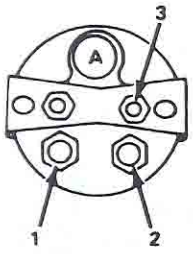
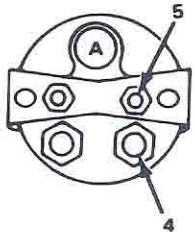
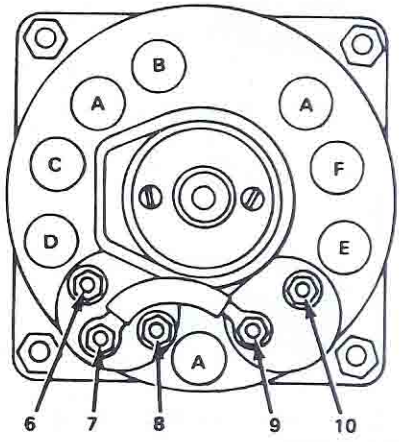


OIL PRESSURE GAUGE



VOLTMETER



FUEL GAUGE (WITH INTEGRAL CVR)

COOLANT TEMPERATURE GAUGE

TERMINAL STUDS

1. OIL PRESSURE GAUGE S-TERMINAL
2. OIL PRESSURE GAUGE I-TERMINAL
3. OIL PRESSURE GAUGE GROUND
4. VOLTMETER +-TERMINAL
5. VOLTMETER GROUND
6. FUEL GAUGE S-TERMINAL
7. FUEL GAUGE A-TERMINAL
8. FUEL GAUGE I-TERMINAL
9. COOLANT TEMPERATURE GAUGE S-TERMINAL
10. COOLANT TEMPERATURE GAUGE A-TERMINAL

LAMPS

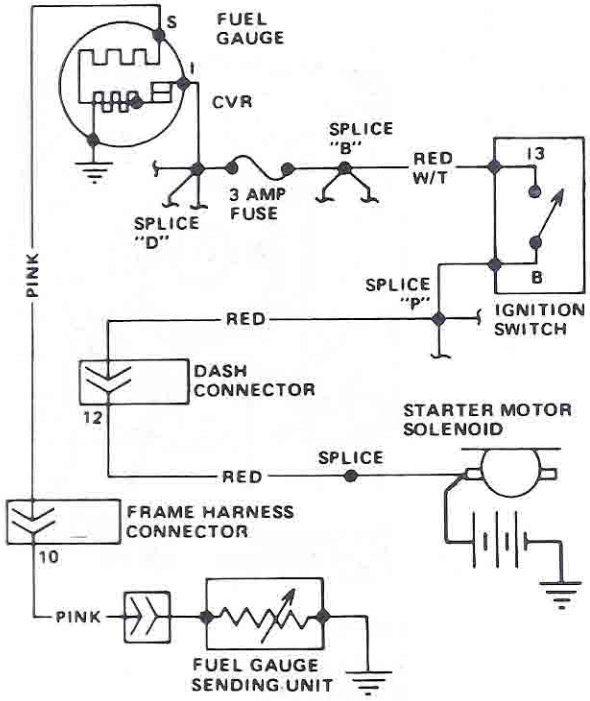
A ILLUMINATION
B HIGH BEAM
C RIGHT TURN
D FOUR-WHEEL DRIVE
E BRAKE
F LEFT TURN

SEE I.S. NOTES

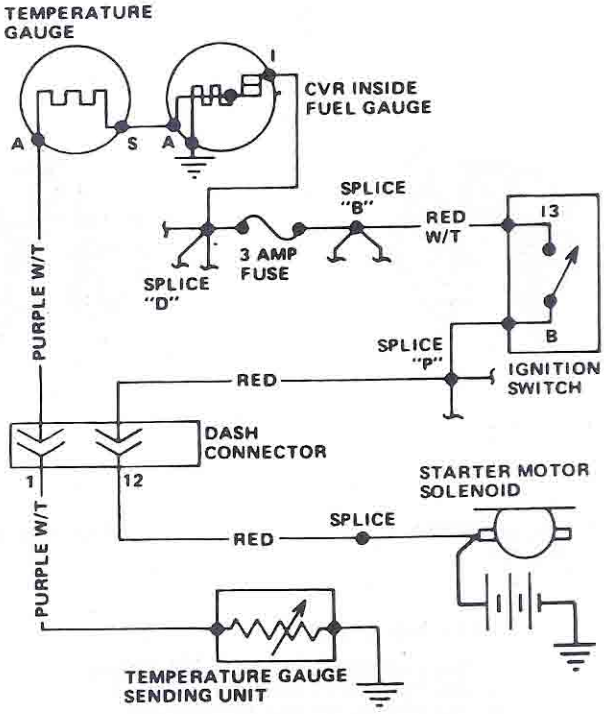
80125

SEE I.S. NOTES

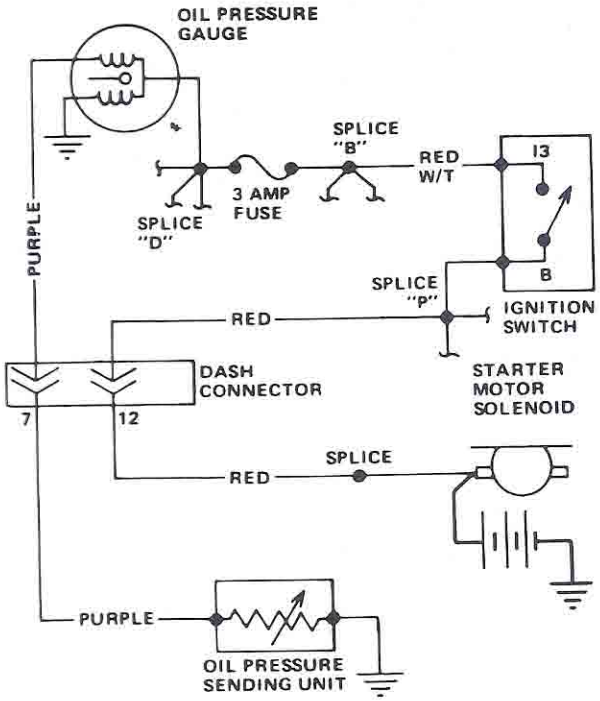
Fuel Gauge Circuit



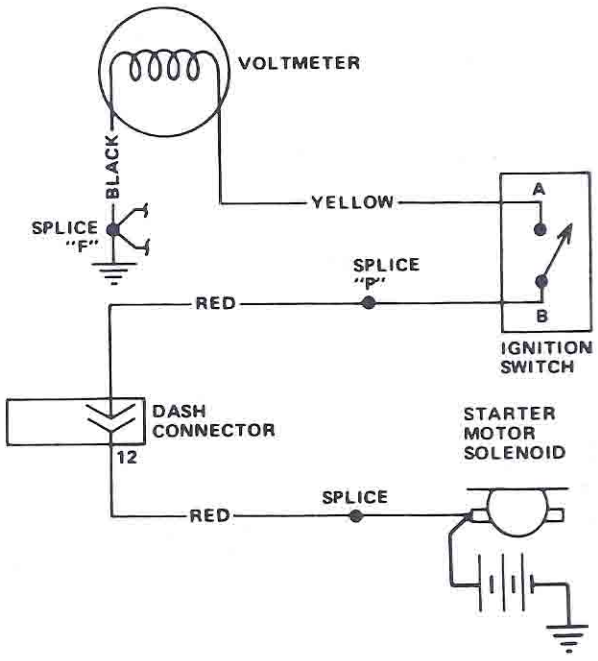
Coolant Temperature Gauge Circuit



Oil Pressure Gauge Circuit



Voltmeter Circuit



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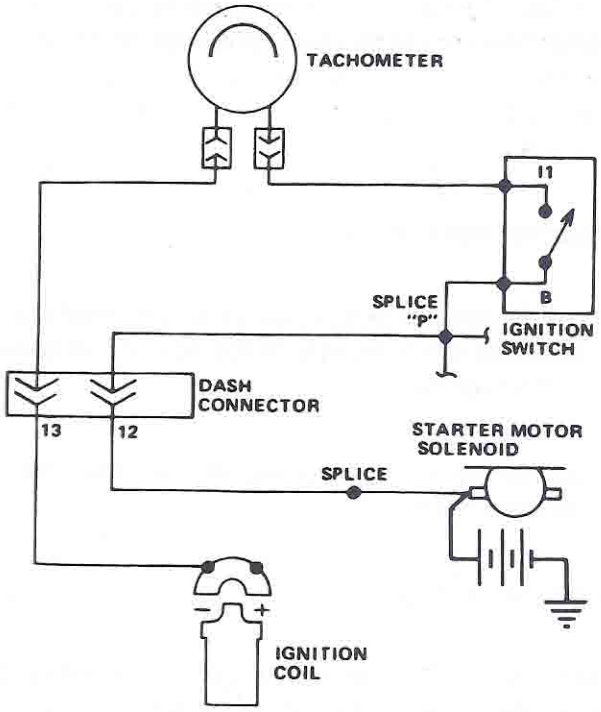
Tachometer Circuit

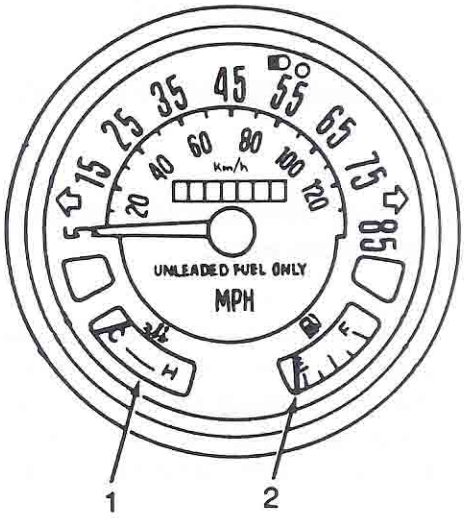


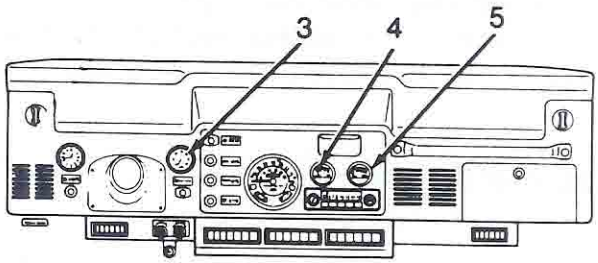
86376

DIAGNOSIS

Improper operation of electrical gauges or meters can usually be traced to either faulty electrical wiring continuity, improperly calibrated components or high resistance caused by loose or corroded connections.

A common diagnostic procedure is to bypass a suspected component, wire or connection with a jumper wire. If the system functions normally with the jumper wire installed, the problem usually is within the bypassed circuit, wire, connection or component.

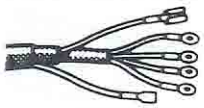




1. Temperature Gauge
2. Fuel Gauge
3. Tachometer
4. Voltmeter
5. Oil Pressure Gauge

841282

SEE I.S. NOTES



SEE I.S. NOTES

Test Equipment

Several gauge tests require the use of Universal Gauge Tester J-24538. This instrument provides a wide range of variable resistance. If the tester is not available, a suitable substitute can be constructed with an accurate ohmmeter and a spare fuel gauge sending unit.

Attach one ohmmeter test probe to the sending unit terminal.

Attach the other ohmmeter test probe to the sending unit ground wire.

Refer to the applicable Sending Unit Resistance (Ohms) charts for the resistance values that apply to the gauge being tested. To calibrate, move the float arm and mark the appropriate resistance values on the sending unit case.

Disconnect the ohmmeter probes. Attach a jumper wire to the sending unit terminal. The tester is now calibrated and ready for use.

Voltmeter Diagnosis

Connect a test voltmeter of known accuracy across the battery terminals.

Turn the ignition switch on.

Compare the voltage indication of the test voltmeter with that of the voltmeter installed in the vehicle. Replace the voltmeter if the voltage indications vary more than the calibration tolerance listed in Specifications.

Fuel Gauge Diagnosis

Movement of the fuel in the tank can be caused by driving up or down long hills, driving on rough roads or by rapidly accelerating or braking. The fuel level float, moving up and down erratically by the motion of the fuel, may temporarily cause the fuel gauge to indicate incorrectly. These conditions should be considered before a fault is suspected in the indicating system. Abnormal indications are all variations of three basis malfunctions:

- pointer does not move
- pointer moves but indicates a fuel level that does not correspond with the actual fuel level in the fuel tank
- pointer moves to the top of the scale and remains there
- pointer pulsates

Refer to DARS Chart 1 for a systematic method of locating the causes of these abnormal conditions. Charts 2 and 3 provide additional procedures that should be used only as directed in Chart 1.

Oil Pressure Gauge Diagnosis

An oil pressure gauge malfunction can result in any one of the following conditions:

- pointer does not move
- pointer moves but indicates an oil pressure that does not correspond with the actual oil pressure
- pointer moves to the top of the scale and remains there
- pointer pulsates

Refer to the DARS Chart 4 for a systematic method of locating the causes of these abnormal conditions.

Calibration Test

If an oil pressure gauge is suspected of indicating pressure that does not correspond with the actual oil pressure, perform a calibration test before performing the electrical diagnosis procedures in DARS Chart 4.

Remove the oil pressure sending unit from the cylinder block. Install a T-fitting in the cylinder block. Connect the sending unit to the T-fitting.

Connect the oil pressure test gauge to the T-fitting.

Start the engine. Compare the pressure indicated on the vehicle gauge with that on the test gauge. Conduct the comparison at idle and at higher engine speeds. If both gauge indications are the same (within 10 percent), the vehicle gauge is acceptable. If the gauge is not within specification, perform the gauge test as outlined in DARS Chart 4.

After performing the test, remove the T-fitting, install the sending unit and inspect for oil leaks.

Coolant Temperature Gauge Diagnosis

Before performing a coolant temperature gauge diagnosis, ensure that the cooling system is functioning normally. Overheating can be caused by a low coolant level, restrictions, loose or broken drive belt(s), defective water pump or incorrect ignition timing. Undercooling can be caused by a stuck thermostat (in the open position). These conditions should be considered before suspecting an actual malfunction in the coolant temperature gauge system. A coolant temperature gauge malfunction can result in any one of the following conditions.

- pointer does not move
- pointer moves but indicates a coolant temperature that does not correspond with the actual coolant temperature
- pointer moves to the top of the scale and remains there
- pointer pulsates

Refer to DARS Chart 5 for a systematic method of locating the causes of these abnormal conditions. Charts 2 and 3 provide additional procedures that should be used only as directed in Chart 5.

Tachometer Diagnosis

Test the accuracy of a tachometer by comparing it with the rpm indications of a test tachometer of known accuracy. A service (TACH) terminal is located on the ignition coil connector for the test tachometer connection. Refer to Ignition Systems. Tachometers are not adjustable. Replace if inaccurate.

INSTRUMENT CLUSTER REPLACEMENT

Removal

Disconnect the battery negative cable.

Disconnect the speedometer cable from the speedometer.

Remove the four attaching nuts and pull the cluster from the mounting studs.

SEE I.S. NOTES

Note the positions of all the lamps. Note the wire colors for reference during installation.

Remove the gauge/meter wires and lamps.

Installation

SEE I.S. NOTES

Install the gauge and meter wires and lamps in the cluster.

Position the cluster on the mounting studs and install the attaching nuts.

Connect the speedometer cable.

Connect the battery negative cable.

Reset the clock, if equipped.

GAUGE AND METER REPLACEMENT

Fuel Gauge

Remove the cluster.

Carefully uncrimp the lip of the outer bezel. Remove the outer bezel, glass and glass retaining bezel.

Remove the attaching screws from the speedometer housing. Remove the speedometer and face plate assembly.

Remove the attaching nuts, insulator and fuel gauge.

NOTE: If may be necessary to carefully move the lamp guard aside.

Install the replacement fuel gauge, insulator and attaching nuts. Place the toothed lockwasher on the A-terminal. Ensure the gauge is properly centered in the face plate opening, then tighten the nuts.

Inspect all the lamp guards for correct position. Install the speedometer and face plate assembly. Install the attaching screws and washers.

Examine the glass for fingerprints and debris. Clean as necessary.

Install the glass, glass retaining bezel and outer bezel. Crimp the outer bezel lip in four places.

Install the cluster.

With the ignition switch on, observe the fuel gauge for proper operation.

Coolant Temperature Gauge

Remove the cluster.

Carefully uncrimp the lip of the outer bezel. Remove the outer bezel, glass and glass retaining bezel.

Remove the attaching screws from the speedometer housing. Remove the speedometer and face plate assembly.

Remove the attaching nuts and remove the insulator and coolant temperature gauge.

NOTE: It may be necessary to carefully move the lamp guard aside.

Install the replacement gauge, insulator and attaching nuts. Place the toothed lockwasher on

the S-terminal. Ensure the gauge is properly centered in the face plate opening, then tighten the nuts.

Inspect all the lamp guards for correct position. Install the speedometer and face plate assembly. Install the attaching screws and washers.

Examine the glass for fingerprints and debris. Clean as necessary.

Install the glass, glass retaining bezel and outer bezel. Crimp the outer bezel in four places.

Start the engine and observe the coolant temperature gauge for proper operation.

Voltmeter

Disconnect the illumination lamp and wire connectors. Note the wire locations for installation reference.

Remove the retaining nuts and bracket behind the instrument panel.

Remove the gauge from the instrument panel.

Position the replacement gauge in the instrument panel opening.

Install the bracket and nuts.

Connect the wires to their original locations and install the lamp.

Start the engine and observe the voltmeter for proper operation.

Oil Pressure Gauge

Remove the illumination lamp and disconnect the wire connectors.

Remove the retaining nuts and bracket behind the instrument panel.

Remove the gauge from the instrument panel.

Position the replacement gauge in the instrument panel opening.

Install the bracket and nuts.

Connect the wire connectors and install the lamp.

Start the engine and observe the oil pressure gauge for proper operation.

Tachometer

Disconnect the following wire connectors:

- black ground wire
- orange illumination lamp wire
- red and red with tracer wires

Remove the screw and retaining cup.

Remove the tachometer from the instrument panel.

SEE I.S. NOTES

NOTE: It is possible to start the engine with the tachometer removed. With a jumper wire, connect the harness wire connectors (that were originally connected to the tachometer) together.

Install the replacement tachometer, cup and screw.

Connect the wire connectors and ground wires.

Start the engine and observe the tachometer for proper operation.

SEE I.S. NOTES

Constant Voltage Regulator (CVR) Replacement

The CVR is contained in the fuel gauge housing. If the CVR is defective, replace the fuel gauge. Refer to Fuel Gauge Replacement.

DIAGNOSIS AND REPAIR SIMPLIFICATION (DARS) CHARTS

PROBLEM: FUEL GAUGE NOT FUNCTIONING PROPERLY

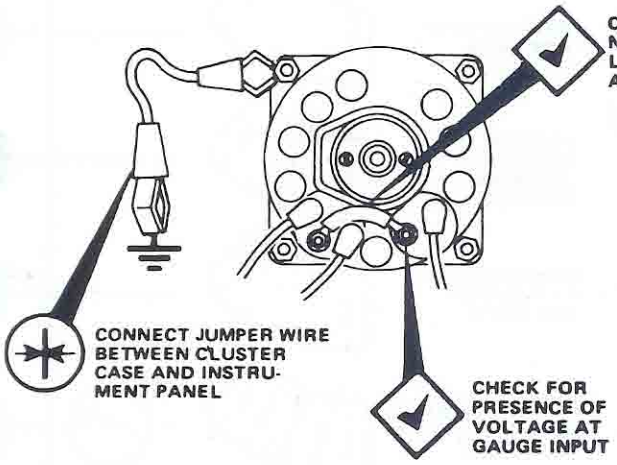
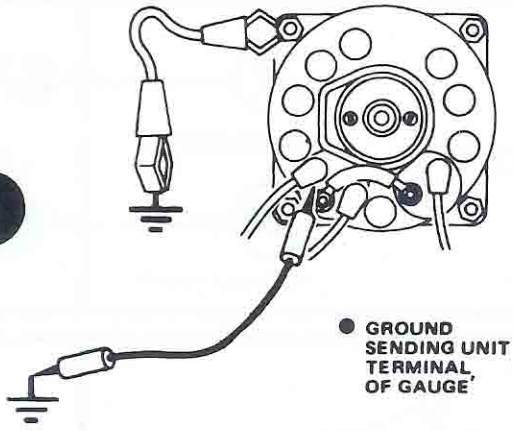
Chart 1

STEP	SEQUENCE	RESULT
1	● NOTE POSITION OF FUEL GAUGE POINTER ● TURN IGNITION SWITCH ON AND WAIT 2 MINUTES FOR GAUGE TO WARM UP ● OBSERVE POINTER BEFORE STARTING TEST: ENGINE MUST BE WARM FUEL TANK MUST BE NEITHER COMPLETELY FULL NOR COMPLETELY EMPTY POINTER DOES NOT MOVE POINTER MOVES TO INCORRECT POSITION POINTER MOVES TO MAXIMUM AND STAYS POINTER PULSATES MORE THAN WIDTH OF POINTER	2 17 9 REPLACE CVR STOP
2	CHECK 3-AMP FUSE AT FUSE PANEL FUSE BLOWN FUSE NOT BLOWN	GO TO CHART 2 STEP 1 3
3	OBSERVE TEMPERATURE GAUGE TEMPERATURE GAUGE POINTER DOES NOT MOVE TEMPERATURE GAUGE POINTER INDICATES PROPERLY	GO TO CHART 3 STEP 1 4

86377A

SEE I.S. NOTES

Chart 1

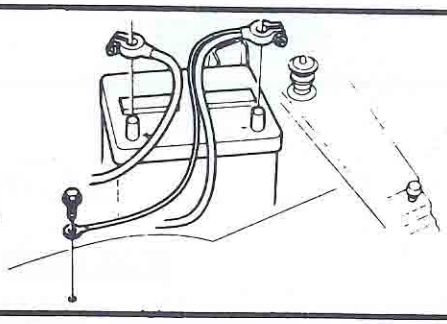
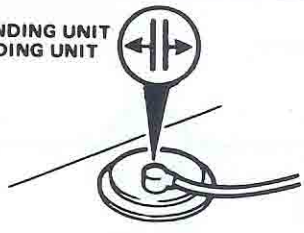
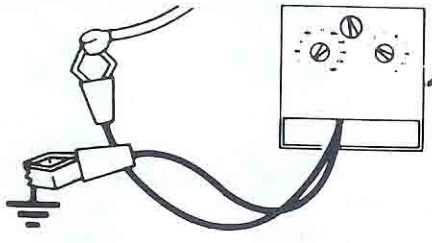
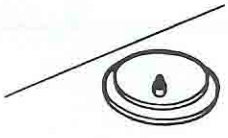
STEP	SEQUENCE	RESULT
SEE I.S. NOTES		
4	● REMOVE CLUSTER ● DO NOT DISCONNECT WIRES  CHECK GAUGE NUTS FOR LOOSENESS AND CORROSION CONNECT JUMPER WIRE BETWEEN CLUSTER CASE AND INSTRUMENT PANEL CHECK FOR PRESENCE OF VOLTAGE AT GAUGE INPUT OK → VOLTAGE NOT PRESENT → LOCATE AND REPAIR FAULT IN JUMPER STRAP → STOP OK → VOLTAGE PRESENT	5
5	 ● GROUND SENDING UNIT TERMINAL, OF GAUGE  POINTER MOVES  POINTER DOES NOT MOVE → REPLACE GAUGE → STOP	6
6	LOCATE AND REPAIR OPEN CIRCUIT IN SENDING UNIT WIRE	STOP

86377B

ELECTRICAL

ENGINE INSTRUMENTATION

Chart 1

STEP	SEQUENCE	RESULT
7	CHECK BATTERY GROUND CABLE ● BROKEN ● MISSING ● CORRODED ● SCREWS LOOSE, MISSING 	OK → GROUND NOT OK → 8 OK → GROUND OK → 9
8	REPAIR GROUND	POINTER DROPS FROM MAXIMUM → STOP POINTER REMAINS AT MAXIMUM → 9
9	DISCONNECT SENDING UNIT WIRE FROM SENDING UNIT 	POINTER DROPS FROM MAXIMUM → 10 POINTER REMAINS AT MAXIMUM
10	  CONNECT ONE TESTER LEAD TO GROUND AND ONE LEAD TO SENDING UNIT WIRE ● TURN IGNITION SWITCH ON ● ADJUST TESTER TO SELECT OHM VALUES LISTED IN SENDING UNIT RESISTANCE CHART. OBSERVE FUEL GAUGE INDICATION AT EACH OHM SETTING.	OK → GAUGE INDICATIONS NOT ACCURATE AT EACH OHM SETTING → 11 OK → GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING → 12

SEE I.S. NOTES

86377C

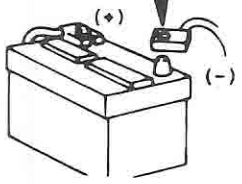
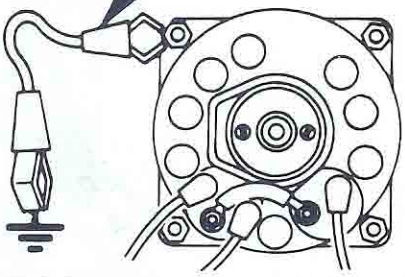
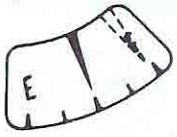
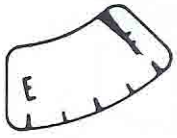
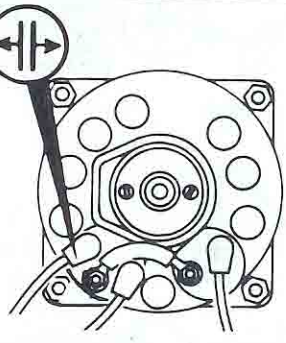
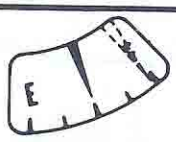
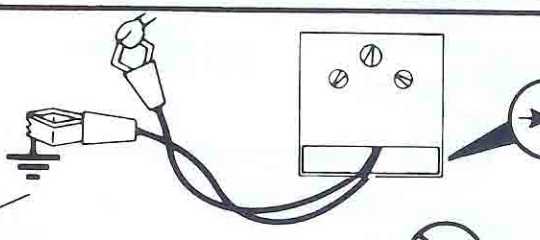
Chart 1

STEP	SEQUENCE	RESULT
11	● OBSERVE TEMPERATURE GAUGE TEMPERATUR GAUGE POINTER IS AT MAXIMUM → REPAIR CLUSTER GROUND OR REPLACE CVR → STOP TEMPERATURE GAUGE POINTER INDICATES NORMALLY → REPLACE FUEL GAUGE → STOP	
12	CHECK FUEL TANK FOR DEFORMATION OK → FUEL TANK NOT DEFORMED	13
	FUEL TANK DEFORMED → REPAIR OR REPLACE FUEL TANK	STOP
13	CHECK SENDING UNIT AND TANK FOR LOOSE SOLDER OK → NO LOOSE SOLDER → REPLACE SENDING UNIT	STOP
	LOOSE SOLDER PRESENT → REMOVE LOOSE SOLDER	STOP

SEE I.S. NOTES

86377D

Chart 1

STEP	SEQUENCE	RESULT
14	DISCONNECT BATTERY NEGATIVE CABLE  REMOVE INSTRUMENT CLUSTER. DO NOT DISCONNECT WIRE HARNESS CONNECT JUMPER WIRE BETWEEN CLUSTER GROUND AND BODY  CONNECT BATTERY NEGATIVE CABLE	 POINTER DROPS FROM MAXIMUM → 15  POINTER REMAINS AT MAXIMUM → 16
15	REPAIR INSTRUMENT PANEL GROUND	STOP
16	DISCONNECT SENDING UNIT WIRE FROM CLUSTER 	 POINTER DROPS FROM MAXIMUM → REPAIR OR REPLACE SENDING UNIT WIRE → STOP  POINTER REMAINS AT MAXIMUM → REPLACE GAUGE → STOP
17	 CONNECT ONE TESTER LEAD TO GROUND AND ONE LEAD TO SENDING UNIT WIRE  ● TURN IGNITION SWITCH ON ● ADJUST TESTER TO SELECT OHM VALUES LISTED IN SENDING UNIT RESISTANCE CHART. OBSERVE FUEL GAUGE INDICATION AT EACH OHM SETTING.	OK → GAUGE INDICATIONS NOT ACCURATE AT EACH OHM SETTING → 18 OK → GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING → REPLACE SENDING UNIT → STOP

SEE I.S. NOTES

86377E

SEE I.S. NOTES

Chart 1

STEP | SEQUENCE | RESULT

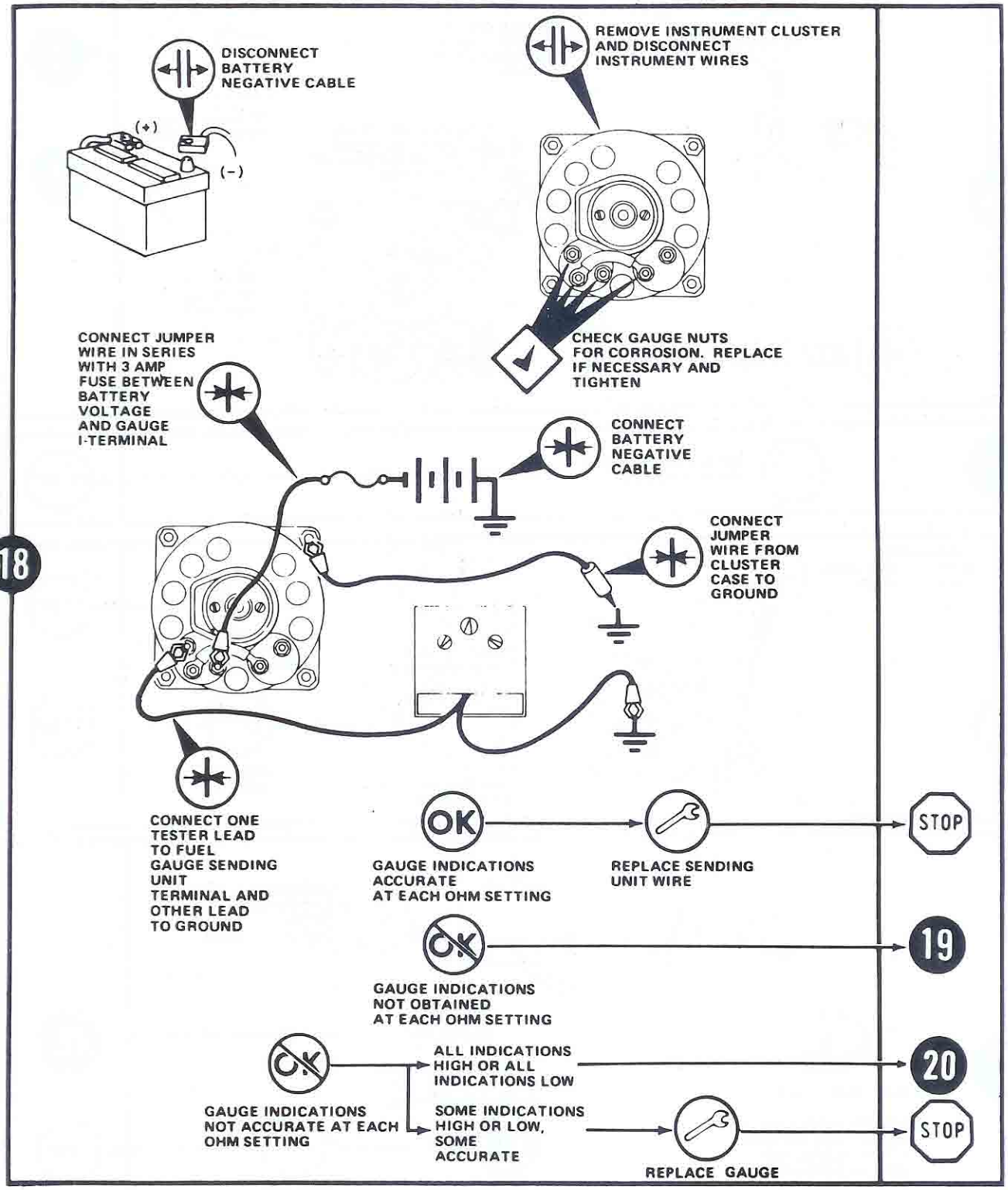


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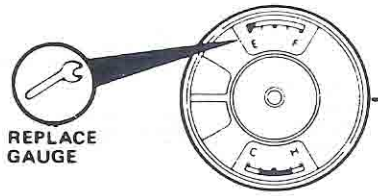
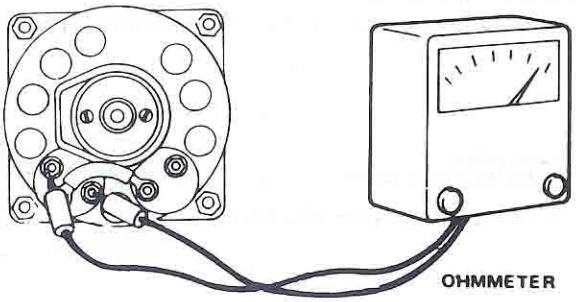
Chart 1

STEP	SEQUENCE	RESULT
19	 REPLACE GAUGE	STOP
20	 OHMMETER CONNECT OHMMETER LEADS TO GAUGE INPUT TERMINAL AND GAUGE SENDING UNIT TERMINAL ● COMPARE OHMMETER INDICATIONS WITH VALUES LISTED IN GAUGE RESISTANCE CHART OK — GAUGE RESISTANCE CORRECT → REPLACE CVR (INTEGRAL WITH FUEL GAUGE)	STOP
	OK — GAUGE RESISTANCE INCORRECT → REPLACE GAUGE	STOP

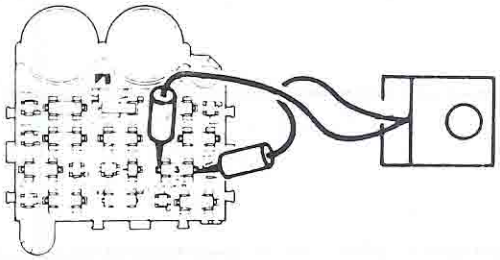
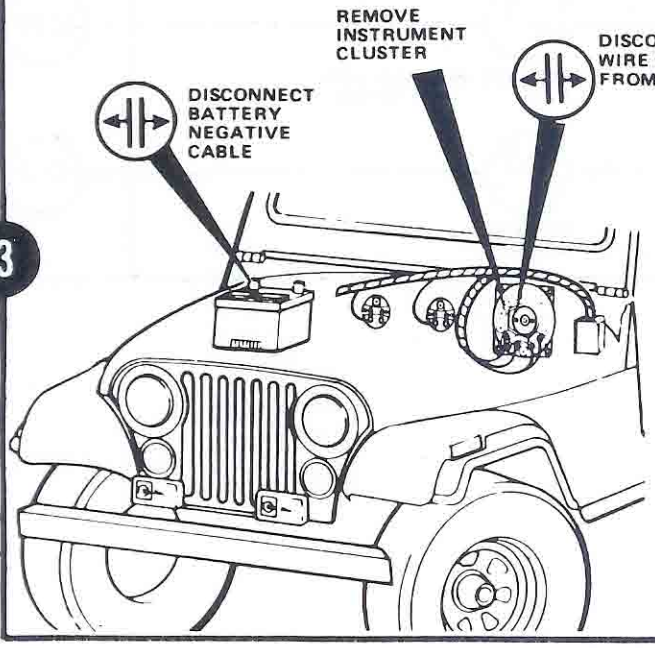
SEE I.S. NOTES

86377G

PROBLEM: GAUGE FUSE BLOWN

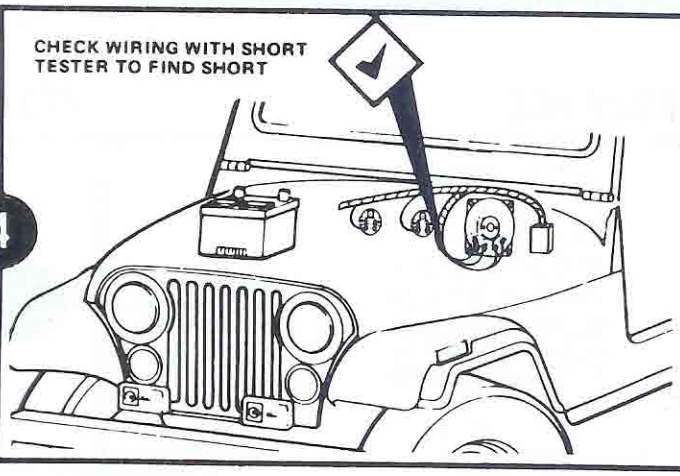
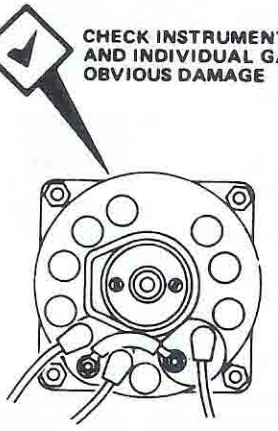
Chart 2

SEE I.S. NOTES

STEP	SEQUENCE	RESULT
1	 CONNECT SHORT TESTER J-8681 → OK: SHORT NOT INDICATED	2
	→ O.K.: SHORT INDICATED	3
2	CHECK FOR INTERMITTENT SHORT ● RED IGNITION WIRE TO GAUGES → O.K.: SHORT INDICATED → REPAIR AS NECESSARY	STOP
3	 REMOVE INSTRUMENT CLUSTER; DISCONNECT BATTERY NEGATIVE CABLE; DISCONNECT INSTRUMENT WIRE HARNESS CONNECTOR FROM GAUGES CHECK FOR SHORT AT GAUGE FUSE CONNECT BATTERY NEGATIVE CABLE → O.K.: SHORT INDICATED	5
	→ OK: SHORT NOT INDICATED	6

86378A

Chart 2

STEP	SEQUENCE	RESULT
4	CHECK WIRING WITH SHORT TESTER TO FIND SHORT  → REPLACE SHORTED WIRE HARNESS	STOP
5	CHECK INSTRUMENT CLUSTER AND INDIVIDUAL GAUGES FOR OBVIOUS DAMAGE  → OK: DAMAGE NOT EVIDENT → REPLACE CVR	STOP
	→ OK: DAMAGE EVIDENT → REPLACE DAMAGED COMPONENT	STOP

SEE I.S. NOTES

86378B

PROBLEM: FUEL GAUGE AND COOLANT TEMPERATURE GAUGE BOTH MALFUNCTION

Chart 3

SEE I.S. NOTES

STEP	SEQUENCE	RESULT
1	TURN IGNITION SWITCH ON CONNECT VOLTMETER TO INPUT SIDE OF 3-AMP GAUGE FUSE AND TO GROUND	RECORD VOLTMETER INDICATION → 2
2	DISCONNECT BATTERY NEGATIVE CABLE REMOVE INSTRUMENT CLUSTER DISCONNECT INSTRUMENT WIRE HARNESS CONNECTOR CONNECT VOLTMETER TO IGNITION WIRE TERMINAL IN INSTRUMENT WIRE HARNESS CONNECTOR AND TO GOOD GROUND CONNECT BATTERY NEGATIVE CABLE	● VOLTMETER INDICATION DIFFERENT FROM STEP 1 → 3 ● VOLTMETER INDICATION SAME AS STEP 1 → 4
3	REPAIR OR REPLACE INSTRUMENT PANEL WIRE HARNESS	STOP
4	REPLACE CVR (INTEGRAL WITH FUEL GAUGE)	STOP

86379A

PROBLEM: OIL PRESSURE GAUGE NOT FUNCTIONING PROPERLY

Chart 4

STEP	SEQUENCE	RESULT
1	● NOTE POSITION OF OIL PRESSURE GAUGE POINTER ● START ENGINE ● OBSERVE POINTER BEFORE STARTING TEST: OIL PAN MUST BE FILLED TO SPECIFICATION FUEL TANK MUST BE NEITHER COMPLETELY FULL NOR COMPLETELY EMPTY NOTE: Indicated Oil Pressure Observed from Driver's Seat	POINTER DOES NOT MOVE → 2 POINTER MOVES TO INCORRECT POSITION → 11 POINTER MOVES TO MAXIMUM AND STAYS → 6
2	● OBSERVE FUEL GAUGE	FUEL GAUGE POINTER DOES NOT MOVE → 3 FUEL GAUGE POINTER INDICATES PROPERLY → 4
3	CHECK 3-AMP FUSE AT FUSE PANEL	FUSE BLOWN → GO TO CHART 2 STEP 1 FUSE NOT BLOWN → LOCATE AND REPAIR FAULT IN IGNITION SWITCH-TO-GAUGE CIRCUIT → STOP

80314A

SEE I.S. NOTES

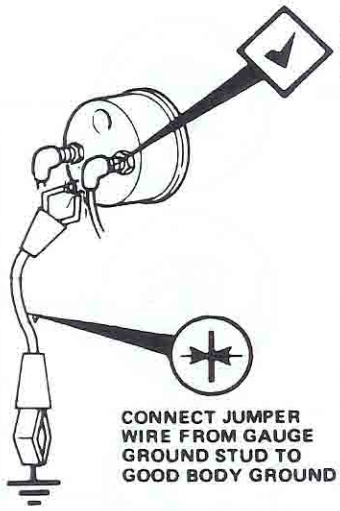
Chart 4

STEP | SEQUENCE | RESULT

SEE I.S. NOTES

4

- REMOVE OIL PRESSURE GAUGE
- DO NOT DISCONNECT GAUGE WIRES



CHECK FOR PRESENCE OF VOLTAGE AT GAUGE I-TERMINAL

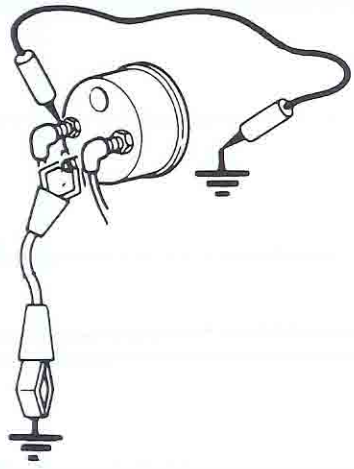
TURN IGNITION SWITCH ON

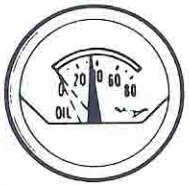
CONNECT JUMPER WIRE FROM GAUGE GROUND STUD TO GOOD BODY GROUND

VOLTAGE NOT PRESENT → OK → LOCATE AND REPAIR FAULT IN IGNITION SWITCH-TO-OIL PRESSURE GAUGE CIRCUIT → STOP

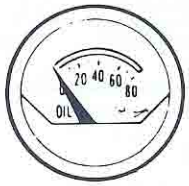
VOLTAGE PRESENT → OK → **5**

5





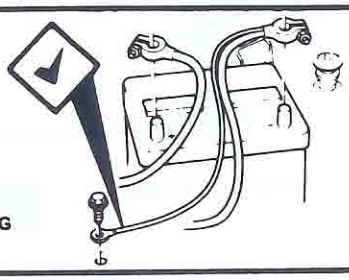
POINTER MOVES → LOCATE AND REPAIR OPEN IN SENDING UNIT CIRCUIT → STOP



POINTER DOES NOT MOVE → REPLACE GAUGE → STOP

6

CHECK BATTERY GROUND CABLE



- BROKEN
- MISSING
- CORRODED
- SCREW LOOSE, MISSING

OK → GROUND NOT OK → **7**

OK → GROUND OK → **8**

80314B

Chart 4

STEP	SEQUENCE	RESULT
7	REPAIR GROUND START ENGINE POINTER DROPS FROM MAXIMUM POINTER REMAINS AT MAXIMUM	STOP 8
8	DISCONNECT SENDING UNIT WIRE POINTER DROPS FROM MAXIMUM POINTER REMAINS AT MAXIMUM	9 10
9	CONNECT ONE TESTER LEAD TO GROUND AND ONE LEAD TO SENDING UNIT WIRE ● TURN IGNITION SWITCH ON ● ADJUST TESTER TO SELECT OHM VALUES LISTED IN SENDING UNIT RESISTANCE CHART. OBSERVE GAUGE INDICATION AT EACH OHM SETTING GAUGE INDICATIONS NOT ACCURATE AT EACH OHM SETTING → O.K → REPLACE GAUGE GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING → OK → REPLACE SENDING UNIT	STOP STOP

80314C

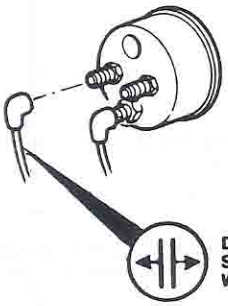
SEE I.S. NOTES

Chart 4

STEP | SEQUENCE | RESULT

SEE I.S. NOTES

10

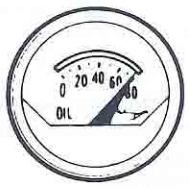


DISCONNECT SENDING UNIT WIRE FROM GAUGE

POINTER DROPS FROM MAXIMUM

REPLACE SENDING UNIT WIRE

STOP



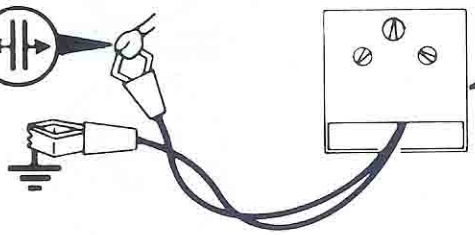
POINTER REMAINS AT MAXIMUM

REPLACE GAUGE

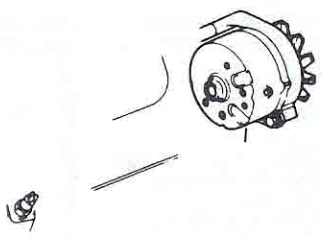
STOP

11

DISCONNECT SENDING UNIT WIRE



CONNECT ONE TESTER LEAD TO GROUND AND ONE LEAD TO SENDING UNIT WIRE



- TURN IGNITION SWITCH ON
- ADJUST TESTER TO SELECT OHM VALUES LISTED IN SENDING UNIT RESISTANCE CHART.

  OBSERVE GAUGE INDICATION AT EACH OHM SETTING.

OK

GAUGE INDICATIONS NOT ACCURATE AT EACH OHM SETTING

12

OK

GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING

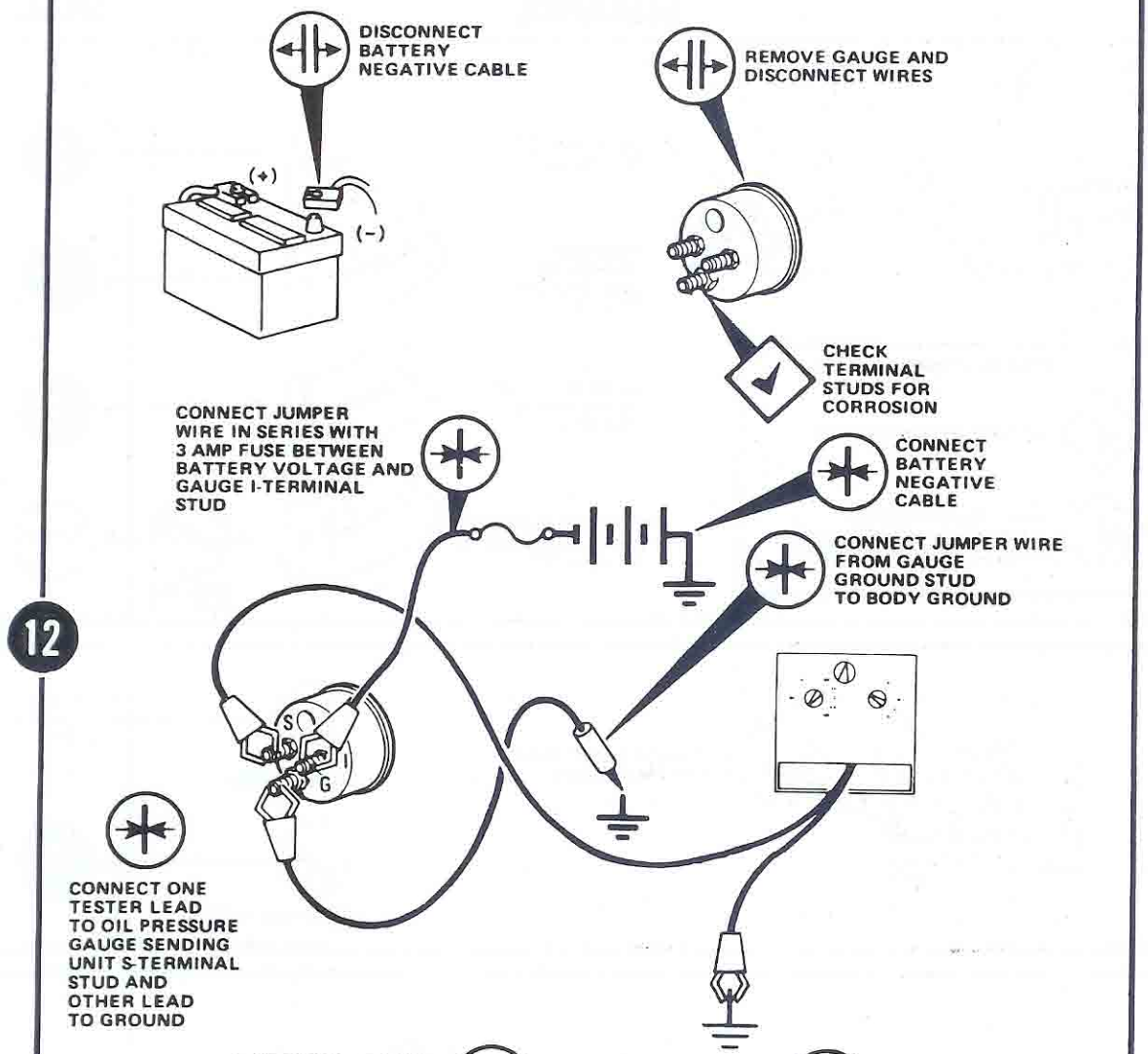
REPLACE SENDING UNIT

STOP

80314D

Chart 4

STEP	SEQUENCE	RESULT



80314E

SEE I.S. NOTES

PROBLEM: COOLANT TEMPERATURE GAUGE NOT FUNCTIONING PROPERLY

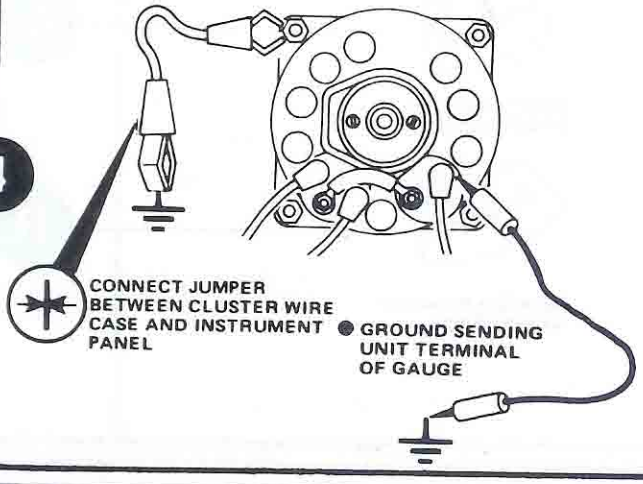
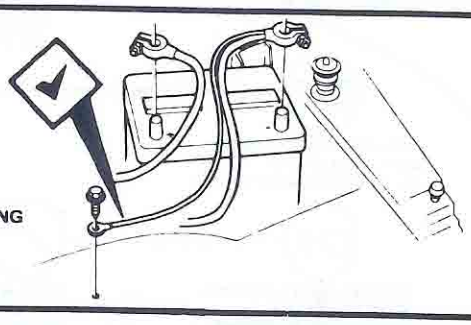
Chart 5

SEE I.S. NOTES

STEP	SEQUENCE	RESULT
1	● NOTE POSITION OF COOLANT TEMPERATURE GAUGE POINTER ● TURN IGNITION SWITCH ON AND WAIT 2 MINUTES FOR GAUGE TO WARM UP ● OBSERVE POINTER BEFORE STARTING TEST: ✓ ENGINE MUST BE WARM ✓ FUEL TANK MUST BE NEITHER COMPLETELY FULL NOR COMPLETELY EMPTY	POINTER DOES NOT MOVE → 2 POINTER MOVES TO INACCURATE POSITION → 14 POINTER MOVES TO MAXIMUM AND STAYS → 6 POINTER PULSATES MORE THAN WIDTH OF POINTER → REPLACE CVR → STOP
2	CHECK 3-AMP FUSE AT FUSE PANEL	FUSE BLOWN → GO TO CHART 2 STEP 1 FUSE NOT BLOWN → 3
3	● OBSERVE FUEL GAUGE	FUEL GAUGE POINTER DOES NOT MOVE → GO TO CHART 3 STEP 1 FUEL GAUGE POINTER INDICATES PROPERLY → 4

86380A

Chart 5

STEP	SEQUENCE	RESULT
4	● REMOVE CLUSTER ● DO NOT DISCONNECT INSTRUMENT WIRES  CONNECT JUMPER BETWEEN CLUSTER WIRE CASE AND INSTRUMENT PANEL ● GROUND SENDING UNIT TERMINAL OF GAUGE	 POINTER MOVES → 5  POINTER DOES NOT MOVE → REPLACE GAUGE → STOP
5	LOCATE AND REPAIR OPEN CIRCUIT IN SENDING UNIT WIRE	STOP
6	CHECK BATTERY GROUND CABLE  ● BROKEN ● MISSING ● CORRODED ● SCREWS LOOSE, MISSING	OK GROUND NOT OK → 7 OK GROUND OK → 8
7	REPAIR GROUND	POINTER DROPS FROM MAXIMUM → STOP POINTER REMAINS AT MAXIMUM → 8

SEE I.S. NOTES

86380B

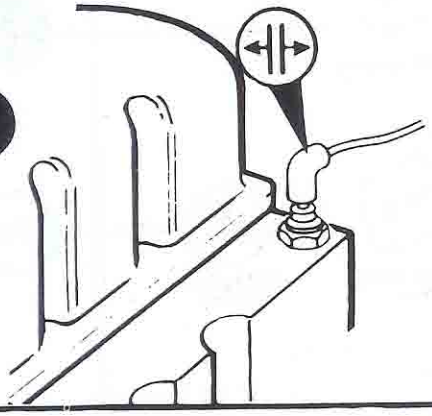
Chart 5

STEP | SEQUENCE | RESULT

SEE I.S. NOTES

8

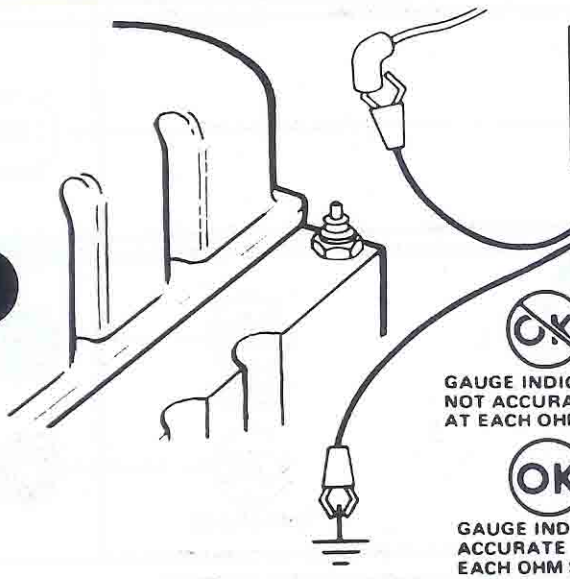
DISCONNECT SENDING UNIT WIRE FROM SENDING UNIT



POINTER DROPS FROM MAXIMUM → **9**

POINTER REMAINS AT MAXIMUM → **11**

9



CONNECT ONE TESTER LEAD TO GROUND AND ONE LEAD TO SENDING UNIT WIRE

- TURN IGNITION SWITCH ON
- ADJUST TESTER TO SELECT OHM VALUES LISTED IN SENDING UNIT RESISTANCE CHART. OBSERVE GAUGE INDICATION AT EACH OHM SETTING.

C.V. GAUGE INDICATIONS NOT ACCURATE AT EACH OHM SETTING → **10**

OK GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING → REPLACE SENDING UNIT → STOP

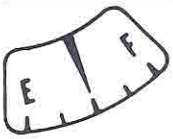
10

- OBSERVE FUEL GAUGE

FUEL GAUGE POINTER IS AT MAXIMUM

REPAIR CLUSTER GROUND OR REPLACE CVR (INTEGRAL WITH TEMPERATURE GAUGE) → STOP

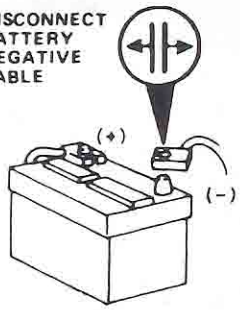
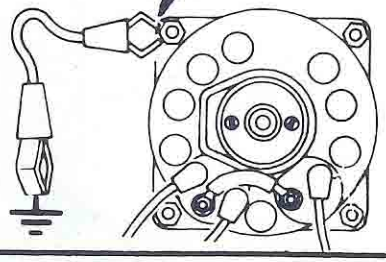
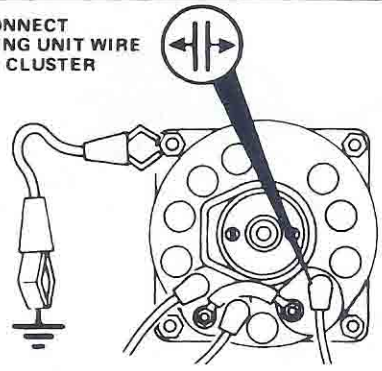
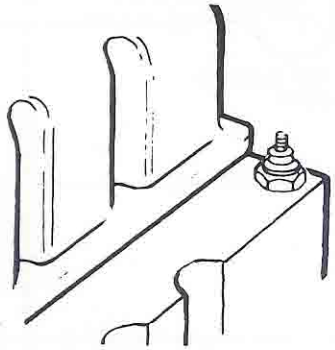
FUEL GAUGE POINTER INDICATES NORMALLY



REPLACE TEMPERATURE GAUGE → STOP

86380C

Chart 5

STEP	SEQUENCE	RESULT
11	DISCONNECT BATTERY NEGATIVE CABLE  REMOVE INSTRUMENT CLUSTER. DO NOT DISCONNECT WIRE HARNESS CONNECT BATTERY NEGATIVE CABLE POINTER DROPS FROM MAXIMUM → 12 CONNECT JUMPER WIRE BETWEEN CLUSTER GROUND AND BODY  POINTER REMAINS AT MAXIMUM → 13	
12	REPAIR INSTRUMENT PANEL GROUND	STOP
13	DISCONNECT SENDING UNIT WIRE FROM CLUSTER  POINTER DROPS FROM MAXIMUM → REPAIR OR REPLACE SENDING UNIT WIRE	STOP
	POINTER REMAINS AT MAXIMUM → REPLACE GAUGE	STOP
14	 CONNECT ONE TESTER LEAD TO GROUND AND ONE LEAD TO SENDING UNIT WIRE ● TURN IGNITION SWITCH ON ● ADJUST TESTER TO SELECT OHM VALUES LISTED IN SENDING UNIT RESISTANCE CHART. OBSERVE GAUGE INDICATION AT EACH OHM SETTING OK → GAUGE INDICATIONS NOT ACCURATE AT EACH OHM SETTING	15
	OK → GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING → REPLACE SENDING UNIT	STOP

SEE I.S. NOTES

Chart 5

STEP | SEQUENCE | RESULT

SEE I.S. NOTES

15

DISCONNECT BATTERY NEGATIVE CABLE

(+) (-)

REMOVE INSTRUMENT CLUSTER AND DISCONNECT INSTRUMENT WIRES

CHECK GAUGE NUTS FOR CORROSION. REPLACE IF NECESSARY AND TIGHTEN

CONNECT JUMPER WIRE IN SERIES, WITH 3 AMP FUSE AND FUEL GAUGE I-TERMINAL

CONNECT BATTERY NEGATIVE CABLE

CONNECT JUMPER WIRE FROM CLUSTER CASE TO GROUND

CONNECT ONE TESTER LEAD TO TEMPERATURE GAUGE SENDING UNIT TERMINAL AND OTHER LEAD TO GROUND

OK → GAUGE INDICATIONS ACCURATE AT EACH OHM SETTING → REPLACE SENDING UNIT WIRE → STOP

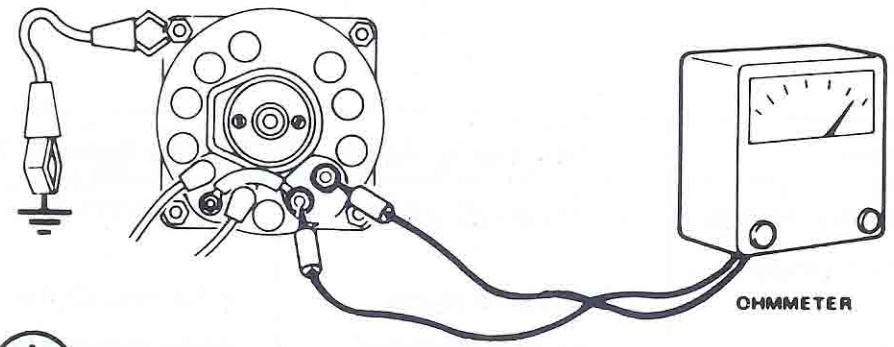
OK → GAUGE INDICATIONS NOT OBTAINED AT EACH OHM SETTING → 16

OK → GAUGE INDICATIONS NOT ACCURATF AT EACH OHM SETTING

- ALL INDICATIONS HIGH OR ALL INDICATIONS LOW → 17
- SOME INDICATIONS HIGH OR LOW, SOME ACCURATE → REPLACE GAUGE → STOP

86380E

Chart 5

STEP	SEQUENCE	RESULT
16	 REPLACE GAUGE	STOP
17	 CONNECT OHMMETER LEADS TO GAUGE INPUT TERMINAL AND GAUGE SENDING UNIT TERMINAL ● COMPARE OHMMETER RESISTANCE INDICATIONS WITH VALUES LISTED IN GAUGE RESISTANCE CHART OK — GAUGE RESISTANCE CORRECT → REPLACE CVR (INTEGRAL WITH TEMPERATURE GAUGE) → STOP OK — GAUGE RESISTANCE INCORRECT → REPLACE GAUGE → STOP	

SEE I.S. NOTES

86380F

SPECIAL TOOLS

Tool Ref.	Description	Required	Recommended
AMOT ET-502	Digital Multimeter		■
J-21008	Continuity Lamp		■
J-21232-01	Steering Wheel Puller		■
J-23653	Headlight Aimer		■
J-25300-01	Lock Plate Compressor	■	

SEE I.S. NOTES

TORQUE SPECIFICATIONS

Component	Service Set-To Torque	Service Recheck Torque
Directional Signal Switch Handle	3 N·m (25 in-lbs)	2-3 N·m (15-30 in-lbs)
Hazard Warning Knob Mounting Screws	1 N·m (5 in-lbs)	0.5-1 N·m (2-5 in-lbs)
Steering Wheel Nut	47 N·m (35 ft-lbs)	41-54 N·m (30-40 ft-lbs)

SPECIFICATIONS

EXTERIOR LIGHTING

	Number of Bulbs/Bulb Trade Number
Headlights	2/6014 or W6014
Front Parking and Turn Signal Lights	2/1157 NA*
Front Side Marker	2/194
Stop-Tail-Turn Signal	2/1157
Rear Side Marker	2/158
Back-Up Light	2/1156
Engine Compartment Light	1/105

*NA = Natural Amber

86389

INTERIOR LIGHTING

	Number of Bulbs/Bulb Trade Number
Dome Light	1/212
Courtesy Lights	2/89
Auto Trans Selector	1/1892
Instrument Cluster	4/53
Voltmeter & Oil Pressure	1/1895

86390

EXTERIOR LIGHTING

Headlamps

Replacement

Remove the attaching screw and pull the bezel out slightly at the bottom and push up to disengage the upper retaining tab.

Loosen the screws in the headlamp retaining ring; rotate the ring to disengage it from the screws.

Pull the headlamp out and disconnect the wire harness.

Install the replacement headlamp.

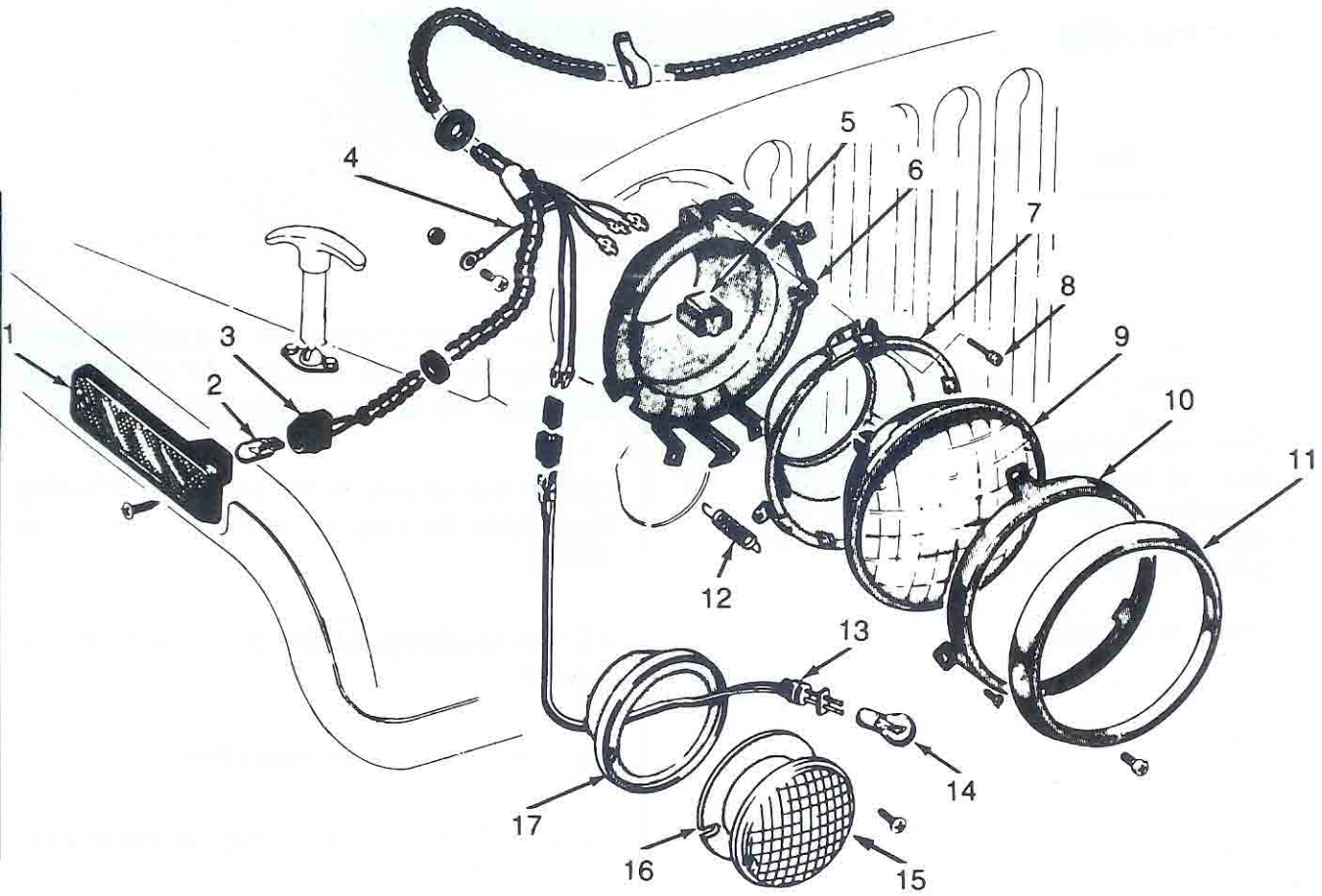
Install the retaining ring and tighten the screws.

Install the headlamp bezel and attaching screw.

Check the headlamp aim following the procedure outlined in this section.

SEE I.S. NOTES

SEE I.S. NOTES



1. Lamp
2. Bulb
3. Harness
4. Lighting Ground Wire
5. Terminal
6. Body
7. Shell
8. Adjusting Screw
9. Bulb
10. Retaining Ring
11. Door
12. Adjusting Spring
13. Harness
14. Bulb
15. Lens
16. Gasket
17. Housing

841289

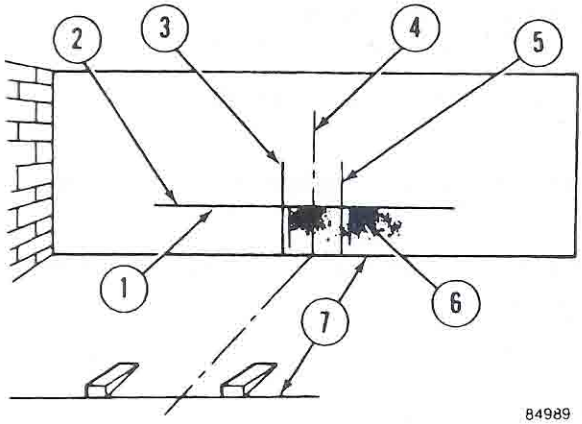
Headlamp Aiming Procedure

Lamps must be aimed on low beam. They may be aimed either with mechanical aimers or by using a screen. Use Headlight Aimer J-25300-01 following the instructions supplied with the equipment for proper aiming.

If a screen is to be used, preparation for aiming is as follows.

Locate the vehicle in a darkened area with a level floor and with the screen (wall) having a nonreflecting white surface.

Mark a reference line on the floor 7.5 meters (25 ft) away from and parallel to the screen.



1 HEIGHT OF LAMP CENTERS
2 HORIZONTAL TAPE
3 VERTICAL TAPE LEFT LAMP CENTER
4 VERTICAL CENTERLINE
5 VERTICAL TAPE RIGHT LAMP CENTER
6 ZONE OF GREATEST INTENSITY
7 25 FEET

Position the vehicle perpendicular to the screen and with the headlamps directly over the reference line.

Locate the middle tape on the screen so it is aligned with the centerline of the vehicle.

Equalize all tire pressures.

Rock the vehicle from side to side to equalize the springs and shock absorbers.

Measure the distance between the vehicle headlamp centers.

Position the marker tapes vertically on the screen to the right and left of the middle tape at half this distance.

Measure the distance from the center of each lamp to the surface on which the vehicle rests.

Position the marker tape horizontally on the screen to cross the vertical tapes at the measured height of each lamp center respectively.

Remove the headlamp bezels.

Clean the headlamps.

Turn the headlamps on LOW beam.

NOTE: Cover the lamp not being aimed.

SEE I.S. NOTES

Turn the vertical aiming screw (1) counterclockwise until the lamp beam is considerably lower than the horizontal reference line on the screen.

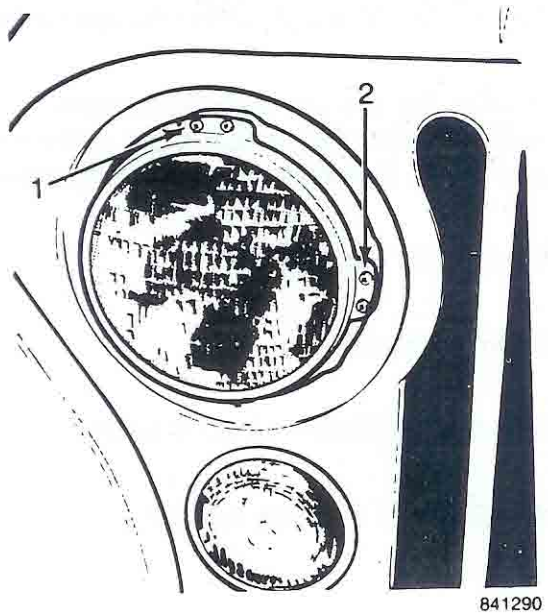
Turn the screw clockwise until the top edge of the high intensity area is even with the horizontal line.

SEE I.S. NOTES

Turn the horizontal aiming screw (2) counterclockwise until the beam is off the centering tape.

Turn the same screw clockwise until the left edge of the high intensity area is 10.2 cm (2 in) to the right of the lamp centerline.

Cover the lamp that has been aimed and aim the other lamp using the same procedure.



841290

Front Parking, Side Marker and Directional Lamps

Parking and Directional Bulb

Remove the lens attaching screws.

Remove the lens.

Replace the bulb.

Parking Lamp Assembly

Remove the lens attaching screws.

Remove the lens and gasket.

Remove the housing from the front panel.

Disconnect the wire connector from the harness.

Side Marker Bulbs

Reach under the fender and twist the socket a quarter turn counterclockwise to remove socket from the housing.

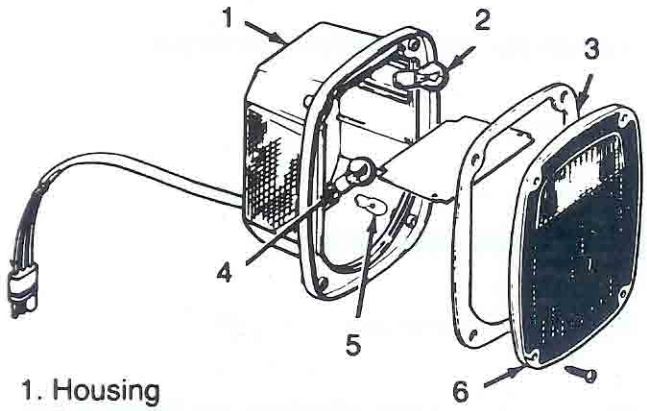
Replace the bulb.

Rear Directional, Side Marker, Stop and Taillamps

Taillamp Bulb Replacement

Remove the lens attaching screws, lens and gasket. Remove bulb and install a replacement

bulb. Clean the lens and reflector before installing.



1. Housing
2. Backup Lamp Bulb
3. Gasket
4. Tail-Stop Directional Lamp Bulb
5. Side Marker Lamp Bulb
6. Lens

841291

Taillamp Housing Replacement

Disconnect the wiring, remove the taillamp lens, and remove the screws attaching the taillamp assembly body and remove.

Side Marker Bulb Replacement

Remove the lens attaching screws, lens and gasket. Clean the lens and reflector before installing.

Pull the side marker bulb straight out of the socket.

To install the new bulb, push straight into the socket.

Position the lens gasket and lens and install the screws.

Back Up Lamp

To replace the bulb remove the taillamp lens.

Remove old bulb and install new bulb.

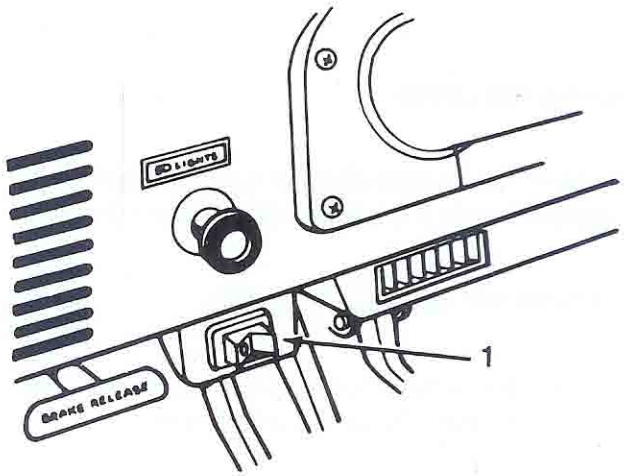
License Plate Lamp

The left taillamp illuminates the license plate.

Fog Lamps

The switch (1) is located on the far left side of the instrument panel.

NOTE: Fog lamps are turned off by the circuit relay when the high beam driving lamps are turned on. The circuit relay is located on the right front wheelhouse panel near the blower motor.



841262

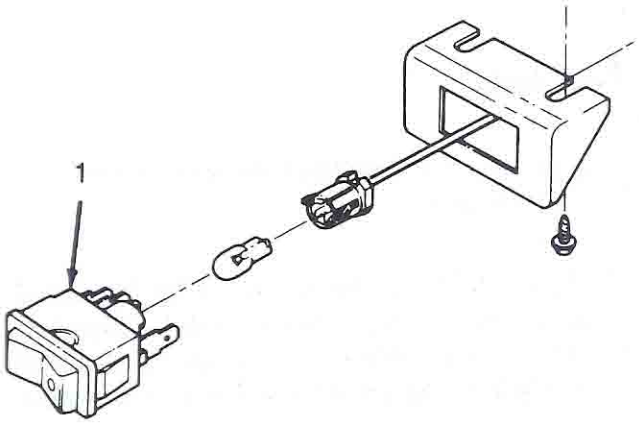
SEE I.S. NOTES

SEE I.S. NOTES

Switch Replacement

Remove the switch (1) from the instrument panel and disconnect the electrical harness.

Connect the harness to the replacement switch and install the switch in the instrument panel.



841264

Aiming Fog Lamps

Position the vehicle on a flat surface, facing and approximately 7.5 meters (25 ft) from the wall.

Remove the lamp stone shields.

Loosen the lamp attaching hardware. Turn the headlamp and fog lamp switches on.

Adjust the lamp beams as follows:

- the horizontal distance between the light beams on the wall should be the same size as the distance between the lamps on the front bumper
- the vertical height of the light beams on the wall should be 10.2 (4 in) less than the height of the lamps on the front bumper

Tighten the lamp attaching hardware.

Install the lamp stone shields.

Lamp Element Replacement

Remove the lamp stone shields.

Remove the screws attaching the bezel to the lamp body. Remove the bezel from the lamp body.

Remove the lens and reflector assembly from the lamp body.

Remove the bulb holder from the lens and reflector assembly.

Remove the lamp element from the bulb holder .

CAUTION: Always handle new elements with a clean cloth. Do not handle quartz elements with your bare hands as body oil residue on the glass will cause the element to fail immediately after ignition.

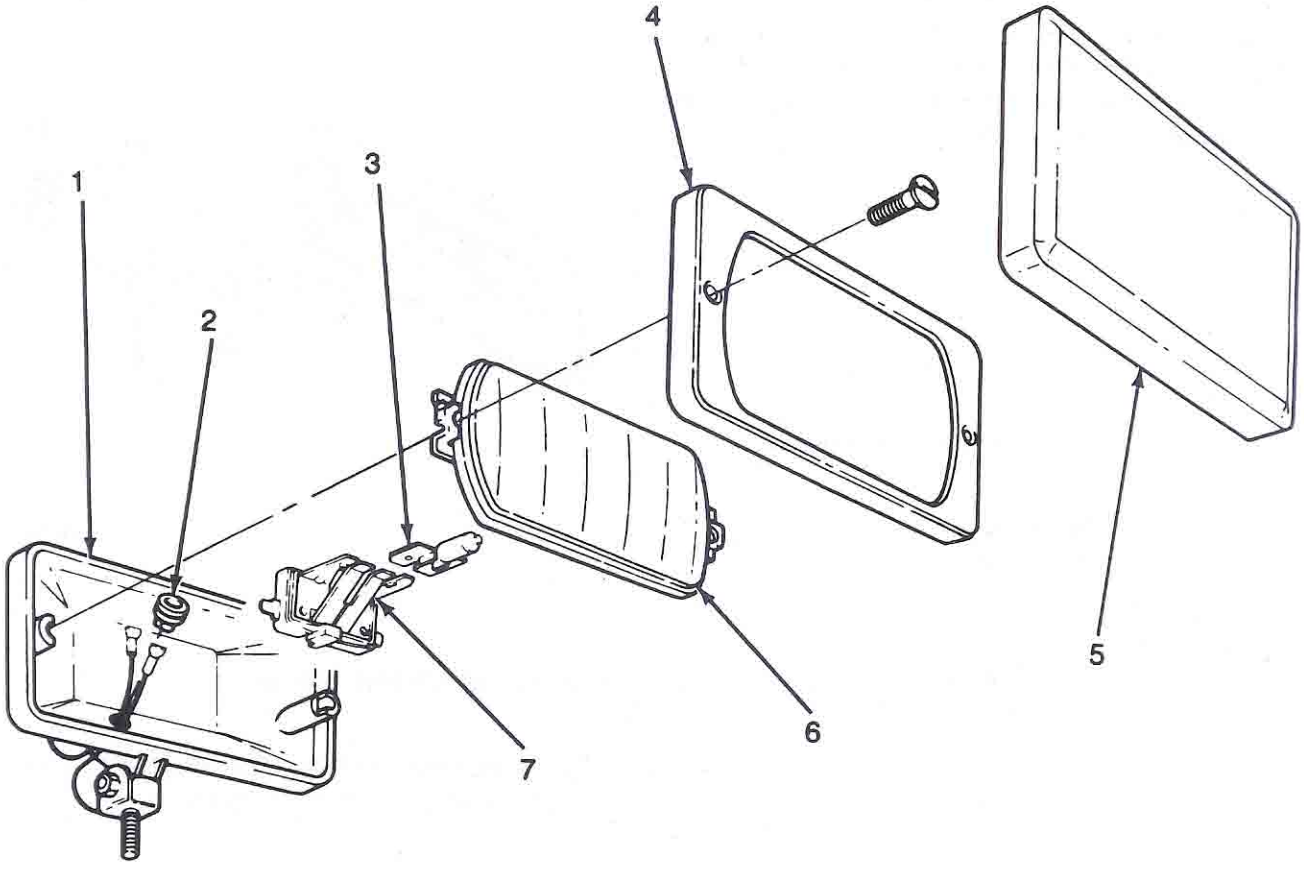
Install the replacement lamp element.

Install the bulb holder in the lens and reflector assembly.

Position the lens and reflector assembly in the lamp body with the top of the lens at the top of the lamp body.

Position the bezel on the lamp body and install the attaching screws.

Install the stone shield on the lamp.



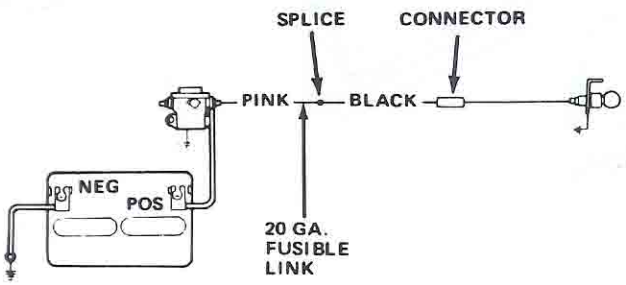
1. Body
2. Grommet
3. Element
4. Bezel
5. Stone Shield
6. Lens and Reflector
7. Bulb Holder

841263

SEE I.S. NOTES

Engine Compartment Lamp

This optional lamp obtains current at the battery terminal of the starter solenoid. A single wire incorporating a fusible link for protection passes current to the lamp assembly. The lamp assembly has a mercury switch which completes the circuit through the hood assembly when the hood is open. When the hood is closed, the mercury within the lamp assembly opens the circuit and the lamp does not light.



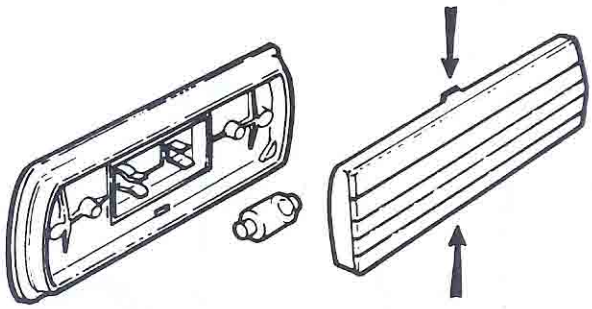
60426

INTERIOR LIGHTING SYSTEMS

Courtesy Lamps/Dome Lamps

CJ and Scrambler models equipped with a hardtop have a dome lamp located above the liftgate. When removing the hardtop, disconnect the wire connector located on the left C-pillar. On the CJ-7 limited model, the dome lamp and courtesy lamps are operated by door pillar switches. On all other models, the lamp is operated by turning the headlamp switch knob counterclockwise to the stop.

The dome lamp lens can be removed by squeezing the lens together to disengage the retaining tabs. The dome lamp assembly can be removed after removing the attaching screws.



841265

Instrument Cluster Lamps

The instrument cluster lamps are covered under Engine Instrumentation section.

SWITCHES

Headlamp Switch

Replacement

Disconnect the harness connector plug (1) from the switch.

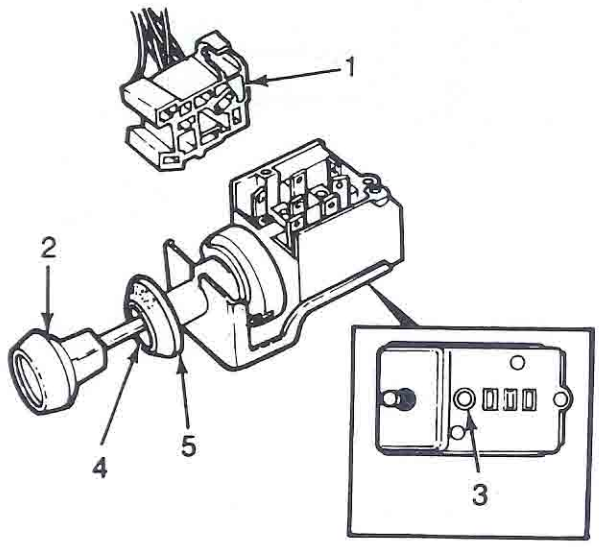
Pull the control knob (2) out to the second position.

From behind the instrument panel, depress the knob release button (3) and pull the knob out of the switch.

Remove the retaining nut (4) and chrome bezel (5).

Remove the switch through the rear of the instrument panel.

When installing the switch, make sure the harness connector plug on the switch is secure.



841254

Dimmer Switch

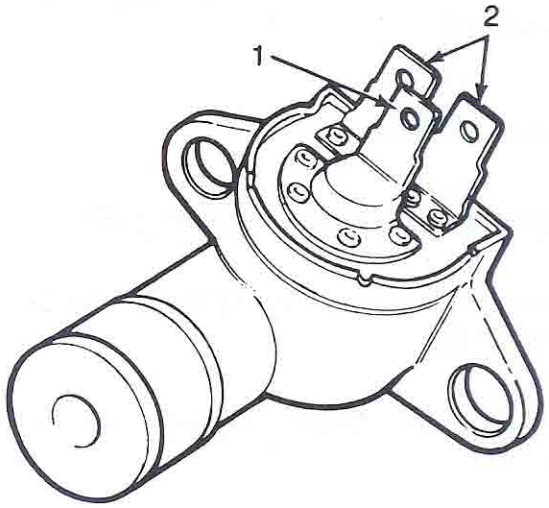
Replacement

Remove the harness plug from the switch.

Remove the screws attaching the dimmer switch to the floorboard.

Remove the switch.

Check the operation of the dimmer switch with Continuity Lamp J-21008. Connect one continuity lamp lead to the switch input terminal (1). Probe each output terminal (2) with the other continuity lamp lead. The current flow should alternate from one output terminal to the other as the switch is operated.



841255

Directional Signal Switch

The most frequent causes of failure in the directional signal system are loose connections and burned out bulbs. A flashing rate approximately twice the normal rate usually indicates a shorted bulb is in the circuit.

If a three-lamp flasher is installed in a vehicle having only two lamp bulbs per side, the lamps will light but will not flash. If a two-lamp flasher is used on a vehicle having three lamps, the higher current draw will cause the lamps to flash too fast.

If there is no signal at any front, rear or indicator lamp, check the fuse.

SEE I.S. NOTES

If the fuse checks okay, substitute a known good flasher. If a new flasher does not cure the problem, check the signal system wiring connections at the fuse and at the steering column connector.

NOTE: If the brake stoplamps function properly, the rear signal bulbs are okay.

The directional flasher is mounted directly to the fuse panel.

SEE I.S. NOTES

Switch Removal

Disconnect the battery negative cable.

Remove the horn center button by pulling straight out.

Remove the screws, bushing, receiver and spring.

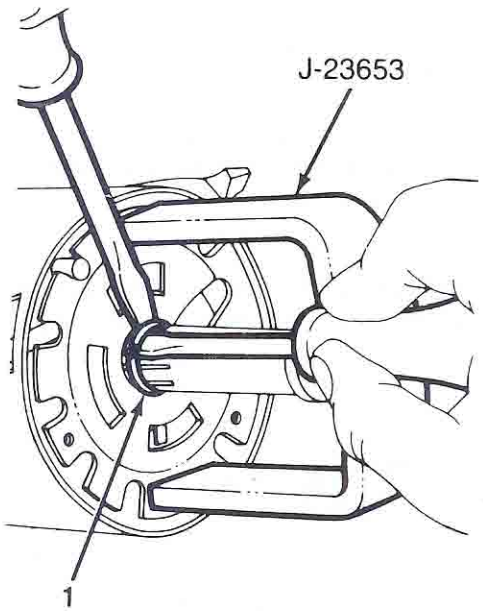
Remove the steering wheel nut. Note the alignment of the steering wheel to the steering shaft index marks for later installation.

Remove the steering wheel with Steering Wheel Puller J-21232-01.

Lift the lock plate cover.

Use Lock Plate Compressor Tool J-23653 to depress the lock plate.

Pry the round wire snap ring (1) from the steering shaft groove.



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Remove the lock plate compressor tool, snap ring, lock plate, directional signal canceling cam, upper bearing preload spring and thrust washer from the steering shaft.

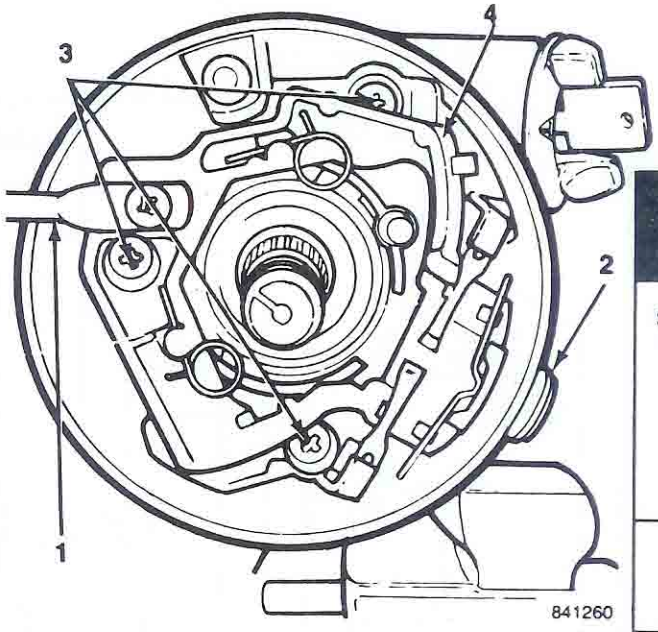
Place the directional signal actuating lever (1) in the right turn position and remove the lever retaining screw.

Depress the hazard warning light switch (2), located on the right side of the column adjacent to the key lock, and remove the button by turning in a counterclockwise direction.

Remove the directional signal wire harness connector block from its mounting bracket on the right side of the lower column.

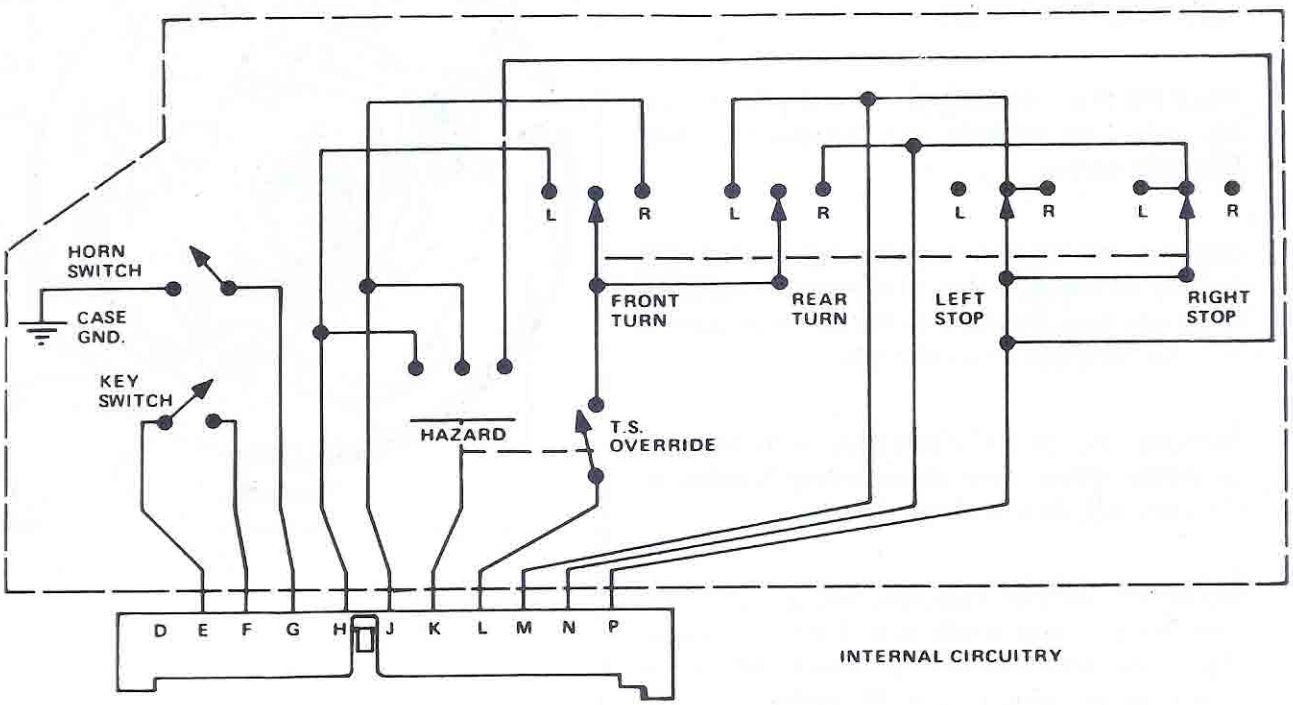
NOTE: On vehicles equipped with an automatic transmission, use a stiff wire, such as a paper clip, to depress the lock tab which retains the shift quadrant lamp wire in the connector block.

Remove the directional signal switch retaining screws (3) and pull the directional signal switch (4) and wire harness from the column.



SEE I.S. NOTES

SEE I.S. NOTES



INTERNAL CIRCUITRY

70465

Switch Installation

Guide the wire harness into position and carefully align the switch assembly.

NOTE: Assure that the actuating lever pivot is correctly aligned and seated in the upper housing pivot boss prior to installing the retaining screws.

Install the directional signal lever and actuate the directional signal switch to assure correct operation.

Place the thrust washer, spring, and directional signal canceling cam on the upper end of the steering shaft.

Align the lock plate splines with the steering shaft splines and place the lock plate in position with the directional signal canceling cam shaft protruding through the dogleg opening in the lock plate.

Install the snap ring.

Install the lock plate cover.

Install the steering wheel. Align the mark on the steering wheel with the previously noted mark on the housing.

Install the washer and nut. Tighten the nut with the specified torque.

Install the spring. The raised side of the spring must be up.

Install the receiver and bushing. The receiver must be free to move after the bushing screws are tightened.

Line up the notch on the receiver with the nib on the horn button. Push the button in until it snaps into place.

Backup Lamp Switch

Switch Adjustment and Replacement – Manual Transmission

The backup lamp switch is threaded into the right rear corner of the transmission cover housing. The backup lamp switch is actuated by the reverse shift rail.

The backup lamp switch is not serviceable or adjustable and must be replaced as a unit.

NOTE: Jumper wires are used at the neutral safety switch connector and the automatic transmission backup lamp switch connector to complete the circuit on vehicles equipped with manual transmission.

Switch Adjustment and Replacement – Automatic Transmission

A combination backup and neutral safety switch is mounted on the steering column. This switch is adjustable. If defective, the switch must be replaced.

To adjust the backup lamp switch, place the transmission shift lever in the R position. Loosen (do not remove) the two switch attaching screws. Turn the ignition switch to the ON position. Rotate the switch one direction or the other until the backup lamps operate. Tighten the attaching screws. Check the switch for an engine start in the N and P positions. The engine must not start in the R, D, 2 or 1 position.

SEE I.S. NOTES

As an aid to adjusting the backup lamp switch, install a test lamp to the lamp side of the switch and ground one side of a test lamp. When the test lamp lights, the backup lamps are operating.

SEE I.S. NOTES

Four-Way Emergency Flasher (Hazard Warning)

The four-way emergency flasher switch is a part of the directional signal switch.

To operate the system, push in on the switch button.

The four-way flasher can only be canceled by pulling out on the flasher switch knob.

Refer to Directional Signal Switch for the four-way flasher switch removal or replacement procedure.

The battery feed for the four-way flasher system is in the fuse panel.

Stoplamp Switch

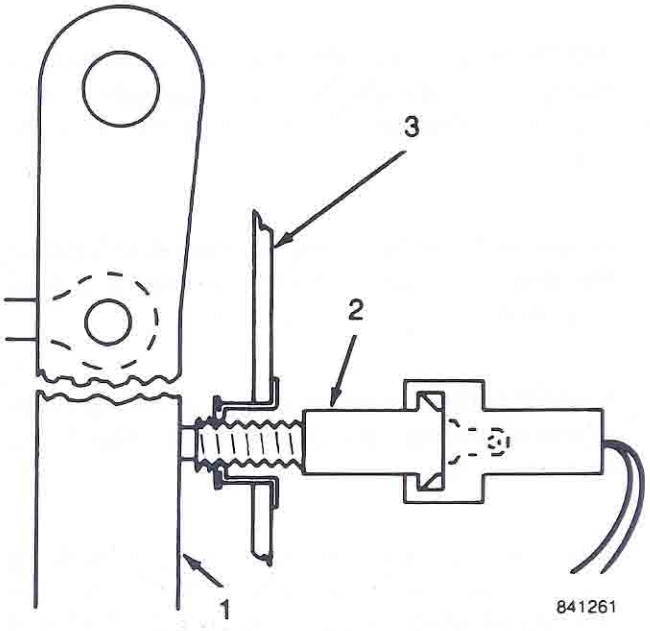
Adjustment

Depress the brake pedal (1) and hold in the depressed position.

Push the stoplamp switch (2) completely into the mounting bracket (3) until the switch bottoms.

Release the brake pedal and allow it to return to the undepressed position. The brake pedal will push the switch to the properly adjusted position.

Check the switch operation. The stoplamps should operate after 9.53 - 15.88 mm (3/8 - 5/8 in) of pedal travel.



Stoplamp Switch Electrical Test

This test requires a voltmeter.

Ground one lead of the voltmeter.

Probe each connection of the stoplamp switch with the other lead of the voltmeter.

- with the switch plunger depressed (brake not applied), one switch connector should indicate voltage and the other should not
- with the switch plunger released (brake applied), both switch leads should show voltage

SPECIAL TOOLS

Tool Ref.	Description	Required	Recommended
J-21008	Continuity Lamp		■

WIRING HARNESS COMPONENTS

Main Harness Connector

All models have a main wiring harness connector located at the left upper corner of the dash panel. This connector is made up of the engine and forward lamp harness at the engine compartment and the fuse and instrument panel harness at the passenger compartment side.

The connector can be removed from the dash panel by removing the center bolt from the engine compartment side and the two attaching screws from the driver's side. Be careful not to bend the male spade terminals when removing or installing the connector. The center of the connector is filled with a non-conductive grease to prevent corrosion of the terminals. If any wires are replaced on the engine compartment side, the terminal opening must be resealed with a durable waterproof sealer. Do not use string-type body caulk as a sealer.

Fusible Links

Fusible links are harness wires covered with a special non-flammable insulation. The links protect circuits which are not normally fused due to carrying high amperage loads or because of their location in the chassis.

They are used to prevent major harness damage in the event a short circuit, short to ground or overload condition occurs.

CJ and Scrambler models are equipped with fusible links, located in the engine compartment.

Each link is of a fixed value for the specific load. Replacement links are listed in the parts catalog.

NOTE: Failure of a fusible link is often caused by a grounded circuit; therefore, the cause of the failure must be determined prior to installing a new link.

Fusible Link Replacement

Disconnect the battery negative cable.

Follow one end of the link to the terminal end. Follow the remaining end to the wire harness.

Remove the harness tape approximately 5 cm (2 in) from where the link enters the harness; the soldered splice will be visible.

Determine which circuit(s) may have caused the failure. Test the circuit(s) using an ohmmeter or test light until the ground condition is located and corrected.

Unsolder the link from the harness; solder the replacement link to the harness wire(s).

NOTE: The solder joint MUST be made with rosin core solder only. DO NOT use acid or acid core solder. Protect the harness wires from damage when soldering.

SEE I.S. NOTES

Tape the harness using plastic electrical tape.

Route the wire as originally installed and make the connection.

Connect the battery negative cable and check the operation of the circuit(s) involved.

SEE I.S. NOTES

IGNITION SWITCH

The ignition switch is mounted on the steering column and is connected to the key lock assembly by a remote lock rod.

Removal

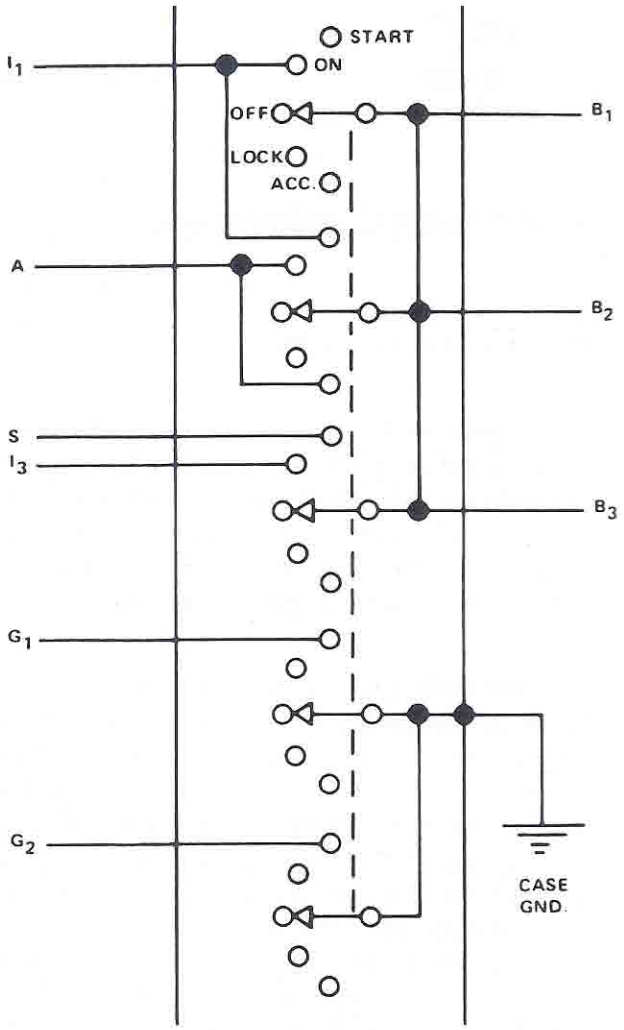
Place the key lock in the OFF – LOCK position and remove the two switch attaching screws.

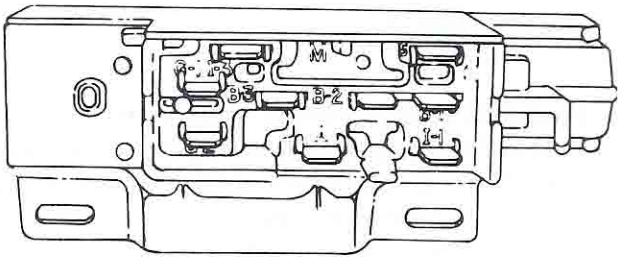
Disconnect the switch from the remote rod.

Disconnect the harness connector and remove the switch from the steering column.

Testing

The ignition switch terminals are shown in the illustration.





60140

To test the ignition switch circuitry and continuity, place the slide bar in the position to be tested and use either an ohmmeter or Continuity Light J-21008.

The ignition switch slide bar positions can be easily identified by first locating the alignment hole located in the flat portion of the switch adjacent to the terminals. Starting from the alignment hole end of the switch, the switch positions are: ACCESSORY, OFF – LOCK, OFF, ON and START. Each position has a detent stop except START which is spring loaded to release when the key is released.

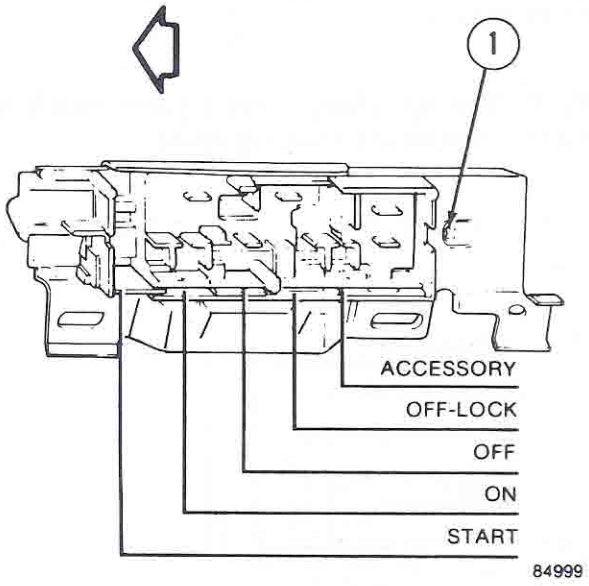
No electrical resistance should be indicated (test lamp on) between two connected terminals. The maximum voltage drop between any two connected terminals should not exceed 12.5 millivolts per amp. For example: If a 10-amp load is drawn through the switch, the maximum voltage drop should be 10 x 0.0125 or 0.125 volt.

Installation – Standard Column

Move the slider to the extreme left (ACCESSORY position).

NOTE: The left side of the ignition switch is toward the steering wheel.

Position the actuator rod in the slider hole (1) and install the switch to the steering column, being careful not to move the slider out of the detent.



Hold the key in the ACCESSORY position and push the switch down the column slightly to remove slack in the actuator rod.

Tighten the attaching screws securely.

Connect the white connector and then the black connector to the switch.

Install the steering tube cover.

Installation – Tilt Column

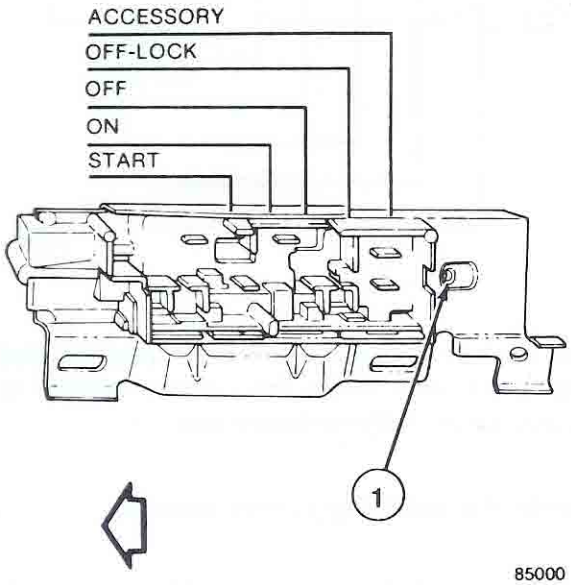
With the actuator rod disconnected, position the switch as shown in the illustration.

SEE I.S. NOTES

Move the slider to the extreme right (ACCESSORY position).

NOTE: The right side of the ignition switch is downward from the steering wheel.

Position the actuator rod in the slider hole (1).



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Install the switch to the steering column but do not tighten the attaching screws.

Lightly push the switch down the column (away from the steering wheel) to remove the lash in the actuator rod, while holding the key in the ACCESSORY position. Be careful not to move the slider out of the detent.

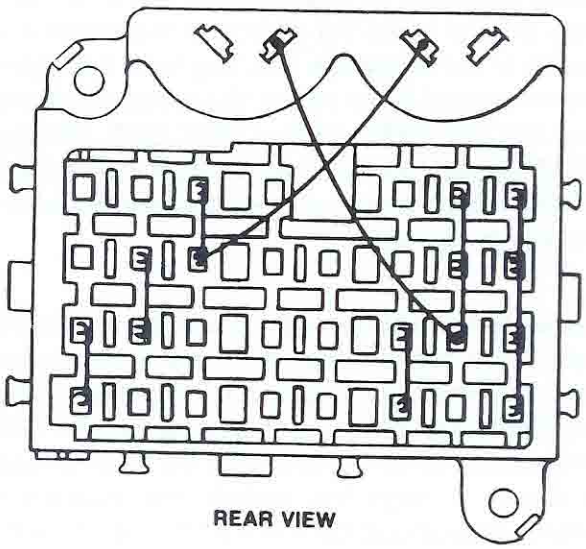
Tighten the attaching screws securely.

Connect the white connector and then the black connector to the ignition switch.

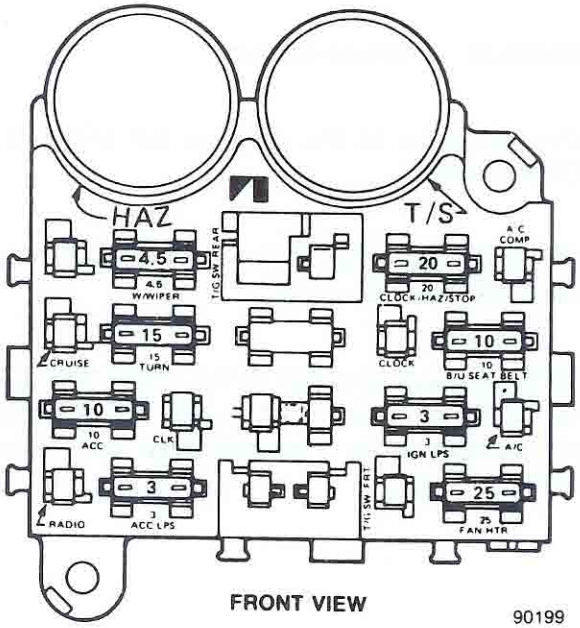
Install the steering tube cover, if removed.

FUSE PANEL

The fuse panel is located on the passenger compartment side of the dash panel, attached to the main harness connector.



REAR VIEW



FRONT VIEW

90199

CIRCUIT BREAKERS

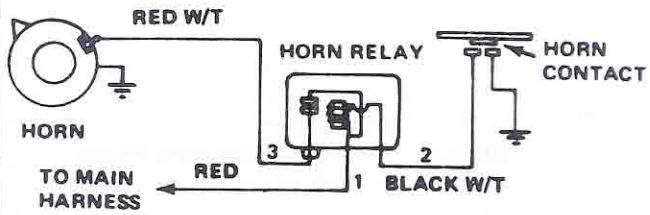
Headlamps are protected by a 24-amp circuit breaker located in the headlamp switch.

GENERAL

The horn circuit includes the horn(s), horn relay, battery, steering column wiring harness, horn ring, and the body sheet metal.

CJ and Scrambler horns are located on the inner left wheelhouse.

NOTE: A cadmium-plated ground screw is used to attach the horn(s) to the body. Do not substitute other types of ground screws as they may become corroded and cause a loss of ground.



80264

SEE I.S. NOTES

SPECIAL TOOLS

Tool Ref.	Description	Required	Recommended
J-21008	Continuity Lamp		■

TORQUE SPECIFICATIONS

Component	Service Set-To Torque	Service Recheck Torque
Horn Bracket Screw	20 N·m (15 ft-lbs)	11-23 N·m (8-17 ft-lbs)

SPECIFICATIONS

Item	Current Flow
Horn	4-5 Amps

70446

SEE I.S. NOTES

DIAGNOSIS AND REPAIR

In case of horn system failure, proceed as follows.

Using a test light or voltmeter, check for battery voltage in the red lead to relay before the individual components are tested or replaced.

A lack of voltage indicates that the fusible link or harness is open and the cause of the failure must be determined and repaired prior to installing a replacement fusible link or other components.

The replacement fusible link is supplied in the proper length with a terminal connector on one end.

Inspect the wiring between the horn, relay and battery for loose connections, faulty insulation, corroded terminals, or an improper ground connection at the horn base.

NOTE: Be sure the clip on the horn assembly bracket cuts through the inner wheelhouse to ensure a good ground.

If the horn does not operate when the ring or button is depressed, ground the No. 2 terminal of the horn relay with a jumper lead. If the horn operates, this indicates proper operation of the horn and relay.

Inspect the horn ring switch and the wire from the switch to relay carefully for the source of the trouble.

CAUTION: Do not ground the red lead.

If the horn does not operate, ground the No. 2 terminal and connect a jumper lead from the horn relay terminals 1 to 3.

If the horn now operates, a faulty horn relay is indicated.

If it does not operate, check the wiring and connections between the horn relay terminal No. 3 and the horn for continuity.

Connect a jumper lead from the horn base to the vehicle chassis or engine and repeat the above tests.

If the horn now operates, remove the attaching screw, horn and mounting bracket; clean the mating surfaces.

Install the horn, mounting bracket and attaching screw; tighten the screw with 20 N·m (15 ft-lbs) torque.

If the horn still does not operate, the horn is inoperative and must be replaced.

To check for a bad component ground, place a voltmeter between the component and the ground. If a sizeable voltage is shown on the meter, repair the poor ground connection.

Continuous horn operation is usually caused by an improper ground in the horn ring or button wiring.

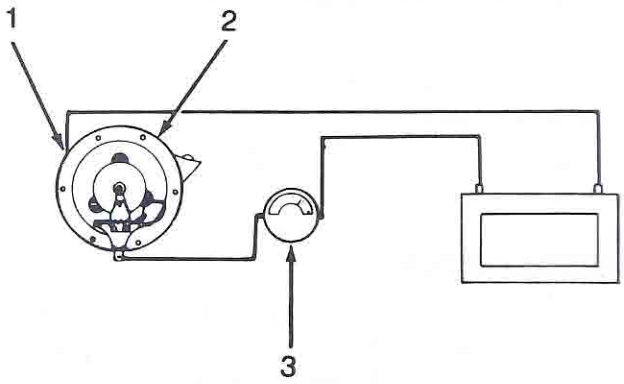
ADJUSTMENT

Adjust the current by turning the adjusting screw counterclockwise to decrease the current until the specified current is reached. Current adjustment is very sensitive. Therefore, care must be taken not to turn the horn adjustment screw too far. Turn the screw only 1/10 of a turn at one time.

Check for normal battery voltage (about 12.6 volts).

Connect an ammeter series between the horn and battery and read the current as shown in the illustration.

Adjust the current to 4.5 amps.



1. Ground
2. Horn
3. Ammeter

A42233

NOTE: Do not stuff rags or other materials in the horn protector to muffle the sound while adjusting, as this changes the vibration frequency and would give a raise in the current setting. When adjusting a set of horns, each horn should be connected and adjusted separately. Then check for tone by operating them as a pair.

SEE I.S. NOTES

GENERAL

All CJ and Scrambler models are equipped with a two-speed, electric wiper motor.

The motor is mounted on the lower left corner of the windshield.

SEE I.S. NOTES

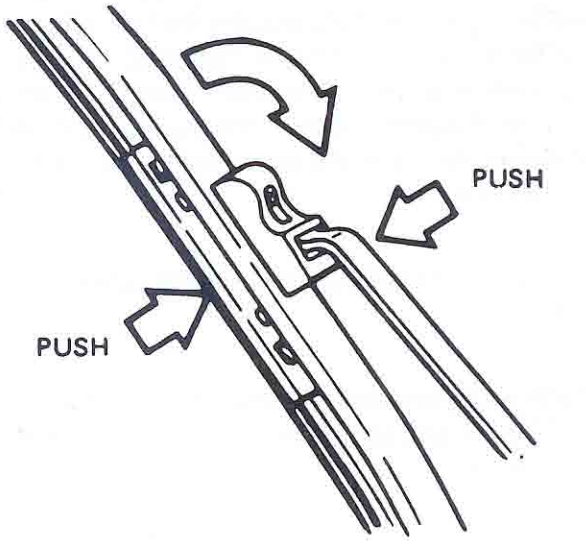
SPECIAL TOOLS

Tool Ref.	Description	Required	Recommended
J-21008	Continuity Lamp		■
J-22128	Remover Tool		■

WIPER BLADE REPLACEMENT

The wiper blade assembly is removed from the wiper arm by holding the blade away from the windshield, and pushing it firmly against the tip of the arm to compress the locking spring and disengage the retaining pin. At the same time, pivot the blade clockwise to unhook it from the end of the arm.

To install, place the blade assembly on the wiper arm and snap the blade assembly into position.



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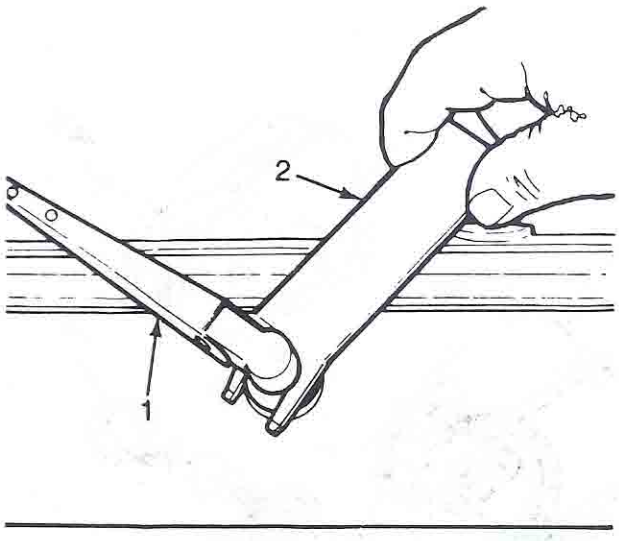
WIPER ARM REPLACEMENT

Remove the windshield wiper arm (1) from the pivot shaft body with Remover Tool J-22128 (2).



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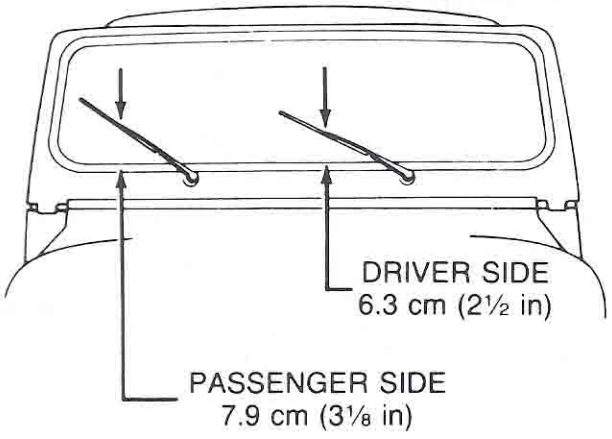
To install, push the wiper arm over the pivot shaft. Be sure the pivot shaft is in the Park position and the wiper arm is positioned correctly on the windshield.



841295

PIVOT SHAFT BODY AND LINKAGE

Removal

Remove the left and right wiper arms.

Remove the nuts attaching the pivots to the windshield frame.

Remove the necessary hard or soft top components from the windshield frame.

Remove the left and right windshield holddown knobs and fold the windshield forward.

Remove the left and right access hole covers.

Disconnect the wiper motor drive link from the left wiper pivot.

Remove the pivot shaft body and linkage through the access hole.

Installation

Install the pivot shaft body and linkage in the windshield frame.

Connect the wiper motor drive link to the left wiper pivot.

Install the left and right access hole covers.

Raise the windshield to the upright position and install the left and right windshield holddown knobs.

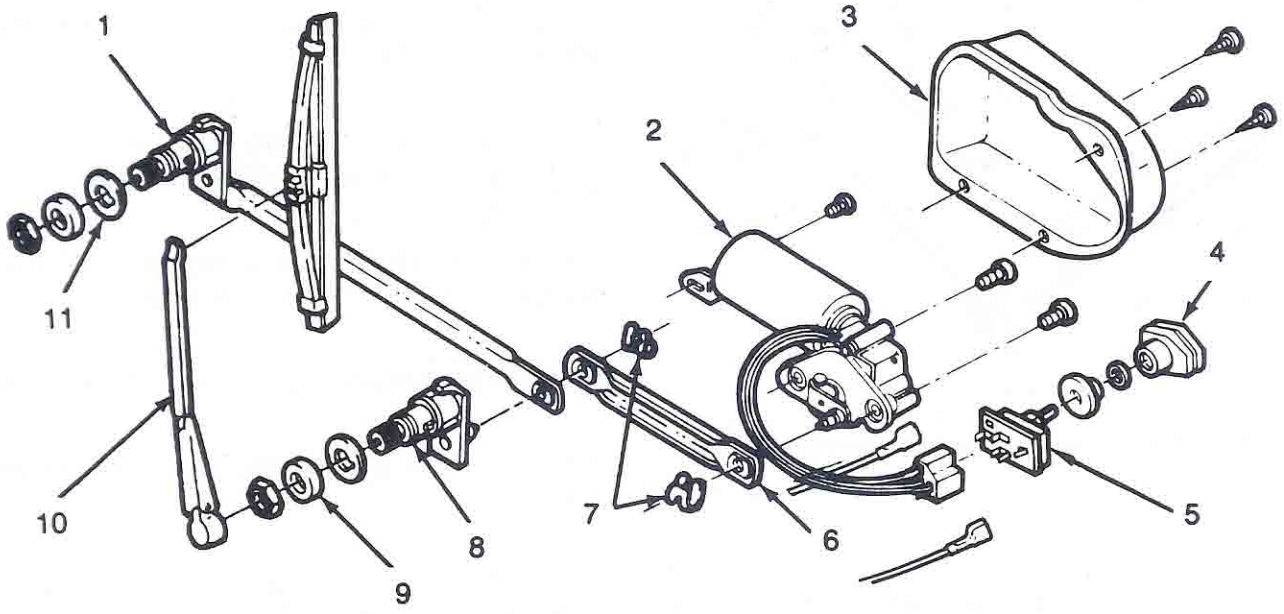
Install the nuts attaching the pivots to the windshield frame.

SEE I.S. NOTES

Install the left and right wiper arms.

Install the necessary top components on the windshield frame.

SEE I.S. NOTES



1. Pivot Shaft and Arm
2. Crank and Motor
3. Motor Cover
4. Control Knob
5. Switch
6. Drive Link
7. Clips
8. Pivot Shaft
9. Escutcheon
10. Wiper Arm
11. Gasket

841292

CONTROL SWITCH

The control switch is mounted on the instrument panel. The switch is a through-type multi-position switch which does not require grounding for proper operation.

The two-speed wiper motor is energized for continuous wiping action by turning the control knob in a clockwise direction.

The electric washer pump is operated by depressing the wiper control knob.

Removal

On models with air conditioning, remove the screws attaching the evaporator assembly to the instrument panel and lower the evaporator assembly.

Remove the wiper control knob.

Remove the nut and switch.

Mark the wire color locations on the switch and disconnect the wires.

Installation

Connect the wires to the switch, in the proper location as noted previously.

Position the switch in the instrument panel and install the attaching nut.

Install the control knob.

Install the evaporator assembly, if removed.

Diagnosis

The wiper motor may be operated independently of the switch to aid in determining defective components.

NOTE: The wiper motor must be grounded for proper operation and during all wiper tests.

With the ignition switch on, check for 12-volts at the switch terminal B. If the 12-volt test lamp lights but the wiper motor does not operate, connect a jumper wire from the ground strap on the motor to a good body ground. If the motor still does not operate, disconnect the wiring from the switch. Using a jumper wire, connect switch terminals 2 and B. This connection should give low speed operation. If the wiper motor does not operate in low speed, there is an open in the green wire, a defective internal motor connection or a stuck low speed brush.

To obtain high speed, connect a jumper wire between terminals 3 and B. If the wiper motor fails to operate, there is an open in the red wire, a defective internal motor connection, or a stuck high speed brush.

With the wiper blades in a position other than Park, connect a jumper wire between terminals 1 and B. The wiper blades should run on low speed and stop in the Park position. If the motor does not run after making the jumper connection, there is an open in the black wire, a defective internal motor connection, a misaligned or damaged set of contact points or a bad connection through the park point set to the low speed brush. If the wiper motor runs but does not park, the cam on the drive gear is not sufficiently breaking the contact points.

If wiper motor operation is intermittent, a defective solder joint, wiring connection, body ground or worn brush may cause the condition.

SEE I.S. NOTES

INTERMITTENT WIPERS

Switch

Removal

SEE I.S. NOTES

On models with air conditioning, remove the screws attaching the evaporator assembly to the instrument panel and lower the evaporator assembly.

Remove the wiper control knob.

Remove the slotted trim nut on the front of the switch.

Push the switch through the instrument panel, disconnect from the harness and remove the ground wire strap at the instrument cluster attaching stud.

Installation

Connect the ground strap to the instrument cluster attaching stud. Connect the switch to the harness and push the switch through the instrument panel.

Install the slotted trim nut on the front of the switch and tighten.

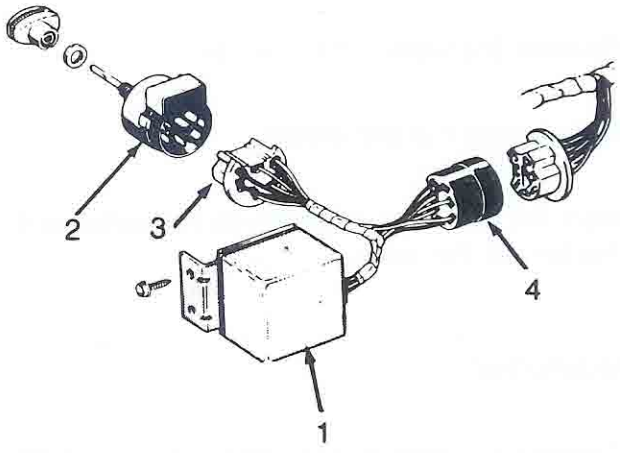
Align the control knob and push on the shaft.

Install the evaporator assembly, if removed.

Intermittent Governor

To check the intermittent governor accurately requires electronic testing equipment. However, if the intermittent wipe cycle is not satisfactory, check the related components such as the motor, control switch and connecting wires. If all components function properly, install a new governor.

The electronic governor assembly (1) is contained in a 5-cm (2-in) cube which is attached to an instrument panel bracket adjacent to the wiper control switch (2). The 15.2-cm (6-in) governor lead (3) plugs into the wiper control switch and the shorter , 10.1-cm (4-in) lead (4) plugs into the instrument panel harness.



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WIPER MOTOR

The wiper motor is protected by a 4.5-amp circuit breaker in the fuse panel.

Removal

Remove the necessary hard or soft top components from the windshield frame.

Remove the left and right windshield holddown knobs and fold the windshield forward.

Remove the left access hole cover.

Disconnect the drive link from the left wiper pivot.

Disconnect the wiper motor wire harness from the switch.

Remove the attaching screws and remove the wiper motor.

Installation

Position the wiper motor on the windshield frame and install the attaching screws.

Connect the wiper motor wire harness to the switch.

Connect the drive link to the left wiper pivot.

Install the left access hole cover.

Raise the windshield to the upright position and install the left and right windshield holddown knobs.

Install the necessary top components on the windshield frame.

WASHER PUMP

The electric washer pump assembly is mounted in the water reservoir. The impeller motor case is grounded to the body sheet metal by a black ground wire. It is energized by a yellow feed wire from the single blade terminal on the control switch.

SEE I.S. NOTES

NAME	LOCATION ON VEHICLE	DIAGRAM ZC
A/C Blower Motor	In A/C evaporator/blower under I/P	21F
A/C Blower Resistor	In A/C evaporator/blower under I/P	21E
A/C Blower Switch	In A/C evaporator/blower under I/P	21D
A/C Compressor Clutch	In compressor RH side of engine	21E
A/C Thermostat Control	In A/C evaporator/blower under I/P	21E
Air Lamp	Behind I/P LH center	14B
Alternator	RH side of engine	2A
Anti-Diesel Delay Relay	LH rear engine compartment	6A
Anti-Diesel Relay	LH rear engine compartment	6B
Back Up Lamp Switch	In transmission LH side	10B
Battery	RH rear corner of engine compartment	1A, 3A
Bowl Vent Solenoid	LH side of engine at front	7C
Brake Warning Indicator Switch	LH side of engine compartment on brake valve	15C
Choke Heater	In carburetor LH side of engine	5C, 11C
Choke Relay	RH front of engine compartment	4B
Choke Switch	RH side of engine	10B
Cigar Lighter	On I/P center	26E
Clock	On I/P LH side	26D
Closed Throttle Relay	Center rear engine compartment	6A
Closed Throttle Resistor	In electronic engine control harness	6B
Closed Throttle Switch	LH side of engine in carburetor	6B
Clutch Switch	Above clutch pedal	7B, 23D
Coolant Temperature Switch	LH rear side of engine	7B, 13B
Courtesy Lamps	Under I/P at RH and LH ends	25E
Cruise Fuse	Above brake pedal in harness	23E
Cruise Regulator	Under I/P at LH end	22E
Cruise Servo	In engine compartment	23E
Cruise Switch	LH side of steering column	23E
Defroster Lamp	Behind I/P LH center	14B
Diagnostic Connector D1	RH rear engine compartment	5A
Diagnostic Connector D2	RH rear engine compartment	4A
Dimmer Switch	Inside car on floor LH side	28E
Diode Assy.	Center rear engine compartment	6C, 11C
Distributor	RH side of engine	3B, 9C
Door Switches	In door jambs	25E
Downstream Solenoid	LH wheelhouse panel (4-cylinder)	6A, 11B
Electronic Control Unit	Under RH side of I/P	5B-8B, 11B 13B
Fan Lamp	Behind I/P LH center	14B
Fog Lamp Relay	RH wheelhouse panel near blower motor	27E
Fog Lamp Switch	Below instrument panel LH side	28E
Four-Wheel Drive Indicator Switch	In transfer case	15C
Fuel Gauge	In instrument cluster	16B
Fuel Gauge Sender	In fuel tank LH side under car	16C
Fuse Block	Under RH side of I/P	10B, 10A, 21D, 23
Fuse Link A	RH front of engine compartment	2A, 4A
Fuse Link B	RH front of engine compartment	2A
Hazard Flasher	On fuse block	30D
Heater Blower	RH front side of dash	22E
Heater Blower Resistor	In heater on dash at center	22E
Heater Blower Switch	On I/P LH center	22E
Horn	Front of engine compartment	31E
Horn Relay	Under I/P LH side	32E
Idle Relay	Center rear engine compartment	5C, 11C
Idle Solenoid	LH wheelhouse panel (4-cylinder)	6A, 11B
Ignition Coil	RH side of engine	10C
Ignition Module	RH side of engine compartment	3C, 9C
Ignition Switch	RH side of steering column	16A
Instrument Cluster	On I/P center	28F
Intermittent Wiper Governor	Behind wiper switch	20E
Knock Sensor	LH rear side of engine	7B
Light Switch	On LH side at I/P	28E
Light Switch Lamp	Behind I/P LH end	14C
Low Freon Switch	RH side of engine in refrigerant line	21D
Manifold Heater	LH rear of engine in intake manifold	4C
Manifold Heater Relay	Center rear engine compartment	4C, 10C
Manifold Heater Switch	LH rear of engine	5C, 10C
Marker Lamps	Front of vehicle	29F
Mixture & Control Solenoid	LH side of engine	7A
Multi-Function Switch	LH side of steering column	23D, 30E

NT LOCATIONS

NAME	LOCATION ON VEHICLE	DIAGRAM ZONE
Neutral Safety Switch	In transmission LH side	4C, 10C
Oil Pressure Gauge	On I/P RH center	15B
Oil Pressure Sensor	RH side of engine	15C
Oxygen Sensor	Rear of engine on exhaust manifold	6C, 12C
Parking Brake Switch	LH side under I/P	15B
P.C.V. Shutoff Solenoid	LH side of engine	7B, 12B
Power Steering Pressure Switch	LH front of engine compartment	5C
Radio	On I/P RH center	25F-27F
Resistance Wire (15.0 ohms)	In engine harness at alternator	3A
Solenoid Vacuum	LH side of engine on carburetor	6C, 12C
Speed Sensor	In speedometer cable	23E
Starter Solenoid	RH side of engine compartment	9B
Starter Motor	Lower rear of engine	3B, 9B
Stepper Motor	LH side of engine in carburetor	12B
Stop Lamp Switch	Above brake pedal	23D, 30D
Tachometer	On I/P LH center	16B, 27D
Temperature Gauge	In instrument cluster	16B
Temperature Lamp	Behind I/P LH center	14B
Thermal Electric Switch	LH rear side of engine in air cleaner	7B
Turn Flasher	On fuse block	30D
Turn Lamps	On fuse block	29F
Turn Signal/Hazard/Horn Switch	LH side of steering column	29D
Up-Shift Switch	In transmission LH side	17B
Upstream Solenoid	LH wheelhouse panel (4-cylinder)	5B
	Rear top of engine (6-cylinder)	11B
Vacuum Switch	Center rear of engine compartment	8B
Voltmeter	On I/P RH center	16B, 15B
Washer Pump	In washer fluid reservoir	19D
Wide-Open Throttle (WOT) Switch	LH side of engine in carburetor	7B
Wiper Motor	LH front side of dash	18E
Wiper Switch	On I/P right of steering column	19E
Wiper Switch Lamp	Behind I/P LH center	14F

CONNECTOR LOCATIONS

See In-Line Connector Views on reverse side of this page (single pin connectors not shown).

CONNECTOR NO.	LOCATION ON VEHICLE	DIAGRAM ZONE
C100	Lower LH side of dash behind fuse block	1A, 4A, 3B, 4B, 6A, 10B, 15B, 16B, 17B, 19E, 21D, 22E, 24E, 25D, 29F, 28E, 29E, 31E
C102	Under LH side of I/P near fuse block	24F, 29E, 31E
C103	Under LH side of I/P near fuse block	25D, 25E
C108	Under LH side of I/P above fuse block	20E, 28E
C110 (Single Pin)	Under LH side of I/P	25D
C111 (Single Pin)	Under LH side of I/P	25E
C120 (Single Pin)	Under I/P near steering column	4B, 10B
C132	On LH "C" pillar	26E, 26D, 26E
C134 (Single Pin)	Under car at rear LH	16B
C142 (Single Pin)	Front of dash at center	25D
C143	Front of dash at center	5C, 5B, 11B, 11C
C146	Front of dash RH side	3B, 9B, 15B, 24E
C151 (Single Pin)	RH side of engine near coil	4C
C158	Front of dash LH side	15B, 15C
C161 (Single Pin)	Front LH behind headlamp	28F
C166	Front LH behind bumper	28F
C167	Front RH behind bumper	27F
C187	Front of dash RH side	17B
C202 (Single Pin)	RH side of engine at front	21E
C222 (Single Pin)	Under LH side of I/P near fuse block	26D, 27D

CIRCUIT INDEX

CIRCUIT	ZONE
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HARNESS CODES

CODE	HARNESS
A	Engine Forward Lamp
B	Engine
C	Electronic Engine Control
D	Instrument Panel
E	Body Lamps
R	(Miscellaneous Engine Compartment)
R6	Fog Lamps
R9	Low Freon
R10	Alternator Jumper
R11	Brake Warning
S	(Miscellaneous Instrument Panel)
S1	Courtesy Lamp
S3	Windshield Wiper
S5	Cruise Control
S7	Fog Lamps
S8	Radio Jumper
S10	Clock/Tachometer
S11	A/C Control
T	(Miscellaneous Body)
T5	Fuel Sender

WIRE COLOR CODES

CODE	COLOR	CODE	COLOR
BLK	Black	PNK	Pink
BLU	Blue	RED	Red
BRN	Brown	VIO	Violet
GRN	Green	WHT	White
GRY	Gray	YEL	Yellow
ORN	Orange		

GROUND LOCATIONS

For details see Ground Distribution on reverse side of this page.

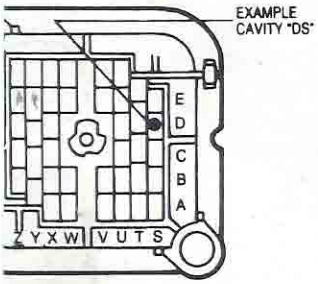
GROUND NO.	LOCATION ON VEHICLE	DIAGRAM ZONE
G1	Underhood near battery	1A, 3A, 9A
G100		
G101	Underhood near LH headlamp	28F
G102	Underhood near LH headlamp	28F
G103	Underhood near RH headlamp	28F
G104	Under I/P LH side	27E, 32E
G105	Front of dash at center	5C
G106	Underhood RH side near coil	8B, 33E
G107	Underhood RH side near coil	13C
G108	Underhood RH side near coil	10C
G110	Under I/P LH side	26E
G111	Under I/P LH side	27E
G112	Under car LH rear	16C

IN-L

CAVITY	INST. PANEL
AW	V10 W/TR
AX	LT BLU
BS	BLACK
BU	BLACK
BW	RED W/T
BX	BRN
BY	RED W/T
BZ	V10
CS	ORN
CX	RED
CY	LT BRN
CZ	RED
DA	YEL
DY	ORN
DZ	WHT W/
ES	GRN W/T
ET	GRY
EU	RED W/T
EV	GRY W/T
EY	RED
EZ	ORN
FU	WHT
FV	GRN
FW	V10
FX	ORN

IE CONNECTORS

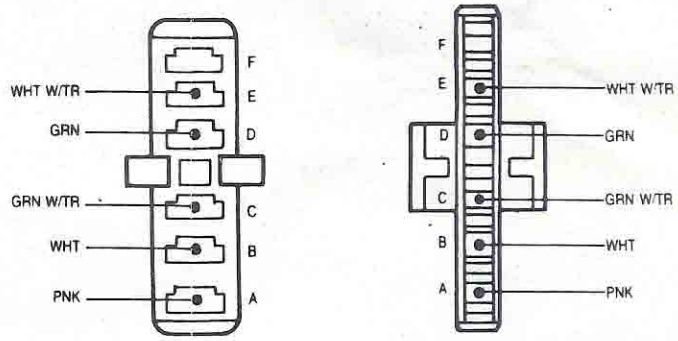
C100



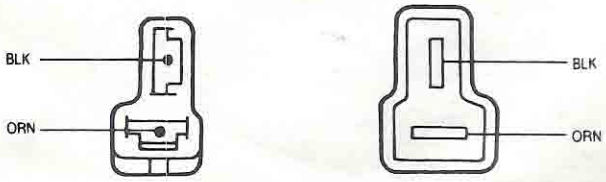
VIEWED FROM DASH PANEL

ENGINE	FUNCTION
V10 W/TR	ENGINE TEMPERATURE
LT BLU	START
BLACK	BRAKE WARNING
BLACK	BRAKE WARNING
RED W/TR	IGNITION FEED
BRN	A/C COMPRESSOR
	HEADLAMP ON
V10	ENGINE OIL PRESSURE
ORN	FOG LAMP FEED
RED	ELECTRONIC ENGINE CONTROL FEED
LT BRN	HEATER BLOWER MOTOR FEED
RED	FUSED IGNITION ON FEED
YEL	WINDSHIELD WASHER PUMP FEED
ORN	UNDERHOOD LAMP FEED
WHT W/TR	BACKUP LAMP FEED
GRN W/TR	LH FRONT TURN LAMP FEED
GRY	LH HEADLAMP LO BEAM FEED
RED W/TR	HORN FEED
GRY W/TR	LH HEADLAMP HI BEAM FEED
RED	BATTERY FEED
ORN	4-WHEEL DR IND LAMP
WHT	PARK AND MARKER LAMP FEED
GRN	RH FRONT TURN LAMP FEED
DK GRN	TACHOMETER COIL SIGNAL
	EMISSION MAINT. LAMP

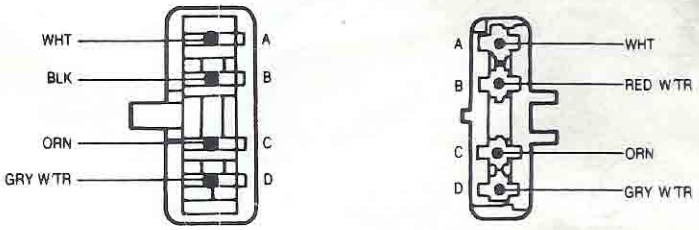
C102



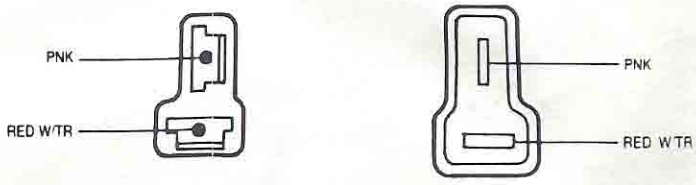
C103



C108

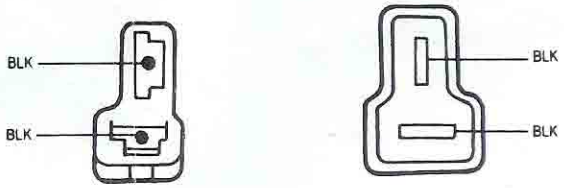


C123

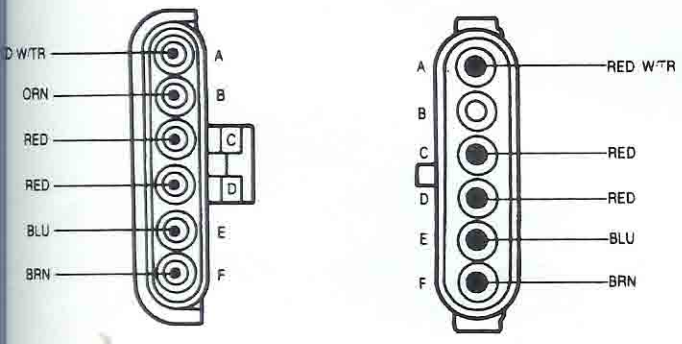


C132

C158

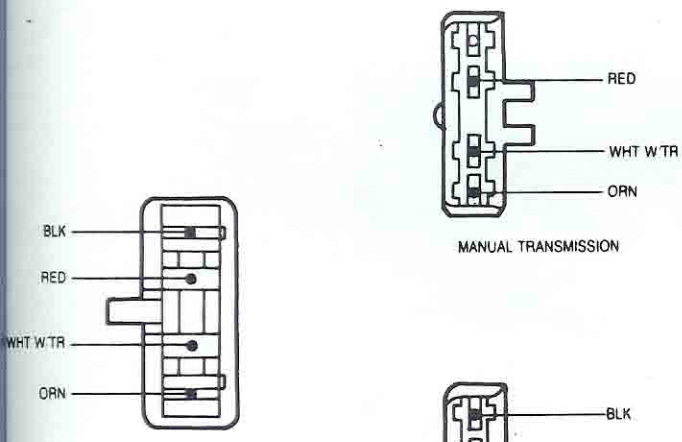


C143



C166

C146

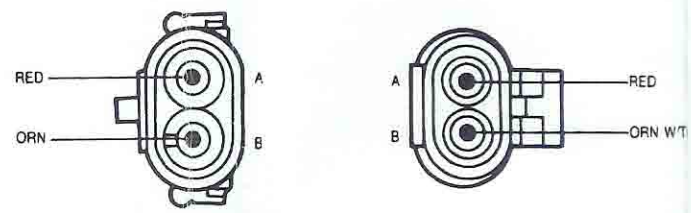


MANUAL TRANSMISSION

AUTOMATIC TRANSMISSION

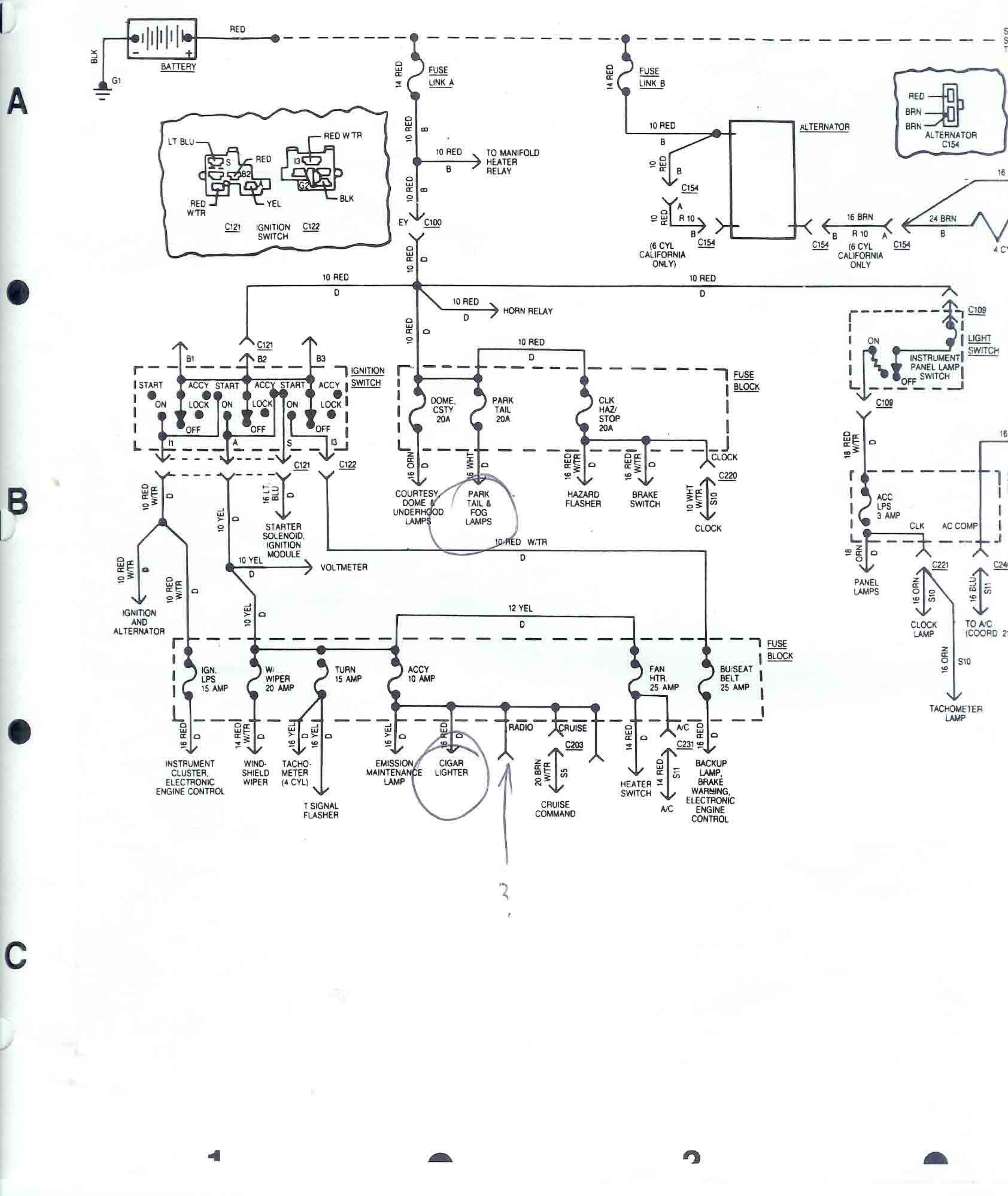
C167

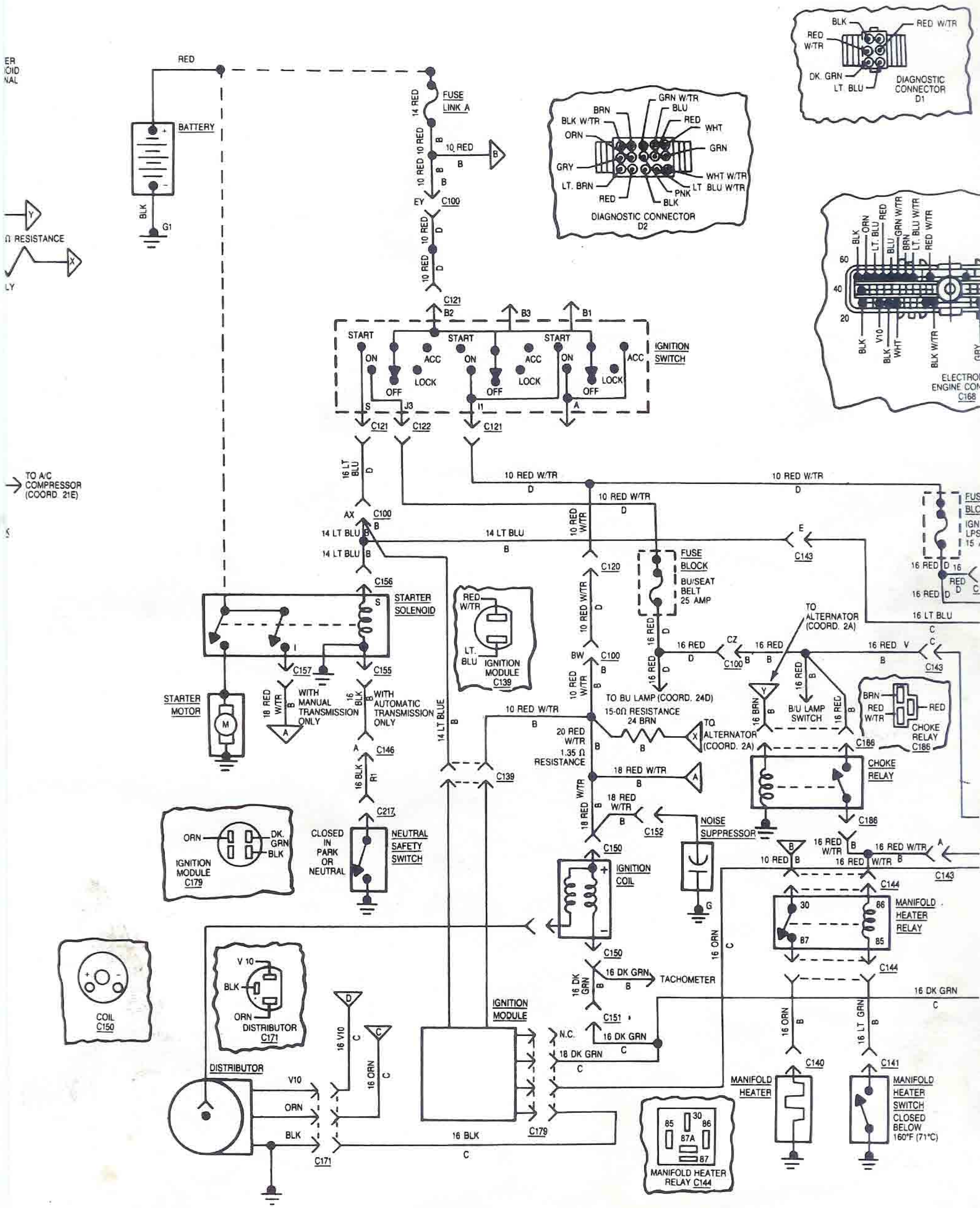
C187



4-CYLINDER

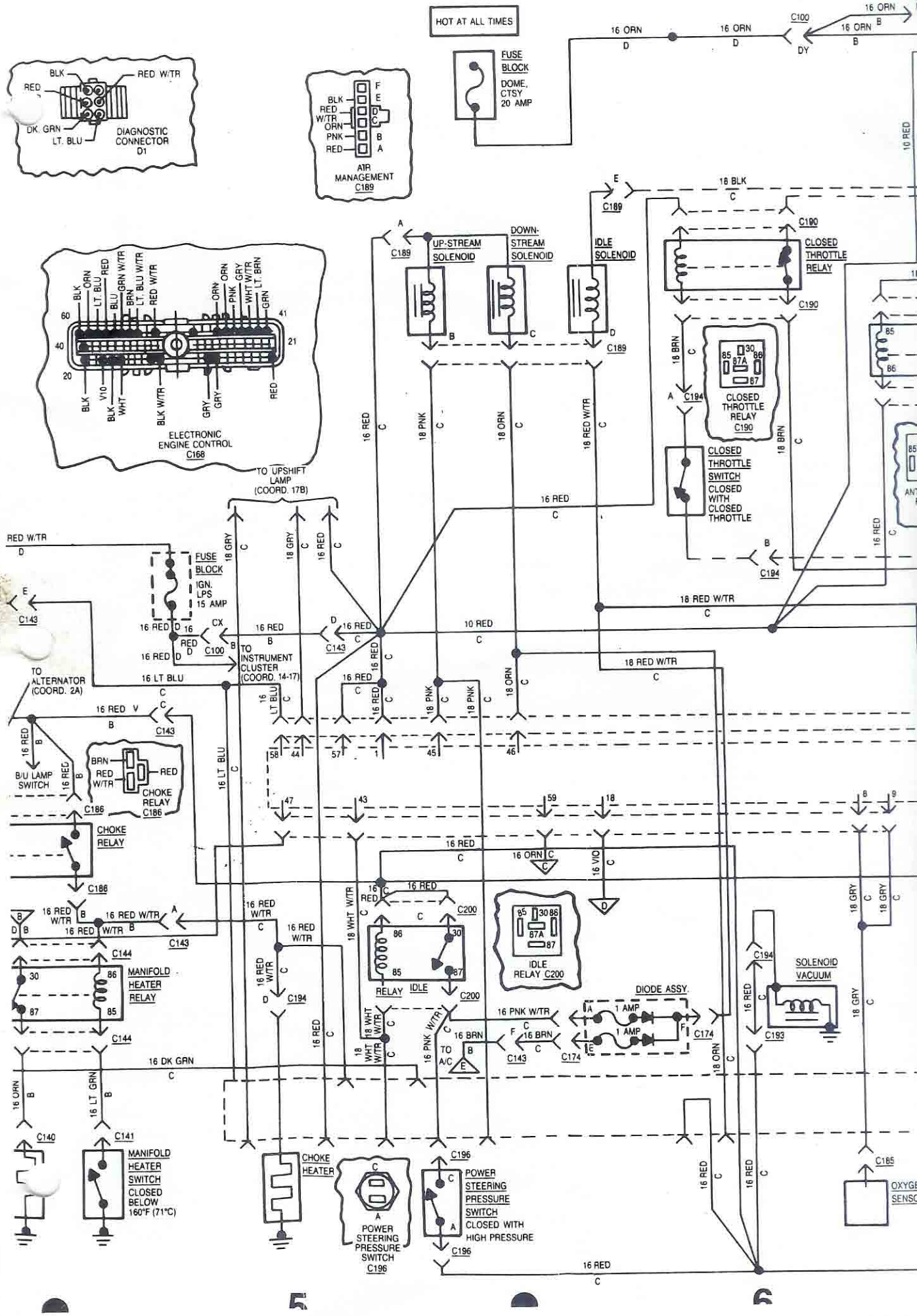
BATTERY POWER DISTRIBUTION CHARGE

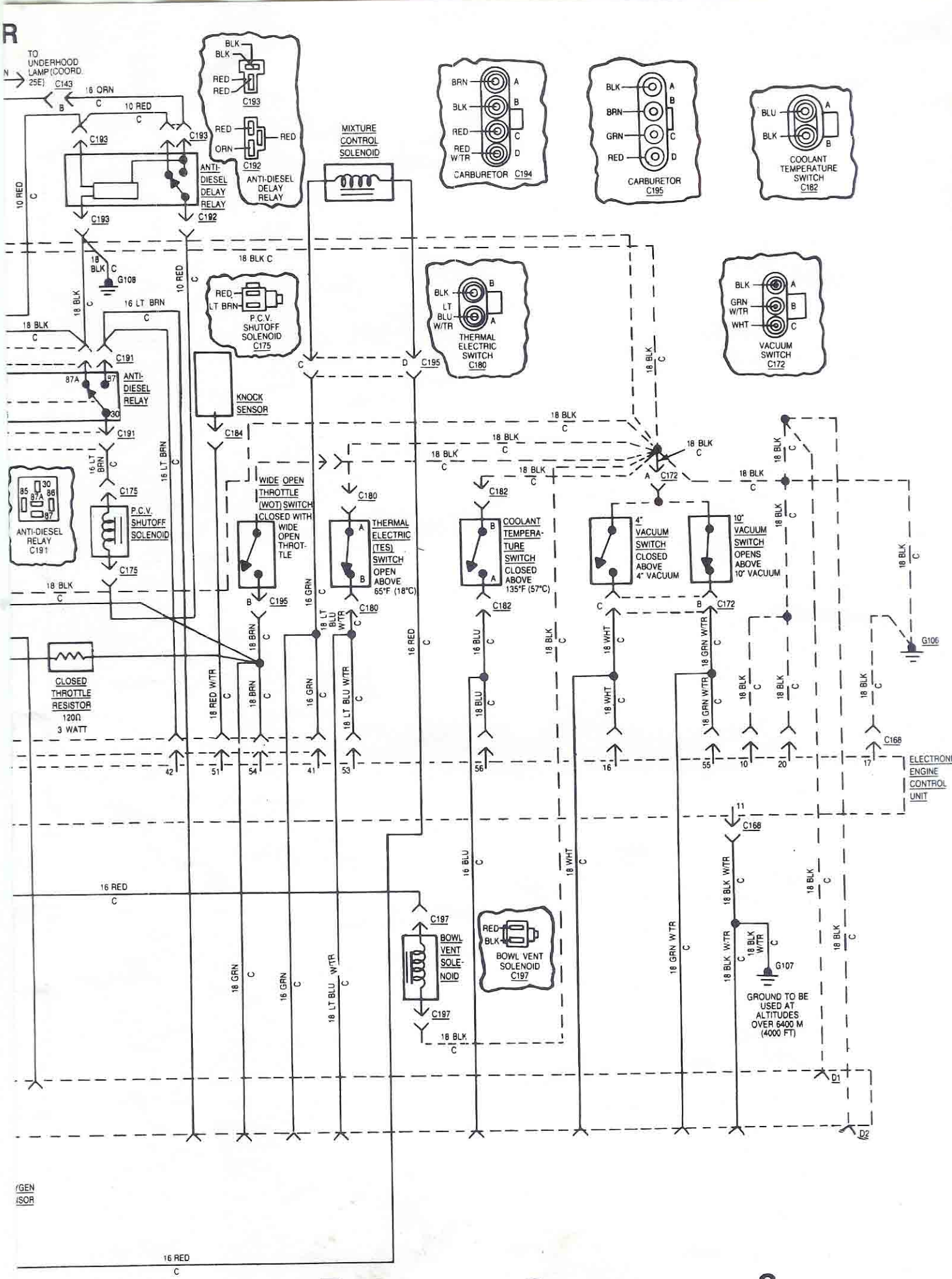


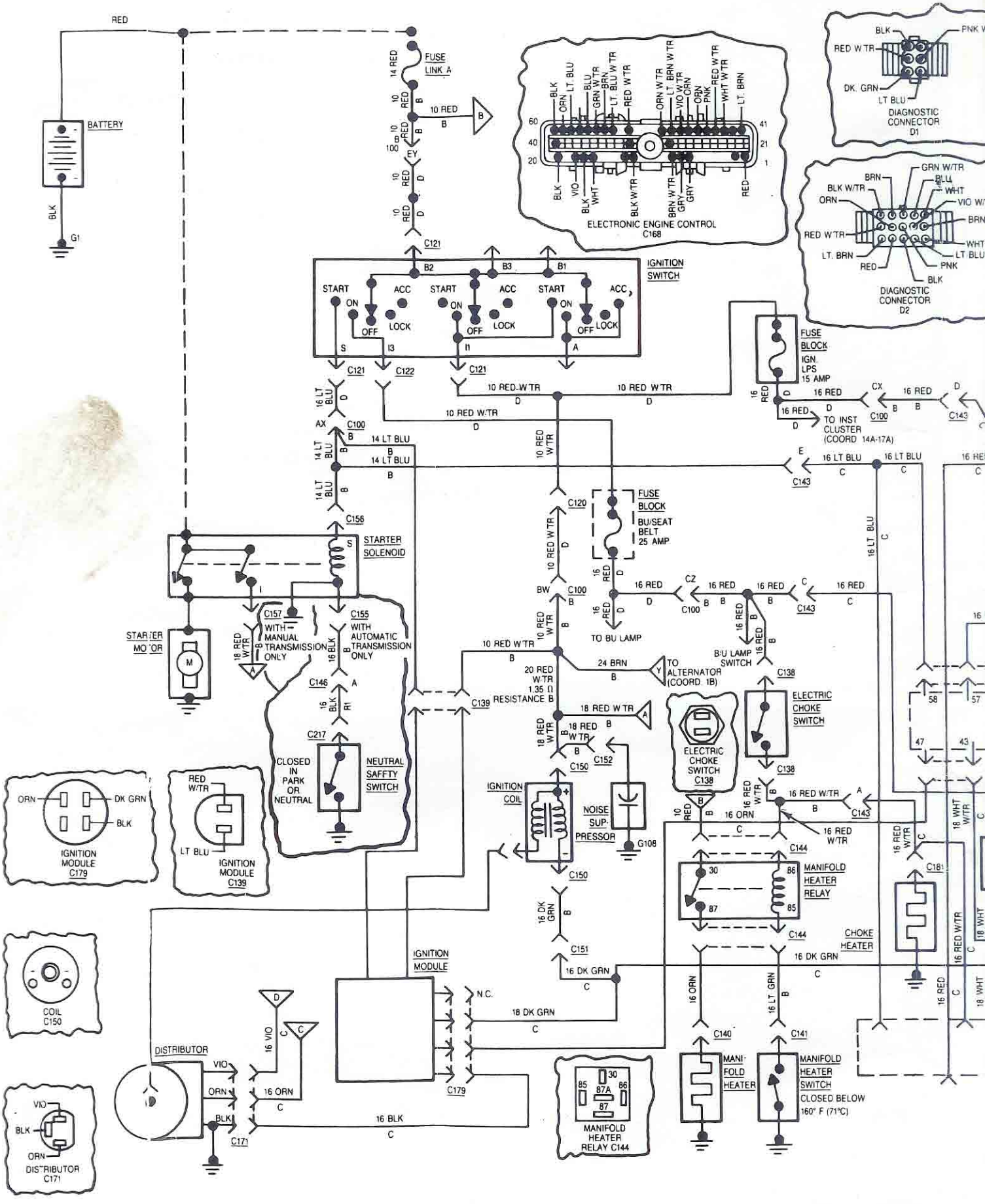


RED
BATTERY
BLK
G1
FUSE LINK A
14 RED
10 RED
10 RED B
C100
TO A/C COMPRESSOR (COORD 21E)
Ω RESISTANCE
C121
B2
B3
B1
START
ON
ACC
OFF
LOCK
IGNITION SWITCH
C122
10 RED W/TR
16 LT BLU
14 LT BLU
C156
STARTER SOLENOID
C157
C155
STARTER MOTOR
WITH MANUAL TRANSMISSION ONLY
WITH AUTOMATIC TRANSMISSION ONLY
18 RED W/TR
16 BLK
C146
C217
CLOSED IN PARK OR NEUTRAL
NEUTRAL SAFETY SWITCH
IGNITION MODULE C179
IGNITION MODULE C139
14 LT BLUE
C139
C120
FUSE BLOCK
BU/SEAT BELT 25 AMP
16 RED
C143
TO ALTERNATOR (COORD. 2A)
TO BU LAMP (COORD. 24D)
15-0Ω RESISTANCE 24 BRN
20 RED W/TR 1.35 Ω RESISTANCE
18 RED W/TR
NOISE SUPPRESSOR
C152
C150
IGNITION COIL
16 DK GRN
TACHOMETER
C151
N.C.
18 DK GRN
B/U LAMP SWITCH
16 BRN
CHOKE RELAY C186
CHOKE RELAY
C186
10 RED
16 RED W/TR
C144
MANIFOLD HEATER RELAY
16 ORN
16 LT GRN
C140
C141
MANIFOLD HEATER
MANIFOLD HEATER SWITCH CLOSED BELOW 160°F (71°C)
MANIFOLD HEATER RELAY C144
COIL C150
DISTRIBUTOR C171
V 10
BLK
ORN
DISTRIBUTOR
V10
16 BLK
C171
C179
IGNITION MODULE
16 V10
16 ORN
DIAGNOSTIC CONNECTOR D2
GRN W/TR
BRN
BLU
BLK W/TR
RED
ORN
WHT
GRN
GRY
WHT W/TR
LT. BRN
LT BLU W/TR
PNK
DIAGNOSTIC CONNECTOR D1
DK. GRN
LT. BLU
ELECTRO ENGINE CON C168
3
4

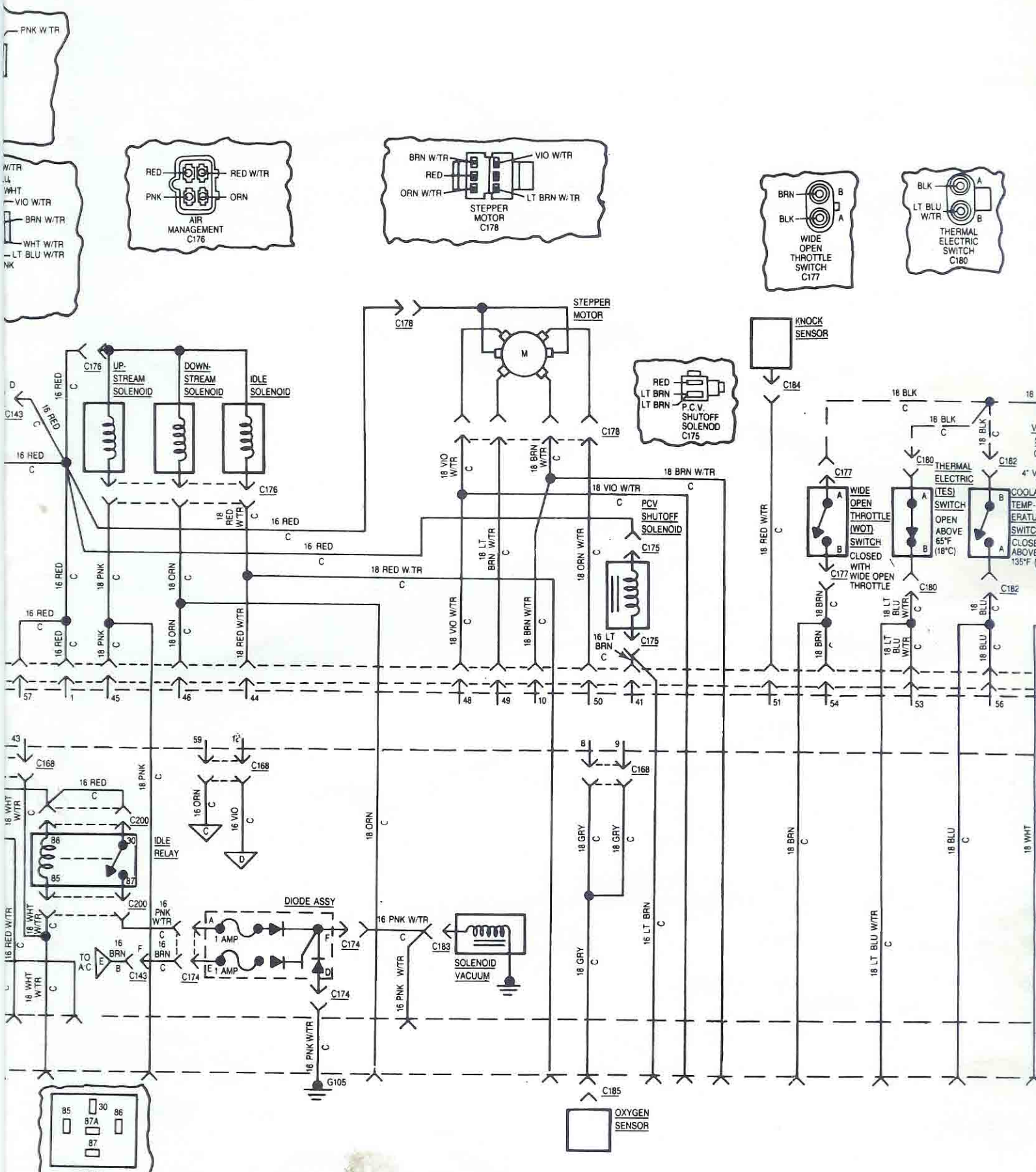
ELECTRONIC ENGINE CONTROL 4 CYLINDER

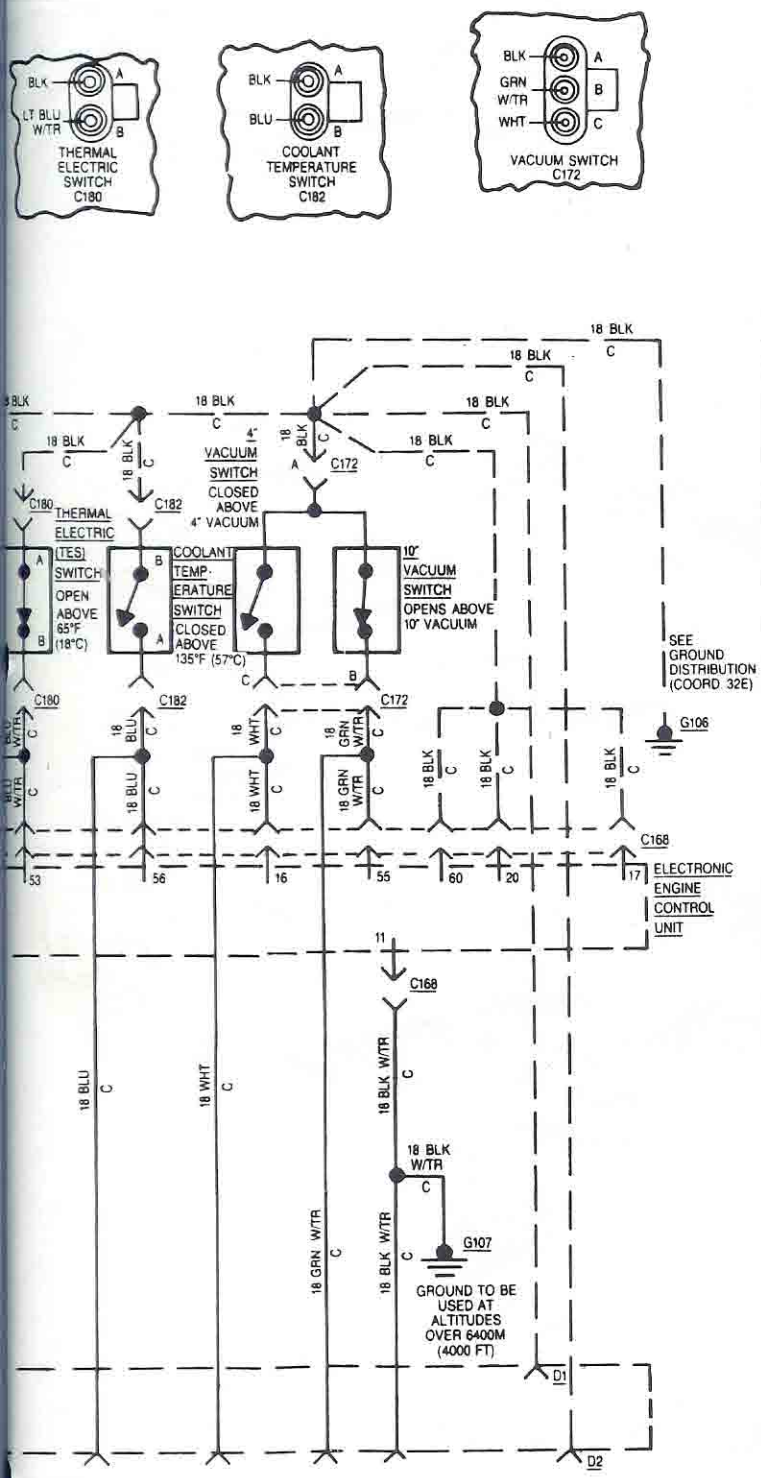


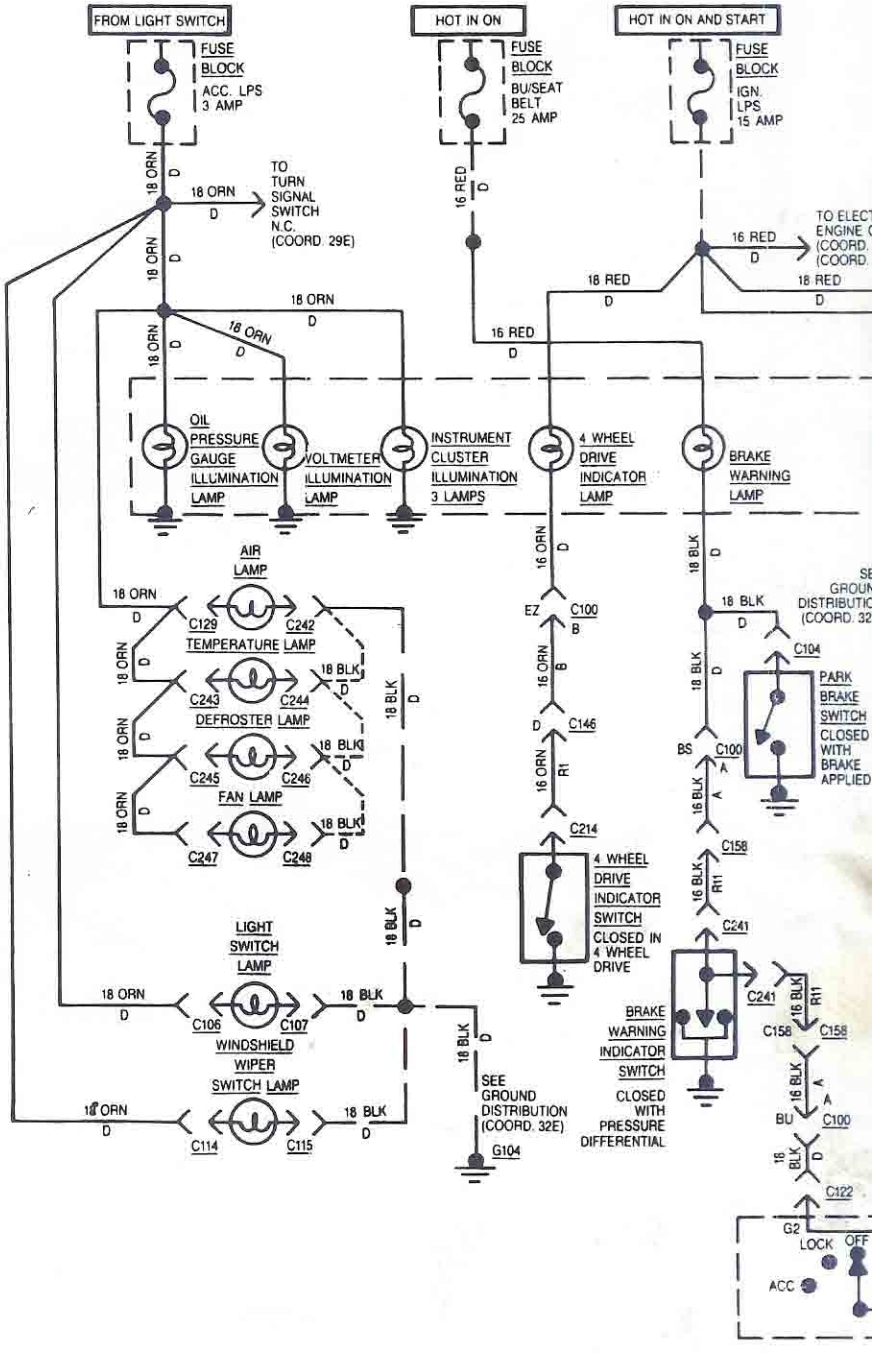

TO UNDERHOOD LAMP (COORD. 25E)
C143
16 ORN
10 RED
C193
ANTI-DIESEL DELAY RELAY
C192
MIXTURE CONTROL SOLENOID
CARBURETOR C194
CARBURETOR C195
COOLANT TEMPERATURE SWITCH C182
G108
P.C.V. SHUTOFF SOLENOID C175
THERMAL ELECTRIC SWITCH C180
VACUUM SWITCH C172
C191
ANTI-DIESEL RELAY
KNOCK SENSOR
C184
WIDE OPEN THROTTLE (WOT) SWITCH CLOSED WITH WIDE OPEN THROTTLE
THERMAL ELECTRIC (TES) SWITCH OPEN ABOVE 65°F (18°C)
COOLANT TEMPERATURE SWITCH CLOSED ABOVE 135°F (57°C)
4" VACUUM SWITCH CLOSED ABOVE 4" VACUUM
10" VACUUM SWITCH OPENS ABOVE 10" VACUUM
CLOSED THROTTLE RESISTOR 120Ω 3 WATT
BOWL VENT SOLENOID C197
G106
G107
GROUND TO BE USED AT ALTITUDES OVER 6400 M (4000 FT)
C168
ELECTRONIC ENGINE CONTROL UNIT
D1
D2


RED
BATTERY
BLK
G1
FUSE LINK A
14 RED
10 RED
ELECTRONIC ENGINE CONTROL
C168
DIAGNOSTIC CONNECTOR D1
DIAGNOSTIC CONNECTOR D2
IGNITION SWITCH
START
ACC
ON
OFF
LOCK
C121
C122
FUSE BLOCK
IGN. LPS 15 AMP
TO INST CLUSTER (COORD 14A-17A)
FUSE BLOCK
BU/SEAT BELT 25 AMP
TO BU LAMP
BU LAMP SWITCH
TO ALTERNATOR (COORD 1B)
STARTER SOLENOID
STARTER MOTOR
WITH MANUAL TRANSMISSION ONLY
WITH AUTOMATIC TRANSMISSION ONLY
RESISTANCE
NEUTRAL SAFTY SWITCH
CLOSED IN PARK OR NEUTRAL
ELECTRIC CHOKE SWITCH
IGNITION COIL
NOISE SUPPRESSOR
G108
MANIFOLD HEATER RELAY
CHOKE HEATER
IGNITION MODULE
IGNITION MODULE C179
IGNITION MODULE C139
COIL C150
DISTRIBUTOR
DISTRIBUTOR C171
MANIFOLD HEATER RELAY C144
MANIFOLD HEATER
MANIFOLD HEATER SWITCH
CLOSED BELOW 160° F (71°C)

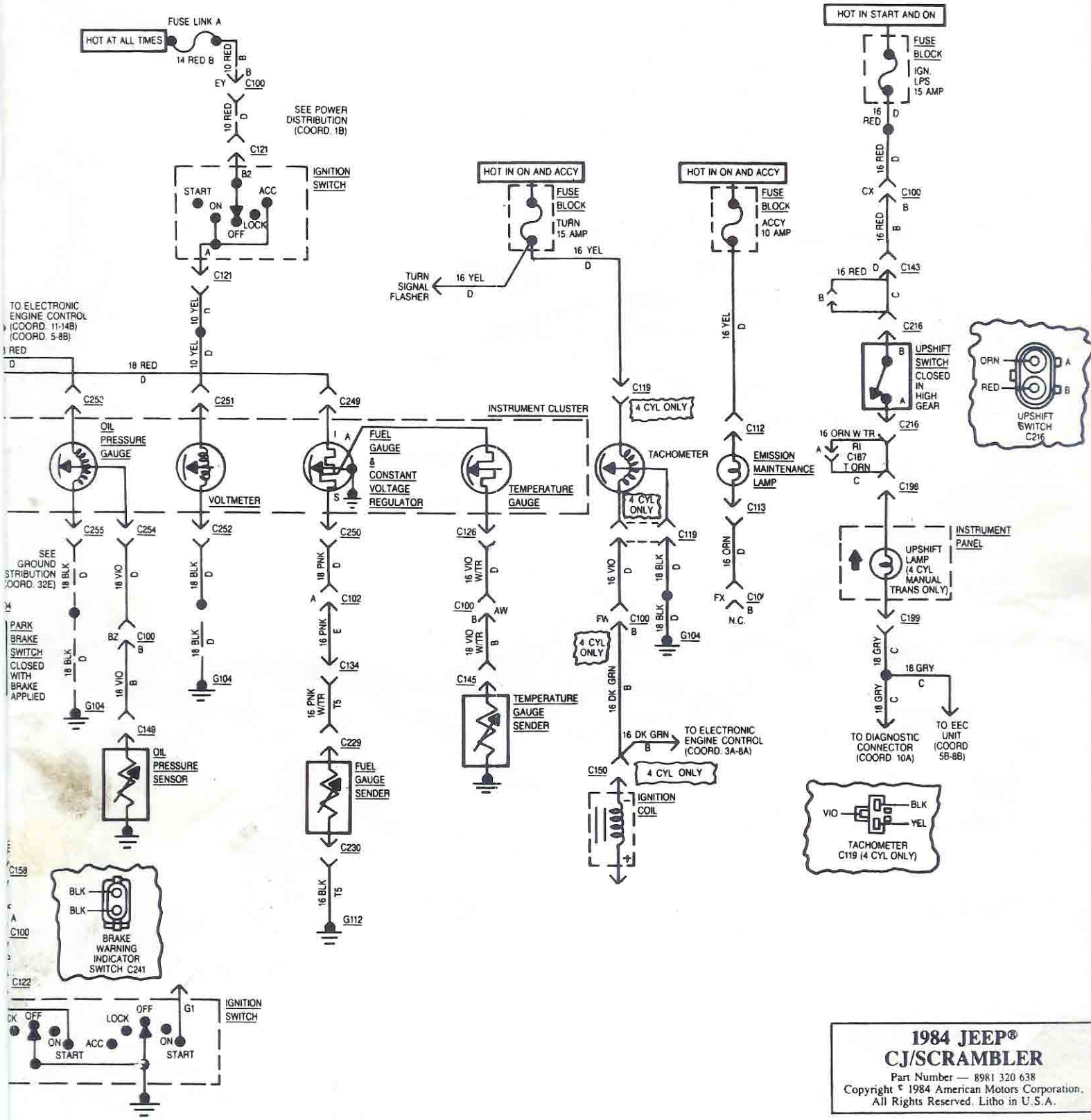
ONIC ENGINE CONTROL 6 CYLINDER




BLK
LT BLU W/TR
A
B
THERMAL ELECTRIC SWITCH C180
BLK
BLU
COOLANT TEMPERATURE SWITCH C182
BLK
GRN W/TR
WHT
VACUUM SWITCH C172
18 BLK
4" VACUUM SWITCH CLOSED ABOVE 4" VACUUM
C172
C180
THERMAL ELECTRIC (TES) SWITCH OPEN ABOVE 65°F (18°C)
C182
COOLANT TEMP. ERATURE SWITCH CLOSED ABOVE 135°F (57°C)
10" VACUUM SWITCH OPENS ABOVE 10" VACUUM
SEE GROUND DISTRIBUTION (COORD. 32E)
G106
18 BLU
18 WHT
18 GRN W/TR
18 BLK W/TR
C168
ELECTRONIC ENGINE CONTROL UNIT
53
56
16
55
60
20
17
11
G107
GROUND TO BE USED AT ALTITUDES OVER 6400M (4000 FT)
D1
D2


FROM LIGHT SWITCH
HOT IN ON
HOT IN ON AND START
FUSE BLOCK
ACC. LPS 3 AMP
BU/SEAT BELT 25 AMP
IGN. LPS 15 AMP
18 ORN
16 RED
TO TURN SIGNAL SWITCH N.C. (COORD. 29E)
OIL PRESSURE GAUGE ILLUMINATION LAMP
VOLTMETER ILLUMINATION LAMP
INSTRUMENT CLUSTER ILLUMINATION 3 LAMPS
4 WHEEL DRIVE INDICATOR LAMP
BRAKE WARNING LAMP
AIR LAMP
C129
C242
TEMPERATURE LAMP
C243
C244
DEFROSTER LAMP
C245
C246
FAN LAMP
C247
C248
LIGHT SWITCH LAMP
C106
C107
WINDSHIELD WIPER SWITCH LAMP
C114
C115
SEE GROUND DISTRIBUTION (COORD. 32E)
G104
EZ
C100
C146
C214
4 WHEEL DRIVE INDICATOR SWITCH CLOSED IN 4 WHEEL DRIVE
BS
C104
PARK BRAKE SWITCH CLOSED WITH BRAKE APPLIED
C158
C241
BRAKE WARNING INDICATOR SWITCH CLOSED WITH PRESSURE DIFFERENTIAL
BU
C122
G2
LOCK
OFF
ACC

ENTS AND INSTRUMENT PANEL ILLUMINATION



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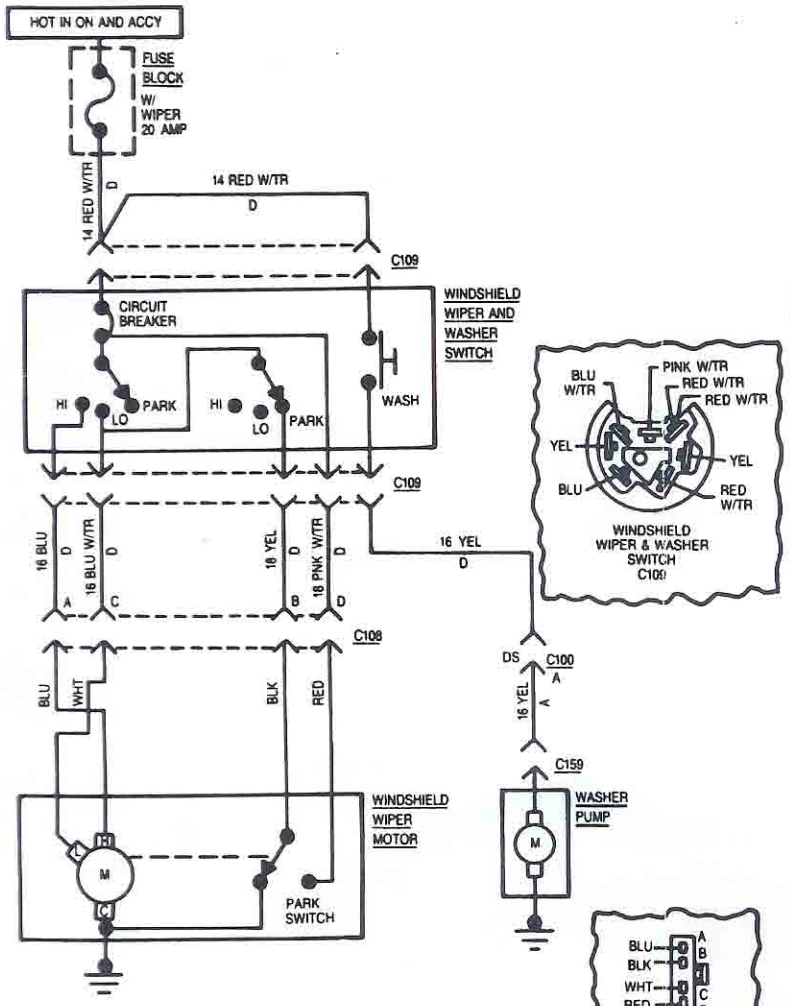
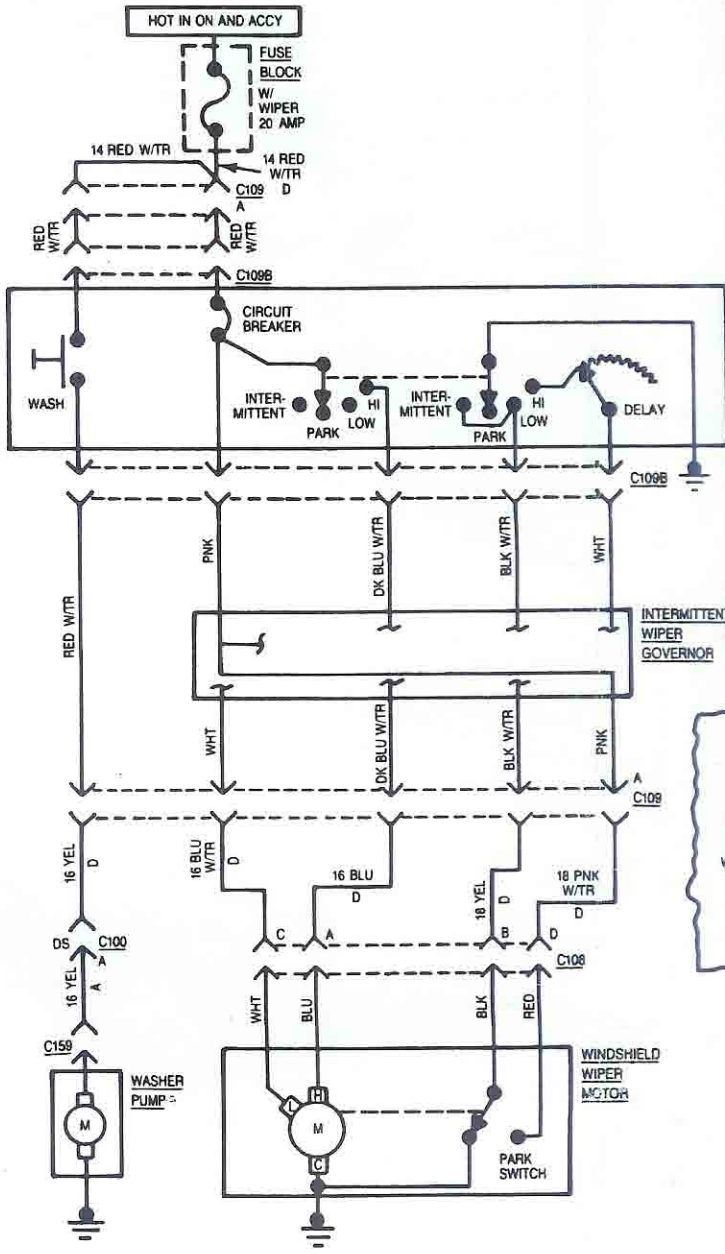
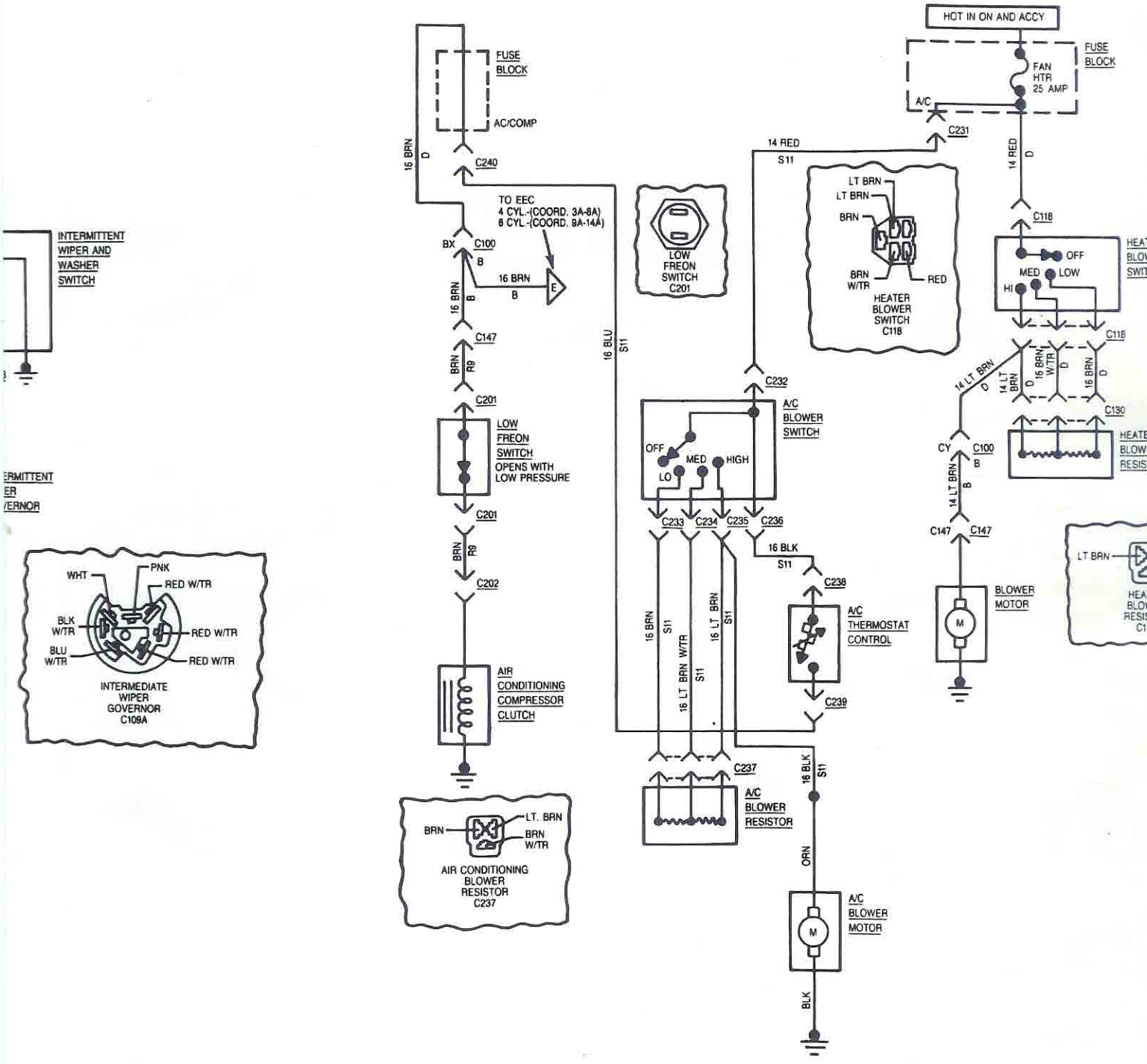
WINDSHIELD WIPER

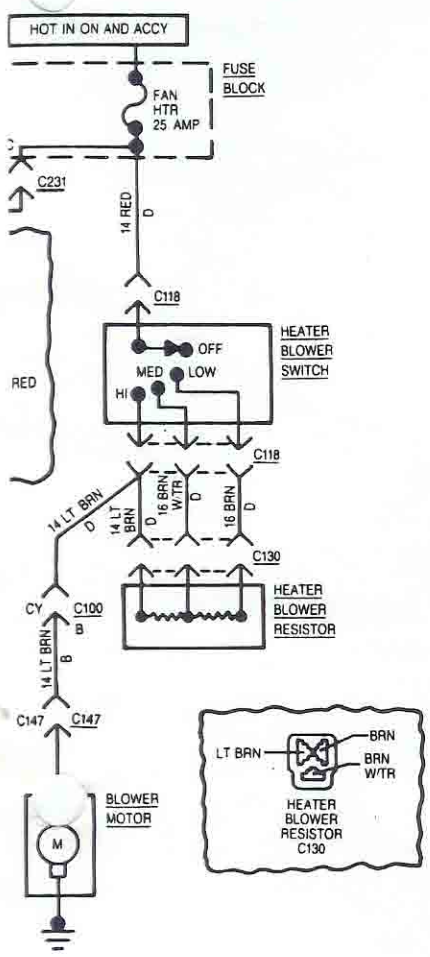


INTERMITTENT WINDSHIELD

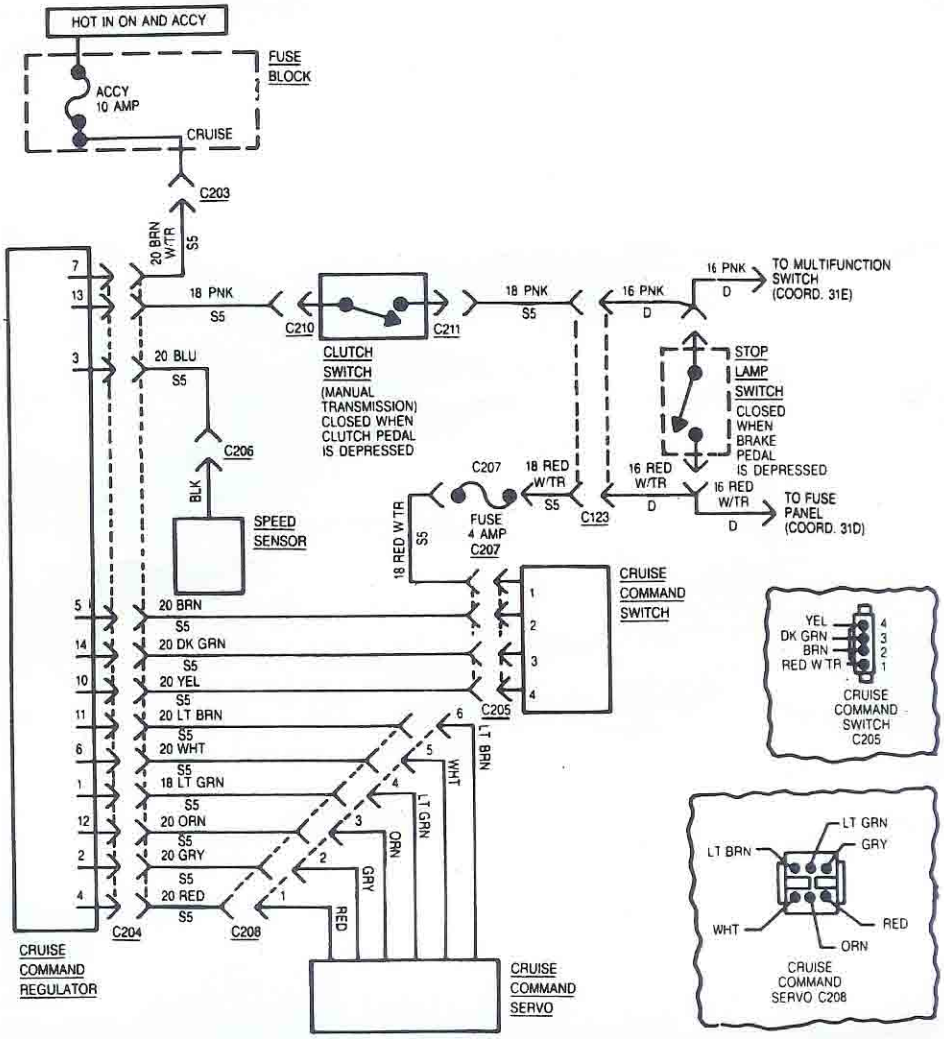


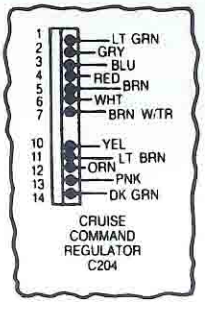

INTERMITTENT WIPER AND WASHER SWITCH
ERMITTENT
ER
/ERNOR
WHT
PNK
RED W/TR
BLK W/TR
RED W/TR
BLU W/TR
RED W/TR
INTERMEDIATE WIPER GOVERNOR C109A
FUSE BLOCK
AC/COMP
16 BRN D
C240
TO EEC
4 CYL.-(COORD. 3A-8A)
6 CYL.-(COORD. 9A-14A)
BX
C100
B
16 BRN B
E
16 BRN B
C147
BRN R9
C201
LOW FREON SWITCH
OPENS WITH LOW PRESSURE
C201
BRN R9
C202
AIR CONDITIONING COMPRESSOR CLUTCH
BRN
LT. BRN
BRN W/TR
AIR CONDITIONING BLOWER RESISTOR C237
16 BLU S11
LOW FREON SWITCH C201
HOT IN ON AND ACCY
FUSE BLOCK
FAN HTR 25 AMP
A/C
C231
14 RED S11
14 RED D
LT BRN
LT BRN
BRN
BRN W/TR
RED
HEATER BLOWER SWITCH C118
C118
OFF
MED
LOW
HI
C118
14 LT BRN D
16 BRN W/TR D
16 BRN D
C130
C232
A/C BLOWER SWITCH
OFF
MED
HIGH
LO
C233
C234
C235
C236
16 BLK S11
C238
A/C THERMOSTAT CONTROL
C239
16 BRN S11
16 LT BRN W/TR S11
16 LT BRN S11
C237
A/C BLOWER RESISTOR
16 BLK S11
ORN
A/C BLOWER MOTOR
BLK
CY
C100
B
14 LT BRN B
C147
C147
BLOWER MOTOR
LT BRN

HEATER



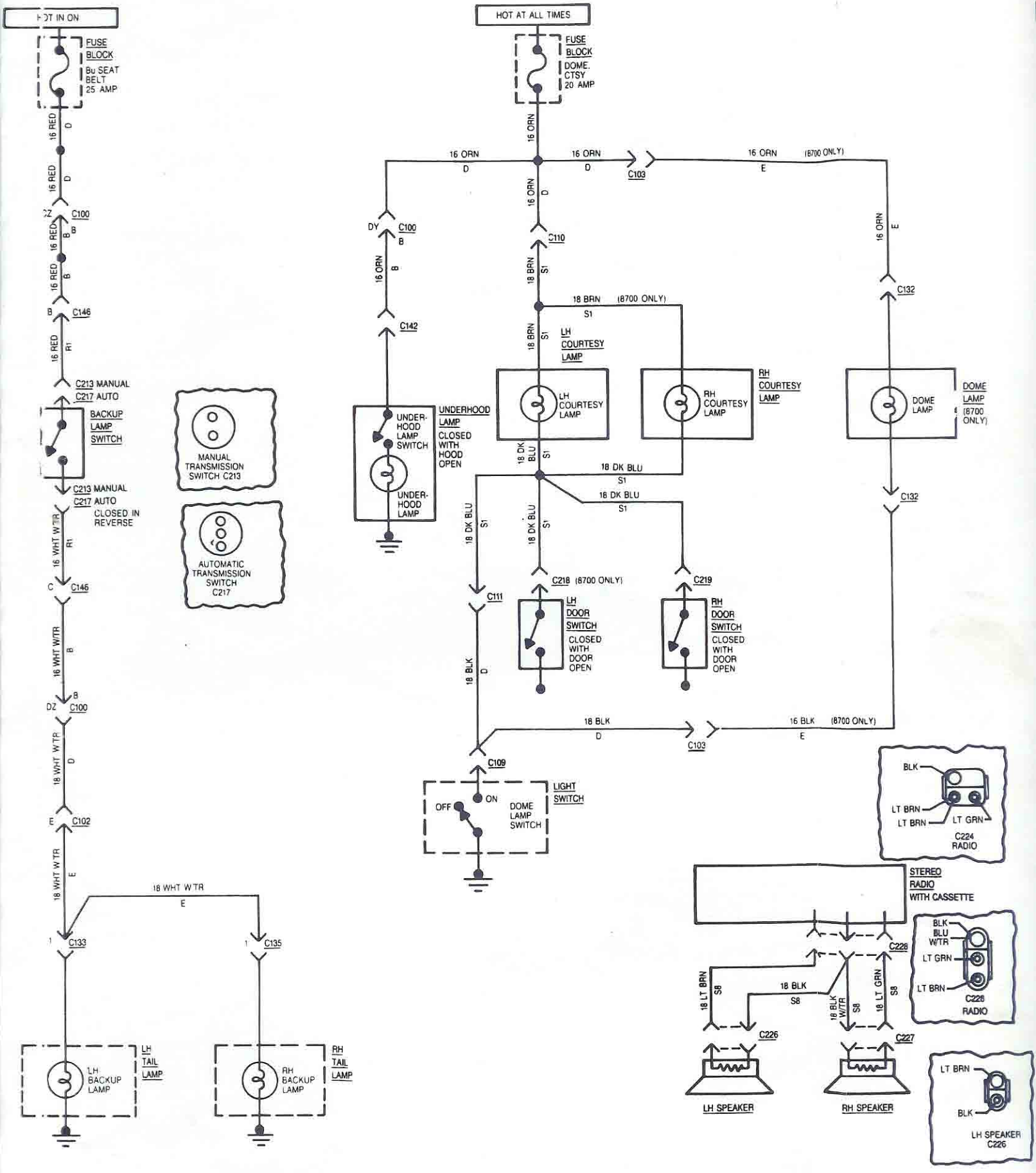
CRUISE COMMAND





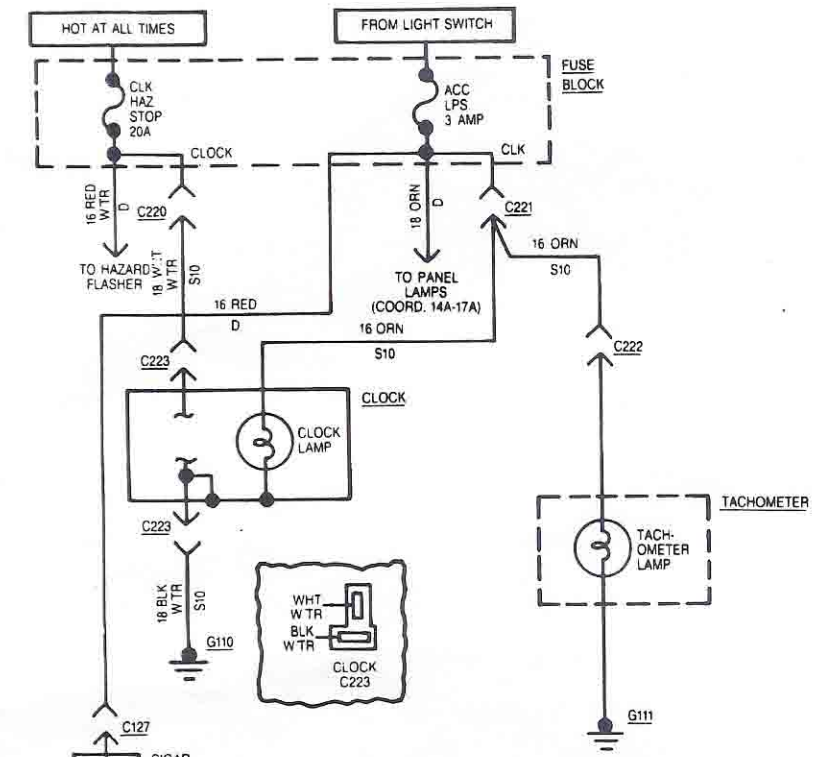
BACKUP LAMP

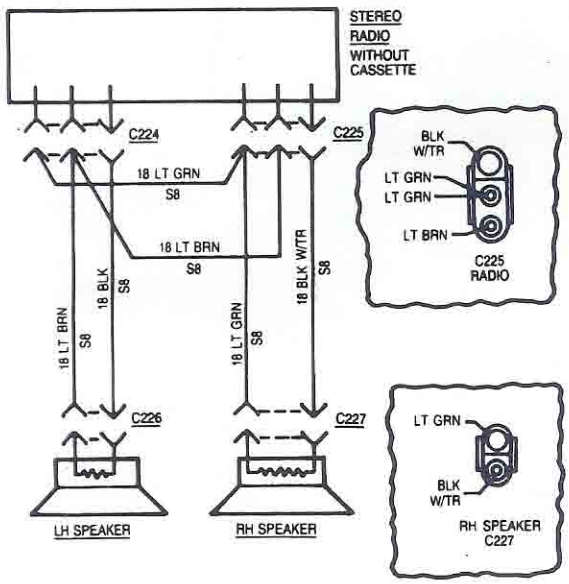
UNDERHOOD LAMP, COURTESY LAMPS, DOME LAMP

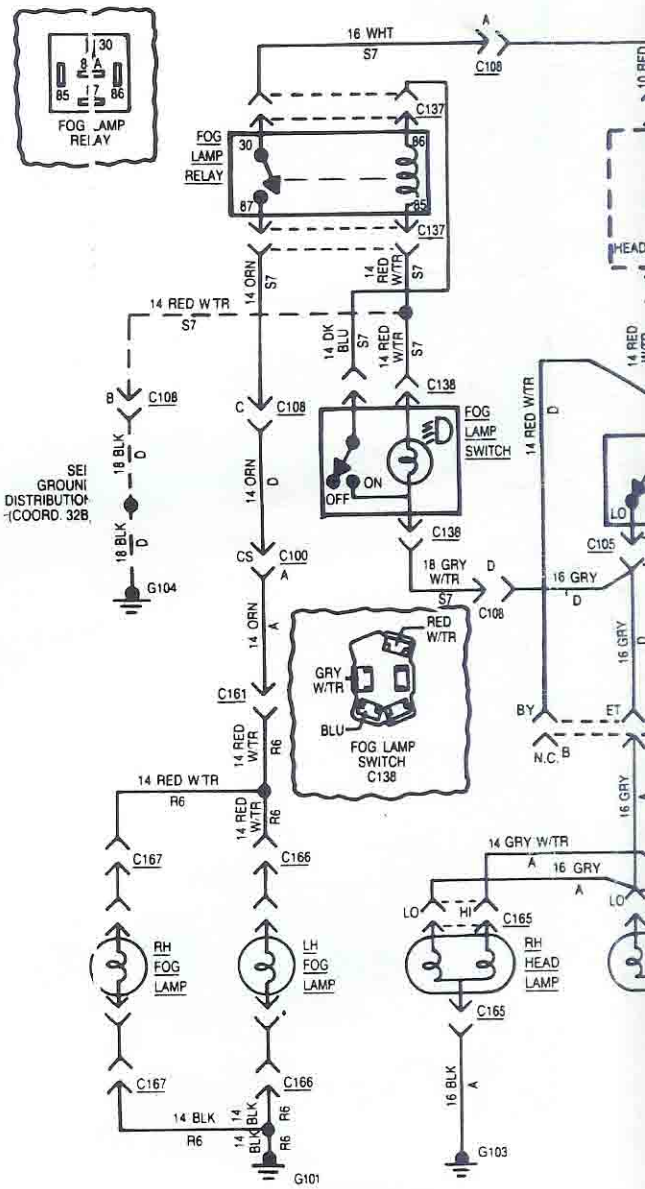


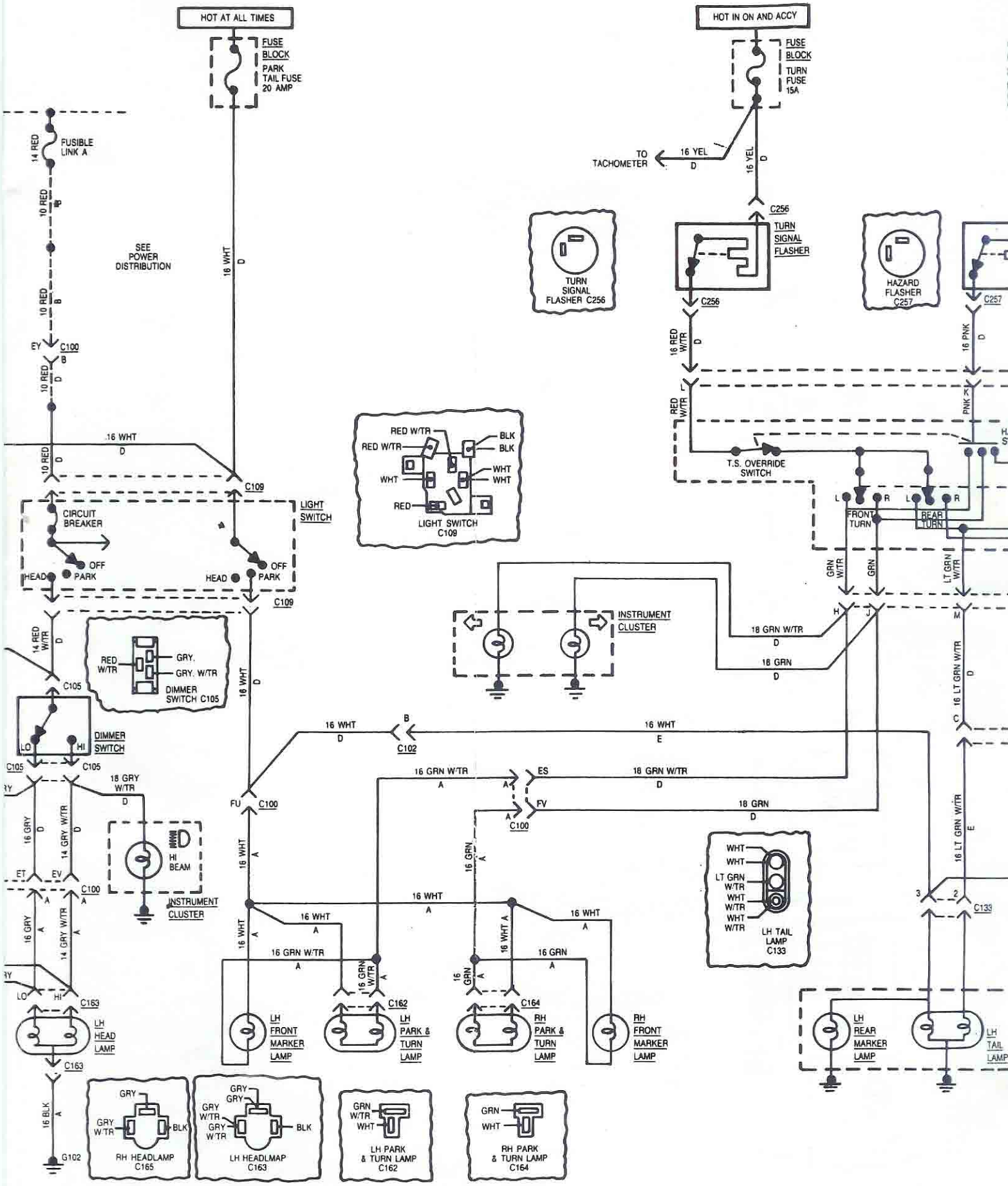
CIGAR LIGHTER CLOCK RADIO TACHOMETER LAMP

FOG LAMPS HEAD



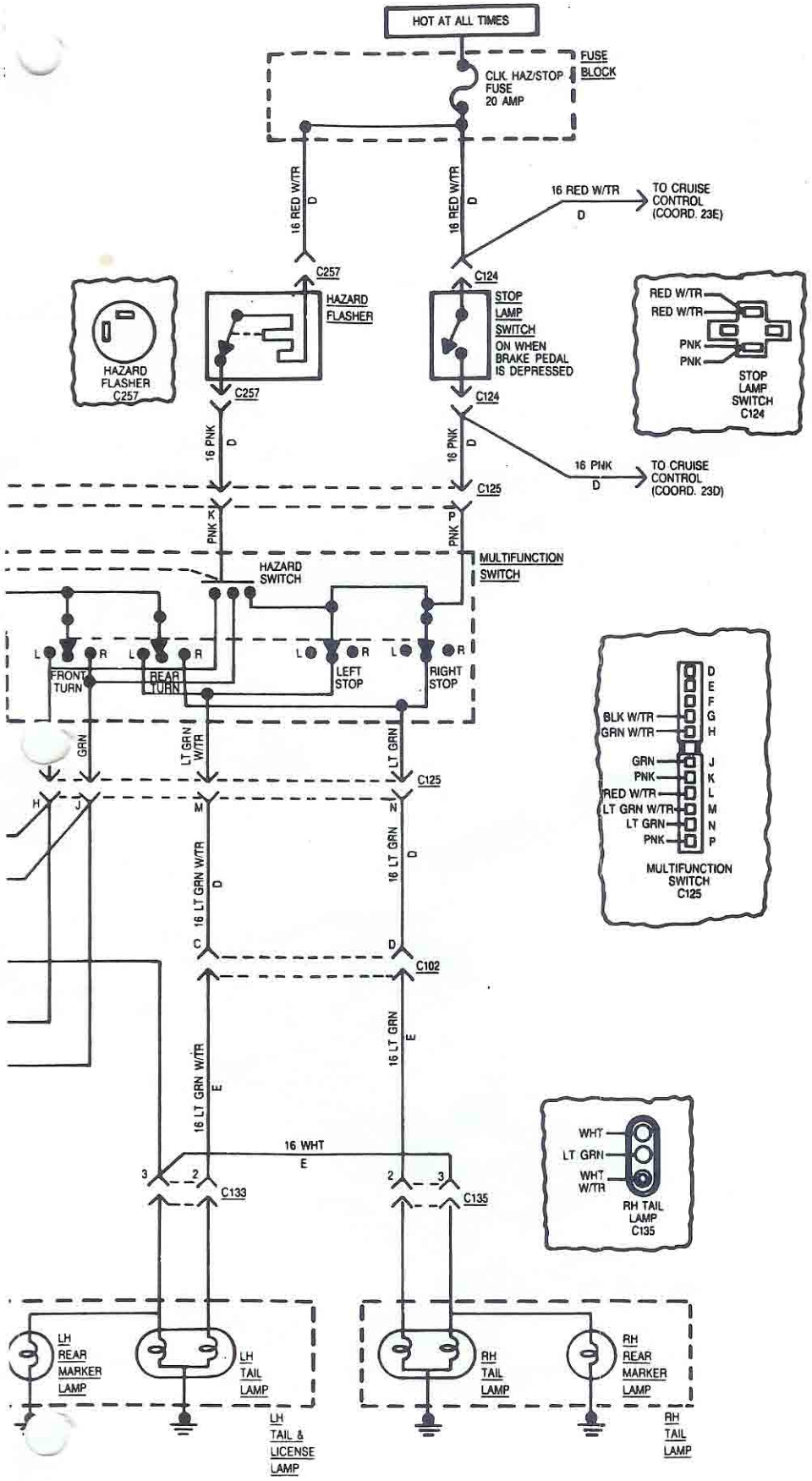





HOT AT ALL TIMES
FUSE BLOCK
PARK TAIL FUSE 20 AMP
HOT IN ON AND ACCY
FUSE BLOCK
TURN FUSE 15A
TO TACHOMETER
16 YEL D
FUSIBLE LINK A
14 RED
10 RED
SEE POWER DISTRIBUTION
16 WHT D
C100
C256
TURN SIGNAL FLASHER
TURN SIGNAL FLASHER C256
HAZARD FLASHER C257
C257
16 RED W/TR D
16 PNK D
T.S. OVERRIDE SWITCH
RED W/TR
BLK
WHT
RED
LIGHT SWITCH C109
CIRCUIT BREAKER
LIGHT SWITCH
OFF PARK
HEAD
C109
FRONT TURN
REAR TURN
GRN W/TR
GRN
LT GRN W/TR
INSTRUMENT CLUSTER
18 GRN W/TR D
18 GRN D
14 RED W/TR D
RED W/TR
GRY.
GRY. W/TR
DIMMER SWITCH C105
C105
DIMMER SWITCH
LO
HI
16 WHT D
B
C102
16 WHT E
16 GRN W/TR A
ES
FU
FV
C100
HI BEAM
INSTRUMENT CLUSTER
16 GRY D
14 GRY W/TR D
18 GRY W/TR D
16 WHT A
16 GRN A
WHT
LT GRN W/TR
WHT W/TR
LH TAIL LAMP C133
C133
LH FRONT MARKER LAMP
LH PARK & TURN LAMP
RH PARK & TURN LAMP
RH FRONT MARKER LAMP
C162
C163
C164
LH HEAD LAMP
LH REAR MARKER LAMP
LH TAIL LAMP
16 BLK A
G102
GRY
GRY W/TR
BLK
RH HEADLAMP C165
LH HEADLMAP C163
GRN W/TR
WHT
LH PARK & TURN LAMP C162
RH PARK & TURN LAMP C164

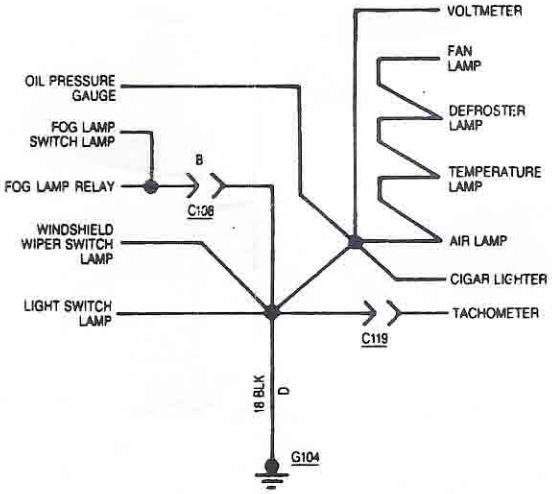
REAR LAMPS

HORN

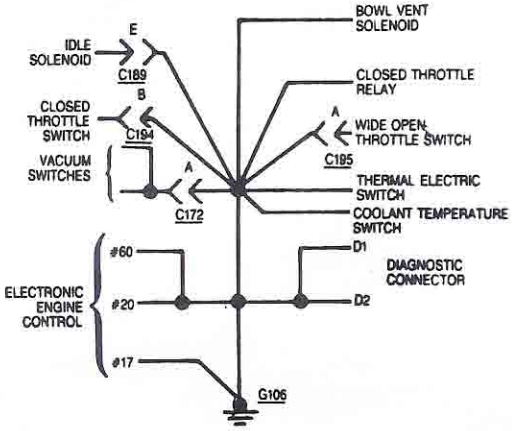


GROUNDS

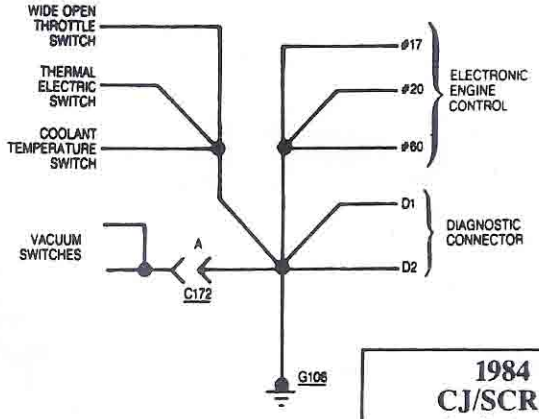
INSTRUMENT PANEL GROUND



4 CYLINDER ELECTRONIC ENGINE CONTROL GROUND



6 CYLINDER ELECTRONIC ENGINE CONTROL GROUND



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