



In Summary:
The Ergonomic
Advantages of
Work Station Cranes



Work Station Cranes vs. Standard Jibs: an Ergonomic Comparison

On the material-handling floor, it all comes down to being productive and profitable. But, due to the rising costs associated with workplace injuries, we can add “ergonomic” to that list as well. In fact, today, ergonomics—in this case, optimizing the interaction between operator and machine—is a key influencer for purchasers of manual material-handling equipment. **Case in point: many employers are reducing workplace injuries in light- to medium-load-handling environments by replacing traditional manually operated I-beam jib cranes—the culprit of most push-pull repetitive-motion injuries—with more ergonomic work station cranes.**

Out in the field, Gorbels Work Station Cranes are meeting the demand for ergonomic function and performance. The crane’s unique design allows for easier positioning and movement of product than standard jibs, making it perfectly suited for the easy transfer of loads, while minimizing common repetitive-motion injuries such as back, neck and shoulder strains.

As a leader in the materials-handling category and a proponent of ergonomic work station crane technology, Gorbels commissioned a third-party study in an attempt to quantify the ergonomic advantages of work station cranes over standard I-beam jibs. Here’s what they found:



The Study

In this study performed by the Rochester Institute of Technology, manually operated, traditional I-beam cranes were compared to Gorbels® Work Station Cranes (WSC) in relation to push and pull standards developed by Snook and Cirello (1991) for consideration by the National Institute for Occupational Safety and Health (NIOSH). This study consisted of two parts:

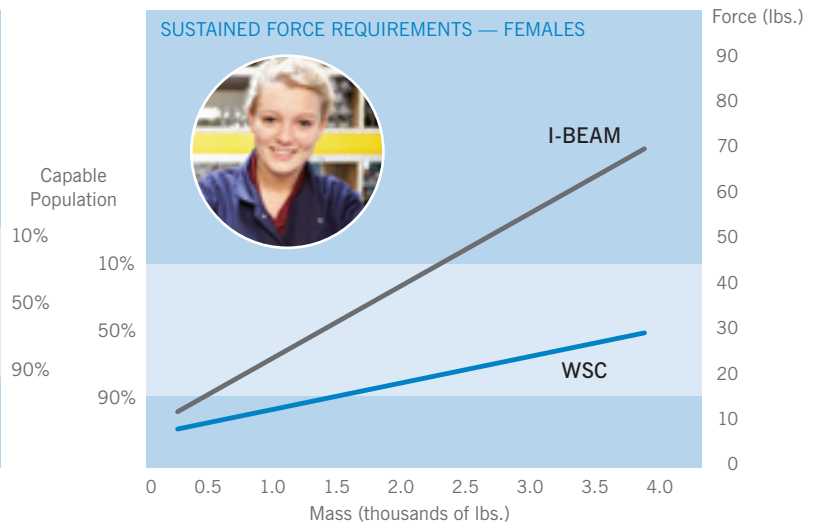
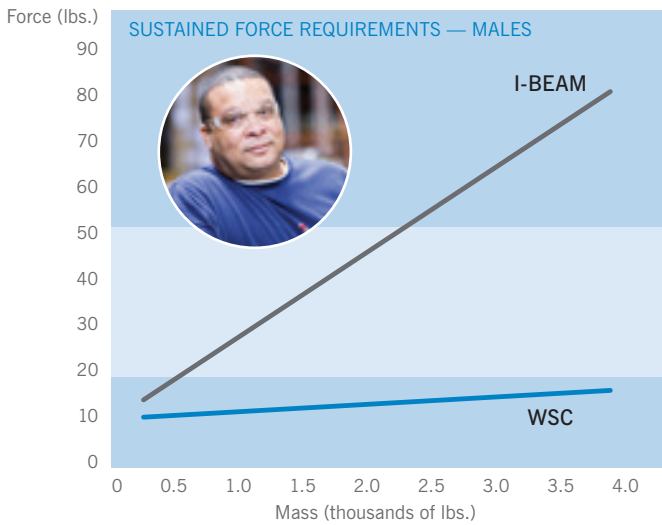
- I. Compare the Snook and Cirello guidelines with the type of push/pull forces experienced in industrial conditions on I-beam and WSCs.
- II. Determine the difference in productivity for both types of cranes.



Ergonomics: The Great Equalizer

The first part of the study determined the gross force required by an average male and an average female to keep a load in motion (sustaining force) while safely* performing work at a sustainable rate on both types of cranes. The graphs below illustrate the sustaining forces for the subjects.

COMPARING SUSTAINING FORCES WITH THE PROPOSED NIOSH GUIDELINES



- Over 99% of males can safely handle 4000 lb. on a Gorbel® WSC
- Under 10% can safely handle 4000 lb. on an I-beam
- 4000+ lb. = maximum load on a WSC
- 2600 lb. = maximum load on an I-beam

- Over 65% of females can safely handle 3000 lb. on a Gorbel WSC
- Under 10% can safely handle 3000 lb. on an I-beam
- 4000+ lb. = maximum load on a WSC
- 2400 lb. = maximum load on an I-beam

Given this data, it is evident that only a small portion of the workforce can handle a 4000 lb. load on an I-beam crane, while most workers can handle 4000 lb. on a Gorbel WSC. Using these WSCs instead of I-beam cranes results in a more flexible workforce and a safer work environment.

*“Safe,” as it is referred to above, indicates that a worker should not exceed 33% of his or her work capacity. It is an accepted ergonomic principle that the human body should not be required to work for extended periods of time in excess of one-third of its aerobic work capacity. Exceeding this level heightens the risk of chronic fatigue, a condition where the body doesn’t recover from the fatigue of one day’s work before the next day’s work begins. Chronic fatigue causes the overall work capacity of the worker to decline over time.

Ergonomics: Greater Productivity and Profitability



This part of the study determined whether an economically significant difference exists in the amount of work that an individual can accomplish in a typical work day using a Gorbel® WSC versus an I-beam crane. By measuring an individual's work cycles (moving and positioning a load over a measured path) and keeping work intensity at a constant rate via a heart rate monitor, productivity could be accurately measured. Productivity of the male and female subjects are as follows:

In all cases, productivity levels of males using the Gorbel WSC increased by an average of 27%. Additionally, productivity for female subjects increased by 28%.

Enhanced performance with a Gorbel WSC results from the ease of movement associated with a WSC's design. Reduced dead weight and a design superior to that of the I-beam crane result in reduced coefficients of friction and lower initial and sustained movement forces that allow workers to position and move loads on Gorbel WSCs more easily than on I-beam cranes.



Easier movement equals more work cycles, which can result in significant increases in productivity over time.

Work station cranes improve productivity, profitability and safety.

In summary, the study revealed that workers using manually operated bridge cranes can safely handle significantly more weight with a Gorbel Work Station Crane than with a traditional I-beam jib crane. Additionally, the facts show that operators of these systems can do their jobs better, faster and for longer periods without fatigue or discomfort. Consequently, the simultaneous increase in productivity and reduction in job-related injuries can positively impact the bottom line of today's materials-handling companies.

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