ASSEMBLY AND LUBRICATION INSTRUCTIONS

SN/SD/SAF REPLACEMENT BEARING

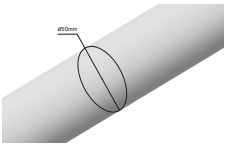
www.bowmansplitbearings.com

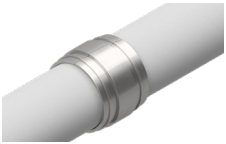
A division of Bowman International Ltd

BOWMAN®
SPLIT BEARINGS

PRELIMINARY NOTES

Determine the bearing positions and where possible install the fixed bearing first, as this then locates the shaft axially. Clean all bearing parts to remove preservative oil before fitting. 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.

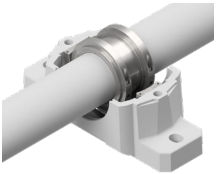




STAGE 1

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 clamping ring halves. Maintain even joint gaps on the inner race and clamping rings. Soft packing can be used to equalise the inner race joint gaps. Fit the clamping rings with their joints approximately 90° to the inner race joints. Progressively tighten the clamping ring joint screws keeping all gaps equalised. With a soft faced hammer, tap the clamping 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 clamping ring joint gaps are equal, and the race is correctly positioned axially.

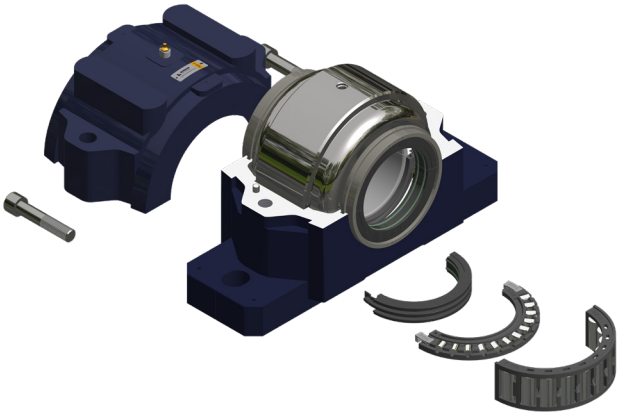


STAGE 2

Insert the lower half seating ring (without the through-hole at 90° to joints) into the housing base.

STAGE 3

The radial cage is supplied with a number of 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. 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.

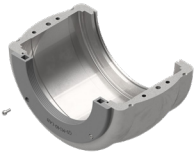


STAGE 4

Apply a film of grease to the side face of the clamping ring and axial rollers.

The axial cage halves are joined using clips. Place halves around the shaft then push the clip into the slots.

(applicable only for a fixed bearing)



STAGE 5 WHERE PROVIDED

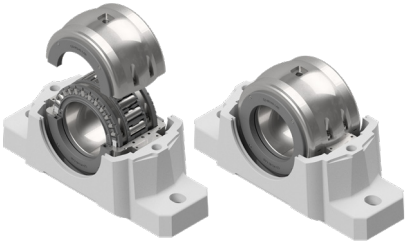
Fit the seal carrier plates to the ends of the SN/SD/SAF housing using the M4 screws supplied (seals may already be inserted into the carrier).

STAGE 6

Apply lubricant to the inside surface of the SN/SD/SAF housing, covering the entire surface. Coat the assembled cages and rollers on the inner race and add some grease to the seals. The quantity of grease to be used in the bearing can be determined from the grease weights table.

STAGE 7

Place the lower half of the SN/SD/SAF housing on top of the shaft. Lubricate the spherical surfaces of the housing and seating ring. Align the two spherical surfaces and rotate the housing around the shaft into the seating ring until both joint faces are aligned. It may be necessary to manually guide the axial rollers into position between the clamping rings and thrust faces whilst rotating the housing into position.



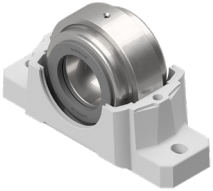
STAGE 8

Noting the orientation of the housing lower half, place the upper half of the SN/SD/SAF housing on top of the shaft in position ensuring the axial rollers & races align. Lower gently into position, then fit and progressively tighten the joint screws.

Shaft supports or jacks can now be removed.

ASSEMBLY CHECK LIST

- Clean bearings 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, labyrinth and housing spherical surfaces
- Tighten screws according to torque figures provided



STAGE 9

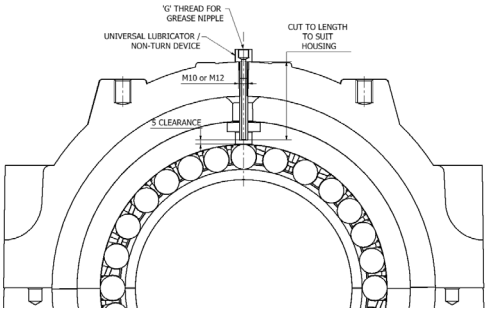
Apply a thin film of grease to the spherical surfaces of the upper housing half of the seating ring. Place the upper half of the seating ring on top of the housing and align it with its lower half.

The SN/SD/SAF outer housing needs to be checked for any internal casting interference. A checker tool can be supplied for this purpose. Run the checker tool around the outer race seat of the outer housing and remove any internal material that fouls the checker tool as it is rotated around the bore of the outer race seat. The image on the next page shows a lubrication casting that needs removing from the outer housing top half.

CHECKER TOOL

STAGE 10

The pedestal cap can now be fitted, ensuring the matching numbers are together. Fit and tighten the joint screws. The existing SN/SD/SAF housing seals should be used to prevent contaminants from entering the housing.



The bearing is supplied with a universal lubricator / non-turn device. This must be installed into the existing housing cap at top centre, so it aligns through the hole in both the seating ring and SN/SD/SAF housing. Due to variation in housing design between manufacturers, the stem may need to be cut to the desired length.

The lubricator is threaded to accept a standard G1/4 or G1/8 grease nipple depending on size (supplied with the bearing). The housing must be drilled through and tapped M10 or M12 to accommodate the lubricator. When measuring and cutting to length, ensure the adaptor passes into the SN/SD/SAF housing, while maintaining clearance between the end of the adaptor and the rollers.

SCREW SIZES AND TIGHTENING TORQUES

SHAFT DIAMETER (mm)	SN/SD/SAF GROUP SIZE	CLAMP RING JOINT SCREW SIZE	TORQUE (Nm)	BEARING JOINT SCREW SIZE	TORQUE (Nm)
135 - 140	GROUP 9	M8	35	M8	35
150 - 160	GROUP 10	M8	35	M8	35
170	GROUP 11	M10	70	M10	70
180	GROUP 12	M10	70	M10	70
200	GROUP 13	M12	120	M10	70
220	GROUP 14	M12	120	M10	70
240 - 260	GROUP 15	M12	120	M10	70
280	GROUP 16	M16	300	M12	120
300	GROUP 17	M16	300	M12	120

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 dispensation.

Greases with extreme pressure (EP) additives are recommended. However, Bowman 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 may not mix 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.

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 on the opposite page 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.

FULLY PACKED GREASE QUANTITY

SHAFT SIZE (mm)	SN/SD/SAF GROUP SIZE	FIXED BEARING GREASE QUANTITY (g)	FREE BEARING GREASE QUANTITY (g)
110 - 115	GROUP 7	250	510
125	GROUP 8	330	610
135 - 140	GROUP 9	360	760
150 - 160	GROUP 10	370	800
170	GROUP 11	560	1020
180	GROUP 12	600	1080
200	GROUP 13	600	1080
220	GROUP 14	930	1600
240 - 260	GROUP 15	1040	1790
280	GROUP 16	1380	2280
300	GROUP 17	1540	2500

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

Estimation of the quantity required depending on the speed can be made using the table below.

SPEED RANGE	PERCENTAGE
0 - 50,000dn	100%
50,000dn - 100,000dn	75%
150,000dn - 200,000dn	50%
Above 200,000dn	25%

ENHANCED

ADVANCED

SN/SD/SAF

www.bowmansplitbearings.com

+44 (0) 1235 462500 sales@bowman.co.uk