SAE Aerospace
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AEROSPACE RECOMMENDED PRACTICE

SAE ARP5483/7

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Dynamic Radial Load Test, Track Roller Bearings

1. SCOPE:

This test method outlines the recommended machine function, fixtures and procedures for performing dynamic radial load tests on track roller bearings for airframe applications. Bearings covered by this test method shall be yoke and stud type track roller, needle bearings.

2. 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 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AS39901 Bearings, Roller, Needle, Airframe, Antifriction, Inch

3. GENERAL REQUIREMENTS:

3.1 Test Machine:

The test machine shall be capable of applying a radial load equivalent to the Capacity as a Track Roller to the bearing, as defined in the applicable drawing standard, with either reversing or rotating motion. Instructions for operating and maintaining the test machine are required.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

3.1.1 Design: A test machine may test any number of bearings simultaneously, providing all bearings are being subjected to the same test conditions and that all measured values can be individually determined. The support structure, drive motor or system, tracks, and mechanisms should be designed for continuous operation and high reliability.

3.1.2 Test Fixtures: The test fixtures shall be similar to the illustration in Figures 1 and 2. The rigid support shall be of steel construction.

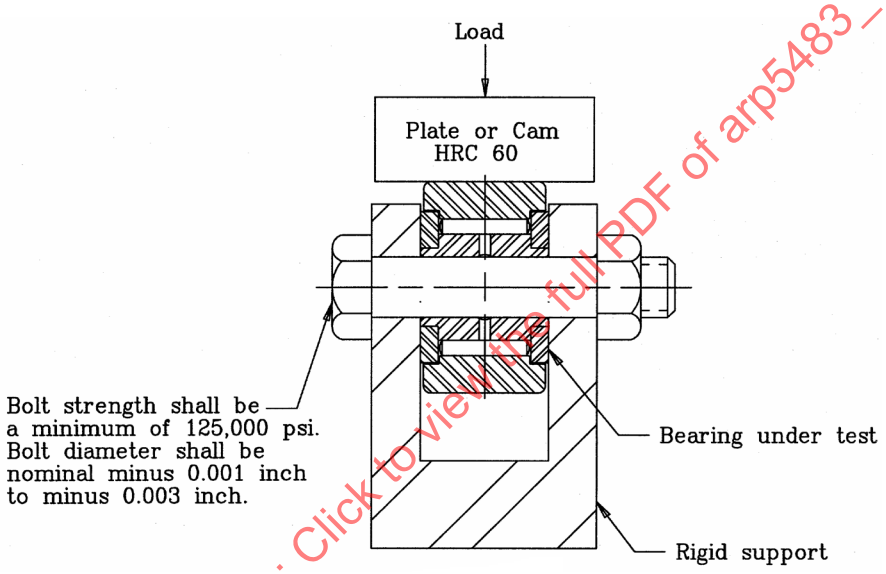

FIGURE 1 - Test for Dynamic Load Rating, as a Yoke Type Track Roller

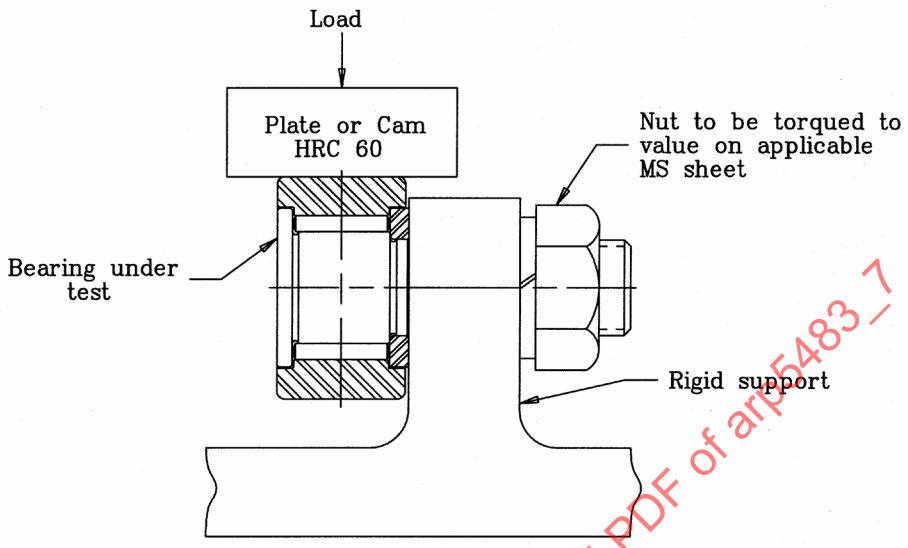

FIGURE 2 - Test for Dynamic Load Rating, as an Integral Stud Type Track Roller

3.1.3 Load Application: The load can be applied by any means providing the magnitude of load to each test bearing is verifiable. The load must remain constant within ±2% for the duration of each test.

3.1.4 Rotational Speed: The speed of the bearing outer diameter shall be controllable within the speed range of the applicable procurement standard.

3.1.5 Re-lubrication Provisions: Provisions shall be available for re-lubrication of the bearings during testing, as required.

3.2 Safety Provisions:

The test machine shall be protected to the extent necessary to provide safety of personnel operating the test. In particular, moving shafts, belts, chains and mechanisms shall be shrouded or otherwise protected. Electrical controls shall be housed in consoles to avoid shock hazards. Automatic shutoffs shall be provided for the test machine to detect mechanical, electrical or hydraulic problems that endanger personnel or cause property damage due to fire, smoke or explosion.

3.3 Quality Assurance:

Verify and document that the following items have been checked and are acceptable:

a. Operating instructions and maintenance procedures for the test machine are prepared and are understood by the operator of the test machine.
b. Safety requirements have been met and no additional safety hazards exist.
c. Test machine is operational and all required test parameters are within specified limits.
d. All instrumentation is functional and within calibration limits.

3.4 Specimen:

3.4.1 Test Bearing: Sizes and quantities of the test bearings shall be as specified in the applicable procurement standard.

3.4.2 Disposition of Test Bearings: The test bearings shall be removed from the test machine for post test inspections as required by the procurement standard. Disposition of the tested bearings shall be in accordance with that standard.

3.5 General:

The bearing shall be mounted in the appropriate test fixture similar to that shown in Figures 1 and 2 and installed in the test machine. A load shall be applied so that the load requirements of the applicable drawing standard are met and maintained throughout the operation of the test. The linear velocity of the bearing outside diameter shall be as specified in the applicable procurement standard. If the motion is periodically reversed, the bearing shall rotate at least one complete revolution before direction is reversed. Testing on a rotating circular cam or track is an acceptable method, without reversal of direction. When the applicable procurement standard permits, the test bearing may be re-lubricated on a periodic basis. Testing shall continue until bearing failure or until the minimum number of revolutions specified by the applicable procurement standard have been completed.

3.5.1 Failure During Test: Stop the test if the bearing seizes or a component fractures.

4. DETAILED REQUIREMENTS:

4.1 Test Bearing Analysis:

Bearings reaching the required number of revolutions shall be removed from the test fixture, disassembled and examined. Records of the bearing's condition shall be maintained with the test data and pre-test measurements.

4.1.1 Premature Removal: Bearings failing to reach the required number of revolutions shall also be examined to determine the cause of failure, and recorded.

5. NOTES:

5.1 Intended Use:

This test method is intended to provide a means for evaluating the performance of yoke and stud type track roller type rolling bearings for airframe applications under dynamic radial loads.

5.2 Method of Reference:

This test method shall be referenced in procurement standards, or drawings or bearing standards for track roller type airframe bearings. Specific test and data requirements are given in the applicable standard. The following note shall be used to reference this test method:

NOTE: The bearings shall be tested in accordance with ARP5483/7.

5.3 Test Data:

5.3.1 Test Parameters: Specific test requirements are given in the referencing document. Test requirements shall include the following test parameters as applicable:

a. Test specimen design envelope
b. Shaft and housing configuration
c. Radial load
d. Track speed
e. Number of revolutions, including partial revolutions, in each direction of rotation
f. Original grease pre-pack, including grease specification and brand name
g. Frequency of re-lubrication if applicable (in terms of bearing revolutions)
h. Test duration (revolutions)
i. Failure criteria (breakage, etc.)

5.3.2 Data Requirements: Specific load requirements are specified in the applicable specification. Data requirements shall include the following measurements as applicable:

a. Radial load
b. Track speed
c. Number of revolutions completed before removal from test
d. Reason for removal from test
e. Analysis of bearing condition following removal from test