

ASSEMBLY INSTRUCTIONS: RETROFIT FOR BRIDGEPORT SERIES 1 MILLS

The Rockford Ball Screw retrofit kits are factory set with the proper preload. Should the ball nut and screw become disengaged, please contact Rockford Ball Screw Co. Upon receiving screw, make sure the packing slip lists the proper screws for your machine.

REMOVING EXISTING SCREWS

1. Run the table all the way (Y-Axis) out toward you.
2. Remove the jam nuts and all three bearing brackets. (One bracket for Y-Axis, one each end of X-Axis.) The brackets are not all the same so remember where each one belongs.
3. Remove the gib adjusting screw and pull out the gib.
4. The table should now be loose; slide the table onto a flat surface which has the same height as the table. CAUTION: The table is quite heavy.
5. Remove the support housing cap screws and 5/32" oil lines attached to support housing. (Be careful not to kink or bend oil lines excessively.)
6. Unscrew both X & Y acme screws from support housing and remove support housing.

INSTALLING RETROFIT KIT

1. Insert the X-Axis ball screw in the housing. Install (2) 5/16"-24 cap screws provided. Tighten, finger tight only. The return tubes on ball nut should face up and fit within slot opening at top of housing.
2. Place housing (and X-Axis screw) in opening in saddle. The ball nut flange should face to the left. The bolt holes for the Y-Axis face back of machine.
3. Insert the (4) 3/8" bolts you removed from the old support housing into the holes in the supplied housing. Tighten bolts finger tight only.
4. By hand, rotate the Y-Axis nut towards the unmachined end of the screw. Stop about 1-1 1/2" from the end of the screw. DO NOT rotate the end of the screw into the ball nut.
5. Angle the Y-Axis screw into the saddle opening. (Fig. #1)
6. Push the ball nut beyond the slot in the bottom of the supplied housing. Then slide the screw into the slot and pull the ball screw assembly back towards yourself to seat ball nut in housing.
7. Slide chip plates forward until a 4" x 4" hole appears behind the supplied housing.
8. Fasten the Y-Axis flange to the housing, using (3) 5/16"-24 screws furnished. This is done through the chip plate hole behind the saddle. An extension on a 1/4" socket hex head or a long length of 1/4" hex stock will make the screw tightening easier. Make sure the three screws are tight at this time.
9. Clean the ways and oil grooves on the machine. Test the Bijur System (if applicable) to see if oil is flowing through the oil holes and through the 5/32" tubing that lubricates the screw. If you have proper lubrication, proceed.
10. Install the 5/32" lubrication tubing into the 5/32" diameter holes located in the flanges on each ball nut assembly. Just press the tubing into hole as far as it will go.

ALIGNMENT & REASSEMBLY

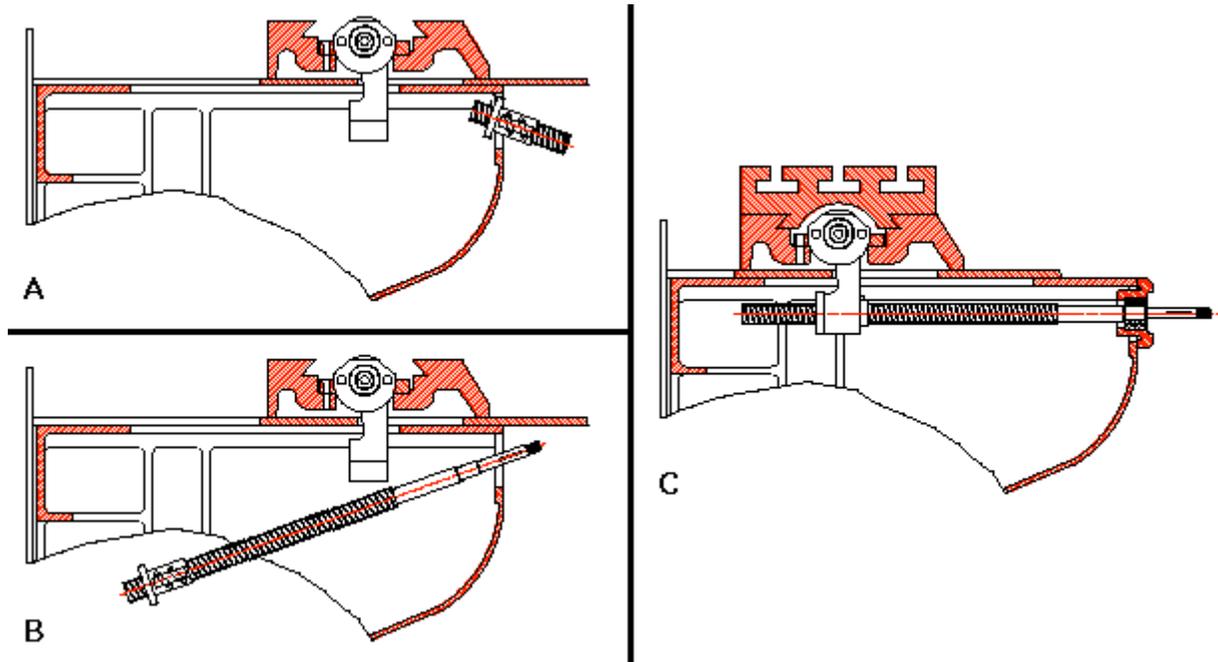
1. Replace the bearing bracket (see "**Replacement of Bearings**" below) onto the Y-Axis screw. Place one of the woodruff keys (remove from original screws) into the Y-Axis screw. Install the handle assembly. Replace and tighten the bearing bracket bolts.
2. Rotate the Y-Axis handle counterclockwise to move the table towards you. Snug (slightly) the four bolts that attach the housing to the saddle. Rotate the screw to move the table away from you. Let the housing find it's "center" and tighten the screws a bit more. Repeat this procedure until the torque to turn the Y-Axis screw seems to be the same throughout the travel of the screw. Tighten the screws to secure the housing to the saddle. You may want to drill some pin holes to secure the housing to the saddle (optional).
3. Make sure the X-Axis screw ends are equidistant from center of housing.
4. Install the other woodruff keys into the ends of the screw.
5. Slide table back onto ways and assemble the table gib.
6. Reassemble the right hand table bearing bracket finger tight.
7. Reassemble the left hand table bearing bracket (see "**Replacement of Bearings**" below) finger tight.
8. Assemble the dials and handles on both ends. Run the table through its complete travel in both directions to center the ball nut within the support housing. With the table as far to the left (thrust bearing end) as possible. (Allowing room between the ball nut and thrust bearings to tighten the cap screw.) You will need approximately 7" of extension with a 1/4" hex end to reach the 5/16"-24 screws that secure the X-Axis nut to support housing.
9. Tighten the X-Axis screws that secure the flange on the ball nut to the support housing.
10. Tighten the thrust bearing bracket.
11. Run table to far right end. Tighten right hand end bracket.
12. Check both X-Axis and Y-Axis for full travel and check torque for alignment. Realign if necessary.

TROUBLE SHOOTING GUIDE

Problem	Causes	Solution
X-Axis screw won't accept bearing brackets.	#1 - Wrong screw length. #2 - Misalignment.	#1 - Check packing slip and oal of screw. #2 - Realign.
Backlash and/or "spring" in handle.	#1 - Original bearings are overly worn. #2 - Preload setting not tight enough.	#1 - Replace bearings with angular contact bearings. See attached sheet. #2 - Consult factory.
Supplied housing bolt holes won't line up with saddle.	Slight differences in saddle assembly.	Elongate holes in housing.
Screw(s) hard to turn towards end of travel.	Screw(s) misaligned.	Realign.
Rough feel to screw.	#1 - Lack of lubrication. #2 - Excessive chips or dirt on screw.	#1 - Check lubrication.* #2 - Clean off screws.

*Lubrication with light weight oil (SAE 5 or 10) is required periodically. If central lube system (Bijur or equivalent) is available on machine, install a 5/32 diameter line from oil system to ball nut flange. Lubricate with way oil periodically.

Cross View of Final Assembly (Fig. 1)



REPLACEMENT OF BEARINGS

The Y-Axis and left hand end of X-Axis have factory thrust bearings. These bearings are adequate for use with acme screws. But if you require zero backlash and repeatability that our preloaded ball screws allow, changing the bearings may be required.

There are different grades of angular contact bearings. The 7204 series of angular contact bearings are the size required. Be sure to purchase sets that have ground faces. The minimum type bearings are as follows (or equivalent):

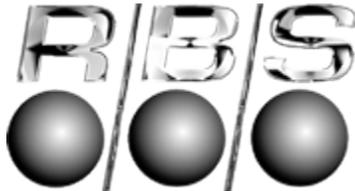
- **Fafnir 7204 WNSU**
- **FAG 7204B. TVP. UA**
- **SKF 7204 BYG**

There are more precise bearings (much more expensive), but for most applications on Series I mills, they are not necessary.

All of the angular contact bearing sets are going to require a set of spacers. The inner race spacer should be .115 - .120 thick, an I.D. of .790/.800 and an O.D. of 1.195/1.205. The outer race spacer should be the same thickness (.115-.120), I.D. of 1.255/1.265 and O.D. of 1.848/1.838 diameter. The inner race spacer should be placed on the screw before the bearings. The outer race spacer should be placed in the bearing bore before installing the bearings. When tightening the bearing retaining ring, be sure not to tighten too tight. The bearing retaining ring is made of aluminum and the screw heads can break through.

The bearings should be packed with grease prior to assembling and periodically regreased.

If you have any further problems with bearing installation, contact your bearing supplier.



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