

Use abrasion-resistant cross-linked polyethylene coated wire to prevent the possibility of fire. Minimum requirement is PVC cable conforming to SAE J11288 type GPT. Wire leads should be soldered to ring terminals to eliminate voltage drops.

CAUTION
MAKE SURE ELECTRICAL WIRING IS SECURED AWAY FROM MOVING OR HOT ENGINE COMPONENTS.

1. Mount the shunt where its terminals will not contact any metal.
2. If there is a wire from the starter relay (or solenoid) to the voltage regulator, remove it, and replace with the shunt and two lengths of wire. Use wire of at least the same gauge. If shunt location requires a longer total length for this wire, use a larger wire gauge to minimize voltage drop.
3. Measure the **total wire run from the shunt to the ammeter, and back to the shunt**. Refer to the Chart for the size ammeter you are installing, then obtain the shortest length/size suitable. Run a lead from the starter relay (solenoid) side of the shunt to the ammeter's "+" (plus) terminal.
4. Using **ALL** the remaining wire, run a lead from the other terminal of the shunt to the ammeter's "-" (minus) terminal. Coil any excess length, and secure away from any moving/hot engine parts, or walkways.

Following are instructions for installing an external-shunt type ammeter. Use is restricted to Single Station applications only. If the vehicle (or vessel) does not have an external shunt type ammeter installed now, you must modify the lead between the alternator (or voltage regulator), and the starter solenoid (or positive battery cable); and install a shunt and wires between the shunt and the ammeter. Refer to Figure 3. Current to the battery from the alternator, or from the battery to the ignition and accessories, must pass thru the shunt, as shown in Figure 3. If you are replacing only a previously installed ammeter, you must verify that the existing shunt has the resistance shown in the Chart for the size ammeter you are installing, and the wire size/length is correct.

CAUTION: READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY BEFORE PROCEEDING WITH INSTALLATION. DO NOT DEVIATE FROM WIRING INSTRUCTIONS. INCORRECT INSTALLATION COULD CAUSE ELECTRICAL SHORT WITH POSSIBLE FIRE. ALWAYS DISCONNECT BATTERY BEFORE MAKING ANY ELECTRICAL CONNECTIONS.

Note: Various Standard-making Organizations have established rules for wiring. Those applicable to your area should be followed.

Additional Supplies required to complete installation:

- No. 16 gauge wire (for gauge lighting)
- Lamp Kit (included with some models)
- Shunt - see Chart for Part Number
- Wire - to connect shunt - see Chart for proper Size

GAUGE INSTALLATION

1. Select a mounting location for the gauge which provides good readability from the operators positions. Check behind mounting surface for sufficient installation clearance.
2. Cut a 2-1/8" (54 mm) diameter hole through panel at location selected.
3. Insert gauge through hole and secure with "U"-shaped bracket, lock-washers, and nuts. Legs of the bracket may be shortened if required. Tighten until gauge can no longer be rotated by hand.

CAUTION: OVER-TIGHTENING OF NUTS MAY CRACK GAUGE HOUSING OR MOUNTING PANEL.

WIRING THE GAUGE AND SHUNT

The accuracy of an external-shunt ammeter installation depends on the total resistance of the shunt and the wire leads to and from the ammeter. You should follow the wire gauge size/length specifications for wire as shown in the charts in this instruction sheet for best gauge accuracy. Select the shortest suitable length for your installation. Any excess length will be coiled and secured away from moving or hot engine/chassis parts.

WIRING THE GAUGE'S LIGHT

If gauge lighting is desired, obtain a lamp and 5/8" push-in socket. Remove dust plug from gauge housing and install. Run a lead from the socket's "G" (Ground) lead to the electrical system's common ground. Run a lead from the panel's light switch (or the "L" terminal of another gauge, to the socket's remaining lead).

CAUTION
BEFORE RECONNECTING BATTERY, RECHECK WIRING TO ENSURE ALL CONNECTIONS ARE PROPERLY MADE. INCORRECT CONNECTIONS OR ELECTRICAL SHORT COULD CAUSE DAMAGE TO SYSTEM OR POSSIBLE FIRE.

When system wiring is complete, connect battery and start motor. Check gauge for proper operation. If gauge reads backwards, reverse leads at ammeter "S" and "I" terminals.

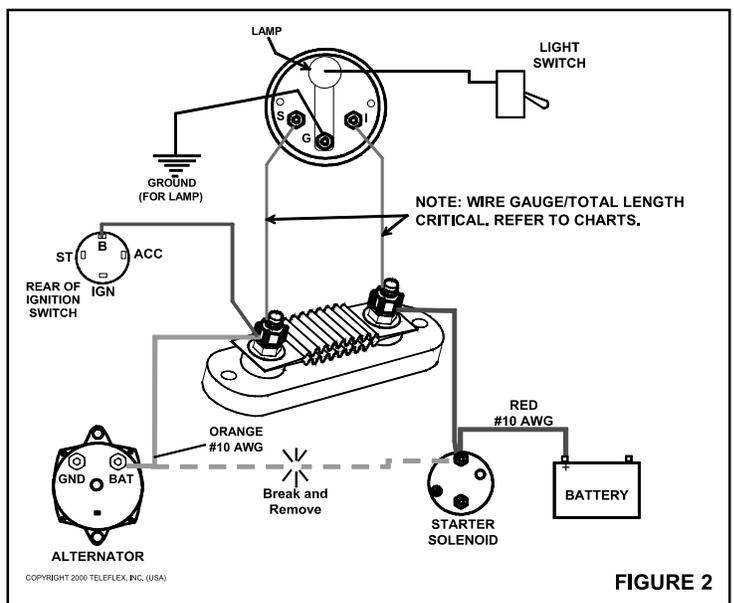


FIGURE 2

WIRE GAUGE CHART # 1, FOR 60-0-60 AMMETER - USE SHUNT # 56246 (0.003 OHMS)

Total Length of Wire, shunt to ammeter to shunt	Gauge Wire to Use
13 ft. 6 in.	18
19 ft. 11 in.	16
32 ft. 10 in.	14
51 ft. 0 in.	12
80 ft. 4 in.	10
125 ft. 4 in.	8

WIRE GAUGE CHART # 2, FOR 100-0-100 AMMETER - USE SHUNT # 54125(0.0015 OHMS)

Total Length of Wire, shunt to ammeter to shunt	Gauge Wire to Use
10 ft. 1 in.	18
14 ft. 8 in.	16
24 ft. 4 in.	14
37 ft. 8 in.	12
59 ft. 5 in.	10
92 ft. 8 in.	8

WIRE GAUGE CHART # 3, FOR 150-0-150 AMMETER - USE SHUNT # 53745(0.00065 OHMS)

Total Length of Wire, shunt to ammeter to shunt	Gauge Wire to Use
3 ft. 8 in.	18
5 ft. 4 in.	16
8 ft. 9 in.	14
13 ft. 6 in.	12
21 ft. 4 in.	10
33 ft. 3 in.	8

NOTE: These Charts are based on untinned stranded wire from Packard Electric with the following resistance characteristics. Wire from other manufacturers may vary slightly.

Wire Gauge	Strands/size	Ohms per 1000 ft.
18	16/.0099	6.46
16	19/.0110	4.545
14	19/.0142	2.748
12	19/.0177	1.772
10	19/.0224	1.125
8	19/.0280	0.721

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