

Mounted Roller Bearings

Rexnord® 6000 Series Adapter Mounted Spherical Roller Bearing Units with SHÜRLOK® Technology Installation Instructions

Important -- Read Carefully

These instructions are provided to aid in the proper installation, operation, and maintenance of the Rexnord® adapter mounted spherical roller bearing units. They should be carefully read and followed. Failure to do so may result in unsatisfactory service as well as serious personal injury or property damage.

NOTE: IT IS IMPORTANT TO ALIGN THE ADAPTER SLEEVE LOCKING PIN WITH THE INNER RING KEYWAY BEFORE ASSEMBLING THE ADAPTER SLEEVE INTO THE INNER RING IF REMOVED. WHEN INSTALLING TWO FIXED BEARINGS, PLEASE REFER TO PAGE 2.

DO NOT OVERTIGHTEN BEARING OR WARRANTY WILL BE VOID. REFER TO TABLE 2, PAGE 2 FOR TIGHTENING INSTRUCTIONS.

CAUTION: The reliability built into all Rexnord® bearings can be realized in service only when they are correctly selected, properly installed, protected and maintained.

The correct selection of bearings or mounted units requires that the magnitude and nature of all loads, speed, alignment, mounting, operating requirements and maintenance be adequately considered. The selection of materials and design of housings, shafting, fasteners, seals, and accessories as well as provisions for installation and maintenance must follow good engineering principles.

Housings must be selected and installed with regard to the degree and direction of the forces that will occur. Housings should not be used under tension loads except with adequate safety factors. For this reason pillow blocks are best suited to withstand radial loads passing through the base. When heavy loads or shock loads are possible it is most important to mount a unit so that the line of force passes directly into its base so that the unit is directly and substantially supported other than through its mounting bolts. Where the line of force falls outside the base, such as with horizontal or uplift loads on pillow blocks, serious housing and fastener deflection or failure may occur. These conditions may require designs using different materials, fasteners, mounting design, stop bars, etc., together with proper safety factors. When these conditions are unavoidable, the Rexnord® Bearing Division should be consulted.

Please note the following important points:

A. Cleanliness

Keep dirt, water, and metal chips off all parts.

B. Careful Handling

Hammer blows, overheating, or improper use of force can damage precision parts.

C. Adapter Sleeve Tightening

Bearings must be correctly forced up their tapered adapter sleeves. Improperly tightened bearings and adapter assemblies may slip or turn on the shaft. When mounting these bearings on a used or worn shaft, care must be taken to clean up the shaft journal and rebuild, as necessary, to the required tolerances. Never replace bearings on a shaft which is bent or which has been damaged or softened by a torch.

D. Shaft Tolerances

These bearings can be mounted to commercially available shafts with standard undersized tolerances as shown in the following table:

Table 1 - Shaft Diameter Tolerances

Shaft Diameters	Tolerances
1" through 2"	Nominal to -.003"
2 1/16" through 4"	Nominal to -.004"
4 1/16" through 5"	Nominal to -.005"

E. Bolts

Housing mounting bolt tightness is important to prevent the housing from shifting and to adequately support loads.

F. Free Rotation and Alignment

Check for free rotation before machine startup to assure that final alignment is proper.

G. Lubrication

Units must be adequately lubricated. A bearing not properly lubricated can run to destruction and possibly cause damage to other components.

H. Installation in Extreme Temperatures

Use alternative installation instructions as outlined on Page 2, Step 5, if installing bearings in temperatures greater than 120°F or less than 20°F. The optical strain sensor may not indicate properly outside of this temperature range.

I. High Speed Applications

If the bearing will run at higher speeds than shown in Table 5, clearance must be adjusted. Refer to the clearance adjustment instructions on page 3.

INSTALLATION

ONE FIXED AND ONE FLOATING UNIT

1. Check Shaft - Shafting must be clean, round, straight, free of burrs and nicks, and of correct size. Do not coat the shaft or adapter bore with a preservative, lubricant, or other substance such as LOCTITE®. Adapter mounted units are normally not detrimental to the shaft surface and the use of any preservative or lubricating medium is not required.

2. Assembly on Shaft - The adapter assembly is shipped inside the bearing. The adapter components do not need to be removed. **If you should happen to remove the adapter sleeve from the bearing during installation, you must align the locking pin mounted in the adapter sleeve with its mating keyway in the inner ring bore as shown in the picture below:**



Slide the bearings on the shaft to their intended positions. Back off the setscrews in the locknut so the locknut will turn easily. If the bearings do not slide freely down the shaft, slightly loosen the locknut by hand until the bearing is free to slide down the shaft. Position the bearings on the shaft with the fixed bearing closest to the drive. Align the housings square to the shaft, then tighten the mounting bolts.

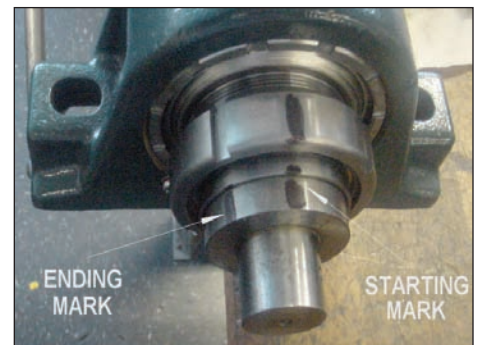
3. Tighten the Adapter Assembly of the Fixed Bearing first - Make sure the shaft is locked so as not to rotate. Hand tighten the locknut to take out looseness, then use a hook type spanner wrench to bring the locknut to a snug fit.



If the adapter sleeve begins to slip around the shaft, then retain the sleeve using a second small hook type spanner wrench. Engage the second spanner wrench into the split area of the adapter sleeve. Position the wrench in the opposing direction of the first spanner wrench that is engaged in the locknut. Continue tightening until the adapter sleeve will no longer slip about the shaft.



Now mark the position of the locknut relative to the shaft with a grease pencil or a dark marker at the top of the locknut and shaft. Make sure the mark is legible and marks both the locknut and shaft at the same point.



Begin to tighten the locknut using one of these methods:

1. the special SHÜRLOK® installation tool with a 1/2 or 3/4" drive breaker bar (see below)
2. a soft steel drift pin and a hammer
3. an impact type spanner wrench
4. a chain wrench



Bearing Size	SHÜRLOK® Installation Tool Part Number
115	105-90420-11
203	105-90420-21
206/207	105-90420-31
211/212/215	105-90420-41
303/307	105-90420-51
311/315	105-90420-61
403/407	105-90420-71
415	105-90420-81

Tighten the locknut clockwise about 3/4 of a turn. Check the visual indicators for any color change. It is important to check both indicators. If neither indicator shows any color, continue tightening the locknut in 1/8 turn increments while noting the condition of the visual indicators. The visual indicators are used to confirm the tightness in the mounting.



Table 2 - Final Locknut Adjustments

Shaft Size Range - in		Minimum Locknut Adjustment (Turn)	Maximum Locknut Adjustment (Turn)
From	To		
1 15/16	2 15/16	1	1 1/4
3 3/16	4 7/16	1 1/8	1 3/8
4 15/16	—	1	1 1/4

At least one of the visual indicators should show a color change. It is important to note that any of the color patterns shown here or any patterns in between are acceptable. The indication pattern does not need to be centered and may show on one side of the indicator only. Only one of the indicators needs to show color for the bearing to be properly tightened. If both of the indicators are still clear after tightening to the Minimum Locknut Adjustment in Table 2, then continue to tighten in 1/8 turn increments. Discontinue tightening when at least one indicator shows a color change or the Maximum Locknut Adjustment in

Table 2 is reached. If the Maximum Locknut Adjustment is reached and neither indicator shows a color change, the unit should be dismounted. Remount the unit using the alternate method of mounting as shown in step 5.



4. Over-Tightening the Adapter Assembly – If the indicator starts to show yellow and/or red indication anywhere on the indicator, the mounting has been over-tightened. As shown in the following picture:



Over tightening can reduce too much bearing internal clearance and cause the bearing to run hot. To rectify this situation, simply impact the locknut in the counter clockwise direction which loosens the adapter assembly. When the adapter assembly becomes completely loose, start the tightening procedure again from step 3.

5. Alternate Mounting Method – If for any reason the visual indicator becomes damaged or no color change was seen in Step 3, this alternate method for mounting the adapter assembly must be used, otherwise skip to step 6.

Start at step 1 INSTALLATION, then hand tighten the locknut to take out looseness. Use a hook type spanner wrench to bring the locknut to a snug fit. If the adapter sleeve begins to slip around the shaft, then retain the sleeve using a second small hook type spanner wrench. Engage the second spanner wrench into the split area of the adapter sleeve. Position the wrench in the opposing direction of the first spanner wrench that is engaged in the locknut. Continue tightening until the adapter sleeve will no longer slip about the shaft.

Mark the position of the locknut relative to the shaft with a grease pencil or a dark marker at the top of the locknut and shaft. Make sure the mark is legible

and marks both the locknut and shaft at the same point. Tighten the locknut clockwise until the Maximum Locknut Adjustment is achieved in Table 2. When tightening the locknut, be sure to check the sleeve to make sure it does not turn on the shaft.

6. Secure Locknut – To secure the locknut from coming loose during operation, tighten the two radial setscrews positioned in the locknut to the following recommended seating torque with a hex type torque wrench. If one of the setscrews is lined up with the slot in the adapter sleeve, tighten the locknut clockwise until the setscrew clears the slot in the adapter sleeve. An alternate method for tightening these set screws is to use a hex wrench. Tighten the setscrew until the wrench takes a permanent twisting set.

While tightening the setscrews, the color of the indicator may change, become darker, lighter, or completely clear. This is acceptable as the bearing has already been properly tightened.

Table 3 - Locknut Setscrew Seating Torque

Shaft Size in	Seating Torque in - lbs
1 15/16	87 - 92
2 3/16	
2 3/8 – 2 7/16	
2 11/16 – 2 15/16	165 - 185
3 3/16 – 3 7/16	
3 11/16 – 3 15/16	290 - 325
4 3/16 – 4 7/16	
4 15/16	

7. Tighten the Floating Bearing - Center the floating bearing cartridge in the housing. Tighten the bearing to the shaft following the same procedure for the fixed bearing.

REMOVAL

Back out the locknut setscrews, then loosen the locknut in a counter-clockwise direction until the adapter assembly becomes completely loose. The bearing should slide freely along the shaft.

INSTALLATION TWO FIXED UNITS

When installing two fixed units on a shaft, special precautions need to be taken.

If you are installing two fixed pillow block units, tighten the mounting bolts of the first unit, then install it as shown in the INSTALLATION section. Install the second bearing as normal, then tighten its mounting bolts last. This ensures that the axial take-up of the adapter is compensated by the clearance in the mounting bolt holes.

If you are installing two fixed flange units, tighten the mounting bolts of the first unit and install as normal. Snug up the mounting bolts on the second unit. Now go through the INSTALLATION procedure to take out the adapter assembly looseness for the second bearing. After reaching a snug fit for the locknut, loosen the mounting bolts enough to allow for housing movement away from the mounting base. Housing movement should equal the required shim stock thickness shown in Table 4.

When using in a cartridge application and your equipment does not have the ability to provide floating capability, consult factory.

Table 4 - Shim Stock Thicknesses

Shaft Size Range – in		Shim Stock in
From	To	
1 15/16	2 3/16	.056
2 3/8	2 7/16	.063
2 11/16	2 15/16	.063
3 3/16	3 7/16	.080
3 11/16	3 15/16	.080
4 3/16	4 7/16	.094
4 15/16	—	.100

Now complete the installation of the second bearing. Once the second bearing has been mounted, place shim stock underneath each bolt pad between the housing base and the structure. Place the shim stock adjacent to each bolt on two sides about the shaft of the bolt to allow for uniform pressure under each bolt pad. Tighten housing mounting bolts to complete the installation.

BEARING UNIT REPLACEMENT

Disassembly

1. Remove adapter sleeve and locknut
2. Remove seals
3. Remove MICROLOCK screw and key. (Do not loose nylon washer)
4. Remove threaded cover by turning counter clockwise
5. Place housing threaded cover side down on arbor press with spacer blocks under housing
6. Place a soft metal bar or wood block on face of inner ring and press bottom outer ring and inner ring assembly from housing
7. To remove the back outer ring, large bore bearings 4 7/16" thru 7" have drive pin holes. The back outer ring of smaller size units may be removed with a bearing puller or hammer and drift.

Reassembly

1. Place housing cover side up on arbor press with spacer blocks under housing.
2. Press in back outer ring and seat against housing shoulder.
3. Insert inner ring assembly and rotate to seat rollers against back outer ring.
4. Press in front outer ring.
5. Install threaded cover, turning clockwise until inner ring resists rotation or misalignment.
6. Back off threaded cover one quarter turn – align cover slot with the nearest counter bored hole in housing. See Table 5 - ADJUSTMENT TABLE.
7. Install microlock key with nylon washer under the head of the screw.
8. Using a soft drift or block, rap face of inner ring on side opposite threaded cover to seat front outer ring. Inner ring assembly should rotate freely.
9. Install seals. Z-Seal – Place centering spring in seal groove with fingers facing up. Place U-shaped element on fingers. Place centering ring on element with projection on face up. Install snap ring so that projection on centering ring is between ends of snap ring. K-Seal – Place seal into the seal groove with anti rotation boss sticking up. Install snap ring so that the raised boss is between the snap ring ends. M-Seal – Place seal into seal groove with spring facing out. No snap ring is required with M-Seal.
10. Mount the bearing to the shaft per standard mounting instructions starting at Step 1, Page 1.
11. Lubricate bearing with amount of grease shown in Table 6 - LUBRICATION TABLE. Rotate inner ring assembly during lubrication to assure distribution of grease in bearing

Table 5 - Adjustment Table (AXIAL AND RADIAL CLEARANCES)

Size Code	SHAFT SIZE (INCHES)	FACTORY ADJUSTMENT (Average Speeds)		RECOMMENDED ADJUSTMENT HIGH SPEEDS			CLEARANCE ADJUSTMENT INCHES PER 1/12 TURN		
		6000 SERIES	STD AXIAL CLEARANCE	STD RADIAL CLEARANCE	SPEED OVER	AXIAL CLEARANCE	RADIAL CLEARANCE	AXIAL	RADIAL
2-4007-.012	.0022-.0037	2000	.012-.017	.0037-.0053	0.005	0.0016
5-6	1 15/16		.007-.012	.0020-.0034	1500	.012-.017	.0034-.0049	0.005	0.0014
7-9	2 3/16 – 2 15/16		.010-.017	.0026-.0044	1250	.017-.024	.0044-.0062	0.007	0.0018
10-11	3 3/16 – 3 15/16		.010-.017	.0025-.0043	1000	.017-.024	.0043-.0060	0.007	0.0018
12-13	4 3/16 – 4 15/16		.015-.025	.0032-.0054	750	.025-.035	.0054-.0076	0.010	0.0022

LUBRICATION

Rexnord® adapter mounted spherical roller bearing units are prelubricated. No additional lubricant is required for startup. As a precaution, if equipment is to be built and left idle for any period of time prior to actual use, the units should be filled 100% full to provide maximum protection from corrosion, etc. The bearing's inner ring should also be rotated every 6 months.

The specific conditions on an application such as exact hours of operation, temperature, moisture, speed and dirt govern the required lubrication cycle. A proper lubrication cycle can be determined by inspection of the flushed out lubricant during a trial period of operation. Add grease slowly. Use a sufficient volume of grease to purge the bearing seals of old lubricant. It is preferable to rotate bearings during relubrication where good safety practice permits.

Inspection of bearing installations at least every six months is recommended. Any unusual noise or vibration change should be immediately investigated. The suggested relubrication schedule in the following table is a general guide.

Table 6 - Lubrication Table

SHAFT SIZE inches	GREASE WT. REQUIRED (OZ.)		RECOMMENDED NUMBER OF MONTHS BETWEEN RELUBRICATION INTERVALS. (BASED ON 40 HR. WK.)					
	To Lubricate Rebuilt Units	To Relubricate Units	RPM					
			100	300	500	1000	1750	3000
1 15/16	.9	.2	8	5	3	1	1/2	---
2 3/16	1.1	.2						
2 3/8 – 2 7/16	1.5	.3						
2 11/16 – 2 15/16	2.8	.5	6	4	2	1	1/2	---
3 3/16 – 3 7/16	3.7	.6						
3 11/16 – 3 15/16	6.9	1.1						
4 3/16 – 4 7/16	8.4	1.5	4	2	1	1/2	---	---
4 15/16	14.3	2.5						

*Relubrication amounts and frequencies shown in the table are based on standard clearances, moderate loads, etc., which yield housing temperatures of 150° F or less. Lubrication practices indicate that the relubrication frequency should be doubled every 20° F above 150° F. Rexnord® Bearing Division cannot be held responsible for performance of individual batches of grease. Changes in lubricant specifications, performance, and lubricant guarantees are the responsibility of the lubricant manufacturer.

INTERNAL CLEARANCE ADJUSTMENT FOR HIGH SPEEDS

Before adjusting bearing clearance, please contact Rexnord® tech service at 866-REXNORD. To adjust bearing clearance for speeds greater than illustrated in Table 5, the threaded cover must be backed off. Using a grease pencil or marker, draw a line on the housing face at one of the notches on the cover. Using a screwdriver, back off the micro-lok screw and tab that locks the cover. Using a drift pin or screwdriver and hammer, drive the threaded cover in a counter-clockwise rotation until the next closest notch in the cover aligns with the mark on the housing. Check alignment of the micro-lok setscrew and tab to make sure it fits in the notch of the cover. If not, tap the threaded cover to align the notch. Re-tighten the micro-lok setscrew and tab. The bearing now has the increased clearance needed to run at the higher speeds and temperatures.

Mounted Roller Bearings

LIMITED WARRANTY - LIABILITY

A. IT IS EXPRESSLY AGREED THAT THE FOLLOWING WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSLY IMPLIED OR STATUTORY, INCLUDING THOSE OF **MERCHANTABILITY** AND FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR LIABILITY ON OR PART OF ANY KIND OR NATURE WHATSOEVER.

No representative of ours has any authority to waive, alter, vary, or add to the terms hereof without prior approval in writing, to our customer, signed by an officer of our company. It is expressly agreed that the entire warranty given to the customer is embodied in this writing. This writing constitutes the final expression of the parties' agreement with respect to warranties, and that it is a complete and exclusive statement of the terms of the warranty.

We warrant to our customers that all Products manufactured by us will be free from defects in material and workmanship at the time of shipment to our customer for a period of **two (2) years** from the date of shipment. All warranty claims must be submitted to us within ten days of discovery of defects within the warranty period, or shall be deemed waived. As to Products or parts thereof that are proven to have been defective at the time of shipment, and that were not damaged in shipment, the sole and exclusive remedy shall be repair or replacement of the defective parts or repayment of the proportionate purchase price for such Products or parts, at our option. Replacement parts shall be shipped free of charge f.o.b. from our factory.

This warranty shall not apply to any Product which has been subject to misuse; misapplication, neglect (including but not limited to improper maintenance and storage); accident, improper installation, modification (including but not limited to use of unauthorized parts or attachments), adjustment, repair or lubrication. Misuse also includes, without implied limitation, deterioration in the Product or part caused by chemical action, wear caused by the presence of abrasive materials, and improper lubrication. Identifiable items manufactured by others but installed in or affixed to our Products are not warranted by us but, bear only those warranties, express or implied, given by the manufacturer of that item, if any.

Responsibility for system design to insure proper use and application of Rexnord Products within their published specifications and ratings rests solely with customer. This includes without implied limitation analysis of loads created by torsional vibrations within the entire system regardless of how induced.

B. It is expressly agreed that our liability for any damage arising out of or related to this transaction, or the use of our Products, whether in contract or in tort, is limited to the repair or replacement of the Products, or the parts thereof by us, or to a refund of the proportionate purchase price. We will not be liable for any other injury, loss, damage, or expense, whether direct or consequential, including but not limited to loss of use, income, profit, production, or increased cost of operation, or spoilage of or damage to material, arising in connection with the sale, installation, use of, inability to use, or the replacement of, or late delivery of, our Products.

C. It is also expressly agreed that any cause of action for breach of any warranty must be brought within one year from the date of the breach.

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