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SELECTING THE RIGHT SHOCK LENGTH



ASK THE EXPERTS

SUSPENSION TECH WITH SUPERIOR ENGINEERING

Our suspension expert, Michael Hayes, shows us the right way to ensure you select the correct shock length

With all the amazing shocks and suspension parts available now, you may get to the point of needing to work out just what is the right shock length to suit your vehicle and what will work for YOU! Sure a lot of our rigs are similar, but more often than not unless you are buying an off the shelf mass produced kit, we will all seem to need something just a bit different to get the most out of our setup. Often simple differences like changes to bumpstop heights, air-bag helpers or swaybar-disconnects can play a large part in what available travel needs to be considered.

With IFS front vehicles, measuring the amount of safe travel can be quite difficult as it generally requires removing the spring from the strut and cycling the suspension.

It is interesting to note that in many situations the factory length shock is often very close in travel to what the other components such as CVs and steering will allow before binding and damage. Fancy marketing with claims of massive travel gains should be taken with a grain of salt unless they are combined with a heap of other parts.

So how do we find the correct length? Easy, measure the suspension travel at the shock mounting points! The hardest part is finding a safe way to max out the

flex on the axle. Stretch one side out, compress the other – both as much as possible. This can be done several ways, a ditch, a flex ramp or a small, loud Japanese car with stupid stickers can work well. Jokes aside, ALWAYS test in a safe manner, ensure the vehicle is positioned safely and stationary before climbing underneath with a tape measure. Measure between the shock mounts, at the actual mounting locations either the centre of stud/pin or bolt holes. Measure both sides, the extension and compression will give you the needed shock travel data. Ideally, add at least 10-15mm to the minimum compression dimension. This keeps the shock from acting as the bumpstop and damaging the internals.

If you are in doubt about how much your shock shaft is cycling, run travel indicators, such as O-rings or zip ties on the shaft to reveal how far the shock shaft is traveling during compression. This is a great visual illustration as to what is happening under your rig in the real world. Things to look out for when measuring for collapsed length are chassis, link, tyre interference issues, overwrapping of the leaf-spring packs, and coil bind on a coil suspension. It is also important to know that as a general rule, installing longer shocks will almost always require a corresponding change to the height of the bumpstop. The reason for this is

that the longer a shock's travel is, the longer the collapsed length is. This is why suspension manufacturers often include bumpstop extensions with lift kits.

Most good manufacturers will have dimensions for their shocks readily available and can also cross reference similar models that may suit. Look up your stock application and take note of the mounting points (shock ends). You may find a shock that matches your range well or you may have to possibly consider modifying your existing shock mounts to maximise your shock travel, such as installing raised shock towers.

When choosing extended length shocks be careful not to overextend the brake lines, exceed safe driveshaft angles, or on coil-sprung vehicles, allow the coil spring to unseat (coil drop-outs may be required).

For leaf spring suspensions, you may see the maximum droop as the point where you run out of spring/shackle length and the axle cannot drop any further, or you may have other limiting factors such as tire interference, spring bind, etc.

On some performance applications where lots of unsprung mass and high speeds are present together, it is important to pair shocks with limiting straps. Most shocks are not designed for the high tensile loads that may be experienced at full droop when heavy axles and high-velocity shock

cycling are mixed.

Ideally select the most efficient shock you can, that suits the purpose of the vehicle. Then get the longest CLOSED length shock that fits (minus a little bit for bump clearance). That way you get the most amount of possible travel for that specific vehicles geometry. In vehicles with plenty of suspension / shock room then it may be necessary to consider the open length to allow the springs to remain retained at full travel.

Matching springs to shocks is also something that needs to be considered. Many off the shelf springs are often a rehash of modification of an existing spring to get another spring in their range. An example of a correctly designed spring are the Superior Engineering coils that were designed specifically to fit each lift size and to suit the range of shocks available for that lift.

For many of us getting dirty, unbolting, ramping, twisting and measuring is just too much and this is where sometimes it is far better to consult a local suspension specialist that has a reputation for supplying and fitting properly designed long travel kits. www.superiorengineering.com.au

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