

# Bucyrus Precision Technologies, Bucyrus

**Intervention Key Words:** Electric Tug, Wheels

**Industry:** Manufacturing

**Risk Factor(s):** Repetitive motion, Awkward Posture- Back deviations, Shoulder deviations, High Hand Force- Pinching/Gripping, Manual Handling- Pushing/Pulling

## **Situation:**

Bucyrus Precision Technologies manufactures various size drive shafts for the automotive industry. The process involves numerous steps, requiring the parts to be transferred and unloaded at a number of different stations. The parts are transported using large push carts which have 6" diameter wheels. An individual shaft can weigh around 6 lbs, and when the carts are loaded they can have a total weight of 1300 lbs. When measured, it takes a 70 lb force to initiate movement in the cart and a 49 lb force to sustain it when it is fully loaded. This high force, coupled with the repetition inherent in the volume they produce, creates a significant risk for Cumulative Trauma Disorders (CTDs). It is especially apparent in the smaller stature employees who must use their entire body to move the carts.



**High forces needed to push loaded carts with 6" wheels**

## **Solution:**

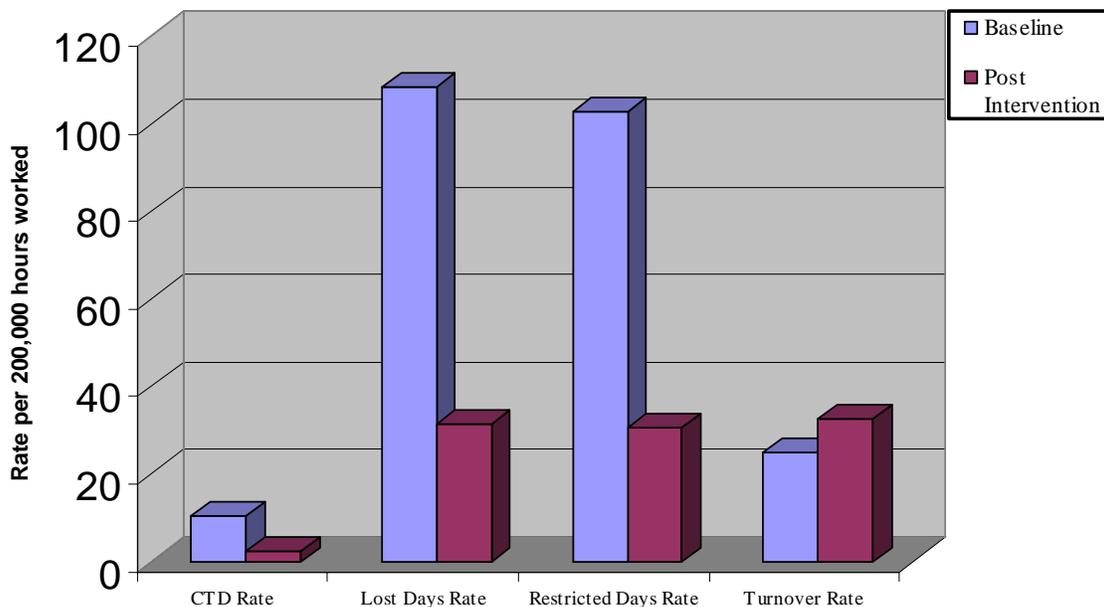
Bucyrus Precision Technologies approached the problem in two ways. The first step was to install larger 8" wheels made of harder material on each of their 190 carts. Based on a test cart they had retrofitted, it will significantly reduce the push/pull force needed to move the carts between stations. In addition, they also purchased a small electric tug to transfer the carts. Although not every situation allows for its use, the new tug eliminates the human forces required by the task. In theory, the intervention will

reduce fatigue, decrease aches and pains and increase employee retention and job satisfaction.



Larger wheels and an electric tug assist in part transport

**Results:**



- CTD rate (per 200,000 hours worked) decreased from 10.4 the year prior to the intervention, to 2.2 in the 2 years following, a 79% improvement.
- Lost Days rate decreased from 108.4 to 31.3 and Restricted Days rate decreased from 102.8 to 30.5 in the same time period. This equates to a 70% reduction for both values.
- An increase in Employee turnover was observed but may not be directly attributed to the intervention.
- The force required to manually start the cart in motion was reduced to 27.5 lbs while the force needed to keep it in motion fell to 17 lbs.
- CTD risk factor scores decreased 35% following the intervention.