

Flyin' Miata

INSTALLATION INSTRUCTIONS



V-MAXX
13-16XXX



Congratulations on purchasing your new suspension. These instructions will not tell you how to remove/install Miata springs and shocks, but will give you V-Maxx-specific instruction. If the original V-Maxx instructions are present (an exploded diagram), please disregard them. If you'd like details on how to pull the shocks out of a Miata, we recommend *Mazda Miata Performance Projects*, available from Flyin' Miata.

WARNING: Not everyone can perform every installation. It is critical that you be honest with yourself in regards to your ability. We're more than happy to help, but there are only so many things we can do from the other end of a phone / computer. If in doubt, discuss the install with us before you dive in. Improper installation could cause injury and / or death!

Torque specs

- **Upper shock nuts: Tighten until upper bushing is close to same OD as upper washer**
- **End links: 27-40 lb-ft**
- **Lower shock bolt: 54-69 lb-ft**
- **Upper shock mount nuts: 22-27 lb-ft**
- **Front upper inner control arm bolts: 87-101 lb-ft**

Pre-assembly checklist:

Please note that the V-Maxx shocks have a shorter body than other Miata shocks, and are thus incompatible with our FM upper shock mounts or other high-travel mounts as this will extend the shock travel beyond the limitations of the Miata suspension.

It's a good idea to be sure that the springs are on the correct shocks. The front (longer) shocks should have the 200-70 (Sport / Classic) / 140-90 (Track) springs, the rear (shorter) shocks should have the 185-46 (Sport / Classic) / 170-60 (Track) springs. The smaller secondary springs should be present on rear shocks only for Classic and Sport setups and all four corners (same spring, 100-20) for Track setups.

The front Classic / Sport springs (200-70) are longer (relatively speaking) than the rear springs, so the secondary springs aren't used here.

Look at the plastic piece that goes between the two springs on the rear (1) - be sure that plastic piece isn't on the front shocks (Classic and Sport only), remove if necessary.

The black rubber / plastic boots (2) are frequently cracked or missing, but since they don't serve any purpose this doesn't matter. It's typically best to remove them prior to installation.



Slide the bumpstop down onto the shock shaft - it doesn't matter which way is up - being sure to follow the order shown in the picture. **The secondary spring (100-20) should go on the bottom, and the main spring on top.** This is so that the plastic piece that goes between the two won't catch on the top of the shock. The springs probably won't be in this orientation when they come out of the box, be sure to correct it. There is no rubber between the machined blue (now black) spring guide (be sure the conical side faces up) and the upper mount. The assembly sequence is shown here. Note the lower bushing is the one with the "UP" marking - this marking goes towards the top when installed. If you have one of the 1990 - 97 NB conversion kits, all the parts you need will be supplied. If you bought an NB V-Maxx kit, you'll reuse your shock mount parts.



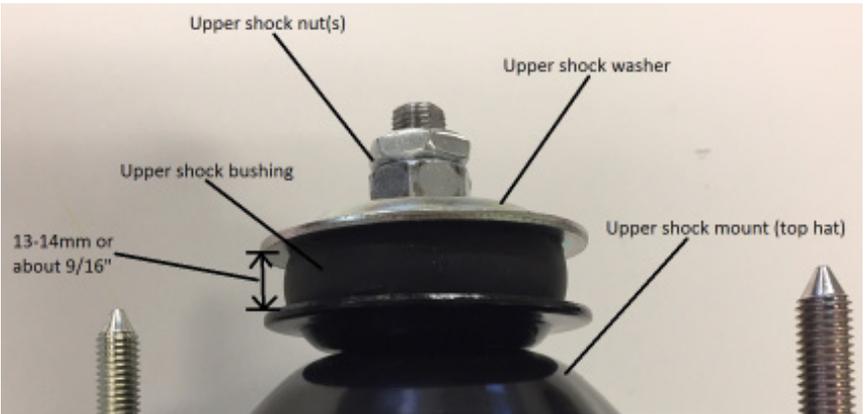
Thread the spring perch down to allow you to more easily install the shock mount - because of the adjustable spring perch, no spring compressor is necessary for installation of this setup.

If you're reusing the shock mounts (NB only), you'll need a spring compressor to disassemble the stock parts.



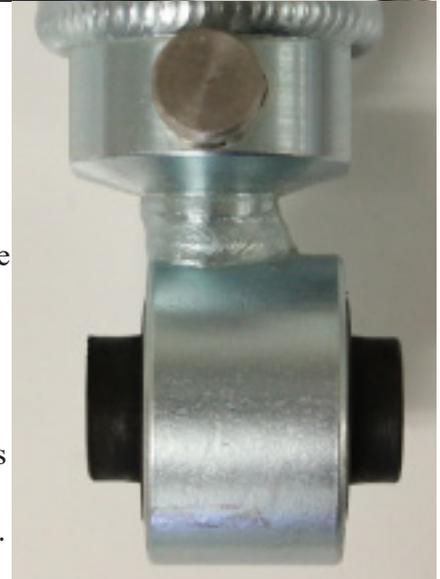
Be **VERY CAREFUL** threading the nuts onto the shock shaft, as the threads are very fine so it's easy to get them cross-threaded. When you tighten the top nuts, do NOT use an impact wrench. You **WILL** strip things. Be sure to use the included nuts, not the stock nuts (regardless of what you may read elsewhere). There are flats on the

top of the shock shaft that can help you keep the shock shaft from spinning if need be. Tighten the thin nut until the top washer is roughly 9/16" (14mm) away from the shock mount (as shown). Double-check this once the car is on its wheels. For the lower bushings (connecting the shock to the control arm), as well as any other rubber bushings that have been loosened, don't tighten them until all four corners are on the ground.



The lower bushings on the rear shocks are offset. This is intentional, so that the shock body will have as much clearance as possible on the axle. Be sure that the shocks are installed such that the offset pushes the shock farther away from the axle / more rearward. Classic rear shocks don't have a left or a right, but XXtreme rear shocks do - be sure that the shock body is rearward AND the damping adjustment knob is towards the outside / wheel.

When you slip the shock/spring assembly into place, thread the perch down. This allows you to compress the shock, which make the whole assembly shorter, which makes it easier to install the assembly. Thread the perch up to the suggested measurements below once the assembly has been bolted into place. Again, you can fully tighten the top nuts (don't overtorque them), but leave the lower shock bolt loose for the time being.



Perch heights / damping:

The ride height of the car is set by the height of the adjustable perches. The range of adjustment in the V-Maxx shocks allows you to lower the car to the point of uselessness. We don't recommend you slam the car too low, as you need to retain some suspension travel for good handling and ride. If you measure from the center of the wheel to the bottom of the fender, a good target would be around 12" in the front and 12.5" in the rear. You can run the car a bit higher than that (1/2" or so), but running the car too high will cause coil bind, which will damage the springs.

To start, set the perches as shown to the right (numbers are for Sport springs only, Track perches should be a bit lower in the rear), measured from the center of the lower mounting point to the bottom of the lower perch / lock nut (7.5" front, 5" rear). Once you have them installed and are adjusting the ride height with the weight of the car on the springs, apply some silicone lube to the threads and the base of the spring to help everything spin more easily. **These are starting numbers, you will most likely need to adjust from here.**

These springs do tend to settle initially, so don't worry about getting the ride height perfect until you have at least 100 miles on them.

Once the ride height has been set, you'll need to tighten the rubber bushings. ALL of the rubber bushings must be loosened and re-tightened at proper ride height. Once the car is back on its wheels with the correct ride height, roll it back and forth a few times to make sure everything is settled. At this point, tighten all of the bushings. Our hub stands make the rolling unneeded. Ramps are acceptable for this, but jack stands (which will leave the wheels at full droop) aren't. Our hub stands are by far the best tool, they give you more access while also negating the need to roll out the car.

Moving the perch up (towards the shock mount) equals a higher ride height, moving it down (towards the ground) equals a lower ride height. The motion ratio is roughly .7, so for every .7" the spring perch moves, the ride height will change 1". It's typically easiest to round it to 2:1.

If you got the V-Maxx XXtremes, you'll want to set the damping as follows. All settings are from full stiff (full stiff = all the way clockwise). The total number of clicks may vary slightly from shock to shock, but as long as you count backwards from full stiff the settings will be accurate and matched.

	Front	Rear
Track	2 clicks	4 clicks
Sport	18 clicks	20 clicks



Alignment:

A good alignment makes a huge difference to car handling. The standard numbers from Mazda are fairly vague and don't necessarily flatter the Miata. A precision alignment can make even a standard Miata more fun to drive. Don't set the alignment until your ride height is properly set. As noted above, the springs have a tendency to settle, so it's typically best to wait 100 miles or so before getting an alignment. Remember that your alignment is relative to your ride height, and the springs tend to settle a bit (i.e., decrease your ride height) after installation. It's typically easiest to roughly set the ride height upon initial installation, put 100 miles on the car, then get it aligned. It's fine to get it aligned immediately after installation, but be sure your ride height is correct at that point. Also be sure to check it for the next 100 miles or so and adjust if need be.

These are the numbers that we use at Flyin' Miata. No, really - if you call asking for the super-secret setup we keep for ourselves, you'll find out that there isn't one. They work well for cars fitted with our suspension kits or stock setups. There is no odd tire wear. Racers might want to vary their setup based on their particular needs, of course. If you take your car to an alignment shop, ask them to come as close as possible to these settings. For a full discussion of what these numbers mean, you can read *Miata Performance Projects*.

It's possible that not all cars will be able to reach these numbers. If this is the case, please call or email our tech department (below) and we'll be able to advise you.

Front:

Caster: 5.0 degrees

Camber: 1.0 degrees negative

Toe-in: 1/16" or .15° or 9 arcminutes total

Rear:

Camber: 1.5 degrees negative

Toe-in: 1/16" or .15° or 9 arcminutes total