

## Failure modes and Repair of Weller WTCPN Soldering Station

The Weller WTCPN is a roughly 50 year old, temperature controlled soldering station and was a workhorse of the industry. It has a base unit that floats the voltage and converts 120Vac to ~ 27 Vac to power the “pencil”. The pencil has wiring, a heater, a barrel, a tip, a thermo-switch and a body. All can fail. While many jump to the conclusion that a lack of heat means a broken heater, in my case that was not true.

A link to the Weller tech sheet is here:

<http://bama.edebris.com/manuals/weller/wtctl/>

Nearly all the parts are still available, on EBAY, and from Digi-key and mouser plus others.

Before we begin – note that working on the pencil is mostly difficult due to the small confines – the mess of a bracket, the heater, wiring, the switch and wire nuts must be removed and worse – stuffed back in.

Tip: The cord and its strain relief bind somewhat on dis-assembly – coax it along. Since this OLD unit tends to get crusty and stiff, and curled permanently, it bids a LOT on re-assembly. Straighten it and somehow fit that stiff, bend strain relief through the none-too-big hole in the pencil body.

### **Heater:**

The heater can and does fail. Testing requires that you disconnect all the wires. Now test continuity and resistance of the two that come from the heater element. It should be ~ 13 ohms +/- 1 ohm. (not, as Weller suggests with sloppy documentation, 12/13<sup>th</sup> of an ohm). Mine was fine after God knows how many years.

### **Switch:**

The thermo switch is a small yellow (relay?) that closes when the temperature falls below set, and opens somewhere above it. It is activated also by magnetic attraction by the tip on the heater slug. You should hear the slug move freely when you insert the tip and remove it. If not, gently help it and clean the area non-abrasively (or so I would guess). Yep, mine was sticky, but generally worked. Open should be “big ohms” and closed should be << 1 Ohm. Anything else or no change means no good.

### **Barrel:**

This is a stamped steel piece with a hold down threaded collar. Can't fail really, but if you replace the heater, you need the new, larger barrel for another \$10 or so. Just sayin'

### **Transformer:**

In the base unit. Check continuity on the primary – it should show a very low resistance.

Check voltage working, iron unplugged, on the secondary. Should be around 27 Vac.

Note 3A fast fuse in series between the secondary and the pencil. If that goes..... I put in a fuse holder. Note with fuse blown the switch LED continues to illuminate, which is not really very illuminating.

### **Wires:**

Yes, wires. That's what was wrong with mine. The pencil has a beautifully flexible 3-wire cord (AC plus safety ground) inside a lovely silicone sheath. The small wires inside have a thin, flexible insulation. Toward the business end, bent and unbent 100,000s of times, they didn't just crack, they turned to dust. And blew the fuse only upon me testing it ☺ I have no idea where to get a replacement, so I tested continuity as I mangled it. About 9" from the pencil itself produced intermittent shorts, so I cut that out and re-threaded everything. Dicey, shorter, but it works. With a new fuse of course.

### **Morals:**

While these are serviceable, everything deteriorates. Don't forget the wires. About 5 years ago I had the AC mains fail! (cut, replaced plug with a \$3 piece from Home Depot, back to work).

Moral 2 – don't assume it's the usual suspects. There are many suspects.

And Sam is playing again.

Grant