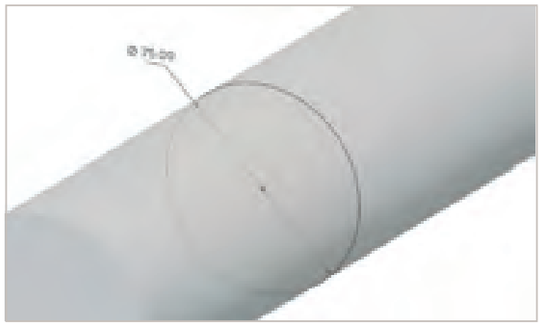
BOWMAN®
SPLIT BEARINGS

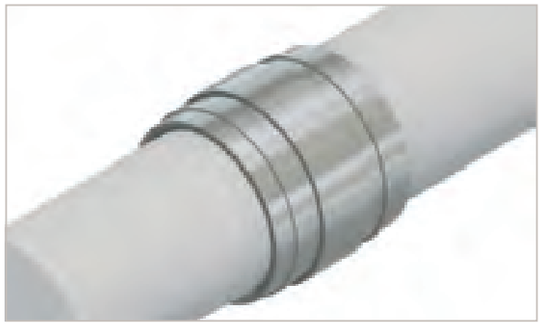
Assembly and Lubrication Instructions

www.bowmansplitbearings.com

Preliminary Notes

Determine the bearing positions and where possible install the fixed bearing first, as this then locates the shaft axially. Wipe clean all bearing parts to remove preservative oil before fitting. All split components have marking numbers at the joint to identify matching halves. Lightly oil the shaft with thin oil. Other interfaces and threads should also be lubricated.





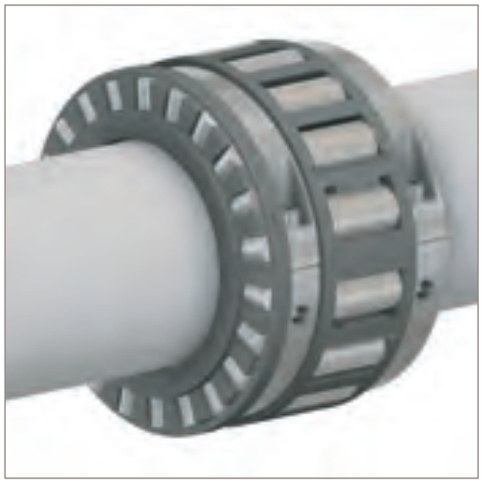
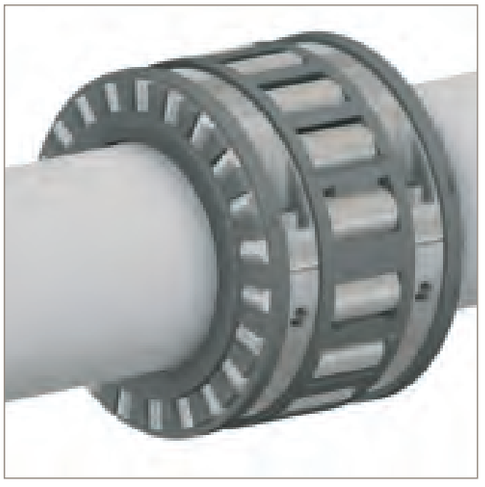
Stage 1:

Clean and inspect the shaft at the bearing seating. Determine the tolerance required from the table provided. When the two halves of the inner race are assembled around the shaft there should be a gap at each joint. This feature ensures the race is gripped to the shaft securely by the clamp ring halves. Maintain even joint gaps on the inner race and clamp rings. Soft packing can be used to equalise the inner race joint gaps. Fit the clamp rings with their joints approximately 90° to the inner race joints. Progressively tighten the clamp ring joint screws keeping all gaps equalised. With a soft faced hammer, tap the clamp ring halves to seat in their grooves. Finally, tighten the joint screws to the torque figure indicated in the provided table.

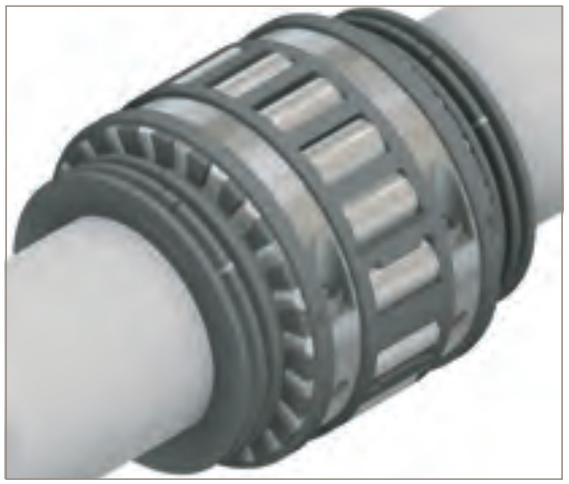
For expansion bearings, the inner race can be offset according to the amount of shaft thermal expansion, so that when operating temperature is reached, the rollers will run central to the outer race. When fitted, re-check the inner race and clamp ring joint gaps are equal and the race is correctly positioned axially.



Stage 2:
The radial cage is supplied with some loose rollers which join the cage halves once assembled on the inner race. Apply a film of grease to the roller path and bore of the cage before placing the cage around the race. Insert the joint coupler with its bevel edge toward the shaft. The cage halves do not have matching numbers, instead each half has a male / female tenon. With the two halves around the inner race, fit the loose rollers with firm pressure until they lock in the pockets and retain the halves of the cage. Couplers can be fitted to one half of the cage before the cage is fitted. Rotate the cage to assemble the second joint.

Stage 3 (applicable only for a locating bearing):
The axial cage halves are joined in a similar way to the radial cages. Apply a film of grease to the side face of the clamp ring and axial rollers.



Stage 4:
Individual instructions are supplied with each seal. Separate the seal halves using the release tool provided. Lubricate the bore of the seal and the shaft with a thin film of grease. Place the two halves of seal around the shaft ensuring the male / female joints correspond and compress the ‘O’ rings to clip the halves together. Once fitted, the seals can be moved axially to position them relative to the housing grooves (when the housing is fitted)

Stage 5:
Prime the small radial groove of the inner housing with grease. Take the radial outer race halves. The upper half is identifiable by the radial lubrication holes and must be fitted in the housing top half which has the lubrication nipple. Push the race halves into the seating grooves ensuring matching numbers coincide. The race joints will protrude slightly beyond the housing joints. Protect these faces when handling the halves.

For fixed bearings, place the axial races in their recesses as shown. When pushed fully into their seating the joints of the axial races will be slightly below the face of the housing.

Stage 6:
Apply lubricant to the inside surface of the housing, covering the fitted races. Coat the assembled cages & rollers on the inner race and add some grease to the labyrinths of the seals. The quantity of grease to be used in the bearing can be determined from the grease weights table.

Stage 7:
With the pedestal base located in position, place the lower half of the inner housing on top of the shaft. Lubricate the spherical surfaces of pedestal and inner housing. Align the two spherical surfaces, ensure the labyrinth seals mate with their corresponding grooves and rotate the housing around the shaft into the pedestal base until both joint faces are aligned. It may be necessary to manually guide the axial rollers between the clamp rings and axial outer races whilst rotating the housing into position.

Stage 8:
Place the upper half of the inner housing on top of the shaft in position, ensuring the axial rollers & races align. Lower gently into position, then fit and progressively tighten the housing joint screws.

Shaft supports or jacks can now be removed.

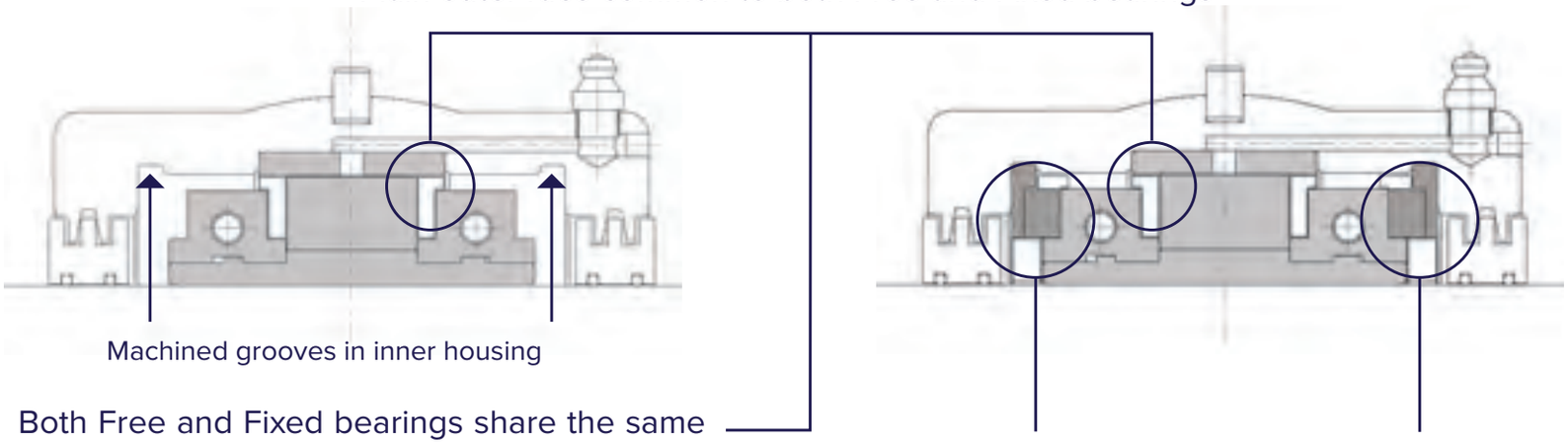
Apply a thin film of grease to the spherical surfaces of the pedestal cap and the upper half of the inner housing. The pedestal cap can now be fitted, ensuring the matching numbers are together. Fit the joint screws, tighten then release approximately half a turn.

Rotate the shaft by hand or under power for a few revolutions before finally tightening the cap screws. This allows the housings to align the bearing with the shaft.

Free (Non-Locating) Bearing

Fixed (Locating) Bearing

Plain outer race common to both Free and Fixed bearings



Both Free and Fixed bearings share the same radial bearing components (inner races, clamp rings, radial cage and roller assemblies AND plain radial outer races). For the Free bearing this plain outer race accommodates axial expansion as the radial rollers are not axially constrained.

Free bearings can be converted into Fixed bearings by adding axial bearing components (axial cage and roller assemblies and axial outer races) between the clamp rings of the free bearing and machined grooves in the inner housing.

Screw Sizes and Tightening Torques

(All screws are metric coarse thread, socket-head cap screws grade 12.9)

Size Group	Bearing Bore Ø (mm)	Bearing Bore Ø (inch)	Clamp Ring Joint Screw	Torque (Nm)	Cartridge Joint Screw	Torque (Nm)
108	30, 35, 40	1.1875” - 1.5”	M5	8.5	M5	6.5
200	45, 50	1.6875” - 2.0”	M5	8.5	M5	6.5
208	55, 60, 65	2.1875” - 2.5”	M5	8.5	M5	6.5
300	70, 75	2.6875” - 3.0”	M6	15	M6	11
308	80, 85, 90	3.1875”- 3.5”	M6	15	M6	11
400	100, 105	3.6875” - 4.0”	M6	15	M6	11
408	110, 115	4.1875” - 4.5”	M8	35	M8	26
500	120, 125, 130	4.6875” - 5.0”	M8	35	M8	26
508	135, 140	5.1875” - 5.5”	M8	35	M8	26
600	150, 155, 160	5.6875” - 6.0”	M8	35	M8	26

Pedestal	Joint Screw	Torque (Nm)
PED1	M10	52.5
PED2	M10	52.5
PED3	M12	90
PED4	M16	225
PED5	M20	420
PED6	M20	420
PED7	M24	712
PED8	M24	712
PED9	M24	712
PED10	M24	712
PED9A	M24	712
PED10A	M24	712

Grease Quantity for Initial Lubrication

The quantity of grease required for initial lubrication is dependent upon operating speed. For slow applications, the bearing and housing can be packed full of grease, however at higher speeds excessive grease will cause the bearing to overheat.

The table below shows the fully packed quantity of grease for each housing size. The actual amount should be estimated using the percentage of this quantity factored according to the shaft speed.

Lubricant Type

Greases of NLGI No. 2 designation are recommended for most applications. For centrally pumped systems a No. 1 grease may be used for increased pumpability.

Greases with extreme pressure (EP) additives are recommended. However, Bowman Advanced Split Bearing units do not rely upon EP greases being used to achieve the axial capacities listed, unlike existing manufacturers units.

Grease with a lithium complex thickener is usually used for normal applications operating at temperatures between 0° and 80°C. When water resistance is required a grease with an aluminium complex thickener can be used. Some greases are immiscible with each other so if changing lubricants, the bearing unit must be solvent-cleaned of the old lubricant before using the new lubricant.

Please contact our Technical Department if lubrication advice is required.

- Clean bearing parts and shaft before installation
- Measure shaft to ensure it is within tolerance
- Keep matched component halves together
- Equalise joint gaps on both sides of inner race and clamp rings
- Inner race must be fully tightened
- Lubricate bearing during assembly NOT after
- Lubricate seal bores, labyrinths and housing spherical surfaces
- Tighten screws according to torque figures provided

Fully Packed Grease Quantity

Group Size	Inner Housing Ref	Grease Quantity (g)	Inner Housing Ref	Grease Quantity (g)
108	C1	35	-	-
200	C2	55	C2A	55
208	C3	75	C3A	75
300	C4	90	C4A	90
308	C5	140	C5A	140
400	C6	190	C6A	190
408	C7	260	C7A	260
500	C8	300	C8A	300
508	C9	350	C9A	350
600	C10	400	C10A	400

Estimation of the quantity required depending on the speed can be made using the tables below:

Speed Range			Percentage
0	→	50,000dn	100%
50,000dn	→	100,000dn	75%
150,000dn	→	200,000dn	50%
Above 200,000dn			25%

The routine greasing interval is dependent upon operating speed, temperature and environment. As a guide, the re-lubrication quantity should be around 2 – 3 grams given at the following interval:

- Radial bearing with axial bearing (fixed or thrust arrangement) re-grease every 100 hours
- Radial bearing only (expansion arrangement) re-grease every 400 hours