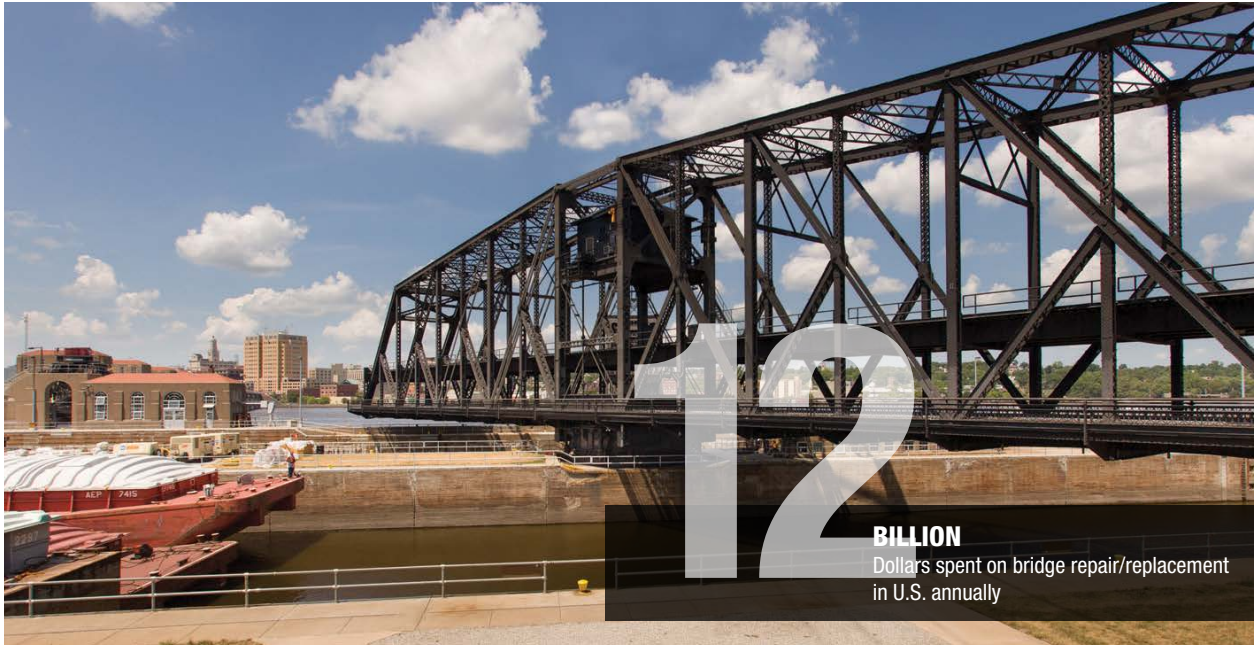


INNOVATION

SPOTLIGHT from the brands of Altra Industrial Motion Corp.



NUTTALL GEAR IMPROVES PROCESSES AND CAPABILITIES TO SUPPORT THE GROWING NEED FOR MOVEABLE BRIDGE GEARBOXES

Over the past decade, infrastructure engineers have been cautioning municipalities and governing bodies across the U.S. about the deteriorating condition of the country's bridges and dams. The average age of the 609,380 bridges in the U.S. is now nearly 42 years old. These warnings have proven to be justified with bridge failures such as the Minneapolis I-35W Mississippi River bridge collapse in 2007.

In response to the looming crisis, extensive bridge inspection programs were conducted nationwide with findings that, in some cases, caused immediate bridge closures. Moveable bridges, including bascule lift, vertical lift and swing bridges are susceptible to degradation due to the wear on their mechanical systems from repeated open/close operations over time. Many of these bridge drive systems are at the end of their useful lives.

MARKET LEADERSHIP

Since 1887, Nuttall Gear has been known as innovators in the field of gear engineering and leaders of setting gearing standards. For more than 60 years, moveable structure engineers, bridge and dam mechanical OEM's and bridge authorities/owners around the country have come to rely on Nuttall Gear for highly engineered, long-lasting gearbox solutions. Recognized industry-wide, as a leader in the bridge market, Nuttall Gear engineers have presented papers at Heavy Moveable Structures Biennial Symposiums.



www.altrabridgeanddam.com

 **Nuttall Gear**
Altra Industrial Motion

INNOVATION

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EVERY BRIDGE GEARBOX IS UNIQUE

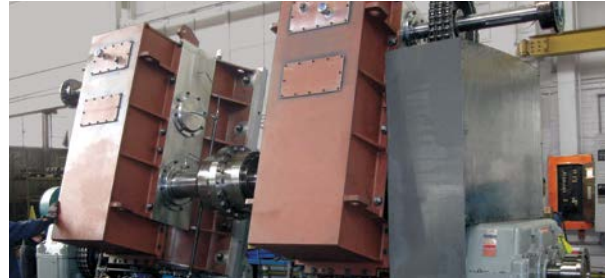
Nuttall Gear's extensive application expertise combined with their exceptional engineering capability is critical to their success. Every bridge gearbox is unique so understanding the requirement differences associated with each bridge type drive system allows Nuttall Gear to meet customer expectations faster and more cost effectively than others.

Nuttall Gear engineers work very closely with customers to meet all the various bridge challenges including vertical lift bridges that require dual matching drivetrains, the need to accommodate the heavy weight typically encountered on most rail swing bridges, and the load-sharing gearbox requirements on larger, dual-span bascule bridges to ensure a level lift of both spans.



STRUCTURED FOR PERFORMANCE

Nuttall Gear has refined their internal processes to allow for highly efficient bridge drive design and manufacturing. Advanced technologies are utilized throughout all operations including through hardening or carburizing of the gearing as well as hobbing, grinding, machining... all performed in-house to save time and costs while controlling quality and craftsmanship. Nuttall Gear's commitment to the bridge industry is company-wide from quality documentation through selective use and application of required paint and coatings.



TESTING CAN SIGNIFICANTLY INCREASE THE COST OF PRODUCING A GEARBOX BY 15-20%.

While substantial investments have been made in manufacturing areas, the most recent focus has been on expanding comprehensive, cost-effective and convenient in-house testing capabilities to meet often demanding moveable bridge drive customer load test requirements. Most moveable bridge drives are quite large and need to be tested to very high torque loads. The bridges also have differential style gearboxes that require load equalizing on each output shaft.

Nuttall Gear technicians utilize the latest testing techniques and technology including laser alignment of all drivetrain components, twin dynamometers, and massive, custom-built test stands which allow two 15,000 lb. gearboxes to be mounted and tested back-to-back on inclines up to 75 degrees.

Customers enjoy significant benefits by utilizing the innovative in-house testing capability including:

- Complete control of the test schedule
- Elimination of transportation costs to an outside test facility (which can be significant for a 15,000 lb. gearbox)
- Initial run and diagnostic challenges can be quickly overcome by technicians without having to remove the gearbox from the test floor, saving considerable setup time.
- Nuttall Gear can be significantly more cost-effective vs. competitors that outsource testing at an off-site facility.

Through a focus on continuous improvement, innovation and a dedicated team, Nuttall Gear provides the highest quality gear drive solutions with the lowest cost of ownership to the bridge and dam market.