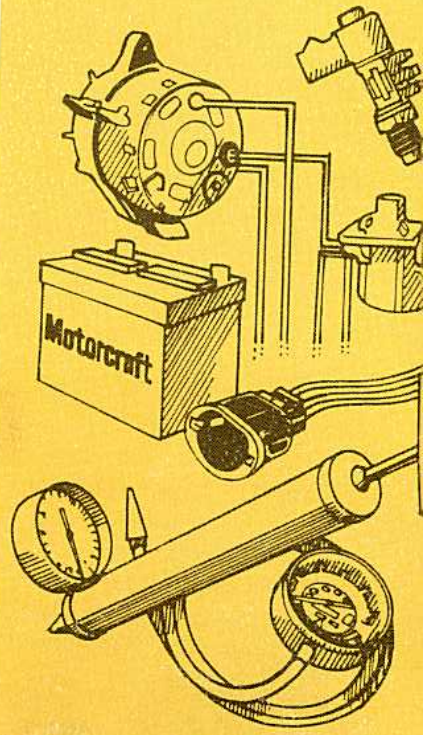
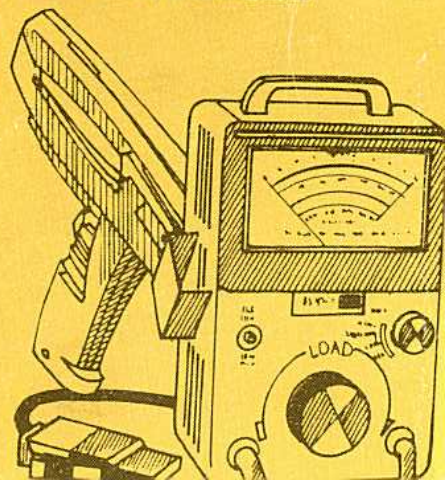
1985 T-BIRD/ COUGAR

Ford



Electrical & Vacuum Trouble-Shooting Manual



1985 T-BIRD/COUGAR

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IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the personal safety of the individual doing the work. This Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliablility.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.

The purpose of this manual is to show electrical and vacuum circuits of these vehicles in a clear and simple fashion to make troubleshooting easier. With each circuit is a description of *How the Circuit Works* and some *Troubleshooting Hints*. A *Component Location* chart lists components, connectors, and references to pictures in the manual.

Wiring Diagrams give a schematic picture of when and how the circuit is powered, what the current path is to circuit components, and how the circuit is grounded. Each circuit component is named (underlined titles). Wire and connector colors are listed (standard Ford color abbreviations are used):

COLOR ABBREVIATIONS

BL	**Blue**	**N**	**Natural**
BK	**Black**	**O**	**Orange**
BR	**Brown**	**PK**	**Pink**
DB	**Dark Blue**	**P**	**Purple**
DG	**Dark Green**	**R**	**Red**
GR	**Green**	**T**	**Tan**
GY	**Gray**	**W**	**White**
LB	**Light Blue**	**Y**	**Yellow**
LG	**Light Green**		

Where two colors are shown for a wire, the first color is the basic color of the wire. The second color is the dot, hash, or stripe marking. If **D** or **H** is given, the second color is dots or hash marks. If there is no letter after the second color, the wire has a stripe.

For example:

BR/O is a brown wire with an orange stripe.
R/Y D is a red wire with yellow dots.
BK/W H is a black wire with white hash marks.

Connector end views of switches and other components are shown to help with bench testing. The views show the harness wire colors that connect to the mating terminals. Connector colors and locations are shown in the *Component Location* chart. Two-color listings indicate separate colors for each connector half.

Components which work together are shown together. For example, all electrical components used in any circuit are shown on one diagram. The circuit breaker or fuse is shown at the top of the page. All wires, connectors, splices, switches, and motors are shown in the flow of current to ground at the bottom of the page. Notes are included which describe how switches and other components work. If a component is used in several different circuits, it is shown in several places. For example, the **Main Light Switch** is an electrical part of many circuits and is repeated on many pages. In some cases, however, a component may seem by its name to belong on a page where it has no electrical connection. For example, **Radio Illumination** is electrically part of **Instrument Illumination**. Since it has no electrical connection at all with the actual **Radio** circuit, it is not shown on the **Radio** page.

Troubleshooting Hints point the tecnician in a general direction, but are not intended as a step-by-step procedure. Ignition troubleshooting is an exception to this. It includes a step-by-step procedure of basic quick checks to locate some of the more common **Ignition System** problems. Read the Shop Manual for more detailed repair procedures.

The **Grounds** pages show detailed views of multiple component ground points. This is useful for checking interconnections among the ground circuits of different diagrams.

Notes, Cautions, and **Warnings** appear in boxes on text pages and contain important vehicle and mechanic safety information.

Notes give added information to help complete a particular procedure. Cautions are included to prevent making an error that could damage the vehicle. Warnings highlight areas where carelessness can cause personal injury. The following list contains some general **Warnings** that should be followed when working on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires being under a vehicle.
- Be sure that the **Ignition Switch** is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on any vehicle. An automatic transmission should be in PARK. A manual transmission should be in NEUTRAL.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
- Keep away from moving parts when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter, and muffler.
- Do not allow flame or sparks near the battery. Gases are always present in and around the battery cell. An explosion could occur.
- Do not smoke.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing.

TROUBLESHOOTING STEPS

These six steps present an orderly method of troubleshooting:

Step 1. Verify the problem.

- Operate the complete system and see all symptoms for yourself in order to:
  - —check the accuracy and completeness of the customer's complaint.
  - —learn more that might give a clue to the nature and location of the problem.

Step 2. Narrow the problem.

- Using this manual, narrow down the possible causes and locations of the problem in order to more quickly find the exact cause.
- Read the description of *How the Circuit Works* and study the wiring diagram. You should then know enough about the circuit operation to figure out where to check for the trouble.

Step 3. Test the cause.

- Use electrical test procedures to find the specific cause of the symptoms.
- *Troubleshooting Hints* will give some helpful ideas.
- The *Component Location* charts and the pictures will help you find components, grounds, and connectors.

Step 4. Verify the cause.

- Confirm the fact that you have found the correct cause through operating the parts of the circuit you think are good.

Step 5. Make the repair.

- Repair or replace the faulty component.

Step 6. Verify the repair.

- Operate the system as in Step 1 and check that your repair has removed all symptoms, and also has not caused any new symptom.

Some engine circuits may need special test equipment and special procedures. See the *Shop Manual* and other service books for details. You will find the circuits in this manual to be helpful with these special tests.

TROUBLESHOOTING TOOLS

JUMPER WIRE

This is a test lead used to connect two points of a circuit. A **Jumper Wire** can complete a circuit by bypassing an open.

Uses: Bypassing Switches or Open Circuits

WARNING

Never use a jumper wire across loads (motors, etc.) connected between hot and ground. This direct battery short may cause injury or fire.

VOLTMETER

A DC **Voltmeter** measures circuit voltage. Connect negative (– or black) lead to ground, and positive (+ or red) lead to voltage measuring point.

OHMMETER

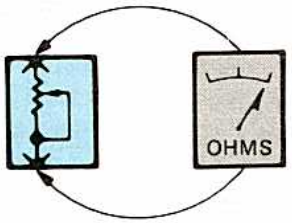


Figure 1 — Resistance Check

An **Ohmmeter** shows the resistance between two connected points (Figure 1).

TEST LIGHT

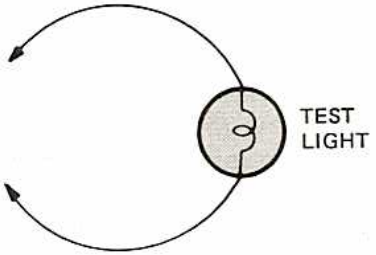


Figure 2 — Test Light

A **Test Light** is a 12-volt bulb with two test leads (Figure 2).

Uses: Voltage Check. Short Check

SELF-POWERED TEST LIGHT

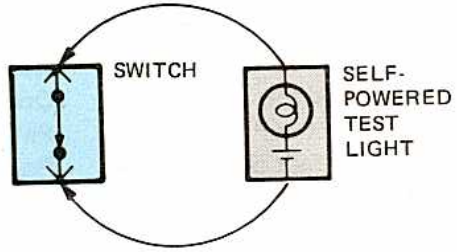


Figure 3 — Continuity Check

The **Self-Powered Test Light** is a bulb, battery and set of test leads wired in series (Figure 3). When connected to two points of a continuous circuit, the bulb glows.

Uses: Continuity Check. Ground Check

CAUTION

When using a self-powered test light or ohmmeter, be sure power is off in circuit during testing. Hot circuits can cause equipment damage and false readings.

TROUBLESHOOTING CHECKS

SWITCH CIRCUIT CHECK

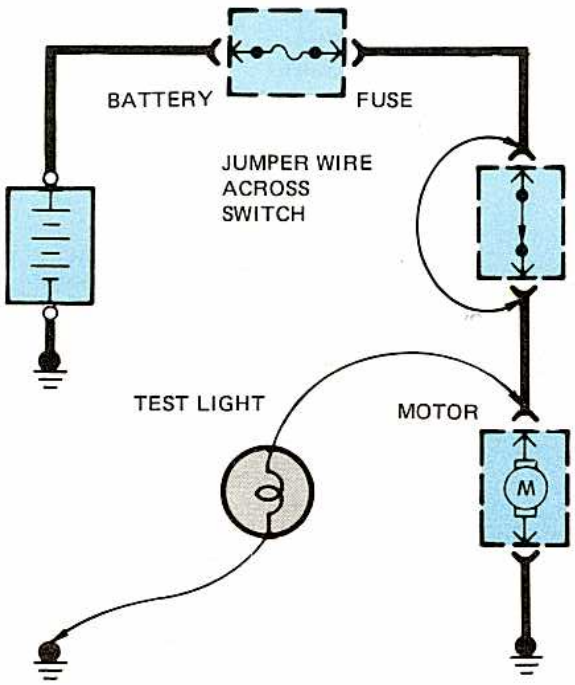


Figure 4 — Switch Circuit Check and Voltage Check

In a bad circuit with a switch in series with the load, jumper the terminals of the switch to power the load. If jumping the terminals powers the circuit, the switch is bad (Figure 4).

CONTINUITY CHECK (Locating open circuits)

Connect one lead of **Self-Powered Test Light** or **Ohmmeter** to each end of circuit (Figure 3). Light will glow if circuit is closed. Switches and fuses can be checked in the same way.

VOLTAGE CHECK

With circuit power off, connect one lead of **Self-Powered Test Light** or **Ohmmeter** to each end of circuit (Figure 3). Light will glow if circuit is closed. Switches and fuses can be checked in the same way.

SHORT CHECK (short to ground)

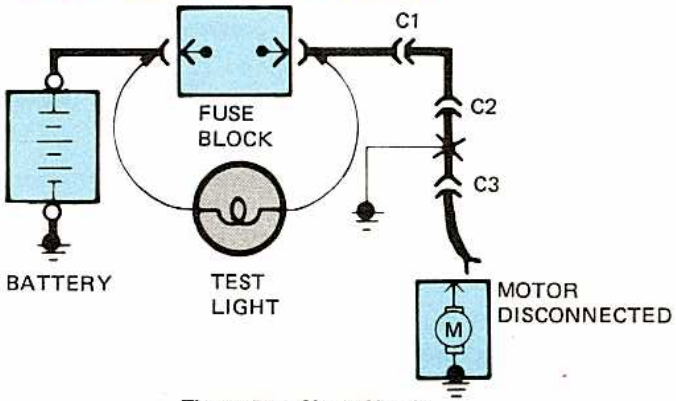


Figure 5 — Short Check

A fuse that repeatedly blows is usually caused by a short to ground. It's important to be able to locate such a short quickly (Figure 5).

1) Turn off everything powered through the fuse.
2) Disconnect other loads powered through the fuse:
   - Motors: disconnect motor connector.
   - Lights: remove bulbs.
3) Turn **Ignition Switch** to RUN (if necessary) to power fuse.
4) Connect one **Test Light** lead to hot end of blown fuse. Connect other lead to ground. Bulb should glow showing power to fuse. *(This step is just a check to be sure you have power to the circuit.)*
5) Disconnect the **Test Light** lead from ground and reconnect it to the load side of the fuse.
   - If the **Test Light** is off, the short is in the disconnected equipment.
   - If the **Test Light** goes on, the short is in the wiring. You must find the short by disconnecting the circuit connectors one at a time until the **Test Light** goes out. For example: with a ground at X, the bulb goes out when C1 or C2 is disconnected, but stays on after disconnecting C3. This means the ground is between C2 and C3.

"GOOD GROUND" CHECK

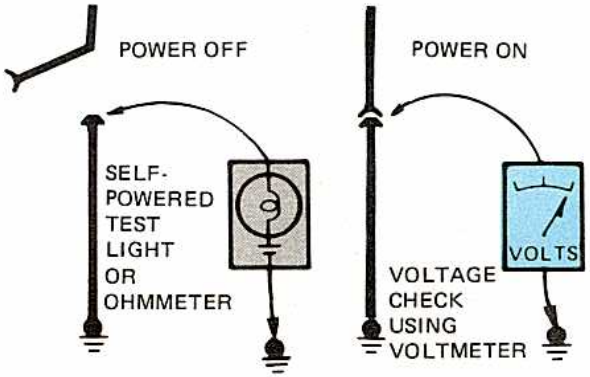


Figure 6 — Grounds Checks

Turn on power to circuit. Perform Voltage Check between suspected bad ground and frame. Any voltage means ground is bad.

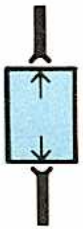
Turn off power to circuit. Connect one lead of **Self-Powered Test Light** or **Ohmmeter** to wire in question, and the other to known ground. If bulb glows, circuit ground is OK (Figure 6).

TROUBLESHOOTING HINTS

The circuit schematics in this manual are designed to make it easy to identify common points in circuits. This knowledge can help narrow the problem to a specific area. For example, if several circuits fail at the same time, check for a common power or ground connection. (See *Power Distribution* or *Grounds*). If part of a circuit fails, check the connections between the part that works and the part that doesn't work.

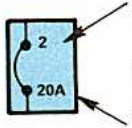
For example, if low beam headlamps work, but high beams and the indicator lamp don't work, then power and ground paths must be good. Since the dimmer switch is the component which switches this power to the high beam lamps and indicator, it is most likely the cause of failure.

DASHED COMPONENT BOX
ONLY PART OF THE COMPONENT IS SHOWN, OR COMPONENT IS SHOWN IN TWO PLACES



COMPONENT WITH CONNECTORS

POSITION NUMBER
FUSE
CURRENT RATING



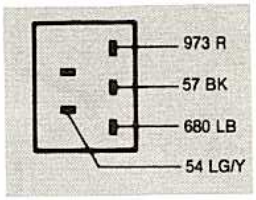
POSITION NUMBER
CIRCUIT BREAKER
CURRENT RATING

SCREW TERMINAL ON COMPONENT

SOLID STATE

SEALED ELECTRONIC COMPONENT
ANY CIRCUITRY SHOWN INSIDE THE BOX IS A FUNCTIONAL EQUIVALENT ONLY AND IS NOT EXACT

GAGE

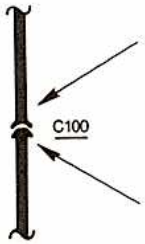


COMPONENT CONNECTOR END VIEW SHOWS PINS OR SOCKETS ON A COMPONENT TO AID IN BENCH TESTING

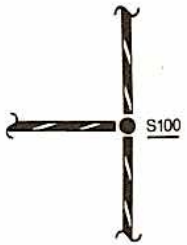
WIRE COLORS ARE LABELED FOR MATING HARNESS CONNECTOR

PIN AND BLADE TERMINAL TYPES

SOCKET TYPES



SOCKET
IN-LINE CONNECTOR
PIN



SPLICED OR CRIMP CONNECTION MOST ARE BUILT INTO HARNESS AND ARE NOT ACCESSIBLE

GROUND CONNECTION

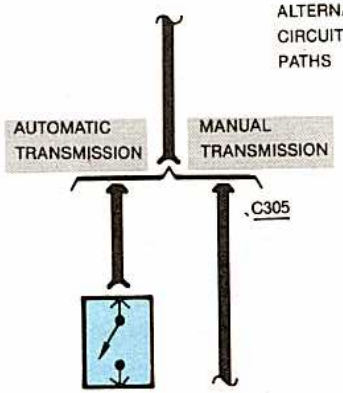
FUSE LINK

SOLID STATE

STRIPED WIRE

DOTTED WIRE

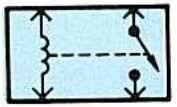
HASHED WIRE



ALTERNATE CIRCUIT PATHS

CANDELABRA CONNECTOR ACCEPTS SINGLE-PIN CONNECTORS

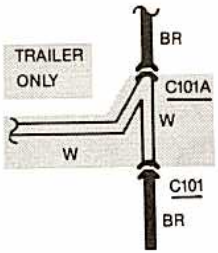
JUNCTION BLOCK



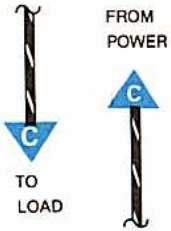
RELAY CONTACTS CLOSE WITH CURRENT THROUGH COIL

DASHED LINE SHOWS MECHANICAL CONNECTIONS

DIODES CURRENT FLOWS IN DIRECTION OF ARROW ONLY



OPTIONAL WIRING
BR WIRES (INCLUDING C101) ARE ON ALL VEHICLES, BUT W WIRES (INCLUDING C101A) ARE USED ONLY WITH TRAILER

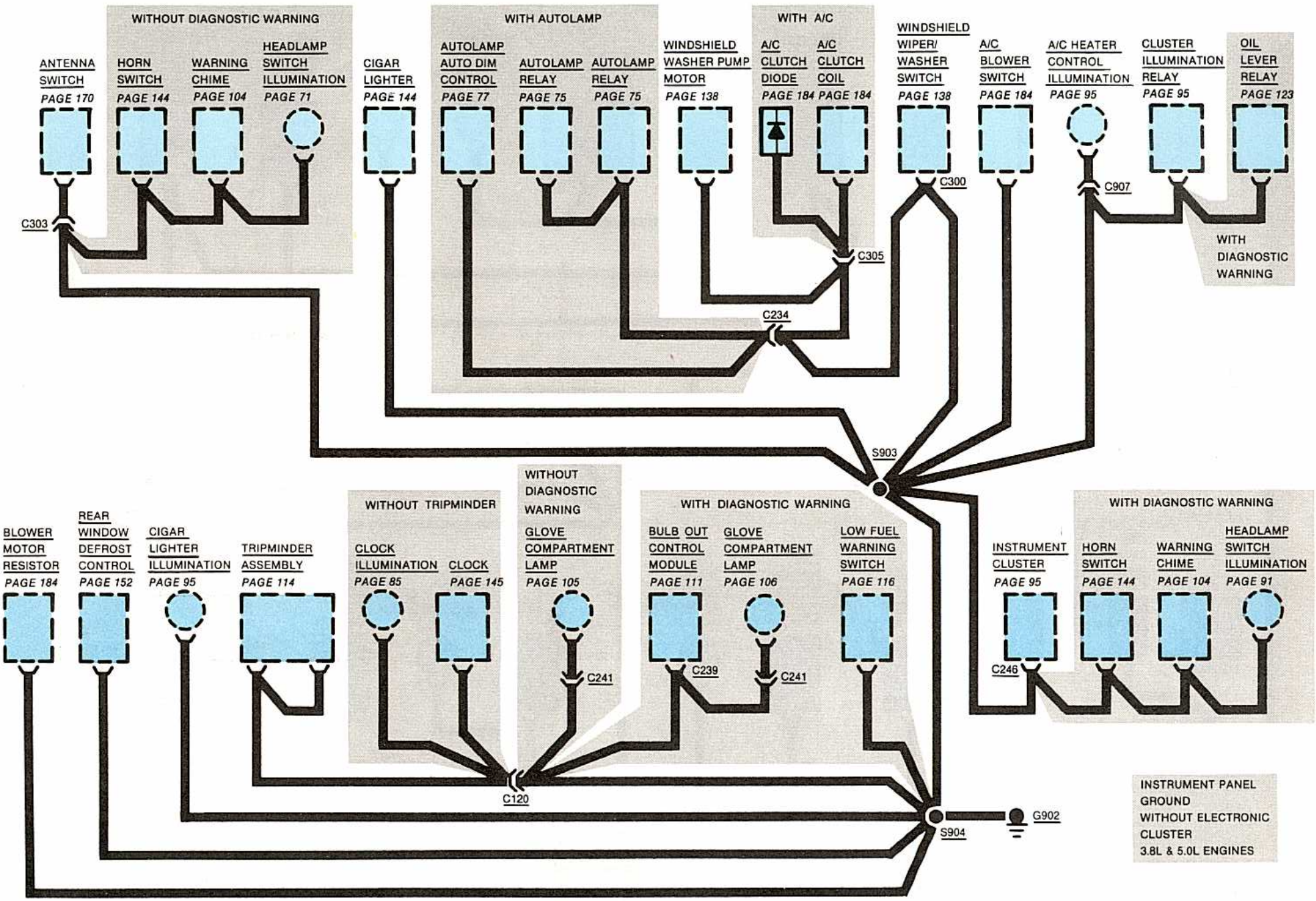


"CUT" WIRES REFERENCED BETWEEN PAGES ARROWS SHOW CURRENT FLOW FROM POWER TO GROUND

BACKUP LIGHTS

"REFERENCE" WIRES COMPLETE WIRING SHOWN ON ANOTHER PAGE

DASHED WIRE CIRCUITRY IS NOT SHOWN IN COMPLETE DETAIL, BUT IS COMPLETE ON ANOTHER PAGE


WITHOUT DIAGNOSTIC WARNING
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WARNING CHIME PAGE 104
HEADLAMP SWITCH ILLUMINATION PAGE 71
C303
CIGAR LIGHTER PAGE 144
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AUTOLAMP RELAY PAGE 75
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S903
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REAR WINDOW DEFROST CONTROL PAGE 152
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TRIPMINDER ASSEMBLY PAGE 114
WITHOUT TRIPMINDER
CLOCK ILLUMINATION PAGE 85
CLOCK PAGE 145
WITHOUT DIAGNOSTIC WARNING
GLOVE COMPARTMENT LAMP PAGE 105
C241
WITH DIAGNOSTIC WARNING
BULB OUT CONTROL MODULE PAGE 111
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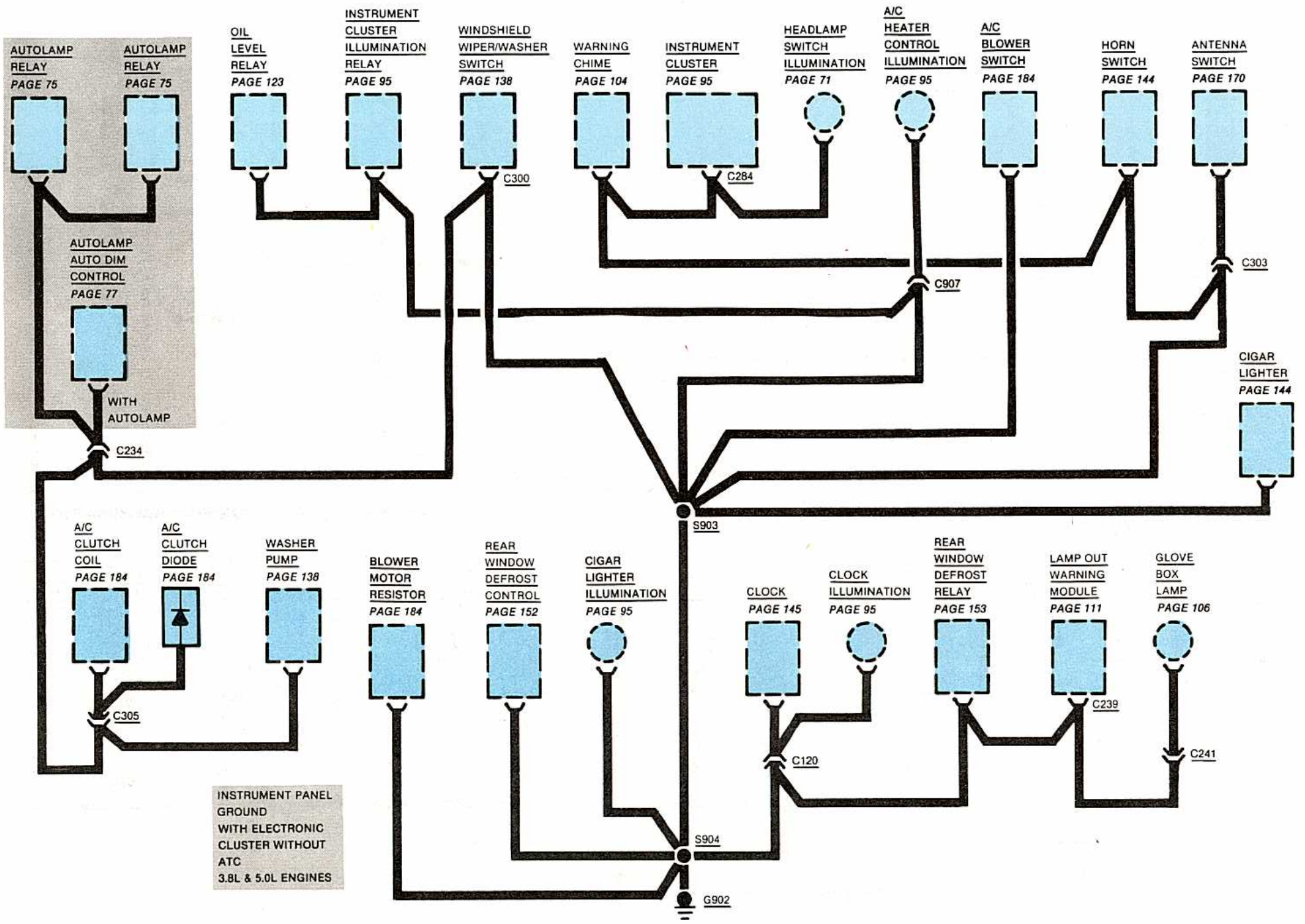
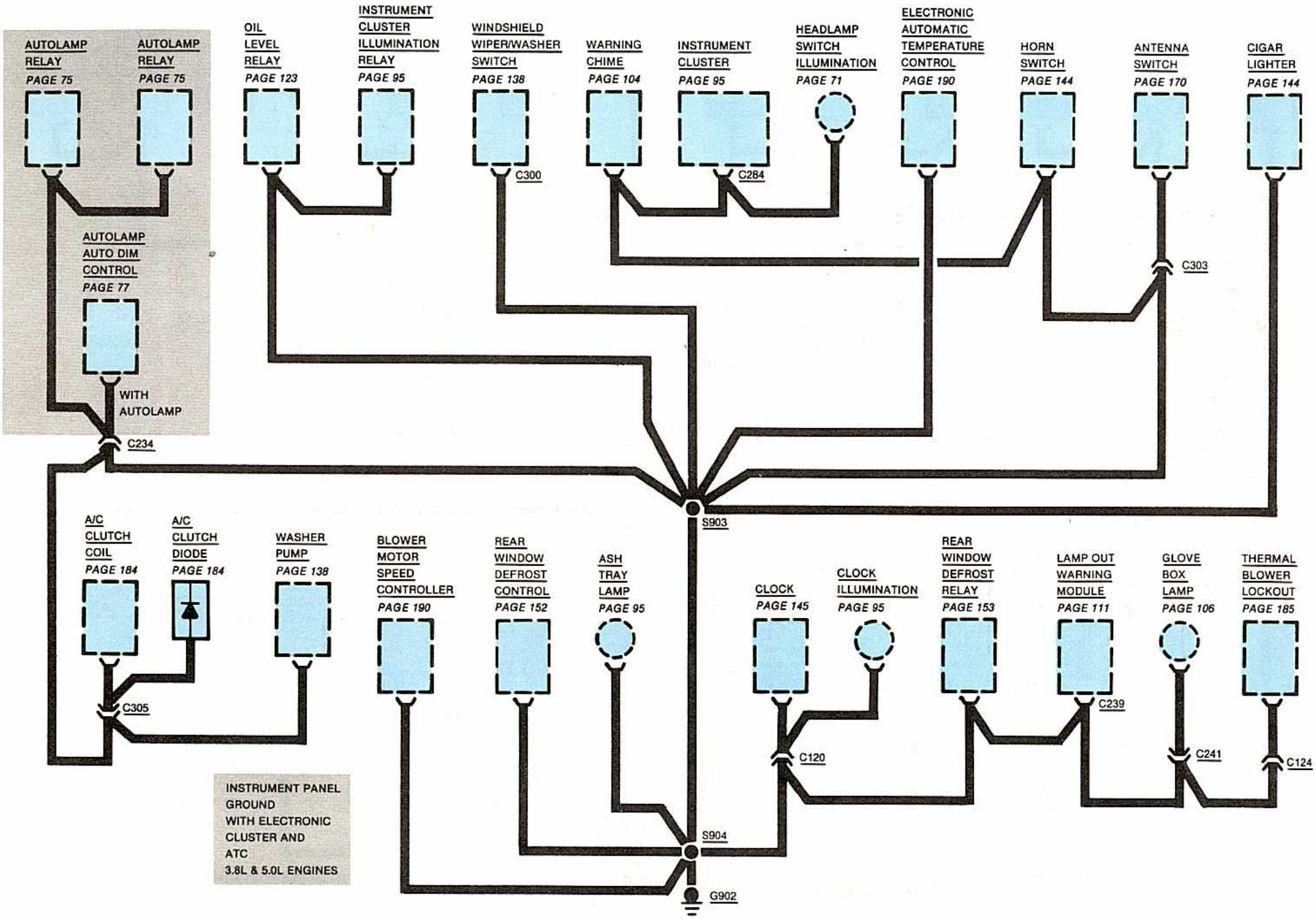
C239
C241
LOW FUEL WARNING SWITCH PAGE 116
C120
S904
G902
WITH DIAGNOSTIC WARNING
INSTRUMENT CLUSTER PAGE 95
C246
HORN SWITCH PAGE 144
WARNING CHIME PAGE 104
HEADLAMP SWITCH ILLUMINATION PAGE 91
INSTRUMENT PANEL GROUND
WITHOUT ELECTRONIC CLUSTER
3.8L & 5.0L ENGINES

6 GROUND (G902)

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AUTOLAMP RELAY PAGE 75
AUTOLAMP AUTO DIM CONTROL PAGE 77
WITH AUTOLAMP
C234
OIL LEVEL RELAY PAGE 123
INSTRUMENT CLUSTER ILLUMINATION RELAY PAGE 95
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C300
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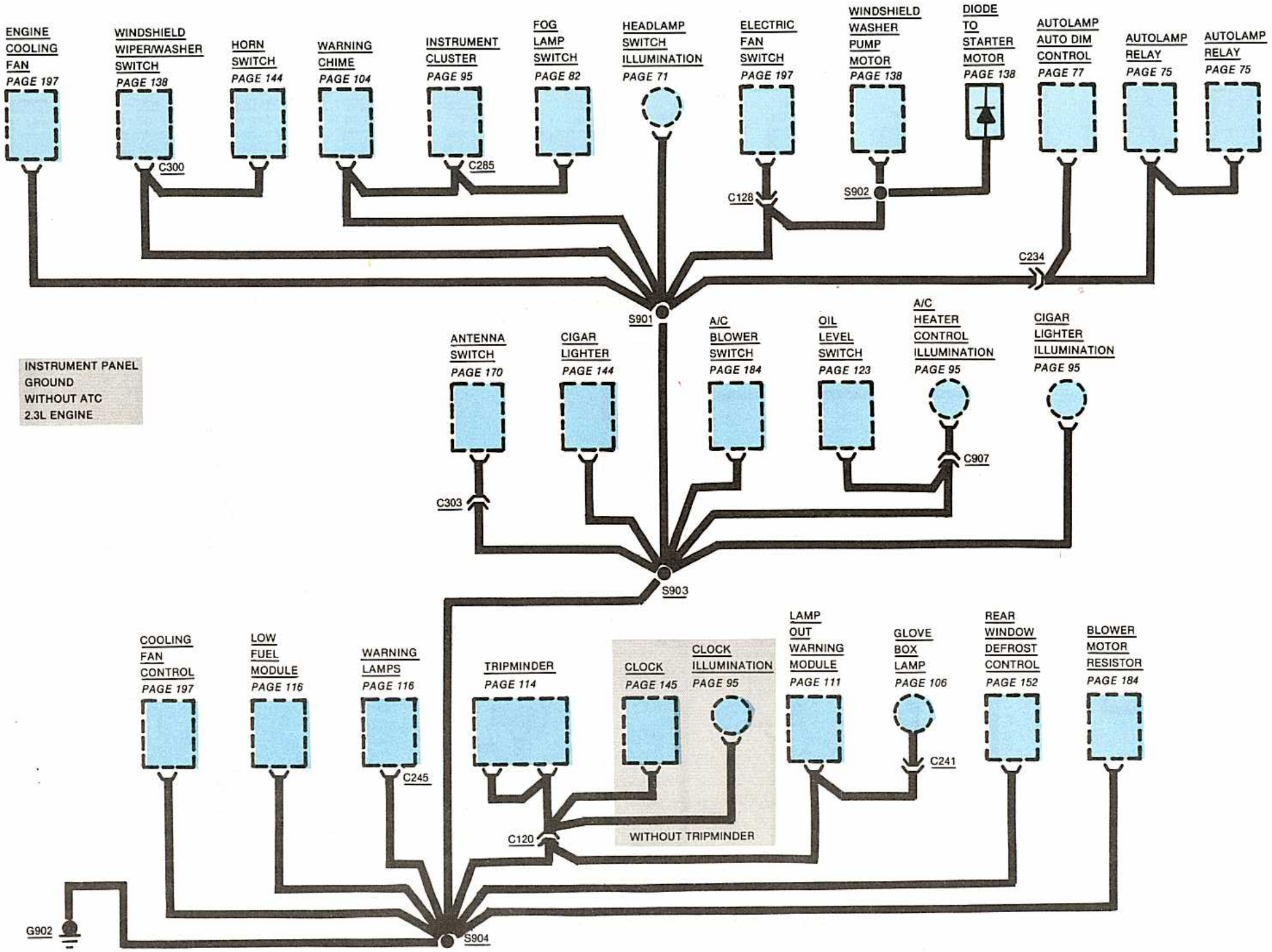
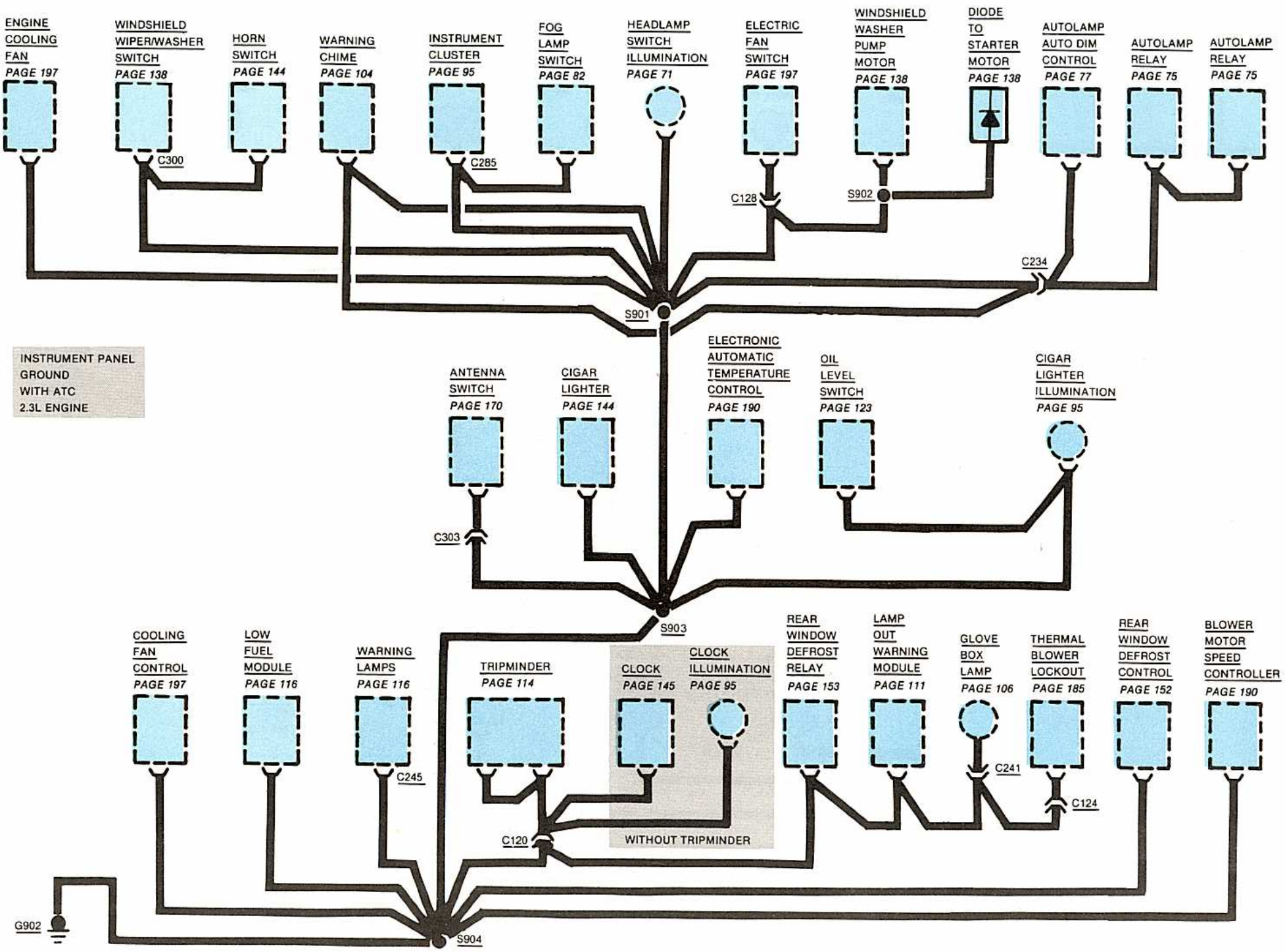
C239
C120
C241
C124
S904
G902
INSTRUMENT PANEL GROUND WITH ELECTRONIC CLUSTER AND ATC 3.8L & 5.0L ENGINES

8 GROUND (G902)

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C241
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C120
WITHOUT TRIPMINDER
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S904

HOW THE CIRCUIT WORKS

The ground circuits shown here are complete, and connect several components together to central ground points. On other pages only parts of these circuits are shown dashed on those pages.

All simple or component ground circuits are shown on the individual circuit pages, and are complete on these pages.

All ground wires are 57 BK unless otherwise noted.

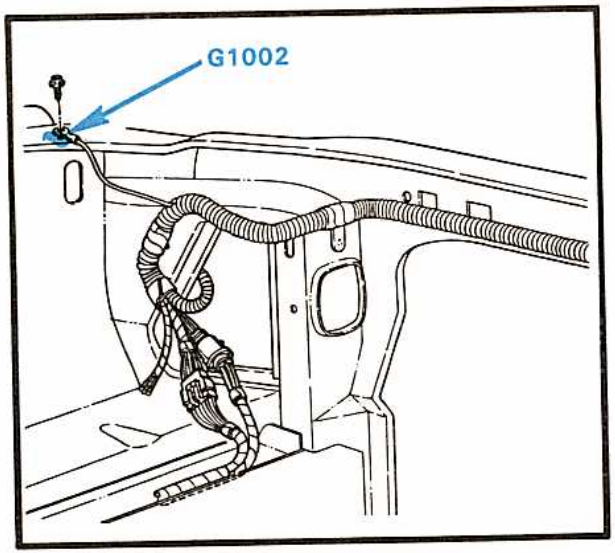


Figure 1—Ground G1002

COMPONENT LOCATION

		Page-Figure	Color	Terminals
Connector C120	Lower center of I/P	74-6	GY	8
Connector C128	Near top of I/P		GY	6
Connector C135	Above top center of windshield		GY	8
Connector C136	RH floor pan		BK	4
Connector C234	Behind LH side of I/P	155-1	BR	6
Connector C239	Attached to lamp out module		GY	8
Connector C241	Behind glove box at light		BR	2
Connector C246	Near glove box		BR	18
Connector C249	Attached to main light switch		WH	3
Connector C250	Attached to keyless entry module	136-1	GY	14
Connector C251	Attached to keyless entry module	136-1	GR	14
Connector C284	Near w/w switch		GY	18
Connector C285	Attached to instrument cluster	122-9	GY	18
Connector C293	Lower LH side of cowl	220-1	GY	4
Connector C300	Attached to washer/wiper switch	140-3	GY	8
Connector C303	Center of I/P, behind radio	156-2	GY	2
Connector C305	Near LH front shock tower	155-1	GY	1
Connector C342	LH side of trunk, near hinge	156-2	GY	3
Connector C347	Near LH door latch	103-1	GR	2
Connector C348	Near RH door latch	103-1	GR	2
Connector C370	LH rear side of transmission hump		GY	2
Connector C405	In LH door	150-2	GY	4
Connector C406	In RH door	150-2	GY	4
Connector C407	In LH door	150-2	GY	8
Connector C410	Under driver's seat assembly		GY	2
Connector C411	In console		GY	8
Connector C412	Under driver's seat		GY	2
Connector C413	In console		GR	8

(Continued on next page)

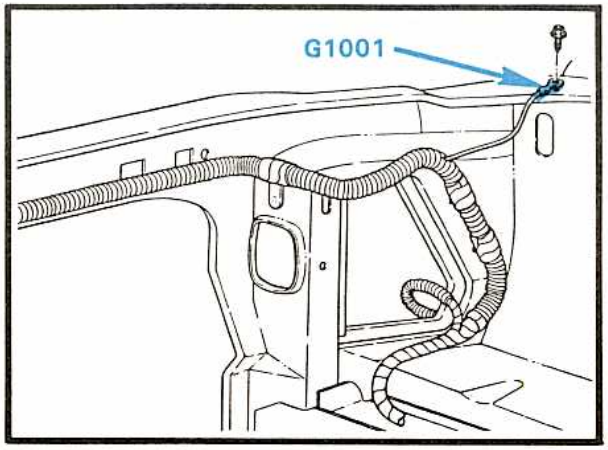


Figure 2—Ground G1001

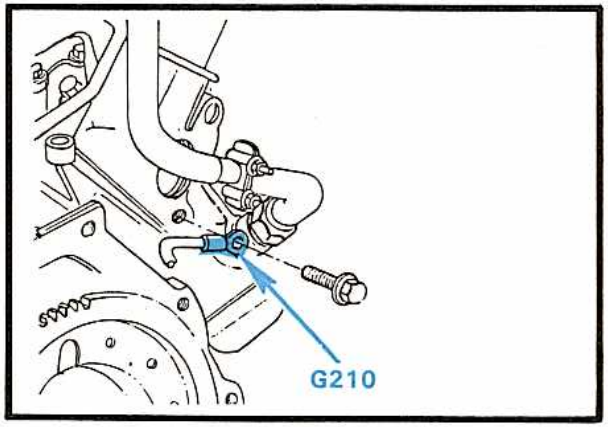


Figure 3—Ground G210

COMPONENT LOCATION *(Continued from previous page)*

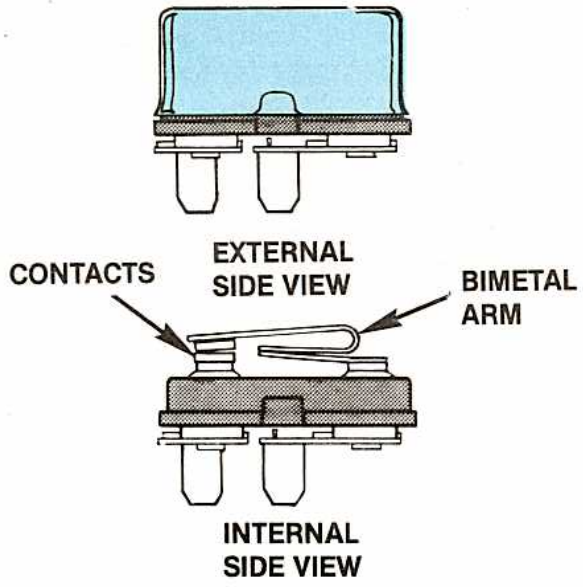
		Page-Figure	Color	Terminals
Connector C418	Lower RH cowl access hole	121-7	GY	3
Connector C420	Above top center of windshield	72-1	GY	3
Connector C461	Behind I/P above steering column		GY	2
Connector C907	Near w/w switch	196-3	GY	2
Ground G206	On RH floor pan			
Ground G902	Lower center of I/P	73-2		
Ground G1001	Above LH headlamp assembly	17-2		
Ground G1002	Above RH headlamp assembly	16-1		
Ground G1201	Connected to trunk lid brace			
Splice S488	Near RH door latch			
Splice S501	RH floor pan			
Splice S502	RH floor pan			
Splice S503	RH floor pan			
Splice S504	RH floor pan			
Splice S505	RH floor pan			
Splice S506	RH floor pan			
Splice S507	RH floor pan			
Splice S508	RH floor pan			
Splice S901	Lower center of I/P			
Splice S902	Near top of I/P			
Splice S903	Lower center of I/P			
Splice S904	Lower center of I/P			
Splice S1002	Above LH headlamp assembly			
Splice S1007	Above RH headlamp assembly			
Splice S1201	Near trunk lid brace			
Splice S1204	Near trunk lid brace			
Splice S1207	Near trunk lid brace			

REPLACEMENT OF FUSES/ CIRCUIT BREAKERS

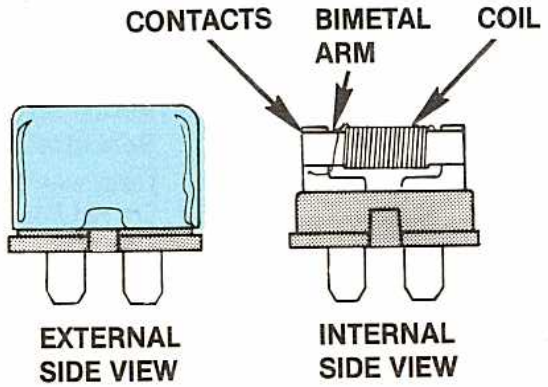
GOOD FUSE BLOWN FUSE

Fuses are mounted either in the **Fuse Panel** or in-line. They are identified by the numbered value in amperes, and by a color code. Some positions may have either a fuse with adapter or a circuit breaker. Be sure to replace a fuse or circuit breaker with the same kind of unit and with the same ampere rating. Remove fuses in order to check them.

CIRCUIT BREAKER OPERATION



Cycling Fuse Panel Type



Non-Cycling Fuse Panel Type

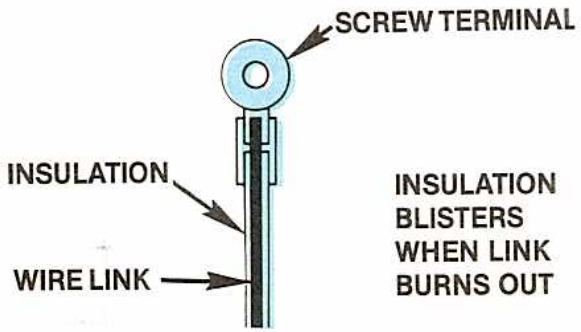
Cycling In-Line Type

Some circuits are protected by circuit breakers. (Abbreviated "c.b." in fuse chart.) They can be **Fuse Panel** mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal bonded together (bimetal arm). If the arm starts to carry too much current, it heats up. As one metal expands faster than the other the arm bends, opening the contacts. Current flow is broken. In the cycling type, the arm cools and straightens out. This closes the circuit again. This cycle repeats as long as the overcurrent exists, with power applied.

In the non-cycling type, there is also a coil wrapped around the bimetal arm. When an overcurrent exists and the contacts open, a small current passes through the coil. This current through the coil is not large enough to operate a load, but it does heat up both the coil and bimetal arm. This keeps the arm in the open position until power is removed.

FUSE LINKS



The fuse link is a short length of wire smaller in gage than the wire in the protected circuit. The wire is covered with a thick non-flammable insulation. An overload causes the link to heat and the insulation to blister. If the overload remains, the link will melt, causing an open circuit. The links are color coded for wire size as follows:

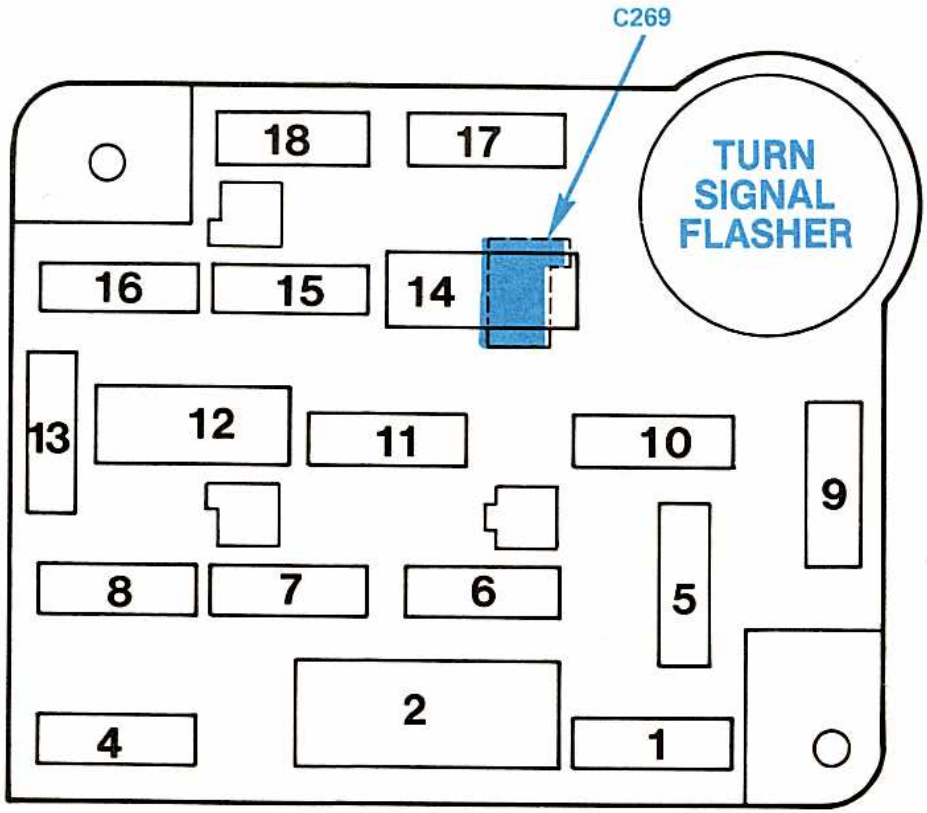
COLOR CODE

BLUE	**20 GA**
BROWN or RED	**18 GA**
BLACK or ORANGE	**16 GA**
GREEN	**14 GA**

When replacing, make tight crimp joints or hot solder joints for good connections.

DIODES

Diodes are electrical devices that permit current to flow in one direction only. The current flows in the direction indicated by the arrow.



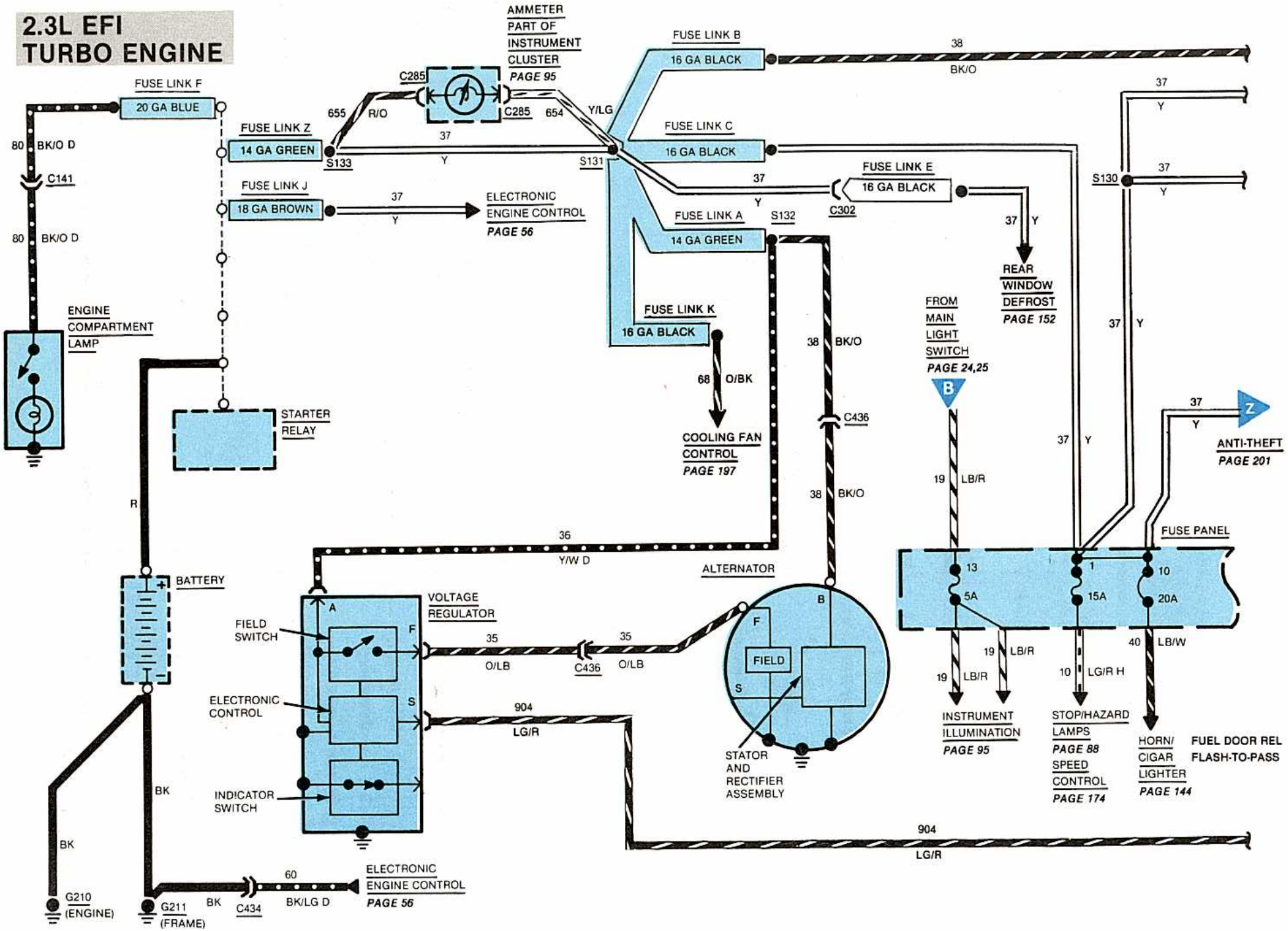
Fuse Position	Amps	Circuits Protected
1	15	Stop/Hazard Lamps; Speed Control.
2	6 c.b.	Windshield Wiper/Washer; Interval Wiper.
4	15	Exterior Lamps; Instrument Illumination.
5	15	Turn Lamps; Backup Lamps; Illuminated Entry; Keyless Entry; Electric Day-Night Mirror; Electronic ATC, A/C Clutch on ATC Cars
6	20	A/C Clutch; Speed Control; Cornering Lamps; Lamp Out Warning; Rear Window Defrost; Trunk Release; Digital Clock; Anti-Theft; Chime Rear Reading Lamps
7	15	Fog Lamps (with 2.3L Turbo only)
8	15	Courtesy Lamps; Clock; Key Warning; Tripminder; Illuminated Entry; Keyless Entry; Power Door Locks; Anti-Theft; Power Outside Mirrors.
9	30	Blower for Heater, A/C, ATC.
10	20 c.b.	Horn; Cigar Lighter, Flash-to-Pass, Fuel Door Release
11	20	Radio; Premium Sound; Power Antenna.
12	20 c.b.	Power Seat; Power Door Locks; Keyless Entry; Fuel Filler Door Release.
13	5	Instrument Illumination.
14	20 c.b.	Power Windows; Flash-to-Pass
15	10	Rear Taillamps
16	4	Electronic ATC Control Head
17	15	Electronic Fuel Gage; Tripminder; Speed Indicator.
18	10	Warning Indicators; Seatbelt Warning; Carburetor Circuits; Low Fuel Module; Automatic Lights; Washer Fluid Level; Voice Alert.

Fuse Value Amps	Color Code
4	Pink
5	Tan
10	Red
15	Light Blue
20	Yellow
25	Natural
30	Light Green

The **Alternator** and **Battery** are connected together at the **Starter Relay** hot terminal. Other circuits originate at the **Starter Relay** hot terminal and are protected by fuse links. Low power circuits are also protected by fuses.

The **Ignition Switch** and **Main Light Switch** are powered at all times as are **Fuses 1, 4, 8, 10, 12** and **16**. The other fuses are powered through the **Ignition Switch** or the **Main Light Switch**.

Position 3 is not used and is covered by **Circuit Breaker 2**.


2.3L EFI
TURBO ENGINE
AMMETER
PART OF
INSTRUMENT
CLUSTER
PAGE 95
C285
655 R/O
C285
654 Y/LG
FUSE LINK F
20 GA BLUE
FUSE LINK Z
14 GA GREEN
S133
37 Y
S131
FUSE LINK B
16 GA BLACK
38 BK/O
FUSE LINK C
16 GA BLACK
37 Y
S130
37 Y
FUSE LINK E
16 GA BLACK
C302
37 Y
REAR
WINDOW
DEFROST
PAGE 152
80 BK/O D
C141
80 BK/O D
FUSE LINK J
18 GA BROWN
37 Y
ELECTRONIC
ENGINE CONTROL
PAGE 56
FUSE LINK A
14 GA GREEN
S132
FUSE LINK K
16 GA BLACK
68 O/BK
COOLING FAN
CONTROL
PAGE 197
38 BK/O
C436
38 BK/O
FROM
MAIN
LIGHT
SWITCH
PAGE 24,25
B
19 LB/R
37 Y
37 Y
Z
ANTI-THEFT
PAGE 201
ENGINE
COMPARTMENT
LAMP
STARTER
RELAY
R
36
Y/W D
FUSE PANEL
13
5A
1
15A
10
20A
BATTERY
ALTERNATOR
VOLTAGE
REGULATOR
A
F
FIELD
SWITCH
35
O/LB
C436
35
O/LB
B
F
FIELD
S
ELECTRONIC
CONTROL
S
904
LG/R
STATOR
AND
RECTIFIER
ASSEMBLY
19 LB/R
19 LB/R
INSTRUMENT
ILLUMINATION
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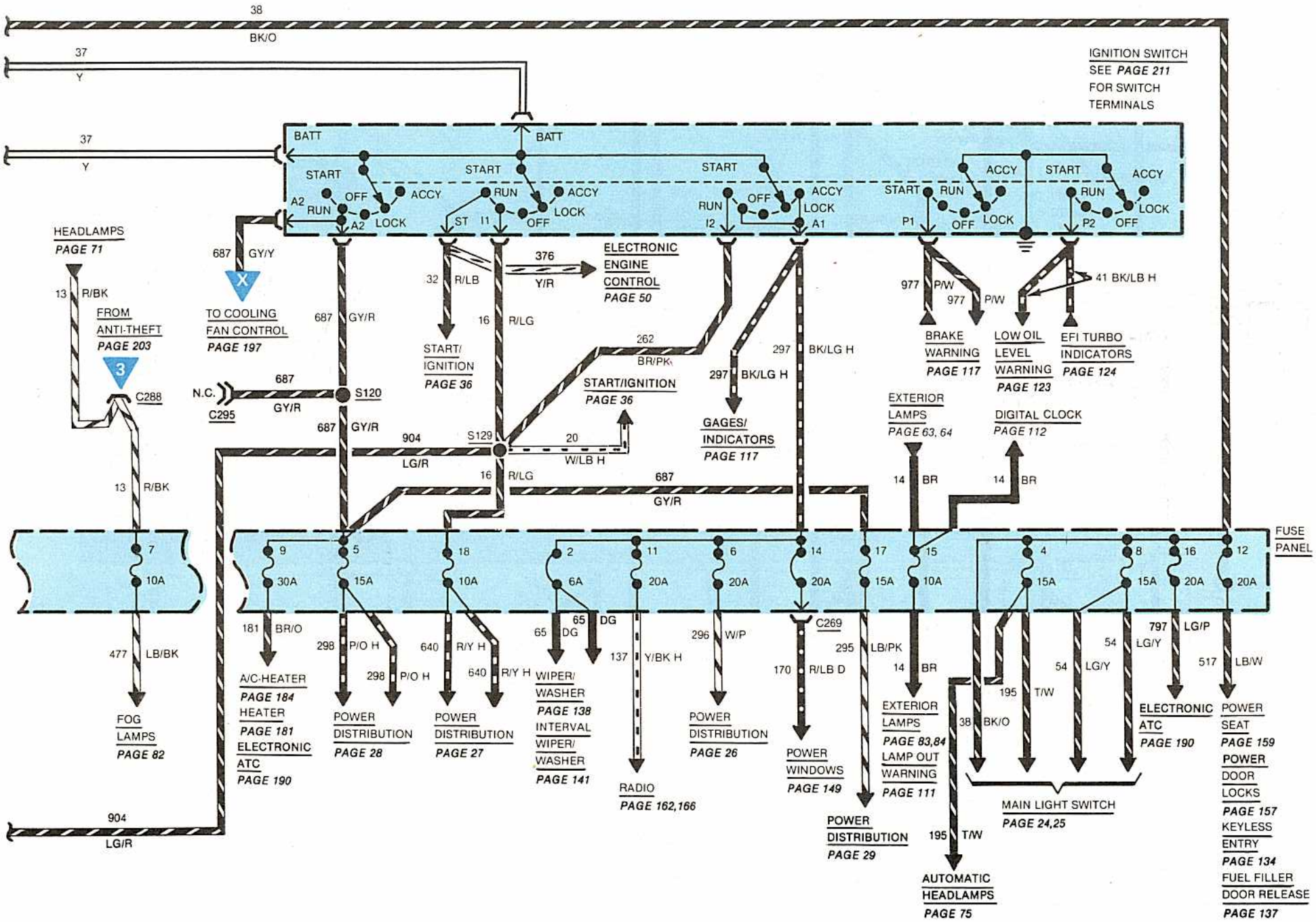
10 LG/R H
STOP/HAZARD
LAMPS
PAGE 88
SPEED
CONTROL
PAGE 174
40 LB/W
HORN/
CIGAR
LIGHTER
PAGE 144
FUEL DOOR REL
FLASH-TO-PASS
INDICATOR
SWITCH
BK
BK
904
LG/R
60
BK/LG D
ELECTRONIC
ENGINE CONTROL
PAGE 56
G210
(ENGINE)
G211
(FRAME)
BK
C434


38
BK/O
37
Y
37
Y
IGNITION SWITCH
SEE PAGE 211
FOR SWITCH
TERMINALS
BATT
BATT
START
START
START
START
ACCY
START
ACCY
A2
RUN
OFF
ACCY
RUN
ACCY
RUN
OFF
ACCY
START
RUN
ACCY
RUN
A2
LOCK
ST
I1
OFF
LOCK
I2
A1
LOCK
P1
OFF
LOCK
P2
OFF
LOCK
HEADLAMPS
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13 R/BK
FROM
ANTI-THEFT
PAGE 203
3
C288
687 GY/Y
X
TO COOLING
FAN CONTROL
PAGE 197
687 GY/R
N.C.
687
GY/R
C295
687
GY/R
S120
904
LG/R
S129
32 R/LB
START/
IGNITION
PAGE 36
16 R/LG
376
Y/R
ELECTRONIC
ENGINE
CONTROL
PAGE 50
262
BR/PK
START/IGNITION
PAGE 36
20
W/LB H
297 BK/LG H
GAGES/
INDICATORS
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297 BK/LG H
977 P/W
977 P/W
BRAKE
WARNING
PAGE 117
41 BK/LB H
LOW OIL
LEVEL
WARNING
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EFI TURBO
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14 BR
13 R/BK
16 R/LG
687
GY/R
FUSE
PANEL
7
10A
9
30A
5
15A
18
10A
2
6A
11
20A
6
20A
14
20A
17
15A
15
10A
4
15A
8
15A
16
20A
12
20A
477 LB/BK
181 BR/O
298 P/O H
298 P/O H
640 R/Y H
640 R/Y H
65 DG
65 DG
137 Y/BK H
296 W/P
170 R/LB D
295 LB/PK
14 BR
38 BK/O
195 T/W
195 T/W
54 LG/Y
54 LG/Y
797 LG/Y
517 LB/W
904
LG/R
FOG
LAMPS
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A/C-HEATER
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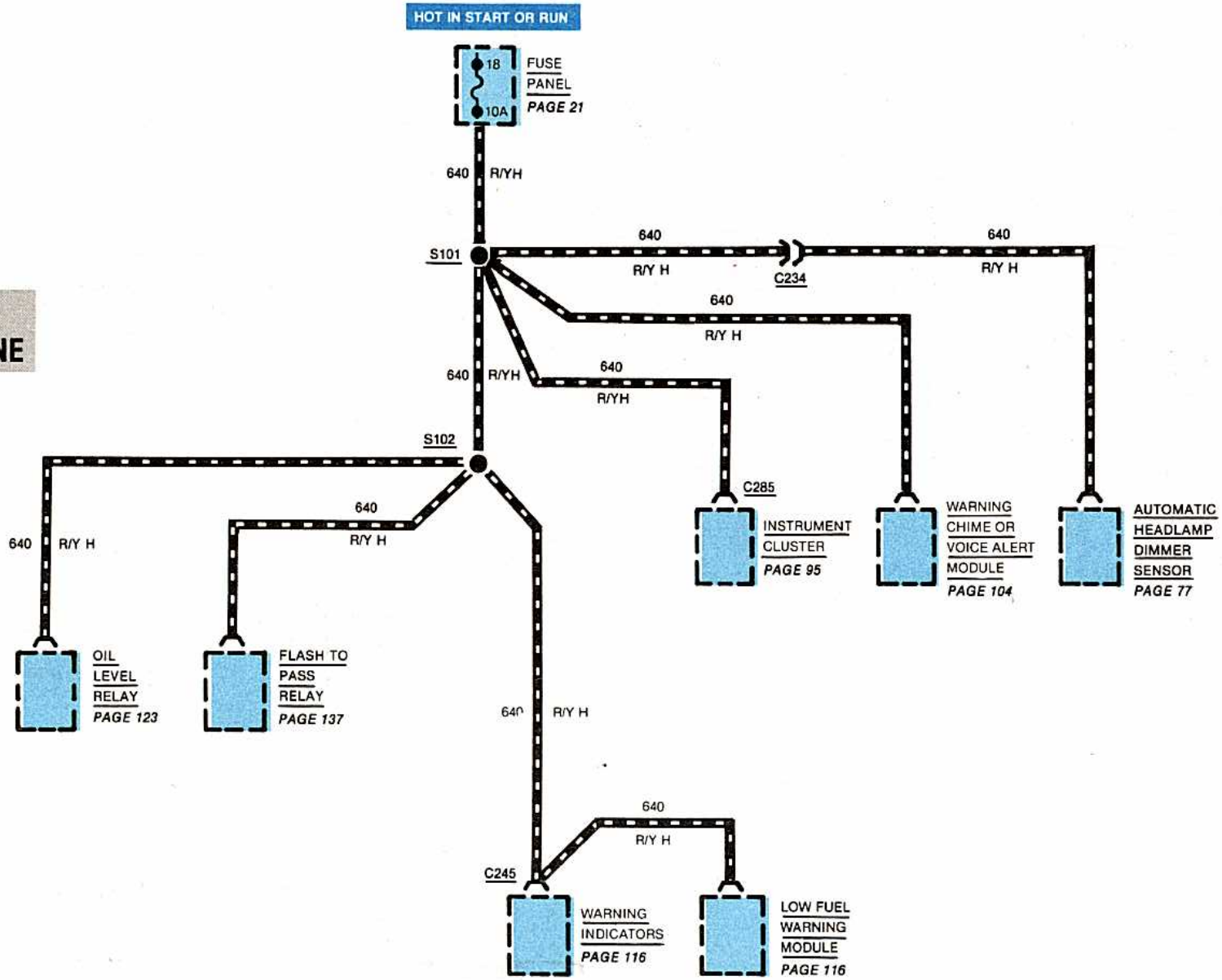
HEATER
PAGE 181
ELECTRONIC
ATC
PAGE 190
POWER
DISTRIBUTION
PAGE 28
POWER
DISTRIBUTION
PAGE 27
WIPER/
WASHER
PAGE 138
INTERVAL
WIPER/
WASHER
PAGE 141
RADIO
PAGE 162,166
POWER
DISTRIBUTION
PAGE 26
C269
POWER
WINDOWS
PAGE 149
POWER
DISTRIBUTION
PAGE 29
EXTERIOR
LAMPS
PAGE 83,84
LAMP OUT
WARNING
PAGE 111
AUTOMATIC
HEADLAMPS
PAGE 75
MAIN LIGHT SWITCH
PAGE 24,25
ELECTRONIC
ATC
PAGE 190
POWER
SEAT
PAGE 159
POWER
DOOR
LOCKS
PAGE 157
KEYLESS
ENTRY
PAGE 134
FUEL FILLER
DOOR RELEASE
PAGE 137

FUSE 18
2.3L TURBO ENGINE



HOW THE CIRCUIT WORKS

The **Battery, Alternator** and **Voltage Regulator** make up the **Charging System.**

With the **Ignition Switch** in RUN, **Battery** current flows through the **Alternator Warning Indicator** into the regulator at terminal I and to ground through the solid-state indicator switch. The electronic control measures a low voltage at regulator terminal A, and closes the field switch. This applies battery voltage to the field through **Alternator** terminal F.

With current in the field and the rotor turning, the **Alternator** stator produces a DC voltage at terminal B (to **Battery**) and terninal S. (Voltage at S is one-half voltage at B).

A preset voltage at terminal S operates the electronic control to open the indicator switch, which removes ground from the **Alternator Warning Indicator.**

The **Alternator** output is controlled by the current in the field. The average voltage on the field depends on the percentage of time the field switch is closed. The electronic control closes the field switch when the voltage at A is low, and opens the switch when the voltage at A is high.

The **Voltage Regulator** holds the system voltage at about 14 volts. The average **Alternator** output is then any required value between zero and full current depending on conditions sensed by the **Voltage Regulator.**

COMPONENT LOCATION (3.8L and 5.0L Engines)

		Page-Figure	Color	Terminals
Choke Heater	Connected to LH rear of throttle body			
Fuse LInks A, B, C	At starter relay terminal post	33-1		
Fuse Link E	Attached to starter relay	154-2		
Fuse Link F	Attached to starter relay			
Fuse Links L, M	Attached to starter relay	66-11		
Fuse Link R	At starter relay			
Fuse Link S				
Fuse Link T				
Starter Relay	Attached to RH fender apron	66-11		
Voltage Regulator	Attachd to RH fender apron	66-11,24-1		
Connector C110	Behind center of I/P		BK	7
Connector C111	Under LH side of I/P, near fuse panel		GY	3
Connector C120	Behind RH side of I/P		GY	8
Connector C135	Behind center of I/P		GY	8
Connector C135A	Behind center of I/P		GY	8
Connector C136	Behind center of I/P		BK	4
Connector C137	Behind console		GY	8
Connector C141	LH fender apron		GY	1
Connector C150	Behind LH side of I/P		BR	6
Connector C161	RH front fender below voltage regulator		BR	3
Connector C232	LH front fender apron below headlamps		GY	12
Connector C234	Behind LH side of I/P		BR	6
Connector C239	Attached to lamp out warning module		GY	8
Connector C246	Attached to warning indicator module		GY	18
Connector C248	Part of main light switch		GY	3
Connector C249	Attached to main light switch		WH	1
Connector C269	At fuse panel		NAT	1
Connector C276	Behind center of I/P		GY	4

(Continued on next page)

COMPONENT LOCATION *(Continued from previous page)*

		Page-Figure	Color	Terminals
Connector C284	Attached to I/C		GY	18
Connector C285	Attached to instrument cluster	122-9	GY	18
Connector C287	Under LH side of I/P, at fuse panel	120-1,122-8	BR	6
Connector C288	Under LH side of I/P, at fuse panel	100-1	GY	12
Connector C290	LH fender apron		BK	4
Connector C294	Near LH front shock tower		BR	6
Connector C295	LH front fender apron	41-6	GY	12
Connector C297	LH front fender apron		BK	4
Connector C297	RH fender apron		GY	4
Connector C301	Attached to windshield washer switch		GY	8
Connector C403	LH front fender apron below washer reservoir	154-2	BR	3
Connector C411	In console		GY	8
Connector C434	Near battery		GY	1
Connector C1104	Attached to main light switch	73-2,74-5	GY	14
Ground G202	Lower RH front of engine	33-2		
Ground G203	RH fender apron, near battery			
Ground G902	Lower center of I/P	73-2		
Splice S100	Behind I/P near fuse panel			
Splice S101	Behind I/P near fuse panel			
Splice S106	Behind I/P near main light switch			
Splice S108	Luggage compartment near LH rear lamps			
Splice S120	Behind I/P near fuse panel			
Splice S121	Under hood near dash			
Splice S130	LH front fender apron			
Splice S131	LH front fender apron			
Splice S150	Behind center of I/P			
Splice S801	LH front fender apron			

NOTE
The Voltage Regulator with BLACK printing on the cover is used with Alternator Warning Indicator:
BLUE printing with Ammeter;
RED printing with either.

TROUBLESHOOTING HINTS

IMPROPER CHARGING

The most common charge system complaints are dead **Battery,** and **Alternator Warning Indicator** on at normal speed.

- Check **Fuse Link A** at **Starter Relay.**
- Check **Alternator** belt tension.
- Check **Battery** terminals and cable clamps.
- Check for clean and tight connections on **Alternator, Voltage Regulator,** and **Starter Relay.**

Read "Charging System Diagnosis" in Section 31-01 of Shop Manual for detailed **Charging System** tests.

COMPONENT LOCATION (2.3L Turbo Engine)

		Page-Figure	Color	Terminals
Battery	LH fender apron, behind headlamp	38-1		
Fuse Links A, B, C	Near starter relay			
Fuse Links E, F, K, J	At starter relay terminal post			
Fuse Link Z	At starter relay			
Starter Relay	Attached to LH fender apron	38-1		
Voltage Regulator	Attached to LH fender apron	24-1		
Connector C110	Near speed control amplifier		BK	2
Connector C111	Behind center of I/P		GY	3
Connector C120	Behind RH side of I/P		GY	8
Connector C135	Behind center of I/P	155-1	GY	8
Connector C136	Behind center of I/P		BK	4
Connector C137	Behind console	90-3	GY	8
Connector C141	LH fender apron		GY	1
Connector C234	Behind LH side of I/P		GY	12
Connector C239	Attached to lamp outage module		GY	8
Connector C245	Attached to instrument cluster	90-3,122-9	GY	14
Connector C248	Attached to autolamp switch		BK	6
Connector C269	At fuse panel		NAT	1
Connector C276	Behind center of I/P	196-3	GY	4
Connector C285	Attached to instrument cluster	122-9	GY	18
Connector C287	Under LH side of I/P near fuse panel	100-1,122-8	GY	8
Connector C288	Under LH side of I/P, at fuse panel	100-1	GY	12
Connector C295	LH front fender apron	47-6,122-9	GY	12
Connector C411	In console		GY	8
Connector C434	Near battery		BK	1
Connector C436	LH fender apron near dual brake switch		BR	3
Connector C1104	Attached to main light switch	73-2,74-5	GY	14
Ground G210	Lower LH front of engine	17-3,39-1		
Ground G211	Inside LH fender, behind battery	38-1		
Ground G902	Lower center of I/P			
Splice S100	Near speed control amplifier			
Splice S101	Behind I/P			
Splice S102	Behind I/P near fuse panel			
Splice S120	Behind I/P near fuse panel			
Splice S129	Near fuse panel			
Splice S130	LH fender apron near dual brake switch			
Splice S131	LH fender apron near dual brake switch			
Splice S132	LH front fender apron			
Splice S133	LH front fender apron near starter relay			
Splice S150	Behind center of I/P			
Splice S510	Lower LH side of cowl			

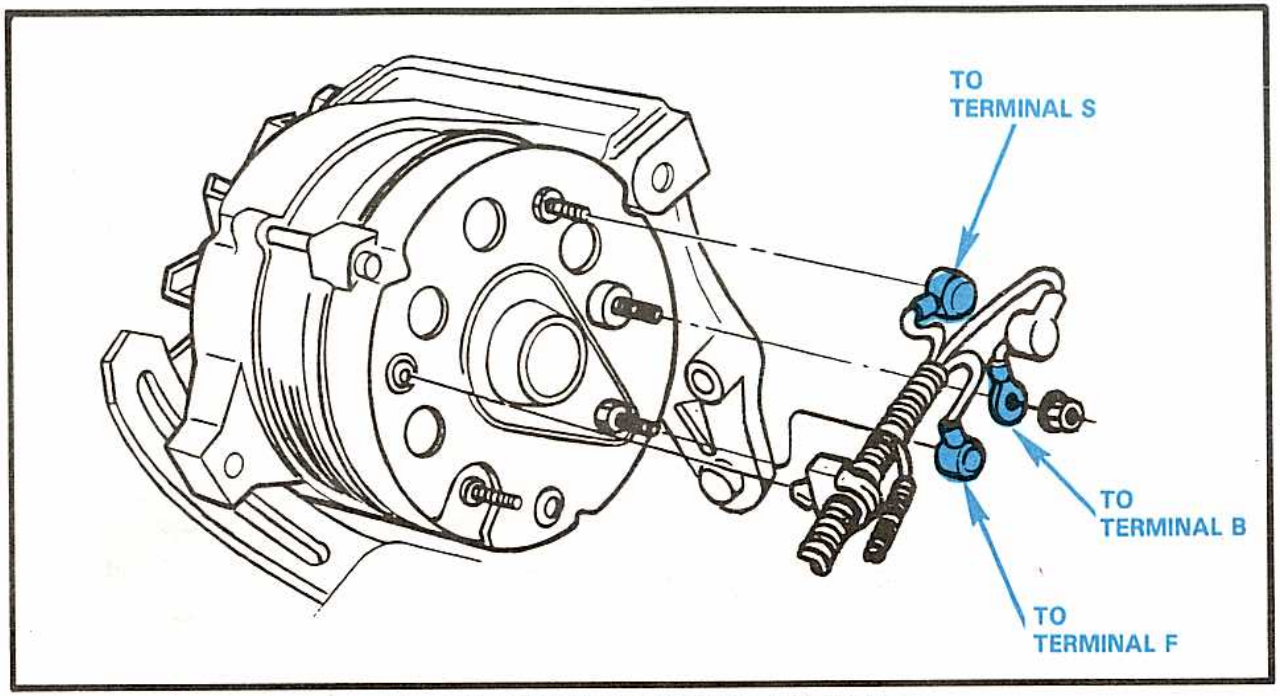


Figure 2—Alternator Connections—2.3L Engine

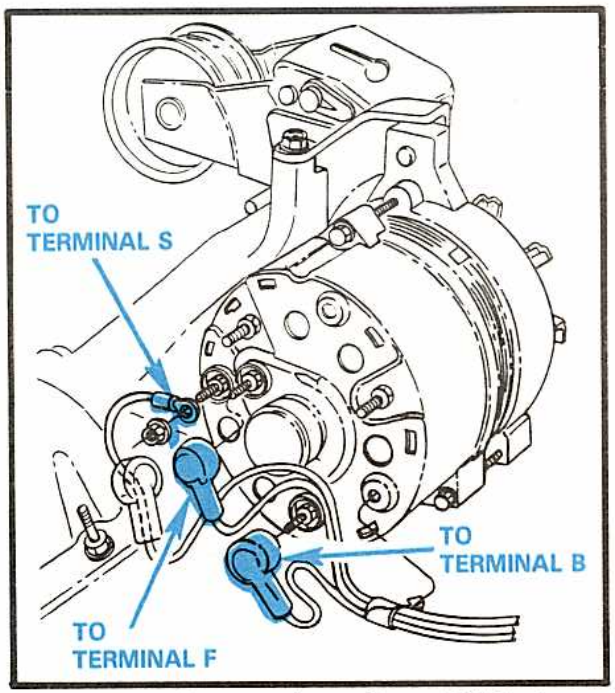


Figure 3—Alternator Connections—3.8L Engine

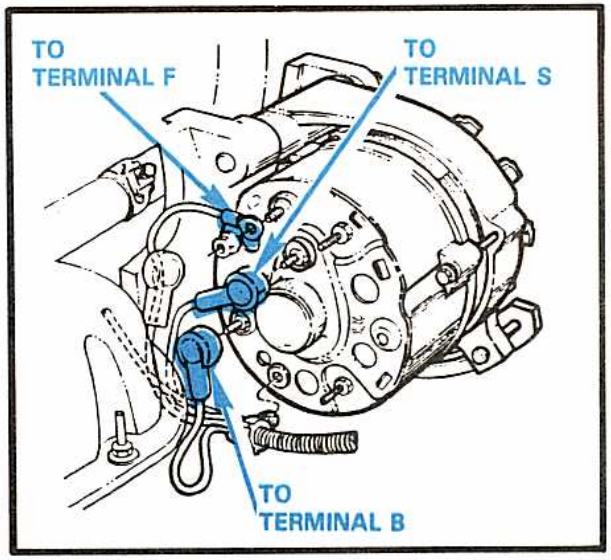
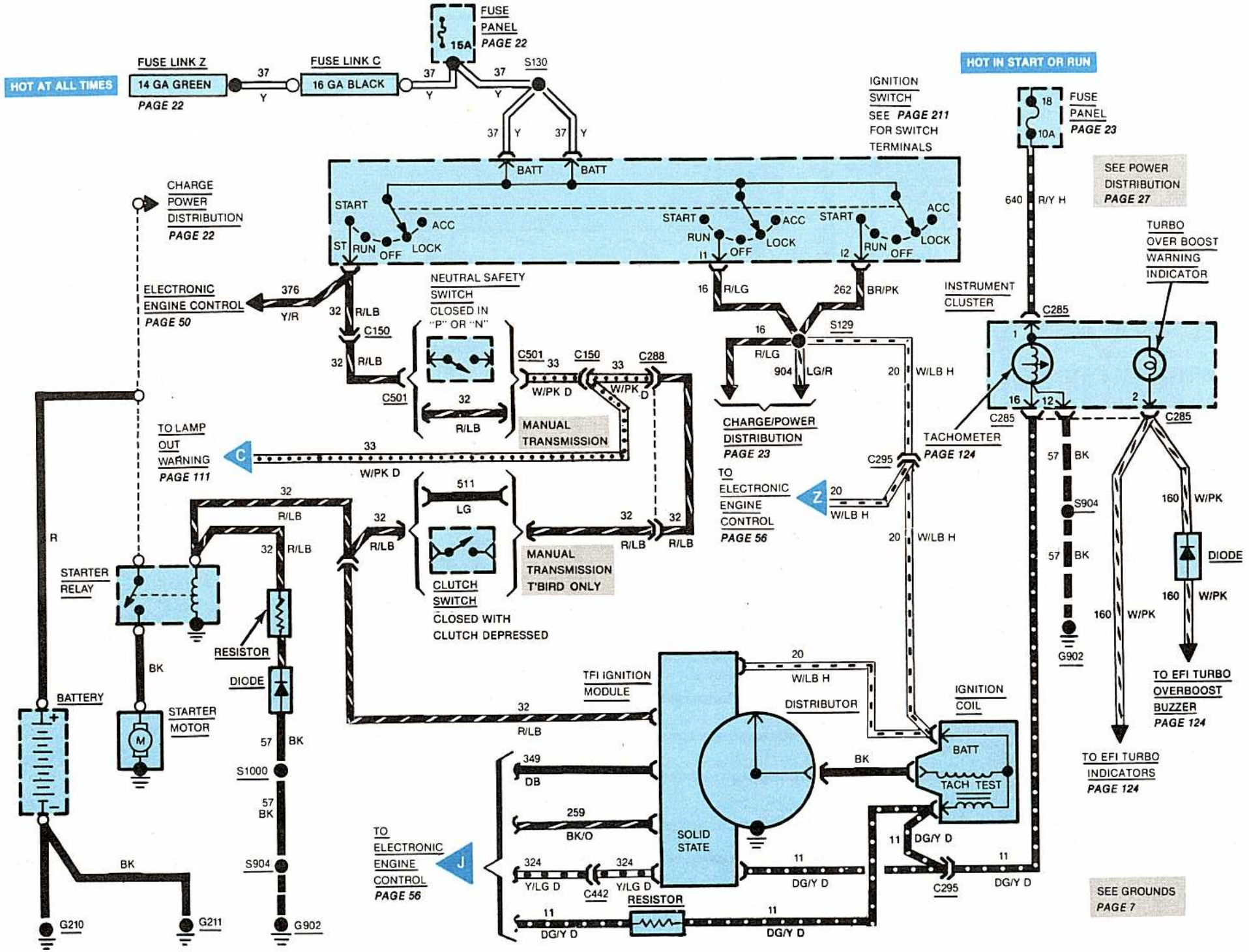


Figure 4—Alternator Connections—5.0L Engine


FUSE PANEL PAGE 22
15A
HOT AT ALL TIMES
FUSE LINK Z
14 GA GREEN
PAGE 22
FUSE LINK C
16 GA BLACK
S130
HOT IN START OR RUN
IGNITION SWITCH SEE PAGE 211 FOR SWITCH TERMINALS
BATT
START
ACC
RUN
LOCK
OFF
ST
I1
I2
FUSE PANEL PAGE 23
18
10A
640 R/Y H
SEE POWER DISTRIBUTION PAGE 27
CHARGE POWER DISTRIBUTION PAGE 22
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511 LG
CLUTCH SWITCH CLOSED WITH CLUTCH DEPRESSED
MANUAL TRANSMISSION T'BIRD ONLY
RESISTOR
DIODE
BK
BATTERY
STARTER MOTOR
57 BK
S1000
S904
G210
G211
G902
TFI IGNITION MODULE
DISTRIBUTOR
IGNITION COIL
SOLID STATE
349 DB
259 BK/O
324 Y/LG D
C442
RESISTOR
11 DG/Y D
BATT
TACH TEST
TO ELECTRONIC ENGINE CONTROL PAGE 56
J
SEE GROUNDS PAGE 7

START

HOW THE CIRCUIT WORKS

The **Battery, Starter Motor, Starter Relay,** and **Ignition Switch** make up the **Starting System.**

Turning the **Ignition Switch** to START sends current through the **Starter Relay** coil and operates the relay Current from the **Battery** then flows directly through the **Starter Relay** to the **Starter Motor** to start the engine.

When the **Ignition Switch** is in START, battery voltage is applied to both the START (circuit 32) and RUN (circuit 16) terminals of **Thick Film Integrated Design Ignition (TFI) Module.** When the Ignition Switch is released to the RUN position, the voltage on circuit 32 drops to zero.

TROUBLESHOOTING HINTS

CHECK BATTERY AND CABLES

- Check condition of **Battery.** Recharge or replace if necessary.
- Check **Battery** posts and cable lugs.
- Check cable terminals at **Starter Relay,** engine ground and **Starter Motor,** and clean if necessary. Make sure cable wire strands are securely attached in terminals. Cables are tight when eyelet can't be easily turned by hand.

IF STARTER CRANKS SLOWLY

- Check **Battery** and cables (see above).
- If still slow, repair or replace **Starter Motor.**

IF STARTER RELAY CHATTERS OR DOESN'T CLICK

- Check **Battery** and cables (see above).
- Make sure **Starter Relay** brackets are grounded tightly.

COMPONENT LOCATION

		Page-Figure	Color	Terminals
Electronic Control Assembly (ECA)	RH cowl side at access hole		BK	
Fuse Link C	Near starter relay			
Ignition Coil	Near front of LH front shock tower	41-6		
Ignition Switch	Upper LH side of steering column	90-3		
Neutral Safety Switch	On transmission assembly	94-3, 94-4		
Starter Motor	Bottom RH rear of engine, at flywheel	39-1		
Starter Relay	Attached to upper RH fender apron (3.8L, 5.0L)	40-2		
	Attached to upper LH fender apron (2.3L EFI)	39-1		
TFI Ignition Module	Connected to side of distributor	65-9		
Connector C232	LH front fender apron below headlights		BR	6
Connector C285	Near center of I/P		GY	18
Connector C288	Under LH side of I/P, near fuse block	100-1	GY	12
Connector C294	Near LH front shock tower		BR	6
Connector C295	On dash panel near wiper motor	41-6, 122-9	GY	8
Connector C297	LH fender apron		GY	4
Connector C403	LH front fender apron below headlights		BR	3
Connector C440	RH fender apron		BK	3
Connector C442	LH front of engine	62-2	GY	2
Connector C501	At LH transmission support	93-1, 94-2, 4	BR	4
Connector C1984	LH fender apron		BR	4
Ground G202	Lower RH front of engine		BR	4
Ground G203	RH fender apron, near battery			
Ground G210	Lower LH front of engine	17, 3, 39-1		
Ground G211	Inside LH fender behind battery	32-1		
Ground G902	Under center of I/P	73-2		
Ground G1002	Above RH headlamp	16-1, 33-1		
Splice S129	Near LH front shock tower			
Splice S130	LH front fender apron			
Splice S131	LH front fender apron			
Splice S294	Near LH front shock tower			
Splice S296	LH front fender apron near headlights			
Splice S904	Near center of I/P			
Splice S1000	Near center of I/P			
Splice S1007	Above RH headlamp			

- With **R/LB** wires removed from **Starter Relay,** and transmission in PARK or NEUTRAL, jumper this terminal on **Starter Relay** to main terminal (**Battery** connection). If **Starter Motor** works, check **Ignition Switch.** Check wiring to **Starter Relay** for open or dirty connections. If this jumper doesn't operate **Starter Relay,** replace it.

IF STARTER DOES NOT CRANK AND STARTER RELAY CLICKS

- Clean and tighten cable connection to **Starter Motor** terminal and relay terminals. Check cable to **Starter Motor** for damage and make sure wire strands are secure in eyelets.

IF STARTER SPINS (HUMMING NOISE) BUT DOES NOT CRANK ENGINE

- Remove **Starter Motor.** Repair or replace starter driver.
- Read "Testing" in the Shop Manual for detailed Starting System tests.

IGNITION

HOW THE CIRCUIT WORKS

The Ignition system contains **Thick Film Integrated Design Ignition (TFI) Module,** which is mounted on the side of the **Distributor.**

When the engine is running:

— The pickup in the **Distributor** provides the signal input through the **TFI Module** to the **Electronic Control Assembly,** which returns a signal to the **TFI Module.**

— The **TFI Module** switches current on and off in the primary circuit of the **Ignition Coil** according to the **Distributor** pulses.

— Each interruption of primary current makes the **Ignition Coil** secondary produce an open circuit high-voltage pulse of up to 40,000 volts.

— High voltage pulses are transmitted to the **Distributor,** which sends them to fire the spark plugs.

Two signal lines (circuits 324 and 349) plus a ground line (circuit 259) are connected between the **Electronic Control Module** and the **TFI Ignition Module.**

TROUBLESHOOTING HINTS

EEC SYSTEM

- Because of the complexity of this system, special test equipment is requried to diagnose it effectively. See the Shop Manual for details of testing.

In general —

- If there is *NO SPARK* at the spark plugs, check the primary circuit from the Ignition Switch through the Ignition Coil and Ignition Module to ground.
- Check **Battery** for state of charge and for clean, tight battery terminal connections.
- If the engine operates with a fixed 10° BTDC spark timing and the EGR system does not operate, the EEC System is operating in its fail-safe mode which indicates a problem in the EEC System.

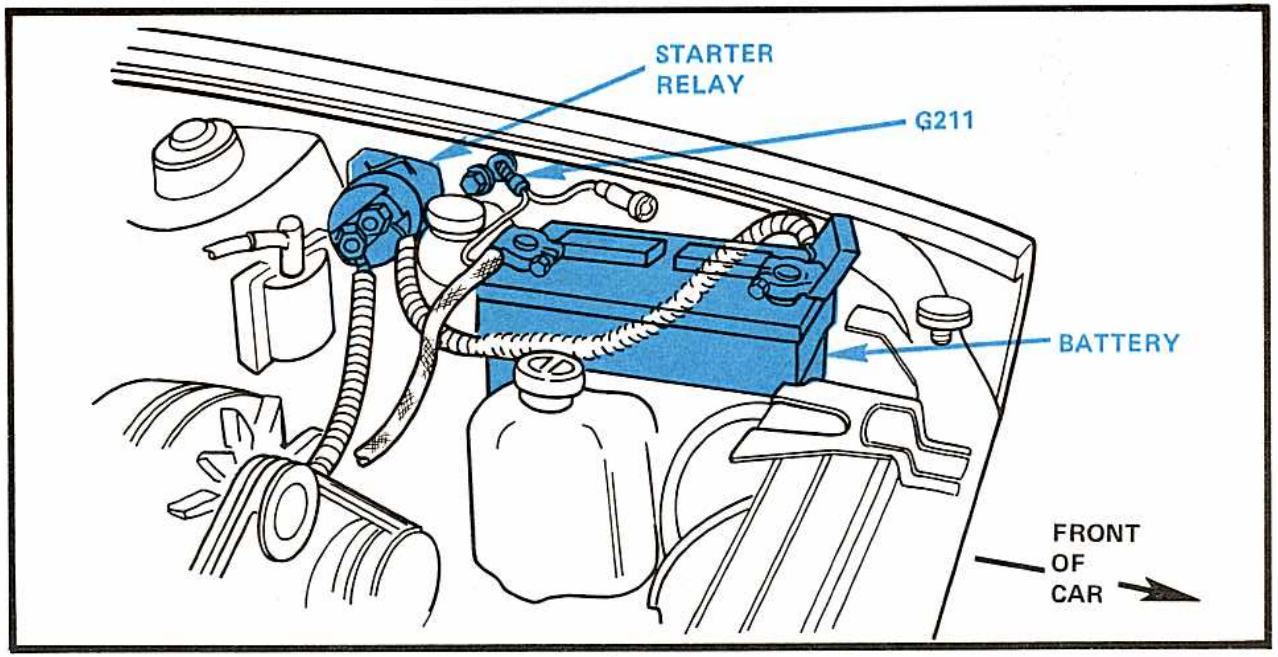


Figure 1 — Starter Wiring — 2.3L Turbo Engine

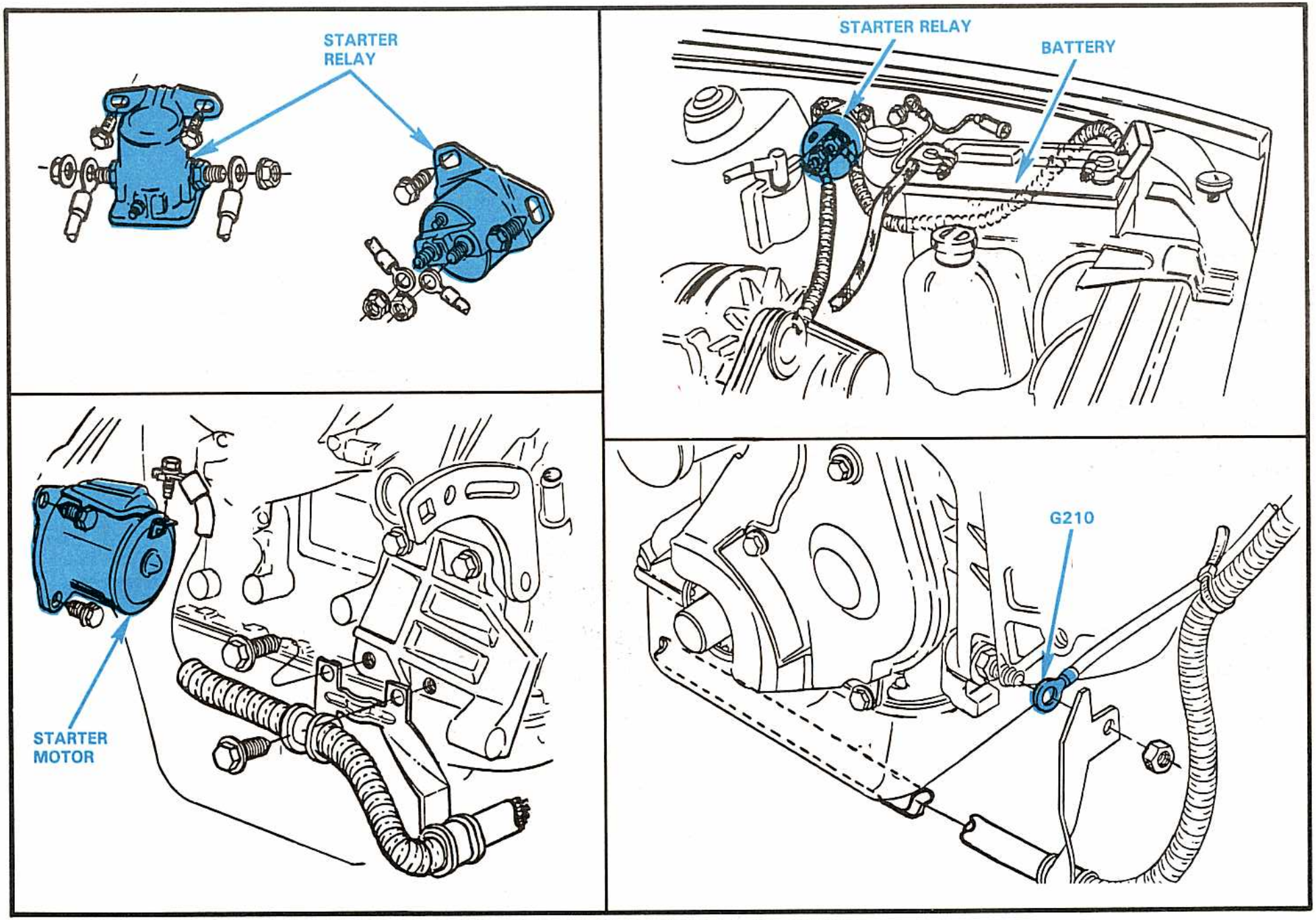


Figure 1—Engine Starter Sub-System—2.3L EFI Turbo

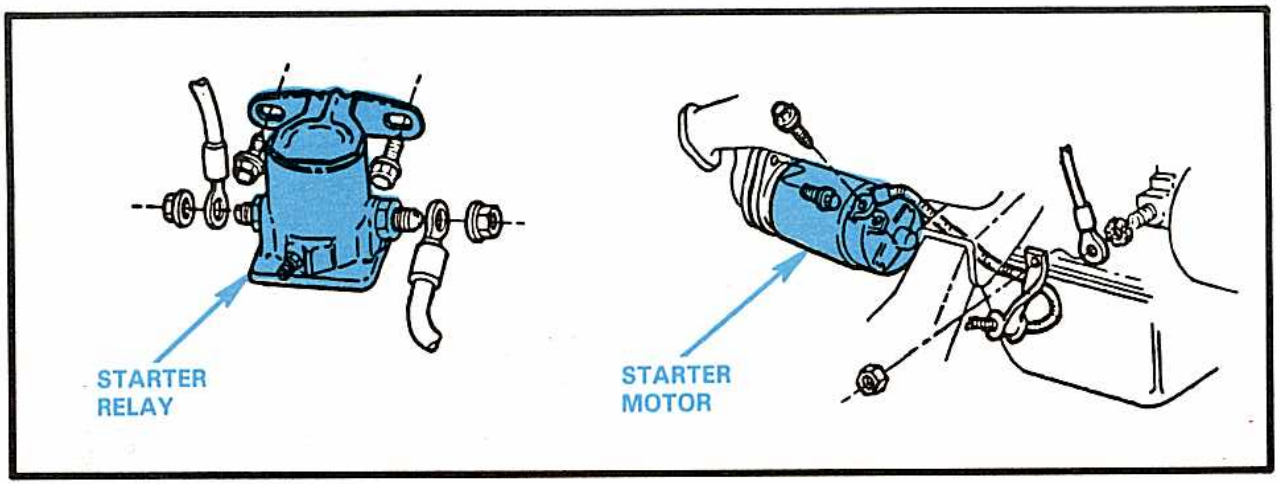


Figure 2 — Starter Wiring — 3.8L and 5.0L Engines

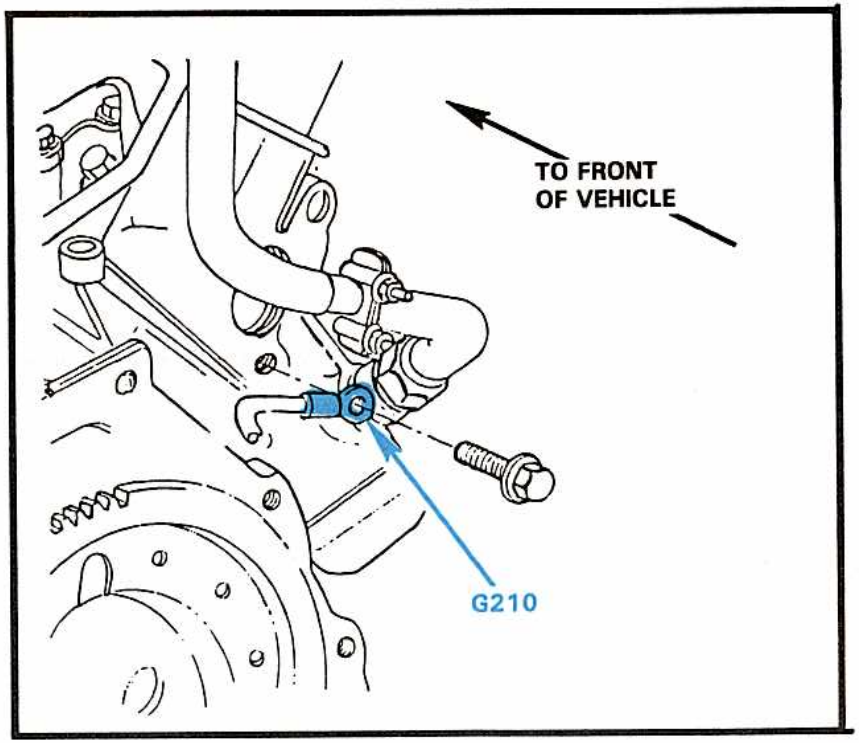


Figure 3 — 2.3L Turbo Engine Ground G210

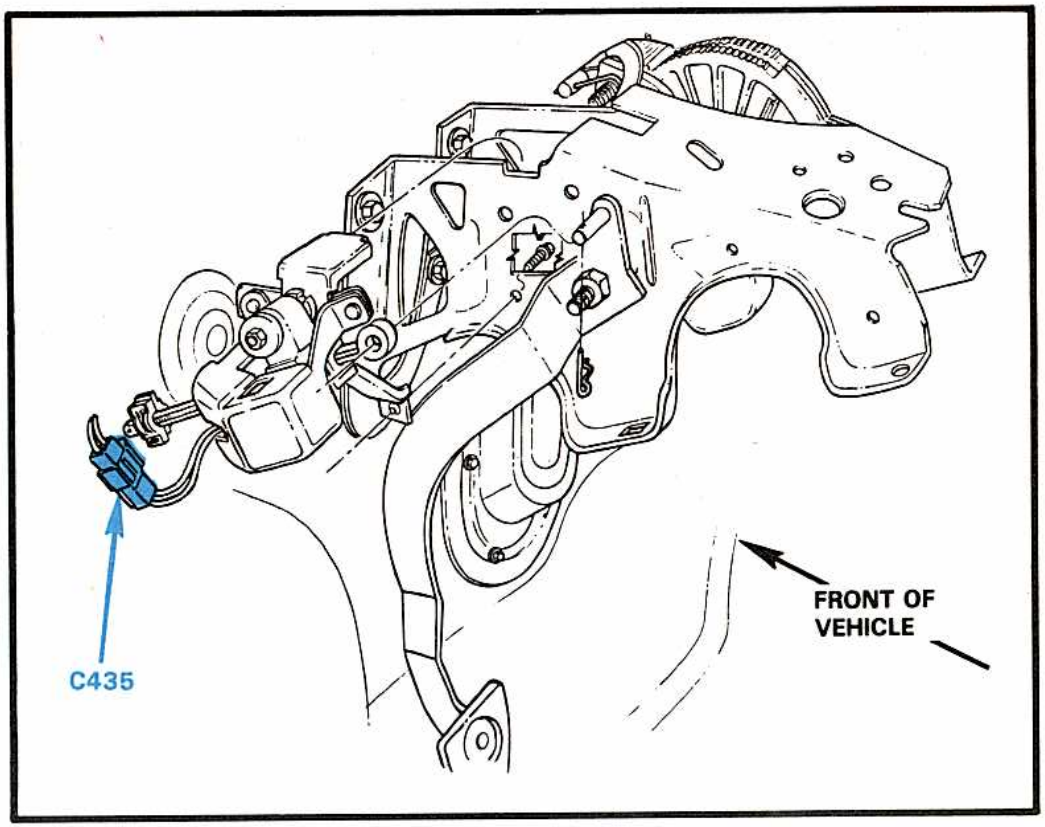


Figure 4 — RH Cowl Side

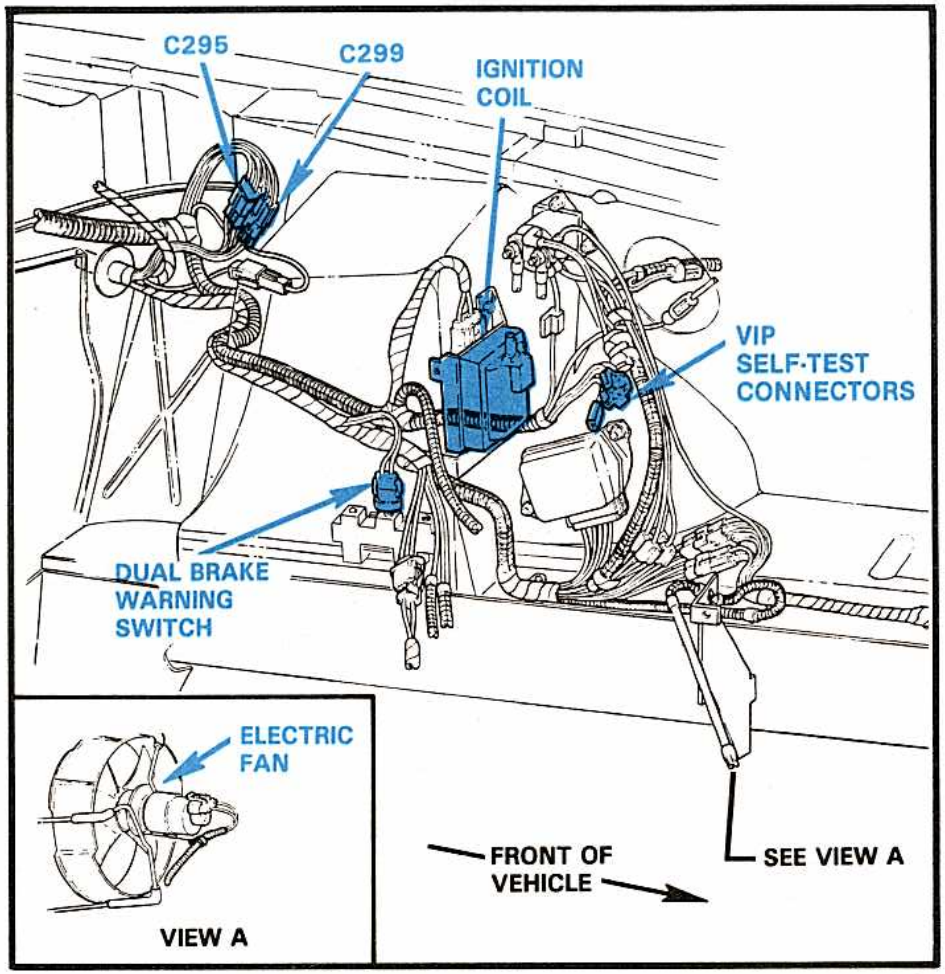


Figure 6—LH Fender Apron—2.3L Turbo Engine

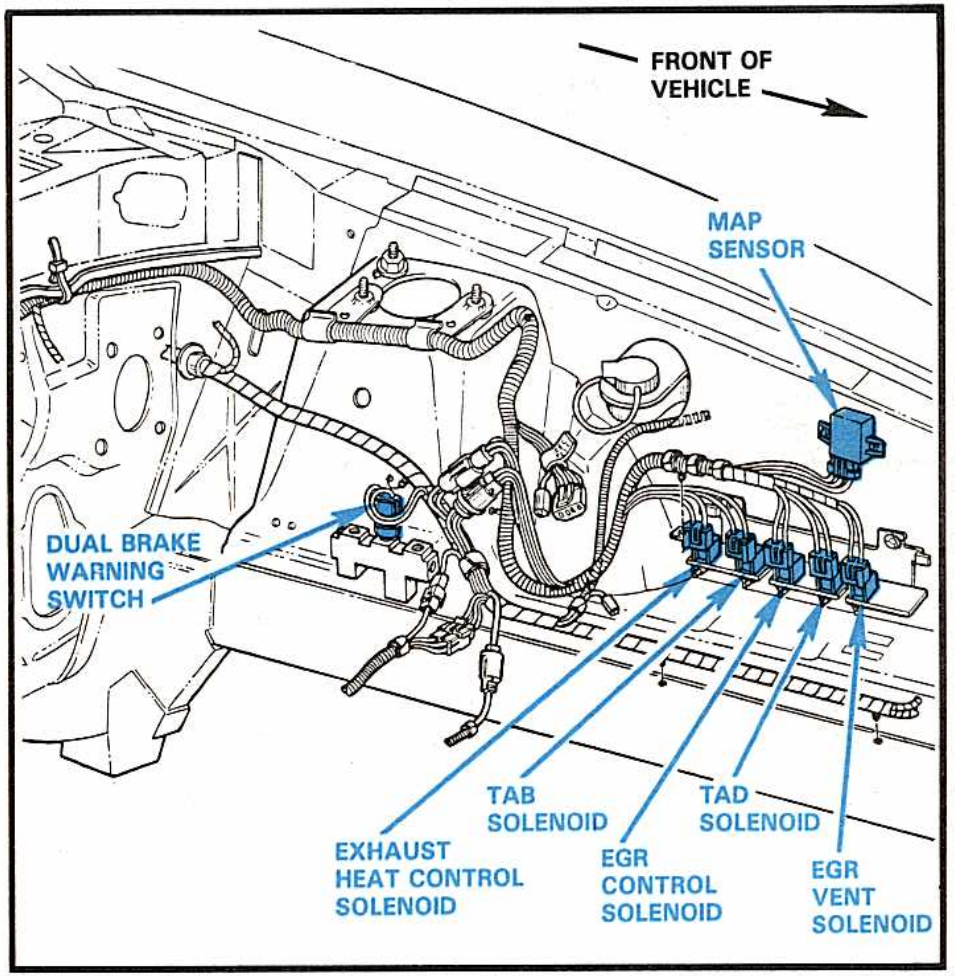


Figure 7—LH Fender Apron—3.8L CFI EEC IV

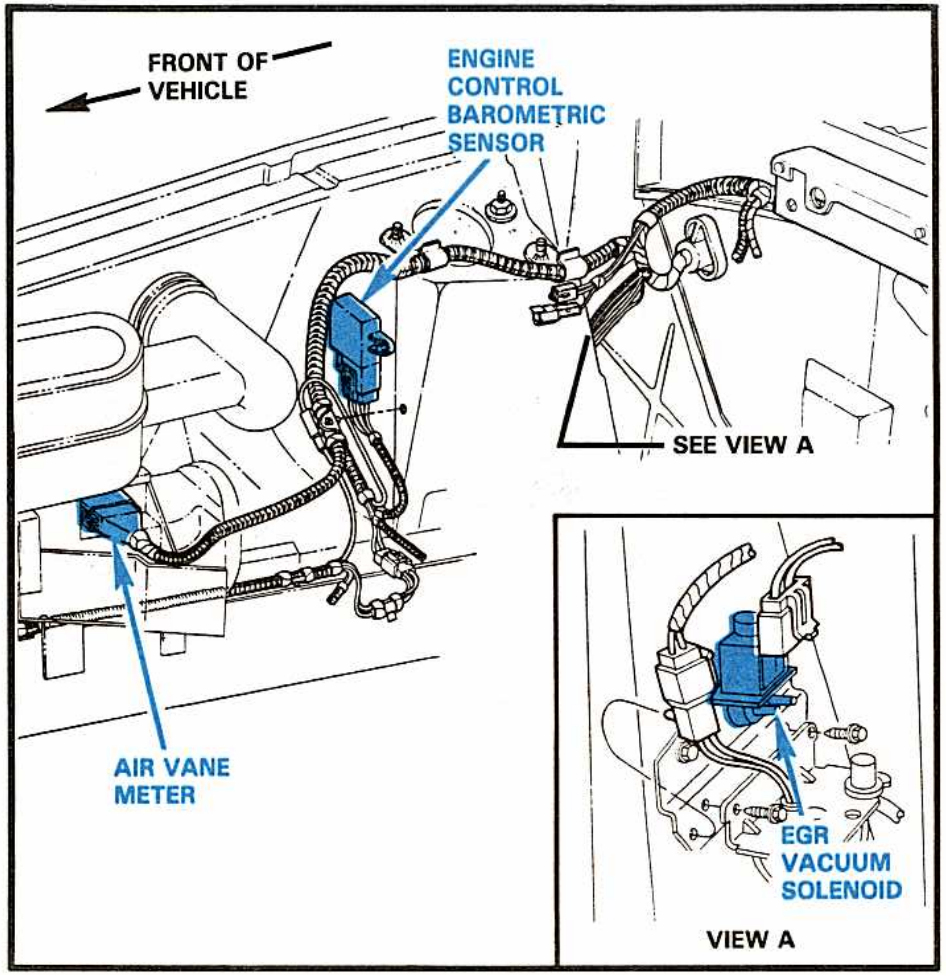


Figure 10—RH Fender Apron—2.3L EFI Turbo

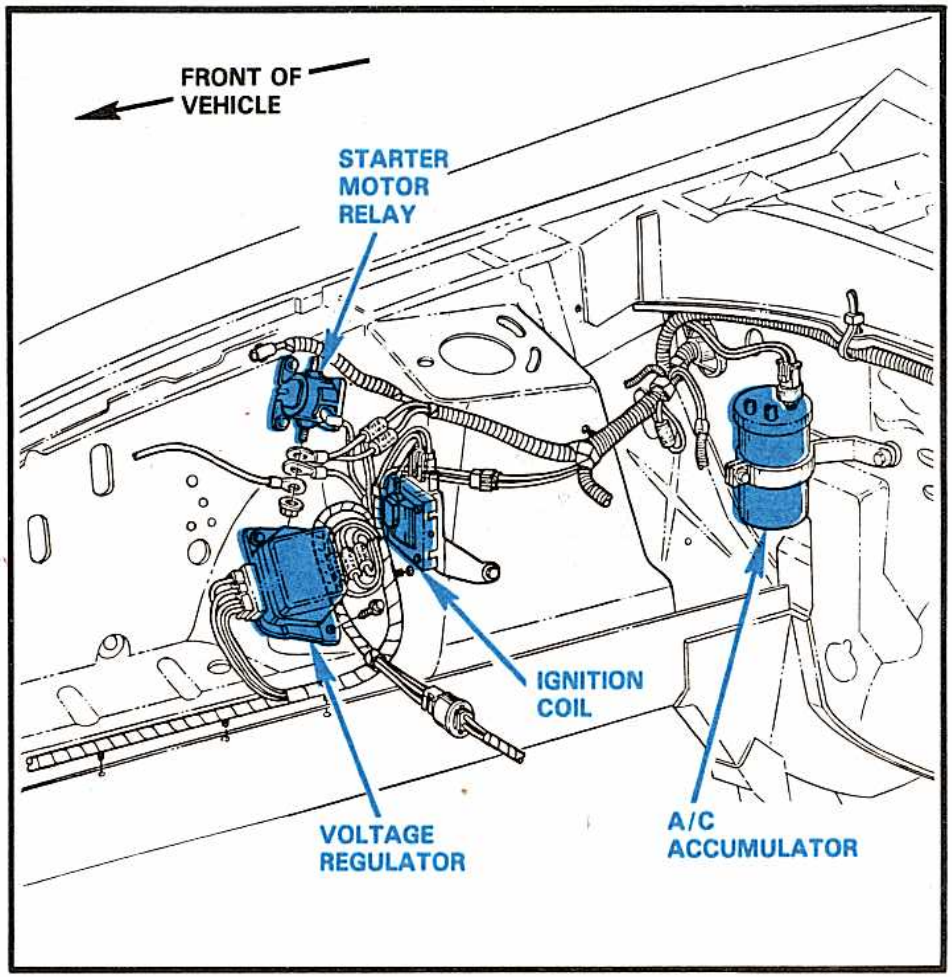
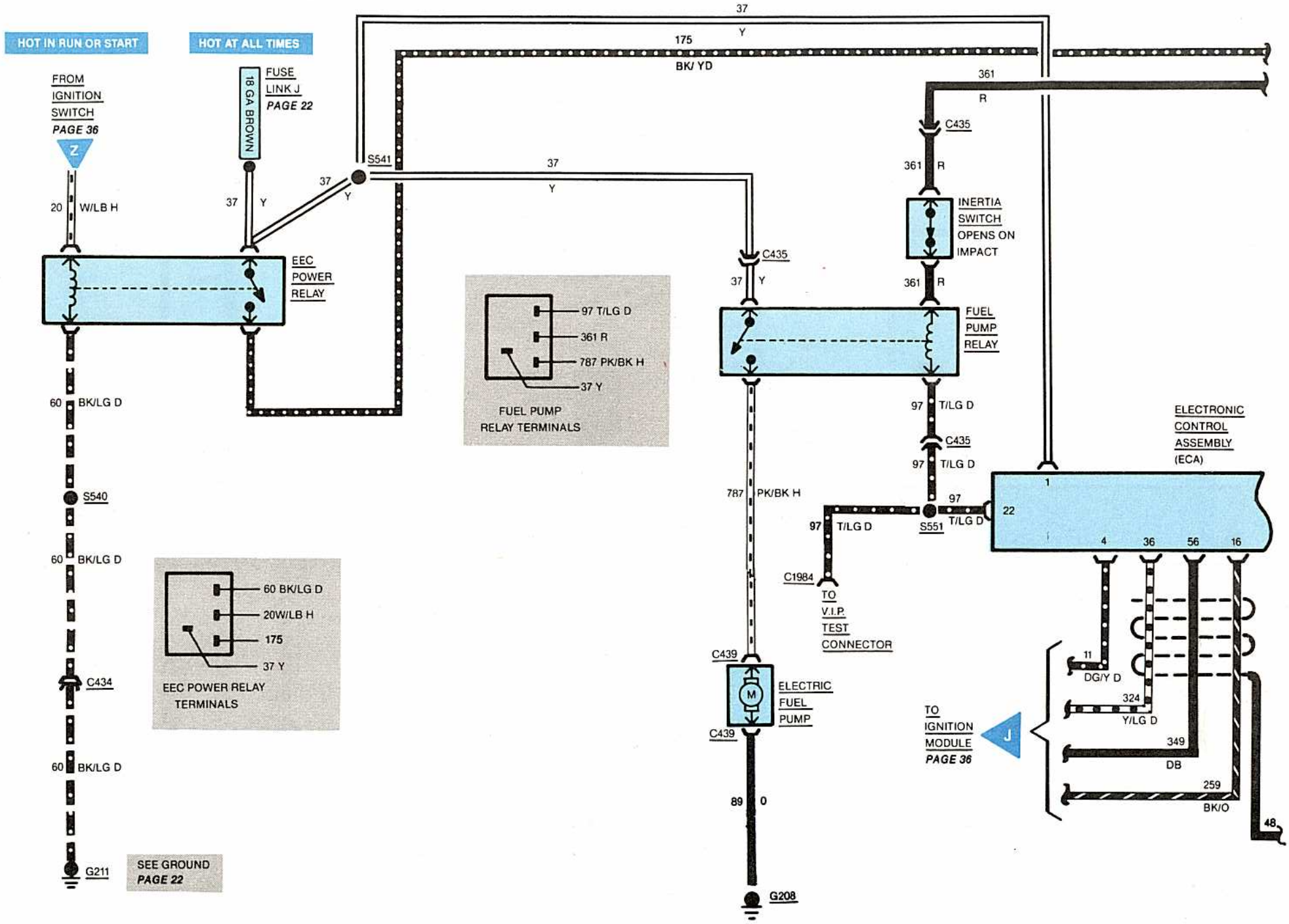
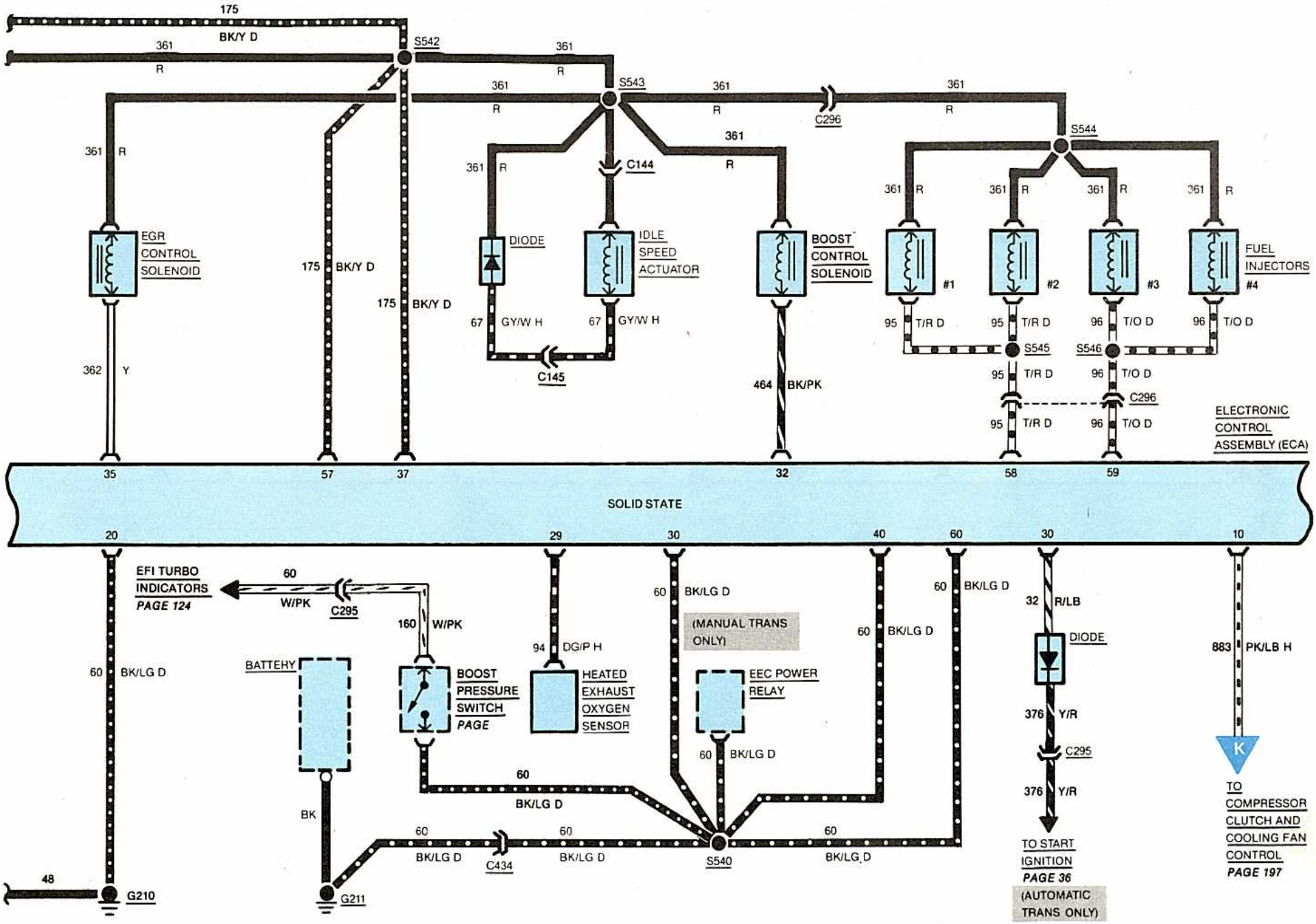
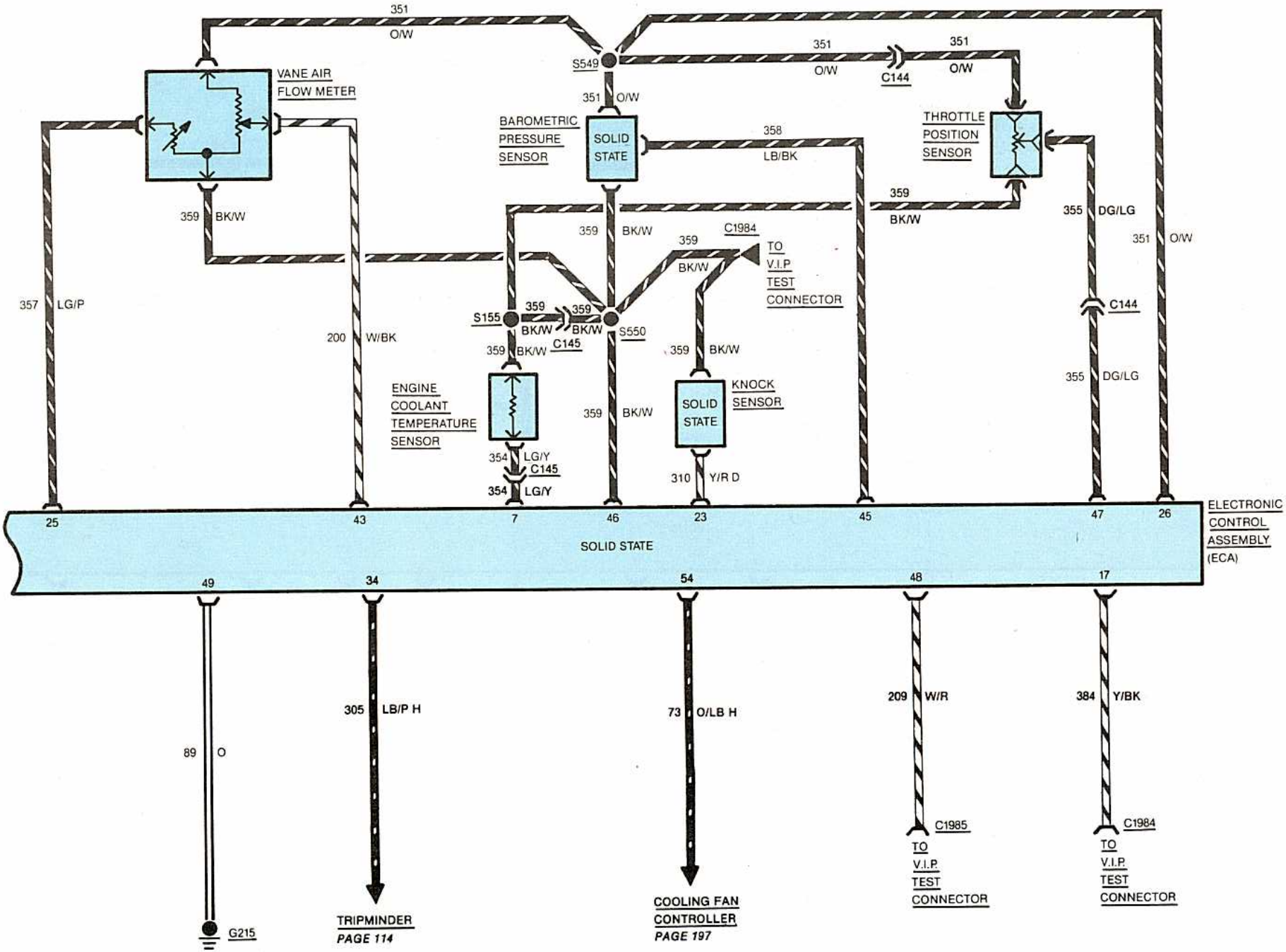


Figure 11—RH Fender Apron—3.8L CFI-EEC IV


HOT IN RUN OR START
HOT AT ALL TIMES
FROM IGNITION SWITCH PAGE 36
Z
FUSE LINK J PAGE 22
18 GA BROWN
37 Y
175 BK/ YD
361 R
20 W/LB H
S541
C435
INERTIA SWITCH OPENS ON IMPACT
EEC POWER RELAY
FUEL PUMP RELAY
97 T/LG D
361 R
787 PK/BK H
37 Y
FUEL PUMP RELAY TERMINALS
60 BK/LG D
S540
C434
G211
SEE GROUND PAGE 22
60 BK/LG D
20W/LB H
175
EEC POWER RELAY TERMINALS
787 PK/BK H
C439
ELECTRIC FUEL PUMP
M
89 0
G208
C1984
TO V.I.P. TEST CONNECTOR
S551
ELECTRONIC CONTROL ASSEMBLY (ECA)
1
22
4
36
56
16
11 DG/Y D
324 Y/LG D
349 DB
259 BK/O
48
TO IGNITION MODULE PAGE 36
J


175
BK/Y D
361
R
S542
S543
S544
C296
C144
C145
C295
C434
S540
S545
S546
G210
G211
EGR CONTROL SOLENOID
DIODE
IDLE SPEED ACTUATOR
BOOST CONTROL SOLENOID
FUEL INJECTORS
#1
#2
#3
#4
362 Y
67 GY/W H
464 BK/PK
95 T/R D
96 T/O D
35
57
37
32
58
59
ELECTRONIC CONTROL ASSEMBLY (ECA)
SOLID STATE
20
29
30
40
60
10
EFI TURBO INDICATORS
PAGE 124
W/PK
160 W/PK
BATTERY
BOOST PRESSURE SWITCH
PAGE
94 DG/P H
HEATED EXHAUST OXYGEN SENSOR
(MANUAL TRANS ONLY)
EEC POWER RELAY
BK/LG D
BK
48
32 R/LB
376 Y/R
883 PK/LB H
TO START IGNITION
PAGE 36
(AUTOMATIC TRANS ONLY)
TO COMPRESSOR CLUTCH AND COOLING FAN CONTROL
PAGE 197


351 O/W
VANE AIR FLOW METER
S549
351 O/W
C144
351 O/W
351 O/W
BAROMETRIC PRESSURE SENSOR
SOLID STATE
358 LB/BK
THROTTLE POSITION SENSOR
359 BK/W
359 BK/W
C1984
359 BK/W
TO V.I.P TEST CONNECTOR
359 BK/W
355 DG/LG
351 O/W
357 LG/P
S155
359 BK/W
359 BK/W
S550
200 W/BK
359 BK/W
C145
359 BK/W
C144
355 DG/LG
ENGINE COOLANT TEMPERATURE SENSOR
359 BK/W
SOLID STATE
KNOCK SENSOR
354 LG/Y
C145
354 LG/Y
310 Y/R D
25
43
7
46
23
45
47
26
ELECTRONIC CONTROL ASSEMBLY (ECA)
SOLID STATE
49
34
54
48
17
89 O
305 LB/P H
73 O/LB H
209 W/R
384 Y/BK
G215
TRIPMINDER
PAGE 114
COOLING FAN CONTROLLER
PAGE 197
C1985
TO V.I.P. TEST CONNECTOR
C1984
TO V.I.P. TEST CONNECTOR

HOW THE CIRCUIT WORKS

The Electronic Engine Control System (EEC) includes an **Electronic Control Assembly (ECA)** that receives inputs from various sensors. The **ECA** uses this information to control Fuel Flow. Exhaust Gas Recirculation (EGR). Thermactor Air (not 2.3L turbo engine), Exhaust Vent Control (not 2.3L turbo engine), and Ignition. These systems and the **ECA** work together to provide improved fuel economy and performance, and lower exhaust emissions.

FUEL FLOW

The 2.3L EFI Turbo engine uses **EEC IV** Electronic Fuel Injection (EFI). Fuel is injected directly into each cylinder through the **Fuel Injectors.** A carburetor is not used. Fuel pressure is built up by the **Electric Fuel Pump.** With the **Ignition Switch** in START or RUN, the **EEC Power Relay** applies voltage to the circuit.

The 5.0L and 3.8L engine uses **EEC IV Central Fuel Injection (CFI).** Fuel is injected directly into the engine through the fuel charging assembly (Fuel Injectors #1 and #2). Fuel pressure is built up by the Electric Fuel Pump. With the **Ignition Switch** in START or RUN, the **EEC Power Relay** applies voltage to the circuit.

When controlled by the **Electronic Control Assembly,** and with the **Inertia Switch** closed, the **Fuel Pump Relay** operates, applying power to the **Fuel Pump** through the **Inertia Switch.**

NOTE

If engine does not operate after collision, it is possible that ***Inertia Switch*** *has opened. Switch can be reset by putting finger through hole on RH side of trunk trim liner, and pushing down on plunger.*

COMPONENT LOCATION (3.8L and 5.0 Engine)

		Page-Figure	Color	Terminals
EEC Power Relay	Under RH side of I/P	70-18		
EGR Control Solenoid	On RH shock tower, rear face	66-10		
EGR Valve Position Sensor	At top of engine behind carburetor	62-3		
EGR Vent Solenoid	On RH shock tower, near face	66-10		
Electronic Control Assembly	Under RH side of I/P			
Engine Coolant Temperature Sensor	At top of engine on RH side of distributor	62-2		
Exhaust Gas Oxygen Sensor	At rear RH side of engine in manifold	62-3		
Exhaust Heat Control Solenoid	On LH shock tower, front face	66-10		
Sender In-Fuel Tank	Top of fuel tank on RH side	69-17		
Fuel Pump Relay	Above RH rear wheel well	68-15		
Fuel Injectors	At central fuel injection assembly	65-9	BK	4
Fuse Link L.M	At starter relay		BR	
Idle Speed Control Motor	Top of engine	62-2		
Inertia Switch	Attached to LH rear wheel well			
Manifold Absolute Pressure Sensor	On LH fender apron	66-10		
Manifold Charge Temperature Sensor	On top rear LH side of engine	62-2		
Electric Fuel Pump	Top of fuel tank on RH side	69-16,17		
Thermactor Air Bypass Solenoid	At cowl top, to right of center			
Themactor Air Diverter Solenoid	At cowl top, to right of center			
Throttle Kicker Solenoid (5.0L Engine Only)	On LH shock tower, front face			
Throttle Position Sensor	Attached to RH side of carburetor	62-2		
Connector C144	LH fender apron		GY	3
Connector C145	LH fender apron		GY	3
Connector C294	RH side of I/P		BR	6
Connector C297	LH front fender apron		GY	4
Connector C429 (5.0L Only)	RH fender apron		BK	2
Connector C430	RH rear of engine		BK	4
Connector C434	RH fender apron, near battery		BK	1

(Continued on next page)

Pressure and flow are produced by the fuel pump in fuel tank.

The **Idle Speed Actuator** on the 2.3L turbo engine controls air flow to increase idle speed on low temperature. It adjusts for load when the A/C and power steering operate.

On 3.8.L and 5.0L engines, the **Exhaust Heat Control Solenoid** controls the vacuum flow to the **Heat Control Valve** during early warmup on 50-state models. On Altitude Compensation models, this solenoid also takes over control of canister purge. It controls flow of vapors from the canister to the intake manifold during various engine operating modes.

Exhaust Gas Recirculation (EGR)

The **EGR Control Solenoid** on 2.3L turbo engine models sends vacuum to the ported EGR valve, which allows exhaust gases to recirculate. The solenoid operates at a time after the engine starts. With higher coolant temperature at start, the time delay is shorter. It turns off at high temperature, high load (boost) and high engine speed.

On 3.8L and 5.0L engine models, the **EGR Vent and Control Solenoids** control **EGR** valve movement. The **ECA** receives data from seven sensors. It also checks existing valve position through the **EGR Valve Position Sensor,** and calculates if the present **EGR** flow should be increased, maintained or decreased. The **ECA** then determines which **EGR** solenoids will be operated or not operated to control emissions.

Thermactor Air (3.8L and 5.0L Engines Only)

The efficiency of the catalytic converter is dependent upon the temperature and chemical make-up of the exhaust gases. To meet these requirements on air supply system called **Thermactor Air** is provided. Depending on engine conditions sensed by the **ECA,** themactor air is sent to one of three places.

With the **Thermactor Air Diverter Solenoid** in normal (operated) position, thermactor air flows to the catalytic converter. During engine warmup, the **Thermactor Air Diverter Solenoid** does not operate. Thermactor air is then diverted to the exhaust manifold.

When the **Thermactor Air Bypass Solenoid** is operated, thermactor air is dumped to the atmosphere rather than to the catalytic converter or exhaust manifold.

Ignition

The **EEC** system has a special **Distributor** and **Ignition Module.** The **EEC Distributor** has no vacuum advance mechanism. Instead, all ignition timing is controlled by the **ECA.**

The **ECA** receives engine timing information from the Distributor through the **TFI Ignition Module.** The **ECA** uses this information for spark timing and advance.

COMPONENT LOCATION (3.8L and 5.0 Engine)

(Continued from previous page)

		Page-Figure	Color	Terminals
Connector C435	Under RH side of I/P	40-4	GY	3
Connector C439	Top of fuel tank RH side (large flanged hole)		R	2
Connector C461	LH fender apron		GY	2
Connector C1984	LH fender apron		GY	6
Connector C1985	LH fender apron		GY	1
Ground G202	Lower RH front of engine			
Ground G203	RH fender apron, near battery			
Ground G208	RH floor pan			
Ground G210	RH cowl near electronic control assembly	39-1		
Ground G213	RH rear of engine			
Ground G214	LH rear of engine			
Ground G215	On engine near EGO sensor			
Splice S155	Center of engine			
Splice S294	RH side of I/P			
Splice S532	Lower RH front of engine			
Splice S533	RH fender apron			
Splice S534	RH rear of engine			
Splice S535	RH side of engine			
Splice S540	Under RH side of I/P			
Splice S541	Under RH side of I/P			
Splice S543	RH fender apron			
Splice S549	RH fender apron			
Splice S550	Under RH side of I/P			
Splice S551	Under RH side of I/P			

Sensing Devices

Various sensing devices are used to determine engine operating conditions. They provide the **ECA** with throttle, pressure, temperature, and exhaust gas information. The Throttle Position Sensor sends one of three signals to the **ECA** to indicate closed, partially open, or wide open throttle.

The **Engine Coolant Temperature Sensor** measures engine temperature.

The **Barometric Pressure Sensor** measures atmospheric pressures (changes with altitude).

The **Exhaust Gas Oxygen Sensor** provides a voltage to the **ECA** for regulating the air/fuel ratio by sensing the oxygen content of the exhaust gages. Oxygen shows a lean exhaust gas mixture, while no oxygen shows a rich mixture.

The **Vane Air Flow Meter** (on 2.3L turbo engine only) measures both the temperature and flow rate of inlet air. The **ECA** computer uses these signals to calculate mass air flow.

The **Knock Sensor** (on 2.3L turbo engine only) detects engine knock so that timing can be changed.

The **Manifold Charge Sensor** (on 3.8L and 5.0L engines only) detects temperature of air charge mixture in the **Air Cleaner Assembly.**

TROUBLESHOOTING HINTS

If **EEC** engine operates with 10° BTDC constant spark timing, and EGR system does not operate, there is a problem in either the calibration assembly or the **ECA** (LOS model).

The constant 10° advance is a fail-safe mode which permits the car to be driven in for service when the electronics are not operating correctly.

When this happens, it is necessary to go into the full electroics diagnosis routine.

Read the Shop Manual and special service bulletins for complete **EEC** test procedures using special Rotunda test equipment.

COMPONENT LOCATION (2.3L Turbo Engine Only)

		Page-Figure	Color	Terminals
Barometric Pressure Sensor	Inside RH fender apron			
Boost Control Solenoid				
Boost Control Switch				
ECA	RH cowl side at access hole			
EEC Power Relay	Upper RH cowl side	70-18		
EGR Control Solenoid	Rear of RH shock tower			
Engine Coolant Temperature Sensor	Front LH side of engine	67-12		
Exhaust Gas Oxygen Sensor	At exhaust manifold	67-12		
Fuel Injectors	Upper LH side of engine			
Fuel Pump Relay	Above RH rear wheel well	68-15		
Fuse Link J	At starter relay		BR	
Fuse Link N	Near connector C299		BL	
Idle Speed Actuator	Upper RH side of engine	67-12		
Inertia Switch	In trunk, aft of RH rear wheel. Reach through small hole in trim panel			
Knock Sensor	Lower LH side of engine	67-12		
Fuel Pump	Top of fuel tank RH side (big flanged hole)	69-16,17		
TFI Ignition Module	Connected to RH side of Distributor			
Throttle Position Sensor	At upper rear center of engine	67-12		
Vane Air Flow Meter	Inside front RH fender apron			
Connector C144	LH front fender apron		GY	3
Connector C145	LH front fender apron		GY	3
Connector C295	Behind LH front shock tower	41-6	GY	8
Connector C296	LH side of engine	67-12	GY	4
Connector C434	Near battery		BK	1
Connector C435	Lower RH cowl side, near ECA	40-4	GY	3
Connector C1984	Near starter relay on LH fender apron		GY	6
Connector C1985	Near starter relay on LH fender apron		GY	1
Ground G208	RH floor pan			
Ground G210	Lower LH front engine	38-1		
Ground G211	Inside LH fender behind battery			
Ground G215	Near EGO sensor			
Splice S155	Center of engine			
Splice S540	Near battery			

(Continued on next page)

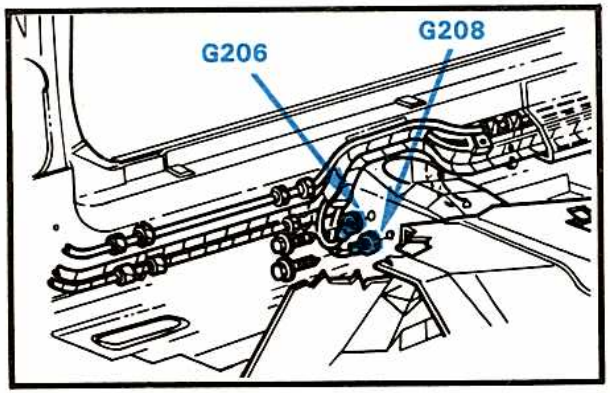


Figure 1 — RH Floor Pan Wiring

COMPONENT LOCATION (2.3L Turbo Engine Only)

(Continued from previous page)

		Page-Figure	Color	Terminals
Splice S541	Lower RH cowl			
Splice S542	RH cowl near EEC module			
Splice S543	LH side of engine			
Splice S544	LH side of engine			
Splice S545	Under hood near fuel injectors			
Splice S546	Under hood near fuel injectors			
Splice S549	Under hood at RH dash panel			
Splice S550	LH fender apron			
Splice S551	RH side of I/P			

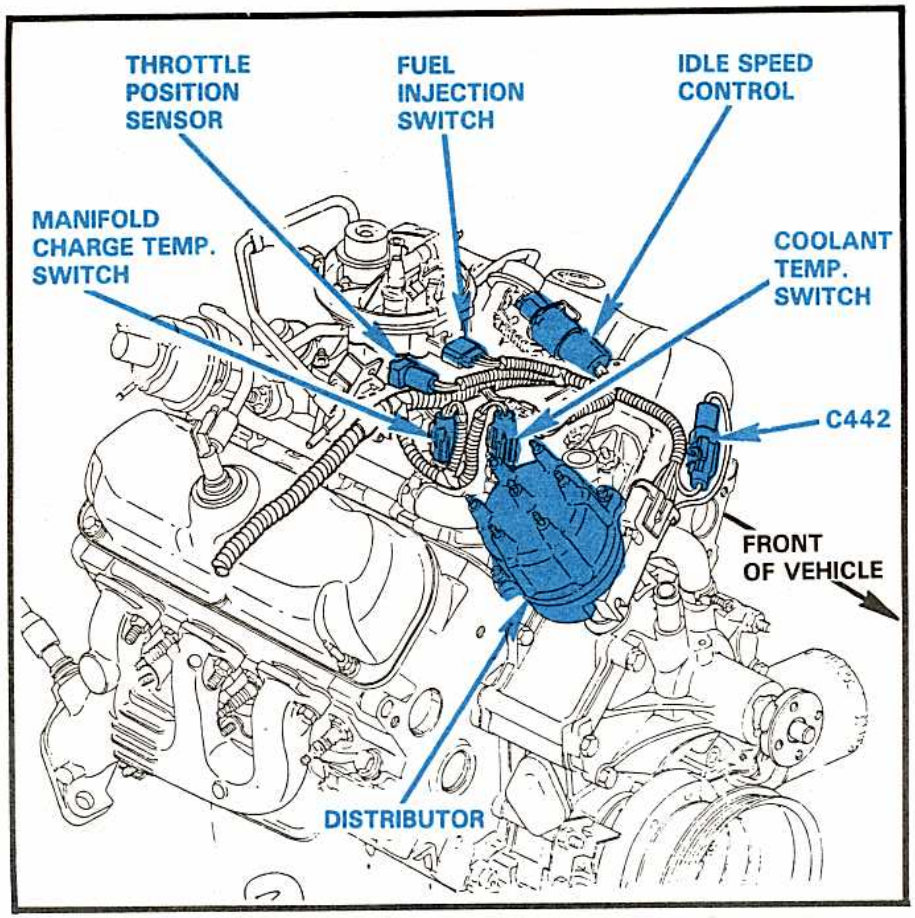


Figure 2 — 3.8L Engine RH Side Wiring

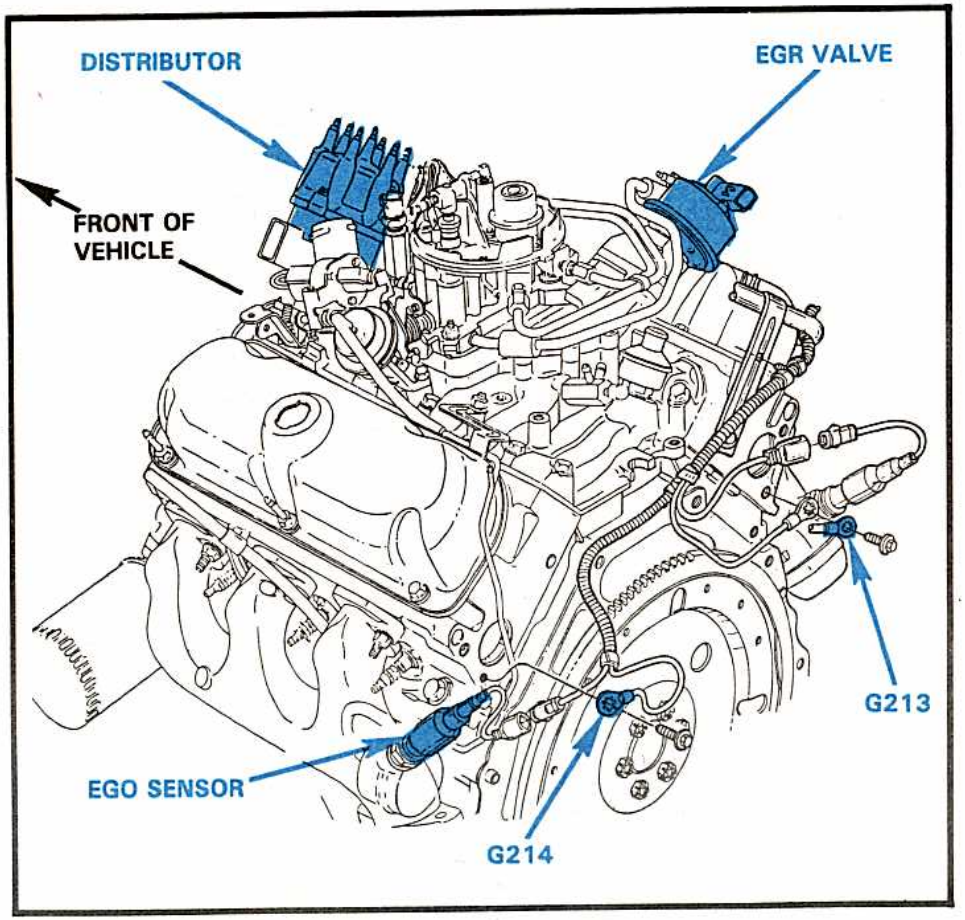


Figure 3 — 3.8L Engine LH Side Wiring

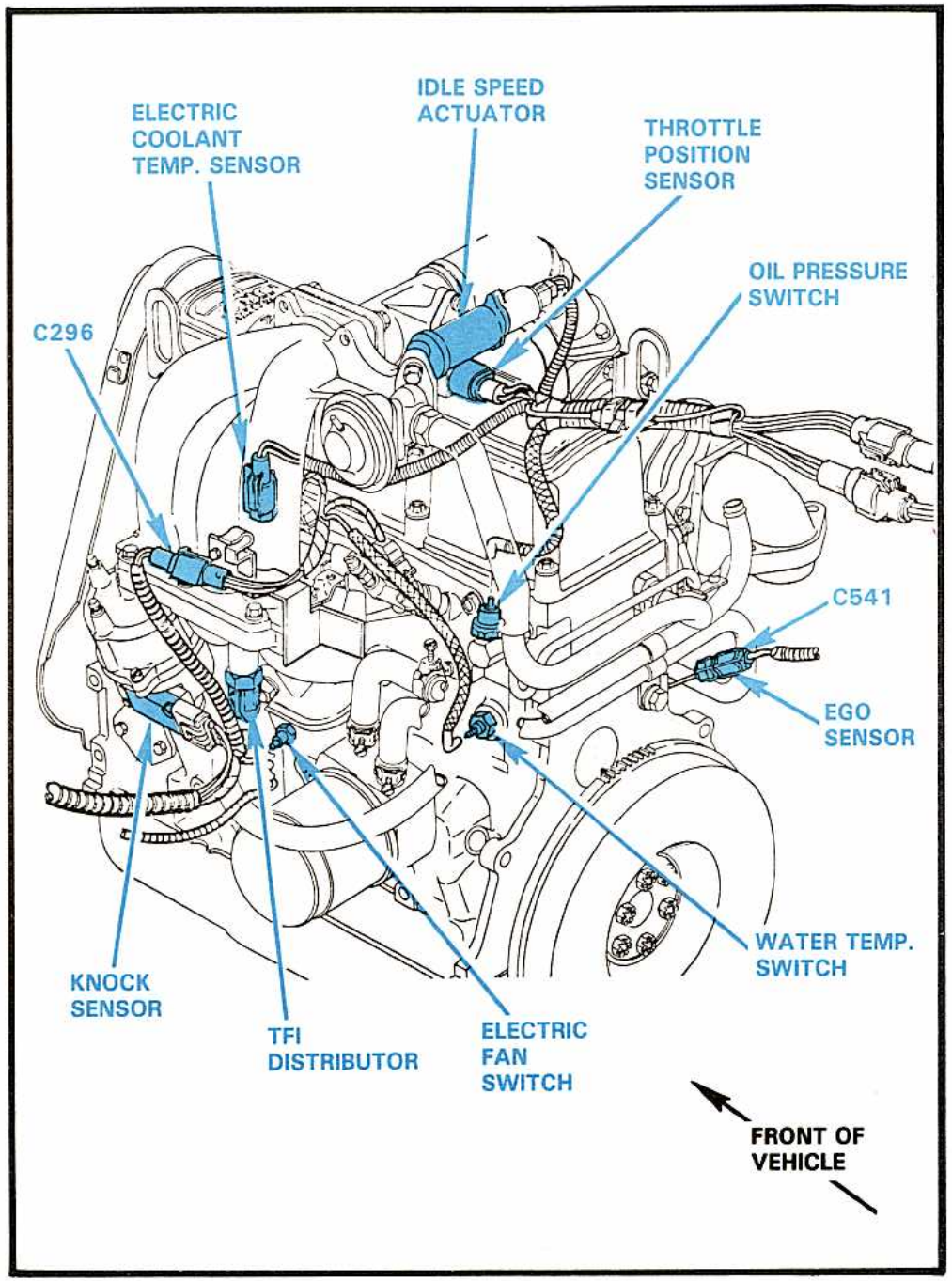


Figure 12—2.3L Turbo Engine Wiring

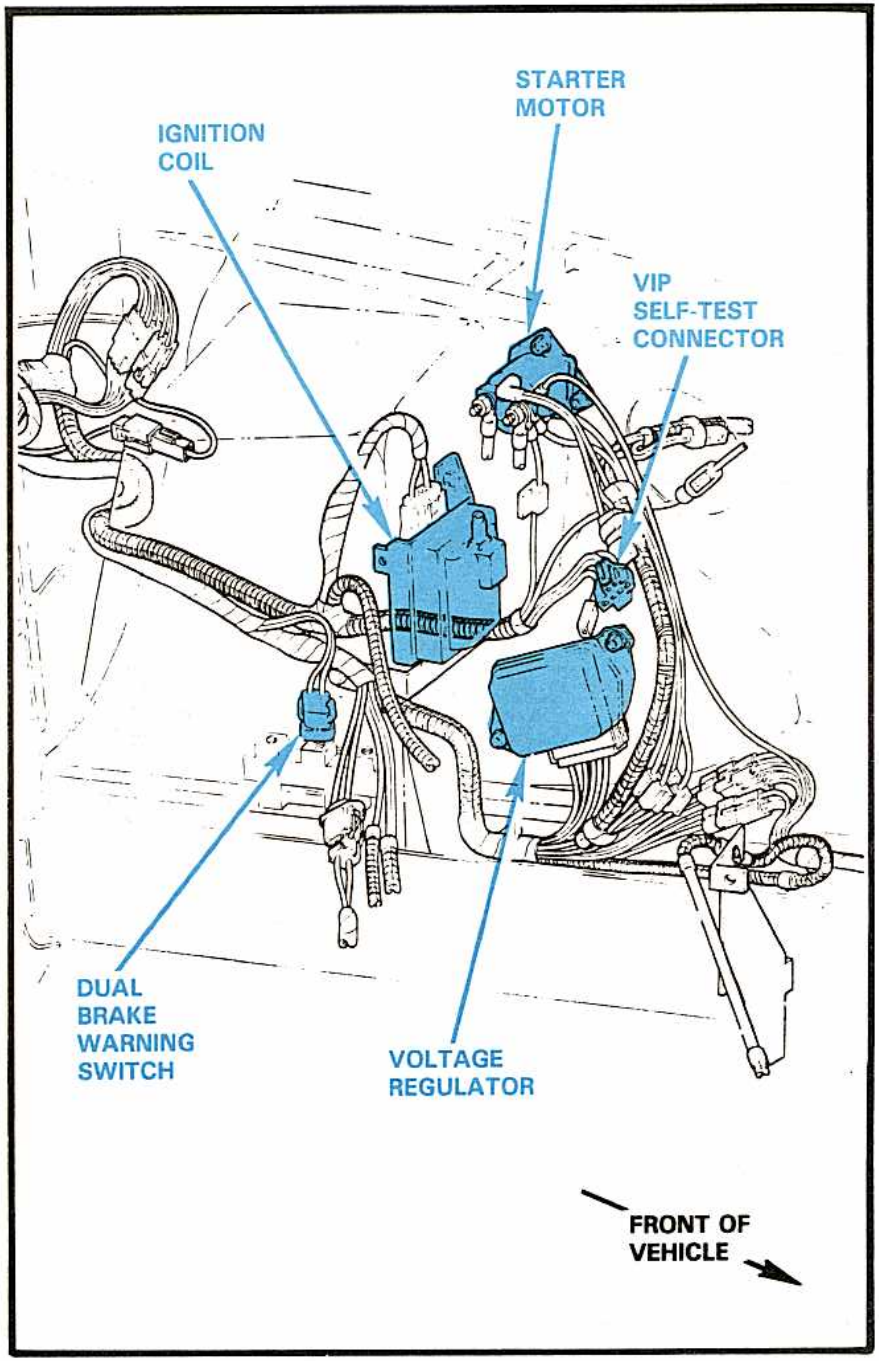


Figure 13—2.3L Turbo Engine Wiring

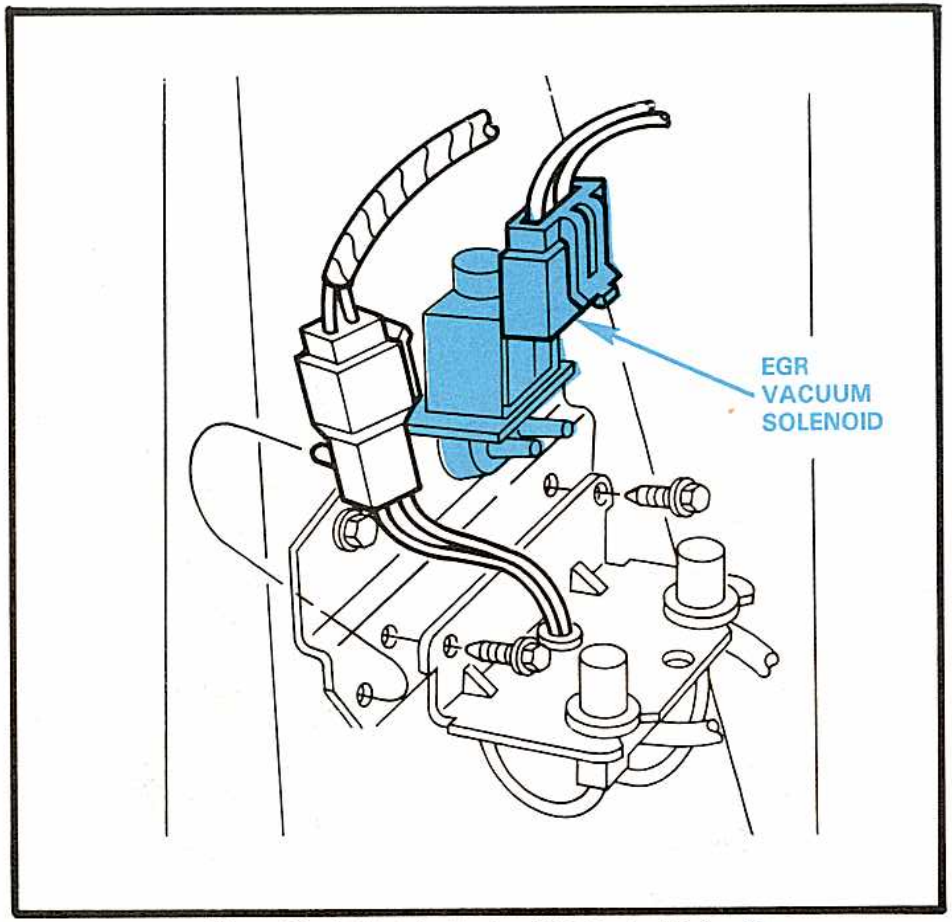


Figure 14—2.3L Turbo Engine EGR Control Solenoid

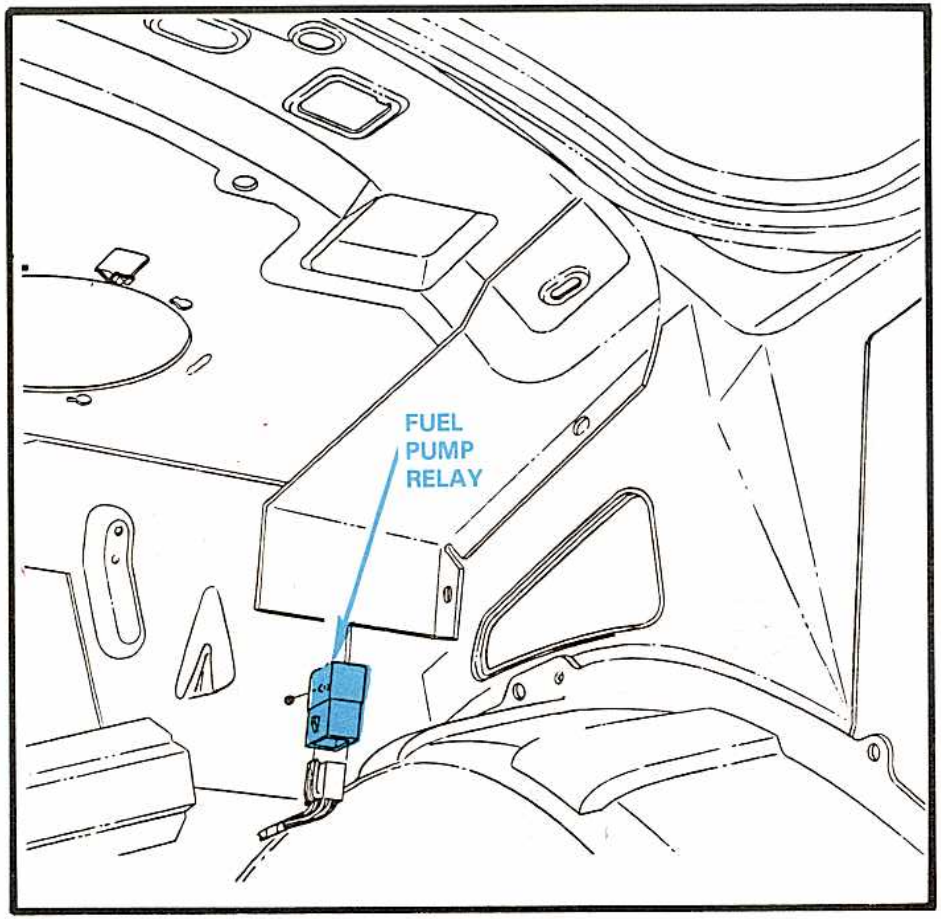


Figure 15—Fuel Pump Relay

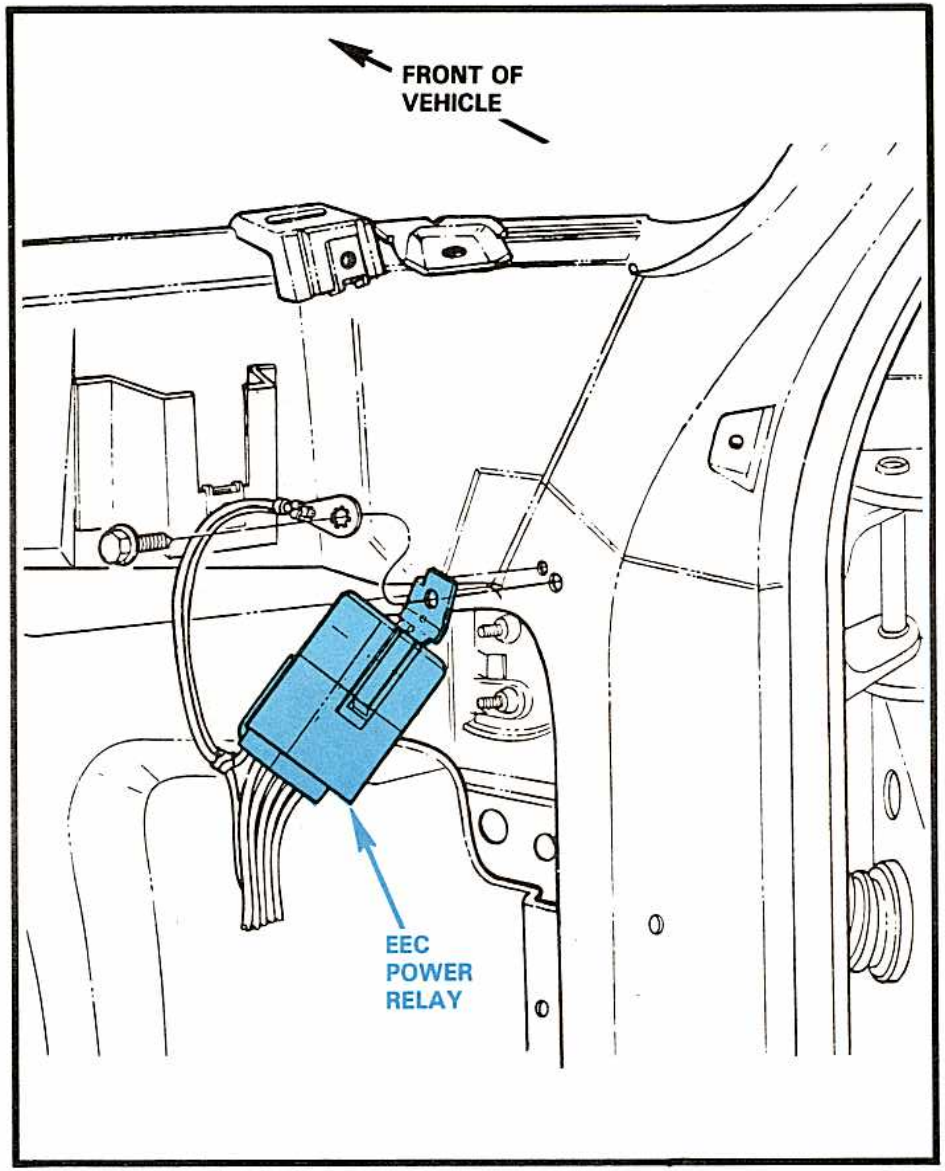


Figure 18—EEC Power Relay

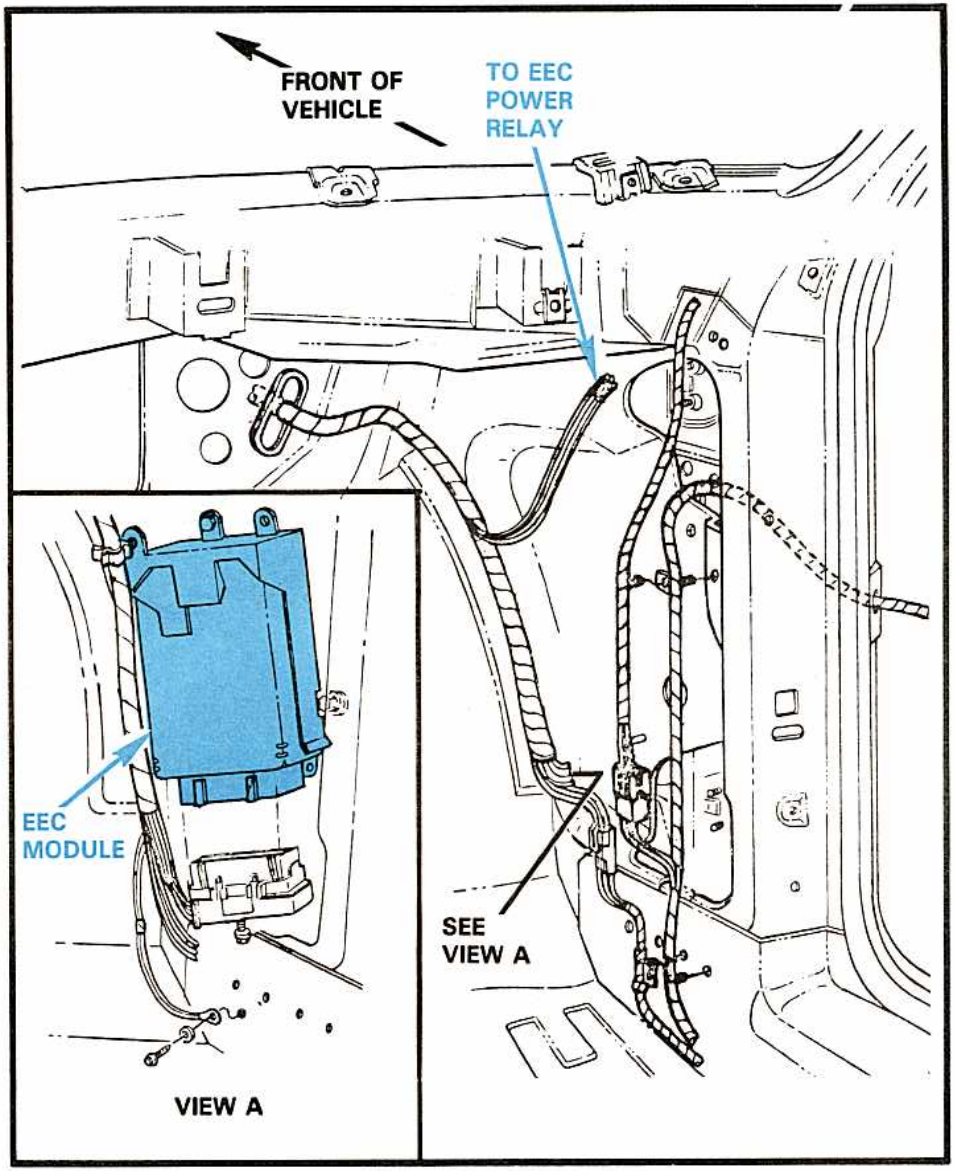
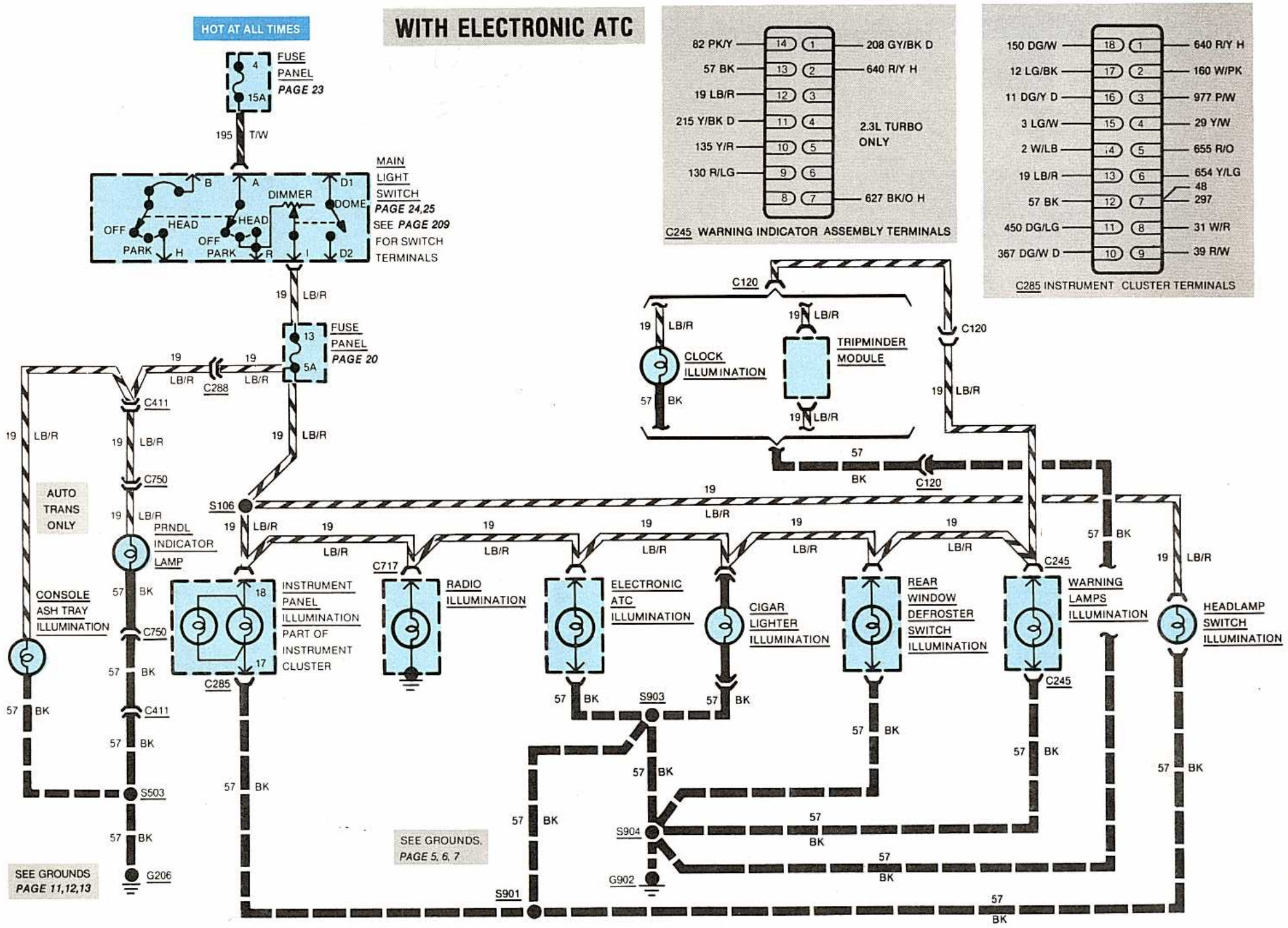
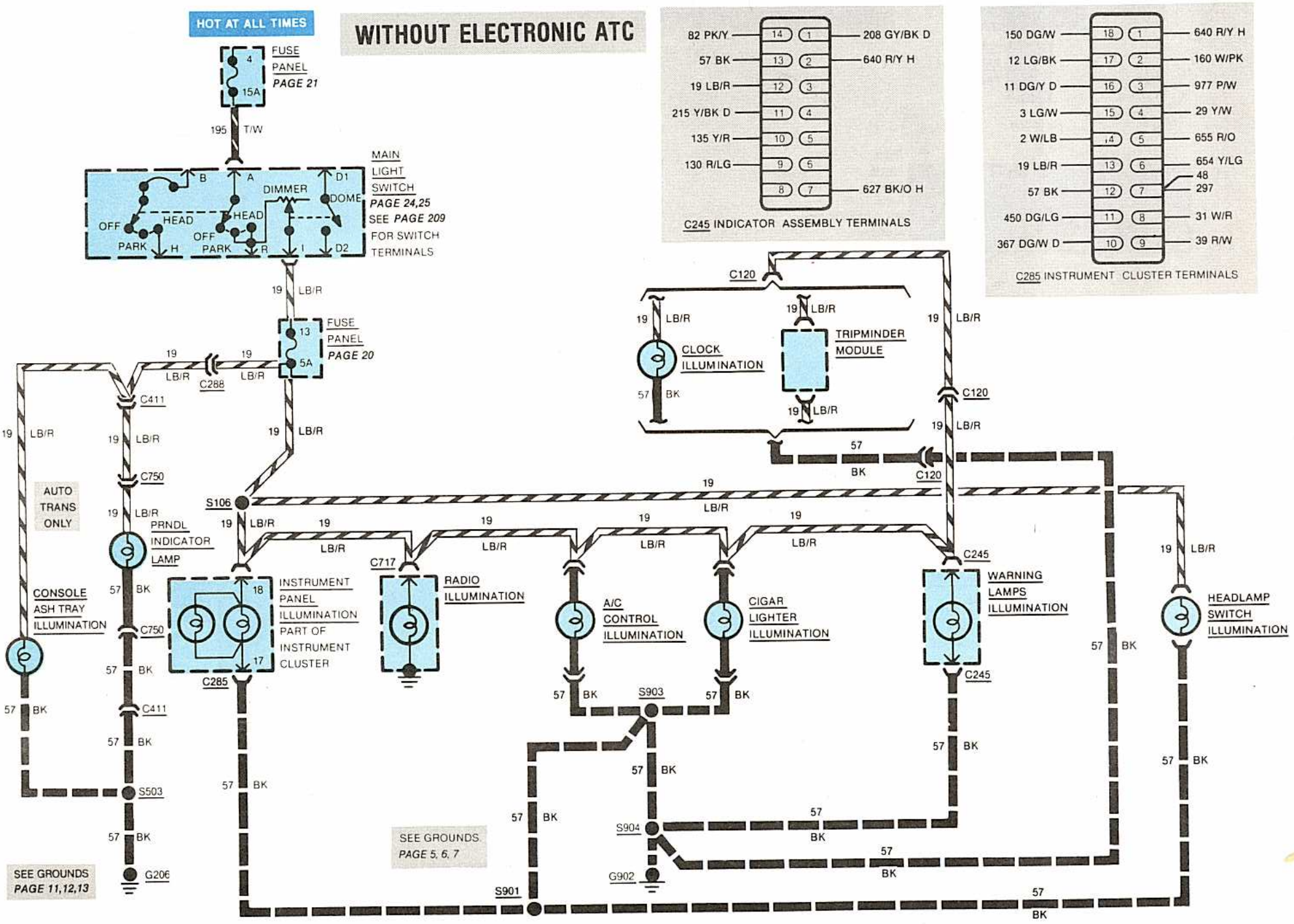


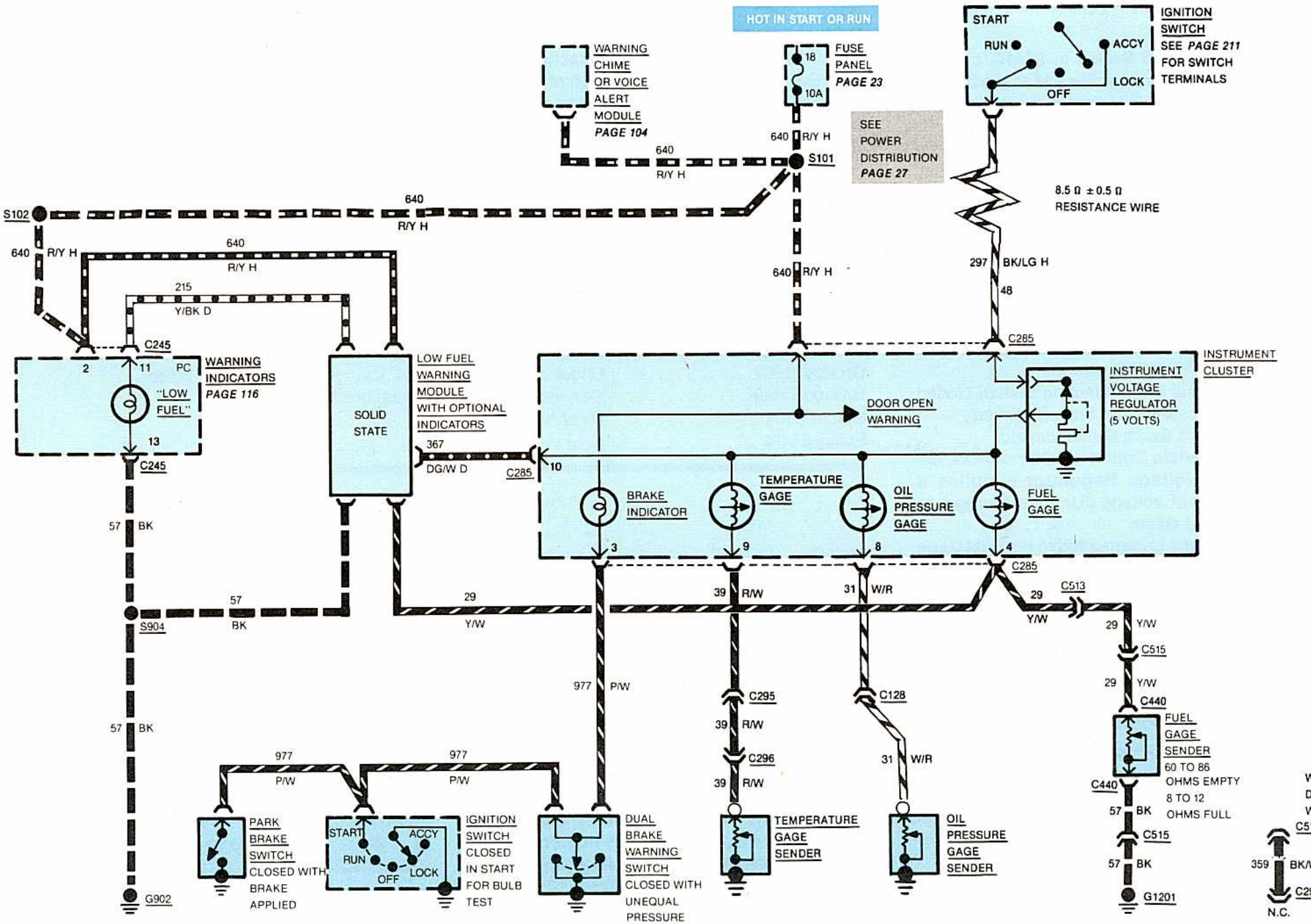
Figure 19—RH Cowl Side—2.3L EFI, 3.8 and 5.0L Standard Production

INSTRUMENT ILLUMINATION, TRANSMISSION INDICATOR LAMP (2.3L EFI TURBO ENGINES)

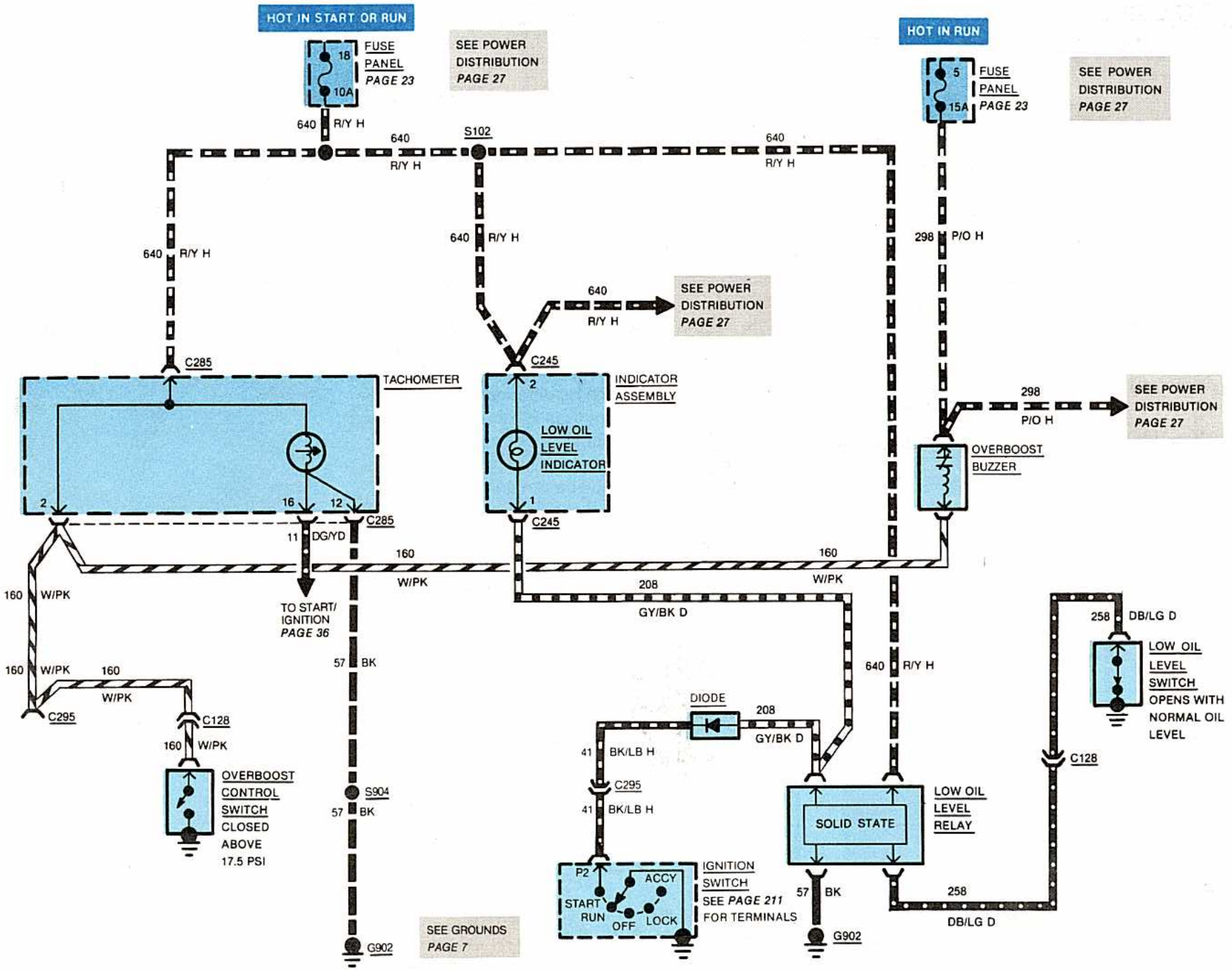


INSTRUMENT ILLUMINATION, TRANSMISSION INDICATOR LAMP (2.3L EFI TURBO ENGINES)




HOT IN START OR RUN
WARNING CHIME OR VOICE ALERT MODULE PAGE 104
FUSE PANEL PAGE 23
18
10A
IGNITION SWITCH SEE PAGE 211 FOR SWITCH TERMINALS
START
RUN
ACCY
LOCK
OFF
SEE POWER DISTRIBUTION PAGE 27
640 R/Y H
S101
S102
8.5 Ω ± 0.5 Ω RESISTANCE WIRE
297 BK/LG H
48
C285
215 Y/BK D
C245
WARNING INDICATORS PAGE 116
"LOW FUEL"
LOW FUEL WARNING MODULE WITH OPTIONAL INDICATORS
SOLID STATE
367 DG/W D
INSTRUMENT CLUSTER
DOOR OPEN WARNING
INSTRUMENT VOLTAGE REGULATOR (5 VOLTS)
BRAKE INDICATOR
TEMPERATURE GAGE
OIL PRESSURE GAGE
FUEL GAGE
57 BK
S904
G902
29 Y/W
39 R/W
31 W/R
C513
C515
C440
FUEL GAGE SENDER
60 TO 86 OHMS EMPTY
8 TO 12 OHMS FULL
G1201
977 P/W
C295
C296
C128
PARK BRAKE SWITCH CLOSED WITH BRAKE APPLIED
IGNITION SWITCH CLOSED IN START FOR BULB TEST
DUAL BRAKE WARNING SWITCH CLOSED WITH UNEQUAL PRESSURE WHEN BRAKE IS APPLIED
TEMPERATURE GAGE SENDER
OIL PRESSURE GAGE SENDER
WITH DIAGNOS
WARNING
359 BK/W
C292
N.C.

EFI TURBO INDICATORS (2.3L TURBO ENGINE ONLY)



HOW THE CIRCUIT WORKS

The **Turbo Boost System** is powered by engine exhaust gases. The gases rotate the turbine, which rotates the compressor. The compressor increases pressure in the engine intake manifold. As engine speed increases, the turbine and compressor rotate faster and the intake manifold pressure increases.

The intake manifold pressure is indicated on the turbo gage located on bottom of tachometer dial. When the manifold pressure reaches 18 psi, the engine is overboosted and will close turbo overboost switch turning on overboost buzzer.

COMPONENT LOCATION

		Page-Figure	Color	Terminals
Diode 3, 4	Near turbo pressure switch, in harness			
Ignition Switch	Lower R side of steering column	90-3		
Overboost Buzzer	LH side of I/P, near light switch	125-1		
Tachometer	RH center of I/P			
Turbo Pressure Switch	Rear face of RH shock tower			
Connector C128	Near instrument cluster		GY	6
Connector C245	Near center of I/P	122-9	GY	14
Connector C285	Attached to instrument cluster	122-9	GY	18
Connector C292	Near instrument cluster	100-1	GR	8
Connector C295	Near instrument cluster	122-9	GY	8
Connector C296	Near instrument cluster	67-12	GY	4
Connector C440	Near instrument cluster		BK	3
Connector C513	Near instrument cluster	100-1	GY	8
Connector C515	Near instrument cluster		GY	2
Ground G902	Under center of I/P	73-2		
Ground G1201	Near instrument cluster			
Splice S101	Near fuse panel			
Splice S102	Near center of I/P			
Splice S904	Near center of I/P			

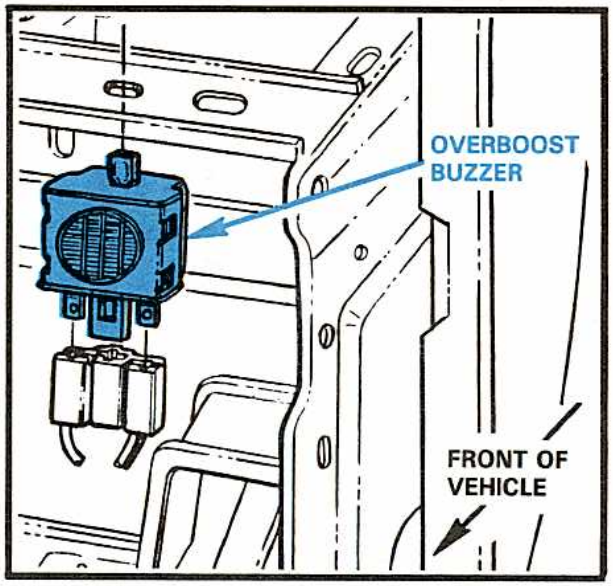
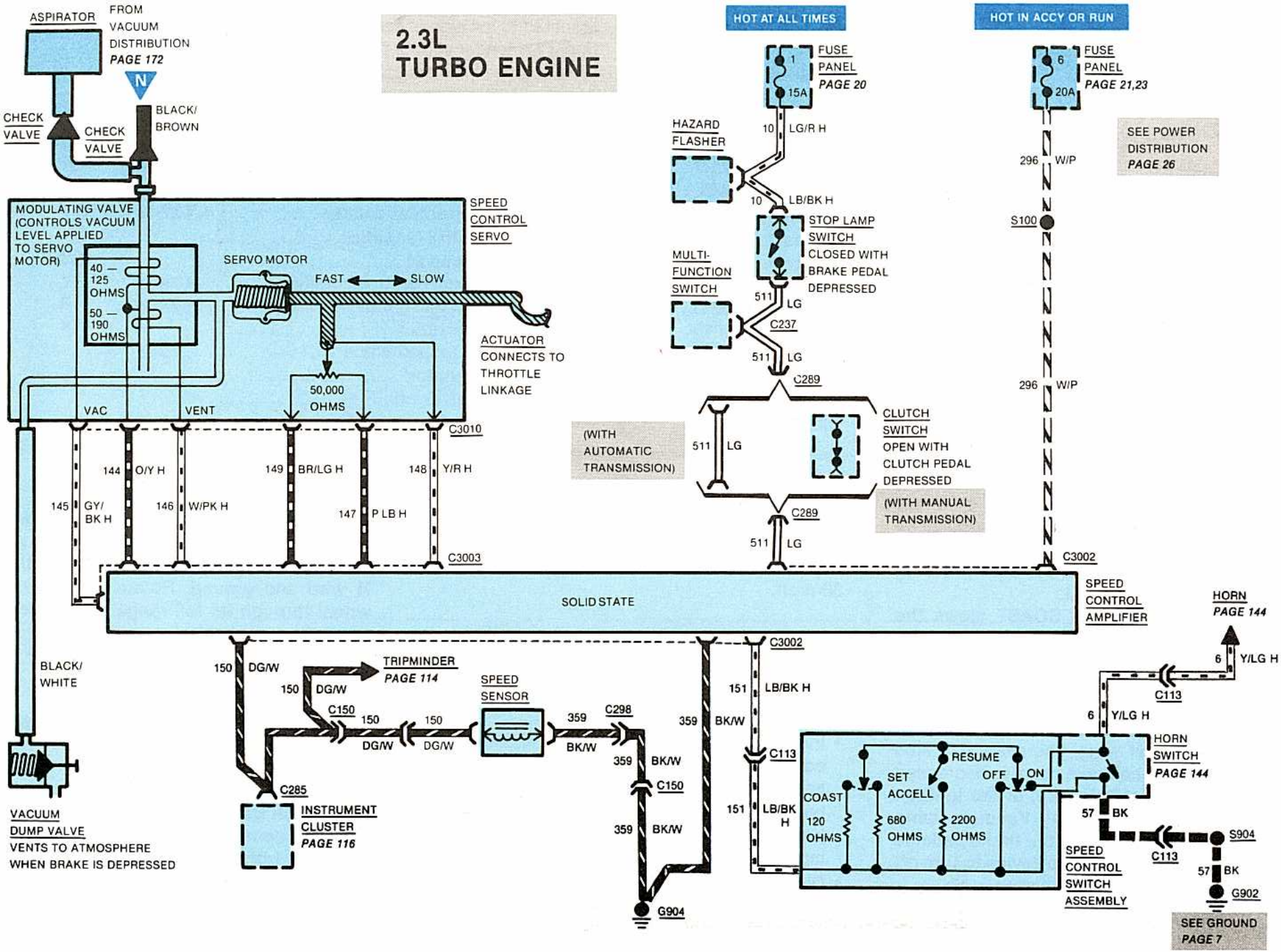


Figure 1 — 2.3L Turbo Engine Overboost Buzzer


2.3L
TURBO ENGINE
ASPIRATOR
FROM VACUUM DISTRIBUTION
PAGE 172
N
CHECK VALVE
CHECK VALVE
BLACK/ BROWN
MODULATING VALVE (CONTROLS VACUUM LEVEL APPLIED TO SERVO MOTOR)
40 — 125 OHMS
50 — 190 OHMS
SERVO MOTOR
FAST
SLOW
SPEED CONTROL SERVO
ACTUATOR CONNECTS TO THROTTLE LINKAGE
50,000 OHMS
VAC
VENT
C3010
144 O/Y H
145 GY/ BK H
146 W/PK H
149 BR/LG H
147 P LB H
148 Y/R H
C3003
HOT AT ALL TIMES
FUSE PANEL
PAGE 20
1
15A
HAZARD FLASHER
10 LG/R H
10 LB/BK H
STOP LAMP SWITCH CLOSED WITH BRAKE PEDAL DEPRESSED
MULTI-FUNCTION SWITCH
511 LG
C237
511 LG
C289
(WITH AUTOMATIC TRANSMISSION)
511 LG
CLUTCH SWITCH OPEN WITH CLUTCH PEDAL DEPRESSED
(WITH MANUAL TRANSMISSION)
C289
511 LG
HOT IN ACCY OR RUN
FUSE PANEL
PAGE 21,23
6
20A
SEE POWER DISTRIBUTION
PAGE 26
296 W/P
S100
296 W/P
C3002
SOLID STATE
SPEED CONTROL AMPLIFIER
HORN
PAGE 144
6 Y/LG H
C113
6 Y/LG H
HORN SWITCH
PAGE 144
BLACK/ WHITE
VACUUM DUMP VALVE
VENTS TO ATMOSPHERE WHEN BRAKE IS DEPRESSED
150 DG/W
TRIPMINDER
PAGE 114
150 DG/W
C150
150 DG/W
150 DG/W
SPEED SENSOR
359 BK/W
C298
359 BK/W
359 BK/W
C150
359 BK/W
G904
C285
INSTRUMENT CLUSTER
PAGE 116
C3002
151 LB/BK H
359 BK/W
C113
151 LB/BK H
COAST
120 OHMS
SET ACCELL
680 OHMS
RESUME
2200 OHMS
OFF
ON
SPEED CONTROL SWITCH ASSEMBLY
57 BK
C113
S904
57 BK
G902
SEE GROUND
PAGE 7

HOW THE CIRCUIT WORKS

The **Speed Control Amplifier** controls vacuum to the **Speed Control Servo** motor through the modulating valve. The servo motor moves the throttle through the **Actuator cable.**

To operate the **Speed Control System,** the engine must be running and the car speed faster than 30 mph. The system is turned on by pressing the ON switch of the **Speed Control Switch Assembly.**

Pressing and releasing SET/ACCEL sends a command to hold the present speed. This speed is now the *set speed.* The **Speed Sensor** (on the speedometer cable) sends signals to the **Speed Control Amplifier.** These signals tell the amplifier to increase or decrease the vacuum at the servo motor to keep the car at the *set speed.*

Pressing and holding SET/ACCEL speeds the car up. The car speed increases as long as SET/ACCEL is depressed. Releasing SET/ACCEL gives the system a new *set speed* to maintain. Car speed may also be increased by depressing the accelerator until the higher speed is reached, then pressing and releasing SET/ACCEL.

Pressing and holding COAST slows the car down. The car speed decreases as long as COAST is depressed. Releasing COAST gives the system a new *set speed* to maintain.

Pressing OFF turns the system off (grounds **LB/BK H** wire). The system is also turned off when the brake pedal is depressed (power through **LG/R H** wire) or the **Ignition Switch** is turned OFF. The **Vacuum Dump Valve** also operates when the brake pedal is depressed. This is a backup device to turn off the system.

When the system has been deactivated by depressing the brake or clutch pedal, the last *set speed* may be resumed by pressing RESUME. This feature will not work if OFF has been depressed or if car speed is below 30 mph.

COMPONENT LOCATION

		Page-Figure	Color	Terminals
Speed Control Amplifier	Mounted to LH side of center I/P support	177-1		
Speed Control Servo	Under LH fender at door pillar	179-5		
Speed Sensor	LH rear side of transmission			
Vacuum Dump Valve	At top of brake pedal support			
Connector C113	Behind steering column		GY	3
Connector C150	RH side of I/P support		BR	6
Connector C237	Near speed control amplifier	90-3	BK	7
Connector C246	RH side of I/P support		GY	18
Connector C285	Attached to instrument cluster	122-9	GY	18
Connector C289	Near speed control amplifier		GY	2
Connector C298	RH side of I/P support		GY	2
Connector C3002	Connector to speed control amplifier	178-2	GY	6
Connector C3003	Connected to speed control amplifier	178-2	GR	8
Connector C3010	Rear of LH fender apron		GY	6
Ground G902	At center of I/P support brace	73-2		
Ground G904	RH side of I/P support			
Splice S100	Near speed control amplifier			
Splice S904	At center of I/P			

TROUBLESHOOTING HINTS

SYSTEM DOES NOT OPERATE

- Inspect system for broken wires or damaged hoses. Be sure **Speed Control Servo** and throttle linkage operate freely without binding. The **Actuator** cable must be adjusted as tightly as possible without opening the throttle plates.
- Disconnect **C3002** at **Speed Control Amplifier.** Check for battery voltage on **W/P** wire. Check for ground on **BK** wire.
- Check for battery voltage at **LB/BK H** wire when ON is pressed.
- Connect an ohmmeter between the **LB/BK H** wire and ground. Rotate the steering wheel through its full range, and perform the following checks:
  Depress OFF; read 0 to 1 ohm.
  Depress SET/ACCEL; read 646 to 714 ohms.
  Depress COAST; read 114 to 126 ohms.
  Depress RESUME; read 2090 to 2310 ohms.
- Check operation of **Vacuum Dump Valve** and **Clutch Switch.**
- Check steering wheel brushes for continuity of 1 ohm or less.
- Read "Speed Control Circuit Diagnosis" in the Shop Manual. Refer to Video Course No. 3701-007.

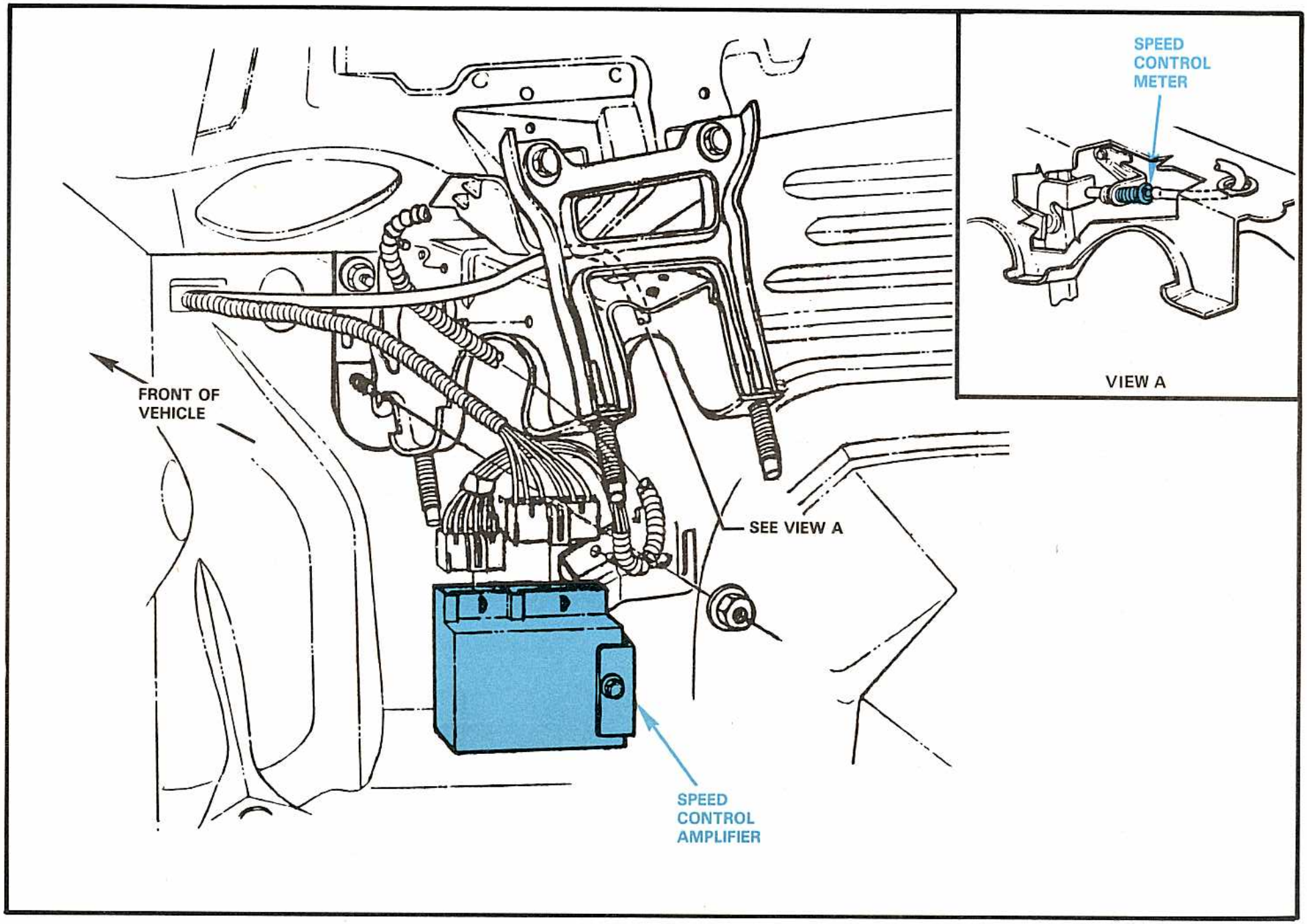


Figure 1 — Speed Control Underhood Wiring

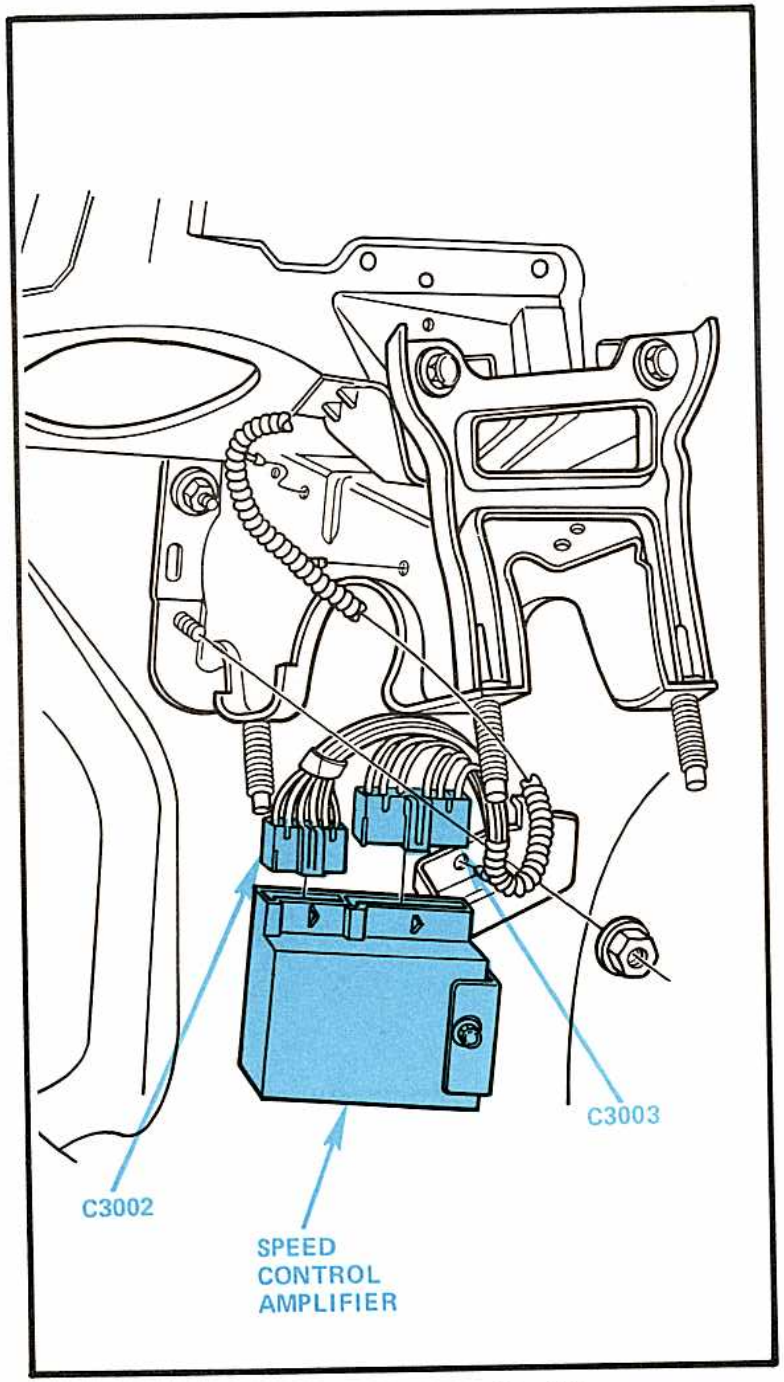


Figure 2 — Speed Control Amplifier

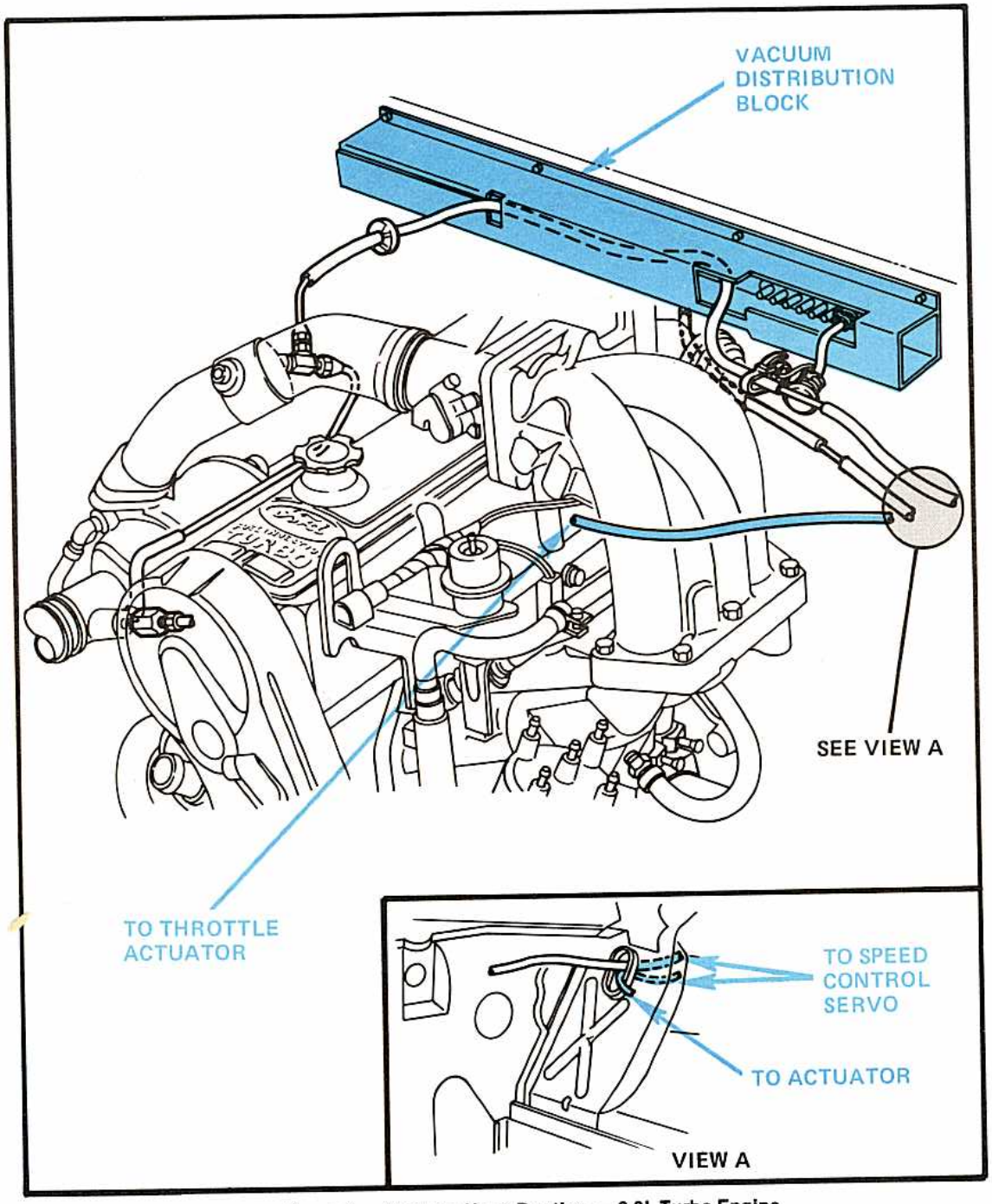


Figure 3 — Vacuum Hose Routing — 2.3L Turbo Engine

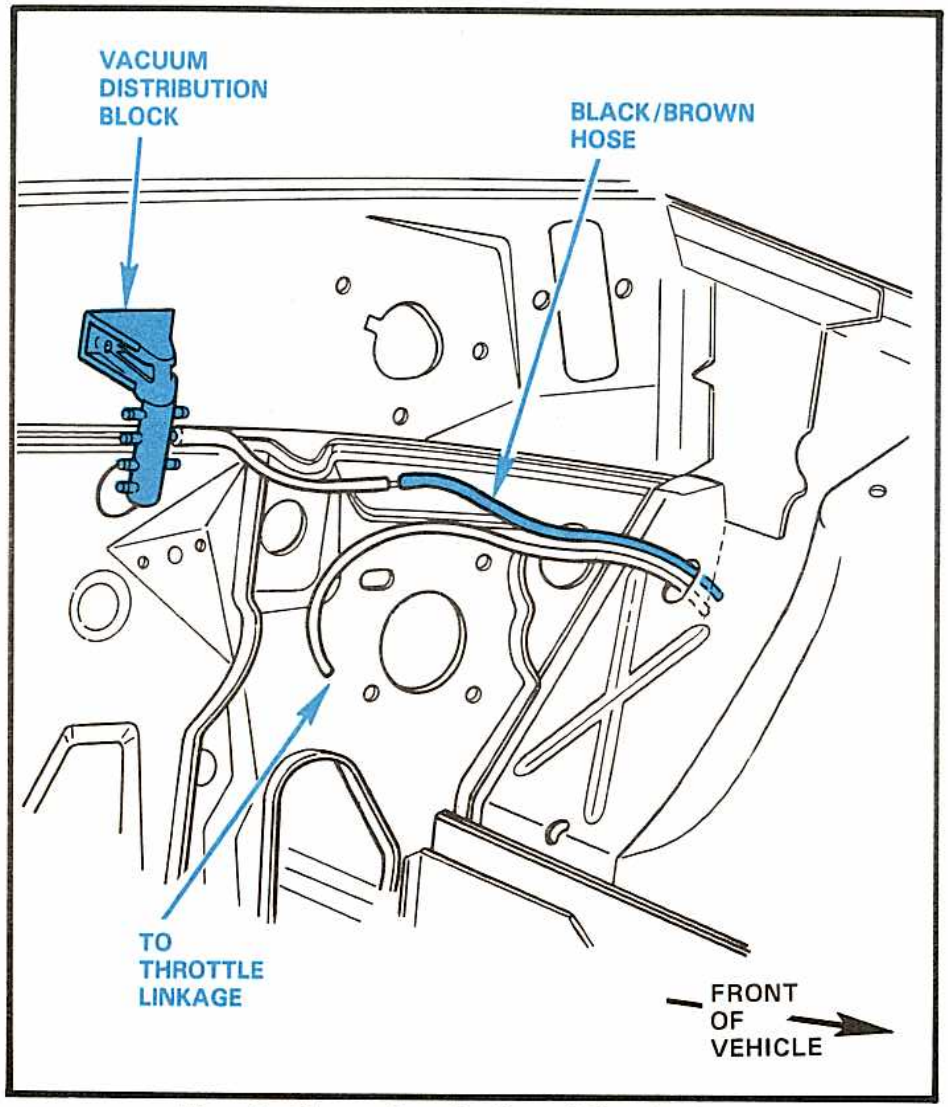


Figure 4 — Vacuum Hose Routing — 3.8L and 5.0L Engines

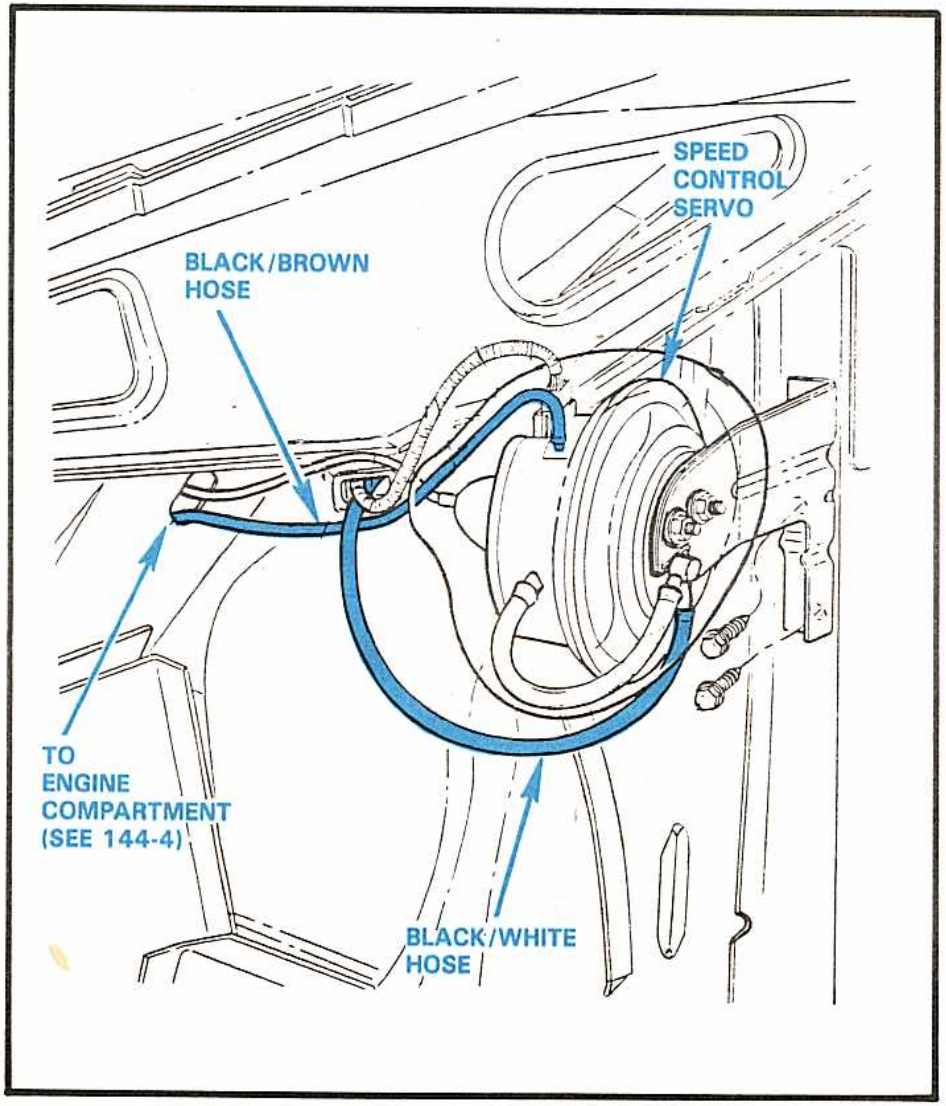
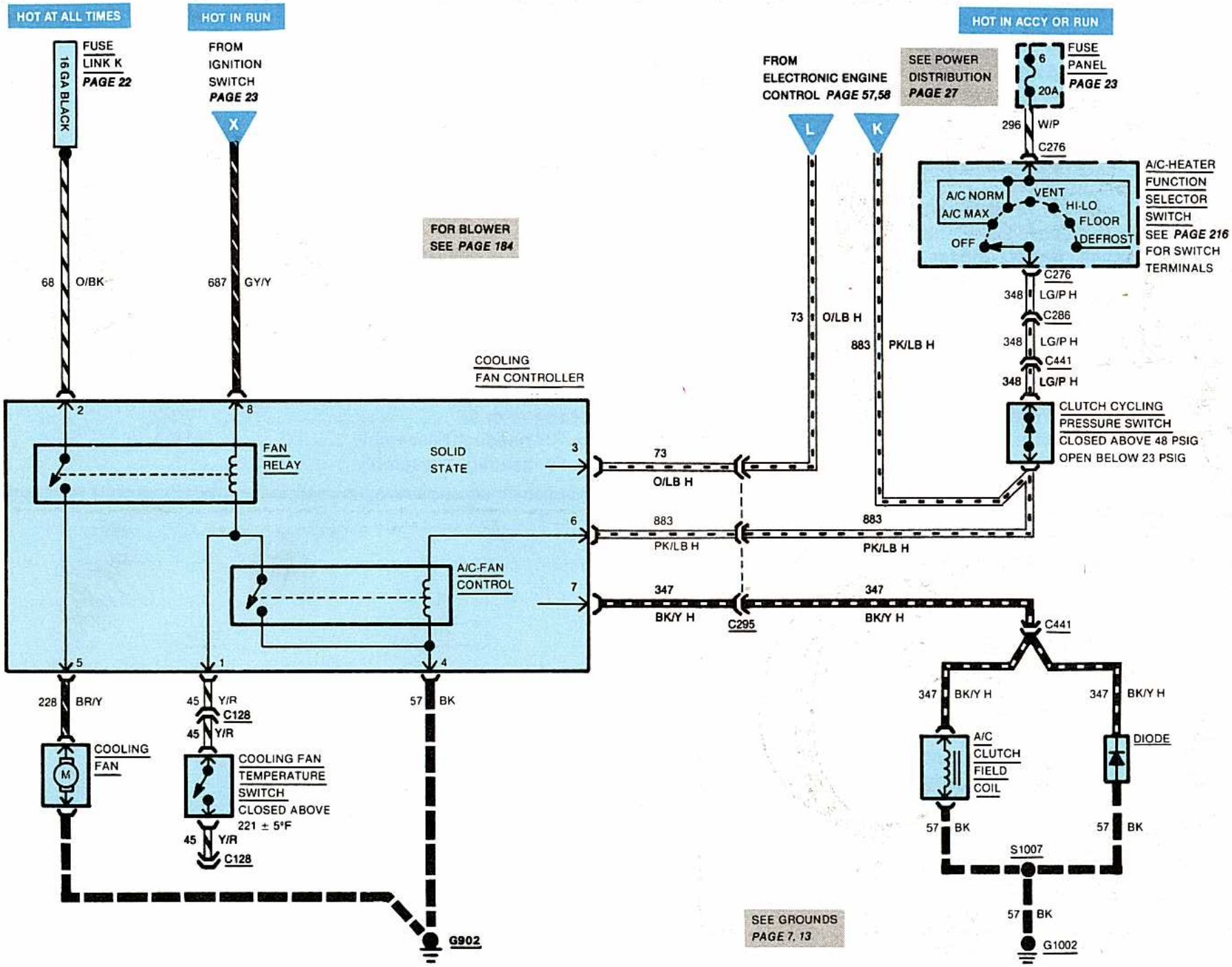


Figure 5 — Speed Control Servo


HOT AT ALL TIMES
HOT IN RUN
HOT IN ACCY OR RUN
FUSE LINK K PAGE 22
16 GA BLACK
FROM IGNITION SWITCH PAGE 23
X
FROM ELECTRONIC ENGINE CONTROL PAGE 57,58
SEE POWER DISTRIBUTION PAGE 27
L
K
FUSE PANEL PAGE 23
6
20A
296 W/P
C276
A/C-HEATER FUNCTION SELECTOR SWITCH SEE PAGE 216 FOR SWITCH TERMINALS
A/C NORM
A/C MAX
VENT
HI-LO
FLOOR
DEFROST
OFF
FOR BLOWER SEE PAGE 184
68 O/BK
687 GY/Y
73 O/LB H
883 PK/LB H
348 LG/P H
C286
C441
COOLING FAN CONTROLLER
SOLID STATE
FAN RELAY
A/C-FAN CONTROL
CLUTCH CYCLING PRESSURE SWITCH
CLOSED ABOVE 48 PSIG
OPEN BELOW 23 PSIG
2
8
3
6
7
5
1
4
C295
228 BR/Y
45 Y/R
57 BK
C128
COOLING FAN
COOLING FAN TEMPERATURE SWITCH
CLOSED ABOVE 221 ± 5°F
347 BK/Y H
A/C CLUTCH FIELD COIL
DIODE
S1007
G902
SEE GROUNDS PAGE 7, 13
G1002

COOLING FAN/COMPRESSOR CLUTCH CONTROL (2.3L TURBO ENGINE)

HOW THE CIRCUIT WORKS

The **Cooling Fan** circuit is powered by **Fuse Link K.** With the **Ignition Switch** in RUN, the **Cooling Fan** operates when either of two conditions occurs: (1) the **Cooling Fan Temperature Switch** closes; (2) voltage is supplied to terminal 6 of the **A/C Cooling Fan Controller** (A/C ON).

When the **Ignition Switch** is in RUN and engine coolant temperature above 226°F, the **Cooling Fan Temperature Switch** closes. Power flows from the **Ignition Switch** (hot in RUN), and the Fan Relay contacts close in the **A/C Cooling Fan Controller.** Power then flows from **Fuse Link K,** and the **Cooling Fan** operates.

During normal operation of the A/C system, power is applied from **Fuse 6** and the **A/C-Heater Function Selector Switch,** through the normally closed contacts of the **Clutch Cycling Pressure Switch,** to the **A/C Clutch Field Coil.** At the same time power is applied to pin 6 of the **A/C Cooling Fan Controller.** The A/C-Fan Control causes the Fan Relay to operate. Whenever the A/C compressor operates, the **Cooling Fan** will also operate. In addition, voltage is sent to pin 10 of the **Electronic Control Assembly (ECA)** to increase the fuel to the engine to compensate for the extra load.

When the refrigerant suction pressure drops below 23 psig, the **Clutch Cycling Pressure Switch** cuts off power to the **A/C Clutch Field Coil.** At the same time voltage is removed from the idle boost to the **ECA** and to the A/C-Fan Control. The A/C-Fan Control stops the fan, unless the **Cooling Fan Temperature Switch** is closed.

For further details about how the A/C circuit operates, see A/C-Heater (page 98 of the EVTM).

COMPONENT LOCATION

		Page-Figure	Color	Terminals
A/C Clutch Field Coil	Part of A/C compressor	192-1		
A/C Cooling Fan Controller	Under LH side of I/P			
Clutch Cycling Pressure Switch	Top of A/C suction accumulator	188-3		
Cooling Fan	At radiator			
Cooling Fan Temperature Switch	Lower LH side of engine			
Electronic Control Assembly (ECA)	RH cowl side at access hole			
Fuse Link K	Near starter relay		BK	
Connector C128	Lower center of I/P		GY	6
Connector C276	Center of I/P, behind ATC control	196-3	GY	4
Connector C286	LH front fender apron, near voltage regulator	92-2	GY	8
Connector C295	On dash panel near wiper motor	122-9	GY	8
Connector C441	Lower RH fender apron		BR	2
Ground G902	Lower center of I/P	73-2		
Ground G1002	Above RH headlight assembly	16-1		
Splice S1007	Above RH headlight assembly			