



Instructions for Hoyt SG-1 2" Alternator-Starter-Battery Checker

Please perform the following inspections carefully with the Engine OFF! before testing with the Meter.

Visually inspect the Alternator:

1. Is the Alternator belt worn or cracked? if yes, replace belt.
2. Loose belt tension will reduce the charging rate, tighten if necessary.
3. Are Alternator connections clean and tight? Output leads should not be frayed at terminal ends and insulation should be in good shape. If found defective? Replace leads.

Visually inspect Battery:

1. Check to be sure that battery cable connections are clean and tight.
2. The point where the battery cables connect to the battery terminals should be clean and cable insulation intact. Rotted insulation is a sign of a deteriorated electrical connection.
3. Be sure to inspect both battery cable connections at the other ends. Some vehicles have two battery grounds, one is to the engine for grounding the starter, and the other is to the fender wall in ground accessories.

Alternator Test

1. Turn off all accessories and lights.
2. Start engine and adjust idle to 2000-2500 RPM.
Let engine run for at least 2 minutes or until charging voltage stabilizes before performing next step.
3. The CG-1 voltmeter can be connected by plugging into the cigarette receptacle.
4. The reading of the voltmeter is the Dynamic charging voltage of the charging system.

The voltmeter should read as follows:

Maintenance-Free Batteries	LOW Maintenance Batteries	When charging system voltage is measured, the following approximate guidelines apply:
Above 15.5	Above 15.1	Overcharging (unless very cold)
14.5-15.1	13.8 - 14.6	Normal charging at 80 deg. F.
13.8-14.4	13.0 - 13.8	Normal for hot weather, may indicate low charging rate in cold weather
12.6 - 13.0	12.6 - 13.0	Charging rate too low, unless very hot.
Below 12.6	Below 12.6	Not charging at all.

Note: If charging voltage decreases when engine RPM is suddenly increased, and the voltage increases again when the RPM is reduced to idle, check for a loose belt. The loose belt slips at higher RPM and reduces the Alternator output.

Factors affecting charging voltage

1. **Ambient Temperature:** The charging voltage reads higher at lower temperatures because batteries are harder to charge when cold. The charging voltage reads lower at higher temperatures because batteries charge easier when hot.
2. **Amount of Electrical load:** as the demand for current from the alternator increases, the alternator charging voltage decreases. If the charging voltage is checked with a heavy electrical load, it will measure lower than normal.
3. **Age of Battery:** Older batteries have less charge acceptance.
4. **State of original Charge:** The higher the battery state of charge before cranking, the faster the charging voltage will rise to its upper limit.
5. **Manufacturers use various levels to operate Electrical Systems:** Normal charging voltages will range from 13.8 to 15.1 V at 80 Deg.F.

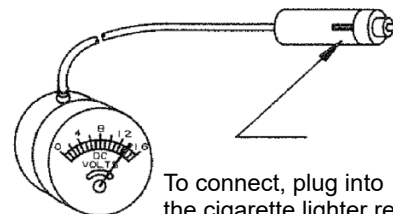
The Starter Test

Visually inspect the Starter

1. Are there any corroded connections at the battery, solenoid, starter motor or defective cables that would cause voltage drop?
2. Is the battery fully charged? Charge if not.

Plug in The Hoyt CG-1 meter in the cigarette lighter. Disconnect the light tension load from the coil and engage the starter. All accessories should be off. While the engine is cranking, the meter pointer should be read in the green zone from 9 volts to 12 volts.

Meter reads:	Possible cases are:
Below 9 volts	a: Undercharged battery. b: High starter current draw indicating a bad starter or solenoid. Check current draw with Hoyt SG-1 Inductive meter tester.
Above 12 volts	a: Bad cables. b: Corroded or loose terminals.



To connect, plug into the cigarette lighter receptacle in the vehicle being tested and read voltage for test being conducted.