

INSTRUCTIONS

RVI to RVC Tachometer conversion board

This board is designed to fit the Smiths RVI tachometers made around the 60s and 70s.

Installation

a) Dismantle tachometer.

- twist the outer bezel until the tabs line up with the slots
(easier said than done.. it can help to soak in WD40)
- remove the outer bezel, glass, seal and inner bezel
- remove the two movement retaining screws from the back of the case
- slide the movement out of the case
- remove **the needle from the shaft** *(it is a press fit, two lollipop sticks make a useful tool)*
- remove the two dial mounting screws
- de-solder the two wires that connect the board to the coil
- de-solder the wire that connects the board to the power-in terminal
- undo the two screws that fix the board to the movement
- remove the old electronics completely.



If you have an ultrasonic cleaner, this is the time to clean the movement
My advice is to use clean water only and thoroughly dry the unit before proceeding

DO NOT LUBRICATE THE BEARINGS

b) Fitting..

- fit the new board as shown in the illustration using the original mounting screws in the original holes.
- the thicker red wire should be soldered to the power-in terminal
- the two thinner wires should be soldered to the coil terminals, **leave them long at this stage in case you need to reverse them.**

The board has four pads for signal input, only one needs to be connected at a time.

The four input pads are for different input types.

- The pad nearest the power input (furthest from the 14 pin chip) is for higher voltage inputs such as connecting to the coil -ve terminal on a sports or low impedance coil, (voltages from this terminal can exceed 100V)
- The pad second nearest the power input is for standard ignition coils, connect to the coil -ve terminal, (voltages from this terminal can exceed 60V)
easier.
- The pad third from the power input is a nominal 12V input, use this for connecting to 12V switched outputs.
- The Pad nearest the 14 pin chip (furthest from the power input) is for low voltage inputs such as from an ECU and for calibration.
If not connecting this pad to an external terminal, solder on a short length of wire to make connecting the calibration cable

Usually one or more pads are connected to external terminals on the tachometer case, however, this will vary depending on which case style you have. Some examples are shown over.

test fit the movement in the case to make sure the adjustment screw is visible through the inspection hole
If it is not, a new hole will need to be drilled in the case to gain access

reassembly is then the reverse of disassembly

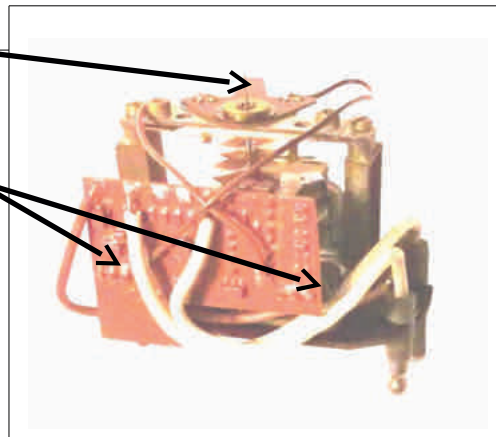
* there is a moveable fibre plate upon which the coil connections are mounted. This is used to set the zero end of the movement. It should not need adjusting, but if it has been accidentally moved, the correct position is so that the moving part of the movement only just rests against the magnet assembly.

**** leave the thin wires long at first until you have checked the operation of the board in case you need to reverse them.**

There are links to installation videos at www.spiyda.com/smiths-rvi-rvc-conversion-board.html

Movement Zero Adjust

Original mounting screws
through transistor tabs



A

High Voltage Input
Pad on circuit board

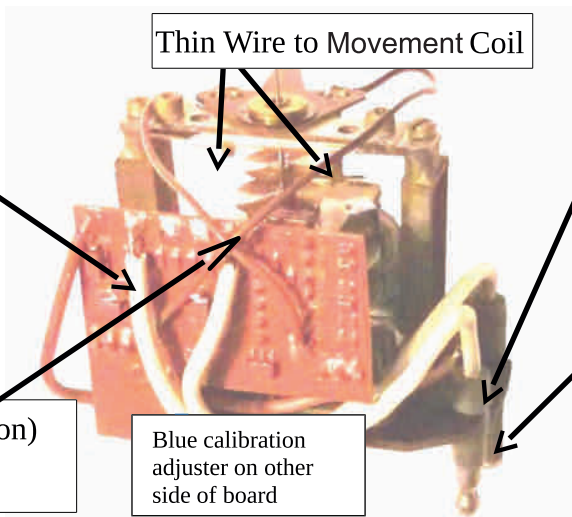
Thin Wire to Movement Coil

Thick Red Wire to Power
In Spade (lucar) terminal
Spade

Low Voltage (and calibration)
Input Pad on circuit board

Blue calibration
adjuster on other
side of board

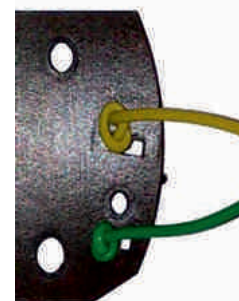
Old male and female
Bullet connectors
On White wire.



Instead of the bullet connectors on the white wire, you may have a small sense coil mounted on the end plate with a threaded post on the outside where the white wire would loop through. In this case you need a different way to get your connections to the outside world !

Remove the whole coil assembly and this will expose two small slots and a hole. fit new wires from the board, through the holes left behind to the outside, knot the wires on the inside and glue in place (epoxy or hot glue) You can bring the calibration connection out too.

You can terminate these with bullet or spade connectors or whatever suits your install. Jags used a connector similar to a headlamp bulb



Calibration

Calibration should be done with the tachometer in the orientation it will be in the vehicle

Connect +12V to the Power in terminal

Connect ground to the metal body or one of the mounting screws

Connect the calibration cable RED crocodile clip to the low voltage signal input (nearest the 14 pin chip)

Connect the calibration cable BLACK crocodile clip to the body or one of the mounting screws.

Connect the other end of the cable to the headphone out socket of your computer or laptop

Download the correct audio file from <https://www.spiyda.com/tacho-calibration-information>

Play the audio file at **full volume and with bass and treble turned fully on**, then adjust the tachometer adjust screw (the small screw on the blue component) until the tachometer shows the appropriate rpm (it can turn up to 22 turns) .

If the needle does not move, or tries to move the wrong direction, swap the thin red and black wires from the board to the movement. If the needle still does not move, try a different audio source with a higher output.

More detailed instructions on calibration and links to videos are on our website www.spiyda.com

Thin Wire to Coil

Coil Negative
(high power coil)

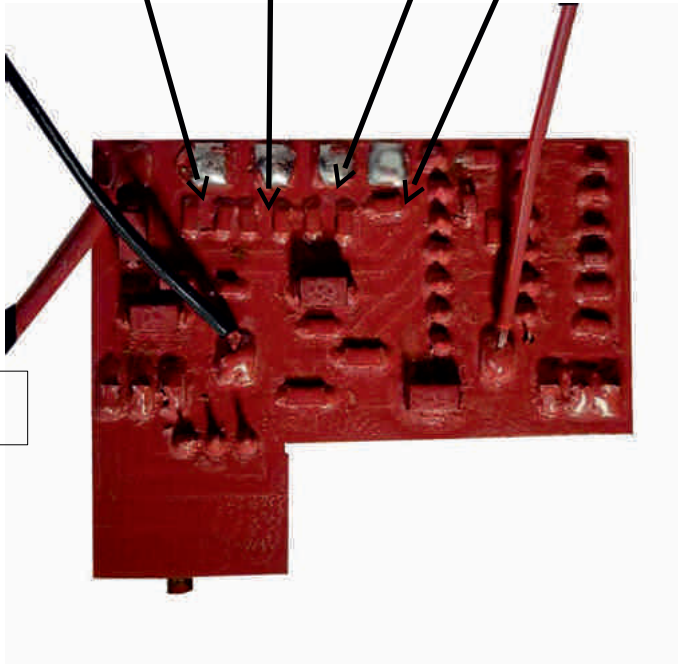
12V Square Wave
Input

Coil Negative
(standard coil)

Calibration input
(2 - 5V)

Thin Wire to Coil

Thick wire to
+12V



Special “W” terminal instructions

The board is capable of recognising the pulses from an alternator “W” terminal. Since the alternator always rotates proportionally to the crankshaft, this can be used to drive the tachometer board.

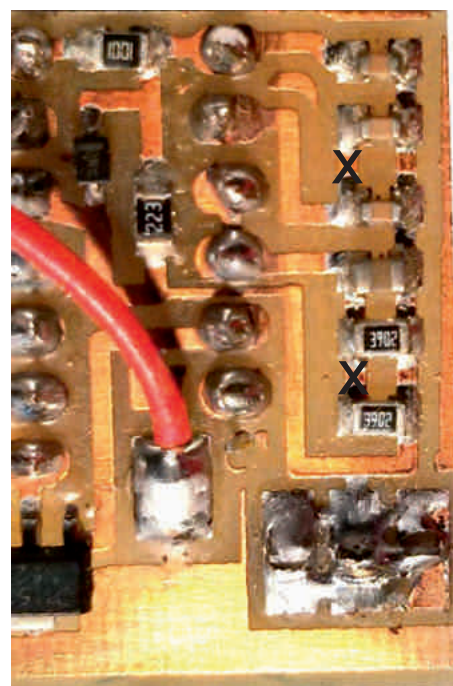
There is however an issue in that the frequency of the alternator pulses is higher // than the equivalent pulse rate from a coil for any given rpm

To enable the board to work properly with this higher frequency two small cuts are requires to the pcb tracks

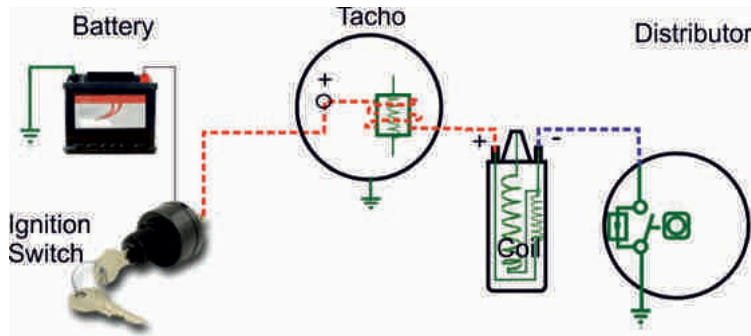
Just use a sharp knife, edge of a small screwdriver to cut through the copper at these points.

The picture shows the board without its coating

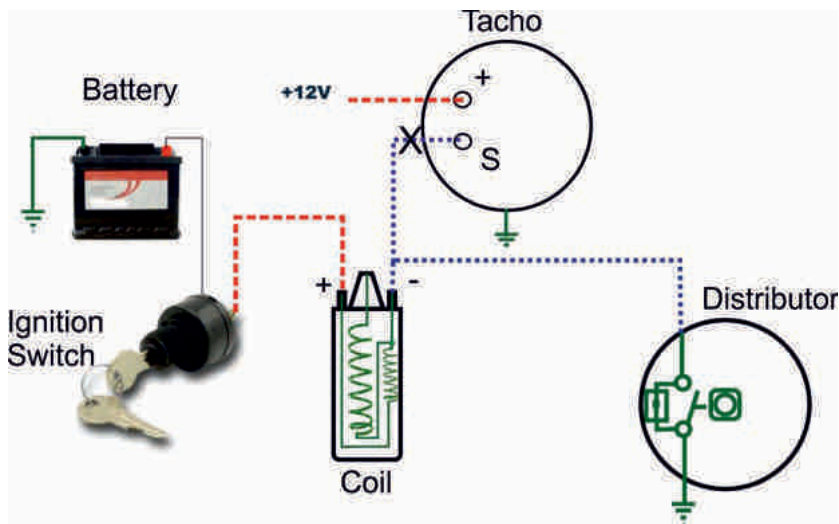
This has the effect of removing the two components marked in red from the circuit.



Notes on Modifying wiring from RVI to RVC



The old wiring has a white wire that loops into the tacho and goes on to feed the coil with power . This is no longer required by the RVC tacho but must be left connected to itself to power the coil. In this example it also powers the tachometer, but that is not always the case (and not ideal)



When fitting the new or modified tachometer, the old white wire still has to power the coil so should be replaced, left in situ, or connected to itself if it has the male / female bullets.

You will need to add a new wire from the coil negative to the signal input of the tachometer (marked with an "X in this diagram") The british colour code for this would be white with a black stripe.

The power for the tacho could come from the old wire, but this can cause interference, it is better fed directly from the fuse box or ignition switch (this may already be the case on your vehicle)

If you have issues with the tachometer going to full scale when the starter is engaged, you may be lucky and have an ignition switch terminal that turns the power off when the starter solenoid is active.. If this is the case, wire the tacho to this terminal .. if not talk to us.

Any problems contact Spiyda Ltd at enquiry@spiyda.design or enquiry@spiyda.com

note, a standard distributor is shown, but the wiring is the same for points replacement systems