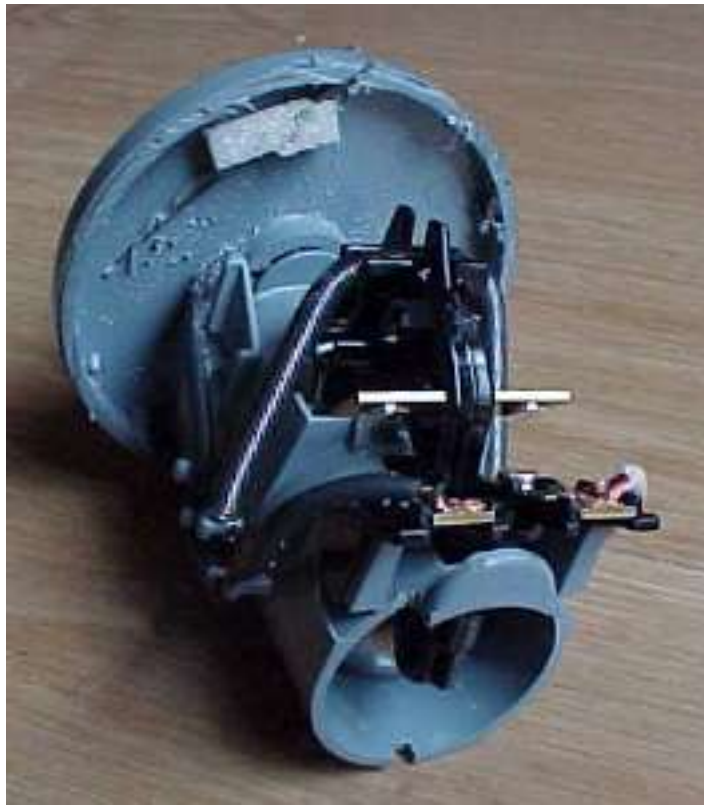

Failed Float Switches and Home-Built Replacements



These darned things cost \$40 each and failed after only 1 1/2 years!

I was quite distressed last February when these expensive commercial float switches failed. They are the standard variety found at farm supply stores; I bought them from Jade Mountain. The one on my cistern failed completely, letting the solar pump overflow the tank and flood my root cellar. The one at the spring continued to correctly turn off the pump when the water level got low (whew...otherwise, if the pump sucked air from the spring instead of water, I'd have to remove all the fiberglass insulation layers, climb down in, and bleed the air from the line). But the switch also started failing to reset itself...so I'd have to hike up the hill to the spring through 3 feet of snow, open the spring house and manually shake the switch to make it reset. What a drag.



We cut open a switch to see why it failed

Why they failed (we think)

Everything appears fine with the inner mechanism of the switch. No corrosion was noticed on the contacts. These switches were originally designed to be used for the direct switching of 120 volt AC pump loads. In my application, they are only switching a miniscule amount of power from the pump controller box instead of the whole load. We are guessing that the switch design depends on a tiny 120VAC arc to jump between the contacts every time the switch triggers.

Our Do-It-Yourself Float Switch

We decided a simpler, more reliable alternative was needed. My home-built version uses a well made of 1 1/2 inch PVC pipe with a cap on one end. Holes are drilled in the end to allow water in, but not let the float drop. The float is just a pill bottle super glued shut with a strong magnet glued to the top. The switch is a glass-encased magnetic reed switch that triggers when it is about 1 inch from the magnet. It is sealed inside a plastic soda straw and inserted through holes drilled in the PVC above the top of the tank (so the switch never touches water). I drilled a series of holes to allow easy calibration of where the switch turns on and back off by moving the reed switch up and down.



The finished float switch



Magnetic reed switch



Float with magnet glued on top

So far the new switch has been very reliable. It took a bit of adjustment to get the magnet to trigger the reed switch without sticking to it and holding the float up when the water level dropped. All in all this was about a 2 hour project, including epoxy drying time. Total cost was ZERO for me, since all the parts were from my junk bin. New, the reed switch would cost less than a dollar, same for the magnet.

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