



AEROSPACE RECOMMENDED PRACTICE

ARP5483™/4

REV. A

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Superseding ARP5483/4

Rolling Element Test Method for Axial Limit and Fracture Load Testing

RATIONALE

ARP5483/4A is being revised in association with the five-year document review to clarify test procedures and correct typographical errors in the text.

1. SCOPE

This test method outlines the recommended procedure for performing static axial limit and ultimate load tests on rolling element bearings used in airframe applications. Bearings covered by this document shall be antifriction ball bearings and spherical roller bearings in either annular or rod end configurations.

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 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E4 Standard Methods of Verification of Testing Machines

ASTM E83 Method of Verification and Classification of Extensometers

2.1.2 ANSI/NCSL Publications

National Conference of Standards Laboratories, 2995 Wilderness Place, Suite 107, Boulder, CO 80301-5404, Tel: 303-440-3339, www.ncsli.org.

ANSI/NCSL Z540-3 Calibration Laboratories and Measuring and Test Equipment- General Requirements

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2.1.3 ISO Publications

Available from International Organization for Standardization, 1, rue de Varembe, Case postale 56, CH-1211 Geneva 20, Switzerland, Tel: +41-22-749-01-11, www.iso.org.

ISO 10012 Quality Assurance Requirements for Measuring Equipment

2.2 Definitions

AXIAL LIMIT LOAD: The maximum axial load which, when applied and released, does not affect the smoothness of operation of the test bearing. The load for each bearing size is specified in the applicable document. This load is the maximum load that should be applied to the bearing in application.

AXIAL STATIC FRACTURE LOAD: The axial load equal to 1.5 times the Axial Limit Load, unless otherwise specified in the applicable document. Bearings subjected to this load shall be capable of being turned by hand and shall have no fractured components.

BRINELL: Permanent deformation of a bearing raceway caused by a rolling element. Brinelling occurs when a bearing is subjected to a static load which causes the stress in the ball contact area to exceed the yield stress of the material.

3. GENERAL REQUIREMENTS

3.1 Test Apparatus

3.1.1 Test Machine

The fixture shall be mounted onto a test machine capable of applying the required load at a controlled rate. The calibration system for the machine shall conform to ANSI/NCSS Z540-1 and ISO 10012. Its accuracy shall be verified every 12 months by a method complying with ASTM E4. The limit and ultimate loads of the test bearing shall be within the loading range of the testing machine as defined in ASTM E4.

3.1.2 Test Fixtures

Dimensions of the test fixtures shall provide sufficient section thickness to assure rigid support of the test specimen when subjected to the fracture load.

3.1.3 Material

The mounting apparatus and test plug shall be fabricated from steel and heat treated to a hardness of 40 HRC minimum.

3.1.4 Mounting Fit

A clearance fit shall be employed between the test plug and the inner ring. Clearance between the fixture and the outer ring shall be 0.0000 to 0.0010 inch or as specified in the applicable document.

NOTE: The above approach for mounting the test bearing produces generally repeatable results by promoting stiff structural performance. The use of thin section fixtures or looser fits may result in significantly different results.

3.1.5 Measuring Equipment

Inspection equipment shall be capable of measuring an indentation in the inner or outer ring raceway that is 0.0005 times the rolling element diameter.