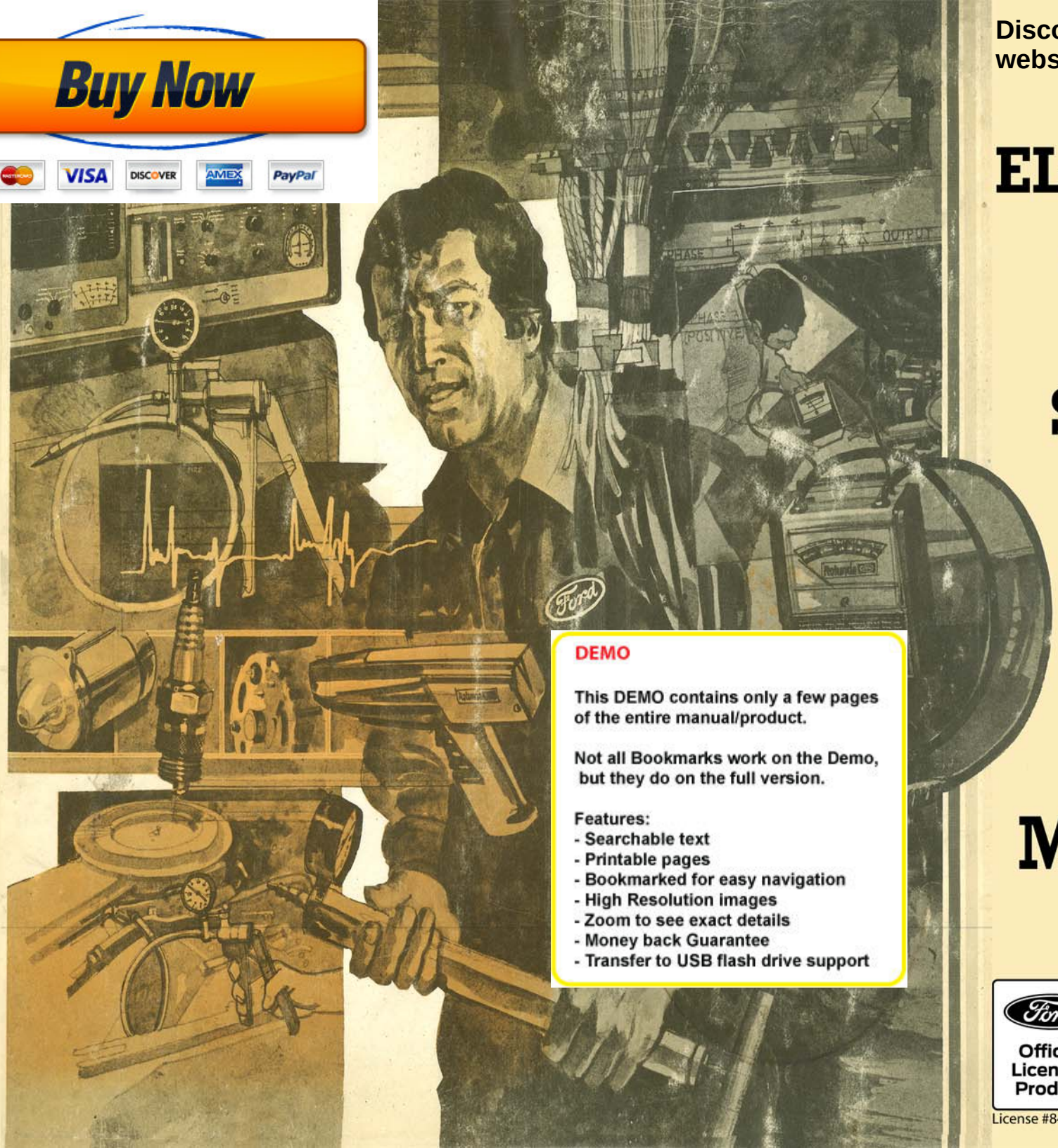
1979 MUSTANG-CAPRI



ELECTRICAL & VACUUM TROUBLE-SHOOTING MANUAL

1979 MUSTANG CAPRI

1979 Mustang / Capri Electrical & Vacuum Trouble-Shooting Manual (EVTM)

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INDEX

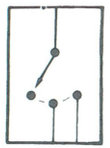
ELECTRICAL SYMBOLS

NOTE

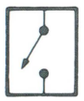
ALL SWITCHES SHOWN IN THIS MANUAL ARE IN CAR "AT REST" POSITION, WITH ENGINE JUST TURNED OFF.

COMPONENT SHOWN IN TWO PLACES OR PART OF A COMPONENT

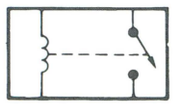
COMPONENT WITH CONNECTORS



SELECTOR SWITCH

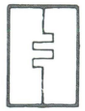


SWITCH

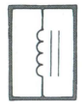


RELAY

MOTOR

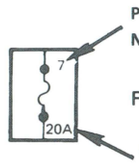


HEATER



SOLENOID, SOLENOID VALVE, CHOKE, OR COIL

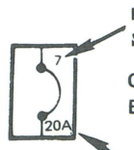
COMPONENT
NON-SERVICEABLE



POSITION NUMBER

FUSE

AMPERAGE VALUE



POSITION NUMBER

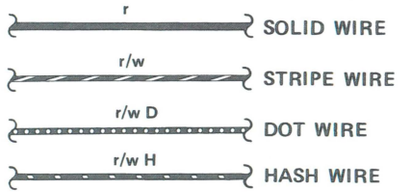
CIRCUIT BREAKER

AMPERAGE VALUE

LIGHT

GAGE

FUSE LINK

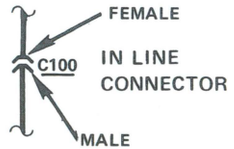


SOLID WIRE

STRIPE WIRE

DOT WIRE

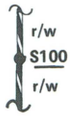
HASH WIRE



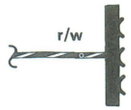
FEMALE

IN LINE CONNECTOR

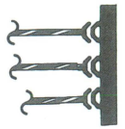
MALE



SPLICE OR CRIMP TERMINAL



CANDELABRA CONNECTOR
ACCEPTS SINGLE-PIN CONNECTORS

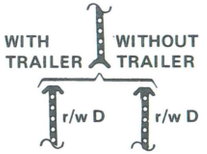


JUNCTION BLOCK

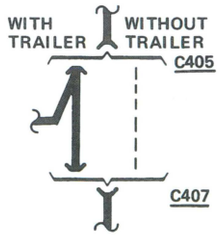
COMPONENT GROUND

EYELET GROUND

SCREW TERMINAL



ALTERNATE CIRCUIT PATHS OR OPTIONAL WIRING



OPTIONAL WIRING
DASHED LINE MEANS C405 CONNECTS TO C407

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

COMPLETE WIRING SHOWN ON ANOTHER PAGE

20 REFERENCE NUMBER

IMPORTANT INFORMATION, AND CAR AND MECHANIC SAFETY NOTES APPEAR IN BOXES ON TEXT PAGES. THERE ARE THREE KINDS:

NOTE

Additional information.

CAUTION

Possible damage to vehicle or equipment.

WARNING

Possible injury to mechanic.

TROUBLESHOOTING STEPS

1. Check the complaint. Operate circuit yourself to find out what's not working. Don't waste time troubleshooting *part* of the problem.
2. Read **How The Circuit Works** and study the wiring diagram.
3. Find the fault. Read **Troubleshooting Hints** and see if any hint fits your problem. The **Component Location Chart** lists where the components and connectors are found.
4. Make the repair.
5. Test the repair. Try the system in all modes to be sure the *whole* problem is fixed.

TROUBLESHOOTING TOOLS

TEST LIGHT

A test light is a 12-volt bulb with two test leads (Figure 1).

Uses: Voltage Check, Short Check

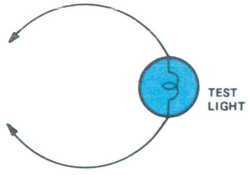


Figure 1 – Test Light

SELF-POWERED TEST LIGHT

The self-powered test light is a light, battery, and set of test leads wired in series (Figure 2). When connected to two points of a continuous circuit, the light glows.

CAUTION

Be sure power is off in circuit during testing.

Uses: Continuity Check, Ground Check

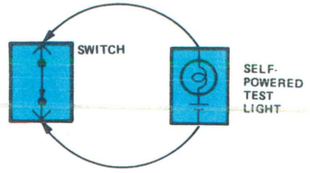


Figure 2 – Self-Powered Test Light

JUMPER WIRE

This is a length of wire with clips, used to connect two points of a circuit. A jumper wire can complete a circuit by bypassing an open.

WARNING

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

Uses: Bypassing Switches or Open Circuits

VOLTMETER (Rotunda 02-0204 Circuit Tester or equivalent)

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

OHMMETER

An ohmmeter shows the resistance between two connected points. IT SHOULD ONLY BE USED ON DE-ENERGIZED CIRCUITS. Hot circuits can cause meter damage and false readings.

BASIC TROUBLESHOOTING

Voltage Check:

Connect one lead of test light to a known good ground, or the negative (–) battery terminal. Test for voltage by touching the other lead to the test point. Bulb lights when the test point has voltage.

Short Check (short to ground):

A blown fuse is usually caused by a short to ground in that circuit. Check as follows:

1) Turn off everything powered through the fuse.
2) Disconnect all 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. Light should glow showing power to fuse.

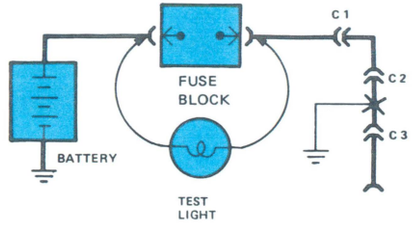


Figure 3 – Short Check

5) Disconnect ground lead and connect to load side of fuse.
   a) Test light OFF: the short is in the disconnected equipment.
   b) Test light ON: short is in wiring. Find short by disconnecting circuit connectors one at a time. In the example (Figure 3) with a ground at X, the light goes out when C1 or C2 is disconnected, but stays on after disconnecting C3. This means the ground is between C2 and C3.

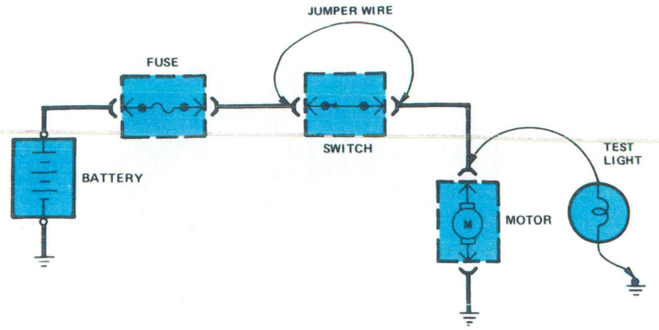


Figure 4 – Switch Circuit Check and Voltage Check

Continuity Check:

CAUTION

Be sure power is off in circuit during testing.

(Locating open circuits) Connect one lead of self-powered test light or ohmmeter to each end of circuit (Figure 2). Light will glow if circuit is closed. Switches and fuses can be checked in the same way.

"Good Ground" Check:

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 light glows, circuit ground is ok.

Switch Circuit Check:

In an inoperative 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).

This test also finds an open in part of a circuit.

GENERAL TROUBLESHOOTING HINTS

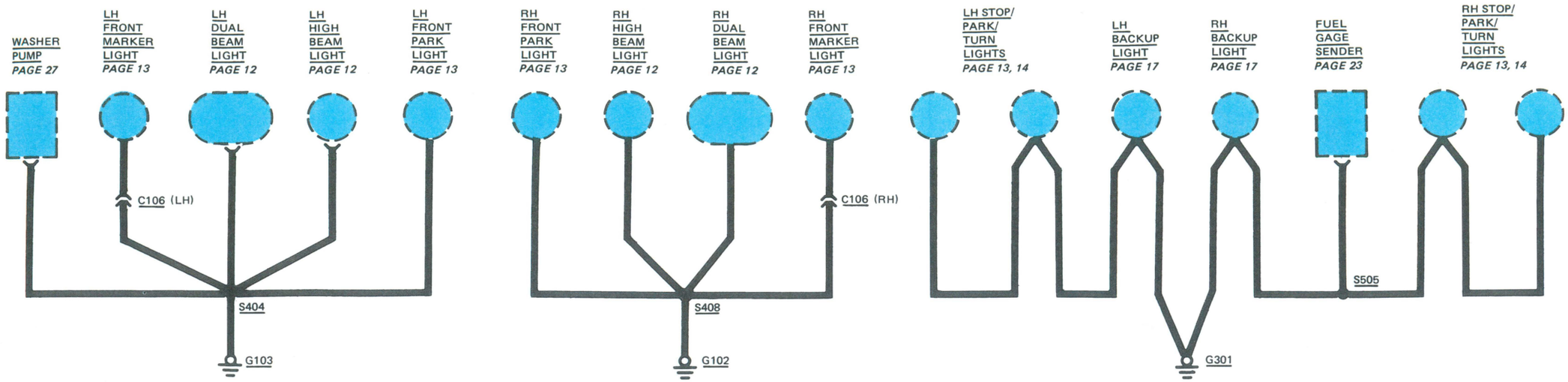
If several unrelated circuits fail at the same time, chances are the power (fuse) or ground circuit is bad.

Use the **Fuse Block/Power Bus Information** to find what circuits are powered through each fuse.

Use the **Ground Pages** to find which circuits have a common ground. 40% of all car electrical problems are grounding faults.

NOTE

Ground pages show only complex eyelet grounds. Circuits with single or component grounds are shown on circuit diagram page.


WASHER PUMP
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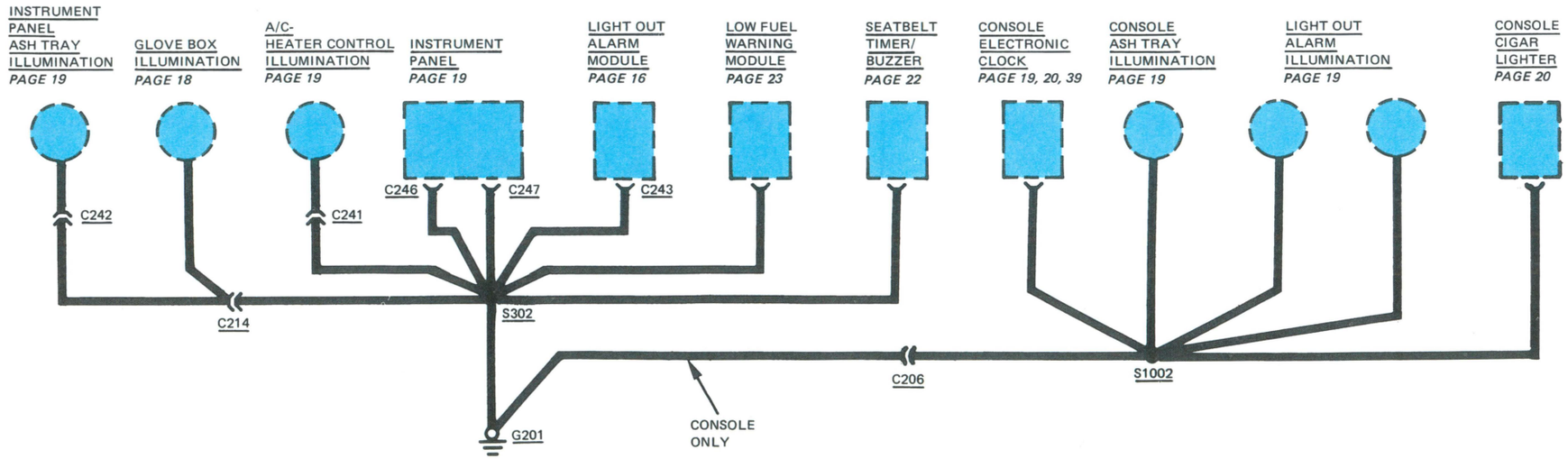
LH FRONT MARKER LIGHT
PAGE 13
LH DUAL BEAM LIGHT
PAGE 12
LH HIGH BEAM LIGHT
PAGE 12
LH FRONT PARK LIGHT
PAGE 13
C106 (LH)
S404
G103
RH FRONT PARK LIGHT
PAGE 13
RH HIGH BEAM LIGHT
PAGE 12
RH DUAL BEAM LIGHT
PAGE 12
RH FRONT MARKER LIGHT
PAGE 13
C106 (RH)
S408
G102
LH STOP/ PARK/ TURN LIGHTS
PAGE 13, 14
LH BACKUP LIGHT
PAGE 17
RH BACKUP LIGHT
PAGE 17
FUEL GAGE SENDER
PAGE 23
RH STOP/ PARK/ TURN LIGHTS
PAGE 13, 14
S505
G301


INSTRUMENT PANEL ASH TRAY ILLUMINATION
PAGE 19
GLOVE BOX ILLUMINATION
PAGE 18
A/C- HEATER CONTROL ILLUMINATION
PAGE 19
INSTRUMENT PANEL
PAGE 19
LIGHT OUT ALARM MODULE
PAGE 16
LOW FUEL WARNING MODULE
PAGE 23
SEATBELT TIMER/ BUZZER
PAGE 22
CONSOLE ELECTRONIC CLOCK
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CONSOLE ASH TRAY ILLUMINATION
PAGE 19
LIGHT OUT ALARM ILLUMINATION
PAGE 19
CONSOLE CIGAR LIGHTER
PAGE 20
C242
C241
C246
C247
C243
C214
S302
C206
S1002
G201
CONSOLE ONLY

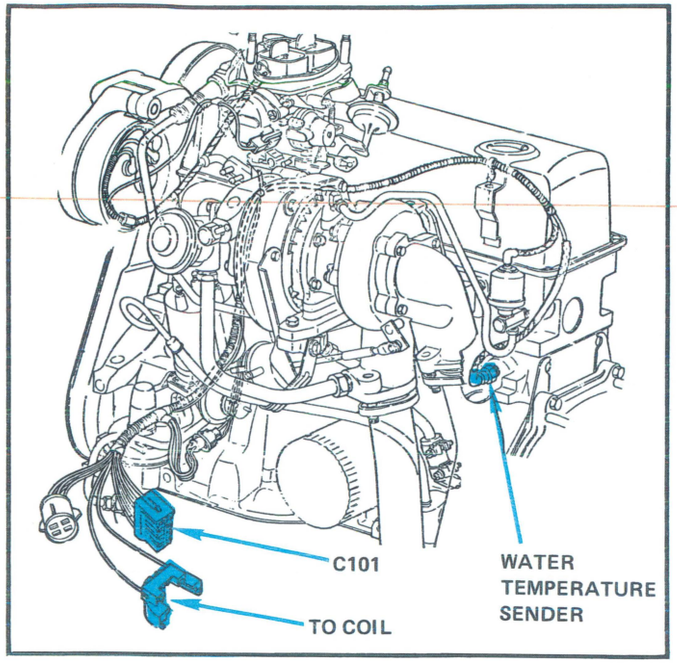


Figure 1 — 4 Cylinder With Turbocharger

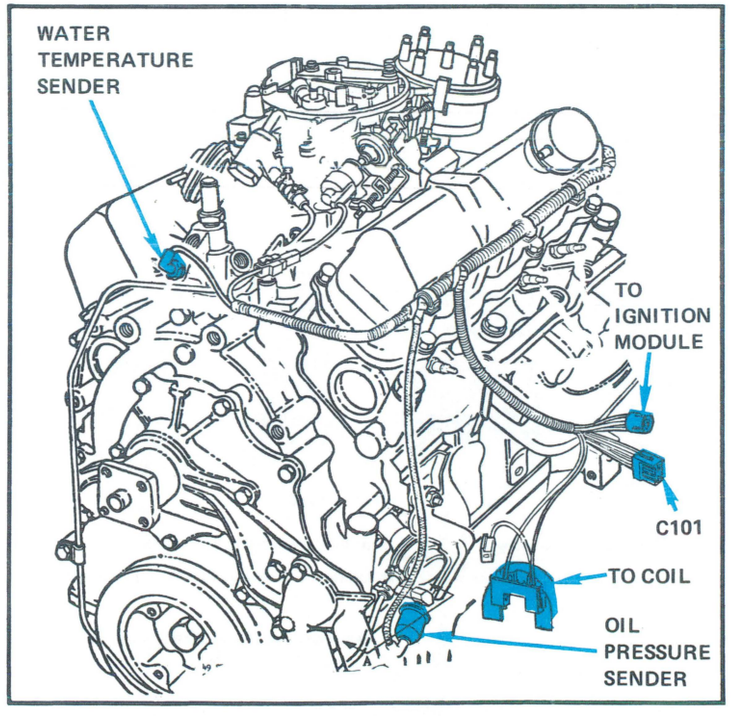


Figure 2 — 6 Cylinder

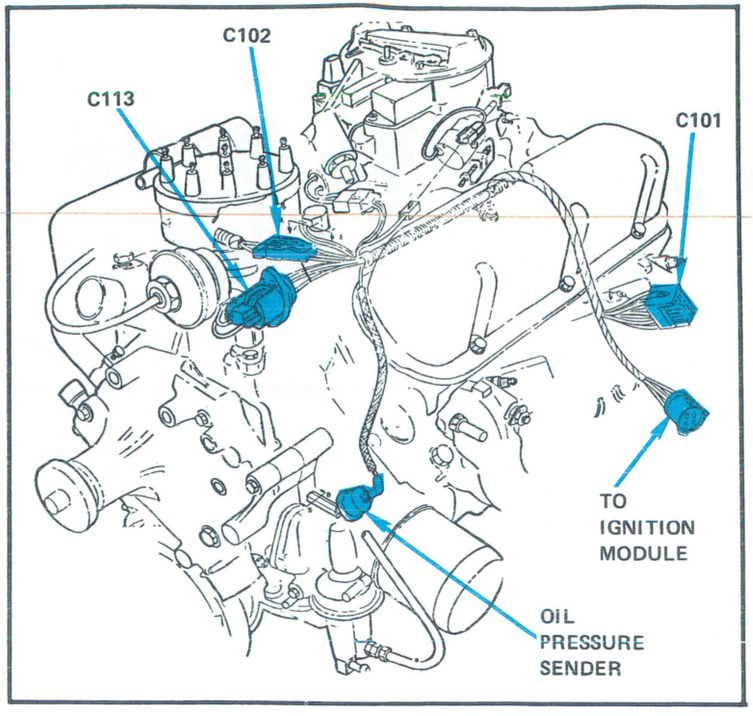


Figure 3 — 8 Cylinder

HOW THE CIRCUIT WORKS

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

With the **Ignition Switch** in RUN, **Battery** current flows through the solid-state **Electronic Control** section of the **Electronic Voltage Regulator.** The **Electronic Control** operates the solid-state **Field Switch,** which applies battery voltage to the **Alternator Field** through terminal *F.*

With current in the **Field** and the rotor turning, the **Alternator Stator** produces a DC voltage at terminal *B* (to **Battery).** This voltage balances the **Battery** voltage. If the voltages are different, the resulting current flow is indicated on the **Ammeter.**

TROUBLESHOOTING HINTS

IMPROPER CHARGING

The most common charge system complaints are dead battery, battery using too much water, and alternator warning light on at normal speed.

- Check fuse link at **Starter Relay.**
- Check **Alternator** belt tension.
- Check **Battery** terminals and cable clamps.
- Check for clean and tight connections on **Alternator, Regulator,** and **Starter Relay.**

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

> *CAUTION*
>
> *Do not use a new alternator (4 amp field winding) with an electromechanical regulator.*

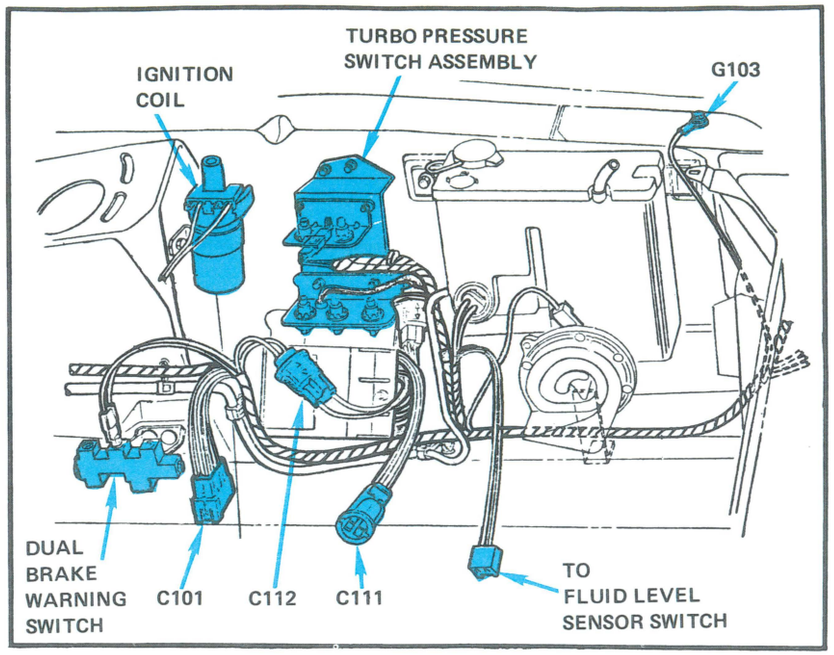


Figure 1 — LH Fender Apron (4 Cylinder)

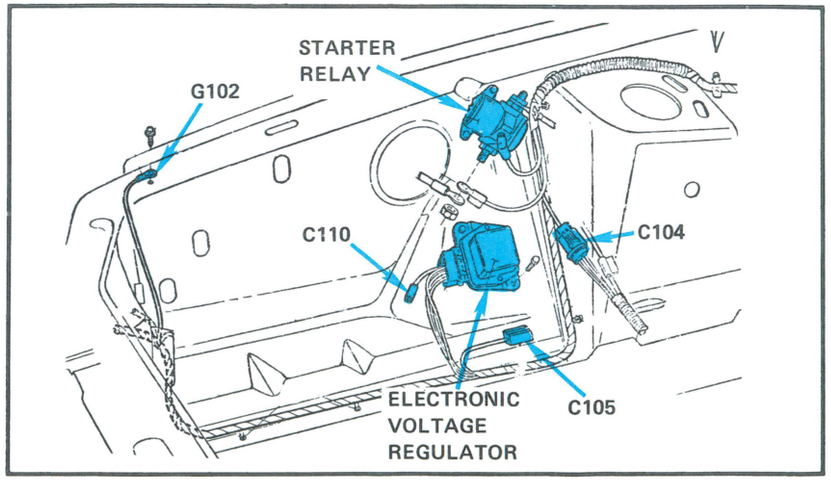
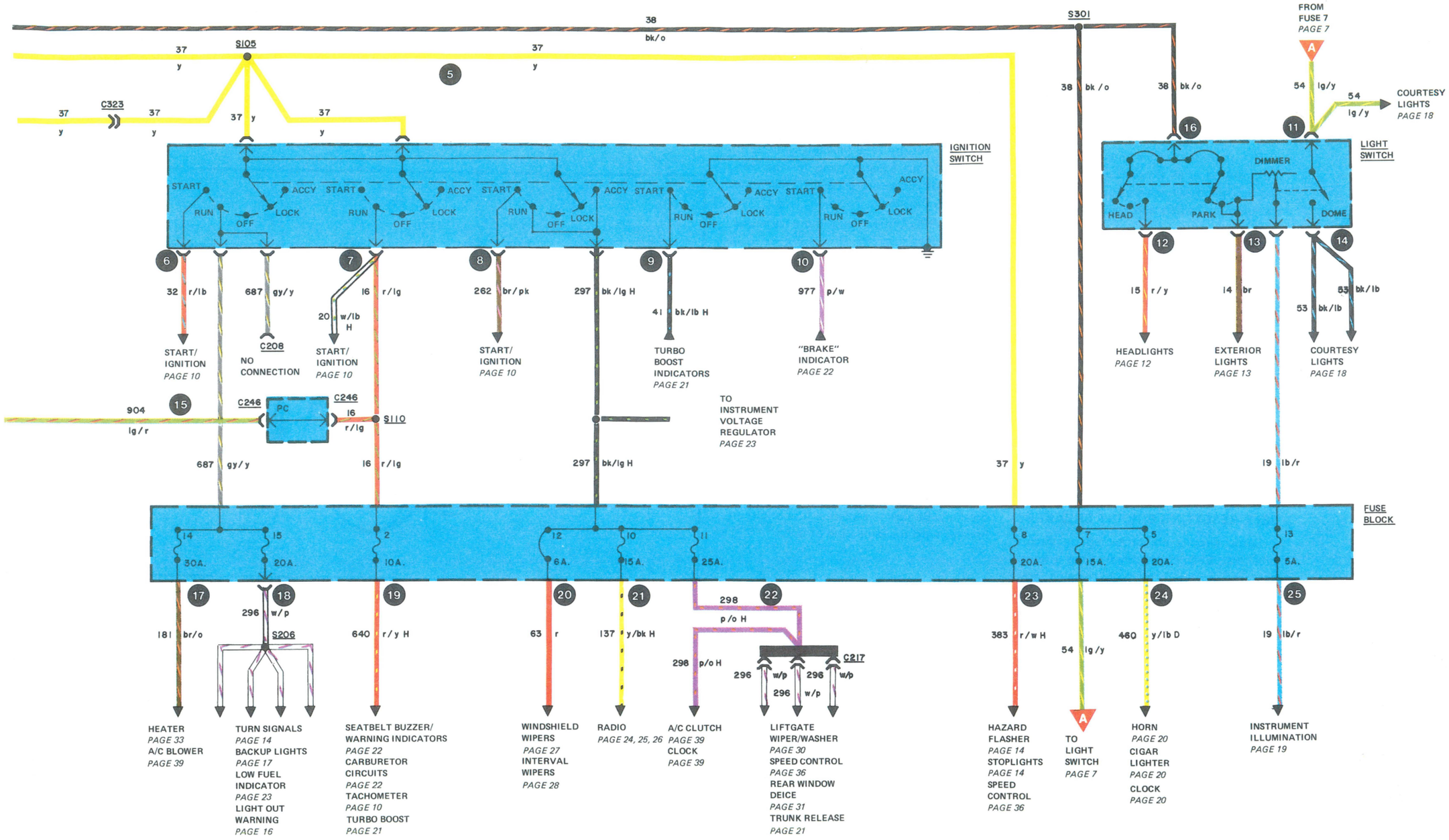


Figure 2 — RH Fender Apron

COMPONENT LOCATION

		Page-Figure	Shape	Color	Terminals
Choke Heater	On engine at choke				
Electronic Voltage Regulator	RH fender apron	5-2			
Radio Noise Capacitor	RH fender apron				
Starter Relay	RH fender apron	5-2			
Connector C104	RH fender apron	5-1		br	3
Connector C201	LH and RH cowl in "A" pillar	8-1		—	8
Connector C202	RH cowl in "A" pillar	8-1		gy	3
Connector C210	Under instrument panel, near brake pedal	8-1		br	
Ground G101	Engine compartment				


38 bk/o
S105
37 y
5
C323
S301
FROM FUSE 7 PAGE 7
A
54 lg/y
COURTESY LIGHTS PAGE 18
IGNITION SWITCH
START
ACCY
RUN
OFF
LOCK
LIGHT SWITCH
DIMMER
HEAD
PARK
DOME
6
7
8
9
10
11
12
13
14
15
16
32 r/lb
START/ IGNITION PAGE 10
687 gy/y
C208
NO CONNECTION
20 w/lb H
16 r/lg
262 br/pk
297 bk/lg H
41 bk/lb H
TURBO BOOST INDICATORS PAGE 21
977 p/w
"BRAKE" INDICATOR PAGE 22
15 r/y
HEADLIGHTS PAGE 12
14 br
EXTERIOR LIGHTS PAGE 13
53 bk/lb
COURTESY LIGHTS PAGE 18
904 lg/r
C246
PC
S110
TO INSTRUMENT VOLTAGE REGULATOR PAGE 23
19 lb/r
FUSE BLOCK
30A.
20A.
10A.
6A.
15A.
25A.
5A.
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CLOCK PAGE 39
C217
LIFTGATE WIPER/WASHER PAGE 30
SPEED CONTROL PAGE 36
REAR WINDOW DEICE PAGE 31
TRUNK RELEASE PAGE 21
383 r/w H
HAZARD FLASHER PAGE 14
STOPLIGHTS PAGE 14
SPEED CONTROL PAGE 36
TO LIGHT SWITCH PAGE 7
460 y/lb D
HORN PAGE 20
CIGAR LIGHTER PAGE 20
CLOCK PAGE 20
INSTRUMENT ILLUMINATION PAGE 19

POWER BUS INFORMATION

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 **Light Switch** are powered at all times as are **Fuses 5, 7,** and **8.** The other fuses are powered through the **Ignition Switch** and the **Light Switch.**

FUSE LINK

The **Fuse Link** is a short length of wire smaller than the wire in the protected circuit. The wire is covered with a thick nonflammable insulation. An overload causes the link to heat and the insulation to smoke or blister. If the overload remains, the link will melt, causing an open circuit. The links are color coded for wire size as follows: **Blue - 20 gage, Red - 18 gage, Yellow - 17 gage, Orange - 16 gage, Green - 14 gage.**

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

SELF-RESETTING CIRCUIT BREAKERS

Some circuits are protected by circuit breakers. Each circuit breaker has a set of contacts operated by a bi-metallic arm which carries the breaker current. If the current becomes too high, the heating of the arm causes it to bend and open the contacts.

When the arm cools, it bends straight and re-closes the contacts. This cycle repeats as long as the overcurrent exists, with power applied.

WIRING HARNESS INFORMATION

All wiring between components is routed through wiring harnesses. Each harness is tagged with a coding which tells: year of development, car line, harness number, and design level. For example, a harness tagged "D9LB-14401-AE" means "Developed 1979 for the Mark V-14401 harness (main wiring assembly behind the instrument panel) -Model 'A', revision 'E.' "

Figure 1 shows the major harness wiring assemblies for the 1979 Mustang and Capri. The small blue squares stand for the connector (or connectors) which join one harness to the next.

Each "RPO Option" adds more harnesses to the car.

Because the harnesses are bound with a heavy tape, pinpointing a short or open in a single wire of a long harness is almost impossible. If a short or open is traced to a major harness, either the harness must be replaced or the circuit can be jumpered with an added wire.

FUSE BLOCK

The Fuse Block for the 1979 Mustang/Capri is a new design. Fuses are identified by the numbered value in amps, and by a color code. Some positions (5) 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.

COMPONENT LOCATION

		Page-Figure	Shape	Color	Terminals
Fuse Block	Under instrument panel, LH cowl	9-1			
Connector C217 . .	LH side of instrument panel	9-1		–	3
Connector C246 . .	LH side of instrument cluster	9-1		–	21

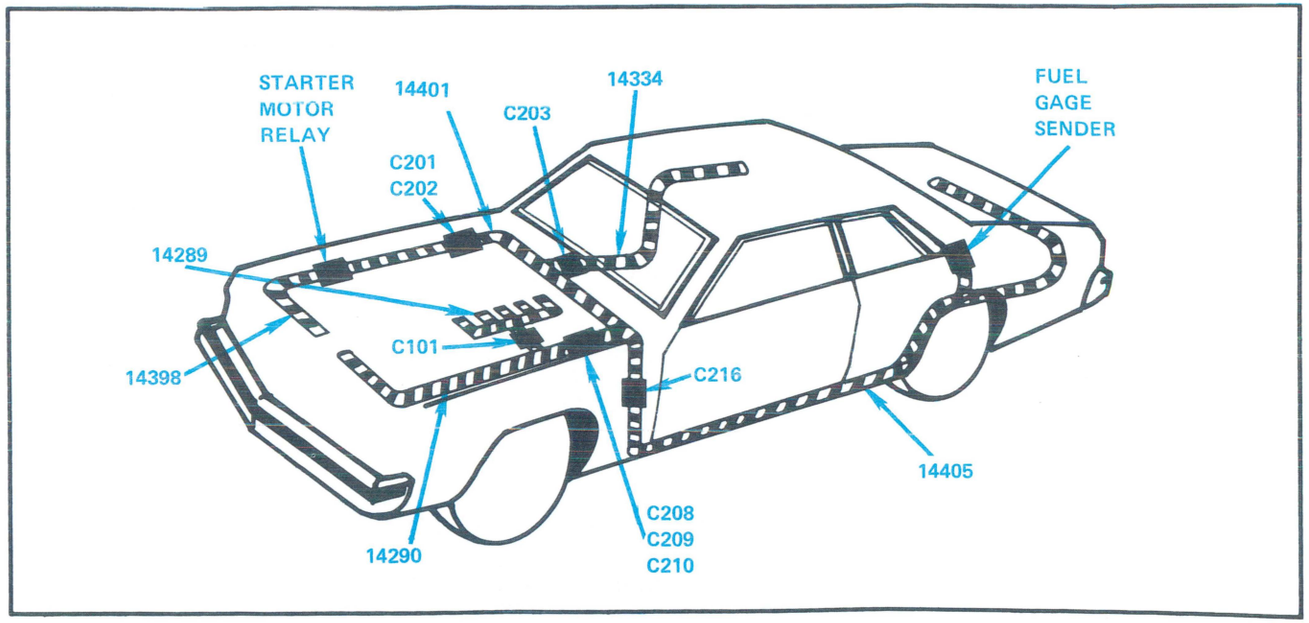
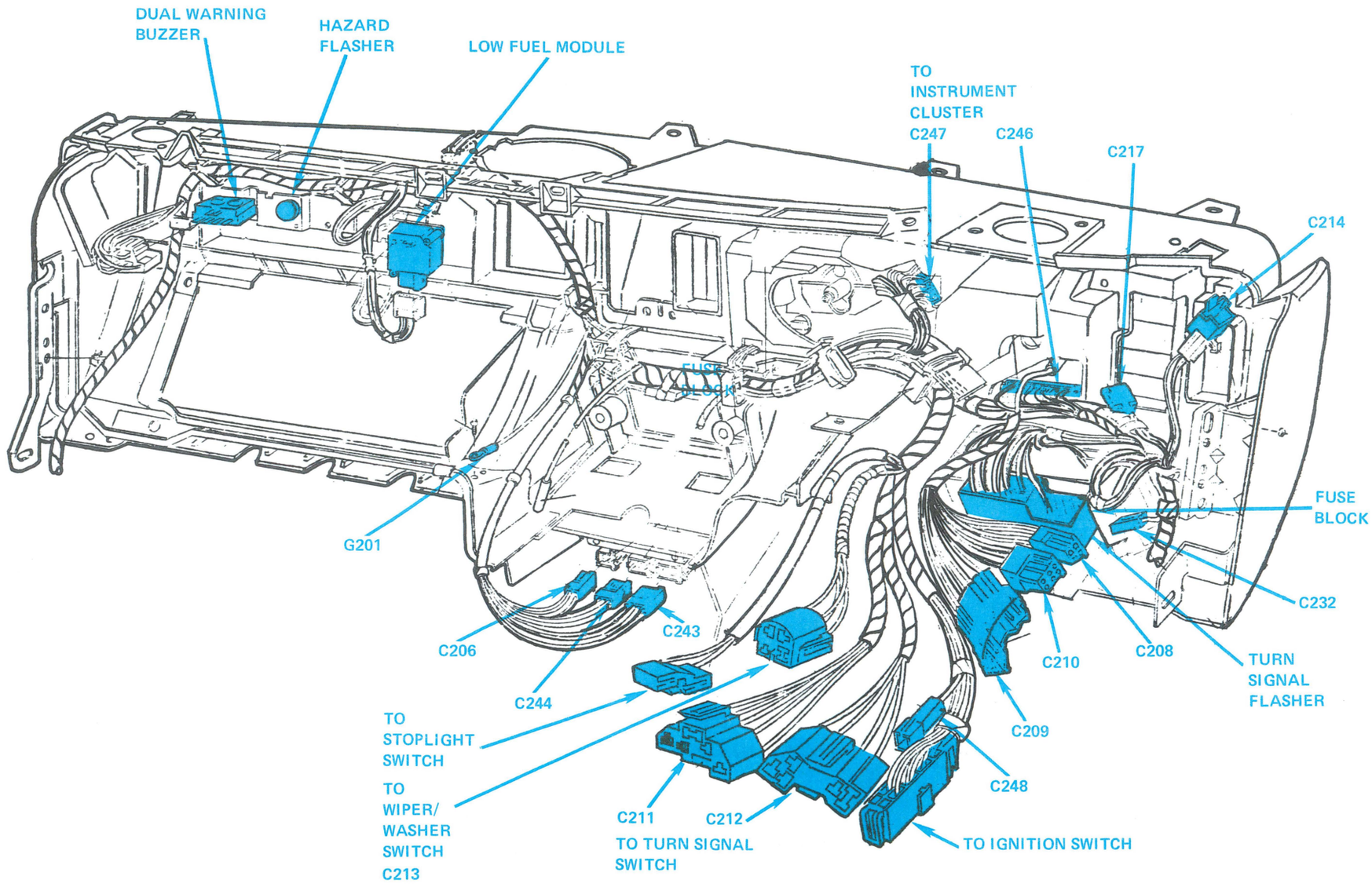


Figure 1 — Main Harness Location


DUAL WARNING BUZZER
HAZARD FLASHER
LOW FUEL MODULE
TO INSTRUMENT CLUSTER
C247
C246
C217
C214
FUSE BLOCK
G201
FUSE BLOCK
C232
C243
C206
C208
C210
TURN SIGNAL FLASHER
C244
TO STOPLIGHT SWITCH
C209
TO WIPER/ WASHER SWITCH C213
C248
C211
C212
TO TURN SIGNAL SWITCH
TO IGNITION SWITCH

START

HOW THE CIRCUIT WORKS

The **Battery, Starter Motor, Starter Relay,** and **Ignition Switch** make up the **Starting System.** In cars with automatic transmission, the **Neutral Safety Switch** must be closed (PARK or NEUTRAL).

Turning the **Ignition Switch** to START operates the **Starter Relay.** The **Starter Relay** sends power from the **Battery** to the **Starter Motor** to start the engine.

A **Crank Solenoid** is used on all California cars equipped with 302 CID V8 and 2.8 liter 6 cylinder engines. This solenoid supplies additional fuel during cold starts.

TROUBLESHOOTING HINTS

- Check condition of **Battery.** Replace or recharge if necessary. Check battery posts and terminals.
- Check cables for damage and proper connection.

ENGINE WILL NOT CRANK

- Listen for **Relay** click when **Ignition Switch** is turned to START position. If no click, check **Ignition Switch, Neutral Safety Switch,** and wiring to **Relay** for open connection.
- If **Relay** clicks, check voltage at terminal stud of **Starter.**
- Read "Routine 102 - Engine Will Not Crank" in Section 29-02 of Shop Manual.
- Read "Testing" in Section 28-02 of Shop Manual for detailed starting system tests.

IGNITION

HOW THE CIRCUIT WORKS

The **Ignition System** generates high-voltage pulses to fire the spark plugs in proper sequence and timing.

The high-voltage pulses are generated in the **Ignition Coil,** a transformer with a low-voltage primary, and a high-voltage secondary.

Primary current is switched on and off by a solid state **Ignition Module** when signaled by the magnetic pickup in the **Distributor.** The magnetic pickup is installed close to a toothed rotor on the **Distributor** shaft. As each tooth passes by the magnetic pickup, a single pulse is generated, causing the **Ignition Module** to interrupt current to the primary of the **Ignition Coil** momentarily. Each interruption of current causes a sudden collapse of magnetic field in the **Ignition Coil,** producing a high voltage pulse of up to 40,000 volts in the coil secondary.

CAUTION

In the Dura Spark II System, a high-voltage pulse is produced when the **Ignition Switch** *is turned off.*

The high-voltage pulses are transmitted to the **Distributor,** which sends them to the spark plugs.

Full **Battery** voltage is used for starting. When running, battery voltage is reduced by a 1.1 ohm resistor in series with the **Ignition Coil.** In California 302 V8 engines, this resistor is bypassed by the **w/lb H** jumper at C101. For this one engine, the coil is powered at full **Battery** voltage in RUN and START. A special **Ignition Coil** and **Ignition Module (Duraspark I)** are used for this engine.

TROUBLESHOOTING HINTS

CAUTION

Catalytic converters are damaged by excessive unburned fuel. Disconnect air supply line between the bypass valve and the manifold before performing the following procedure.

After testing, run the engine at least 3 minutes before reconnecting air supply line.

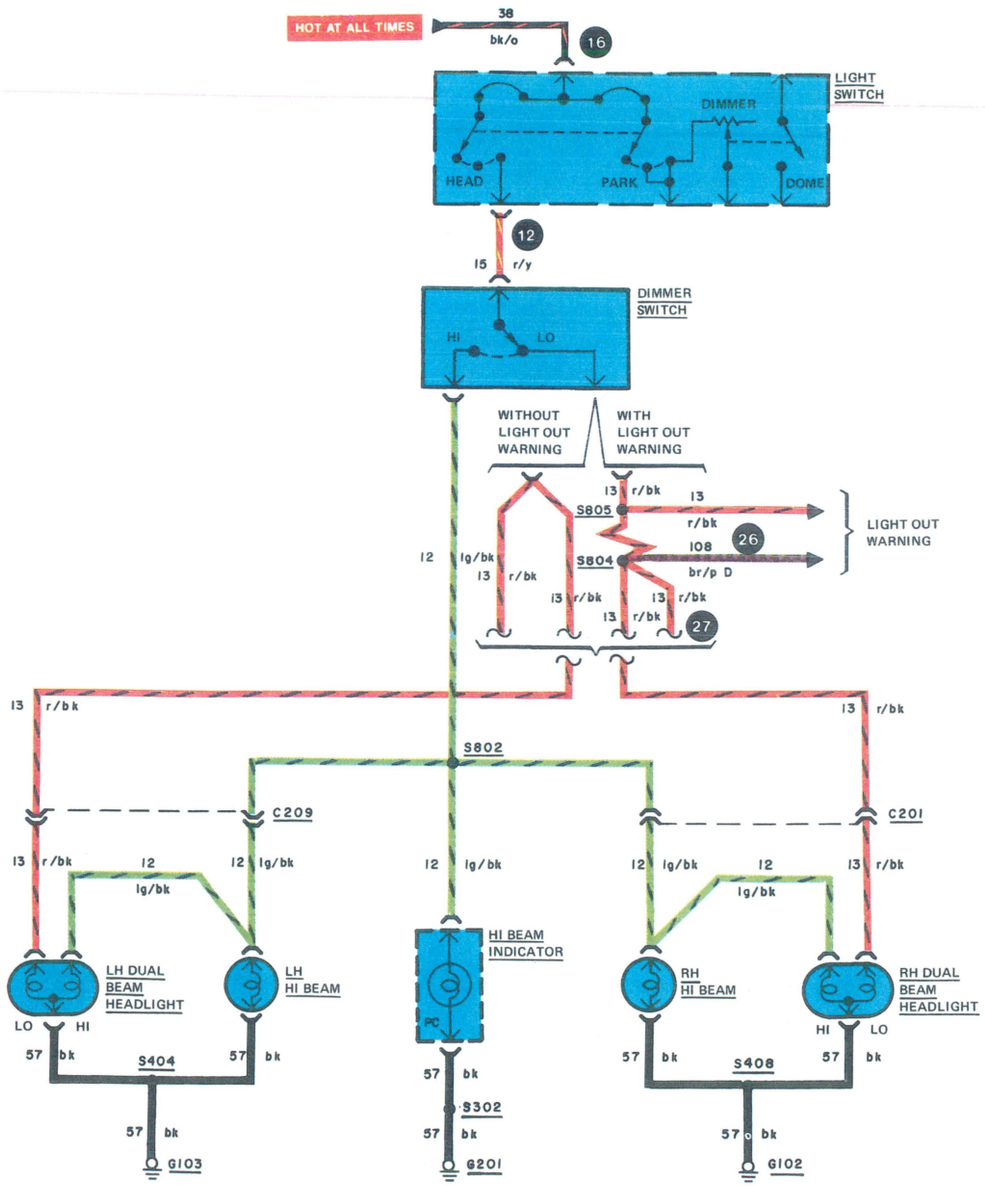
- Turn **Ignition Switch** OFF and remove air cleaner carefully. Inspect pressure and vacuum hoses for damage and proper connections.
- Check for loose or damaged spark plug or ignition coil wires. Clean and inspect wires one at a time. Repack each boot with silicone grease. When all wires are serviced, start car.
- If ignition system is still bad, turn **Ignition Switch** OFF. Remove ignition coil (center) wire from distributor and insert spark plug. Turn ignition on and ground side of spark plug against engine block. Tap base of distributor with screwdriver handle and watch for spark. If there is a good spark, skip down to "CRANKING TEST" on this page.
- If no spark, measure voltage of ignition module red wire without disconnecting 2-wire connector (see figure 10-1). If voltage is less than battery voltage, repair red wire circuit **(w/lb H).**
- If voltage equals battery voltage, turn **Ignition Switch** from RUN to OFF a few times. If a spark is seen when the switch is turned to OFF, replace the distributor.
- If no spark, turn **Ignition Switch** ON. Check voltage at BAT terminal of coil. If between 6 and 8 volts, replace **Ignition Module.** If less than 6 volts, repair feed to BAT terminal. Tap distributor to check spark. If there is a good spark, system is ok. If there is no spark, replace the **Ignition Coil.**
- If BAT terminal voltage equals battery voltage, disconnect 4-wire connector at **Ignition Module.** Jumper the harness wires which mate to the module **dg** and **bk/lg** wires. Again check voltage at BAT terminal. If voltage is 6 to 8 volts, replace the **Ignition Module.**
- If BAT terminal voltage still equals battery voltage, ground TACH TEST terminal. Check voltage at BAT terminal. If voltage is equal to battery voltage replace the ignition coil. If voltage is 6 to 8 volts, repair ground circuit (mates to ignition module **bk/lg** wire). If voltage is less than 6 volts, repair power circuit (mates to ignition module **dg** wire). Remove jumper and reconnect module. Tap distributor to check spark. If there is a good spark, system is ok.

CRANKING TEST

- Hold connected spark plug against engine block. Turn **Ignition Switch** to START and crank engine. If there is a good spark, the ignition system is ok.
- If no spark, measure voltage of ignition module white wire without disconnecting 2-wire connector (see figure 10-1). Turn **Ignition Switch** to START and crank engine. If voltage is less than battery voltage, repair white wire circuit **(r/lb).**
- If voltage equals battery voltage, measure voltage at BAT terminal of coil while cranking. If voltage equals battery voltage, replace **Ignition Module.** If BAT terminal voltage is less than battery voltage, repair 262 **br/pk** or 16 **r/lg** circuit.
- For more details, see "Engine Diagnosis and Service," Section 29-02 of Shop Manual.

COMPONENT LOCATION

		Page-Figure	Shape	Color	Terminals
Breakerless Ignition Module	LH fender apron				
Crank Solenoid	On engine				
Starter Relay	RH fender apron	5-2			
Connector C101	Near breakerless ignition module	4-1		gr	8
Connector C102	Engine compartment, near coil	4-3		gy	3
Connector C107	On transmission	17-2		–	4
Connector C111	Ignition module	5-1		–	4
Connector C112	Ignition module			–	4
Connector C113	On distributor	4-3		–	3
Connector C114	RH fender apron			–	1
Connector C201	LH and RH cowl in "A" pillar	8-1		gr	8
Connector C209	Behind instrument panel	9-1		gy	11
Connector C246	Center instrument cluster	9-1		–	2
Connector C247	Center instrument cluster	9-1		–	21
Ground G101	Engine compartment				
Ground G201	Behind center instrument panel	9-1			



COMPONENT LOCATION

HEADLIGHTS

		Page-Figure	Shape	Color	Terminals
Connector C201	LH cowl in "A" pillar	8-1		gr	8
Connector C209	Behind instrument panel	9-1		gy	11
Ground G102	RH front fender	5-2			
Ground G103	LH front fender				
Ground G201	Behind center of instrument panel	9-1			

EXTERIOR LIGHTS

Connector C106	RH and LH side marker lights			br	2
Connector C201	RH and LH cowl side	8-1		gr	8
Connector C216	LH cowl side, in "A" pillar	8-1		gy	8
Connector C233	Near brake warning indicator switch			gy	1
Connector C302	LH side of rear window	31-1		gy	3
Connector C303	LH rear fender apron			–	1
Ground G102	RH front fender	5-2			
Ground G103	LH front fender				
Ground G203					
Ground G301	On deck lid striker	17-1			
Ground G302	On deck lid striker				
Ground G303	Near license lights				
Ground G304	LH fender apron				

TROUBLESHOOTING HINTS

HEADLIGHTS

NO EXTERIOR LIGHTS

– Look for frayed or damaged wires or loose connections.
– Make sure connector is securely mated to **Light Switch.**
– Check for power at **bk/o** wire of **Light Switch.** If bad, check harness back to **Battery.**
– Check continuity of switch. Replace if bad.

NO HEADLIGHTS;

– Check for power a
Switch. If bad
wire and **Light S**
– Check continuity of **Dimmer Switch.** Replace if bad.

NO HI AND LO BEAM ON ONE SIDE

– Make sure ground connection on that side is clean and tight.

EXTERIOR LIGHTS

NO EXTERIOR LIGHTS OPERATION

– If **Instrument** (dimmer) **Lights** work, check continuity of **br** wire in harness.
– If no **Instrument Lights** work, replace
Light Switch