

Homework VI

Due March. 27, 2009

1. Juvinall, Problem 5.23
2. Juvinall, Problem 5.24
3. Juvinall, Problem 5.25
4. Juvinall, Problem 5.26
5. Juvinall, Problem 5.27
6. The figure shows a schematic drawing of a vehicular jack that is to be designed to support a maximum mass of 400 kg based on the use of a design factor $n_d = 2.50$. The opposite-handed threads on the two ends of the screw are cut to allow the link angle θ to vary from 15° to 70° . The links are to be machined from AISI 1020 hot-rolled steel bars with a minimum yield strength of 380 MPa. Each of the four links is to consist of two bars, one on each side of the central bearings. The bars are to be 300 mm long and have a bar width of 25 mm. The pinned ends are to be designed to secure an end-condition constant of at least $C = 1.4$ for out-of-plane buckling. Find a suitable preferred thickness and the resulting factor of safety for this thickness.

