Don't destroy armatures with Hipot testing

COLUMN BY NATHAN UNGER



Hipot (high potential) testing is the procedure for applying high voltage to check leakage through insulation between the conductors and the steel core of a winding. This is otherwise known as "testing for shorts to ground" or "ground fault testing."

If the voltage is increased more and more, *any* insulating material will eventually break down. Then the insulation has to be replaced before the unit can be put back into service.

This, of course, usually means rewinding it. But what if an armature comes in soaked with water? Does excessive leakage represent failed insulation or can the armature be cleaned, dried, revarnished, and reclaimed?

Some time ago I found an article about flood damage restoration of electrical equipment.

Here are the dos and don'ts. Do *not* test it with high voltage until the very end of the following steps:

- First, you're supposed to clean it as best you can. I use a citrus-based cleaner that mixes with water (TC105), then blow-dry it.
- Now test it for shorts to ground with a DVOM, which uses only two 1.5 volt cells. If the resistance is more than 20,000 ohms, the armature can probably be reclaimed.
- I usually glass bead all the rust off, especially around the commutator. I make sure that the end of the com and also behind the risers is as clean as possible. Also, I take care to not injure the insulation too much in this process.
- Then I bake it until it's dry. (I use a convection oven.) Two or three hours at 375 degrees F seems to work for me. If it now tests over 100,000 ohms on your DVOM, then go to the next step.
- While still hot, I dip it in varnish. I use Dolph's AC43 and let it soak until no more bubbles come up.
- Then I bake it at 375 degrees F for another two or three hours.
- When it's cool, *then* I test it at 250VDC on my megger, and expect to see 10 MegOhms or more.

I've saved at least 75 percent of water-soaked armatures this way.

The reason one should not start out with high voltage testing is that the water, rust, and foreign material will leak electricity. As the test current penetrates the soaked insulation, it will flash over, creating carbon tracks and ruining the armature's insulation.

Maybe it's like Abraham Lincoln said, "If you look for the bad...you will surely find it."

Nathan Unger, owner, ASI Rebuilders, Abottsford, B.C.

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