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Miata Suspension Part 4- Springs

Before I start in on Springs, I thought I would do an update on the Motorcraft Synthetic Tranny Lube for the Miata 6 speed Manual Transmission. So far there are 3 of us in the club who have changed their 6 speed manual transmissions over to the Motorcraft XT-M5-QS. One of the Miatas was a NB (2001 or 2002) and the other two of us own the newer NC Miatas (2006 and newer). All 3 of us have found a marked improvement in the smoothness of shifting. The NC 6 speed manual has a reputation of being “notchy” when shifting from 1st to 2nd gear, and sometimes 3rd gear can be a little notchy. This fluid was specially designed for high performance manual transmissions and does a great job of smoothing out the shifting. If it is time to change the fluid in your 6 speed manual transmission, do yourself a favor. Make an appointment with your Ford dealer and have them put this fluid in. Remember to specifically ask for it. Or buy 3 quarts and do it yourself. I am always willing to help someone do this too.

“Miata Springs”

The springs in your Miata do more than just hold the car up off of the road. For example they also push “down” to keep the tires ON the road. The shocks help with that too, but Shocks are for next month. As I said before, the suspension in the Miata is a compromise between handling and a comfy ride. Mazda found out that a lot of people buy the Miata for leisure driving more than for hard racing, so they designed the suspension softer for a comfortable ride rather than stiff for high performance. Your Miata OEM Springs are soft enough to give a decent ride, but stiff enough for some fun while cornering.

The Miata also uses what the Industry calls a “Coil Over”, which means the springs are mounted right on the shock absorbers. Most “family” cars have springs separate in the suspension, or on Front Struts like our old Dodge Minivan had. The Springs mounted right on the shock like in the Miata are the best for performance handling.

There are 2 basic types of Springs, and many variations of them. Fixed rate springs, and variable rate springs. Springs are rated by how much force it requires to compress the individual spring by one inch.

A fixed rate spring has the coils wound evenly from top to bottom. They can be made either soft for a cushy ride, or very firm for Autocross or Racing. When racing, you may go thru a series of quick left and right turns at high speeds and

sometimes one right after the other. To be better able to do this, you need stiffer sway bars and stiffer springs. You need to control the roll of the car body so it does not lurch from one side to the other as you go thru these “S” type curves. So a stiff suspension of high performance Springs and Sway Bars work together to keep the car body more level as you push thru the “S” curves. For my own driving, I like the combination I have done to mine by just adding a stiffer matched set of front & rear sway bars and keeping the stock “compromise” springs. My springs are stiff enough for my type of sporty driving, and the sway bars I have added help control the car’s body roll in the “S Curves”.

I have attached a picture here of the shocks I replaced on my previous 2002 Miata. You can see what I meant by “Coil Over Shocks”, as the shocks and springs are assembled as one unit and then installed in the car. This is not a Strut, but a Shock. You can also see that the coil springs are fixed rate springs, as the spacing between the coils are the same from one end to the other. The shorter springs & shocks go to the front, and the longer ones go to the rear.



Variable rate springs are made with one end of the coil spring having the coils close together, and varying to the other end where the coils are farther apart. The end where the coils are close together gives a softer ride, and the other end where the coils are far apart give a stiffer ride. These type of springs are mainly used for load carrying vehicles like a 4 door family car, or a pick up truck that might have coil springs on the rear. When the vehicle is unloaded, the softer end

of the springs make the ride more smooth and comfy. But when loaded, the softer spring coils squeeze close together and the stiffer end of the springs carry the weight.

The thing to remember when modifying your Miata is that if you are happy with the way something is, don't change it! □ But if you want make something perform better, be sure to talk to the proper people where you might buy what you are going to change. You can easily make the car perform worse by changing something and not buying the right part. If you want to modify your springs, you might talk to Brian Goodwin, at Goodwin Racing. His company specializes in all kinds of performance parts to upgrade a Miata. He has a 2006 Miata he has been racing since they first came out. He raced the earlier series Miatas before too, and he won't steer you wrong. He also makes the line of RoadsterSport after market mufflers.