When replacing coil springs, beware of budget brands

Labour costs associated with a coil spring replacement are often more than the cost of the spring itself, making it economical to choose quality over price.

Coil Springs are deceptively simple; a length of steel formed in to a helix and painted black. This apparent simplicity can give the impression that all springs are created equal. The reality is very different. Each Lesjöfors coil spring is manufactured in-house, checked to ensure correct fitment, and designed to match or exceed OE quality.

While a coil spring may look insubstantial, it is a safety-critical component responsible for maintaining the correct vehicle ride height and absorbing impacts during travel.

Coil springs, constantly exposed to the elements, are subjected to high amounts of stress as they support the weight of the vehicle, isolating it from the road. It is therefore vital that the spring material is of sufficient quality and the spring surface suitably protected from corrosion, to ensure the spring can withstand years' of dynamic use.

The quality of the steel wire used to produce coil springs is of utmost importance. In lower quality steel, found in some 'budget' springs on the market, surface and inner defects are not uncommon *(fig 1)*.

These defects reduce the spring fatigue strength, leading to premature sag and increasing the risk of early breakage. *Fig 2* shows the results of life-cycle testing on 'budget' springs.

OE standards require no breakage within at least 1 million test cycles, but the 'budget' springs tested all broke at between 240,000 and 320,000 cycles.

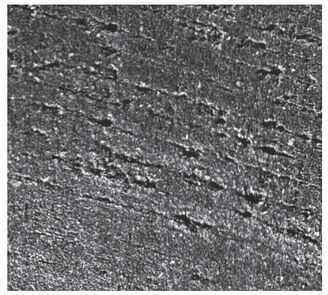

Fig 1. *Cracks in a poor quality wire surface*

Only a few steel mills worldwide are capable of achieving the necessary surface and internal wire quality for modern suspension springs, and Lesjöfors source only the highest grade specialist spring steel from selected mills.

Even the best quality spring wire requires additional treatment to ensure optimum performance and a long life.

After coiling, each Lesjöfors spring goes through a multi-stage heat treatment process to improve fatigue strength and to ensure a tough and ductile spring. Additionally, each Lesjöfors spring is bombarded with millions of tiny steel shots in a process called 'shot peening,' further improving the fatigue strength of the spring and providing an optimal surface for painting.

Fig 2. *Result of life-cycle testing on budget springs*

The most common cause of spring failure is corrosion, as chips in the exposed layer of paint cannot be avoided. Without additional protection the spring will immediately begin to rust, leading to creep corrosion under the paint which spreads rapidly, greatly reducing spring life expectancy.

Fig 3 shows surface defects on a spring after 1000 hours of salt spray testing. There are many small rust points, plus a large area where laser surface etching was used to apply logo and part number. It is clear this solution compromises surface quality.

Fig 3. *Surface defects on a spring after 1000 hours of salt spray testing*

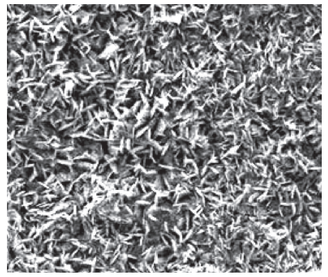

Fig 4. *Zinc Phosphate layer. The discs are phosphate crystals giving protection under, and adhesion to, the paint layer*

Lesjöfors provide an additional layer of corrosion protection between the paint and the spring by using the protection method of zinc phosphating *(see fig 4)*. This provides protection from corrosion even after defects occur in the paint layer, and is significantly more effective at preventing corrosion than other methods, e.g. iron phosphate, sometimes used on cheaper springs *(see fig 5)*.

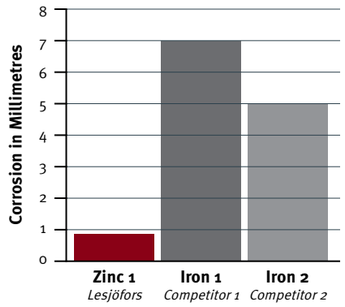

Fig 5. *Creep corrosion test results showing the difference in corrosion resistance afforded by alternative phosphate methods*

Because the labour costs associated with a coil spring replacement can often be more than the cost of the spring itself, it is economical to choose quality over price.

Lesjöfors coil springs include a 3 years manufacturers' warranty for complete peace of mind. Fit and forget – the Lesjöfors standard!

For further information, visit: **www.lesjofors-automotive.com**