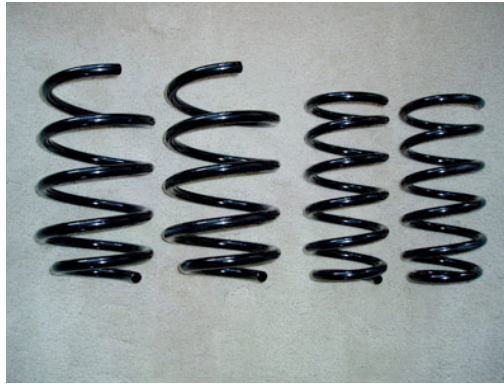


Lowering Springs .EDU



[TSW Linear Lowering Springs for ALL MINI Coopers](#)

Lowering springs are one of the most common car tuning purchases. Technically speaking, lowering springs are components that support the car by means of weight, including passengers and all other load. Lowering springs also help eliminate (or minimize) brake dive, body roll, rear squatting on acceleration and keep a smooth, comfortable ride.

Lowering Springs vs. Performance Springs - Marketing Categories

The main difference between Lowering Springs and Performance Springs is best summed up by a simple definition of each. For the most part, performance springs are designed to help your car realize its optimum handling capabilities. Lowering springs are made to offer a more drastic reduction in ride height. **To decide which is right for you, first determine if you prefer to have your car perform, or look like it performs.**

There is no answer, just personal preference. Should you do most of your performance driving while cruisin', then lowering springs will serve you well. If you are into a little weekend competition, performance springs are better suited for your needs.

No matter what your interests or activities, the worst thing you can do is cut your factory springs. Roland Grath of H&R explained this: "Cutting your factory springs will result in spring rates that are impossible to determine. In addition, without precision forming or cutting equipment, each spring will be cut slightly different. This will give you, at best, unbalanced handling. It could be a very dangerous situation. It could also be a very dangerous situation." (*HCI Oct/Nov 2000 premier issue*)

Design Types: Normal, Step Linear and Progressive Springs

1. Normal Springs (Linear rate Springs, Specific Rate Springs)

In a normal Linear spring, like TSW, space between the coils is equal. Normal (or linear rate) springs are designed to respond with a specific rate when compressed.

Consider we have a 10-coil spring, each coil spaced 2 centimeters apart. Put a load on the spring to compress it 2 centimeters. Because in Normal Springs coils compress at the same rate, these 2 centimeters will be divided into all 10 coils equal, resulting each coil spaced 1, 8 cm apart. Put another additional load which is the same as the first one and the coils will become 1, 6 cm apart.



2. Step Linear Springs (2 Step Linear Springs)

These are springs that have a 2 different spring rate.

In a two-step linear spring, about half the coils have shorter spacing. As the spring compresses, the coils move closer. At a certain point, the shorter spaced coils touch, effectively eliminating them from the spring. You then have a spring comprised of only the longer coils. This "second-step" spring will be much stiffer than the whole spring (the more coils, the easier it is to compress the spring). The result is that you have one set of handling characteristics before the shorter coils touch and then you have another, completely different level of response after they touch.



3. Progressive Springs (Rising Rate Springs, Progressive Rate Springs, Progressive Wound Springs)

In progressive springs each coil is spaced differently and has a variable spring rate. When free, it is easy to compress progressive springs for first centimeters. As you apply more forces, coil on a progressive spring come closer. After a certain point, coil at the top 1/4 of progressive springs begin to touch each other and finally become inactive or dead, and that makes the spring stiffer. Apply more forces to a progressive spring then it becomes stiffer because as the number of active coils in a spring decreases, the spring rate increases. So, progressive springs may both be sensitive to very small bumps on the road, while giving the stiffness you need during hard braking and turning.



Each spring design has its own market.

Progressive springs are likely "all-in one" solutions. Progressive springs are often used on performance aftermarket kits like H&R, Eibach and others, and they are good for daily performance street driving. They help you achieve the highest performance when driving hard, while providing a smooth, comfortable drive the rest of the time.

Linear springs, TSW and JCW are more often used in drag racing, road racing, track and races that require a "high spring rate", in which a constant spring rate is more important than a smooth ride. They are still popular because they are:

1. **Easier to produce and can be made to lower a car beyond the point of progressive springs.**
2. **Easy to work with, because spring rate never changes, allowing quick chassis setup**
3. **Cheaper than progressive springs, allowing most race teams to use several different sets depending on track conditions**

Base of above borrowed from <http://www.tuninglinx.com/html/lowering-springs.html>