INSTRUMENT PANEL AND GAUGES—YJ

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GENERAL INFORMATION

Following are general descriptions of major instrument panel components. Refer to Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

INSTRUMENT PANEL

Modular instrument panel construction allows all gauges and controls to be serviced from the front of the panel. In addition, most instrument panel wiring and heater components can be accessed without complete instrument panel removal.

Removal of the left instrument cluster bezel allows access to the main cluster assembly and most switches. Removal of the center cluster bezel allows access to the gauge package cluster assembly, the heater controls, and the radio. Removal of the cluster assemblies allows access to the individual gauges, illumination and indicator lamp bulbs, printed circuits, and most wiring.

INSTRUMENT CLUSTERS

The instrument cluster used on YJ (Wrangler) models consists of two separate assemblies. The main cluster assembly is located on the left side of the instrument panel, centered over the steering column opening. The gauge package cluster assembly is located near the center of the instrument panel. Each cluster assembly is served by a separate printed circuit and wiring connector. Some variations of each cluster exist due to optional equipment and regulatory requirements.

The main cluster assembly includes a speedometer/odometer/trip odometer and a tachometer. It also includes provisions for the following indicator lamps:

- anti-lock brake system lamp
- brake warning lamp
- headlamp high beam indicator lamp
- malfunction indicator (Check Engine) lamp
- seat belt reminder lamp
- turn signal indicator lamps
- upshift indicator lamp.

The gauge package cluster assembly includes a four-wheel drive indicator lamp and the following gauges:

- coolant temperature gauge
- fuel gauge
- oil pressure gauge
- voltmeter.

GAUGES

With the ignition switch in the ON or START position, voltage is supplied to all gauges through the two cluster printed circuits. With the ignition switch in the OFF position, voltage is not supplied to the gauges. A gauge pointer may remain within the gauge scale after the ignition switch is OFF. However, the gauges do not accurately indicate any vehicle condition unless the ignition switch is ON.

All gauges except the odometer are air core magnetic units. Two fixed electromagnetic coils are located within the gauge. These coils are wrapped at right angles to each other around a movable permanent magnet. The movable magnet is suspended within the coils on one end of a shaft. The gauge needle is attached to the other end of the shaft.

One of the coils has a fixed current flowing through it to maintain a constant magnetic field strength. Current flow through the second coil changes, which causes changes in its magnetic field strength. The current flowing through the second coil can be changed by:

- a variable resistor-type sending unit (fuel level, coolant temperature, or oil pressure)
- changes in electrical system voltage (voltmeter)
- electronic control circuitry (speedometer/odometer, tachometer).

The gauge needle moves as the movable permanent magnet aligns itself to the changing magnetic fields created around it by the electromagnets.

COOLANT TEMPERATURE GAUGE

The coolant temperature gauge gives an indication of engine coolant temperature. The coolant temperature sending unit is a thermistor that changes electrical resistance with changes in engine coolant temperature. High sending unit resistance causes low coolant temperature readings. Low resistance causes high coolant temperature readings. Sending unit resistance values are shown in a chart in Specifications.

FUEL GAUGE

The fuel gauge gives an indication of the level of fuel in the fuel tank. The fuel gauge sending unit has a float attached to a swing-arm in the fuel tank. The float moves up or down within the fuel tank as fuel level changes. As the float moves, an electrical contact on the swing-arm wipes across a resistor coil, which changes sending unit resistance. High sending unit resistance causes high fuel level readings. Low resistance causes low fuel level readings. Sending unit resistance values are shown in a chart in Specifications.

OIL PRESSURE GAUGE

The oil pressure gauge gives an indication of engine oil pressure. The combination oil pressure sending unit contains a flexible diaphragm. The diaphragm moves in response to changes in engine oil pressure. As the diaphragm moves, sending unit resistance increases or decreases. High resistance on the gauge side of the sending unit causes high oil pressure readings. Low resistance causes low oil pressure readings. Sending unit resistance values are shown in a chart in Specifications.

SPEEDOMETER/ODOMETER

The speedometer/odometer give an indication of vehicle speed and travel distance. The speedometer receives a vehicle speed pulse signal from the Vehicle Speed Sensor (VSS). An electronic integrated circuit contained within the speedometer reads and analyzes the pulse signal. It then adjusts the ground path resistance of one electromagnet in the gauge to control needle movement. It also sends signals to an electric stepper motor to control movement of the odometer number rolls. Frequency values for the pulse signal are shown in a chart in Specifications.

The VSS is mounted to an adapter near the transfer case output shaft. The sensor is driven through the adapter by a speedometer pinion gear. The adapter and pinion vary with transmission, axle ratio and tire size. Refer to Group 21 - Transmission and Transfer Case for more information.

TACHOMETER

The tachometer gives an indication of engine speed in Revolutions-Per-Minute (RPM). With the engine running, the tachometer receives an engine speed pulse signal from the Powertrain Control Module (PCM). An electronic integrated circuit contained within the tachometer reads and analyzes the pulse signal. It then adjusts the ground path resistance of one electromagnet in the gauge to control needle movement. Frequency values for the pulse signal are shown in a chart in Specifications.

TRIP ODOMETER

The trip odometer is driven by the same electronic integrated circuit as the speedometer/odometer. However, by depressing the trip odometer reset knob on the face of the speedometer, the trip odometer can be reset to zero. The trip odometer is serviced only as a part of the speedometer/odometer gauge assembly.

VOLTMETER

The voltmeter is connected in parallel with the battery. With the ignition switch ON, the voltmeter indicates battery or generator output voltage, whichever is greater.

INDICATOR LAMPS

All indicator lamps, except the four-wheel drive indicator, are located in the main cluster tell-tale area above the steering column opening. Each of the lamps is served by the main cluster printed circuit and cluster connector. The four-wheel drive indicator lamp is located in the gauge package cluster and is served by the gauge package printed circuit and cluster connector.

Up to eleven indicator lamps can be found in the tell-tale area of the main cluster. These lamps are arranged in two rows, with six lamps in the upper row and five lamps in the lower row.

ANTI-LOCK BRAKE SYSTEM LAMP

The Anti-Lock Brake System (ABS) lamp is switched to ground by the ABS module. The module lights the lamp when the ignition switch is turned to the START position as a bulb test. The lamp will stay on for 3 to 5 seconds after vehicle start-up to indicate a system self-test is in process. If the lamp remains on after start-up, or comes on and stays on while driving, it may indicate that the ABS module has detected a system malfunction or that the system has become inoperative. Refer to Group 5 - Brakes for more information.

BRAKE WARNING LAMP

The brake warning lamp warns the driver that the parking brake is applied or that the pressures in the two halves of the split brake hydraulic system are unequal. With the ignition switch turned ON, battery

voltage is supplied to one side of the indicator bulb. A ground path for the bulb is provided by 3 switches. The bulb will light when:

- the brake warning switch is closed (indicating unequal brake system hydraulic pressures possibly due to brake fluid leakage)
- the ignition switch is in the START position (bulb test)
- the parking brake switch is closed (parking brake is applied).

Refer to Group 5 - Brakes for more information.

FOUR-WHEEL DRIVE INDICATOR LAMP

This lamp lights when the transfer case is engaged in the 4H or 4L position. Voltage is supplied to one side of the indicator bulb. A switch on the front axle disconnect housing is connected to the other side of the indicator bulb. When the switch is closed, a path to ground is provided and the indicator bulb lights.

HEADLAMP HIGH BEAM INDICATOR LAMP

The high beam indicator lamp is controlled by the headlamp dimmer switch. One side of the indicator bulb is grounded at all times. The other side of the bulb receives battery feed through the contacts of the dimmer switch when the turn signal switch lever is actuated to turn the headlamp high beams on. Refer to Group 8L - Lamps for more information.

MALFUNCTION INDICATOR LAMP

The CHECK ENGINE or Malfunction Indicator Lamp (MIL) lights each time the ignition switch is turned ON, and stays on for 3 seconds as a bulb test. If the Powertrain Control Module (PCM) receives an incorrect signal or no signal from certain fuel or emission system related circuits or components, the lamp is turned on. This will indicate that the PCM has recorded a Diagnostic Trouble Code (DTC) in electronic memory for a circuit or component malfunction. Refer to Group 14 - Fuel System for more information.

SEAT BELT REMINDER LAMP

The seat belt reminder lamp lights for 4 to 8 seconds after the ignition switch is turned to the ON position. A timer in the chime/buzzer module controls ignition-switched battery feed to the lamp. Refer to Group 8U - Chime/Buzzer Warning Systems for more information.

TURN SIGNAL INDICATOR LAMPS

The left and right turn signal indicator lamps are controlled by the turn signal and hazard warning switches. One side of the bulb for each lamp is grounded at all times. The other side of the bulb receives battery feed through the contacts of the turn signal switch, when the turn signal lever or hazard warning button are actuated. Refer to Group 8J - Turn Signal and Hazard Warning Systems for more information.

UPSHIFT INDICATOR LAMP

Vehicles equipped with manual transmissions have an optional upshift indicator lamp. Ground feed for the lamp is switched by the Powertrain Control Module (PCM). The lamp lights to indicate when the driver should shift to the next highest gear for best fuel economy. The PCM will turn the lamp off after 3 to 5 seconds if the upshift is not performed. The lamp will remain off until the vehicle stops accelerating and is brought back to the range of lamp operation, or until the transmission is shifted into another gear.

The indicator lamp is normally on when the ignition switch is turned ON and is turned off when the engine is started. The lamp will be turned on during vehicle operation according to engine speed and load.

CLUSTER ILLUMINATION LAMPS

All cluster illumination lamps receive battery feed from the instrument lamps fuse in the fuseblock module through the panel dimmer switch. When the park or headlamps are on, the cluster illumination lamps light. Illumination brightness can be adjusted by rotating the panel dimmer thumb-wheel, which is next to the headlamp switch.

DIAGNOSIS

GAUGES

If an individual gauge is inoperative, see the diagnostic procedure under the heading for that gauge. If more than one gauge in the main cluster or gauge package cluster is inoperative, perform the following:

(1) Check fuse 9 in the fuseblock module. If OK, go to next step. If not OK, replace fuse.

(2) Check for battery voltage at fuse 9 with ignition switch in ON position. If OK, go to next step. If not OK, repair open in circuit from ignition switch and/or refer to Group 8D - Ignition Systems for testing of ignition switch.

(3) Turn ignition switch to OFF. Disconnect battery negative cable. Remove the affected instrument cluster bezel and cluster assembly. Disconnect the cluster connector.

(4) Connect battery negative cable. Turn ignition switch to ON. If problem is in main cluster, check for battery voltage at cavity 3 and cavity 19 of main cluster connector. If problem is in gauge package cluster, check for battery voltage at cavity 2 and cavity 12 of gauge package cluster connector. If OK, go to next step. If not OK, repair open in circuit from fuse 9 as required.

(5) Turn ignition switch to OFF. Disconnect battery negative cable. Probe cavities 14 and 20 of main cluster connector, or cavities 1 and 13 of gauge package cluster connector. Check for continuity to a good ground. There should be continuity. If OK, replace the cluster printed circuit. If not OK, repair open in circuit as required.

COOLANT TEMPERATURE GAUGE

The diagnosis found here addresses an inoperative gauge condition. If the problem being diagnosed is related to gauge accuracy, be certain to confirm that problem is with gauge and not with cooling system performance. Actual engine coolant temperature should be checked with a test gauge or thermometer and compared to gauge readings before you proceed with gauge diagnosis. Refer to Group 7 - Cooling System for more information.

(1) Turn ignition switch to ON. Disconnect coolant temperature sending unit connector. Sending unit (Fig. 1) is located near left rear corner of the cylinder head. The gauge needle should move to low end of gauge scale. If OK, go to next step. If not OK, go to step 3.

(2) Install a jumper wire from sending unit wiring to ground. The gauge needle should move to high end of gauge scale. If OK, replace sending unit. If not OK, remove jumper wire and go to next step.

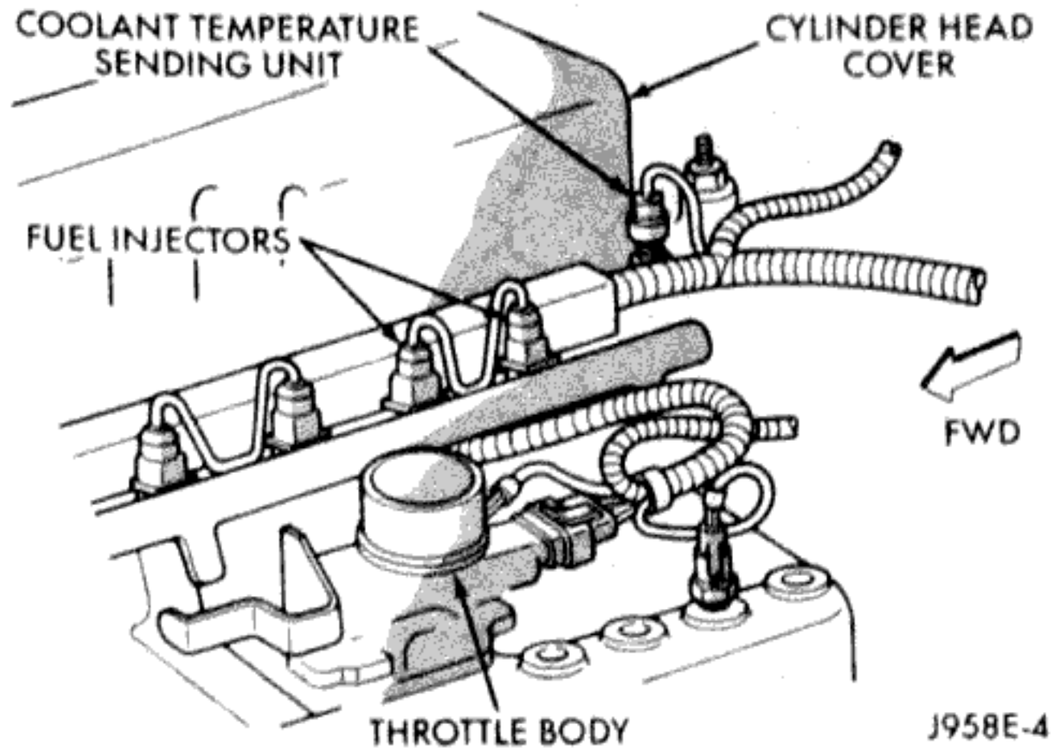


Fig. 1 Coolant Temperature Sending Unit - Typical

(3) Turn ignition switch to OFF. Disconnect battery negative cable. Remove center instrument cluster bezel and gauge package cluster assembly. Disconnect cluster connector.

(4) Probe cavity 11 of cluster connector. Check for continuity to a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short in circuit as required.

(5) Still probing cavity 11 of cluster connector, check for continuity to sending unit wiring connector. There should be continuity. If OK, replace gauge. If not OK, repair open in circuit as required.

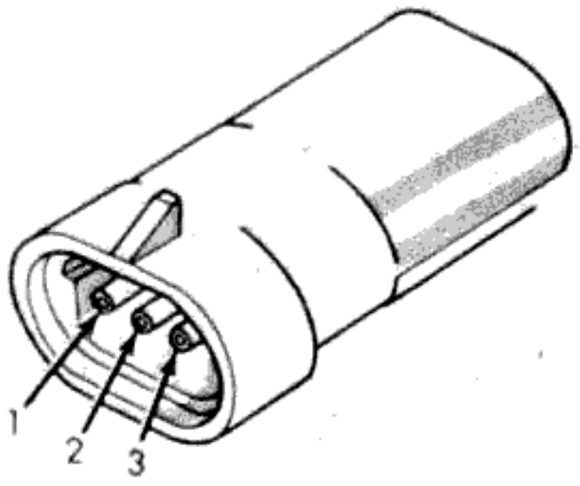
FUEL GAUGE

The diagnosis found here addresses an inoperative gauge condition. If the problem being diagnosed is related to gauge accuracy, be certain to confirm that problem is with gauge and not with fuel tank. Inspect fuel tank for signs of damage or distortion that could affect sending unit performance before you proceed with gauge diagnosis. Refer to Group 14 - Fuel System for more information.

(1) Turn ignition switch to ON. Disconnect fuel gauge sending unit connector. Connector is located near the left front upper corner of fuel tank. The gauge needle should move to high end of gauge scale. If OK, go to next step. If not OK, go to step 4.

(2) Connect a jumper wire between terminals 1 and 2 in the body half of the fuel gauge sending unit connector (Fig. 2). The gauge needle should move to low end of gauge scale. If OK, refer to Group 14 - Fuel System for procedure to replace sending unit. If not OK, remove jumper wire and go to next step.

(3) Turn ignition switch to OFF. Disconnect battery negative cable. Check for continuity between terminal 1 in the body half of fuel gauge sending unit connector and a good ground. There should be



NO.	IDENTIFICATION
1	GROUND
2	FUEL LEVEL SENSE
3	FUEL PUMP RELAY OUTPUT

J958E-12

Fig. 2 Fuel Gauge Sending Unit Connector

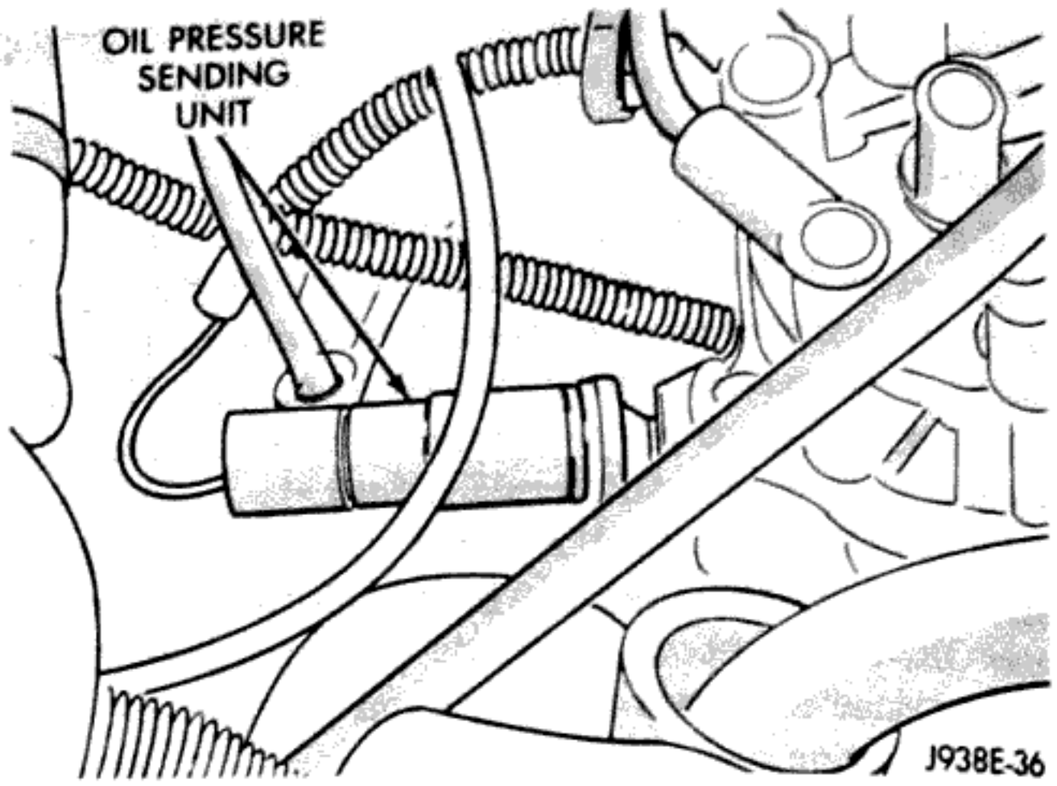


Fig. 3 Oil Pressure Sending Unit - Typical

continuity. If OK, go to next step. If not OK, repair circuit to ground as required.

(4) Remove center instrument cluster bezel and gauge package cluster assembly. Disconnect cluster connector.

(5) Probe cavity 6 of cluster connector. Check for continuity to a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(6) Still probing cavity 6 of cluster connector, check for continuity to cavity 2 of sending unit wiring body half connector. There should be continuity. If OK, replace gauge. If not OK, repair open circuit as required.

OIL PRESSURE GAUGE

The diagnosis found here addresses an inoperative gauge condition. If the problem being diagnosed is related to gauge accuracy, be certain to confirm that problem is with gauge and not with engine oiling system performance. Actual engine oil pressure should be checked with a test gauge and compared to gauge readings before you proceed with gauge diagnosis. Refer to Group 9 - Engines for more information.

(1) Turn ignition switch to ON. Disconnect oil pressure sending unit connector. The sending unit (Fig. 3) is located on right side of engine block. On 2.5L engine, it is just forward of ignition distributor and just to the rear of generator mounting bracket. On 4.0L engine, it is just to the rear of ignition distributor and above oil filter adapter. The gauge needle should move to high end of gauge scale. If OK, go to next step. If not OK, go to step 3.

(2) Install a jumper wire from sending unit wiring to ground. The gauge needle should move to low end of gauge scale. If OK, replace sending unit. If not OK, remove jumper wire and go to next step.

(3) Turn ignition switch to OFF. Disconnect battery negative cable. Remove center instrument cluster bezel and gauge package cluster assembly. Disconnect cluster connector.

(4) Probe cavity 9 of cluster connector. Check for continuity to a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(5) Still probing cavity 9 of cluster connector, check for continuity to sending unit wire connector. There should be continuity. If OK, replace gauge. If not OK, repair open circuit as required.

SPEEDOMETER/ODOMETER

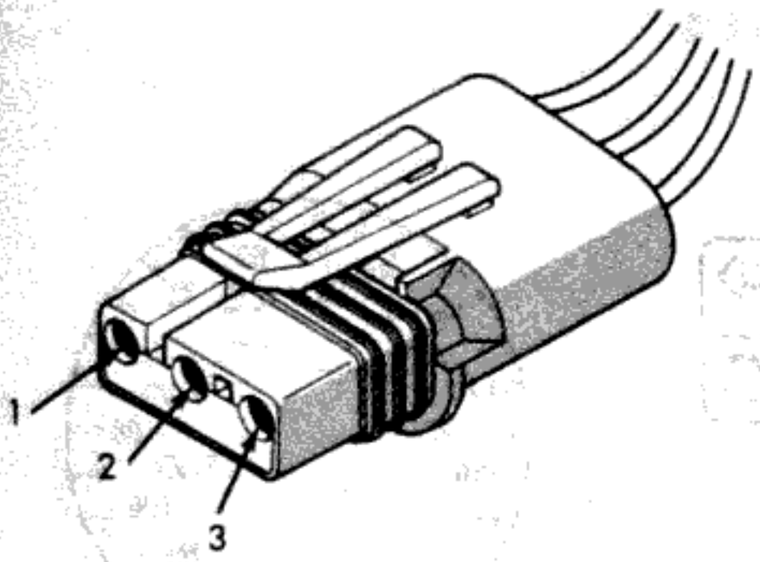
The diagnosis found here addresses an inoperative gauge condition. If the problem being diagnosed is related to gauge accuracy, be certain to confirm that problem is with gauge and not with incorrect speedometer pinion, axle ratio or tire size. Refer to Group 21 - Transmission and Transfer Case for more information.

(1) Perform vehicle speed sensor test as described in the appropriate Powertrain Diagnostic Procedures manual. If OK, go to next step. If not OK, replace vehicle speed sensor.

(2) Disconnect battery negative cable. Unplug vehicle speed sensor, PCM, and daytime running lamp module connectors. Remove left instrument cluster bezel and main cluster assembly. Disconnect cluster connector.

(3) Probe cavity 13 of cluster connector. Check for continuity to a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(4) Still probing cavity 13 of cluster connector, check for continuity to cavity 1 of vehicle speed sensor connector (Fig. 4). There should be continuity. If OK, replace speedometer/odometer. If not OK, repair open circuit as required.



NO.	IDENTIFICATION
1	VSS SIGNAL
2	SENSOR GROUND
3	SENSOR SUPPLY

J958E-6

Fig. 4 Vehicle Speed Sensor Connector

TACHOMETER

(1) With engine running, check for tachometer signal at pin 43 of PCM connector (Fig. 5). See Tachometer Calibration chart in Specifications. If OK, go to next step. If not OK, replace PCM.

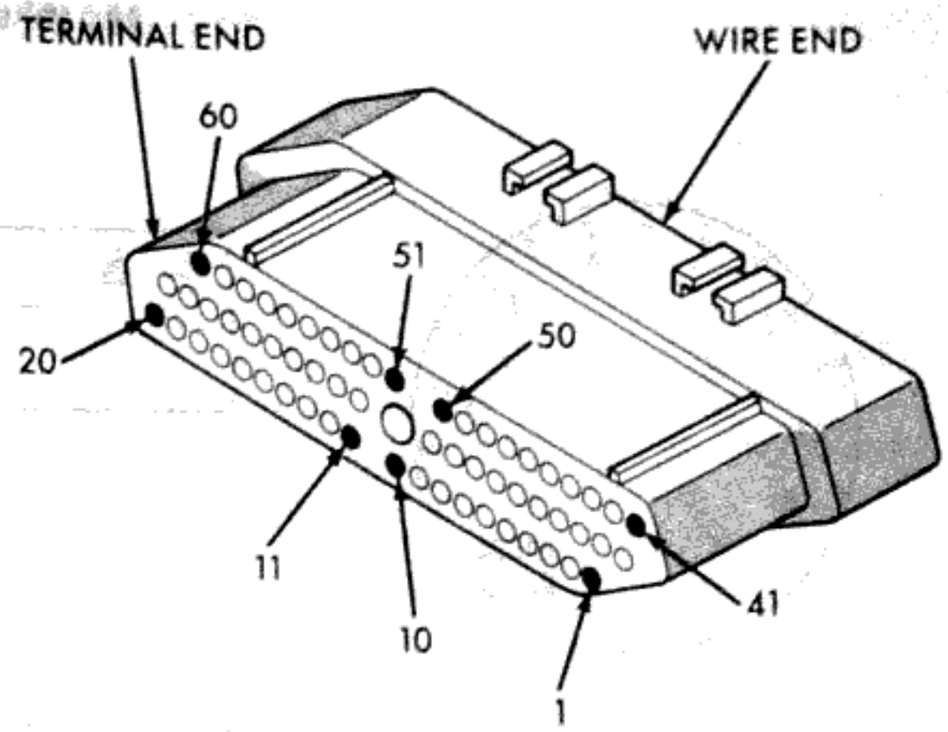
(2) Disconnect battery negative cable. Unplug PCM connector. Remove left instrument cluster bezel and main cluster assembly. Disconnect cluster connector.

(3) Probe cavity 12 of cluster connector. Check for continuity to a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(4) Still probing cavity 12 of cluster connector, check for continuity to cavity 43 of PCM connector. There should be continuity. If OK, replace tachometer. If not OK, repair open circuit as required.

TRIP ODOMETER

If the trip odometer is inoperative, but the speedometer/odometer functions are unaffected, replace speedometer assembly. If speedometer/odometer functions are affected, see Speedometer/Odometer diagnosis in this section.



NO.	IDENTIFICATION
32	MALFUNCTION INDICATOR LAMP
36	GENERATOR WARNING LAMP
43	TACHOMETER SIGNAL
54	UPSHIFT INDICATOR LAMP

J958E-7

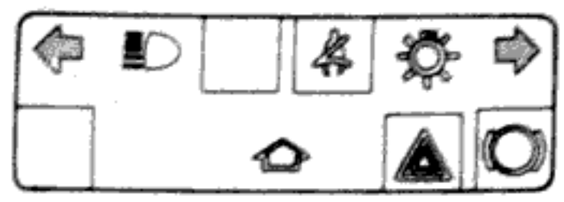
Fig. 5 Powertrain Control Module Connector

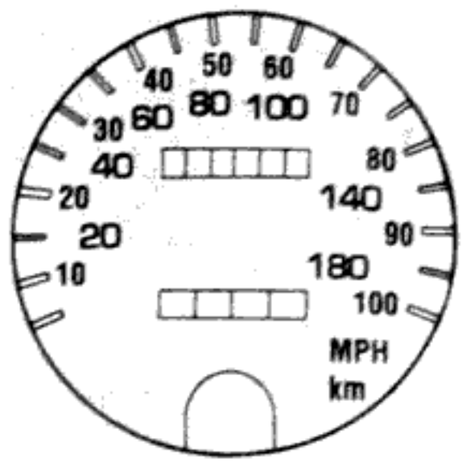
VOLTMETER

(1) Turn ignition switch to ON. Voltmeter should read battery voltage. If all gauges except voltmeter are OK, go to next step. If other gauges are inoperative, see Gauges in this section for diagnosis.

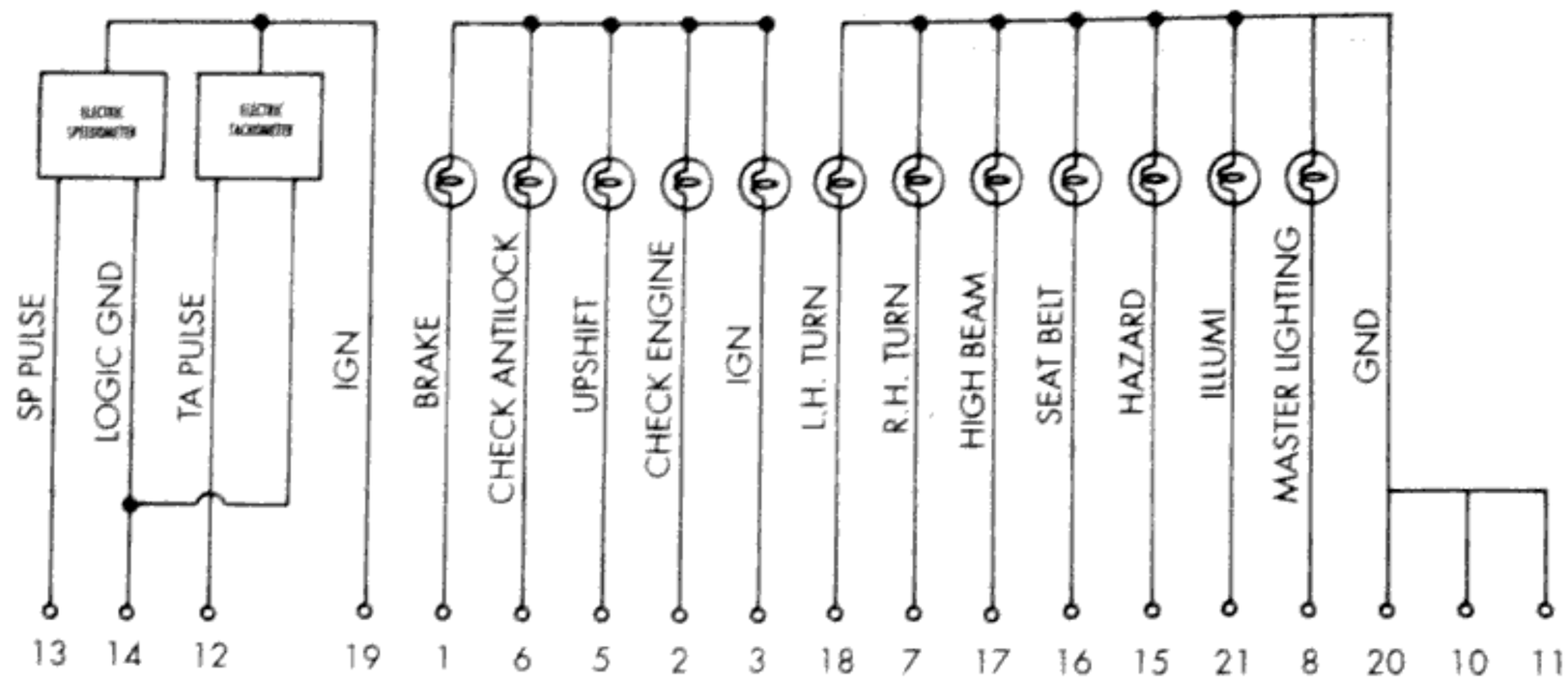
(2) Using an accurate test voltmeter, measure battery voltage at battery. Compare this reading to instrument cluster voltmeter reading. Now see Voltmeter Calibration chart in Specifications. If voltmeter does not perform to specification, replace voltmeter.

MAIN CLUSTER

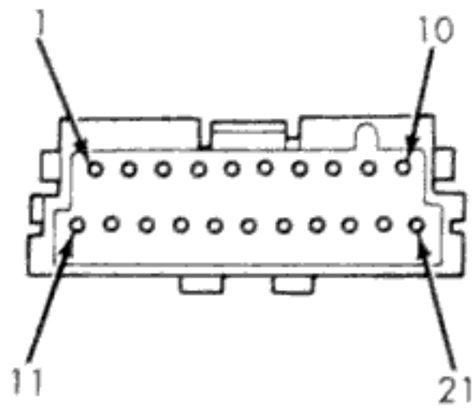




MAIN CLUSTER CIRCUIT SCHEMATIC



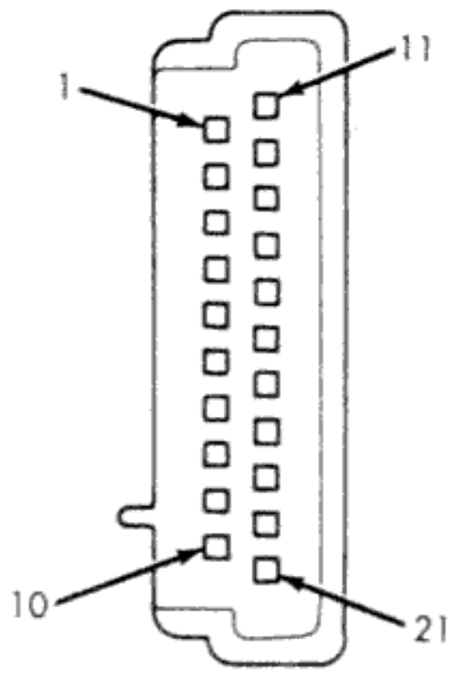
MAIN CLUSTER
PRINTED CIRCUIT TERMINALS



MAIN CLUSTER
LEGEND

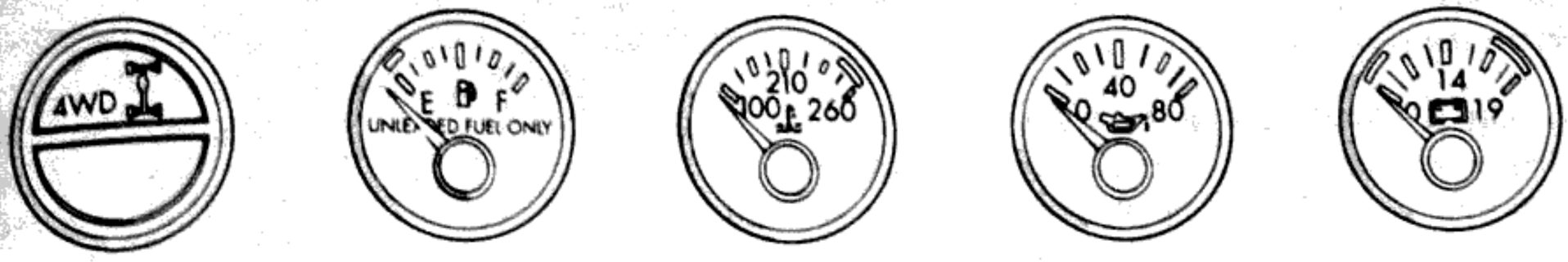
NO.	IDENTIFICATION
1	BRAKE
2	CHECK ENGINE
3	IGNITION
4	NOT USED
5	UP SHIFT
6	ABS
7	RIGHT TURN
8	NOT USED
9	NOT USED
10	GROUND
11	GROUND
12	TACHOMETER
13	VEHICLE SPEED SENSOR
14	GROUND
15	NOT USED
16	SEAT BELT
17	HEADLAMP HIGH BEAM
18	LEFT TURN
19	IGNITION
20	GROUND
21	ILLUMINATION

MAIN CLUSTER
CONNECTOR

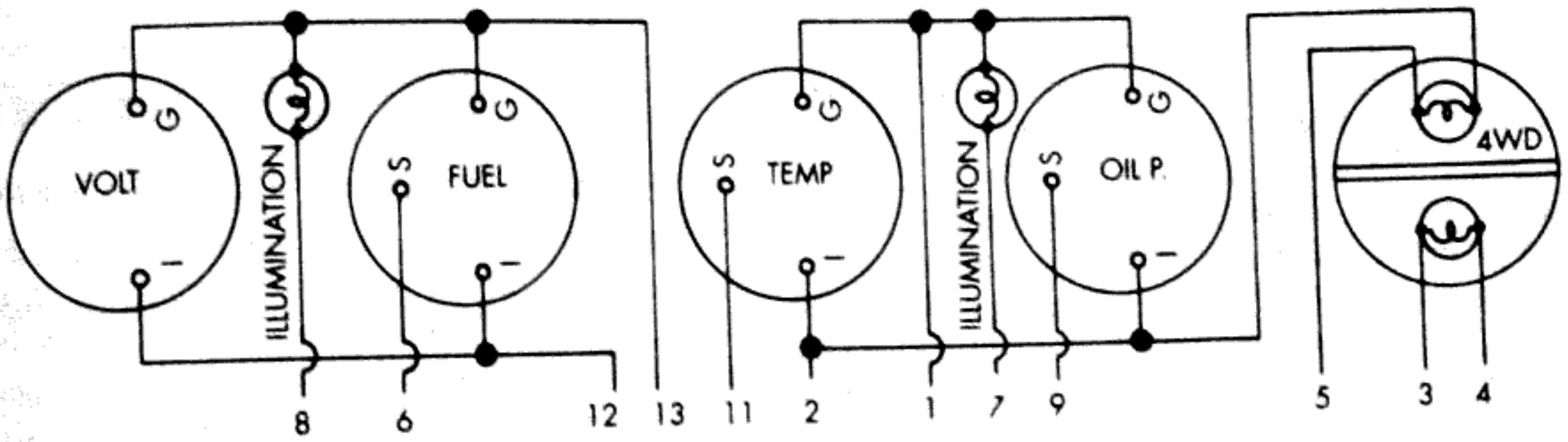


VIEWED FROM TERMINAL END

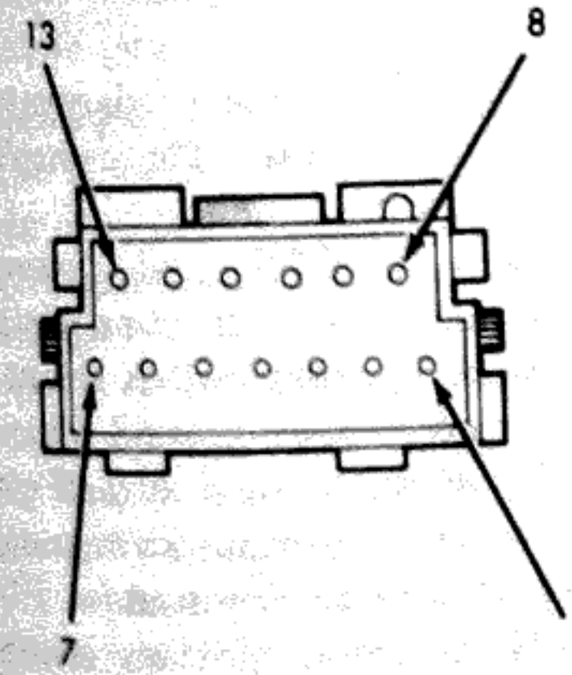
GAUGE PACKAGE CLUSTER



GAUGE PACKAGE CLUSTER
CIRCUIT SCHEMATIC



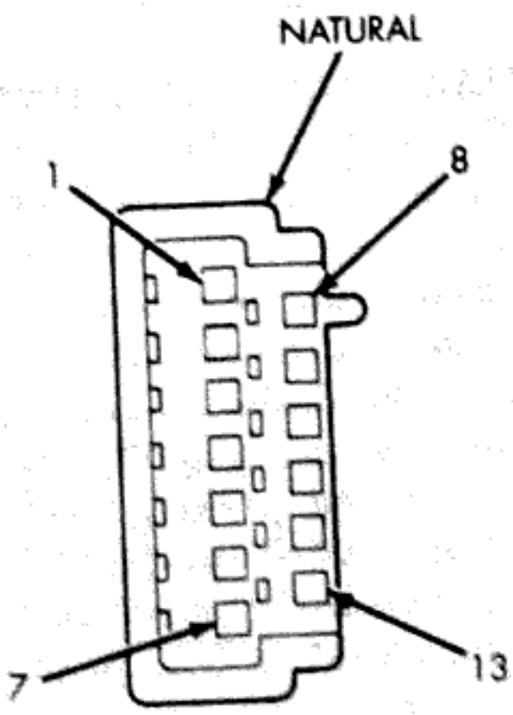
GAUGE PACKAGE CLUSTER
PRINTED CIRCUIT TERMINALS



GAUGE PACKAGE CLUSTER
LEGEND

NO.	IDENTIFICATION
1	GROUND
2	IGNITION
3	NOT USED
4	NOT USED
5	FOUR-WHEEL DRIVE
6	FUEL GAUGE
7	ILLUMINATION
8	ILLUMINATION
9	ENGINE OIL PRESSURE
10	NOT USED
11	ENGINE COOLANT TEMP
12	IGNITION
13	GROUND

GAUGE PACKAGE CLUSTER
CONNECTOR



VIEWED FROM TERMINAL END

INDICATOR LAMPS

If an individual indicator lamp is inoperative, see the diagnostic procedure under the heading for that lamp. If more than one indicator lamp or a combination of lamps and gauges in the main cluster or the gauge package cluster is inoperative, see Gauges in this section for diagnosis.

ANTI-LOCK BRAKE SYSTEM LAMP

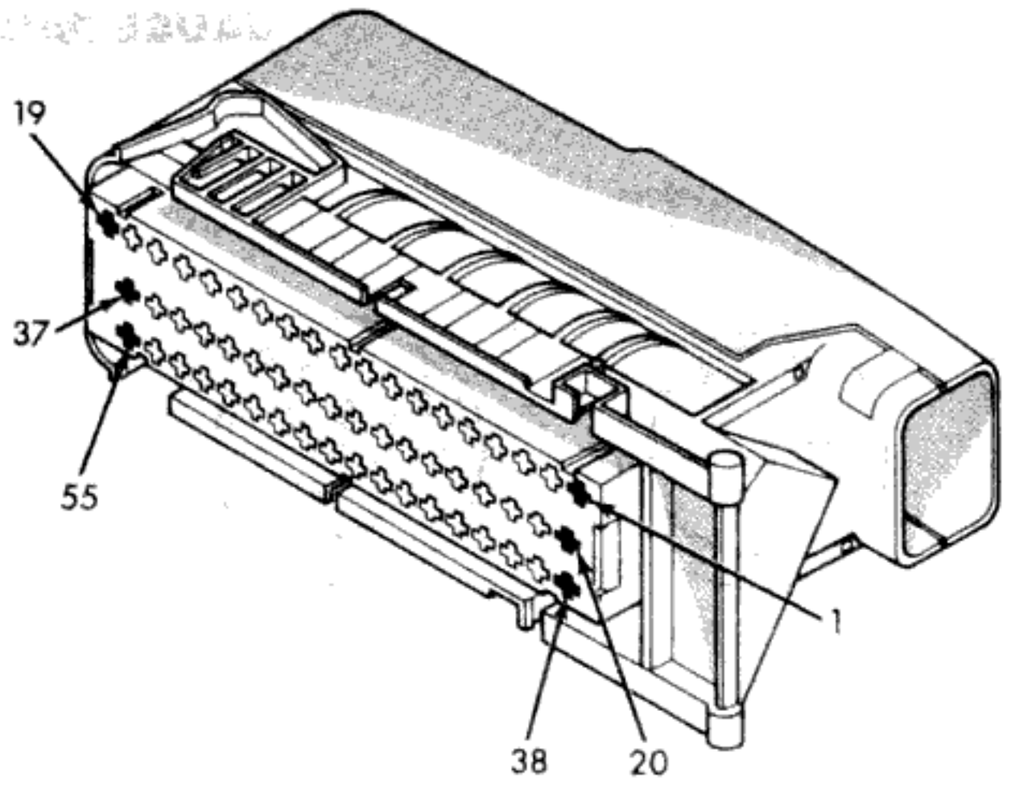
The diagnosis found here addresses an inoperative lamp condition. If the ABS lamp stays on with the ignition switch in the ON position, or comes on and stays on while driving, refer to Group 5 - Brakes for diagnosis. If no ABS problem is found, the following procedure will help locate a short or open in the ABS lamp circuit.

(1) Disconnect battery negative cable. Remove left instrument cluster bezel and main cluster assembly. Disconnect ABS control module connector.

(2) Install a jumper wire between cavity 6 of cluster connector and a good ground. Connect battery negative cable. Turn ignition switch to ON. Lamp should light. If OK, remove jumper wire and go to next step. If not OK, replace bulb.

(3) Turn ignition switch to OFF. Disconnect battery negative cable and unplug cluster connector. Check for continuity between cavity 6 of cluster connector and a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(4) Check continuity between cavity 6 of cluster connector and cavity 52 of ABS control module connector (Fig. 6). There should be continuity. If OK, refer to Group 5 - Brakes for diagnosis of ABS control module. If not OK, repair open circuit as required.



NO.	IDENTIFICATION
52	ANTI-LOCK BRAKE SYSTEM LAMP

J958E-9

Fig. 6 ABS Control Module Connector

BRAKE WARNING LAMP

The diagnosis found here addresses an inoperative lamp condition. If the brake warning lamp stays on with the ignition switch in the ON position and the parking brake released, refer to Group 5 - Brakes for diagnosis. If no service brake or parking brake problem is found, the following procedure will help locate a short circuit or faulty switch.

(1) Unplug parking brake switch connector. Turn ignition switch to START position. Lamp should light. Release ignition switch to ON position. Lamp should go off. If OK, go to step 10. If not OK, go to next step.

(2) Unplug brake warning switch connector. Install a jumper wire between two cavities of connector. Turn ignition switch to START. Lamp should light. Remove jumper wire and lamp should go off. If OK, replace brake warning switch. If not OK, remove jumper wire and go to next step.

(3) Turn ignition switch to ON position. Install a jumper wire between brake warning switch connector cavity for circuit G9 and a good ground. Lamp should light. If OK, go to step 5. If not OK, go to next step.

(4) Turn ignition switch to OFF. Remove jumper wire and disconnect battery negative cable. Remove left instrument cluster bezel and main cluster. Install a jumper wire between cavity 1 of cluster connector and a good ground. Connect battery negative cable and turn ignition switch to ON. Lamp should light. If OK, repair open in circuit to brake warning switch. If not OK, replace bulb.

(5) Turn ignition switch to OFF and remove jumper wire. Disconnect battery negative cable. Check for continuity between brake warning switch connector cavity for circuit G11 and a good ground with ignition switch in START position. There should be continuity. If not OK, go to next step.

(6) Turn ignition switch to OFF and remove jumper wire. Unplug ignition switch connectors. Check for continuity between ignition switch connector cavity for G11 circuit and a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit between ignition switch and brake warning switch connectors as required.

(7) Check for continuity between ignition switch connector cavity for G11 circuit and brake warning switch connector cavity for G11 circuit. There should be continuity. If OK, go to next step. If not OK, repair open circuit as required.

(8) Check for continuity between metal steering column jacket and a good ground. There should be continuity. If OK, go to next step. If not OK, refer to Group 19 - Steering to check steering column ground clip installation.

(9) Turn ignition switch to START position and hold there. Check for continuity between terminal for circuit G11 of ignition switch and a good ground. There should be continuity. If not OK, replace ignition switch.

(10) Unplug brake warning switch connector. Check for continuity between parking brake switch connector and a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(11) Check for continuity between parking brake switch connector and brake warning switch connector cavity for circuit G11. There should be continuity. If OK, replace parking brake switch. If not OK, repair open circuit to brake warning switch as required.

FOUR-WHEEL DRIVE INDICATOR LAMP

(1) Apply parking brake, start engine, vehicle in 4WD Lock or 4WD.

(2) Unplug switch and touch harness side of wire to ground. Lamp should light. If OK, check switch operation, replace if bad. If bulb is OK, repair open to indicator.

HEADLAMP HIGH BEAM INDICATOR LAMP

(1) Check that headlamp high beams are functional. If OK, go to next step. If not OK, refer to Group 8L - Lamps for diagnosis of headlamp system.

(2) Disconnect battery negative cable. Remove left instrument cluster bezel and main cluster assembly. Unplug cluster connector. Connect battery negative cable. Turn headlamps on and select high beam. Check for battery voltage at cavity 17 of cluster connector. If OK, replace indicator bulb. If not OK, repair circuit to headlamp dimmer switch as required.

MALFUNCTION INDICATOR LAMP

The diagnosis found here addresses an inoperative lamp condition. If the lamp comes on and stays on with engine running, refer to Group 14 - Fuel System for diagnosis. If no fuel or emission system problem is found, the following procedure will help locate a short or open in the lamp circuit.

(1) Disconnect battery negative cable. Unplug PCM connector. Install a jumper wire from cavity 32 of PCM connector (Fig. 5) to a good ground. Connect battery negative cable. Turn ignition switch to ON. Lamp should light. Remove jumper wire and lamp should go OFF. If OK, refer to Powertrain Diagnostic Procedures to check PCM. If not OK, go to next step.

(2) Turn ignition switch to OFF. Disconnect battery negative cable. Remove left instrument cluster bezel and main cluster assembly. Install a jumper wire from cavity 2 of cluster connector to a good ground. Connect battery negative cable. Turn ignition switch to ON. Lamp should light. If OK, go to next step. If not OK, replace bulb.

(3) Turn ignition switch to OFF. Disconnect battery negative cable. Unplug cluster connector. Check for continuity between cavity 2 of cluster connector and a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit to PCM as required.

(4) Check continuity between cavity 2 of cluster connector and cavity 32 of PCM connector. There should be continuity. If not OK, repair open circuit to PCM as required.

SEAT BELT REMINDER LAMP

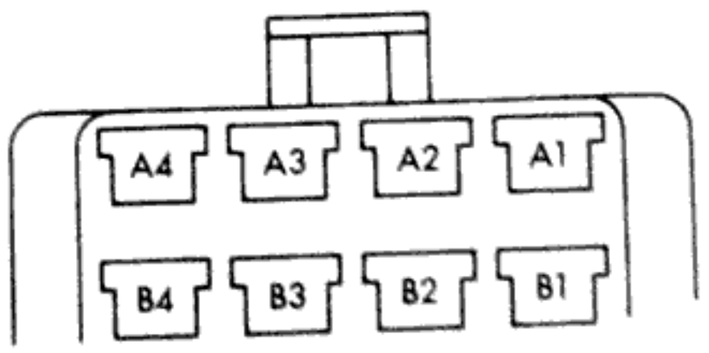
(1) Refer to Group 8U - Chime/Buzzer Warning Systems to check chime/buzzer module operation. If OK, go to next step. If not OK, replace chime/buzzer module.

(2) Disconnect battery negative cable. Remove left instrument cluster bezel and main cluster assembly. Unplug cluster connector. Check for continuity between cavity 20 of cluster connector and a good ground. There should be continuity. If OK, plug cluster connector back into cluster and go to next step. If not OK, repair open circuit to ground as required.

(3) Connect battery negative cable. Install a jumper wire between a 12-volt battery feed and cavity 16 of cluster connector. Lamp should light. If OK, go to next step. If not OK, replace bulb.

(4) Disconnect battery negative cable. Unplug chime/buzzer module from fuseblock module. Unplug cluster connector. Check for continuity between cavity 16 of cluster connector and a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit to chime/buzzer module as required.

(5) Check continuity between cavity 16 of cluster connector and cavity for terminal A3 of chime/buzzer module (Fig. 7) in fuseblock module. There should be continuity. If not OK, repair open circuit to chime/buzzer module as required.



NO.	IDENTIFICATION
A3	SEAT BELT REMINDER LAMP

J958E-10

Fig. 7 Chime/Buzzer Module Receptacle

TURN SIGNAL INDICATOR LAMPS

(1) Disconnect battery negative cable. Remove left instrument cluster bezel and main cluster assembly. Probe cavity 20 of cluster connector. Check for continuity to a good ground. There should be continuity. If OK, go to next step. If not OK, repair open circuit to ground.

(2) Connect battery negative cable. Install a jumper wire from cavity 18 (left indicator) or cavity 7 (right indicator) of cluster connector to a 12-volt battery feed. Lamp should light. If OK, continue to next step. If not OK, replace bulb.

(3) Disconnect battery negative cable. Check for continuity between cavity 18 (left indicator) or cavity 7 (right indicator) of cluster connector and cavity H (left front turn signal) or cavity J (right front turn signal) of steering column wiring connector. There should be continuity. If OK, refer to Group 8J - Turn Signal and Hazard Warning Systems for further diagnosis. If not OK, repair open circuit as required.

UPSHIFT INDICATOR LAMP

(1) Disconnect battery negative cable. Unplug PCM connector. Connect battery negative cable. Turn ignition switch to ON. Install a jumper wire from cavity 54 of PCM connector (Fig. 5) to a good ground. Lamp should light. Remove jumper from ground. Lamp should go off. If OK, refer to Powertrain Diagnostic Procedures manual to diagnose PCM. If not OK, turn ignition switch to OFF and go to next step.

(2) Disconnect battery negative cable. Remove left instrument cluster bezel and main cluster assembly. Install a jumper wire from cavity 5 of cluster connector to a good ground. Connect battery negative cable. Turn ignition switch to ON. Lamp should light. If OK, go to next step. If not OK, replace bulb.

(3) Turn ignition switch to OFF. Disconnect battery negative cable. Unplug cluster connector. Check for continuity between cavity 5 of cluster connector and a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(4) Check for continuity between cavity 5 of cluster connector and cavity 54 of PCM connector. There should be continuity. If not OK, repair open circuit as required.

CLUSTER ILLUMINATION LAMPS

(1) Check fuse 10 in fuseblock module. If OK, go to next step. If not OK, replace fuse.

(2) Turn park lamps on at headlamp switch. Rotate panel dimmer switch thumb-wheel to HI position, just before interior lamps detent. Check for battery voltage at fuse 10 in fuseblock module. Rotate panel dimmer thumb-wheel towards LO position while observing test voltmeter. Reading should go from battery voltage to zero volts. If OK, go to next step. If not OK, repair open circuit to headlamp switch or refer to Group 8L - Lamps to diagnose headlamp switch.

(3) Disconnect battery negative cable. Remove left or center instrument cluster bezel and main or gauge package cluster assembly. Unplug cluster connector. Connect battery negative cable. Turn park lamps on at headlamp switch. Rotate panel dimmer thumb-wheel to HI position, just before interior lamps detent. Check for battery voltage at cavity 21 of main cluster connector, or cavity 7 of gauge package cluster connector. If OK, go to next step. If not OK, repair open circuit to fuse as required.

(4) Turn park lamps off. Disconnect battery negative cable. Remove fuse 10 from fuseblock module. Probe cavity 21 of main cluster connector, or cavity 7 of gauge package cluster connector. Check for continuity to a good ground. There should be no continuity. If OK, go to next step. If not OK, repair short circuit as required.

(5) Probe cavity 20 of main cluster connector, or cavities 1 and 13 of gauge package cluster connector. Check for continuity to ground. There should be continuity. If not OK, repair open circuit as required.

SERVICE PROCEDURES

CLUSTER ASSEMBLY REMOVE/INSTALL

MAIN CLUSTER

(1) Disconnect battery negative cable.

(2) Remove 6 screws from left instrument cluster bezel (Fig. 8).

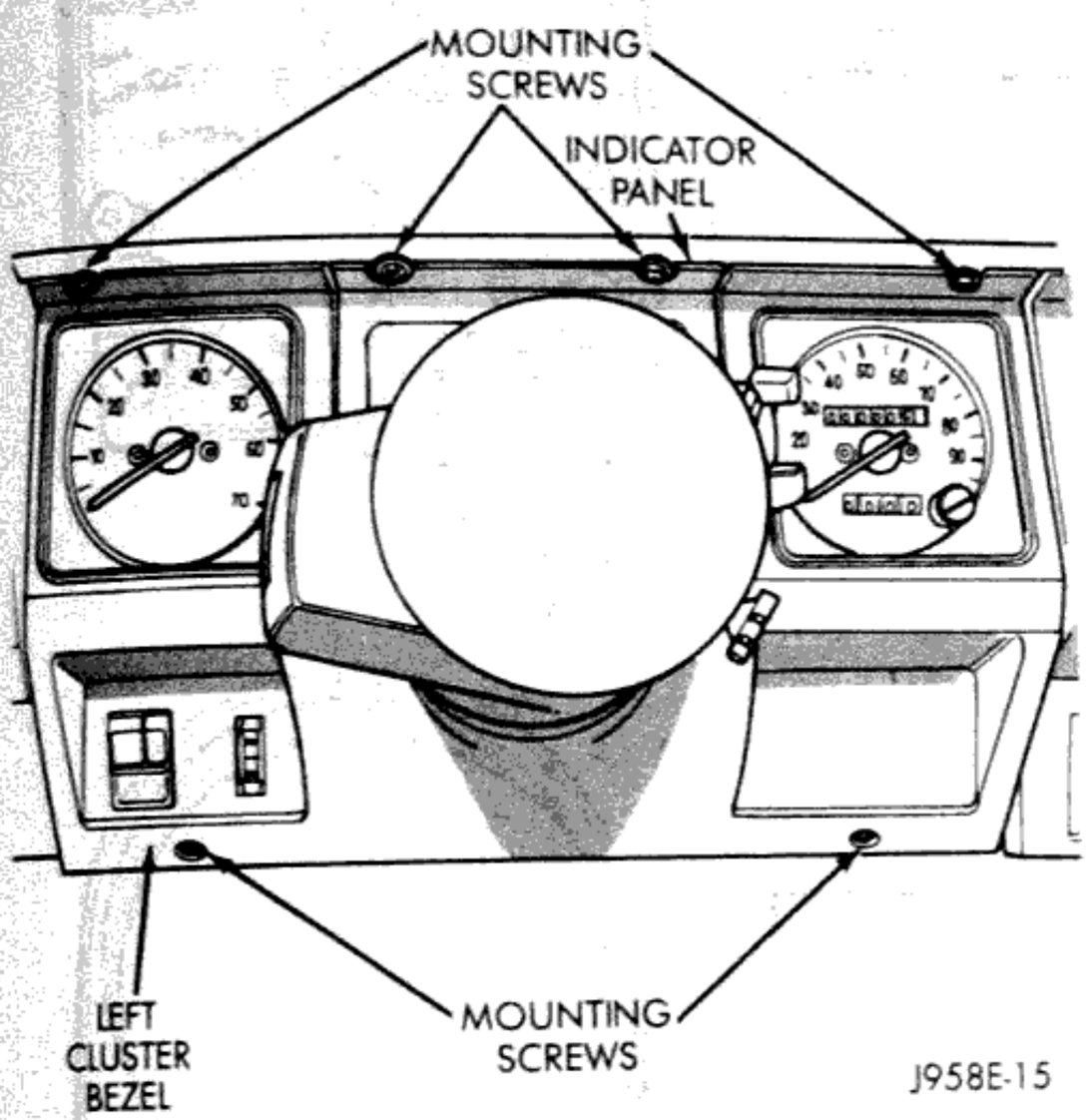


Fig. 8 Left Cluster Bezel Remove/Install

(3) Slide bezel toward steering wheel.

(4) Remove 3 screws holding right side switch panel (Fig. 9).

(5) Remove 3 screws holding left side switch bezel.

(6) Remove 2 screws holding cluster in place.

(7) Lift up top of cluster. Roll cluster out between steering column and instrument panel far enough to reach connector located behind tachometer.

(8) Disconnect cluster connector and remove cluster (Fig. 10).

(9) Reverse removal procedures to install.

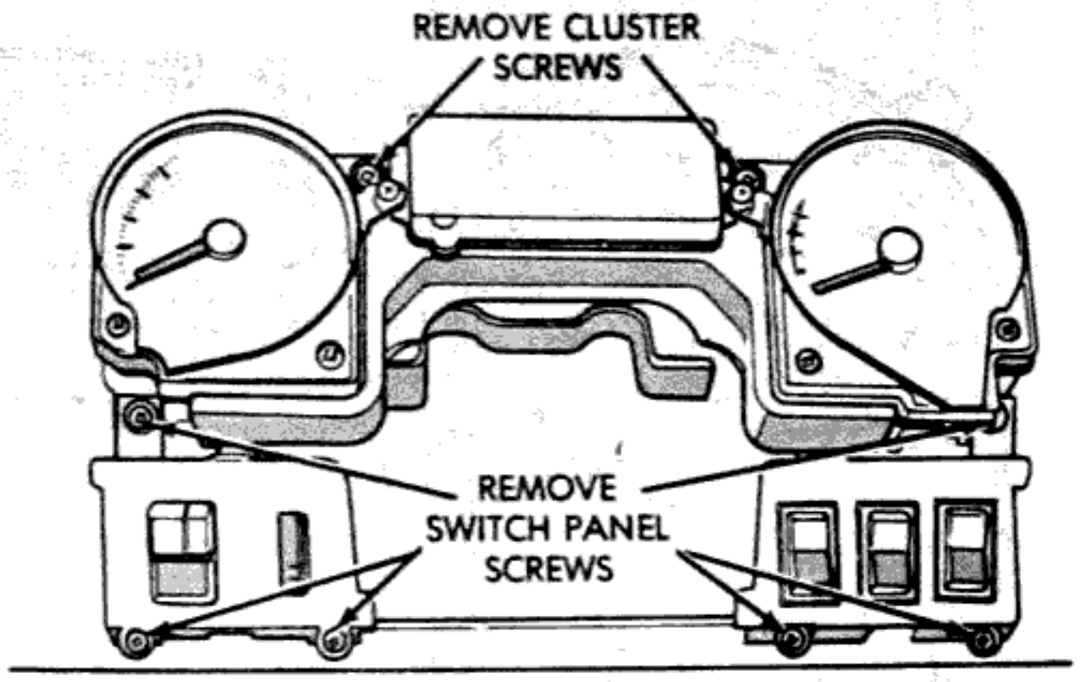


Fig. 9 Main Cluster Remove/Install

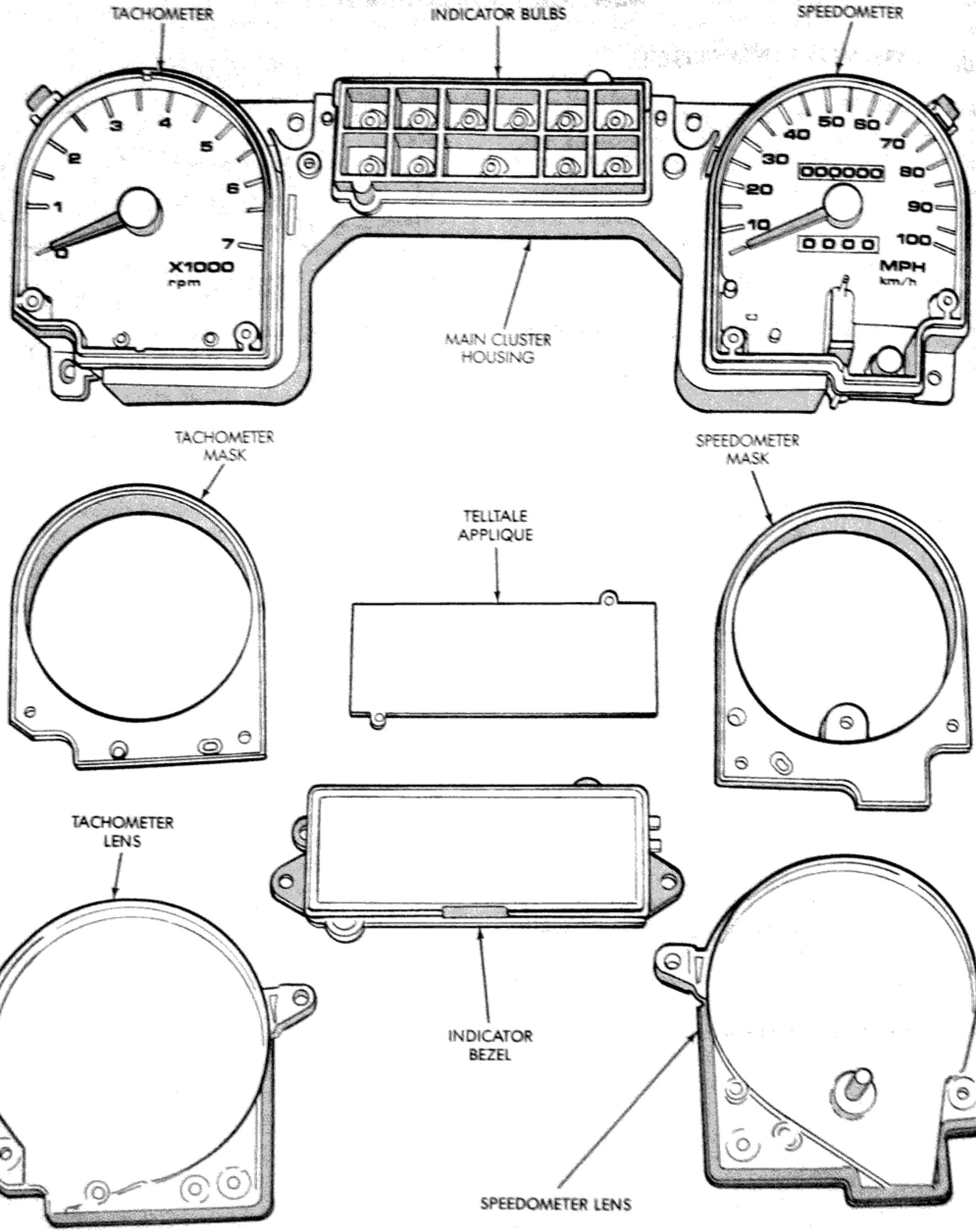


Fig. 10 Main Cluster

GAUGE PACKAGE CLUSTER

(1) Disconnect battery negative cable.
(2) Remove 6 screws from center instrument cluster bezel (Fig. 11).
(3) Remove 6 cluster assembly mounting screws (Fig. 12).
(4) Unplug the connector from cluster.
(5) Reverse removal procedures to install.

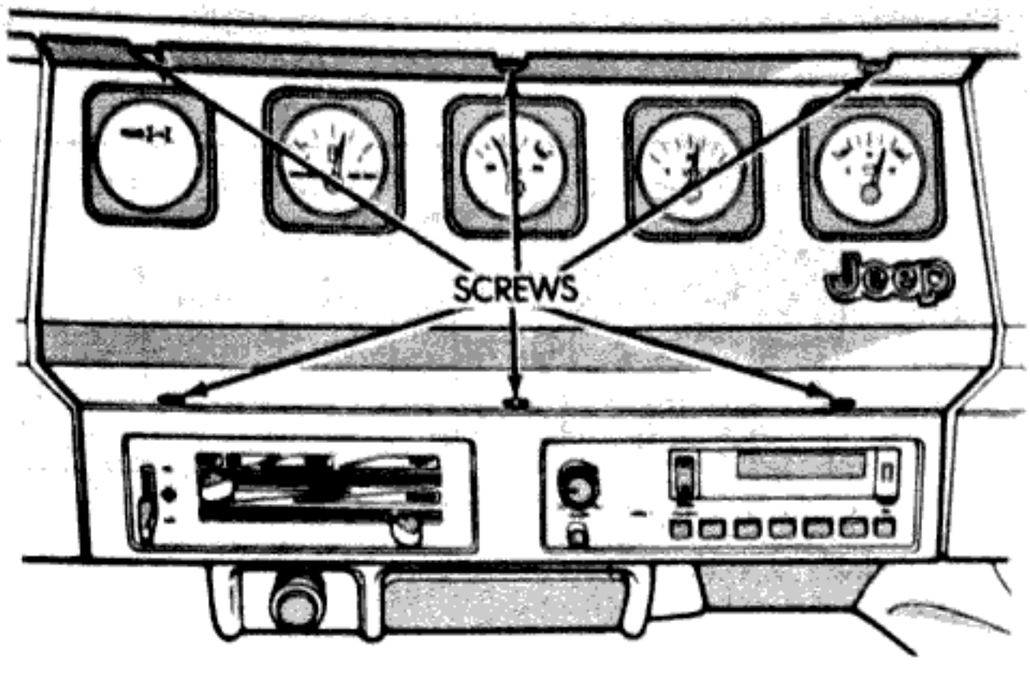


Fig. 11 Center Cluster Bezel Remove/Install

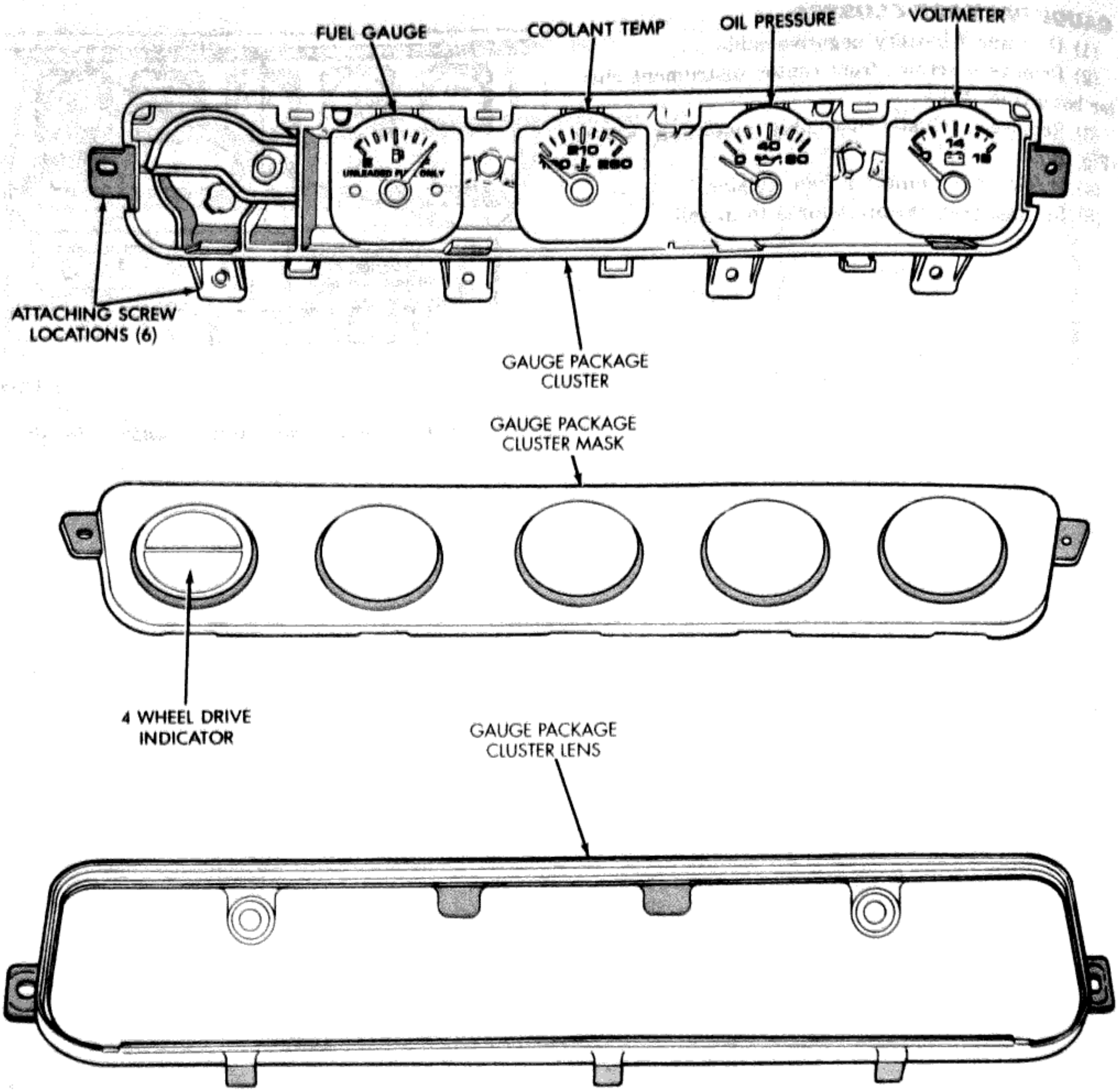


Fig. 12 Gauge Package Cluster

GAUGES REMOVE/INSTALL

MAIN CLUSTER

(1) Remove cluster as described in Cluster Remove/Install.

(2) Remove 3 screws from speedometer or tachometer lens (Fig. 13).

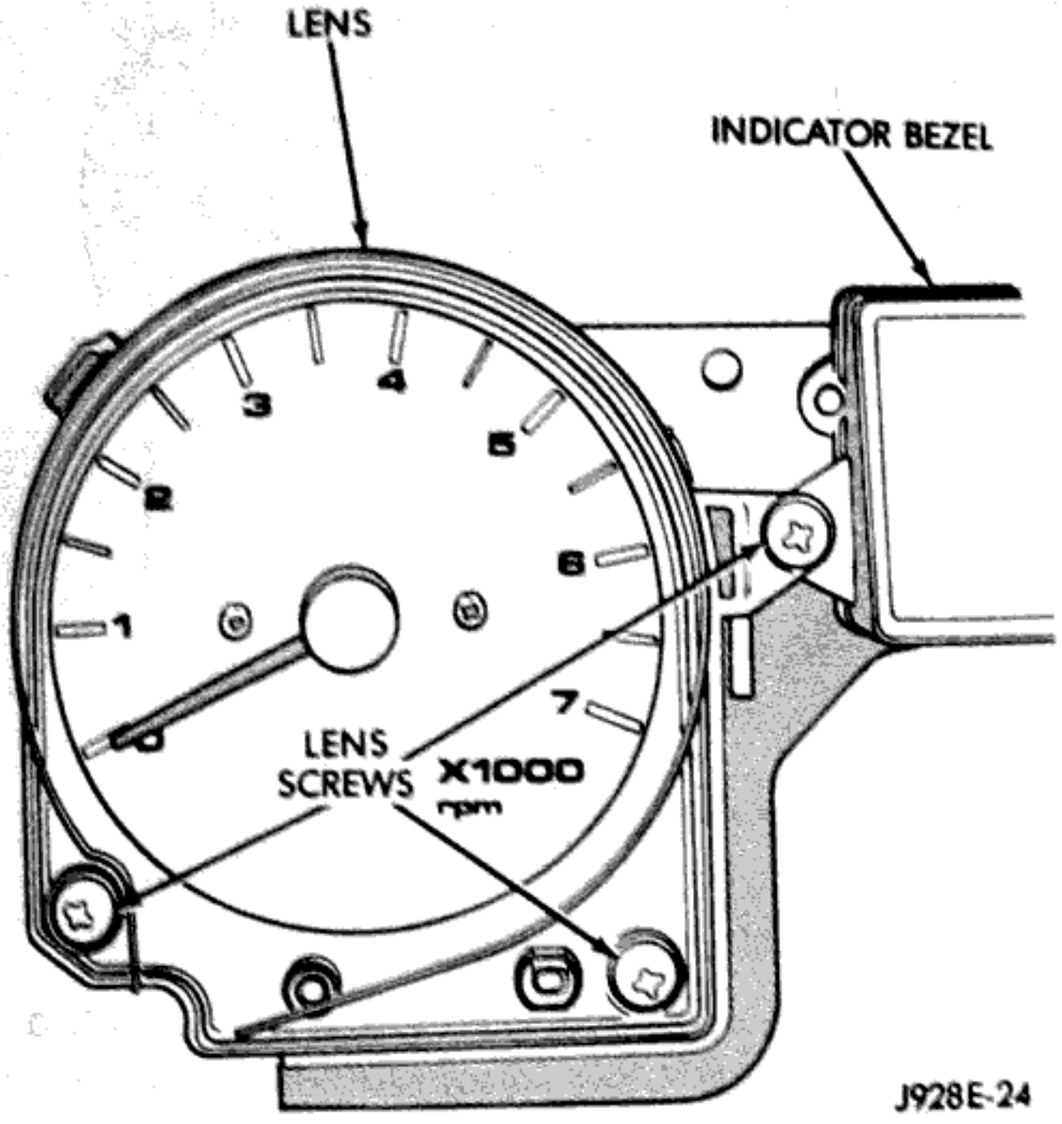


Fig. 13 Gauge Lens - Typical

(3) Gently pry up retaining clip to release lens and mask from cluster (Fig. 14).

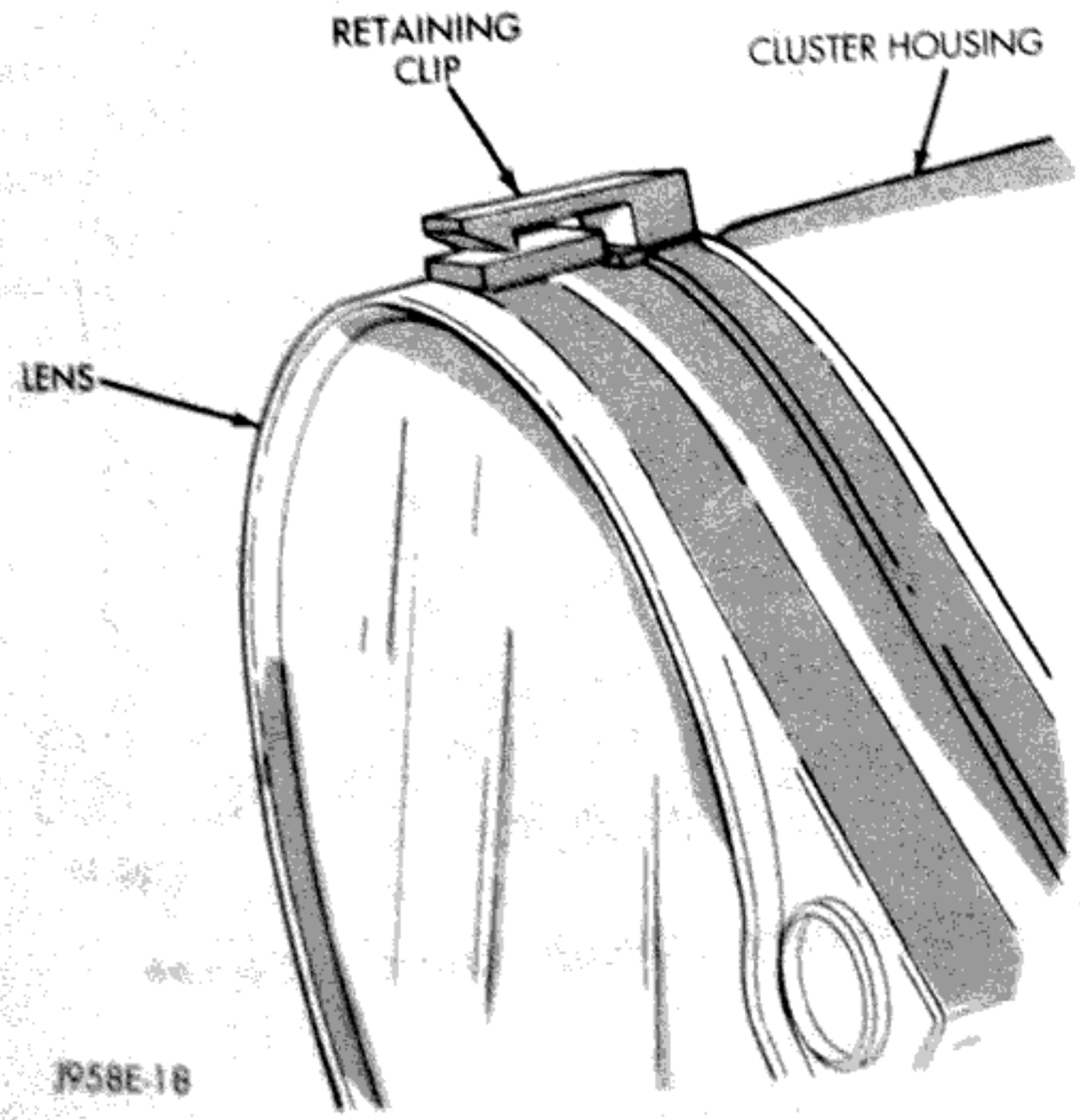


Fig. 14 Lens Retaining Clip

(4) Remove 3 screws that retain gauge from rear of cluster housing (Fig. 15) and remove gauge.

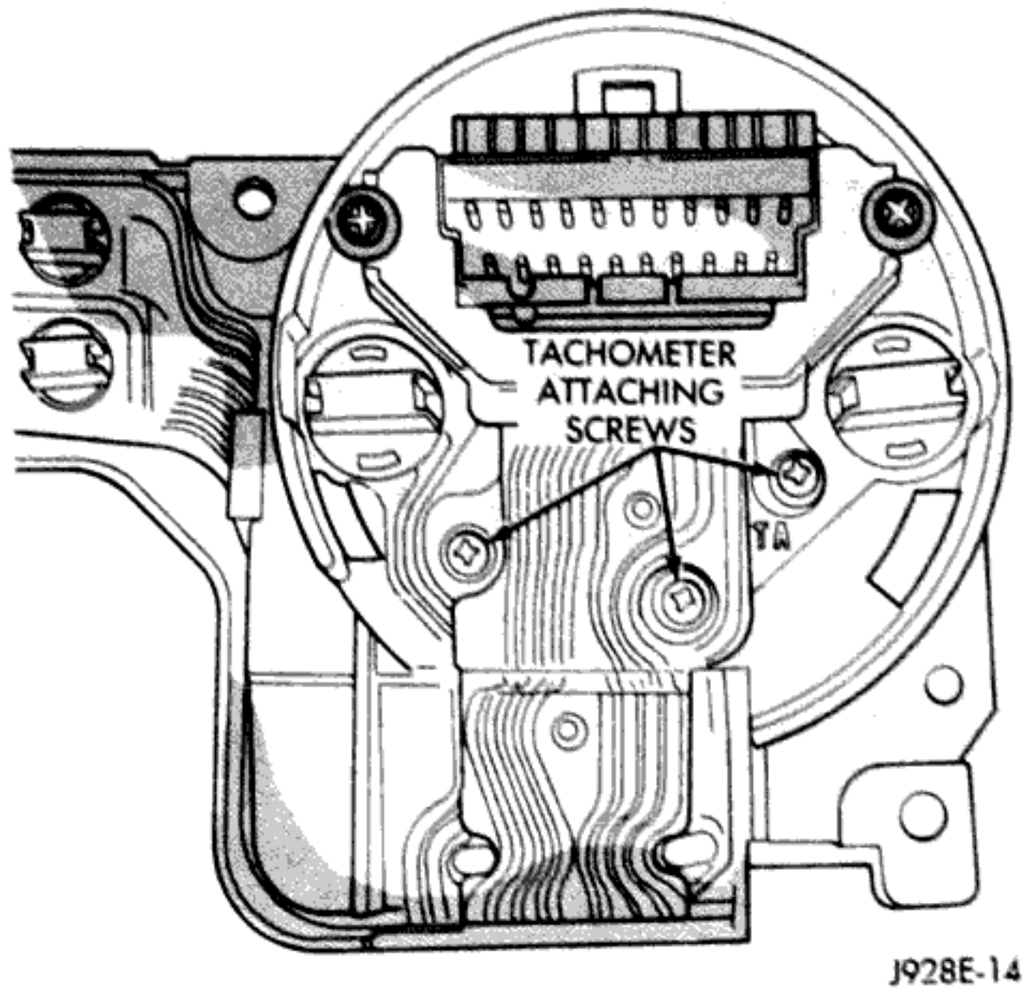


Fig. 15 Gauge Remove/Install

(5) Reverse removal procedures to install.

GAUGE PACKAGE CLUSTER

(1) Remove cluster as described in Cluster Remove/Install.

(2) Remove 2 screws from lens.

(3) Remove lens by tilting off of lower hooks (Fig. 16).

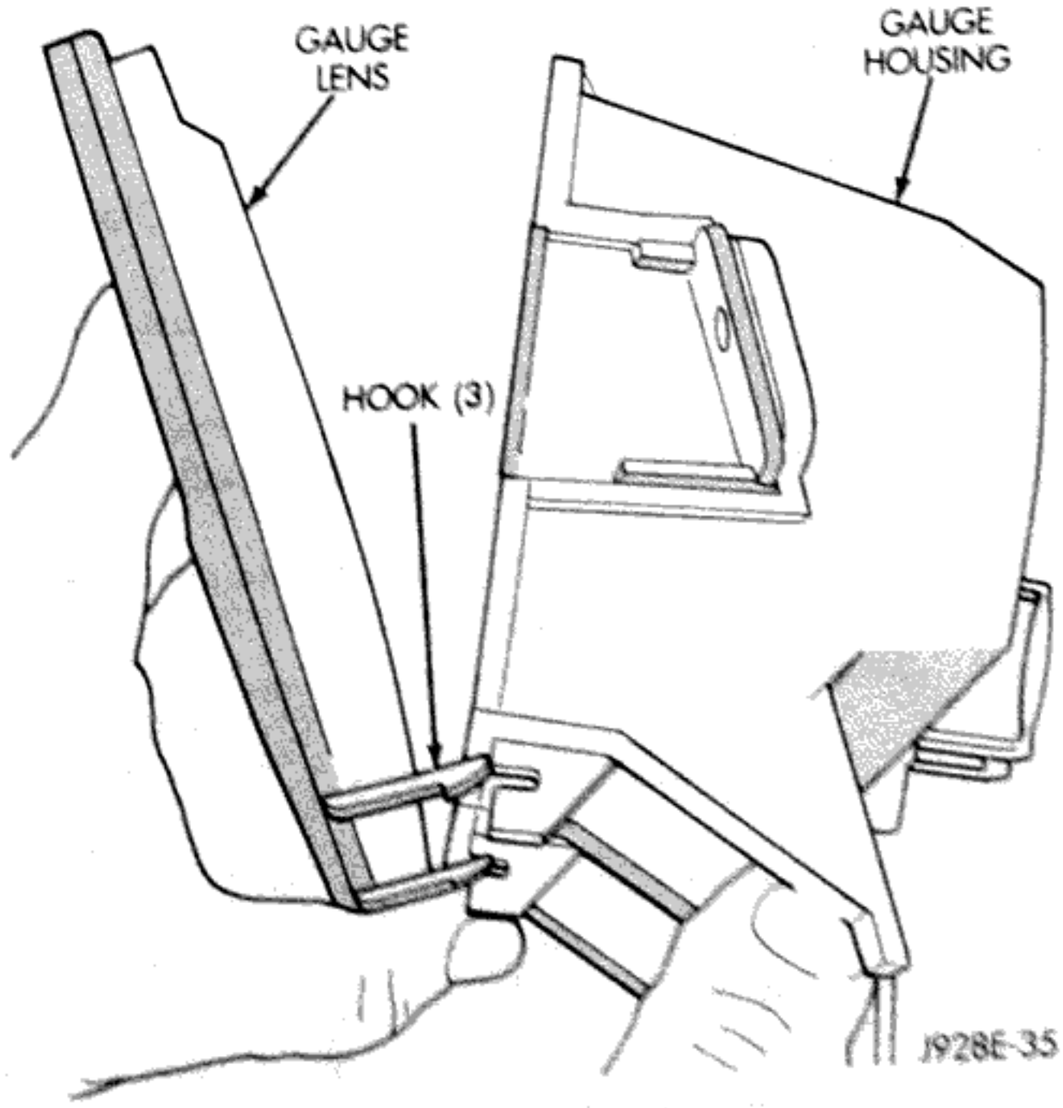
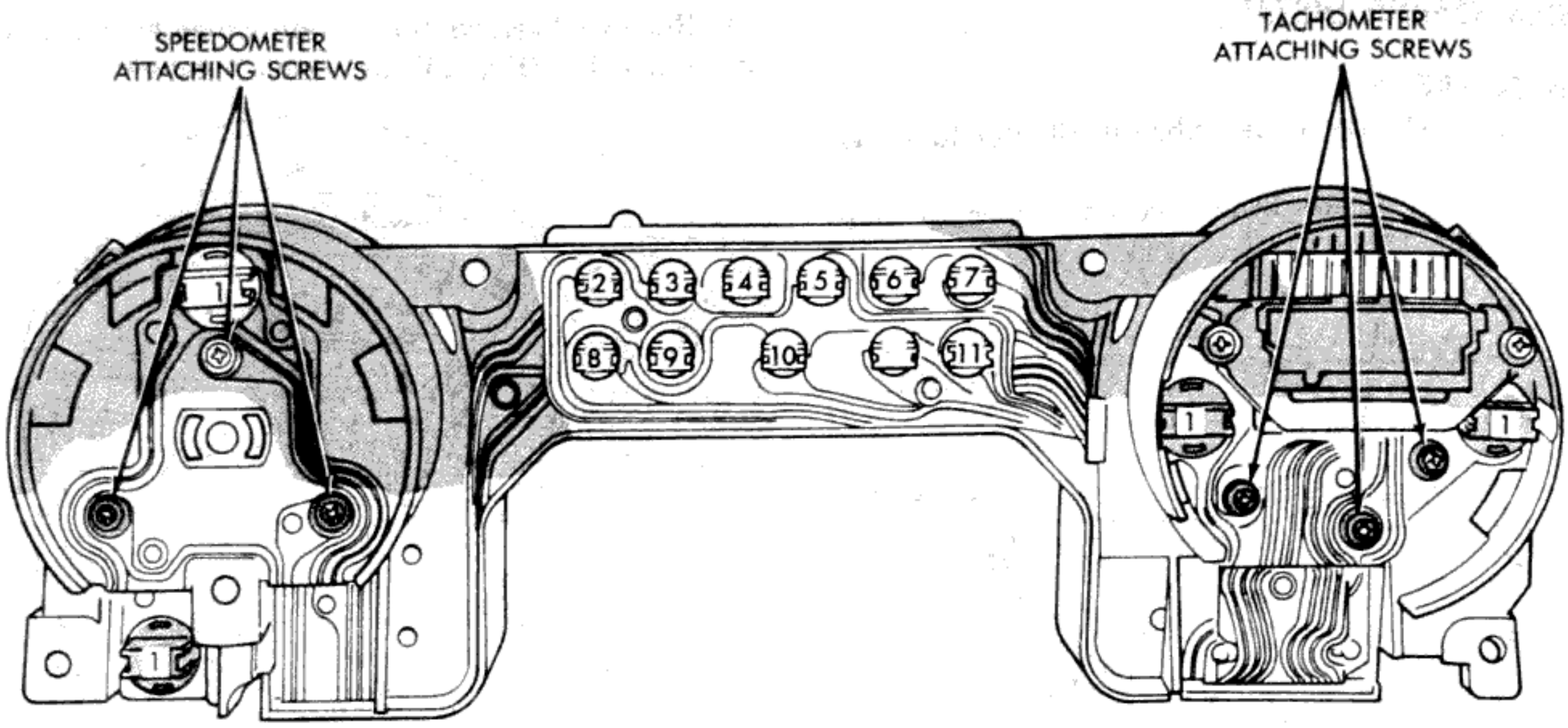


Fig. 16 Gauge Package Lens Remove

(4) Remove gauge mask.



1. Illumination Lamps
2. Right Turn Indicator Lamp
3. Master Lighting
4. Seat Belt Indicator Lamp
5. Parking Brake Indicator Lamp
6. High Beam Indicator Lamp
7. Left Turn Indicator Lamp
8. Check Anti Lock
9. Hazard Indicator Lamp
10. Upshift Indicator Lamp
11. (Check Engine) Malfunction Indicator Lamp

Fig. 17 Printed Circuit Remove/Install

(5) Remove screws that retain gauge from rear of cluster housing and remove gauge.

(6) Reverse removal procedures to install.

PRINTED CIRCUIT REMOVE/INSTALL

MAIN CLUSTER

(1) Remove main cluster as described in Cluster Remove/Install.

(2) Remove gauge lenses and masks as described in Gauges Remove/Install.

(3) Remove all attaching screws for speedometer and tachometer from rear of cluster housing (Fig. 17).

(4) Remove 2 screws holding cluster connector retaining plate to housing (Fig. 18).

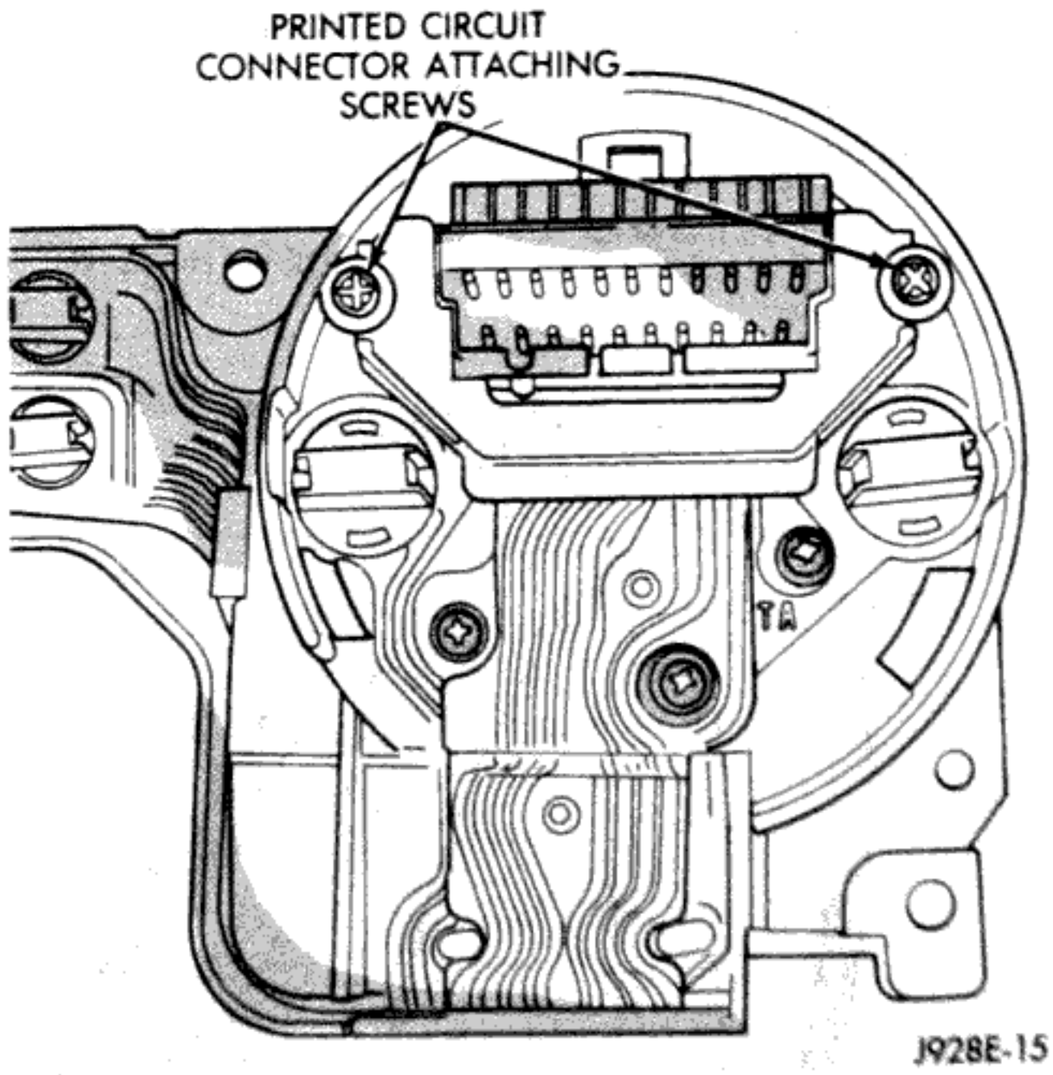


Fig. 18 Printed Circuit Connector Screws

(5) To remove plate, slide it toward bottom of housing (Fig. 19).

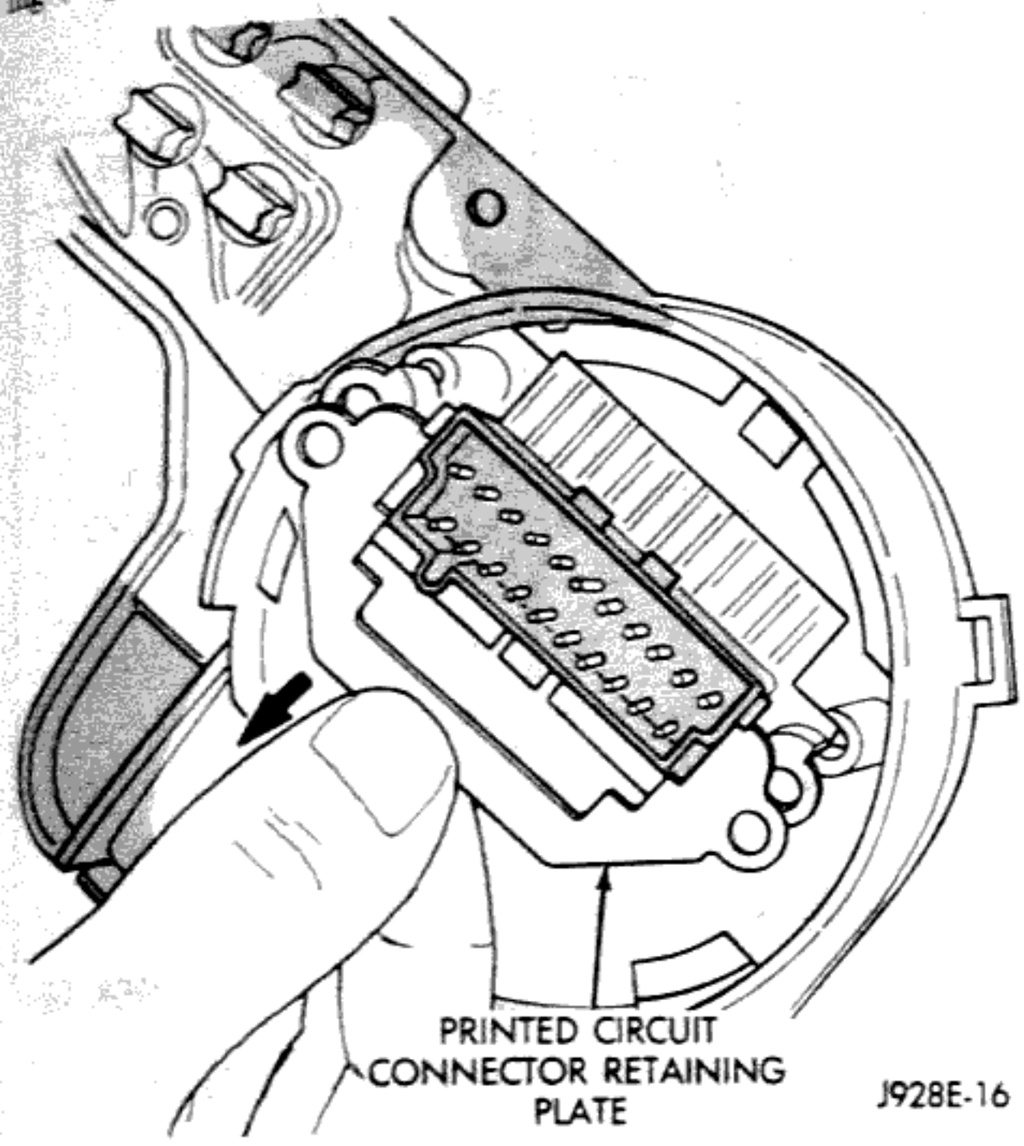


Fig. 19 Cluster Connector Retaining Plate

(6) Remove all lamp holders from printed circuit.
(7) Remove printed circuit including connector.
(8) Reverse removal procedures to install.

GAUGE PACKAGE CLUSTER

(1) Remove gauge package cluster as described in Cluster Remove/Install.
(2) Remove gauge package lens and mask as described in Gauges Remove/Install.
(3) Remove all gauge attaching screws from rear of cluster housing (Fig. 20).
(4) Remove screw holding the cluster connector retaining plate to the housing.
(5) To remove plate, slide it toward the bottom of the housing (Fig. 21).

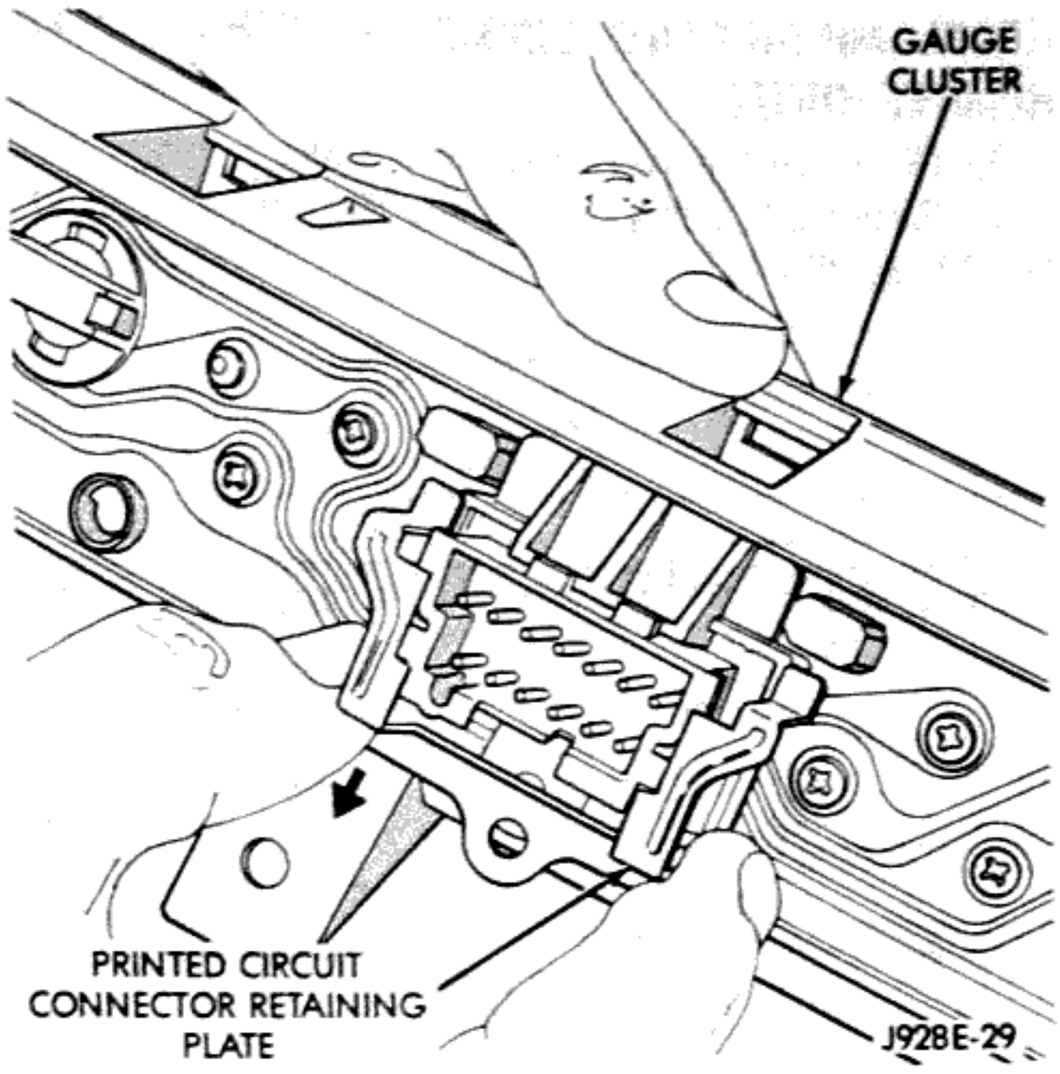


Fig. 21 Cluster Connector Retaining Plate

(6) Remove all lamp holders from the printed circuit.
(7) Remove printed circuit including connector.
(8) Reverse removal procedures to install.

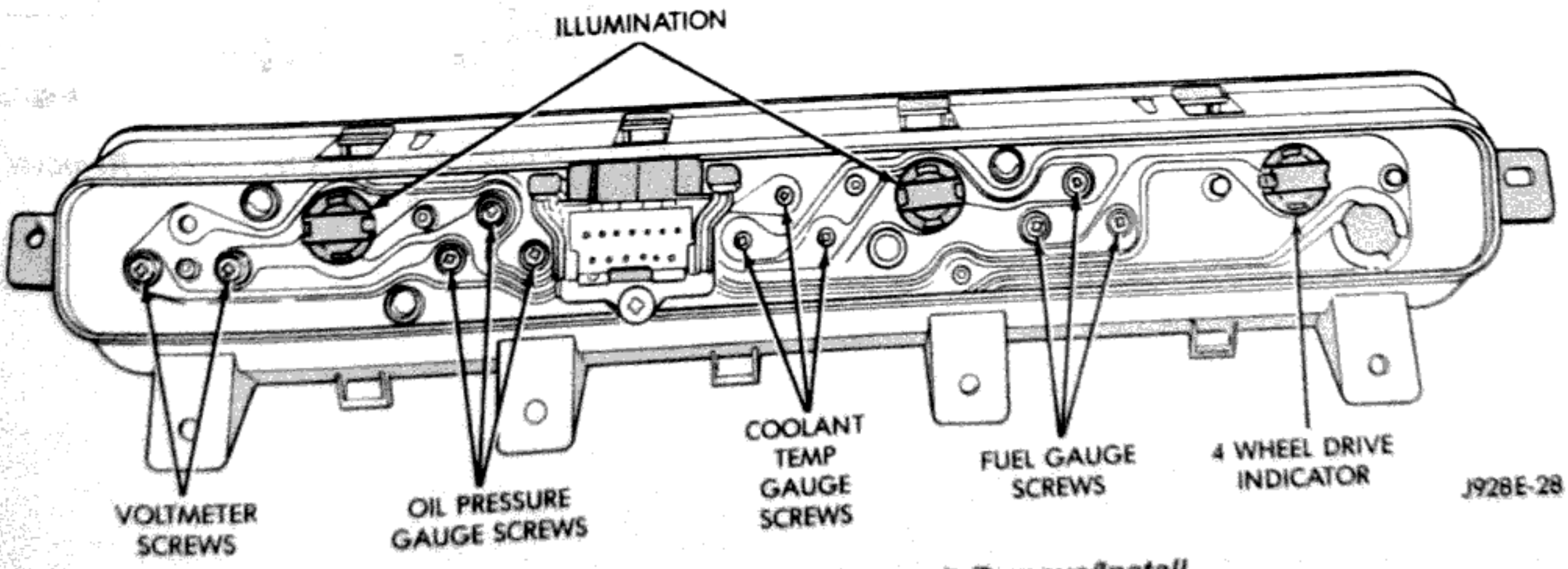


Fig. 20 Gauge Package Printed Circuit Remove/Install

HEADLAMP OR PANEL DIMMER SWITCH REMOVE/INSTALL

(1) Disconnect battery negative cable.

(2) Remove 6 screws from left instrument cluster bezel (Fig. 22).

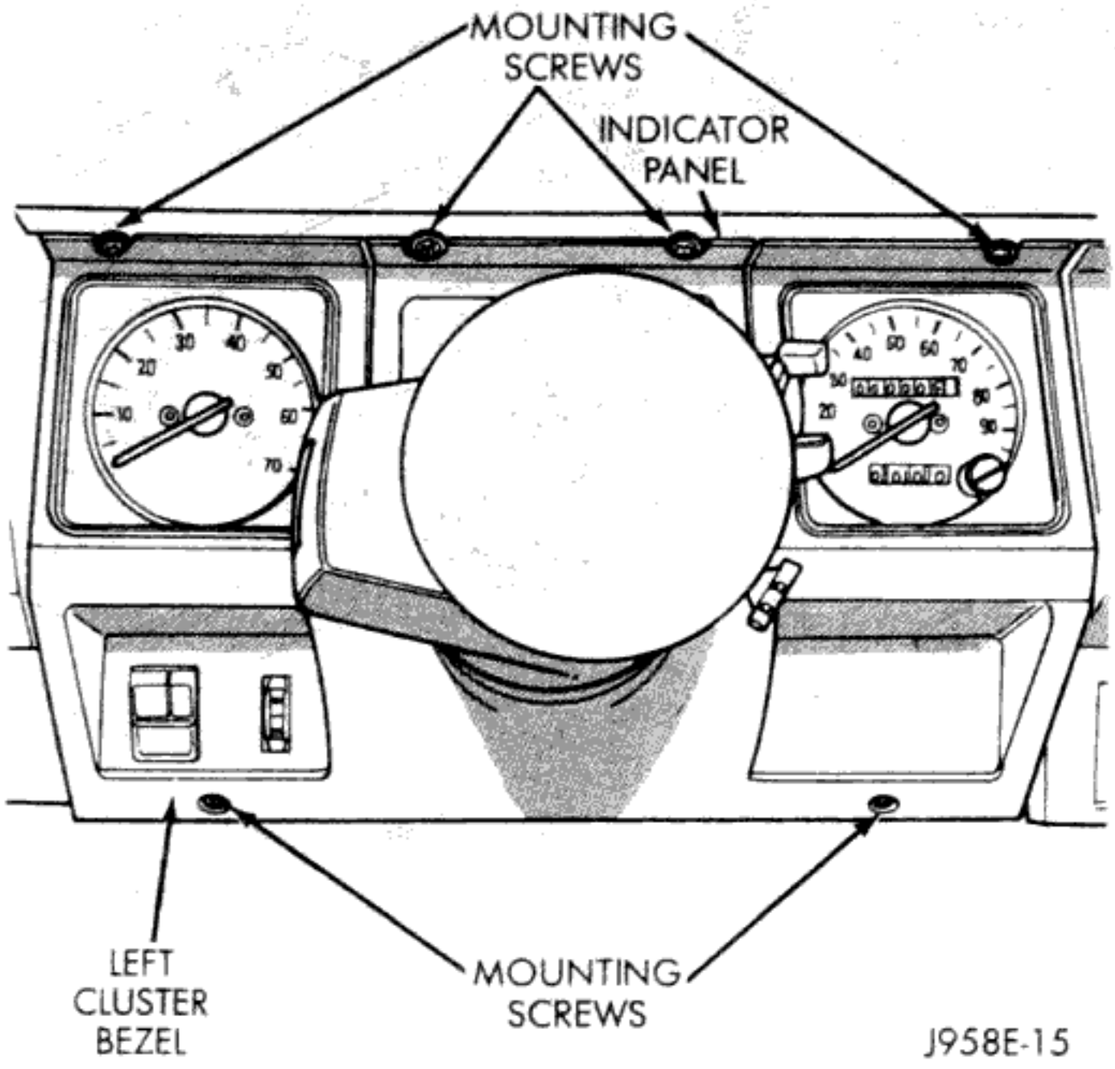


Fig. 22 Left Cluster Bezel Remove/Install

(3) Slide bezel toward steering wheel.

(4) Apply upward force to the bezel and downward force to the indicator panel. This will release the indicator panel holding tabs (Fig. 23).

(5) Remove the bezel from the instrument panel.

(6) Remove the headlamp or panel dimmer switch retaining screws (Fig. 24).

(7) Disconnect the headlamp/panel dimmer switch wire harness connector.

(8) Remove the headlamp/panel dimmer switch from the instrument panel cavity.

(9) Reverse removal procedures to install.

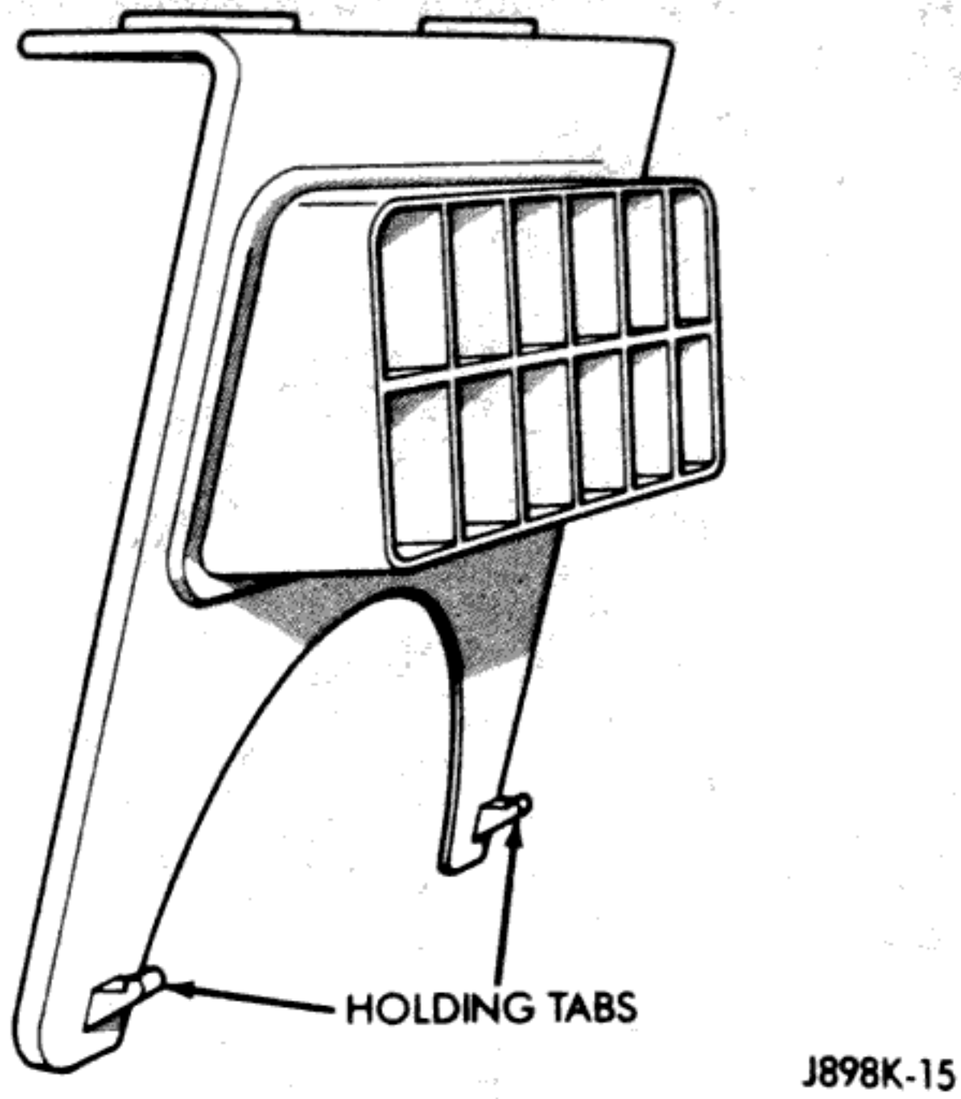


Fig. 23 Indicator Panel Holding Tabs

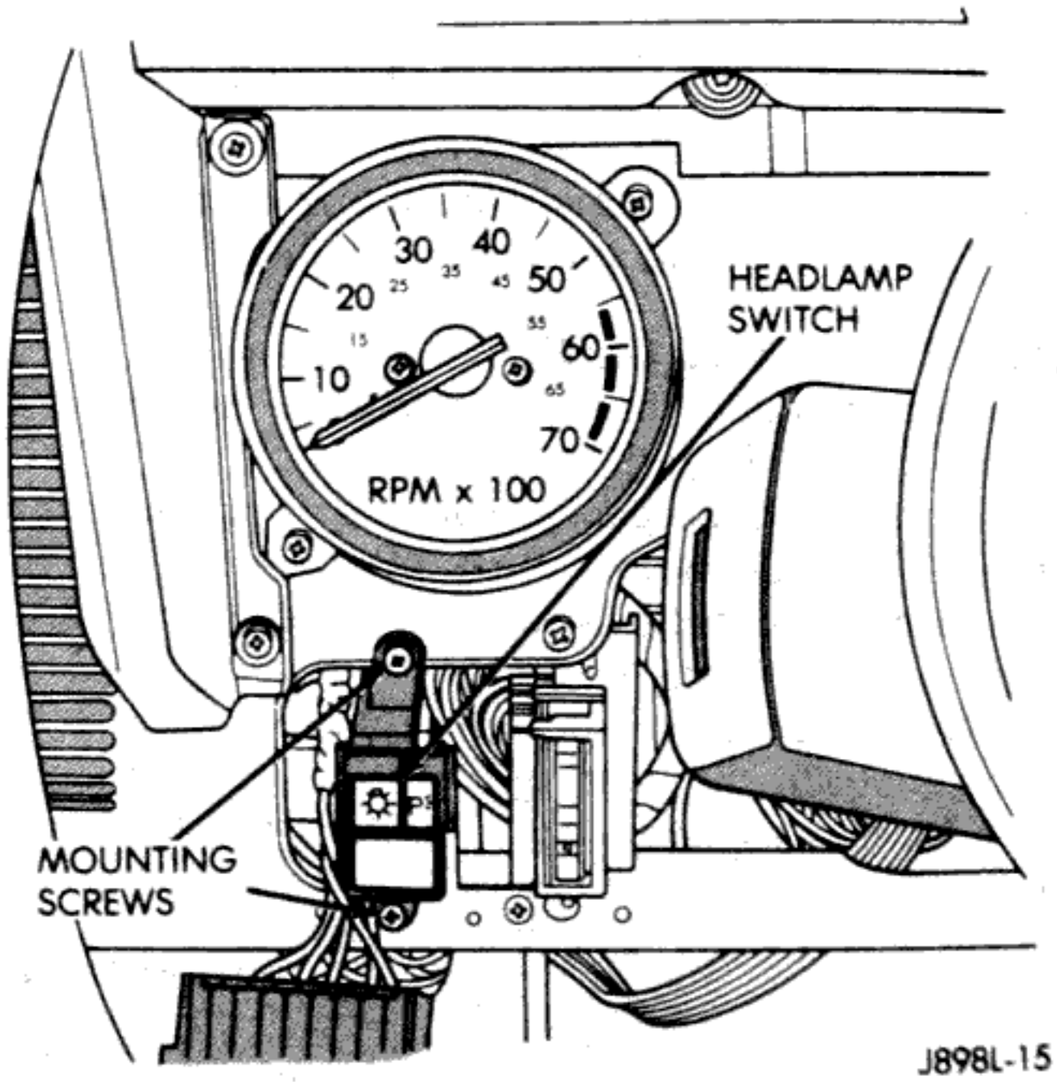


Fig. 24 Headlamp/Panel Dimmer Switch Remove/ Install

SPECIFICATIONS

MAIN CLUSTER

SPEEDOMETER CALIBRATION

ENGINE	FREQUENCY	INDICATION
4 & 6 CYLINDER	44.4 HZ	20 mph +0 −1.5
	122.2 HZ	55 mph +3.3 −0.3
	166.7 HZ	75 mph +3.3 −0.3
	55.2 HZ	40 km/h +6 −0
	110.4 HZ	80 km/h +8 −0
	165.6 HZ	120 km/h +10 −0

TACHOMETER CALIBRATION

ENGINE	FREQUENCY	INDICATION
4 & 6 CYLINDER	33.3 HZ	1000 RPM ±150
	100 HZ	3000 RPM ±250
	200 HZ	6000 RPM ±250

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GAUGE PACKAGE CLUSTER

OIL PRESSURE GAUGE CALIBRATION

POINTER POSITION	RESISTANCE
0 psi Grad. ± 3°	1 ohm
40 psi Grad. ± 3.6°	47 ohms
80 psi Grad. ± 3.6°	89 ohms

FUEL GAUGE CALIBRATION

POINTER POSITION	RESISTANCE
Empty Grad. +0° −5°	1 ohm
1/2 Full Grad. ± 3.6°	44 ohms
Full Grad. − 0° +6°	88 ohms

TEMPERATURE GAUGE CALIBRATION

POINTER POSITION	RESISTANCE
100°F Grad. ± 3.5°	1365 ohms
210°F Grad. ± 2.5°	115 ohms
240°F Grad. ± 2.5°	55.1 ohms

VOLTMETER CALIBRATION

POINTER POSITION	VOLTAGE INPUT
12V Grad. ± 6°	12V ± 0.02V
16V Grad. ± 3°	16V ± 0.02V

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INSTRUMENT CLUSTER

INSTRUMENT CLUSTER

The instrument cluster contains the gauges and warning lamps. All gauges have magnetic movements.

When the ignition switch is in either the START or RUN position, circuit A1 from fuse 4 in the Power Distribution Center (PDC) connects to circuit A21.

Circuit A21 powers fuse 9 in the fuse block. Fuse 9 powers circuit G5. One branch of circuit G5 connects directly to the combination buzzer. The other branch of circuit G5 splices to power the gauges, speedometer, tachometer, voltmeter, indicator lamps, and warning lamps in the instrument cluster.

When the parking lamps or headlamps are ON, the headlamp switch connects circuit F33 to circuit L7. Circuit L7 splices to the dimmer switch. Circuit E1 from the dimmer switch powers fuse 10 in the fuse block when the parking lamps or headlamps are ON. Circuit E2 from fuse 10 in the fuse block feeds the illumination lamps in the instrument cluster.

Circuit Z1 provides ground the instrument cluster illumination lamps, gauges and warning lamps.

HELPFUL INFORMATION

- Circuit G5 also powers the heated rear window, A/C compressor clutch relay. On Canadian vehicles, circuit G5 powers the Daytime Running Lamps (DRL) module.
- Circuit F33 originates at fuse 8 in the fuse block. Circuit A6 from fuse 3 in the PDC powers fuse 8 in the fuse block.

ENGINE COOLANT TEMPERATURE GAUGE

Circuit G20 connects the engine coolant temperature gauge to the engine coolant temperature sensor. The sensor is a variable resistor and case grounded to the engine. Circuit G5 connects to the instrument cluster and supplies voltage for the gauge.

The gauge uses two coils. The first coil has fixed current flowing through it to maintain magnetic field strength. Circuit Z1 provides ground for the fixed current coil. The current level passing through the second coil is controlled by the variable resistor in the engine coolant temperature sender. The changing current varies the magnetic field in the second coil.

Refer to group 8E, Instrument Panel and Gauges for gauge operation.

FUEL GAUGE

Circuit G4 connects the fuel level sensor to the fuel gauge in the instrument cluster. Circuit G5 supplies voltage to the fuel gauge. The fuel level sensor draws voltage from circuit G5 through the fuel gauge on circuit G4.

The gauge uses two coils. The first coil has fixed current flowing through it to maintain magnetic field strength. Circuit Z1 provides ground for the fixed current coil. The current level passing through the second coil is controlled by the variable resistor in the fuel level sensor. The changing current varies the magnetic field in the second coil.

Circuit Z2 provides the ground path for the fuel level sensor.

Refer to group 8E, Instrument Panel and Gauges for gauge operation.

OIL PRESSURE GAUGE

The case grounded oil pressure sending unit is a variable resistor. The sending unit connects to the oil pressure gauge on circuit G60.

Circuit G5 connects to the instrument cluster and supplies battery voltage to the oil pressure gauge. The gauge uses two coils. The first coil has fixed current flowing through it to maintain magnetic field strength. Circuit Z1 provides ground for the fixed current coil. The current level passing through the second coil is controlled by the variable resistor in the oil pressure sending unit. The changing current varies the magnetic field in the second coil.

Refer to group 8E, Instrument Panel and Gauges for gauge operation.

TACHOMETER

The Powertrain Control Module (PCM) provides the tachometer signal to the electronic tachometer on circuit G21. Circuit G21 originates at cavity 43 of the PCM. Circuit Z1 provides ground for the tachometer's internal logic circuits.

SPEEDOMETER

The electronic speedometer and odometer receive a signal from the vehicle speed sensor on circuit G7. Circuit G5 connects to the instrument cluster and supplies battery voltage to the speedometer. Circuit Z1 provides ground for the speedometer internal logic circuits.

Circuit G7 splices to connect to the Powertrain Control Module (PCM) and if equipped, the Daytime Running Lamps (DRL) module.

FOUR-WHEEL DRIVE (4WD) INDICATOR LAMP

When the 4WD switch closes, circuit Z1 provides ground for the 4WD indicator lamp in the instrument panel. Circuit G5 connects to the instrument cluster and supplies battery voltage to the 4WD indicator lamp. Circuit G1 connects the indicator lamp to the 4WD switch.

MALFUNCTION INDICATOR (CHECK ENGINE) LAMP

The Powertrain Control Module (PCM) provides ground for the malfunction indicator (Check Engine) lamp on circuit G3. Circuit G3 connects to cavity 32 of the PCM. Circuit G5 connects to the instrument cluster and supplies battery voltage for the malfunction indicator lamp. When illuminated, the malfunction indicator lamp displays the message CHECK ENGINE.

For information regarding diagnostic trouble code access using the malfunction indicator lamp, refer to Group 14, Fuel Systems.

UP-SHIFT LAMP

On vehicles equipped with a manual transmission, the Powertrain Control Module (PCM) provides ground for the Up-Shift lamp on circuit K54. Circuit G5 provides battery voltage for the lamp.

ABS WARNING LAMP

Circuit G5 provides power for the ABS warning lamp at the instrument cluster. Ground for the ABS warning lamp is provided by either the ABS control module or by the ABS power relay when the relay is not energized. The ABS control module illuminates the lamp by providing ground on circuit G19.

Circuit G19 splices to connect to circuit B15 through a diode. When the ABS power relay is not energized, it connects circuit B15 to circuit Z12. The ground path for the warning lamp is provided through the diode to circuit B15, through the ABS power relay to ground on circuit Z12.

The diode between circuit G19 and B15 prevents voltage from flowing to the ABS control module when the ABS power relay switches to supply power on circuit B15.

BRAKE WARNING LAMP

Circuit G5 provides battery voltage for the brake warning lamp. Circuit G11 can provide ground for the lamp in 3 ways. The first ground path is through the ignition switch when the key is in the START position.

The second ground path for the brake warning lamp on circuit G11 is through the case grounded brake warning switch. When the switch closes it provides a ground.

The third ground path on circuit G11 is through the case grounded park brake switch. When the switch closes it provides ground.

HIGH BEAM INDICATOR LAMP

Circuit G34 supplies power for the high-beam indicator lamp when the operator either flashes the optical horn (high beams) or selects high beam operation. Circuit Z1 provides the ground path for the lamp.

Circuit L3 from the headlamp switch powers the high beam circuits of the headlamps. On vehicles not equipped with Daytime Running Lamps (DRL), circuit G34 double crimps to circuit L3 at the bulkhead connector.

On vehicles equipped with DRL, circuit L3 splices to the DRL module. The DRL module powers circuit G34.

TURN SIGNAL INDICATOR LAMPS

Circuit L61 supplies battery voltage to the left turn signal indicator lamp. The right turn signal indicator lamp receives battery voltage from circuit L60. The turn signal/hazard flasher switch powers circuits L60 and L61. Circuit Z1 provides ground for the lamps.

HELPFUL INFORMATION

- If the warning lamps, gauges and indicator lamps don't operate, check fuse 4 in the PDC and fuse 9 in the fuse block.
- If the illumination lamps don't operate, check fuse 10 in the fuse block.

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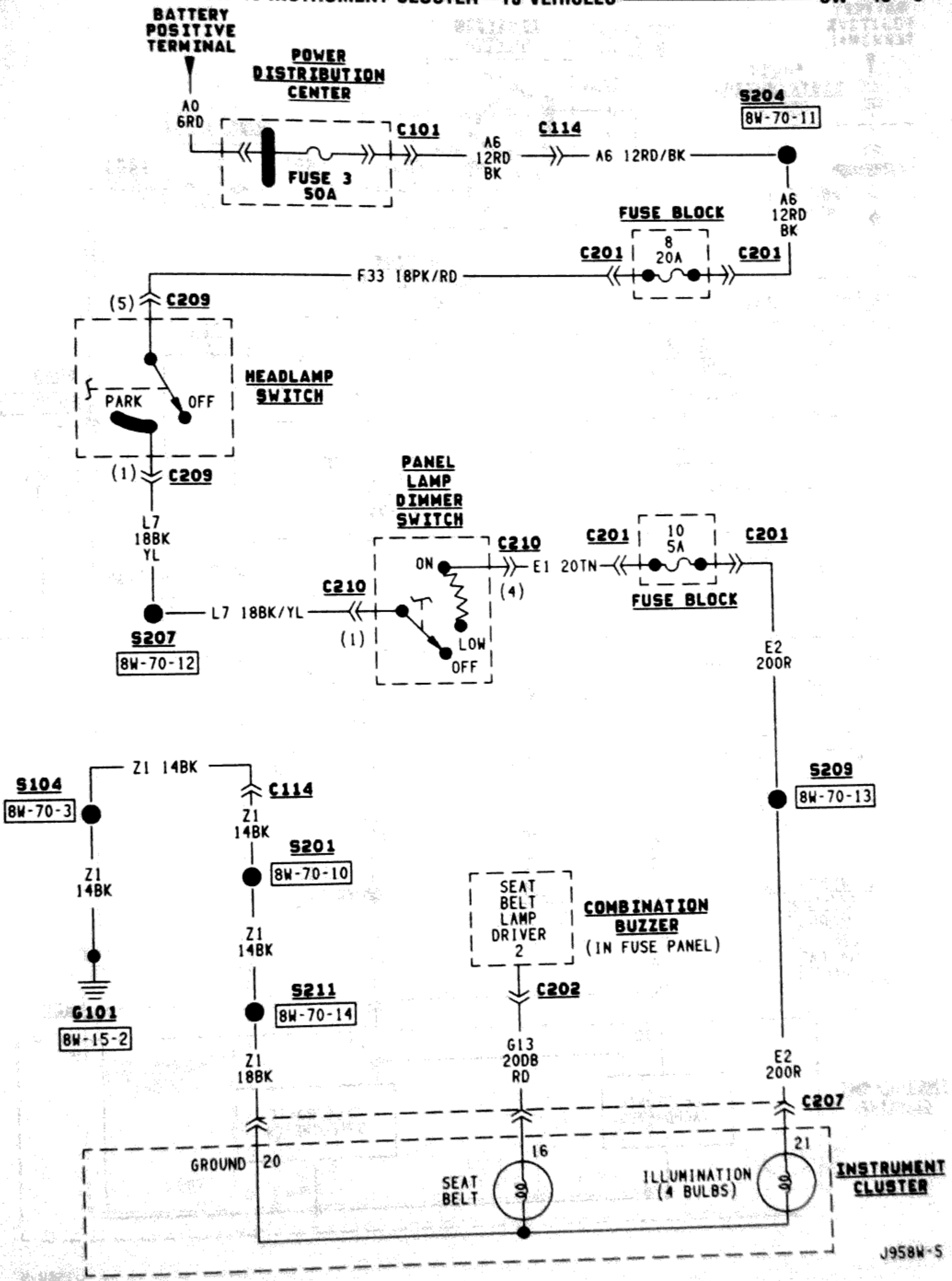
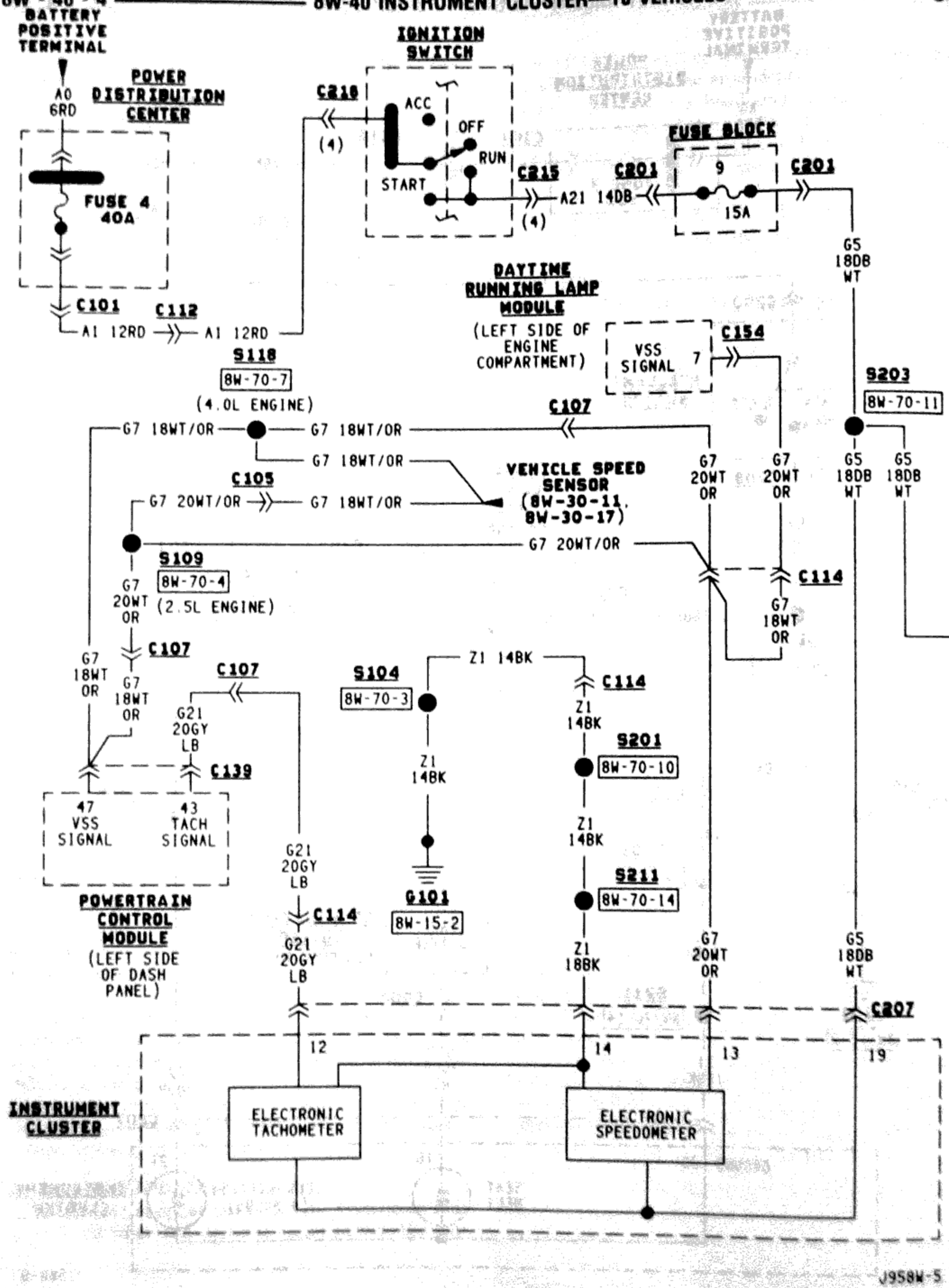
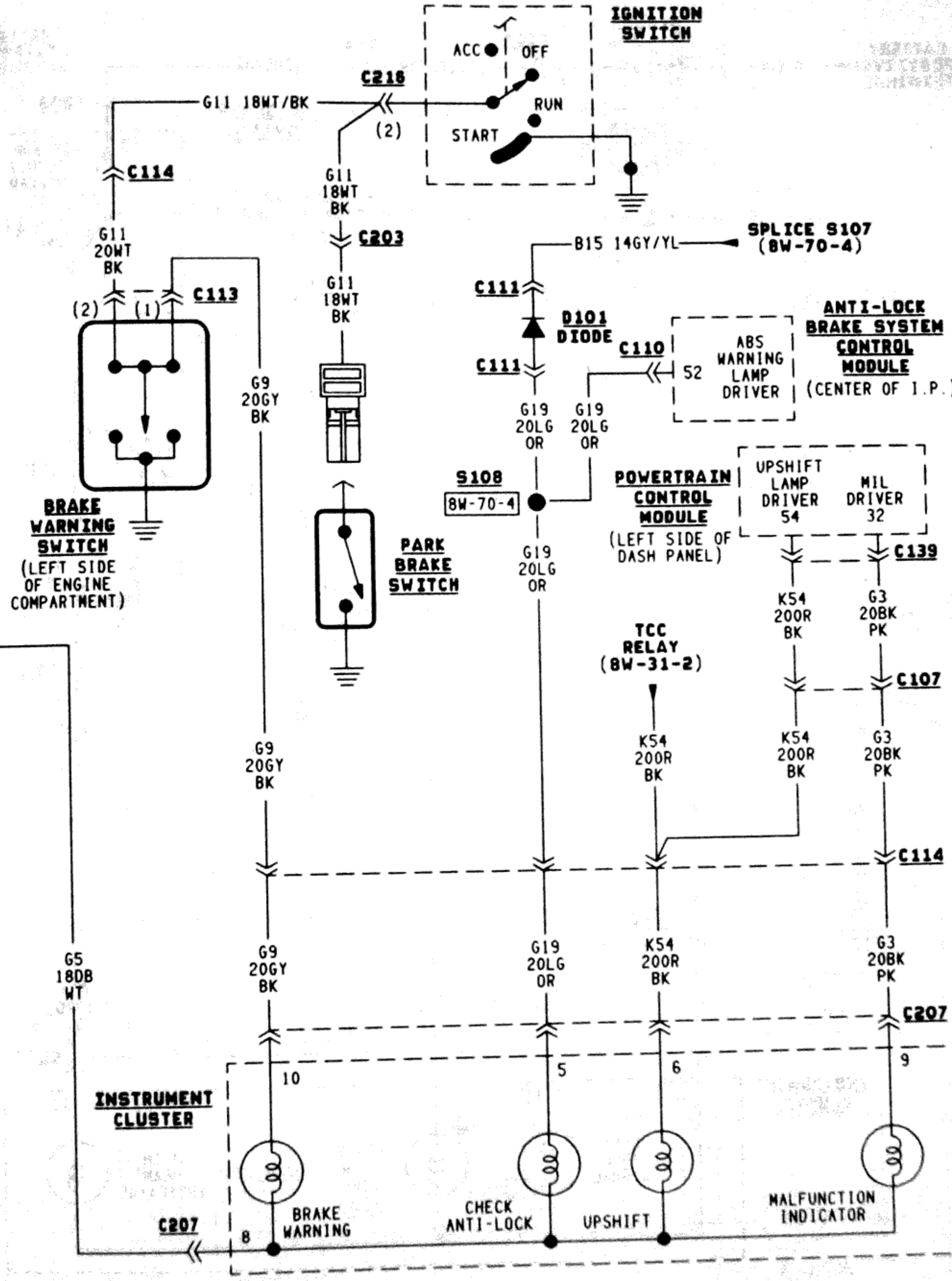
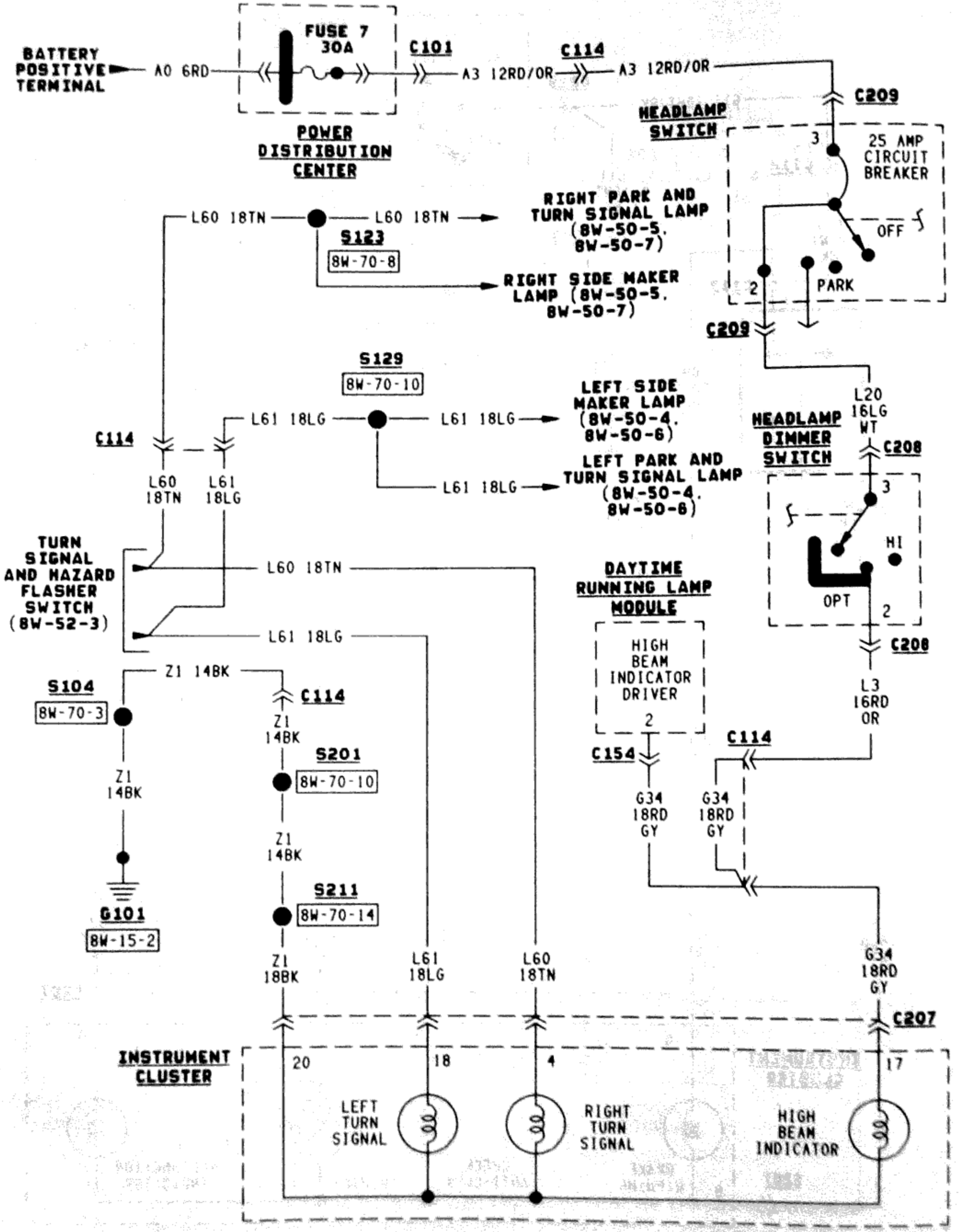
Park Brake Switch	8W-40-5
Powertrain Control Module	8W-40-4, 5


BATTERY POSITIVE TERMINAL
A0 6RD
POWER DISTRIBUTION CENTER
C101
FUSE 3 50A
A6 12RD BK
C114
A6 12RD/BK
S204
8W-70-11
A6 12RD BK
FUSE BLOCK
C201
8 20A
C201
F33 18PK/RD
(5) C209
HEADLAMP SWITCH
PARK
OFF
(1) C209
L7 18BK YL
S207
8W-70-12
PANEL LAMP DIMMER SWITCH
C210
ON
E1 20TN
(4)
C210
L7 18BK/YL
(1)
LOW
OFF
C201
10 5A
C201
FUSE BLOCK
E2 200R
S209
8W-70-13
Z1 14BK
S104
8W-70-3
C114
Z1 14BK
S201
8W-70-10
Z1 14BK
S211
8W-70-14
Z1 18BK
G101
8W-15-2
SEAT BELT LAMP DRIVER 2
COMBINATION BUZZER
(IN FUSE PANEL)
C202
G13 20DB RD
C207
GROUND
20
16
SEAT BELT
21
ILLUMINATION (4 BULBS)
INSTRUMENT CLUSTER
J958W-S

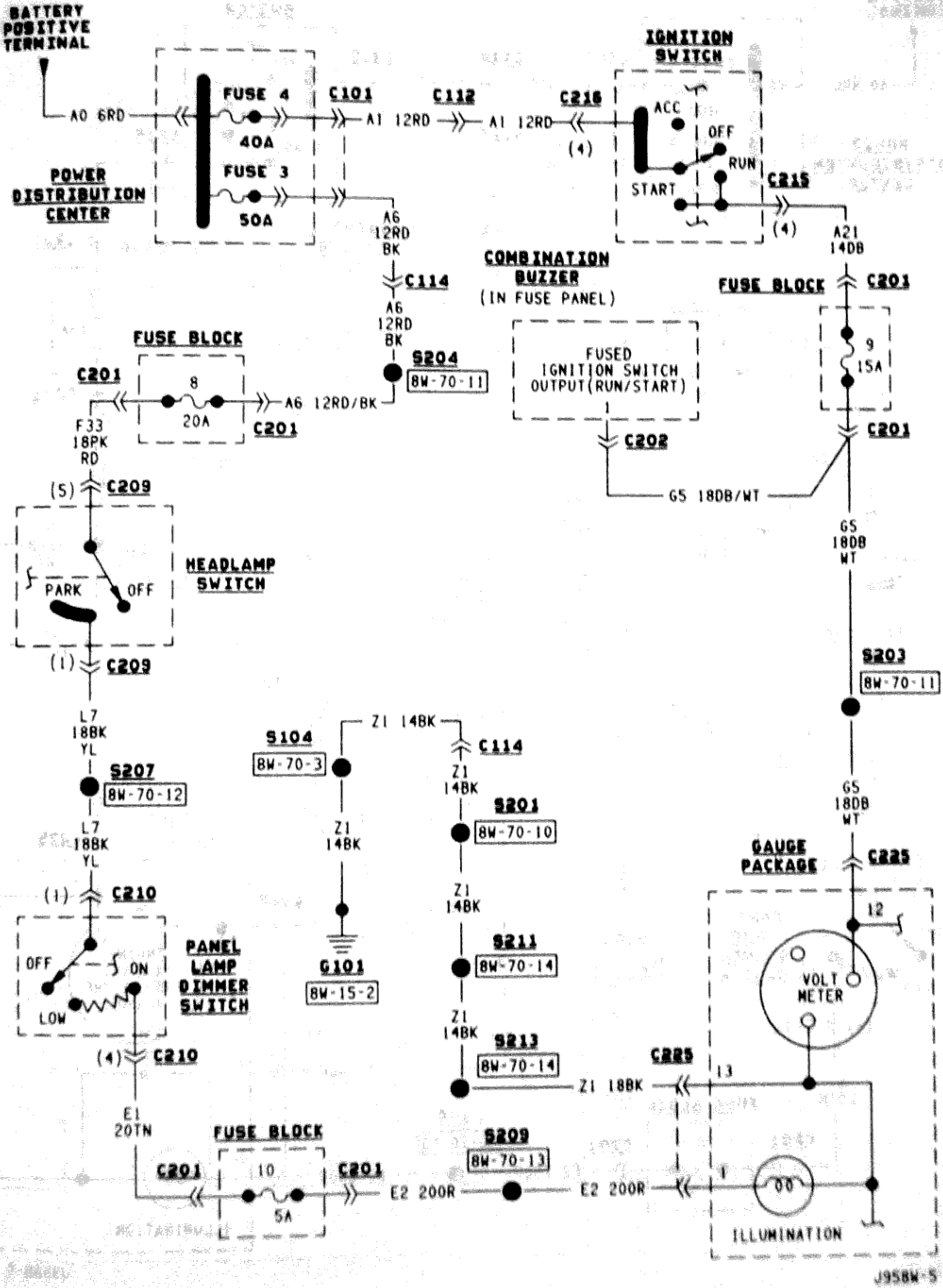

BATTERY POSITIVE TERMINAL
A0 6RD
POWER DISTRIBUTION CENTER
FUSE 4 40A
C101
C112
A1 12RD
A1 12RD
IGNITION SWITCH
C210
(4)
ACC
OFF
RUN
START
C215
A21
(4)
FUSE BLOCK
C201
14DB
9
15A
C201
G5 18DB WT
DAYTIME RUNNING LAMP MODULE
(LEFT SIDE OF ENGINE COMPARTMENT)
VSS SIGNAL
7
C154
S118
8W-70-7
(4.0L ENGINE)
G7 18WT/OR
G7 18WT/OR
G7 18WT/OR
C107
G7 20WT OR
G7 20WT OR
G5 18DB WT
G5 18DB WT
S203
8W-70-11
C105
G7 20WT/OR
G7 18WT/OR
VEHICLE SPEED SENSOR (8W-30-11, 8W-30-17)
G7 20WT/OR
S109
8W-70-4
(2.5L ENGINE)
G7 20WT OR
C114
G7 18WT OR
C107
G7 18WT OR
C107
G21 20GY LB
S104
8W-70-3
Z1 14BK
C114
Z1 14BK
Z1 14BK
S201
8W-70-10
Z1 14BK
S211
8W-70-14
Z1 18BK
G101
8W-15-2
47 VSS SIGNAL
43 TACH SIGNAL
C139
POWERTRAIN CONTROL MODULE
(LEFT SIDE OF DASH PANEL)
G21 20GY LB
C114
G21 20GY LB
G7 20WT OR
G5 18DB WT
C202
12
14
13
19
INSTRUMENT CLUSTER
ELECTRONIC TACHOMETER
ELECTRONIC SPEEDOMETER
J958W-5

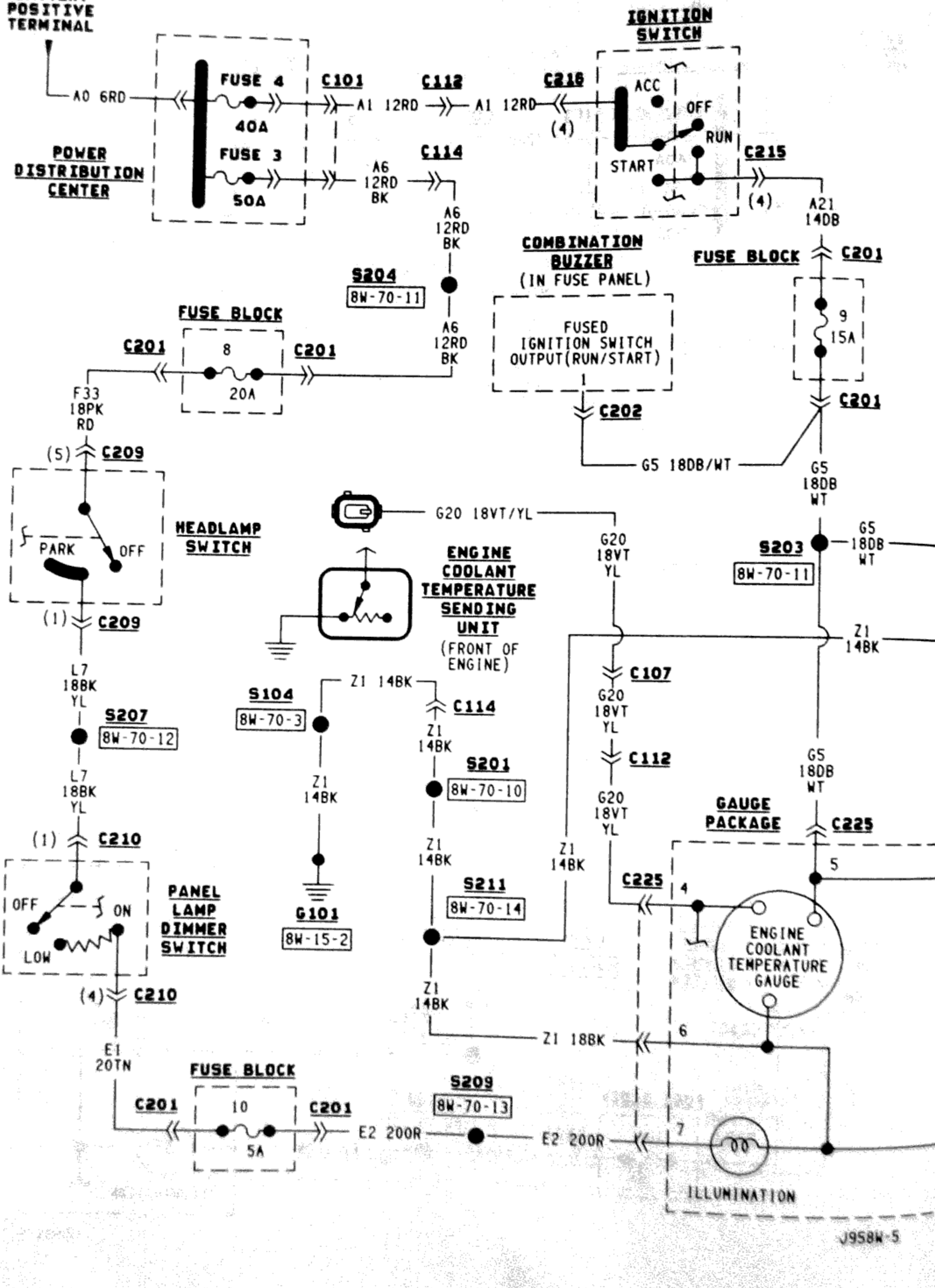

IGNITION SWITCH
ACC
OFF
RUN
START
C216
(2)
G11 18WT/BK
G11 18WT BK
C203
C114
G11 20WT BK
C113
(2)
(1)
G9 20GY BK
BRAKE WARNING SWITCH
(LEFT SIDE OF ENGINE COMPARTMENT)
PARK BRAKE SWITCH
B15 14GY/YL
SPLICE S107
(8W-70-4)
C111
D101 DIODE
C111
C110
52
ABS WARNING LAMP DRIVER
ANTI-LOCK BRAKE SYSTEM CONTROL MODULE
(CENTER OF I.P.)
G19 20LG OR
G19 20LG OR
S108
8W-70-4
G19 20LG OR
POWERTRAIN CONTROL MODULE
(LEFT SIDE OF DASH PANEL)
UPSHIFT LAMP DRIVER 54
MIL DRIVER 32
C139
K54 200R BK
G3 20BK PK
C107
TCC RELAY
(8W-31-2)
K54 200R BK
K54 200R BK
G3 20BK PK
C114
G5 18DB WT
G9 20GY BK
G9 20GY BK
G19 20LG OR
K54 200R BK
G3 20BK PK
C207
INSTRUMENT CLUSTER
10
5
6
9
BRAKE WARNING
CHECK ANTI-LOCK
UPSHIFT
MALFUNCTION INDICATOR
C207
8

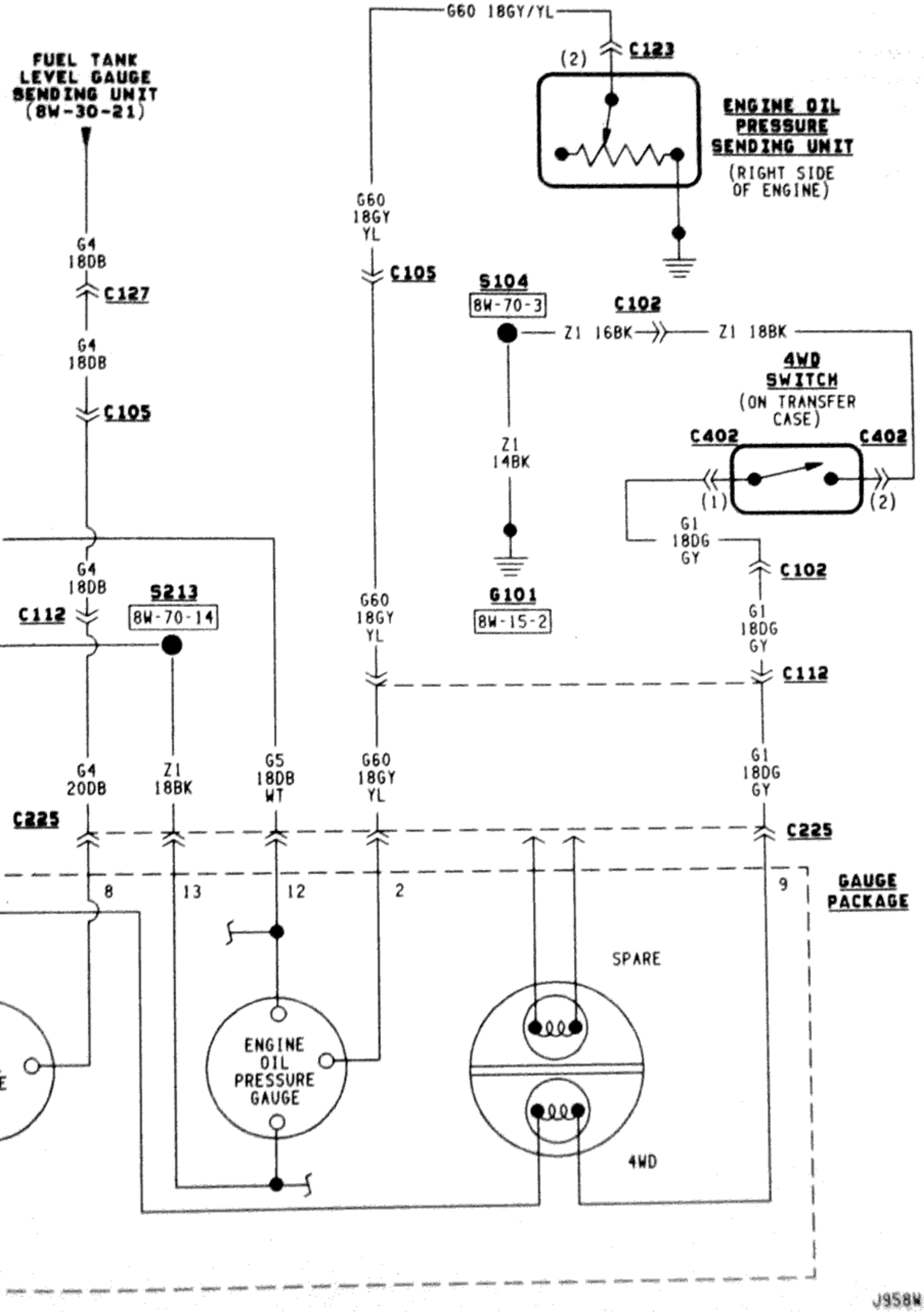
J958W-5


BATTERY POSITIVE TERMINAL
A0 6RD
FUSE 7 30A
C101
A3 12RD/OR
C114
A3 12RD/OR
POWER DISTRIBUTION CENTER
C209
HEADLAMP SWITCH
3
25 AMP CIRCUIT BREAKER
OFF
PARK
2
L60 18TN
S123
8W-70-8
L60 18TN
RIGHT PARK AND TURN SIGNAL LAMP (8W-50-5, 8W-50-7)
RIGHT SIDE MAKER LAMP (8W-50-5, 8W-50-7)
C209
S129
8W-70-10
L61 18LG
L61 18LG
LEFT SIDE MAKER LAMP (8W-50-4, 8W-50-6)
L61 18LG
LEFT PARK AND TURN SIGNAL LAMP (8W-50-4, 8W-50-6)
HEADLAMP DIMMER SWITCH
L20 16LG WT
C208
C114
L60 18TN
L61 18LG
3
HI
OPT
2
C208
TURN SIGNAL AND HAZARD FLASHER SWITCH (8W-52-3)
L60 18TN
L61 18LG
DAYTIME RUNNING LAMP MODULE
HIGH BEAM INDICATOR DRIVER
2
L3 16RD OR
Z1 14BK
C114
S104
8W-70-3
C114
Z1 14BK
S201
8W-70-10
C154
G34 18RD GY
G34 18RD GY
Z1 14BK
Z1 14BK
S211
8W-70-14
G101
8W-15-2
G34 18RD GY
Z1 18BK
L61 18LG
L60 18TN
C207
INSTRUMENT CLUSTER
20
18
4
17
LEFT TURN SIGNAL
RIGHT TURN SIGNAL
HIGH BEAM INDICATOR

J958W-5


BATTERY POSITIVE TERMINAL
A0 6RD
POWER DISTRIBUTION CENTER
FUSE 4
40A
FUSE 3
50A
C101
C112
A1 12RD
A1 12RD
C216
(4)
IGNITION SWITCH
ACC
OFF
RUN
START
C215
(4)
A21 14DB
FUSE BLOCK
C201
9
15A
C201
A6 12RD BK
C114
A6 12RD BK
S204
8W-70-11
COMBINATION BUZZER (IN FUSE PANEL)
FUSED IGNITION SWITCH OUTPUT(RUN/START)
C202
G5 18DB/WT
FUSE BLOCK
C201
8
20A
C201
A6 12RD/BK
F33 18PK RD
(5) C209
HEADLAMP SWITCH
PARK
OFF
(1) C209
L7 18BK YL
S207
8W-70-12
L7 18BK YL
(1) C210
PANEL LAMP DIMMER SWITCH
OFF
ON
LOW
(4) C210
E1 20TN
FUSE BLOCK
C201
10
5A
C201
S104
8W-70-3
Z1 14BK
G101
8W-15-2
Z1 14BK
C114
Z1 14BK
S201
8W-70-10
Z1 14BK
S211
8W-70-14
Z1 14BK
S213
8W-70-14
Z1 18BK
S209
8W-70-13
E2 200R
E2 200R
G5 18DB WT
S203
8W-70-11
G5 18DB WT
GAUGE PACKAGE
C225
12
VOLT METER
C225
13
1
00
ILLUMINATION
J958W-5


BATTERY POSITIVE TERMINAL
A0 6RD
FUSE 4
40A
FUSE 3
50A
POWER DISTRIBUTION CENTER
C101
C112
A1 12RD
A1 12RD
C216
(4)
IGNITION SWITCH
ACC
OFF
RUN
START
C215
(4)
A21 14DB
C114
A6 12RD BK
A6 12RD BK
S204
8W-70-11
COMBINATION BUZZER
(IN FUSE PANEL)
FUSED IGNITION SWITCH OUTPUT(RUN/START)
1
C202
FUSE BLOCK
C201
9
15A
C201
G5 18DB/WT
G5 18DB WT
FUSE BLOCK
C201
8
20A
C201
F33 18PK RD
(5)
C209
HEADLAMP SWITCH
PARK
OFF
(1)
C209
L7 18BK YL
S207
8W-70-12
L7 18BK YL
(1)
C210
PANEL LAMP DIMMER SWITCH
OFF
ON
LOW
(4)
C210
E1 20TN
FUSE BLOCK
C201
10
5A
C201
E2 200R
S209
8W-70-13
E2 200R
G20 18VT/YL
ENGINE COOLANT TEMPERATURE SENDING UNIT
(FRONT OF ENGINE)
Z1 14BK
S104
8W-70-3
Z1 14BK
G101
8W-15-2
Z1 14BK
C114
Z1 14BK
S201
8W-70-10
Z1 14BK
S211
8W-70-14
Z1 14BK
Z1 18BK
G20 18VT YL
C107
G20 18VT YL
C112
G20 18VT YL
C225
4
C225
6
7
ENGINE COOLANT TEMPERATURE GAUGE
00
ILLUMINATION
GAUGE PACKAGE
C225
5
G5 18DB WT
S203
8W-70-11
G5 18DB WT
Z1 14BK
G5 18DB WT
J958W-5


FUEL TANK LEVEL GAUGE SENDING UNIT (8W-30-21)
G4 18DB
C127
G4 18DB
C105
G5 18DB/WT
G4 18DB
C112
S213
8W-70-14
Z1 14BK
G4 20DB
Z1 18BK
G5 18DB WT
G60 18GY YL
C225
8
13
12
2
FUEL GAUGE
G60 18GY/YL
(2)
C123
ENGINE OIL PRESSURE SENDING UNIT
(RIGHT SIDE OF ENGINE)
G60 18GY YL
C105
S104
8W-70-3
Z1 16BK
C102
Z1 18BK
4WD SWITCH
(ON TRANSFER CASE)
C402
C402
(1)
(2)
Z1 14BK
G101
8W-15-2
G1 18DG GY
C102
G1 18DG GY
C112
G1 18DG GY
C225
9
GAUGE PACKAGE
SPARE
ENGINE OIL PRESSURE GAUGE
4WD

J958W-5

INTERIOR COMPONENTS

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INSTRUMENT PANEL—YJ

The instrument panel is constructed of sheet metal and is attached to cowl panel with screws. The instrument panel and defroster grille pad is attached to the instrument panel with screws.

INSTRUMENT CLUSTER AND GAUGE HOUSINGS—YJ

REMOVAL

(1) Remove the instrument cluster and gauge housing attaching screws (Fig. 1, 2 and 3).

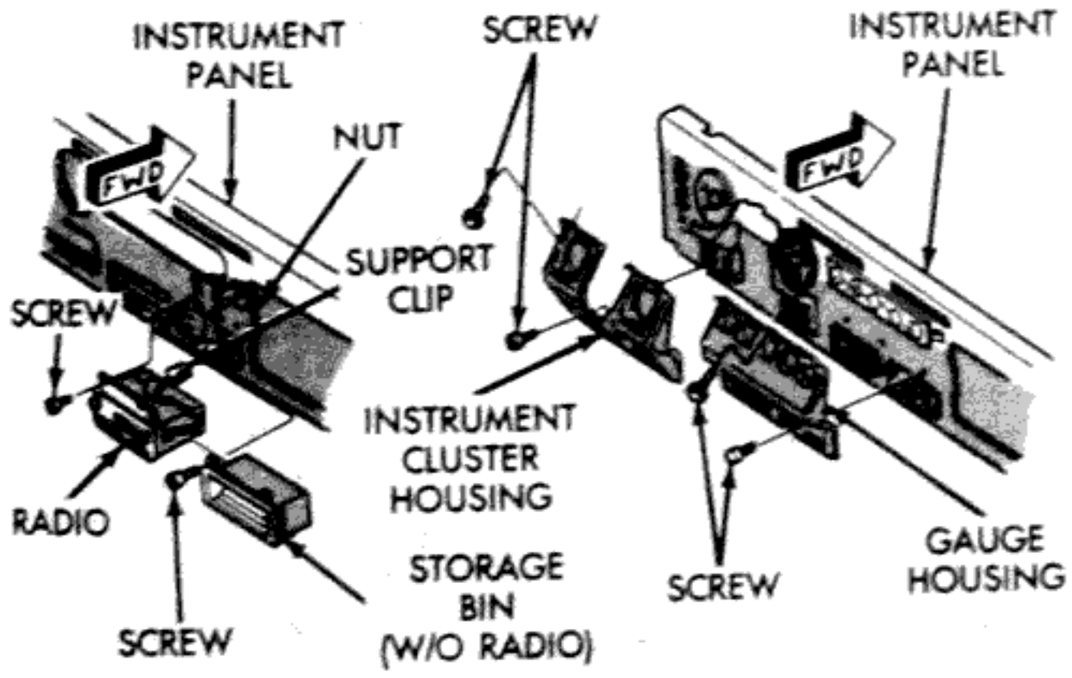


Fig. 1 Instrument Cluster/Gauge Housing and Radio

(2) Disconnect the switch illumination bulb socket from the instrument cluster housing (Fig. 4). Remove the housings from the instrument panel (Fig. 1).

INSTALLATION

(1) Position the instrument cluster and gauge housings on the instrument panel (Fig. 1). Connect the switch illumination bulb socket to the instrument cluster housing (Fig. 4).

(2) Install the attaching screws (Fig. 1, 2 and 3). Tighten the screws to 3 N·m (24 in-lbs) torque.

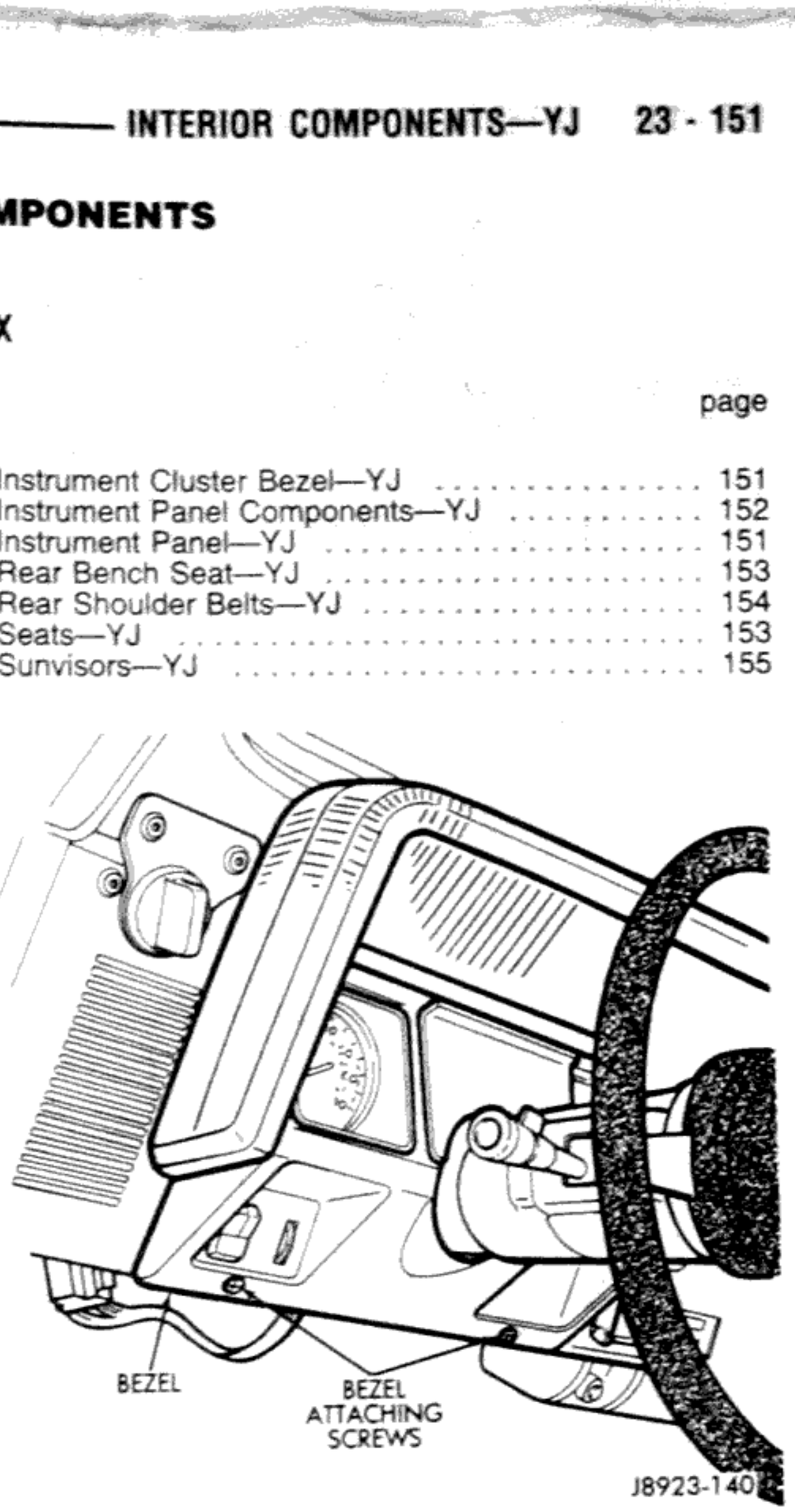


Fig. 2 Instrument Cluster Housing Lower Screws

INSTRUMENT CLUSTER BEZEL—YJ

REMOVAL

(1) Remove the instrument cluster housing attaching screws (Fig. 1, 2 and 3).

(2) Disconnect the switch illumination bulb from instrument cluster (Fig. 4). Remove the housing from the instrument panel (Fig. 1).

(3) Remove the bezel retaining screws.

(4) Disconnect the accessory switch, warning indicator, rheostat and lamp wire harness connectors from the bezel (Fig. 5).

(5) Remove the bezel from the instrument panel (Fig. 6).

INSTALLATION

(1) Position bezel at the instrument panel and connect accessory switch, warning indicator, rheostat and lamp wire harness to bezel.

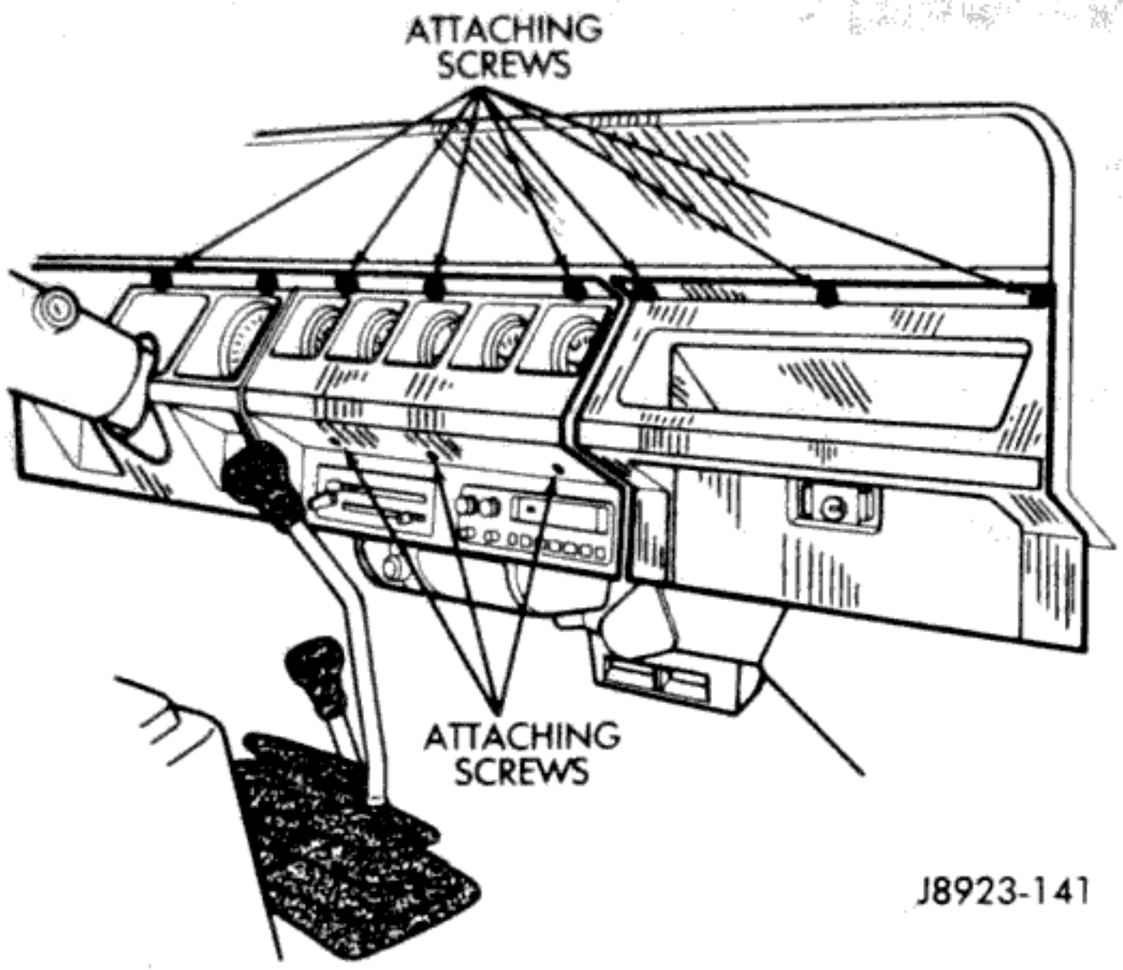


Fig. 3 Instrument Gauge Housing Screws

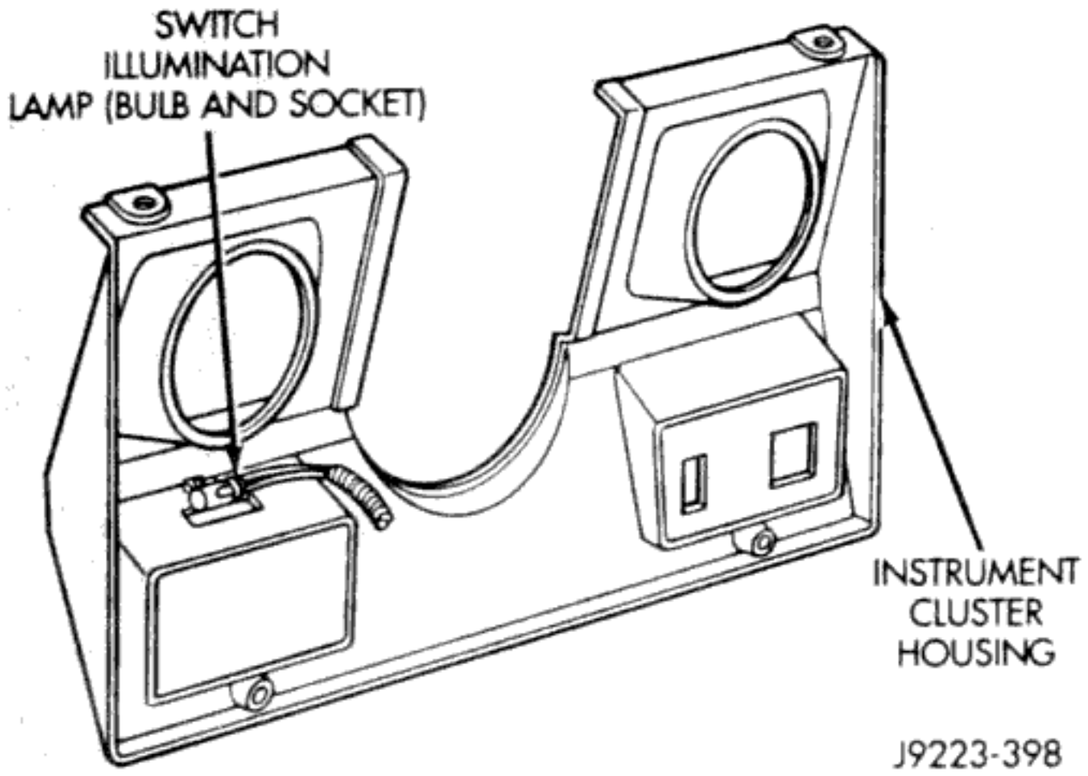


Fig. 4 Instrument Cluster Housing and Lamp

(2) Install the bezel screws. Tighten the screws to 3 N·m (24 in-lbs) torque.

(3) Position the instrument cluster housing on the instrument panel (Fig. 1). Connect the switch illumination bulb socket to the instrument cluster housing (Fig. 4).

(4) Install the attaching screws (Fig. 1, 2 and 3). Tighten the screws to 3 N·m (24 in-lbs) torque.

INSTRUMENT PANEL COMPONENTS—YJ

For service procedures regarding individual I/P components refer to Group 8, Electrical.

GLOVE BOX—YJ

REMOVAL

(1) Remove the glove box-to-instrument panel retaining screws (Fig. 7).

(2) Pull the glove box housing out of the instrument panel opening (Fig. 14).

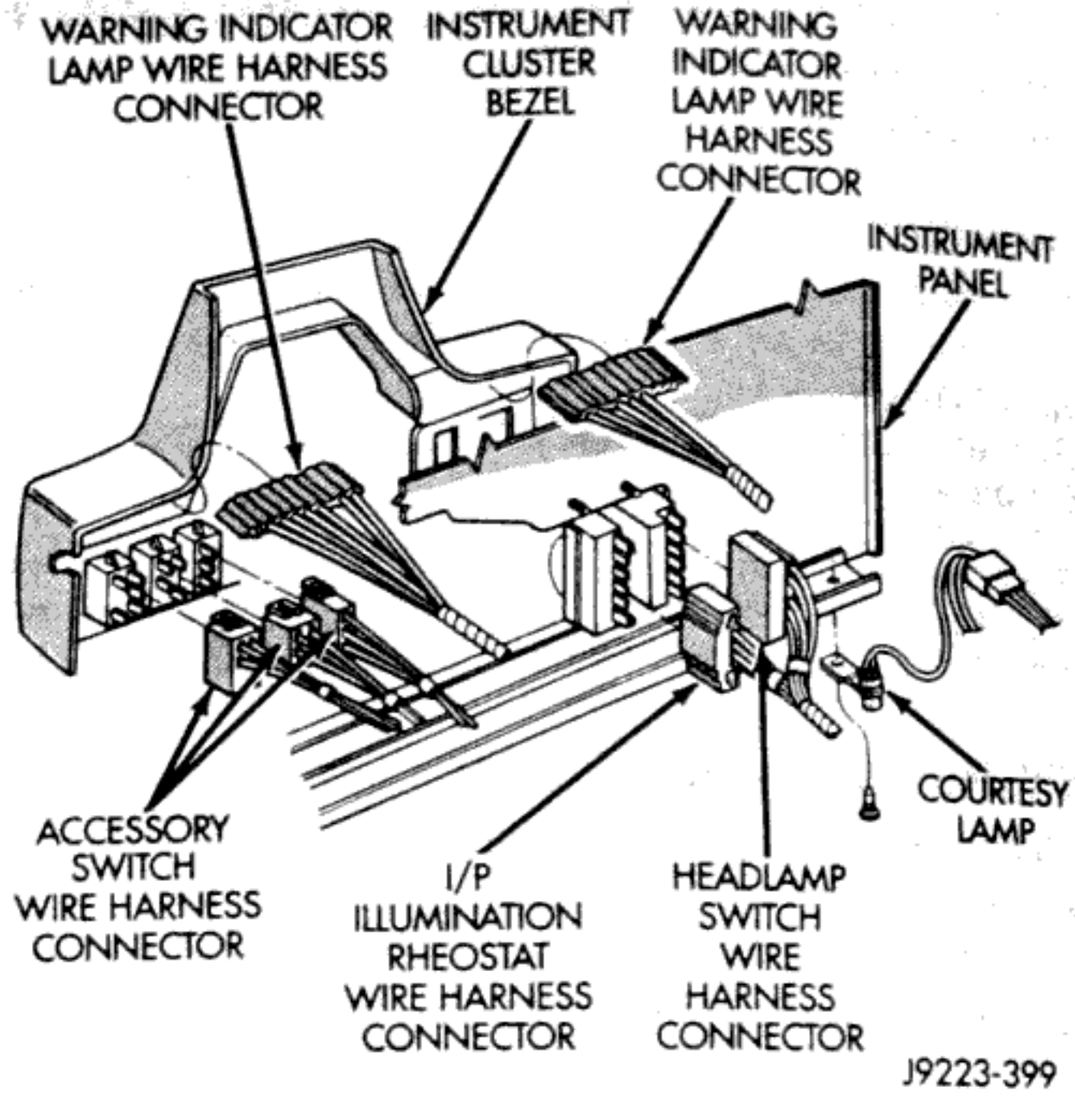


Fig. 5 Instrument Cluster Bezel

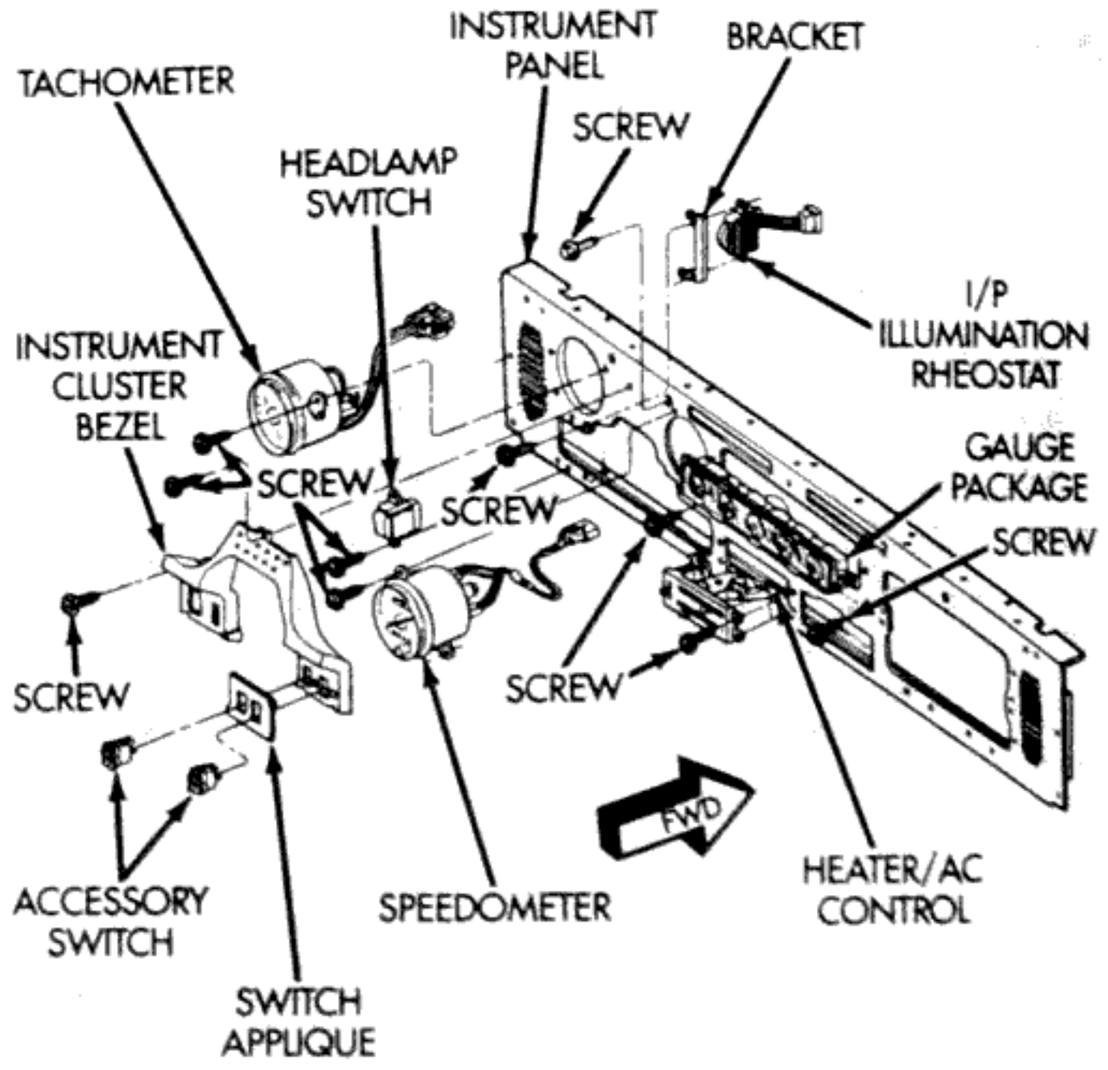


Fig. 6 Instrument Panel Components

INSTALLATION

(1) Position the glove box housing in the instrument panel opening.

(2) Install the glove box-to-instrument panel screws. Tighten the screws securely.

DOOR AND HINGE

The glove box door hinge attaching screw holes are elongated for adjustment. The hinge screws can be loosened and the door moved in direction for the best fit within the door opening.

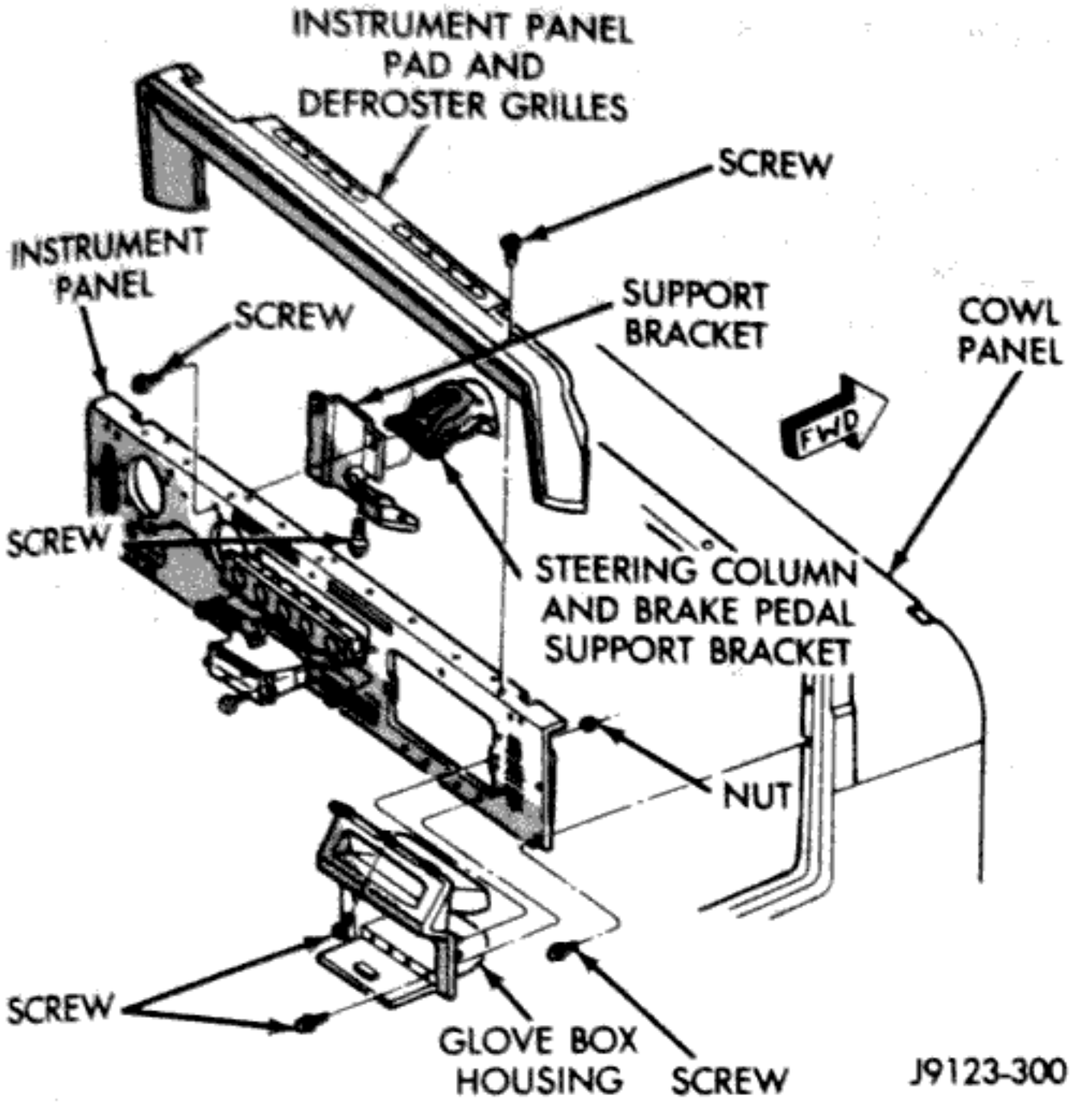


Fig. 7 Glove Box Removal/Installation

REMOVAL

(1) Remove the hinge-to-glove box housing retaining screws.

(2) Remove the door and the hinge from the glove box housing.

(3) If necessary, remove the retaining screws and the hinge from the glove box door.

INSTALLATION

(1) If removed, install the hinge on the glove box door with screws. Tighten the screws securely.

(2) Position the glove box door and hinge on the glove box housing.

(3) Install the hinge-to-glove box housing screws and adjust the door for proper fit within the opening. Tighten the screws securely.

DOOR LATCH STRIKER ADJUSTMENT

The glove box door lock cylinder latch striker is attached to the glove box housing opening with screws. The striker can be moved in or out for adjustment.

SEATS—YJ

Bucket-type front seats are standard on YJ vehicles. The rear passenger seat is a forward pivoting/folding, bench-type seat.

BUCKET SEATS—YJ

The passenger-side (RH), front bucket seat frame is the tilt-type (Fig. 1). The driver-side (LH) seat is fixed in-place. Both the passenger-side (RH) seat and the driver-side (LH) seat have fore-and-aft track adjustment.

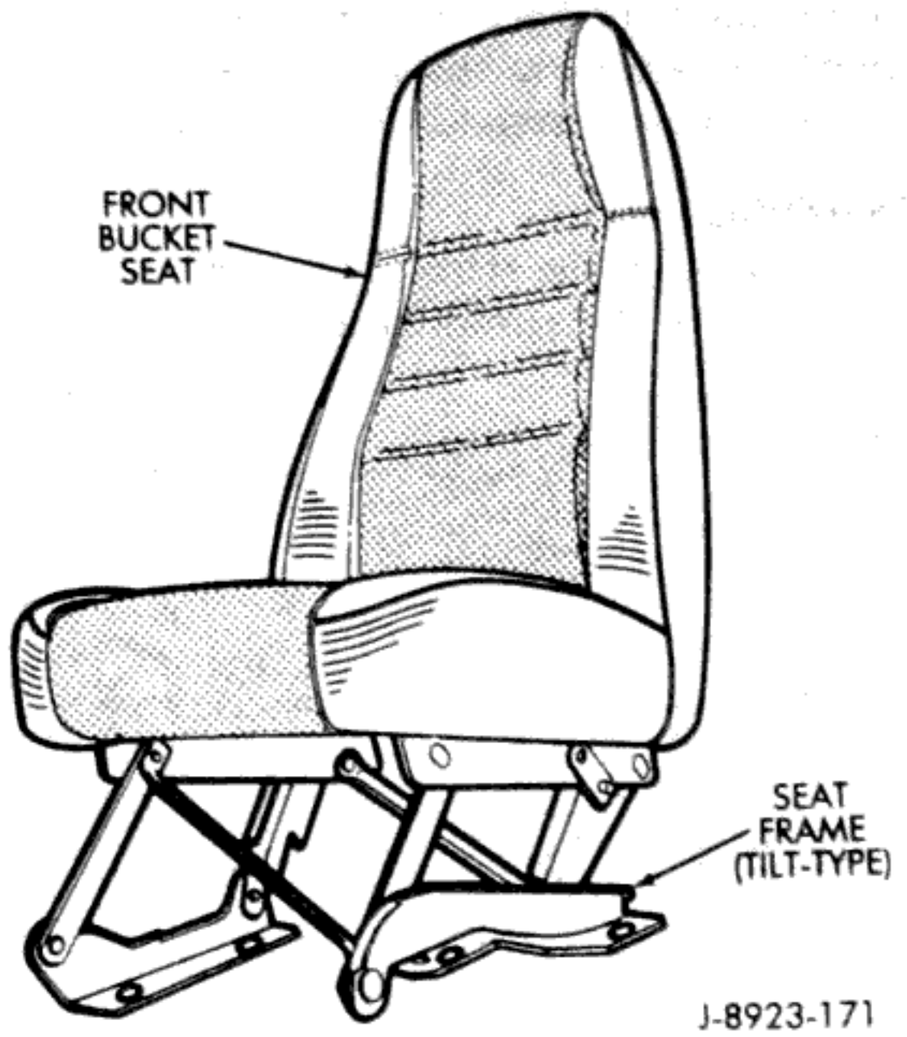


Fig. 1 Passenger-Side Bucket Front Seat

REMOVAL

(1) Remove the bolts attaching the seat frame to the floor panel (Fig. 2).

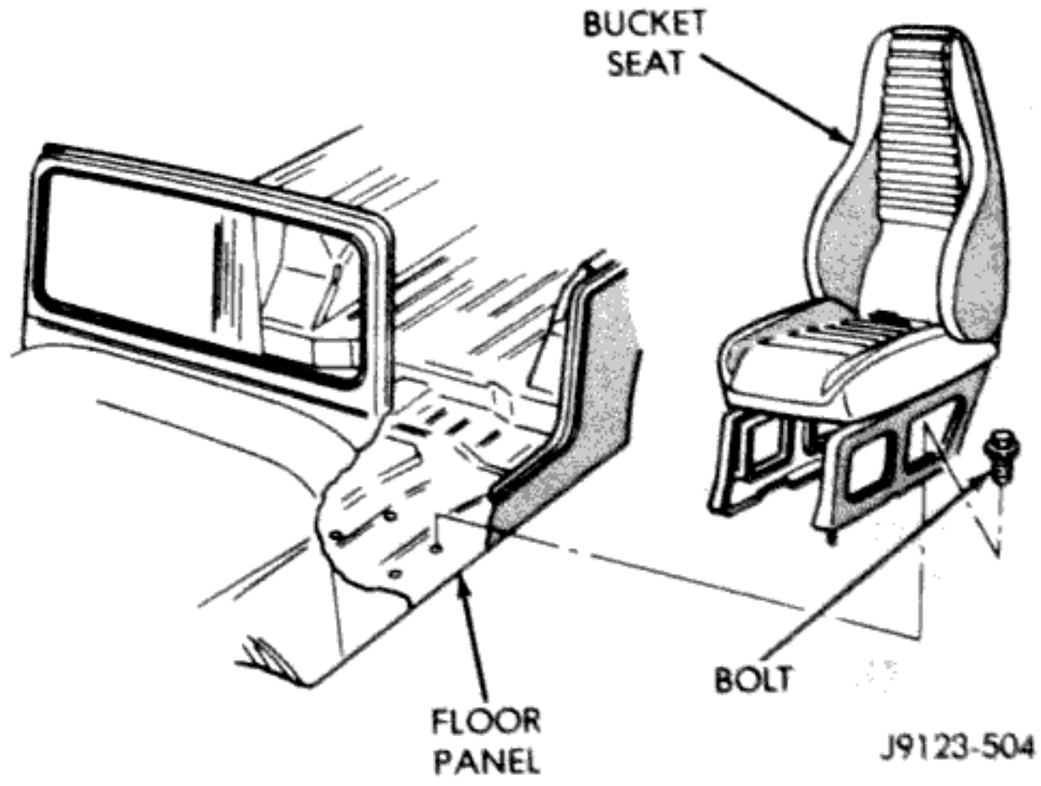


Fig. 2 Bucket Front Seat

(2) Remove the seat from the vehicle.

INSTALLATION

(1) Position the seat in the vehicle.

(2) Install seat frame bolts into floor panel. Tighten to 33 N·m (25 ft. lbs.) torque.

REAR BENCH SEAT—YJ

The rear bench seat pivot brackets are attached to the floor panel with screws. The front of the seat is attached to the pivot brackets with washers and hitch pins.

CAUTION!

- **Prolonged driving with the Check Engine light on could cause damage to the emission control system. It also could affect fuel economy or driveability.**
- **If the Check Engine light is flashing, severe catalytic converter damage and power loss will soon occur. Immediate service is required.**

The light will come on when the ignition is first turned on and remain on briefly as a bulb check. If the bulb does not light during starting, have the bulb repaired promptly.

GAUGE PACKAGE

16. 4-Wheel-Drive Indicator Light

The 4WD symbol indicates that the transfer case is in 4-wheel drive mode.

17. Fuel Gauge

18. Engine Coolant Temperature Gauge

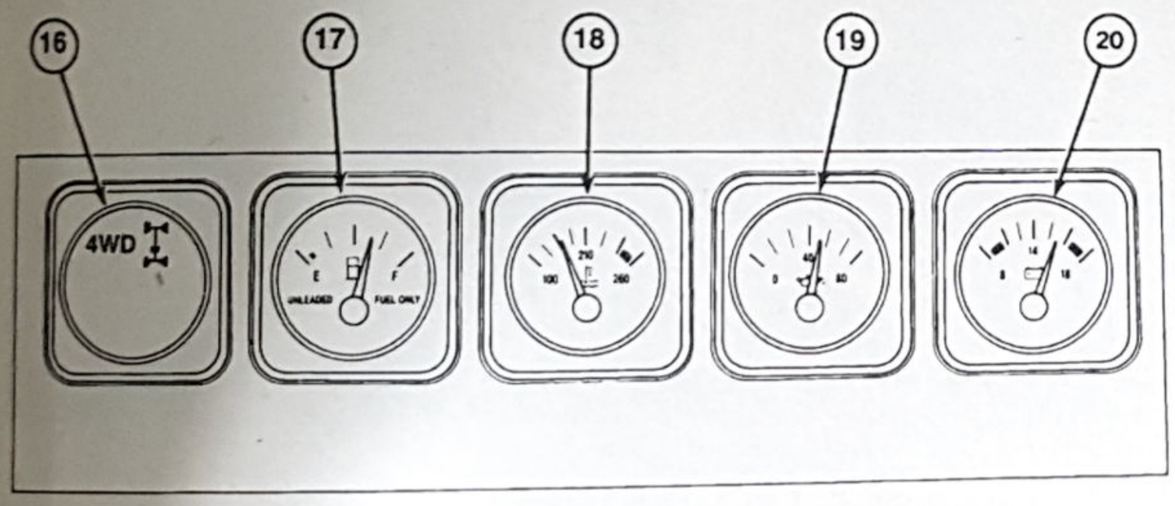
Indicates engine coolant temperature. The red zone to the far right indicates possible overheating. Seek authorized service immediately if the gauge operates in the red zone. See Cooling System Operating Information in the **Service and Maintenance** section. In U.S. vehicles, temperature is indicated in degrees fahrenheit; in Canadian vehicles in degrees centigrade.

19. Engine Oil Pressure Gauge

Indicates engine oil pressure. This gauge does not indicate oil level. Normal readings are 20-65 psi (1.4-4.5 bars in Canadian vehicles) in city driving and 45-65 psi (3-4.5 bars in Canadian vehicles) at highway speeds. Pressure varies with engine speed, temperature and oil viscosity. Hot engine idle pressure of 13 psi (.9 bar in Canadian vehicles) is satisfactory. Consistent lower readings indicate possible malfunction. Seek authorized service.

20. Voltmeter

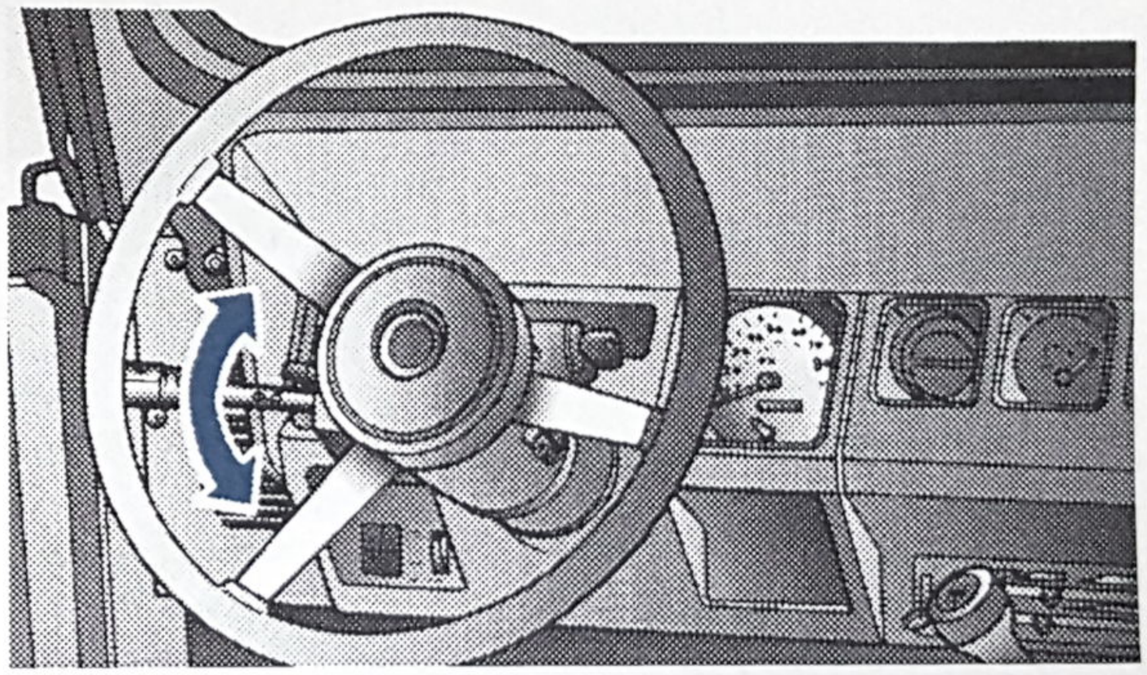
Indicates available battery voltage and charging system operation. The lower red zone indicates that battery charge may be too low to start the engine. With the engine running, the normal operating range is between 11 and 15 volts. Prolonged gauge readings between 8-11 (undercharge) or above 15 (overcharge) indicate possible malfunction of generator, voltage regulator or battery. See your dealer if such indications occur.



NOTE: When the ignition switch is turned to OFF, the fuel gauge, voltmeter, oil pressure and temperature gauges may not show accurate readings. When the engine is not running, turn the ignition switch to ON to obtain accurate readings.

TURN SIGNALS

Move the multifunction stalk up or down, depending on the direction of the turn.



Up: right turn signal.

Down: left turn signal.