AUSTIN 7 ENGINE – TORQUE SETTINGS (lbf./ ft.)

Little-end Allen Screws	10	Sump Gauze & Cover Screws	6
Big-end Nyloc Nuts	20	Head Nuts	20
Oil Pump Screws	8	Dynamo Housing Screws	8
Rear Main Cover Screws	15	Manifold Nuts (Brass)	6
Starter Dog	80	General 1/4" into ali.	6
Flywheel Nut	120	into steel	8
Camshaft Gear Nut	30	5/16" into ali.	15
Timing Cover (Nose Cone) screws	8	into steel	20
Camshaft Pulley Nut	20		

The list has been compiled and refined over the years, based on good engineering practice, screw manufacturers reference books and experience gained during many years of development of competition engines, from 350cc two-stroke outboard motors, through 3500 cc V8's for saloon car racing, Fiat 500's and Hillman Imps for Production Car Trials, to 1000cc inboard hydroplane engines (my speciality).

On top of this I can add over 20 A7 engines rebuilt for members, as well as my own engine for 'Pearl' – on more than one occasion. Apart from carefully using a torque wrench, I never use tab-washers or split pins – I have found too many bits in the sump and in one case in the oil pump! I do use the correct grade of Loctite though, except for big-end nuts where I specify Nyloc nuts – and no other. I'm sure Herbert would have used these aids too – had they been around then. None of the engines have fallen apart – so far!

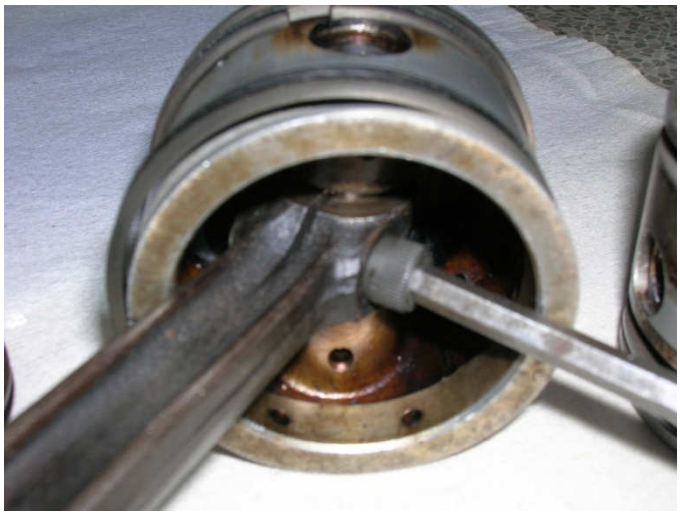
Blown-up, yes, but that is another story. So what are the pictures all about? My Torque List started with 'Little-end Allen screws' and I have been asked to elaborate on the use of them and why – so here goes.

Soon after I got 'Pearl' a horrible rattle came from the engine, but lasted no more than 5 seconds or so but she ran fine all the way to the New Brighton Rally and back home. Investigation showed a piston to be shattered (on the left) and this had been caused by a little-end screw shearing off and getting trapped between the piston and con-rod as it fought it's way down to the sump. Ouch! The piston on the right is from another engine, but this time it only knocked a couple of pieces off the bottom of the skirt. Apart from the damage to the pistons, one rod was bent and in both cases the gudgeon pin had moved in the piston and rod, carving nice 'tram-lines' in the cylinder bore.

Why had the screws sheared?

1. They were not high-tensile and nor were the ones supplied by one of our main suppliers! Yes, they were black, but not HT.

2. Had they been over tightened? Who knows – but probably. You can't get a socket and torque wrench on them so it is all down to 'feel'. Too tight and the result is as above. Too slack and the gudgeon pin is not clamped sufficiently to stop it 'fretting' in the con-rod eye.



This is what got me thinking that there had to be a better way and Unbrako Allen screws were the answer.

They are HT (very) and by choosing a 'cap head' I could use a straight Allen-key to get outside the skirt and apply my torque wrench via a series of adaptors.

The picture above shows the general principle and the other is a close-up of the screw and Allen key in place. I hope the above will give you 'food for thought', but I stress that this is my opinion only – perhaps there are those amongst you who decry any variation on the 'original'?

I leave you to decide.
John Hopwood.