Sun SST-306 Electronic Tachometer Analysis

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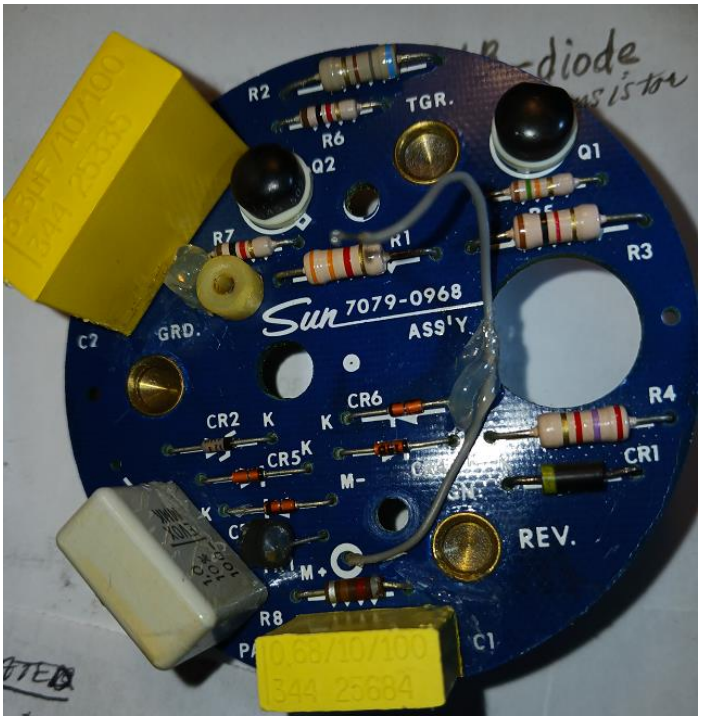
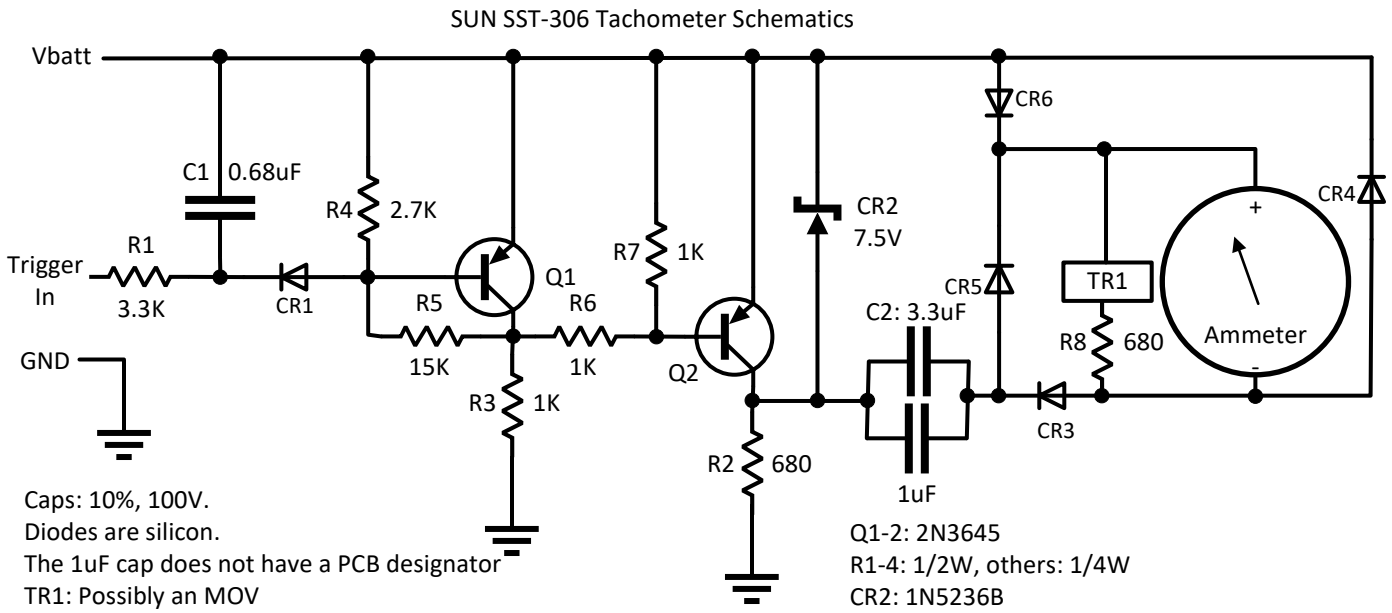
Rev. 1.1

I received a request for help from an owner of a 1977 Harley Davidson Superglide. His tachometer had failed so he dismantled it to see what could be done to repair it. He sent me a series of photos of the PCB so that I would be able to reverse engineer it. Here is what I have learned.



In this case, Sun did a great job of marking the component designators on the PCB as you can see from the photos.

Sun SST-306 Tachometer Schematics:



Theory of Operation:

R1 protects CR1 by limiting its current. R1 and C1 form a 71Hz low pass filter that filters out any high frequency noise in the ignition signal.

Whan the points are open, the Trigger In signal is typically at 12V (or above with coil ringing.) Not enough current flows out of the base of Q1 to turn it on, so R4 and R5 draw enough current out of the base of Q2 to turn it on. With Q2 on, the collector goes to battery voltage. Any charge in C2/C2 will cause the voltage on the other side of them to go above battery voltage. That gets discharged by current flowing through CR5, the meter and CR4, helping to deflect the needle.

When the points close, enough current can flow from the base of Q1 to turn it on. The collector of Q1 pulls the base of Q2 up to battery voltage, turning Q2 off. That allows C2 to charge to battery voltage minus Zener voltage through CR6, the ammeter and CR3 causing the needle to deflect.

TR1 and R8 are in parallel with the meter. A Reddit user suggest that TR1 is an MOV (Metal Oxide Varistor) surge suppressor used to protect the meter from power surges. He thinks that “TR” stands for “Transient”.