

Here's an easy way to test transformer windings, coils, chokes, and motors—almost any device containing a winding.



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SIMPLE TEST FOR TRANSFORMERS

ONE COMPONENT THAT PRESENTS perplexing troubleshooting problems is the ordinary power transformer. It is particularly difficult to tell if the windings are short-circuited because ohmmeter readouts are rather ambiguous when measuring resistance values less than 1 ohm. When I first started to repair power supplies, I got the idea of bucking an ordinary 6.8-volt filament transformer against the winding of a suspect transformer. (Transformers called *filament* transformer were used to power the heating elements of vacuum receiving tubes known as filaments. These

transformers are still widely available.)

I found that when I connected the 6.8-volt secondary of the transformer across (or parallel to) the winding of a transformer under test, the output voltage was approximately the same as the open-circuit voltage of the unloaded filament transformer. If the suspect transformer had a short-circuited winding in it, the voltage would drop to 50% or more. Thus, by placing an AC voltmeter across the winding, I could identify a defective transformer with no trouble. Figure 1 shows my test setup.

I found that a continuity

check with an ohmmeter is also necessary to ensure that the winding is not open. When making a continuity test with an ohmmeter, I looked for a very low resistance reading, and made sure that the meter was set to its lowest range. Transformer winding resistance is typically several ohms, depending on the number of turns in the winding. This value depends on the length of wire in the winding, its diameter, and its DC resistance.

Why does this work? An AC inductive impedance is parallel to an unknown reactive element such as a coil or winding. Because the secondary winding of the filament transformer has a relatively low impedance, it should, in most cases, be in parallel with a higher impedance, so the filament transformer will not be loaded down. If the transformer being tested has shorted windings, the impedance will usually be less than the filament transformer impedance. This will result in a lower-than-normal voltage reading.

This test will work for power transformers, as well as relay coils, solenoid coils, chokes, ferroresonant transformers, AC adapters, inverter transformers, electric motors, and fans. Almost any product containing a winding can be tested. Ω

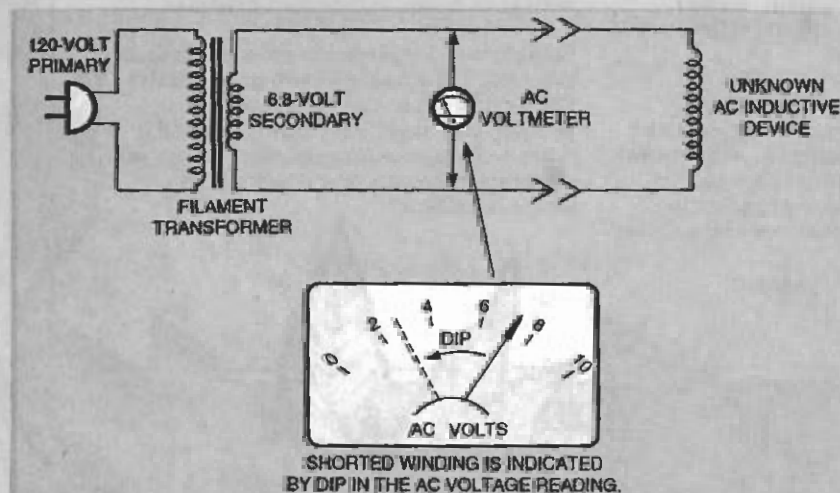


FIG. 1—THIS SIMPLE TEST SETUP makes the testing of any kind of coil or winding easy.