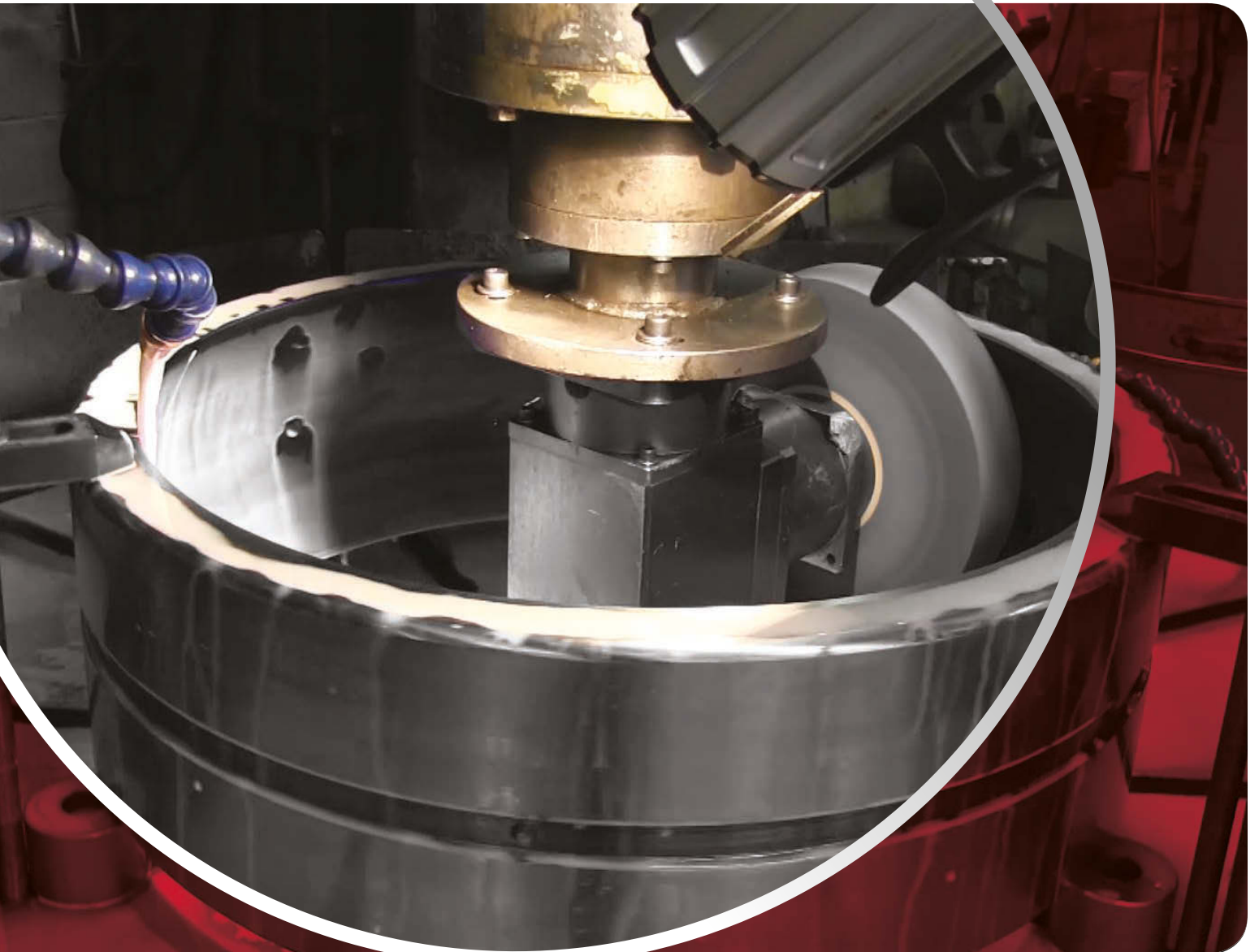




NSK RECONDITIONING PROGRAM



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WHAT IS RECONDITIONING?

Reconditioning brings used bearings back to life. This is accomplished through various procedures that may include: cleaning, polishing, grinding, replacement, resetting and refinishing. This process restores bearings, bringing them back to like-new specifications and performance. NSK offers bearing reconditioning in four different levels:

LEVEL R1

- › Pressure cleaned
- › Inspected with thorough damage analysis
- › Raceway, bore, cup, cone, inner, outer and roller angles verified
- › New components (rollers or rolling elements, pins and cage rings) if applicable
- › Raceways reground as needed
- › Polished, vibratory finished/touched up as required
- › Verified for size and angle
- › Clearances measured, verified and reset
- › Cleaned and repacked

LEVEL R2

- › Pressure cleaned
- › Inspected with thorough damage analysis
- › Raceway, bore, cup, cone, inner, outer and roller angles verified
- › Raceways reground as needed
- › Polished, vibratory finished/touched up as required
- › Verified for size and angle
- › Clearances measured, verified and reset
- › Cleaned and repacked

LEVEL R3

- › Pressure cleaned
- › Inspected with thorough damage analysis
- › Polished
- › Minor repair (spalls/imperfections)
- › Measured and spacers reground if applicable
- › Proper clearances checked
- › Cleaned and repacked

LEVEL R4

- › Pressure cleaned
- › Repackaged

CASE STUDY

A major coal-fired power plant was on a tight deadline to obtain a new thrust bearing for a rebuild on one of its pulverizer gearboxes. The current supplier's lead time for a new thrust bearing was beyond their deadline with an unattractive price as well. NSK was approached to help reduce the lead time and also provide cost reduction.

Utilizing NSK's Reconditioning Program, NSK inspected, quoted and repaired the 28-year-old thrust bearing back to specifications. The bearing was returned to the customer well before the deadline, significantly reducing lead time. In addition, reconditioning the bearing provided a cost savings of \$102,000.

NSK RECONDITIONING PROGRAM

WHEN TO RECONDITION?

Routine maintenance checks can indicate signs of bearing fatigue and a need for further inspection. In addition, knowing the history, performance and operating environment will provide indications as to the condition of the bearing. Not all bearings will benefit from reconditioning. Some bearings may be too damaged, requiring the purchase of a new bearing. NSK can help you determine whether reconditioning would be beneficial for your specific bearing requirements.

WHY RECONDITION?

Many times, a bearing can be reconditioned and placed back into service, extending the life of the bearing while avoiding the possible high cost and lengthy lead times of a new bearing. Reconditioned bearings that are not returned to service immediately, but stored for later service, can reduce inventory costs. Reconditioning can cost a fraction of the time and money compared to new.

Original specifications are used to ensure the bearing's quality, functionality and performance. A warranty is provided to further support the quality of work used to recondition the bearing.

Reconditioning is a timely, reliable and cost-effective means of maintaining productivity and reducing downtime.

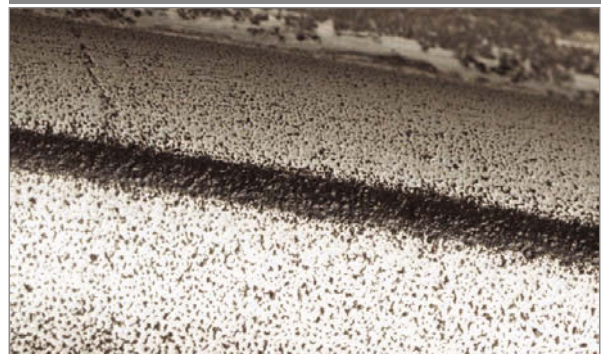
TYPES OF BEARING DAMAGE*

SCORING: Scratches in a metal surface (scuffing, smearing, galling)



Possible Causes: contamination, inadequate lubrication, excessive/improper loading

PITTING: Breaking away of small particles



Possible Causes: contamination, moisture, inadequate lubrication

WHO TO TRUST?

NSK strives to provide our customers with the best options available to keep their businesses running smoothly. The reconditioning program is not limited to NSK branded bearings. We welcome various brands, types and sizes of bearings.

Our reconditioning lead times are among the shortest in the industry based on industry standards and given the reconditioning level required. We want our customers to continue their success. Our reconditioning reports include a thorough damage analysis to help our customers assess the cause of the problem, enabling them to prevent issues that would reduce the life of the bearing in the future.

TYPES OF BEARINGS SERVICED

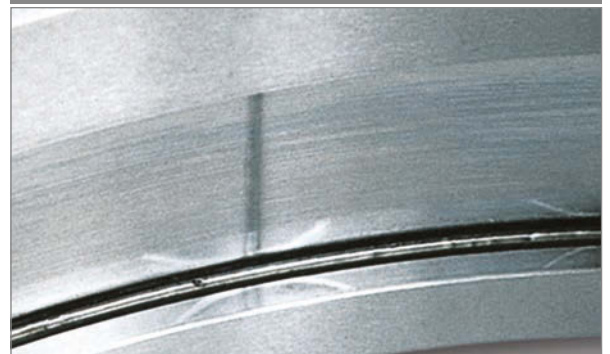
- › Ball
- › Spherical
- › Tapered Roller
- › Cylindrical Roller
- › Continuous Caster
- › Roll Neck
- › and more

DENTING: Indentation, surface depressions in a metal surface



Possible Causes: contamination, dropping

FRETTING: Wear debris and wear spots



Possible Causes: inadequate lubrication, vibration, improper storage

HOW TO BEGIN?

- › Contact your NSK representative to begin communicating your bearing needs.
- › NSK's reconditioning facility will inspect the damaged bearing and provide a quotation and inspection report specific to the bearing(s) requiring reconditioning.
- › Upon receiving your authorization, the damaged bearing will undergo the appropriate reconditioning processes.
- › The reconditioned bearing will be securely repackaged and delivered to you within the quoted lead time.
- › If the quotation is declined, NSK will make arrangements to dispose of, or return your damaged bearing.

The reconditioning process begins by simply contacting your NSK representative.

MORE INFORMATION

Call 1-800-675-9930 or contact your NSK representative for more information on bearing reconditioning. In addition, ask about NSK's reclamation and modification capabilities.

FLAKING: Chipping, fragmentation, flaking or separation of surface material
(OR SPALLING)



Possible Causes: contamination, misalignment, overload, poor lubrication

RUST AND: Chemical actions attacking on surface (rust)
CORROSION



Possible Causes: moisture, poor storage conditions, improper handling

*Images used in this brochure are to illustrate types of bearing damage. Damage in some cases is very severe. Images may not depict the types of bearing damage that can be repaired through the NSK Reconditioning Program.



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