AEROSPACE RECOMMENDED PRACTICE

ARP5448™/5 REV. B

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Superseding ARP5448/5A

(R) Plain Bearing No-Load Rotational Breakaway Torque Measurement

RATIONALE

This revision updates the requirement to hold the outer race fixed and rotate the ball, to allow for the reverse; that is, to hold the ball fixed and rotate the race.

1. SCOPE

This test method provides a procedure for measuring no-load rotational breakaway torque of self-lubricating spherical bearings.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 ANSI Accredited Publications

Copies of these documents are available online at http://webstore.ansi.org/.

ANSI/NCSL Z540.3 Requirements for the Calibration of Measuring and Test Equipment

2.1.2 ISO Publications

Copies of these documents are available online at http://webstore.ansi.org/.

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories

2.2 Definitions

NO-LOAD ROTATIONAL BREAKAWAY TORQUE: No-load rotational breakaway torque of a spherical bearing is the torque required to initiate rotation of the ball with respect to the race with no radial or axial loads applied.

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https://www.sae.org/standards/content/ARP5448/5B

3. GENERAL REQUIREMENTS

3.1 Test Apparatus

3.1.1 The test fixture shall provide a means of holding the race of the bearing fixed while rotating the ball about the bearing axis. At the discretion of the manufacturer, the reverse of this method may be used, that is, to hold the ball fixed and rotate the race.

3.1.2 The test fixture shall provide a means of holding the race or ball in such a manner as to minimize bearing distortion and the resultant effect on bearing torque.

3.1.3 The test fixture shall provide a means of measuring the rotational torque of the component (ball or race) that is being rotated. The accuracy of the torque measuring device shall be ±5% of the indicated value.

3.1.4 Calibration of the test apparatus shall be in accordance with ISO/IEC 17025 & ANSI/NCSL Z540.3.

3.2 Temperature

Unless otherwise specified, temperature of the test area shall be 75 °F ± 10 °F (18.3 to 29.4 °C).

3.3 Relative Humidity

Relative humidity of the test area shall not exceed 75%.

4. DETAILED REQUIREMENTS

4.1 Stabilize the test bearing at the temperature and relative humidity of the test area.

4.2 Immediately prior to testing, misalign the ball or race to the maximum misalignment angle in each direction about the y-axis and back to zero, repeating this procedure for the z-axis, and then rotate the ball or race through two to three revolutions around the x-axis as illustrated in Figure 1. This may be accomplished by hand or with the assistance of an appropriately sized test shaft inserted in the bore of the bearing.

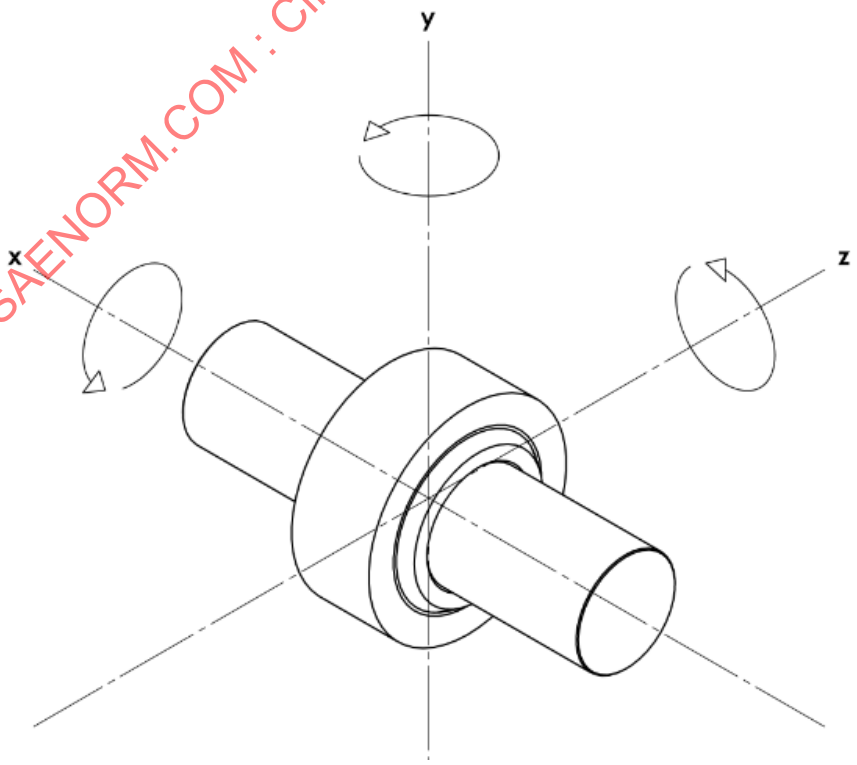

Figure 1 - Orientation of ball and race