REAR SUSPENSION, SHOCKS AND SPRINGS

NOTICE

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REVISING THE EARLY TR-6 REAR SUSPENSION GEOMETRY

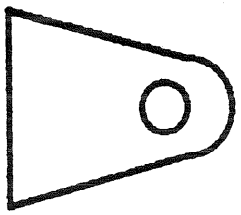
Skill Level B/C

Sometime in 1972 the factory changed the rear suspension mounting brackets. They supposedly did this to lessen squat on acceleration and to correct the definite negative camber the TR-6 took on after a few miles. It appears the springs were changed also but TR-6 rear springs are a real point of debate. At present I'd estimate there must be about 17 different varieties out there between the factory and the aftermarket suppliers. Essentially what they did was take the early inner bracket which was about symmetrical top and bottom (top illustration below) and move it to the outside. They then made a new inner bracket which was level on the bottom (lower illustration below), thus dropping the inner end of the suspension arm. Now to my mind this would swing the inner end lower and make the camber (tilt of wheel in at the top) worse. Anyhow it don't seem to work that way. So much for my career as a suspension designer at Lotus.

Since the factory did this and we all know that all factories at all times know what they are doing and are doing it for our benefit, it seems like a good idea for us to do the same. One small problem - the late inner bracket is not available.

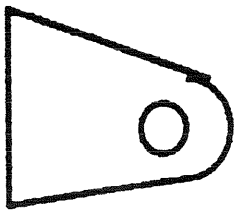
Since the early outer bracket is somewhere between the two, sloping more on the bottom than on the top (reverse of center illustration below), I reasoned that it might help to reverse the brackets and turn the former outer one over. After this profound and extended analysis I proceded with the change, which was not too much of a job since I previously reversed the bolt thru the bushing in the suspension arm on the inner bracket. This can be done by putting about 3 washers under the bolt head when reassembling to keep the bolt from hitting the inner frame rail. Since you'll not be able to just drop the bushing bolts, and must pull the suspension with brackets attached back far enough to get the mounting bolts out of the frame, allow about a day for this job. Just use the drawings below for reference on positioning the brackets *and notches*

I *think* the rear squats less and maybe even has a *little* less camber. However the car does seem to handle better (more neutral in long sweeping curves). It has the latest version of the Roadster Factory "mild competition springs" which seem to me to be just about right. I have a set of their early competition springs which I got back at TRials 84 and they are so damn stiff I'm thinking of putting them in my Studebaker. Since I rarely have the opportunity or the nerve to push my TR-6 really hard on winding country roads, I believe we should make it clear that this is merely a report on something I tried and anyone doing it does so at their own risk.



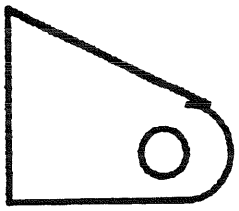
Early Inner &
Late Outer
1 Notch Up

Revised Early Outer
1 Notch Up



Early Outer
2 Notches up

Revised Early Inner
2 Notches Down



Late Inner
3 Notches up

REAR SUSPENSION BRACKETS

REAR SUSPENSION BUMP STOP REPLACEMENT

Skill level D

If it feels and sounds like you've just been rear ended by a tank when you hit a bump, chances are your rear springs are weak and the rear bump stops are gone. Spring replacement is relatively easy. It is covered in the manuals so we'll let that job slide for now. However, you can get into a real mess trying to replace the bump stops. The bump stops on the rear suspension are those rubber cone shaped things - one under the middle of the rear shock absorber arm and the other in the rear suspension arm (the big aluminum part the spring sets on). Above the latter there is a vertical protrusion on the body about 1 1/2" square which the rubber stop strikes when the suspension comes up all the way. Chances that either one still remain on your car are slim unless it has been driven gently from new. This is due to the very soft original rear springs and shocks.

Look for a washer about 1 1/2" in diameter with some traces of rubber on the face. Hopefully, you haven't tried to replace one of these and had it break off. The one in the suspension arm is especially prone to this since the metals are dissimilar (steel bolt on the stop and an aluminum suspension arm). The only cure in that case is to carefully center punch the broken bolt and drill it out. If you get off-center with the drill, you're in deep dog do Charlie.

The easy way is to heat the bolt. If there is any of the rubber left, cut it away with a knife or chissel. Now heat the top of the bolt as hot and rapidly as possible, dark red hot is ideal. An acetylene torch is best but a propane torch will do. If you are not sure the bolt is hot enough, try heating the aluminum base just below it. Let cool for about 10 to 20 seconds. Get a good grip on the washer part of the stop with a pipe wrench. Try turning with a steady, hard push. Do not hammer on the pipe wrench. If it doesn't give, try the torch again. Once it starts turning, squirt some WD-40 or other penetrant under the washer. It will probably burn off and little if any will get to the bolt, but keep it up as you keep turning the bolt . Within about 3 turns the stop should start turning out freely. When installing the new bump stop, coat the threads liberally with anti-sieze.

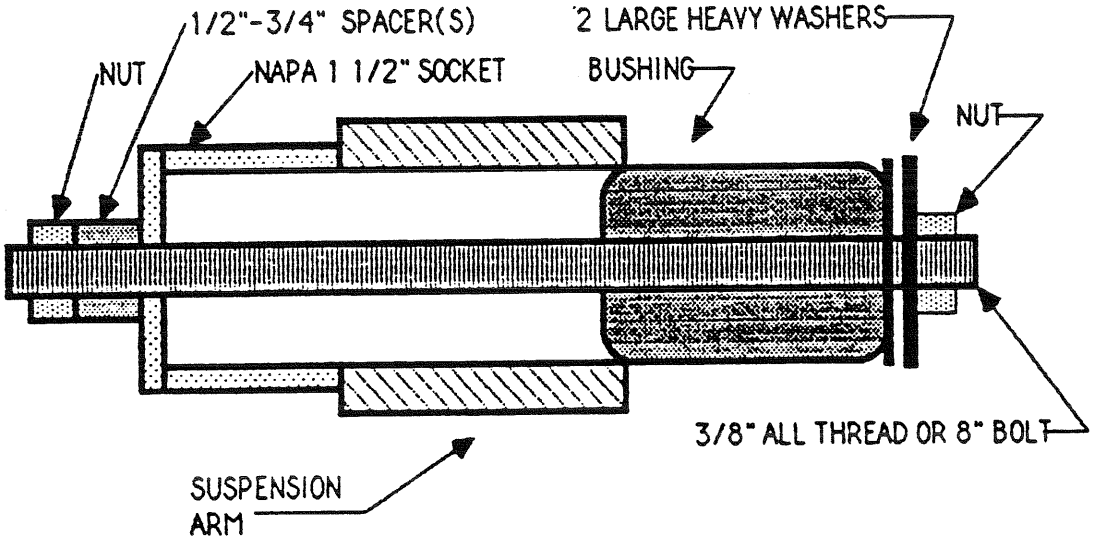
INSTALLING REAR SUSPENSION BUSHINGS WITH HAND TOOLS

Skill Level B

Many owners of cars with severe rear camber try new springs and virtually every weird gimmick you can think of but just won't concede their problem is worn bushings in the suspension arms. Maybe it is the cost of having it done or that they don't feel they can handle the job. Unless the rear of your car sets much lower than the front or the crossmembers are rusted out, the odds are you need bushings. Here is a way you can do it with an electric drill and hand tools in an afternoon.

Removing the suspension arm is adequately described in the manuals so I won't go into that. However, I can tell you that if you carefully loosen the brake line mounting lock bolt at the hose and the clip, you can ease the brake backing plate off without loosening the connection at the brake cylinder.

To remove the old bushing, drill as many holes through it as you can. The holes should be as large as possible but not allow the drill to cut into the suspension arm. The old bushing can then be easily knocked out. Clean the hole and coat liberally with Armorall. Coat the bushing liberally with Armorall and assemble it and the other components as shown below.



Tightening the bolt and nut (or all-thread rod and nuts) will ease the bushings nearly all the way in. Near the end you may have to use only the smaller diameter spacer, tightening it on the steel bushing sleeve to get the bushing fully in place.

REAR SPRINGS

There are 3 things which give TR-6 owners more trouble than probably all other complaints combined. First is rear frame rust, second is rear axles, and third is "good" rear springs. The first two you can control to some degree through reasonable maintenance. Really, we should not complain because most axles, and certainly frames, have lasted as long as the normal design life of the car. Springs, on the other hand were never really that good to begin with - especially on the early cars. Various aftermarket springs varied from some I felt like putting on my Studebaker truck because they were so stiff to some that had sagged virtually to the axles within a few weeks. Needless to say, with between 150,000 and over 300,000 miles on each of three TR-6s, we went through a lot of springs. I guess the most frustrating thing about all this was that the same terms, "stock", "competition", "mild competition", keep popping up in every suppliers ads. Are the "mild competion" the same from all suppliers? I doubt it.

I have yet to find my ideal pair. There is little doubt in my mind that the "competition" set (about 5 years old) I have on one early car are far stiffer, and perhaps longer, than the ones on the the other (installed about 6 months ago) which I got from the same supplier.

I think there is a better way than the designations "stock", "competition", etc. Most (perhaps all) spring manufacturers code their springs with colors. The latest set of "mild competition" springs I got have a yellow and white code. I consider them just about right. They are maybe a little softer than I'd like, but certainly far better than the "God-awful stiff" ones on the other car. Also, to get the right camber and rear standing height they require the spacers sold by the major suppliers at another $50 (high, but worth it when you see that they are machined aluminum). The '72 has the late suspension mounting brackets, which help dampen the rear end "squat" some, and is equipped with green and white code springs. I consider them acceptable. I'd recommend specifying in your order either if available (preferably the yellow/white).