

# WORKSHOP

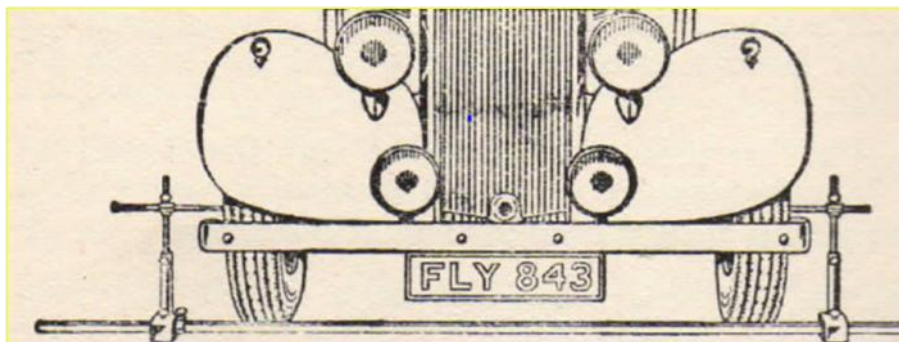
**“For the sheer joy of driving ..... I’d like to go there in an Alvis”**

(Advertisement in The Motor 1952)

## *Three Litre cars - Wheel alignment*

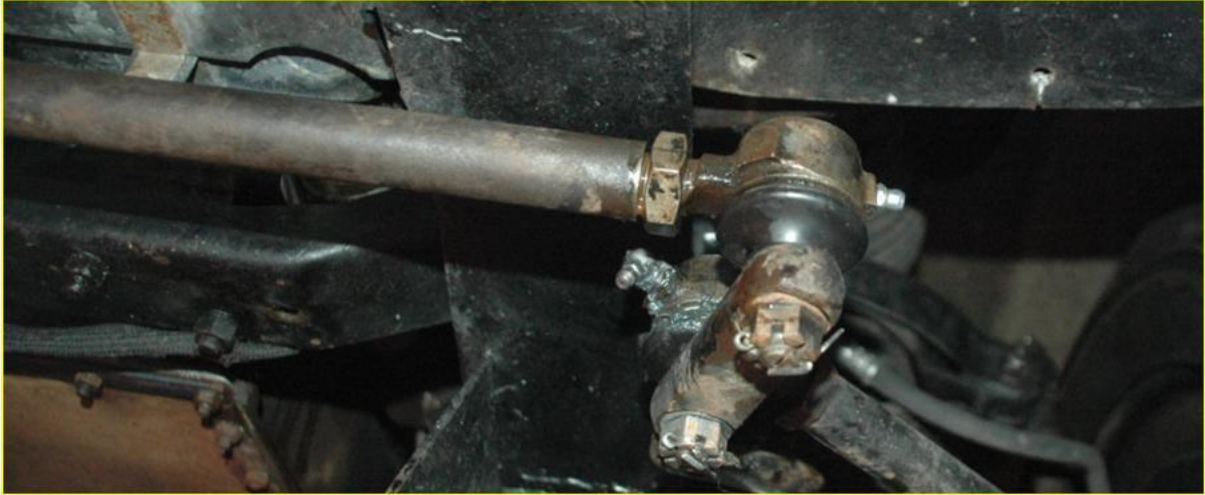
In 2012 I wrote about the poor handling of my TA21 when descending a windy section of the Dandenong Ranges on the outskirts of Melbourne. The tyres squealed around the bends and the car only drove well in a straight line. I later discovered that the ball joints had been replaced and that both steering side rod assembly lengths had been altered. It is my understanding that when new the lock nuts were tack welded to prevent any adjustment. No mention was made of their overall length in the Owner's Manual other than a comment that they were not to be adjusted. The result was that the toe in/toe out on turns had been significantly disturbed. Therefore the starting point for a Three Litre wheel alignment, be it done at home or by a garage, is to ensure that the side rod assemblies are of the correct and equal length between ball joint centres. This is where some confusion may exist as the Motor Trader Service Data Bulletin 202 of 1953 records the overall length between ball joint centres to be 13 1/8<sup>th</sup> inches however David Michie, the last service director for Alvis, writing in the April 1971 Alvis Owners Club Bulletin, (*see AOC Technical Compendium TA-TC, Section 4*) has the length at 13 1/4 inches. This is the measurement I have used with success. To achieve this setting I had made a simple tool from a thin piece of wood and hammered two small nails 13 1/4 inches apart right through the timber until their points came a good half inch out the other side. A small indentation at the base of each ball joint allowed the homemade tool to be accurately positioned.

As camber and castor are both fixed the only other adjustment is the toe setting. The Works stipulated a **0 - 1/16<sup>th</sup> inch toe out** and this was applicable from the TA21 through to the TF series. For those keen to do the job with original tools can usually find a period gauge on eBay, otherwise newer types are available. At the time of preparing this piece there was an American unit listed. The one I purchased was made by Dunlop and was the type typically found in a post war Australian local garage. A drawing of the unit is reproduced below and is from a Dunlop tyre booklet supplied with a new TA14 in 1946.

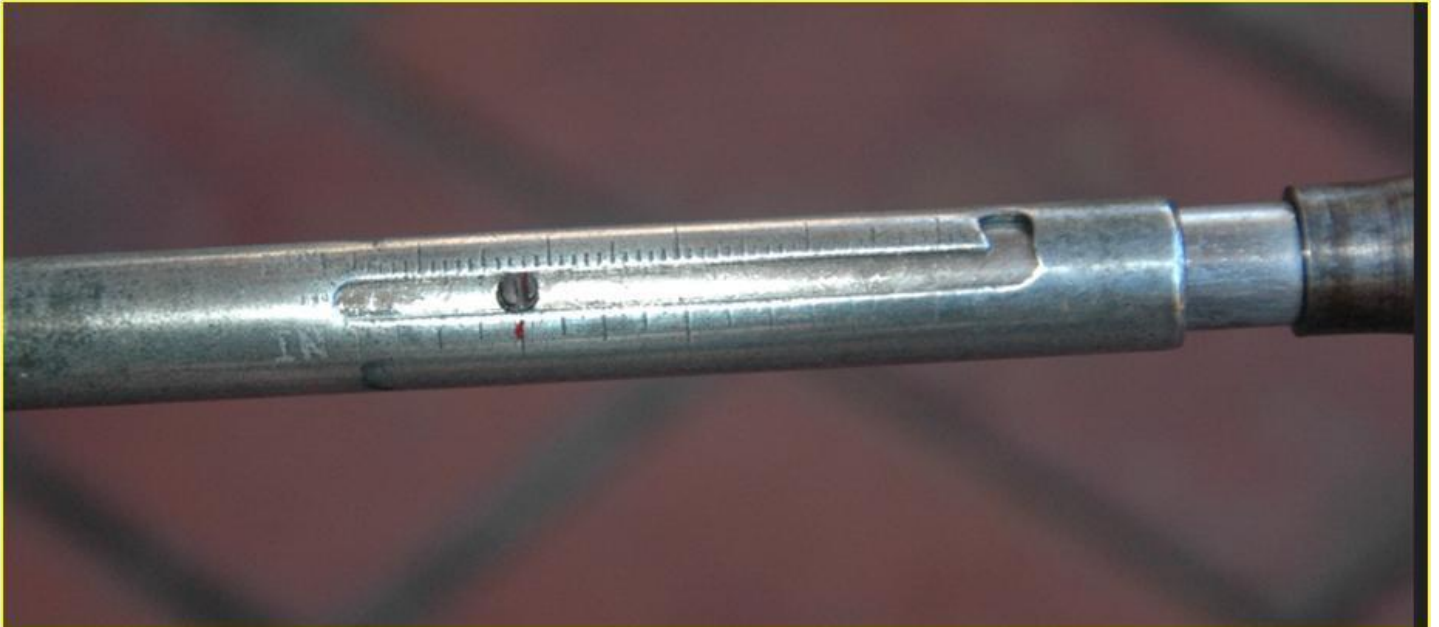


Given the gauges age it was in remarkably good condition. This unit is simple to use and quite accurate. As it came through the post my only requirement was to source the trammel which is a 6' length of galvanised pipe.

The toe setting procedure is straight forward. The first task is to undo the front tie rod ball joint lock nuts (*anti-clockwise direction*). The lock nuts can be quite difficult to budge. The tie rod is akin to a turnbuckle; rotating the bar in an anticlockwise direction will cause both wheels to toe in and vice versa.



I set the gauge in place now that the 2 lock nuts were undone and then recorded the starting point on the inches scale with a fine red pen. This can be seen in the calibration picture. It doesn't matter where one commences the initial reading on the gauge scale. The gauge is calibrated in both inches and millimetres. I just adjusted the arm and clamp to a section that had clear markings. The inch scale is marked in 1/16ths of an inch. (They are just visible between the larger 1/8<sup>th</sup> inch lines.)



Having made sure that all the gauge finger screws were tight I pulled the spring loaded calibration rod out to its locking position and then tipped the gauge on its side and rolled the car forward half a wheel rotation so that the toe reading was taken from the same rim positions. This lessened the possibility of out of true rims effecting the reading. The gauge was then pulled through and set up again this time in front of the wheels. With the lever released a reading could be taken and compared with the original. The tie rod was subsequently rotated in order get a zero toe reading, (i.e. the same as the starting point) as I have found zero toe to be quite satisfactory when running cross ply tyres.



As can be seen in the above photos the centre line of the wheel is the starting point for the measurement. I repeated the process this time without rotating the wheels in order to see if the rims were true and they were. Assuming that all adjustments have been done correctly and everything else is in proper order the steering wheel spokes should be symmetrical in the straight ahead position.

#### Postscript

In that earlier article I ended with a comment on regular steering arm inspection (see below) and I feel it is worth mentioning it again for there is not an overly generous amount of metal around where the side tie rod ball joint tapered end fits within each steering arm. If one of these were to fracture due to age related fatigue or other cause, then steering would be lost.



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*You know it is time for a  
wheel alignment when  
you can change lanes by  
letting go the steering  
wheel!*