

Smarter rail

Bearing Remanufacturing & The 100/100 business model



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About SKF Railway

Today, SKF solutions and services for the railway industry deliver global solutions for rail around the world.

From contributing design expertise and providing advanced axlebox bearings, to installing lubrication systems, validating reliability and safety requirements, mounting bearings and more, SKF helps increase railway vehicle safety, reliability, efficiency and service intervals

SKF offers customers unique insights into railway vehicle bogie system operations by drawing on our unmatched combination of railway bearing design and manufacturing expertise and cutting-edge condition monitoring and application knowledge. By collecting and analyzing data throughout the operational life of the train, we're helping to enhance the next generation of railway vehicle designs in ways not previously possible.



Bearing remanufacturing

A delicate and critical process

Wheelset bearings are among the most safety-critical components on rail vehicles. Reliability with minimal maintenance is essential as these bearings must operate in harsh conditions, withstanding heavy loads, constant exposure to the elements, possible contamination and extremes of climate.

When bearing refurbishment is needed, the process steps must be carried out in the right way to ensure continued reliability and smooth operation. Following are key factors to keep in mind during each critical step of the refurbishing process.

Cleanliness

A clean environment during refurbishment operations is imperative. This prevents dirt and debris from entering the bearing during the assembly and re-greasing process. This contamination can lead to premature failure.

Inspection

After dismounting and cleaning, the used bearings must be inspected. The inspection should be conducted by staff trained to identify bearing damage, and certified to work on safety critical products. These qualifications include not only theoretical education but also many hours of practical experience, including shadowing experts who can demonstrate methods of identifying failure modes and possible trends. To keep up to date with the latest technologies, products and inspection methods, personnel must continue developing these competencies with additional training and education on a regular basis.

Axial clearance

Axial clearance is a critical measurement to ensure that the bearing is not exposed to premature failure. If the bearing is assembled with the incorrect clearance, problems

will arise when mounting to the axle in service. It's very important to pay attention to the measurements provided in the OEM specifications and to measure carefully.

Checklist

- ☐ Ensure the environment for the remanufacturing operation is clean
- ☐ Visual inspection
- ☐ Correct axial clearance
- ☐ Grease filled in a proper way
- ☐ Seals mounted correctly
- ☐ Marked for traceability



Grease filling

Grease is necessary for optimized bearing performance. But, it is not as simple as filling the bearing with the right grease and quantity. It's essential to ensure that the grease is distributed to the right areas. Additionally, it is important that the grease filling be performed in a clean environment with the right tools, so that contamination does not enter the bearing.

Grease storage

Before filling, be sure that the grease has been stored properly. Grease condition and contamination issues are major concerns and typical issues in railway refurbishment workshops. Proper storage practices will assure that the grease is in optimum condition to support bearing performance. Temperature and environment, storage methods and inventory control can all affect grease quality.

Correct mounting of seals

Seals must be mounted in the correct way to allow low-friction torque and to avoid unwanted contact and misalignment. Used seals should not be mounted back on the bearings. Instead, they should be replaced with new seals to ensure the correct fit and performance in the field.

Traceability

It is mandatory that all refurbished bearings are marked with the date of the refurbishment and the facility that carried out the work. The ability to trace individual bearings is the main factor in analyzing failure trends, enabling corrective actions.



Remanufacturing operations

To reduce scrap rates, remanufacturing operations such as polishing, honing and grinding of raceways can be used. Through these operations, bearings with minor defects can be repaired instead of scrapped. However, these operations require access to OEM equipment and should not be implemented by a 3rd party without support from an OEM bearing manufacturer.

Refurbishing in-house vs. outsourcing

Proper bearing refurbishment is key to the reliability of wheelset bearings – and to railway operations. If in-house staff is not qualified to follow recommended processes, it is best to outsource refurbishment operations to a partner that can guarantee the process quality required. OEMs have the sophisticated equipment and expertise needed. By taking advantage of these resources operators will be able to use refurbished bearings with confidence.



The 100/100 business model:

Helping improve spare parts management

Spare parts management is a common challenge for rail operators. The pressure for train availability is high and spare parts must be available exactly when needed to avoid unnecessary downtime. At the same time, cost pressure is increasing. Cost drivers such as space for stock keeping, and capital tied up in spare parts, must be avoided in order to keep budgets low. SKF's new 100/100 model for railway bearings offers a solution, by addressing the issues of cost control and parts availability.

The challenge: Predicting needs and costs

Having bearing refurbished costs less than a purchasing a new one. But, it's not always clear how many bearings will be suited to refurbishment, and how many may need to be scrapped and replaced with new bearings. To avoid delays, most operators will keep a number of new bearings in stock, or will order new bearings in anticipation of future needs. This creates a cost disadvantage related to space for stock keeping and tied up capital. It also creates budget planning difficulties, as exact costs cannot not be identified until bearings that have been in operation are evaluated for refurbishment or replacement.

The solution: Assuring bearing availability and fixed costs

The SKF 100/100 business model helps railway operators and maintenance partners by reducing the uncertainty, complexity and costs of spare parts

management. It does so by shifting the spare parts planning and stock keeping responsibility and management from operators / maintenance partners to SKF. The model is actually very simple. The bearings are sent for refurbishment, and no matter how many of them need to be scrapped, the operator will always get exactly the same number of bearings back. If 100 bearings are sent for refurbishment, 100 will be brought back to the operator / maintenance partner as a mix of refurbished and new. And most importantly, the price will always be the same, whether the scrap rates for a specific batch are unusually high or low. It is very much like an insurance system where the supplier takes the risk. This way the operator will avoid surprises and stock keeping uncertainty, and can rest assured that the right amount of bearings will be available at the right time within the agreed budget.

Getting started

To set up the system, SKF requires that scrap-rate statistics are gathered during a period of six months. Based on the results, the contract will be agreed. The operator or maintenance partner will know exactly what to pay during the contractual period. The contract will then be revised every six months to make sure the scrap rates are in the right range.



The 100/100 model: Inventory and cost control

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