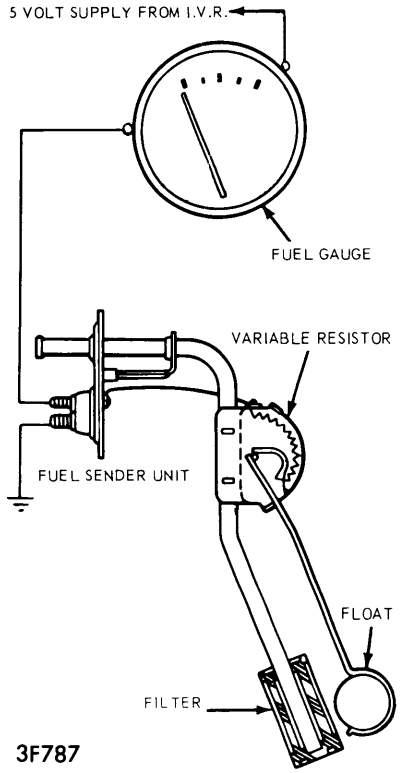
1966-74 FORD MOTOR CO.

DESCRIPTION & OPERATION

Ammeter – Gauge is a shunt type which senses the direction and rate of flow of electrical current to or from the battery to indicate whether the battery is being charged or discharged. Ammeter is non-adjustable.

Fuel Level Indicator – Fuel gauge is a bimetal resistance type system, and consists of an instrument voltage regulator, fuel gauge, and tank mounted sending unit.



FUEL LEVEL INDICATING SYSTEM

Instrument Voltage Regulator – IVR is used in conjunction with fuel gauge. It controls and maintains an average pulsating value of 5 volts at gauge. A supression choke is connected in series between printed circuit and IVR to prevent radio interference.

Oil Pressure Gauge – Oil pressure indicating system consists of an IVR, oil pressure gauge, and pressure sending unit, all connected in series. The sending unit consists of a diaphragm, a contact, and a variable resistor. Oil pressure causes the diaphragm to move the contact on the variable resistor thus controlling current flow through the gauge.

Temperature Gauge – System consists of a sending unit mounted in heater hose block (1600cc Pinto), in engine block (2000cc Pinto), in cylinder head (6 Cyl.), intake manifold (8 Cyl.) and a temperature gauge. When engine temperature is low, resistance of sending unit is high, thus restricting flow of current through gauge, resulting in a low reading. The reverse is true when engine temperature increases.

TESTING

Ammeter (All Models) – Turn headlights on and ignition in on position with engine off. Meter pointer should move toward the "D" or discharge side of the gauge. If no pointer movement is noted check the following: Rear of meter housing for loose connection, printed circuit connections, multiple connector at printed circuit. If connections are good, replace ammeter. Should ammeter pointer move toward "C", ammeter connections are reversed. This is most likely to occur in an ammeter system that uses a wiring harness rather than a printed circuit.

Instrument Voltage Regulator (1966-67) – Turn the ignition switch on. Remove gauge feed wire at either fuel or temperature gauge. Connect the lead of a 12 volt test light, or positive lead of a voltmeter to gauge lead and other test lead to a good ground. A flashing light or fluctuating voltmeter will indicate instrument voltage regulator is operating. If test results are not as prescribed, the instrument voltage regulator is defective or there is a short to ground between the voltage regulator and the gauges.

Fuel Gauge & Fuel Level Sending Unit (1966-67) – Disconnect terminal wire at sending unit and connect to a known good sending unit. Connect jumper wire between sending unit mounting plate and vehicle frame to ground the unit. Turn ignition on. Raise float arm to upper stop and observe gauge. Gauge should read full. Lower float arm to bottom stop and gauge should read empty. If gauge reads properly, sending unit in tank is defective. If gauge unit still indicates improperly or is erratic in its operation, gauge unit or wiring to gauge is faulty. Repair wire or replace gauge.

Fuel Level Indicator (1968-74) – Disconnect wiring connector from terminals at sender unit. Check terminals for possible corrosion or undercoating, and clean as necessary. Connect lead of a 12 volt test light, or positive lead of a voltmeter to guage lead that was disconnected from sender. Connect other test lead to a good ground. With ignition on, a flashing light or fluctuating voltmeter will indicate instrument voltage regulator is operating and that gauge indicator circuit is not interrupted. If light stays on, or voltage reading is steady, replace IVR. If no voltage is indicated by meter or test light, check IVR for proper ground, or open circuit across IVR. Do not ground or spark either terminal of IVR, this could burn out dash wiring harness of IVR, or both.

Fuel Level Indicator Calibration Test (1968-74) – When instrument voltage regulator or gauge is suspected of being out of calibration, having a fluctuating movement, or a high or low reading, both the gauge and IVR must be tested simultaneously. This test is done on vehicle.

Test equipment consists of a suitable fuel system tester (WRE-500-70) if available, or a pair of 10 and 73 ohm resistors, or another fuel sender of known good quality.

If test is performed with resistors: Disconnect wiring connector at sender unit, connect the resistor between the gauge lead and a suitable ground. Turn ignition on. With the 10 ohm resistor, the gauge should read on or above FULL. With the 73 ohm resistor, the gauge should read on or below EMPTY.

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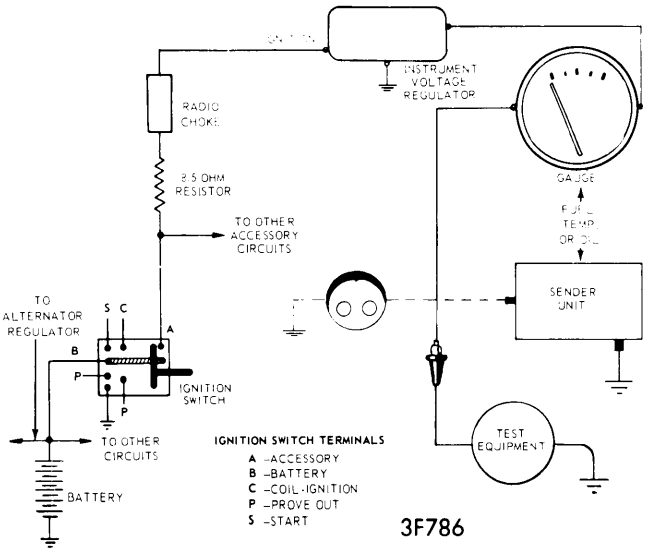
If test is performed with a good fuel sender: Disconnect wiring connector from sender and connect it to substitute sender, be sure sender is grounded. Turn ignition on, move float rod against full stop position (away from fuel filter). The gauge should read on or above FULL mark. With float against empty stop, gauge should read on or below EMPTY mark.

If gauge performs as indicated, replace sender unit. If gauge does not perform as indicated, replace IVR and retest to determine if gauge is causing trouble. If gauge now (with new IVR) reads correctly, problem is solved. If gauge is still out of calibration, gauge is defective and must be replaced.

Fuel Sender (1968-74) – To test fuel sender for proper resistance, remove sender from vehicle. Connect leads of ohmmeter to sender terminals. With float rod against FULL stop (away from fuel filter), the ohmmeter should read 8-12 ohms. With float rod against EMPTY stop it should read 60-86 ohms. If resistance is not within these limits, replace sending unit. *NOTE – Before replacing sending unit, ohmmeter should be checked for accuracy by checking a known resistance.*

Oil Pressure Gauge (1966-67) – Remove oil pressure sender unit and temporarily attach a mechanical oil pressure gauge in its place. Operate engine to determine oil pressure. If engine oil pressure is normal, instrument cluster gauge should also indicate normal pressure. If gauge does not indicate, momentarily short the oil pressure switch wire to ground. *NOTE – Do not leave wire grounded longer than necessary to make test, as gauge may be damaged.* If gauge now indicates, sender is defective or not properly sealed to engine. Be sure to use an electrically conductive sealer (C3AZ-19554-B). If gauge does not indicate, then IVR, gauge or wiring is defective.



IVR & OIL, FUEL, OR TEMP GAUGE TEST

Oil Pressure Gauge (1968-74) – Remove oil pressure sender unit and temporarily attach a mechanical oil pressure gauge in its place. Operate engine to determine oil pressure. If engine oil pressure is normal, instrument cluster gauge should also indicate normal pressure. To test oil pressure gauge and IVR, proceed as follows: Disconnect gauge lead from terminal at sender unit. Connect lead of a 12 volt test light or positive lead of a voltmeter (20 volt scale) to lead that was disconnected from sender unit. Connect other test lead to a good ground. With ignition on, a flashing light or fluctuating voltmeter indicates IVR is operating properly and gauge circuit is not interrupted.

If pulsating voltage is shown but gauge is not accurate, perform calibration test. If light stays on or voltage reading is steady replace IVR. If no voltage is indicated by voltmeter or test light, check for an open circuit in IVR, gauge windings, or printed circuit. Do not spark or ground either terminal of IVR. This could burn out dash wiring harness or IVR, or both.

Oil Pressure Gauge Calibration Test (1968-74) – When instrument voltage regulator or gauge is suspected of being out of calibration, having a fluctuating movement, or high or low pressure, both the gauge and IVR must be tested simultaneously. This test is done on the vehicle.

Test equipment consists of a 10 ohm resistor, 22.8 ohm resistor and a 73 ohm resistor. Disconnect lead from gauge at sender unit, and connect resistor between gauge lead and ground. Turn on ignition. With the 10 ohm resistor, gauge should show a high scale reading. With 22.8 ohm resistor, gauge should show a mid scale reading. With the 73 ohm resistor, gauge should show a low scale reading.

If gauge does not perform as prescribed, replace IVR and retest. If gauge now (with new IVR) reads correctly problem is solved. If gauge is still out of calibration it is defective and must be replaced.

Oil Pressure Gauge Bench Test (1968-74) – To test gauge for open windings; remove gauge from cluster. Connect gauge to ohmmeter and read resistance. An upward movement of needle from 10 to 14 ohms is normal because current increases the temperature of gauge coil windings. If ohmmeter reads below 10 ohms or above 14 ohms, replace gauge.

Temperature Indicator (1966-67) – Place a thermometer in coolant in radiator filler neck. Start engine and allow it to run until the thermometer reads a minimum of 180°F. The instrument panel gauge should indicate within the normal band. If gauge does not indicate, short sender unit wire to ground momentarily. *NOTE – Do not leave wire grounded longer than necessary to make test, as gauge may be damaged.* If gauge now indicates, sender is defective or not properly sealed to engine. Be sure to use an electrically conductive sealer (C3AZ-19554-B). If gauge does not indicate, then IVR, gauge or wiring is defective.

Temperature Indicator (1968-74) – Place a thermometer in coolant in radiator filler neck. Start engine and allow it to run until the thermometer reads a minimum of 180°F. The instrument panel gauge should indicate within the normal band.

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To test gauge proceed as follows: Disconnect gauge lead from terminal at sender unit. Connect lead of a 12 volt test light or positive lead of voltmeter (20 volt scale) to gauge lead that was disconnected from sender unit. Connect other lead to a good ground, turn ignition on. A flashing light or fluctuating voltmeter indicates instrument voltage regulator is OK and gauge circuit is not interrupted.

If a pulsating voltage is shown but gauge is not accurate perform a calibration test. If light stays on, or voltage reading is steady, replace IVR. If no voltage is indicated by voltmeter or test light, check for an open in IVR, gauge windings, or printed circuit. Do not spark or ground either terminal of IVR, as this could burn out dash wiring or IVR, or both.

Temperature Gauge Calibration Test (1968-74) – When gauge is suspected of being out of calibration, having a fluctuating movement or high or low readings, both gauge and IVR must be tested simultaneously. This test is done on vehicle.

Test equipment consists of a 10 ohm resistor to check gauge calibration for correct high readings, and a 73 ohm resistor to check for correct low scale readings.

Disconnect lead from gauge at sender unit, connect resistor between gauge lead and ground. Turn ignition on. With the 10 ohm resistor the gauge should show a high reading. With the 73 ohm resistor the gauge should show a low reading.

If gauge does not perform as perscribed, replace IVR and retest. If gauge now (with new IVR) reads correctly problem is solved. If gauge is still out of calibration it is defective and must be replaced.