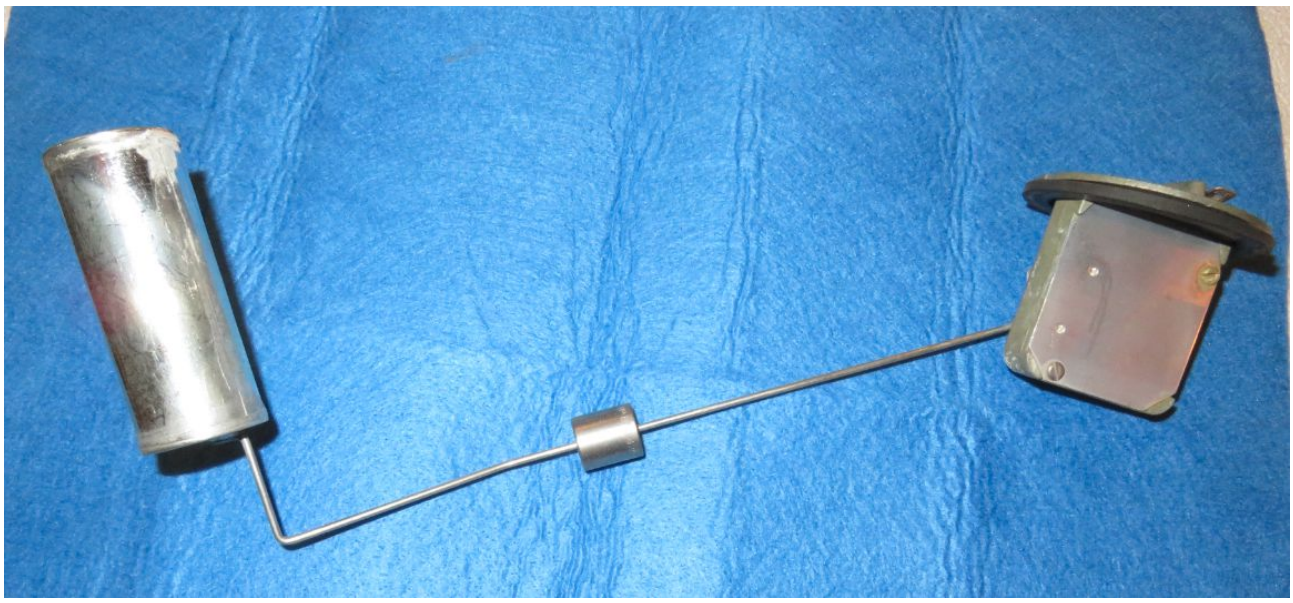
Adding a Ground Connection to a Series V Fuel Sender

Michael Hartman
Version 1.3
February 14, 2017

My fuel gauge on my series V had become flaky and was reading as empty most of the time. There is a good thread on the SAOCA forum about grounding issues with fuel senders: http://www.sunbeamalpine.org/forum/s...ad.php?t=15723

My gas tanks passed the tipping point and my fuel filter was capturing too much crud. So I pulled the tanks (for cleaning and sealing) and the fuel sender. The sender was giving erratic resistance measurements.



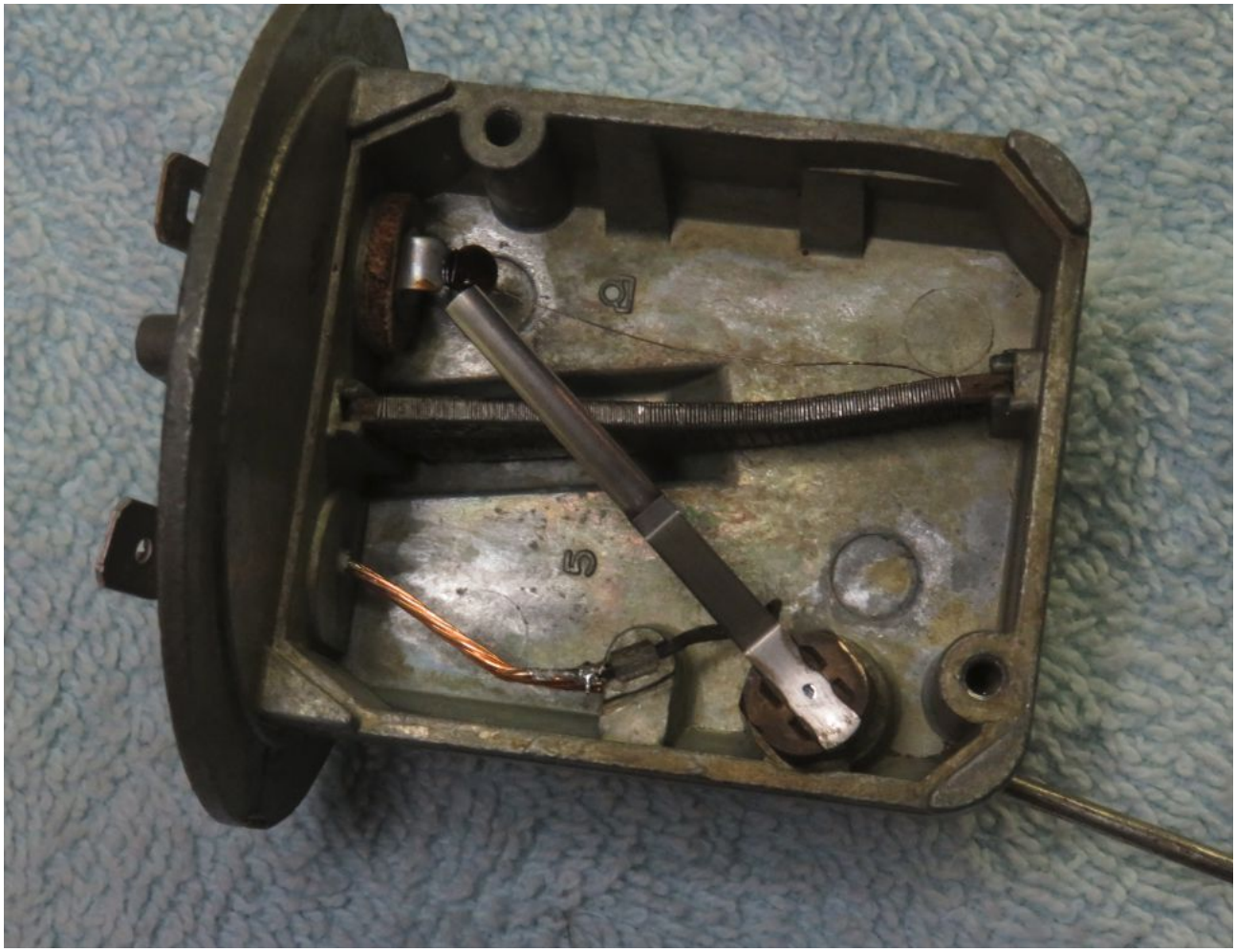
The sender has a braided cable to connect the wiper arm to the housing body. From what I could tell with my multimeter, the braided cable was not making a good connection anymore. The braided cable was just pushed into the slot via some high force press. No weld or solder used.

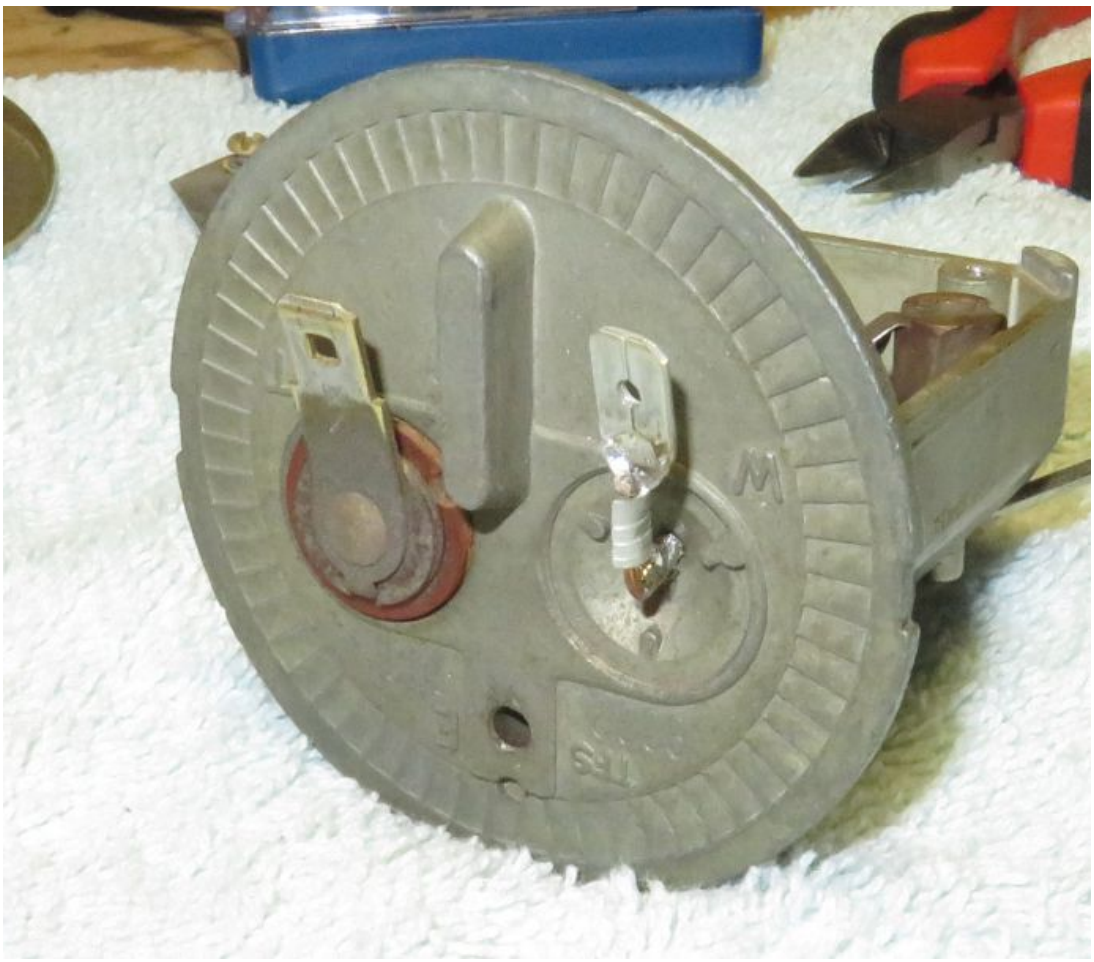
The grounding scheme for the sender housing is not ideal. The braided cable needs contact with the housing. The top of the housing needs good contact with the bottom of the metal retaining ring. The retaining ring then needs good contact with the "pinches" in the gas tank opening. Then the gas tank needs good contact with the car frame (no worries there). Accumulation of dust & dirt over the

years, vibrations, rubber gasket shrinkage, etc. and the connection is likely to become broken.

There is a second blank plate area in the sender top, as if there was a thought to have a second connection come through the sender top. There was probably a design revision where a dedicated grounding connection came through that second blank plate. Likely a bean counter deletion at some point.

I ended up drilling a hole in the cover blank, ran an 18 gauge stranded wire through the hole I had drilled, then soldered the 18 gauge stranded wire onto the braided cable end. Then I soldered a 1/4" male quick disconnect onto the stranded wire. I sealed up the hole I had drilled in the cover using Permatex fuel tank repair epoxy. The epoxy serves two purposes - sealing the hole and also locking the stranded wire in place to prevent any strain on the braided cable.

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TFS


Permatex
Adhesives & Sealants
Ethanol Resistant
Fuel Tank
Repair
Reparación
Tanque
Set Time:
Cure Time:
Up to 500 P
Dries Brown
Sticks to Gasol
Wet Metal
Use on: Metal
Tanks, Gas
#84334
NET WT
1 OZ
CONT. NE
28 g
CAUTION:
Read carefully
PRECAUCIONES: PUEDE CAUSAR REACCIÓN ALERGICA
EN LA PIEL. Lea cuidadosamente las precauciones al reverso.

After reassembly, I tested the sender using a multi-meter. The "full" position was reading around 18 ohms. The "empty" position was reading around 250 ohms. However, I noticed some erratic readings near the fully "empty" position. All other readings were coming in solid. I removed the cover plate again. There definitely was some wear between the cover plate dimple and the sweep arm mount. There is some slop in the sweep arm mount. The wear could be reducing the contact force of the sweep arm on the wiring windings.

I used a 5/32" punch and a hammer to push the dimple farther into the inside of the cover plate. I moved the dimple .003". (Note: I positioned both dimples over small holes in a piece of wood when using the punch to avoid bending the cover plate and avoid flattening the dimple being punched.)

Here is a photo showing the dimple that was pushed in .003".

I reinstalled the cover plate and re-tested the sender. There were no more erratic readings at the fully "empty" end.