



**Mounting of rolling bearings
Mounting
of needle roller bearings**

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 needle roller bearings

Needle roller bearings with machined rings are mounted in accordance with the same perspectives as cylindrical roller bearings. Bearings mounted adjacent to each other must have the same radial internal clearance so that the load is distributed uniformly.

Needle roller bearings with ribs

Needle roller bearings with ribs are single or double row units comprising machined outer rings with ribs, needle roller and cage assemblies and removable inner rings.

Replacement of inner rings

In the case of the standard bearings, the inner rings are matched to the enveloping circle tolerance F6 and can be interchanged with each other (mixed use) within the same accuracy class.



In needle roller bearings with ribs, the inner ring is not self-retaining.

Radial and axial location

Needle roller bearings with an inner ring are radially located by means of a fit on the shaft and in the housing. In order to prevent axial creep of the bearing rings, they must be located by means of form fit, *Figure 1*.

The abutment shoulders (shaft, housing) should be sufficiently high and perpendicular to the bearing axis. The transition from the bearing seat to the abutment shoulder must be designed with rounding to DIN 5418 or an undercut to DIN 509. The minimum values for the chamfer dimensions r in the dimension tables must be observed.

The overlap between the snap rings and the end faces of the bearing rings must be sufficiently large, *Figure 1*.

The maximum chamfer dimensions for the inner rings in accordance with DIN 620-6 must be taken into consideration.

- NA49**
- ① Snap rings
 - ② Abutment shoulders

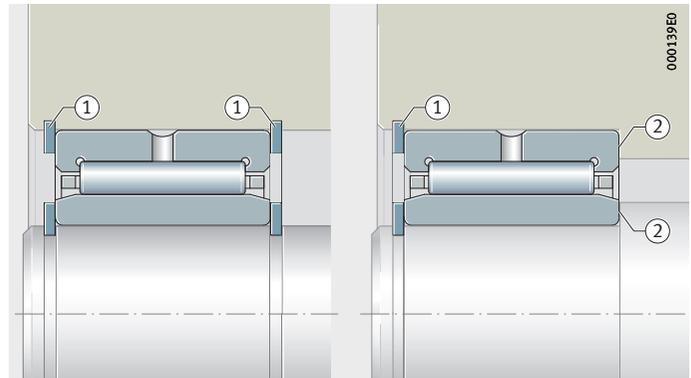


Figure 1
Axial location of bearing rings

Mounting of special types

Needle roller bearings without ribs

These single or double row units comprise machined outer rings without ribs, needle roller and cage assemblies and removable inner rings. Since the bearings are not self-retaining, the outer ring, needle roller and cage assembly and inner ring can be mounted separately from each other.

Replacement of inner rings



In needle roller bearings without ribs, the inner ring is not self-retaining.

The outer ring and the needle roller and cage assembly are matched to each other and must not be interchanged during fitting with components from other bearings of the same size.

In the standard bearings, the inner rings are matched to the enveloping circle tolerance F6 and can be interchanged with each other (mixed use) within the same accuracy class.

Radial and axial location

Needle roller bearings with an inner ring are radially located by means of a fit on the shaft and in the housing. In order to prevent axial creep of the bearing rings, they must be located by means of form fit, *Figure 2*.

The abutment shoulders (shaft, housing) should be sufficiently high and perpendicular to the bearing axis. The transition from the bearing seat to the abutment shoulder must be designed with rounding to DIN 5418 or an undercut to DIN 509. The minimum values for the chamfer dimensions r in the dimension tables must be observed.

The overlap between the snap rings and the end faces of the bearing rings must be sufficiently large, *Figure 2*.

The maximum chamfer dimensions for the inner rings in accordance with DIN 620-6 must be observed.

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RNAO

- ① Snap rings
- ② Abutment shoulders

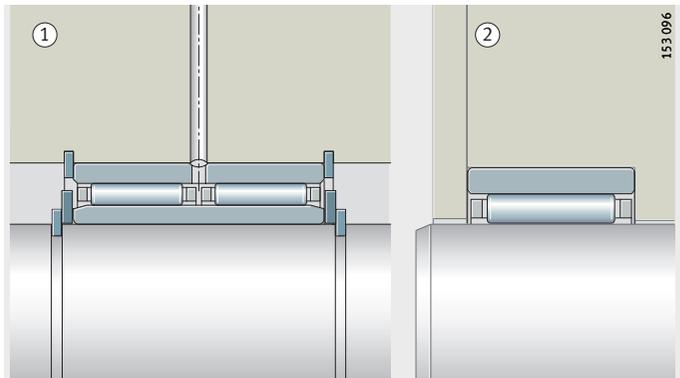


Figure 2

Axial location of bearing rings

Aligning needle roller bearings

The bearings comprise drawn outer cups, plastic support rings with a concave inner profile, outer rings with a spherical outside surface, needle roller and cage assemblies and removable inner rings.

Radial and axial location

Aligning needle roller bearings are firmly seated in the housing bore. No further axial location is required. The bore can therefore be produced easily and economically.

Replacement of inner rings

In the standard bearings, the inner rings are matched to the enveloping circle tolerance F6 and can be interchanged with each other (mixed use) within the same accuracy class.



In aligning needle roller bearings, the inner ring is not self-retaining.

Mounting using pressing mandrel

Due to the drawn outer cup, the bearings must be mounted using a special pressing mandrel. The marked side of the bearing should be in contact with the flange of the mandrel. A toroidal ring on the mandrel holds the bearing securely on the mandrel.

If grease lubrication is to be used, the bearings should be lubricated with grease before mounting.



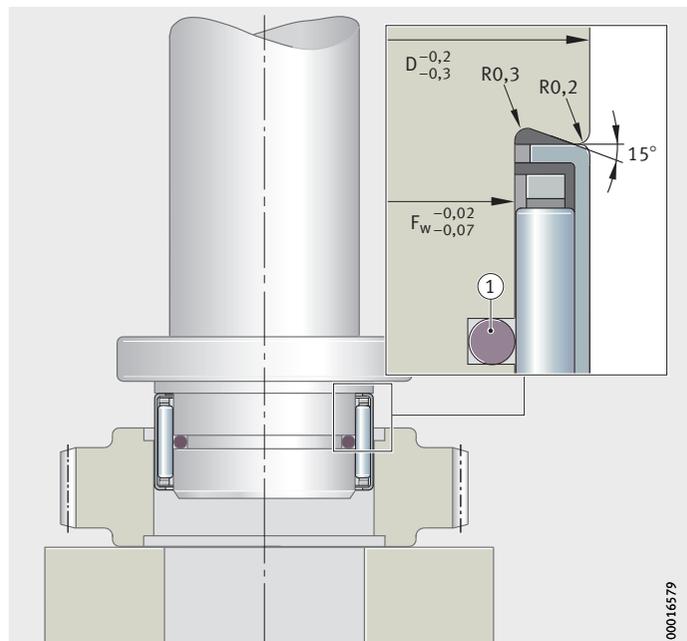
Drawn cup bearings must not be tilted while they are being pressed in.

The forces occurring during pressing-in are dependent on several factors. Mounting must be carried out so that the bearing rib on the end face is not deformed.

If the application requires a mounting procedure different from the one described, mounting trials must be carried out in order to ensure that the bearings can be mounted correctly and without causing damage.

① Toroidal ring

Figure 3
Mounting using pressing mandrel



Mounting of special types

Combined needle roller bearings

These series comprise radial needle roller bearings and a rolling bearing component capable of supporting axial loads. They can support high radial forces as well as axial forces in one direction, while NKIB can support axial forces from both directions, and are used as locating or semi-locating bearings.

The bearings are available in the following designs:

- needle roller/axial deep groove ball bearings
- needle roller/axial cylindrical roller bearings
- needle roller/angular contact ball bearings.

The tight fits of combined needle roller bearings lead to relatively large press-in forces. This must be noted especially in the case of needle roller/axial deep groove ball bearings and needle roller/axial cylindrical roller bearings with dust caps, where the roller and cage assembly of the axial bearing must not be removed. These bearings must be pressed in. It is advantageous to heat the housing.

Combined needle roller bearings must be pressed into the housing, *Figure 4*.

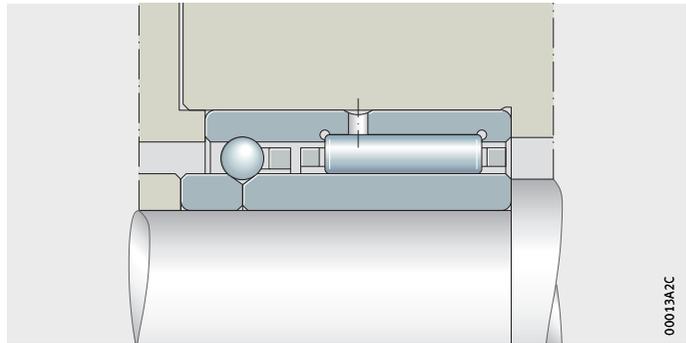


Figure 4
Mounting
of combined needle roller bearings
(needle roller/
angular contact ball bearing)

Replacement of inner rings

In the standard bearings of series NKIA and NKIB, the inner rings are matched to the enveloping circle tolerance F6 and can be interchanged with each other (mixed use) within the same accuracy class. Combined needle roller bearings are not self-retaining.



Radial and axial location

Bearings with an inner ring are radially located by means of a fit on the shaft and in the housing. The axial abutment shoulders (shaft, housing) should be sufficiently high and perpendicular to the bearing axis. The transition from the bearing seat to the abutment shoulder must be designed with rounding to DIN 5418 or an undercut to DIN 509. The minimum values for the chamfer dimensions r in the dimension tables must be observed.

The overlap between the snap rings and the end faces of the bearing rings must be sufficiently large.

The maximum chamfer dimensions for the inner rings in accordance with DIN 620-6 must be taken into consideration.



In order to prevent lateral creep of the bearing rings, they must be located by means of form fit. For locating bearings and for bearings with a split inner ring, axial abutment of the bearing rings on both sides is particularly important.

Further information

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**Schaeffler Technologies
AG & Co. KG**

Industriestraße 1–3
91074 Herzogenaurach
Germany
Internet www.schaeffler.de/en
E-mail info.de@schaeffler.com

In Germany:

Phone 0180 5003872
Fax 0180 5003873

From other countries:

Phone +49 9132 82-0
Fax +49 9132 82-4950

**Schaeffler Technologies
AG & Co. KG**

Georg-Schäfer-Straße 30
97421 Schweinfurt
Germany
Internet www.schaeffler.de/en
E-mail faginfo@schaeffler.com

In Germany:

Phone 0180 5003872
Fax 0180 5003873

From other countries:

Phone +49 9721 91-0
Fax +49 9721 91-3435

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