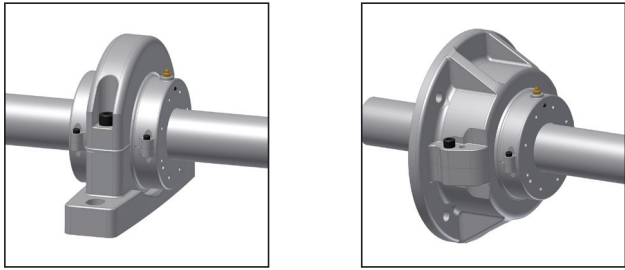


**Stage 9 - Housing top half**

Lubricate the top half of the cartridge spherical surface.

Remove the shaft supports (e.g. jack) that have been used during assembly, to allow the shaft to rest upon the bearing, then place the pedestal cap or flange top half into position and fully tighten the joint screws.



**Initial Lubrication**

These bearings are intended for grease lubrication. If oil lubrication has been specified specific instructions must be from Cooper technical department.

For operation between 0°C and 80°C we recommend the use of good quality lithium based grease with extreme pressure additives. Grease of NLGI No.2 designation (i.e. EP2 or equivalent) is suitable for most applications. EPI may be used for centrally pumped systems.

If the bearing is to operate at slow speed, the roller bearing and housing should be fully packed with grease on assembly. For higher speeds progressively less grease should be used. The percentage pack and quantity used is given in the table below. The table assumes normal density grease (about 0.85 g/cm<sup>3</sup>).

Never assemble the bearing dry and inject grease only after closing the cartridge. For full pack lubrication additional grease will need to be injected after closing the cartridge in order to properly fill the cartridge.

Shaft Diameter d (mm)	Bearing Reference	Speed (rpm) up to	Grease (full pack) (Kg)	Speed (rpm)		Grease (75% full pack) (Kg)	Speed (rpm)		Grease (50% full pack) (Kg)	Speed (rpm)		Grease (33% full pack) (Kg)	Speed (rpm)		Grease (25% full pack) (Kg)
				from	to		from	to		from	to		from	to	
75	IDTB75M	667	0.19	667	1333	0.14	1333	2000	0.10	2000	2667	0.06	2667	0.05	
80	IDTB80M	625	0.23	625	1250	0.17	1250	1875	0.12	1875	2500	0.08	2500	0.06	
90	IDTB90M	556	0.25	556	1111	0.19	1111	1667	0.12	1667	2222	0.08	2222	0.06	
100	IDTB100M	500	0.41	500	1000	0.31	1000	1500	0.20	1500	2000	0.13	2000	0.10	
110	IDTB110M	455	0.44	455	909	0.33	909	1364	0.22	1364	1818	0.14	1818	0.11	
120	IDTB120M	417	0.50	417	833	0.38	833	1250	0.25	1250	1667	0.17	1667	0.13	
130	IDTB130M	357	0.65	357	714	0.48	714	1071	0.32	1071	1429	0.21	1429	0.16	
140	IDTB140M	357	0.65	357	714	0.48	714	1071	0.32	1071	1429	0.21	1429	0.16	
150	IDTB150M	313	0.63	313	625	0.47	625	938	0.32	938	1250	0.21	1250	0.16	
160	IDTB160M	313	0.63	313	625	0.47	625	938	0.32	938	1250	0.21	1250	0.16	
180	IDTB180M	278	0.77	278	556	0.58	556	833	0.39	833	1111	0.25	1111	0.19	

**Routine Greasing**

Relubricate the bearing weekly or every 150 hours of operation.

Sizes up to and including 120mm: Use 2ml of fresh grease.

Sizes over 120mm: Use 4ml of fresh grease.

Note that 2ml is approximately 1 shot from a conventional side-lever grease gun.

Automatic lubrication systems should be metered to deliver grease at an average rate equivalent to the routine greasing periods and quantities specified.

If it can be done safely, the bearing should be re-greased as it rotates to help distribute the grease.

Do not mix different types of grease in the bearing. Excessive quantities of lubricant should not be used, particularly at high speeds, as this may result in excessive churning and overheating.

**Shaft Tolerance**

Journal diameter tolerance is h6 to BS 4500. The tolerance on roundness and parallelism is IT6.

Journal Diameter (mm)	Over	50	80	120
	Up to & including		80	120
Tolerance (µm)	h6	+0	+0	+0
	IT6	-19	-22	-29

**Health and Safety at Work**

We draw attention to the aspect of safety in the fitting and use of bearings. Damage to equipment and personal injury may result if bearings are not installed according to the instructions given here, or are operated under conditions or loads not recommended by the Cooper technical department.

Any significant mist from lubricant should be ducted away.

All threaded lifting holes are marked with the appropriate thread size, e.g. M16.

**SCREW SIZES AND TIGHTENING TORQUES**

Shaft Diameter (mm)	Bearing Reference	Clamping ring screw			Cartridge joint screw			Side screw			Pedestal joint screw			Flange joint screw		
		Screw size	Key size A/F (mm)	Torque (Nm)	Screw size	Key size A/F (mm)	Torque (Nm)	Screw size	Key size A/F (mm)	Torque (Nm)	Screw size	Key size A/F (mm)	Torque (Nm)	Screw size	Key size A/F (mm)	Torque (Nm)
75	IDTB75M	M5x25	4	8.5	M6x25	5	11	M6x10	3	7.8	M16x65	14	225	M12x55	10	90
80	IDTB80M	M5x25	4	8.5	M10x45	8	52.5	M6x10	3	7.8	M16x65	14	225	M16x65	14	225
90	IDTB90M	M5x25	4	8.5	M10x45	8	52.5	M6x10	3	7.8	M16x65	14	225	M16x65	14	225
100	IDTB100M	M8x30	6	35	M10x45	8	52.5	M6x10	3	7.8	M20x80	17	420	M16x65	14	225
110	IDTB110M	M8x30	6	35	M12x55	10	90	M6x10	3	7.8	M20x80	17	420	M20x80	17	420
120	IDTB120M	M8x30	6	35	M10x45	8	52.5	M6x10	3	7.8	M20x80	17	420	M20x80	17	420
130	IDTB130M	M10x45	8	70	M10x45	8	52.5	M6x10	3	7.8	M20x80	17	420	M20x80	17	420
140	IDTB140M	M8x30	6	35	M10x45	8	52.5	M6x10	3	7.8	M20x80	17	420	M20x80	17	420
150	IDTB150M	M10x45	8	70	M10x45	8	52.5	M10x16	5	30	M16x65	14	225	M20x100	17	420
160	IDTB160M	M8x30	6	35	M10x45	8	52.5	M10x16	5	30	M16x65	14	225	M20x100	17	420
180	IDTB180M	M8x30	6	35	M10x55	8	52.5	M10x16	5	30	M20x80	17	420	M24x100	19	712

**CHECK LIST**

- The correct shaft size is important
- Parts should not be interchanged
- Match marks should coincide
- Lightly oil threads and interfaces
- Gap at each inner race joint
- Fully tighten clamping ring screws
- Lubricate before closing the housing
- Lubricate swivel seating
- Be careful not to damage inner race lips with rollers

**BASIC TOOLS REQUIRED**

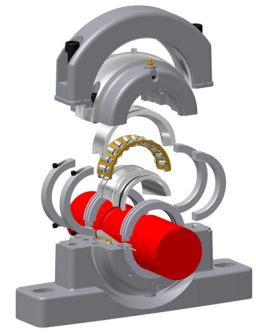
- Allen Keys - For bearing and housing assembly
- Feeler Gauges - To ensure correctly spaced joint gaps
- Flat Bladed Screwdriver - For separating cage halves
- Micrometer - To measure the shaft
- Soft Faced Hammer - To ensure correct seating of components
- Torque Wrench - To ensure correct torque on screws



**Tapered Bearing Assembly and Lubrication Instructions**

**Caution**

Some components have sharp edges. Please read instructions before assembly.



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**Preliminary Notes**

Bearings must be disassembled before assembling into position – do not attempt to install on the shaft by sliding the bearing over the shaft end.

All bearing and housing components are marked with matching serial numbers and/or letters on each half. Ensure that the serial numbers/ letters match and are placed together on assembly.

Complete roller bearings are interchangeable between similar Cooper cartridges. Individual parts should not be interchanged. Cartridges are interchangeable between standard outer housings provided that standard clearances have been specified.

It is important that the correct tightening torques are applied to all screws. Tightening torques of standard units are tabulated overleaf. For non-standard units tightening torques are usually specified on the relevant arrangement drawing or may be obtained from Cooper technical department.

During assembly lightly oil threads and all interfaces, including bores and end faces of clamping rings and the joint faces of the outer race

**Preliminary Operations**

Unwrap the bearing parts. Disassemble the cage (if received assembled) by removing the 'U' clips. Undo the clamping ring screws and remove the clamping rings from the inner race. Remove the preservative from all parts. Handle all parts with care and keep safe from damage.

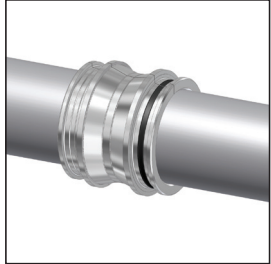
Clean and inspect the shaft diameter. Ensure that it is within the tolerances specified for mounting the bearing.

**Stage 1 - Housing bottom half**

Place the pedestal base or flange lower half into position. If the precise location of the housing is predetermined it may be bolted into position. Generally, pedestal bases may require slight movement at a later stage in order to accurately position the shaft.

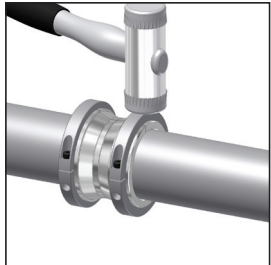
**Stage 2 - Inner race**

Lightly oil the shaft with thin machine oil, then remove the excess with a clean wiper. Place the inner race in the correct position on the shaft. There should be equal gaps of approximately 0.5mm at both joints. To help achieve this soft packing on the joint faces may be used.



**Stage 3 - Clamping rings**

The clamping rings are designed to ensure that the two halves of the inner race are aligned with each other in service, but should not be used to force the two halves into alignment during assembly. Fit the clamping rings with the joints at approximately 90° to the inner race joint. There should be equal gaps at both joints of each clamping ring and both inner race joints. Progressively tighten all clamping ring screws equally using the correct hexagon key and torque wrench.



Tap down both clamping rings all around using a soft-faced hammer. Re-tighten the screws. Repeat until screws are fully tight and re-check all joint gaps.

**Stage 4 - Cage and rollers**

Coat the bore of the cage and roller assembly with grease and lightly cover the inner race assembly (fitted to the shaft) all over with grease.

Assemble the cage (complete with rollers) around the shaft. Refer to Figure 1 and note that the angle of the inner race lip is such that the rollers cannot assume their working position (1a) radially upon assembly

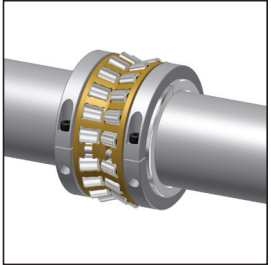
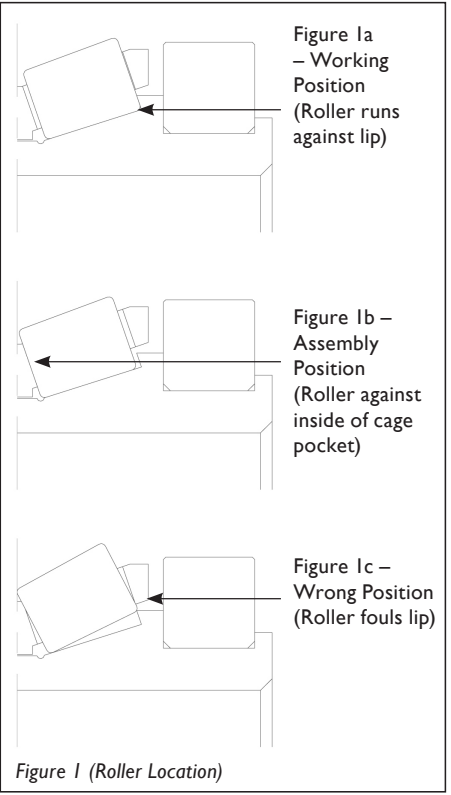
There is sufficient axial movement of the rollers in the cage that the cage can be assembled with the rollers axially clear of the lips as in 1b. It is sometimes possible for the rollers to assume a position as at 1c during assembly. It is important that the positions of these rollers is corrected before assembling the cartridge and outer race into position.

Secure the two halves of the cage together by pressing the four 'U' clips provided into position into the recesses provided for the purpose. Push the 'U' clip fully home so that the clip touches the outside diameter of the cage.

**Stage 5 - Cartridge and outer race subassembly**

Ensure that the preservative is removed from the outer race seating in the cartridge and lightly oil the seating. Place the half-outer race with the lubrication hole in the top half-cartridge (with lubrication point), and the second half outer race into the lower half-cartridge, ensuring that the pairing marks match. Ensure that the ends of the outer race halves project from the cartridge joint faces by approximately equal amounts.

Refer to Figure 2. Before putting the two halves of the cartridge together, fit side rods 'A' and side screws 'B' and very lightly tighten. Place together the two halves of the cartridge complete with outer race halves and fully tighten joint screws 'C' and 'D'. Progressively and fully tighten side screws 'B'.



Inject grease to fill the grease passages. Remove joint screws 'C' and 'D' and separate the cartridge halves, taking care that the outer race halves do not move out of position in their respective cartridge halves.

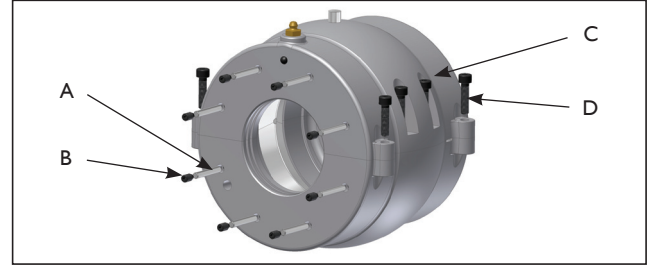
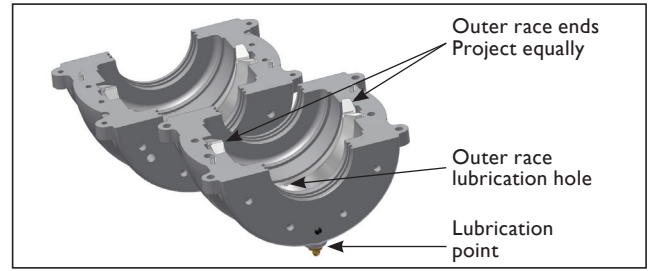


Figure 2

**Stage 6 - STET**

**Grease groove (LAB) seals**

Lubricate the cartridge end bores (machined with a series of small grooves) with grease.

**Felt seals**

Soak the seals in oil before fitting into the cartridge end bores with the seal ends corresponding to the cartridge joint faces.

**Aluminium triple labyrinth (ATL) seals**

Separate the seal halves by driving out the two jointing pins. Lubricate the 'O' rings in the bore with grease. Reassemble on the shaft by compressing the 'O' rings of both halves sufficiently to allow the jointing pins to be reinserted, and reinsert the pins. Note: ATL seals are able to slide along the shaft once assembled.

**Spring-loaded lip seals with retaining plate (SRSRP)**

Note: Unlike most other types of seal, spring loaded lip seals are assembled after closing the cartridge (Stage 8).

For each seal, remove the spring from the lip of its seal by twisting it in the appropriate direction at the joint. Place the seal around the shaft with its lip pointing outwards and the joint of the seal at the top position. Place the spring round the shaft, hold one end firmly & twist the other end round 3 or 4 times in the opposite direction to which it was twisted to release the spring. Place the two ends of the spring together, slowly let the twisted end unwind joining the two ends together & fully twist the two ends of the spring together. Place the spring over the lip of the seal so that it sits in its groove. Grease the shaft where the seal will run then push the seal along the shaft until it is fully back in the seal groove in the end of the cartridge. Apply further lubricant to the seal lip. Screw the seal retaining plate to the end face of the cartridge.

**Other seal types**

High temperature packing (HTP) and synthetic rubber lip (SRS) seals without retaining plates are placed into the cartridge end bores and lubricated before closing the cartridge. Other seal types may have different assembly requirements.

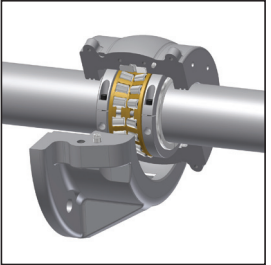
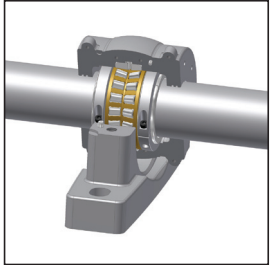
**Stage 7 - Lubrication**

Coat the cage and rollers and the inside of the cartridge with grease. The quantity required is dependent on operating temperature and speed. For operating temperatures below 80°C the grease quantity required is tabulated overleaf according to maximum operating speed. For operating temperatures above 80°C always use a 25% pack of grease.

Where a 50% pack or less grease is used due to operating speed, ensure a good coating is applied to the working parts, but any excess should be applied to the inside of the cartridge to avoid excessive churning of the grease during initial running.

**Stage 8 - Cartridge**

Lubricate the spherical outer surface of the cartridge bottom half. Place the bottom half of the cartridge (with outer race half) on top of the bearing and rotate 180° into the pedestal base. Maintain close contact of the cartridge and outer race against the bearing during this operation, and until the top half of the cartridge is assembled tightly against the bottom half, to prevent rollers assuming positions as shown in Figure 1c.



Place the top half of the cartridge on top of the bottom half ensuring that the side screws are on the same face. Close cartridge, rocking the bearing around slightly if required to help the rollers assume their working position. Fully tighten the joint screws.

Note that there should not be unusual resistance to tightening the screws – do not force the cartridge halves together using the screws.

