The majority of these tips have appeared in club newsletters over the years. Please note that you use them at your own risk as neither the Bristol Austin 7 Club nor the authors can be responsible for the results of trying to follow the instructions given.

Shock absorbers - rear - by Ron Hayhurst

Shock absorbers are often amongst the components to receive little maintenance and can end up offering little of their intended damping action. A strip down may reveal a glazed rusty appearance on the metal face next to the friction discs, the discs themselves may be worn and the centre bush may be damaged. So the first tip (obvious of course!) is to carry out an overhaul. The second tip describes a relatively easy way to increase the effectiveness of the rear shock absorbers by loading up the spring which pulls the friction parts together. The procedure for the overhaul of a rear shock absorber, including an exploded diagram of the parts, can be found in the popular “Austin Seven Manual” by the late Doug Woodrow. The method is briefly summarised here with a few additional thoughts.

The Overhaul

Remove the lock nuts securing the assembly of spring, discs and arms to the chassis bracket and swing down the shock absorber arm. Beware of asbestos dust! Decide if the rubber bushes in the alloy link to the spring pin need to be replaced and, if this is the case, remove link and lift out the arm. Clean any rust from the face mating with the friction discs and check the faces are flat i.e., no distortion. Ideally there should be clean metal in contact with the friction disc but in practice it will tend to rust up unless the car is in very regular use. Thereafter this glazed surface will offer less resistance to movement and be less effective. Thoroughly clean off the faces of the chassis bracket as well as the brass discs which go on either side. Consider fitting new brass discs if they are worn or distorted. These discs are not intended to move relative to the bracket so it’s a good idea to glue them on, having checked that they will be dead parallel to each other. Replace the centre bush, friction discs and, if necessary, the rubber bushes in the alloy links – all available from our usual suppliers.

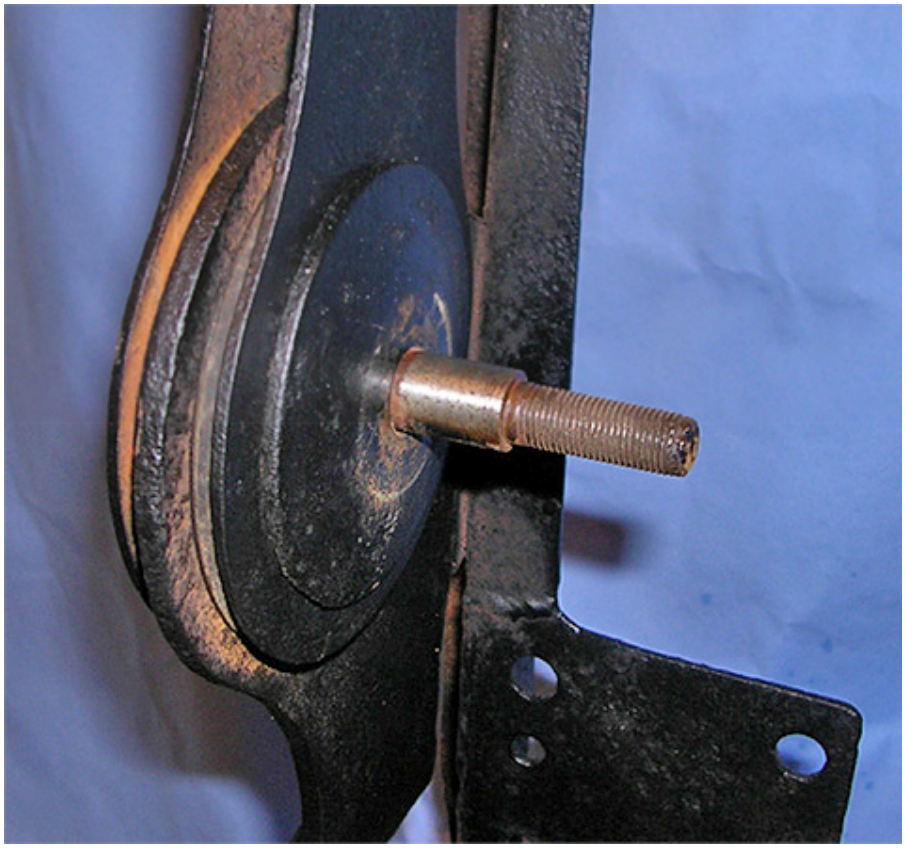
The Modification

The long frame models of the A7, although considerably heavier than the short

chassis cars, still retained the same design of rear shock absorber with a long arm from the axle damped by two friction discs “loaded” by a heavy spring secured between a cup washer and a dished washer. On the low frame model, although the discs and spring arrangement remain the same, the arm is much shorter, allowing more resistance to movement at this reduced radius. Now many will remember from their school days the simple formula $F = \mu R$ for calculating the force F needed to move one part against another, against a resistance due to friction. R is the closing force between the two parts and μ is the friction factor for the pairing of these items. In other words if we want to increase the resistance F, offered by the shocker we need to increase the friction factor μ or increase R by putting in more spring load.

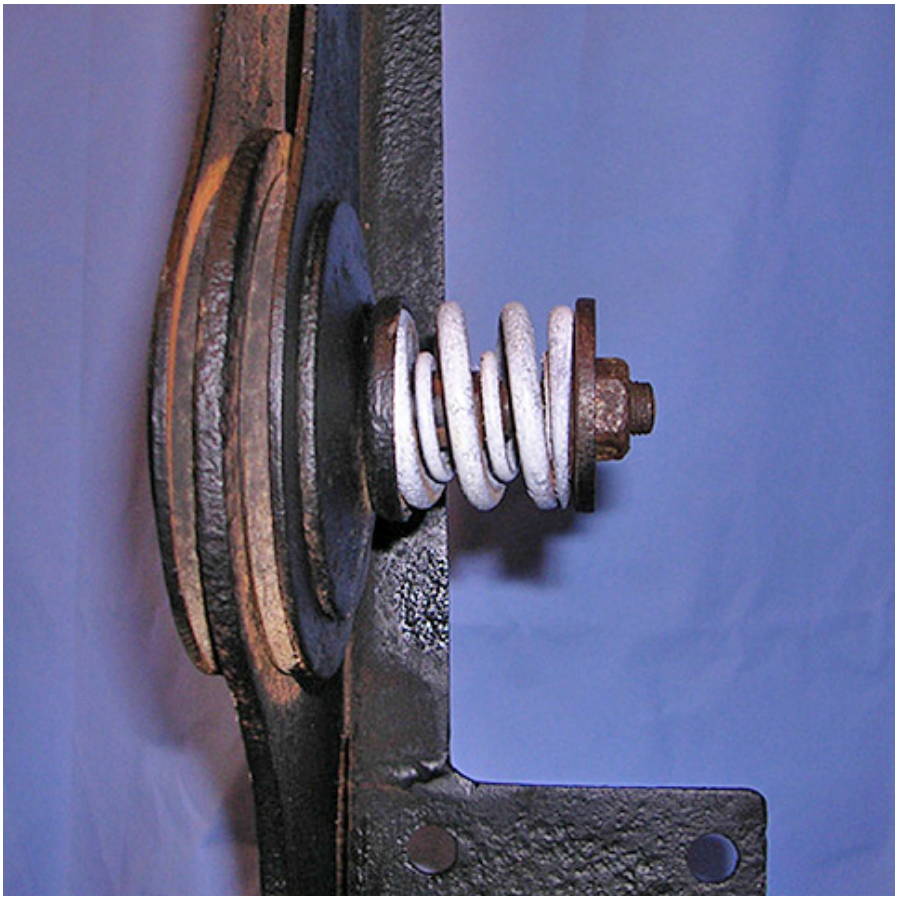
An overhaul of each shock absorber may help to restore the friction factor but a more positive action is to increase the closing force by modifying the spring arrangement.

The mushroom shaped centre bolt, with its threaded portion to carry the lock nuts, and the spring are designed as a pair. This is so that when all of the parts are assembled and pulled tight, by taking the dished washer up to the shoulder on the stem of the mushroom, the spring is just short of being coil-bound. It should still be possible to get a feeler gauge between the coils so that a controlled load is applied rather than it being pulled up “solid”. I have estimated that this maximum load would be about 200lb*.



Centre bolt showing shoulder for dished washer

According to some handbooks this may make the shock absorber too stiff. I felt that it wasn't stiff enough. With this in mind I noticed that a valve spring could be placed inside the standard spring and could add to the closing force; although admittedly, at 1⅝" it was too long and would become coil-bound.



Loosely assembled pair of springs

Using an angle grinder the valve spring was cut across a diameter to reduce its length to 1⅜" taking it down to about 5½ turns. It was checked by placing it on the centre bolt with all the other components except the original spring, fully loading it between the washers with the locknut, and then checking with a feeler gauge that it was just short of being coil-bound. Finally, the original spring was added and the assembly boxed up. I estimate that the load to compress the modified spring is about 60lb*. It is therefore likely that there has been a 30% increase on the maximum load that can now be applied to the shock absorber spring arrangement.

After carrying out this mod on my 1934 Four Seat Tourer I noticed a marked improvement in the ride and handling of the car. I now intend to do the same on the Box Saloon.

Further Thoughts

There are other ways of improving (increasing) the spring load e.g. with a spring stiffer than the valve spring but having comparable dimensions. If the original

spring is replaced with a bigger one, there will be a need to alter the cup and dished washer that encloses it. In a thread on www.AustinSevenFriends.com there was mention of adding a third arm and disc to the shock absorber. No mention was made of adding more closing load but, in my opinion, this would be essential if the load was not to be “shared” by the new surfaces. We rarely get any correspondence in the newsletter, but if anyone has any additional thoughts or disagreements on the above, or can supply the spring rates and/or their maximum loads I would welcome it. All grist for the mill!

In a later article I will pass on some of the details, published by others, on methods of stiffening up the front suspension.

Ron Hayhurst

* It is not too easy to accurately measure these loads but I would say they were OK to within 5%. If someone could determine them more accurately it would make a useful contribution.