



## Handling and Maintenance Instructions for Coil Springs

### 1. General

Modern coil springs are high-stressed springs with optimal material utilization. Their lifetime is substantially influenced by the residual stresses which are brought into the surface layer by shot peening and presetting. By these special treatments the springs get constant spring characteristics and a long lifetime if they are treated carefully and properly.

It is very important for coil springs that the whole surface of the acting coils is not damaged.

Therefore the springs are protected against corrosion by a paint coating. This surface protection has to remain absolutely undamaged otherwise there can be local corrosion attack resulting in spring failures.

### 2. Transport

During transport, storage and assembly it has to be paid attention that the surface protection is not damaged. If the surface protection is damaged a repair of the paint layer is necessary. For this the same material as during the first coating should be used.

Paint damages which go through to the metal surface have to be cleaned with a steel brush and/or sand paper. Afterwards the cleaned area has first to be primed (at parabolic springs with zinc rich primer, at coil springs with a 2-component water soluble epoxy metal primer). After the primer has dried the damaged area has to be painted with top coat (at parabolic springs with acrylic dispersion, at coils springs with 2-component water soluble epoxy paint (for all applications except goods wagons) or 1-component (for goods wagon applications).

### 3. Handling of spring elements during the assembly

Welding operation at the springs itself are strictly forbidden.

During welding operations at the vehicle the springs have to be protected reliably against welding heat, weld splatter and contacts with the electrode or welding tongs otherwise this can lead to local hardenings and cracks which result in fractures. The ground cable must not be attached to the spring during welding.

Every other heating has to be avoided same as a plastic deformation of the springs because both changes the residual stresses in a negative way.

During assembly or disassembly of the springs the springs must not be beaten with a steel hammer. If it is absolutely necessary only plastic hammers have to be used whereat potential damages of the surface protection have to be repaired.

### 4. Maintenance Information

During maintenance of the vehicle the spring should be visually checked for potential cracks or damages of the paint. Paint damages have to be repaired.

Broken coil springs have to be replaced by new ones.

If during a check it is noticed that the spring is not broken but in the course of time it has a loss of spring height below an allowable value due to relaxation also the spring has to be replaced.