

NASA TECH BRIEF



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

Simple Technique Extends Life of Angular-Contact Ball Bearings

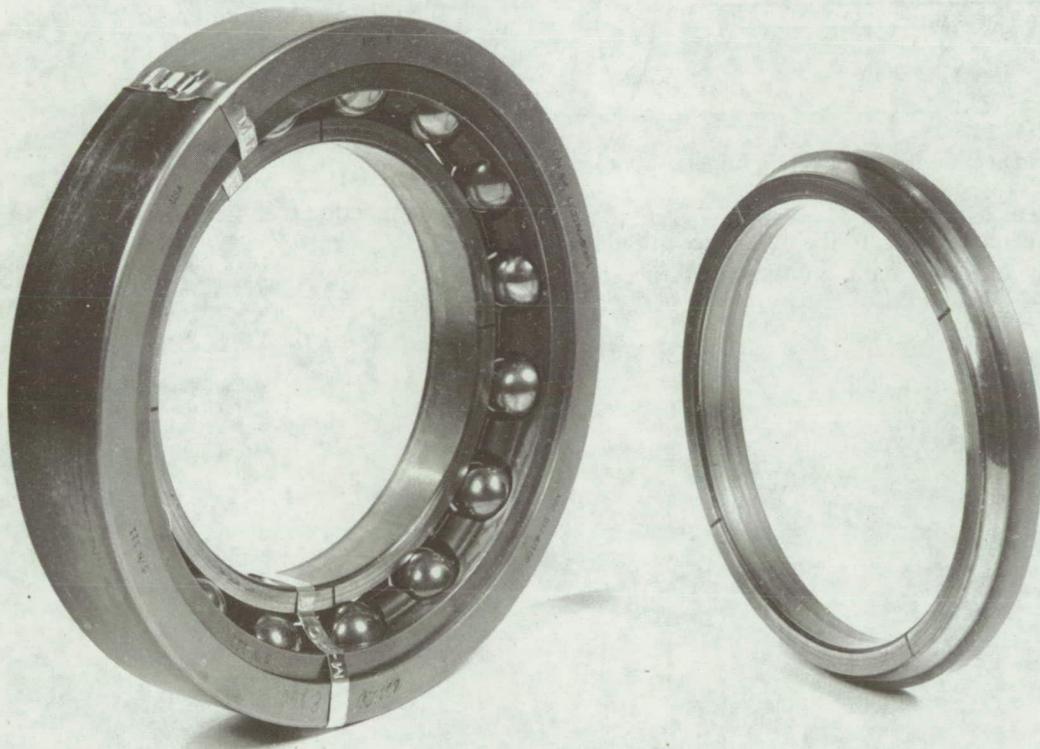


Figure 1. Split Inner-Ring Angular Contact Ball Bearing (Partially Disassembled)

A simple technique has been devised to double the operational life of angular-contact ball bearings of the type that incorporates a two-directional or split inner ring.

The advent of the turbine engine brought about the development of the two-directional or split ring, angular-contact bearing (Fig. 1). The inner-ring race

is normally ground with a shim between the two inner-ring halves. The shim is removed before assembly so that the resulting inner-ring groove is shaped like a gothic arch. This provides a much lower ratio of axial-to-radial play when both race grooves are circular. By this procedure, both halves of the inner race are symmetrical.

(continued overleaf)

As shown in Figure 2, thrust load F_1 is applied to the split inner race at Side 1 and is transmitted through

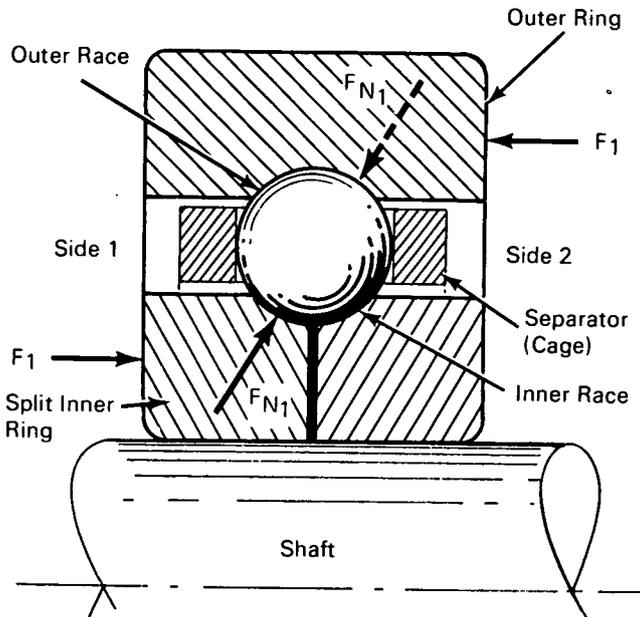


Figure 2. Cross Section Split Inner-Ring Angular-Contact Ball Bearing

the ball complement, F_{N1} , to the outer race at Side 2. There is only one ball path on the inner race and the outer race.

Upon failure of either the inner race or outer race and/or the balls, the bearing may be reused by replacing the balls and reversing the bearing in its housing whereby Side 2 becomes Side 1. Once this reversal is made, the force or thrust will be applied to the opposite points on the races. Thus, the bearing operation would be unaffected by the previous failure. In this manner, the used bearing will operate with the same reliability and life potential as a new bearing.

Notes:

1. This technique would be appropriate for major machine tools where both the bearings and down time are costly.
2. No additional documentation is available. Specific questions, however, may be directed to:
Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: B70-10535

Patent status:

No patent action is contemplated by NASA.

Source: E.V. Zaretsky
Lewis Research Center
(LEW-11117)