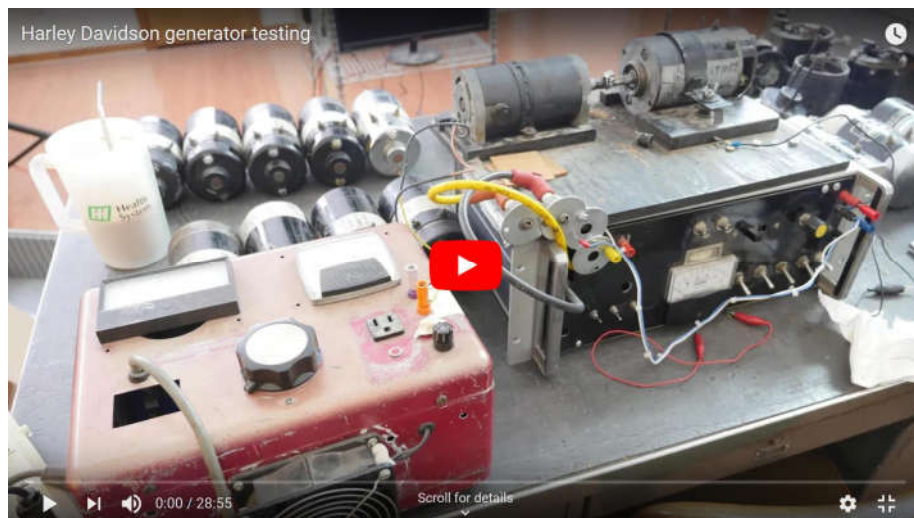


Iron Sportster generator testing

I test and qualify dozens of Harley 12-volt generators with a home-brew test rig.

The tips and tricks:

1. **The 1982-84 Hitachi Model 65B has more output.**
2. **The Model 65A is used from 1965 to 1981.**
3. **The Model 65A has 10 Amperes continuous output.**
4. **Most generator failures are due to a burnt armature from over-current.**
5. **If you ground the field, the generator will spin like a motor with 12V to the "A" terminal.**
6. **Looking from the shaft side, the generator spins counter-clockwise.**
7. **12V field coils measure 5.3 Ω (ohms) in a 65A, 6.1 Ω in a 65B.**
8. **If the field coil measures fine, the armature is probably bad.**



Here are test results of all my 12-volt generators both Model 65A and Hitachi 65B. (Click for video.)

Decades ago, I built a generator test rig. It uses a DC motor to spin a Harley generator. I built an unregulated DC power supply using a Variac variable transformer, a diode, and several large capacitors to filter and smooth the output.

Under the motor-generator breadboard, I built a load box that contains load resistors, as well as a headlamp, brake light, and ignition coil. This lets me switch in loads to see how well a generator is working. This also helps in evaluating voltage regulators, from old mechanical points units, to electronic regulators.

I dug out every old generator I had, and did a quick test to see if they worked. Most did, some didn't. The Hitachi generators are smooth with good output. Some generators worked as a motor, but had no output. Others died on load.



My 12-volt generators hauled out of storage and arranged for testing.



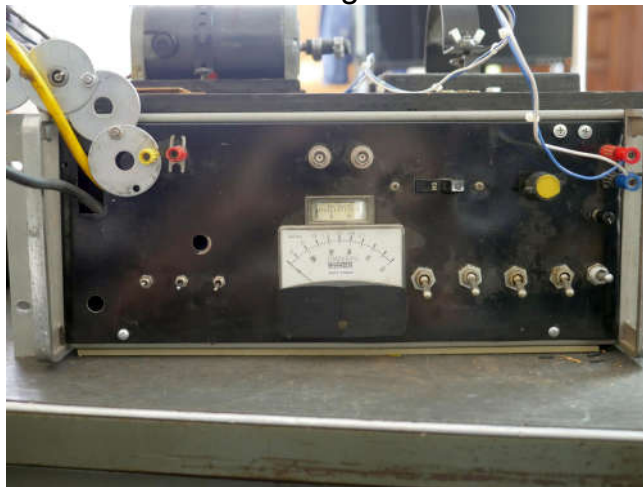
The test rig with power supply (left), motor-generator, and load box.



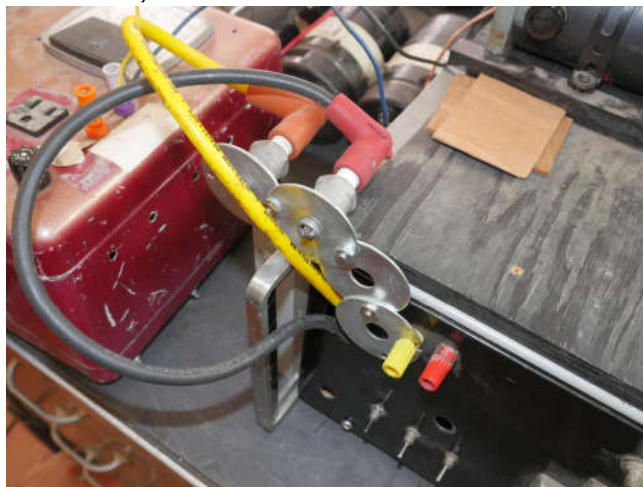
The motor driving the generator comes from a salvage yard. It is a 115V DC brush permanent magnet motor. A rubber hose hooks it to the generator under test. The plywood base sits on a load box.



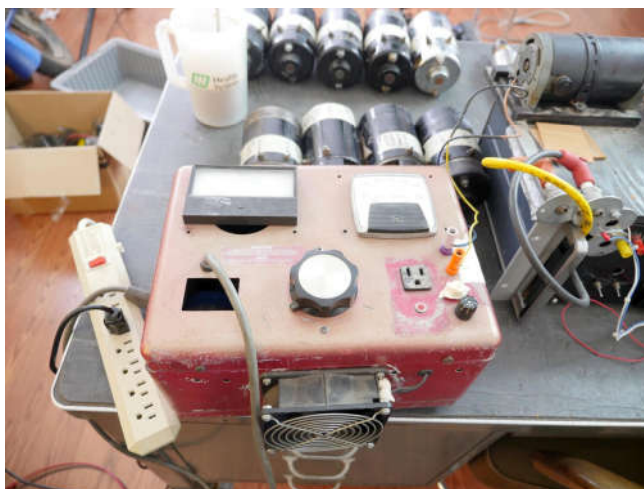
Sportster generators turn counter-clockwise when looking at the drive shaft.



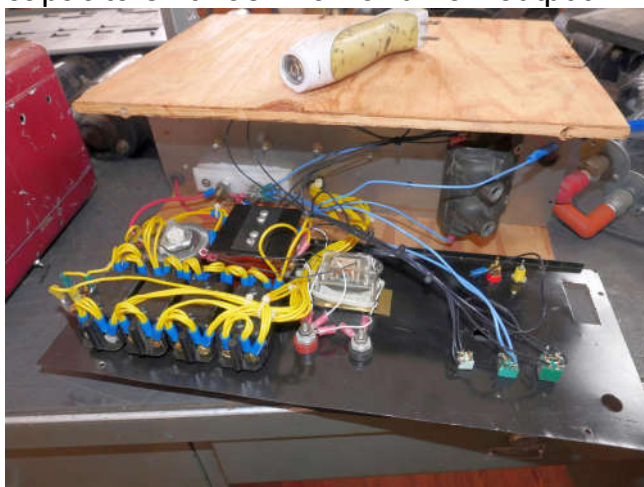
The load box has a voltmeter and ammeter, as well as switches to add load.



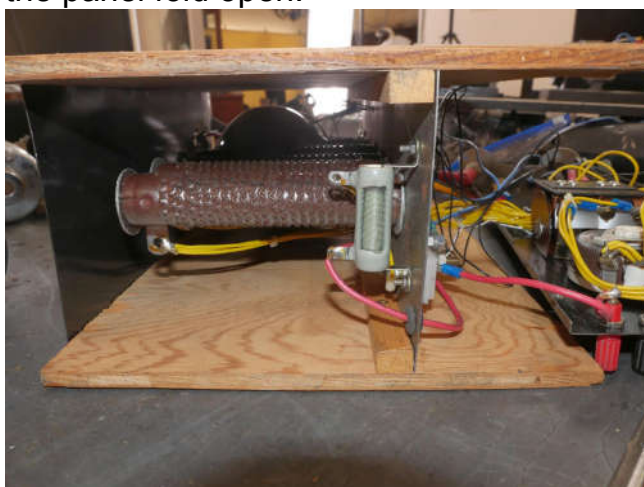
The box has a headlamp and tail-lamp, as well as an ignition coil that can drive these two spark plugs. Intent is that this rig can drive a circuit breaker ignition too.



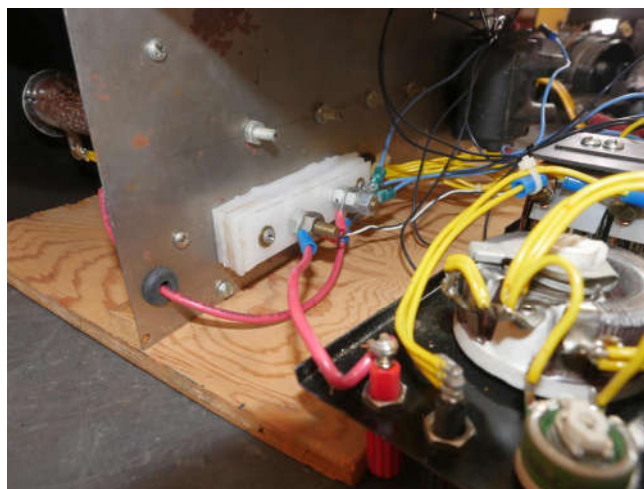
The DC power supply has a Variac transformer, a diode, and smoothing capacitors. It has 140V and 15A output.



The inside of the box, upside down, to let the panel fold open.



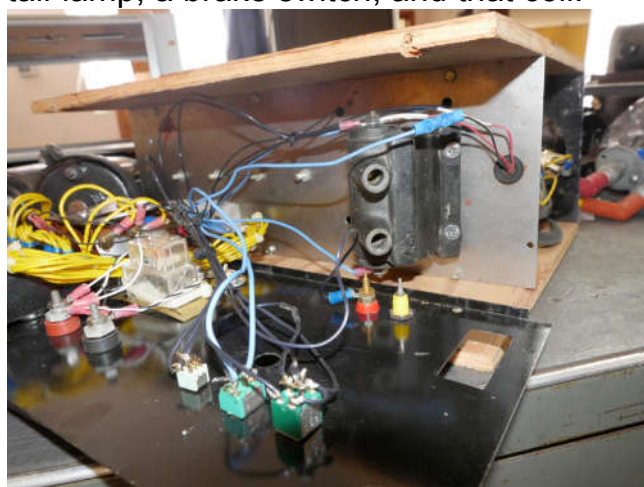
You can switch in power resistors to add load to the generator under test.



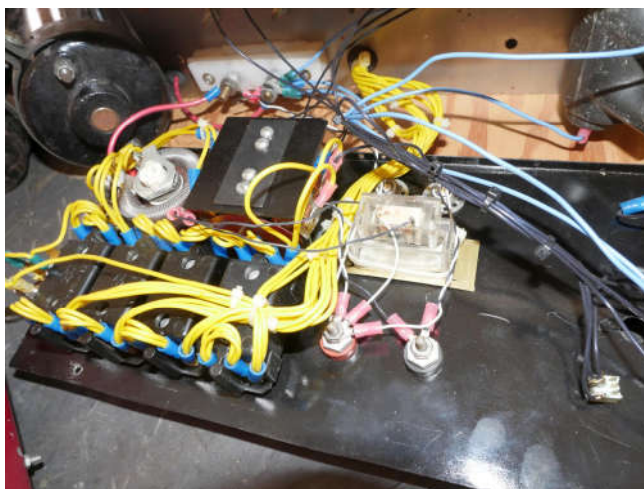
The white block is a shunt used to measure the current out of the generator.



Other switches turn on a headlamp and tail-lamp, a brake switch, and that coil.



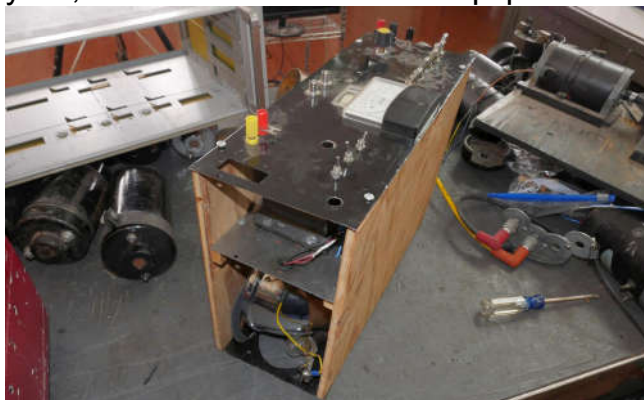
The switch applies power to the coil, the other side of the coil goes to that red terminal where a distributor can connect.



The panel has the load switches at the bottom, a main contactor above, with the variable load rheostat to the left of the main contactor. The meters are in the center, with the switches that control the lights and coil on the right.



The test box case is from some salvage yard, it used to be some test equipment.



A plywood frame mounts the components.



This is all that is left on the label of the DC motor used to spin the generator under test. It's 115V, one or two horsepower.



Four Model 65A, 12-V, part number 29975-65A with steel end bells, 3 good.



Five aftermarket generators with aluminum end bells, one 6V, three bad.



Seven Hitachi 29975-65B generators used on 1982-1984 Sportsters. A 29978-77A has a black end cap, and is used on 1982 XLS and XLX models.



Four frames and end bells for parts.



The brush covers and seven armatures, the part that usually fails.



three of the armatures have damaged shafts where the needle bearings run. The middle one is not too bad, but you can feel the bearing fits loosely on it.



Original Harley generators with steel end bells use a thicker shaft stake under the bolt head to keep the long bolts from turning. If the stakes wear off, like this one, you have to use a 7/16" nut driver to hold the bolt. A socket has walls too thick, it won't fit in the recessed hole.

With all the 12-volt generators spun up and tested for output, it is time to do some precise testing of output over RPM range, and performance with a regulator. Next is ordering some armatures to test, as well as getting those Hitachi 29975-65B generators all working and measured.