Series B22400 and B22500

Link-Belt® SPHERICAL ROLLER BEARING UNITS
Service Instruction
B-RBU-46

IMPORTANT—Read Carefully

These instructions are provided to aid in the proper installation, operation and maintenance of Link-Belt Series B22400 and B22500 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.

CAUTION

The reliability built in all Link-Belt 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, speeds, alignment, mounting, operating requirements and maintenance be adequately considered. The selection of materials for and design of housings, shafting, fasteners, seals and accessories as well as provisions for installation and maintenance must follow good engineering principles.

Housing 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, or so that the unit is directly and substantially supported other than through its mounting bolts. Where the line of force falls outside 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, Link-Belt Bearing Division should be consulted.

The following general points of installation and operation are very important:

A. Cleanliness—Keep dirt, water and metal chips off all parts.

B. Careful Handling—Hammer blows or improper use of force can damage precision parts.

C. Shaft Fits — Bearings should have proper fits on the shafts to minimize fret wear. See installation instructions for shaft tolerances. When mounting 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. Bolts—Housing mounting bolt tightness is important to prevent the housing from shifting, and to adequately support loads.

E. Setscrews—Setscrews must be properly torqued to prevent the shaft from slipping in the inner ring and to prevent loosening during operation.

When axial (thrust) loads are present, shaft collars or other means may be required to transmit the thrust from the shaft to the inner ring and prevent the bearing from slipping axially on the shaft.

F. Free Rotation and Alignment—Check for free rotation before machine start-up 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.

INSTALLATION

1. **Check Shaft**—Shafting must be clean, round, straight, free of burrs and nicks and of correct size. For the average installation with moderate loads and speeds, the shaft should measure as follows.

Shaft Diameter	Recommended Tolerance
½" thru 2"	Nominal to minus .0005"
2 1/16" thru 4"	Nominal to minus .0010"
4 1/16" thru 5"	Nominal to minus .0015"

Satisfactory performance may be obtained with increased shaft tolerances under some less severe conditions. Very difficult applications may require a light interference fit of the bearing on the shaft. Consult Link-Belt Bearing Operation for recommendations.

2. **Shaft Preparation**—When frequent removal of bearings is anticipated, file flats on the shaft approximately 1/16" deep under the collar setscrew locations. This provides for easy removal, as bearings will clear the burrs caused by correctly tightened setscrews.

3. **Lubricate Shaft & Bearing Bore**—Coat the shaft and bearing bore with grease or oil to facilitate assembly.

4. **Assemble on Shaft**—If it is necessary to tap or press units on the shaft, use a hardwood block, soft steel bar or tube against the end of the inner ring. Do not strike or exert pressure on housing or seals.

5. **Bolt Fixed or Locating Unit to Support**—Bolt fixed unit securely to its support. Bolt grade selection is important on many applications depending on load and shock conditions. SAE Grade 5 mounting bolts properly torque can be used. Grades over SAE 5 should not be used with cast iron housings.

6. **Final Positioning**—Establish final shaft position and secure locking collar of fixed unit to shaft. Tighten collar setscrews to the torque values given in Table 1.

7. **Bolt Expansion or Other Unit to Support**—If an expansion unit is used, position the cartridge in the housing to allow for adequate movement in the direction of expected expansion. Align and shim the housing as necessary to place the bearings in the approximate centers of their housing alignment range. Bolt unit securely to its support. (Reference step 5)

8. **Final Mounting**—Rotate shaft slowly, under load if possible, for several revolutions to properly center the roller elements with respect to the raceways. Securely tighten collar setscrews of remaining bearing, following the same procedure as outlined under step 6.

9. **Check System for Freedom of Rotation**—Any condition of strain, irregular rotational torque, abnormal sound or vibration may be due to improper alignment, improper location, bent shaft, distorted supports, etc. Installation should be rechecked and corrections made as required.

The use of stop bars welded to the support at each end of the units leaving about 1/32" space for ease of assembly is good practice. Wedge shims in 1/32" space after units are securely fastened. These bars assure proper location of the units and prevent shifting when loads are applied.

TABLE 1—Setscrew Tightening Torque

Shaft Size (In.)	Seating Torque (In./Lbs.) (1)
¾ to 1 ¼	185
1 3/16 to 2	325
2 1/16 to 2 ¼	460
2 3/16 to 3 ½	680
3 3/16 to 5	1350

(1) Values can vary ±5%

Note: Satisfactory tightness can be obtained using a standard hex wrench (50-52 minimum RHN C) and tightening until a slight permanent twist is obtained in wrench for each screw.

LUBRICATION

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 suggested relubrication schedule under Table 2 is a general guide.

The specific conditions on an application such as exact hours of operation, temperature, moisture, speed and dirt govern the required lubrication cycle. This 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.

TABLE 2—Grease Lubrication

Ambient conditions		Operating conditions		Bearing operating temperature		Suggested greasing interval**	Use these greases or equivalent
Dirt	Moisture	Load	Speed	Low	High		
Clean	Dry	Light to medium	Slow to medium	0	120	2 to 6 months	High quality NLGI #1 or 2 multi-purpose bearing greases are generally satisfactory. Consultation with a reputable lubricant supplier is recommended.
				120	200	1 to 2 months	
Moderate to Dirty	Dry	Light to medium	Slow to medium	0	120	1 to 4 weeks	
				120	200	1 to 7 days	
Extreme Dirt	Dry	Light to medium	Slow to medium	0	200	Daily-flushing out dirt	
*	High humidity Direct water splash	Light to heavy	Slow to medium	32	200	1 to 4 weeks grease at shutdowns	Mobil Oil Co., Mobilith AW2 Texaco Inc., RB2 Shell Oil Co., Alvania EP2
		Heavy to very heavy	Slow	0	200	1 to 8 weeks	Shell Oil Co., Alvania EP2
				−20	120	1 to 8 weeks	Mobil Oil Corp., Mobiltemp 78
		Light	High speed	100	200	1 to 8 weeks	Imperial Oil & Grease Co., Molub-Alloy No. 2 Gulf Oil Corp., Gulfcrown No. 2 Texaco Inc., Molytex No. 2
	Possible frost	Light to heavy	Slow to medium	−65	+250	1 to 4 weeks grease at shutdown	Esso, Beacon 325 Texaco Inc., 2346EP Low Temp Shell Oil Co., Aeroshell 7A
Clean to moderate	Dry	Light to medium	Slow to medium	80	250	1 to 8 weeks	Union Oil Co., Unoba EP No. 2 Texaco Inc., 1999 Hi-Temp
Clean to dirty	Dry	Light	Slow	80	300	1 to 4 weeks	Keystone Lubricants Co., No. 89 Dow Chemical Co., DC44

*Additional bearing protection or special sealing may be required. Consult Link-Belt Bearing Division

**Suggested starting interval for maintenance program. Check grease condition for oiliness and dirt and adjust greasing frequency accordingly. Watch operating temperatures. Sudden rises may show need for grease or indicate over lubrication on higher speed applications.

Link-Belt 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.

LIMITED WARRANTY-LIABILITY

A. IT IS EXPRESSLY AGREED THAT THE FOLLOWING WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING THOSE OF **MERCHANTABILITY** AND FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR LIABILITY ON OUR 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; that 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 one (1) year 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. 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 Link-Belt 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 damages 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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