



GT-18

Hoyt Generator And Regulator Tester

0/18 Volts 5/0/60 Amps

For both 6- and 12-volt Systems
(Supersedes GT-4 and GT-20)

This moving-coil type, double-scale, voltammeter was designed to give the automotive electrician an instrument of small size and reasonable price that would be dependably accurate and make all important tests. The sturdy black bakelite case is small enough to slip into the coat pocket - and is equipped with a hanger for hooking over the car door or bumper, or any convenient projection on the test-bench.

Three terminals are provided marked: +, A, and V and a pair of test leads with clips are supplied.

Connection of the leads to the + and V terminals gives the user a precise volimeter with a scale 2" long, reading 0/18 volts.

90 scale divisions together with the needle-like pointer of the knife-edge type. makes readings to 1/10-volt easy and accurate, while the full scale of 18 volts will test either 6 or 12 volt systems on passenger cars or trucks.

Green colored blocks on volt scale aid in checking voltage regulators.

Connection of the leads to the + and A terminals gives the user a precise ammeter with a red colored scale of 5-0-60 amperes divided into 1 amp. divisions - a high enough range to measure the output of special generators, but with easy readings of low currents down to 44 amp., by pressing button. The 5 amp. reverse reading is provided for checking opening of cutout relay.

THE TWO RANGE METER enables the service - and horn relaysman to make these tests and adjustments accurately.

1. Tests all 6 or 12 volt generators.
2. Adjust all types of regulators - 6 or 12 volts.
3. Test batteries under starter load by the single cell method, or complete battery.
4. Test battery cables and ground straps by the Voltage-Drop method.
5. Test-lamp socket voltages, lamp circuits, lamp and horn relays.
6. Test primary coil current, radio current draw, circuit continuity and many other tests.

Instructions

Whether it is a tune-up or electrical trouble shooting, test the battery first.

Battery Load Test

Motor off. Connect leads to + and V of meter. Test each cell of battery with starter engaged.

Readings should be between 1.5 and 1.8 volts and all cells within 1/10th of a volt.

Hydrometer should read 1.250-1.280 specific gravity.

Charging Rate Test

Motor running fast idle. Connect 1 voltmeter lead to ground; other to B or BAT terminal of regulator.

Reverse if meter reads backwards. Meter should read (7-7.5) 13.8-14.8 volts; current 8-12 amps.

What to do if you find:

1. FULLY CHARGED BATTERY (1.5-1.8 volts under load and 1.250-1.280 S.G.) AND LOW CHARGING RATE 8-12 amps at (7-7.5) 13.8-14.8 volts. This is a normal condition.

2 FULLY CHARGED BATTERY - HIGH CHARGING RATE (continues to charge at 20-80 amps. at fast idle).

On Ford, replace regulator; on others, disconnect Field wire from regulator.

If no reading on meter, replace regulator; if a reading, generator field is grounded.

3. LOW BATTERY - NO CHARGING RATE.

Disconnect "F" wire from regulator and ground it; on Ford products, use jumper from A to F generator terminals.

If meter reads, replace regulator; if no reading, ground Arm. wire. If sparking occurs, generator OK but regulator bad

Polarizing Generators

After installing a battery or doing work on generator or regulator, always polarize generator. Short A or GEN terminal to B or BAT terminal of regulator for 2 seconds. On Ford products, remove "F" wire from regulator and touch to "B" terminal of regulator for two seconds.

Checking Starter Action

Connect leads to meter: Red lead to + meter terminal; other lead to V terminal. Clip red lead to + POS battery post, other to NEG battery post. Press starter (ignition off). Pointer should be steady for good starter condition. If it flickers badly and dips below (4.8) 9.6 volts, starter has bad brushes, bent shaft, worn bearings, etc. If meter is steady but reads below (4.8) 9.6 volts, battery is low.

Locating Short Circuits

Connect meter leads to + and V meter terminals. Test for leaks by first disconnecting cable from battery ground post. Clip one meter lead to disconnected battery cable; other to battery post (voltmeter is IN SERIES). DO NOT start motor. If there is a definite short in wiring, meter will indicate until short has been found by disconnecting each circuit where it is connected into the wiring system. If meter shows less than battery voltage, check battery top for leakage through dirt and acid. Clean with soda.

Resistance

Use voltmeter leads only. See table below for connections and allowable readings. If readings are more check wires for breaks; clean, tighten connections.

Testing Voltage Regulators

CUT-OUT

Hook up meter at regulator; one voltmeter lead to ground; other lead to A or GEN terminal of regulator. Slowly increase motor speed, Relay points should close between (6.2-6.6) 12.4-18.6 volts. If not, adjust cut-out spring tension. Increase spring tension to raise voltage closing point of relay. To test opening point of relay, see paragraph below.

VOLTAGE UNIT

Move voltmeter lead from A or GEN terminal of regulator to B or BAT terminal. Run motor at fast idle. Meter should read (7-7.5) 18.8-14.8 volts or to manufacturers specs. If it does not, regulator needs adjustment. Adjust spring tension on coil which has finest wire. Increase spring tension to increase voltage setting. On some regulators, spring tension is adjusted by a screw. Recheck after any adjustments with cover in place.

On some new 12 volt regulators, there is a double set of control points on the voltage unit for wider voltage regulation. Replace unit or see manufacturer's special instructions for checking and adjustment of these special regulators.

CURRENT UNIT

Disconnect all meter lead connections after above tests. Move lead from meter V terminal to meter A terminal. Disconnect wire from regulator B or BAT terminal. Connect red or + meter lead to B terminal of regulator, and other meter lead to disconnected B wire. Meter is now IN SERIES (for negative grounded cars). Reverse, connections if meter reads backwards. Press button on meter for ampere reading. To Test: Partially discharge battery by using starter three or four times but not more than 5 seconds at a time. Then start motor. Run motor fast enough to get maximum charging rate on meter. Meter reading should correspond to rated manufacturers specs for the generator. If not, Current Unit is out of adjustment. Adjust spring tension for correct setting in the same manner as Voltage Unit above.

CUT-OUT OPENING TEST

Use same connections as above for testing Current Unit. Slowly decrease motor speed from fast idle, and note reverse current on meter necessary to open cut-out. Press button on meter for reading. 0-4 amps. is normal. If cut-out does not open, reduce carburetor idle speed. If it takes more than 5 amps. to open cut-out, the contact points are dirty or air gap is not correct.

Starting Circuit Resistance Test

Crank Engine While Making the Test - Ignition Off

Type of Test	Connections of Voltmeter Leads	Maximum Reading on Voltmeter
Starter and solenoid circuit	One to Hot battery post One to Hot starter post	3/10 for new cars 5/10 for cars with front starter
Starter ground circuit	One to ground Battery post One to ground of starter	2/18

Generator-Regulator Circuit Resistance Test

Type of Test	Connections of Voltmeter Leads	Maximum Allowable Reading at Fast Idle Engine Speed
Generator-Battery Circuit - Hot side	One to A terminal of Generator. One to Hot Battery terminal.	8/10th with Field wire disconnected and grounded at regulator. (connect A to F on Ford generator)
Generator-Battery ground circuit	One to Generator Housing ground. One to Grounded Battery terminal	1/10th with Field wire disconnected and grounded at regulator. (connect A to F on Ford generator.)
Generator-Regulator ground	One to Generator Housing ground. One to Regulator ground or base.	Should not be any reading. If reading, clean, tighten generator and regulator mountings.

Primary Coil Circuit Resistance Test

Ignition Switch On, But Motor Off

Type of Test	Connections of Voltmeter Leads	Maximum Reading on Voltmeter
Coil to battery Hot side	One to Hot Battery terminal One to BAT, terminal of coil primary	2/10th with ignition Switch On, but motor Off