

Project Title: [Returnable Axle Rack for Packaging and Assembly](#)

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Area: [Mechanical Engineering](#)

Sponsor: [Reliable PMW](#)

Reliable Production Machining & Welding of Kendallville, Indiana provides custom machined, welded, and assembled products for a wide variety of industries, with the commitment of their products being crafted with “Quality and Service”. They further provide these services for one of their customer companies, JLG Industries, located in Terre Haute, Indiana. Specifically, they provide some manufacturing and assembly for axles, which are used in applications such as boom lifts. There are various designs in use currently for racks that hold two types of JLG axles, those being denoted as 1001302764 and 1001302765, with these racks also being used for the packaging and shipping of the axles to the customer company. Designs currently in use either are non-reusable, needing to be disposed of after use, or do not support the further assembly of the axles while they are loaded onto the rack.

Reliable is seeking a new rack design that can support the additional assembly required of these axles while they are loaded and can be reusable for future shipments, with some additional considerations such as an attached container for loose parts that are shipped with the axles and a proper retention system for the axles which is made of non-disposable materials. The rack design needs to have forklift access, fit within a 60” by 60” by 34” space, weigh less than 3000 lbs. when fully loaded, and be able to be stacked three racks high for shipping and production purposes. Its frame will also need to be made from ASTM structural steel. The budget for an initial prototype is \$3000, and a \$30,000 budget is estimated for up to 24 racks in production.