TIMKEN

ElectroSpexx™ bearings block stray current, extending service life for heavy-haul locomotives

Challenge

Railroads depend on reliable locomotives to keep freight moving. A major Brazilian operator with a large fleet of AC locomotives was experiencing electric arcing damage on their motor suspension unit (MSU) tapered roller bearings. Despite using a competitor's insulated bearings, stray electrical current still passed through, causing arcing, surface damage, lubrication breakdown, and scrap rates of up to 70%.

Installation practices worsened the issue. The railroad's bearing mounting process often chipped the dielectric coating, compromising insulation and accelerating failure. With costs of roughly $70,000 annually in replacements, the customer needed a more durable solution and improved installation method.

Timken Solution

Timken's Brazil and U.S. engineering teams partnered closely with the customer to collaborate onsite, review inspection and installation records, and rapidly identify root causes. This teamwork allowed the team to optimize coating durability and installation by refining geometry, introducing controlled mounting methods, and training maintenance teams during initial installs. After validating these procedures through the deployment and performance tracking of more than 100 units, the team finalized their solution: a purpose-built dielectric-coated bearing that launched our ElectroSpexx™ line of insulated bearings.

Results That Matter

These new ElectroSpexx bearings are expected to last two full service cycles, about 14 years, effectively doubling service life.

Key benefits include:

- Reduced electrical arcing damage
- Lower bearing scrap rates
- Fewer premature MSU removals
- Estimated $70,000 in annual savings
- Lower risk of locomotive failures

By combining engineered products with onsite support and global expertise, Timken delivered a reliable insulation solution that improves asset protection, maintenance planning, and operational uptime.