

## Operation

Gauges operate by sending a low amperage current through the gauge's meter to ground via a sending unit with variable resistance. The resistance of the sending units increase or decrease with the changes in pressure, temperature, tilt, etc. As the sender's resistance varies, the amount of current allowed to flow through it to ground changes and the meter deflects. See Appendix I for gauge dimensions. Instrument part numbers are located on a label attached to the outside of the case (i.e. GP0000A).

## Troubleshooting

See Appendix IV for a quick reference troubleshooting guide.

Symptom:

- A. Gauge appears to “stick” during operation - Slightly loosen nuts holding backclamp and check operation. If gauge now operates properly and is not loose in panel, gauge now should provide suitable service. If gauge continues to stick during operation -- replace gauge.
- B. Gauge is inoperative:
  - 1) To test for voltage to the gauge (use a 12-volt test light or voltmeter for testing):
    - a) Turn key switch to ON position. Connect the test light or voltmeter lead to the ignition “I” terminal of the gauge and the other lead to the ground “G” or “GND” terminal of the gauge. If test light lights or approximately 12 volts is indicated on the test meter, the ignition and ground lead connections are good.
    - b) If test light does not light or there is no reading on the test voltmeter, check the positive 12 volt power source at the key switch of fuse block. If power is available at those points, correct the lead problem or replace any blown fuses.
    - c) If test light still does not light or voltmeter still shows no voltage, check ground lead and connections by connecting one lead of test light or voltmeter to a known source of B(+) and the other lead to the ground terminal of the gauge. If lamp lights or voltage is indicated on the voltmeter while touching the ground terminal of the gauge, the ground connection to the gauge is good. If lamp does not light or voltmeter does not show voltage, check ground connection to gauge, ground wire, and ground connection to ground source.
  - 2) To test gauge operation and sending unit connections (after performing electrical checks above):
    - a) Turn key switch to OFF position. Connect a jumper lead between the “S” terminal and the “G” or “GND” terminal of the gauge. Turn key switch to ON position. If the gauge registers a full scale reading under those conditions, the gauge is good. If less than full scale reading is indicated, the gauge is defective and should be replaced. **Note: European resistance gauges will operate in reverse.**
    - b) If no reading is indicated, remove sending unit lead wire from sending unit on the engine. Turn the key switch to the “ON” position. Ground the sending unit lead wire to a good ground and note the gauge reading. If the gauge registers a full scale reading, the sending unit may be defective.

- c) Remove jumper lead. Remove sending unit lead wire from the sending unit on the engine. Turn the key switch to ON position. Ground the sending unit lead wire to a good ground and note the gauge reading. If the gauge now (after grounding the sending unit lead wire) registers a full scale reading, the sending unit is defective and should be replaced. See Appendix V & VI.

NOTE: Intermittent readings usually indicate loose connections or shorted wiring. Check all connections and wiring if the above checks do not pinpoint a specific defect.

- C. Gauge is out of calibration - Disconnect sending unit lead wire from gauge. Connect test resistance as shown in the sending unit resistance value table (See Appendix V) between sender (S) terminal of gauge and ground. Gauge should indicate the approximate range indicated in chart. If readings on gauge do not match those on table (gauge pegs early or doesn't read) and ohms resistance is correct as measured by an ohmmeter, gauge may not be correctly matched to sender, or gauge is out of calibration.
- D. Sending Unit is defective - Disconnect sending unit lead from gauge "sender" terminal. Using ohmmeter, test sending unit resistance per the sending unit resistance value table (See Appendix V). If sending unit shows "0" ohms or open circuit, check sending unit at the motor and/or wiring for defects.