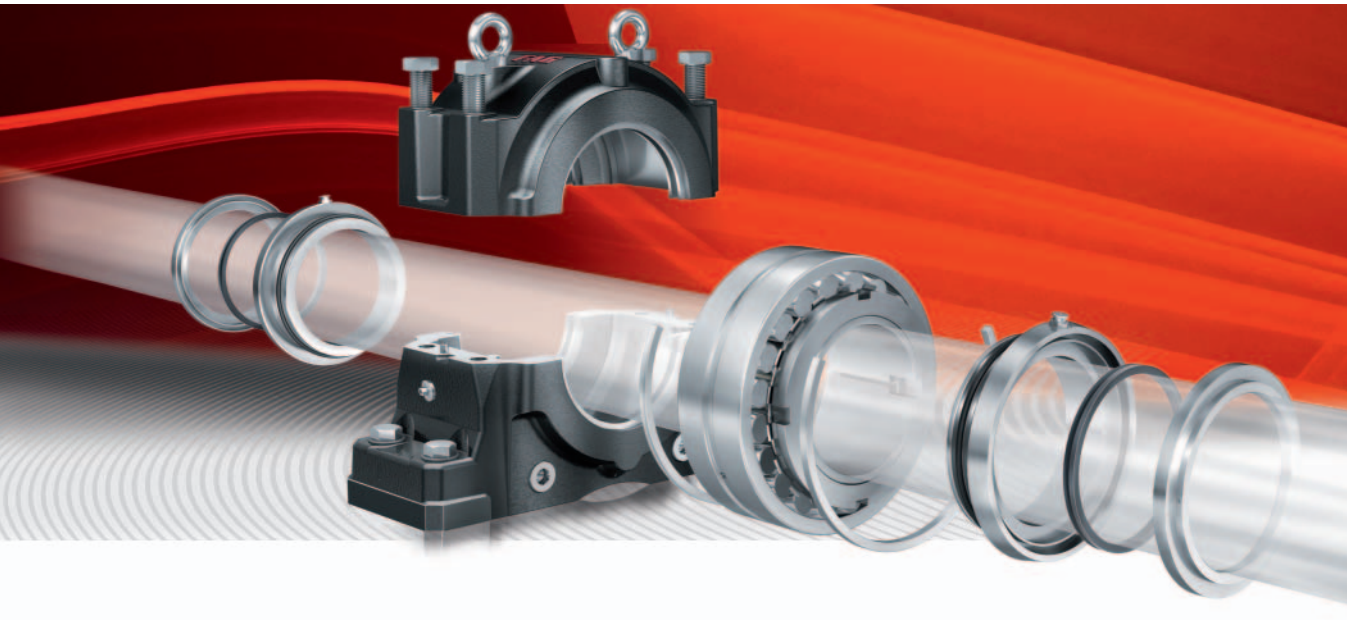
FAG



Split Plummer Block Housings SNS

Mounting manual

SCHAEFFLER

Foreword

Split plummer block housings SNS represent a completely new generation of large size housings. Through the systematic further development of the proven FAG plummer block housings, Schaeffler can offer even greater efficiency and cost-effectiveness for machinery and equipment.

The improvements include longer bearing life due to an innovative housing design as well as increased strength and shock resistance of the housing. Further advantages include optimised lubricant supply to the bearing by means of special lubrication grooves and grease outlet holes in the housing or the optional use of various sealing variants.

During mounting, rapid and simple alignment of the housing is made possible by indentations indicating the shaft and bearing centre as well as machined locating faces. In addition, both halves of the housing have serial numbering to ensure their correct allocation. The presence of prepared mounting points allows the immediate use of Condition Monitoring.

This purpose of this mounting manual is to ensure correct mounting, thereby making it possible to utilise to the full the advantages of plummer block housings SNS.

Contents

About the mounting manual

The purpose of this mounting manual is to assist the fitter in mounting split plummer block housings SNS safely and correctly.

It contains important information on mounting with the following objectives:

- to prevent personal injury or damage to property that may be caused by errors in mounting
- to facilitate, through correct mounting, a long operating life of the housing and the bearing mounted therein.

Availability

This mounting manual is available immediately for download at www.schaeffler.com in the menu Media Library, Publications.

We will be pleased to send you a printed copy upon request.

Legal guidelines

The information in this manual corresponded to the most recent status at the close of editing. The illustrations and descriptions cannot be used as grounds for any claims relating to housings that have already been delivered. Schaeffler Technologies AG & Co. KG accepts no liability for any damage or malfunctions if housings or accessories have been modified or used in an inappropriate manner.

Symbols

The warning and hazard symbols are defined along the lines of ANSI Z535.6–2006.

WARNING In case of non-compliance, death or serious injury may occur. ◁

CAUTION In case of non-compliance, minor or slight injury will occur. ◁

NOTICE In case of non-compliance, damage or malfunctions in the product or the adjacent construction will occur. ◁

Further information

If you have any questions on mounting, please contact the Schaeffler industrial service experts:

- industrial-services@schaeffler.com, +49 9721 91-3142.

General safety guidelines

Usage for the intended purpose

Split plummer block housings SNS are for the purpose of supporting rolling bearings. The function of the seals and covers available as accessories is the sealing of the bearing position. Functionality can be expanded through the connection of systems for condition monitoring and for automatic relubrication.

Usage for any other purpose is not permissible.

Selection and qualification of personnel

Mounting of split plummer block housings SNS must be carried out by qualified personnel only.

A person defined as qualified personnel:

- is authorised to perform mounting of the housings
- has all the knowledge necessary for mounting of the housings
- is familiar with the safety regulations.

Personal protective equipment

Personal protective equipment is intended to protect operating personnel against health hazards. This comprises safety shoes, safety gloves and protective goggles and these must be used in the interests of personal safety.

Depending on the mounting location and on the machine or equipment in which the housings are to be mounted, it may be necessary to use additional personal protective equipment. The applicable regulations relating to occupational safety must be observed.

Safety specifications

In order to prevent the occurrence of personal injury or damage to property during mounting, the following safety specifications must be observed.

Fundamental specifications

The mounting area must be kept free of trip hazards.

Heavy components such as the upper and lower housing sections, seals, covers and rolling bearings must be secured to prevent toppling or falling.

When heavy components are being set down and fitted together, particular attention must be paid to the limbs in order to prevent crushing.

If special mounting methods are used, the safety specifications applicable to these methods must be observed. These may include thermal and hydraulic methods for mounting the bearing on the shaft.

Mounting and maintenance work of all types may only be carried out when the machine or equipment is at a standstill.

Grease

The greases used for the greasing of housings and bearings may contain components that are hazardous to health. A safety data sheet exists for each grease that describes the hazards.

⚠ CAUTION

Grease containing components hazardous to health. Hazard in case of skin or eye contact or swallowing.

Avoid direct contact with the skin and wear protective gloves. Observe the safety data sheet for the grease. ◁

Cleaning

Volatile solvents are recommended for the cleaning of housing components since these allow cleaning without leaving a residue. In this case, attention must be paid to the compatibility of the solvent used with the paint coating of the housing. If compatibility is inadequate, the paint coating may be damaged with the result that protection of the housing against corrosion is no longer ensured.

⚠ WARNING

Volatile solvents. Hazard through ignition of vapours or in the case of skin or eye contact, inhalation or swallowing.

Avoid direct contact with the skin and wear protective gloves. Observe the safety guidelines of the manufacturer. ◁

Disposal

Any cloths soaked with grease or solvents, excess grease, packaging material and any other waste generated in connection with mounting must be disposed of by environmentally acceptable methods. The applicable legal regulations must be observed.

Environmental hazards

Depending on the ambient conditions, safety risks may be present at the mounting location that are not associated directly with the housing but must be taken into consideration in mounting of the housing. These may include dusts that are hazardous to health or working at a considerable height. Furthermore, the machine or equipment in which the housing is mounted may be a source of hazards, for example as a result of movable machinery or equipment parts.

Before starting mounting work, a safety engineer must be consulted. All safety specifications that are applicable to the mounting location and the machine or equipment affected by the mounting work must be observed.

Transport specifications

In order to prevent the occurrence of personal injury or damage to property during transport, the following transport specifications must be observed.

WARNING

Swivelling out or falling apart of rolling bearings. Severe personal injury or damage to property as a result of falling components.

Before transport, secure rolling bearings against swivelling out or falling apart. ◁

Lifting of heavy components

Lifting of heavy components must be carried out using suitable technical accessories. The mounting personnel must be familiar with correct usage of the accessories and must observe all safety specifications relating to the handling of suspended loads.

WARNING

Suspended loads. Severe personal injury or damage to property as a result of the swivelling out or falling of heavy components.

Do not remain below or within the swivel range of suspended loads.
Use only lifting gear and tackle that is approved and has sufficient load capacity.
Do not draw unprotected lifting tackle under load across sharp edges, avoid kinking or twisting.
Never leave suspended loads unsupervised. ◁

Securing for transport after prior mounting

If a premounted unit comprising a shaft, bearings and housing is to be transported, it is recommended that it should be secured for transport. The shaft should be radially clamped against the housing. Securing for transport assists in preventing transport damage such as standstill marks on the rolling bearing.

Split plummer block housings SNS

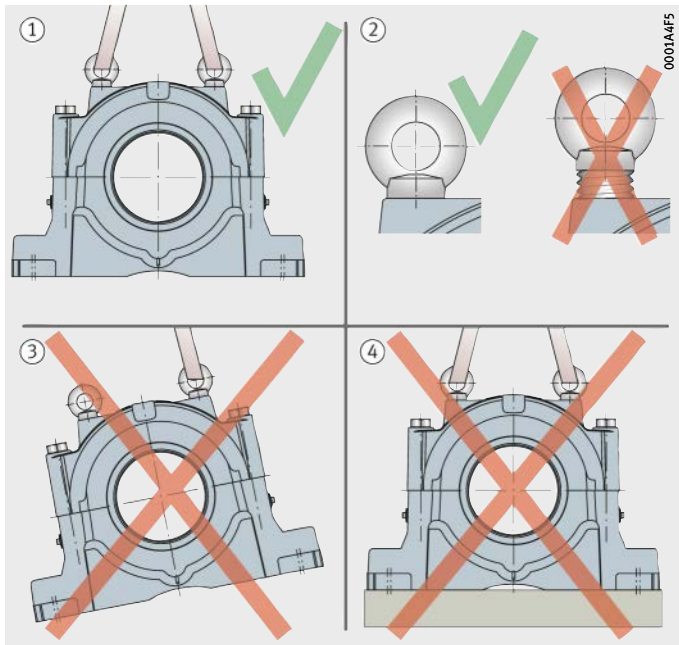
Attachment points

The upper housing section has 2 eye bolts in accordance with DIN 580. These are intended as attachment points for mounting and dismounting of the housing, *Figure 1*. The load carrying capacity of the eye bolts allows lifting of the housing including a bearing fitted in the housing. The eye bolts must not be subjected to additional load as a result of parts attached to the housing.

WARNING

Rupture of the eye bolts due to overload. Severe personal injury or damage to property as a result of the falling housing.

Always screw eye bolts completely into the upper housing section. Always use both eye bolts simultaneously as attachment points. Only use eye bolts for lifting the housing including the bearing fitted in the housing. ◁



① Correct usage of eye bolts as attachment points
② Screw in eye bolts completely
③ Never use only one eye bolt
④ Do not apply additional load as a result of attached parts

Figure 1
Usage of eye bolts as attachment points

Preparation for mounting

Checking the locating surface

The locating surface on which the housing will be mounted must be checked before mounting.

The requirements for the locating surface are as follows:

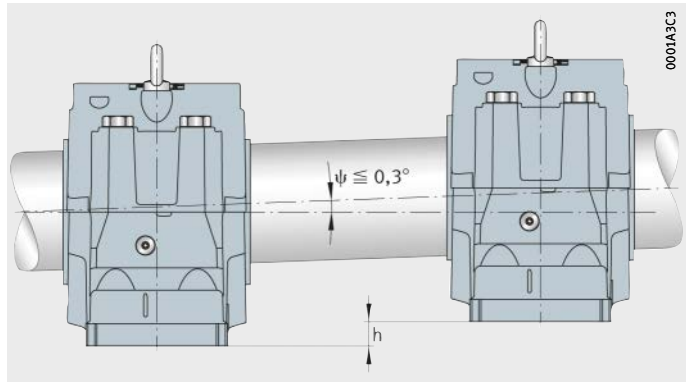
- sufficiently robust to withstand the static and dynamic loads occurring in operation over the long term
- surface roughness Ra ≦ 12,5
- flatness tolerance to IT7, measured across the diagonal
- free from colouration
- compensation of differences in level between locating surfaces.

Level of mounting surfaces

A difference in level between the locating surfaces of bearing housings will lead to misalignment of the shaft, *Figure 2*.
The labyrinth and Taconite seals of plummer block housings SNS permit misalignments of up to 0,3°.

Differences in level must therefore be compensated such that the misalignment of the shaft is no greater than 0,3°. Levelling shims can be used for this purpose.

In addition, it must be ensured that the bearings mounted can compensate the misalignments present.



ψ = misalignment of shaft
h = difference in level between locating surfaces

Figure 2
Misalignment of the shaft

Checking the bearing seats on the shaft

The bearing seats on the shaft must be free from impact marks and burrs and must have adequate dimensional and geometrical accuracy.

The requirements for dimensional and geometrical accuracy of the bearing seats for a tapered bearing bore and location by adapter sleeve are as follows:

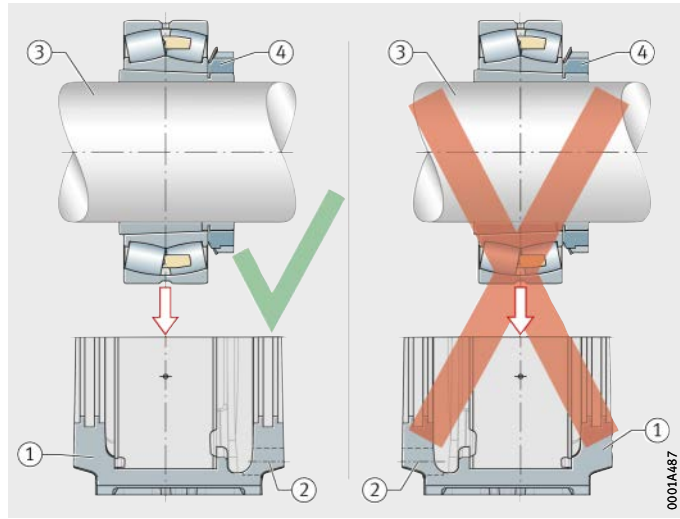
- diameter to tolerance zone h9
- cylindricity tolerance within IT5/2.

The requirements for dimensional and geometrical accuracy of the bearing seats for a cylindrical bearing bore and direct seating of the bearing on the shaft are dependent on the operating conditions. They are generally defined for the specific application by the designer.

Determining the mounting position of the housing

The mounting position of the housing must be defined such that, once the shaft is later inserted in the housing, there is still sufficient space for the locknut (in the case of a housing closed on one side) or for the adapter sleeve and locknut (in the case of a tapered bearing bore).

With a correct mounting position, the locknut will be on the same side of the housing as the grease outlet holes, *Figure 3*.



① Lower housing section
② Grease outlet hole
③ Shaft
④ Locknut

Figure 3
Mounting position of the housing

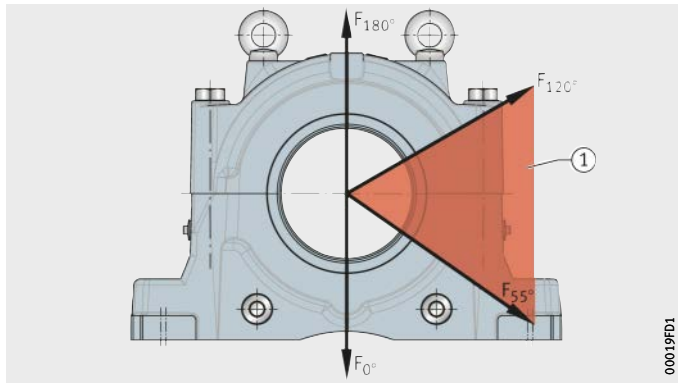
Checking the requirement for horizontal location

In addition to the foot screws, horizontal location of the housing is necessary if one of the following conditions is fulfilled:

- The load angle is between 55° and 120°, *Figure 4*.
- Axial load is present.

Whether horizontal location of the housing is necessary should be checked by the designer of the machine or equipment.

It is recommended that horizontal location is carried out by means of stops in the load direction. The lower housing section is therefore provided with machined locating faces.



① Load angle range within which horizontal location of the housing is necessary

Figure 4
Load directions in the plummer block housing SNS

Cleanliness

Contamination can shorten the operating life of rolling bearings and must therefore be prevented.

NOTICE

Residues of cleaning agents can contribute to contamination.
Only use volatile solvents and lint-free cloths for cleaning. ◁

Measures for ensuring cleanliness are as follows:

- Ensure that the mounting area is clean.
- Clean the mounting surface.
- Clean the housing, seals and cover, paying particular attention to any machining or moulding sand residues.
- After cleaning, lightly grease the labyrinth rings of the seals with the grease to be used for lubrication of the bearing.
- Do not remove rolling bearings and adapter sleeves from their packaging until immediately before mounting. Do not remove the anti-corrosion protection on these components.

Mounting with labyrinth or Taconite seal

If labyrinth or Taconite seals are used in plummer block housings SNS, housings of the designs H and Z are necessary. These housings have rectangular section annular slots on both sides in which the seals are inserted.

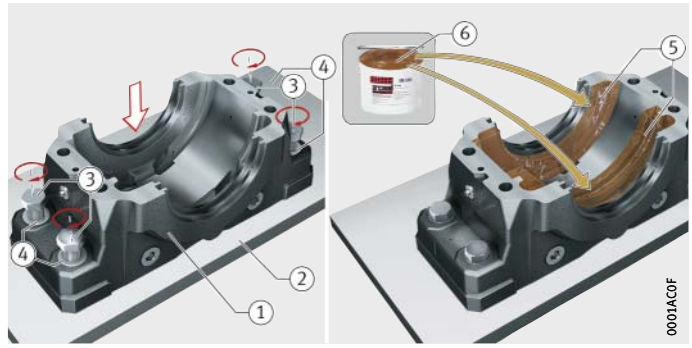
Locating and greasing the lower housing section

The lower housing section should be located on the locating surface and greased as follows, *Figure 5*:

⚠WARNING

Rupture of the eye bolts. Severe personal injury or damage to property as a result of the falling housing. Always use both eye bolts and screw them in completely. ◁

- ▶ Place the lower housing section in the correct mounting position on the locating surface. The complete housing can first be set down and the upper section housing can then be lifted off again.
- ▶ Insert foot screws each with a support washer in the lower housing section.
- ▶ Screw the foot screws into place but do not tighten them fully.
- ▶ Introduce a portion of the grease to be used for initial greasing into the lower housing section on both sides of the ultimate bearing position. Grease quantity for initial greasing, see page 48.
- ▶ If labyrinth seals are to be used: introduce grease additionally into the annular slots in the lower housing section.



① Lower housing section
② Locating surface
③ Foot screws
④ Support washers
⑤ Area for grease
⑥ Grease

Figure 5
Locating and greasing the lower housing section

Mounting the inner seal

Of the two seals in a housing, the inner seal is mounted first on the shaft, followed by the bearing and then the outer seal.

Plummer block housings SNS can be sealed as standard by means of labyrinth seals or by means of Taconite seals. On the side of the housing with the grease outlet holes, a cover can be used instead of a seal.

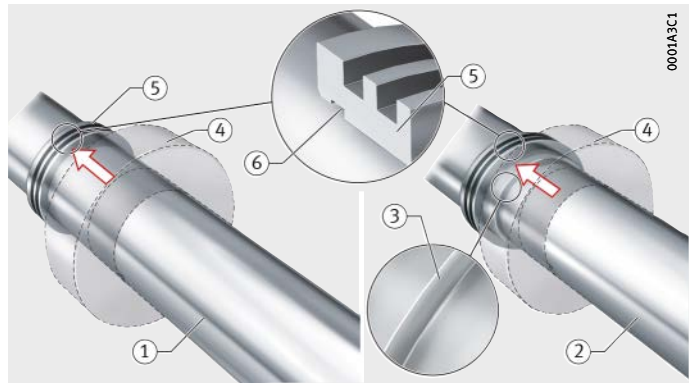
Variant 1: Labyrinth seal

The labyrinth seal comprises the labyrinth ring and the mating contour in the upper and lower housing section. The labyrinth ring must be slid onto the shaft until the slot for the O ring is on the side facing away from the bearing.

The inner labyrinth seal is mounted as follows:

- ▶ Smooth shaft, *Figure 6*, left:
  slide the labyrinth ring onto the shaft.
- ▶ Stepped shaft, *Figure 6*, right:
  slide the labyrinth ring onto the larger diameter of the shaft.

The O ring is only fitted later in the slot in the labyrinth ring, see section *Final mounting of the seals*, page 27. As a result, the labyrinth ring can initially still be displaced on the shaft.



① Smooth shaft
② Stepped shaft
③ Shaft shoulder
④ Planned bearing location
⑤ Labyrinth ring
⑥ Groove for O ring

Figure 6
Mounting of inner labyrinth seal

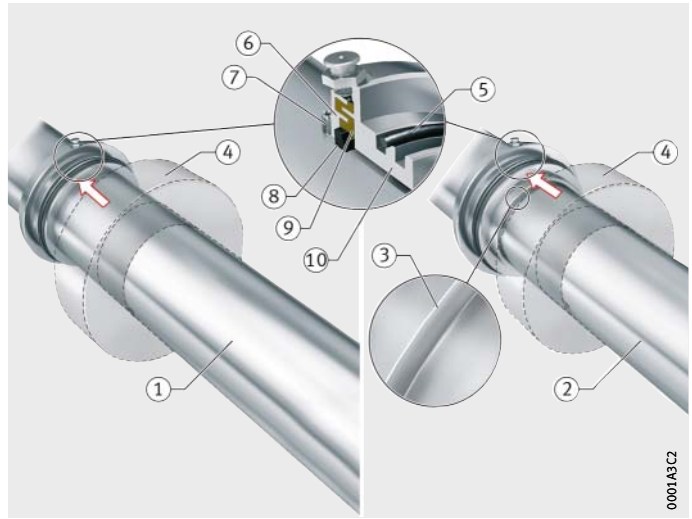
Variant 2: Taconite seal

The inner Taconite seal is mounted on a smooth shaft as follows, *Figure 7*, left:

- ▶ Fit the O ring on the housing ring.
- ▶ Slide the shaft ring onto the shaft, do not fully tighten the grub screws yet.
- ▶ Slide the V ring onto the shaft such that the lip points towards the bearing position.
- ▶ Coat the V ring and labyrinth area of the shaft ring generously with grease.
- ▶ Slide the housing ring onto the shaft.

The inner Taconite seal is mounted on a stepped shaft as follows, *Figure 7*, right:

- ▶ Fit the O ring on the housing ring.
- ▶ Slide the shaft ring onto the larger diameter of the shaft, do not fully tighten the grub screws yet.
- ▶ Slide the V ring onto the larger diameter of the shaft such that the lip points towards the bearing position.
- ▶ Coat the V ring and labyrinth area of the shaft ring generously with grease.
- ▶ Slide the housing ring onto the larger diameter of the shaft.



① Smooth shaft
② Stepped shaft
③ Shaft shoulder
④ Planned bearing location
⑤ O ring
⑥ Shaft ring
⑦ Grub screw
⑧ V ring
⑨ Grease
⑩ Housing ring

Figure 7
Mounting the inner Taconite seal

Mounting a bearing with a tapered bearing bore

This section describes the mounting of a bearing with a tapered bore and adapter sleeve on the shaft.

Mounting of a bearing with a cylindrical bore is described in a separate section, see page 20.

The mounting of sealed spherical roller bearings and split spherical roller bearings must be considered as a special case and is not described in this mounting manual. If necessary, please contact us.

Recommendation of the hydraulic method

Where the bearing must be slid onto the adapter sleeve, the hydraulic method is recommended in the case of larger diameters. In the hydraulic method, oil is injected under pressure between the bearing and adapter sleeve, giving a significant reduction in the force required for sliding on. After the bearing has been slid on, the bearing seat is relieved of oil pressure.

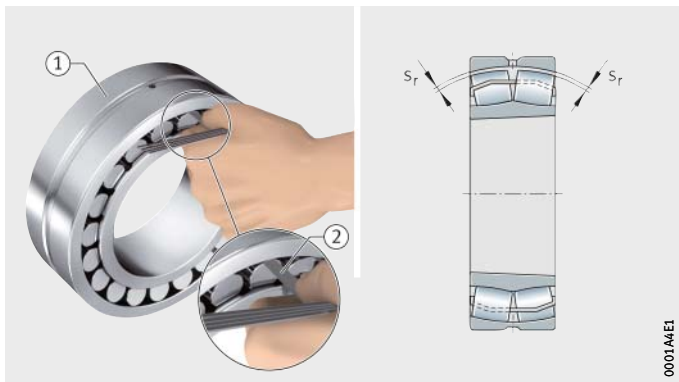
Further information

- WL 80 100/3, Mounting of Rolling Bearings.
- TPI 195, FAG Pressure Generation Devices.

Measurement of radial internal clearance

Rigid seating is indicated by the reduction in the radial internal clearance or, if it is not possible to measure the radial internal clearance at the bearing position, by the axial drive-up distance of the bearing on the sleeve. During mounting, the radial internal clearance or the axial drive-up distance must be measured continuously until the specified value is achieved, see *table*, page 52.

The radial internal clearance of spherical roller bearings is measured by means of feeler gauges. In spherical roller bearings, the radial internal clearance must be measured simultaneously over both rows of rollers, *Figure 8*.



s_r = radial internal clearance

① Spherical roller bearing
② Feeler gauge

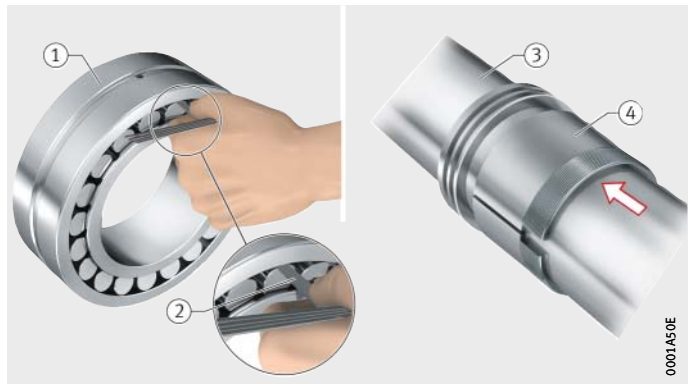
Figure 8
Measurement of the radial internal clearance of a spherical roller bearing

Mounting a bearing with a tapered bore and adapter sleeve

For mounting of a bearing with a tapered bore and an adapter sleeve, there are various methods for applying the force necessary to achieve axial drive-up of the bearing.

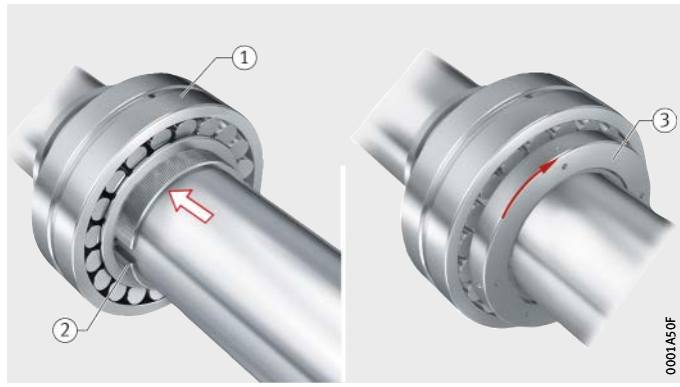
This manual describes the method using a hydraulic nut, *Figure 9* to *Figure 13*, page 19:

- ▶ Measure the radial internal clearance and note the value, *Figure 9*.
- ▶ Slide the adapter sleeve onto the shaft, *Figure 9*.
- ▶ Slide the bearing onto the adapter sleeve, *Figure 10*.
- ▶ Screw the hydraulic nut onto the thread of the adapter sleeve and tighten until the bearing is seated fully on the adapter sleeve, *Figure 10*.



① Bearing
② Feeler gauge
③ Shaft
④ Adapter sleeve

Figure 9
Measuring the radial internal clearance, sliding on the adapter sleeve



① Bearing
② Adapter sleeve
③ Hydraulic nut

Figure 10
Sliding on the bearing, tightening the hydraulic nut

▶ Check the position of the bearing. Take account of the drive-up distance of the bearing on the sleeve in subsequent sliding on, *Figure 11*.

⚠WARNING

Risk of severe injury due to escape of hydraulic oil at high pressure.

Use hydraulic hoses and devices only if in acceptable condition. Observe the operating manuals for the devices. ◁

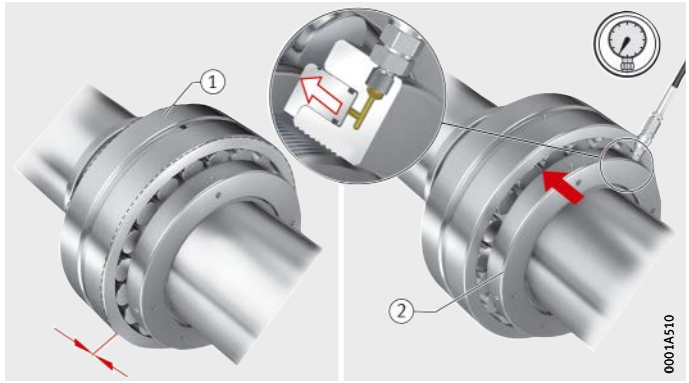
▶ When using the hydraulic method:
subject the bearing seat to oil pressure.

▶ Slide the bearing onto the sleeve using the hydraulic nut until the required reduction in the radial internal clearance is achieved, *Figure 11*. When using the hydraulic method, the oil pressure must be zero during measurement of the radial internal clearance.

▶ When using the hydraulic method:
relieve the bearing seat of oil pressure and wait until the oil has escaped from the joint without leaving any residue.

▶ Relieve the hydraulic nut of oil pressure.

▶ Unscrew the hydraulic nut.



① Bearing
② Hydraulic nut

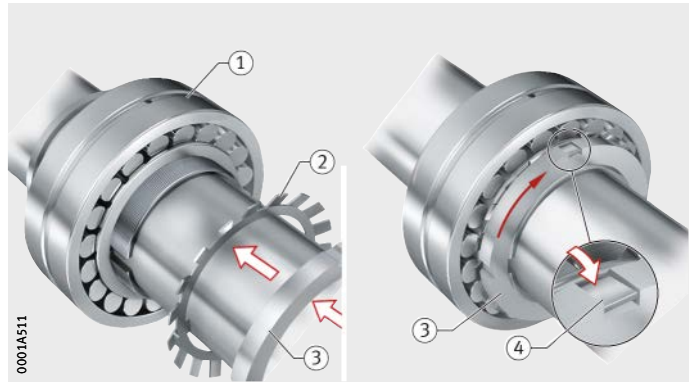
Figure 11
Checking the position of the bearing, sliding the bearing onto the adapter sleeve

NOTICE

If the locknut is not secured, the rigid seating of the bearing may become loosened. Secure the locknut by means of a tab washer or retaining bracket. ◁

The locknut is secured by means of a tab washer as follows, *Figure 12*:

- ▶ Slide the tab washer onto the adapter sleeve.
- ▶ Tighten the locknut until it abuts the bearing.
- ▶ Bend back the tab on the tab washer.
- ▶ Check the radial internal clearance.

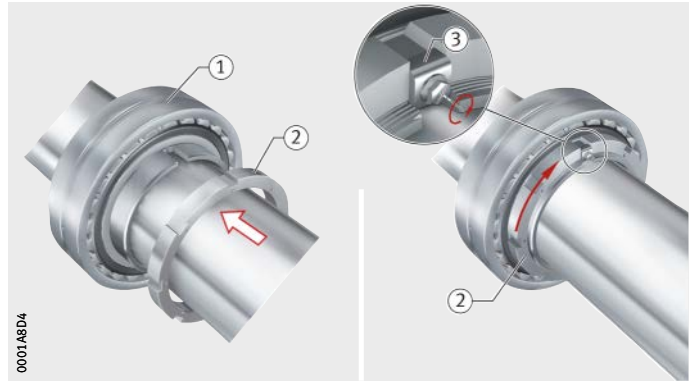


① Bearing
② Tab washer
③ Locknut
④ Tab on tab washer

Figure 12
Securing the locknut by means of a tab washer

The locknut is secured by means of a retaining bracket as follows, *Figure 13*:

- ▶ Tighten the locknut until it abuts the bearing.
- ▶ Tighten the retaining bracket against the locknut until it engages in one slot each in the locknut and the adapter sleeve.
- ▶ Check the radial internal clearance.



① Bearing
② Locknut
③ Retaining bracket

Figure 13
Securing the locknut by means of a retaining bracket

Further information

- TPI 195, FAG Pressure Generation Devices.
- TPI 196, FAG Hydraulic Nuts.

Mounting a bearing with a cylindrical bearing bore

This section describes the mounting of a bearing with a cylindrical bore on the shaft.

Mounting of a bearing with a tapered bore and an adapter sleeve is described in a separate section, see page 16.

Recommendation of the thermal method

Where the bearing must be slid onto the shaft, the thermal method is recommended. In the thermal method, the bearing is heated until the bore diameter of the bearing increases as a result of thermal expansion and the bearing can be easily slid onto the shaft.
In general, the bearing is slid onto a cylindrical shaft until the inner ring abuts a bearing shoulder.

Further information

- WL 80 100/3, Mounting of Rolling Bearings.
- TPI 200, FAG Heating Devices for Mounting of Rolling Bearings.

Mounting a bearing with a cylindrical bearing bore

Bearings with a cylindrical bore are mounted on a stepped shaft. If this is a continuous shaft, a spacer sleeve is necessary on the side with the smaller shaft diameter. The outside diameter of the spacer sleeve must be identical to the larger shaft diameter. In the case of a housing closed on one side, a spacer sleeve is not used.

A bearing with a cylindrical bore is mounted using the thermal method as follows, *Figure 14* and *Figure 15*, page 21:

▶ Apply a thin coating of mounting paste to the bearing seat on the shaft, *Figure 14*, page 21.

⚠WARNING

Risk of burns during heating of the bearing. Wear heat-resistant safety gloves. ◁

NOTICE

Risk of damage to the bearing due to incorrect heating.

Observe the maximum heating temperature of +120 °C. In the case of non-separable bearings, carry out heating using a heating device at reduced power or in stages. ◁

▶ Heat the bearing.

▶ Slide the hot bearing onto the shaft until the inner ring abuts the shaft shoulder, *Figure 14*, page 21.

▶ For large bearings:
locate the bearing axially during cooling.

▶ Check the abutment of the inner ring against the shaft shoulder by means of a feeler gauge, *Figure 15*, page 21.

▶ For a continuous shaft:
slide the spacer sleeve onto the shaft until it abuts the inner ring of the bearing, *Figure 15*, page 21.

① Shaft
② Shaft shoulder
③ Mounting paste
④ Bearing
⑤ Inner ring of bearing

Figure 14
Applying mounting paste, sliding on the bearing

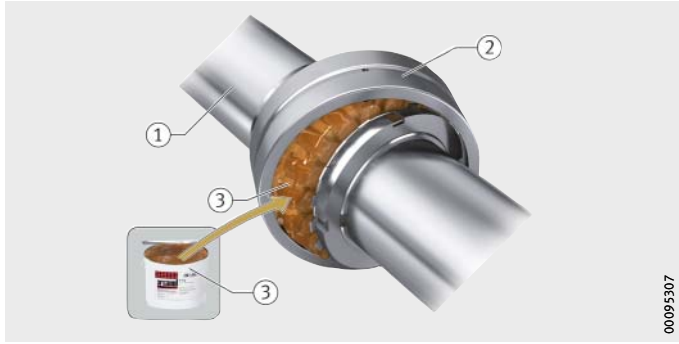
① Shaft
② Bearing
③ Feeler gauge
④ Spacer sleeve

Figure 15
Checking abutment of the inner ring, sliding on the spacer sleeve (for a continuous shaft)

Greasing the bearing

The bearing is greased as follows, *Figure 16*:

▶ With the outer ring swivelled out, fill the free cavities of the bearing completely with grease.



① Shaft
② Outer ring of bearing
③ Grease

Figure 16
Greasing the bearing

Mounting the outer seal

In the case of a continuous shaft, a second seal is mounted on the shaft. In the case of a housing closed on one side, this operation is omitted.

Variant 1: Labyrinth seal

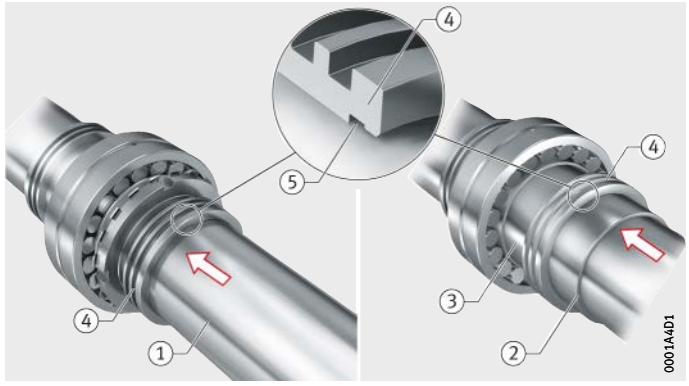
The labyrinth ring must be slid onto the shaft until the slot for the O ring is on the side facing away from the bearing.

The outer labyrinth seal is mounted as follows:

▶ Smooth shaft, *Figure 17*, left:
slide the labyrinth ring onto the shaft.

▶ Stepped shaft, *Figure 17*, right:
slide the labyrinth ring onto the spacer sleeve.

The O ring is only fitted later in the slot in the labyrinth ring, see section *Final mounting of the seals*, page 27.
As a result, the labyrinth ring can initially still be displaced on the shaft.



① Smooth shaft
② Stepped shaft
③ Spacer sleeve
④ Labyrinth ring
⑤ Groove for O ring

Figure 17
Mounting the outer labyrinth seal

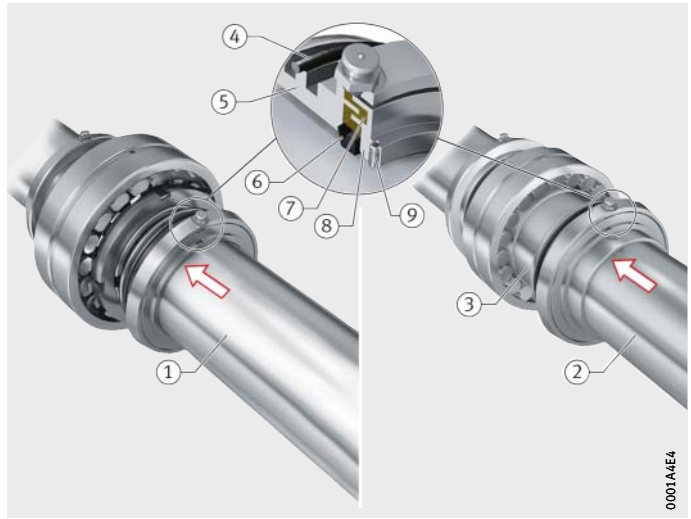
Variant 2: Taconite seal

The outer Taconite seal is mounted on a smooth shaft as follows, *Figure 18*, left:

- ▶ Fit the O ring on the housing ring.
- ▶ Slide the housing ring onto the shaft.
- ▶ Slide the V ring onto the shaft such that the lip points towards the bearing.
- ▶ Coat the V ring and labyrinth area of the housing ring generously with grease.
- ▶ Slide the shaft ring onto the shaft, do not fully tighten the grub screws yet.

The outer Taconite seal is mounted on a stepped shaft as follows, *Figure 18*, right:

- ▶ Fit the O ring on the housing ring.
- ▶ Slide the housing ring onto the spacer sleeve.
- ▶ Slide the V ring onto the spacer sleeve such that the lip points towards the bearing.
- ▶ Coat the V ring and labyrinth area of the housing ring generously with grease.
- ▶ Slide the shaft ring onto the spacer sleeve, do not fully tighten the grub screws yet.



① Smooth shaft
② Stepped shaft
③ Spacer sleeve
④ O ring
⑤ Housing ring
⑥ V ring
⑦ Grease
⑧ Shaft ring
⑨ Grub screw

Figure 18
Mounting the Taconite outer seal

Inserting the shaft and locating rings in the housing

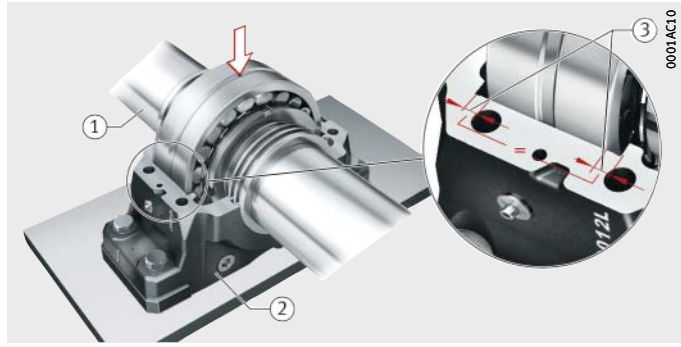
Locating rings are always necessary if the bearing position is to be realised as a locating bearing arrangement.

Non-locating bearing arrangement

In the case of a non-locating bearing arrangement, the shaft must be inserted in the housing until the bearing is seated centrally on the bearing seating surface of the housing. As a result, the drive-up distance of the bearing in the housing is equally large on both sides.

The shaft is inserted in the housing as follows, *Figure 19*:

▶ Insert the subassembly comprising the shaft, bearing and sealing rings in the lower housing section, observing the drive-up distance of the bearing.



① Shaft
② Lower housing section
③ Drive-up distance of bearing in housing

Figure 19
Inserting the shaft, non-locating bearing arrangement

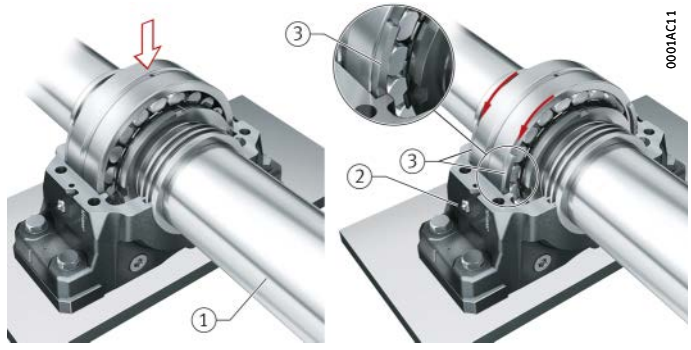
Locating bearing arrangement

The shaft and locating rings are inserted in the housing as follows, *Figure 20*:

▶ Insert the subassembly comprising the shaft, bearing and sealing rings in the lower housing section.

▶ Insert the locating rings in the housing, using equal numbers on both sides of the bearing.

▶ Position the locating rings so that their opening faces upwards.



① Shaft
② Lower housing section
③ Locating rings

Figure 20
Inserting the shaft and locating rings, locating bearing arrangement

Further information

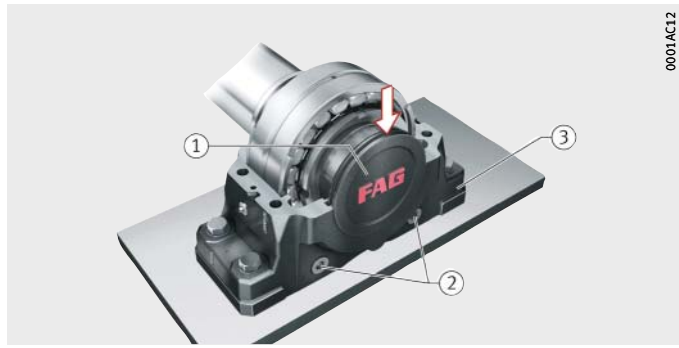
- For the number of locating rings required, see TPI 231, Split Plummer Block Housings SNS.

Inserting the cover

In the case of a housing closed on one side, the cover is inserted on the side of the housing with the grease outlet holes. In the case of a continuous shaft, this operation is omitted.

The cover is inserted as follows, *Figure 21*:

▶ Insert the cover from above in the lower housing section.



① Cover
② Grease outlet holes
③ Lower housing section

Figure 21
Inserting the cover
in a housing closed on one side

Aligning the housing

Precise alignment of the housing is a prerequisite for high operational security and long life of the seals and bearing.

The lower housing section includes the following features that assist in alignment:

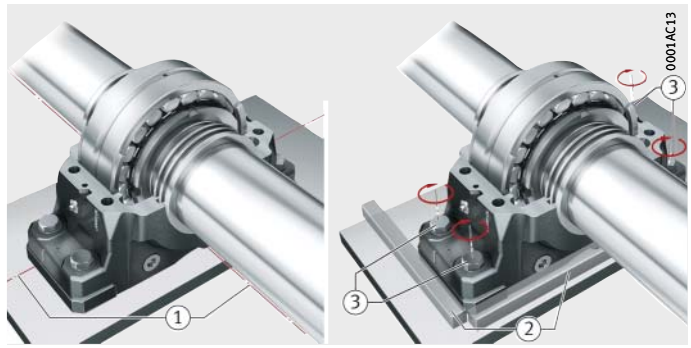
- Indentations indicate the shaft and bearing centres in the housing.
- Machined locating faces facilitate precise alignment.

The housing is aligned as follows, *Figure 22*:

▶ First align the housing approximately. This should be based on the indentations in the lower housing section.

▶ Align the housing precisely. Use the machined locating faces on the lower housing section, in conjunction with suitable locating strips.

▶ Lightly tighten the foot screws.



① Approximate alignment by means of indentations
② Precise alignment by means of locating faces and strips
③ Foot screws

Figure 22
Aligning the housing

Greasing and mounting the upper housing section

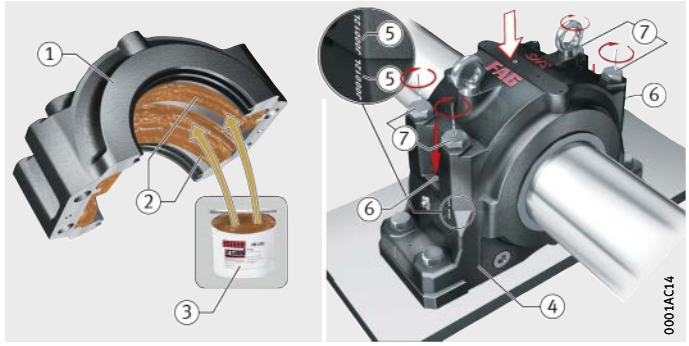
The upper housing section is greased and mounted as follows, *Figure 23*:

- ▶ Introduce a portion of the grease to be used for initial greasing into the upper housing section on both sides of the ultimate bearing position. Grease quantity for initial greasing, see page 48.
- ▶ If labyrinth seals are to be used: introduce grease additionally into the annular slots in the upper housing section.
- ▶ Check whether the upper and lower housing sections have matching serial numbering.

⚠WARNING

Rupture of the eye bolts. Severe personal injury or damage to property as a result of the falling housing. Always use both eye bolts and screw them in completely.◁

- ▶ Place the upper housing section on the lower housing section.
- ▶ Drive in the dowel pins connecting the upper and lower housing section.
- ▶ Tighten the connecting screws in a crosswise sequence to the recommended tightening torque, see page 51.



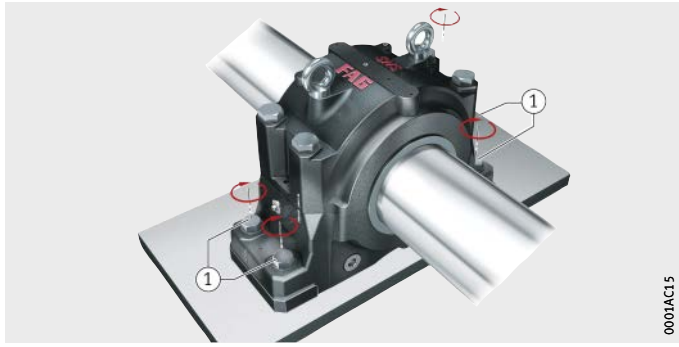
① Upper housing section
② Area for grease
③ Grease
④ Lower housing section
⑤ Serial numbering
⑥ Dowel pins
⑦ Connecting screws

Figure 23
Greasing and mounting the upper housing section

Final screw mounting of the housing

The lower housing section is finally screw mounted on the locating surface as follows, *Figure 24*:

- ▶ Check the alignment of the housing and correct if necessary.
- ▶ Tighten the foot screws in a crosswise sequence to the recommended tightening torque, see page 50.



① Foot screws

Figure 24
Final screw mounting of the housing

Final mounting of the seals

Final mounting operations must be carried out in the case of both the labyrinth and the Taconite seal.

Variant 1: Labyrinth seal

Mounting of the labyrinth rings on both sides of the housing is completed by inserting O rings made from FKM. This can be carried out using, for example, a screwdriver with rounded corners.

Inserting the O rings, *Figure 25*:

▶ Position the labyrinth ring on the shaft such that is seated centrally in the appropriate annular slot in the housing.

NOTICE

Take care if using sharp-edged tools. Damage to O ring.
Only use rounded tools. ◁

▶ Insert the O ring in the slot in the labyrinth ring.
Rotate the shaft and carefully press the O ring into the slot using a suitable tool.

If temperatures of more than +125 °C can occur during operation:

▶ On both sides of the housing, unscrew the screw located at the position for the vibration sensor.

▶ Remove the plastic support washer.

▶ Screw the screw back in.

① Shaft
② Labyrinth ring
③ O ring
④ Screw at position for vibration sensor
⑤ Plastic support washer

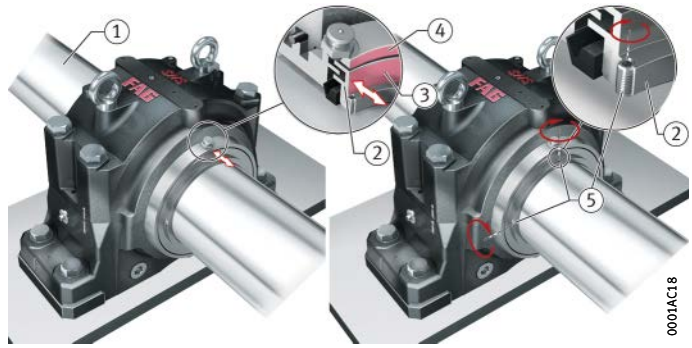
Figure 25
Inserting the O ring in the slot in the labyrinth ring

Variant 2: Taconite seal

If Taconite seals are used on both sides of the housing, the position of the shaft ring of the Taconite seal must be set.

Adjusting the Taconite seal, *Figure 26*:

- ▶ Position the Taconite seal axially such that the end faces of the shaft ring and the housing ring are flush.
- ▶ Fully screw tighten the shaft ring on the shaft using the grub screws provided.



① Shaft
② Shaft ring
③ End face of shaft ring
④ End face of housing ring
⑤ Grub screws

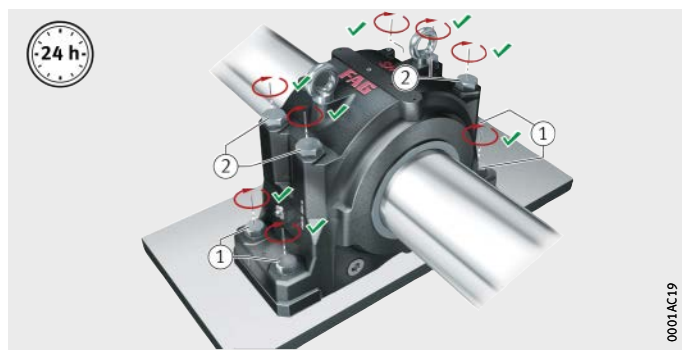
Figure 26
Setting the position of the shaft ring of the Taconite seal

Checking the tightening torques

Settling of screw connections can lead to a reduction in screw preload. The tightening torques must therefore be checked after 24 hours of operation.

The tightening torques are checked as follows, *Figure 27*:

- ▶ Check the tightening torques of the foot screws, see page 50.
- ▶ Check the tightening torques of the connecting screws, see page 51.
- ▷ Mounting of the housing is now complete.



① Foot screws
② Connecting screws

Figure 27
Checking the tightening torques

Mounting with Bolt-on seal

If Bolt-on seals are used in plummer block housings SNS, housings of the design B are necessary. These housings are prepared for the mounting of Bolt-on seals by machining of the end faces.

Locating and greasing the lower housing section

Locating the lower housing section on the locating surface and greasing, *Figure 28*:

⚠WARNING

Rupture of the eye bolts. Severe personal injury or damage to property as a result of the falling housing. Always use both eye bolts and screw them in completely. ◁

- ▶ Place the lower housing section in the correct mounting position on the locating surface. The complete housing can first be set down and the upper section housing can then be lifted off again.
- ▶ Insert foot screws each with a support washer in the lower housing section.
- ▶ Screw the foot screws into place but do not tighten them fully.
- ▶ Introduce a portion of the grease to be used for initial greasing into the lower housing section on both sides of the ultimate bearing position. Grease quantity for initial greasing, see page 48.

① Lower housing section
② Locating surface
③ Foot screws
④ Support washers
⑤ Area for grease
⑥ Grease

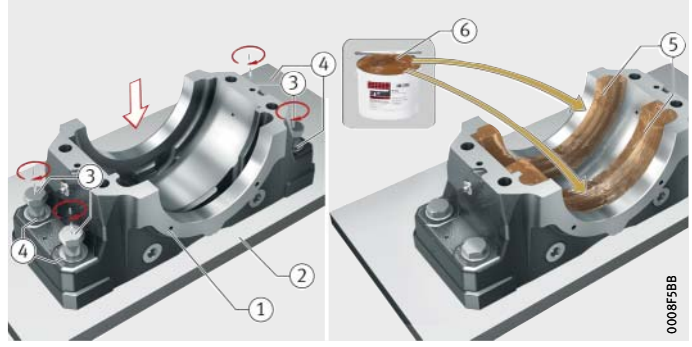


Figure 28
Locating and greasing the lower housing section

Mounting the inner seal

Of the two seals in a housing, the inner seal is mounted first on the shaft, followed by the bearing and then the outer seal.

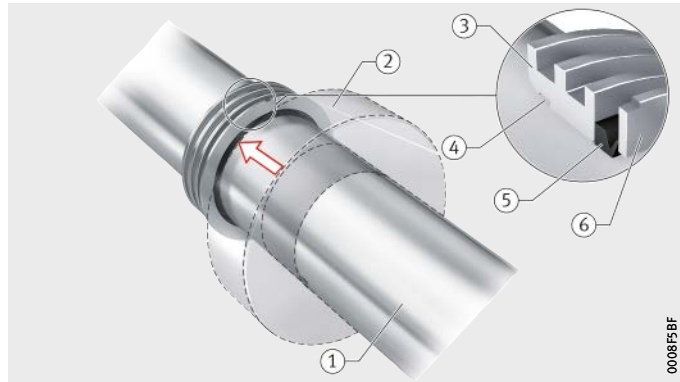
On the side of the housing with the grease outlet holes, a cover can be used instead of a seal.

Bolt-on Seals are always used in conjunction with a smooth shaft, on which the bearing is mounted by means of an adapter sleeve.

Mounting of the inner Bolt-on seal on the shaft, *Figure 29*:

- ▶ Unpack and dismantle the seal.
- ▶ Slide the labyrinth ring onto the shaft.
- ▶ Slide the V ring onto the shaft such that the lip points towards the bearing position.
- ▶ Slide the grinding plate onto the shaft.

The O ring is only fitted later in the slot in the labyrinth ring, see section *Final mounting of the seals*, page 39. As a result, the labyrinth ring can initially still be displaced on the shaft.



① Shaft
② Planned bearing location
③ Labyrinth ring
④ Slot for O ring
⑤ V ring
⑥ Grinding plate

Figure 29
Mounting the inner Bolt-on seal

Mounting the bearing

In the case of bearing housings SNS with Bolt-on seals, bearings with a tapered bore are always used, which are located on the shaft by means of an adapter sleeve.

The mounting of such a bearing in the case of housings with a Bolt-on seal is carried out as described for housings with a labyrinth or Taconite seal.

Description of mounting of the bearing, see section *Mounting a bearing with a tapered bearing bore*, page 16 to page 19.

Greasing the bearing

Greasing the bearing, *Figure 30*:

▶ With the outer ring swivelled out, fill the free cavities of the bearing completely with grease.

① Shaft
② Outer ring of bearing
③ Grease

Figure 30
Greasing the bearing

Mounting the outer seal

In the case of a continuous shaft, a second seal is mounted on the shaft. In the case of a housing closed on one side, this operation is omitted.

Mounting of the outer Bolt-on seal on the shaft, *Figure 31*:

▶ Unpack and dismantle the seal.

▶ Slide the grinding plate onto the shaft.

▶ Slide the V ring onto the shaft such that the lip points towards the bearing position.

▶ Slide the labyrinth ring onto the shaft.

The O ring is only fitted later in the slot in the labyrinth ring, see section *Final mounting of the seals*, page 39. As a result, the labyrinth ring can initially still be displaced on the shaft.

① Shaft
② Grinding plate
③ V ring
④ Labyrinth ring
⑤ Slot for O ring

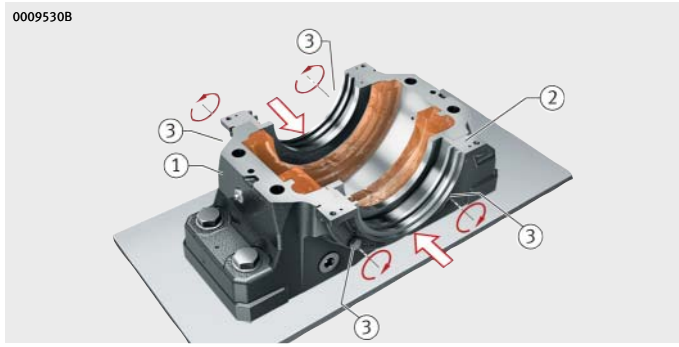
Figure 31
Mounting the Bolt-on outer seal

Fitting the lower carrier half

In the case of a continuous shaft, one carrier half is fitted, while two carrier halves are fitted if the housing is closed off on one side.

Fitting the lower carrier halves for the Bolt-on seal to the lower housing section, *Figure 32*:

▶ Place the lower carrier half on the lower housing section and tighten the two screws supplied finger tight.



① Lower housing section
② Lower carrier half
③ Screws supplied

Figure 32
Fitting the lower carrier half

Inserting the shaft and locating rings in the housing

Locating rings are always necessary if the bearing position is to be realised as a locating bearing arrangement.

Non-locating bearing arrangement

In the case of a non-locating bearing arrangement, the shaft must be inserted in the housing until the bearing is seated centrally on the bearing seating surface of the housing. As a result, the drive-up distance of the bearing in the housing is equally large on both sides.

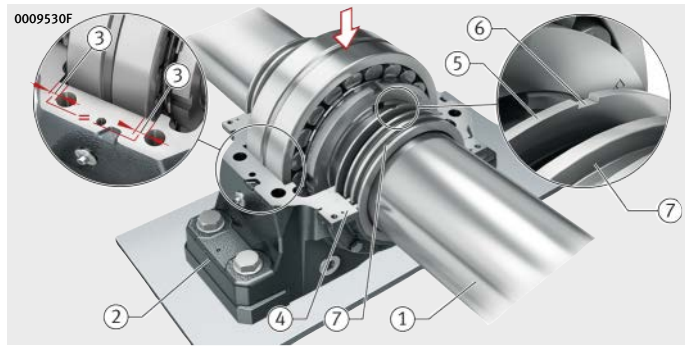
Inserting the shaft in the housing, *Figure 33*, page 33:

▶ Lower the subassembly comprising the shaft, bearing and seals onto the lower housing section but do not insert it yet. Observe the drive-up distance of the bearing.

▶ Align the grinding plate to match the associated annular slot in the lower carrier half. Rotate the grinding plate so that its slot faces upwards.

▶ Align the labyrinth ring centrally to the labyrinth slots in the lower carrier half.

▶ Insert the subassembly comprising the shaft, bearing and sealing rings in the lower housing section.



① Shaft
② Lower housing section
③ Drive-up distance of bearing in housing
④ Lower carrier half
⑤ Grinding plate
⑥ Slot in grinding plate
⑦ Labyrinth ring

Figure 33
Inserting the shaft,
non-locating bearing arrangement

Locating bearing arrangement

Inserting the shaft and locating rings in the housing, *Figure 34*:

- ▶ Lower the subassembly comprising the shaft, bearing and seals onto the lower housing section but do not insert it yet.
- ▶ Align the grinding plate to match the associated annular slot in the lower carrier half. Rotate the grinding plate so that its slot faces upwards.
- ▶ Align the labyrinth ring centrally to the labyrinth slots in the lower carrier half.
- ▶ Insert the subassembly comprising the shaft, bearing and sealing rings in the lower housing section.
- ▶ Insert the locating rings in the housing, using equal numbers on both sides of the bearing.
- ▶ Position the locating rings so that their opening faces upwards.

① Shaft
② Lower housing section
③ Locating rings
④ Lower carrier half
⑤ Grinding plate
⑥ Slot in grinding plate
⑦ Labyrinth ring

Figure 34
Inserting the shaft,
locating bearing arrangement

Further information

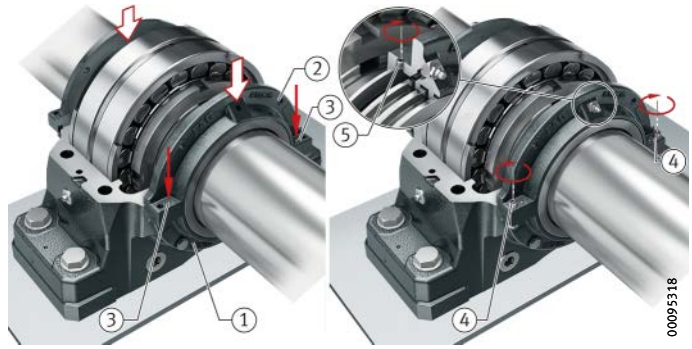
- For the number of locating rings required, see TPI 231, Split Plummer Block Housings SNS.

Fitting the upper carrier half

In the case of a continuous shaft, one carrier half is fitted, while two carrier halves are fitted if the housing is closed off on one side.

Fit the upper carrier half for the Bolt-on seal on the lower carrier half, *Figure 35*:

- ▶ Place the upper carrier half on the lower carrier half.
- ▶ Drive in the dowel pins connecting the upper and lower carrier half.
- ▶ Tighten the screws between the upper and lower carrier half to the recommended tightening torque, see page 51.
- ▶ Fully tighten the grub screw to prevent rotation of the grinding plate.



① Lower carrier half
② Upper carrier half
③ Dowel pins
④ Screws between carrier halves
⑤ Grub screw

Figure 35
Fitting the upper carrier half

Aligning the housing

Precise alignment of the housing is a prerequisite for high operational security and long life of the seals and bearing.

The lower housing section includes the following features that assist in alignment:

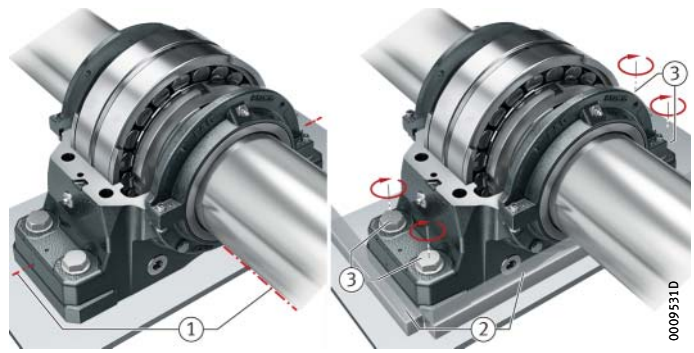
- Indentations indicate the shaft and bearing centres in the housing.
- Machined locating faces facilitate precise alignment.

The housing is aligned as follows, *Figure 36*:

▶ First align the housing approximately. This should be based on the indentations in the lower housing section.

▶ Align the housing precisely. Use the machined locating faces on the lower housing section, in conjunction with suitable locating strips.

▶ Lightly tighten the foot screws.



① Approximate alignment by means of indentations
② Precise alignment by means of locating faces and strips
③ Foot screws

Figure 36
Aligning the housing

Greasing and mounting the upper housing section

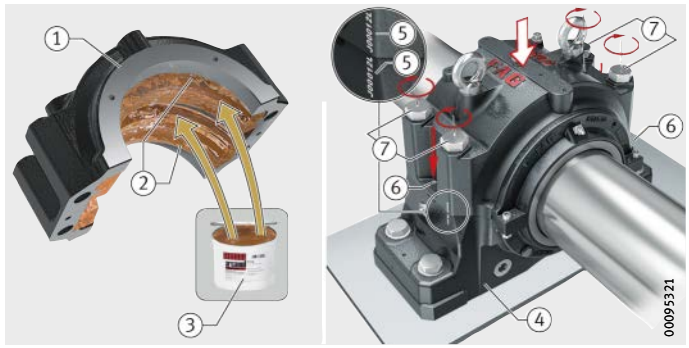
The upper housing section is greased and mounted as follows, *Figure 37*:

- ▶ Introduce a portion of the grease to be used for initial greasing into the upper housing section on both sides of the ultimate bearing position. Grease quantity for initial greasing, see page 48.
- ▶ Check whether the upper and lower housing sections have matching serial numbering.

⚠WARNING

Rupture of the eye bolts. Severe personal injury or damage to property as a result of the falling housing. Always use both eye bolts and screw them in completely. ◁

- ▶ Place the upper housing section on the lower housing section.
- ▶ Drive in the dowel pins connecting the upper and lower housing section.
- ▶ Tighten the connecting screws in a crosswise sequence to the recommended tightening torque, see page 51.



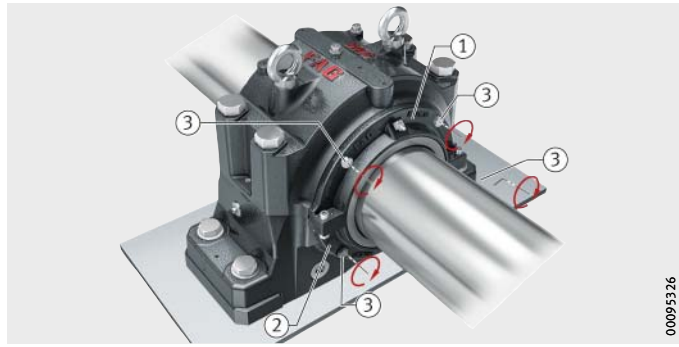
① Upper housing section
② Area for grease
③ Grease
④ Lower housing section
⑤ Serial numbering
⑥ Dowel pins
⑦ Connecting screws

Figure 37
Greasing and mounting the upper housing section

Final screw mounting of the carrier halves

Screw mount the upper and lower carrier halves for the Bolt-on seal fully to the housing, *Figure 38*:

▶ Tighten the screws for locating the carrier halves to the recommended tightening torque, see page 51.



① Upper carrier half
② Lower carrier half
③ Screws between carrier halves and housing

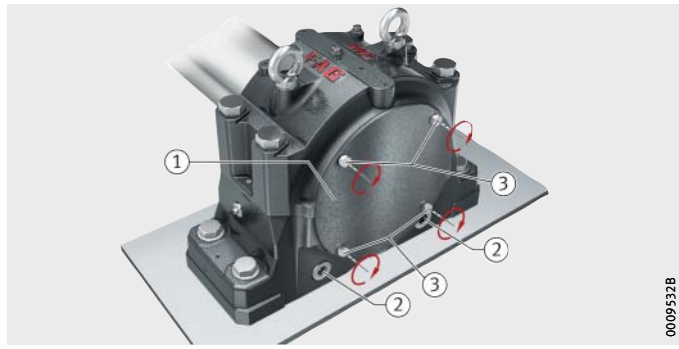
Figure 38
Final screw mounting of the carrier halves

Mounting the cover

In the case of a housing closed on one side, the cover is screw mounted to the side of the housing with the grease outlet holes. In the case of a continuous shaft, this operation is omitted.

Screw mounting the cover, *Figure 39*:

▶ Tighten the screws for locating the cover to the recommended tightening torque, see page 51.



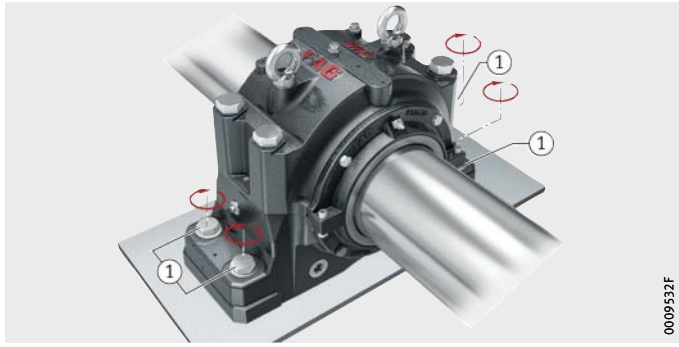
① Cover
② Grease outlet holes
③ Screws between cover and housing

Figure 39
Screw mounting the cover in a housing closed on one side

Final screw mounting of the housing

The lower housing section is finally screw mounted on the locating surface as follows, *Figure 40*:

- ▶ Check the alignment of the housing and correct if necessary.
- ▶ Tighten the foot screws in a crosswise sequence to the recommended tightening torque, see page 50.



① Foot screws

Figure 40
Final screw mounting of the housing

Final mounting of the seals

Mounting of the Bolt-on seals on both sides of the housing is completed by inserting O rings made from FKM. This can be carried out using, for example, a screwdriver with rounded corners.

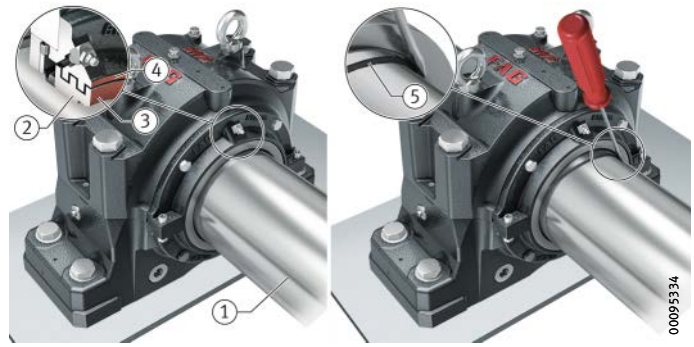
Inserting the O rings, *Figure 41*:

▶ Position the labyrinth ring axially such that the end faces of the labyrinth ring and the carrier half are flush.

NOTICE

Take care if using sharp-edged tools. Damage to O ring.
Only use rounded tools. ◁

▶ Insert the O ring in the slot in the labyrinth ring.
Rotate the shaft and carefully press the O ring into the slot using a suitable tool.

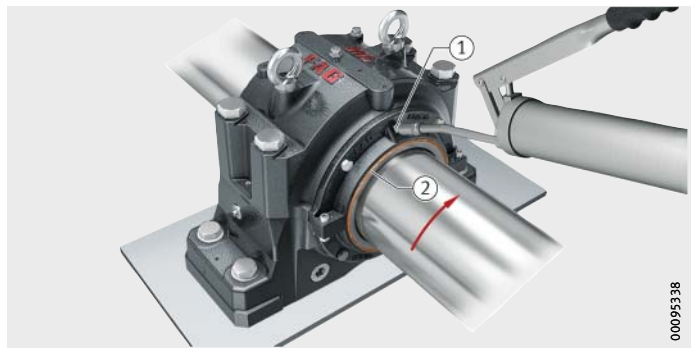


① Shaft
② Labyrinth ring
③ End face of labyrinth ring
④ End face of carrier half
⑤ O ring

Figure 41
Inserting the O ring
in the slot in the labyrinth ring

The Bolt-on seal is then greased, *Figure 42*:

▶ Grease the Bolt-on seal via its lubrication nipple, while rotating the shaft, until grease emerges from the outer labyrinth gap.



① Lubrication nipple
② Grease emerging from the labyrinth gap

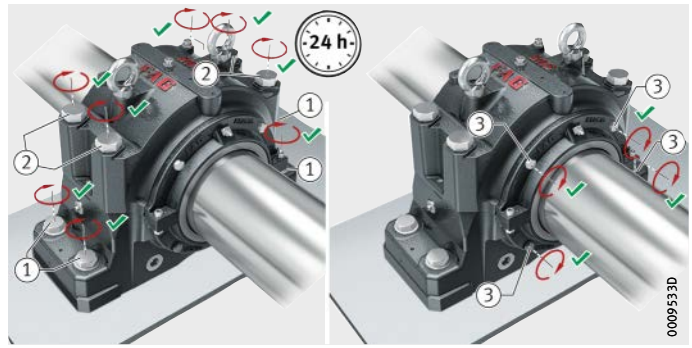
Figure 42
Greasing the Bolt-on seal

Checking the tightening torques

Settling of screw connections can lead to a reduction in screw preload. The tightening torques must therefore be checked after 24 hours of operation.

Checking the tightening torques, *Figure 43*:

- ▶ Check the tightening torques of the foot screws, see page 50.
- ▶ Check the tightening torques of the connecting screws, see page 51.
- ▶ Check the tightening torques for the Bolt-on seal, see page 51. In the case of a housing closed on one side, this also applies to the screws for locating the cover.
- ▷ Mounting of the housing is now complete.



① Foot screws
② Connecting screws
③ Screws for Bolt-on seal

Figure 43
Checking the tightening torques

Mounting with a split labyrinth seal in case of repair

When the housing is mounted for the first time, an unsplit seal is normally fitted. Split seals are provided in case of repair.

Application in combination with a split bearing

In case of repair, the work involved in mounting can be considerably reduced if the unsplit bearing originally fitted is replaced by a split bearing and a split seal is fitted at the same time.

The emphasis in this chapter is on description of the mounting of a split labyrinth seal in a plummer block housing SNS. Mounting of the bearing is dependent on the design of the bearing and cannot be described in detail here. In this case, the mounting manual for the bearing must be observed.

Further information

For split spherical roller bearings from Schaeffler:

- MON 90, Mounting Manual for Grease Lubricated Split FAG Spherical Roller Bearings and Housings.

Dismounting

Dismounting of housing, bearing and seals, *Figure 44*, page 42:

▶ Loosen the connecting screws between upper and lower housing section.

⚠WARNING

Rupture of the eye bolts. Severe personal injury or damage to property as a result of the falling housing. Always use both eye bolts and screw them in completely. ◁

▶ Detach the upper housing section.

▶ Raise the shaft by at least 1 mm or lower the lower housing section. Ensure that the shaft is securely supported at both ends.

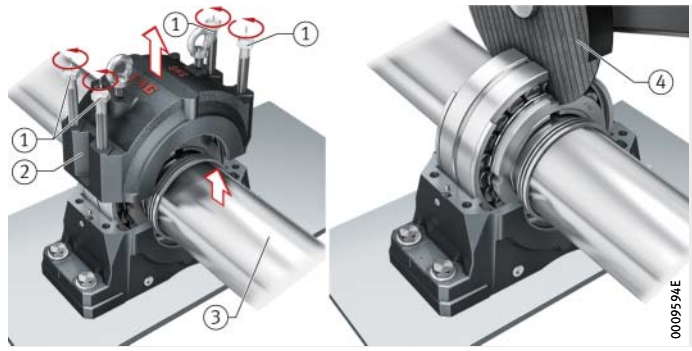
▶ Dismount the old bearing and seals. If these are of an unsplit design, cut up the bearing, adapter sleeve and seals using an angle grinder. Avoid any damage to the shaft and housing.

▶ Clean the bearing seat and annular slots in the upper and lower housing section as well as the housing contact surfaces.

NOTICE

The operating life of the new bearing will be shortened if the grease is contaminated. Completely remove any contaminants, especially residues from the use of the angle grinder. ◁

▶ In the case of a locating bearing arrangement: check the condition of the locating rings.



① Connecting screws
② Upper housing section
③ Shaft
④ Angle grinder

Figure 44
Dismounting

Mounting a split bearing

▶ Mount the split bearing in accordance with the mounting manual for the bearing.

NOTICE

If the split bearing is mounted incorrectly, this may lead to function problems and a shortened operating life. Observe the mounting manual for the split bearing. ◁

Mounting a split labyrinth seal

Mounting the split labyrinth seal, *Figure 45*:

▶ Unpack and dismantle the seal.
▶ Introduce grease into the annular slot in the lower housing section.
▶ Insert the lower half of the labyrinth ring centrally into the annular slot in the housing.
▶ Place the upper half of the labyrinth on the lower half and screw mount to the recommended tightening torque, see page 51.
▶ Lower the shaft.

① Split bearing
② Grease
③ Lower half of labyrinth ring
④ Upper half of labyrinth ring
⑤ Screws for split labyrinth seal
⑥ Shaft

Figure 45
Mounting
a split labyrinth seal

Mounting the upper housing section

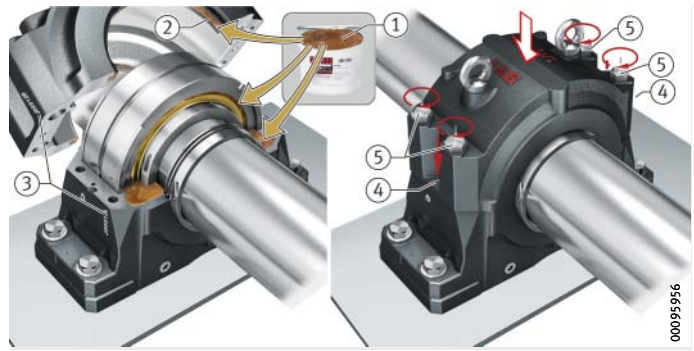
Mounting the upper housing section, *Figure 46*:

- ▶ Add to the grease quantity in the bearing and housing so that the bearing is filled completely with grease and the lower housing section is half filled with grease.
- ▶ Introduce grease into the annular slot in the upper housing section.
- ▶ Check whether the serial numbering on the upper and lower housing section matches (the upper and lower section must not be interchanged with other parts).

⚠WARNING

Rupture of the eye bolts. Severe personal injury or damage to property as a result of the falling housing. Always use both eye bolts and screw them in completely.◁

- ▶ Place the upper housing section on the lower housing section.
- ▶ Drive in the dowel pins connecting the upper and lower housing section.
- ▶ Tighten the connecting screws in a crosswise sequence to the recommended tightening torque, see page 51.



① Grease
② Annular slots in upper housing section
③ Serial numbering
④ Dowel pins
⑤ Connecting screws

Figure 46
Mounting
the upper housing section

Final mounting of the seal

Mounting of the labyrinth rings on both sides of the housing is completed by inserting O rings made from FKM. This can be carried out using, for example, a screwdriver with rounded corners.

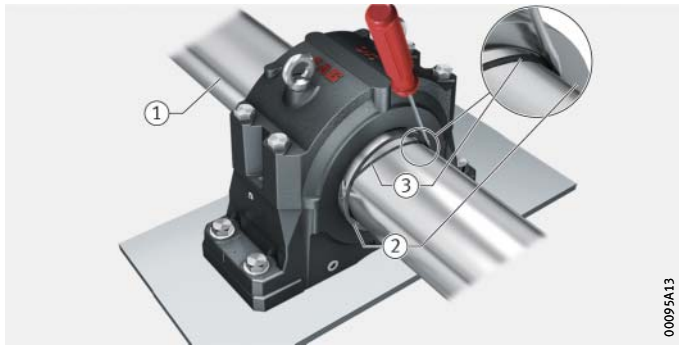
Inserting the O rings, *Figure 47*:

▶ Position the labyrinth ring on the shaft such that is seated centrally in the appropriate annular slot in the housing.

NOTICE

Take care if using sharp-edged tools. Damage to O ring.
Only use rounded tools. ◁

▶ Insert the O ring in the slot in the labyrinth ring.
Rotate the shaft and carefully press the O ring into the slot using a suitable tool.



① Shaft
② Labyrinth ring
③ O ring

Figure 47
Inserting the O ring in the slot in the labyrinth ring

Checking the tightening torques

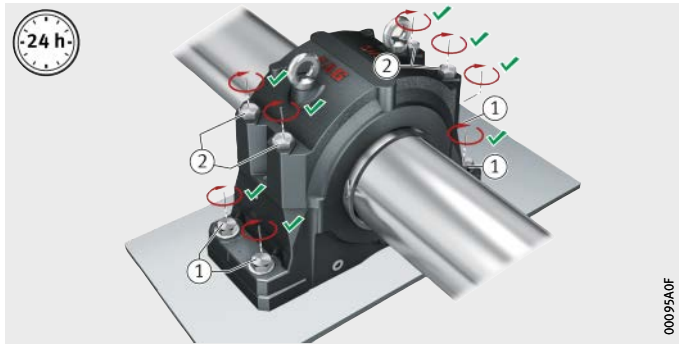
Settling of screw connections can lead to a reduction in screw preload. The tightening torques must therefore be checked after 24 hours of operation.

Checking the tightening torques, *Figure 48*:

▶ Check the tightening torques of the foot screws, see page 50.

▶ Check the tightening torques of the connecting screws, see page 51.

▷ Mounting of the housing is now complete.



① Foot screws
② Connecting screws

Figure 48
Checking the tightening torques

Operating guidelines

Careful maintenance of the housing in conjunction with monitoring of the operating condition of the bearing position makes a significant contribution towards achieving a long operating life and reliable operation.

Maintenance

Regular maintenance must be carried out and the intervals for the various maintenance operations are dependent on the ambient and operating conditions.

WARNING

Danger of death if maintenance operations are carried out on a machine that is still running.

Only carry out maintenance operations when the machine is at a standstill. Take precautions to prevent unintentional startup of the machine. ◁

Regular maintenance operations are as follows:

- Check the alignment of the housing.
- Retighten the foot screws and connecting screws. This should be carried out more frequently at first after commissioning and at longer intervals later.
- Inspect the housing for damage. Any indications such as conspicuous noise or unusual grease escape must also be noted.
- Relubricate the seals. Taconite seals and Bolt-on seals are equipped for this purpose with lubrication nipples. If the ambient air contains high levels of dust, the seals must be relubricated more frequently.
- Carry out a grease change. The housing must be opened and the used grease replaced by new grease.
- As an alternative to a grease change, relubrication can be carried out. For this purpose, a lubrication nipple is provided in the upper housing section. During relubrication, the grease outlet holes in the lower housing section must be left open.
- Clean the housing to remove baked-on material and other coarse contaminants.

NOTICE

If cleaning is not carried out correctly, contamination or moisture may enter the housing.

In the area of the seals in particular, do not use compressed air, steam cleaners or comparable cleaning methods. ◁

Automatic relubrication

For automatic relubrication, Schaeffler offers a range of lubrication systems and lubricators. These supply lubrication points with fresh lubricant automatically, in the defined quantity and at the defined time.

Further information

- IS 1, Mounting and Maintenance of Rolling Bearings.

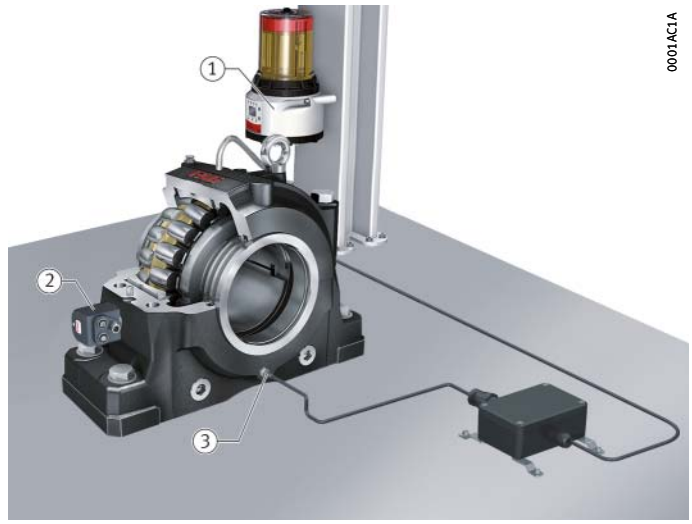
Condition monitoring

Operating condition can be monitored at regular intervals or continuously (Condition Monitoring). The objective is to detect damage at an early stage in order to prevent major damage and long downtime by means of appropriately scheduled repair.

Recommendations for condition monitoring are as follows:

- Vibration monitoring is the most important element of condition monitoring. This can be used to detect rolling bearing damage as well as imbalance or alignment errors.
- Temperature monitoring can be used to detect unusual heating of the housing body, seals or bearing.
- Lubricant monitoring can be carried out by means of a grease sensor in order to assess grease condition and facilitate targeted relubrication.

Schaeffler offers a wide portfolio of products for condition monitoring, with one example of such an application on a plummer block housing SNS shown in *Figure 49*.



① Lubrication system FAG CONCEPT8
② Online monitoring system for vibration diagnosis, FAG SmartCheck
③ Grease sensor FAG GreaseCheck

Figure 49
Plummer block housing SNS, fitted with lubrication system and condition monitoring

Further information

- IS 1, Mounting and Maintenance of Rolling Bearings.

Replacement parts

Seals and other individual parts can be ordered separately as replacement parts. Information on the selection and ordering designation of seals can be found in the dimension tables in TPI 231. If you have any questions, please contact our Engineering Offices.

Further information

- TPI 231, Split Plummer Block Housings SNS.

Appendix
Grease quantities for initial greasing

The grease quantity for initial greasing can be determined for each housing/bearing combination using a basic rule.

Basic rule

For initial greasing, the basic rule is that the bearing should be filled with grease to 100% and the free volume of the housing to 60%. The free volume is the space that remains in the housing once the bearing, adapter sleeve, shaft and seals have been fitted.

Recommended grease quantity for selected housing/bearing combinations

Recommended grease quantity for the initial greasing of selected housing/bearing combinations, see *table*.

The recommended grease quantity in the *table* is stated in grams and takes account of the following:

- filling of the free volume to 60%
- grease with a density of 0,9 g/cm^3.

Recommended grease quantity

Housing		Bearing	Adapter sleeve	Free volume (100%) cm^3	Recommended grease quantity g
SNS22	SNS2264-H-D	22264..-K	H3064	27 550	14 900
SNS30	SNS3036-H-D	23036..-K	H3036	2 900	1 600
	SNS3038-H-D	23038..-K	H3038	3 900	2 250
	SNS3040-H-D	23040..-K	H3040	5 020	3 050
	SNS3044-H-D	23044..-K	H3044	5 770	4 260
	SNS3048-H-D	23048..-K	H3048	7 280	4 550
	SNS3052-H-D	23052..-K	H3052	9 930	6 750
	SNS3056-H-D	23056..-K	H3056	12 500	6 750
	SNS3060-H-D	23060..-K	H3060	14 800	8 000
	SNS3064-H-D	23064..-K	H3064	19 400	10 500
	SNS3068-H-D	23068..-K	H3068	24 000	13 000
	SNS3072-H-D	23072..-K	H3072	30 400	16 450
	SNS3076-H-D	23076..-K	H3076	32 000	17 300
	SNS3080-H-D	23080..-K	H3080	33 500	18 100
	SNS3084-H-D	23084..-K	H3084	35 000	18 900
	SNS3088-H-D	23088..-K	H3088	43 400	23 450
	SNS3092-H-D	23092..-K	H3092	56 600	30 600
	SNS3096-H-D	23096..-K	H3096	55 200	29 850
	SNS30/500-H-D	230/500..-K	H30/500	55 200	29 850
	SNS30/530-H-D	230/530..-K	H30/530	67 500	36 450

Recommended grease quantity (continued)

Housing		Bearing	Adapter sleeve	Free volume (100%) cm^3	Recommended grease quantity g
SNS31	SNS3134-H-D	23134..-K	H3134	2 900	1 600
	SNS3136-H-D	23136..-K	H3136	3 810	2 060
	SNS3138-H-D	23138..-K	H3138	5 030	2 720
	SNS3140-H-D	23140..-K	H3140	6 780	3 660
	SNS3144-H-D	23144..-K	H3144	7 520	4 060
	SNS3148-H-D	23148..-K	H3148	10 100	5 990
	SNS3152-H-D	23152..-K	H3152	11 650	6 300
	SNS3156-H-D	23156..-K	H3156	12 550	6 800
	SNS3160-H-D	23160..-K	H3160	17 200	9 300
	SNS3164-H-D	23164..-K	H3164	21 250	11 500
	SNS3168-H-D	23168..-K	H3168	27 550	14 900
	SNS3172-H-D	23172..-K	H3172	28 500	15 400
	SNS3176-H-D	23176..-K	H3176	28 300	15 300
	SNS3180-H-D	23180..-K	H3180	36 450	19 700
	SNS3184-H-D	23184..-K	H3184	45 550	24 600
	SNS3188-H-D	23188..-K	H3188	48 300	26 100
	SNS3192-H-D	23192..-K	H3192	52 000	28 100
	SNS3196-H-D	23196..-K	H3196	55 000	29 700
SNS32	SNS3234-H-D	23234..-K	H2334	5 350	2 900
	SNS3236-H-D	23236..-K	H2336	5 350	2 900
	SNS3238-H-D	23238..-K	H2338	6 500	3 510
	SNS3240-H-D	23240..-K	H2340	6 900	3 760
	SNS3244-H-D	23244..-K	H2344	10 000	5 400
	SNS3248-H-D	23248..-K	H2348	10 200	5 550
	SNS3252-H-D	23252..-K	H2352	15 500	8 400
	SNS3256-H-D	23256..-K	H2356	15 500	8 400
	SNS3260-H-D	23260..-K	H3260	19 000	10 300
	SNS3264-H-D	23264..-K	H3264	25 300	13 700
	SNS3268-H-D	23268..-K	H3268	25 000	13 500
	SNS3272-H-D	23272..-K	H3272	26 800	14 500
	SNS3276-H-D	23276..-K	H3276	38 600	20 850
	SNS3280-H-D	23280..-K	H3280	44 100	23 850
	SNS3284-H-D	23284..-K	H3284	45 000	24 350
	SNS3288-H-D	23288..-K	H3288	49 400	26 700

Information on the recommended grease quantity for other housing/bearing combinations is available by agreement.

Nominal screw sizes and tightening torques for foot screws

Foot screws are used for screw mounting the housing to the locating surface. They are not included in the scope of delivery of the housings.

Nominal screw sizes, see *table*.

Nominal sizes of foot screws for plummer block housings SNS

Plummer block housing					Nominal screw size
SNS22	SNS30	SNS31	SNS32	SNS40	
–	SNS3036	SNS3134	SNS3234	–	M24
–	SNS3038	SNS3136	SNS3236	–	
–	SNS3040	SNS3138	–	–	
–	SNS3044	SNS3140	SNS3238	–	M30
–	SNS3048	SNS3144	SNS3240	–	
–	SNS3052	SNS3148	SNS3244	–	
SNS2264	SNS3056	SNS3152	SNS3248	SNS4076	M36
–	SNS3060	SNS3156	SNS3252	SNS4080	
–	SNS3064	SNS3160	SNS3256	SNS4084	
–	SNS3068	SNS3164	SNS3260	–	
–	SNS3072	SNS3168	SNS3264	–	
–	SNS3076	SNS3172	SNS3268	–	
–	SNS3080	SNS3176	–	–	
–	SNS3084	–	–	–	
–	SNS3088	SNS3180	SNS3272	SNS4088	M42
–	SNS3092	SNS3184	SNS3276	SNS4092	
–	SNS3096	SNS3188	SNS3280	SNS4096	
–	SNS30/500	SNS3192	SNS3284	SNS40/500	
–	SNS30/530	SNS3196	SNS3288	SNS40/530	M48

The following table contains tightening torques for metric coarse pitch threads in accordance with DIN ISO 962 and DIN ISO 965-2 as well as head contact dimensions in accordance with DIN 931, DIN EN ISO 4017, DIN EN ISO 4032, DIN EN ISO 4762, DIN 6912, DIN 7984, DIN 7990 and DIN EN ISO 8673.

The maximum tightening torques are valid with 90% utilisation of the yield stress of the screw material 8.8 and a friction factor of 0,14. We recommend that foot screws should be tightened to 70% of these values, see *table*.

Tightening torques for foot screws with metric thread in accordance with DIN ISO 962 and DIN ISO 965-2

Nominal screw size	Maximum tightening torque Nm	Recommended tightening torque Nm
M24	740	520
M30	1 450	1 020
M36	2 600	1 820
M42	4 000	2 800
M48	6 000	4 200

Tightening torques for connecting screws

Connecting screws are used for screw mounting the upper housing section to the lower housing section. They are included in the scope of delivery of the housing.

Recommended housing tolerances, see *table*.

Tightening torques for connecting screws

Screws in accordance with DIN EN ISO 4014 Material 8.8	Recommended tightening torque Nm
M24	559
M30	1 118
M36	1 945
M42	2 794

Tightening torques with seals

In the case of the Bolt-on seal, there are screws for connecting:

- the upper carrier half to the lower carrier half
- the two carrier halves to the housing
- the cover to the housing
  (only where the housing is closed on one side).

Depending on the size of the housing, the screws have a thread to M8 or M10. They are included in the scope of delivery of the seal.

Recommended housing tolerances, see *table*.

Tightening torques for screws for the Bolt-on seal

Nominal screw size	Recommended tightening torque Nm
M8	19
M10	38

In the case of the split labyrinth seal, there are screws for connecting the two halves of the labyrinth ring, see *table*.

Tightening torques for screws for the split labyrinth seal

Nominal screw size	Recommended tightening torque Nm
M6	8

Reduction in the radial internal clearance and drive-up distance

In the mounting of bearings with a tapered bore and adapter sleeve, the bearing is slid onto the taper of the adapter sleeve. If the values specified for the drive-up distance on the taper and the reduction in the radial internal clearance are observed, this will ensure a rigid seat on the shaft, see *table*.

Reduction in the radial internal clearance and drive-up distance on the taper 1:12

Nominal bearing bore diameter d		Reduction in radial internal clearance		Drive-up distance on taper 1:12				Minimum radial internal clearance after mounting, control value for		
				Shaft		Sleeve		Group N	Group 3	Group 4
mm		mm		mm		mm		mm	mm	mm
over	incl.	min.	max.	min.	max.	min.	max.	min.	min.	min.
100	120	0,05	0,07	0,7	1,1	0,8	1,2	0,05	0,065	0,1
120	140	0,065	0,09	1,1	1,4	1,2	1,5	0,055	0,08	0,11
140	160	0,075	0,1	1,2	1,6	1,3	1,7	0,055	0,09	0,13
160	180	0,08	0,11	1,3	1,7	1,4	1,9	0,06	0,1	0,15
180	200	0,09	0,13	1,4	2	1,5	2,2	0,07	0,1	0,16
200	225	0,1	0,14	1,6	2,2	1,7	2,4	0,08	0,12	0,18
225	250	0,11	0,15	1,7	2,4	1,8	2,6	0,09	0,13	0,2
250	280	0,12	0,17	1,9	2,6	2	2,9	0,1	0,14	0,22
280	315	0,13	0,19	2	3	2,2	3,2	0,11	0,15	0,24
315	355	0,15	0,21	2,4	3,4	2,6	3,6	0,12	0,17	0,26
355	400	0,17	0,23	2,6	3,6	2,9	3,9	0,13	0,19	0,29
400	450	0,2	0,26	3,1	4,1	3,4	4,4	0,13	0,2	0,31
450	500	0,21	0,28	3,3	4,4	3,6	4,8	0,16	0,23	0,35
500	560	0,24	0,32	3,7	5	4,1	5,4	0,17	0,25	0,36
560	630	0,26	0,35	4	5,4	4,4	5,9	0,2	0,29	0,41

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