RVI To RVC Tach Conversion

by Philip Millward

Stag, TR7 and other LBC owners with RVI, also known as impulse tachometers, are often frustrated as they usually don't work with most electronic ignition systems which have a different on/off cycle than that of a points ignition.

RVI tachometers have an open loop in them that inductively couples current pulses to a circuit in the tachometer that counts the pulses from an on/off cycle, therefore the tachometer does not read correctly if it is trying to read voltage instead of pulses from the electronic ignition.

RVI Tachometer from a Mk 1 Stag

A RCV tachometer is different in that it measures the swings in voltage from 0 V to 12 V and takes its reading from the low side of the coil, providing the RPM and this is what the electronic ignition unit emits.

I have a Mk 1 Stag with a RVI tachometer that would have been originally mated with a Lucas points ignition system, as with other Triumphs, MGs, Lotus, etc. from the 1960s and 70s era. Someone in the past had added electronic ignition which resulted in my newly acquired Stag reading between 2000 rpm and 3000 rpm at idle and jumping up and down all over the place!

I knew this was being caused by the RVI unit not knowing how to count pulses, so I made calls to conversion companies, and to be frank, was horrified at the cost quoted for fixing this issue. Next, I began a search to find a DIY solution - I typed in my search engine "RVI to RVC conversion", passing up on the usual options of sending my unit off. By page two, I found Spiyda Design (**https://www.spiyda.com/magento/index.php/smiths-rvi-rvc-conversion-board.html**), a small outfit in Stourbridge, England, that makes circuit boards to convert Smiths gauges and other parts to modern standards, mainly for BMC Minis. However, a Smiths tachometer in any car is the same RVI or RCV. The RVI-RVC conversion board fits inside the tachometer and replaces all the original internal electronics, except for the actual moving coil movement. Once the board is fitted, the tachometer will trigger from a voltage source such as the coil negative or the electronic ignition. It is adjustable and the tachometer will need calibrating after fitting.

I ordered a board and calibration cable - what could be difficult about soldering a few wires, right? Even with the current pound to dollar exchange rate, at £44 it was still only $62 delivered, far better than the $200+ I had been quoted by U.S. based conversion companies. The new board arrived from the UK in a well designed protective package.

One needs to remove the tachometer from the dash panel and then the outer bezel, glass, seal and inner bezel. The movement can be slipped out of the case after unscrewing two retaining screws.

My next stop was onto the Spyida website to view the tutorial videos - a necessary precaution as anyone cutting those wires and dismantling a 45 year old tachometer would be a little nervous. But hey, any mistakes in connections could be fixed with ease and they even showed this in a video.

Two old wires were desoldered and the old board was removed; four wires were then soldered in position using two of the old ones; the new board was screwed in position; and the face and needle temporally placed in position - it was now time to calibrate. Uniquely, this unit can be calibrated from a PC, laptop, iPhone etc. using the calibration cable provided. There is no need to install software, just download a simple wav file - I downloaded the 300MHz and the 200 MHz files which represented respectively 4500 rpm and 3000 rpm for an 8 cylinder engine. Spiyda recommends choosing an rpm somewhere in the middle of the car's rev band for calibration.

With the wav files on my iPhone, it was time to plug the cable into the earphone socket (you really don't want to listen to the high pitched scream from the file!); then connect two clips - one to ground and the other to input, and provide a 12V input (there are videos showing you what is what). A small screw driver, provided, was used to turn an adjusting screw (variable resistor) on the board whilst playing the wav file. I turned the screw until the tachometer needle moved to 4500 rpm and just to make sure everything was good, I also played the 200MHz wav file to see if it read correctly too; and the needle moved to 3000 rpm - BINGO perfect! I put the tachometer back together again, connected the leads and I now have a tachometer that reads 500 rpm steadily at idle.

The Spyida RVI to RCV Board

The job took me an hour to complete and an investment of about $60, resulting in a working tachometer once again (a RVC this time). If you are comfortable with a little bit of electrical soldering, this is a definite DIY project for the average Stag owner. **SN**

Philip's laurel green Stag

*[Not sure whether you have a RVI or a RVC tachometer? If it is a RVI unit, it will say so in the small print at the six o'clock position on the outer rim of the tachometer face - **Ed**.]*

Philip Millward originally hails from Nottingham, UK but currently resides in Monroe, NC. His laurel green on black 1972 Mk 1 Stag (BW35), original V8, 38k miles was sourced in Washington State and replaces a Triumph Spitfire as the family fun car.