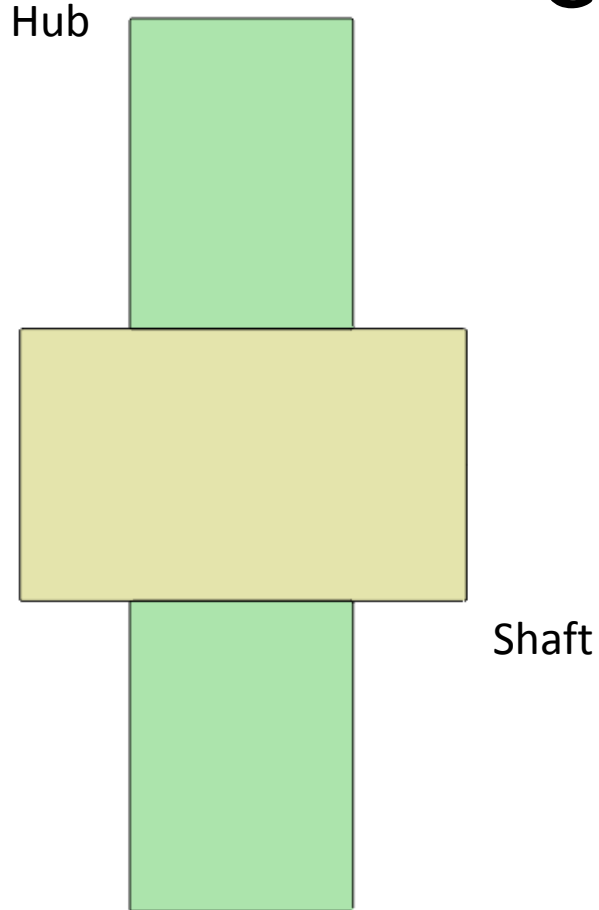


Shrink Fit Contact Set – Initial Conditions



- Contact conditions

- Shrink fit – shaft into hub
- 0.0044" fit
- coefficient of friction = 0.3

- Materials

- Hub - 4340 steel
 - E = 30,000 ksi
 - Poisson = 0.32
 - Yield = 103 ksi
- Shaft - alloy steel
 - E = 30,000 ksi
 - Poisson = 0.28
 - Yield = 90 ksi

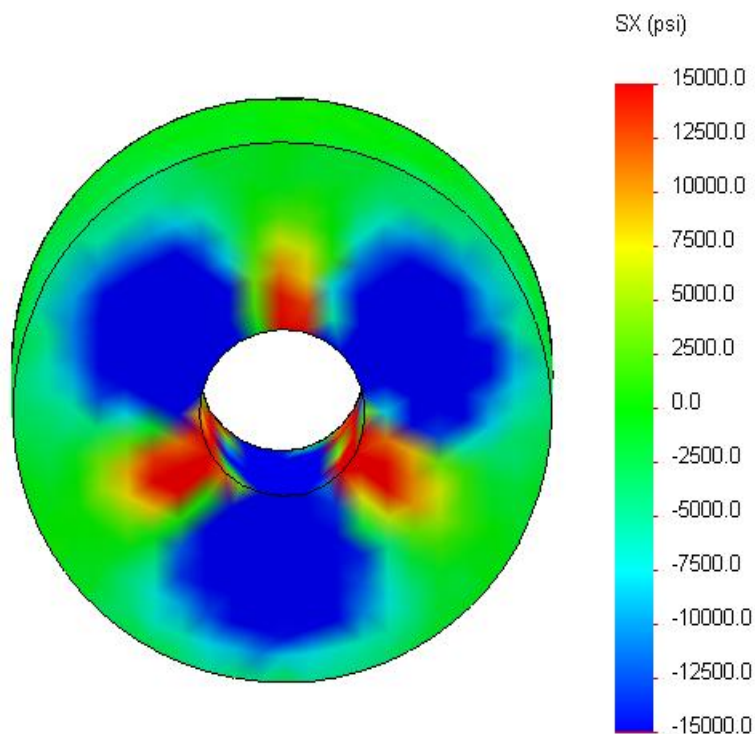
- Constraints

- Fixed translation and rotation on hub outer bore

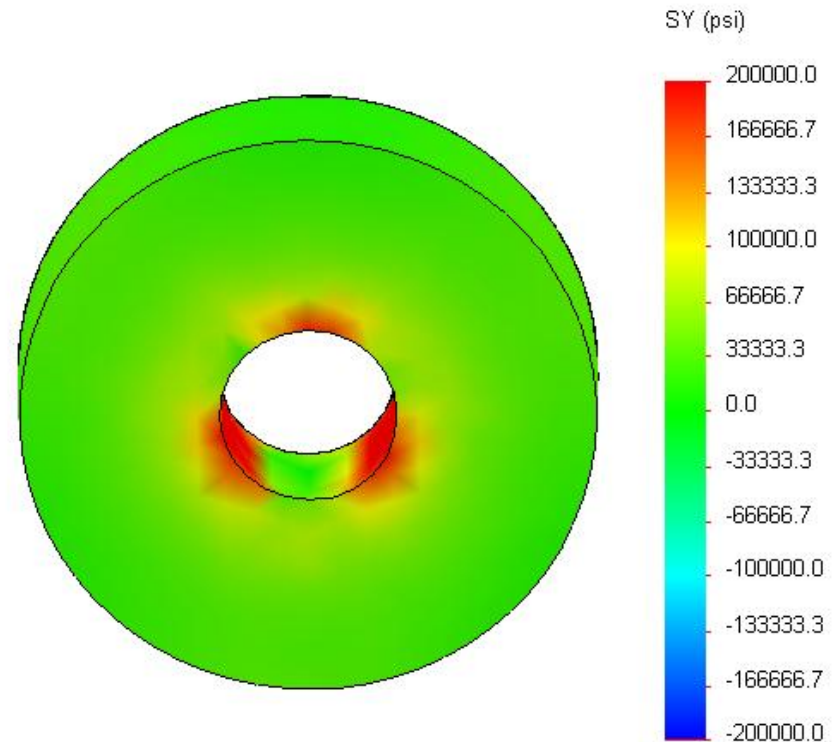
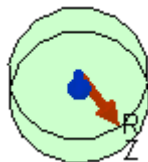
- Mesh

- 1" global tetra 4 mesh

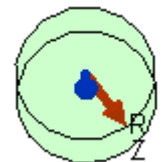
Shrink Fit Contact Set - Results



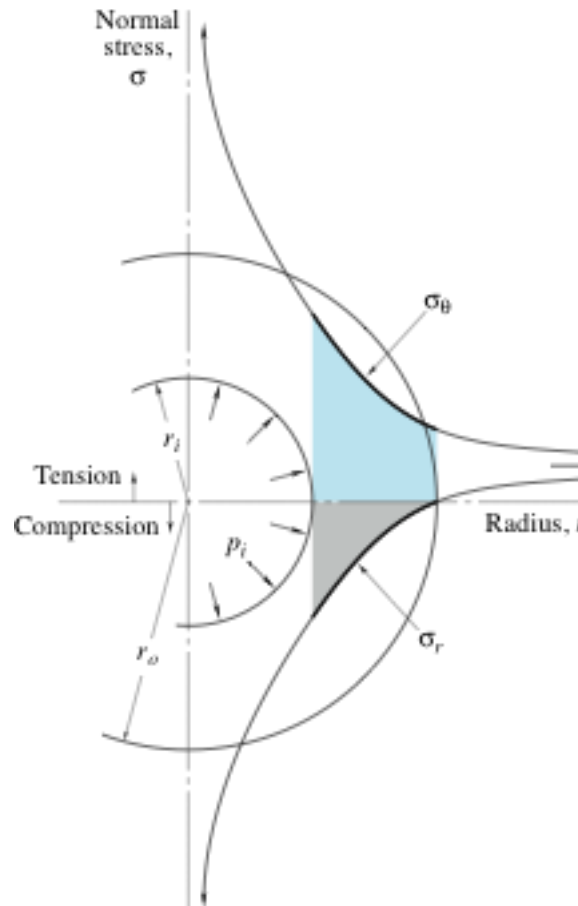
Radial Stress



Hoop Stress

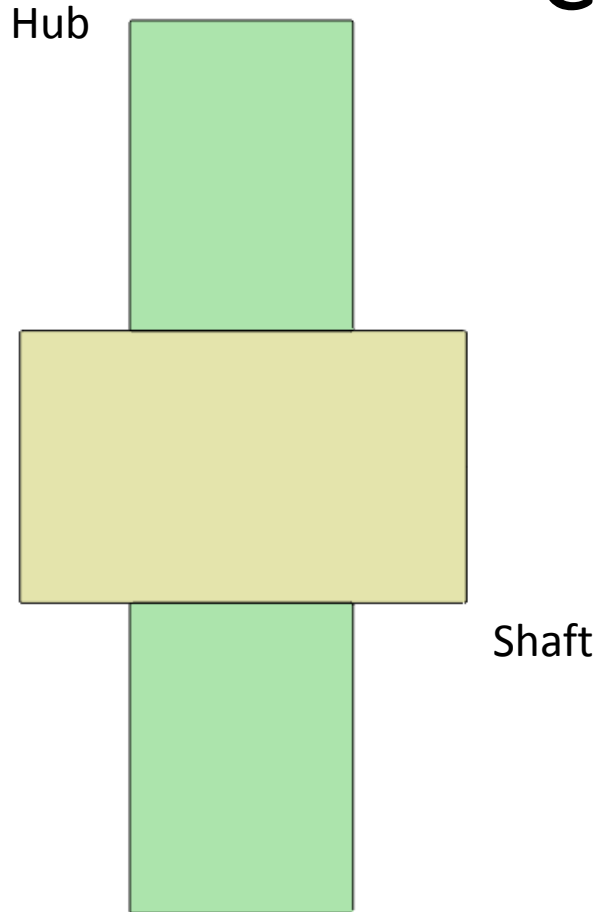


Shrink Fit Contact Set



Internally pressurized, thick-walled cylinder showing circumferential (hoop) and radial stresses for various radii (Hamrock, Schmid, & Jacobson - Fundamentals of Machine Design)

Thermal Differential Shrink Fit – Initial Conditions



- Fit Conditions

- Ambient temperature is 0° F
- 50° F is applied to the shaft to simulate a 0.0044" shrink fit
- The bores are symmetrically glued (bonded)

- Materials

- Hub - 4340 steel
 - E = 30,000 ksi
 - Poisson = 0.32
 - Yield = 103 ksi
- Shaft - alloy steel
 - E = 30,000 ksi
 - Poisson = 0.28
 - Yield = 90 ksi

- Constraints

- Fixed translation and rotation on hub outer bore

- Mesh

- 1" global tetra 4 mesh

Thermal Differential Shrink Fit – Results

