

ASSEMBLY AND MAINTENANCE

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



WARNING

Failure to observe the following warnings could create a risk of death or serious injury.

Proper maintenance and handling practices are critical. Always follow installation instructions and maintain proper lubrication.

Overheated bearings can ignite explosive atmospheres. Special care must be taken to properly select, install, maintain, and lubricate housed unit bearings that are used in or near atmospheres that may contain explosive levels of combustible gases or accumulations of dust such as grain, coal, or other combustible materials.

CAUTION

Failure to follow these cautions may result in property damage.

Do not use damaged housed units

When fitting the inner ring there should be an equal gap at each joint. If there are no gaps do not proceed.

NOTE

Do not use excessive force when mounting or dismantling the unit.

Follow all tolerance, fit, and torque recommendations.

Ensure proper alignment.

Never weld housed units.

Do not heat components with an open flame.

Do not operate at bearing temperatures above 250°F (121°C).

Never interchange components between completed bearing assemblies.

Never use a hammer and steel bar on a bearing for installation or removal. Use only a brass bar or a soft-headed mallet.

Consult your equipment designer or supplier for installation and maintenance instructions.



1. Shaft Check

When fitting bearings on both new and existing installations, the shaft need only be raised 1 to 2 millimetres. This should provide sufficient clearance to allow for easy fitting. Prior to the assembly of any bearing components the shaft must be checked for size, roundness and parallelism.

- Check a minimum of three positions along the journal length.
- Check a minimum of three positions around the shaft to establish roundness.
- Shaft tolerances and shaft surface finish are found in the SRB Technical Catalogue.



2. Fitting the Inner Ring

- Carefully unpack and clean the bearing removing all preservatives.
- Inner race locating clamping rings cannot be removed before the cage has been dismantled.
- Care must be taken that no damage occurs when cage halves are separated.



PLEASE NOTE: SPRING CLIPS SHOULD ALWAYS BE RETAINED ON ONE CAGE HALF.

- Clean the shaft and lightly oil the bore of the inner race.
- Place the two inner race halves in approximately the correct position with the joints at the top and bottom. With the joints in that position it will allow easy access to the clamp ring screws later when they are tightened.
- Ensure that the match marks (black band) in the clamp ring groove on one side of the race coincide.
- Fit the inner race locating clamping rings. Ensure that the correct clamp ring is fitted in the corresponding groove. To assist in this the clamping rings are intentionally manufactured to different widths on the more popular sizes. In addition, the match-marking groove found on the inner race is repeated on the corresponding clamping ring.
- Make sure that the thrust faces are not damaged when the rings enter the grooves.
- The joints should be at 90° to the inner race joints and the screws should be tightened in such a way that there are four equal gaps.
- Screws should only be finger tight so that the race can be adjusted axially into its final position.
- When fitting the inner ring there should be an equal gap at each joint. If there are no gaps do not proceed.



3. Pre-Assembly of the Outer Race into the Seating Groove in the Housing

- The housing must be cleaned thoroughly removing all preservatives. If reusing an existing housing it is essential that the outer race seating groove is clean and free of any hardened grease deposits or corrosion.
- Lightly oil the seating groove and the outside diameter of the outer race halves.
- Place the race halves of the expansion or retained type into the seating groove and ensure that:
 - The match marking numbers on the edge of each race half coincide.
 - The lubrication hole in the outer race is in the upper housing half.
 - The outer race joints should protrude equally above the housing joint faces.

If a retained bearing is being fitted:

- Pre-assemble the housing halves and fully tighten the joint socket head cap screws.
- Ensure that the joints are closed.
- Fit the pins and screws provided and tighten up evenly to ensure that the outer race is fixed square against the opposite shoulder of the seating groove.





- When assembling large bearings, fit outer race retaining screws provided. Ensure that the flat washers are not omitted and that the screws do not protrude above the track surface.
- Separate the housing halves, these are now ready for final assembly.
- Fit the appropriate seals. The seal grooves in the standard housing are suitable for felt and synthetic rubber. If the bearing is inspected or replaced on an existing installation and the housing is re-used, we advise that new seals are fitted.
- Felt seals should be pre-soaked in oil prior to fitting in the seal groove.



4. Pre-Fitting the Lower Housing Half

On existing installations it is often unnecessary to change the support if a bearing, or bearing and housing has to be replaced. In such cases the support base bolts should not be touched to ensure that the replacement bearing and the old or new housing will be in the same position as previously. In new installations the support base should be positioned with the bolts finger tight. This will allow additional freedom of movement when aligning the inner and outer races.

5. Retained Bearing

- Slide the pre-assembled bottom half into the support base.
- Line up the inner and outer race roller track by adjusting the inner ring sideways into the final position. The final position should be confirmed by passing one half of the cage and roller assembly between the inner and outer races. The cage half should pass freely round the lower half of the bearing without becoming jammed or trapped.
- Remove the bottom housing half and tighten the clamp ring socket head cap screws and fit the cage as explained below.

Group LS Series	Maximum Expansion if cage and rollers are assembled central 1	Maximum Expansion 2
40 mm 1 1/2 in.	3 mm	6 mm
50 mm 2 in.	3 mm	6 mm
60 mm 2 1/2 in.	3.5 mm	7 mm
70 mm 3 in.	4 mm	8 mm
80 mm 3 1/2 in.	6.5 mm	13 mm
100 mm 4 in.	6 mm	12 mm
110 mm 4 1/2 in.	6.5 mm	13 mm
120 mm 5 in.	9 mm	18 mm
140 mm 5 1/2 in.	8.5 mm	17 mm
160 mm 6 in.	8.5 mm	17 mm

6. Expansion Bearing

- As in the case of the retained bearing, slide in the pre-assembled bottom housing half.
- Line up the inner ring by adjusting it sideways until it is central with the outer race.
- The clearance between the inner race end faces and inside housing walls should be equal. If cage and rollers are assembled in this position the shaft can expand either side of the center line by the amount shown in column 1 in the table right.
- When the position of the inner ring is satisfactory, remove the bottom half housing and tighten the clamp ring socket head cap screws and fit the cage as explained below. A greater degree of expansion allowance can be obtained, but only in one direction. This is achieved by offsetting the inner race with respect to the housing. In this case the total amount of linear movement in service is given in column 2 of the table.



7. Tightening of the Locating Clamping Ring Screws

- When the inner race is in its final position, tighten all four clamping ring screws equally.
- Use the correct hexagon key and a torque wrench.
- Tap down the locating thrust rings with a nylon mallet to ensure that they are seating down correctly within the grooves.

		M4	M5	M6	M8	M10	M12	M16	M20	M24
Torque values for inner locating thrust ring socket head cap screws grade 12.9.	Nm	5.0	9.0	15	35	72	125	309	600	997
	lb.ft	3.6	7.0	11	26	53	92	228	442	735

- Re-tighten and repeat the tapping down until the crews are fully tight.
- Torque values for the various screw sizes are given in the table opposite. If a screw is lost it must be replaced using a High Tensile Socket Head Cap Screw Grade, 12.9.

8. Fitting the Cage

- Grease the inner race roller track and cage.
- Place the cage halves around the inner race ensuring that the match mark numbers on the edge of each cage half are the same and coincide at one joint.
- Press the cage halves into the clip ensuring that the roll pins are fully located.
- Check that the cage assembly runs freely on the inner race.
- Fully pack the cage and roller assembly with the correct type of grease.



9. Final Fitting of the Housing

- Charge the bottom and upper housing halves with the correct amount of grease. Refer to the Lubrication Section for details.
- Lightly oil the spherical diameter of both housing and support and slide the bottom housing half into the support base.
- Lower the shaft with the assembled inner races and cages, until the rollers touch the tracks in the bottom half housing. Make sure that when the rollers in the retained bearing enter the outer race groove they do not damage the lips.
- Revolve the shaft by hand, the rollers should move freely between the thrust shoulders of the inner race and the lips of the retained outer race.
- Fit the upper housing half then tighten the housing joint screws. Check that there is no gap at the joints.



		M4	M5	M6	M8	M10	M12	M16	M20
Torque values for housing socket head cap screws grade 12.9.	Nm	4.0	7.0	11	27	54	94	231	434
	lb.ft	2.6	5.0	8	20	40	69	170	320

10. Fitting The Retained and Expansion Bearing on Site to New Equipment

- Place the support base on the base plate into the approximate correct position. Fit and tighten base bolts to such an extent that the base can be moved if necessary.
- Place the shaft in position and check as indicated in paragraph 1.
- Locate the exact position for the Expansion and Retained inner race and line up the shaft, where necessary, as accurately as possible with machine parts.
- Fit the inner race as explained in paragraph 2, and fully tighten the inner locating thrust ring screws. See previous table.
- Pre-assemble the outer race into the bottom housing halves and fit pins and screws where necessary to locate lipped outer race axially. See paragraph 3.
- Fit the cage and slide the bottom housing halves loaded with grease into support bases. Lower the shaft into the bottom half housing, paragraph 9.
- Check if the shaft alignment and center height is correct. If not, this must now be corrected and it may be necessary to loosen the Expansion or Retained inner race, both in order to move the shaft into the correct position. Check if the Expansion outer race is central to the inner ring or where necessary the inner race is offset to allow for shaft expansion. See previous table.
- If everything is satisfactory, tighten down the base bolts first, then if the inner races have to be moved again re-tighten the inner locating thrust ring screws.
- Load the upper housing half and cap and tighten the cap screws.

11. Fitting the Support Cap

- Place the support cap over the upper housing half and engage the locating dowels at the joint.
- Using a nylon mallet, gently tap the support cap down to close the gap at the joints.
- Fit the bolts and tighten just enough to hold the support joints closed.
- At this point, rotate the shaft by hand. This will allow the spherical locating surfaces to correctly align.
- Tighten the cap bolts fully using a torque wrench. At this point the support base bolts should also be checked and tightened as required. Torque values for housing and support screws are given in the table on the right.



	M8	M10	M12	M16	M20	M24	
Torque values for support cap bolts grade 12.9	Nm	27	54	94	231	434	760
	lb.ft	20	40	69	170	320	560

12. Lubrication

GREASE

Grease lubrication is suitable for most applications. Where bearing temperature is below 100°C, a grease which is suitable up to this temperature should be used.

For axial loads, an extreme pressure grease, usually marked E.P. grease must be used.

For temperatures above 100°C, high temperature greases must be used. Please contact our technical department.

For speeds up to 25% of the catalogue rating, fill the remaining housing space completely with grease.

For speeds between 25% and 50%, housings should be half full.

For speeds over 50%, a, all bearing parts should be fully packed with the remaining housing space left empty.

LUBRICATION INTERVALS

This depends largely on the loads, speeds, temperatures and surrounding conditions. As a guide the Expansion bearing should be greased at least 2 or 3 times per year, 1 or 2 shots (3ml) from a grease gun.

For the Retained bearing, depending on the thrust load and speed, 1 or 2 shots (3ml) every 2, 3 or 4 weeks depending on duty and experience. If in doubt, please contact our technical department.

Important Points for Bearing Selection, Assembly and Maintenance:-

SELECTIONS:

- Bearing selection must always be based on the correct dynamic and static ratings. All loads should be assessed and the appropriate factors must be used to determine the effective load P.
- Only one retained bearing should be fitted to a shaft for location or thrust. This applies also to a line shaft where a number of shafts are coupled together solidly. In such cases, the offsetting of the Expansion inner races must be considered to allow for shaft expansion.

- Standard bearings in this catalogue are suitable for temperatures up to 140°C. For higher temperatures, special bearings must be considered. There will be a rating reduction between 5% and 40%. The use of a very special high temperature grease is of the utmost importance.
- Very often the wrong type of seal is used. Seal selection should be based on the application, surrounding conditions (wet, dry or dirty), speed, temperature and shaft expansion.
- For some applications, it may be necessary to consider special bearings.

ASSEMBLY:

- Follow the assembly instructions carefully
- Interchangeability - Complete Expansion or Retained bearings can be interchanged with the correct housings.
- A complete bearing and housing can be interchanged with correct support.
- Ensure that all socket head cap screws are pulled up tightly, according to tables.
- Load up the housings with the correct amount of grease in accordance with grease specifications.

MAINTENANCE:

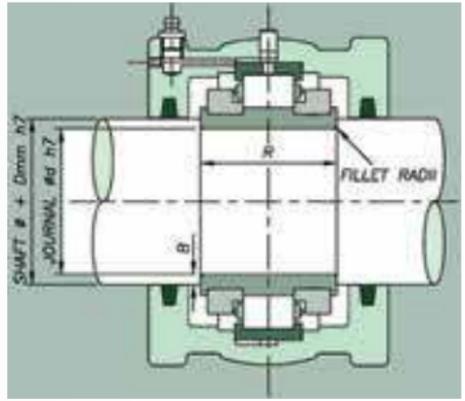
- Lubricate the bearing at regular intervals and inspect visually during shutdown periods, if this is possible. It may be necessary to change the grease and fit new seals.

13. Recess Mounting

In applications where the resultant axial load exceeds 50% of the Ca rating for the bearing, the shaft design should include either a recess for bearing seating or grooves to accommodate retaining rings. Such an arrangement should also be considered if the unit is subjected to shock loads, fluctuations in temperature over 100°C or the shaft is vertical.

The dimensions for producing an appropriate recess or for governing the position and size of the retaining rings if used are derived from the following table.

N.B. Width of recesses for standard bearings may be different from that used for existing products. Please consult SRB Technical Services department for bearings suitable for other recess sizes.



Journal Diameter d	Shoulder Diameter 'D' mm	Fillet Radii	Shoulder Height B	Recess Width R	Squareness of Abutment Faces
40 – 90 mm 1 1/2 – 3 1/2 in.	d + 5 mm	1.2 mm	2.5 mm	C + 0.1 mm C + 0.3 mm	0.1 mm
Over 90 – 150 mm Over 3 1/2 – 6 in.	d + 10 mm	2.0 mm	5.0 mm	C + 0.15 mm C + 0.40 mm	0.1 mm
Over 155 mm Over 6 in.	d + 10 mm	2.3 mm	5.0 mm	C + 0.2 mm C + 0.5 mm	0.1 mm

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