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AEROSPACE RECOMMENDED PRACTICE

SAE ARP5448/8

Issued 2001-04

Plain Spherical Bearing Radial and Axial Clearance Measurement

1. SCOPE:

This test method provides a guidance for determining the total free play between the ball and outer ring of a spherical bearing when measured in both the radial and axial directions. Bearings covered by this test method include all plain spherical type bearings, both self-lubricated (lined) and metal-to-metal.

2. APPLICABLE DOCUMENTS:

There are no referenced publications specified herein.

3. DEFINITIONS:

AXIAL INTERNAL CLEARANCE: The total free play between the ball and the outer ring when measured in the axial direction, i.e., in line with the centerline of the bearing bore.

RADIAL INTERNAL CLEARANCE: The total free play between the ball and the outer ring when measured in radial direction, i.e., normal to the centerline of the bearing bore.

4. GENERAL REQUIREMENTS:

4.1 Measuring Radial Clearance:

4.1.1 The test machine shall provide a mechanical means of holding the bearing ball securely so that it is rigidly fixed. See Figures 1 and 2 for typical test machines. Other test machines may be used.

4.1.2 The test machine shall provide a means of applying a radial force to the outer ring alternately in opposite directions.

4.1.3 A linear displacement measuring device such as a dial indicator or Linear Variable Differential Transformer (LVDT) shall be mounted to detect relative motion between ball and outer ring to an accuracy of 0.0001 in.

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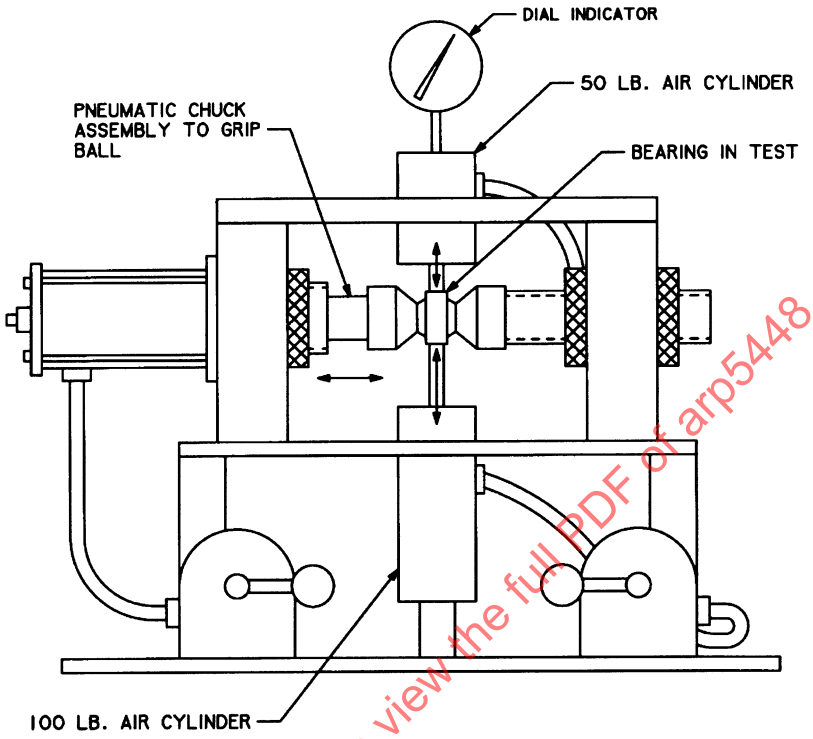

FIGURE 1 - Radial Clearance Test Apparatus

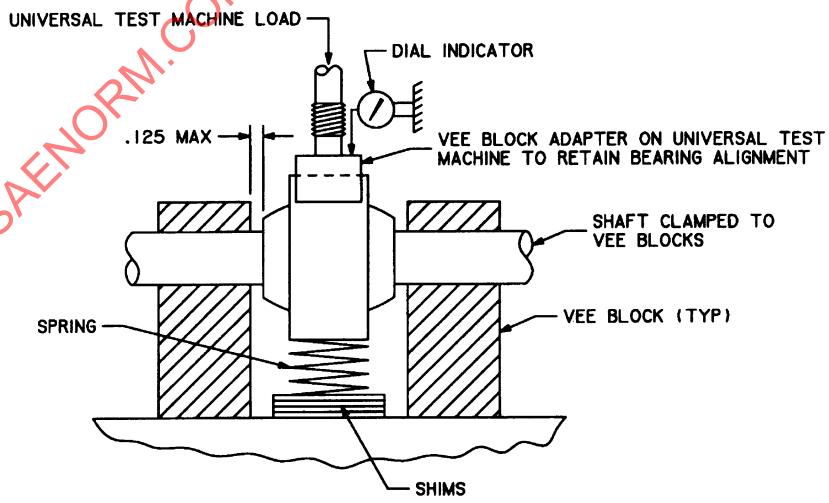

FIGURE 2 - Radial Clearance Test Apparatus

4.1.4 The bearing should be rotated in the test machine in increments of about 60° for one full revolution with measurements taken at each point in order to determine clearance variations. The minimum and maximum values shall be recorded.

4.2 Measuring Axial Clearance:

4.2.1 The test machine shall provide a means of clamping the bearing outer ring rigidly while applying a force alternately to each face of the ball parallel to the bearing bore centerline so that total axial movement between the ball and outer ring can be measured. See Figure 3 for an example of a test machine. Other test machines may be used.

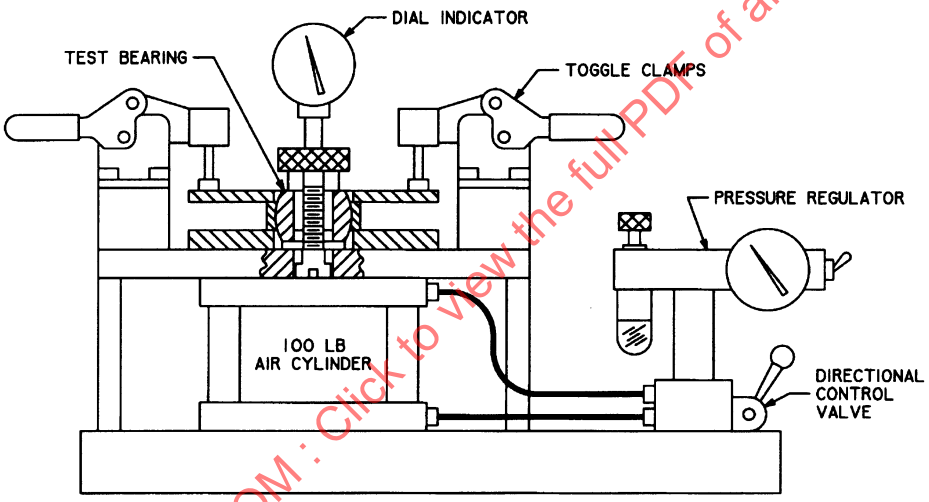

FIGURE 3 - Axial Clearance Test Apparatus

5. DETAILED REQUIREMENTS:

5.1 Test Setup:

All dust, debris, and grease shall be removed from the bearing prior to performing the radial or axial clearance test. For both tests, the faces of the ball and outer ring must be parallel with each other and perpendicular to the centerline of the bearing bore.

5.2 Procedure:

5.2.1 Clamp the ball (radial clearance measurement) or outer ring (axial clearance measurement) tightly to allow no movement under load but not enough to cause distortion of the bearing.

5.2.2 Test loads shall be as specified in the applicable specification. Apply the test load alternately in each direction at least three times and hold. Zero the measuring device.