# JEEP

**All Models**

## DESCRIPTION

### "CJ" & SCRAMBLER MODELS

Instrument panel is composed of speedometer housing, panel lights, high beam indicator, turn signal indicators, brake failure/parking brake warning indicator, temperature gauge, and combination fuel gauge and constant voltage regulator (CVR). Other gauges include tachometer, voltmeter and oil pressure gauge.

### CHEROKEE, TRUCK & WAGONEER MODELS

Instrument cluster is composed of speedometer housing, panel lights, high beam indicator, turn signal indicators, ammeter, oil pressure gauge, temperature and fuel gauges, constant voltage regulator (CVR), brake failure warning bulb, lock-out warning bulbs (Quadra-Trac), emergency drive indicator, heater control lights, wiper/washer control lights, and blower motor fan switch.

## OPERATION

### AMMETER

Used to indicate current flow into and out of battery, depending on vehicle electrical load. It is regular equipment on all but "CJ" and Scrambler models.

### FUEL LEVEL GAUGE

System consists of a fuel gauge, sending unit in fuel tank, appropriate wiring and constant voltage regulator (CVR). Gauge is grounded through variable resistor of sending unit. A float attached to a slide rheostat follows fuel level and varying resistance increases or decreases indicator reading.

### TEMPERATURE GAUGE

System consists of gauge and sending unit, appropriate wiring and constant voltage regulator (CVR). Gauge is grounded through variable resistor of sending unit. Changes in coolant temperature vary resistance in sending unit, increasing or decreasing indication on gauge.

### VOLTMETER

Used on "CJ" and Scrambler models only, system consists of a voltmeter and related wiring. Voltmeter indicates regulated voltage to provide an indication of the chargings system's ability to maintain battery charge.

### OIL PRESSURE GAUGE

Consists of magnetic type gauge, a variable resistance sending unit and wiring on all "CJ" and Scrambler models. There are 2 coils in gauge, one directly grounded, the other connected to sending unit. Resistance is controlled in sending unit by oil pressure. Magnetic fields are created around both coils in gauge. Needle is attracted to coil having greater current flow.

On all other models, oil pressure gauge system consists of CVR-powered gauge, variable resistance sending unit, and CVR. Gauge needle, attached to bi-metal strip, responds to temperature changes. It moves as current flows from CVR through heating coil around bi-metal strip, and to ground at sending unit on engine.

### CONSTANT VOLTAGE REGULATOR

On "CJ" and Scrambler models, CVR is built into fuel gauge. On all other models it is built into temperature gauge. CVR provides equal regulated voltage to each gauge.

The CVR's function is to regulate variable input voltage available from vehicle battery or charging system to provide a constant 5 volt output to gauges. The CVR does not produce a steady DC voltage output, but rather a pulsating voltage averaging 5 volts. Output voltage averaging lower or higher than 5 volts will result in proportionately higher or lower gauge readings.

## TESTING

### OIL PRESSURE GAUGE

**1)** To test accuracy of oil pressure gauge, use a variable resistance tester (J-24538 or equivalent).

**2)** Disconnect wire from sending unit on engine. Turn ignition "ON". Connect one lead of tester to ground and other lead to sending unit wire. Compare results with specifications shown in table.

***OIL PRESSURE GAUGE TEST READINGS***

| Application | psi | Ohms |
|---|---|---|
| "CJ" & Scrambler | 0 | 234-246 |
| | 40 | 100-106 |
| | 80 | 32-35 |
| Cherokee, Truck & Wagoneer | 0 | 69-77 |
| | 10 | 35-38 |
| | 60 | 13-15 |
| | 80 | 9-11 |

### FUEL & TEMPERATURE GAUGES

**1)** Test with a variable resistance tester (J-24538 or equivalent) or extra fuel tank sending unit. If using fuel tank sender unit, attach one ohmmeter lead to sending unit and other lead to sending unit ground wire. Move float arm and mark arm location at each of the appropriate resistance values.

**2)** Disconnect sending wire from sending unit. Connect one lead of tester or extra sending unit to sending wire and other to ground. Turn ignition to "ON" position. Adjust tester or sender to known ohm values and observe gauge indication at each ohm setting.

***TEMPERATURE SENDING UNIT RESISTANCES***

| Gauge Needle Position | Ohms |
|---|---|
| "C" | 73 |
| Beginning of Band | 36 |
| End of Band | 13 |
| "H" | 9 |

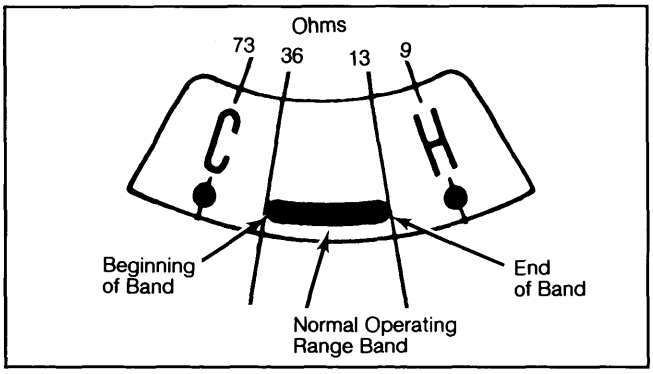
# JEEP (Cont.)

*FUEL GAUGE SENDING UNIT RESISTANCES*

| Gauge Needle Position | Ohms |
|---|---|
| Empty | [1] 61 |
| ½ Full | 23 |
| Full | 10 |

[1] — "CJ" and Scrambler models 73 ohms.

***Fig. 1: Testing Temperature Gauge***




*When known resistance is sent to gauge, needle should move to listed position.*

### VOLTMETER

Connect voltmeter of known accuracy across battery terminals. Turn ignition switch "ON" and compare indication of test voltmeter with indication of vehicle voltmeter. Replace if readings vary.

## REMOVAL & INSTALLATION

### SPEEDOMETER & GAUGES

Instrument panel must be removed to gain access to speedometer and gauges for repair or replacement.

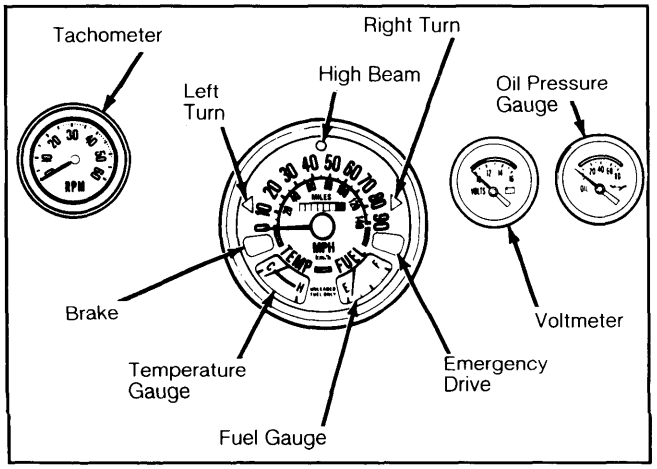
### INSTRUMENT CLUSTER

**"CJ" & Scrambler Models**

**1)** Disconnect battery ground cable. Separate speedometer cable from speedometer head. If equipped with air conditioning, remove screws attaching evaporator to instrument panel and lower evaporator.

**2)** Remove attaching screws and remove cluster. Note position of all lamps and electrical wires. Remove cluster electrical connectors. To install, reverse removal procedures.

***Fig. 2: Jeep Instrument Cluster***




*"CJ" and Scrambler models.*

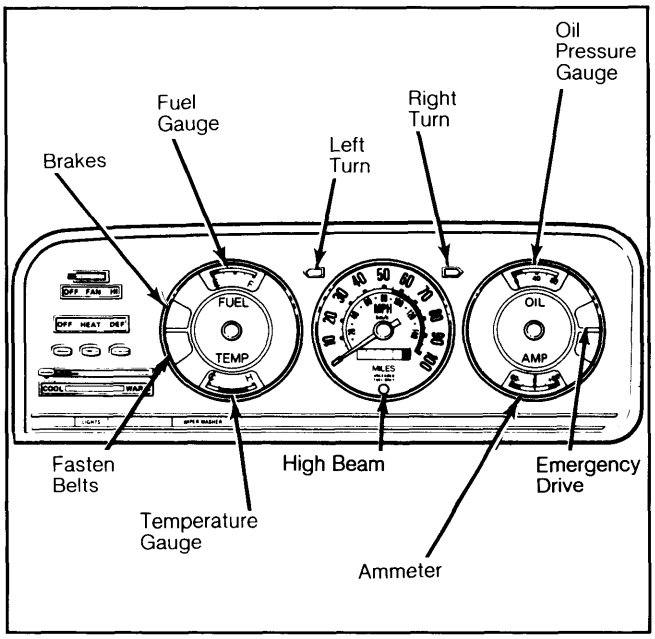
**Cherokee, Truck & Wagoneer Models**

**1)** Disconnect battery ground cable. Disconnect speedometer cable. Cover steering column. Remove cluster retaining screws. Tilt top of cluster toward interior of vehicle. Mark electrical connectors and hoses and disconnect heater vacuum hoses and electrical connections. Disconnect blend air door control cable.

**NOTE: Tag hoses to ensure proper connections when installing the cluster.**

**2)** Remove instrument cluster assembly. To install, reverse removal procedure.

***Fig. 3: Jeep Instrument Cluster***




*Cherokee, Truck and Wagoneer models.*

### PRINTED CIRCUITS

**NOTE: Only Cherokee, Truck and Wagoneer use printed circuit board. "CJ" and Scrambler models use direct wiring for all gauges and cluster lamps.**

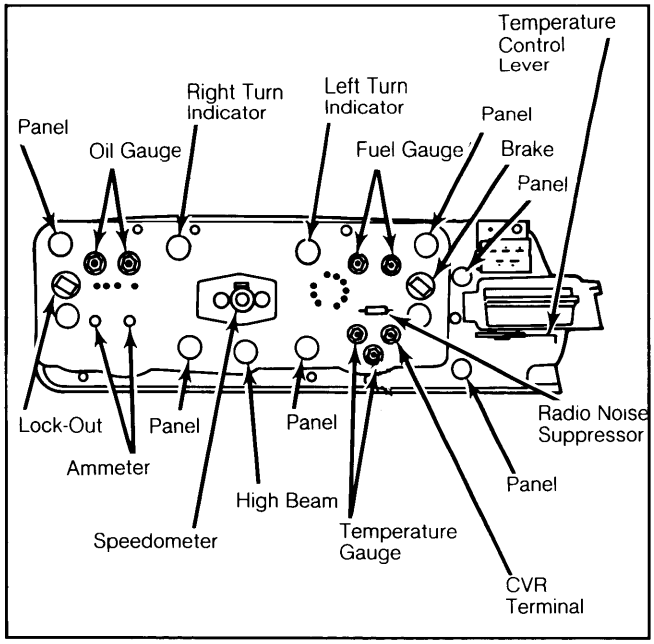
**Cherokee, Truck and Wagoneer**

**1)** Remove instrument cluster, radio noise suppressor, and all lamps from cluster (twist counterclockwise to remove). Remove circuit board and gauge assembly. Remove retaining nuts from ammeter and oil pressure gauges. Lift ammeter, oil pressure gauge and plate out of cluster as an assembly.

**2)** Remove retaining nuts from fuel and temperature gauges. Remove large ground screw from circuit board above speedometer. Remove speedometer, fuel gauge and temperature gauge as an assembly. To install, reverse removal procedure, checking gauge lenses for fingerprints.

## JEEP (Cont.)

*Fig. 4: Rear View of Jeep Instrument Cluster*




*Cherokee, Truck and Wagoneer models.*

### CONSTANT VOLTAGE REGULATOR

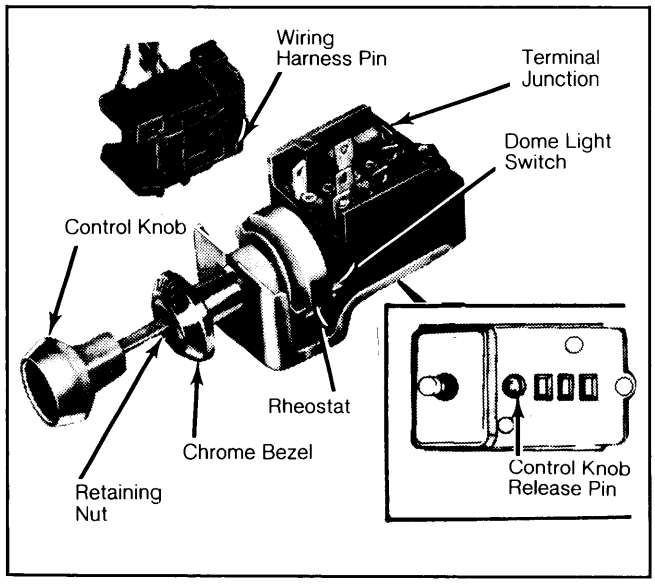
On "CJ" and Scrambler models, CVR is an integral part of fuel gauge. CVR is an integral part of temperature gauge on all other models. If regulator requires replacement, entire gauge must be replaced.

### HEADLIGHT SWITCH

**All Models**

Disconnect connector plug from switch. Pull control knob out to second position. From behind instrument panel, depress knob release button and pull knob out of switch. Remove retaining nut and bezel. Remove switch through rear of instrument panel. To install, reverse removal procedures.

*Fig. 5: Jeep Headlight Switch & Harness Connector*




*Remove switch through rear of instrument panel.*