

Austin Seven handling

My A7 handled really well on flat smooth road surfaces but displayed an alarming tendency to wander around with a mind of its own on uneven roads, especially when travelling any quicker than about 40 mph. This wandering was particularly noticeable where the tyres of heavy lorries had made slight longitudinal grooves in main roads, where the Seven simply refused to maintain a straight trajectory whilst travelling along the 'summit' between grooves.

After consulting several A7 experts, a number of books and of course the Web – I compiled the following list of the possible causes of steering wander ...

1. Bent or misaligned front axle
2. Incorrect toe-in
3. Wrong tyre pressures
4. Play in front spring shackles
5. Worn king-pins/bushes
6. Slack king-pin cotters or worn axle eyes
7. High levels of alcohol in driver's bloodstream
8. Play in track rod or drag link joints
9. Insecure radius arm location at the chassis ball-joint
10. Play in the steering box (longitudinal meshing and steering arm bush)
11. Loose rear springs
12. Worn rear spring pins/bushes
13. Lack of front axle castor angle
14. Lack of positive transverse body to front axle location

I carefully checked and corrected where necessary, the first 12 points of this formidable list – but the problem persisted. Interestingly, the remaining areas for consideration are inherent design features of the A7, suggesting that all Sevens might suffer a tendency to wander. However, that is not my experience.

Anyway, my attention to the last two points is described in the following notes

Castor angle

An examination of the fore and aft angle of my front axle revealed only a degree or so of castor, so, I decided to increase this a little . In the dim and distant past I once tried to achieve some self-centring of the A7 steering by lowering the radius arm ball-joint to increase the castor angle. This car had the later radius arms each with a two bolt fixing at the axle - so, lowering the ball-joint seemed the only easy way to achieve increased castor. Maybe at 1.5" I overdid the lowering but there was no noticeable improvement in self-centring and the steering became unmanageably heavy. The ball-joint was quickly returned to the position determined by Sir Herbert.

A recent chance conversation with the very knowledgeable Malcolm Lyon - revealed that he had slightly rotated the earlier radius arms (tops outwards) on his Chummy to introduce additional

castor and it had dramatically improved the directional stability of his car. However, when I tried this, the axle refused to move until I slackened-off the front spring U-bolts. I was then reluctant to simply re-tighten everything, knowing it would impose severe stress on the shackles. So, I machined and inserted a thin mild steel wedge the width of the spring and about eight inches long tapering from nothing at the front to about $3/32''$ at the back with a locating hole in the centre. The wedge was fitted between the chassis nose piece and the top of the spring and the U-bolts securely tightened.

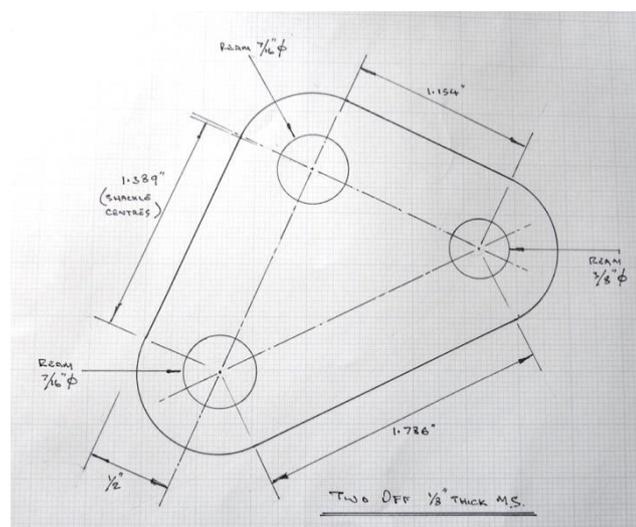
I rechecked the castor angle which had now become around 3.5° and there seemed to be no noticeable stress on the shackles. Basic trigonometry revealed that this corresponded correctly with a spring width of $1.54''$ assuming that the underside of the chassis nosepiece lies in a horizontal plane. The car's stability was noticeably improved and thankfully, the steering remained light. However, there was still a slight remaining tendency to wander.

Transverse body to front axle location

The transverse A7 front spring conveys the weight of the car to the axle, also bump loads (lots of these in Herefordshire) from the axle to the spring – all via a pair of shackles, one at each end of the spring. Unfortunately, this configuration allows the front of the car to 'rock' from side to side if it feels so inclined. It seems this is not a problem at low speeds but does seem undesirable and possibly contributes to instability when travelling more quickly.

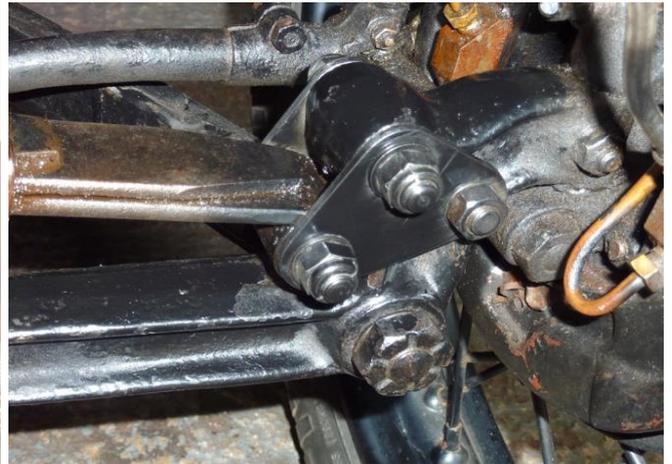
My first attempt to resist this lateral movement was to remove one of the alloy front damper links and modify the side arm to attach it (with a close fitting bush) directly to the damper pin in the axle. This in effect provided a 'Panhard rod' and definitely improved the handling. However, this approach applies a fairly hefty load to the small nylon bush at the centre of the damper which is not ideal and did not entirely cure the tendency to wander.

Finally, in an attempt to completely eliminate any possible sideways axle movement relative to the chassis - I removed one spring shackle and replaced it with a pair of triangular plates that bolt rigidly to the axle whilst allowing the spring eye to rotate a small amount. Incidentally, my front axle is the slightly more robust variety from a late A7 that conveniently already had a hole for the extra top radius arm bolt – although I am using earlier arms (boxed of course).





Using a half shackle as a jig



Shackle replacement plates in place

I found it difficult to take accurate plate dimensions from the car, so drilled the second 'shackle position' hole using a half shackle as a jig. This was initially drilled 3/8" Dia (as per the shackle) then opened-up and finally reamed 7/16" Dia. The location of the third hole is less critical but happily my measurements proved spot-on. This third hole was drilled and reamed 3/8" Dia and required a spacer beneath the front plate before bolting-up tight.

The two top bolts (one 7/16" Dia and one 3/8" Dia) were turned-up from mild steel but I made the lower pivot from Silver Steel. I'll check it for wear and replace it with a case hardened pin if necessary.

The result is amazing, the car is now fabulously stable and a joy to drive – our wandering days are over at last.

..... Spanner