Link-Belt® Cylindrical Roller Bearings

INSTALLATION INSTRUCTIONS

Series 1000, 1200, 1300, 1900, 5200, 5300, 7300, 60000, & 6200

WARNING: These instructions should be read entirely and followed carefully before attempting to install or remove Link-Belt Cylindrical roller bearings. Failure to do so can result in improper installation which could cause bearing performance problems as well as serious personal injury.

ALL UNITS

1. Check shaft and housing. Bearing seats must be to proper dimensions and free of nicks and burrs. Shaft and housing fillets must clear bearing corner radii. Shoulders should be square with bearing seats within .0001 inch per inch of diameter total indicator reading.
2. Clean housing surfaces. Coat unfinished interior surfaces with suitable paint or sealer for added protection. Also clean other auxiliary parts.
3. Assemble on shaft or in housing. Exact mounting procedures will depend on the individual machine, fitting practices, bearing type and position. Adequate fixtures are necessary. An interference fit is required for the ring that is revolving with respect to the load. The ring that is stationary with respect to the load is generally mounted with a push or snug fit depending upon the degree of shock and/or vibration expected.
4. **Tight fit shaft mounting** – Coat shaft bearing seat with oil or suitable solid lubricant to minimize possibility of galling. The mounting method recommended is shrink fitting but hydraulic or mechanical pressure may be used. Start inner ring squarely on shaft with corner radius toward shaft shoulder. For shrink fitting, heat inner ring or bearing evenly in oil to 250°F max. Slip the thoroughly heated part onto the shaft and hold in position until it cools and shrinks onto shaft.
5. Check inner ring face squareness. With shaft supported, if squareness or runout exceeds .0003 inch per inch of radius full indicator reading, check for proper seating of ring on shaft, interference of corner radii, or dirt/burr on shaft.
6. Install and tighten locknut and lockwasher, lock plate or other holding device securely. A lockwasher tang must be bent over into a notch in the locknut or lockwire heads of cap screws holding lock plate.
7. **Tight fit housing mounting** – Coat housing bore with oil or suitable lubricant. Insert outer ring squarely into housing bore. Hydraulic or mechanical pressure are approved methods. For push or snug fits, a soft steel tube or pipe having an I.D. larger than the outer ring I.D. may be used to apply pressure. Outer rings may be installed before or after shaft assembly to accommodate ease of assembly.
8. **Assemble Shaft** – Insert shaft and inner ring assembly into housing-outer ring assembly. A larger chamfer is provided on the separable ring but care must be taken when the rollers slide over the raceways. Rotate or oscillate the shaft and do not force assembly. This procedure will vary depending on bearing style and housing design so exact procedure cannot be described. Make certain raceways have preservative or lubricant coating.
9. Check outer ring face squareness – Mount dial indicator to rotate with shaft and determine outer ring face and housing squareness or runout by rotating the shaft. It squareness or runout of either face exceeds .0004 inch per inch or radius full indicator reading, check for proper seating of ring in housing bore, interference of corner radii, dirt/burrs on housing bore or concentricity of the two housing bores.
10. Check Alignment and freedom of rotation to be assured operating clearance has not been removed by interference fits or misalignment. Check for axial clearance or movement.

ADDITIONAL INSTALLATION COMMENTS

1. If cleaning the bearing is necessary, benzene, gasoline, chlorethane, kerosene, trichlorethane, mineral spirits, Freon, and naphtha are recommended. Do not use alcohols, cresols, phenols, fluoro-propanol or other similar chemicals on bearings with polymeric cages.
2. Correct operating clearance will be obtained only if shaft O.D. and housing I.D. sizes are to specifications.
3. Never replace bearings on a shaft which is bent or has been damaged/softened by a torch.
4. Under normal or light loads, cylindrical roller bearings have their useful capacity reduced for race misalignment in the plane of the load exceeding .0015 inch per inch. Misalignments at right angles to the plane of the load exceeding .0030 inch per inch also reduce useful capacity. For most applications the following alignment tolerances are acceptable:
    a) Inner race face runout w/ respect to the shaft center - .0003 inch/inch of radius total indicator reading.
    b) Outer race face runout w/ respect to the shaft center - .0004 inch/inch of radius total indicator reading.
    c) Housing face runout w/ respect to the shaft center - .0003 inch/inch of radius total indicator reading and complementary (not opposed) to the outer race face runout.
    d) Faces of seal carriers or covers should be parallel within .001 in.
    e) Housing faces should be parallel within .001 inch.
5. Check for free rotation before machine start-up to assure that final alignment is proper.
6. Units must be adequately lubricated. A bearing not properly lubricated can run to destruction and possibly cause damage to other components.
7. Sealing must be provided to retain lubricant and assure adequate protection against entrance of contaminants into the bearing.
8. Bearings assembled with polymeric cages have a temperature limit of 275°F continuous or 300°F intermittent. If the bearings and/or lubricant exceed these temperature limits, steel cages must be substituted and Rexnord Bearing Division should be consulted.

LUBRICATION INFORMATION

Oil lubrication is generally used when speeds and temperatures are high or when a central oil supply is readily available. Oil can be easily replenished or drained. A cooled circulating oil system should be used to remove heat resulting from high speed, heavy loads or environmental sources. A static splash or oil bath lubrication system is suitable for moderate speed applications. Grease lubrication is easier to retain than oil, provides easier relubrication and is generally suitable for operating speed to ½ the values shown by Figure 1 on page 2.

Viscosity Requirements

The required viscosity for good lubrication depends on starting temperatures, operating temperature loads and speed. Recommended viscosity ratings for general purpose applications are show in Figure 2 on page 2.

Circulating Oil Lubrication

A complete circulation system includes the use of a pressure pump, a heat exchanger or a method to cool oil, an adequate sump, a filter to remove particles over 20 micron in size, and safety devises such as pressure and temperature warning devices. It is also best to tap large drain holes in the housing or to provide a suction pump to positively remove oil from the housing. For high speeds, oil should be removed from both sides of the housings, otherwise one side is sufficient. It is recommended that the circulation system have a separate motor so that the oil flow can be started in advance of bearing rotation. Experimentation with pressures, flow rates temperatures and viscosity is often necessary to assure the best possible bearing lubrication.

Oil circulation systems when properly equipped with safety devices, require minimum attention after initial adjustment. Frequency of changing the oil in the system depends on many factors. Periodic check or analysis of oil condition is recommended. Summer and winter grades may be necessary to maintain correct viscosity limits.

The oil flow rate should be adjusted to keep the oil exit temperature below 190°F.

Static or Bath Oil Lubrication

The oil level (static) should be maintained to the center of the lower-most roller. This type of lubrication will not be suitable where excessive oil churning or misting occur from high speed operation. Oil levels should be controlled by sight gages, oil cup, housing reservoirs, etc. Cups or sight gages should be carefully marked for the correct static level. Frequent inspection and replenishment of oil may be required on some applications with a limited amount of oil in the system or high leakage rates.

Oil Mist Lubrication

Air flowing out of a mist lubricated bearing may impart a fine oil vapor to the atmosphere and venting to outside air may be required. Drainage of bearing reservoirs, provisions for lubrication during start-up and timing of the mist flow must meet precise specifications; therefore a system manufacture should be consulted.

FIGURE 1—Approximate Speed Limit Versus Bore Size for Splash or Circulating Oil Lubrication

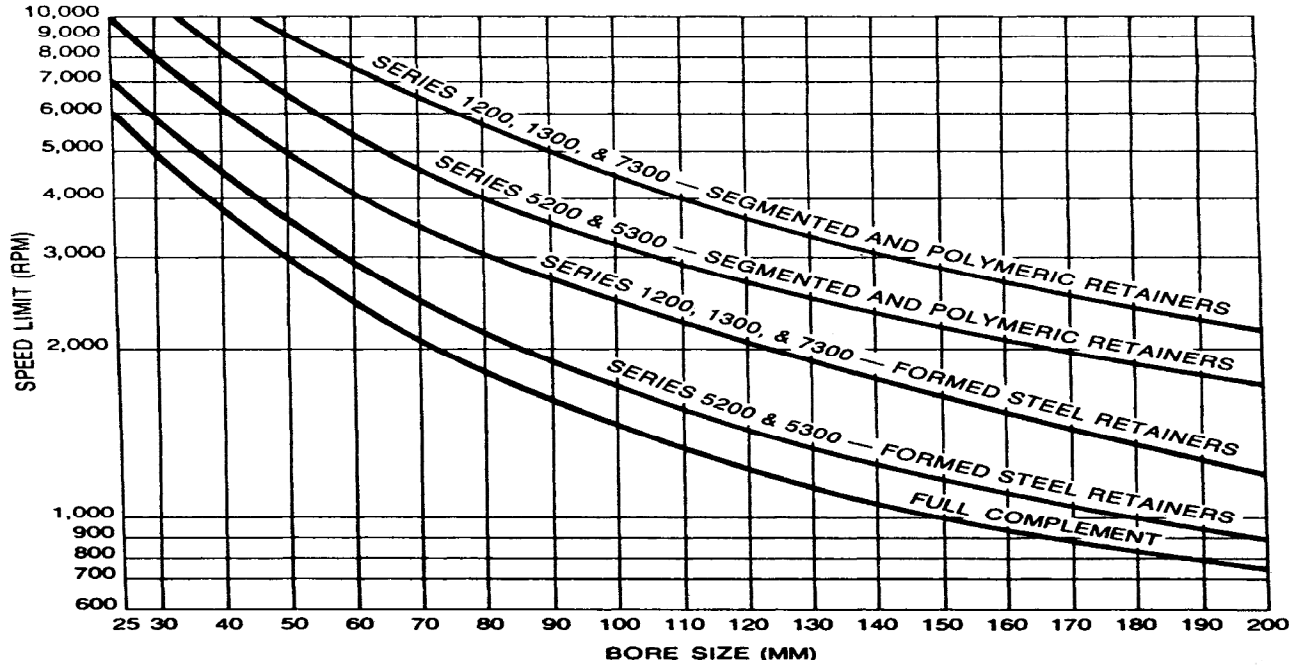
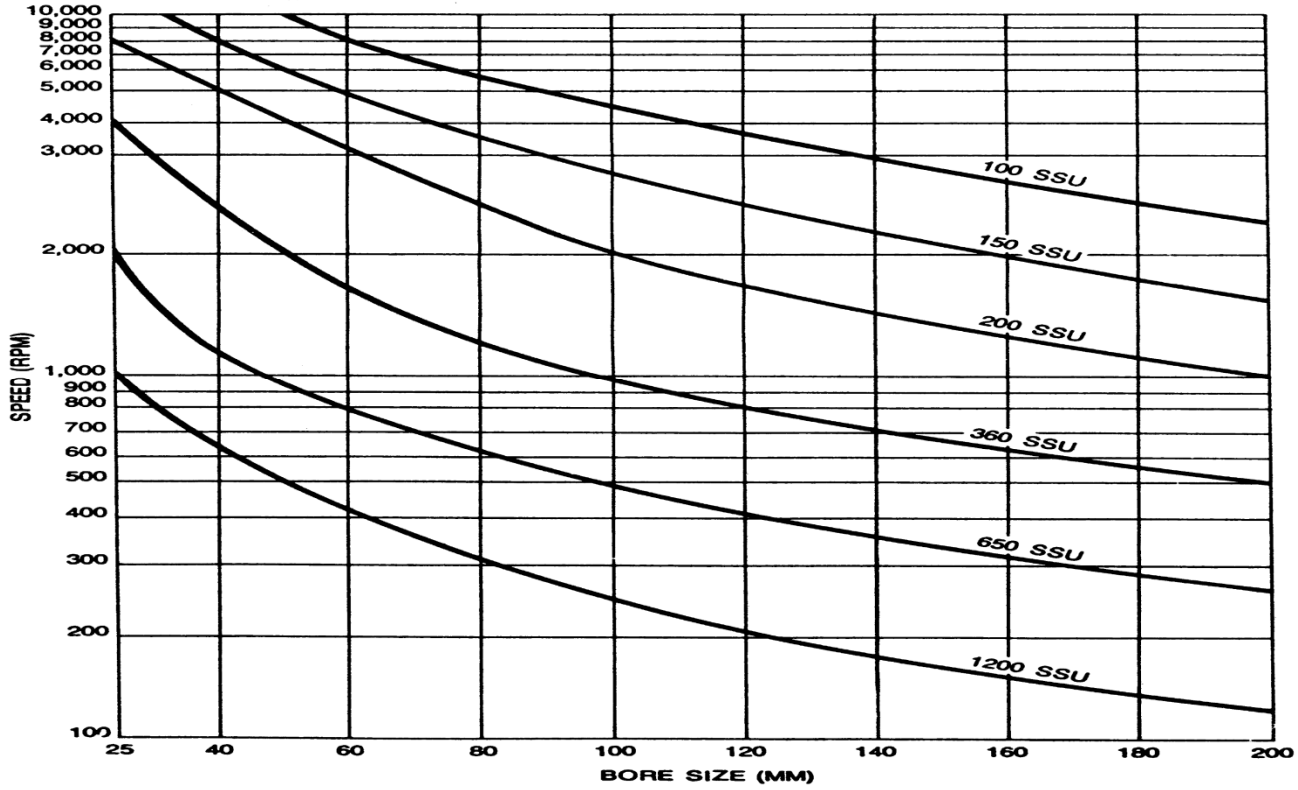


FIGURE 2—Suggested Oil Viscosity at Operating Temperature Versus Bore Size and Speed



Grease Lubrication

The selection of grease will depend on application variables including environmental and operating temperatures, load, speed, and maintenance. The following characteristics govern grease selection:

a. No chemically or mechanically active ingredients. Don't use lubricants of dibasic ester types in bearing having polymeric roller cages without consulting Rexnord Bearing Division.
b. The change in consistency should not be greater than 1000 points after 100,000 strokes per ASTM D-217-52T test method.
c. Usable temperature range up to 250°F (except for low temperature environments).
d. The mineral oil in grease should have a viscosity rating according to Figure 2 or higher.
e. Grease must provide adequate corrosion protection. A reputable lubricant manufacture should be consulted.

Initial greasing varies with equipment - In most cases pack bearing full and fill housing reservoir on both sides of the bearing up to the shaft center for #2 or #3 consistency greases or lesser amounts with #0 or #1 consistency greases. At higher speeds, excessive grease can cause high temperatures, whipping and grease breakdown or deterioration. For operating speeds below 50,000 Dn, bearings and housings can be 100% filled, which is desirable for conditions of heavy loads, moisture or dirt.

Relubrication

Optimum intervals of relubrication should be established by experimentation and observation. Drain plugs should be removed so that old grease can be expelled more effectively. Sudden temperature changes may show need for grease or can indicate over lubrication on higher speed applications.

Figure 3 is a general guide to lubricant selection and relubrication intervals. Presence of dirt and/or moisture is considered.

Figure 3—Grease Lubrication Of Cylindrical Roller Bearings

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 Corp., Mobilith AW-2 Texaco Inc., Premium 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	Shell Oil Co., Alvania EP-RO
		Light	High speed	100	200	1 to 8 weeks	Amoco, Rykon No. 2 Mobil Oil Corp., Mobiltemp SHC32
	Possible frost	Light to heavy	Slow to medium	−65	+250	1 to 4 weeks grease at shutdown	Mobil Oil Corp., Mobiltemp SHC32 Texaco Inc., 2346EP 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 EP2 Mobil Oil Corp., Mobiltemp 78
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.

***Bearing with polymeric cages should not be lubricated with dibasic ester type lubricants.

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.