N. A. Scarlett

The contents of this paper make very interesting reading and I would like to congratulate the author on throwing new light on the problem of “false brinelling” in rolling bearings.

There is one small point which I hope the author will excuse me for raising and that is on terminology. It would seem a pity that the term fretting corrosion should be used in the title instead of false brinelling. This would suggest that false brinelling damage, although to a lesser degree, also occurs on those roller complement was always held in the same position. But grease. In addition, I would reverse the order of the three types of greases listed in their effectiveness in lubricating rotating bearings at high temperature; namely, lithium the best, sodium next best, and calcium the worst.

Author's Closure

The investigations published by N. A. Scarlett were mainly aimed at studying the effect of various greases. They were done with bearings subjected to small oscillatory motions and therefore different from the studies shown here.

However, the results of the two investigations are quite comparable and it is my opinion that there is no basic difference between the development of flutes due to stationary vibrations and those due to small oscillatory motions—except for the type of loading applied. In both cases fretting corrosion is the cause for the development of flutes. I am sorry to disagree with Mr. Scarlett's opinion, false brinelling and fretting wear could be two different problems. Therefore the title “fretting corrosion” was purposely selected.

Admittedly, there are flutes which developed due to stationary vibrations and which have a bright appearance without any fretting wear. These occur mainly in the case of oil lubrication. But this is no proof for the assumption that fretting corrosion could not be the cause for the fluting. In Mr. Scarlett's example the load was 0.164 percent of the static capacity of the bearing, and this is considerably below the limiting value of 0.03 percent of the static capacity for the development of fretting corrosion (see Fig. 6).

No doubt the conditions in the vibrator are different from those in service—they are much more severe, mainly, since the roller complement was always held in the same position. But this had to be done in order to obtain interpretable test results.

Mr. Scarlett didn’t find permanent deformations. In case of such large flutes of 0.001 to 0.01 in. these cannot be found. They were found in flutes with a depth in the magnitude of 0.000010 in. Various types of greases show only small differences, and this mainly also in the relation of lubricated to unlubricated bearings. If Mr. Scarlett found significant differences in the behavior of various greases, this may most likely be explained by the different kind of stress. The conditions of the movement and the lubrication are much more favorable in case of bearings exposed to small oscillatory motions than in case of bearings which are exposed to stationary motions. This is also proved by the statement of Mr. Scarlett that lubricants could be developed which prevent the occurrence of fluting due to small oscillatory motions, but not fluting due to stationary vibrations.