

Lubrication

The main purpose of lubricating a bearing is to coat the rolling contact and load-bearing surfaces with a lubricant, minimizing direct metal-to-metal contact. This accomplishes the following:

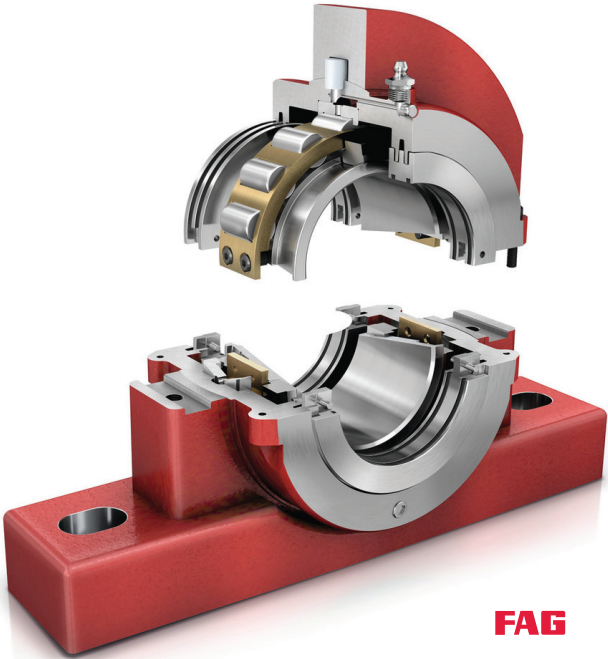
- Reduces heat, friction and abrasion to prolong useful life.
- Transports heat away from the load zone (oil).
- Slows or prevents corrosion.
- Helps reduce the ingress of foreign matter into the bearing (grease).

Proper lubrication during both assembly and operation is critical. The lubricant type and quantity depend on the application, as load, speed and temperature all affect the needed lubrication. The majority (about 90%) of rolling element bearings are grease lubricated. Oil is generally utilized in high-speed and high-temperature applications.

Series	Clamp Collar			
	Range	Bolt	Hex Key Size	Torque ft-lbs (in-lbs)
S1	108 - 300	#10" – 32 UNF	5/32	3.1 (32.2)
	308 - 500	1/4" – 28 UNF	3/16	7.5 (90)
	508 - 600	5/16" – 24 UNF	1/4	15 (180)
	608 - 1000	3/8" – 24 UNF	5/16	27
	1100	7/16" – 20 UNF	3/8	43
	1200	1/2" – 20 UNF	3/8	66
	1300 - 1400	3/8" – 24 UNF	5/16	27
	1500 - 1600	7/16" – 20 UNF	3/8	43
S2	208 - 400	1/4" – 28 UNF	3/16	7.5 (90)
	408	5/16" – 24 UNF	1/4	15 (180)
	500 - 700	3/8" – 24 UNF	5/16	27
	800 - 1000	1/2" – 20 UNF	3/8	66
	1100 - 1600	5/8" – 18 UNF	1/2	133
S3	600	3/8" – 24 UNF	5/16	27
	608 - 800	1/2" – 20 UNF	3/8	66
	900 - 1000	5/8" – 18 UNF	1/2	133
	1100 - 1500	7/8" – 14 UNF	3/4	369

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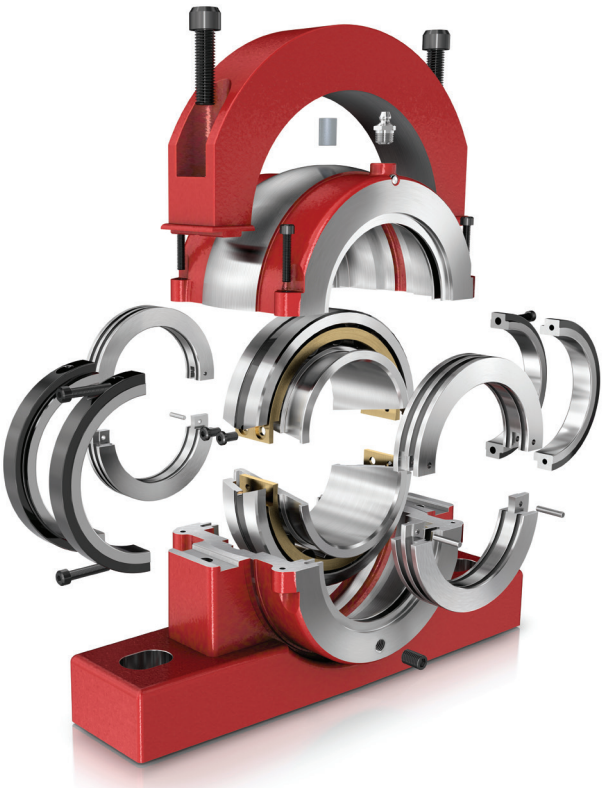


We pioneer motion

Installation & Mounting
Instructions for FAG Split
Cylindrical Roller Bearings

FAG Split Cylindrical Roller Bearings

FAG split cylindrical roller bearings combine the features of conventional anti-friction cylindrical roller bearings with the added benefit of being easily assembled around a shaft. The complete assembly is engineered and split into halves for easy mounting, dismounting and inspection – with minimal to no disturbance of the machine’s other elements. Accordingly, the risk of adjacent equipment damage or realignment is eliminated as well. Installing FAG split bearings requires only simple, inexpensive and readily available hand tools.



Part Nomenclature

Nomenclature		Example
Inch bore sizes	Are in one-inch increments plus the number of sixteenth of an inch. The first one or two numbers are the whole inch and the last two are the number of sixteenths.	203 = 2 3/16" 900 = 9" 1208 = 12 8/16" (12 1/2")
Metric bore sizes	Are indicated by the number of millimeters followed by the letters “mm”	S1BCH- 100mm -HD S1BCH- 75mm -FL
S1 S2 S3 S4	Medium Duty Heavy duty Extra heavy duty Special duty	S1 BCH-312-FL S1 BCF-403-HD S3 BC-1100-FL S4 BCH-307-HD
B	Bearing (only) (one split inner race, two split clamp collars, one split roller cage assembly, one split outer race)	S1 B -207-FL
C	Cartridge (only) for held or floating bearing type	S1 C -500 S2 C -308
PH	Pedestal housing (only) for held or floating bearing type	PH -4 PH -15
FH	Flange housing (only) for held or floating bearing type	FH -4 FH -15
BC	Bearing-cartridge w/seals (a replacement “insert”)	S1 BC -203-FL S2 BC -315-HD
BCH	Complete pillow block (bearing-cartridge w/seals and pedestal housing)	S1 BCH -515-FL S2 BCH -515-HD
BCF	Complete flange block (bearing-cartridge w/seals and flange housing)	S1 BCF -315-FL S2 BCF -800-HD
FL	Floating (expansion) type bearing	S1BCH-207- FL S2BCF-415- FL
HD	Held (fixed or non-expansion) type bearing	S1BCH-207- HD S2BCF-415- HD
ATL	Aluminum triple labyrinth seals – two seals per unit (split)	ATL -407 ATL -200 mm
UHMWTL	Triple labyrinth seals	UHMWTL -500
C2	Less than normal internal clearance (reciprocating loads – crank shafts, etc.)	S2B-307-FL- C2
C3, C5	Greater than normal internal clearance normally used in high temperature applications, above +200 °F use C3 and above +340 °F use C5	S1BCH-607-HD- C3
without C	If no identifier is provided then a C-Normal running clearance will be provided	—
XX	Letter, or number and letter suffix – added to identify special modifications to suit a particular customer’s needs, or a special application	S1BCH-507-FL- XX
2B	Complete pillow block with 2 bolt base for sizes where 4 bolt is standard S1 series: 303 – 400 (3 3/16 – 4), 80 mm – 105 mm S2 series: 211 – 308 (3 3/16 – 3 1/2), 70 mm – 90 mm	—

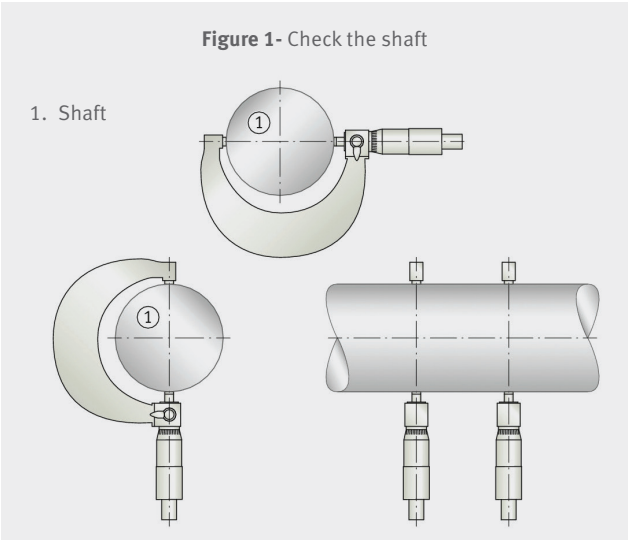
Installation guide for FAG split cylindrical roller bearings

- Micrometer to suit shaft size
- Torque wrench
- Anti-seize compound
- Means to lift and safely support shaft during bearing installation
- Rubber mallet
- Slip joint pliers
- Feeler gauge set
- Strap wrench 1/8" diameter straight shank drift pin
- Clean, lint-free cloth
- SAE Allen wrench set
- Appropriate viscosity lubricant

Check the shaft

Before mounting any components, the shaft should be checked at the intended location of the bearing for diameter, roundness, taper, and conformity to a straight edge. The tolerance of the shaft's diameter is +0.000" to -0.004", where the dn value < 2 000, and +0.000" to -0.002", where the dn value > 2 000.

The shaft's roundness and taper tolerance is ±0.001" and the surface finish is to be +125 µin to +63 µin. Remove any rust, nicks, burrs, raised spots, and ensure that the shaft is clean and dry before mounting any components. See fig. 1 below as a reference for how to check the shaft.



Bearing installation preparation

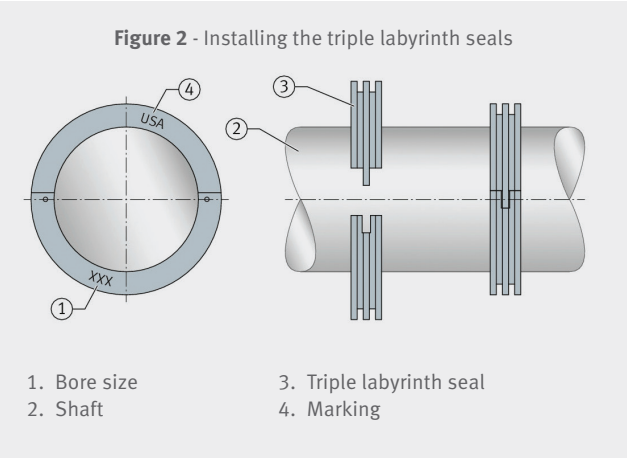
Individual bearing components should not be interchanged. The components of each bearing are matched at the factory for proper fit and internal clearance. To facilitate proper assembly, all FAG split cylindrical roller bearings are provided with match mark numbers at the mating faces of the individual components. Be sure to completely disassemble the bearing components, remove all protective plastic, and wipe the oil from all surfaces at installation.

The shaft should be raised and fully supported before installing the bearing. It is good practice to locate shaft position, and install the held (fixed) bearing first. This practice serves to anchor the shaft in position and facilitate proper positioning for the expansion bearing on the shaft.

For best results, install the seals first and slide them out of the way; one seal to the left of, the other seal to the right of, the inner race position on the shaft.

- Separate the seals by driving out the steel pins with the 1/8" diameter drift pin and pulling the seals apart by hand. Do not mix the two seals up.
- Lightly lubricate the seal bore between the O rings with grease.
- Assemble the seals around the shaft so that the marking and the seal bore size are on the same side and facing outward. This will allow for easy identification in the field.

■ A strap wrench may be used to compress the seal together to re-install the steel pins. Use only enough pressure to bring the seal joint faces together. The steel pins can be squeezed back into place with a pair of slip joint pliers.



Installing the inner race with clamp collars

Check that the inner race and shaft are clean and dry.

NOTICE: Do not coat the shaft or bearing bore with oil or grease. The inner race should be dry fit to the shaft.

■ Observing the match mark numbers, place the inner race halves on the shaft in the desired position. Also note the black reference line in the clamp collar groove on one side. Assemble so the black reference line is continuous around one groove. Place the splits in a “north-south” (up-down position).

■ Place a 0.015" feeler gauge in the center of the bottom half of the split. This will prevent the gap from closing up when installing the clamp collars.

■ Install clamp collars with match numbers facing outboard, both sides. Place a non-threaded half of a clamp collar into one of the machined grooves of the inner race on the top, with its split line at the “east-west” position. The actual position should be between 45° and 90° to the split line of the inner race.

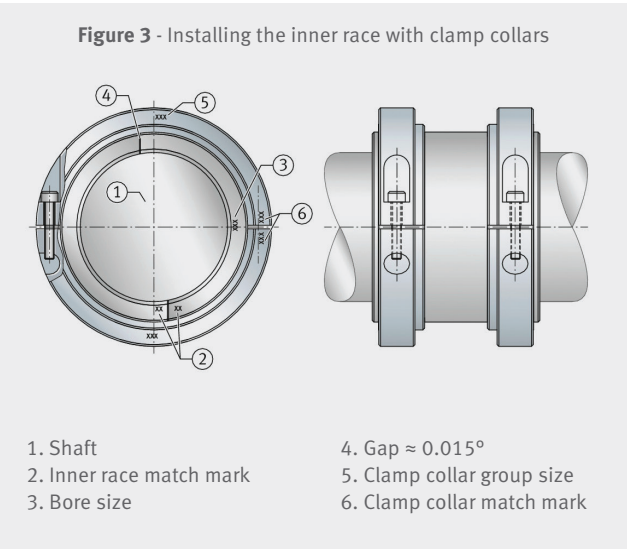
■ Place the bottom (threaded) half of the same clamp collar into position and loosely install the collar locking bolts (fine thread). Repeat the same procedure for the other clamp collar.

■ Re-check inner race position on the shaft before performing the tightening sequence. The race can be moved by tapping it along the shaft with a rubber mallet.

NOTICE: Do not strike the hardened surfaces of the bearing with a hard faced hammer. Permanent bearing damage can occur.

■ Maintain an equal gap at the joint face of the clamp collars when tightening. Judging the gaps of the clamp collars “by sight” will suffice.

■ Tighten all clamp collar bolts using a “Z” pattern sequence. Be sure to remove the feeler gauge as necessary.



There will be gaps at the joint faces of the inner race and clamp collars after final tightening. The gaps are designed to be there, and will vary with shaft size and series of bearings. Provided the shaft is within tolerance, and the race is fully seated on the shaft, the final gap is irrelevant, as long as the gap is evenly split on the inner race halves. However, if there are no gaps at the joints, the shaft is undersized or the bearing bore is incorrect for the shaft. In this case, the bearing should not be run. Discontinue installation and recheck the shaft and bearing for matching size before proceeding.

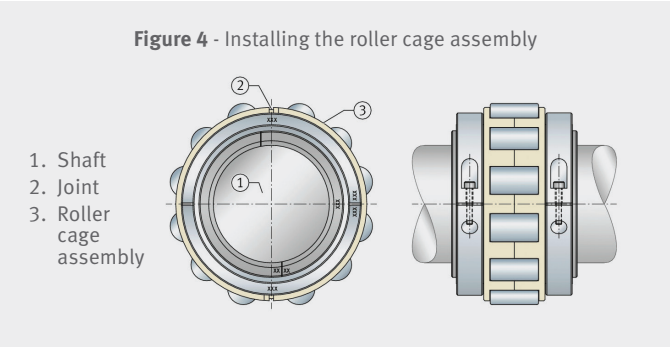
Installing the roller cage assembly

■ Wipe the inner race clean of dirt, fingerprints, etc. Apply a light coating of grease to the raceway area.

■ Apply grease to the inner surface area of the roller cage unit. Rotate the rollers while applying grease to allow lubricant to enter the cage pockets.

■ Place cage halves around the inner race. Install the cage clips or bolts with thread locking compound, depending on cage design. Tighten bolts securely.

■ Lightly coat outer surface of roller and cage with grease. Protect from contamination.



Installing the outer race

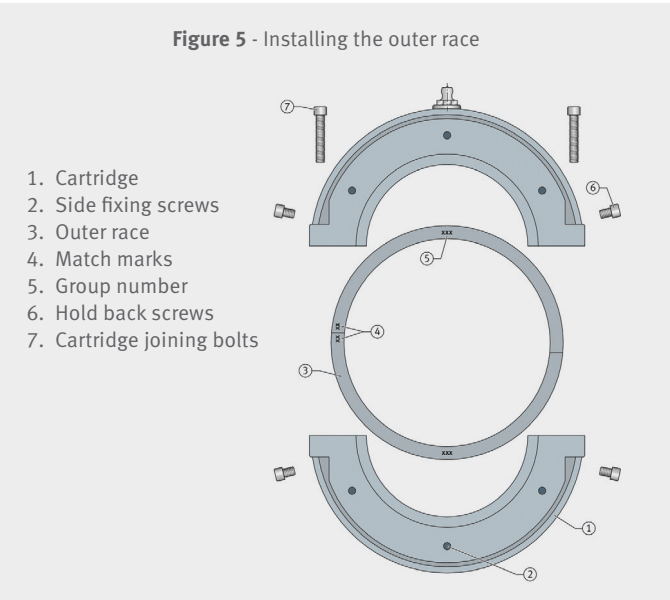
■ Inspect and clean the bore of the cartridge for the outer race, and fill the grease groove in the center of the cartridge bore.

■ Inspect and clean the outer race. Take note of the match marks at the joint, and the top half with the lubrication hole.

■ Install the top half of the outer race into the top half of the cartridge. Press firmly into the cartridge bore. Then repeat for the bottom half. Make sure the outer race match marks line up, and that the outer race with the lubrication hole is in the cartridge half with the lubrication zerk fitting. If the bearing is a 6 1/2" group size or greater, install the radial hold back screws (finger-tight only).

■ Place the two cartridge halves together. Install and tighten all four coarse-thread joining bolts.

■ Tighten each of the side fixing screws (in a star pattern) until they are snug. Inspect the outer race joints, ensuring that they are flush. Remove the four joining bolts.



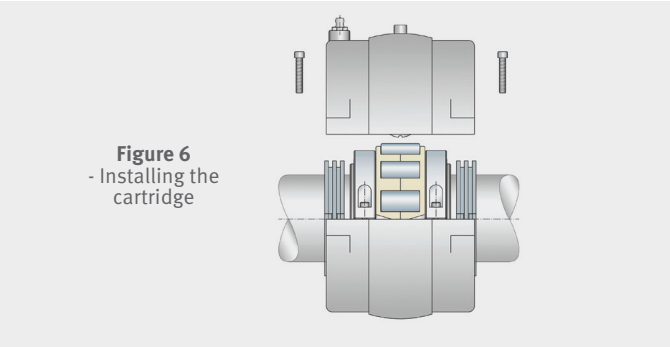
Installing the cartridge

■ Apply grease (about 1/8" deep) to the interior of the cartridge bottom half. Grease the labyrinths of the cartridge. Slide the seals into position. Greasing the labyrinths serves to lubricate the seals and adds an additional grease barrier against contaminants.

■ Repeat the same procedure with the top half of the cartridge.

■ Place the cartridge halves together; install and tighten the cartridge joining bolts (coarse-thread). Rotate cartridge in place to be sure it turns freely without binding. The anti-rotation pin in the top half of the cartridge mates into the housing cap.

■ Coat the spherical ball of the cartridge with a liberal amount of a quality moly or anti-seize compound. We recommend the mounting paste ARCANOL-MOUNTINGPASTE2 from Schaeffler. Be sure that the spherical ball is clean prior to lubricating. Do not use oil or grease for this purpose.



Installing the pedestal housing

■ Be sure the pedestal base mounting area is flat, clean, and free from burrs and nicks

■ If it is necessary to shim the pedestal housing base to adjust the base to center height, Schaeffler recommends a full shim along the length and width of the housing base.

■ Coat the pedestal housing base's spherical area with an anti-seize compound. We recommend the mounting paste ARCANOL-MOUNTINGPASTE2 from Schaeffler. If not already in position, slide the base under the cartridge to its intended mounting position and loosely install the mounting bolts. With the anti-rotation pin on the cartridge properly located, slowly lower the shaft and allow the cartridge unit to settle in the base. When the bearing unit is properly positioned, tighten the mounting bolts.

■ Place the pedestal housing cap in position. Install the bolts, but do not fully tighten. After installation of all bearings, rotate the shaft to allow the pillow blocks to align themselves with the shaft position. Tighten all cap bolts.

■ Perform a visual inspection. Be sure the bearings are properly lubricated, and all bolts are fully tightened before placing machinery in service.

With floating (FL) type bearings, be sure the cartridge and pedestal housing have not been moved in relationship to center with the inner race position on the shaft. A repositioning of the inner race may be necessary if this has occurred. Simply take the down weight off the bearing, slightly loosen the clamp collar bolts without removing them, and tap the inner race up or down the shaft to recenter. When the race is back in center position, re-tighten the clamp collar bolts, and lower the shaft.

If heat-related axial growth of the shaft is anticipated, the floating (FL) inner race can be offset toward the anticipated heat source to accommodate this growth.

