



## The Value of Bearing Remanufacturing

- *Experience in recognizing various types of damage is important for an accurate inspection and repair.*

## The Value of Remanufacturing

If you are involved in the everyday operations of a plant, you know that accuracy, throughput, uptime and performance help to positively contribute to your bottom line. As part of our customer-centric focus, Timken offers comprehensive bearing repair services that save you money.

Used bearings can often be returned to their original specifications using less time and money than purchasing new bearings. In fact, reconditioning a bearing can save up to 90 percent of the cost and time of purchasing a new one.



## The Timken Difference. We meet your need.

Timken Industrial Services offers a bearing program that is designed to provide you with the best service options available – no matter the brand, type or size of bearing. In this program, we provide optimized solutions to you through our experienced service representatives, global presence and continuously refined processes.

### Experienced Service Representatives

Our service engineering team will assist your maintenance crew in assessing the damaged bearing and analyzing the cause of the problem. Together, our service team and your crew will prepare a corrective action plan. Our expert associates will train your personnel on how to identify and prevent various types of bearing damage.

### Global Presence

With operations on six continents, you will find Timken support in any region of the world through our sales and service engineering network.

### Quality Workforce and Processes

Experience in recognizing various types of damage is the only way to fully ensure an accurate inspection and repair. Our trained associates carefully evaluate bearing condition and provide an inspection report and quotation. In addition, we use only the highest quality remanufacturing processes and equipment, allowing us to restore your used bearing to like-new condition.

- *Used bearings can often be returned to their original specifications using less time and money than purchasing new bearings.*



- *Regular maintenance checks can help you determine if a bearing needs maintenance.*



## Assessing the Situation

The process begins with our service engineering team partnering with your maintenance group to analyze the bearing. We assess bearings for remanufacture from 10 inches to 240 inches in outside diameter (OD). It is recommended that sizes smaller than 18 inches OD be grouped into economical quantities. Depending on the urgency and extent of a repair, a bearing can be repaired in as little as 24 hours, sometimes at your site.

If your bearings meet these specifications, repair services can save time and money. When preventative maintenance programs accompany reconditioning, your bearings will be capable of reaching their fullest potential.

### Does Your Bearing Meet the Remanufacture Criteria?

Perhaps the most difficult task is determining if and when a

bearing needs to be serviced. This determination requires much more than a quick visual inspection. Below are a few signs to look for when inspecting bearings that may need to be repaired:

- *The bearing is nearing suggested life expectancy.*
- *The bearing has exceeded an operating temperature of 200° F (93° C).*
- *The bearing has been exposed to excessive vibration.*
- *The bearing experienced a sudden drop or gain in lubrication.*

Paying attention to these details during regular maintenance checks can help you determine if a bearing needs maintenance before it causes unnecessary downtime and expense. Careful observation is the first step to creating a program that monitors your bearings and surround operations.



**WARNING: Proper maintenance and handling practices are critical. Failure to follow installation instructions can result in equipment failure, creating a risk of serious bodily harm.**

- To apply the proper remedy to the damaged bearing, the cause and extent of the damage must be assessed.

## Bearing Damage

To apply the proper remedy to the damaged bearing, the cause and extent of the damage must be assessed. Environmental issues, such as ingress of contamination and water into the bearing chamber, are the common causes of premature bearing failure. The following are typical causes of damage found on large bearings and precautions you can take to prolong life.

### A. Improper Handling:

- Cage deformation and nicking can result from improper installation, handling or removal.
- Precautions: Use proper handling practices along with the correct handling, mounting and disassembly tools.

### B. Inadequate Lubrication:

- Scoring of components or severe bearing deformation can result from inadequate or incorrect lubrication.
- Precautions: Improve lubrication system and change the lubricant at correct intervals.

### C. Corrosion And Etching:

- Water exposure can lead to pitting and rusting of bearing components. Line spalling may result from bearings that operate after etching damage.

- Precautions: Check seals regularly, ensure proper sealing and store bearings properly.

### D. Electric Current:

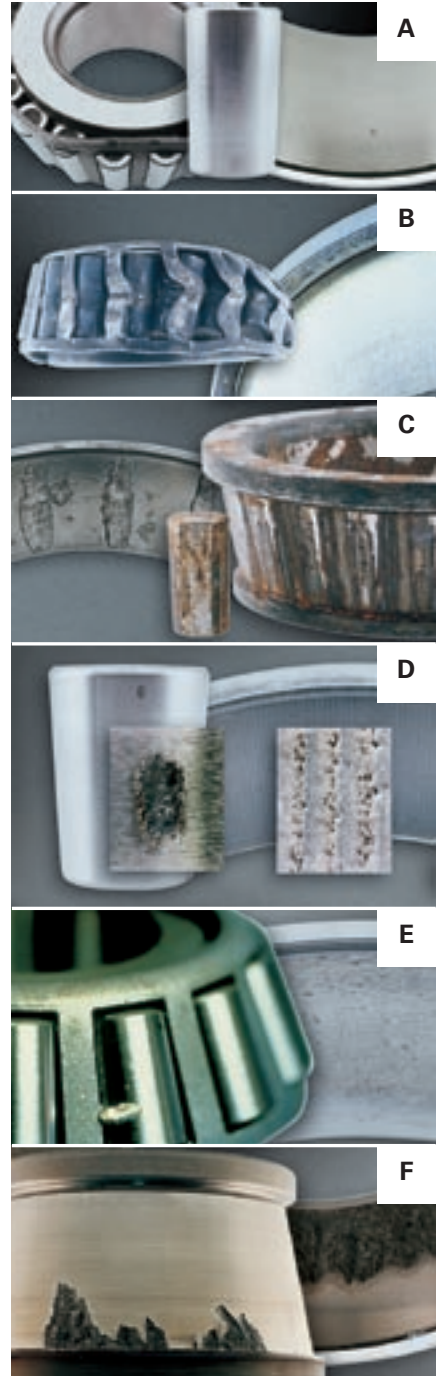
- Passage of electric current while a bearing is rotating may cause fluting or grooving. Improper electric grounding while a bearing is stationary can create small burns.
- Precautions: Shunt the current around the bearing by proper earth connection before welding.

### E. Foreign Material:

- Abrasions, bruising and grooving can result from abrasive particle contamination and debris.
- Precautions: Remove the debris, change the lubricant and check/replace the seals.

### F. Misalignment:

- Geometric stress concentration or spalling can result from misalignment, deflections or heavy loading.
- Precautions: Machine the bearing seats and shoulders accurately. Check accuracy of shaft and housing seats, ensure proper shaft/housing alignment and confirm or reduce operating forces.



**Please contact your local Timken representative for more information. Note: These suggested precautions are not intended to replace the specific instructions of your equipment supplier.**

- *In some instances, on-site repairs are possible.*

## Timken Industrial Bearing Service Options

Once the damaged bearing has been assessed, a remanufacture type is chosen. Depending on the extent of damage, the bearing may be sent to a Timken repair facility. In some instances, on-site repairs are possible.

### Recertification

Bearing assemblies are:

- *cleaned,*
- *examined,*
- *measured for verification of internal clearances,*
- *preserved and packaged.*

### Reclamation

Bearing components are polished utilizing Timken's proprietary vibratory process, preserving and packaging.

### Reconditioning

Bearing assemblies are:

- *cleaned,*
- *examined,*
- *components polished,*
- *measured for verification of internal clearances,*
- *preserved and packaged.*

### Remanufacturing

Bearing assemblies are:

- *cleaned,*
- *examined,*
- *raceways reground,*
- *new roller sets manufactured,*
- *major components may be required,*
- *internal clearances reset,*
- *preserved and packaged.*

### Modification

Special features may be added to existing or new bearing assemblies. These features are used to enhance performance, retrofit to special applications, or even upgrade to our most recent product designs.

### Removing the Bearing

Before a bearing is sent out for service, it first must be removed from its shaft housing. It is important to use great care during the removal process to ensure that the bearing, shaft and housing are not damaged.



Bearing removal is best accomplished by using a bearing puller for standard outer and inner rings, which is available through many manufacturers, including Timken. When removing bearings that have a backing shoulder that extends beyond the cone large rib, a puller that pulls through the rollers should be used.

Hydraulic pressure is another available method to remove bearings. Pullers or wedges may be used to remove the bearing after the hydraulic pressure has expanded the race. Hot oil or heat may be used along with the pullers or wedges.

**Note:** *These suggested precautions are not intended to replace the specific instructions of your equipment supplier.*

- *If you decide not to proceed with the repair, we can arrange for the disposal or return of the damaged bearing.*



When the puller has been placed on the bearing and pressure is applied, the bearing race should expand and be easily removed.

**Always use extreme caution when working with hot oil or steam. Contact with hot oil or other heat sources can result in serious bodily harm. Protective clothing and safety glasses should be worn at all times.**

There are a number of valid methods you may use to remove a bearing from its shaft. **No matter which method is used, be careful not to expose any surface of the bearing to the flame of a torch.** Any torch-

heat damage renders the bearing as scrap. A bearing's hardness and metallurgical structure is dramatically altered by torch heat.

When it is necessary to drive out inner or outer rings, extreme care should be taken to prevent bearing seat damage, backing shoulder damage or burrs on any surface. Damage to these surfaces will prevent proper seating of the bearing and its new components when reassembled in the application.

### **Taking the Next Step**

1. Contact your Timken sales or service representative for your customized solution or visit us at [www.timken.com/industrialservices](http://www.timken.com/industrialservices).
2. Your Timken sales or service representative will work with you to assess your bearing repair needs.
3. Our service facilities will assess the bearing's condition and provide a quotation.
4. When you have authorized the repair, our facilities will perform all necessary repairs and return the bearing to you within the promised lead time.

If you decide not to proceed with the repair, we can arrange for the disposal or return of the damaged bearing.



***Always use extreme caution when working with hot oil or steam. Failure to follow correct maintenance procedures or to wear appropriate protective clothing and safety glasses at all times can result in serious bodily harm.***

***CAUTION: Never expose any surface of a bearing to the flame of a torch.***



## About Timken Industrial Services

Timken Industrial Services works closely with you to define the precise combination of bearings and related products with integrated services to improve your productivity and extend the life of your entire mechanical powertrain. From the intense conditions found in rolling mills to continuously operating power plants, Timken Industrial Services offers solutions for a variety of industrial manufacturing settings. And with the Timken name behind it, you can be assured that our work is of the highest quality and reliability.

To find out how your company can benefit from precisely remanufactured components, contact your Timken sales or service associate today, or visit us on the Web at [www.timken.com/industrialservices](http://www.timken.com/industrialservices).

**TIMKEN**  
Where You Turn

Bearings • Steel •  
Precision Components • Lubrication •  
Seals • Remanufacture and Repair •  
Industrial Services

[www.timken.com](http://www.timken.com)

Timken® is a registered trademark of  
The Timken Company

© 2007 The Timken Company  
Printed in U.S.A.  
7.5M 03-07-29 Order No. 10090