Problem Session 6:

The objective of this assignment is reinforce what you have learned about a stress-life fatigue analysis.

A child stands on the pads of the pogo stick shown below; her weight evenly divided between the pads. When she jumps off of the ground onto the pads, and bounces along the ground, the spring on the stick cushions the impact and stores energy to help each rebound. Your assignment is to design the aluminum cantilever beam pads on which the child stands. You may assume that load is applied at a distance of 5.00 inches from the central support.

The following constraints are required for your design.

The cross section of the pad must be rectangular
The maximum dynamic impact force on both pads is 224 lb
The factor of safety of the final design must be at least 2.00
Design life must be at least 50, 000 stress cycles
The width of the support beam is 1.5 inches

Material properties of the aluminum selected are:

Sut   =   64 ksi
Sy   =   43 ksi

Turn in the following:

- An executive summary stating the final dimensions and factor of safety.

- A drawing of your design (you may model it in Solid Works if you like) with dimensions indicated

- Detailed set of calculations