



AEROSPACE RECOMMENDED PRACTICE

ARP5483™/3**REV. B**

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Superseding ARP5483/3A

Rolling Element Bearing Axial and Radial Internal Clearance

RATIONALE

ARP5483/3B is being revised in association with a Five-Year Review. The document was updated to reflect the current SAE format and align with the SAE Technical Report Style Manual dated May 2015.

ARP5483/3B has been reaffirmed to comply with the SAE Five-Year Review policy.

A reaffirmed status is given to technical reports that have been reviewed by the technical committee and deemed to be current with no need for immediate revision. No changes have been made to this document as a result of this review.

1. SCOPE

This test method outlines the standard procedure for measuring the radial and axial internal clearance of rolling element bearings used in airframe controls.

2. REFERENCES

2.1 Applicable Documents

There are no referenced publications specified herein.

2.2 Definitions

AXIAL INTERNAL CLEARANCE: The axial distance through which one of the rings may be displaced relative to the other, from one axial extreme position to the opposite extreme position, using a specific gage thrust load exerted parallel to the bearing axis.

RADIAL INTERNAL CLEARANCE: The radial distance through which one of the rings may be displaced relative to the other, from one eccentric position to the diametrically opposite extreme position, using a specific gage radial load exerted perpendicular to the bearing axis.

2.3 Order of Precedence

Text of standards and specifications that reference this test method takes precedence over the text of this document.

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3. GENERAL REQUIREMENTS

3.1 Test Apparatus

The test fixtures shall be as shown in Figures 1 to 4. Indicator gage forces and gage point radii shall be as shown in Table 1.

Table 1 - Indicator gage forces and gage point radii

Basic Bore Diameter d, Inch		Indicator Gage Force	Gage Point Radii
Over	Including		
0	0.254	Not to exceed 7 ounces (2 N)	0.032 inch (0.8 mm)
0.254	0.762	Not to exceed 7 ounces (2 N)	0.098 inch (2.5 mm)
0.762	Up	Not to exceed 12 ounces (3.5 N)	0.098 inch (2.5 mm)
Basic Outside Diameter D, Inch		Indicator Gage Force	Gage Point Radii
All Sizes			
		Not to exceed 7 ounces (2 N)	0.098 inch (2.5 mm)

3.2 Test Specimen

The quantities of test specimens shall be in accordance with the applicable specification. Only new bearings shall be subjected to this test.

3.3 Disposition after Test

Bearings that are not damaged after axial and radial internal clearance tests may be shipped and/or used if within required limits.

4. DETAIL REQUIREMENTS

4.1 Axial Internal Clearance

The outer ring or inner ring of the bearing shall be held rigidly as shown in Figure 1, and tested at a temperature of 77 °F ± 10 °F. With an indicator gage set to record the axial movement of the inner ring, the following steps shall be taken:

- The load specified in Table 2 shall be applied axially to the inner ring.
- While under load, the inner ring shall be oscillated through an angle of ±10 degrees to seat the rolling elements.
- When oscillation ceases, the indicator reading shall be taken.
- The specified load shall be applied to the inner ring in the opposite direction.
- Repeat steps b and c.
- The difference in the indicator readings from steps c and e shall be recorded as the axial internal clearance, and shall be within the limits specified in the applicable document.

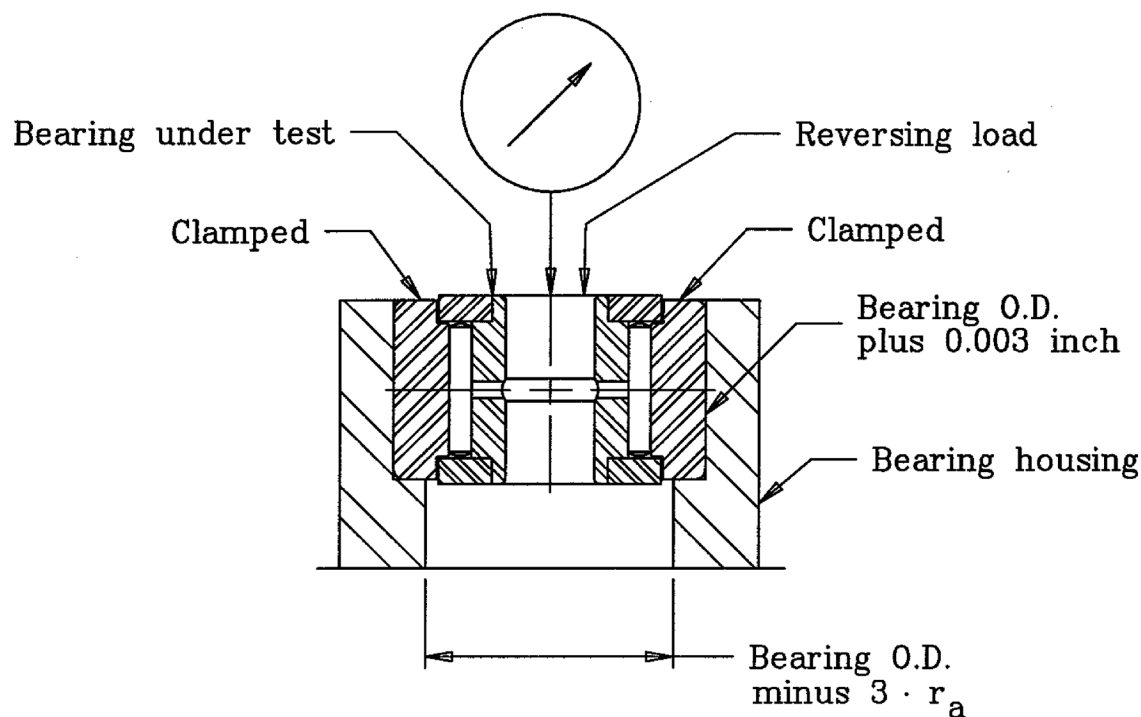


Figure 1 - Axial clearance test

Table 2 - Loads for axial internal clearance

Bearing Type	Load Applied (Pounds)
Needle Roller	5.5
Roller	22
Ball	5.5

4.2 Radial Internal Clearance

The preferred method to determine radial internal clearance for needle roller, ball and roller bearings shall be to measure the components (rolling elements, inner and outer raceway diameters). When that method is not feasible, the following steps shall be taken to measure the radial internal clearance. Testing shall be performed at a temperature of $77^{\circ}\text{F} \pm 10^{\circ}\text{F}$.

4.2.1 Roller and Needle Roller Bearings

4.2.1.1 Mounting of Bearings

The bearings shall be mounted for the test as follows:

4.2.1.1.1 Track Roller Bearings

The inner ring of bearings shall be held rigidly as shown in Figures 2A and 2B.