Lab-6A Assignment

Due next Lab (**8/03/20**)

Upload a single pdf file ***LastName_Simulation.pdf*** with the following results:

P1: Crankshaft (**SolidProfessor**)

Please follow the instructions and complete the SP "**Guided Exercise – Crankshaft**" with two modifications:

(a) Correct the applied load shown in Fig. 1. ***What did SolidProfessor do wrong***?

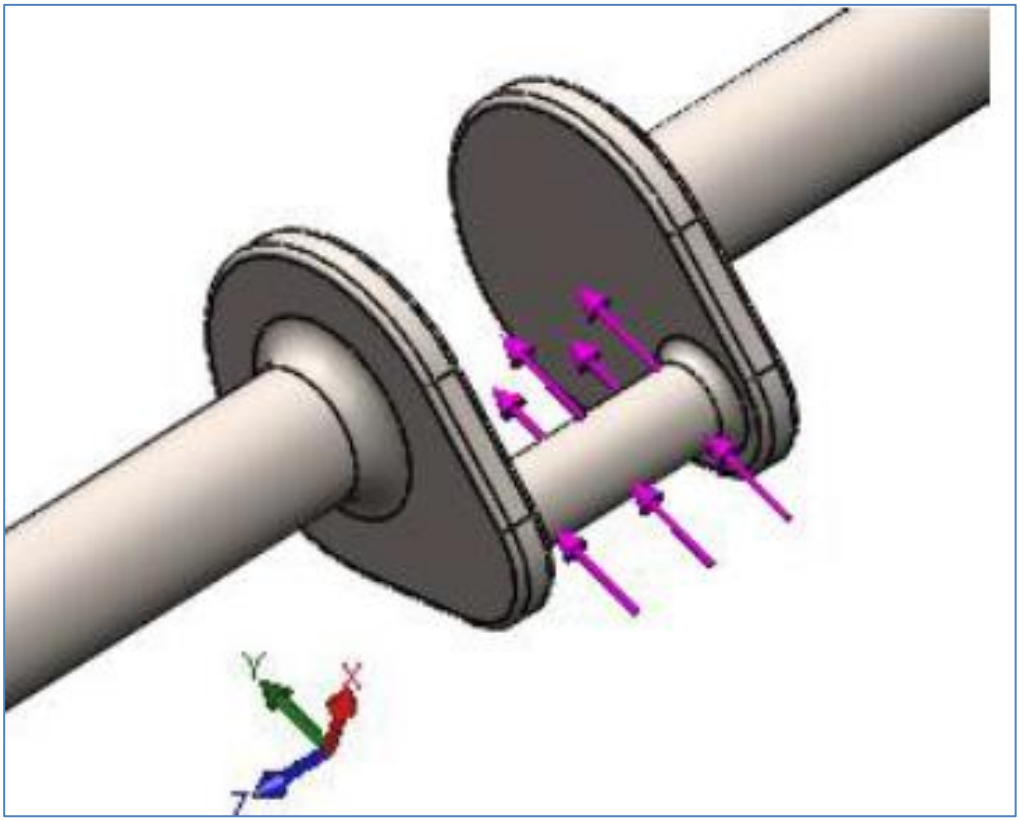

Figure 1: Applied force on crankshaft as shown by SolidProfessor.

(b) Use your engineering intuition and modify the crankshaft geometry so it satisfies a FOS of 4.

Deliverables:

(i) A picture with the corrected applied load (zoom in and show it similar to Fig. 1)
(ii) An isometric view of the modified crankshaft geometry with an explanation what you changed, and
(iii) A figure of the modified crankshaft showing that it satisfies FOS = 4.

P2: Reducer Pipe (**SolidProfessor**)

Run the Simulation Express with two modifications:

(i) fix only two of the bolts on each flange as shown in Fig. 3, and

(ii) apply a pressure of 2500 psi. Save the FOS =3 plot.

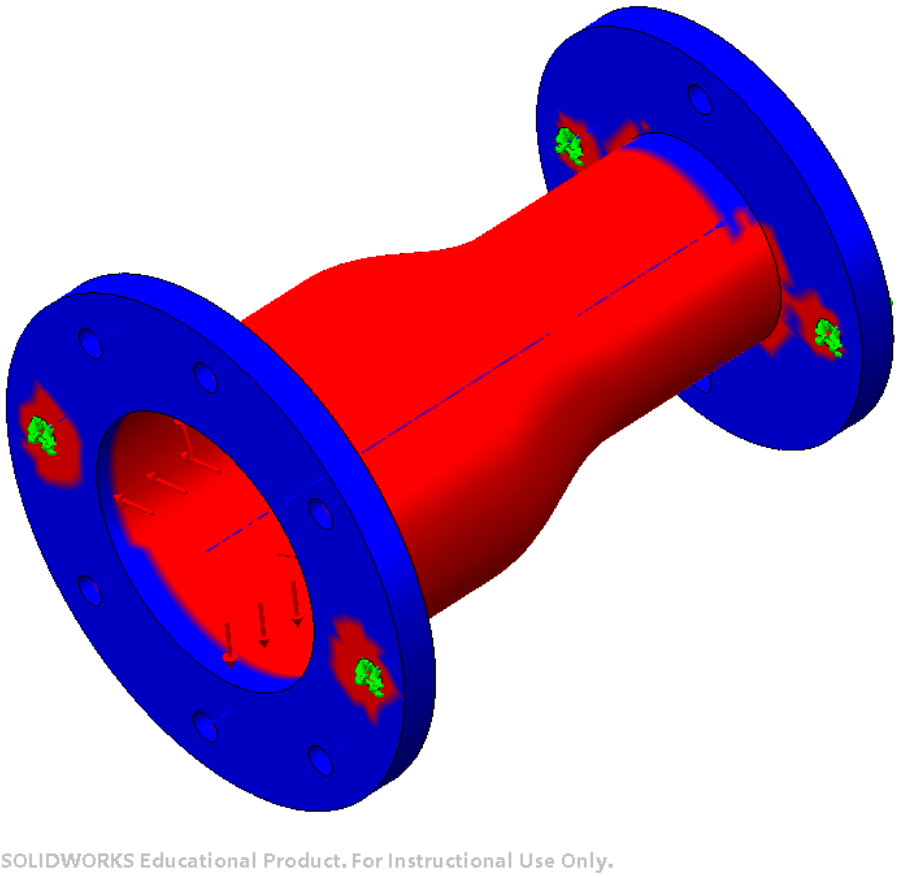

Figure 2: Unmodified reducer pipe with: FOS of 3.

Next, use your engineering logic and intuition and modify the pipe reducer to achieve a FOS of 3 everywhere. Fix the structure at the same four bolts and apply the load of 2500 psi - show a plot of FOS=3 of the modified pipe and include a screenshot of the modified reducer pipe sketch.

Deliverables:

(i) A FOS=3 plot of the unmodified reducer pipe,

(ii) An isometric view of the modified reducer pipe and a description (and sketch) of the changes you made to achieve a FOS=3, and

(iii) A FOS=3 plots of the modified reducer pipe analysis.

P3: Static Analysis of a Sheet Metal Part (SOLIDWORKS)

Find it under: *Tutorials → Go to SOLIDWORKS Simulation Tutorials → Simulation in SOLIDWORKS Premium → Simulation in SOLIDWORKS Premium → Static Analysis:* ***Analysis of a Sheet Metal*** (perform a static analysis on a sheet metal part.)

- Submit a captured view of the "***Bottom von Mises***" stress.

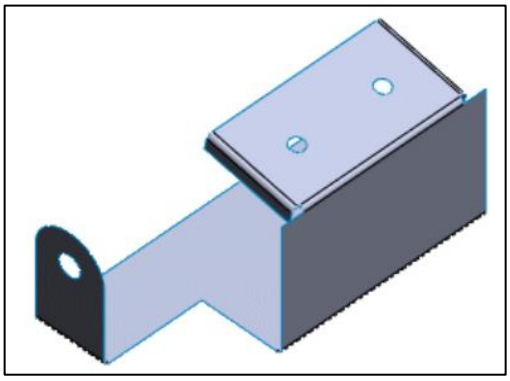

Figure 3: Sheet Metal Part (SOLIDWORKS)

P4: Static Analysis with a Mixed Mesh (SOLIDWORKS)

Find it under: *Tutorials → SOLIDWORKS Simulation Tutorials → Simulation in SOLIDWORKS Premium → Simulation in SOLIDWORKS Premium → Static Analysis:* ***Mixed Solids and Shells****:*
Perform static analysis for an assembly of a **solid** and a **surface** bodies (two element types are present → mixed mesh)

- Submit a view showing the stress x-component (Sx) for the bottom face.

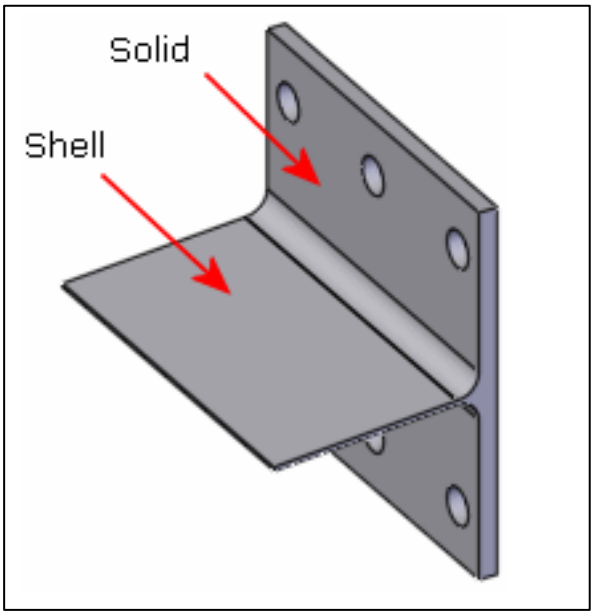

Figure 4: Assembly of a solid and a surface body.