



## Extension Spring Assemblies

### Factors Affecting Design - **SR, SA & BB**

#### Fatigue Life:

The fatigue life has a direct effect on the size of the spring and the maximum load available in the least space. A comparison of various chart values illustrates the effect fatigue requirements have on the size of the spring. For any application the required number of cycles or reversals, should be estimated for the life of the equipment or a replacement schedule.

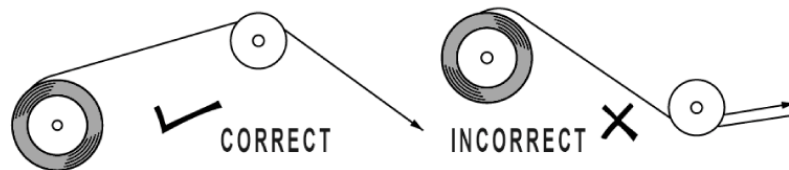
The fatigue life of a spring can be defined as either a full or partial extraction and retraction of the spring i.e. the spring can be exercised over its whole length and achieve the average life expectation, however if it is exercised over any one section of the spring repeatedly then that section can be expected to fatigue when the total number of cycles approaches the life predicted for the spring.

Fatigue life is not time dependant under normal operating circumstances, it is solely dependant on the number of operations.

However pollutants even in low concentrations can have the effect of shortening the fatigue life through corrosion or chemical attack. Please refer to our Technical Department for further details.

#### Extension Spring used in conjunction with Idler Pulley

Rino springs can be used with an idler pulley provided it is positioned to suit the natural curvature of the spring (see diagram). Extension springs should not normally be bent back or reverse wound, as this will permanently damage the spring.

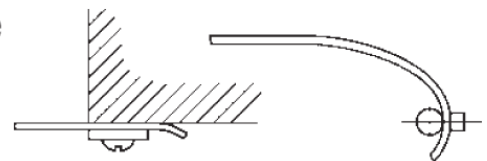


#### Speed and Acceleration

There is almost no limit to the speed or acceleration to which the spring will coil and uncoil. However, tests should be carried out to satisfy yourself the spring will perform satisfactorily under your conditions.

#### Stability:

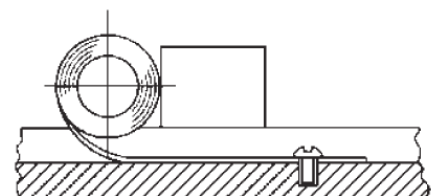
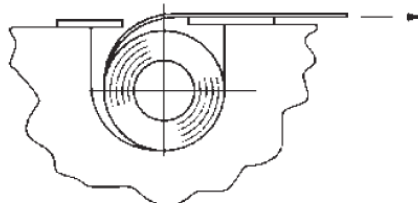
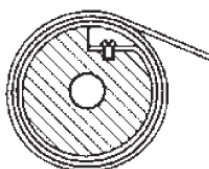
The free end of the extension spring should be guided to prevent the spring from wandering off the drum. The spring should be firmly attached to the moveable member (see diagrams).



#### TYPES OF MOUNTING

##### Drum Mounting:

The spring will be held on the drum by its inherent gripping action. No other fixing is required, provided there is sufficient spring material remaining on the drum when fully extended. An exception to this is when the mechanism does not have its own limiting stops, in which case we recommend the inner end be secured to the drum by the holes provided (drum should be stepped - see diagram).



## Extension Springs

### SR, SA & BB - Factors Affecting Design & Spring Ends



#### Cavity Mounting

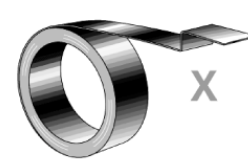
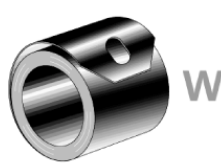
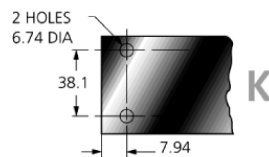
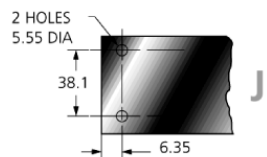
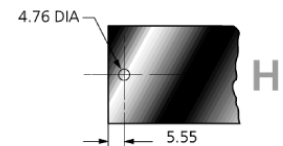
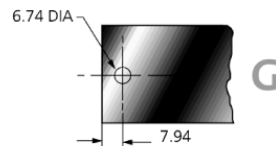
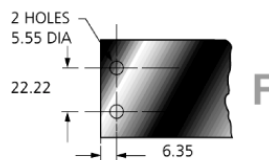
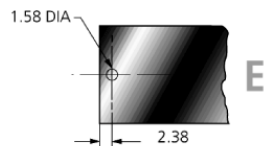
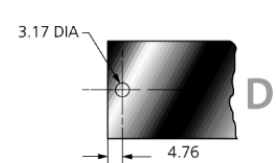
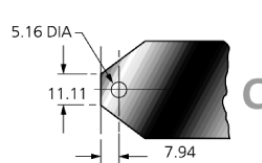
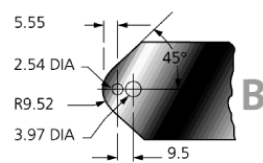
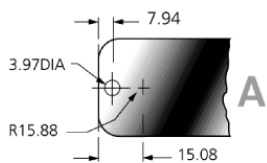
A low cost mounting arrangement is the Rino spring coil seated in a cavity, the obvious disadvantage is the friction between the spring coil and the cavity surface. We would recommend the cavity to be lined with a low friction material. Another method is to use the free coil force against a moveable member.

#### Multiple Mounting

Various standard methods of multiple mounting are shown below. Springs can also be laminated to provide an increase in force or fatigue life in a minimum space.

To discuss your needs please call our technical department who will be pleased to help.

#### EXTENSION SPRING ENDS



All measurements are in mm