

## A load-displacement prediction for a bended slotted disc using the energy method

### Abstract

A slotted disc spring consists of two segments: a coned disc segment and a number of lever arm segments. In this study, a load-displacement formula for the slotted disc spring is newly developed in the form of energy method by considering both rigid and bending deflections of the two segments. This formula is developed with the aim to further improve the SAE formula which is limited to a straight slotted disc spring. The coned and the lever arm angles of the straight slotted disc spring are the same. They are different for a bended slotted disc spring. Because of this limitation, it is geometrically impractical to employ the SAE formula for a bended slotted disc spring. To achieve the goal of this study, new calculations based on geometric and material properties inputs are developed for a bended slotted disc spring. A firm background study based on the theory of Almen is presented in developing new load-displacement calculations for a bended slotted disc spring.