

HP In Reliability

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Consider retrofit-free bearing upgrades for your pumps



Next to mechanical seals, rolling element bearings are the components that fail most frequently in centrifugal pumps. There are many reasons for these failures. Previous columns have highlighted remedial steps aimed at reducing the ingress of water and airborne contaminants while other columns showed the advantages of oil mist lubrication, proper bearing selection, bearing installation, etc. The reader can track these improvement opportunities on a very comprehensive, searchable CD-ROM that is available from Gulf Publishing (e-mail: ezorder@gulfpub.com, fax 713-525-4655).

Until now, however, upgrading the double-row angular contact ball bearings (DRACBBs) in API 5th edition and ANSI-style pumps to meet enhanced 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 you could purchase sets of SRACBBs and then modify your existing shafts and bearing housings to accommodate these bearings.

Newly developed double-row two-piece inner ring bearing. SKF's new DRACBB (double-row angular contact ball bearing) is designed with a two-piece inner ring—a feature that facilitates the use of a machined brass cage (Figs. 1 and 2). This design requires the bearing to be mounted and held on the shaft with a locknut—an action that ensures positive clamping of the inner rings, both together and also against the shaft shoulder. Together with carefully designed 40-degree contact angles, precise axial clearances and P6 internal tolerances, the design engineers at SKF addressed the most common challenges that ANSI-style pumps face: high loads and poor lubrication. These lead to high bearing temperatures, lube oil degradation and premature failure.

Machined brass cage advantages. Bearings in

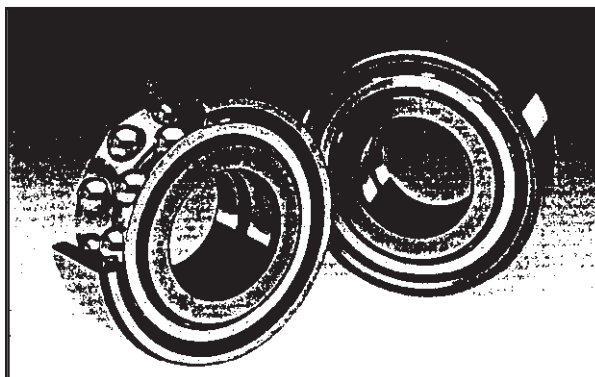


Fig. 1. New bearing features a two-piece inner ring.



Fig. 2. Exploded view shows bearing components.

ANSI and ISO-style pumps can experience lube oil degradation that 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. In fact, cage distress is a leading cause of catastrophic bearing failure in ANSI- and ISO-style pumps. Equipping the DRACBB with robust machined brass cages that withstand rough operation better than plastic and pressed steel cages is important.

While it is not possible to quantify how much

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more rough operation machined brass cage can withstand, field tests show that the new cage is far more durable than plastic or steel cages. Perhaps more important—especially for companies not able to monitor pumps continuously, the machined brass cages will not fail without warning. The DRACBB's machined brass cages produce noise at the initiation of failure, alerting users to impending failure and providing time for a bearing change-out.