

Effect of Centerline Compressibility on a Pressured Ring Weakened by a
Hinge

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Abstract

The large deflections of a compressible circular ring containing a hinge and subjected to external hydrostatic pressure are described in this paper by a nonlinear two-point boundary value problem. For the case of a deformed shape with a single axis of symmetry, the boundary value problem is solved by a two-level shooting method. Graphs of pressure versus the missing initial values so determined are plotted for three values of the compressibility parameter, and these graphs are discussed. Finally, postbuckled shapes for those three compressibilities are shown for a particular large value of the pressure intensity.

Keyword : compressibility, hydrostatic pressure, buckled