Drum Mount Test Machine

Overview
Accurately estimating the lifespan of drum mounts in vibratory compactors is key to ensuring the compactors operate effectively. Currently, Lord Corporation tests these components in single axis loading. This type of loading does not accurately simulate the loading that drum mounts experience during normal operating conditions. Lord wishes to develop a more accurate method and test setup to estimate the lifespan of drum mounts.

Objectives
1. Design a test machine that accurately simulates the forces experienced by drum mounts during operation

Approach
- First, the team benchmarked current testing methods and apparatuses currently used in industry.
- Customer needs were then defined and converted into target specifications.
- The team researched how to characterize the forces that act on drum mounts during operation.
- Using this knowledge, the team wrote a Matlab program that outputs resultant x and y components.
- Based on these results, the team brainstormed 3 concepts.
- A final concept was selected using a concept selection matrix.
- Static, Fatigue, and Frequency finite element analysis was run on the SolidWorks model to refine material selections and dimensions.
- A prototype was constructed.
- Due to time, testing of the prototype was not possible. However based on the FEA results, the test machine should perform as designed.

Outcomes
- Project provided a new approach to testing drum mounts
- The sponsor will be able to more accurately simulate the lifespan of drum mounts