

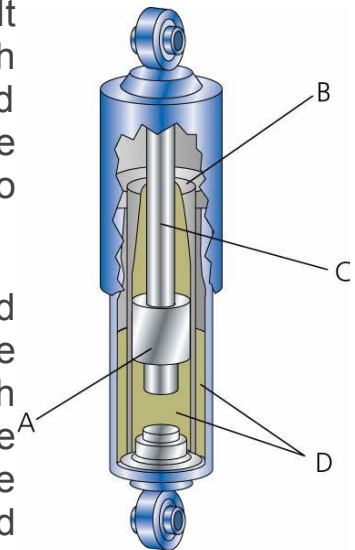
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Miata Suspension, Part 5, “Coilover” Shocks

The “Coilover” shock absorbers on your Miata are critical to handling and safety. In reality they are “dampers”, as they dampen the effect of the bumps on the road surface. Without these “Shocks”, you would not be able to control the car, or to stop. Have you ever seen a child’s toy called a “Slinky”? Without shocks your car would bounce endlessly up and down over the bumps. When you hit the brakes, the shocks help transfer the car’s weight down onto the front tires. Without shocks your car would just bounce front to back while trying to stop. Selecting the proper replacement shocks for your Miata when you need them is something to be carefully considered. Installing the wrong shocks can greatly hurt the performance, as well as installing the proper ones can enhance performance.

The shock absorber is basically a hydraulic pump of sorts. It consists of a tube (B) filled with oil, the rod (C) which connects to the suspension, and the piston (A) on the end of the rod, “D” is the oil. Inside the piston and the shock are sets of valves. These valves are what allow the shocks to do their jobs.

When your car tire hits a bump, the spring is compressed upwards. This is called the “compression cycle”. Without the shock, the spring would push downwards uncontrolled with the same force as the road bump pushed it upwards. The shock absorber valves control the upward bounce of the wheel, and the valves control the rate at which it is pushed down onto the road surface. This downward movement is called the extension or rebound cycle.



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The way the valves are set inside the shock are what makes the difference between a shock for a family car, or a shock for a sports car. If you put “family car” type shocks on your Miata you will wallow and bounce all over the road. It will corner poorly. The shocks also have to be somewhat matched to the spring rates in the car or the springs will overpower them.

If you want to improve the handling of the car, there are many after market shock manufacturers who can help you. Brian Goodwin at Goodwin Racing is a great resource for help when selecting new shocks. Ravenwing Performance, Go Miata, or Moss Motors are also great places to check.

Bilstein Shocks are very good, as they also come standard on many of the Sporty or GT models of the Miata. Some other performance shocks are Koni, Ohlin, and Tokico. Some of these shocks can be sent to the proper facility and have the internal valves changed for particular handling characteristics. Some shocks have external adjustments to change them from softer on the street to firmer for on the track. This lets you make real time adjustments to suite the conditions of the day. The external or internal adjustments vary the way the piston and oil compress and rebound during the bounce cycle therefore controlling the car over the bumps.

Although this is not a very in-depth technical article, I hope it will help some better understand why the car has the shocks and what they do. For more reading click the link below and go to the Monroe Web page.

http://www.monroe.com/support/tec_shockabsorbers.asp