

Vintage Smiths Volvo and Accessory Tachometer  
Reverse Engineering Document R1.1  
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A Volvo owner sent me three vintage Smiths tachometers to examine, test, repair if necessary and calibrate. One was an RVI5413/00 7K RPM tachometer from a 4-cylinder 67 Volvo 123GT. The second was an RVI 5610/00 6.5K RPM tachometer from a 6-cylinder Volvo 164. The third was a Smiths RVI 5000/00A 8K RPM accessory tachometer of the same vintage.

All 3 tachometers use the same housing, meter and PCB with slight differences between the wiring and component population. The circuit design is virtually identical to all Gen 2 Smiths tachometers, with very minor differences. For Gen2 Smiths operation theory, go to [www.accutach.com](http://www.accutach.com).

I started with the accessory tachometer. I had to dismantle it in order to figure out how to drive it with my test equipment. Here are some photos of the accessory tachometer:

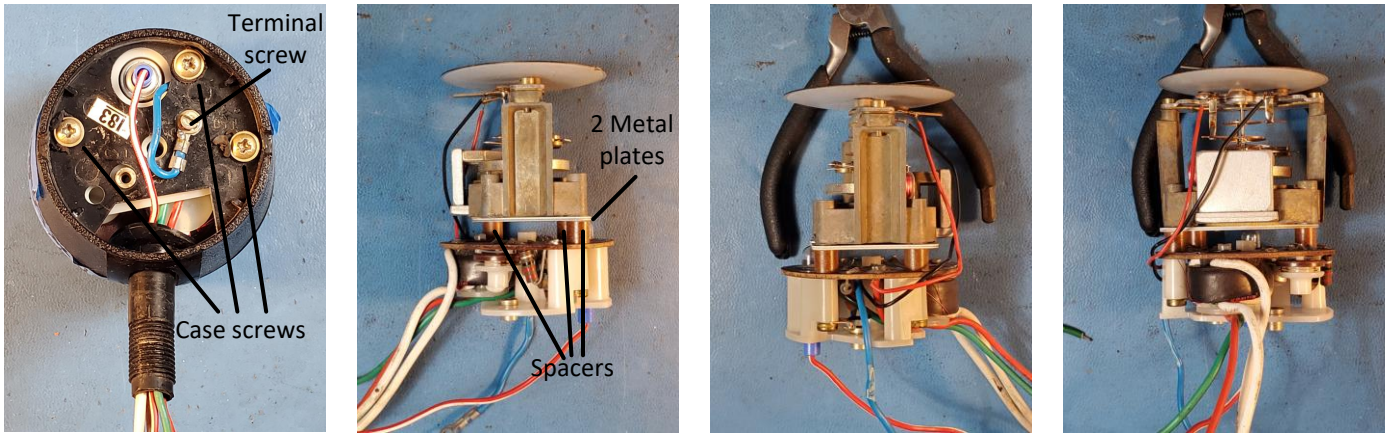


The bezel is held to the case with 3 metal clips. The owner had pulled the bezels off for me. He implied that it is a bit rough getting them off.



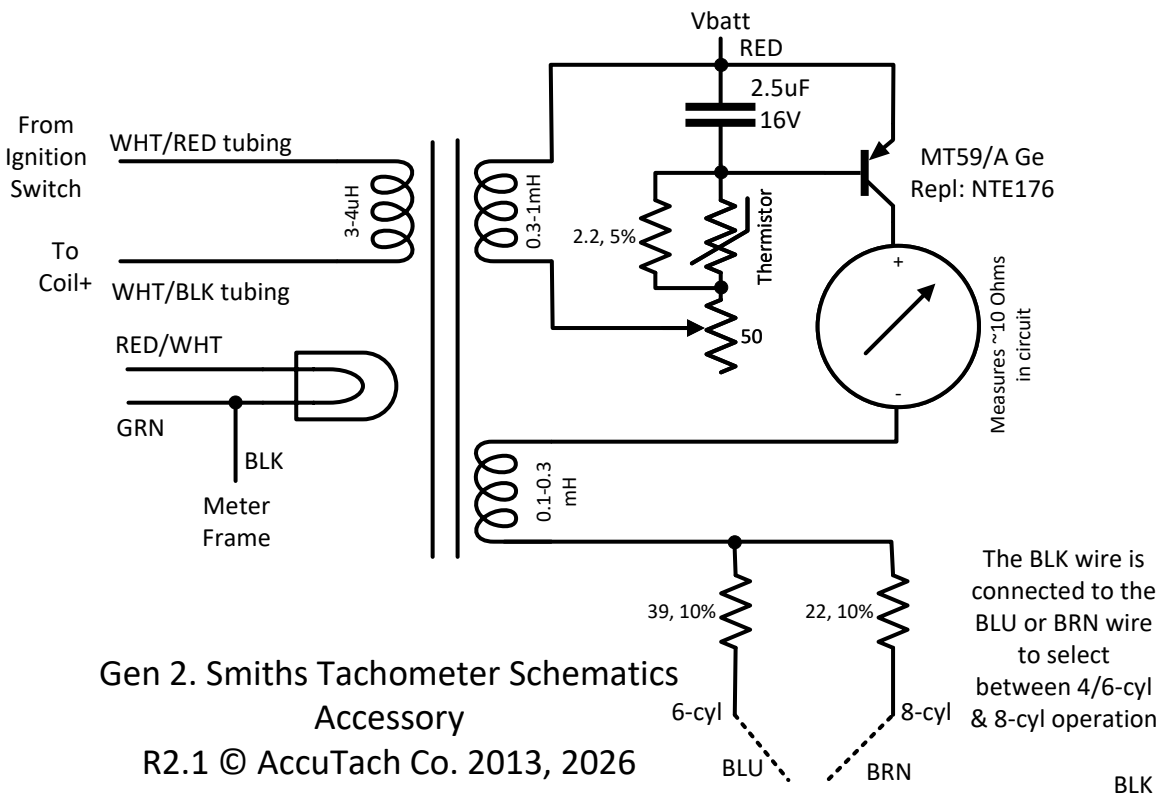
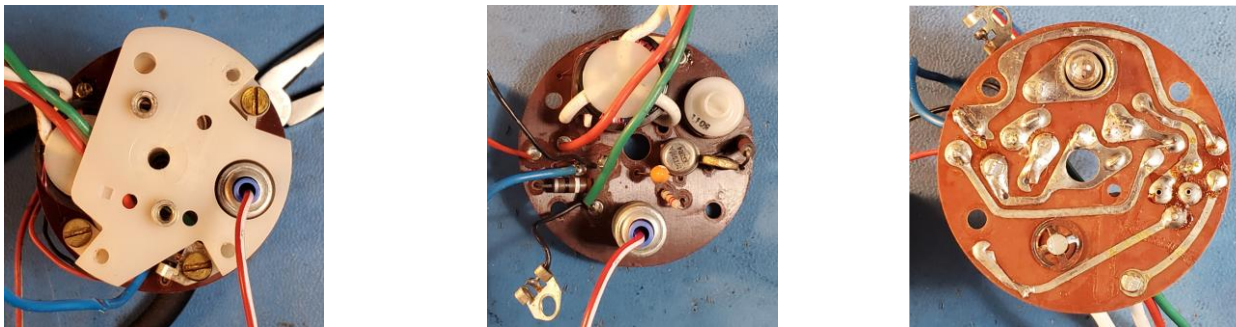
This particular bezel had been broken and repaired with epoxy.

To extract the tachometer innards from the case, remove the three case screws and the screw holding the blue wire.



Note the spacers that hold the PCB away from the back of the meter and the two metal plates between the spacers and the meter. You will need to reassemble them this way when you reassemble the tachometer.

Rest the tachometer face on two spacers so that the needle is not impacted. I used the rubber handles of a pair of pliers. Note where all the wires are run. Remove the 3 screws that hold the PCB to the back of the meter. Remove the spacers and the 2 metal plates along with the white plastic housing. Set the PCB down beside the meter with the meter on its side taking care not to stress the red and black wires to the meter.



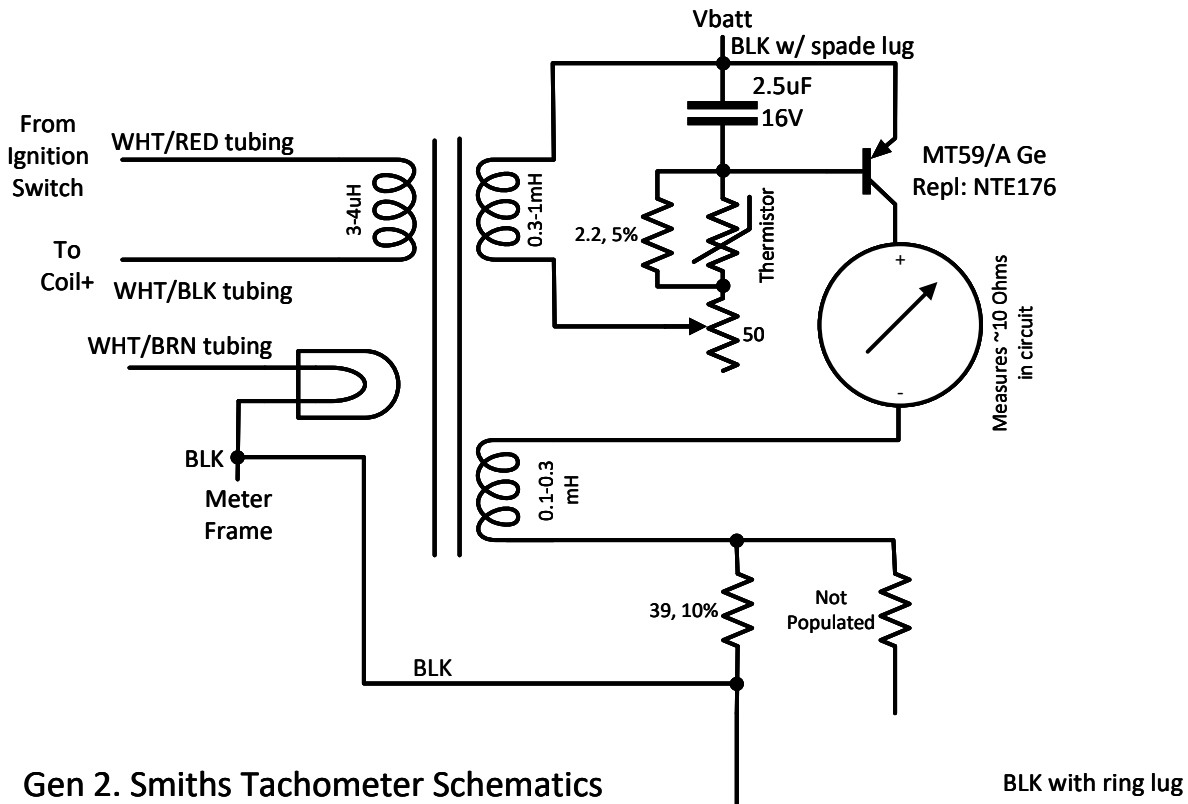
The second and third tachometers were the Volvo branded RVI 5413/00 7K tachometer from a 67 Volvo 123GT and the RVI 5610/00 6.5K tachometer from a Volvo 164.



The differences between the Smiths accessory tachometer and the Volvo branded tachometers include different gauge faces. Additionally, in the Volvo branded tachometers, the 22 ohm 8-cyl resistor is not populated and the brown wire is not there. The ground wire is a black wire with a ring lug. The green wire in the Smith branded unit is replaced with a short black jumper that connects the negative side of the illumination bulb and the case to the black tachometer electronics ground wire on the PCB and there is no blue wire so the black wire with the ring lug provides ground for both the electronics and the illumination bulb. This configuration results in 4/6-cyl operation only. The black wire with the spade lug connector is the +12V power wire.

There is a black bit of shrink tubing on the negative white transformer input lead. The positive white transformer input lead has no shrink tubing on it.

The positive illumination bulb lead is a white wire with brown shrink tubing on it.



Gen 2. Smiths Tachometer Schematics  
 Volvo Branded  
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