

Inductive pumps solve difficult lubrication problems

Authoritative texts show that traditional static oil sumps, both with or without oil rings, represent non-



optimum means of lubricating rolling element bearings. With sump lubrication, the rolling elements plough through the oil bath (Fig. 1) and, depending on shaft

speed and oil level, often generate undesirably high temperatures in the process. Oil rings dipping into the lubricant are vulnerable to out-of-horizontal shaft installation—they tend to run downhill—and can malfunction if the correct submergence depth, linear speed or ring geometry are not maintained. Many oil rings thus degrade rapidly or apply insufficient lubricant to the rolling elements.

These facts have prompted reliability-minded user companies to consider oil mist and oil spray systems; both are generally considered among the safest and most reliable application methods. With oil mist, atomized oil is mixed with air and conveyed to the locations to be lubricated. With oil spray systems, a jet of oil is directed into the rolling elements (Fig. 2).

Until recently, only large-scale oil mist systems were economically attractive, although smaller units are now available for a variety of stand-alone applications (see "HP In Reliability," June 1999). Where overall economics or unavailability of compressed air preclude oil mist, oil spray systems are the best solution. Including a novel inductive pump (Fig. 3) in oil spray units makes the most recent systems inexpensive, virtually maintenance-free and, thus, highly attractive.

Inductive pumps solve problems. Inductive pumps use electromagnetic force to drive a completely encapsulated internal piston, creating positive piston displacement within a sleeved cylinder. By using one-way check valves, both ends of the piston can be used for simultaneous suction and pumping. Since each stroke displaces a fixed volume, any increment of this volume can be delivered with a high degree of accuracy.

One of several pump sizes obtainable from Inductive Pump Corporation (www.inductivepump.com), the Model 1.5 can easily pressurize lubricant taken

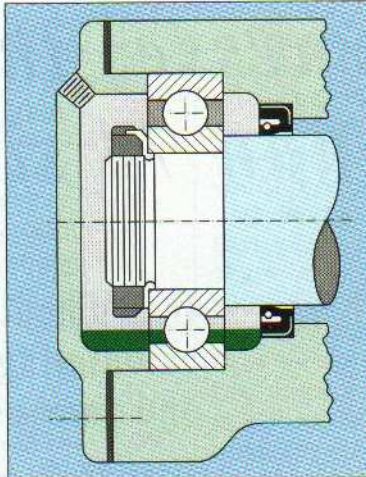


Fig. 1. Oil bath lubrication is recommended for moderate speeds and loads. Note that the oil level should be maintained at approximately the midpoint of the lowest ball.

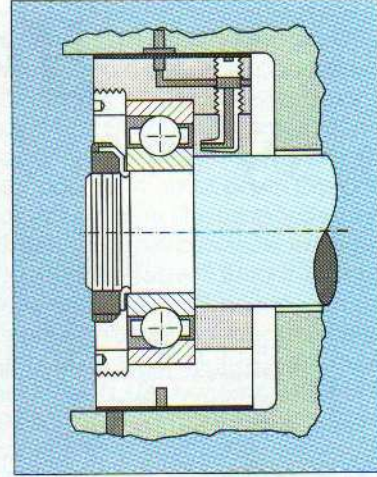


Fig. 2. Jet oil lubrication is recommended for high speeds and heavy loads. The oil jet is directed at the space between the bearing inner ring outside diameter and the cage bore.



Fig. 3. Including an inductive pump in oil spray units makes the most recent systems inexpensive and virtually maintenance-free.

from the bottom of the sump to appropriate spray pressures. Lubricant rates are adjustable from 30 ml/min to 1.5 gpm. Weighing a scant 14 lb (~6 kg), the 3.25 × 9.5 × 4 in. unit can be combined with an automotive spin-on filter and an industrial spray nozzle connected to a length of flexible tubing.

We can readily foresee how this incredibly simple, self-contained, sealless portable assembly will solve numerous lubrication problems on blower bearings, gear units and large API pump bearings. Reliability-minded process plants will want to have one of these well-proven, highly economic pumping units on hand for the inevitable emergencies that we have seen in the past. ■

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