

Modification to Tune-Up Tachometer

Having built the Tune-Up Tachometer described in October 1975 by Leo Simpson, I found it every bit as useful as he suggested. I did however, find two disturbing points which were the lack of exact correlation between the two scales and some difficulties experienced in calibration.

There is however, a small modification which eliminates both faults and that is to use a 4:1 range change instead of the original 5:1 change. This can be achieved by using a series/parallel timing capacitor switch. Any pair of metallised polyester capacitors can be taken off the shelf and I used a pair of $.022\mu\text{F} \pm 10\%$. In

parallel this gives $.044\mu\text{F}$ and in series, $.011\mu\text{F}$. The latter gives a short enough time constant for 6000RPM but more important, even if the two capacitors are on the limits of +10% for one and -10% for the other, the ratio of 4:1 is correct within 1%. Even if you had the correct gear, you would have to go through quite

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a stock of capacitors to get two values like the .0082uF and .033uF within this accuracy.

The two ranges can be 0-1500RPM and 0-6000RPM, in which case you can easily

calibrate the lower range directly with a low voltage mains supply. You do not even have to rectify it as the SAK140 does this for you. Even with the small meter which I used, 100RPM scale points give

all the accuracy needed for tuning.

There is also another point worth noting. A smoothing capacitor across the meter can help to take out the residual flutter on the meter needle which shows with a very light meter movement at low speeds.

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