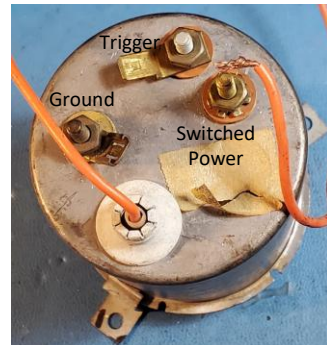
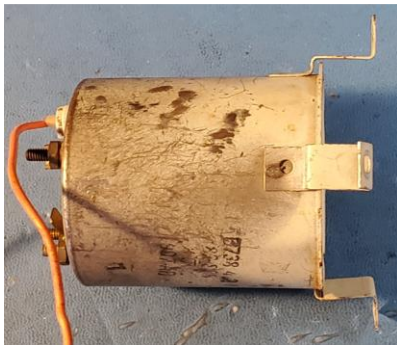
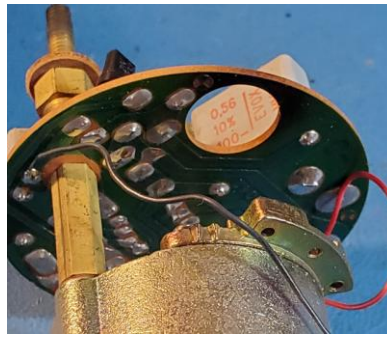
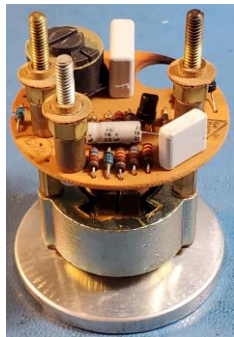


79 Dodge PowerWagon Tachometer
Reverse Engineering Report
© AccuTach Co. 2026
R1.2

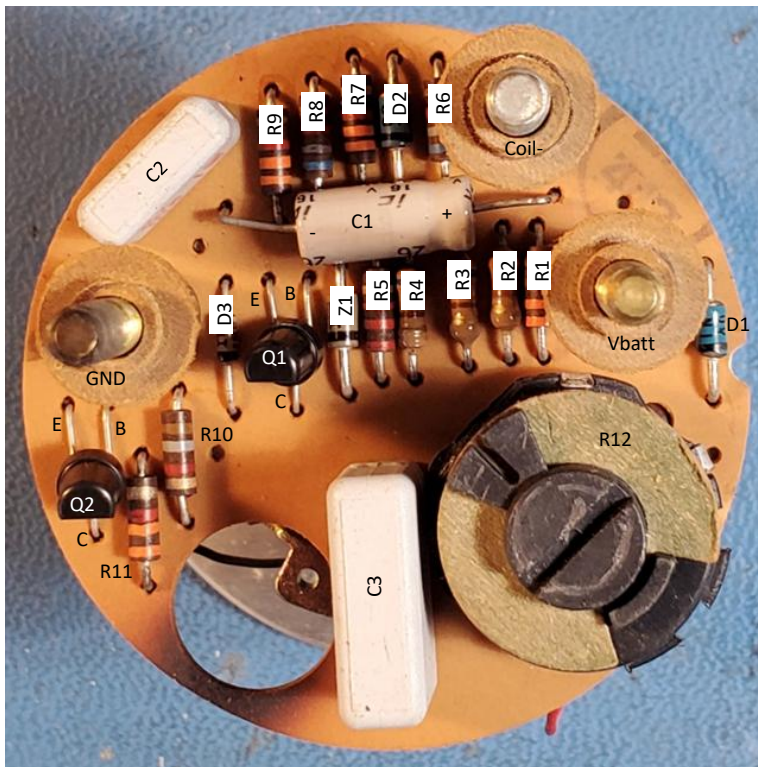
I received a 79 Dodge Power Wagon tachometer to try to repair. It did not look good as the needle would move across the scale as I rotated the tachometer.



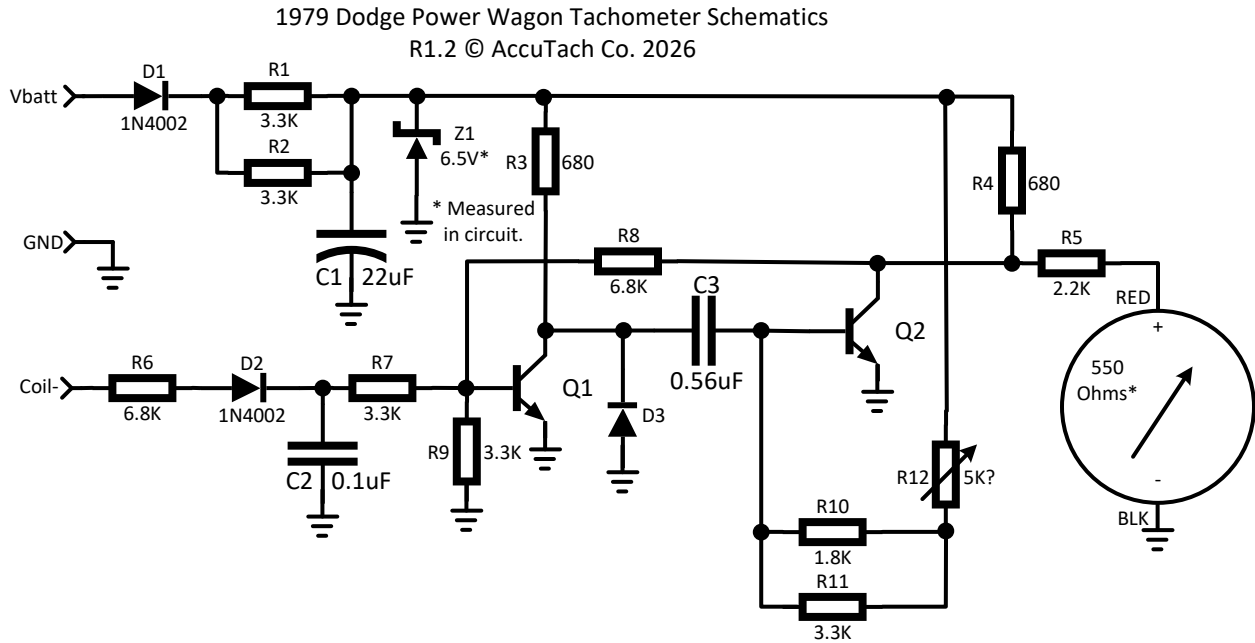
The guts of the tach are removed by removing the nuts and hardware from the 3 terminal studs. The guts then fall out of the cup.



I have labeled the components on the PCB:



Schematics



Theory of operation

D1 protects the circuit from reverse polarity such as what happens if someone hooks up jumper cables backwards. R1, R2, C1 and Z1 make up a regulated 6.5V power supply for the tachometer circuit.

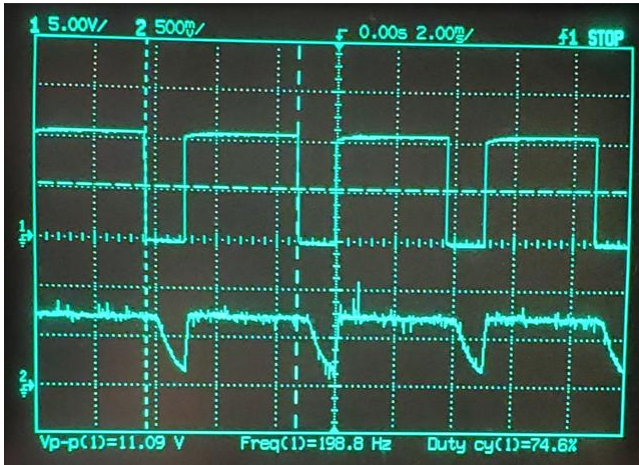
When the points are closed, D2 prevents that signal from pulling the base of Q1 down. But R10-12 pull the base of Q2 up, turning Q2 on. That grounds the base of Q1, turning it off. Since the base of Q2 is at one diode drop above ground and the collector of Q1 is pulled up to about 6.5V by R3, C3 is charged to about 6V. Since the collector of Q2 is at ground level, no current will flow through the meter.

When the points open, the coil will pull the input up, turning Q1 on, grounding its collector. Since the voltage across C3 can't change immediately, the base of Q2 is driven about 6V negative, turning Q2 off very hard. Current starts to flow through the meter via R4 and R5. C3 also starts to discharge through R10-12 until the threshold of Q2 is crossed, turning it back on again. That stops the flow of current through the meter and turns Q1 off again.

The network of R6, D2, C2, R7 and R9 attenuate and filter the input signal, keeping Q1 safe and cleanly triggered.

I was able to reverse engineer this tachometer to this level because the meter was still electrically intact. However the meter shaft was broken, so the deflection coil would drag on the circular magnetic bar that it traveled around, This prevented the needle from moving freely. This tachometer will be going to Redline Gauge Works to have all of its innards replaced with modern innards.

The following page shows scope traces of the bases and collectors of both transistors which should aid in diagnosis of failed Power Wagon tachometers as well as understanding how this circuit works.



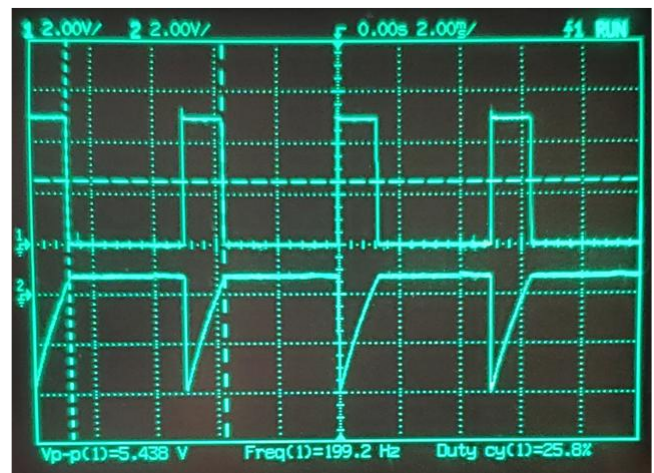
Top Trace: Calibration Signal
Bottom Trace: Q1 Base



Top Trace: Q1 Collector
Bottom Trace: Q1 Base



Top Trace: Q1 Collector
Bottom Trace: Q2 Base



Top Trace: Q2 Collector
Bottom Trace: Q2 Base