



## Product

## Custom Gear Drives

## Application

## Rail Swing Bridge

## Highlights

### Nuttall Gear Custom Reducers

feature through-hardened gearing with CWI weld inspected, fabricated steel housings

### Delroyd Worm Gear Custom Reducers

feature a hardened, ground and polished alloy steel worm and bronze gear

The Beverly Drawbridge spans the Danvers River, connecting Beverly and Salem, Massachusetts. The bridge is positioned adjacent to the Route 1A, Veterans Memorial Bridge. Originally built in 1885, the rail bridge currently carries the Massachusetts Bay Transportation Authority (MBTA) Newport/Rockport commuter line that originates in Boston.

The bridge's center swing section rotates approximately 5,000 times per year to allow passage of marine river traffic through two channels. More than 30 inbound and 30 outbound trains cross the busy bridge daily. In recent years, the bridge had begun to experience mechanical problems requiring expensive repairs while causing significant service interruptions and delays for thousands of daily commuters.

In 2017, the MTBA completed a major rehabilitation of the bridge that included a new swing span, mechanical components, bridge wedges, and drive motor. Nuttall Gear and Delroyd Worm Gear worked with project engineers at HNTB Corp., to design custom gear drives for the bridge's 104 ft. swing span.

The Nuttall and Delroyd splash-lubricated enclosed reducers featured fabricated steel housings and included inspections by an Independent Certified Weld Inspector (CWI). The project had a "Buy USA" requirement (including country of origin for the steel). Required no load and 150% load tests were performed in-house.

- Primary Differential Span Drive Reducer: Input rating: 15 HP @ 900 RPM, Reduction ratio: 2.53:1
- Secondary Span Drive Right Angle Reducers: Input rating: 7.5 HP @ 356 RPM, Reduction ratio: 48.11:1
- Wedge Drive Gearmotors w/Integral Brakes: Input rating: 10 HP @ 1750 RPM, Reduction ratio: 17.1:1
- Wedge Drive Right Angle Reducers: Input rating: 10 HP @ 104 RPM, Reduction ratio: 56.42:1
- Rail Lift Worm Gear Reducers: Input rating: 5 HP @ 1750 RPM, Reduction ratio: 450:1

### Contact Nuttall Gear

### Contact Delroyd Worm Gear

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