ANSYS AIM - Bike Crank

Author: Madison Hill, ANSYS

Problem Specification
1. Pre-Analysis & Start-Up
2. Geometry
3. Mesh
4. Physics Setup
5. Numerical Results, Verification & Validation

3D Finite-Element Analysis of a Bike Crank

Created using ANSYS AIM 17.1

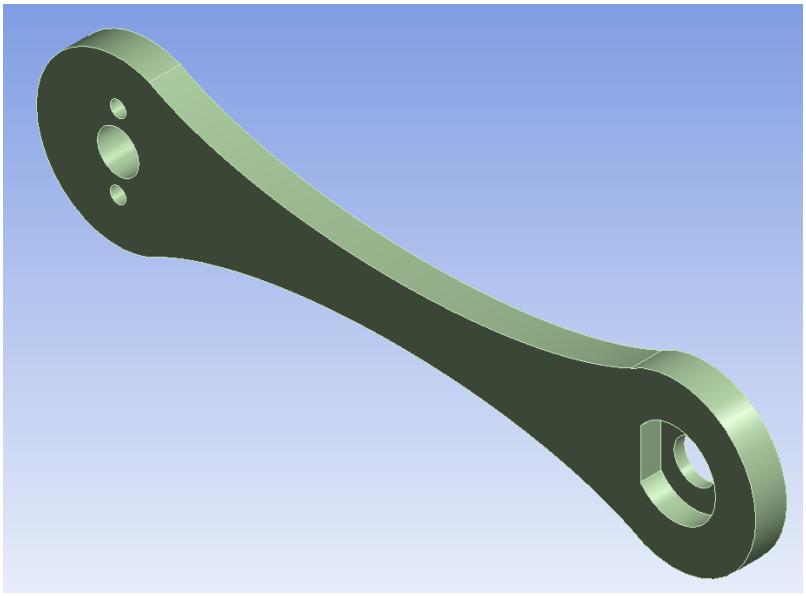
Learning Goals

In this tutorial, you will learn to:

- Determine the displacements and stresses in a bike crank using 3D FEA capabilities in ANSYS AIM
- Verify the finite-element results from ANSYS AIM by refining the mesh and also comparing with hand calculations

Problem Specification

Consider the following bike crank model.

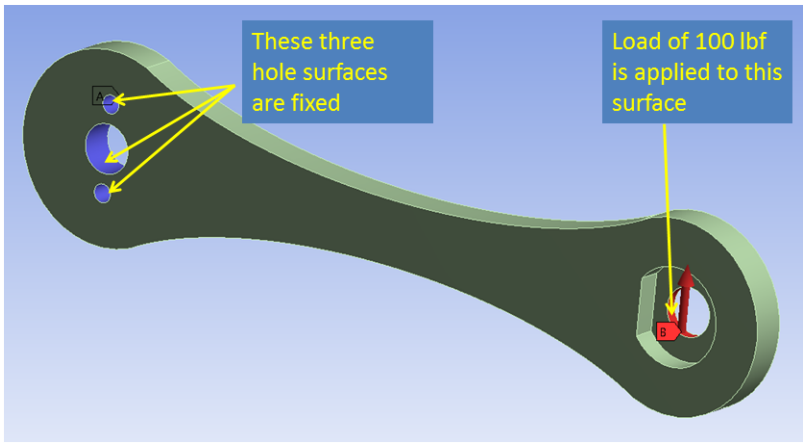


To orient ourselves, the following figure shows the location of a similar bike crank mounted on a bicycle.



Material properties: The bicycle crank's material is aluminum 6061-t6. The Young's modulus is 10,000 ksi, and the Poisson's Ratio is .33.

Boundary conditions: Apply a load of 100 lbf in the y-direction on the right hole surface and fix the 3 left hole surfaces as shown below. Note that this is an approximation of the actual loads and constraints on the bike crank.



Using ANSYS AIM, determine the following:

- Deformed shape and displacement field
- Stress distribution

Go to Step 1: Pre-Analysis & Start-Up

Go to all ANSYS AIM Learning Modules