PEDDERS TECHSTOP

16/09

NEW REPLACEMENT COIL SPRINGS

SHOCK ABSORBER, SUSPENSION, BRAKES, TOWBARS
AND WHEEL ALIGNMENT SPECIALISTS

One of the most frequently asked questions (F.A.Q.) asked is “Why are the new replacement coil springs lower than the old units” and yet they are supposed to raise the car to a restored standard ride height.

The free height of the new increased rate coil is somewhat important, but not as important as the “loaded ride height”. All Pedders coil springs are designed with a heavier rate. The rate for every coil for every car is designed very carefully and is calculated using a “load verses deflection” formula. In doing so, as the rate is higher, the coil will not deflect as much, so the starting height or the “free Length” will be shorter.

The factors that determine spring rate

There are three main elements to be taken into account when designing a coil spring:

- Material size (Wire diameter).
- The amount of working coils.
- The Mean diameter of the coil.

Spring rate refers to the amount of weight needed to compress a spring a given distance (Example:500lb per inch).

To understand and properly check a spring for rate you need to know the factors that determine the rate of the spring. Fortunately, there are only three things that affect spring rate, so there’s not that much to remember.

Wire diameter

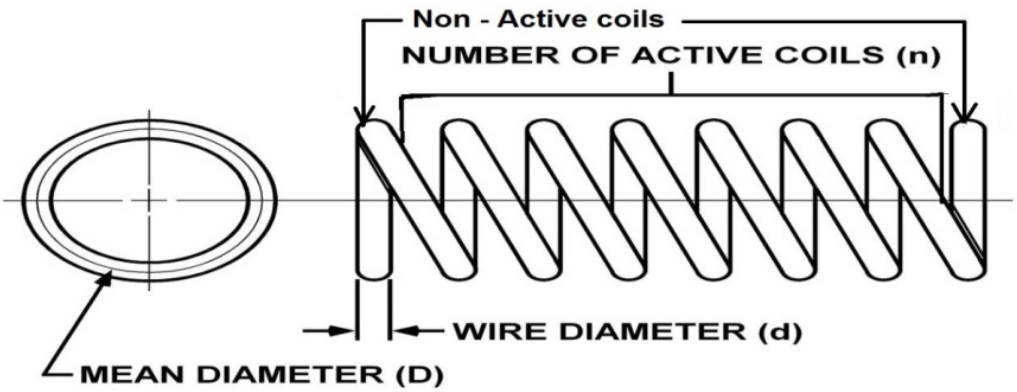
This affects rate since greater diameter wire is stronger than lesser diameter wire. So, when wire diameter is increased, spring rate increases.

Mean diameter of spring

Mean diameter is the overall outside diameter of the spring less one wire diameter. When the mean diameter increases, the spring rate decreases.

Active coils

Determination of the number of active coils varies according to spring design. Count the total coils minus the top and bottom coil, as they are “locating” coils not “working coils. As the number of active coils increases, the spring rate decreases.



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There are two basic coil spring designs

- Linear rate.
- Progressive or Variable rate.

"Linear rate springs" have one defined spring rate per inch of deflection throughout most of their range of travel. For instance, if we have a 350lb/inch linear rate spring that is 16 inches long, it will take approximately 350lb to deflect it 1 inch. The next inch of deflection will take another 350lb of load and the next inch of deflection will take an additional 350lb of load (and so on until the spring goes solid). At this point there will be 1050lb of load on a 16 inch long spring that has now been compressed to 13" of loaded spring height.

"Progressive rate springs" are sometimes called "Variable Rate" springs. The purpose of non-linear springs is to provide more compliance in the suspension over rough surfaces. These springs are designed with low initial spring rates but rapidly increase as the spring is compressed. The theory is that this allows the car to travel smoothly over bumps and road imperfections but still be tight enough to provide good handling and prevent the chassis from bottoming out. Because of this, these springs are popular in aftermarket lowering springs intended for use on public roads. Progressive/ Variable rate springs are easy to spot because the springs are not symmetrical. Typically one end of the spring is wound tighter (coils closer together) than the other end. Because each individual coil compresses at the same rate when load is applied the coils which are wound closer together come into contact, starting with the end coil which is mounted to the vehicle and as the closer wound coils "close" on each other they become inactive which effectively reduces the number of coils in the spring increasing its rate.

Springs that are designed to include coils of different diameter or are wound using a tapered wire will also produce a progressive rate.

The smaller mean diameter the higher the coils rate and the larger the mean diameter the lower the spring rate.

Pedders Suspension coil spring manufacturing plant holds the internationally recognised manufacturing quality standard of ISO 9001.

What this means to the Pedders Suspension customers, is that they can be assured they are being supplied a product of significantly high quality.

Hot Rolled

Slowly Tempered

Shot Peened

Scragged