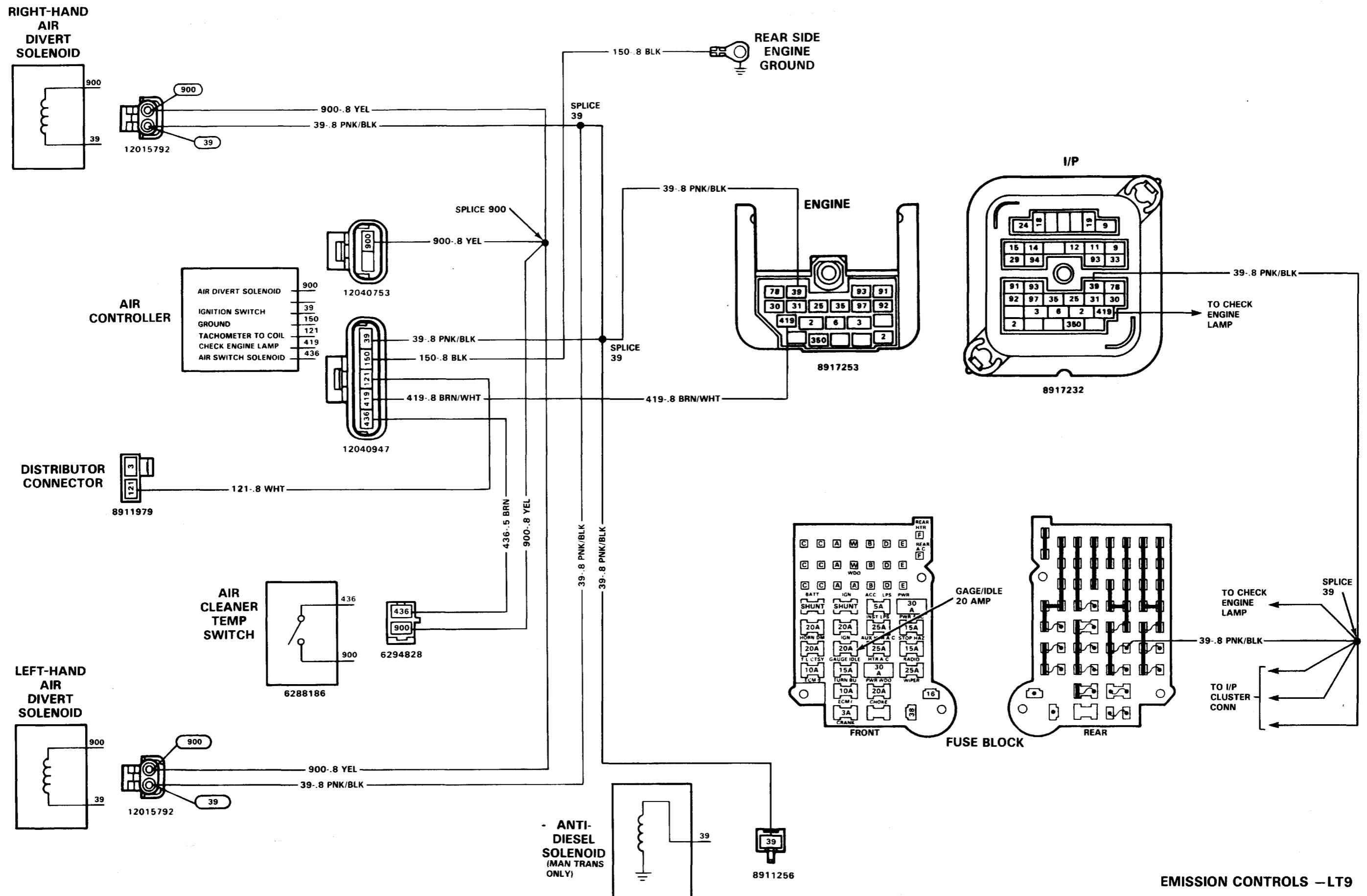


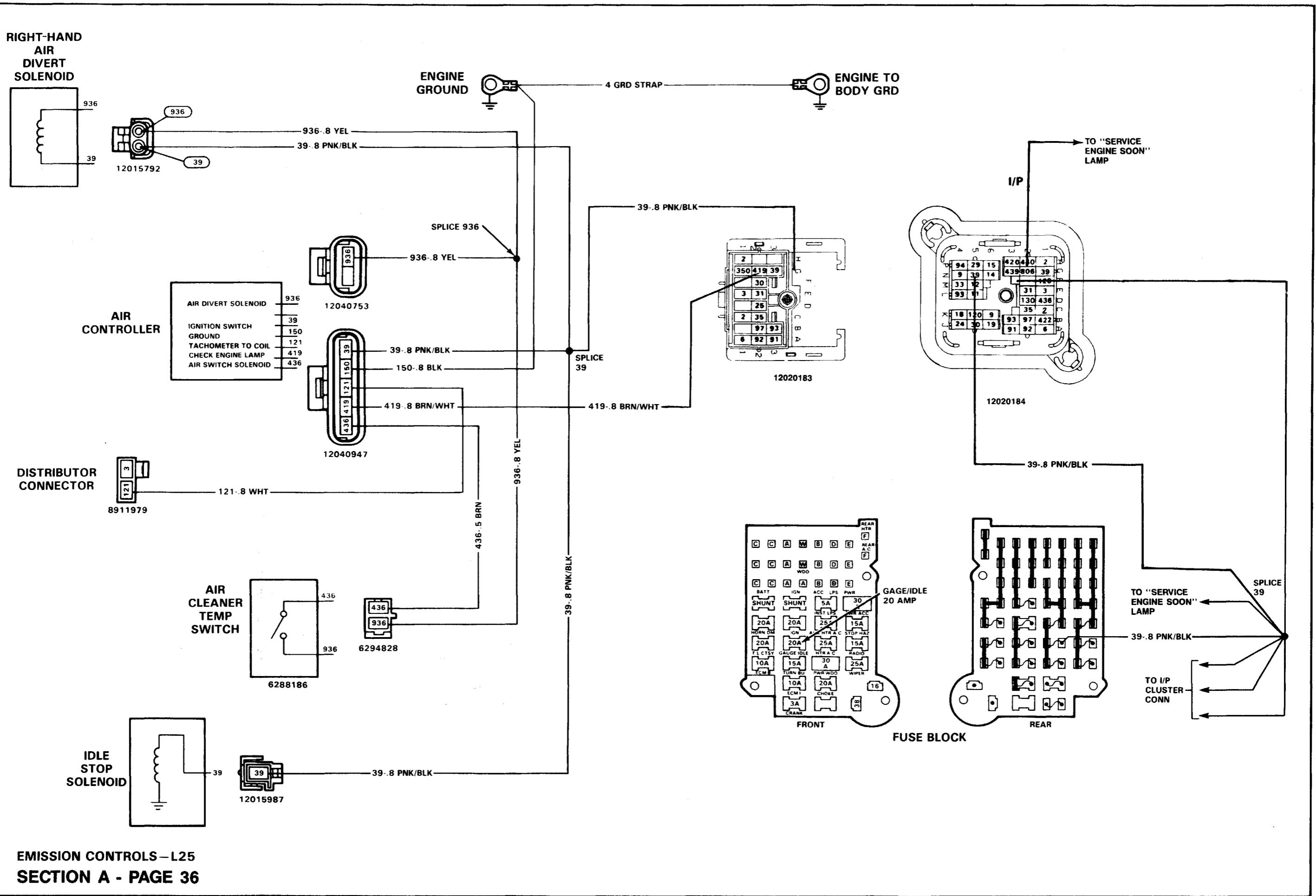


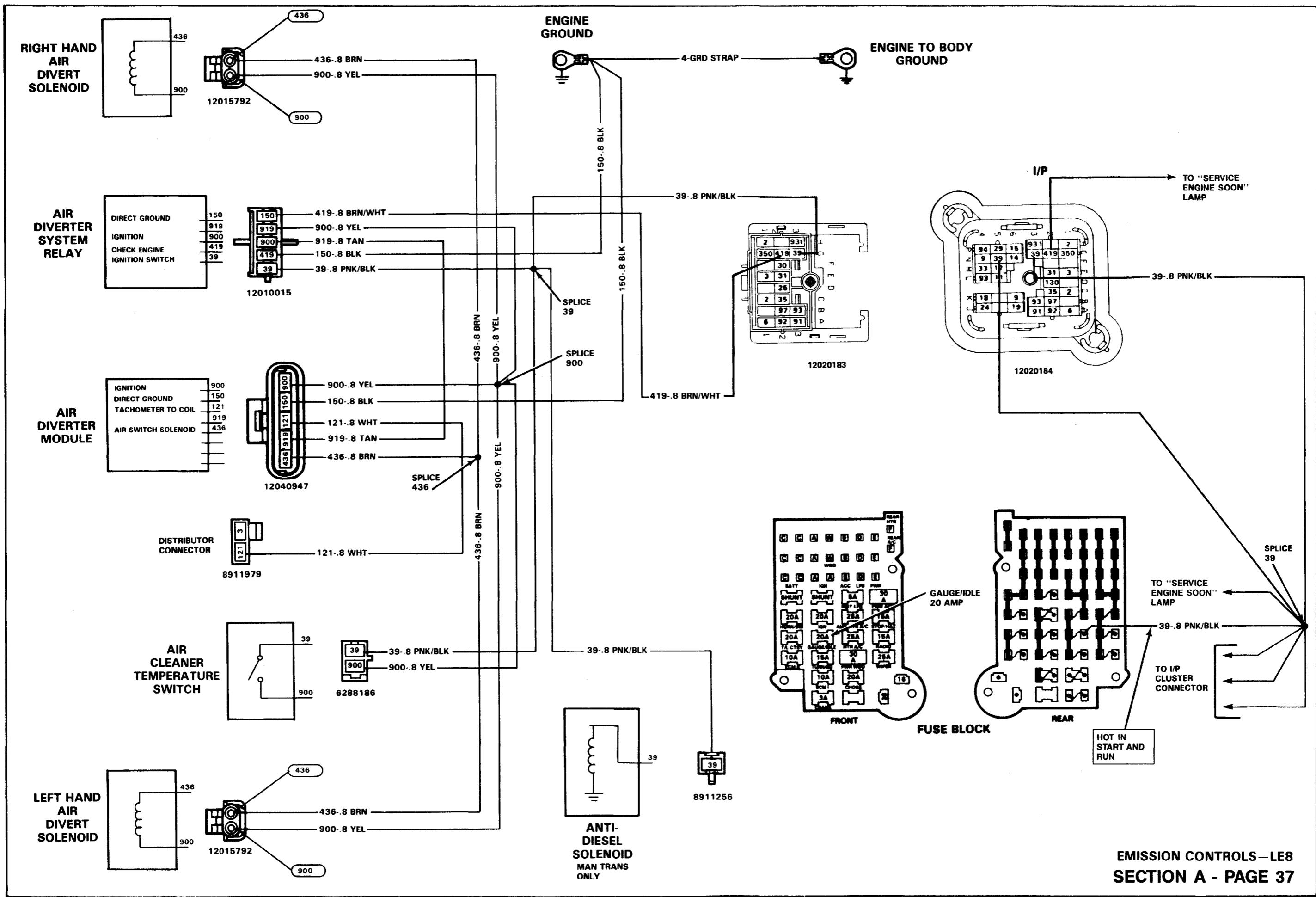


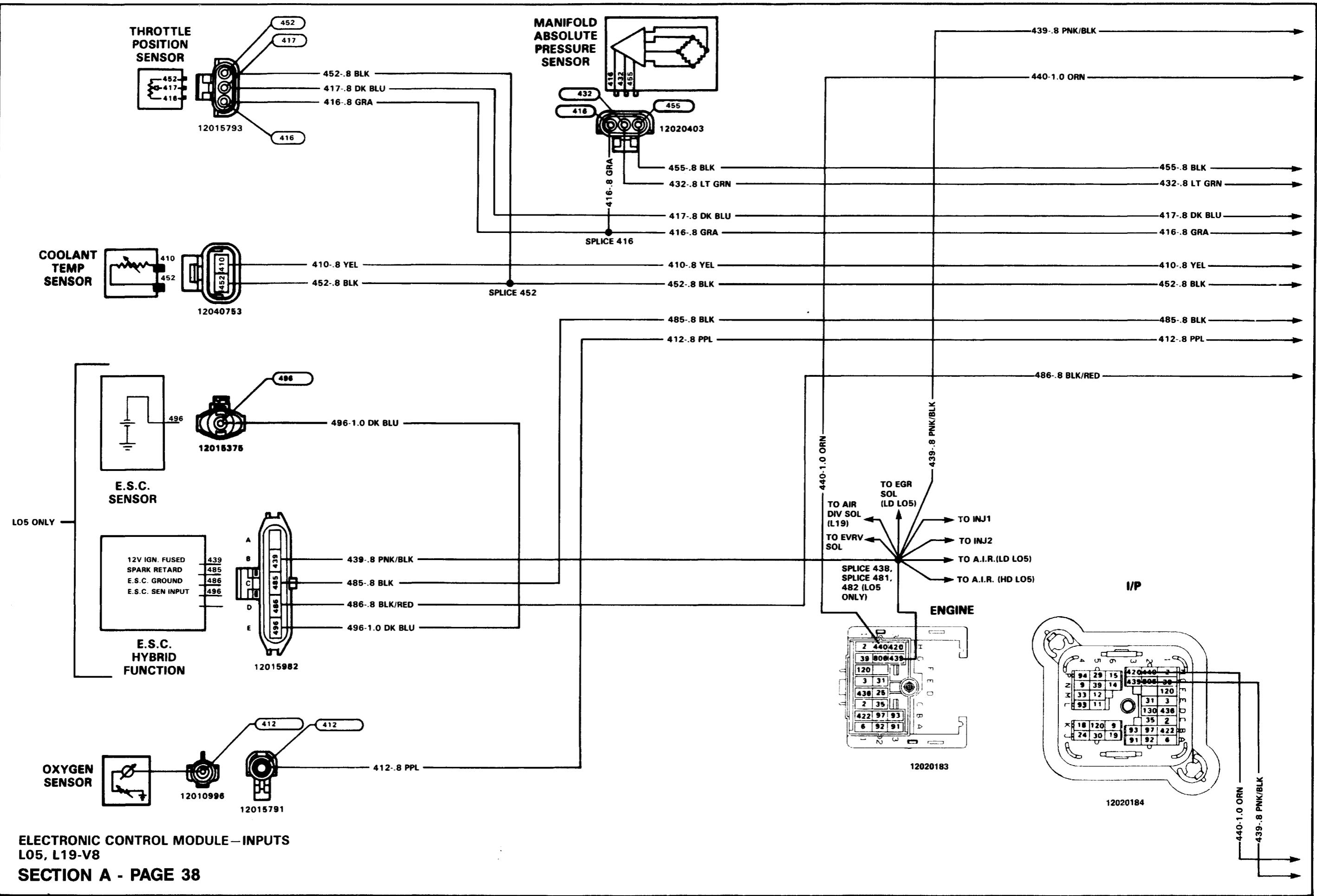


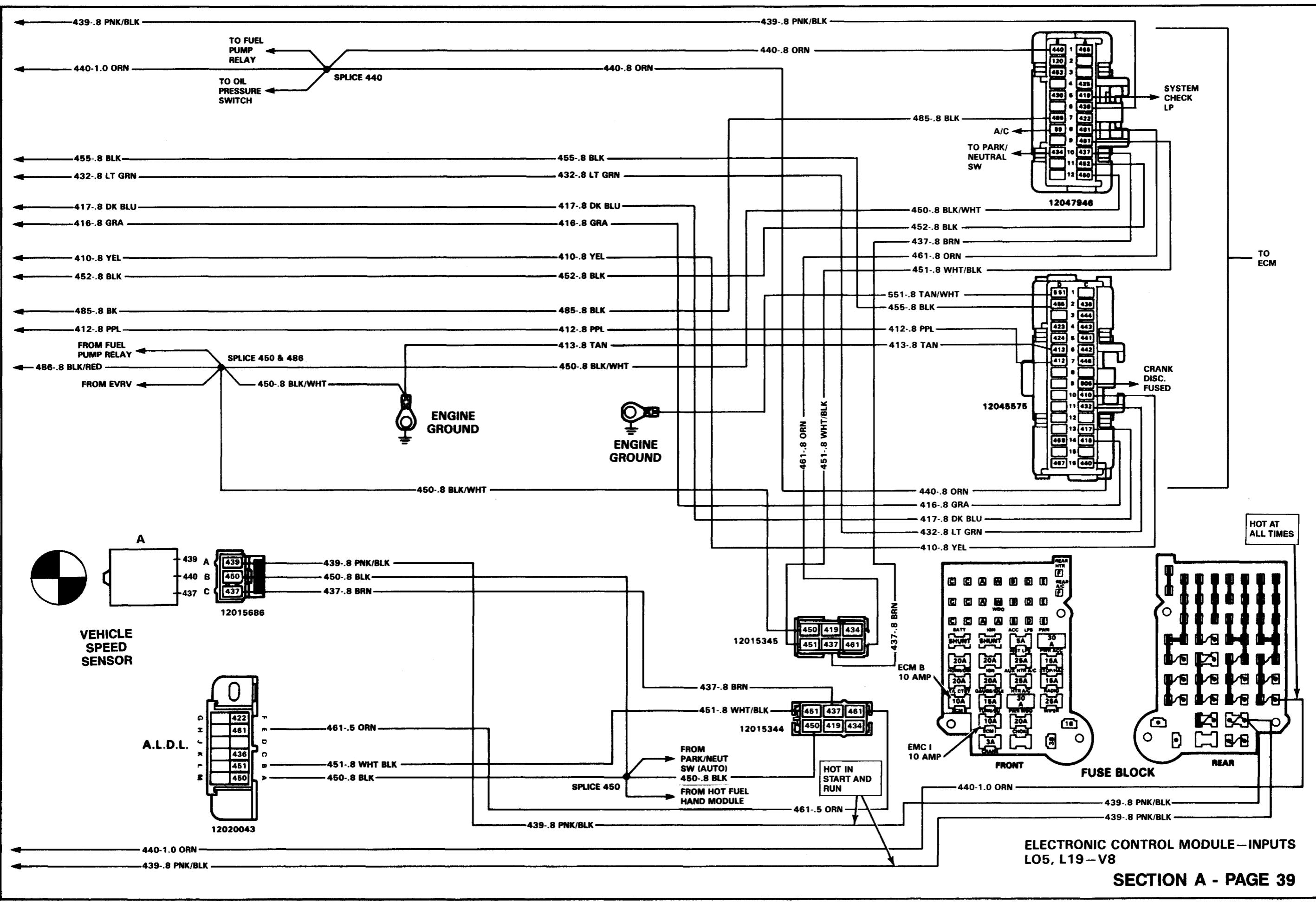


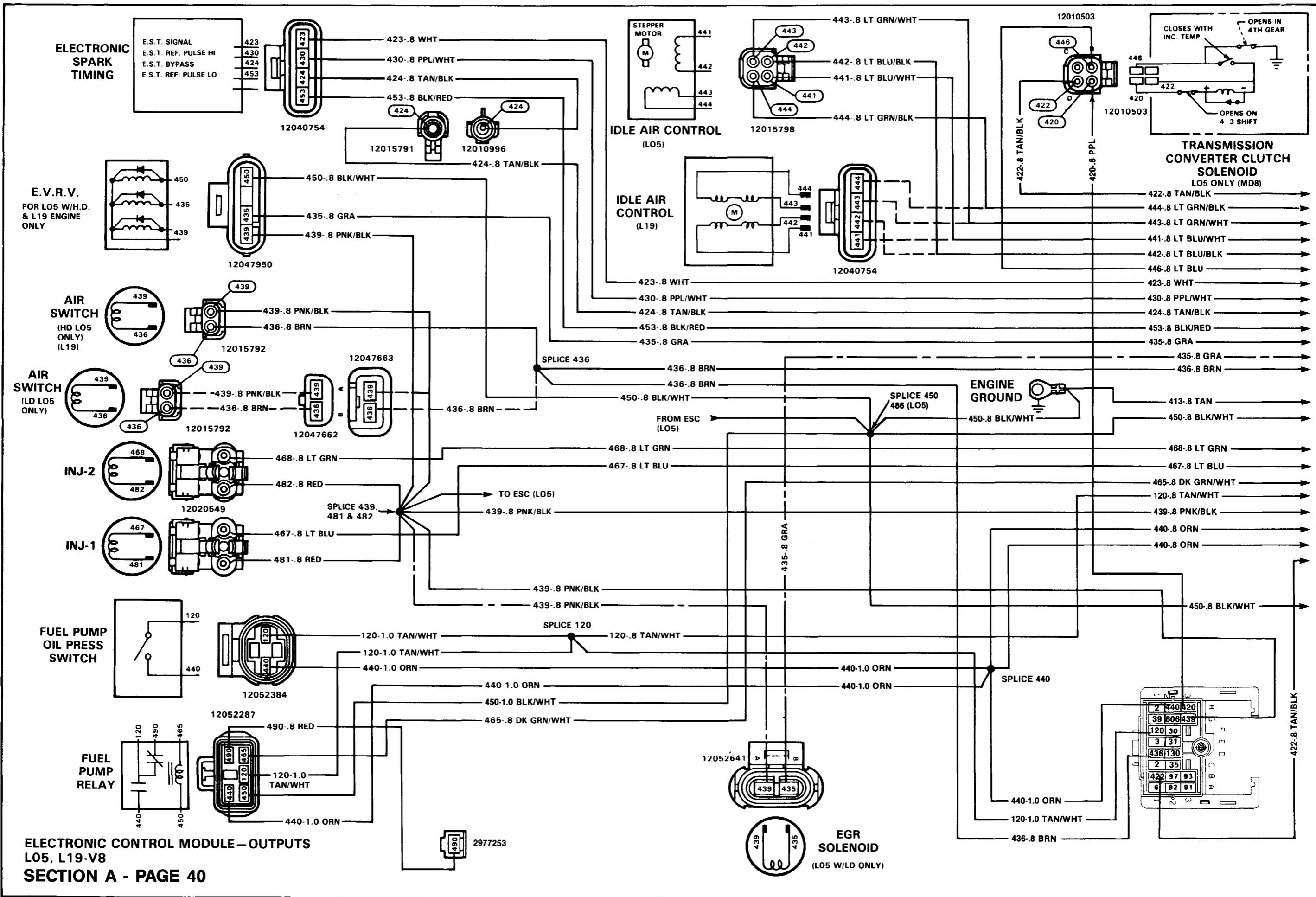


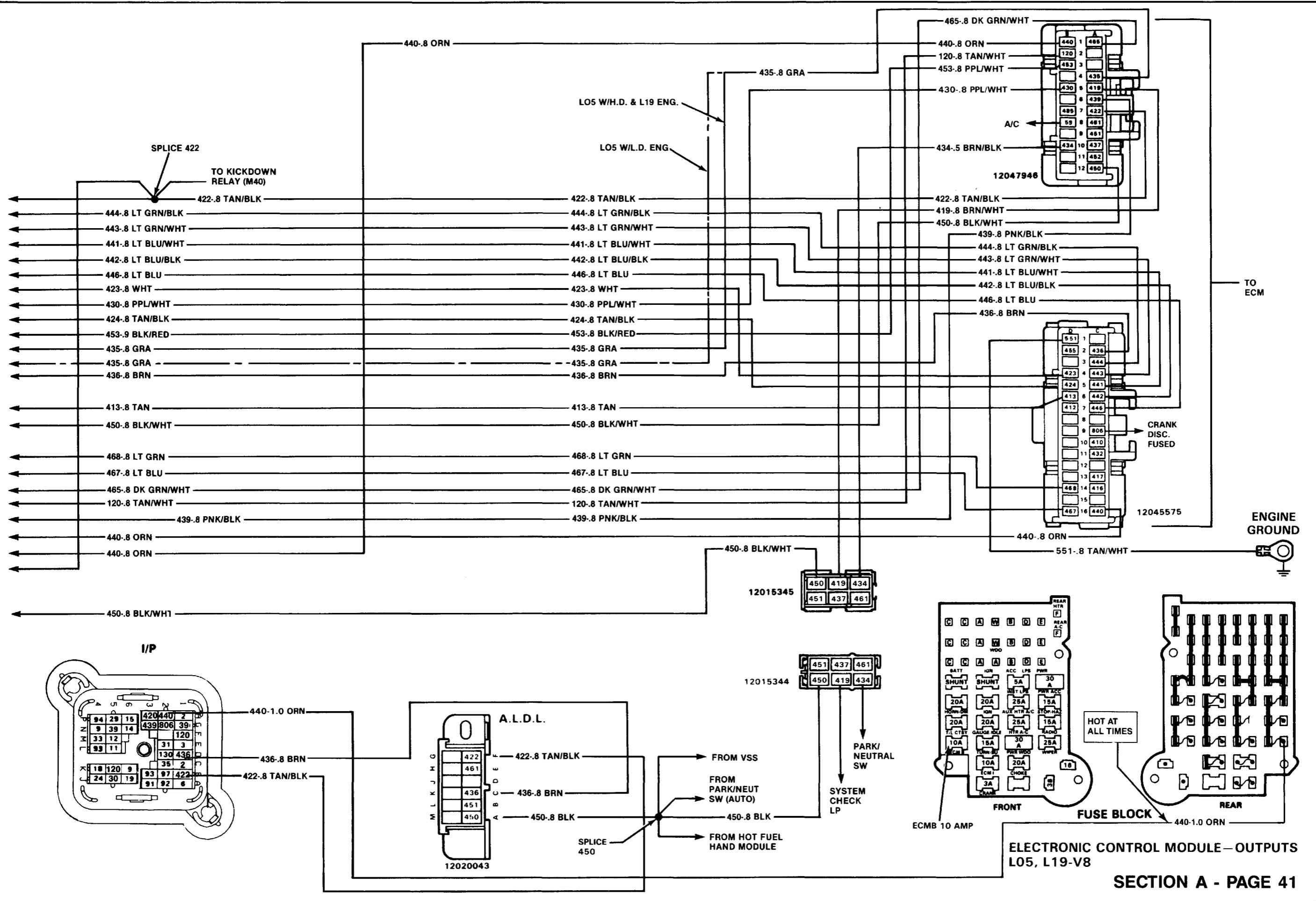












CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
			A2	NOT USED
			A3	NOT USED
435	.8	GRA	A4	EGR SOLENOID
419	.8	BRN/WHT	A5	SYSTEM CHECK LAMP
439	.8	PNK/BLK	A6	12V IGNITION FUSED
* 422	.8	TAN/BLK	A7	TORQUE CONVERTER CLUTCH
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASS'Y LINE DIAG./LINK
437	.8	BRN	A10	SPEED SENSOR
452	.8	BLK	A11	5V RETURN B
450	.8	BLK/WHT	A12	SYSTEM RETURN
440	.8	ORN	B1	12V BATTERY FUSED
120	.8	TAN/WHT	B2	ELEC FUEL PUMP FUSED FEED
453	.8	BLK/RED	B3	DISTRIBUTOR REF LOW
			B4	NOT USED
430	.8	PPL/WHT	B5	DISTRIBUTOR REF HIGH
			B6	NOT USED
● 485	.8	BLK	B7	SPARK RETARD CONTROL
59	.8	DK GRN	B8	AIR CONDITION
			B9	NOT USED
* 434	.5	ORN/BLK	B10	PARK/NEUTRAL SWITCH
			B11	NOT USED
			B12	NOT USED

* AUTO TRANS ONLY

● L05 ONLY

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
436	.8	BRN	C1	NOT USED
444	.8	LT GRN/BLK	C2	AIR SWITCH SOLENOID
443	.8	LT GRN/WHT	C3	STEPPER COIL B LOW
441	.8	LT BLU/WHT	C4	STEPPER COIL B HIGH
442	.8	LT BLU/BLK	C5	STEPPER COIL A HIGH
* 446	.8	LT BLU	C6	STEPPER COIL A LOW
●			C7	A/C CONTROL (4TH GEAR DISCRETE)
806	.8	PPL/WHT	C8	NOT USED
410	.8	YEL	C9	CRANK DISCRETE FUSED
432	.8	LT GRN	C10	COOLANT TEMPERATURE
			C11	MANIFOLD ABSOLUTE PRESS.
			C12	NOT USED
417	.8	DK BLU	C13	THROTTLE POSITION SENSOR
416	.8	GRA	C14	5V SENSOR REFERENCE
			C15	NOT USED
440	.8	ORN	C16	12V BATTERY FUSED
551	.8	TAN/WHT	D1	SYSTEM GROUND
455	.8	PPL	D2	5V RETURN A
			D3	NOT USED
423	.8	WHT	D4	HEI SPARK TIMING
424	.8	TAN/BLK	D5	HEI BYPASS
413	.8	TAN	D6	OXYGEN SENSOR LOW
412	.8	PPL	D7	OXYGEN SENSOR HIGH
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
			D13	NOT USED
468	.8	LT GRN	D14	INJECTOR B DRIVE
467	.8	LT BLU	D15	NOT USED
			D16	INJECTOR A DRIVE

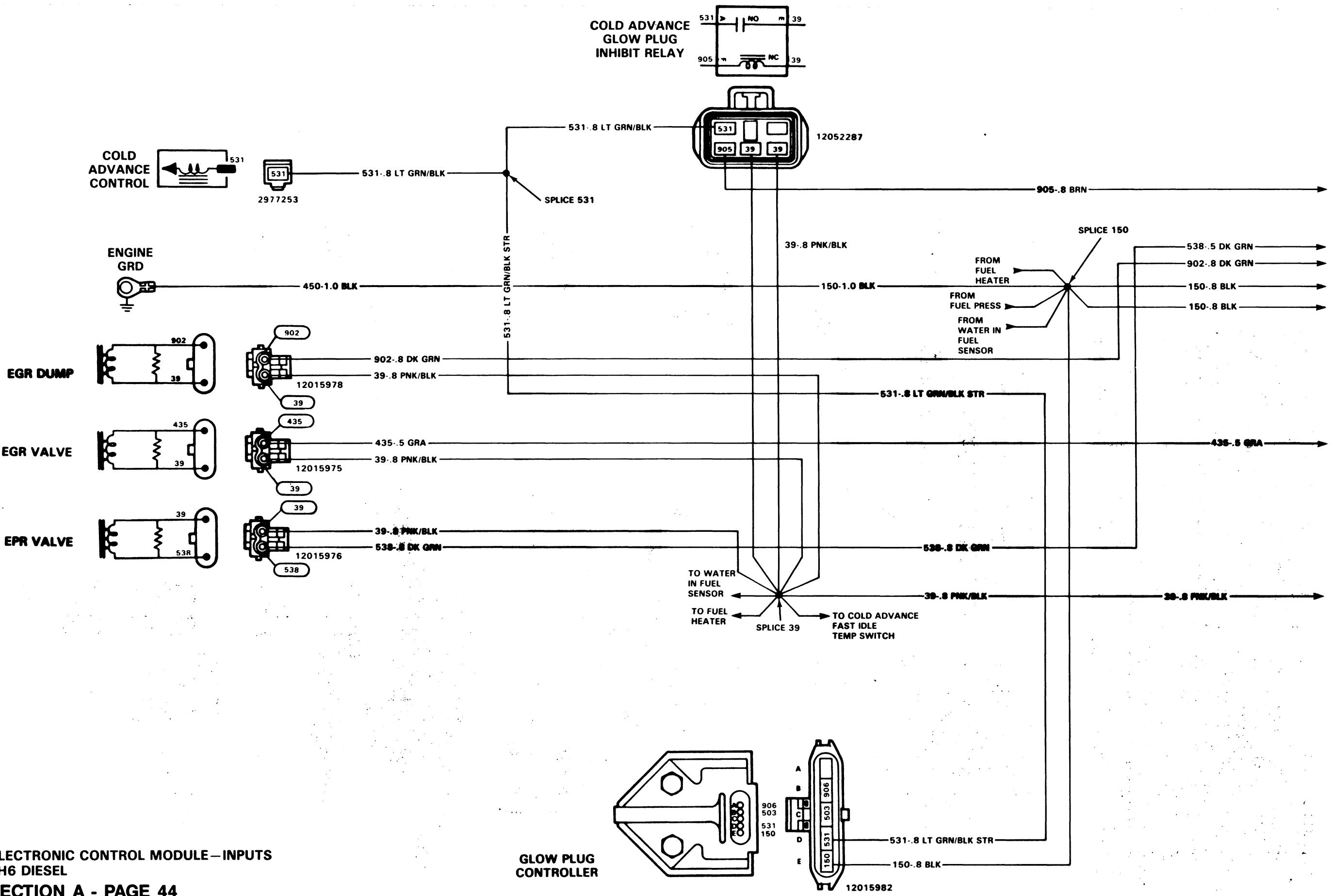
* AUTO TRANS ONLY

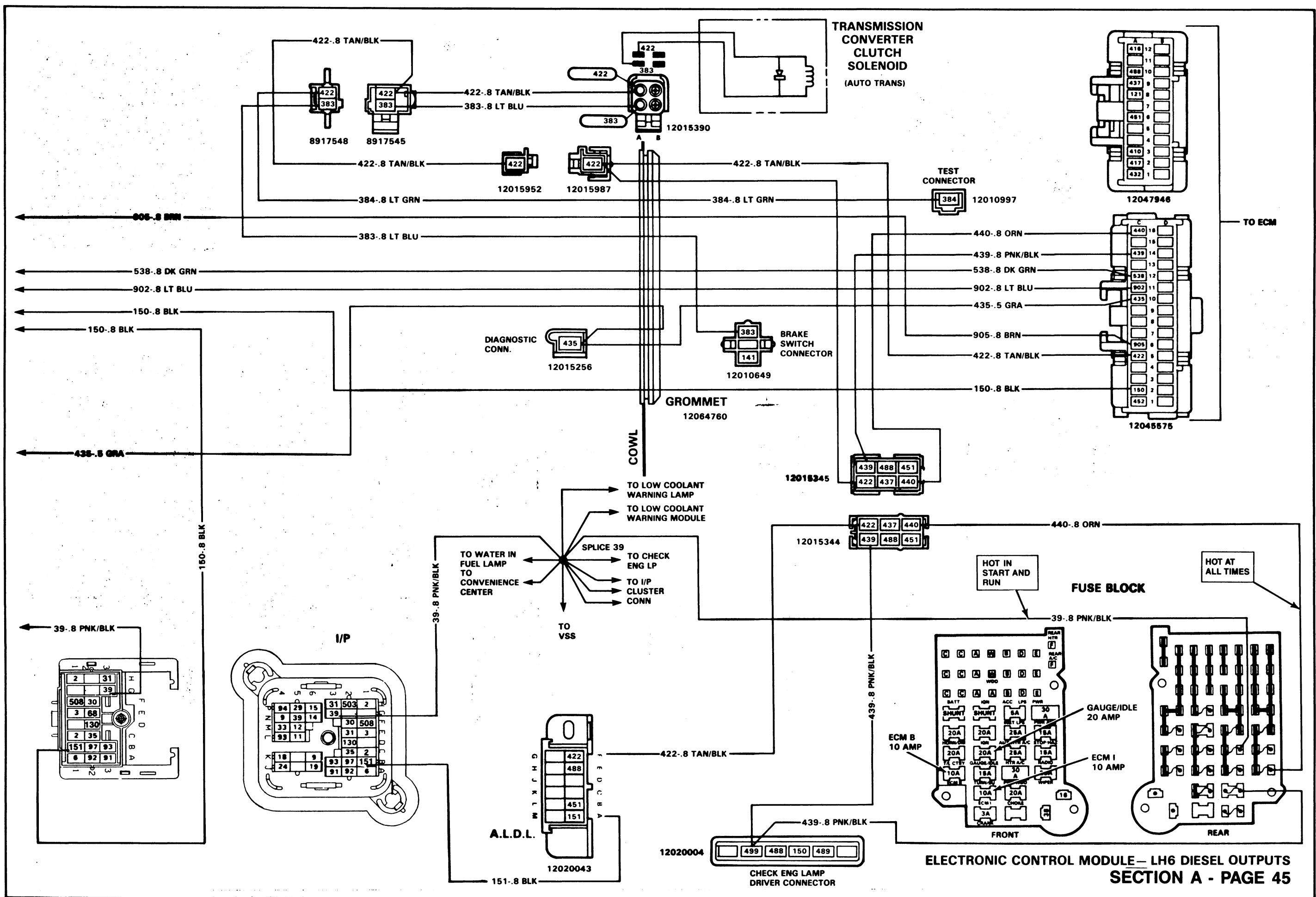
● L05 ONLY

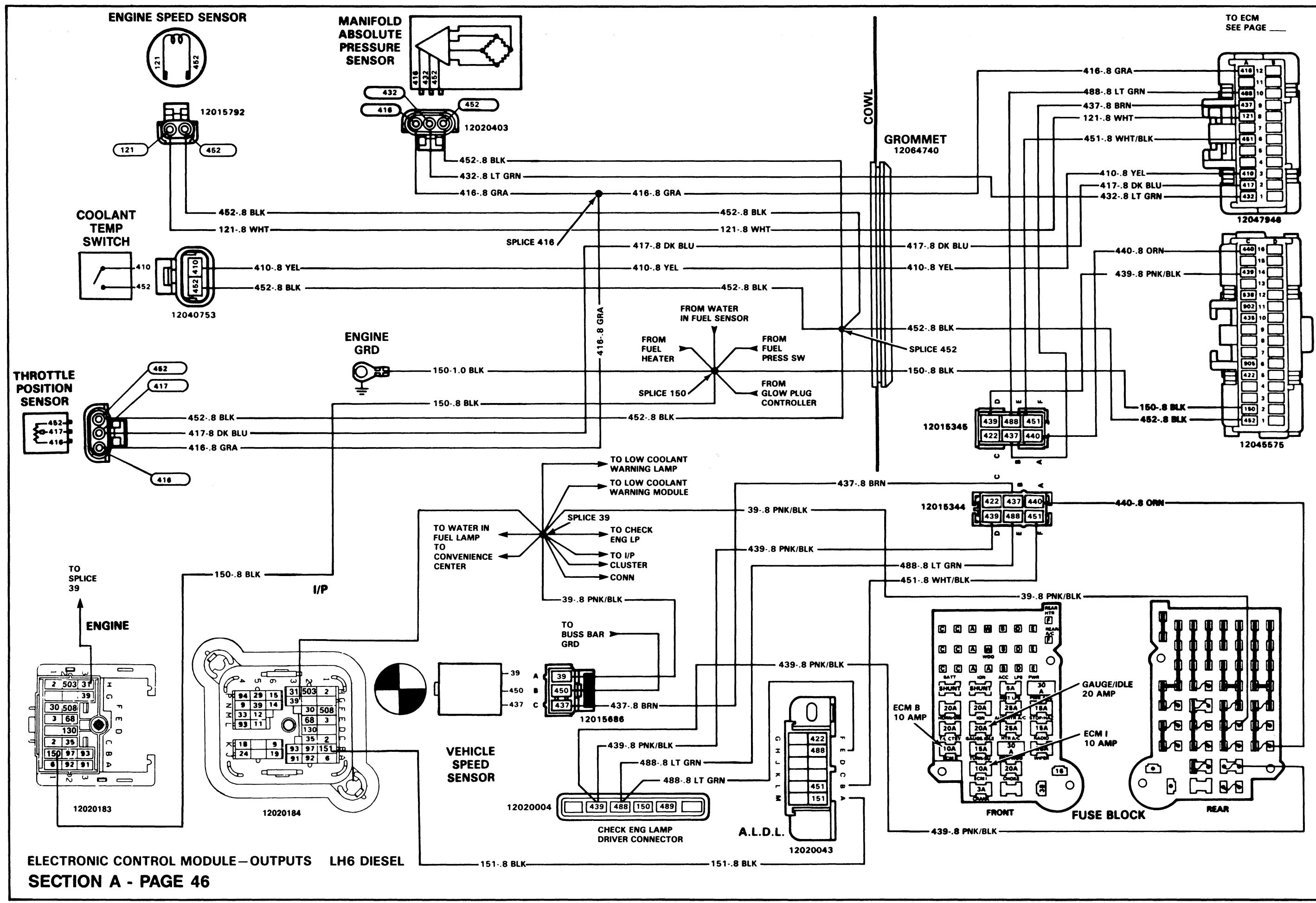
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
432	.8	LT GRN	A1	MANIFOLD ABSOLUTE PRESS
417	.8	DK BLU	A2	THROTTLE POSITION SWITCH
410	.8	YEL	A3	COOLANT TEMP. SENSOR
			A4	NOT USED
			A5	NOT USED
451	.8	WHT/BLK	A6	ASS'Y LINE DIAG./LINK
			A7	NOT USED
121	.8	WHT	A8	ENGINE SPEED SENSOR
437	.8	BRN	A9	VEHICLE SPEED SENSOR
488	.8	LT GRN	A10	ASS'Y LINE DIAG./LINK
			A11	NOT USED
416	.8	GRA	A12	THROTTLE POSITION SWITCH & MANIFOLD ABSOLUTE PRESS.
			B1	NOT USED
			B2	NOT USED
			B3	NOT USED
			B4	NOT USED
			B5	NOT USED
			B6	NOT USED
			B7	NOT USED
			B8	NOT USED
			B9	NOT USED
			B10	NOT USED
			B11	NOT USED
			B12	NOT USED

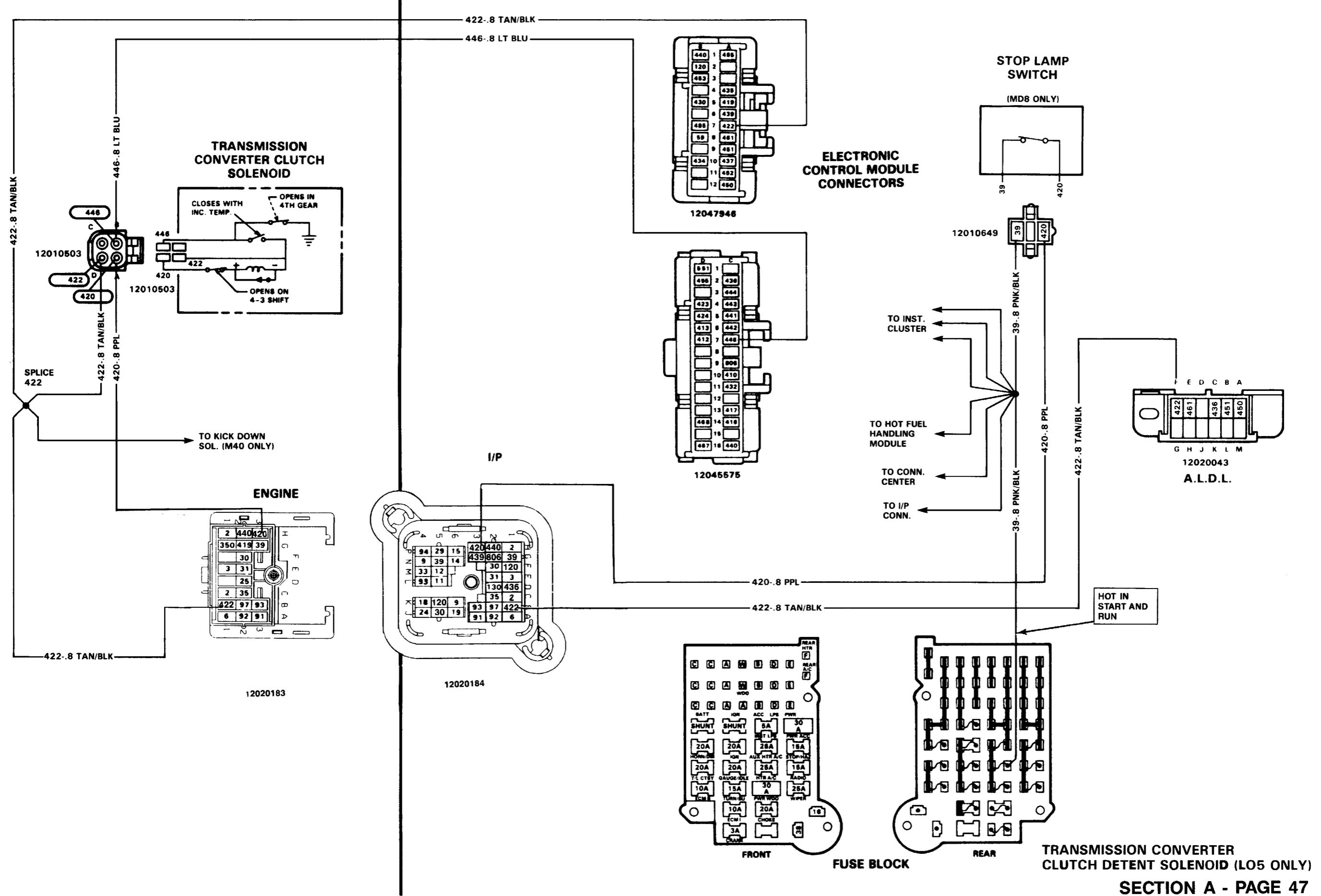
CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
452	.8	BLK	C1	SYSTEM RETURN
150	.8	BLK	C2	SYSTEM GROUND
			C3	NOT USED
			C4	NOT USED
* 422	.8	TAN/BLK	C5	TORQUE CONVERTER CLUTCH
905	.8	BRN	C6	COLD ADVANCE/GLOW PLUG INHIBIT RELAY
			C7	NOT USED
			C8	NOT USED
			C9	NOT USED
435	.5	GRA	C10	EGR DIAGNOSTIC CONNECTOR
902	.8	LT BLU	C11	EGR SOLENOID
538	.8	DK GRN	C12	EPR SOLENOID
			C13	NOT USED
439	.8	PNK/BLK	C14	12V IGNITION FUSED
			C15	NOT USED
440	.8	ORN	C16	12V BATTERY FUSED
			D1	NOT USED
			D2	NOT USED
			D3	NOT USED
			D4	NOT USED
			D5	NOT USED
			D6	NOT USED
			D7	NOT USED
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
			D13	NOT USED
			D14	NOT USED
			D15	NOT USED
			D16	NOT USED

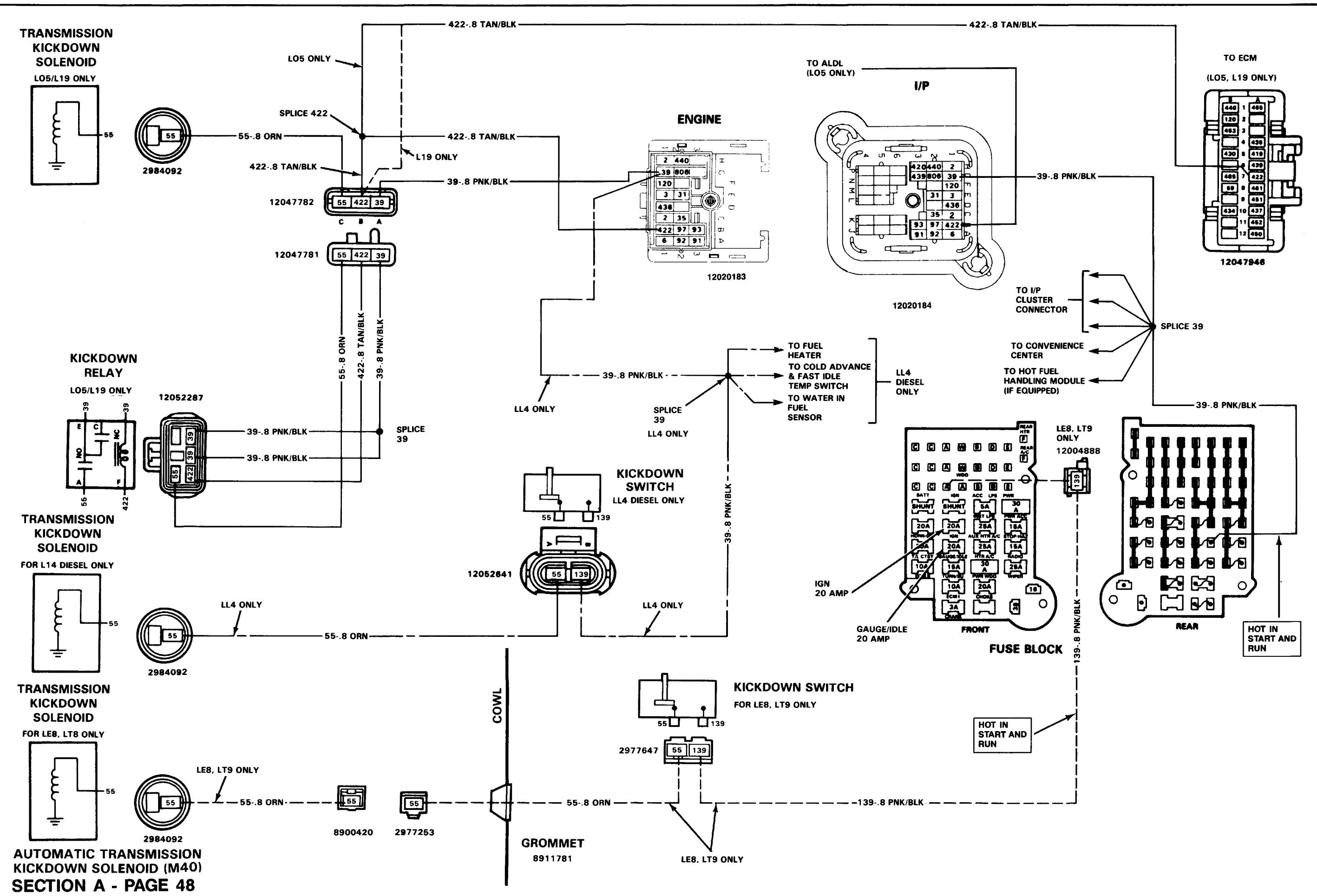
* AUTO TRANS ONLY

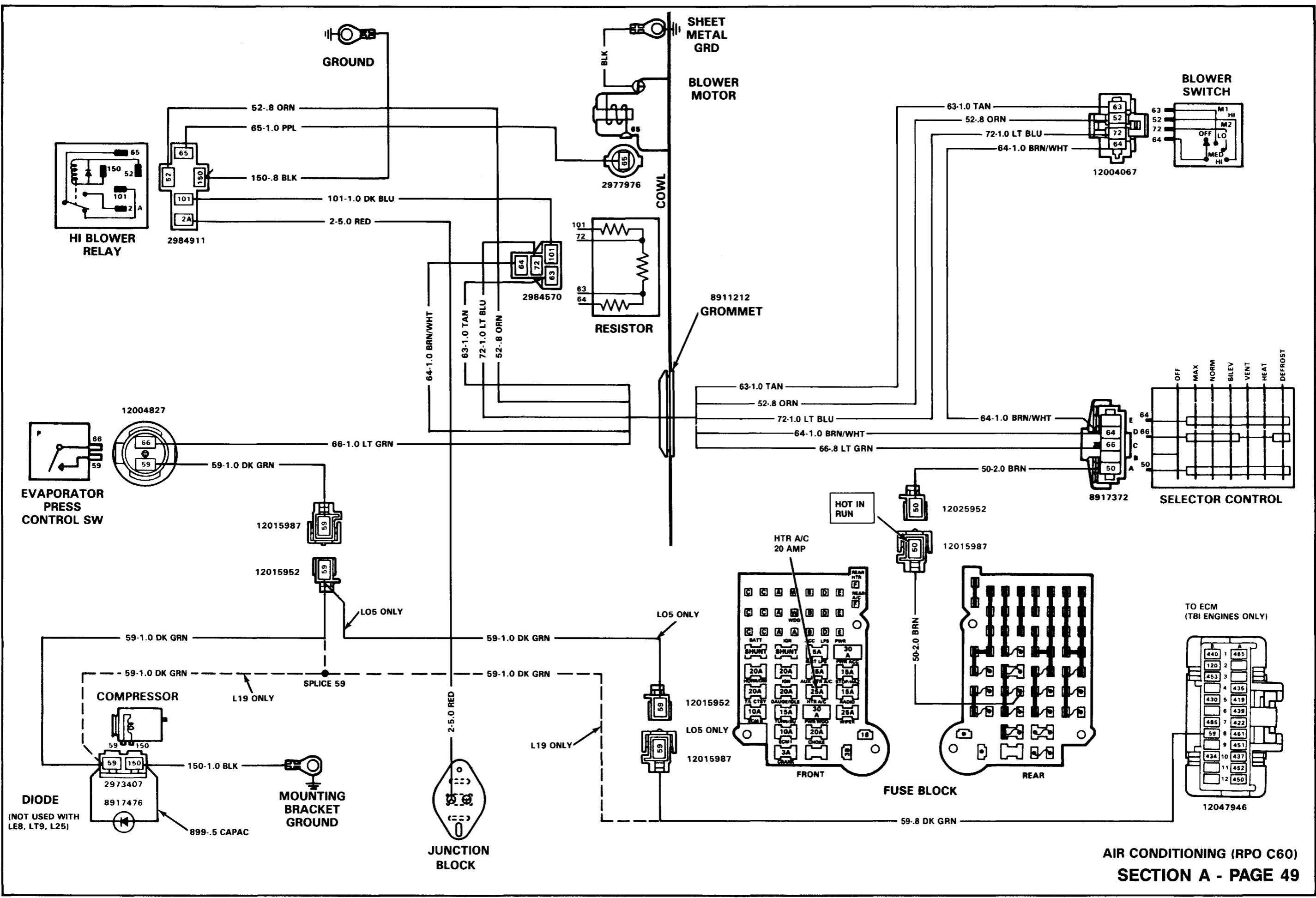


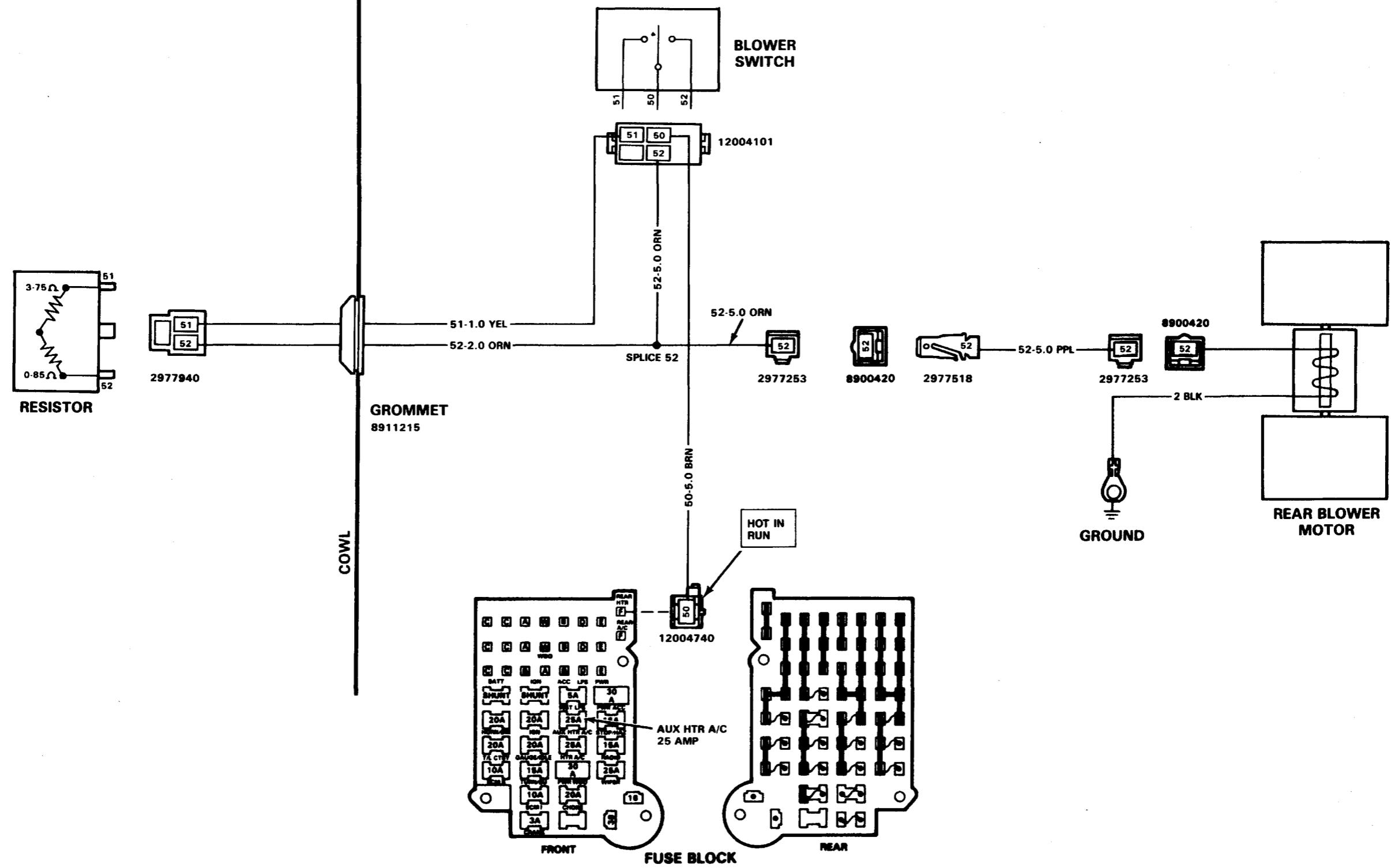


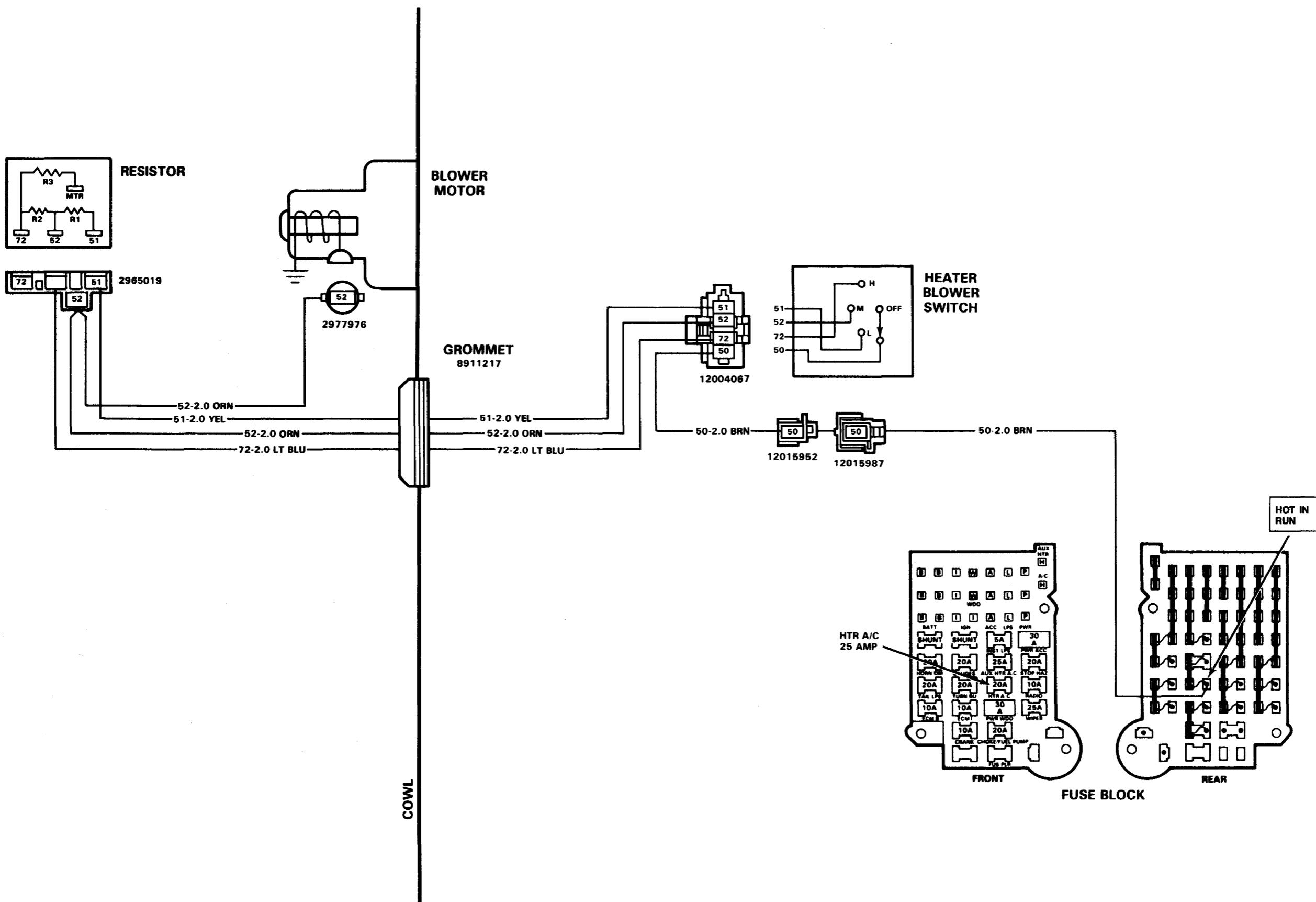




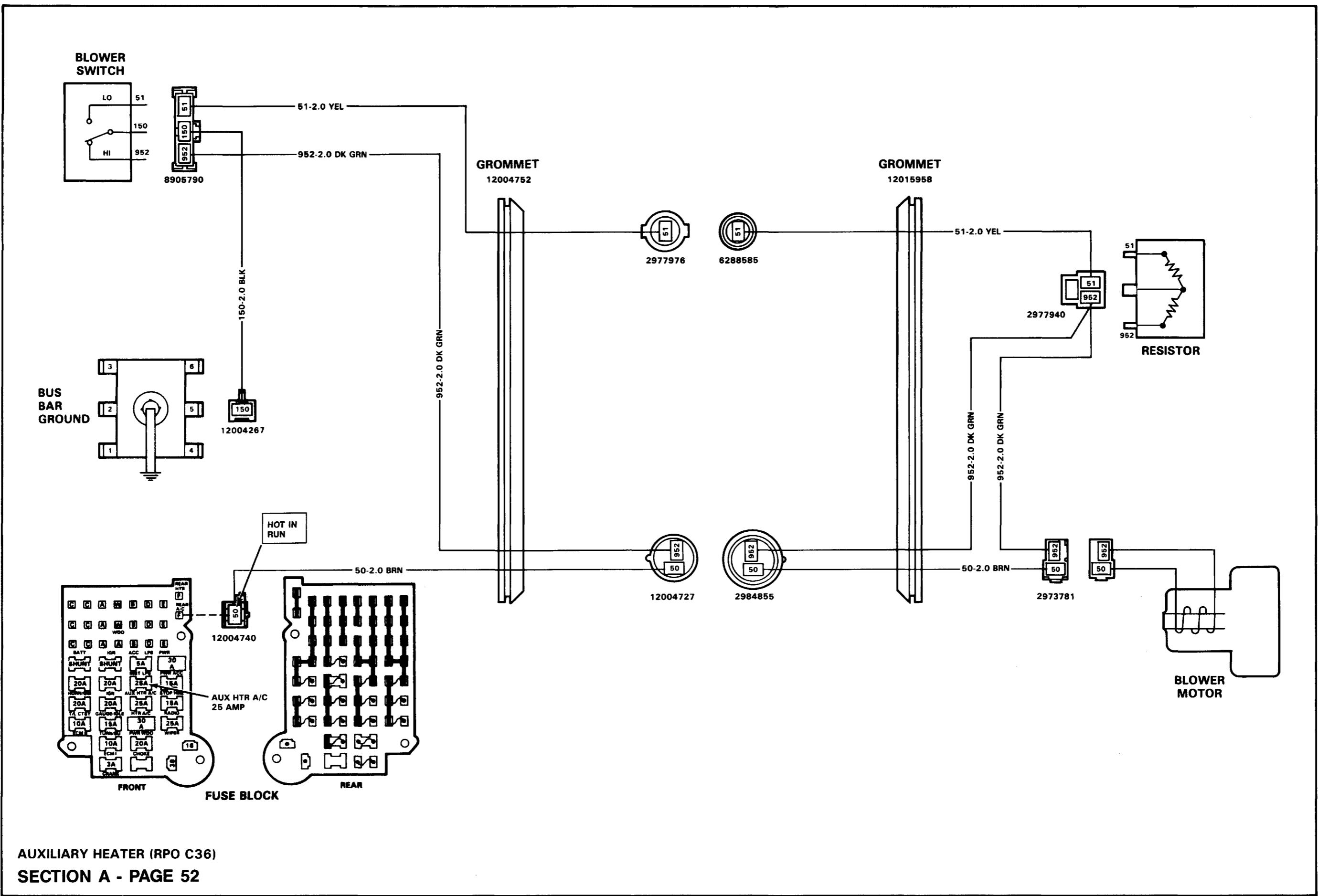


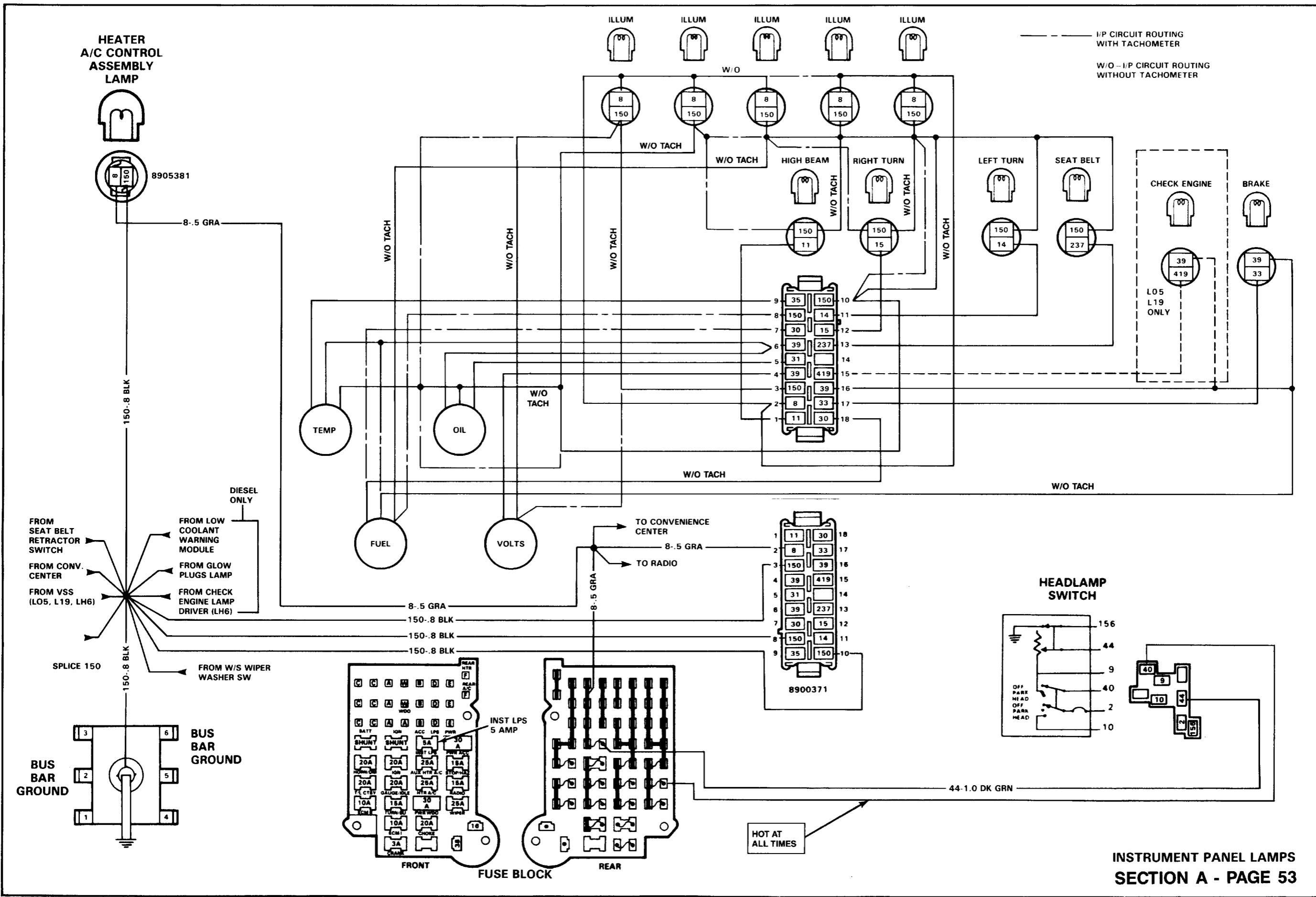


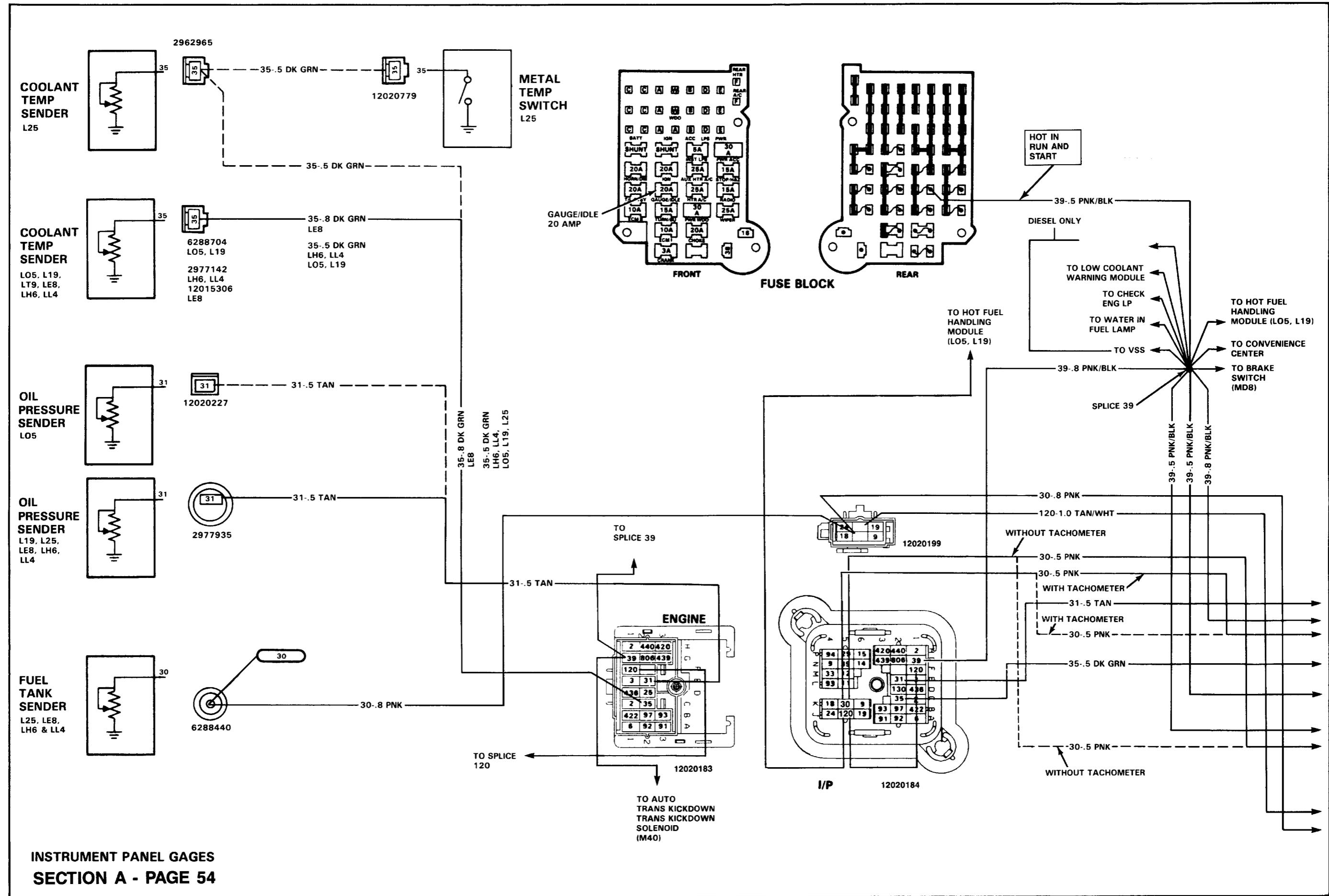


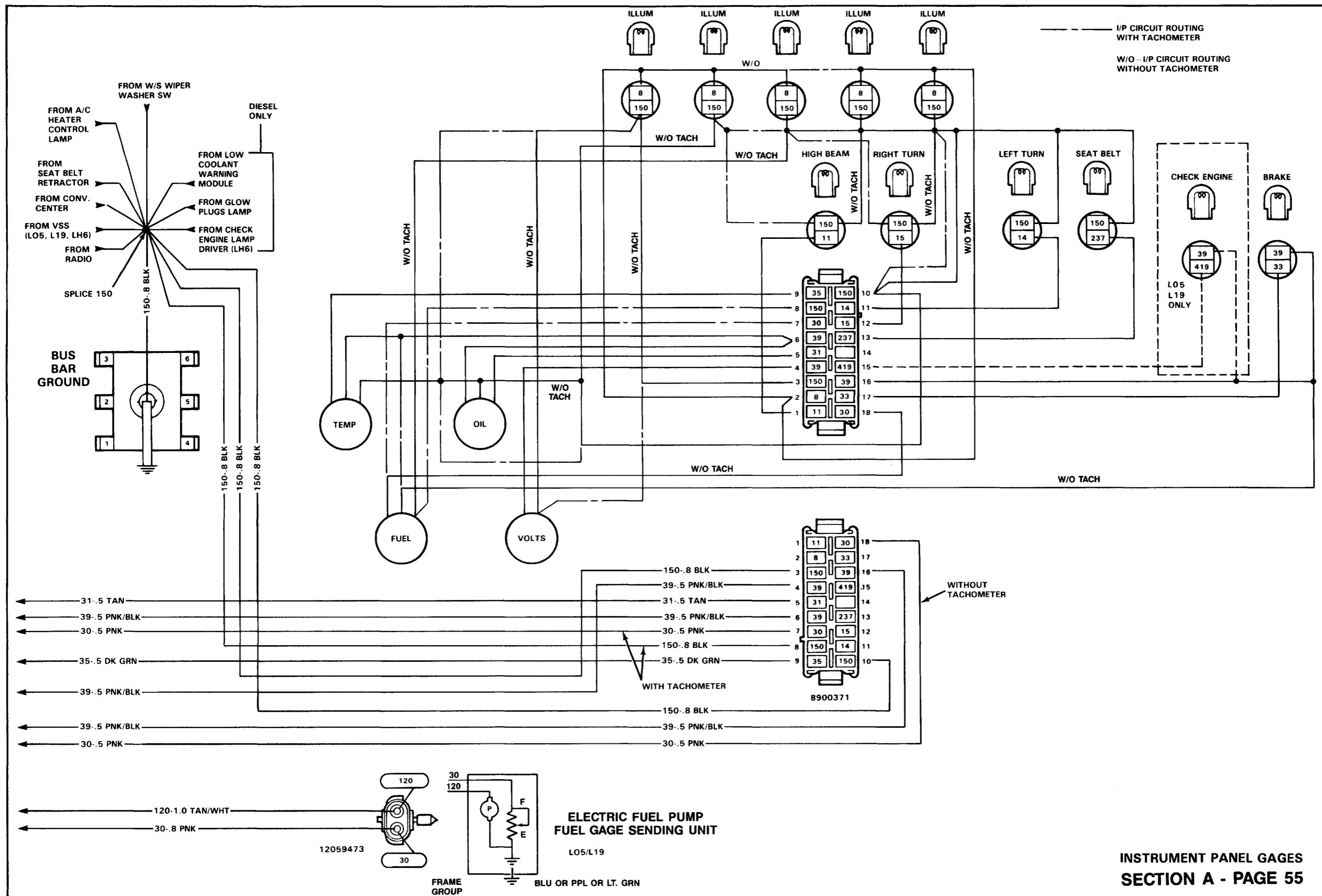


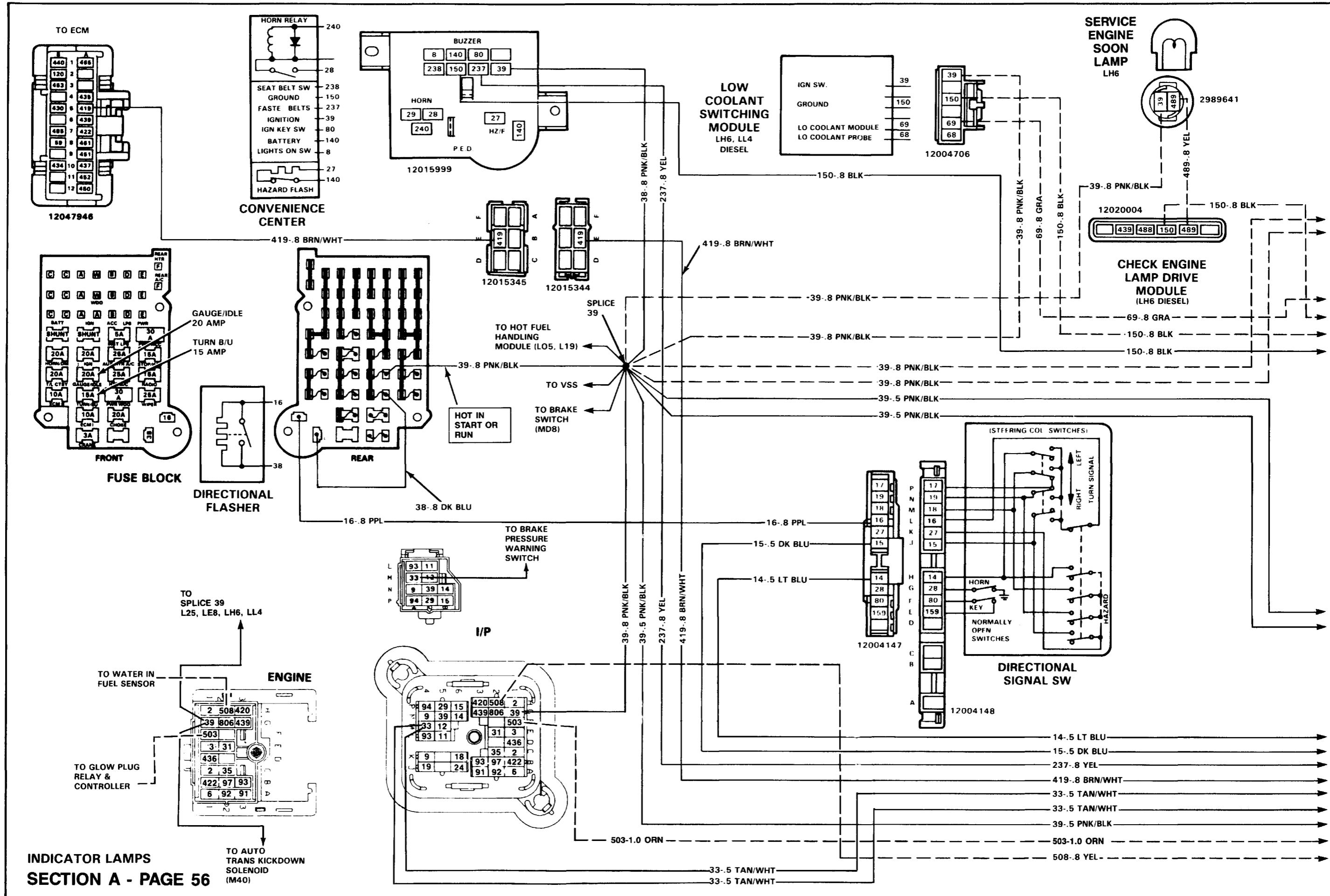
HEATER
SECTION A - PAGE 51

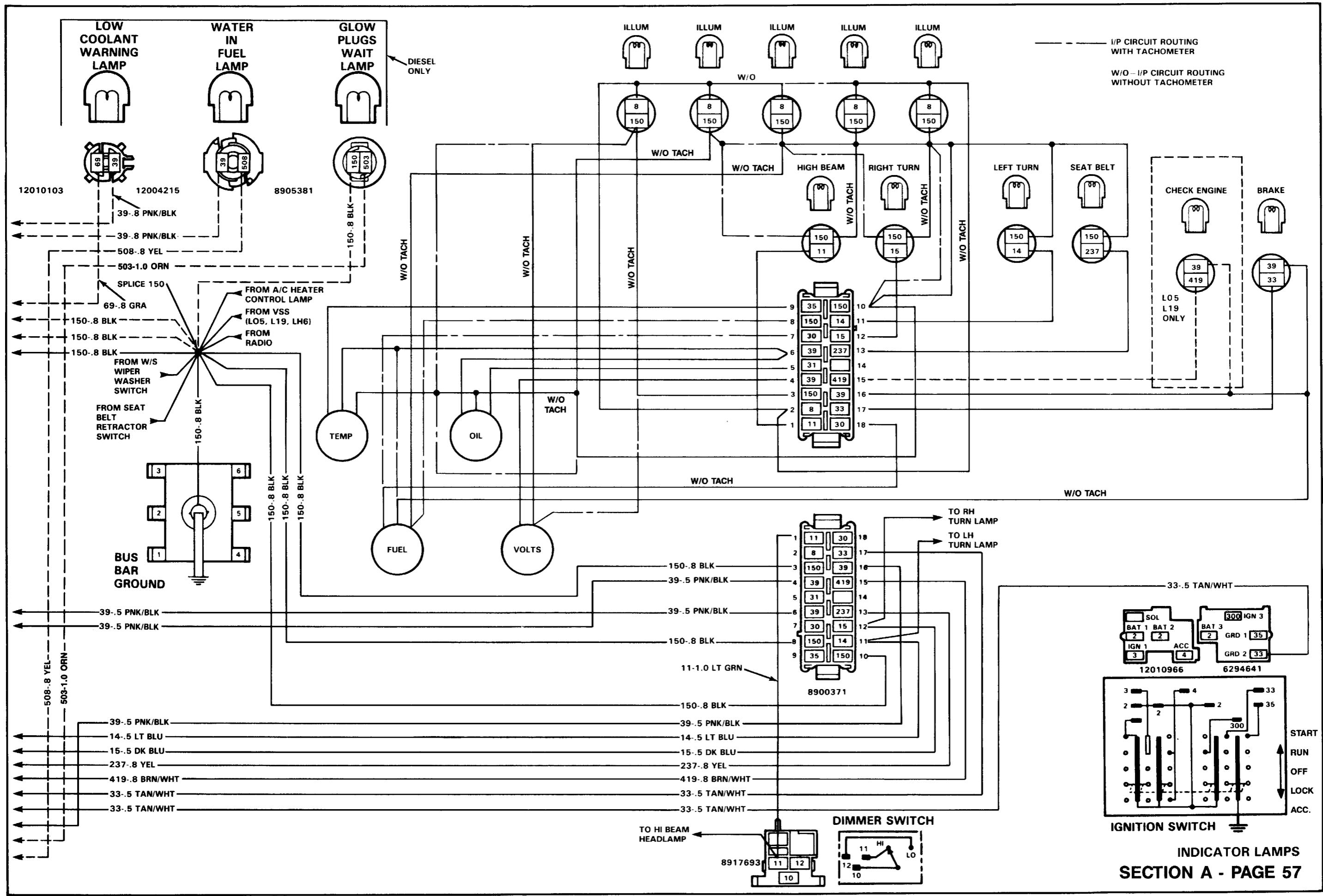


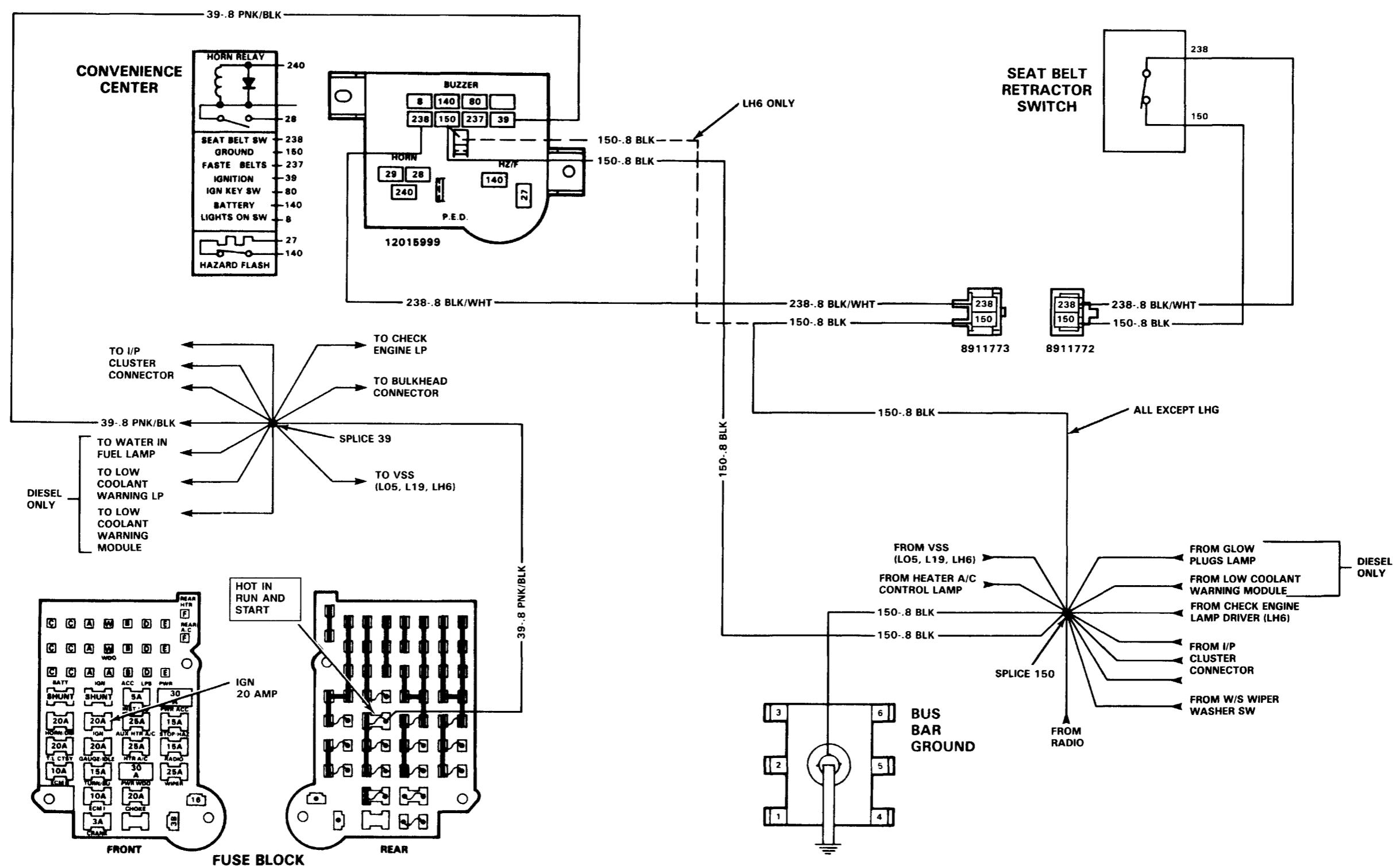






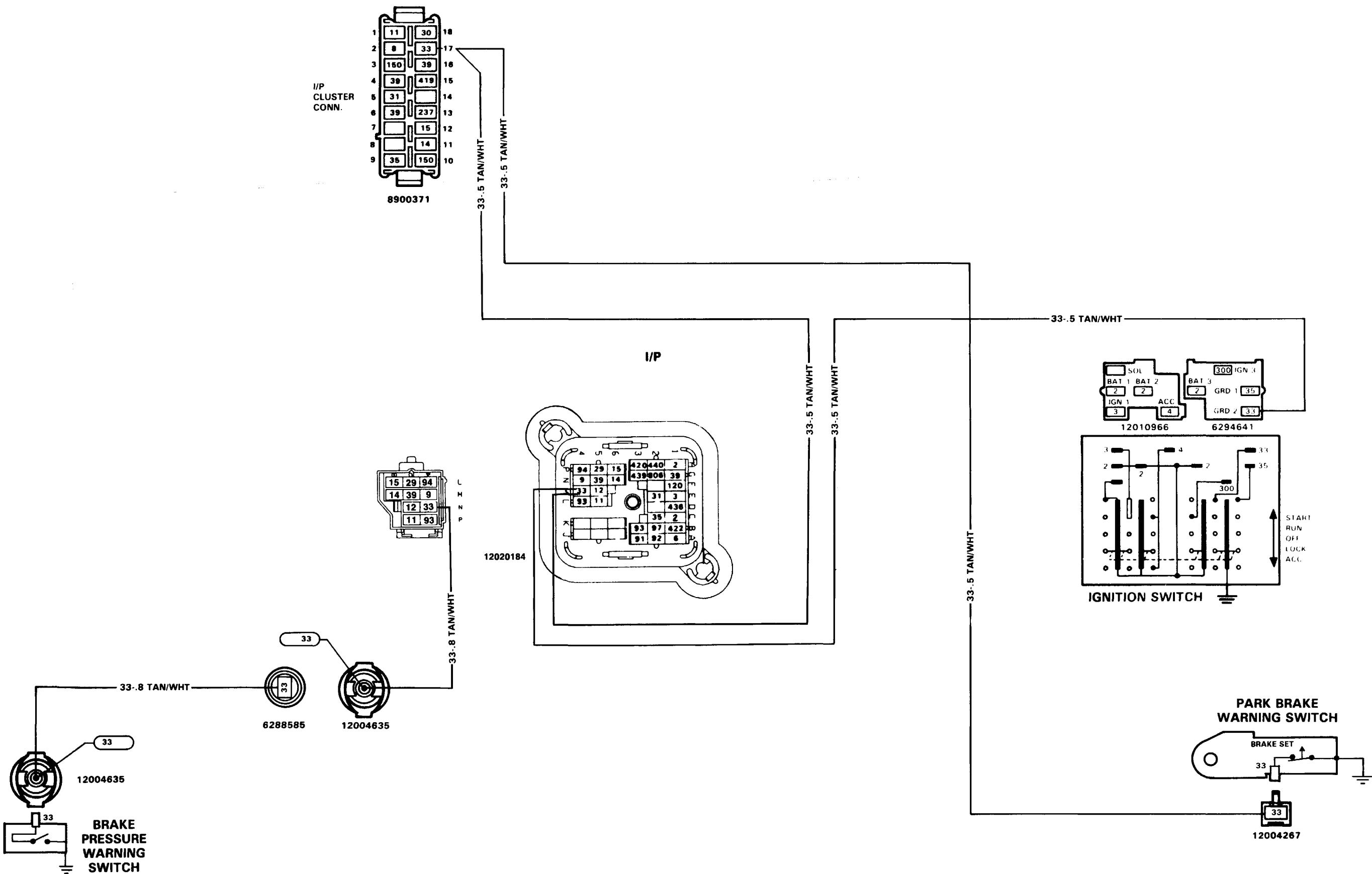




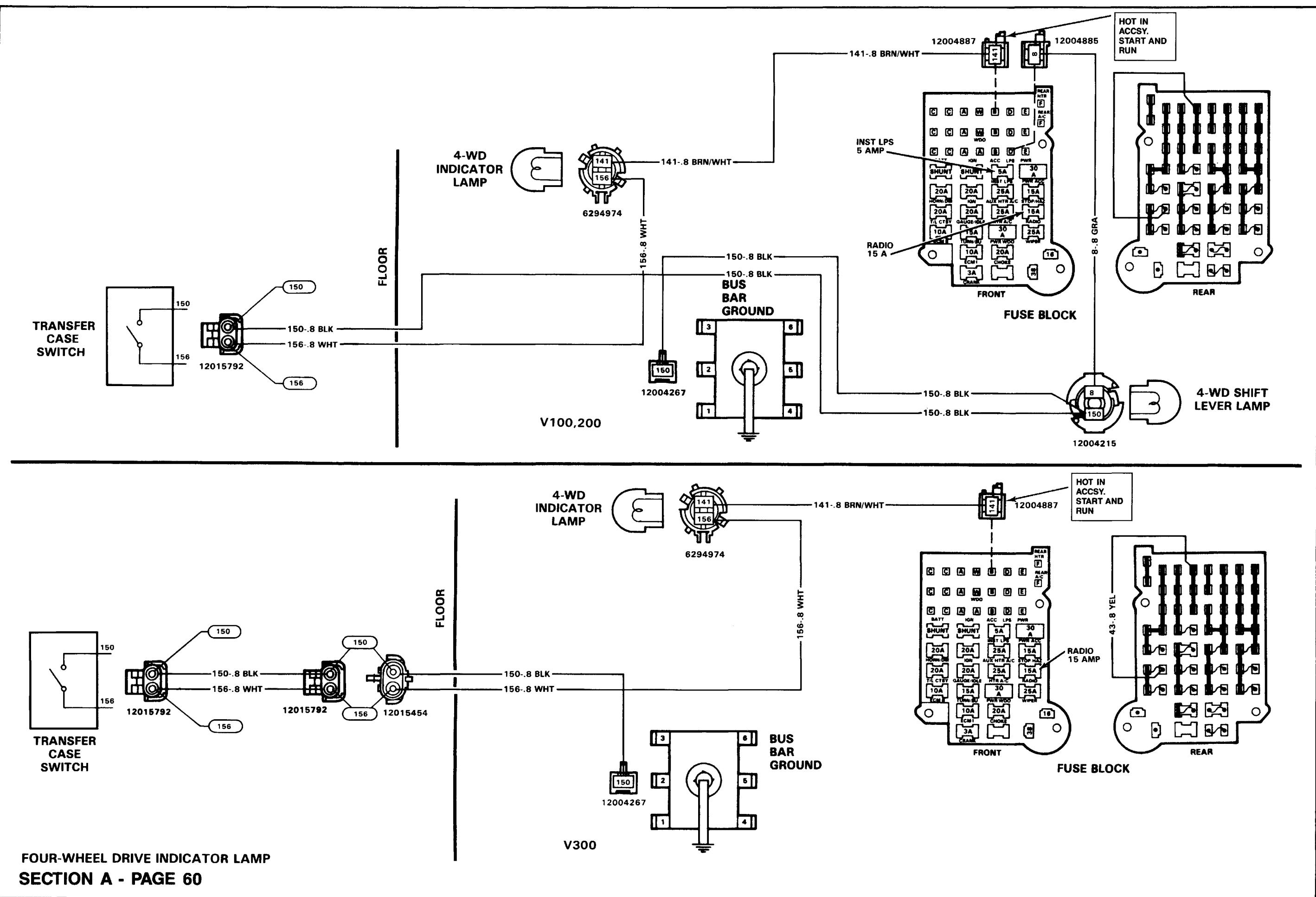


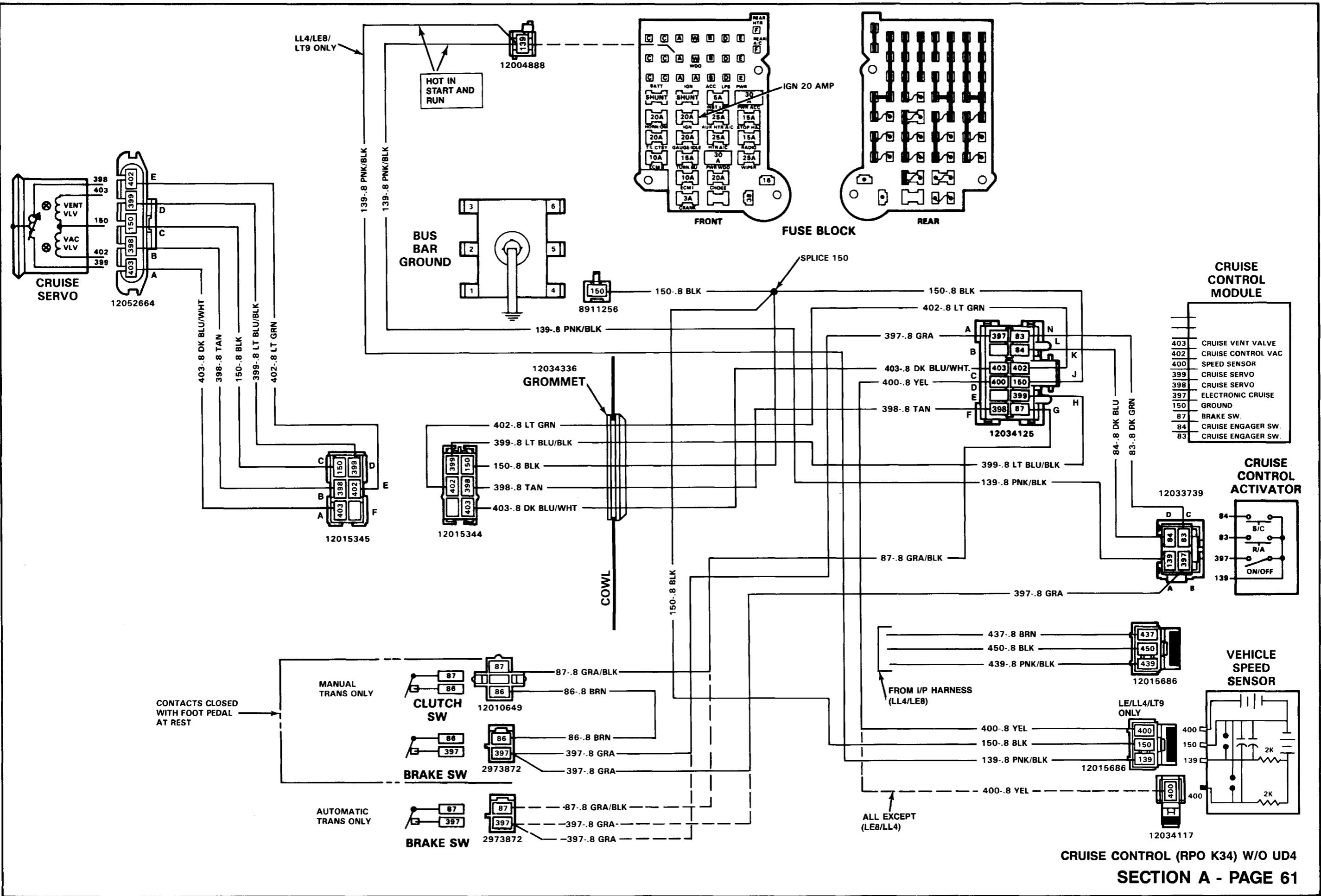
SEAT BELT WARNING BUZZER SECTION D—PAGE 64

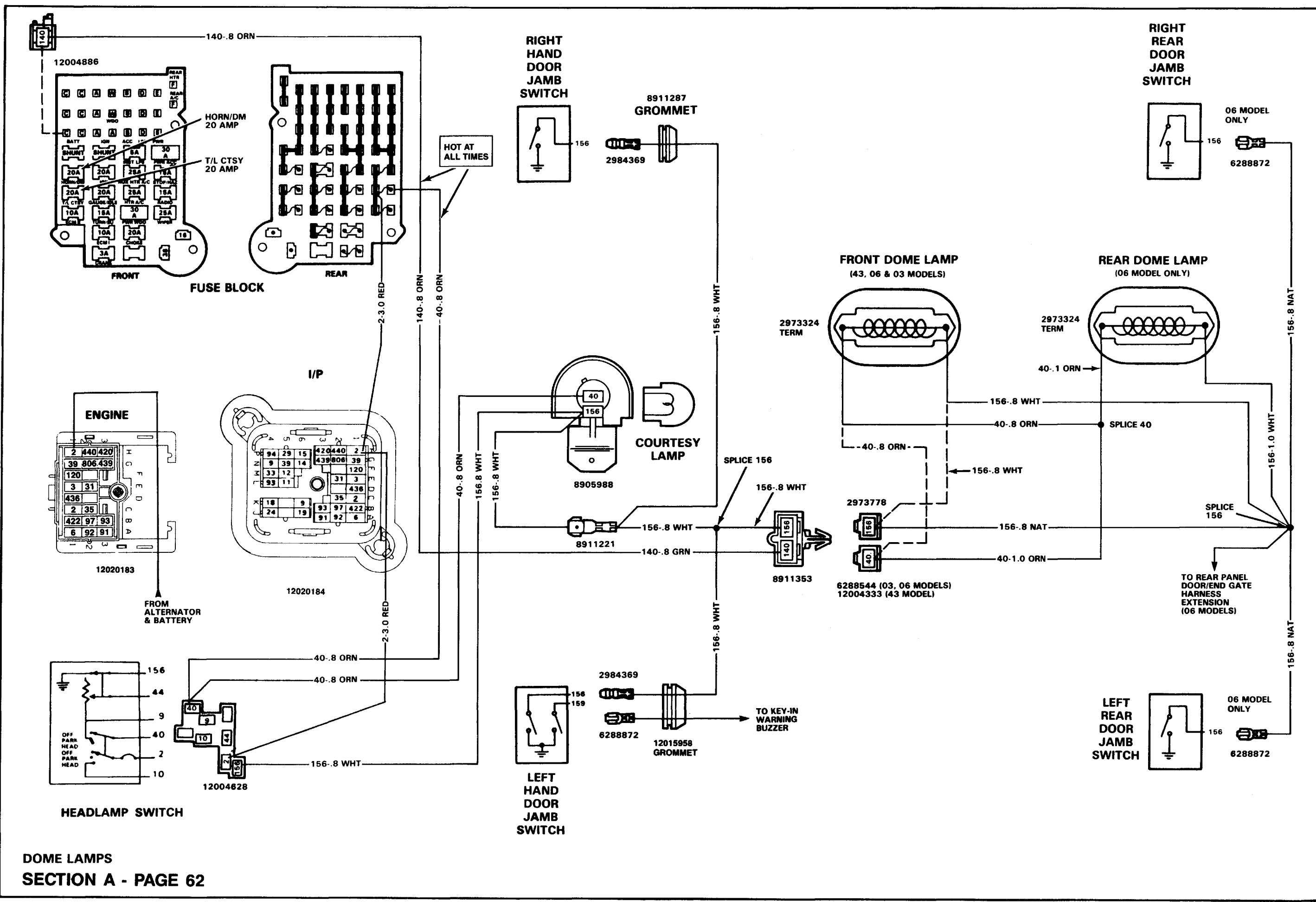
SECTION A - PAGE 58

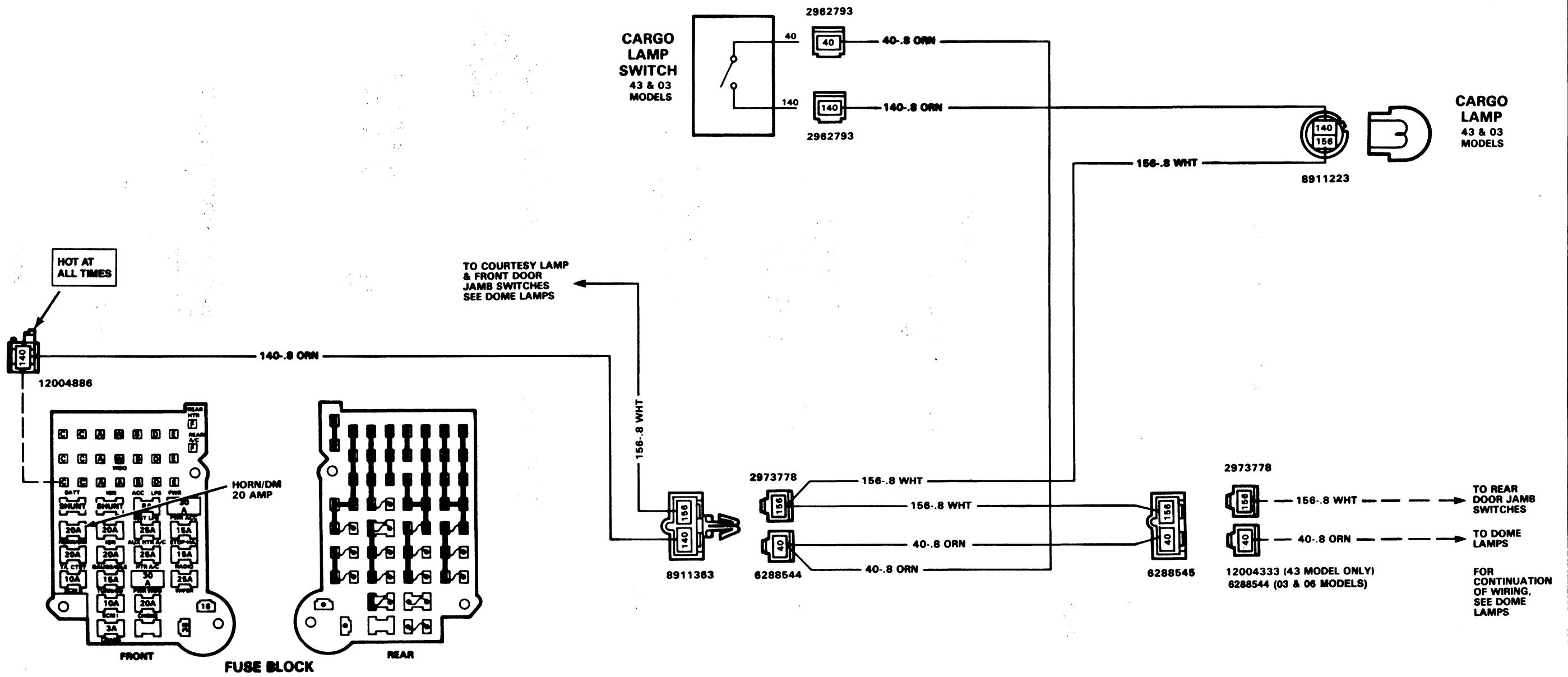


**BRAKE WARNING SYSTEM
SECTION A - PAGE 59**

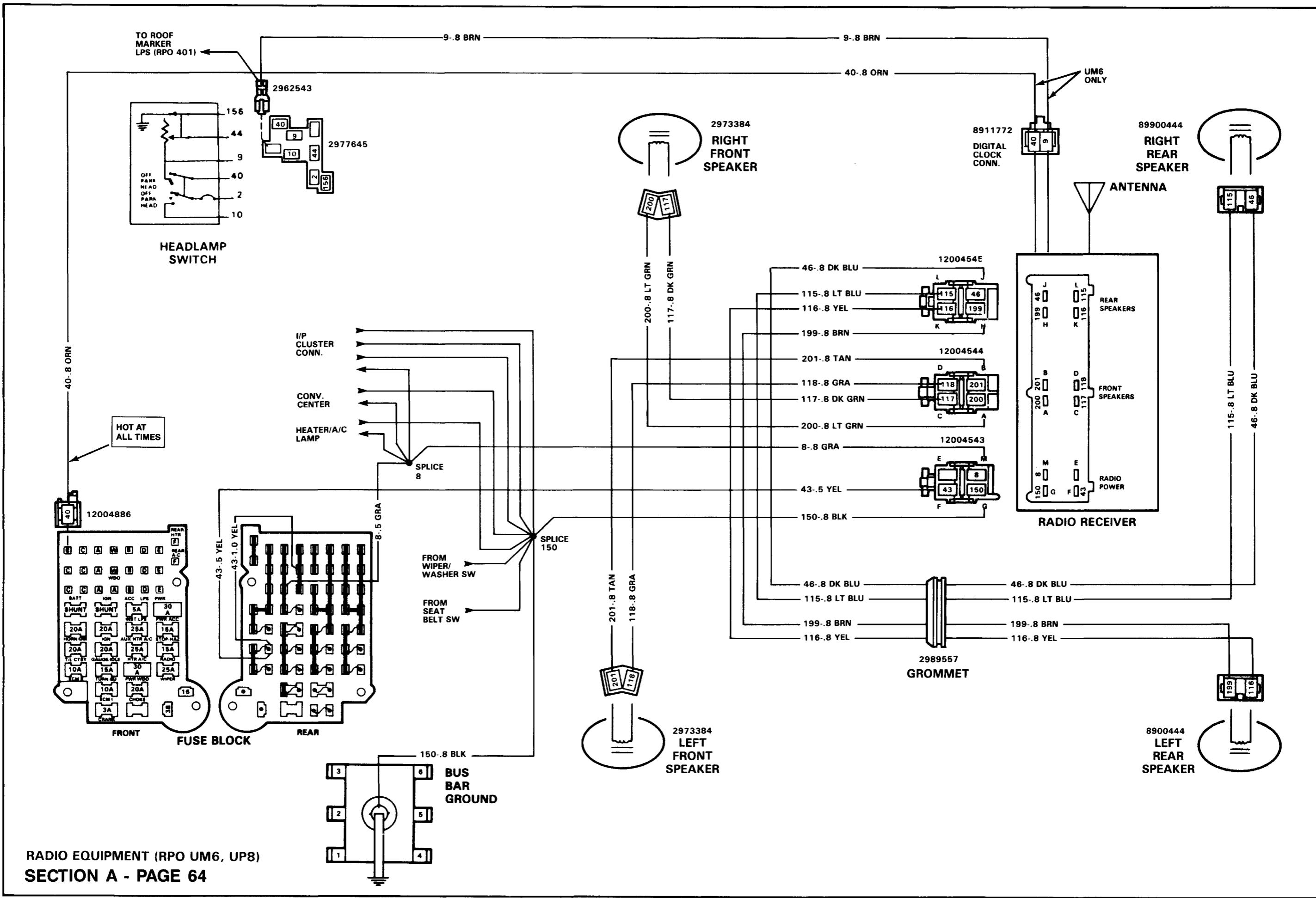


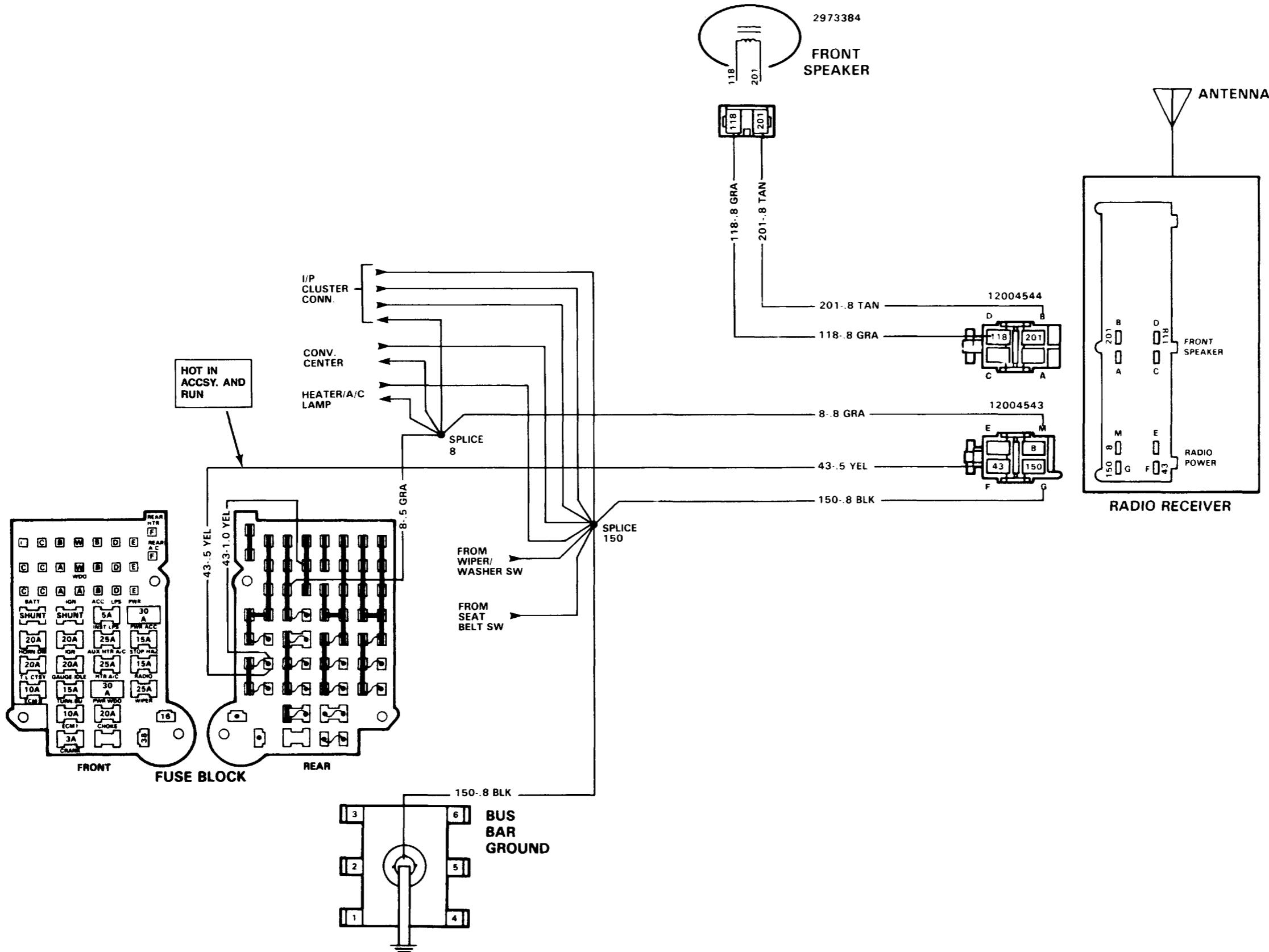


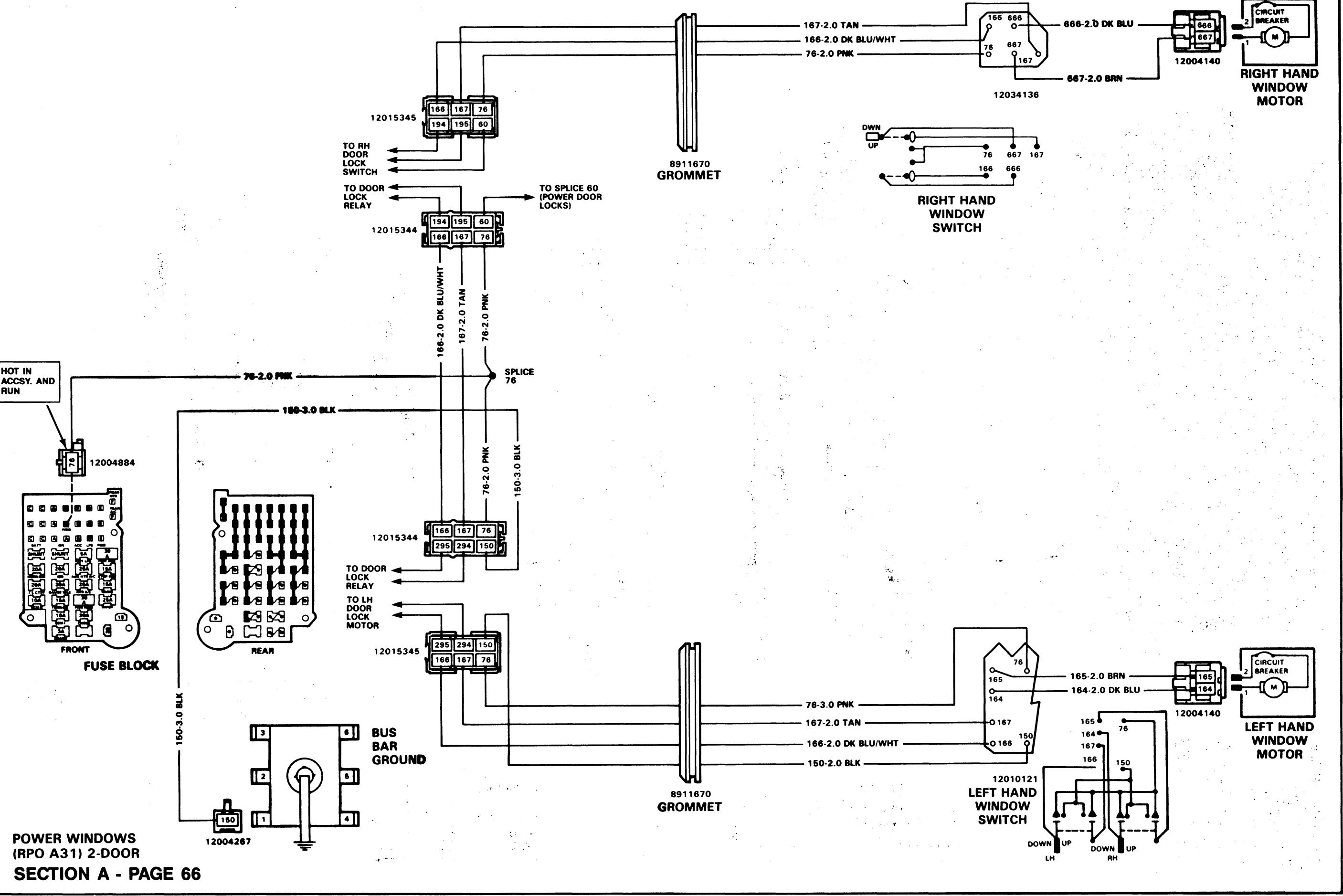


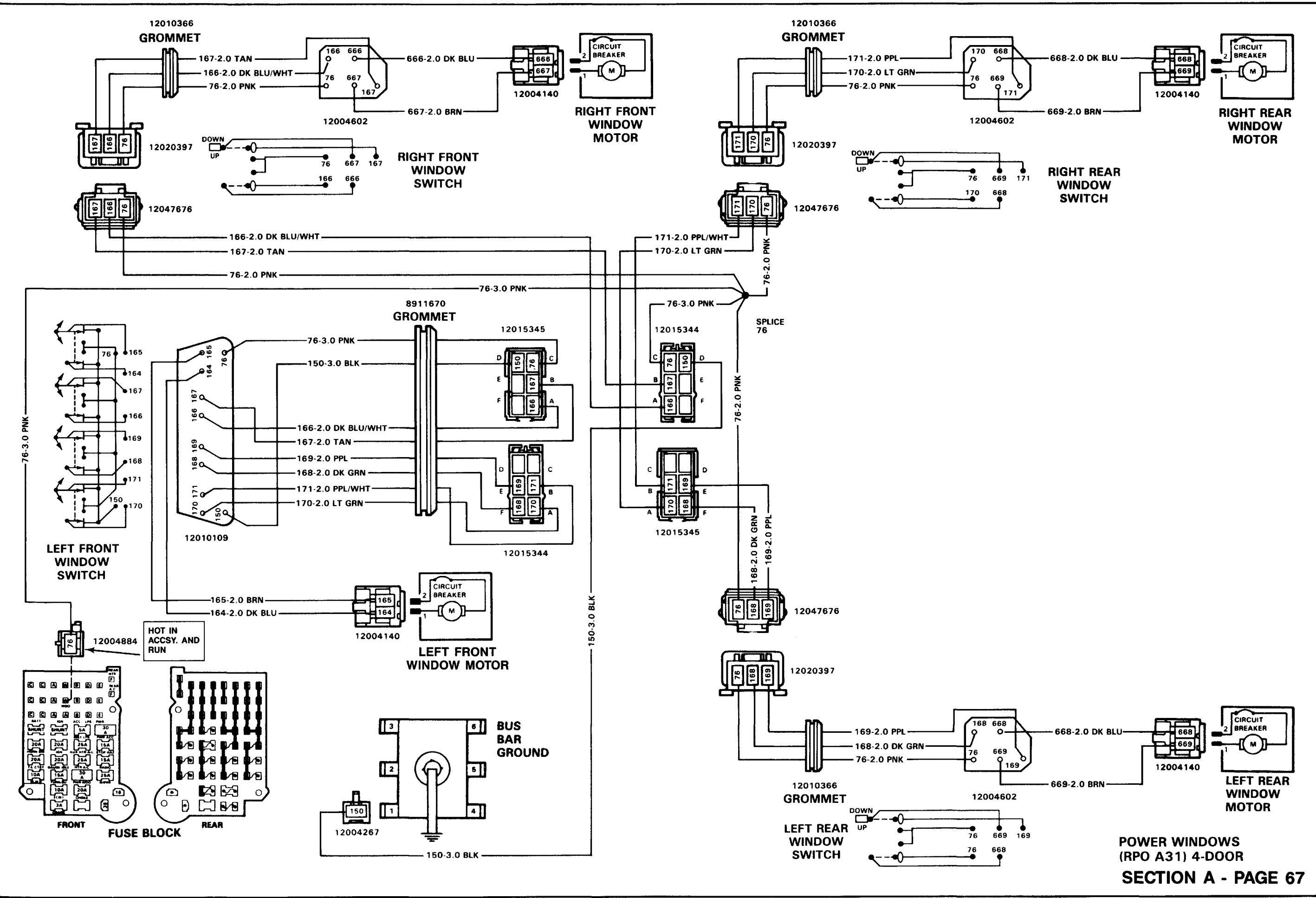


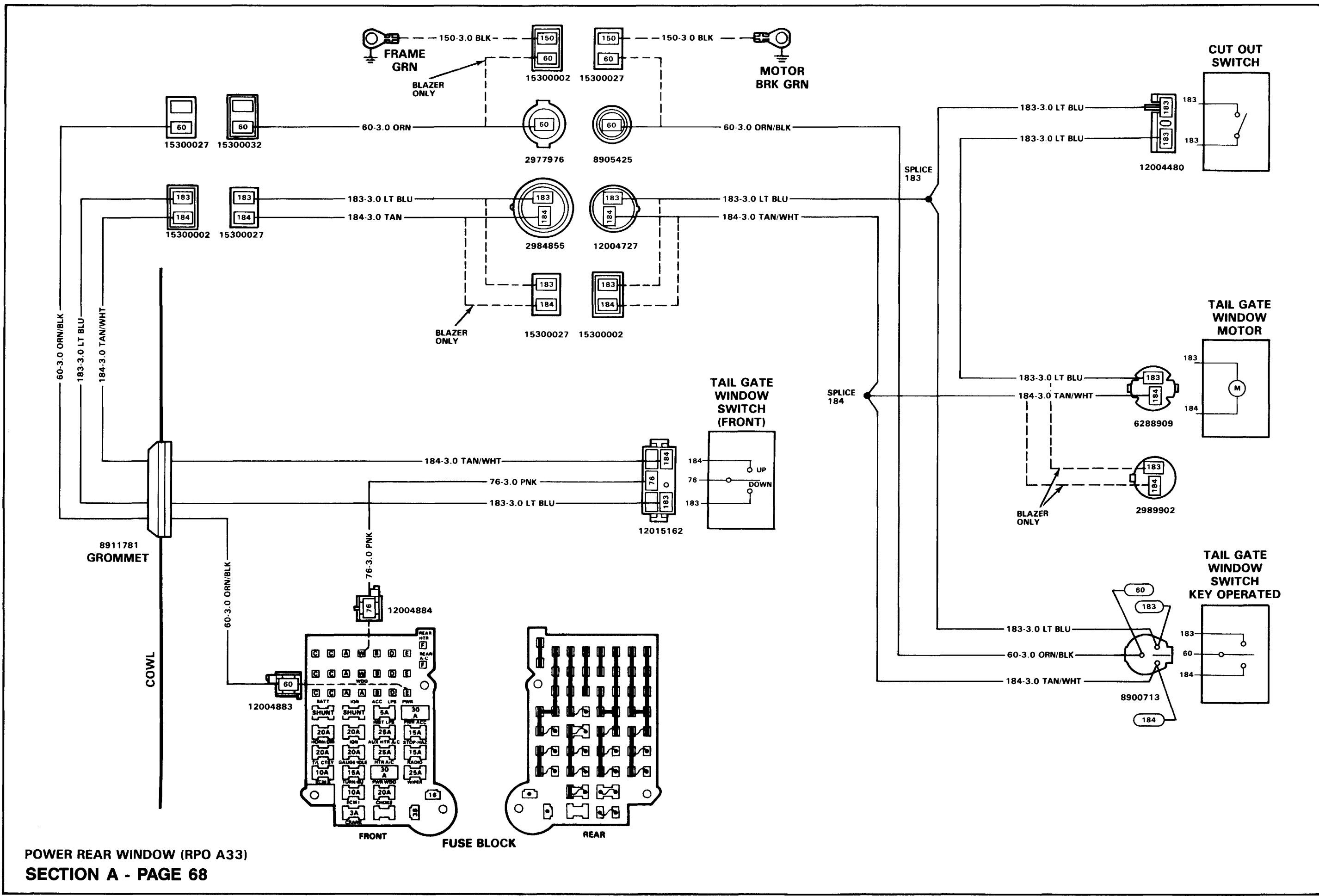
CARGO LAMP (RPO UF2) SECTION A - PAGE 63

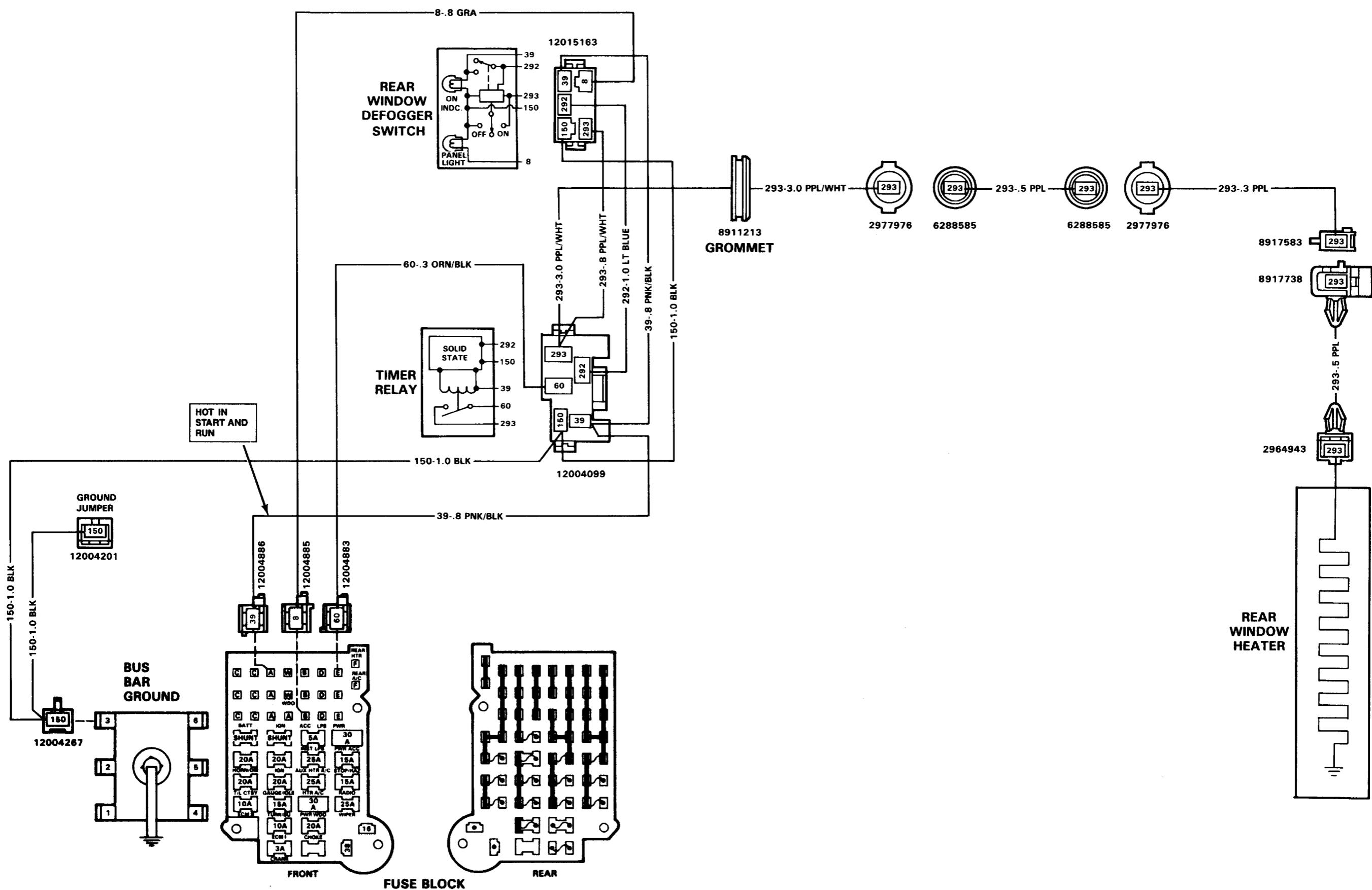




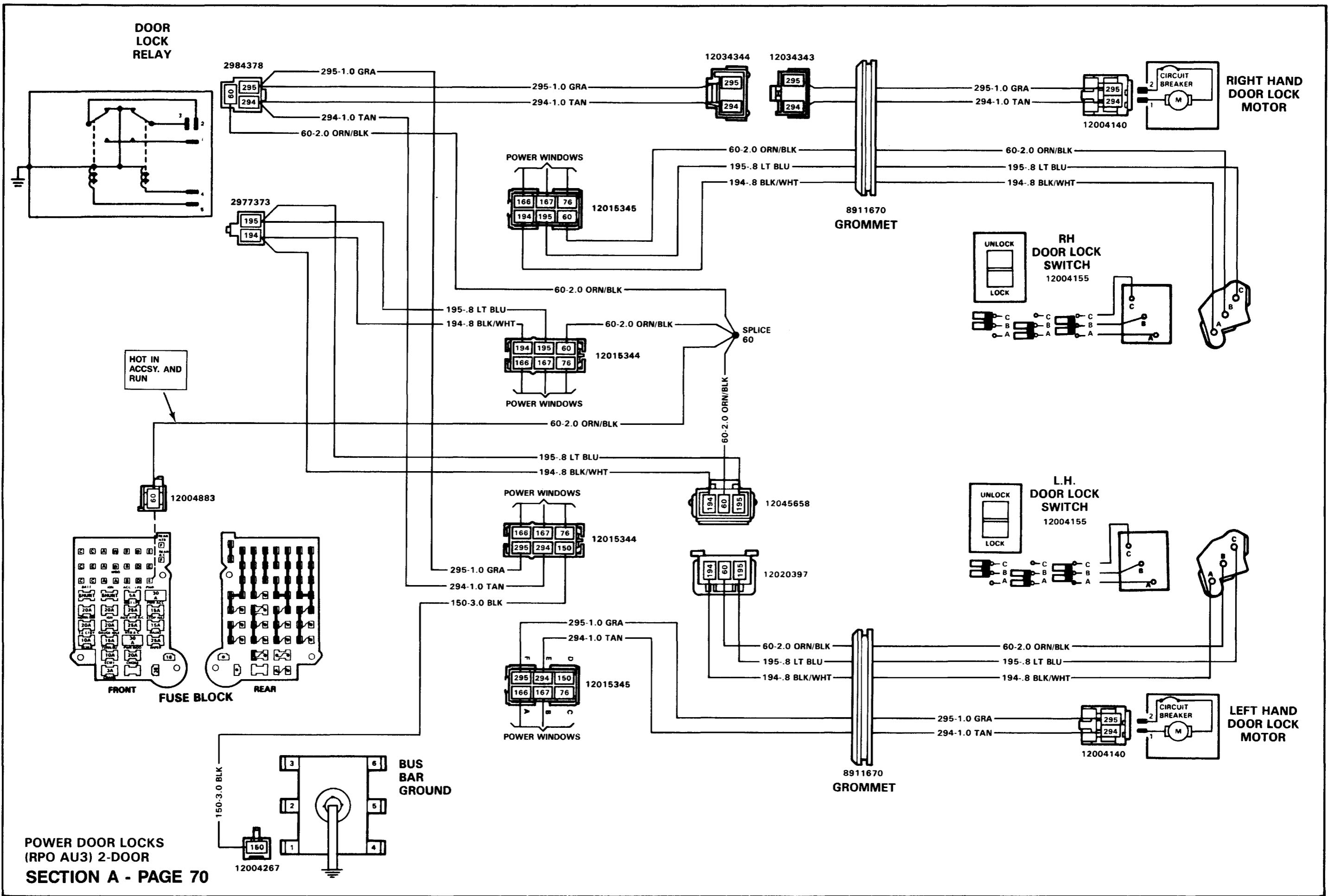


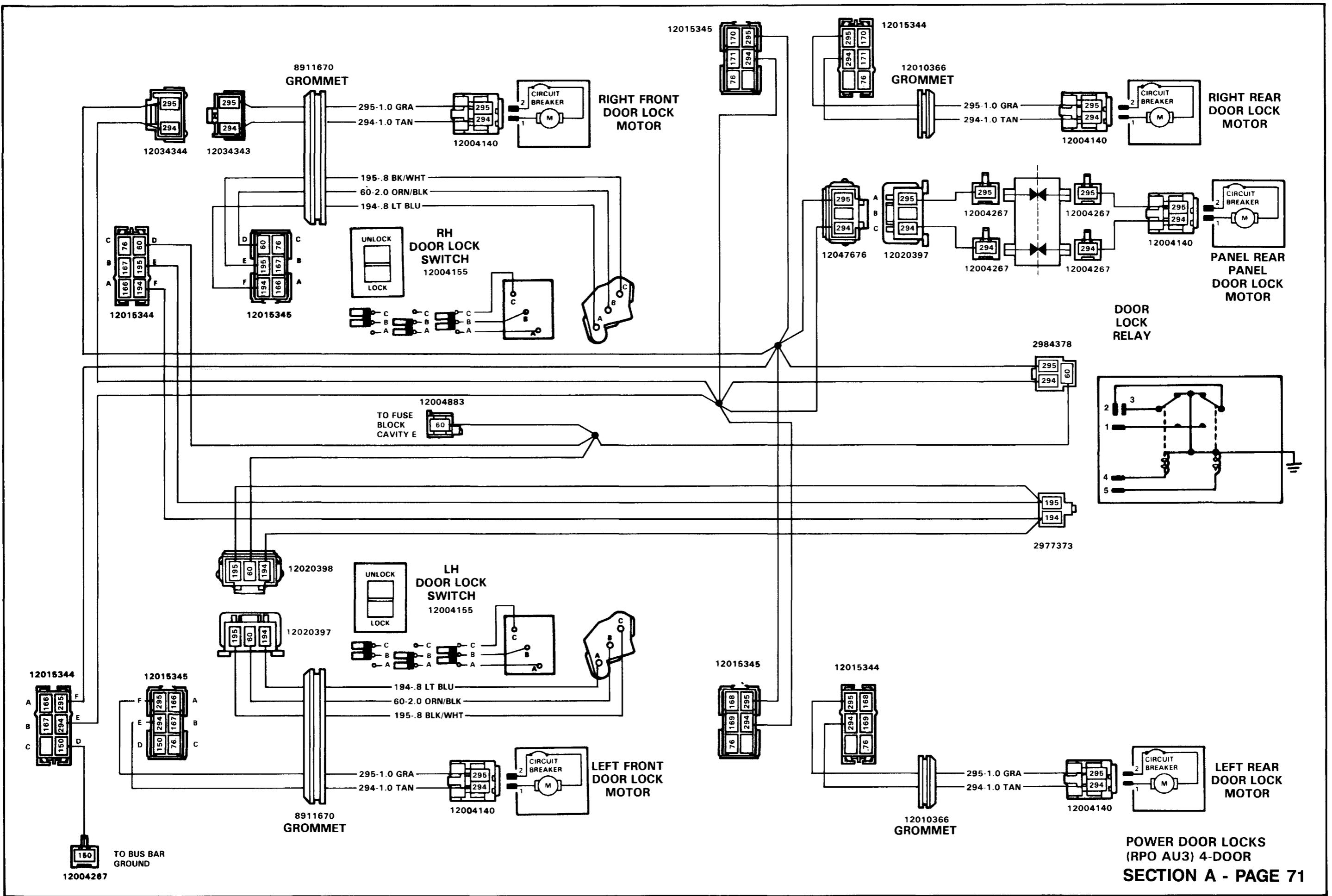


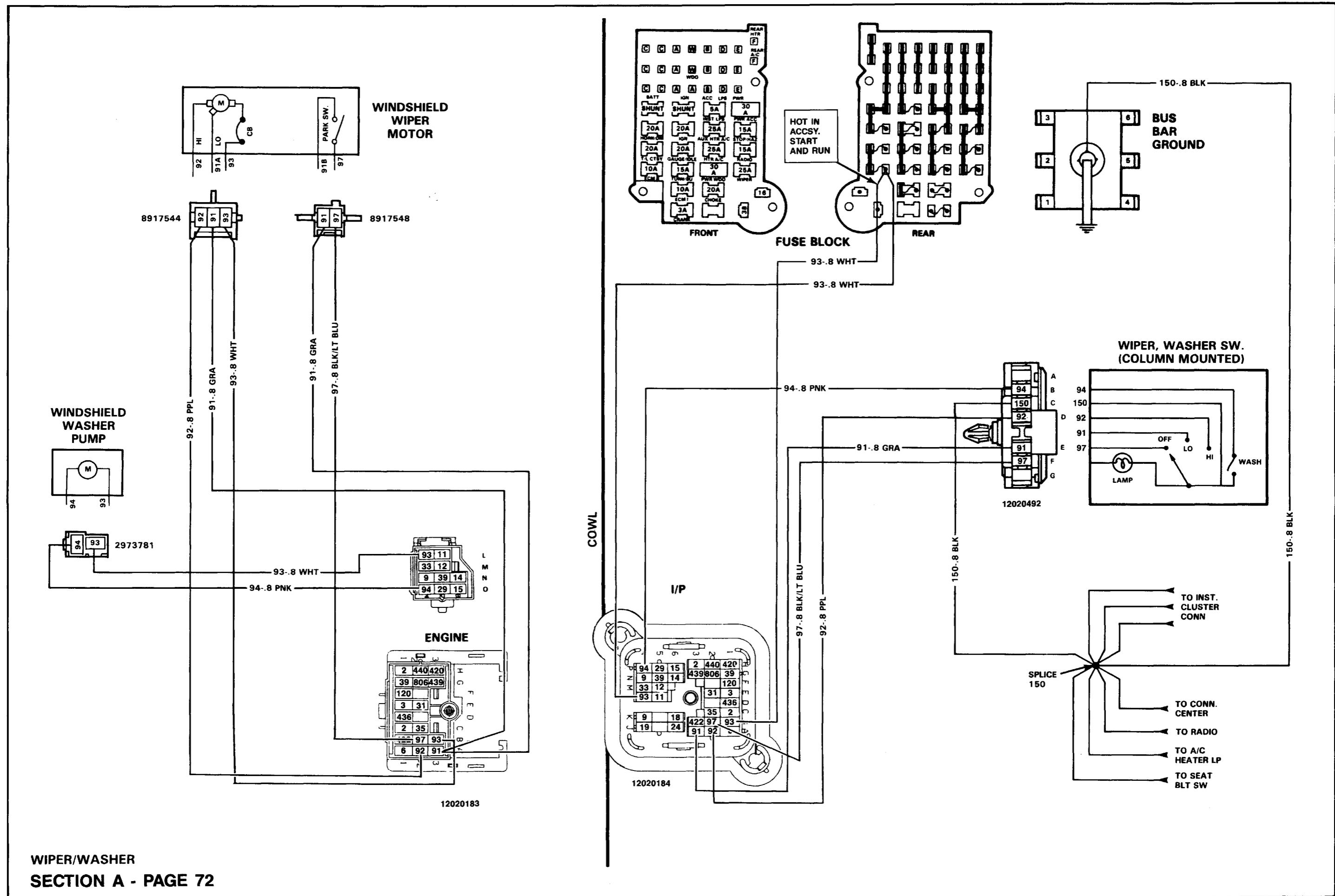


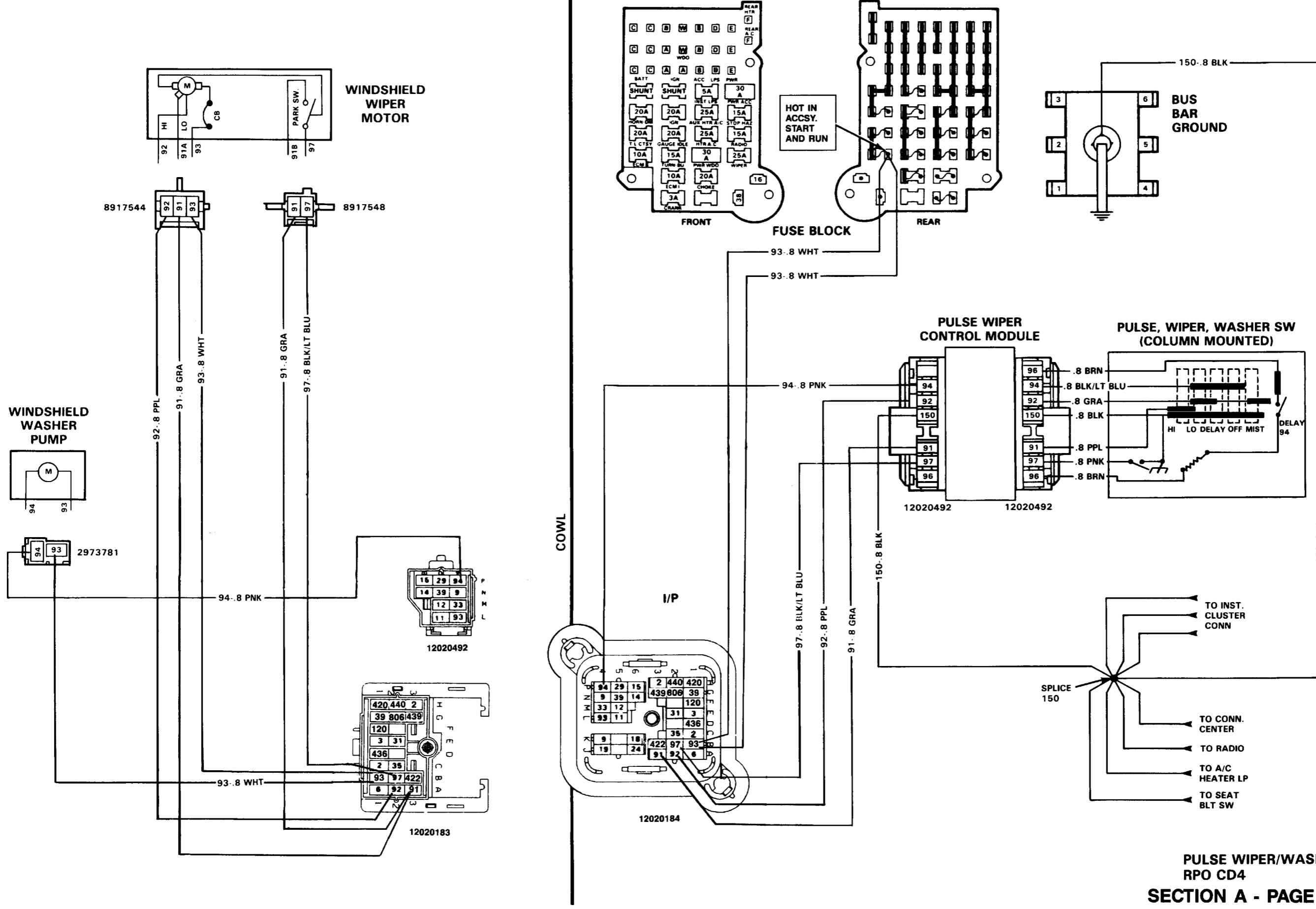


**REAR DEFOGGER (RPO C49)
SECTION A - PAGE 69**

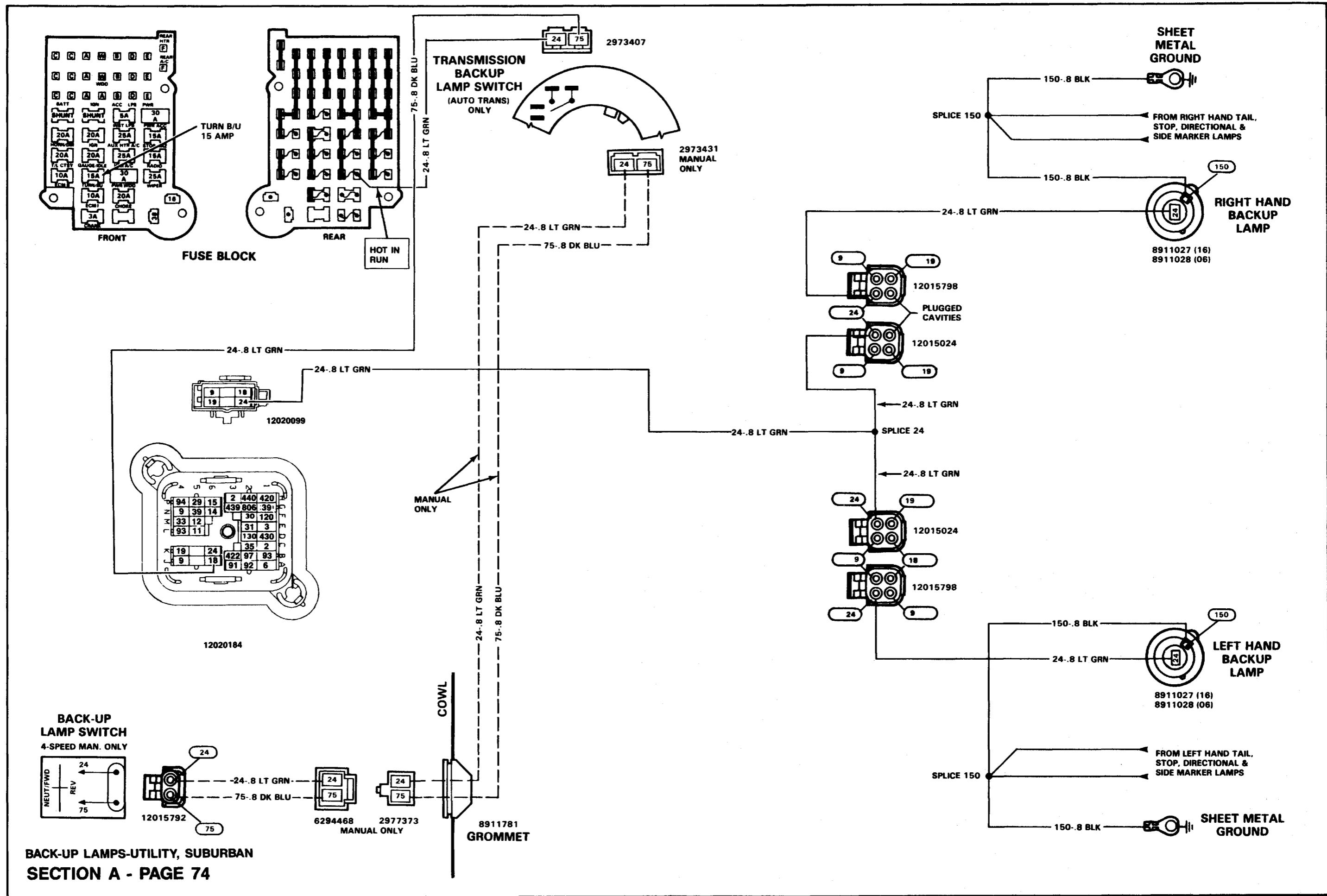


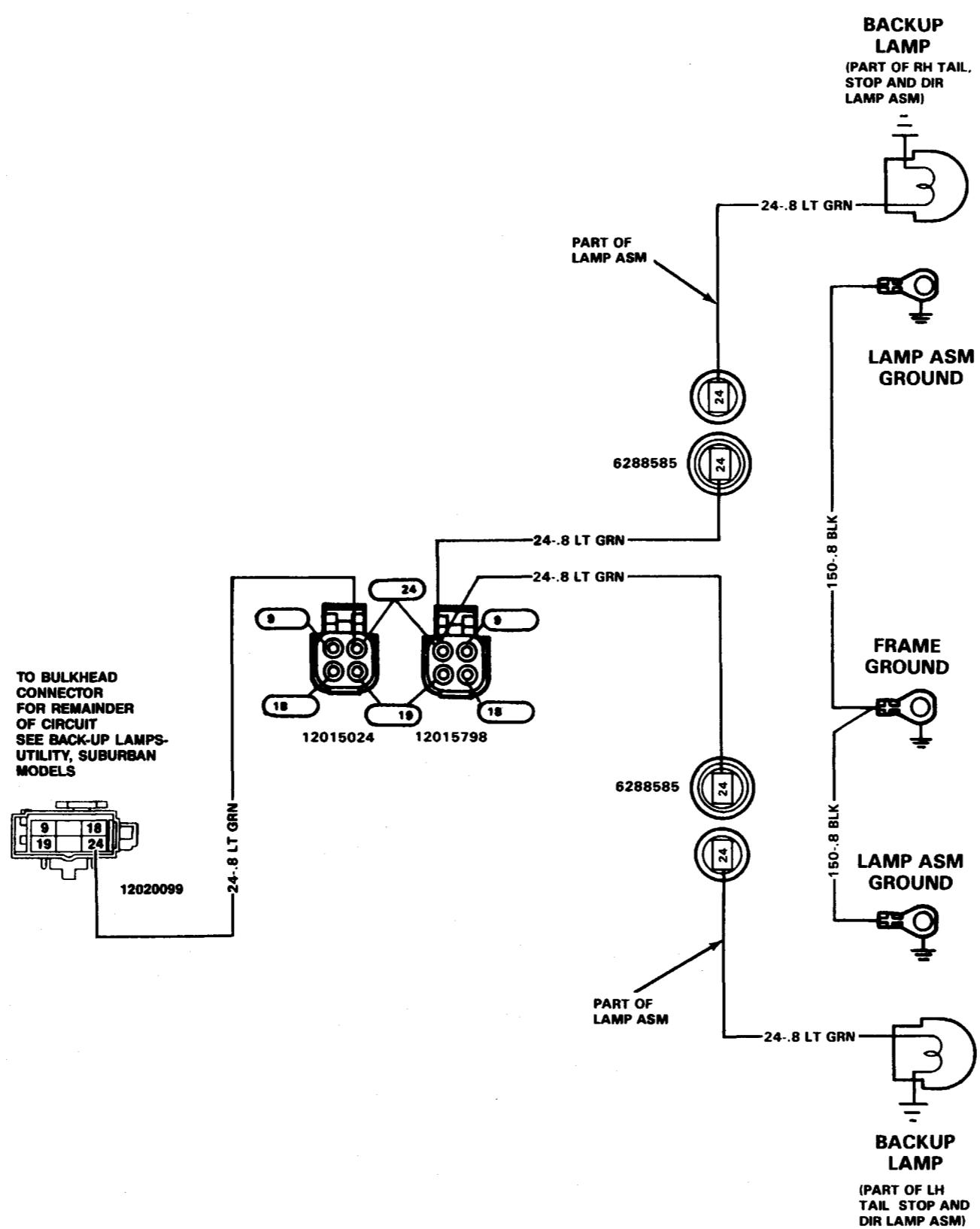






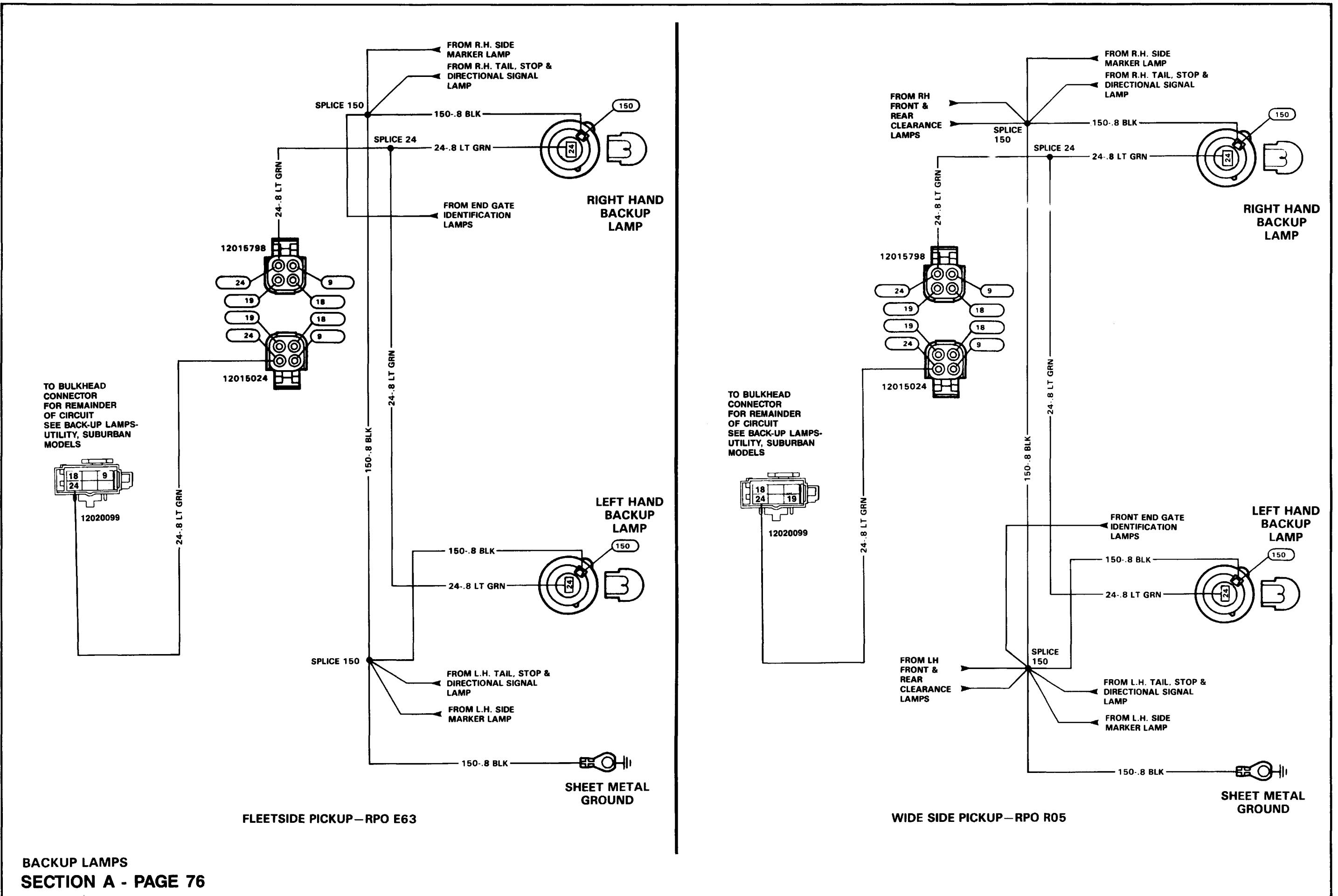
**PULSE WIPER/WASHER
RPO CD4**

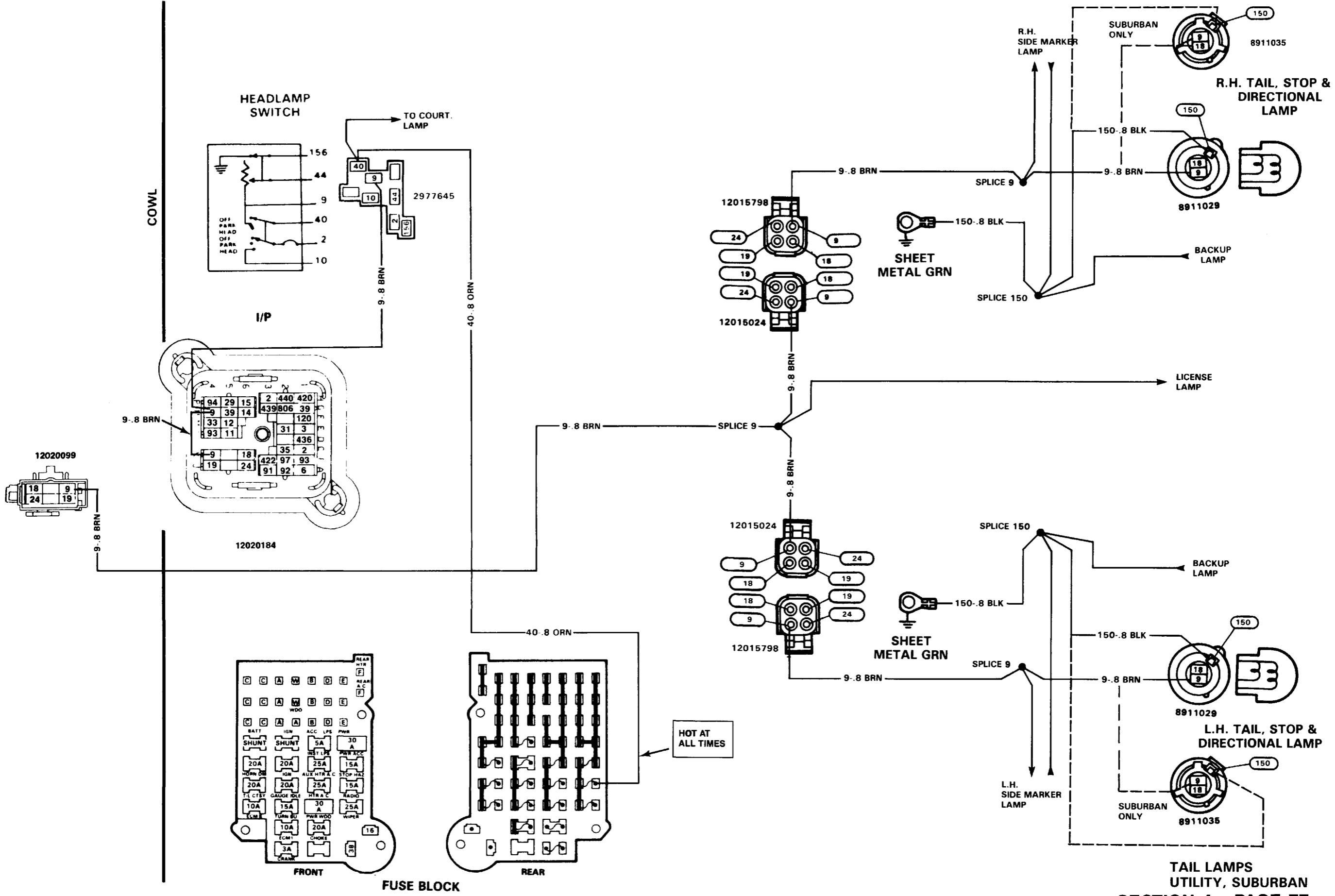




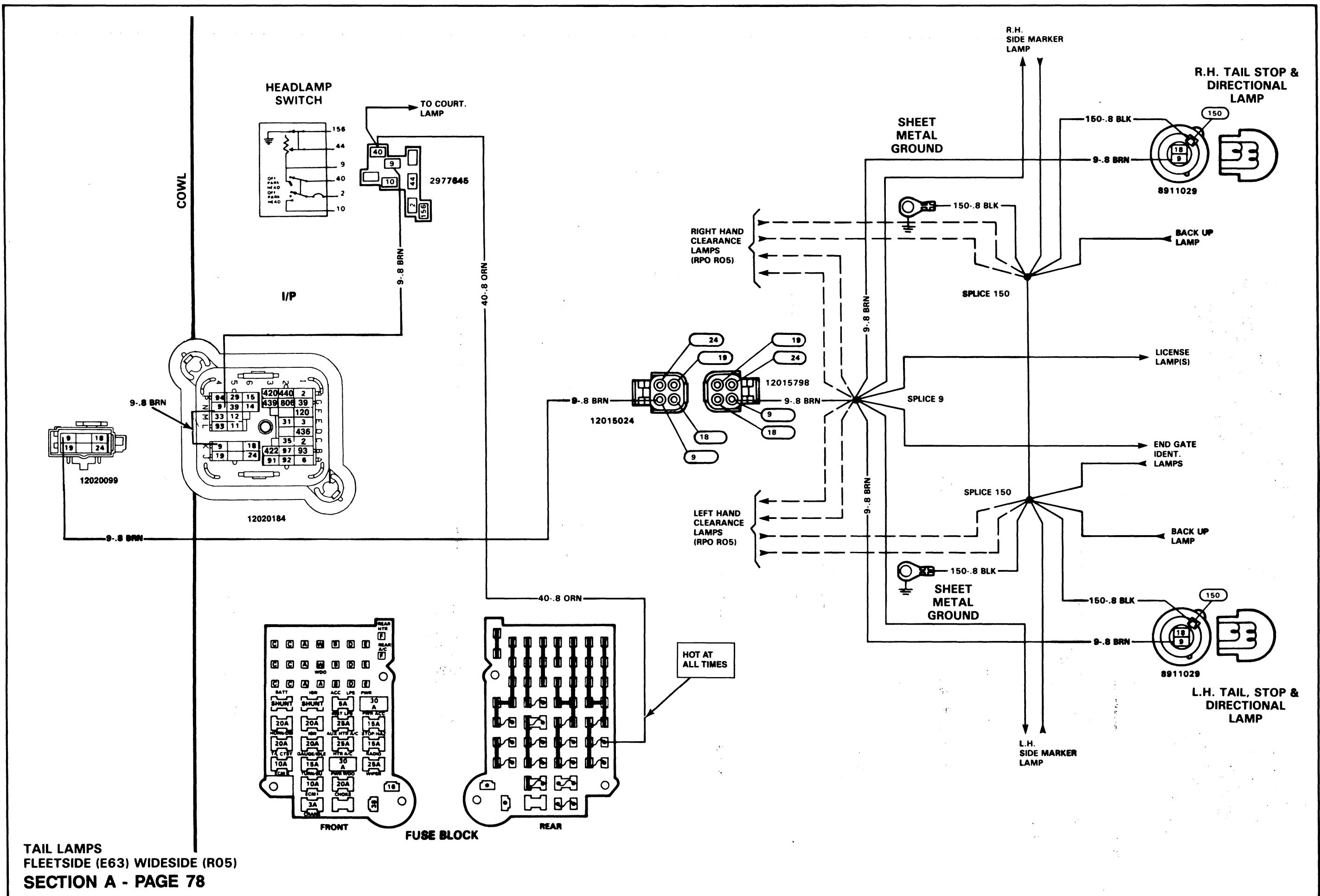
03 & 43 MODELS W/O RPO E62, E63

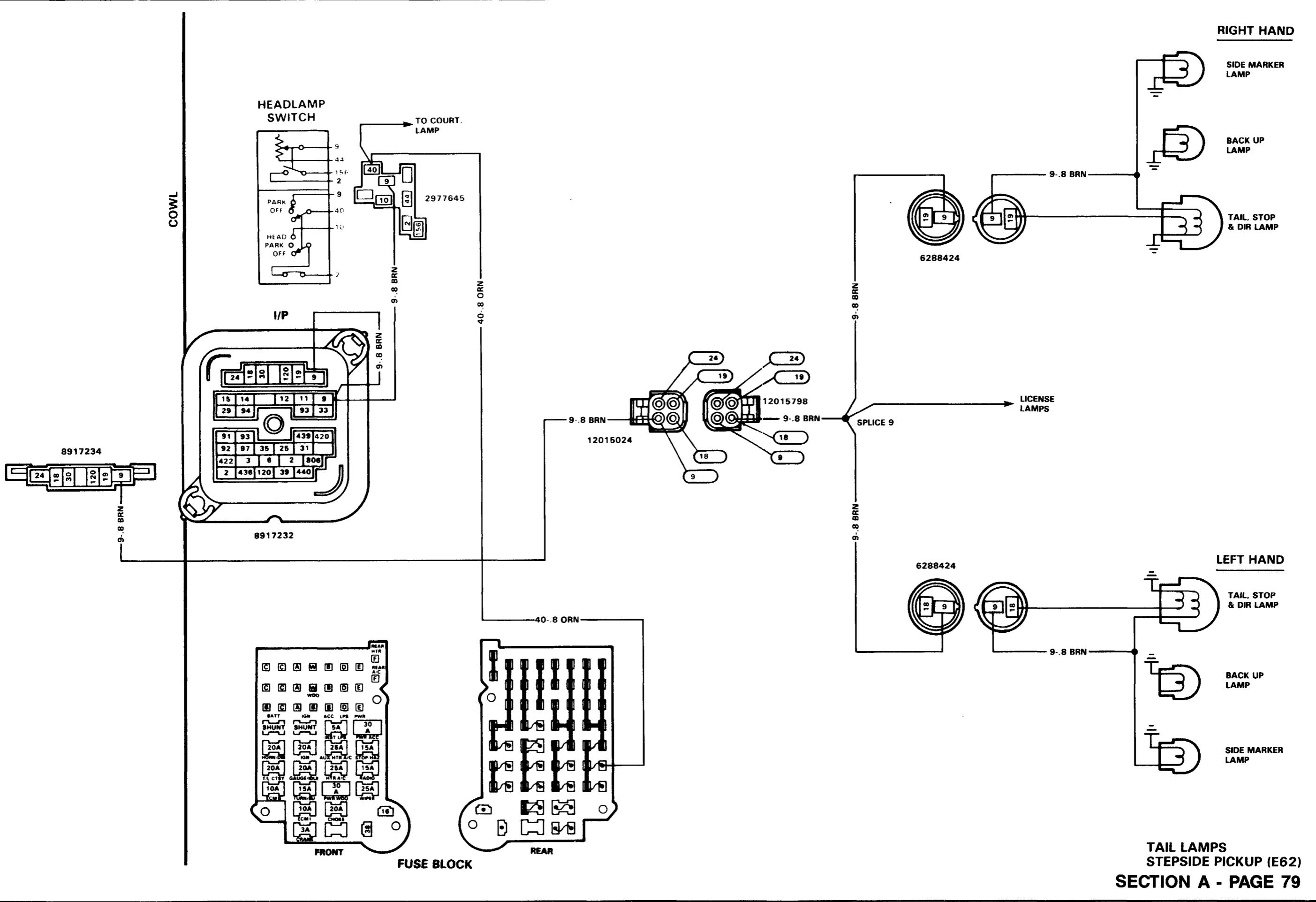
BACK UP LAMPS
SECTION A - PAGE 75

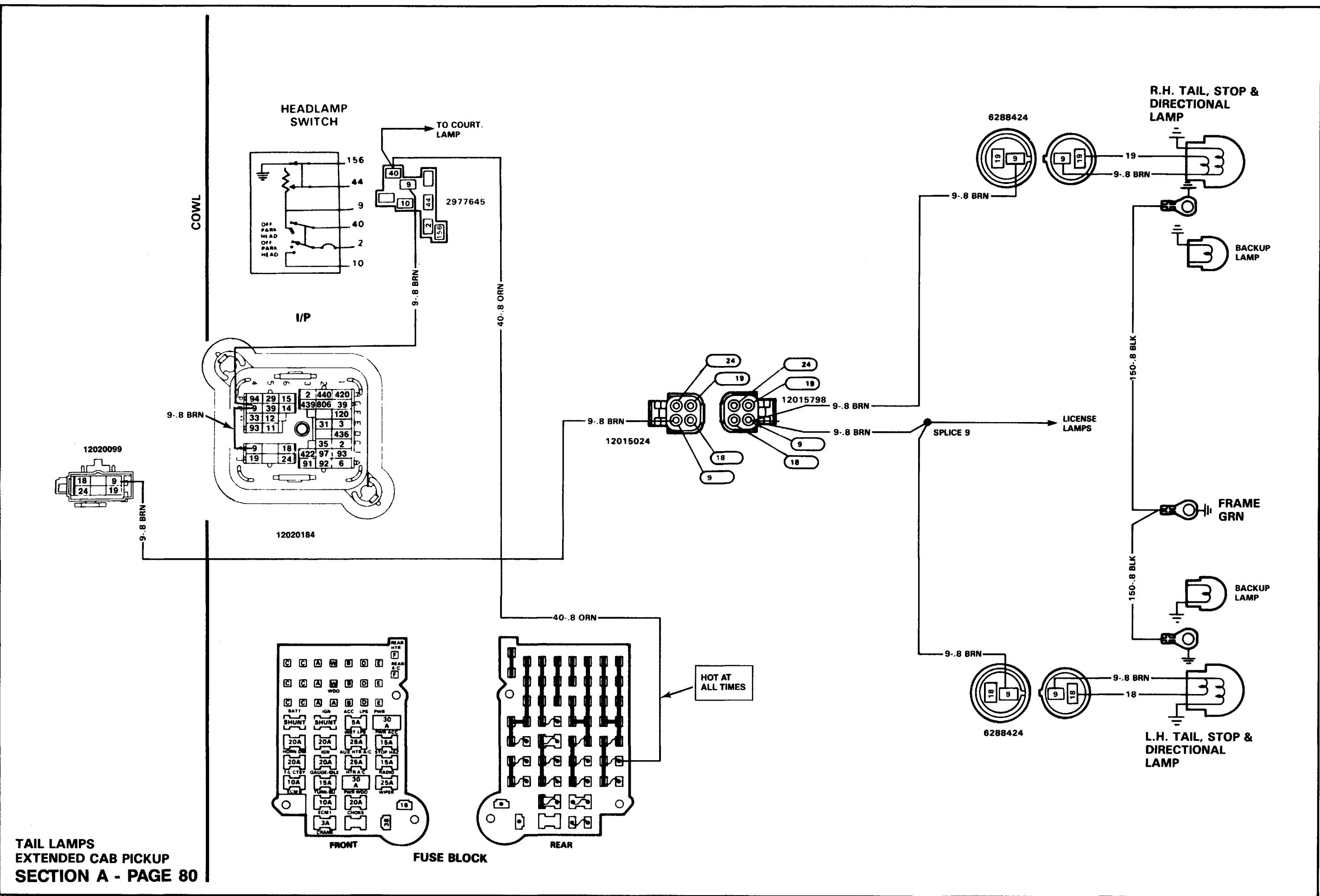


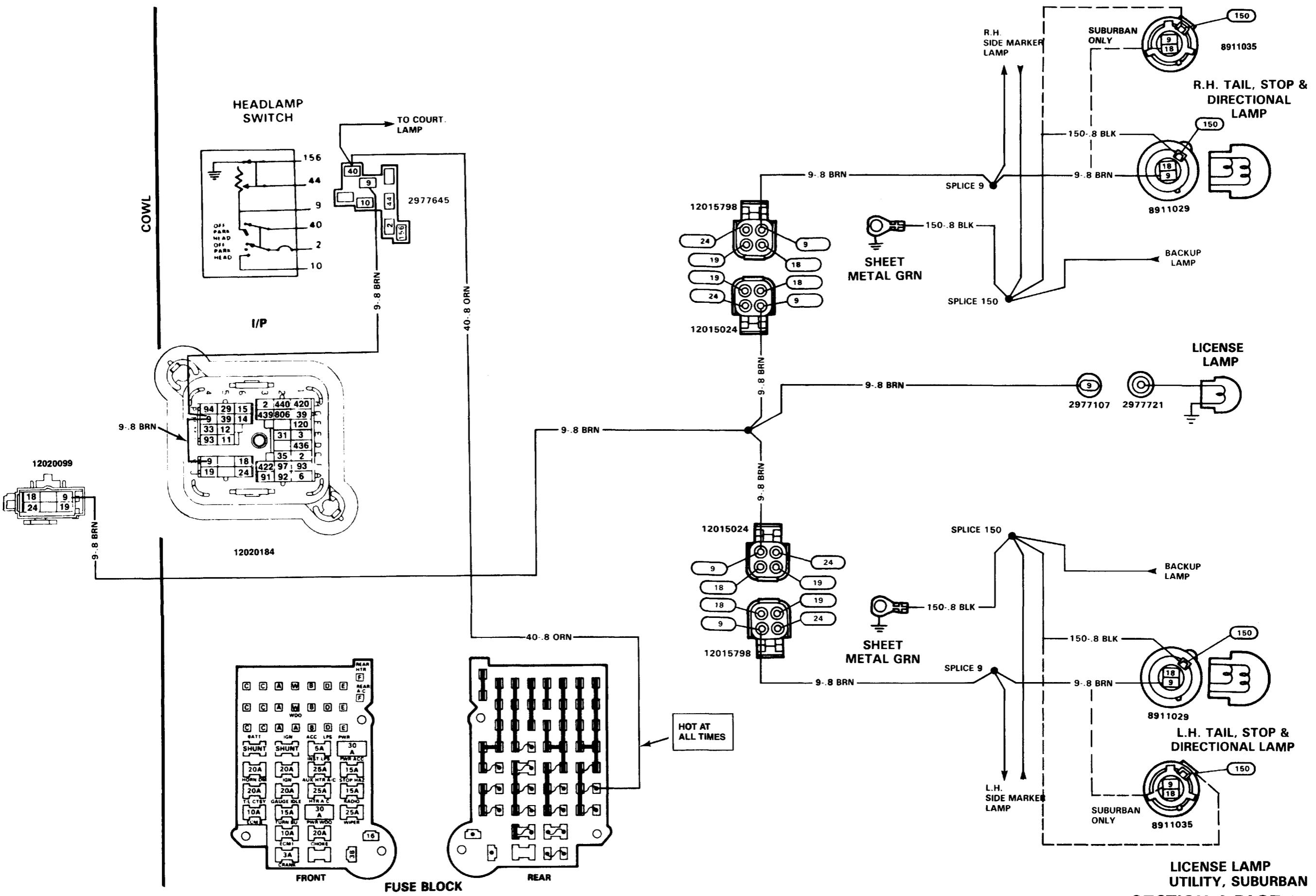


**TAIL LAMPS
UTILITY, SUBURBAN
SECTION A - PAGE 77**

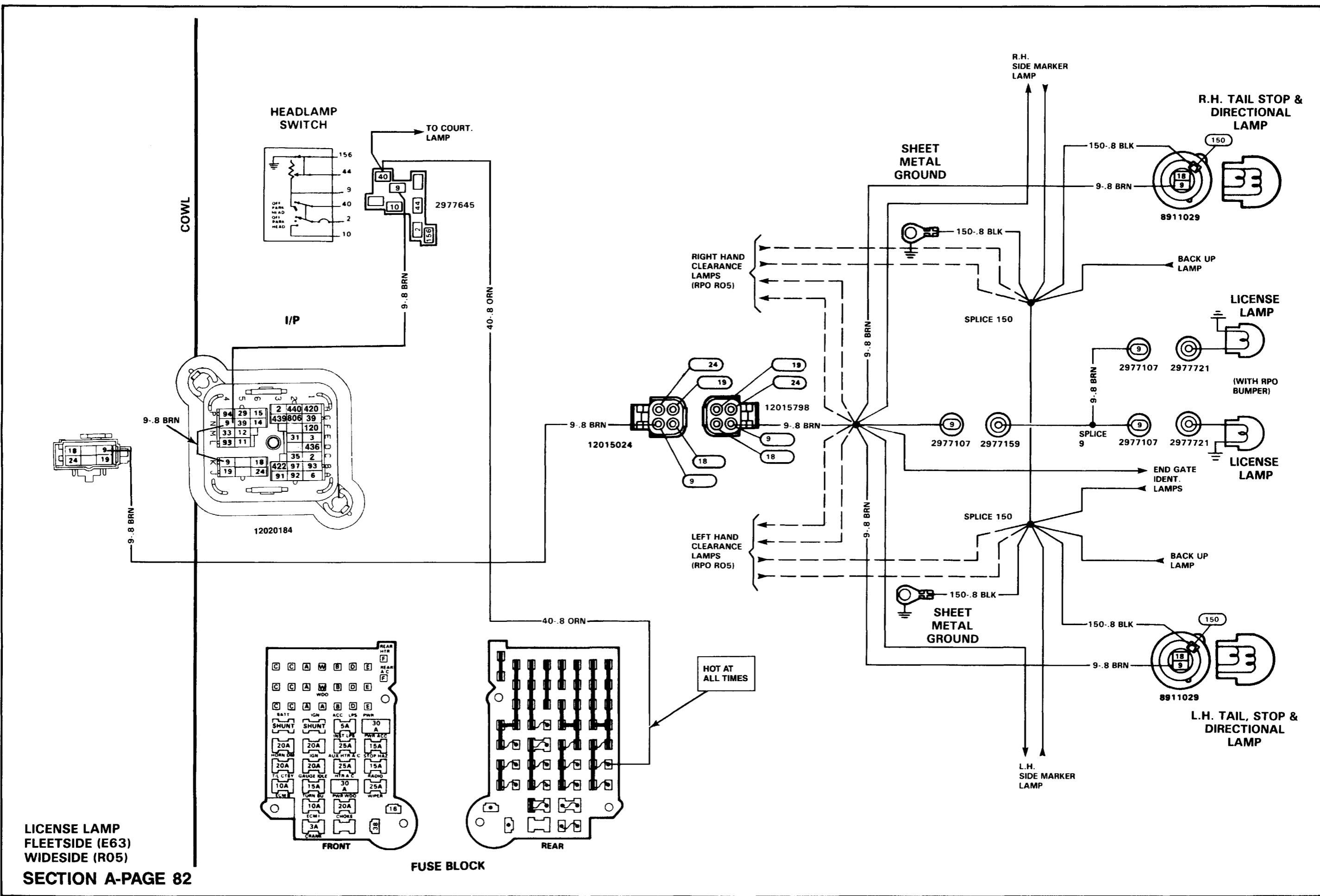


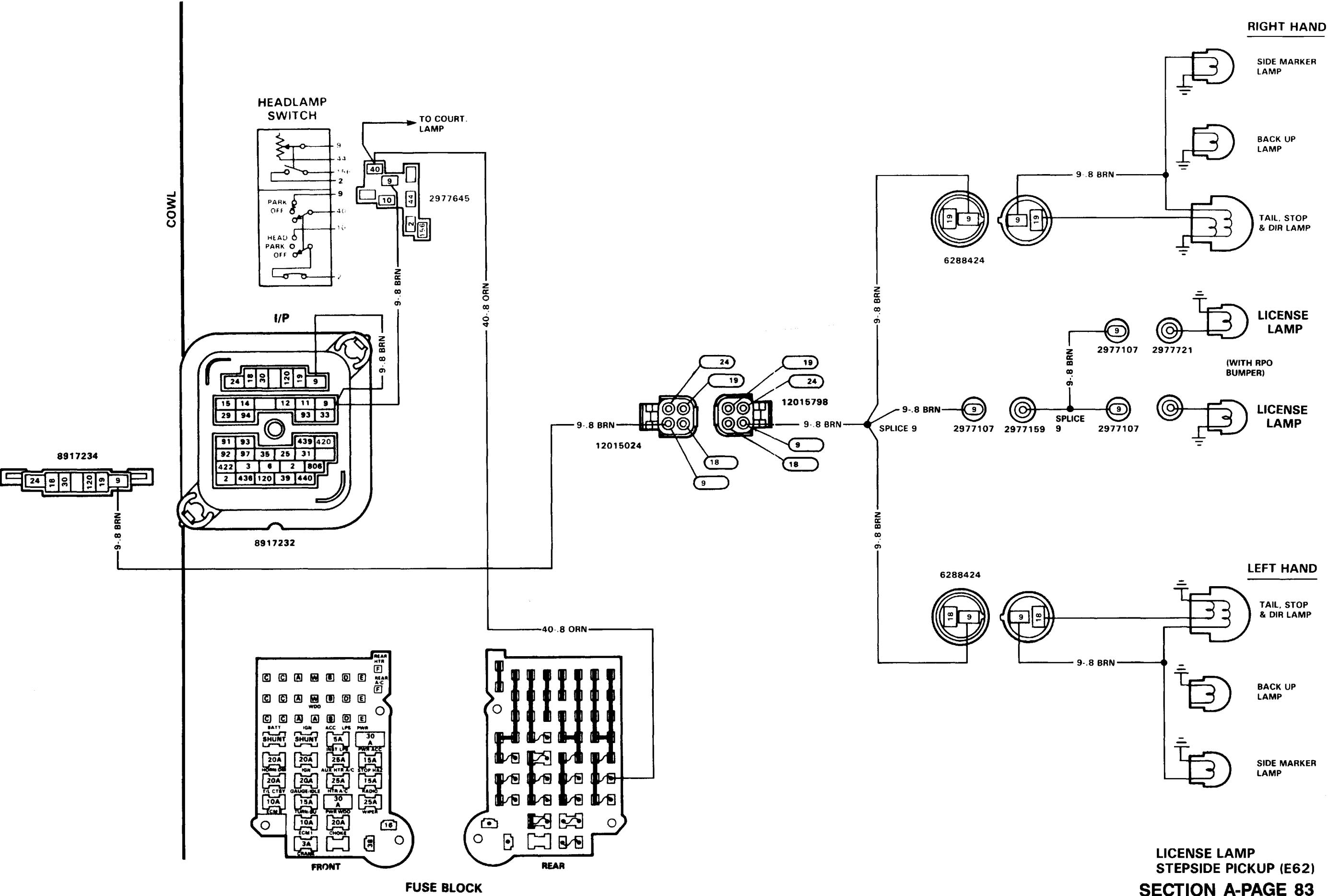


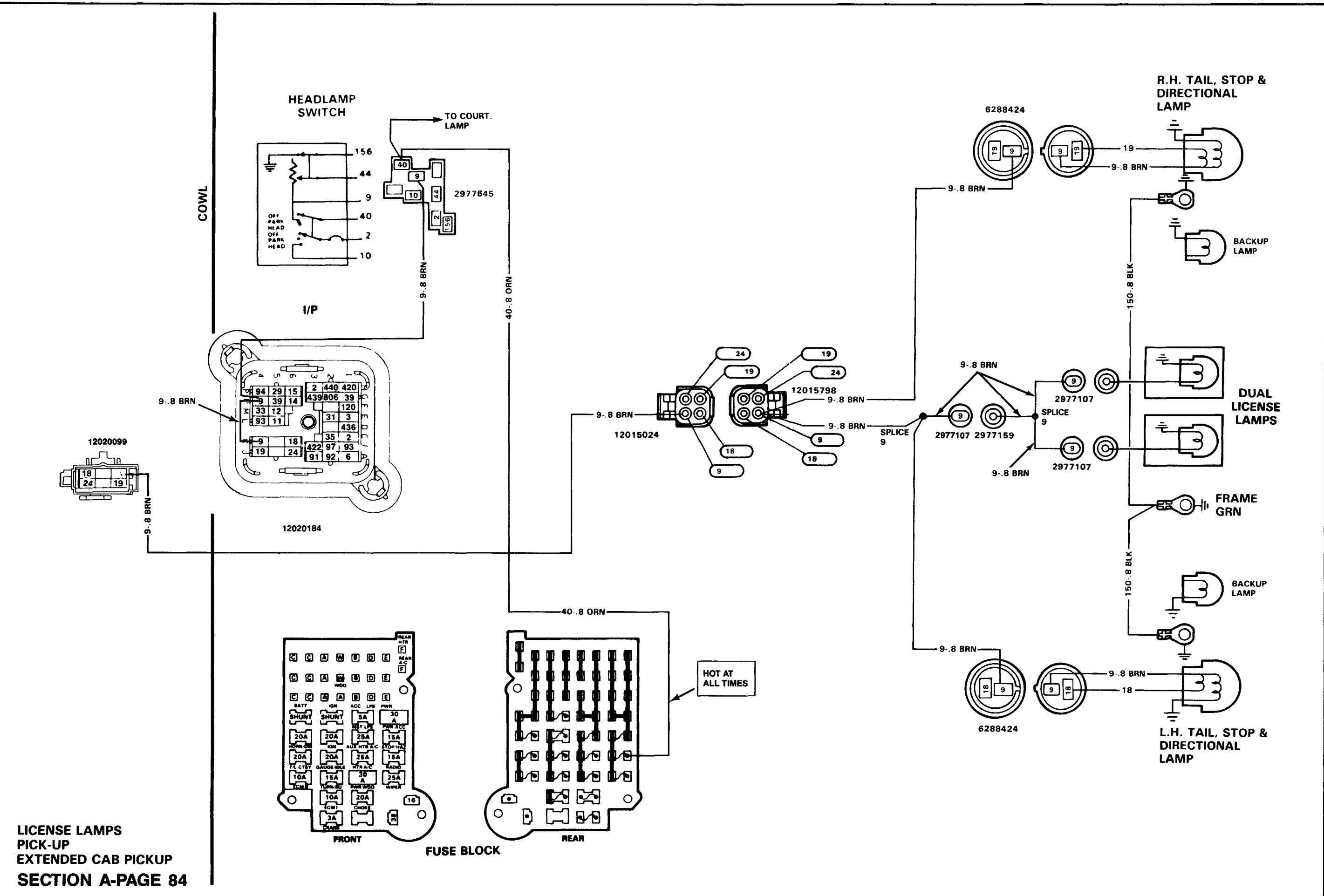


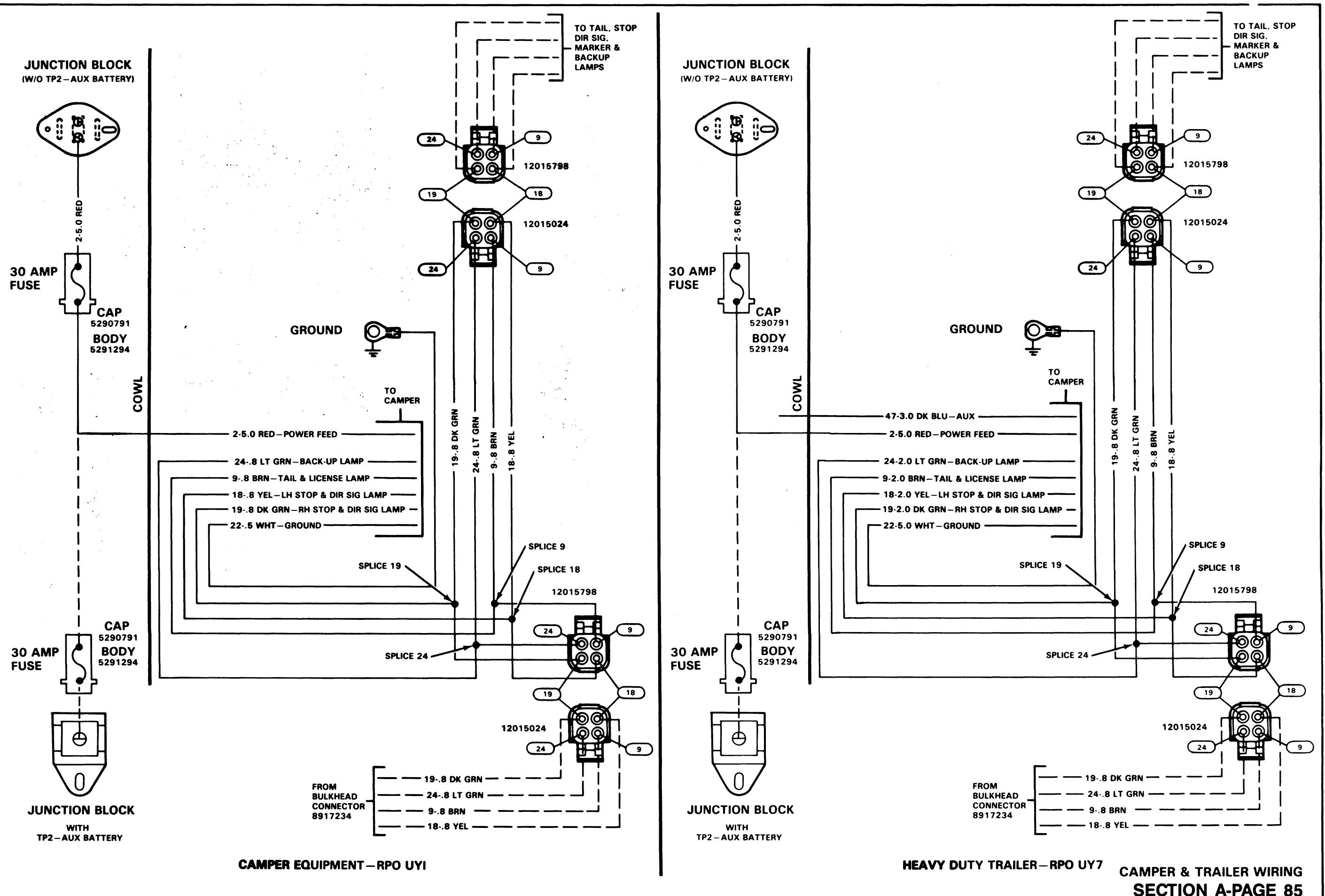


LICENSE LAMP
UTILITY, SUBURBAN
SECTION A-PAGE 81





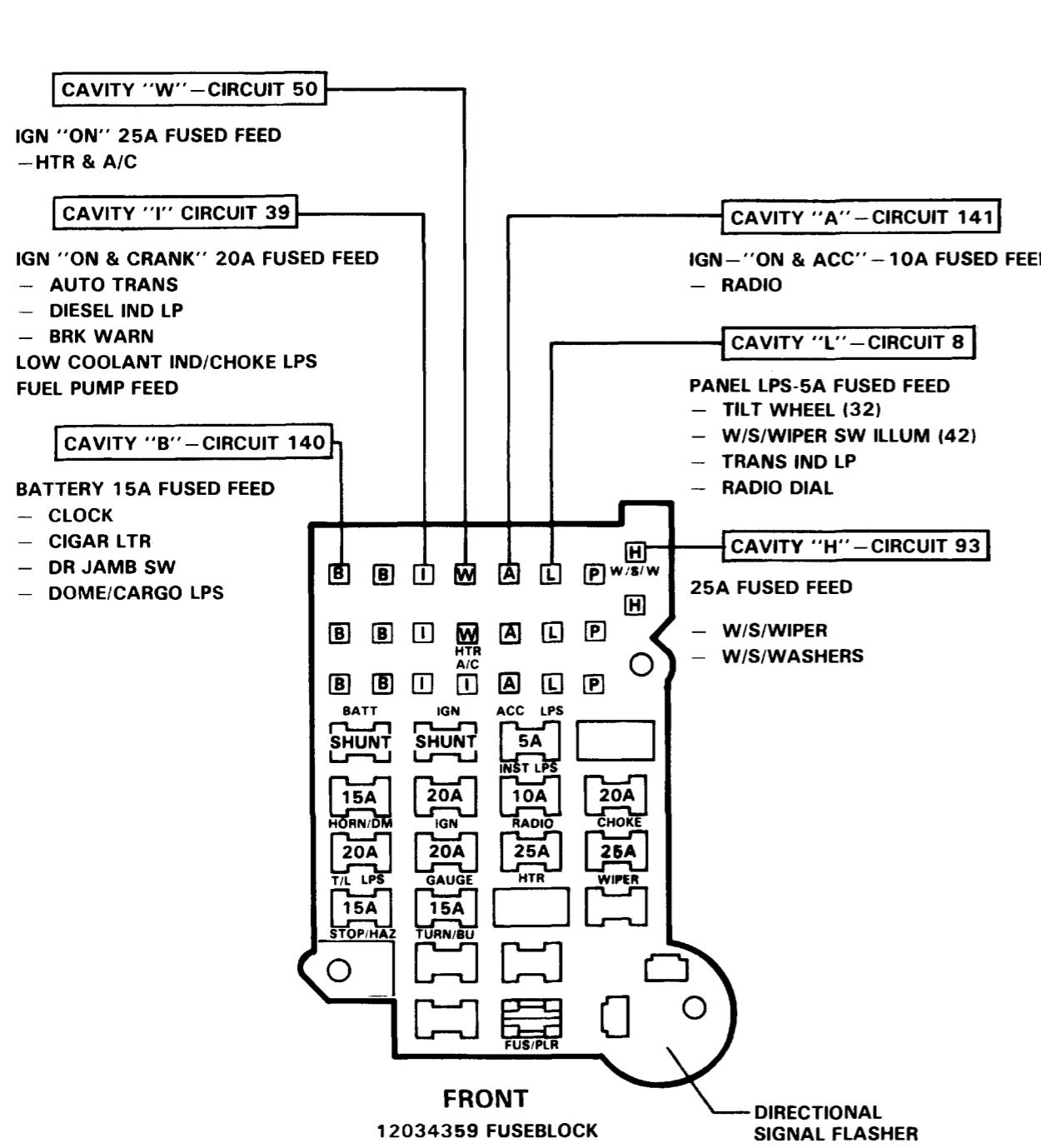




1989 P TRUCK

SECTION B

PAGE	DESCRIPTION	PAGE	DESCRIPTION
2-3	FUSE BLOCK DETAILS	24	EMISSION CONTROLS (6 CYL.)
4	START/IGNITION (8 CYL.)	25-26	EMISSION CONTROLS (8 CYL.)
5	POWER DISTRIBUTION (DIESEL)	27	EMISSION CONTROLS (DIESEL)
6	POWER DISTRIBUTION (6 CYL.)	28	GLOW PLUGS (DIESEL)
7-10	POWER DISTRIBUTION (8 CYL.)	29	AUTO TRANSMISSION KICKDOWN SOLENOID (M4Q)
11	HEAD LAMPS & PARKING LAMPS	30-31	ELECTRONIC CONTROL MODULE (ECM)-INPUTS (8 CYL.)
12	MARKER LAMPS	32-33	ELECTRONIC CONTROL MODULE (ECM)-OUTPUTS (8 CYL.)
13	HAZARD LAMPS	34	ECM CHART (8 CYL.)
14	DIRECTIONAL LAMPS	35-36	BRAKE WARNING SYSTEM
15	HORNS	37	INSTRUMENT PANEL LAMPS
16	WIPER/WASHER	38-39	INDICATOR LAMPS
17-21	START/IGNITION	40	INSTRUMENT PANEL GAGES
22	THROTTLE BODY INJECTION	41	BACKUP LAMPS
23	FUEL CONTROL & IDLE AIR CONTROL (8 CYL.)	42	TAIL LAMPS
		43	LICENSE LAMPS

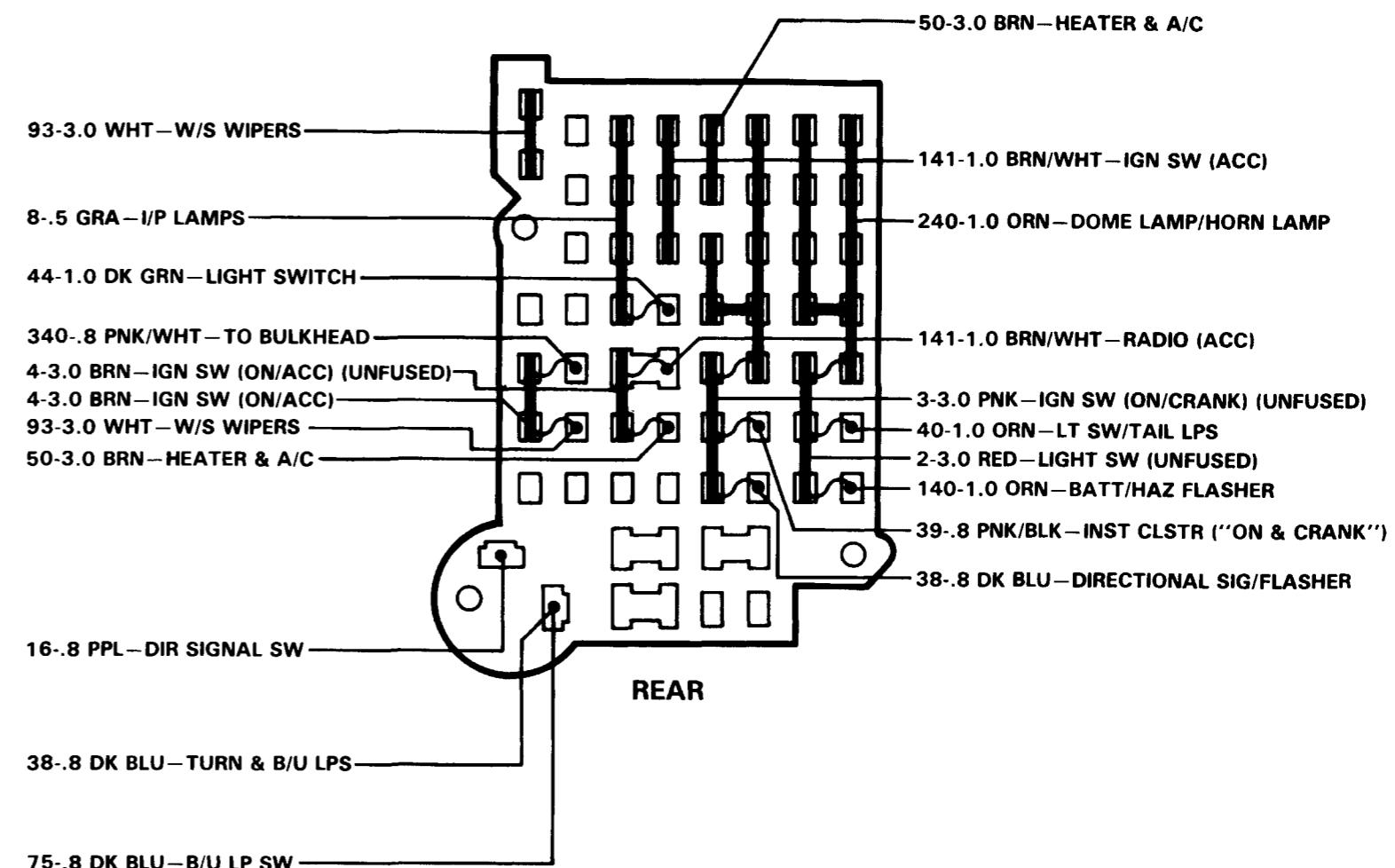


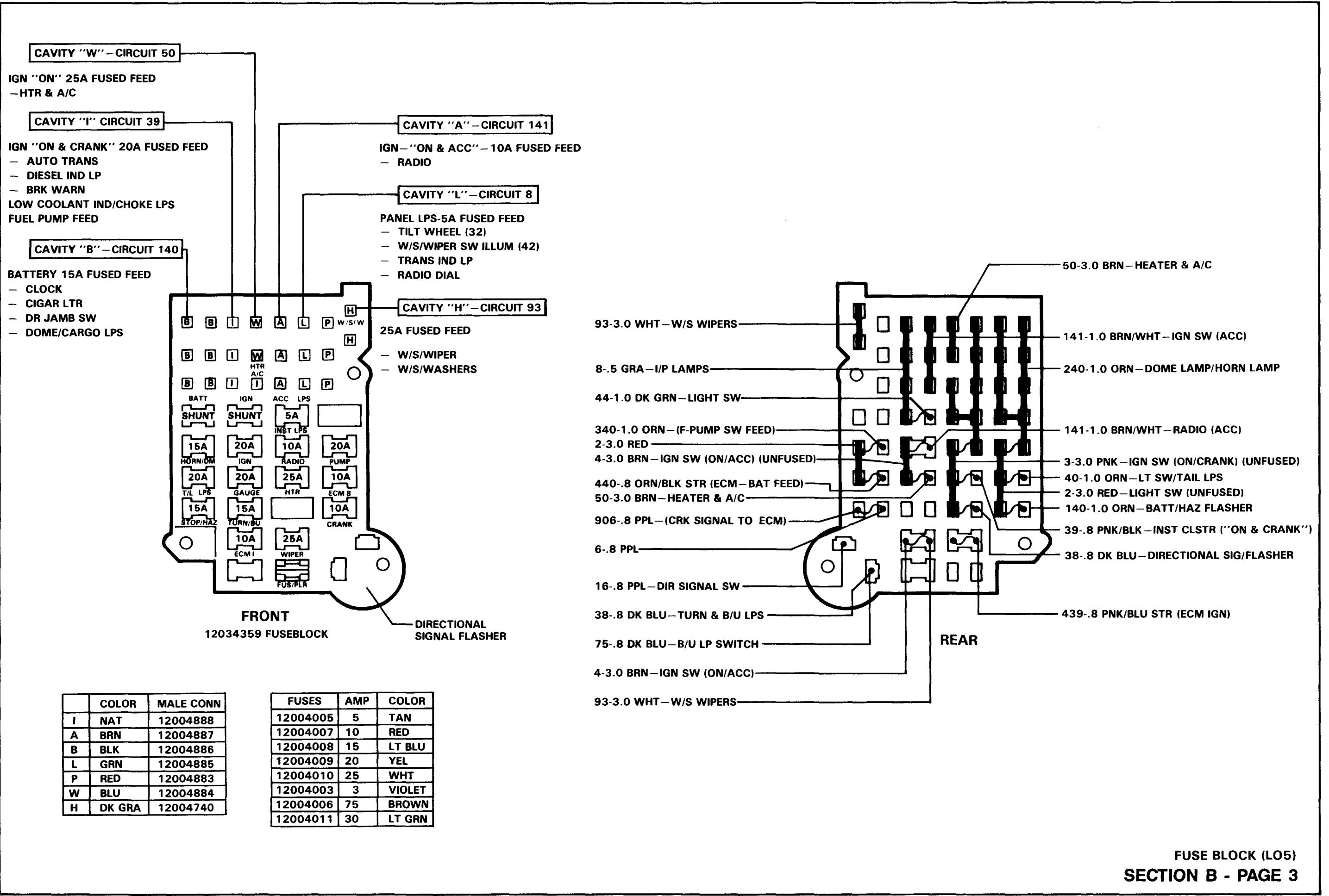
	COLOR	MALE CONN
I	NAT	12004888
A	BRN	12004887
B	BLK	12004886
L	GRN	12004885
P	RED	12004883
W	BLU	12004884
H	DK GRA	12004740

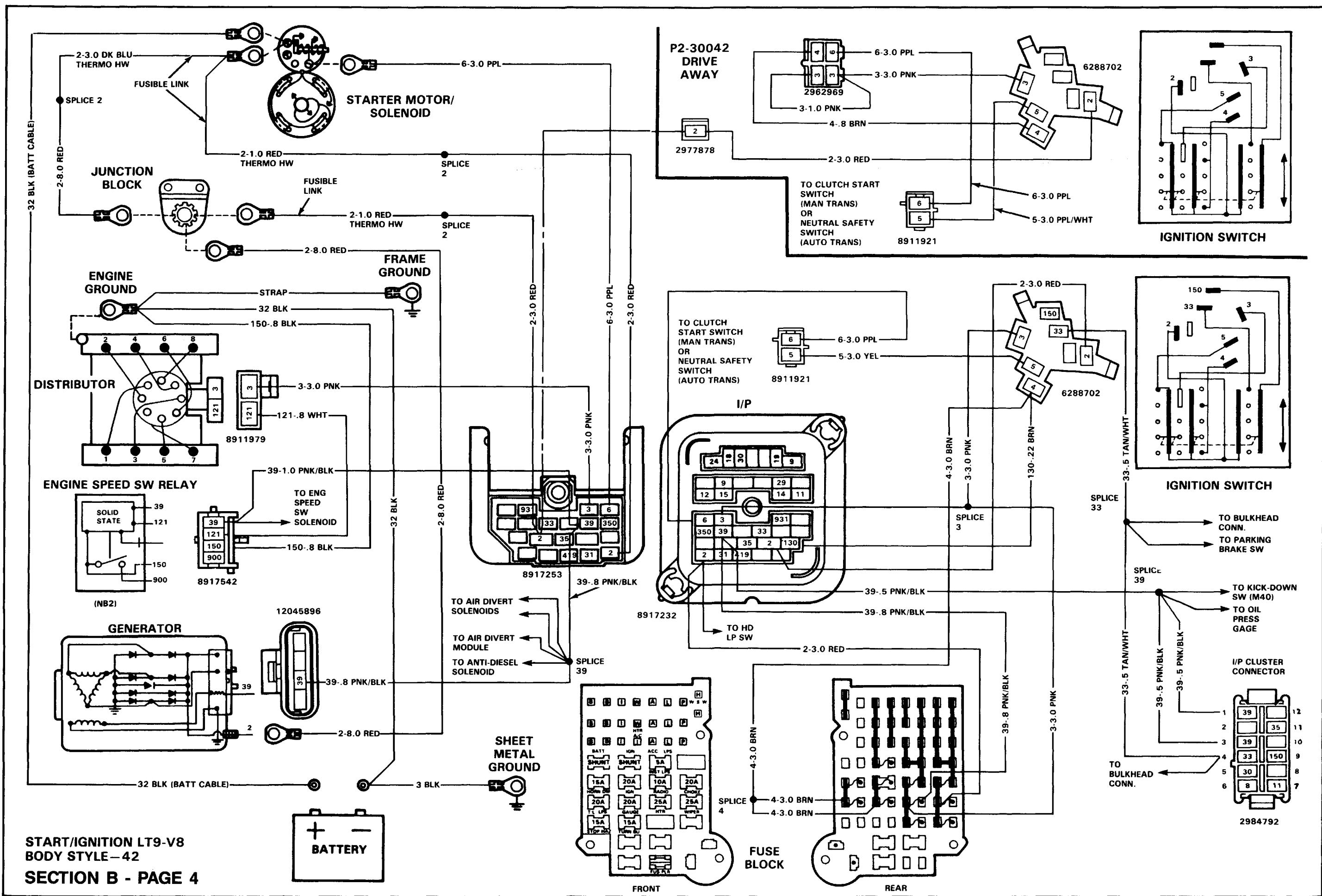
FUSES	AMP	COLOR
12004005	5	TAN
12004007	10	RED
12004008	15	LT BLU
12004009	20	YEL
12004010	25	WHT
12004003	3	VIOLET
12004006	75	BROWN
12004011	30	LT GRN

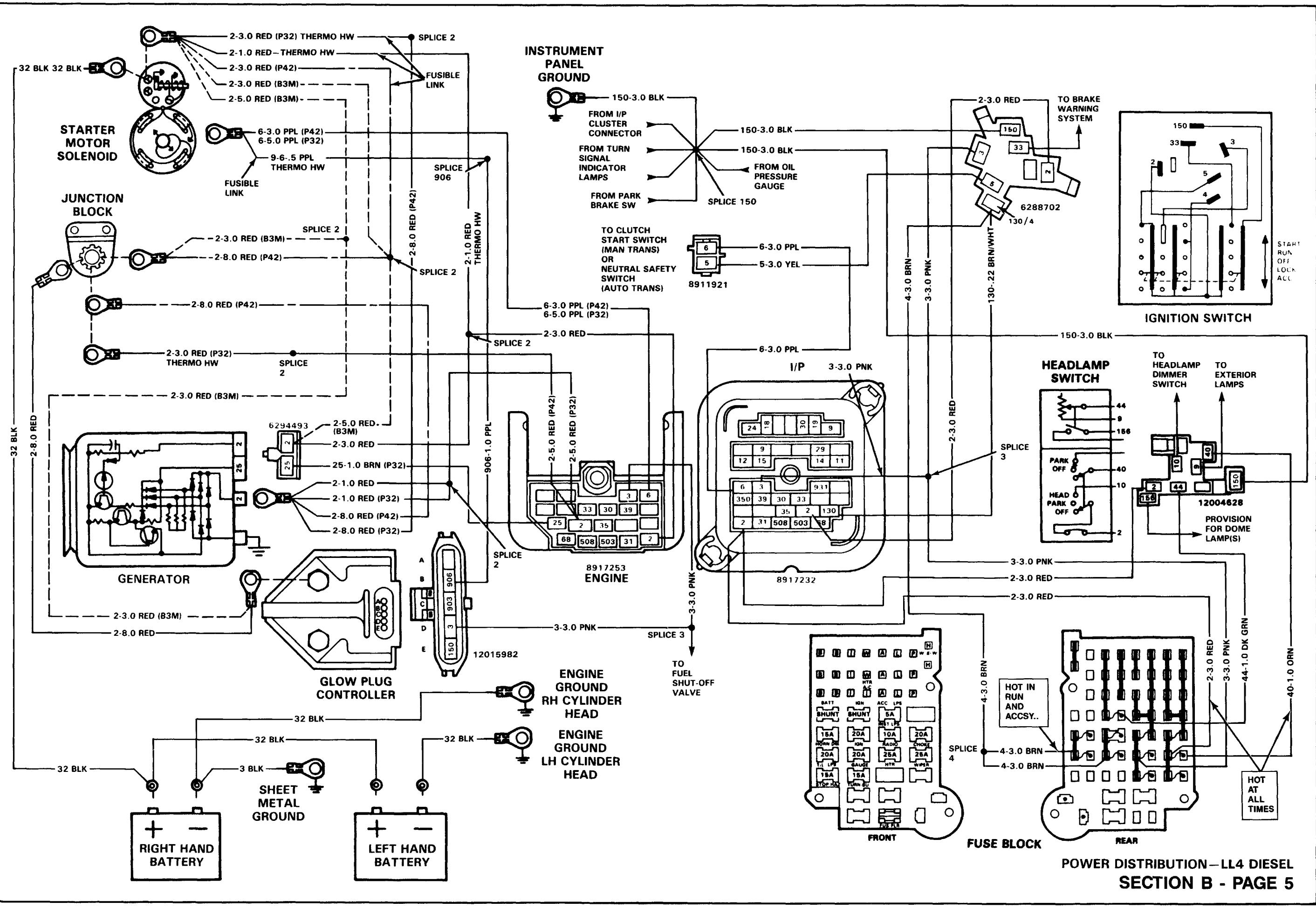
FUSE BLOCK (ALL EXCEPT LO5)

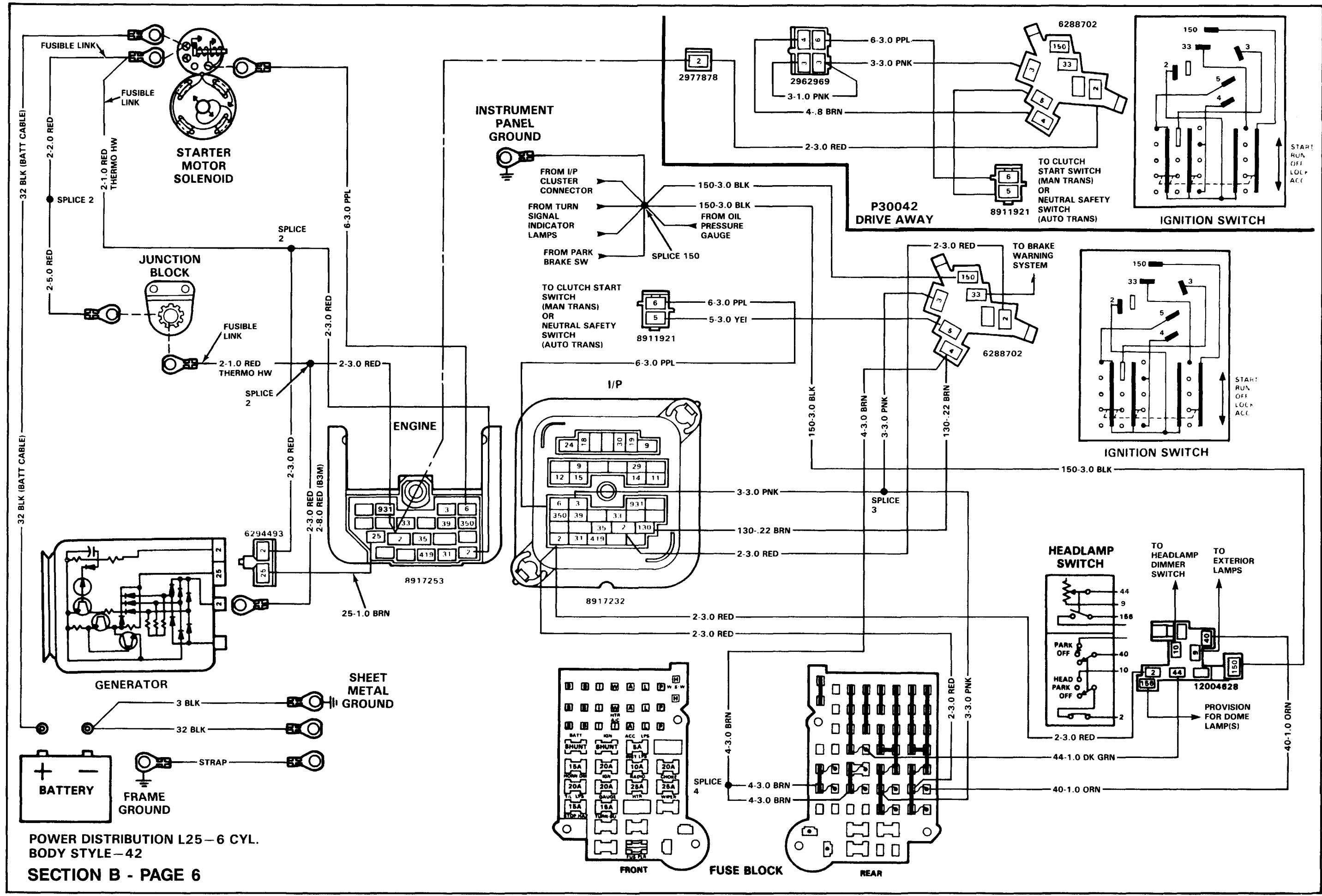
SECTION B - PAGE 2

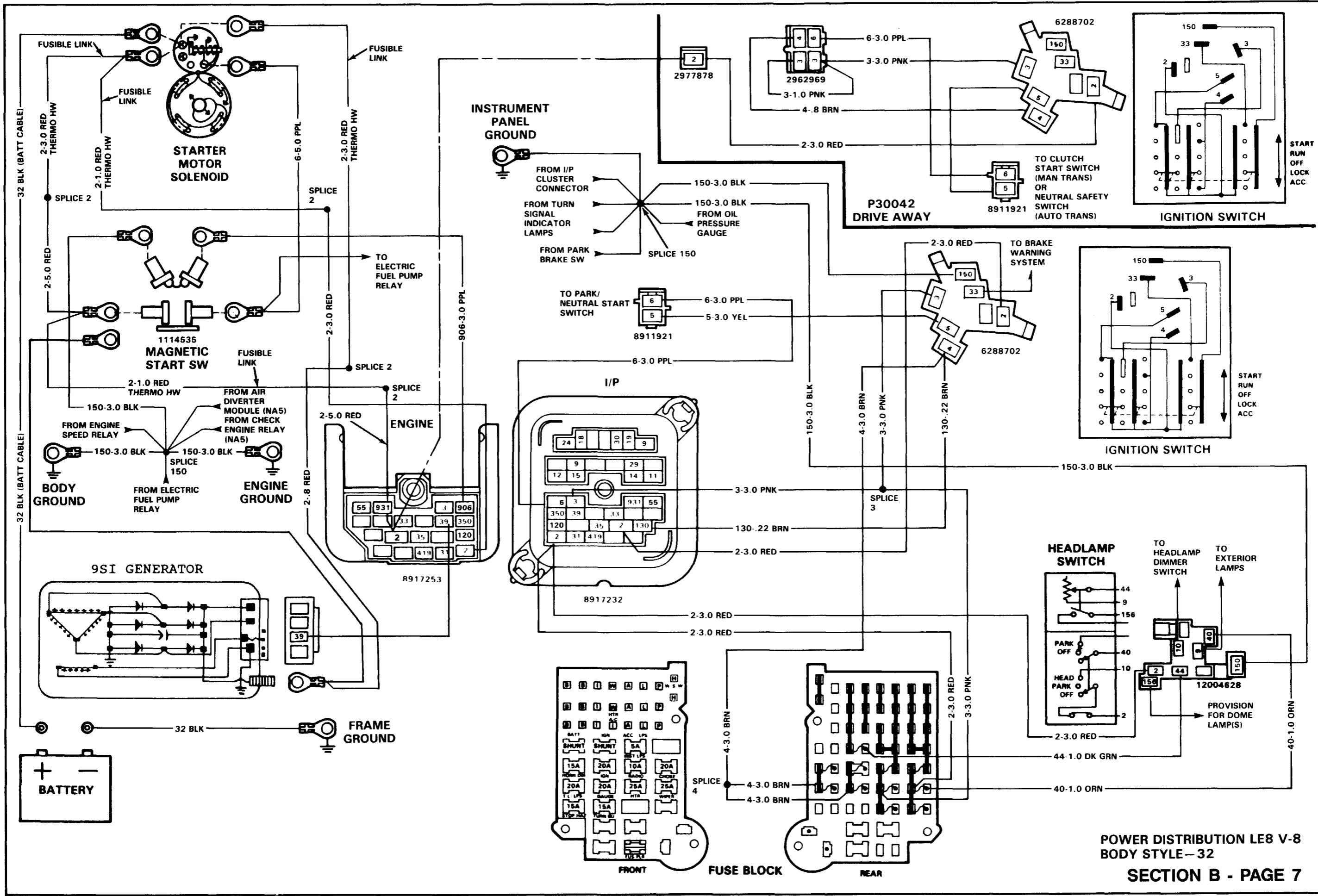


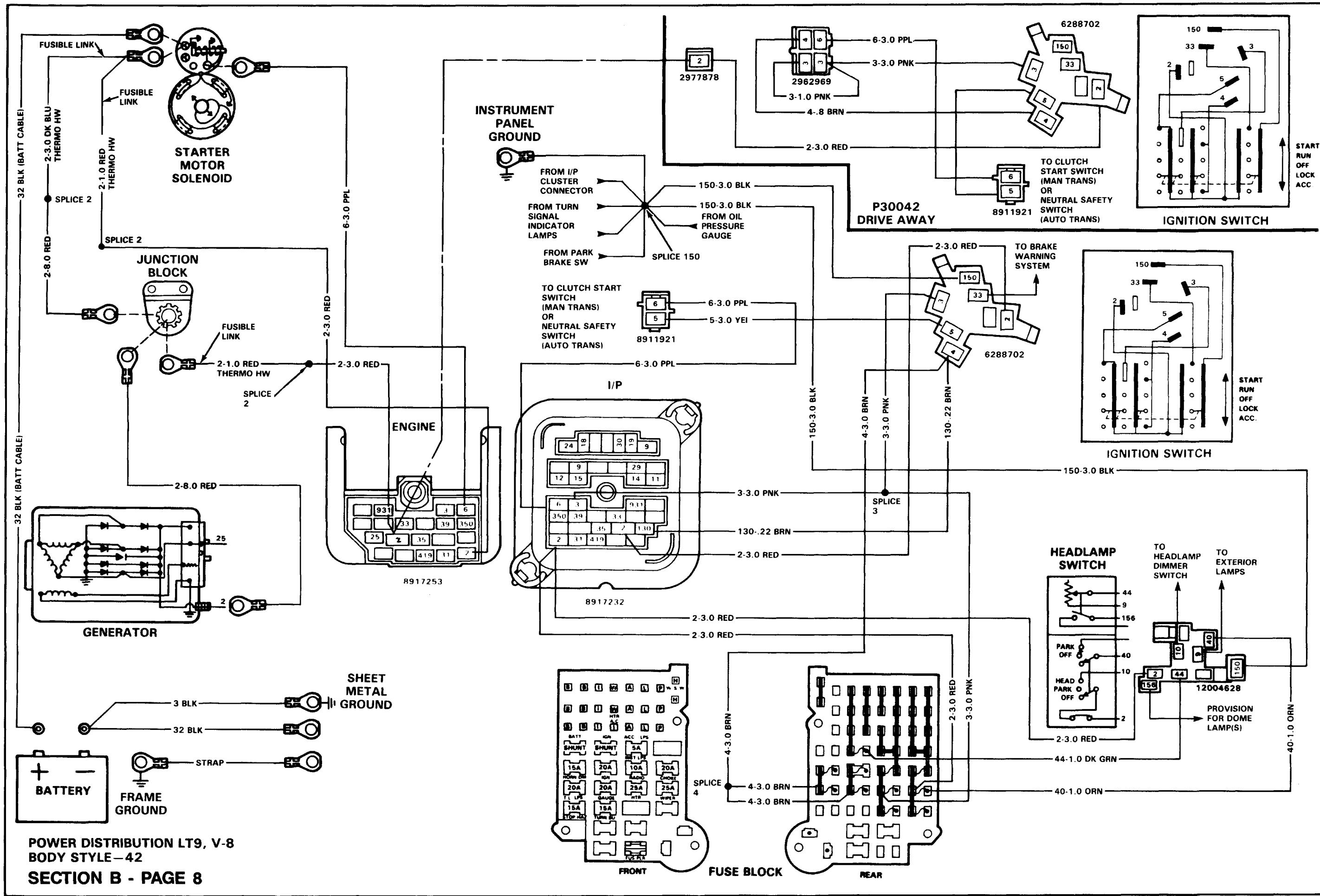


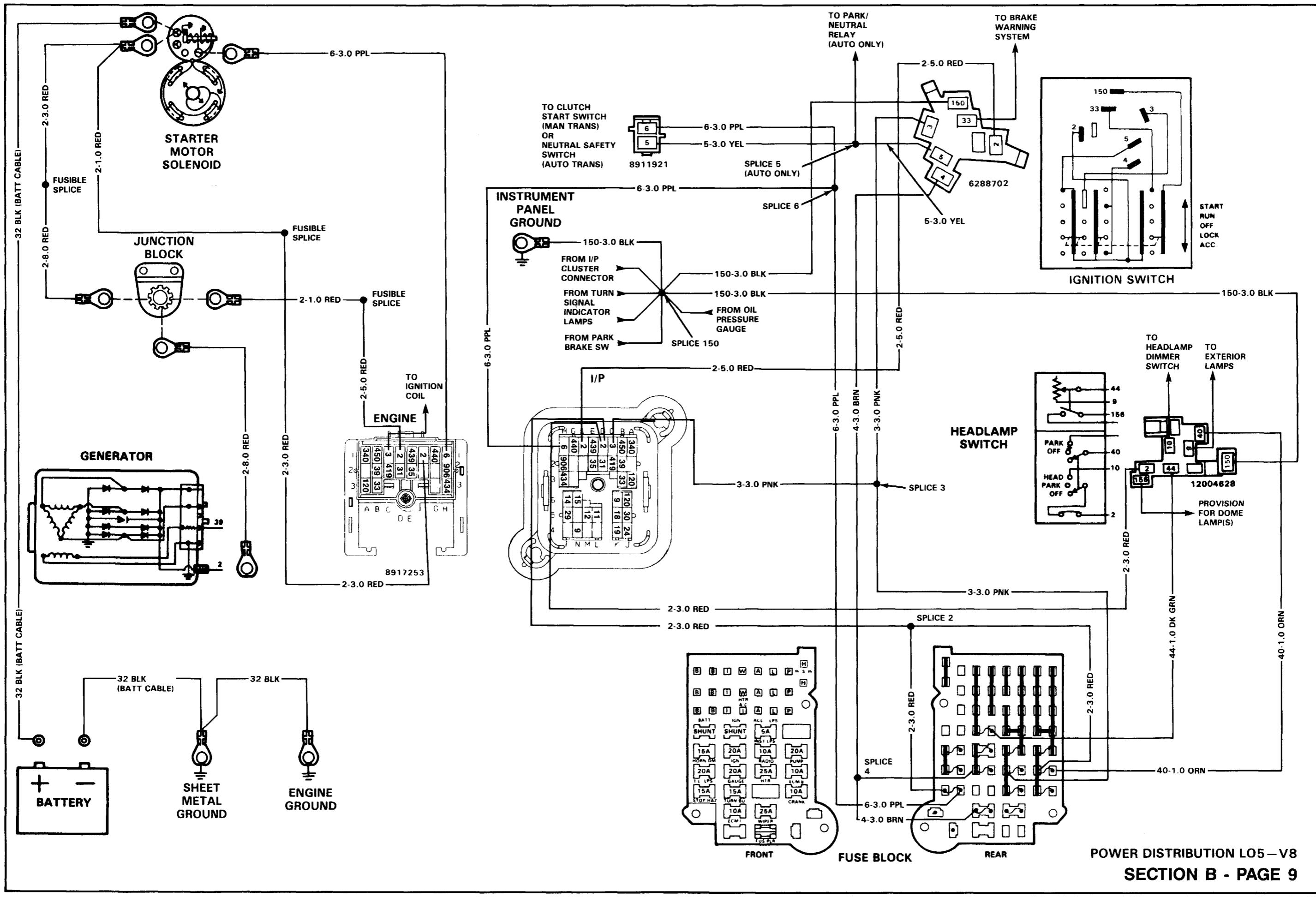


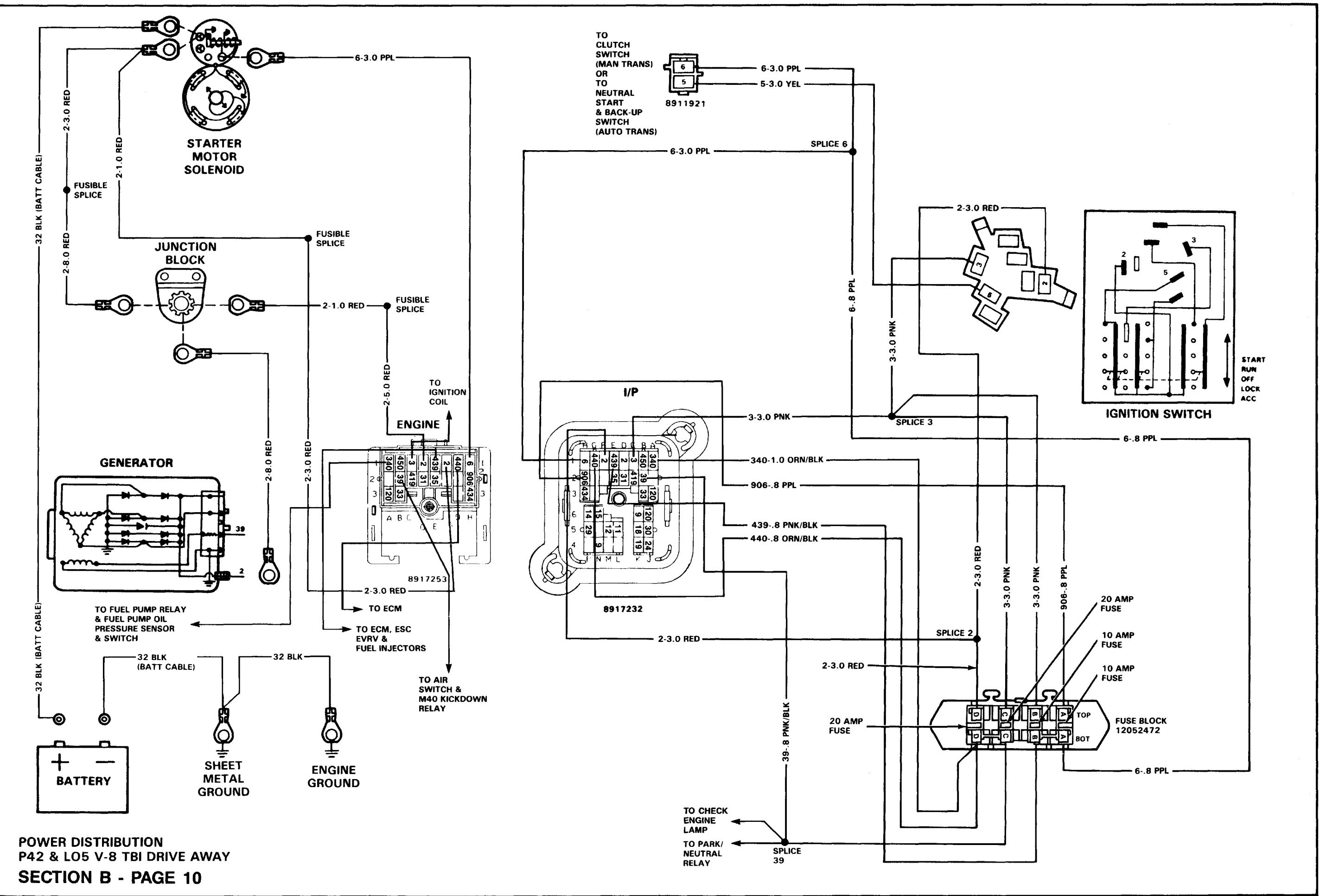


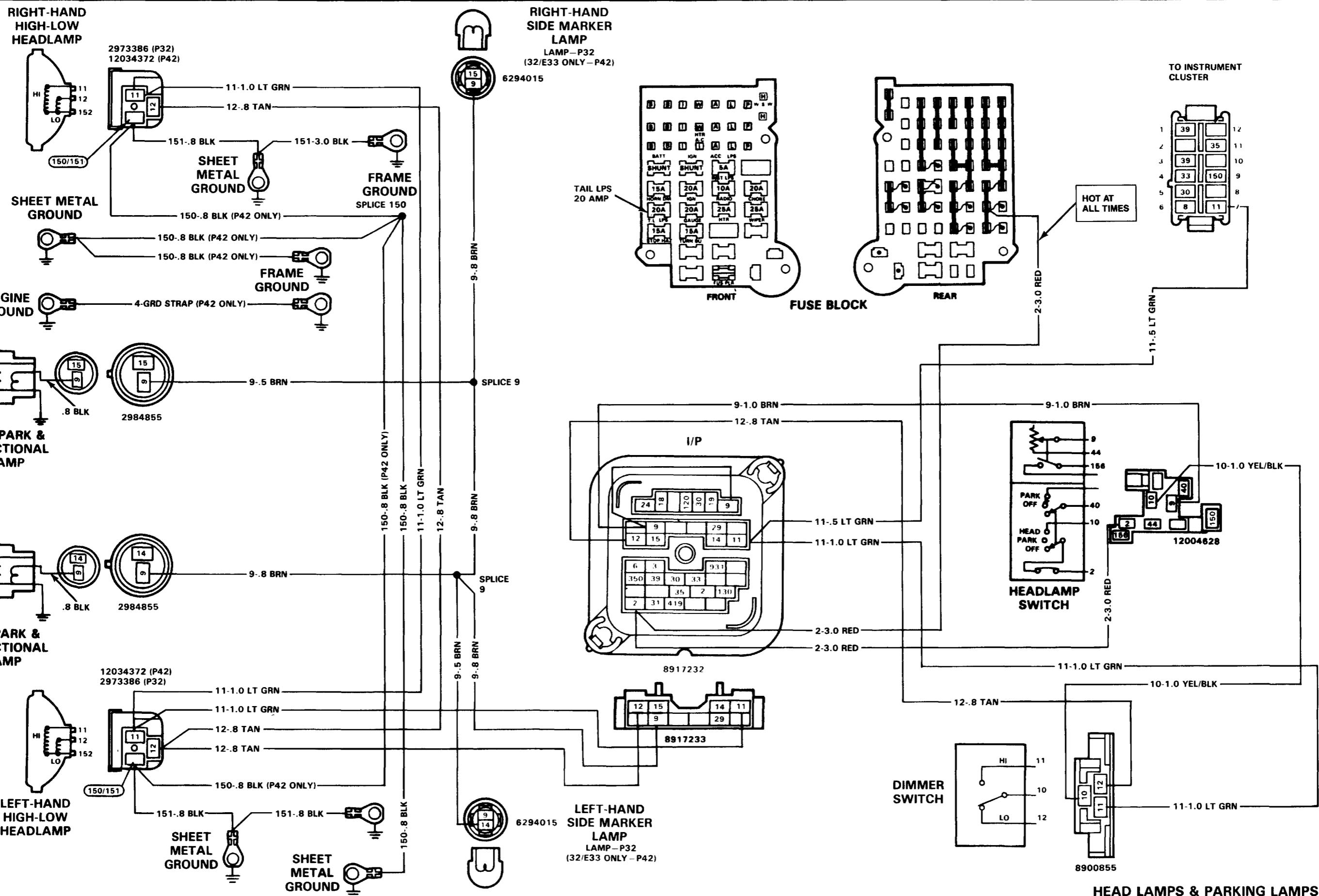


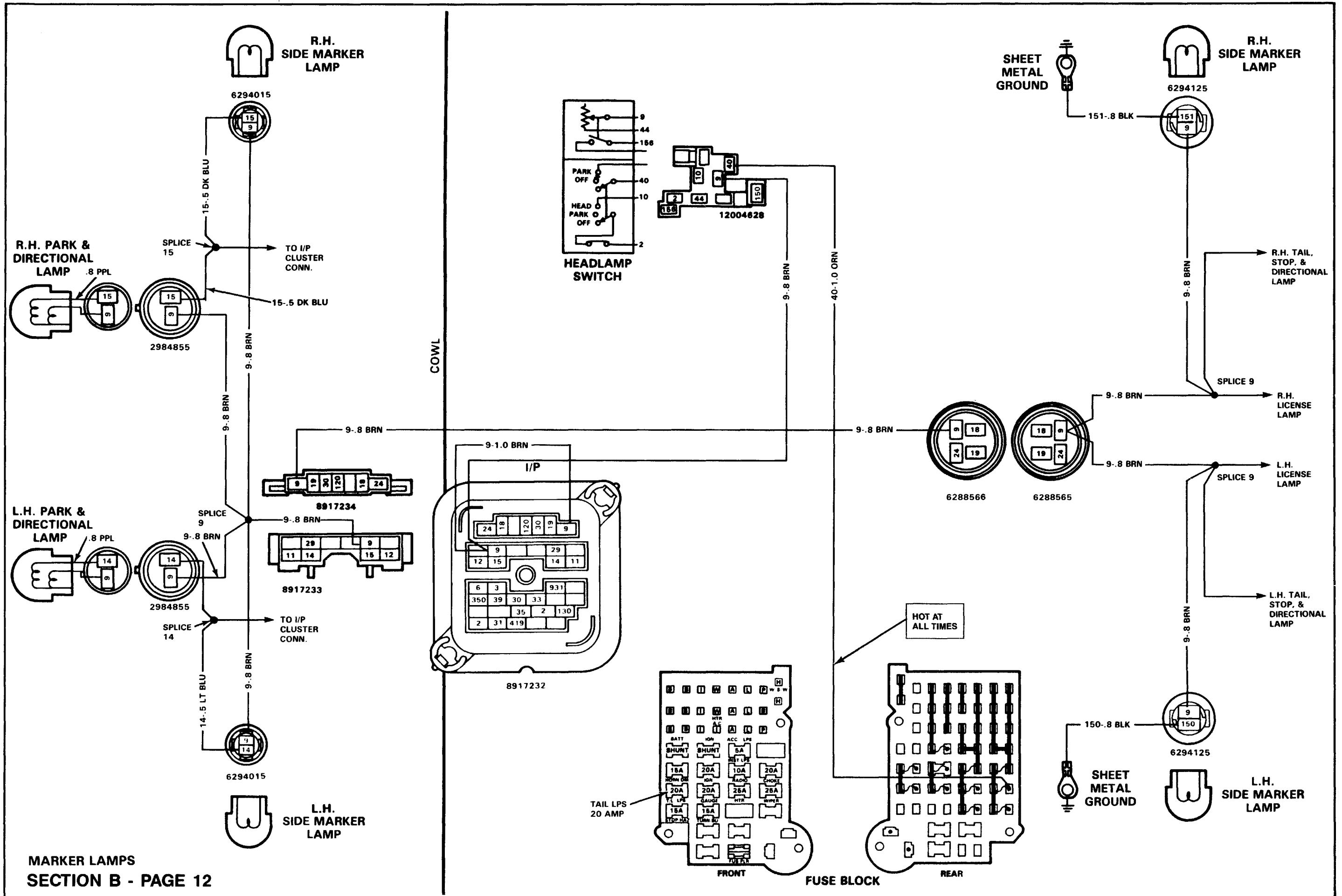








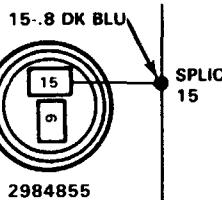
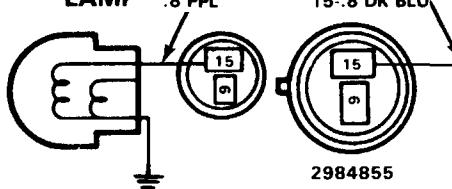




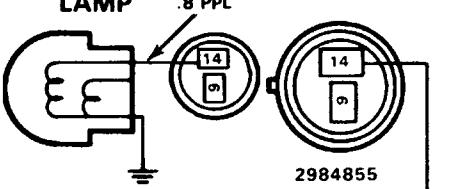
R.H.
SIDE MARKER
LAMP
LAMP-P32
(E32/E33 ONLY-P42)



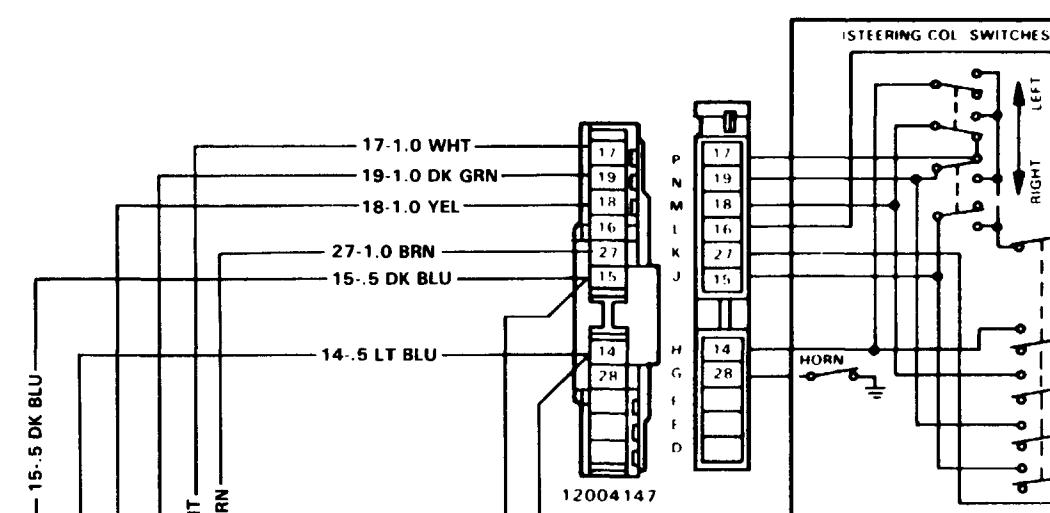
R.H. PARK &
DIRECTIONAL
LAMP



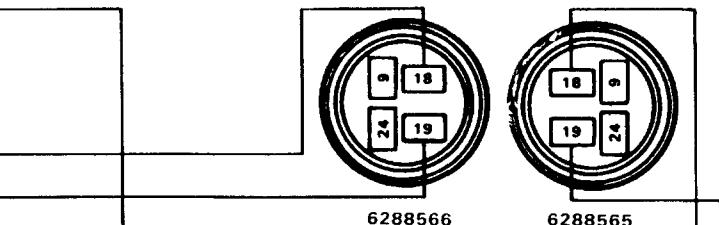
L.H. PARK &
DIRECTIONAL
LAMP



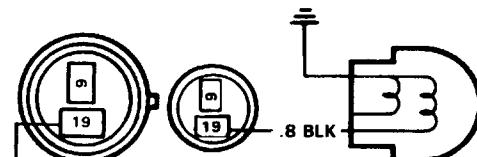
L.H.
SIDE MARKER
LAMP
LAMP-P32
(E32/E33 ONLY-P42)



DIRECTIONAL
SIGNAL SW



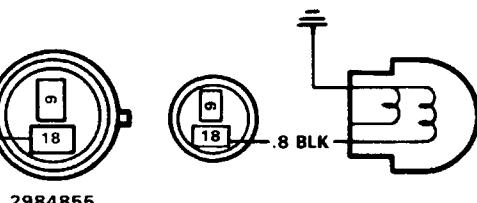
6288566 6288565



2984855

PROVISIONS FOR
R.H TAIL, STOP
& DIRECTIONAL
LAMP (P32)

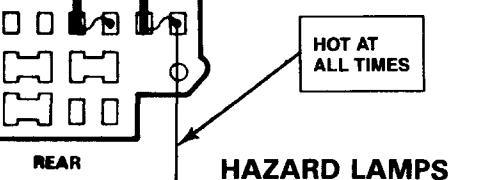
R.H. TAIL, STOP
& DIRECTIONAL
LAMP (P42)



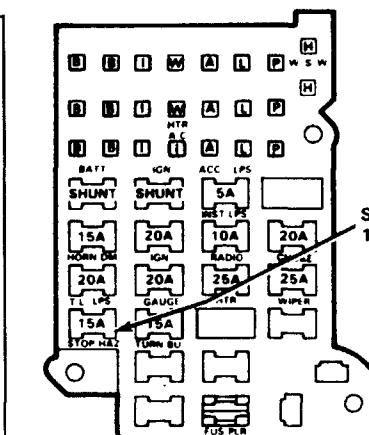
2984855

PROVISIONS FOR
L.H. TAIL,
STOP &
DIRECTIONAL
LAMP (P32)

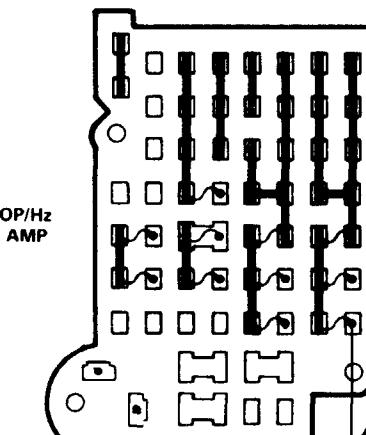
L.H. TAIL, STOP
& DIRECTIONAL
LAMP (P42)



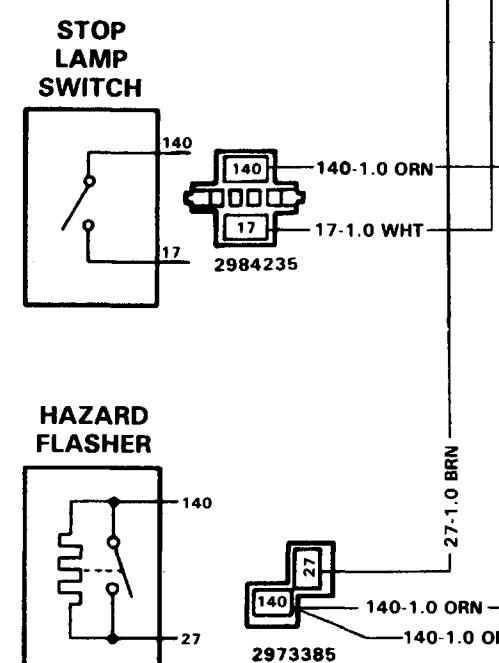
HOT AT ALL TIMES
HAZARD LAMPS



FRONT

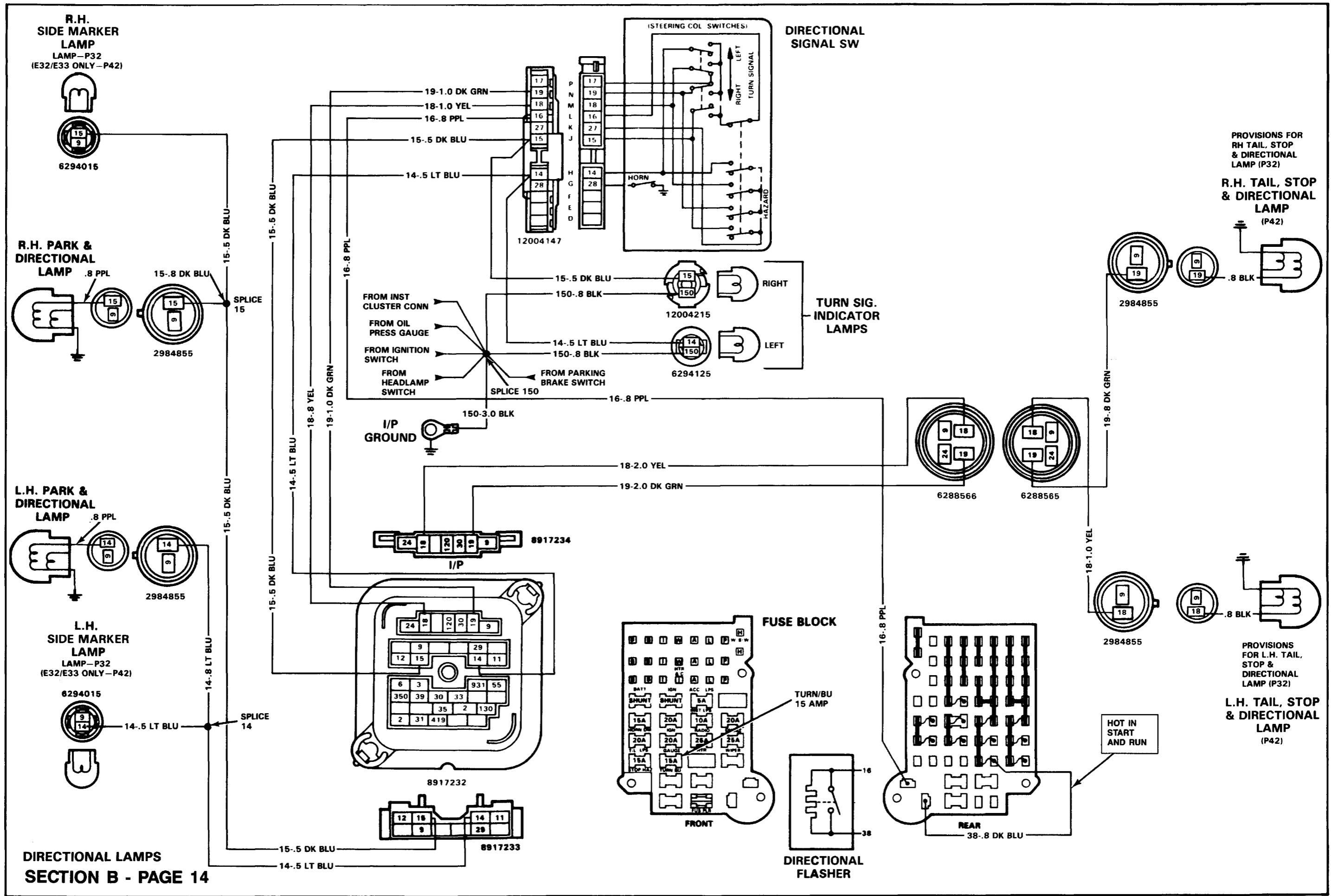


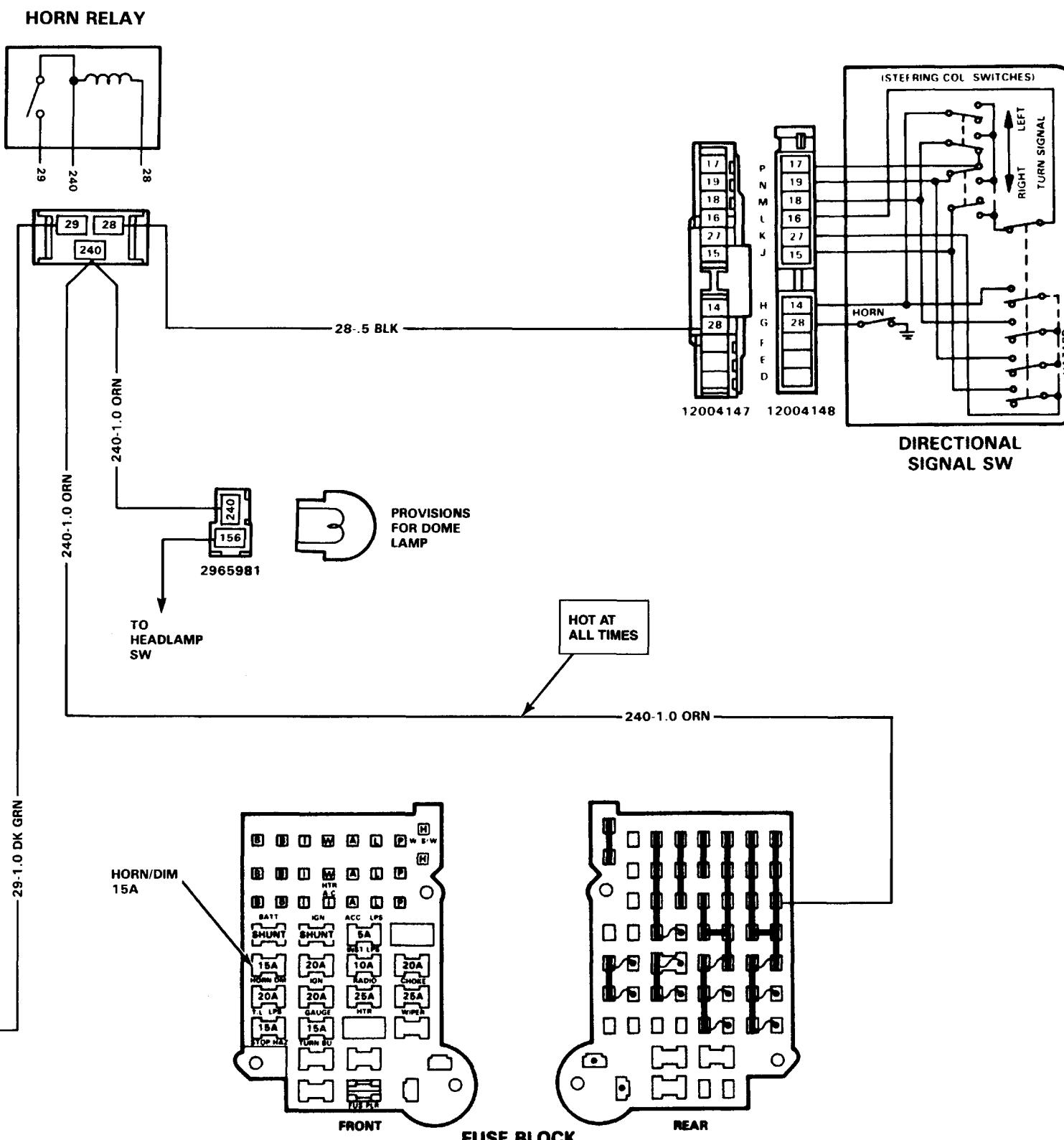
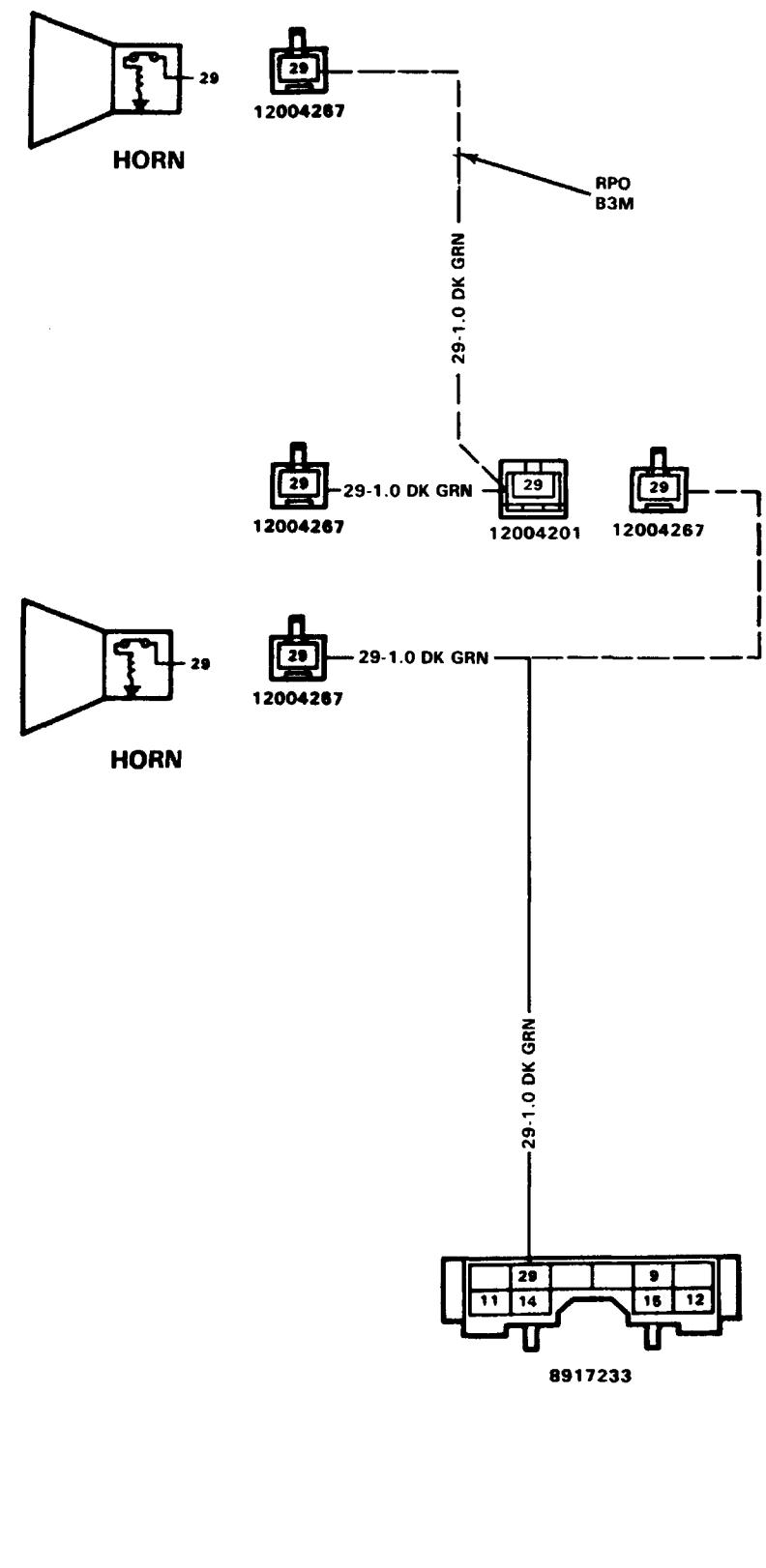
REAR

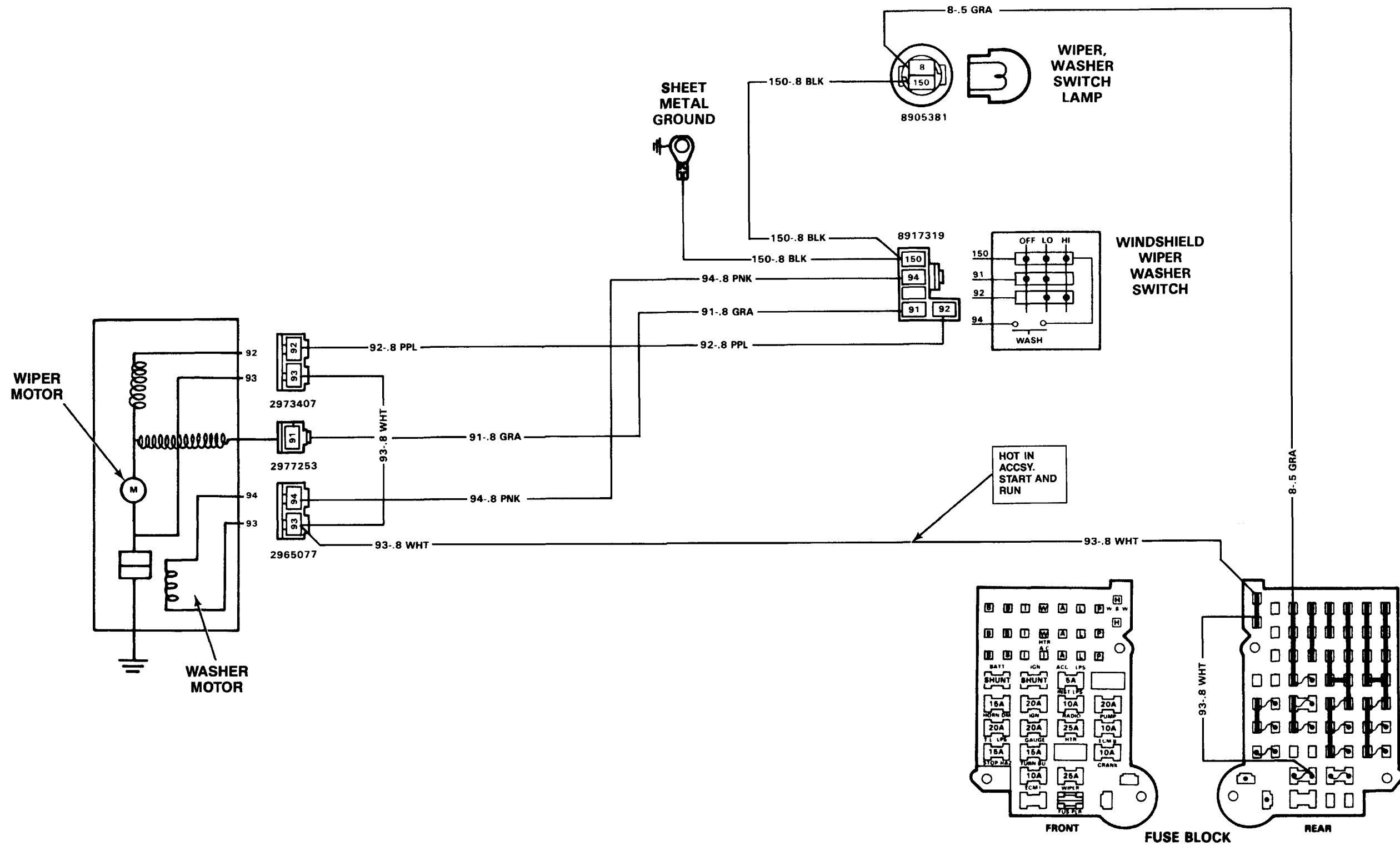


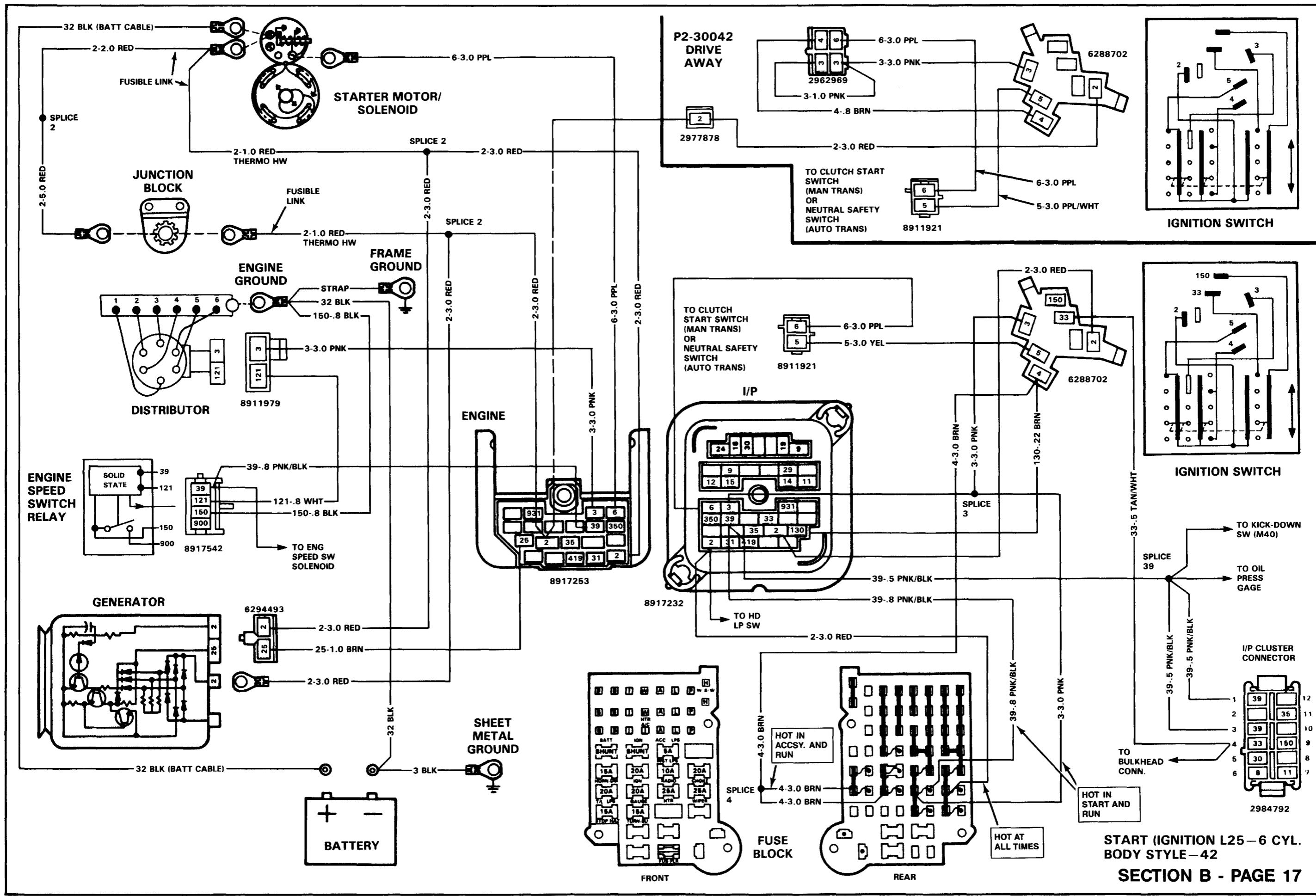
HAZARD
FLASHER

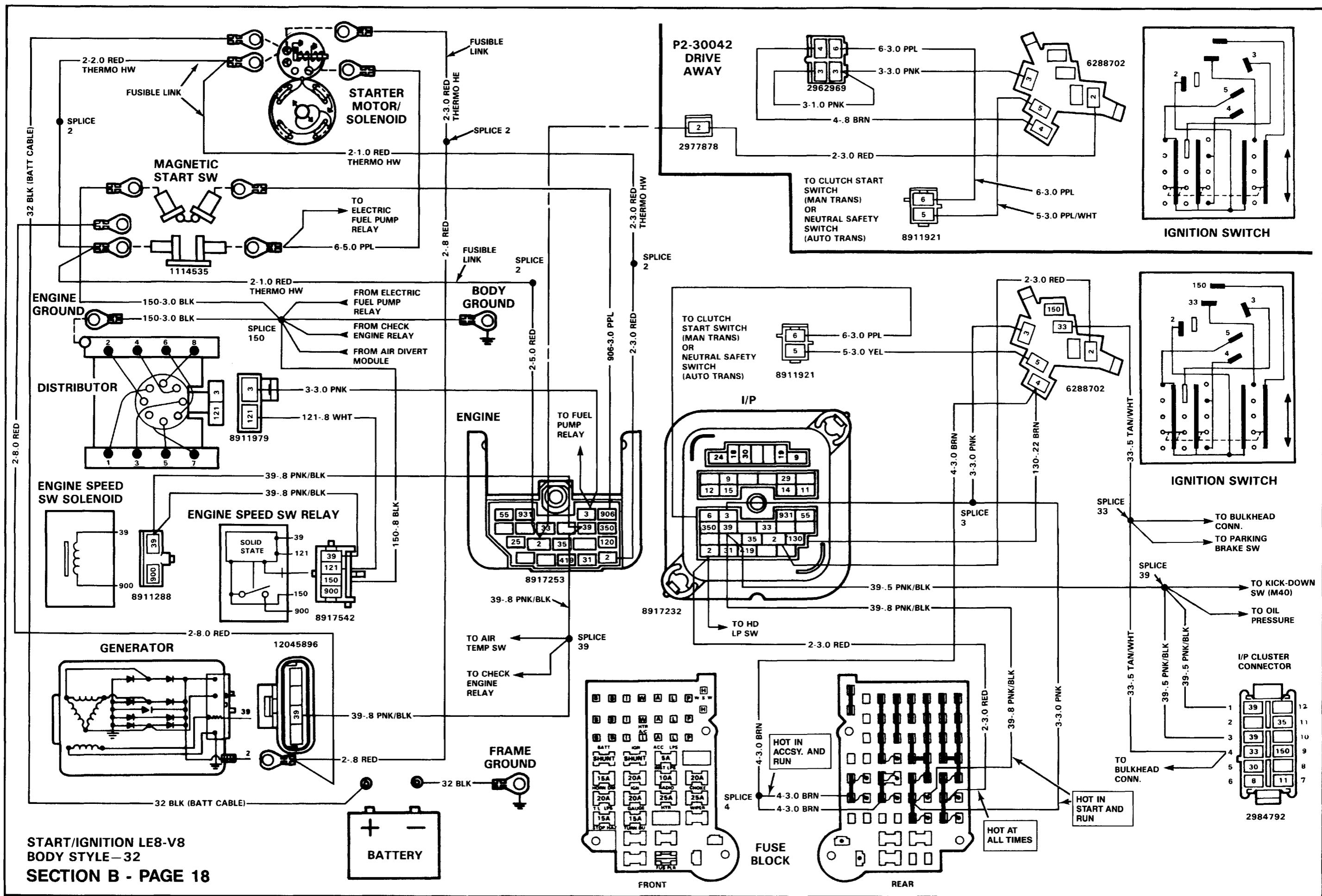
SECTION B - PAGE 13

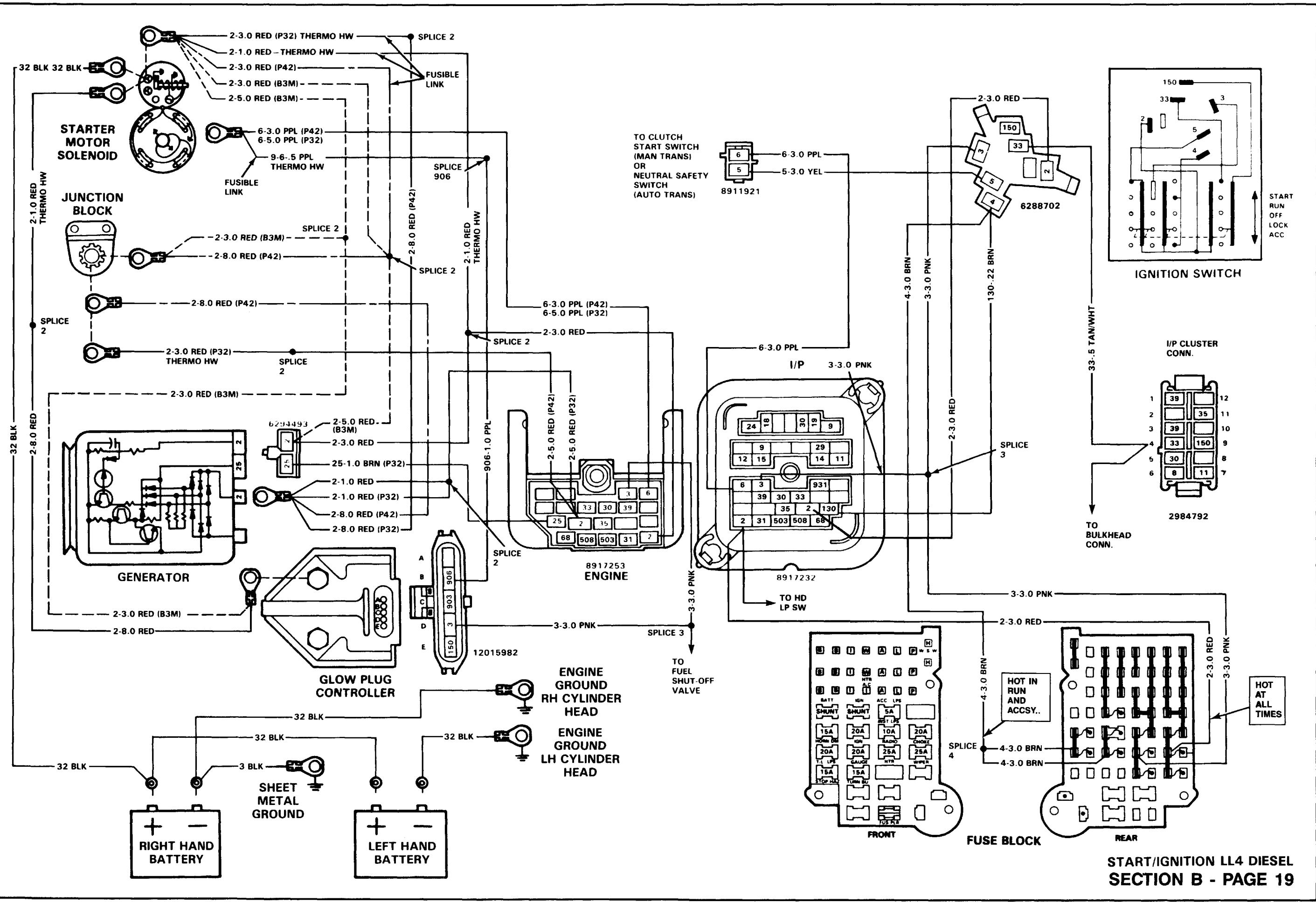


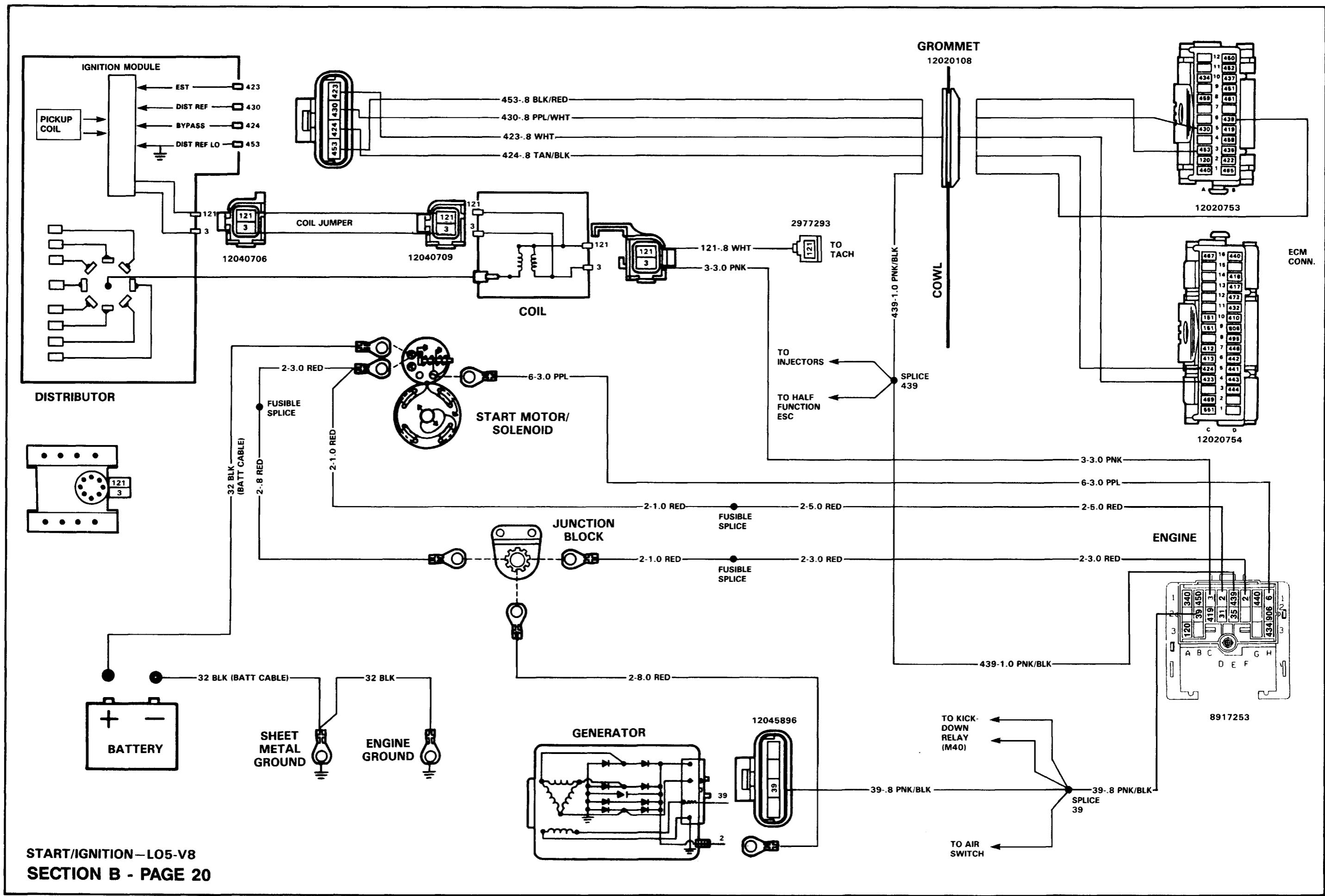


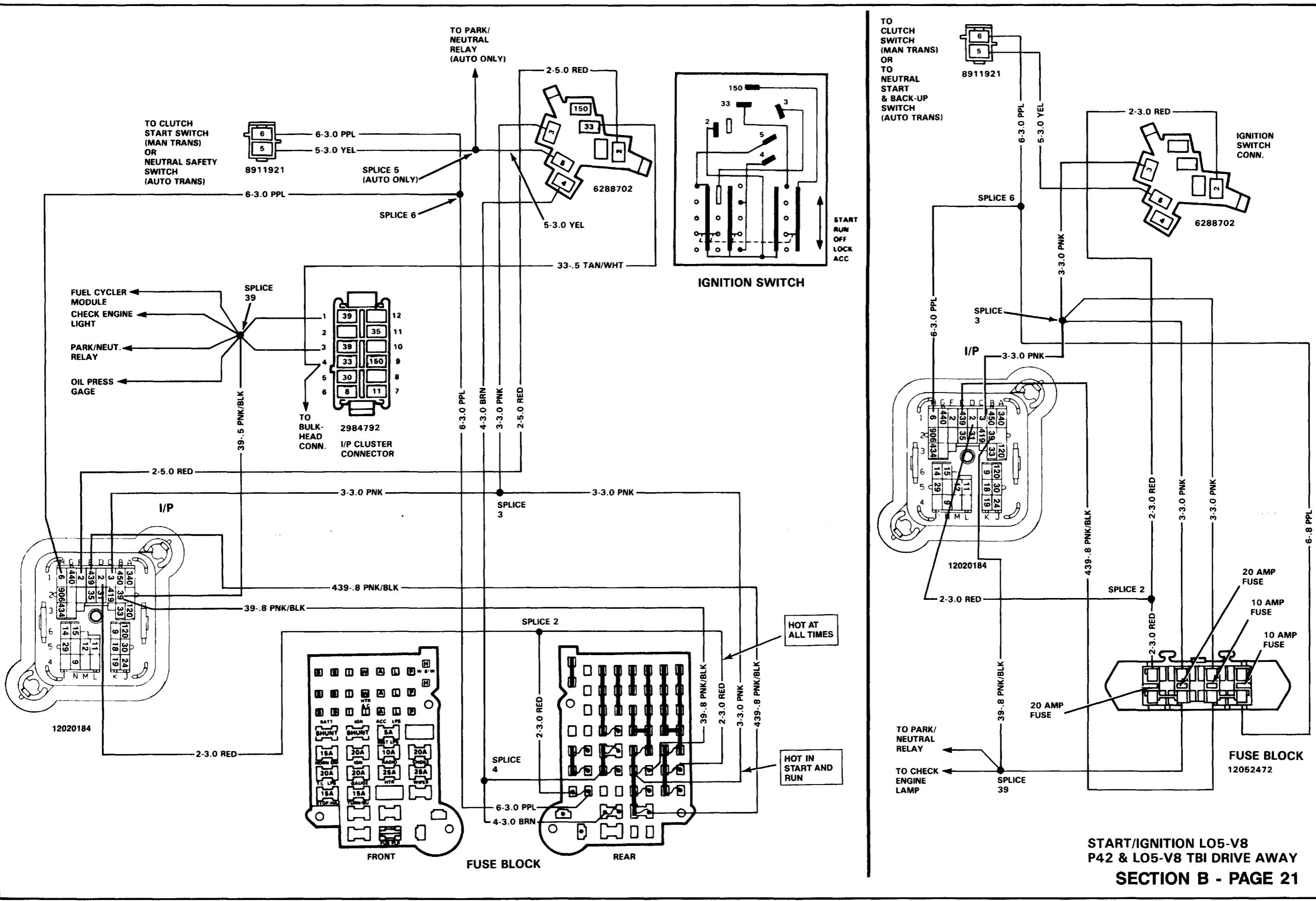


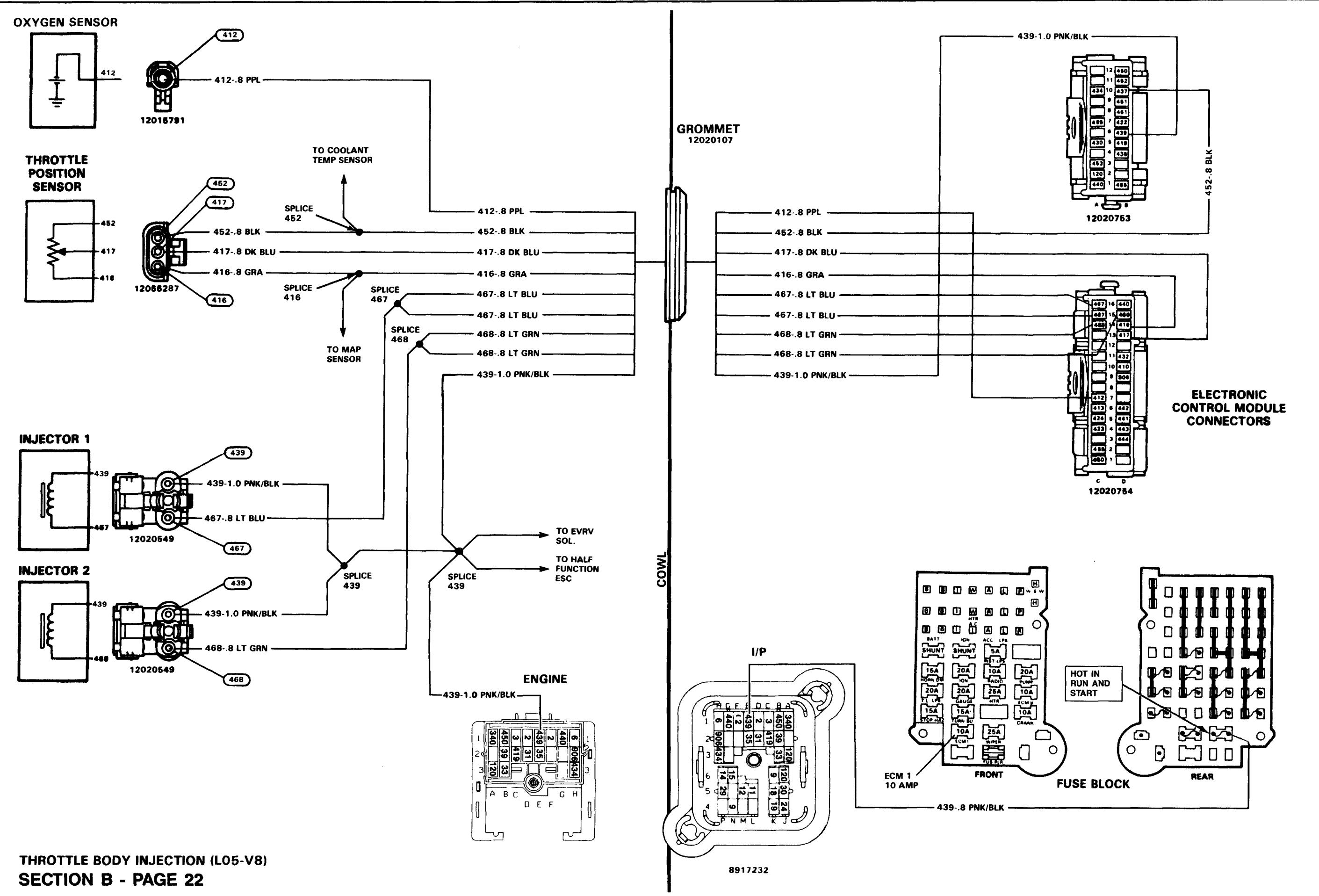


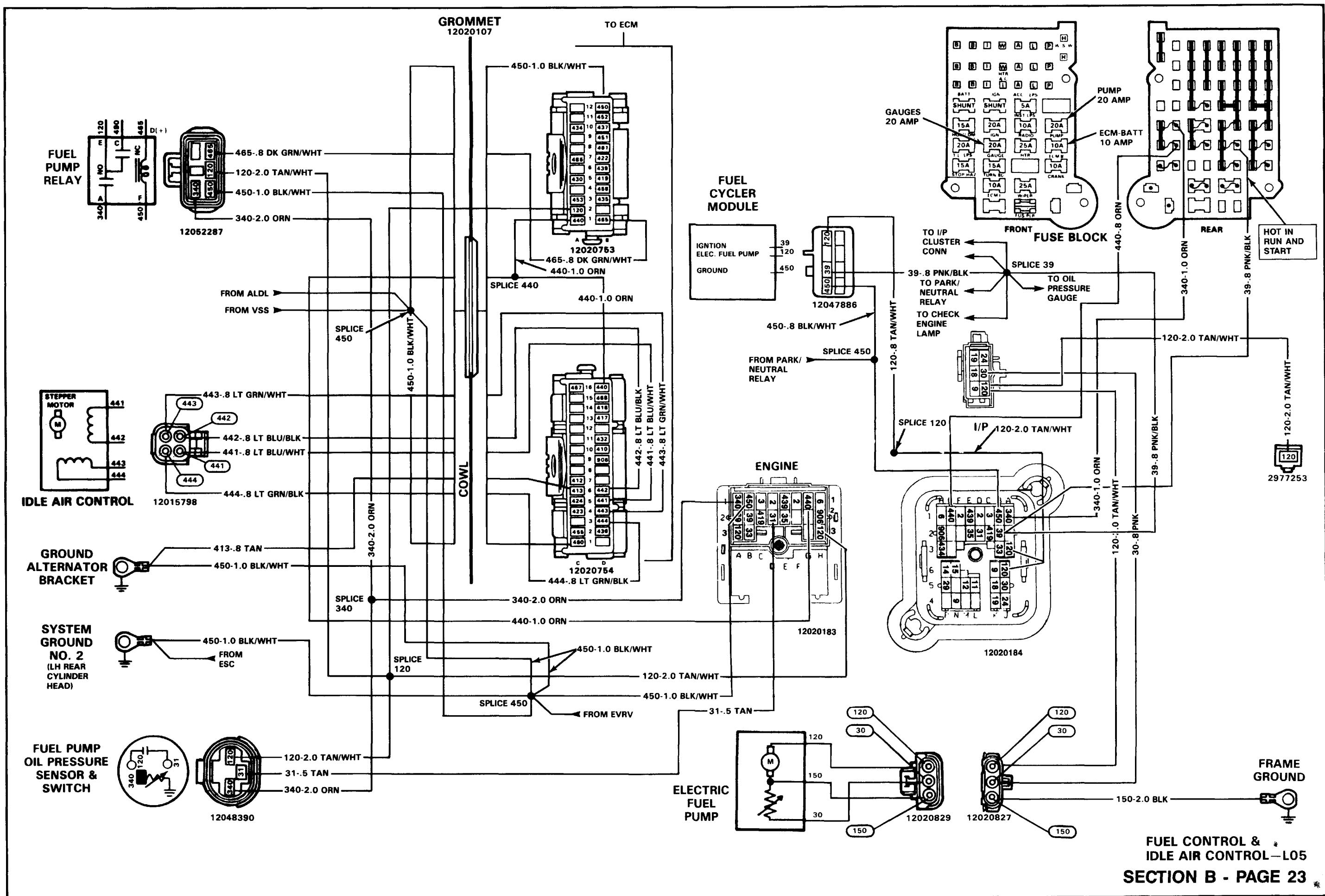


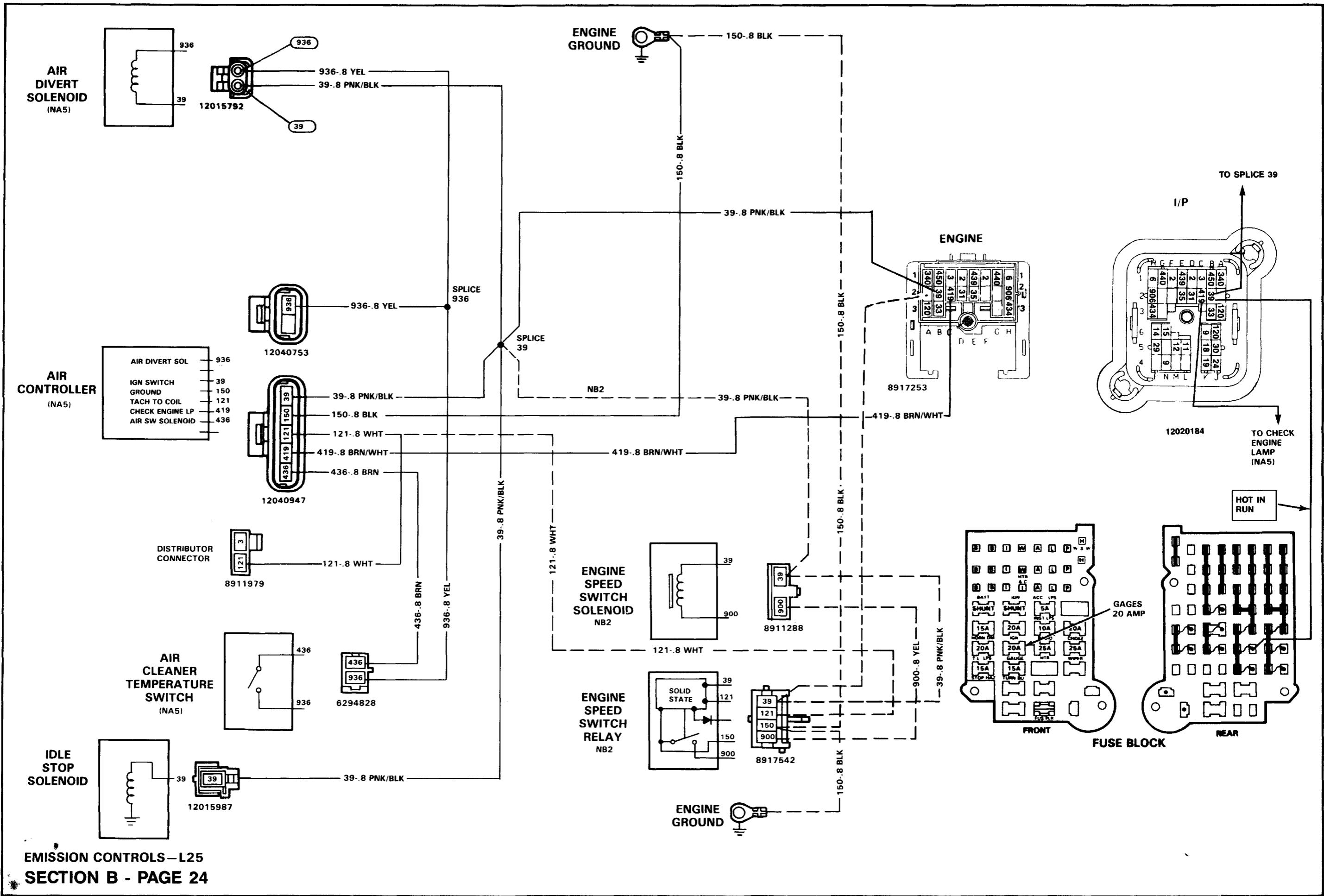


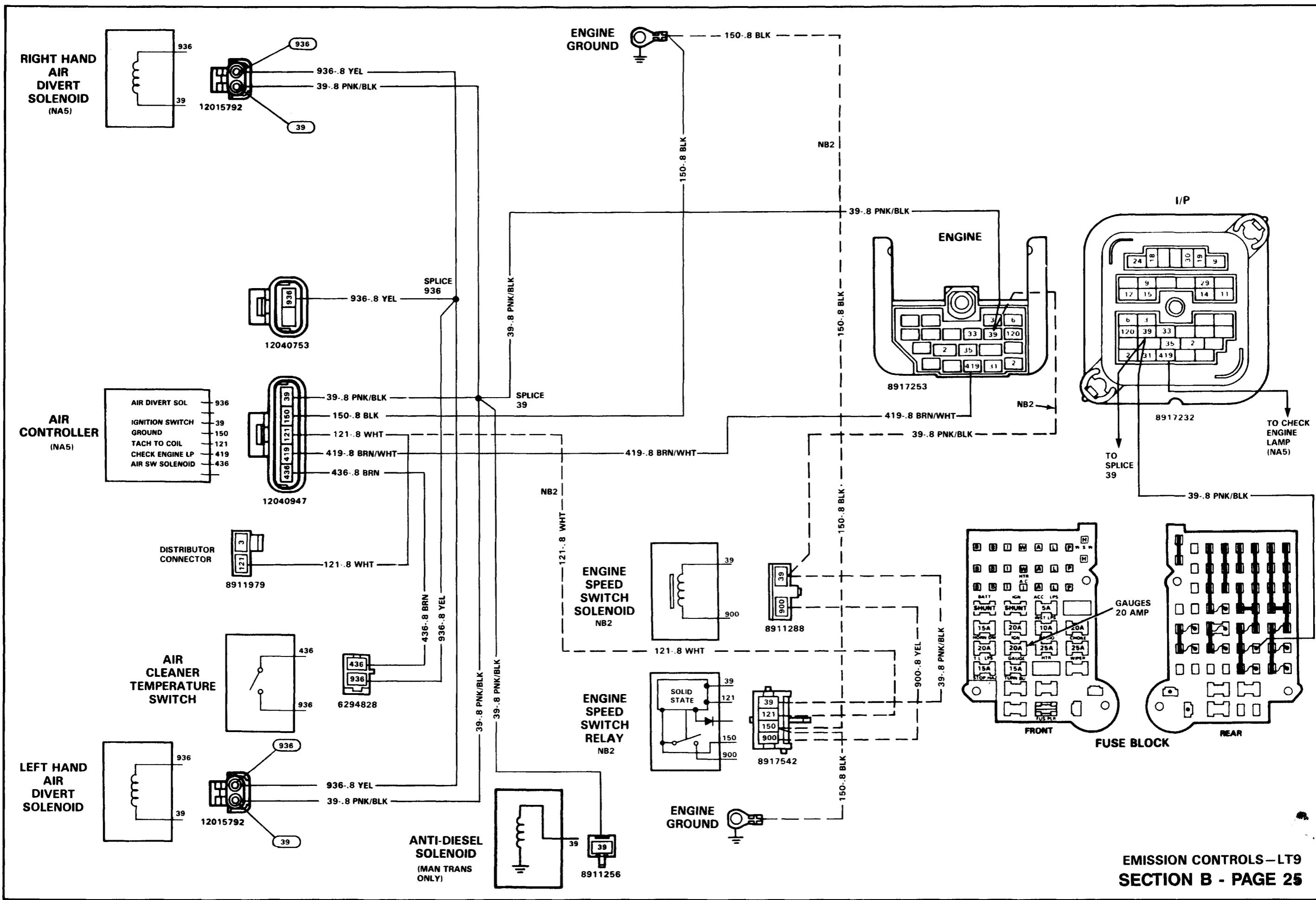


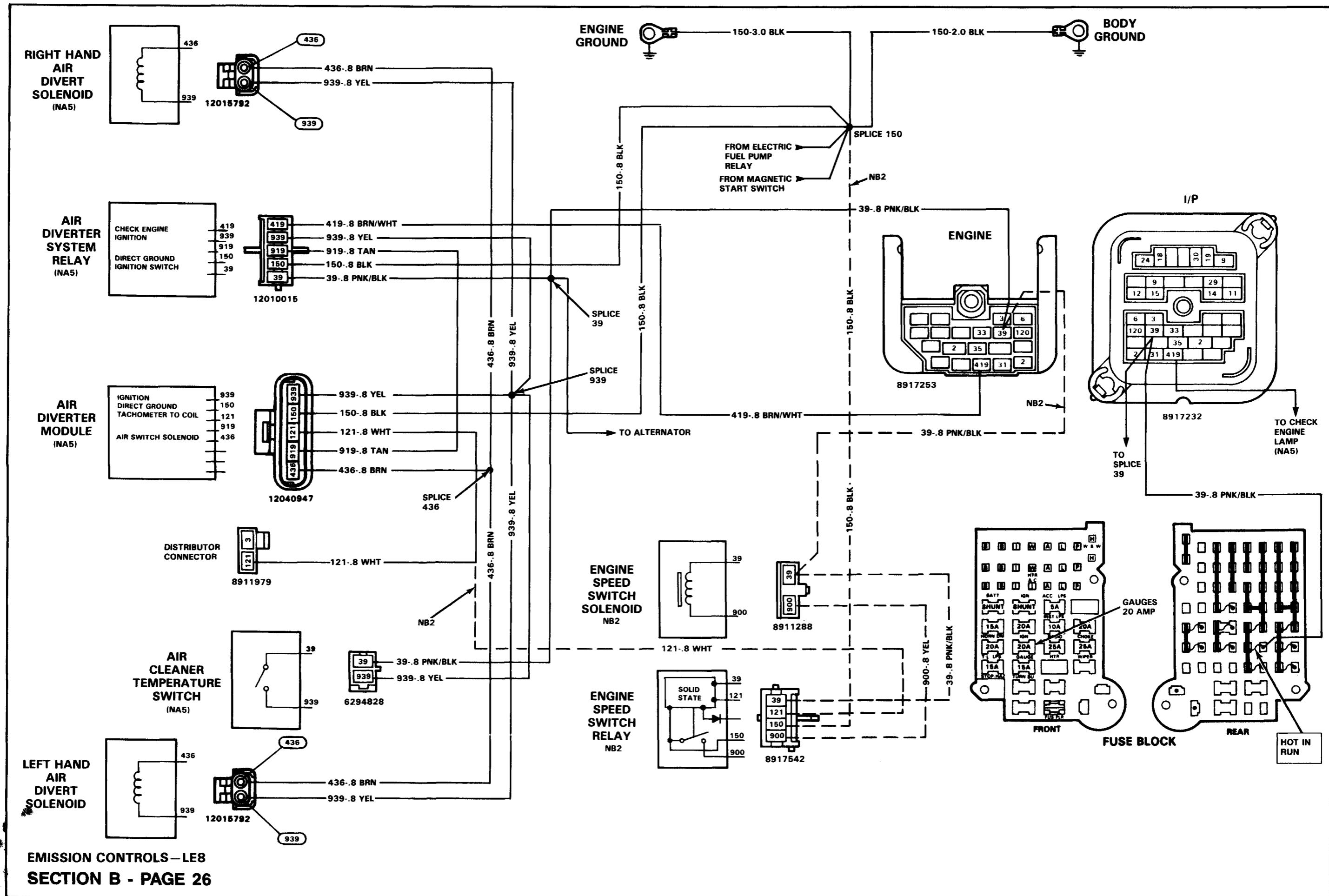


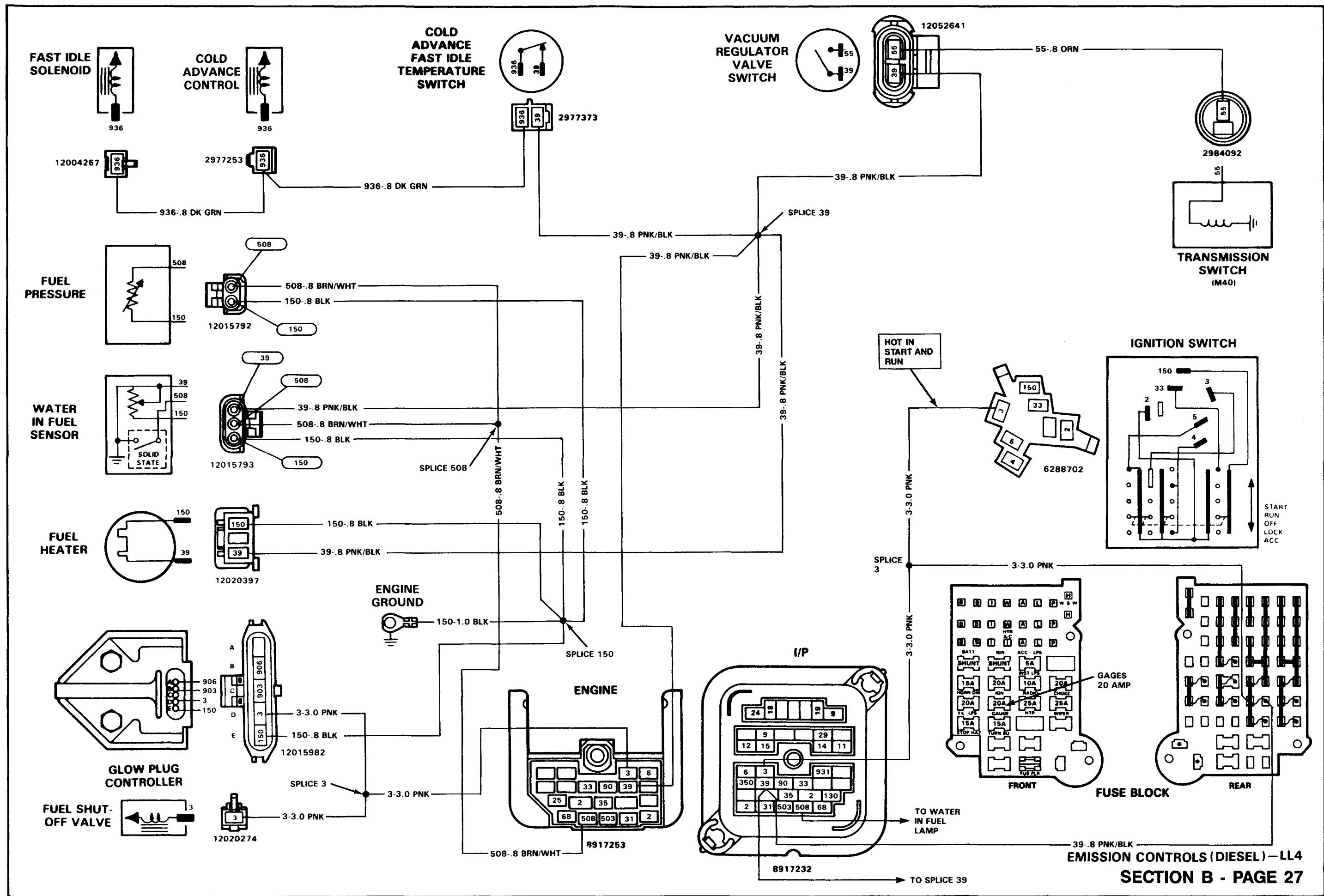


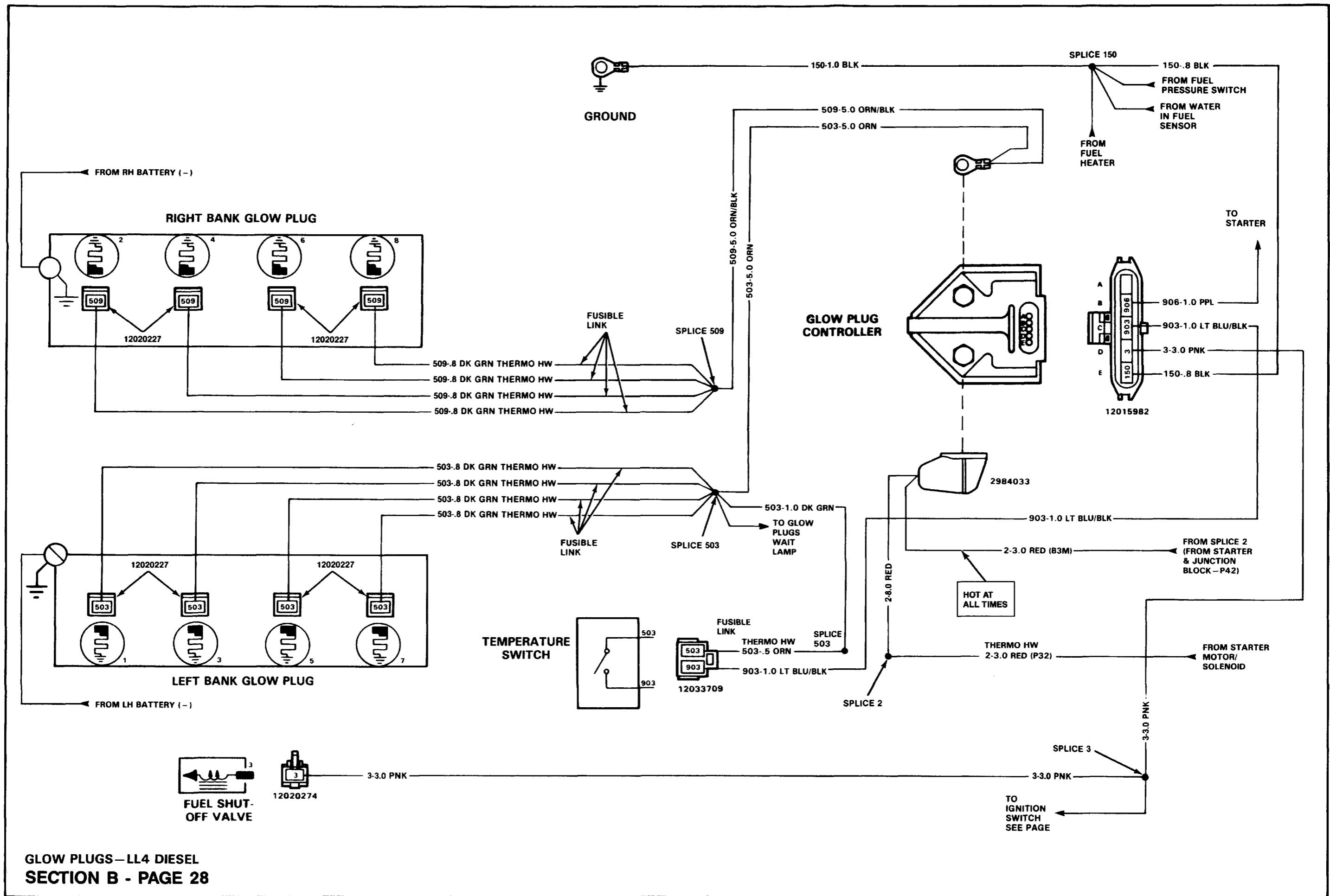


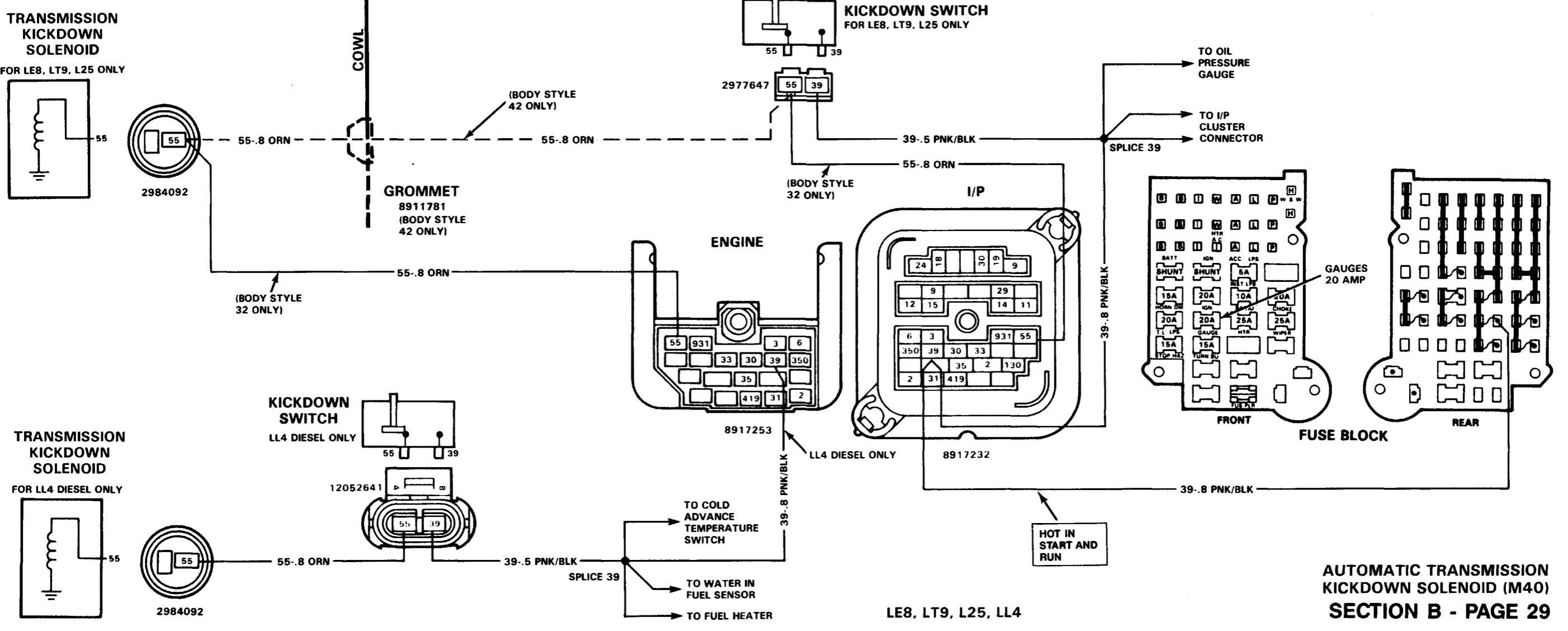
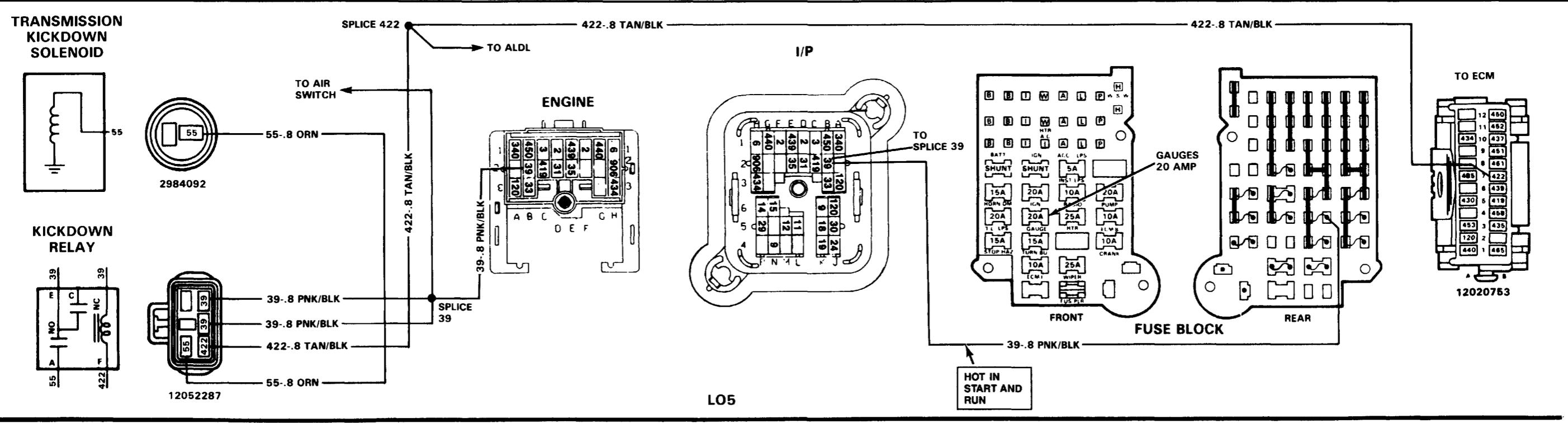


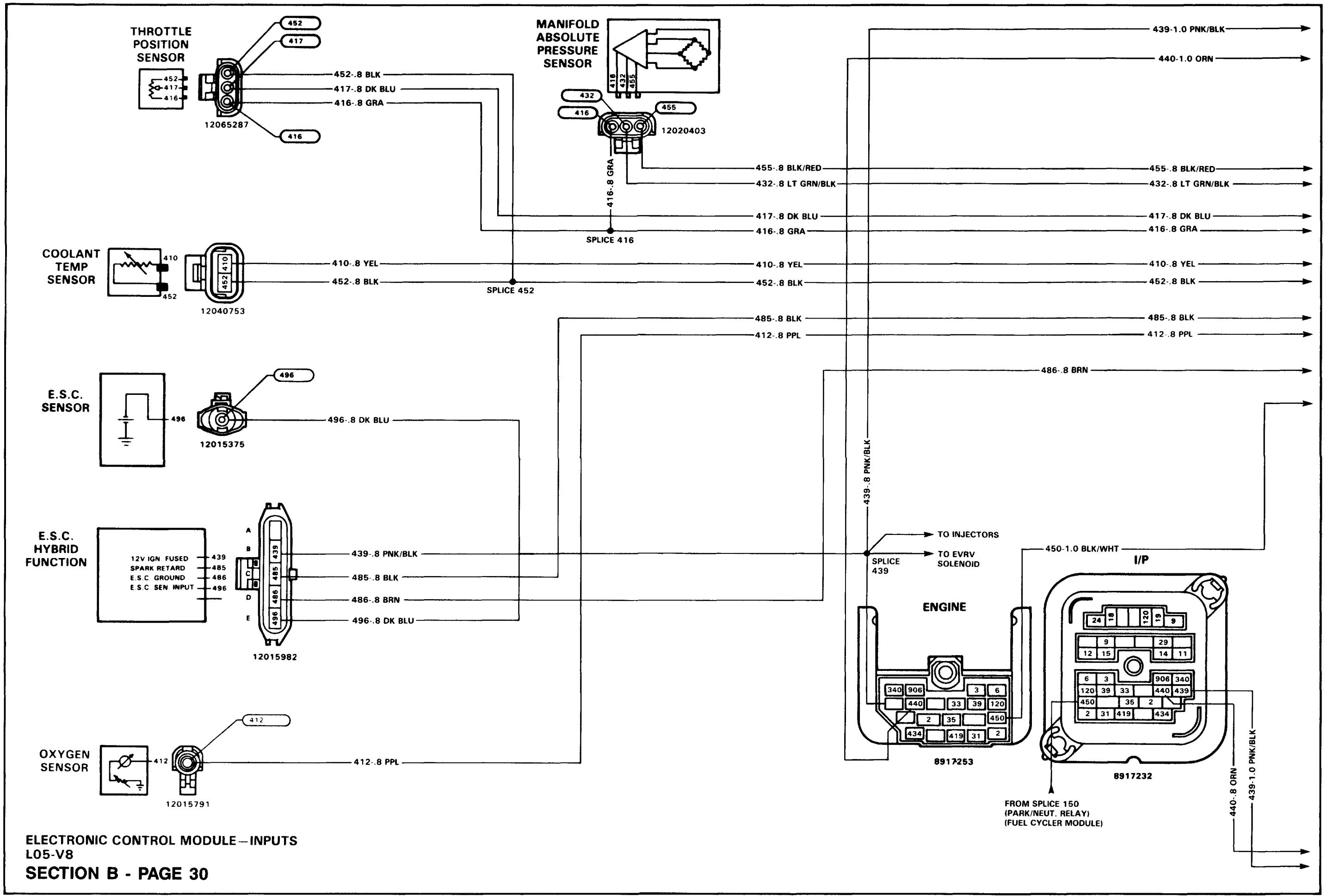


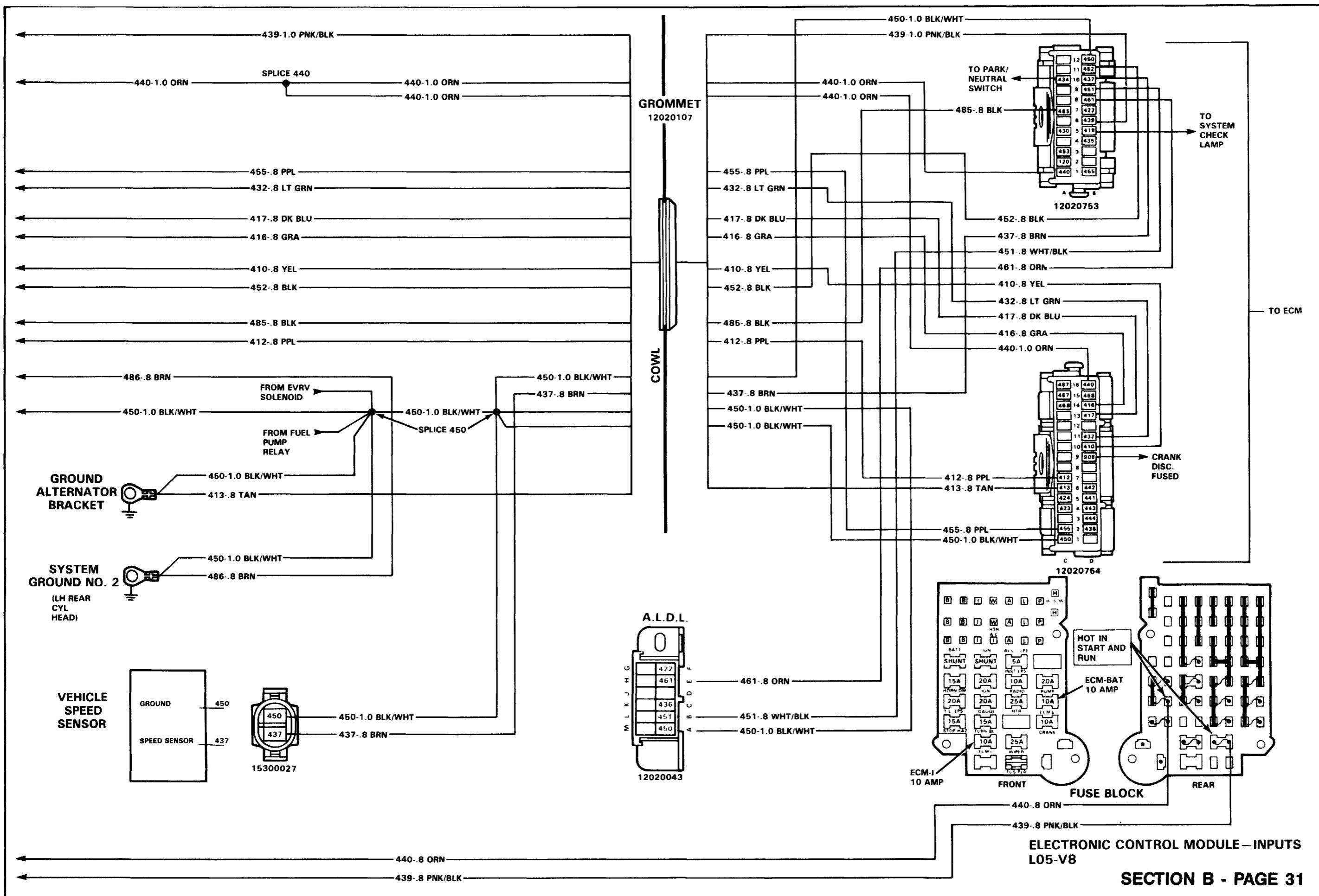


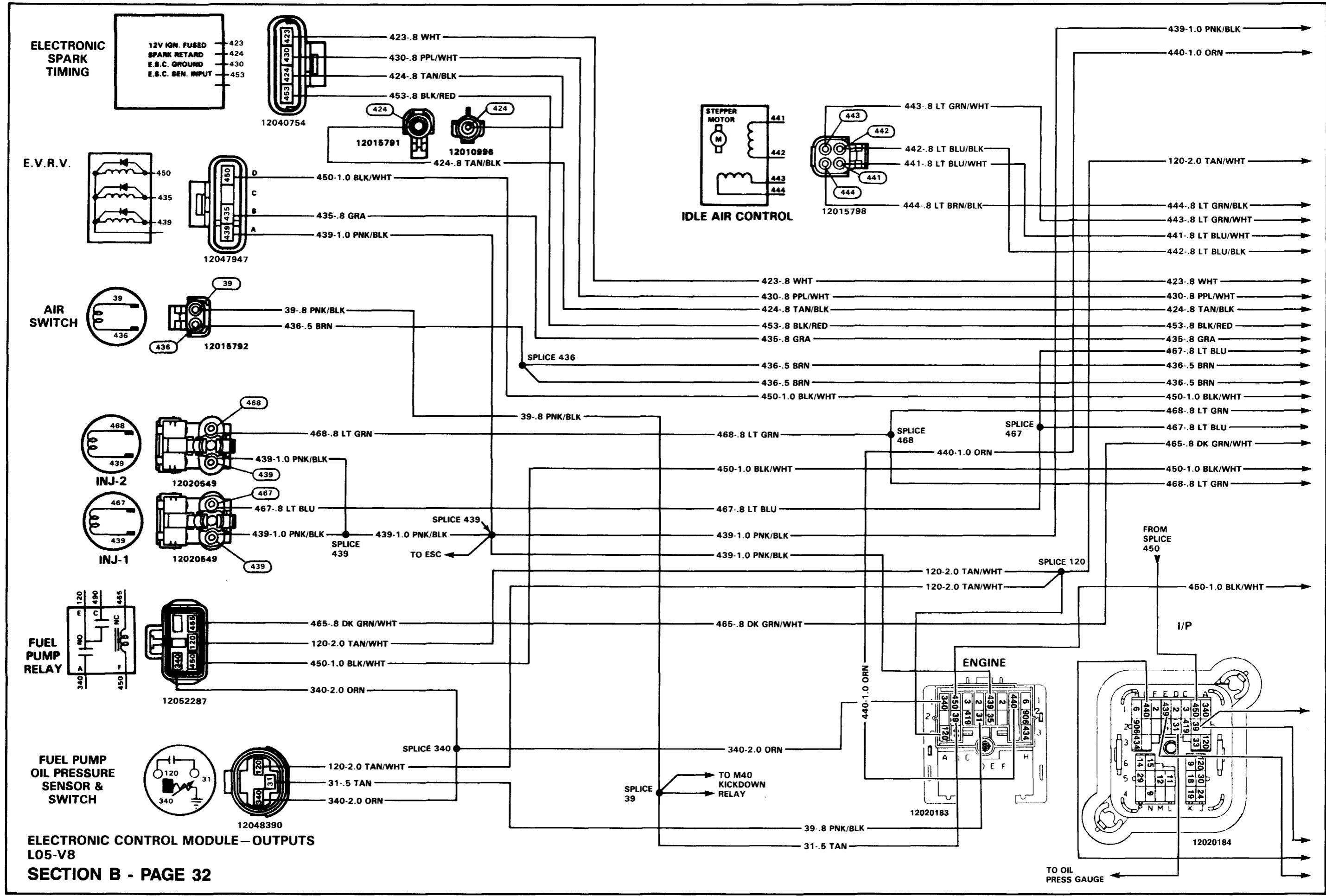


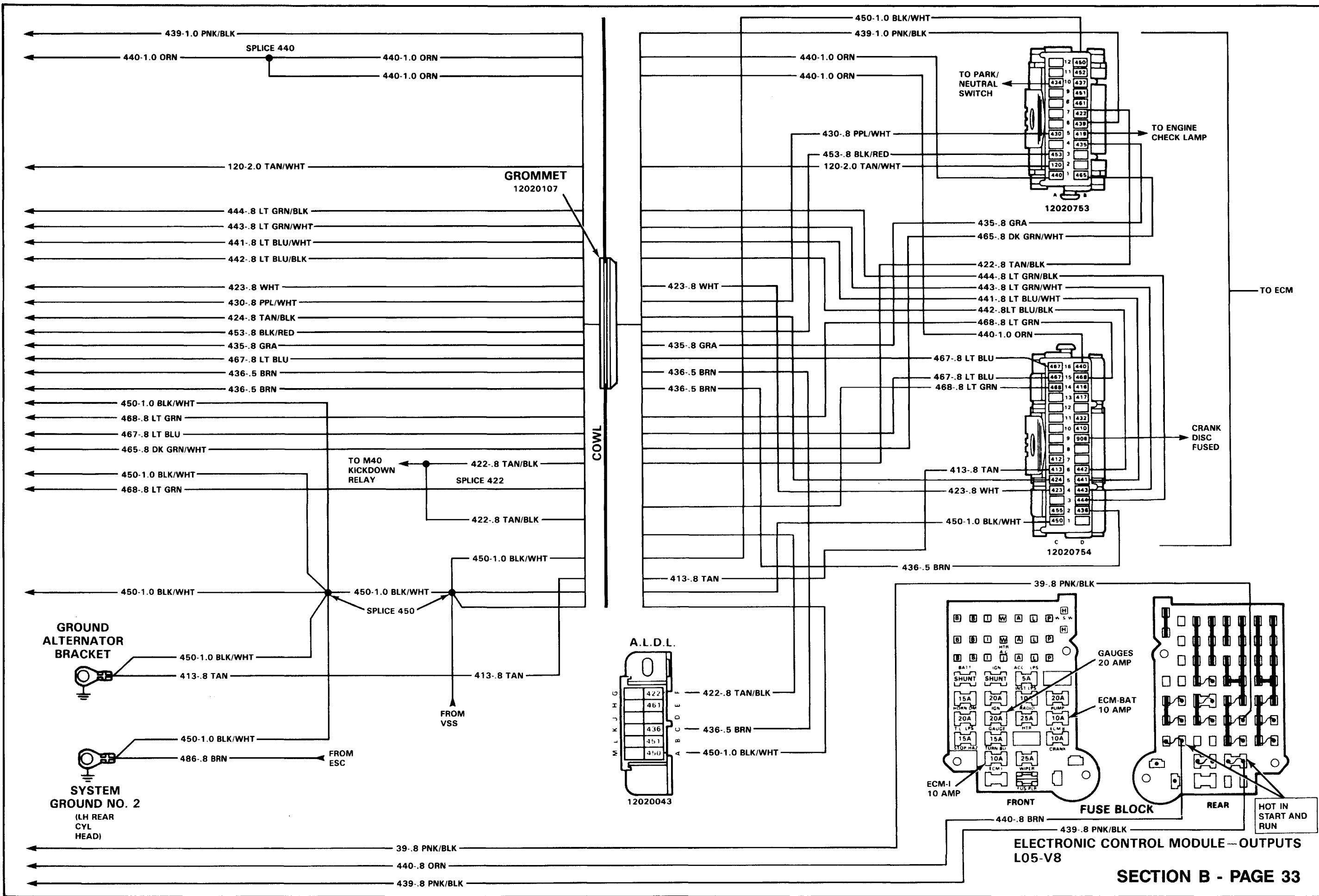












CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
465	.8	DK GRN/WHT	A1	FUEL PUMP RELAY DRIVE
			A2	NOT USED
			A3	NOT USED
435	.8	GRA	A4	EVRV
419	.8	BRN/WHT	A5	SYSTEM CHECK LAMP
439	1.0	PNK/BLK	A6	12V IGNITION FUSED
* 422	.8	TAN/BLK	A7	M40 KICKDOWN RELAY
456	.8	TAN/BLK	A7	UPSHIFT MAN-ONLY
461	.8	ORN	A8	SERIAL DATA
451	.8	WHT/BLK	A9	ASS'Y LINE DIAG/LINK
437	.8	BRN	A10	SPEED SENSOR
452	.8	BLK	A11	5V SYSTEM RETURN A
450	1.0	BLK/WHT	A12	SYSTEM RETURN
440	1.0	ORN	B1	12V BATTERY FUSED
120	2.0	TAN/WHT	B2	ELEC FUEL PUMP FUSED FEED
453	.8	BLK/RED	B3	DISTRIBUTOR REF LOW
			B4	NOT USED
430	.8	PPL/WHT	B5	DISTRIBUTOR REF HIGH
			B6	NOT USED
485	.8	BLK	B7	SPARK RETARD CONTROL
			B8	NOT USED
			B9	NOT USED
* 434	.8	ORN/BLK	B10	PARK/NEUTRAL SWITCH
			B11	NOT USED
			B12	NOT USED

* AUTO TRANS ONLY

CIRCUIT NO.	WIRE SIZE	COLOR	CAVITY	DESCRIPTION
436	.5	BRN	C1	NOT USED
444	.8	LT GRN/BLK	C2	AIR SW SOLENOID
443	.8	LT GRN/WHT	C3	STEPPER COIL B LOW
441	.8	LT BLU/WHT	C4	STEPPER COIL B HIGH
442	.8	LT BLU/BLK	C5	STEPPER COIL A HIGH
			C6	STEPPER COIL A LOW
			C7	NOT USED
			C8	NOT USED
906	.8	PPL	C9	CRANK DISCRETE FUSED
410	.8	YEL	C10	COOLANT TEMPERATURE
432	.8	LT GRN	C11	MANIFOLD ABSOLUTE PRESS
			C12	NOT USED
417	.8	DK BLU	C13	THROTTLE POSITION SENSOR
416	.8	GRA	C14	5V SENSOR REFERENCE
468	.8	LT GRN	C15	INJECTOR B DRIVE
440	1.0	ORN	C16	12V BATTERY FUSED
450	1.0	BLK/WHT	D1	SYSTEM RETURN
455	.8	PPL	D2	5V RETURN A
			D3	NOT USED
423	.8	WHT	D4	HEI SPARK TIMING
424	.8	TAN/BLK	D5	HEI BYPASS
413	.8	TAN	D6	OXYGEN SENSOR LOW
412	.8	PPL	D7	OXYGEN SENSOR HIGH
			D8	NOT USED
			D9	NOT USED
			D10	NOT USED
			D11	NOT USED
			D12	NOT USED
			D13	NOT USED
468	.8	LT GRN	D14	INJECTOR B DRIVE
467	.8	LT BLU	D15	INJECTOR A DRIVE
467	.8	LT BLU	D16	INJECTOR A DRIVE

