



**Mounting of rolling bearings
Mounting of machine tool bearing
arrangements**

Mounting of special types

Features Selection of the suitable mounting method is based not only on the bearing type but also on the adjacent construction and the relevant dimensions. In the case of some rolling bearing types, attention must be paid during mounting to particular features or a particular procedure must be applied, which is discussed in detail below. Further details are given in the product-specific catalogues and brochures. The decisive factor for correct mounting is, however, the mounting manual relating to the application.

Mounting of machine tool bearing arrangements

In the case of machine tool spindles, setting the correct internal clearance is particularly important since the quality of workpieces produced on the machine are dependent on this factor. In order that the operating clearance or preload required by the designer can be precisely set during mounting of the bearings, Schaeffler has developed its own gauges.

Super precision bearings

Super precision bearings include:

- spindle bearings
- super precision cylindrical roller bearings
- axial angular contact ball bearings.

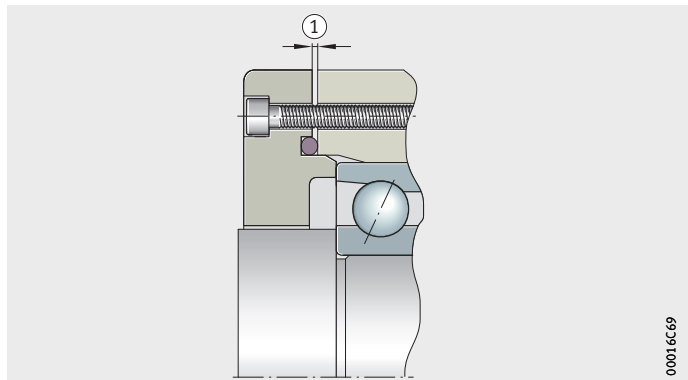
Matching operations

In order to maintain optimum performance or achieve precise positioning of the spindle in relation to the housing, it is often necessary to carry out special matching operations on the components. This applies, for example, to the covers used to clamp the bearings. Before clamping, a gap should be present, *Figure 1*.

Matching of the intermediate rings may be advisable in the case of high speed spindles, in order to compensate the influence of fit and ring expansion on the preload.

- ① Gap before tightening of end cover screws
- Bearing bore $d \leq 100$ mm:
0,01 mm to 0,03 mm
- Bearing bore $d > 100$ mm:
0,02 mm to 0,04 mm

Figure 1
Matching of end cover
(recommendation)



Greasing

The preservative applied to FAG super precision bearings is such that it is not necessary to wash out the bearings before greasing. The setting of the grease quantity places high requirements on the greasing and measurement equipment used. It is recommended that bearings already greased and sealed from Schaeffler are used.



Greasing must be carried out under extremely clean conditions.

In the case of bearings with grease lubrication, a grease distribution cycle must be carried out on the bearings before the test run on the spindle.

Axial clamping of inner rings

Spindle bearing sets are generally clamped on the shaft using shaft nuts. Nuts with axial bores are to be used in preference over locknuts for tightening on the shaft, since they minimise the air turbulence that occurs at high speeds.

The contact faces of the nuts should be ground in a single clamping operation together with the thread. The recommended maximum axial runout tolerance is 2 µm.

In order to prevent impairment of the runout during the clamping operation, the clamping inserts should be ground together with the thread and the axial face.

Values for axial clamping of inner rings on the shaft using a precision nut are given in Catalogue SP 1, Super Precision Bearings.

In order to eliminate or reduce settling effects, the nut should first be tightened to three times the stated torque, loosened and then finally tightened to the nominal torque. The retaining screws should then be fully tightened in accordance with the manufacturer's data.

Mounting procedure for cylindrical roller bearings

Cylindrical roller bearings with a tapered bore are mounted with clearance, clearance-free or with preload.

The precise procedure for the mounting and dismounting of super precision bearings is given in the relevant mounting and maintenance manual for the specific bearing and in Catalogue SP 1, Super Precision Bearings.

Mounting of rotary table bearings

Axial/radial bearings as well as axial angular contact ball bearings are ready-to-fit high precision bearings for high precision applications with combined loads. They can support radial loads, axial loads from both sides and tilting moments without clearance and are particularly suitable for bearing arrangements with high requirements for running accuracy, such as rotary tables, face plates, milling heads and reversible clamps.

Mounting of these units is very simple due to the fixing holes in the bearing rings. The bearings are radially and axially preloaded after mounting.

High precision bearings for combined loads include:

- axial/radial bearings YRT, RTC, YRT_{Speed}
- axial angular contact ball bearings ZKLDF
- axial/radial bearings YRT with integral angular measuring system YRTM.

Further information

- TPI 103, High Precision Bearings for Combined Loads, Mounting and Maintenance Manual
- MON 36, Series YRTSM and YRTM
- MON 20, High Precision Bearings for Combined Loads, Mounting and Maintenance Manual.

Mounting of special types

Mounting of screw drive bearings ZKLF, ZKLN, ZKRN, ZARF, ZARN

Bearings for screw drives include:

- double row axial angular contact ball bearings for screw mounting ZKLF
- double row axial angular contact ball bearings not for screw mounting ZKLN
- single row axial angular contact ball bearings BSB, 7602, 7603
- angular contact ball bearing unit TZKLR
- double row and triple row axial angular contact ball bearings ZKLFA, DKLFA
- needle roller/axial cylindrical roller bearings for screw mounting DRS, ZARF
- needle roller/axial cylindrical roller bearings not for screw mounting ZARN.

Mounting of these bearings is described in detail in TPI 100, Bearings for Screw Drives.

Further information

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Issued: 2017, September

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