



HIGH
TEMP
BEARINGS

MOUNTED BALL BEARING INSTALLATION
MANUAL

Mounted Ball Bearing Installation Manual (UC, UCX, NA, SU, SN and HU series)



UC, UCX, NA, SUC, SNA and HU Series bearings are flange mounted standard duty, medium duty, stainless, and high temperature ball bearings for use in common and high temperature applications found in industrial environments. All mounted ball bearings arrive pre-lubricated, sealed, and ready to install. Cast iron flanges should be mounted with “Dry” SAE grade 2 bolts to prevent housing fracture from over tightening while achieving proper stretch.

UC/UCX/NA/SUC/SNA/HU Bearings Are Best For:

Speed: 0-3600 RPM

Temperature: -45 ° F to 500° F (varies by series)

Normal service/PM conditions: Receive regular PM or easily inspected

Environment: Exposure to normal industrial environment. SUC, SNA and FNCER treated bearings are suitable for corrosive service

Axial shaft movement: Limited or no axial shaft movement expected. For low speed applications removal of the shaft locking mechanism will allow for limited axial displacement.

Ball Bearing Temperature Limits:

| Temperature Range | Product Category | Bearing Type |
|-------------------|----------------------------------------|---------------------------------------------------------------------------------------------------|
| -10 F to 248 °F | Standard and Stainless Roller Bearings | UC, UCX, NA, SUC, SNA Series Mounted Ball bearings Standard C3 Spherical Roller |
| -45 F to 500 °F | Elevated Temperature Roller Bearings | HU Series Mounted Ball bearings W/High temperature grease High Temperature C4 Spherical Roller |

Coefficient of friction mounted ball bearing: $f=0.001$

Coefficient of friction NT polymer sleeve on Steel: $f=0.03$

Coefficient of friction HT750/1000 carbon-graphite sleeve on Steel: $f=0.2$

Shafting Recommendations:

- Shaft tolerance should be $+0.000/-0.002$ " ($+0.000/-0.051$ millimeters) or better
- Shafting resistant to corrosion for the service conditions

Special Bearing Options:

Any UC, UCX, NA, SUC, SNA or HU series bearing may have the following treatments applied by the factory, upon request:

- **Dry Carbon Solid Lubrication (DCSL)** : Permanent dry carbon film lubrication, withstands long term exposure to 660 °F
- **Custom Greasing:** Customer specified, or specially recommended grease by HTB Inc.
- **FNCER Treatment:** Extremely corrosion resistant, anti-friction and wear ceramic coating

Installation:

Warning: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by High Temp Bearings, Inc. nor are the responsibility of High Temp bearings Inc. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a fail-safe device must be an integral part of the driven equipment beyond the speed reducer output shaft.

1. Clean the shaft and bearing bore thoroughly. If using a setscrew locking bearing, file flats on shaft at set screw locations to improve setscrew engagement with the shaft.
2. Slip the bearing into position. Be sure that the bearing is not on a worn section of the shaft. For tighter fit shafting, tap inner ring face with a soft driver. Do not hammer on the outer ring or housing, as this may damage the bearing races.
3. The bearing outer race is spherical and swivels in the housing to accommodate misalignment. Snug the flange bolts and use the shaft to swivel each bearing until its final position is in the center of free movement top to bottom as well as side to side. Pass the shaft through both bearings without forcing. This will prevent unintended axial or radial preloading. Auxiliary load carrying devices are advisable for side or end loading of pillow blocks and radial loads for flange units where normal to heavy loading or shock loading is encountered.
 - a. *NOTE: Flange bolts should be tightened carefully with flat washers to prevent damage to the casting.*
4. **Use SAE Grade 2 “dry bolts” with cast iron flanges;** follow the torque specifications on chart 4 to prevent housing fracture. Once tight, turn the shaft by hand. Resistance to turning should be the same as before tightening hold-down bolts.
5. For setscrew mounted bearings: After the shaft is aligned, hand-tighten both setscrews and then tighten the setscrews alternately until the torque is reached according to Chart 4. After 24 hours of operation, the setscrews should be re-tightened to assure full locking of the shaft. Wrenches or drivers should be in good condition (flats not rounded over), as this could damage the screws and not allow proper tightening. Screws may be re-tightened many times without damaging the bearings. Setscrews may be replaced to achieve maximum holding power.
6. For eccentric collar mounted bearings: Slide the collar against the mating cam end of the inner race of the bearing. Use a steel bar in the hole provided in the collar; tap the collar sharply in the direction of shaft rotation. Tighten setscrew(s) to the proper torque shown in Chart 3. To remove bearings, loosen the setscrew(s) and tap the collar in the direction opposite shaft rotation.

Grease Lubrication

The bearing is greased at the factory and ready to run. When establishing a re-lubrication schedule, small amounts of grease at frequent intervals are preferable to a large quantity at infrequent intervals (see Chart 1 for recommended lubrication intervals). For normal applications, use NLGI No. 2 high quality lithium grease with appropriate oil base stock kinematic viscosity per Chart 5. In general, the slower the application the higher the grease base oil viscosity should be to properly protect the bearings from wear.

High Speed Operation: At higher speeds, too much grease or too high of a grease base oil viscosity may cause overheating. The amount of grease that the bearing will take for a particular high speed application can only be determined by experience. If excess grease in the bearing causes overheating, it will be necessary to remove the grease fitting to permit the excess grease to escape. Synthetic PAO or mineral oil based grease should never be allowed to run over 220° F. If higher temperature is expected, alternative grease chemistry should be selected.

High temperature ball bearings (HU series): Arrive pre-lubricated with specially formulated PFPE grease. They should only be lubricated with equivalent PFPE based grease. Mixing of non-equivalent grease and oils will result in poor bearing life or failure. Bearings treated with DCSL (solid carbon lubrication) cannot be greased.

A second lubrication guide, Chart 2, is provided from normal bearing temperature and conditions (UC, NA, UCX, SUC, SNA bearings). Re-lube periods are better determined by experience. For low speed applications fewer than 20 RPMS, up to 100% fill and a slight show of purged grease at the bearing seals is normal and helps keep contaminants out of the unit.

Chart 1: Suggested lubrication PM Period in Weeks

| Hours Run per Day | 1 to 250 RPM | 250 to 500 RPM | 500 to 750 RPM | 750 to 1000 RPM | 1000 to 1500 RPM | 1500 to 2000 RPM | 2000 to 3000 RPM |
|-------------------|--------------|----------------|----------------|-----------------|------------------|------------------|------------------|
| 8 | 12 | 12 | 10 | 7 | 5 | 4 | 3 |
| 16 | 12 | 7 | 5 | 4 | 2 | 2 | 1 |
| 24 | 10 | 5 | 3 | 2 | 1 | 1 | 1 |

Chart 2: Suggested Lubrication PM period based on bearing temperatures & conditions

| Operating Conditions | Bearing Temperatures | Grease Interval |
|----------------------|----------------------|-----------------|
| Clean | 32°F-120°F | 6-10 months |
| | 120°F-150°F | 1-3 months |
| | 150°F-200°F | 1-4 weeks |
| Dirty | 32°F-120°F | 1-4 weeks |
| | 120°F-150°F | Daily to 1 week |
| | 150°F-200°F | Daily to 1 week |
| Moisture | 32°F-200°F | Daily to 1 week |

Chart 4: Hold Down Bolt Tightening Torques

| SAE Grade 2 "Dry Thread" Torque Values | |
|----------------------------------------|----------------|
| Bolt Size | Torque(in-lbs) |
| 3/8-16 | 240 |
| 7/16-14 | 380 |
| 1/2-13 | 600 |
| 9/16-12 | 840 |
| 5/8-11 | 1200 |
| 3/4-10 | 1950 |
| 7/8-9 | 2890 |
| 1-1/8-7 | 4248 |
| M10 | 265 |
| M12 | 440 |
| M16 | 110 |
| M20 | 2100 |

Chart 3: Set Screw Tightening Torques

| Set Screw Size | Socket Size | Torque In-lbs | Max Axial Load Lbs |
|----------------|-------------|---------------|--------------------|
| ¼ UNF | 1/8" | 60 | 560 |
| 5/16 UNF | 5/32" | 110 | 785 |
| 7/16 UNF | 7/32" | 280 | 1685 |
| 1/2 UNF | 1/4" | 400 | 2025 |
| M6 x 0.75 | 3mm | 50 | 560 |
| M8 x 1.0 | 4mm | 110 | 785 |
| M10 x 1.25 | 5mm | 240 | 1235 |
| M12 x 1.25 | 6mm | 340 | 1800 |

Chart 5: Oil/Grease base stock lubricant selection

