

QuickTurn™

Ball Screw Repair Service

High-quality repairs and quick
delivery at competitive prices



Linear Precision Products

www.rbcbearings.com
800.62.RENEW



Ball Screw Repair Service

RBC Linear Precision Products - A Leading Manufacturer of Precision Ball Screws

RBC Linear Precision Products - located in Walterboro, SC - is a leading supplier of precision ball screws to the machine tool, semiconductor equipment, and specialty machine industries. These ball screws offer high reliability and durability under many different operating conditions. Their outstanding accuracy and smooth operation is the result of precision processing, assembly, and inspection in a controlled environment. To help our customers meet the ever-increasing challenges from industry, RBC uses a total quality control system that employs the latest measurement techniques.

RBC precision ball screws are available in a wide range of materials with numerous options to maximize their performance. Customers may choose from either precision ground or rolled ball screws, in either inch or metric sizes. Depending on the application, RBC will supply a ball screw with either internal or external ball returns. RBC keeps many standard series in stock for quick delivery, and special materials, flanges, and wipers are also available.

But what happens when your ball screws need service?

Time Is Money.

No one understands that better than RBC. Uptime is the key to the success of any manufacturing operation - and RBC is poised to help you stay on track with your production schedule with our **QuickTurn Ball Screw Repair Service**.

Quality Repair. Fast, Reliable Delivery.

The **QuickTurn Ball Screw Repair Service** offers customers high-quality repairs and quick delivery at a competitive price. In addition, **RBC will warranty the workmanship on all of our repairs for one year**. But the advantages of this program do not stop there. We will also work with you to help identify the causes of ball screw failures, and offer solutions to help eliminate them.

The Complete Satisfaction Package.

All repair levels include inspection, cleaning, reballing, and straightening. As with all the RBC precision ball screws, repairs include high-grade materials that meet or beat original manufacturers' specifications. When replacing ball return tubes, we use heat-treated stainless steel exclusively, and when replacing internal deflectors we use stainless steel. Existing components are carefully inspected, cleaned, polished, and returned in "like new" condition. RBC's expertise in ball screw design enables us to repair ball screws with the correct preload torque and geometric tolerancing. **QuickTurn will optimize your budget by extending the life of your ball screws.**



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QuickTurn Delivers.

Superior Quality - RBC is committed to the quality of our repairs. All work is 100% traceable, and conforms to the pertinent ISO or JIS standards for inspection of work done. The use of the latest CNC thread grinding equipment and specialized lead accuracy and preload torque measurement ensures highly accurate ball groove geometry and proper performance of all repairs.

Experience - At RBC Linear Precision Products, we have been in the repair business since 1982. We use our expertise and manufacturing capabilities to evaluate and repair precision ball screws from all leading manufacturers.

Fast, Reliable Turnaround - We respond to your repair needs quickly to keep your critical equipment operating. Our complete precision ball screw repair service is designed to meet your demanding lead-time requirements.

Service - QuickTurn includes a free evaluation of the repair, sales engineering, and application engineering support. Optional failure analysis reporting, on-site ball screw training seminars, and machine installation support services are also available.

Reduced Downtime - We understand that time is money, and we will work with you to ensure that your order is expedited. The opportunity to reduce downtime through use of RBC's cross-reference database (containing thousands of interchanges for different machine tool models and axes) is available to our customers. Provide us with your machine data and we will reverse engineer the ball screw, provide you a part number, and keep a print on file, to allow for quick delivery. In addition, RBC stocks replacement ball screws for popular machine models.

Innovation - In applications where the environment or operating conditions of a machine cause early failure of the ball screw, RBC has redesigned the ball screw for improved life. RBC will also redesign for larger loads and faster operating speeds, as required.

RBC Manufacturing Expertise - RBC utilizes the latest CNC equipment and custom-designed ball screw measurement equipment - including dynamic torque testing and laser lead accuracy measurement - to ensure the quality of the repaired ball screw.

Partners with the Machine Tool Industry.

We have repaired or serviced ball screws on the equipment of virtually every leading machine tool manufacturer, including:

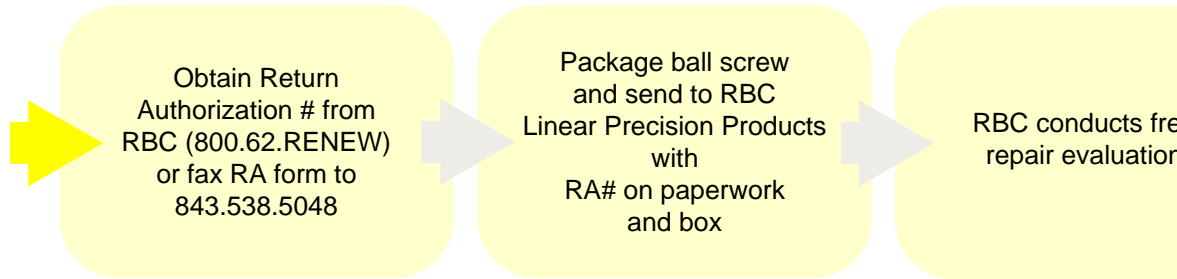
American Tool Works
Bausch & Lomb Optical
Boston Digital
Bridgeport Machines
Brown & Sharpe
Bryant Grinder
Bullard Co.
Burgmaster
Cincinnati Milacron
Cincinnati, Inc.
Cross & Trecker
Danley
Detco Industries
DeVlieg
Duff-Norton
Ekstrom-Carlson
Ex-Cell-O
Fadal
Fellows Corp.
G.A.Gray
Gardner Denver
Geo. Gorton Machine
Gerber Scientific
Giddings & Lewis
Gleason Works
Grob
Heald Machine
Hurco Manufacturing
Ingersoll Milling
Johnson Controls
Jones & Lamson
Hardinge
Kearney & Trecker
Lamb Technicon
LaSalle
LeBlond Makino
Haas
Mori Seiki
Lucas Machine
Lumonics Laserdyne
Mazak
Monark
Motch & Merryweather
Murata
New Britain Machine
Olofson
Onsrud Machine
Okuma
Strippitt
Sundstrand Tool
Tree Machine
Universal Instruments
W. A. Whitney
Warner & Swasey
Wiedeman

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Process Flow/Repair Type

Repair Evaluation - Prior to disassembly, RBC checks the diametral clearance of the ball screw assembly. The ball screw is then disassembled, cleaned, and the condition of each component on the ball screw is checked. This involves a visual examination of each component and then measurements of the wear amount, groove geometry, and hardness, as necessary. The failure mode of the ball screw is identified.

Optionally, a failure report can be provided for the ball screw, which is useful in identifying problems with the machine and tracking the history of ball screw repairs on a machine tool. It is important for the customer to consider the failure cause, as simply repairing the ball screw may not solve the problem.



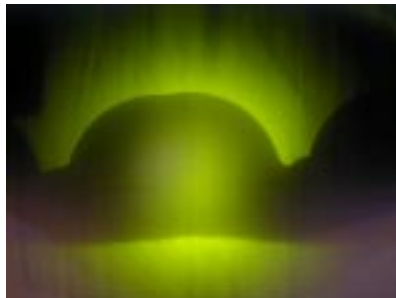
QuickTurn Ball Screw Repair Planning Guide.

Repair Type	Service	Lead Time	Typical Pricing (% of new)
Evaluation Type 1	Receive, inspect & quote	2 days	Free
	Reball/straighten/polish	1 week	10 - 30%
Type 2	Reball with new components	2 weeks	
	Replace nut	5 weeks	40-60%
Type 3	Replace screw	5 weeks	40-60%
Type 4	Regrind screw	2 weeks	30-50%
Type 5	New screw/regrind nut	5 weeks	50-70%
Type 6	Regrind nut	2 weeks	20-40%
Type 7	Regrind screw/new nut	5 weeks	50-70%
Type 8	Complete assembly replacement	6 weeks	100%

Checking Straightness and Geometry



Checking Nut Ball Groove Wear



Laser Lead Accuracy Measurement



RBC issues quote to customer including results of evaluation

Customer places order (including any special instructions)

RBC completes repair work and ships unit to customer

Repair Types.

In each type of repair, all balls are replaced.
The types of repairs RBC performs are outlined below:

Type 1 - Cleaning, reball, straightening, and inspection of the ball screw can include journal repair, which involves grinding the affected journals until they are undersized, plating them until they are oversized, and then regrinding to size. It can also include fabrication of tubes, wipers, spacers, and replacement of internal deflectors and other components, as necessary.

Type 2 - Replacement of the ball nut and use of the existing screw

Type 3 - Replacement of the screw and use of the existing nut

Type 4 - Regrinding of the screw and use of the existing nut

Type 5 - Replacement of the screw and regrinding of the nut

Type 6 - Regrinding of the ball nut and use of the existing screw

Type 7 - Regrinding of the ball screw and replacement of the nut

Type 8 - Total replacement of the ball screw with all new components

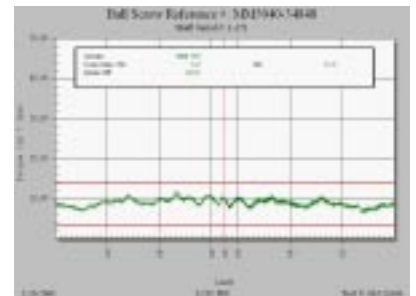
CNC Ball Nut Grinding



Dynamic Preload Torque Testing



Dynamic Preload Torque Test Results



Shipping Information/RBC Assistance

Shipping.

There are a few simple steps to follow when returning a ball screw for repair:

- Include the Return Authorization number obtained from Customer Service in the shipping paperwork (800.62.RENEW).
- Remove all mountings and journal bearings. Ship nut and screw assembly only.
- Mark the RA number on the outside of the shipping container.
- To facilitate smooth transfer of information, you may fax the RA Form on the next page to us for processing of your Return Authorization request.
- Please contact RBC if you would like a box for the ball screw (at a nominal charge).
- If ball nut is removed from the ball screw, please indicate the mounting direction on your paperwork.

RBC Helps You Monitor Your Ball Screws.

To reduce customer downtime, RBC maintains a cross-reference database of part numbers by machine maker, machine model, part number, and axis. If you have a machine that is losing positioning accuracy and you are unable to break the machine down to remove the part for reverse engineering, call us. We have thousands of part numbers in our database for which prints are on file.

In addition, if you wish to build a catalog of your machine tool ball screws, provide us with the machine model and axis. We will reverse engineer the part for you and maintain a record of it in our system. It is also important to note that RBC stocks ball screw replacements for many popular machine tool models.

Periodic Inspection Saves Money.

The life of a ball screw under known conditions can be predicted relatively accurately; however, there are factors that can adversely impact its performance, such as:

1. Lack or absence of maintenance
2. Insufficient lubrication
3. Excessive preloading
4. Damaged return system
5. Loss of preload
6. Incorrect installation
7. Less-than-favorable design
8. Excessive backlash
9. Screw not straight
10. Misalignment
11. Impact damage/machine crash
12. Contaminated environment
13. Damaged seal/wiper

Periodic inspection of the ball screw can save you time and money. RBC can provide on-site training on ball screw repair for your maintenance personnel. Additionally, RBC can provide technical support to ensure proper installation of the ball screw. Contact us for more details.



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Please provide this information to our QuickTurn customer service specialist when requesting a Return Authorization.

Customer Data

Contact Name _____
Company Name _____
Bill To Address _____
Ship To Address _____
Phone# _____ Fax# _____
PO# (if any) _____ Qty of Screws _____

Ball Screw Data

Machine Maker _____
Machine Maker Part# _____
Machine Model _____
Machine Serial# _____
Ball Screw Part# _____
PO# (if any) _____ Qty of Screws _____
Quote Options
Failure Report Required? Yes No
New Price Required? Yes No
Disposition of Screw if Not Repairable? _____

Fax to 843.538.5048

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Innovation. Commitment. Quality.

Who Is RBC?

Innovation, commitment, and quality have long been traditions at RBC. Originating as Roller Bearing Company of America in 1919, RBC today has over ten manufacturing facilities throughout the US and Europe. We design and build bearings and precision products for off-the-shelf and custom applications in the construction, aerospace, mining, material handling, farm, transportation, automation and robotics, machine tool, and semiconductor equipment industries. To serve the growing needs of these customers, RBC has a network of distributors and sales engineers throughout the US and Europe, with authorized agents worldwide.

RBC's product focus demands continuous research, testing, and development of the best product for specific applications. In addition to an impressive list of custom-engineered bearings, RBC's standard products include:



Thin Section Ball Bearings - Standard cross sections to one inch. Sizes to 40 inches. Stainless steel and other materials are available. Seals are available on all sizes and standard cross sections.



Rod Ends - Commercial and industrial, precision, Mil-Spec series, aircraft, self-lubricating. Available in inch and metric sizes.



Self-Lubricating Bearings - Radial, thrust, rod ends, spherical bearings, high temperature, high loads. Available in inch and metric sizes.



Cam Followers and Yoke Rollers - Standard stud, heavy stud, yoke type, caged roller followers. **RBC Roller**® long-life cam followers, **HexLube**® universal cam followers, airframe track rollers. **Mast Guide and Sheave Bearings** - Mast guide rollers and carriage rollers, chain sheaves (for leaf chain), toothless sprockets (for roller chain), and heavy-duty roller bearing construction.



Pins and Shafts - RBC manufactures all types of pins, needle shafts, and rollers.



Spherical Plain Bearings - Radial, angular contact, high misalignment, extended inner ring. **QuadLube**® long-life bearings, **ImpactTuff**® bearings, and self-lubricating bearings. Available in inch and metric sizes.



Ground, Semiground, and Unground Ball Bearings - Full complement, these bearings have burnished races for higher loads, long life, and smooth operation.



Heavy Duty Needle Roller Bearings - **Pitchlign**® caged heavy-duty needle roller bearings, inner rings, type **TJ TandemRoller**® bearings for long life.



Airframe Control Bearings - Ball bearing types, self-lubricating types, needle roller track rollers



Tapered Roller Bearings - Case-hardened in a variety of sizes, used in Class A heavy truck and trailer wheel bearings, final drive transmissions, and gear boxes.



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