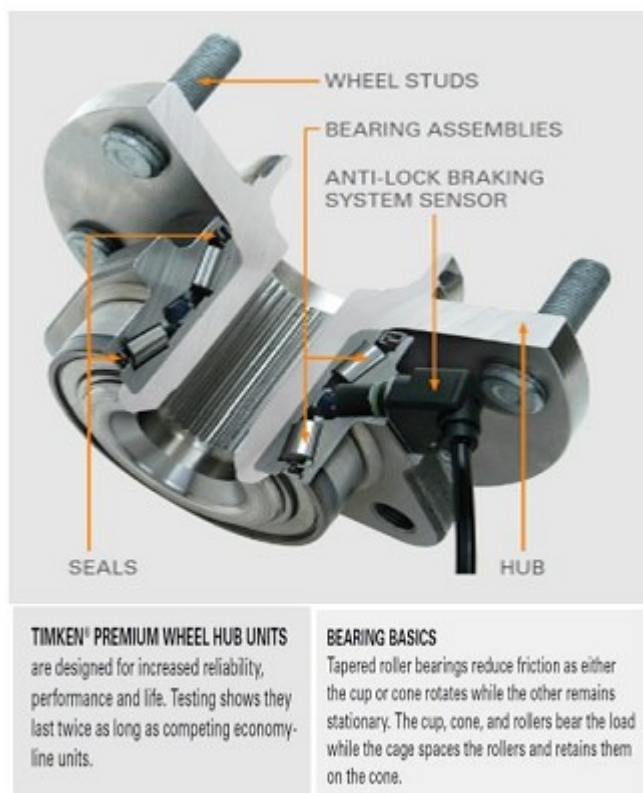


heavy trucks, farm equipment and earthmovers to wheel hub units found in pickup trucks, the Timken Lincolnton Bearing Plant helps keep industries and consumers in motion.

The Timken Company, a \$3 billion global manufacturer of bearings and mechanical power transmission products, opened the Lincolnton Bearing Plant in 1979 with a strategic focus on medium-volume production of industrial bearings. It was considered the most modern tapered roller bearing manufacturing facility in the world at that time.

Since 2002, the plant has undergone several expansions to broaden its original capabilities and add production lines for Timken® premium wheel hub units. These packaged bearings have multiple rows of rollers and are pre-adjusted, pre-lubricated and pre-sealed for easy installation during truck manufacturing and aftermarket service. Today, Lincolnton is the company’s principal domestic source for wheel hub units and is the supplier for wheel hubs for the popular F-Series Ford pick-up truck. (Source: Lincoln Herald.net). This Project will focus on a project in the heat treating area of the plant.



Project Requirements:

Timken uses a variety of metallurgical processes to produce gears and associated parts to the specified hardness tolerances. In one stage of the process, parts are moved from a heat treat process to a machine that performs shot blasting to remove a carbon coating from the previous step. The parts are done in a bulk process and the operator has to load the carbon coated parts onto steel racks which enter the shot blasting chamber and cycled for a specified amount of time.

The following pictures show the process:



The shot blasting chamber is the back of the photo. Parts (the black ones on the left) are loaded onto steel racks that cycle into the shot blasting chamber. When the cycle is complete, the machine cycles and the freshly blasted parts (silver colored) emerge from the right side and a new batch enters on the left.

Parts entering the process arrive on a towed trolley that has two large bins that hold many parts. To start the process, the operator stands on the upper catwalk and reaches over and down into the tub that is on the trolley. They bend over, grab parts, stand up and turn and walk to the waiting empty steel rack. They load the steel hanging rack as shown in the photo.

This is a picture looking down into the incoming part tub:



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The current operation requires bending and lifting. Timken is interested in redesigning this operation so that it is less stressful for the operator. The objective of this project is to evaluate this current operation and develop a new process design that reduces or eliminates the physical exertion required by the operator. The goal is a redesigned process with significant ergonomic improvement,

Expected Deliverables/Results:

- A new design for this operation that uses existing or new tools, fixtures, equipment, etc. in such a way to eliminated the bending/lifting operation and result in better operator ergonomics.
- Equipment built during the prototype stage may be budget limited, so team should have regular discussions with the supporter regarding budget constraints. If desired by the Supporter, based on the team's progress, they may be interested in increasing the budget. Authorization must be received from ISL for any budget changes.
- Complete drawing package for any items built.
- Full testing and verification that demonstrate ergonomic improvements using full scale equipment or a proof of concept model if full scale is beyond budget.
- Operations and maintenance guide.

Disposition of Deliverables at the End of the Project:

Hardware developed will be handed over at the conclusion of the Expo.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Ability to travel to Iron Station, NC for plant visits.
- Interest in mechanical design which can provide ergonomic improvements.
- PLC programming of mechanical components