Bridgestone Americas Tire Operation requires a lifting device for loading tires onto a load cell for acoustic testing. The primary objective of this project is to eliminate operator lifts and improve overall safety of the task. The device will be for use in a semi-anechoic chamber with narrow pathways and sensitive equipment so maneuverability and size will be important factors in the design of the product.

### Objectives
The objective is to develop a device to support and position a tire assembly while it is being mounted onto a load frame. An electro-mechanical lifting device is required to eliminate the need for an operator to manually lift a tire.

### Approach
- A site visit was made to Bridgestone’s facility in Akron, OH.
- Measurements were taken in the testing chamber to construct a clear layout of the room.
- Through direct consultation with Bridgestone, a list of customer needs were established.
- A patent and pre-existing products search was conducted to generate ideas for a solution.
- Concepts were generated and a selection was made for the design that best fit the needs.
- A detailed CAD model was constructed consisting of a base, arm assembly and a lifting mechanism.
- Materials were chosen to minimize cost, weight and manufacturing time.
- Finite element analysis was conducted on the model to identify factors of safety.
- Parts were ordered, manufactured, and assembled.
- Testing was conducted to ensure the safety and functionality of the device.
- The final device was delivered on time to the sponsor.

### Outcomes
- With minimal effort, an operator can easily maneuver the lift around the sensitive acoustics.
- The device will reduce the risk of injuries by eliminating the need to manually lift a tire.
- The device is able to withstand loads over 300 lbs.
- The device can lift a tire ~ 30 seconds from bottom to top.