

HANDELING OF BEARINGS

Care & fitting of bearings

Storage

1. Store ball and roller bearings in a clean, dry place in their original wrappings. This will preserve them from deterioration.
2. Use older stocks first.
3. Do not stack too many large bearings on top of each other otherwise the protective oil could be squeezed out from between the bearing and its wrapping, thus leading to corrosion problems. Also, never store large bearings upright, but lay them flat.

Fitting

4. Absolute cleanliness is essential when handling bearings. They should not be removed from their wrappings until required for fitting. A smooth metal topped bench that can be wiped clean is a great advantage. All tools, shafts, housings and other components must be perfectly clean. If fitting operations are delayed or interrupted, the assembly should be wrapped with greaseproof paper to exclude dirt and dust.
5. All bearings are usually coated with a rust preventative oil, unless pre-lubricated and/or packed to suit individual requirements. There is no need to remove this oil unless:

It is sufficient to cause serious dilution of the oil or grease used in the bearing. This normally applies to smaller bearings where the rust preventative oil represents a large proportion of the required amount of lubricant.

Low torque is required.

A synthetic lubricant is used that may not be compatible with the protecting oil. spirit or good-quality paraffin are suitable. Allow the bearings to drain throughly,. Finally dry them, the following being satisfactory methods.

Place the bearing in an oven or on a hot plate, temperature of 65-80°C should be adequate.

Direct dry, clean, compressed air on to the bearings. The cage and rings of smaller bearings must be held firmly otherwise a sudden blast of air would rapidly accelerate the free bearing parts; this could cause the balls to skid, thus damaging the highly finished internal surfaces of the bearing.

6. The fits of the rings on their seating's are very important. Therefore, ensure that the shaft and housing seating's are of correct size and of good shape.
7. All shoulders must be smooth and square with the axis of rotation.
8. Never drive one ring on to its seating by blows on the other. Such blows would irretrievably damage the balls or rollers and raceways.
9. Apply pressure evenly around the rings. A press is better than a hammer.
10. Should a hammer be used, mild steel or brass tube of suitable size, faced up square, should be interposed between it and the bearing. This will distribute the force of the blows (or rather taps), which should be given progressively around the ring.
11. When the parts of a separable roller bearing are brought together, the inner ring, the outer ring and the rollers must all be square one with the other. If not square, then the rollers would not slide freely, and force would have to be used to bring the parts together. Such force would result in the rollers and raceways becoming scored and this, in addition to causing noisy running, could cause early failure of the bearing.
12. Where the ring of a bearing is to be against an abutment, make sure it is properly seated.
13. For heavy interference fits, inner rings may be shrunk onto their seatings after heating in clean mineral oil at a temperature of approximately 100%. Be sure that the bearing is in contact with the abutment shoulder after it has cooled.
14. In the case of taper clamping sleeve and nut bearings, the clamping nut must not be over-tightened, this could expand the inner ring and eliminate all clearance within the bearing, or even fracture the inner ring.

It is recommended that when using pin spanners they should have a length of approximately five times the shaft diameter, one or two light hammer blows should be given to the handle of the spanner after the nut has been tightened as far as possible by hand pressure; this should tighten the nut sufficiently. It is good practice, if possible, to check that the sleeve is still clamped firmly to the shaft after a few days running.

As an additional precaution it is recommended that, whenever possible, the bearings are fitted so that the rotation of the shaft tends to tighten the nut on the sleeve.

When using torque spanners it is recommended that the following torques be applied to the clamping nut.

For LIGHT series bearings

Shaft Diameter	Torque on Nut
1" and 25m/m	7.6 Kgm/M (55 lbs ft)
1 ^{1/2} " and 40 m/m	12.4 Kgm/M (90 lbs ft)
2" and 50 m/m	17.25 Kgm/M (125 lbs ft)
3" and 75 m/m	30.3 Kgm/m (220 lbs ft)

For MEDIUM series bearings increase the above figures by approximately 50 percent.

Dismantling and replacement

15. Unnecessary removal of a bearing should be avoided, particularly where interference fits have been used. Removal can damage a bearing and, in some instances, cause deterioration of the interference fit. Very often it is sufficient to clean and relubricate the bearing in its fitted position.

Only remove a bearing if you need to inspect it closely. Symptoms that guide are the condition of the lubricant, the bearing temperature and noise level.

16. With roller journal bearings there is sometimes a ball locating bearing. this may be only push fit on the shaft, and therefore facilitates easy dismantling.

17. In certain application some form of extractor may be necessary. This must act directly on the ring to be removed. Never try to remove the inner ring by applying force to the outer ring, or vice versa.

18. Thrust bearings offer no difficulty as push fits should have been used; but, take care to keep the rings square or they will bind.

19. Carefully protect bearings from dirt moisture whilst they are out of their housings. It is advisable to wash them thoroughly immediately after removal, by the following procedure.

Immerse in a washing fluid such as clean white spirit or good-quality paraffin. The washing fluid must not attack the bearing components. After Soaking, move each separate bearing around in the fluid, using a basket or other container if convenient. Occasional slow oscillations of the bearing rings will help to dislodge dried out grease and other matter.

When clean, thoroughly drain and dry.

Lubricate the bearing immediately and re-fit. Alternatively, completely coat all parts with a rust preventative oil, working it well into the internal parts of the bearing. Then wrap the bearing in greaseproof paper and box until required for re-fitting, when the bearing will require re-lubricating.

20. Worn shafts, housings and abutments must have attention if creep had occurred. Knurling, scoring or distortion of the seating on which creep had occurred must not be resorted to in order to simulate an interference fit. Such deceptive practices are ineffective, for creep will very often return all too quickly. Also, even if the ring is prevented from creeping it will usually be distorted by the seating, with bearing failure resulting from local overloading of the raceways and of the balls or rollers.