INTERNATIONAL HARVESTER CORP.

Scout II
Scout Terra
Scout Traveler

DESCRIPTION

Instrument cluster is composed of speedometer, ammeter or charge indicator, fuel gauge, oil pressure gauge and temperature gauge. Electrical instrument gauges are connected to the vehicle electrical system either by individual wires or printed circuit boards.

Gauges may be equipped with a constant voltage regulator or a separate constant voltage regulator unit may be used to supply voltage to all gauges. Type of equipment varies on each model.

OPERATION

Constant Voltage Regulator (CVR) – CVR regulates the input voltage from the battery providing an equal and constant voltage of 5.0 volts to each gauge.

The CVR does not produce a steady DC voltage output, but rather a pulsating voltage averaging 5.0 volts. Output voltage averaging lower or higher than 5.0 volts will result in proportionately higher or lower gauge readings.

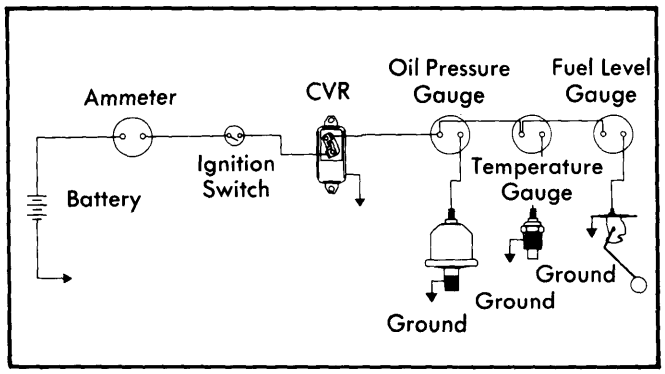

Fig. 1 IHC Constant Voltage Instruments with External Mounted Voltage Regulator

Fuel Level Gauge With "CVR" – Fuel level circuit consists of a fuel gauge, CVR and sending unit. Sending unit is located in fuel tank, gauge and CVR are located on instrument panel.

Gauge is grounded through variable resistance of sending unit. A float attached to a slide rheostat follows fuel level and as the resistance varies, the indicator reading increases or decreases. Stability of indicator reading (elimination of surge fluctuation) is accomplished by use of a bimetal in the fuel gauge.

Fuel Level Gauge (Magnetic) – Fuel gauge system consists of two coils spaced 90 degrees apart with an armature and a pointer at intersection (center) of coil axis. Tank sending unit has a rheostat attached to a float arm. As fuel level changes, the float arm is moved over rheostat changing resistance which changes value of indicating coils and moves the pointer.

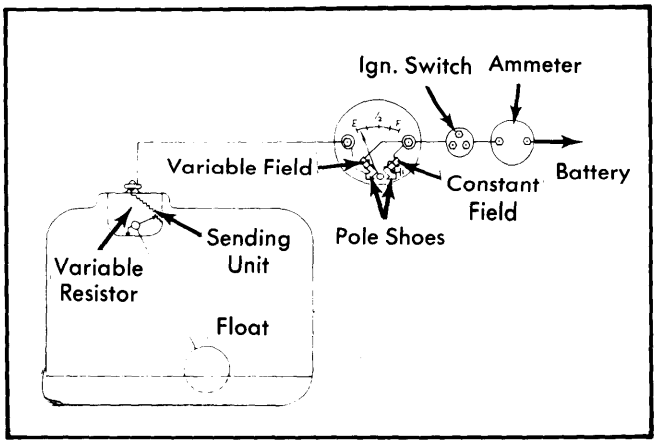

Fig. 2 IHC Magnetic Fuel Gauge System

Temperature Gauge (CVR Type) – Indicator circuit consists of a sending unit and gauge. Sending unit has no moving parts. It consists of a material, enclosed in a sealed bulb, which produces low resistance when hot and high resistance when cold. Changes in coolant temperature causes resistance to vary in the sending unit, which increases or decreases indication on gauge.

Temperature Gauge (Vapor Pressure Type) – An air-tight, thin tube is connected to an immersion bulb, containing a liquid similar to ether. Its vapor pressure is proportional to temperature. When heated, expanded gas is directed up tube into a thin C-shaped tube secured to mechanism frame. As pressure increases C-shaped tube straightens out and moves gauge pointer through linkage. Dial is calibrated in degrees Fahrenheit.

Oil Pressure Gauge (CVR Type) – Works on same principle as Fuel Gauge, except that slide rheostat movement is caused by diaphragm flexing relative to varying oil pressure delivered by engine oil pump.

Oil Pressure Gauge (Pressure Expansion Type) – Works in same manner as vapor pressure type temperature gauge. Oil under pressure passes from engine unit through a connecting tube to gauge. As pressure is increased the thin, C-shaped tube straightens out, moving gauge pointer attached to free end of tube.

Ammeter – Ammeter gauge indicates direction and amount of current flow (charge or discharge). Center of dial is point of no current flow.

TESTING

Ammeter – Check all connections and wiring from ammeter to alternator and battery. If good, check alternator and battery. If all preceding checks are good, replace ammeter gauge.

Fuel Level Gauge (Magnetic Type) – 1) Obtain a good sending unit and two test wires approximately 6 feet in length. Turn ignition switch to "OFF", disconnect battery ground and remove wire from back of the gauge that goes to sending unit. Connect test sending unit to gauge, connect battery and turn ignition switch to "ON".

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2) Move float arm on test sending unit slowly from empty-to-full. If pointer does not move freely from empty-to-full, replace fuel gauge.

3) If gauge is good on preceding test, reconnect wire-to-gauge. Disconnect wire from sending unit-to-gauge at the tank and connect wire to the test sending unit. Connect other lead to ground.

4) Move float arm on test sending unit slowly from empty-to-full. If pointer moves freely, wiring and gauge are good. Replace sending unit.

5) If pointer does not move freely, check wiring from sending unit-to-gauge. If good, check printed circuit board.

Constant Voltage Regulator – Check CVR ground connection. If all gauges read top of scale, replace CVR. If all gauges read zero, check for 5.0 volts at CVR ignition terminal, check lead wire between CVR load terminal and gauges for an open condition, or check for inoperative CVR and replace.

Temperature Gauge (Vapor Pressure Type) – If engine operates above 180-190°F and nothing is noted wrong with cooling system, drain coolant enough to remove sender unit. Remove plug retaining vapor pressure bulb in engine. Place bulb and thermometer in hot water (up to 200°F). Thermometer and gauge should have same reading. If not, replace gauge assembly. Do not overtighten bulb retainer when installing.

Oil Pressure Gauge (Pressure Expansion Type) – Bring oil up to normal operating temperature. Use an accurate master gauge oil line. If master gauge reads correctly, replace old gauge. If oil gauge is jumpy, sticking or uneven, replace it. Condition may be helped by cleaning dirt from small hole in gauge or oil line, using fine wire. Shut down engine, disconnect both ends of oil line and force compressed air tharough in reverse flow.

REMOVAL & INSTALLATION

SPEEDOMETER & GAUGES

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

INSTRUMENT CLUSTER

All Models – Remove faceplate retaining screws, then remove radio control knobs. Remove screws from each cluster. Disconnect speedometer cable and all wiring, then remove cluster from vehicle. To install, reverse removal procedures

PRINTED CIRCUITS

All Models – Remove instrument cluster. Printed circuit board is removed by disconnecting all snap connectors and light sockets. Remove four attaching screws securing board to dash panel. Remove printed circuit board from vehicle. To install, reverse removal procedures.

HEADLIGHT SWITCH

Light Switch Without Fuse & With Circuit Breaker – Pull headlight switch out to "ON" position. Loosen Allen screw in the knob and remove knob from shaft. Remove ferrule nut and disconnect all wires from switch while noting positions of wires to help in installation. Remove switch from vehicle. To install, reverse removal procedures.

All Other Headlight Switches – Pull headlight switch to "ON" position, depress shaft release button on switch body and pull knob and shaft from switch body. Remove ferrule nut and disconnect all wires from switch while noting positions of wires to help in installation. Remove switch from vehicle. To install, reverse removal procedures.

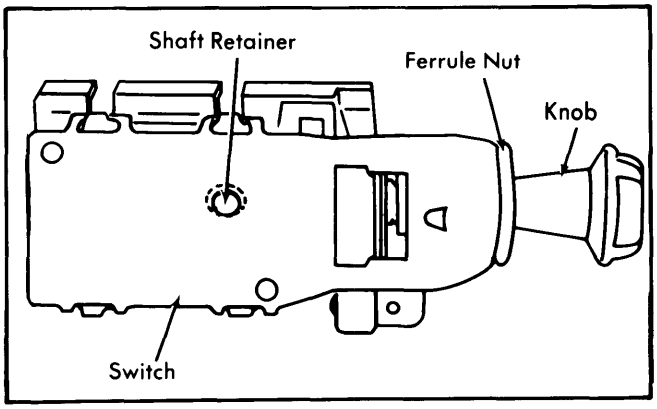

Fig. 3 IHC Headlight Switch (with Fuse & Circuit Breaker)