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Rolling bearings - Measuring methods for axial internal clearance of four-point-contact ball bearings

滚动轴承 四点接触球轴承轴向游隙的测量方法

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1 Scope

This standard specifies the measurement method of the axial clearance of four-point contact ball bearings.

This standard is applicable to the measurement of the axial clearance of four-point contact ball bearings. The measurement of the axial clearance of other types of bearings can use it as a reference.

The different measurement methods specified in this standard are not the only interpretation of them. In view of the fact that there are other applicable measurement methods, and with the advancement of technology, more convenient methods will emerge, so this standard does not limit the use of a particular method. However, in the event of dispute, the method specified in this standard shall be used.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 4199 Rolling bearings - Tolerances - Definitions

JJG 626 Verification regulation of measuring instrument for axial clearance of ball bearings

3 Principles of axial clearance measurement

3.1 The axial clearance of a four-point contact ball bearing is measured, by fixing a ring in the axial direction, applying an axial measuring load that can obtain a stable measurement value to the unfixed ring, performing axial reciprocating movement for measurement. The axially fixed ring can be stationary or rotating, but it shall remain concentric with the unfixed ring. During the reciprocating movement, the unfixed ring shall ensure parallel movement without deflection.

Note: If a ring of the bearing is a double half ring, the two half rings shall be axially clamped

tightly during measurement, to achieve a state that can be regarded as one ring.

3.2 Read the movement of the non-fixed ring along the axial direction from one extreme position to another at each angular position (roughly evenly distributed, at least 3); the arithmetic mean value (minus the increase in axial clearance caused by the measuring load) is the measured value of the bearing axial clearance. If it is a dynamic measurement, the average value is automatically calculated; more than 50 points are sampled per cycle.

4 Preparation before measurement

Before measurement, the grease and/or rust inhibitor adhering to the bearing that may affect the measurement results shall be removed; low-viscosity oil lubrication shall be used.

For closed bearings, the measurement shall be made before closing.

Note: After the measurement is completed, the bearing shall be immediately rust-proofed.

5 General technical conditions for measuring instruments

The design and use conditions of the axial clearance measuring instrument shall comply with the definition of bearing axial clearance in GB/T 4199; the technical requirements shall comply with JJG 626 or other relevant provisions.

6 Measurement of axial clearance

6.1 Instrument measurement method

This method is applicable to four-point contact ball bearings with $d \leq 260$ mm.

6.1.1 Fix the outer ring (or inner ring) of the bearing in the axial direction. Keep it stationary or rotate in the circumferential direction (for dynamic measurement). Evenly and alternately apply the axial measurement load shown in Table 1 to the inner ring (or outer ring), so that the inner ring (or outer ring) of the bearing moves axially. The bearing clearance measurement value can be read from the indicator (see Figure 1 and Figure 2).

Note: During dynamic measurement, the measured ring shall have a guide mechanism or deflection elimination mechanism during the reciprocating movement, to eliminate the error caused by the ring deflection.

6.1.2 Since the axial clearance specified for the bearing is the value under no-load state, the result of the load measurement shall indicate the measured load value; the measured

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