Rear axle

Having recently rebuilt an A7 rear axle for my RN Saloon, I thought members might be interested in the following hint. Before reading any further, you might be reassured to know that the car has covered nearly 2,000 miles since the rebuild and the axle runs quietly on both drive and overrun, it doesn't leak oil, the backlash seems to have remained OK and happily, there are no metal particles in the oil. So, although it maybe a dangerous thing to say - the exercise seems to have been successful.

Incidentally, the reason for the rebuild was that I needed a later 'Semi Girling' axle with detachable backplates in order to fit my much-loved hydraulic brakes, rescued from a previous car - sorry Barbara!

Before starting work, I tried to read-up on the subject and found the following to be particularly helpful ……

- Doug Woodrow (A7 Manual) - Section E
- Austin Seven Specials by L M (Bill) Williams – Chapter 5
- 750 MC Companion – Page 154 et seq
- Dorset A7 Club Website – Article originally from *the Bristol Austin Seven Club magazine 1983*
- Cornwall A7 Club Website – An article entitled 'transmission noise' by Malcolm Watts who acknowledges the assistance of Ian Moorcraft of the Bristol Austin Seven Club

These articles were interesting and tell you everything you need to know about obtaining correct gear tooth contact and the various adjustments. However, I couldn't find consistent advice on the required pre-load for the differential carrier bearings. Several articles agree the pre-load should be three to four thou', Jack French recommended 'considerable pre-load' and Austins reckoned 'slightly slack'. I didn't find words like 'considerable' and 'slightly' particularly helpful so I decided to go for the more specific 'three to four thou'. However, none of the articles I read explained exactly how this might be achieved. It then dawned on me that the adjusters are threaded 20 tpi and each has fourteen castellations, therefore simple arithmetic (1/14 x 1/20 = 1/280 or 0.00357") tells us that a tightening rotation of one castellation on a single adjuster gives a pre-load of 3.6 thou. So, tightening both adjusters by half a castellation each from a position of just touching the bearings, achieves the desired pre-load. This approach also helps preserve the carefully set backlash.

The different articles offered a variety of suggestions for detecting gear tooth contact but I ended-up marking three groups of four or five teeth equally spaced around the Crownwheel. This provided plenty of contact evidence to examine and also reassurance that the crownwheel was running true. I tried several different materials for marking the gear teeth and obtained best results with slightly thinned Humbrol model paint.

I also encountered a variety of suggestions for the repeated temporary assembly of the axle casings and torque tube between meshing tests. This is probably not critical so long as the assembled components are firmly attached each time but I used just two diametrically spaced bolts on the torque tube and four (the front and back pairs) on the axle case and this proved satisfactory. Strangely, Woodrow and others suggest using lock washers at all times but this is clearly unnecessary (arguably even a nuisance) for repeated temporary assembly. Of course, final assembly does require all bolts to be in position together with new spring washers.

I hope some of this helps if you need to re-build or adjust an A7 back axle.