



## Product

## Hoist Worm Gear Drives

## Application

## Steel Mill Charging Crane

## Highlights

- Reverse-engineered enclosed worm gear reducers and worm gear sets
- Aluminum bronze gear material for enhanced durability
- Carburize hardened, ground and polished alloy steel worm
- Fabricated steel housings and mountings for strength and durability
- Redesigned lubrication system

Charging crane hoist drive gear boxes were failing prematurely at a large steel mill in Northeastern U.S. The failures were causing unfavorable outages and expensive periods of downtime.

Due to their desire and reputation to solve problems, Delroyd was called in to help analyze the situation and develop a solution. A meeting was held at the mill with various parties including an outside service group, mill engineers, maintenance managers and Delroyd engineers. All aspects of the ongoing issues were reviewed and an on-site inspection of a failed gearbox was performed.

Based on their findings, Delroyd engineering developed new worm gear sets utilizing aluminum bronze gears and redesigned the bearing mountings to enhance strength and durability. A carburize hardened, ground and polished alloy steel worm develops a smooth, work-hardened surface on the aluminum bronze gear. Extra-heavy side plates were used to connect the worm and gear shaft bearing supports, assuring proper meshing of the gear under all conditions of load. A more rigid fabricated steel housing design was utilized to reduce bending moment stresses. A redesigned, more efficient lubrication system was also incorporated.

The Delroyd design changes resulted in extending the gearbox life by over five years. The charging crane gearbox success prompted the mill to utilize Delroyd's expertise by providing gearboxes for their gantry cranes as well.

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