



BRUNEL TRs

## Technical Tips



### Steering Wheels - Safety Issue

If you have fitted a new steering wheel recently or plan to do so please check out the TR Register Technical Forum for your own safety, it is in the TR Technical Chat page and dated 19 June 2017:

The rims of some steering wheel rims have parted company with the steering wheel hubs. This is not an isolated incident.

Bob Sackley - June 2017

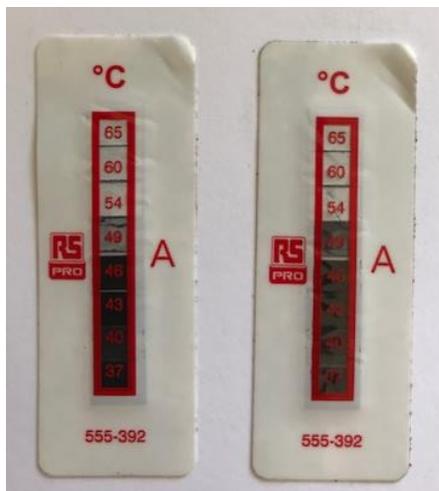
### LED Instrument Lamps

With winter nights coming on and the instrument lights on my TR6 looking pretty feeble, I invested £22.50 in a set of LED lamps for the TR6 from [classiccarleds.co.uk](http://classiccarleds.co.uk) and a good job they do as well. The set does not include the oil or ignition lamps as they say they need to remain as filament lamps, and the dimmer doesn't dim them. They are a bit of a fiddle to change but as I had the speedo, tacho, and ammeter away at JDO Instruments for service and recalibration it wasn't too bad.

### Keep that pump cool

An idea from Hugh Lewin

I don't know whether this would be of any interest to TR owners, I bought one of these for my fuel pump and it is a perfect fit, hopefully it will dissipate heat from the pump? I am hoping to do some "before and after" tests, I have some RS Components temperature tell tale strips to attach to the pump, I just need some decent weather to get the car out, my pump gets very hot (its very old ) and cut out the other day, luckily I had a can of brake cleaner in the car which was very cooling for the pump. I hope to do a decent journey without the heat sink and then put it on for the return and get some results - not terribly scientific but should give an indication as to whether the investment - £49.00 - should be made by other owners. Results below.



The strip on the right was without the heat sync, the one on the left was under the heat sync for similar journeys and the same ambient temperature, not conclusive but the pump was running marginally cooler with the heat sync.

## Voltage Stabiliser

A tip from Tim Carr.

Voltage stabilisers are used to provide a constant operating voltage of 10v to temperature and fuel gauges. Early ones were mechanical devices and were installed in Triumph cars namely TR4s to 6s and GT6s. More recent versions rely on electronics to achieve the same effect.

Recently the stabiliser failed on my GT6 as evidenced by no reading on the gauges so the choice was to buy a new unit or to investigate a more modern solution which could provide a more accurate constant voltage. New Smiths stabilisers, manufactured by Caerbont Automotive Instruments, are available for about £13 but a quick search on the internet revealed this:.

<http://www.britishv8.org/articles/mgb-voltage-stabilizer.htm>.

Okay it is an MG based website but it made interesting reading with a recommendation to make the conversion of an existing stabiliser to solid state using semiconductor LM2940T-10, if available, otherwise alternative semiconductors were quoted.

Fortunately the preferred device was available from <http://cpc.farnell.com/texas-instruments/lm2940t-10-0/v-reg-ldo-10v-2940-to-220-3/dp/SC08358> so I bought 3 of them for less than the price of a single mechanical stabilizer.

My original stabiliser was dismantled, the insides removed and the semiconductor pop riveted to the inside case. Strands of telephone cable wire were used to make the simple connections and were small enough to fit in the limited space. Reassembly and testing revealed a steady constant voltage for the instruments.

The stabilizer on a GT6 is mounted on the back of the speedometer which is very difficult to remove and refit. A lash up test run on the road confirmed the stabilizer worked well but the speedo really needed recalibrating. I tried doing this against the sat nav but without success, so it has been sent to Speedy Cables to get sorted before the whole lot is properly installed again. A long term report on the converted stabiliser will have to wait.

## WIRE WHEEL BALANCING

By Tim Carr

Some 20 years ago I made a wheel balancer because, at the time, facilities were not generally available for my application. A description of the device with operating procedure follows.

The balancer is all mechanical and can be configured to balance most wheels but it was specifically made to balance the wire wheels on my Triumph TR4A, here in action at Castle Combe photo 1.



Photo 1 (Jim Gaisford)



Photo 2



Photo 3

### The Balancer

The balancer works on the two plane (inner and outer rim) principle and balances statically, then dynamically, for completeness. It has a rotating part, to which a wheel needing attention is mounted, and the assembly is installed in a stand ready for operation as shown in photo 2.

### The Rotating Part

The rotating part, shown in photo 3, consists of a short shaft connected to a long shaft by a freely moving universal joint. In its former life this shaft assembly was part of the steering column of a Eurobox.

At the top of the short shaft there is a handle for turning and a double row ball bearing similar to those used in the wheel hubs of modern cars. The outer race of the bearing locates in a housing on the stand.

At the top of the long shaft there is a short spacer, two adaptors which mount the wheel in exactly the manner it is mounted on the car, a long spacer partly painted black, and a washer and nut.

### The Stand

The stand, shown in photo 4, was originally designed to fit on the garage wall but was considered not good if anyone bumped into it. Therefore it is now mounted on a robust base which is in three point contact with the floor for stability. The upper part of the stand has a bearing housing and two interconnected handles which actuate an arm with chalk marker.



Photo 4



Photo 5



Photo 6

### The Process

The process starts by selecting the length of the short spacer so that the plane of the wheel's upper (inner) rim is coincident with the centre line of the universal joint as shown by the string in photo 5. This ensures that only the lower (outer) rim is where any dynamic imbalance can be identified. Once the short spacer has been selected it applies to all wheels with the same offset.

For a wheel to be in balance the long shaft in photo 3 must remain vertical during rotation. Any deviation can be identified by making a chalk mark on the black painted spacer. The point at which the maximum deviation takes place is the position on the wheel rim where a balance weight is required. The amount of weight is carefully determined by trial and error.

### Static Balance

Static balance is achieved with very slow rotation and a balance weight is required on the upper (inner) rim in the same radial location as the maximum deviation. Three 30gram weights have been used for the wheel shown in photo 6.

### Dynamic Balance

Dynamic balance is achieved with rapid rotation of the wheel and marking the point of maximum deviation with the chalk pointer on the black painted spacer. It should be noted that the orbit of the long shaft is irregular, and care is required to obtain a decent chalk mark as in Photo 7.

Photo 7



Photo 8



Photo 9



A balance weight is then required on the lower (outer) rim in the diametrically opposite location to the chalk mark. Having applied this weight the static balance will have been changed, so an opposing equal weight is required on the upper (inner) rim. Weights of 35grams have been used in photos 8 and 9, the latter showing the fully balanced wheel from the outside.

Nowadays there are more facilities that have the appropriate adapters to balance wire wheels but my machine allows me to do the job in the comfort of my own garage even if it might take a bit longer than for modern equipment. Furthermore, not only does it have the ability to handle wheels with significant levels of imbalance, but it also provides the best wheel balance my TR has ever had.

## Adjusting Tappets – 3 Methods Compared

Let's compare 3 methods, feeler gauges, Gunsons Click Adjust, and Dial Test Indicator (DTI). Well, I learnt a few things from this, the main one being the need to maintain absolute consistency. The Gunson Click Adjust was the winner.



With the DTI set up it was clear the reading changes when rocking the arm by fingers alone, I used a screwdriver to lever the arm up and down to ensure solid contact and the results were clear and consistent. This became my datum.

- Feeler gauges work fine provided you know what the right feel is, and are confident the faces between the rocker and valve stem are perfectly flat. Before learning the right feel I was setting them about .003" too tight and a bit variable, having learnt the right feel I was still a bit variable but no worse than .002" tight so ranging from .008" to .010". Which can't be bad.
- Gunson Click Adjust was a similar story of getting the feel. The result was similar to the accuracy of feeler gauges to start with but much quicker and easier. With practise I worked up a consistent routine of screw down to the big click to take out all slack in the rocker arm, the unscrew 7 clicks, then very slowly unscrew one more click and hold the knob rigid until the locknut is tightened. Using this method was within .001" every time.

## Fuel Gauge Sender Unit

For a number of years the fuel gauge in my TR4A has required some interpretation to determine if there is any fuel in the tank. A full reading

means full and anything above a quarter means there is at least enough fuel to get to the next petrol station. Below a quarter the gauge goes dead and it is time to worry. There has never been the urge to do anything about it as the sender unit, which is the cause of the problem is very difficult to access.

The good news is that it is possible to remove the sender without removing the tank but it is awkward and time consuming. The 6 screws securing the sender can be removed with the back panel in the boot taken out: and the sender can be removed from inside the car with the inside back panel out of the way.

Moss supplied a new sender unit together with cork seal but without a rubber ring that goes around the float to reduce any potential noises resulting from the float contacting the tank wall. The ring from the old sender unit was therefore used to do another 50 years of service.

The result is so satisfying that I wish I had done the job earlier.

Tim Carr

### **Overdrive Logic Unit**

I have fitted the Revington Overdrive Logic Unit to my TR6. The overdrive drops out as soon as I move out of gear, I can also press the overdrive switch again to disengage overdrive without moving out of gear. It's great.

Operating Switch - Carl mentioned that inserting a small rubber grommet in the original switch to convert the switch to momentary action, he's right, it works well. I used an old real rubber grommet, not sure a modern plastic one would work as well.

Dave Green