

TIMKEN



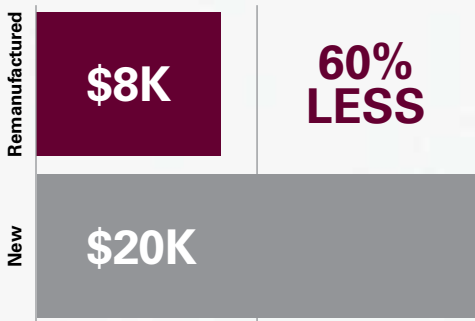
**REDUCE COSTS,
STRENGTHEN PERFORMANCE**

TIMKEN BEARING REPAIR

How can bearing repair save money and time for me?

A bearing remanufactured by Timken can cost 20 to 60 percent less than the cost of a new bearing.

When compared to manufacturing new, lead-times are significantly reduced with bearing repair. Shorter lead times can increase uptime.



If a new bearing costs \$20,000 then the cost of a bearing remanufactured by Timken could be \$8,000 – a savings of \$12,000, or 60 percent.

Repaired bearings good as new – really?

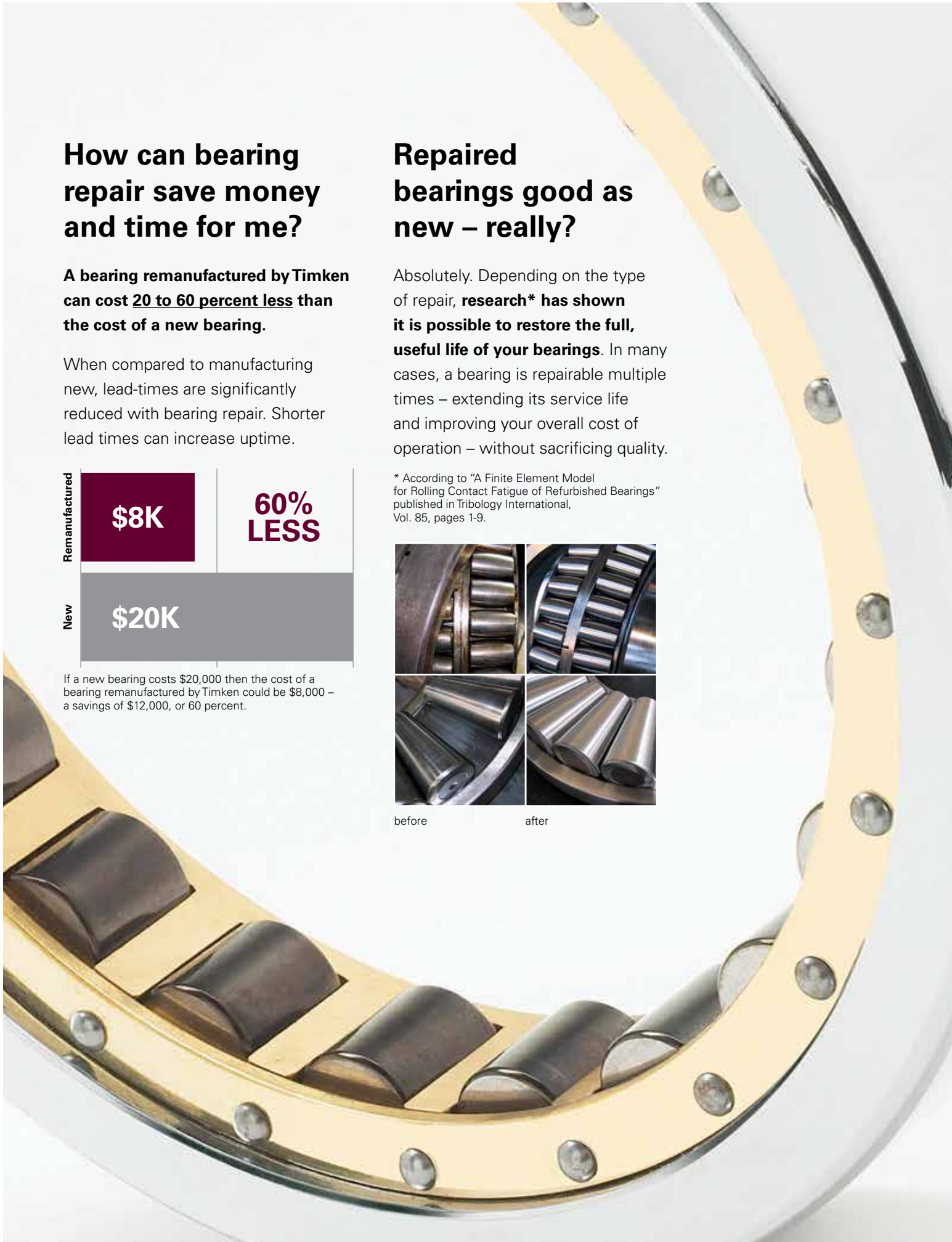
Absolutely. Depending on the type of repair, **research* has shown it is possible to restore the full, useful life of your bearings.** In many cases, a bearing is repairable multiple times – extending its service life and improving your overall cost of operation – without sacrificing quality.

* According to "A Finite Element Model for Rolling Contact Fatigue of Refurbished Bearings" published in Tribology International, Vol. 85, pages 1-9.



before

after



How can I maximize the value of bearing repair services?

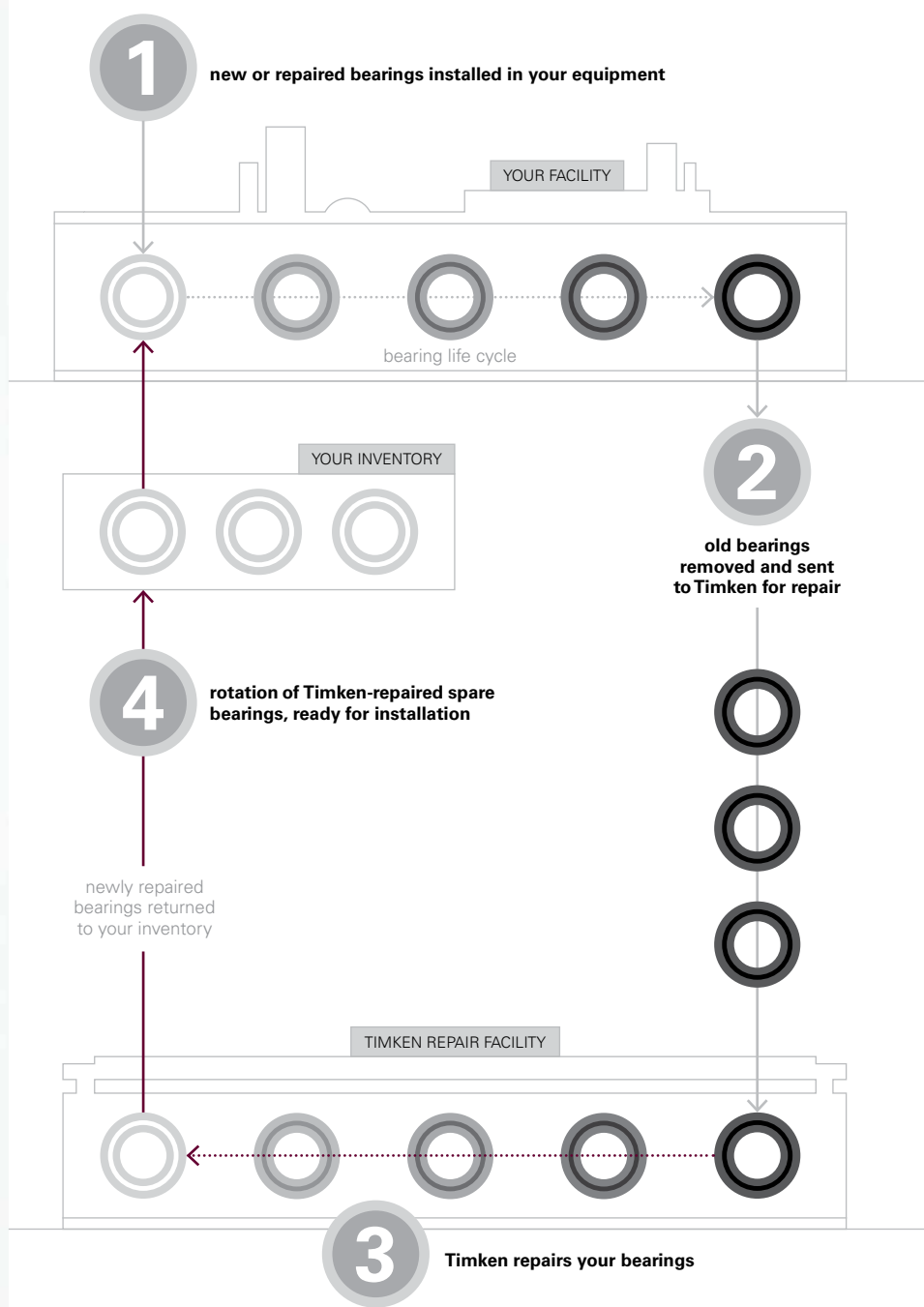
You can **significantly reduce your overall cost of operation by building a critical spares inventory.** With new bearings in operation, send the out-of-service bearings to Timken for repair.

When it is time to replace bearings, you can install the remanufactured part from your inventory, avoiding stock-outs and costly downtime.

As this cycle repeats, you continue to lower your costs and reduce operational downtime.

Repair, Repeat, Save

With each repair cycle, you can save 20 to 60 percent of the cost of replacing the bearing. **Repair the same bearing twice, and you could cover the cost of a new bearing.**





Why Timken for bearing repair?

Timken has a dedicated team of bearing repair experts. This team employs strict Timken standards and quality control in the remanufacturing process. In addition, the repaired bearing is backed by an industry-leading warranty.

While some bearing repair methods consist of just a cosmetic honing, we take the extra steps to help extend the life of your bearing.

Bearings repaired by Timken are backed by an industry-leading warranty.

How do I know when a bearing needs repair?

Timken repair experts can help you to identify the type of bearing damage, determine the root-cause and recommend the best repair method.

Signs or reasons that a bearing may need repair:

- During routine maintenance the bearing is deemed "ready for replacement"
- Exceeds an operating temperature of 200°F (93°C)
- Exposure to excessive vibration
- Experiences a sudden drop or gain in lubrication
- Emits excessive noise
- Loses bearing seal integrity

Timken is a trusted leader in bearing technology with extensive engineering and metallurgical expertise.

What type of bearing is repairable? What if the bearing was made by another brand?

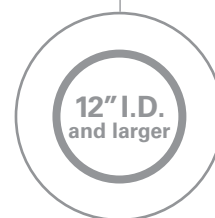
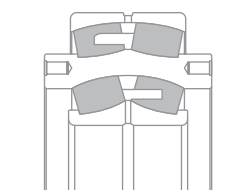
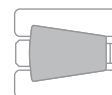
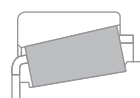
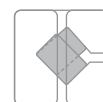
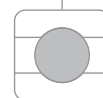
Regardless of the original manufacturer, we can repair **most types of bearings** including:

- Ball bearings
- Class 3 precision bearings (all types)
- Cross roller bearings
- Cylindrical roller bearings
- Spherical roller bearings
- Tapered roller bearings
- Thrust bearings (all types)
- Triple ring bearings

What size bearing is repairable?

Generally suited for bearings with a **12" interior diameter (I.D.) and larger**, our repair methods are comprehensive, methodical and extensive – often using grinding operations to remove damage below the surface and restore bearing geometry.

Sometimes smaller bearings are good candidates for repair, depending on the type of repair needed.



What repair methods does Timken use?

Our repair methods are unique in the industry – with extraordinary attention to detail.

Recertification (Type 1): Bearing assemblies cleaned, examined, measured for verification of internal clearances, inspected, preserved and packaged. This process is used to recertify a bearing for service – generally applying to an unused product with an outdated shelf life.

Reconditioning (Type 2): Bearing assemblies cleaned, examined, polished, honed or tumbled to remove minor surface defects (primarily rust or corrosion), measured for verification of internal clearances, inspected, preserved and packaged.

Remanufacturing (Type 3): Bearing assemblies cleaned, examined, raceways reground, new roller sets and major


components manufactured and replaced as required, internal clearances reset, inspected, preserved and packaged.

Regrinding raceways requires the manufacture of oversized rollers to compensate for the removed material and to maintain bearing geometry and clearance where radial internal clearance is critical. When lateral clearance is critical, oversized rollers, new spacers or additional shims are provided.

Reclamation: Typically used for bearings with a 3" - 8" I.D. (larger, economical quantities required). Bearing assemblies cleaned, polished using our proprietary vibratory process, inspected, preserved and packaged.

Modifications: We can add special features, including advanced coatings, to existing or new bearing assemblies to enhance performance, retrofit to special applications or upgrade to our most recent product designs.

Upgrade with ES Coatings: This advanced coating technology helps prevent bearings from peeling in areas where roller skidding occurs, typically under low load and speed conditions. Skidding breaks through the lubricant film of a bearing, leading to premature damage to rollers and races. This protection can lead to greater uptime and performance.



Timken bearing repair spans a broad range of applications from industrial to aerospace.





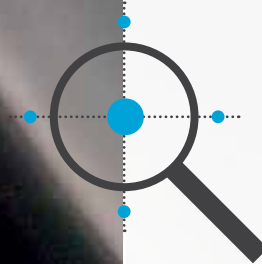
*Earned ISO
9001:2008
Quality
Management
System
Certification*

What are the standards Timken uses?

As a standard practice, we replace or remanufacture rolling elements depending on their condition.

New rolling elements meet or exceed manufacturer's requirements for material, geometry and surface finish. Each rolling element is 100% visually and dimensionally inspected and tested in accordance with all applicable OEM specifications.

Every bearing, upon completion of repairs, undergoes extensive visual and dimensional inspection in accordance with Timken-approved procedures, and OEM acceptance criteria (where available).



What are the environmental benefits of bearing repair?

Bearing repair is a green maintenance procedure, **requiring minimal energy input and significantly reducing raw material consumption** when compared to manufacturing new bearings.



How can I reduce my overall cost of operation with Timken bearing repair services?

Contact Timken Industrial Services (Customer Service) at (877) 4TIMKEN (**877.484.6536**) or by email at **bearing.repair@timken.com**.

For more information, visit us online at **www.timken.com/bearingrepair**.

TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related industrial motion rebuild and repair services.

Stronger. By Design.

www.timken.com/bearingrepair