The SKF pump bearing

The retrofit-free bearing upgrade for API 610 standard, 5th edition and ANSI pumps







Upgrade your ANSI pump bearings

with a routine, cost-effective bearing changeout

No retrofitting. No expensive single-row replacements.

Until now, upgrading the double row angular contact ball bearings (DRACBBs) in your API 610 standard, 5th edition and ANSI-style pumps to meet ANSI+ standards meant one of two things.

You could... Purchase sets of single-row angular contact ball bearings (SRACBBs), complete with a specially designed shaft and housing, at a premium price.

Or... Purchase sets of SRACBBs and then modify your pumps' existing bearing shafts and housings in-house to accommodate them.

SKF has changed all that.
The SKF pump bearing is a specially designed DRACBB. Simply remove your existing bearing and install the SKF pump bearing. There is no need to purchase expensive pump components—and the changeout requires no time-consuming, labor intensive retrofit work.

The SKF pump bearing's dimensions are identical to those for standard DRACBB with comparable bore sizes.

Evolutionary design advantages

The SKF pump bearing design is based on input from pump users and on the vast experience that SKF has with pump bearing applications and solutions.

SKF pump bearing performance advantages come from improvements in cage material (machined brass), contact angle, axial clearance and tolerance.

Each improvement directly addresses the most common challenges that ANSI-style pumps face: high loads and poor lubrication, which lead to high bearing temperatures, lubricant degradation and premature failure.



Machined brass cage

Bearings in ANSI-style pumps can experience lube degradation, which leads to metal-to-metal contact and extremely high temperatures. Conventional plastic and pressed steel cages may fail without warning under such conditions, causing bearing seizure and catastrophic bearing failure.

The SKF pump bearing is equipped with robust machined brass cages that withstand rough operation better than plastic and pressed steel cages.

40° contact angle and P6 tolerance

The SKF pump bearing provides the performance benefits of a pair of SRACBBs, but in a DRACBB package. Two key benefits are increased thrust load capacity and higher running accuracy.

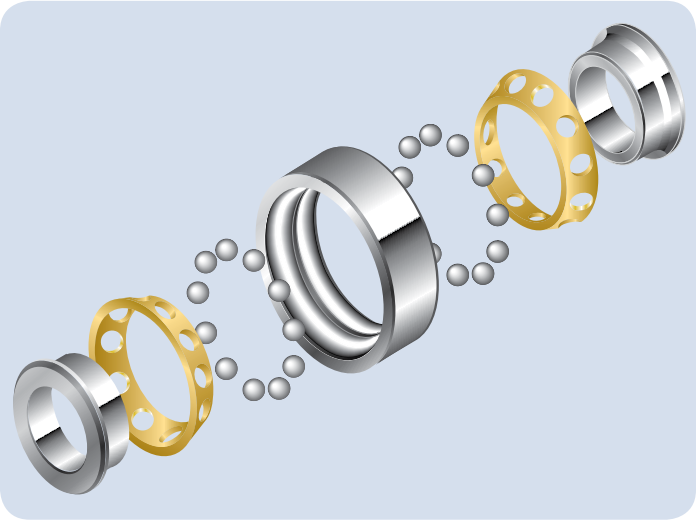
Increased thrust load capacity is made possible by a 40° contact angle, which is greater than the thrust load contact angle in conventional DRACBBs. The steeper angle increases the bearing's thrust capacity.

The bearing's P6 tolerance (ABEC 3) provide improved bore, OD, width and running accuracy tolerances contributing to smoother and cooler bearing operation.









During operation, one row of balls in the SKF pump bearing supports the axial load while the other row handles reverses in thrust direction.

Shaft and housing fits

The SKF pump bearing's shaft and housing fits are identical to those for standard SRACBB and DRACBB with comparable sizes. ISO k5 is the recommended shaft tolerance for the SKF pump bearing in most pump applications.

This tolerance produces an interference fit between the bearing inner ring and the shaft. Interference fits are necessary for bearings supporting any radial load. A lighter fit using ISO j5 or h5 tolerances may be necessary for bearings mounted on shafts made of stainless steel and which have a large temperature differential between the inner and outer rings.

ISO H6 is the standard housing tolerance recommendation. H6 produces a slight clearance between the bearing outer ring and the housing, which facilitates easy assembly and provides radial clearance for bearings when increased temperatures cause them to expand. H6 has minimal ring rotation risk.

CB axial clearance

To help prevent ball skidding, the SKF pump bearing employs a CB-controlled axial clearance. This optimized clearance promotes load sharing between the two rows of balls—a design that reduces the possibility of skidding in the inactive ball set without the use of a preload.

Mounting

SKF recommends mounting the SKF pump bearing with an induction heater.

Heat the entire bearing to approximately 110°C (230°F), but never higher than 125°C (257°F); higher temperatures may alter the structure of bearing materials and cause permanent dimensional changes.

The SKF pump bearing is designed with a two-piece inner ring—a feature that facilitates the use of a machined brass cage. This design requires the bearing to be mounted and held in place on the shaft with a locknut—an action that ensures positive clamping of the inner rings, both together and also against the shaft abutment.

When the bearing is fully heated, place it on the shaft and immediately clamp it into position with a locknut. After the bearing has cooled and secured itself to the shaft, remove the locknut, add the lockwasher, and then retighten the locknut hand tight plus an additional 1/8 to 1/4 turn.

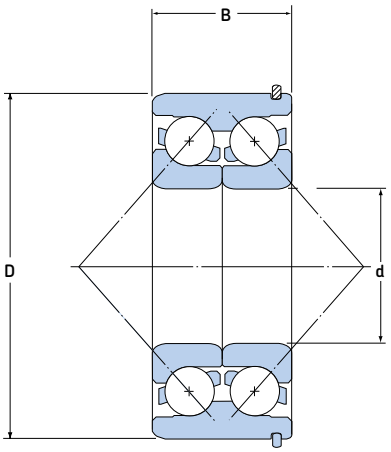
Axial internal clearance

Bore		Clearance			
over	inc.	min		max	
mm	**mm**	**in**	**mm**	**in**	**mm**
30	50	0.0004	0.010	0.0012	0.030
50	80	0.0007	0.018	0.0015	0.038

Nomenclature

D = Split inner ring
NR = Snap ring
CB = Controlled axial clearance range
M = Machined brass cage

Product data
Double row angular contact ball bearing
d 40–65 mm



d Bore dia.	D Outer. dia	B Width	C Basic load rating Dynamic	C_0 Static	P_u Fatigue Load limit	Speed ratings Reference speed	Limiting speed	Mass	Designation
mm in	mm in	mm in	N lbf	N lbf	N lbf	r/min		kg (lb)	
40 1.5748	90 3.5433	36.5 1.4375	49,400 11,110	41,500 9,330	1,760 396	6700	7000	1.2 (2.6)	3308 DNRCBM
45 1.7717	100 3.9370	39.7 1.5625	61,800 13,890	52,000 11,690	2,200 495	6000	6300	1.4 (3.1)	3309 DNRCBM
50 1.9685	110 4.3307	44.4 1.7500	81,900 18,410	69,500 15,620	3,000 674	5300	5600	1.9 (4.2)	3310 DNRCBM
55 2.1654	120 4.7244	49.2 1.9375	95,600 21,490	83,000 18,660	3,550 798	4800	5000	2.5 (5.5)	3311 DNRCBM
65 2.5591	140 5.5118	58.7 2.3125	138,000 31,000	122,000 27,400	5,100 1,147	4300	4500	4.0 (8.8)	3313 DNRCBM

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