

## HIGH-SPEED RAIL LOCOMOTIVE CARS



### BACKGROUND INFORMATION

Keel was selected to manufacture more than 50 high-speed locomotive cars over a four-year time span. Each of the high-speed rail cars included:

- 3,000+ discrete components
- 1,200 pounds of weld
- 15 different alloys
- Eight (8) different coatings and castings
- Welded to: AWS D15.1 Railway Welding Specification.
- Inspected to: EN ISO 5817:2014(E) Welding – Fusion-welded joints in steel, nickel, and their alloys (beam welding excluded) – quality levels for imperfections.

### BUSINESS CHALLENGES

**1**

**Large Scale Production:** Keel manufactured 56 power cars. This significant number highlights our company's capacity for large-scale production. Keel also developed manufacturing and assembly processes that functioned with our equipment and facilities to accommodate the volume and quality requirements of the project.

**2**

**Long-Term Commitment to Quality and Precision:** Maintaining a four-year project requires a sustained focus on quality and precision throughout. The challenge lies in ensuring consistent planning and execution over the extended period.

**3**

**Adapting to Technological Advancements:** Collaborating with international customers to understand evolving design requirements presents the challenge of recommending and implementing technological changes that enhance manufacturability while meeting strict deadlines and product quality.

## APPROACH AND SOLUTION

Keel worked with its international customer to understand the customer's evolving design and recommend changes to improve manufacturability. Keel's in-house engineering team collaborated with the customer's engineering and quality teams to qualify each process and every fixture's capability. Keel engineering also designed and developed several production weld fixtures and work processes to meet the required production demand. Many of these fixtures developed feature both manual and hydraulic clamping. Keel performed Alpha and Beta builds to verify processes, assess tooling capability and identify potential productivity enhancements.

One key assembly operation involved a large rollover fixture where the floor/decking of the locomotive is welded in place. The welded component Keel produced is approximately 56 feet in length.



## VALUE DELIVERED

It begins with the ability to configure the shop floor to meet the production requirements of the customer's project. The complex manufacturing process is organized by Keel's Advanced Planning Excellence Center (APEX). All steps from procurement to product measurement are defined for Keel's manufacturing staff by APEX. Each assembly step is also scheduled at all Keel Midwest plants to ensure available capacity and conformance to the delivery schedule. At the same time, Keel's purchasing department and supplier development group also work with our dependable supply partners to ensure materials are delivered on time and to specifications.

With a large staff of skilled tradesmen and women, Keel can build it! From process and United States Supply Chain development to tooling design & build to certifying our welding team to AWS D15.1 specifications, our team can easily handle your project with precision.

Keel is equipped to handle large-scale projects. Our shop floor is configurable to meet production requirements of the customer's project and Keel has the equipment in place to laser cut materials up to 12 inches thick. Keel's fabrication facilities include CNC plasma contour beveling and oxy fuel torches, waterjet cutting, 6-axis beam coping, five robotic welding systems and an entirely new blast and paint system. We can handle your project's needs all in our facilities.

