



Hydraulic Nuts HYDNUT..-E, HYDNUT..-E-INCH, HYDNUT..-HEAVY

User manual

Foreword

New designation The new hydraulic nuts HYDNUT..-E(-INCH) can be identified from the -E in the designation. The E stands for Enhanced and refers to many improvements to the hydraulic nuts. However, improvements have also been made to the HYDNUT..-HEAVY series.

Measuring the drive-up distance At first sight, it is not possible to identify the new piston form for hydraulic nuts HYDNUT..-E(-INCH), but it is precisely this characteristic that gives a major advantage: the drive-up distance can be measured simply using a conventional dial gauge. This is fitted in the hole for the dial gauge and is located by hand using a knurled clamping screw made from plastic. The tip of the measuring pin lies flat on the new collar of the piston, which means that the stroke can be measured precisely.

Marking The marking is also a new feature. Each hydraulic nut is marked with the maximum permissible pressure and the thread present. This facilitates reliable operation and damage-free mounting.

Mounting and dismounting Mounting and dismounting of a HYDNUT..-E(-INCH) is aided by the hand lever now supplied. This is inserted in a handling hole and, as a result, the hydraulic nut can be easily screwed and unscrewed. If maintenance or repair of a HYDNUT..-E(-INCH) becomes necessary at any time, the dismounting screws made from burnished steel and complete with brass stud give considerable benefit in dismounting. The annular piston can thus be unscrewed uniformly from the press ring.

The maximum stroke is indicated by a red O-ring, thus reliably preventing excessive outward movement of the piston and all the resulting consequences. Simple visual inspection is sufficient during use.

Current version A current version of this user manual can be found at <http://medien.schaeffler.com> using the search term BA04.

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Hydraulic nuts HYDNUT

About the user manual	This user manual is part of the product and contains important information.
Symbols	The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.
 WARNING	In case of non-compliance, death or serious injury may occur. ◀
 CAUTION	In case of non-compliance, minor or moderate injury may occur. ◀
 NOTICE	In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur. ◀
Availability	This user manual is supplied with each hydraulic nut and can also be ordered retrospectively. An electronic version (.pdf) is available in the Mediathek on the Schaeffler page of the Internet.
 WARNING	Serious injuries may occur due to the escape under high pressure of hydraulic oil in the absence of important information for the user since the user manual is incomplete, illegible or absent. As the safety coordinator, you must ensure that this user manual is always complete and legible and that any persons using hydraulic nuts have the user manual available. ◀
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 devices that have already been delivered. Schaeffler Technologies AG & Co. KG accepts no liability for any damage or malfunctions if the device or accessories have been modified or used in an inappropriate manner.
Original user manual	The original user manual is taken to be a user manual in the German language. A user manual in another language is to be taken as a translation of the original user manual.

General safety guidelines	This section describes how the hydraulic nut may be used, who may use the hydraulic nut and what must be observed in general during its use.
Usage for the intended purpose	In the case of hydraulic nuts, usage for the intended purpose comprises the mounting and dismounting of rolling bearings as well as the mounting and loosening of press fits such as ships' propellers and rubber blades, shaft couplings and gears.
Usage not for the intended purpose	The hydraulic nut must not be used to lift loads. Unilateral loading is not possible, instead load must be applied uniformly over the circumference of the annular piston. Usage not for the intended purpose can lead to injury or damage.
Qualified personnel	The hydraulic nut must only be used by suitably qualified personnel. A person defined as qualified personnel: <ul style="list-style-type: none">■ has all the necessary knowledge■ has been trained in working on rolling bearings and hydraulic tools■ is aware of all the hazards and safety guidelines■ is authorised to use a hydraulic nut by the safety co-ordinator■ has fully read and understood this user manual
Hazards	If a hydraulic nut is damaged, hydraulic oil may be sprayed out under high pressure. For this reason, only an undamaged hydraulic nut may be used and repairs to the hydraulic nut are therefore prohibited.
Protective equipment	Personal protective equipment is intended to protect personnel against health hazards. This comprises safety goggles, safety shoes and gloves and must be used for personal safety.

Hydraulic nuts HYDNUT

Safety regulations	The following safety specifications must be observed when working with the hydraulic nut. Further guidelines on hazards and specific operating procedures can be found, for example, in the descriptions of the operation of hydraulic nuts, see page 41. Safety specifications for the pressure generation device can be found in the user manual of the pressure generation device.
Transport	If the ambient conditions during transport differ to a large extent from the ambient conditions specified for its operation, usage of the hydraulic nut must be stopped immediately. The hydraulic nut must always be stored and operated under the ambient conditions described. Before storage, preservative must be applied to the hydraulic nut in order to give protection against corrosion. Unsuitable ambient conditions can endanger the health of the operating personnel. The hydraulic nut must not be operated at a pressure greater than the maximum permissible operating pressure. These ambient conditions are as follows: <ul style="list-style-type: none">■ humidity max. 65%, non-condensing■ no aggressive chemicals in the environment■ temperature from +5 °C to +40 °C■ clean environment
Maintenance	The hydraulic nut must undergo regular maintenance, see page 60. Only original replacement parts may be used.
Conversion	The hydraulic nut must not be converted.

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Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Scope of delivery

The scope of delivery comprises the hydraulic nut, accessories and user manual, see *table* and *Figure 1*.

Hydraulic nuts HYDNUT..-E(-INCH)

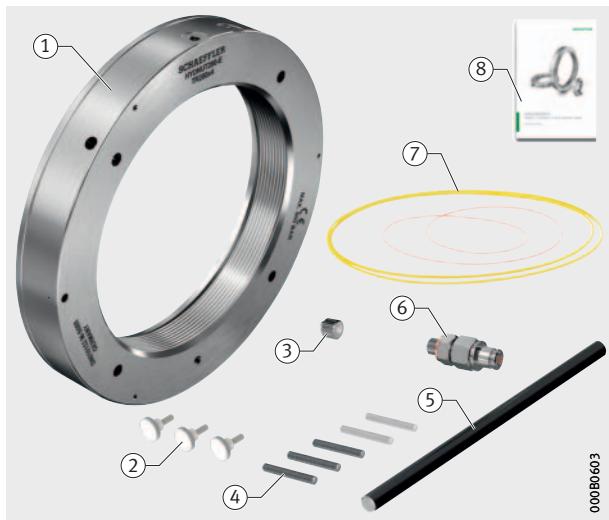
Component	Designation	Quantity
Hydraulic nut	HYDNUT	1
Clamping screw	–	3
Screw plug (G1/4)	HYDNUT.PLUG	2
Dismounting screw ¹⁾	–	3 5
Valve nipple (G1/4)	PUMP1000.VALVE-NIPPLE	1
Hand lever ²⁾	HYDNUT-HANDHEBEL-D10	1
	HYDNUT-HANDHEBEL-D12	1
	HYDNUT-HANDHEBEL-D16	1
Seal set (replacement outer seal, replacement inner seal and red O-ring)	HYDNUT.SEAL	1
User manual	–	1

1) Allocation, see *tables*, page 16.

2) Allocation, see *tables*, page 15.

- ① Hydraulic nut
- ② Clamping screws
- ③ Screw plug
- ④ Dismounting screws
- ⑤ Hand lever
- ⑥ Valve nipple
- ⑦ Replacement seals for outer side,
inner side and red O-ring
- ⑧ User manual

Figure 1
Scope of delivery
HYDNUT..-E(-INCH)



000B0603

Accessories	Hydraulic nuts are supplied with the appropriate replacement seals. Other accessories are available, see page 68.
Further information	<p>The scope of delivery does not include the following documents:</p> <ul style="list-style-type: none">■ TPI 195, Pressure Generation Devices■ TPI 196, Hydraulic Nut HYDNUT■ MH 1, Mounting of Rolling Bearings■ WL 80110, Reduction in Radial Internal Clearance in Mounting of Spherical Roller Bearings with Tapered Bore
Damage during transit	Any damage during transit must be reported as a complaint to the carrier.
Defects	Any defects must be reported promptly to Schaeffler Technologies AG & Co. KG.

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Description

All hydraulic nuts are of a similar design. They have a metric, trapezoidal or inch size thread on the inner cylindrical surface of the press ring. Accessories are necessary for operation.

A hydraulic nut comprises a press ring, in which a movable annular piston is located. Between these two components is a pressure chamber filled with hydraulic oil. This is sealed by means of two seals, *Figure 2*.

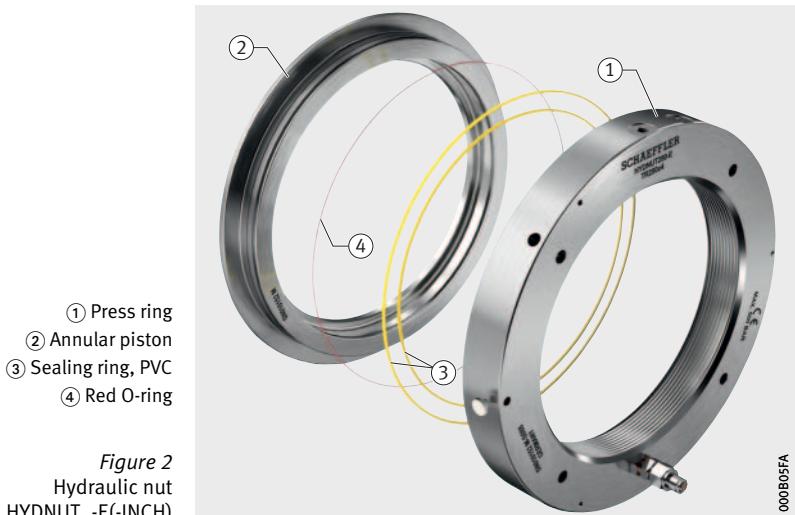


Figure 2
Hydraulic nut
HYDNUT..-E(-INCH)

Press ring

The single piece press ring made from steel supports the movable annular piston.

Annular piston

The single piece annular piston is made from steel. The annular piston has two slots for sealing rings and one flat slot for the red O-ring.

Sealing rings

Two sealing rings made from soft PVC are inserted in corresponding slots in the annular piston and seal off the pressure chamber between the annular piston and the press ring. This prevents escape of the hydraulic oil from the pressure chamber.

Red O-ring

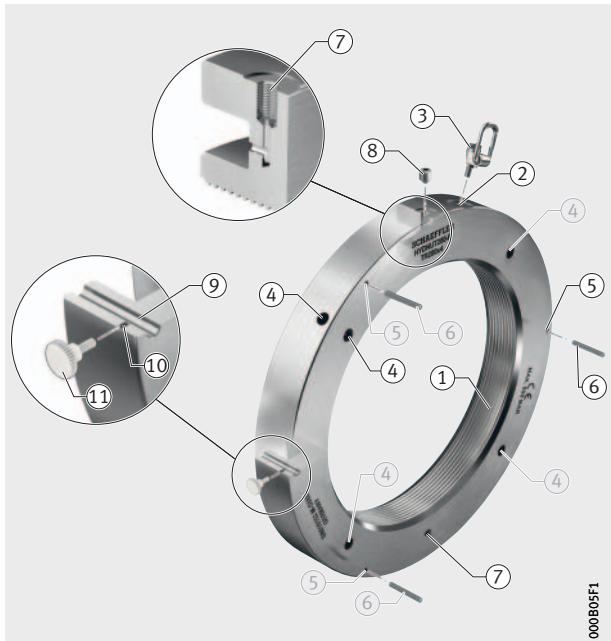
The red O-ring is made from PVC and indicates that the annular piston may only be moved out as far as this position.

Press ring The single piece steel press ring supports the movable annular piston and has a thread on the inner cylindrical surface, *Figure 3*.

- ① Thread on inner cylindrical surface
- ② Threaded hole for folding clevis
- ③ Folding clevis
- ④ Handling hole
- ⑤ Threaded hole for dismounting screw
- ⑥ Dismounting screw
- ⑦ Threaded hole G1/4
- ⑧ Screw plug, W 6
- ⑨ Hole for dial gauge, diameter 8 mm
- ⑩ Threaded hole for clamping screw
- ⑪ Clamping screw, M4

Figure 3
Press ring HYDNUT..E-INCH

Thread on inner cylindrical surface



In order to allow mounting on the thread of a shaft, withdrawal sleeve or adapter sleeve, the inner cylindrical surface has a metric fine pitch thread, a trapezoidal thread or an inch size thread.

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Threaded hole for folding clevis A suitable folding clevis can be screwed into this threaded hole in the outer cylindrical surface.

The threaded hole is available from HYDNUT270-E or 280-E-INCH.

HYDNUT..-E

Designation	Thread
from	to
HYDNUT270-E	HYDNUT395-E
HYDNUT400-E	HYDNUT900-E
HYDNUT930-E	HYDNUT1180-E

HYDNUT..-E-INCH

Designation	Thread
from	to
HYDNUT280-E-INCH	HYDNUT380-E-INCH
HYDNUT400-E-INCH	HYDNUT900-E-INCH
HYDNUT950-E-INCH	–

Folding clevis

If there is a threaded hole for a folding clevis, then a folding clevis of sufficient load carrying capacity (not included in the scope of delivery) can be used to transport the complete hydraulic nut.

Alternatively, a round sling or steel rope of sufficient load carrying capacity can be used for transport. The steel rope may only be wrapped around the outer cylindrical surface of the press ring.

Handling holes Depending on the size, there are two, four or six pairs of handling holes. In each case, two holes are always arranged opposite each other, with one hole in the end face and the other in the outer cylindrical surface. If the hand lever is inserted in the handling hole, the press ring can be rotated more easily.

HYDNUT..-E

Designation		Quantity	Diameter mm
from	to		
HYDNUT50-E	HYDNUT200-E	2×2	10
HYDNUT205-E	HYDNUT395-E	4×2	12
HYDNUT400-E	HYDNUT1180-E	6×2	16

HYDNUT..-E-INCH

Designation		Quantity	Diameter mm
from	to		
HYDNUT50-E-INCH	HYDNUT200-E-INCH	2×2	10
HYDNUT220-E-INCH	HYDNUT380-E-INCH	4×2	12
HYDNUT400-E-INCH	HYDNUT950-E-INCH	6×2	16

A hand lever made from steel is included in the scope of delivery.

NOTICE

Damage to the handling holes and thus irreparable damage to the press ring due to the use of an unsuitable hand lever.

Only use hand levers that are of precisely the stated diameter and up to the maximum stated length. ◀

Hand lever for HYDNUT..-E

Designation		Length mm	Diameter mm
from	to		
HYDNUT50-E	HYDNUT200-E	150	10
HYDNUT205-E	HYDNUT395-E	250	12
HYDNUT400-E	HYDNUT1180-E	300	16

Hand lever for HYDNUT..-E-INCH

Designation		Length mm	Diameter mm
from	to		
HYDNUT50-E-INCH	HYDNUT200-E-INCH	150	10
HYDNUT220-E-INCH	HYDNUT380-E-INCH	250	12
HYDNUT400-E-INCH	HYDNUT950-E-INCH	300	16

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Threaded holes for dismounting screws	The press ring has three or five threaded holes for dismounting screws. If all dismounting screws are uniformly tightened, the annular piston is pressed out of the press ring, see page 61.																														
Dismounting screws	At the time of delivery, dismounting screws made of burnished steel with brass stud similar to ISO 4028 are screwed into the dismounting holes and are used for dismounting of the annular piston.																														
HYDNUT..-E	<table><thead><tr><th colspan="2">Designation</th><th>Quantity</th><th>Thread</th></tr><tr><th>from</th><th>to</th><th></th><th></th></tr></thead><tbody><tr><td>HYDNUT50-E</td><td>HYDNUT200-E</td><td>3</td><td>M5</td></tr><tr><td>HYDNUT205-E</td><td>HYDNUT395-E</td><td>3</td><td>M6</td></tr><tr><td>HYDNUT400-E</td><td>HYDNUT560-E</td><td>5</td><td>M8</td></tr><tr><td>HYDNUT570-E</td><td>HYDNUT900-E</td><td>5</td><td>M10</td></tr><tr><td>HYDNUT930-E</td><td>HYDNUT1180-E</td><td>5</td><td>M12</td></tr></tbody></table>			Designation		Quantity	Thread	from	to			HYDNUT50-E	HYDNUT200-E	3	M5	HYDNUT205-E	HYDNUT395-E	3	M6	HYDNUT400-E	HYDNUT560-E	5	M8	HYDNUT570-E	HYDNUT900-E	5	M10	HYDNUT930-E	HYDNUT1180-E	5	M12
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HYDNUT600-E-INCH	HYDNUT900-E-INCH	5	M10																												
HYDNUT950-E-INCH	-	5	M12																												
Threaded holes G¹/₄	<p>The press ring has two oil ducts. Each oil duct runs to the outside and ends in a threaded hole G¹/₄. The radial threaded hole is in the outer cylindrical surface, the axial threaded hole is on the end face of the press ring. The two threaded holes are offset by 180°.</p> <p>At the time of delivery, a valve nipple is screwed into the radial threaded hole G¹/₄. At the time of delivery, a screw plug is screwed into the axial threaded hole G¹/₄.</p> <p>During operation, the valve nipple can be screwed into the radial or axial threaded hole G¹/₄. This depends on which threaded hole G¹/₄ is more accessible. The other threaded hole G¹/₄ must be closed off with the screw plug.</p>																														

Screw plug	At the time of delivery, a screw plug is screwed into the axial threaded hole G ¹ / ₄ . A second screw plug is included in the scope of delivery.
Hole for dial gauge	The hole through the press ring is used to locate a dial gauge and has a diameter of 8 mm.
Threaded hole for clamping screw	At an angle of 90° to the hole for the dial gauge is a threaded hole for locating a clamping screw.
Clamping screw	The clamping screw made from plastic is knurled and can be tightened or loosened without the use of a tool. It locates the clamping shank of the mounted dial gauge. The material of the screw was selected such that the clamping shank is not damaged by the screw.

HYDNUT..-E

Designation		Length	Thread
from	to	mm	
HYDNUT50-E	HYDNUT260-E	6	M4
HYDNUT270-E	HYDNUT510-E	10	M4
HYDNUT520-E	HYDNUT1180-E	16	M4

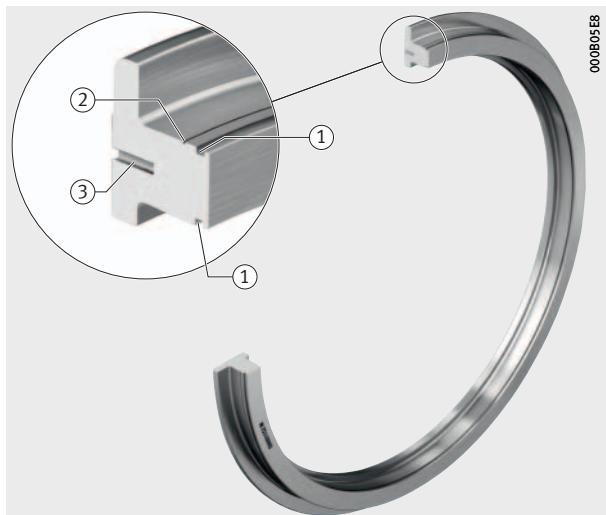
HYDNUT..-E-INCH

Designation		Length	Thread
from	to	mm	
HYDNUT50-E-INCH	HYDNUT260-E-INCH	6	M4
HYDNUT280-E-INCH	HYDNUT500-E-INCH	10	M4
HYDNUT530-E-INCH	HYDNUT950-E-INCH	16	M4

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Annular piston

The single piece annular piston is made from steel. The annular piston has two slots for sealing rings and one flat slot for the red O-ring. At or above a stipulated size, there are three threaded holes in the annular piston, *Figure 4*.



- ① Slot for sealing ring
- ② Slot for red O-ring
- ③ Threaded hole for eye bolt

Figure 4
Annular piston

Slots for sealing rings

Two slots support the sealing rings made from soft PVC.

Slot for red O-ring

A flat slot supports the red O-ring made from PVC.

Threaded holes for eye bolts

In the case of hydraulic nuts HYDNUT400-E(-INCH) or larger, there are three threaded holes in the annular piston. At the pitch circle, the holes have a spacing of 120° to each other. If eye bolts are screwed into these threaded holes, the annular piston can be transported by means of a lifting device, see page 62.

HYDNUT..-E

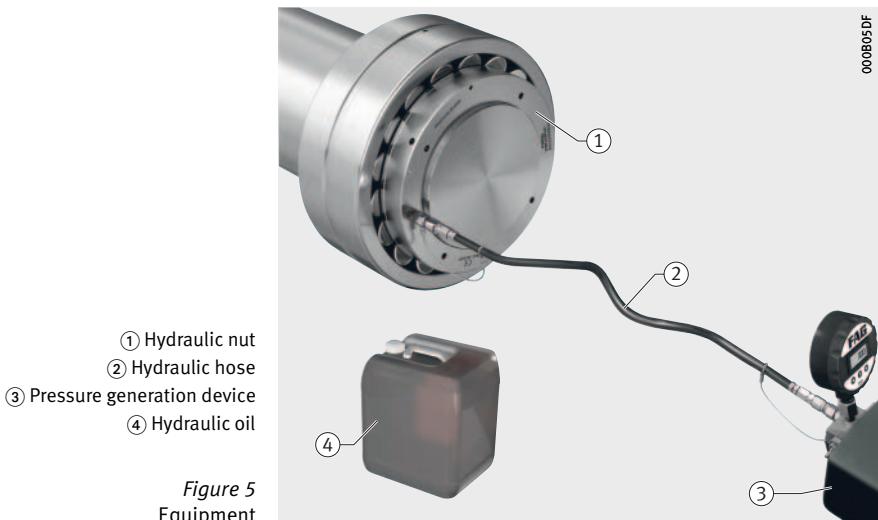
Designation		Thread
from	to	
HYDNUT400-E	HYDNUT930-E	3×M6
HYDNUT950-E	HYDNUT1180-E	3×M8

HYDNUT..-E-INCH

Designation		Thread
from	to	
HYDNUT400-E-INCH	HYDNUT900-E-INCH	3×M6
HYDNUT950-E-INCH	-	3×M8

Other components

In addition to the hydraulic nut, a hydraulic hose and a pressure generation device filled with hydraulic oil are required for operation, *Figure 5*.



Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Hydraulic hose	<p>The following specifications are only a selection. Ensure that all guidelines from the manufacturer are observed.</p> <p>The hydraulic hose:</p> <ul style="list-style-type: none">■ must fulfil all legal requirements valid at the point of use■ must be checked before each use■ must not be damaged■ must be approved for the operating pressure■ must be suitable for the hydraulic oil used■ must not exceed the maximum permissible operating period <p>Further information on the hydraulic hose used is given in the documentation for the hydraulic hose.</p>
Pressure generation device	<p>The points stated below are only a selection. Ensure that all guidelines from the manufacturer of the pressure generation device are observed.</p> <p>The pressure generation device:</p> <ul style="list-style-type: none">■ must fulfil all legal requirements valid at the point of use■ must be checked before each use■ must not be damaged■ may only be operated at a pressure that is lower than the maximum permissible pressure of the hydraulic nut■ must have a sufficiently large tank, see page 40 <p>Further information on the pressure generation device used is given in the documentation for the pressure generation device.</p>
Hydraulic oil	<p>The hydraulic oil used must correspond to a particular viscosity class, see page 68.</p>

Function The sealing rings in the annular piston create an outwardly sealed pressure chamber between the press ring and annular piston. A pressure generation device filled with hydraulic oil is connected to this pressure chamber via a hydraulic hose.

In the pressure generation device, hydraulic oil is placed under high pressure and flows into the pressure chamber. The annular piston undergoes movement, *Figure 6*.

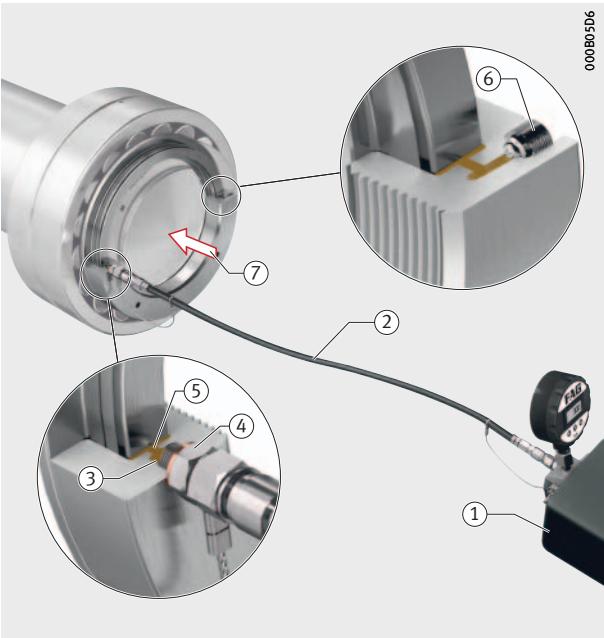


Figure 6
Functional principle

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Mounting

In the mounting of rolling bearings, the end face of the annular piston presses on the end face of the bearing inner ring, withdrawal sleeve or mounting plate, *Figure 7*.

Mounting on and dismounting from an adapter sleeve can be carried out using the oil pressure method. In this method, an additional pressure generation device is used to press hydraulic oil between the fit surfaces of the sleeve and bearing inner ring as well as between the sleeve and shaft.

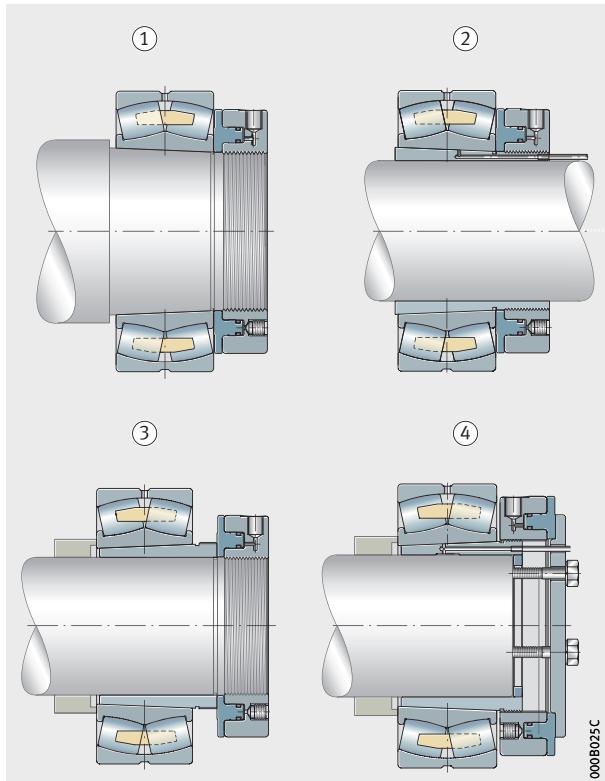


Figure 7
Mounting method

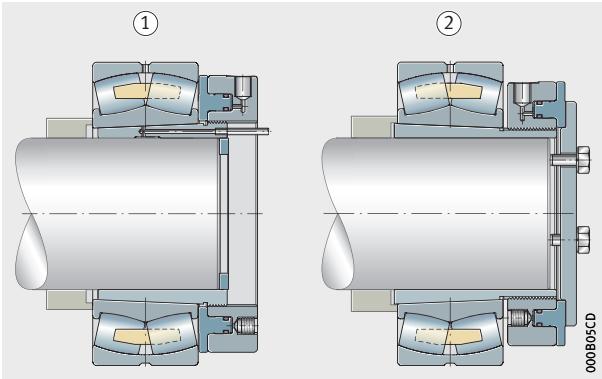
Dismounting

If the rolling bearing is mounted on an adapter sleeve or withdrawal sleeve, the bearing can be dismounted from the sleeve using the hydraulic nut, *Figure 8*.

If mounting is carried out directly on the shaft, the hydraulic nut can not be used for dismounting. However, the hydraulic nut can remain mounted on the shaft in dismounting and intercepts the bearing when it abruptly becomes loose in dismounting.

① Dismounting with withdrawal sleeve
② Dismounting with adapter sleeve

Figure 8
Dismounting method



Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Commissioning

Commissioning comprises the following steps:

- checking the hydraulic nut
- lifting the hydraulic nut out of the transport container and transporting the hydraulic nut
- preparation for mounting
- mounting the hydraulic nut
- applying the mounting ring, optional
- applying the intermediate ring, optional
- selecting and mounting the dial gauge
- selecting the pressure generation device

Checking the hydraulic nut

Before use, it is advisable to check whether the hydraulic nut is suitable for the thread present. The press ring has the diameter and thread information engraved on the surface, *Figure 9*.

① Diameter and thread information

Figure 9
Checking the hydraulic nut



Check also whether the thread is damaged. A hydraulic nut with a damaged thread must not be used, since it can damage the thread on the shaft.

Lifting the hydraulic nut out of the transport container and transporting the hydraulic nut

A hydraulic nut can be delivered lying flat either in a rigid box or a wooden crate. Smaller hydraulic nuts can be lifted out of the box and carried due to their low mass. Larger and thus heavier hydraulic nuts must be lifted using a suitable lifting tool. Lifting must always be carried out by the press ring, the threads of the annular piston are not suitable for transport of the complete hydraulic nut.

WARNING

If a hydraulic nut with threaded holes in the annular piston is lifted by the annular piston and transported horizontally, the press ring may become loose and fall. A falling press ring can cause serious injury.

Always transport hydraulic nuts vertically. 

CAUTION

If a small hydraulic nut is carried horizontally with the annular piston facing down, the annular piston may become loose and fall. A falling annular piston can cause injury to legs and feet.

Hydraulic nuts should always be transported with the annular piston facing up or vertically. 

WARNING

If the annular piston is moved out further than the red O-ring, it may become loose during transport. The falling annular piston can cause injury.

Before transport, press in the annular piston until the red O-ring is no longer visible. 

WARNING

An unsuitable lifting tool can fail. A falling hydraulic nut can cause injury.

Use a suitable lifting tool that can safely support the mass of the hydraulic nut. Ensure that nobody is underneath the hydraulic nut at any time during transport. Secure the hazard area. 

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

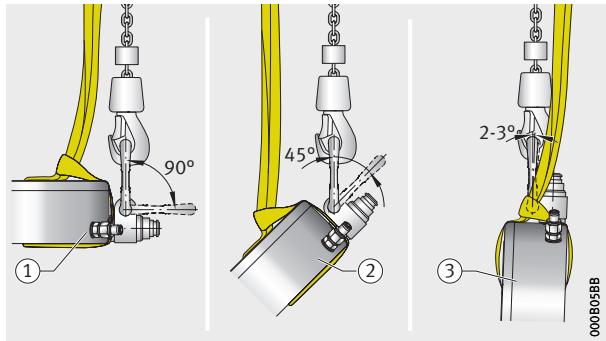
WARNING

Serious injury caused by a falling hydraulic nut due to failure of an unsuitable clevis.

Only use a folding clevis that is suitable for all lifting positions (angles), *Figure 10*. ▶

- ① Hydraulic nut, lying flat
- ② Hydraulic nut, lifted half way
- ③ Hydraulic nut, suspended

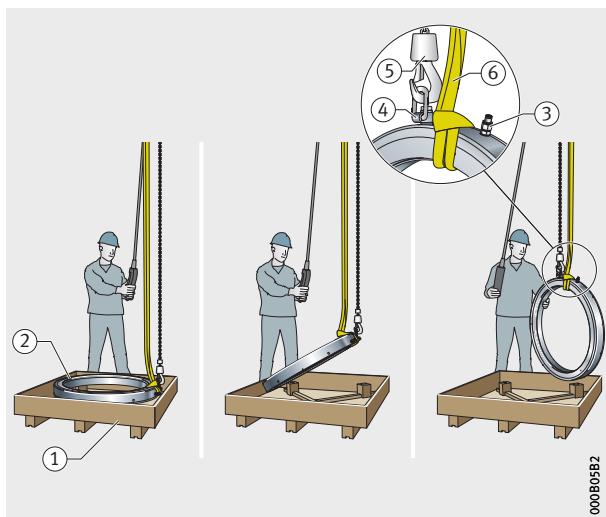
Figure 10
Lifting positions



- ▶ Screw in the folding clevis (if there is a threaded hole for the clevis in the outer cylindrical surface of the press ring).
- ▶ Hang a hook in the folding clevis or thread in a carrying sling.
- ▶ Fit the securing belt.
- ▶ Slowly lift the hydraulic nut until it hangs vertical, *Figure 11*.

- ① Wooden crate
- ② Hydraulic nut
- ③ Valve nipple
- ④ Folding clevis
- ⑤ Hook
- ⑥ Securing belt

Figure 11
Delivered condition



- ▶ Transport the hydraulic nut without shocks or vibration.

Preparation for mounting

The valve nipple is checked as follows:

- ▶ Check optically whether the thread of the valve nipple is damaged. If the thread is damaged, use a new valve nipple, *Figure 12*.

① Valve nipple
② Seal

Figure 12
Valve nipple

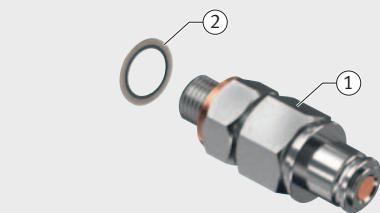
- ▶ Check optically whether the seal is damaged, *Figure 13*. Replace any damaged seal.

① New
② Damaged

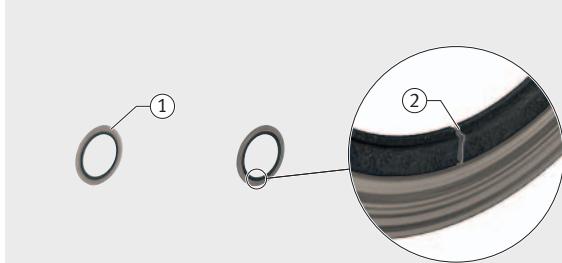
Figure 13
Sealing

A seal with the following characteristics is suitable:

- Type:
 - CEJN rubber/metal seal
- Operating pressure:
 - 1500 bar
- Dimensions:
 - G¹/₄ (20,57 mm×13,74 mm×3 mm)
- Material:
 - high grade steel/fluoro rubber (FKM)



000BG5A9



000BG5A0

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Before mounting a hydraulic nut with thread, the shaft or sleeve must be secured so that it cannot rotate. In addition, the threads of the shaft or sleeve must be checked, *Figure 14*.

NOTICE

Damage to the mating thread during screw mounting if a thread is damaged.

Check the thread of the shaft or sleeve. Repair any damaged thread if possible. A hydraulic nut must not be screwed onto a damaged thread. 

NOTICE

Damage to the thread through scoring if a lubricant is not used.

Apply lubricant to the thread of the hydraulic nut, for example using ARCANOL-MOUNTING-PASTE. 

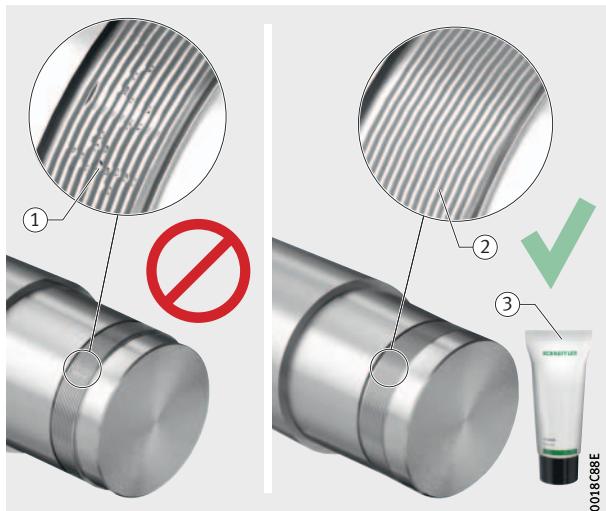


Figure 14
Preparation

Mounting the hydraulic nut

In mounting, the method used depends on the mass of the hydraulic nut.

Mounting a light hydraulic nut

A light hydraulic nut can be mounted manually, *Figure 15*:

- ▶ Rotate the hydraulic nut until the start of the thread on the hydraulic nut and the start of the thread on the shaft journal or sleeve coincide.
- ▶ Align the hydraulic nut exactly parallel and concentrically to the shaft.

WARNING

Injuries due to a hydraulic nut becoming loose from the shaft and falling because too few thread turns were engaged.

At least half the thread width must be engaged. ◀

NOTICE

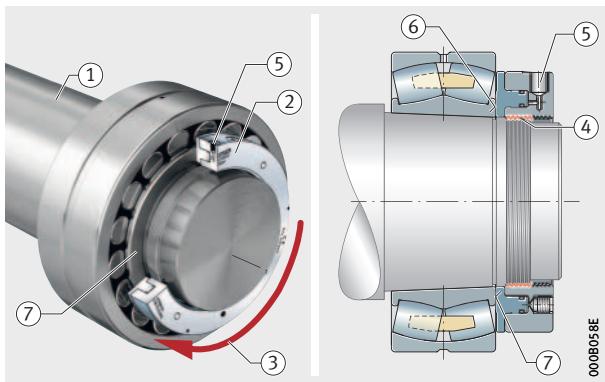
If the thread of the shaft journal or sleeve is subjected during mounting to the mass of the hydraulic nut, scoring may occur in the thread.

Lift the hydraulic nut slightly and prevent the thread from being subjected to load by the whole mass of the hydraulic nut. ◀

- ▶ Screw the hydraulic nut into place (right hand thread) until the end face of the annular piston is in contact with the end face of the bearing inner ring.
- ▶ Loosen the hydraulic nut as necessary until the axial or radial threaded hole G¹/₄ is in the upper position.
- ▶ If necessary, apply a mounting ring, see page 36.
- ▷ The hydraulic nut is mounted and can be bled.

- ① Shaft
- ② Hydraulic nut
- ③ Rotary motion
- ④ Half thread width of press ring
- ⑤ Radial threaded hole G¹/₄, upper position
- ⑥ Annular piston, end face
- ⑦ Inner ring, end face

Figure 15
Mounting



Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Mounting a heavy hydraulic nut

A heavy hydraulic nut cannot be mounted manually. A mounting aid should be used on which the hydraulic nut is supported with the facility for rotation and axial displacement.

⚠ WARNING

If the hydraulic nut tilts or falls from the mounting aid, this can cause serious crushing of body parts.

Use an auxiliary device for screw mounting that has sufficient load carrying capacity and tilting rigidity. During mounting, secure the hydraulic nut against tilting and falling. ◀

- ▶ Align the mounting aid at 90° and concentrically to the axis, *Figure 16.*

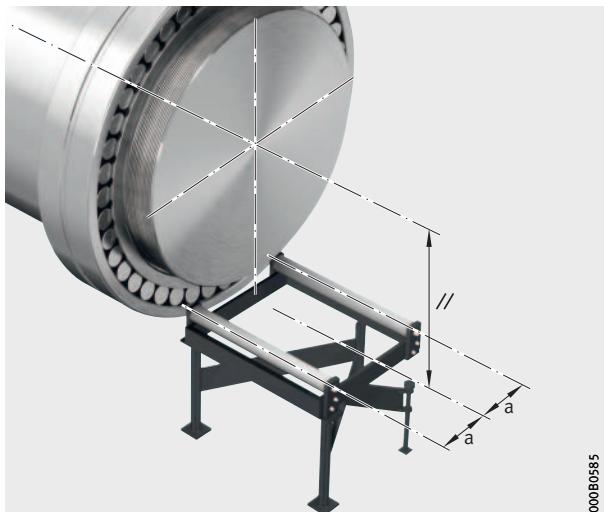


Figure 16
Aligning the mounting aid

WARNING

Serious crushing in setting down of the hydraulic nut.

When setting down the hydraulic nut, ensure that no body parts are located in the gap between the hydraulic nut and shaft or adjacent construction. 

- ▶ Set down the hydraulic nut carefully on the mounting aid using a crane, *Figure 17*.



Figure 17
Setting down the hydraulic nut

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- ▶ Remove the securing belt.

Hydraulic nuts

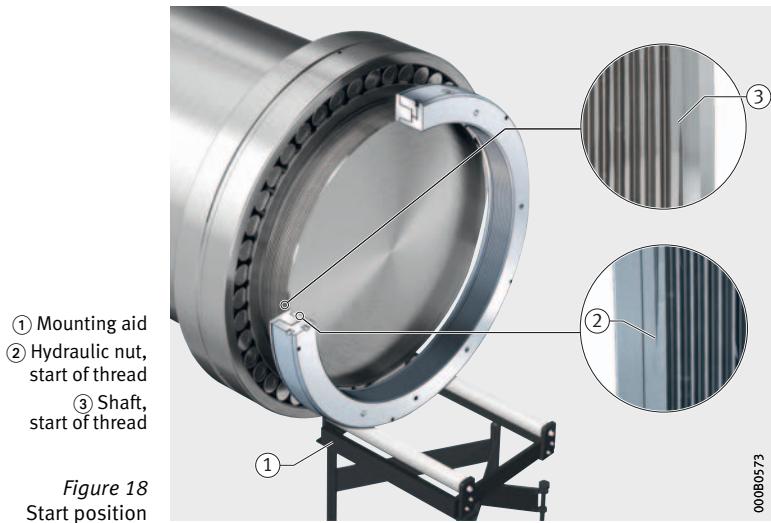
HYDNUT..-E, HYDNUT..-E-INCH

Adjustment of the mounting aid requires precise action.

NOTICE

If the thread of the shaft or sleeve is subjected during mounting to the entire mass of the hydraulic nut, scoring may occur in the thread. Adjust the height of the mounting aid so that the thread of the shaft or sleeve is not subjected to load by the entire mass of the hydraulic nut. 

- Adjust the height of the mounting aid.
- Align the hydraulic nut exactly parallel and concentrically to the shaft.
- Remove the hook or carrying sling.
- Remove the folding clevis (if present).
- Rotate the hydraulic nut until the start of the thread on the hydraulic nut and the start of the thread on the shaft journal or sleeve coincide, *Figure 18*.



When displacing the hydraulic nut, there is an increased risk of injury, especially to the hands.

⚠️ WARNING

Serious crushing in displacement of the hydraulic nut.

When displacing the hydraulic nut, ensure that no body parts are located in the gap between the hydraulic nut and shaft or adjacent construction. ◀

- ▶ Move the hydraulic nut in the direction of the shaft until the start of the thread on the hydraulic nut and the start of the thread on the shaft journal or sleeve are in contact, *Figure 19*.



Figure 19
Displacing the hydraulic nut

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Repeat the following steps as often as necessary until the end face of the annular piston is in contact with the end face of the part to be pressed into place, *Figure 20*:

- Insert the hand lever into the lower handling hole.
- Rotate the hydraulic nut until the next handling hole is in the lower position.
- Move the hand lever into the lower handling hole.

⚠ WARNING

Injuries due to a hydraulic nut becoming loose from the shaft and falling because too few thread turns were engaged.

At least half the thread width must be engaged. ◀



The following step must only be carried out once:

- Loosen the hydraulic nut as necessary until the axial or radial threaded hole G¹/₄ is in the upper position, *Figure 21*.
- If necessary, apply a mounting ring, see page 36.
- The hydraulic nut is mounted and can be bled.



Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Applying a mounting ring

A mounting ring is necessary if the hydraulic nut cannot be screwed far enough onto the shaft journal or sleeve.

NOTICE

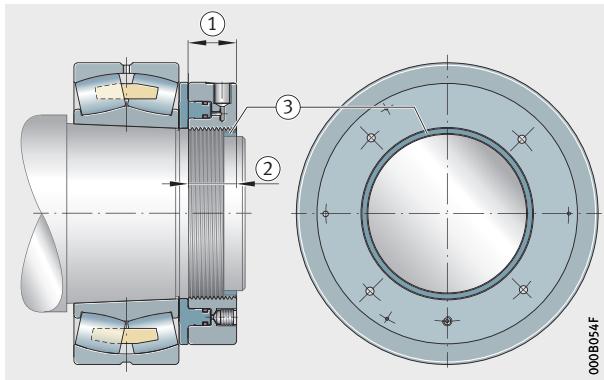
If there is too little interference, the hydraulic nut may become damaged. The pressure of the hydraulic oil can deform the hydraulic nut at the location where the thread of the hydraulic nut is not screwed into place.

If there is an interference of less than 80%, a mounting ring must be used. 

- Measure the interference.
- Produce the mounting ring. For the diameter tolerance to be observed, please contact us in advance.
- Apply the mounting ring, *Figure 22*.

① Hydraulic nut,
width = 100%
② Interference
③ Mounting ring

Figure 22
Mounting ring



Applying an intermediate ring

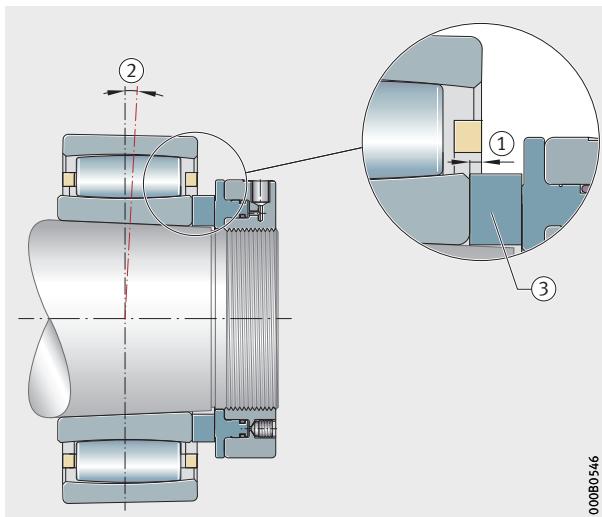
Depending on the nature of the rolling bearing, it may be necessary to apply an intermediate ring.

NOTICE

Without an intermediate ring, the hydraulic nut and bearing may be damaged.

If a rolling bearing is mounted which has a projecting cage or if its outer ring can be axially displaced or tilted too much, an intermediate ring must be applied. 

- ▶ Measure the necessary width.
- ▶ Produce the intermediate ring. For the tolerance to be observed, please contact us in advance.
- ▶ Apply the intermediate ring, *Figure 23*.



Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Selecting and mounting the dial gauge

A dial gauge can be used for precise measurement of the drive-up distance in the mounting of rolling bearings with a tapered bore. This is clamped in the locating hole in the press ring and measures the drive-up distance of the annular piston.

The dial gauge used is selected depending on the dimensions of the hydraulic nut used.

No tools are required for mounting of the dial gauge.

Selecting the dial gauge

Both a digital and an analogue dial gauge are offered. Each dial gauge is delivered with extensions, *Figure 24*. The extensions are available separately, see page 68.

- ① Digital dial gauge
- ② Analogue dial gauge
- ③ Extension 30 mm
- ④ Extension 50 mm

Figure 24
Dial gauges and extensions



For some hydraulic nuts, it is necessary to use an extension, see *table*.

Extensions

Designation	Extension mm
from	to
HYDNUT50-E(-INCH)	HYDNUT440-E(-INCH)
HYDNUT450-E	–
HYDNUT460-E(-INCH)	HYDNUT750-E(-INCH)
HYDNUT760-E	HYDNUT780-E
HYDNUT800-E(-INCH)	HYDNUT950-E(-INCH)
HYDNUT1000-E	HYDNUT1180-E

Mounting the dial gauge

A digital or analogue dial gauge from Schaeffler or a conventional dial gauge can be used. A conventional dial gauge is shown in the following illustration. The mounting procedure is not determined by the design of the dial gauge, *Figure 25*.

After mounting, the measuring pin must be able to move by at least the drive-up distance. This is dependent on the bearing and can be found, for example, in TPI 196.

- Loosen the plastic clamping screw.
- Insert the dial into the locating hole for the dial gauge until the tip of the measuring pin is in contact with the annular piston.
- Slide the dial gauge in by at least the requisite drive-up distance.
- Lightly tighten the clamping screw.

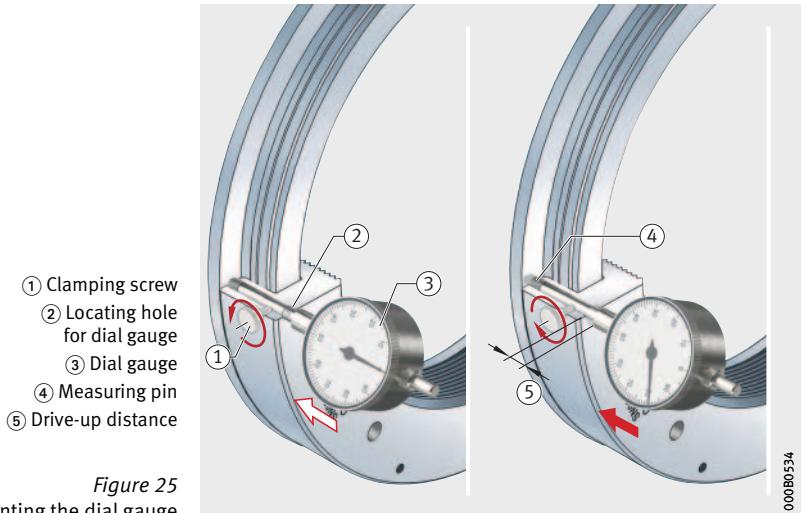


Figure 25
Mounting the dial gauge

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Selecting the pressure generation device

A suitable pressure generation device must have certain characteristics, see page 20. It must have a sufficiently large tank containing at least the requisite oil quantity, since it is not possible to refill with hydraulic oil during operation.

Oil quantity For the maximum drive-up distance, a certain oil quantity is required, see *table*.

HYDNUT..-E, HYDNUT..-E-INCH

Hydraulic nut		Oil quantity ¹⁾ l
from	to	
HYDNUT50-E(-INCH)	HYDNUT340-E(-INCH)	0,5
HYDNUT350-E	–	0,5
HYDNUT355-E	–	1
HYDNUT360-E(-INCH)	HYDNUT480-E(-INCH)	1
HYDNUT490-E	–	2
HYDNUT500-E(-INCH)	HYDNUT630-E(-INCH)	2
HYDNUT650-E	HYDNUT655-E	2
HYDNUT670-E(-INCH)	HYDNUT750-E(-INCH)	3
HYDNUT760-E	–	3
HYDNUT780-E	–	4
HYDNUT800-E(-INCH)	HYDNUT900-E(-INCH)	4
HYDNUT930-E	–	5
HYDNUT950-E(-INCH)	–	5
HYDNUT1000-E	–	5
HYDNUT1060-E	HYDNUT1080-E	6
HYDNUT1120-E	–	8
HYDNUT1180-E	–	9

¹⁾ Assuming usage of a hydraulic hose with a length of 1 m and an inside diameter of 4 mm.

Operation After bleeding, the pressure is built up in order to mount or dismount the component. The oil pressure method can be used for easier mounting and dismounting.

Drive-up distance In the mounting of rolling bearings with a tapered bore, the internal clearance is reduced if the inner ring is driven up onto the shaft or sleeve and is thus expanded. The length of the drive-up distance determines the degree to which the internal clearance is reduced.

NOTICE

If the internal clearance is set incorrectly, this will reduce the life of the rolling bearing or the rolling bearing will be damaged.

Please observe the specifications of the rolling bearing manufacturer. ◀

Hydraulic oil The hydraulic oil used in operation must be clean and of the specified viscosity class, see page 68.

WARNING

Severe burns due to ignition of hydraulic oil.

Avoid sources of ignition, including in particular cutting, welding and soldering work, in the vicinity of escaping hydraulic oil. ◀

WARNING

Hydraulic oil can cause irritation to skin and respiratory organs.

Avoid skin contact if possible. Wear gloves. Protect uncovered skin by means of oil-based skin cream. Do not inhale vapours or fumes. ◀

NOTICE

Contaminated hydraulic oil can damage seals. Damaged seals must be replaced promptly.

Only use clean hydraulic oil. ◀

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Maximum pressure The maximum permissible pressure must be observed throughout operation.



Serious injuries due to the spraying of hydraulic oil under high pressure and damage to the hydraulic nut if the maximum permissible pressure is exceeded.

Measure the operating pressure continuously. The operating pressure must never exceed the maximum permissible pressure, *Figure 26.* ▶



① Maximum pressure information

Figure 26
Maximum permissible pressure,
engraved

Technical data such as dimensions and the permissible pressure for hydraulic nuts can be found in a Technical Product Information. This is available as a PDF file on the Internet under the address <https://www.schaeffler.de>, menu item Mediathek.

Further information ■ TPI 196, Hydraulic Nut HYDNUT

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Mounting the hydraulic hose

Mounting of the hydraulic hose connects the pressure generation device and hydraulic nut with each other.

The following accessories are required:

- hose fasteners
- tool for mounting hose fasteners, see instructions for hose fasteners
- Allen key W 6 for fitting and removing the screw plug
- tool for fitting and removing the valve nipple

WARNING

Serious injuries due to the spraying out of hydraulic oil as a result of an unsuitable, damaged or old hydraulic hose.

Only mount a hydraulic hose that is approved for use with the pressure generation device. The hydraulic hose must be free from damage. Observe the storage life date of the hydraulic hose. 

NOTICE

Damage to the pressure generation device and seals in the hydraulic nut due to contaminants.

Remove any contaminants from the pressure generation device, hydraulic hose and hydraulic nut. All work must be carried out under extreme cleanliness. 

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Mounting the hydraulic hose:

⚠ WARNING

Serious injuries due to the spraying of hydraulic oil under high pressure due to the loosening of a screw connection.

Observe the maximum tightening torque for the threaded hole G¹/₄ (oil connector) in the hydraulic nut, see page 68.

Observe the maximum tightening torque for the oil connector on the pressure generation device. ◀

- ▶ Screw the valve nipple (CEJN series 116) into the axial or radial threaded hole G¹/₄, *Figure 27*.
- ▶ Screw the screw plug into the other threaded hole G¹/₄.
- ▶ Slide the collar of the hydraulic hose onto the valve nipple.

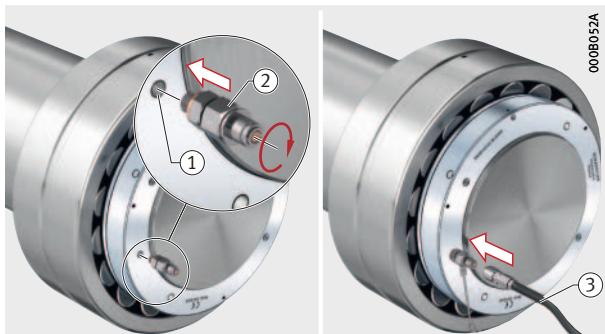


Figure 27
Connector

- ▶ Slide the collar of the hydraulic hose onto the valve nipple of the pressure generation device, *Figure 28*, page 45.

- ▶ Apply the hose fasteners.

⚠ WARNING

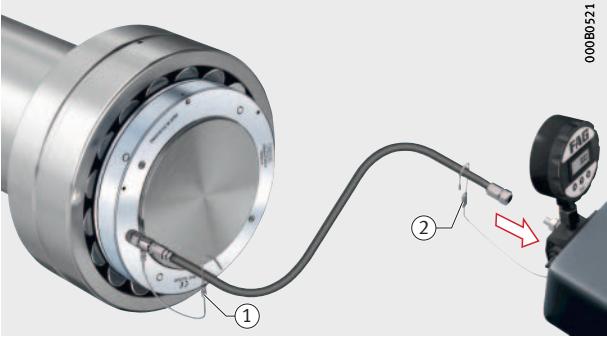
Serious injuries due to detached hose whipping back and forth.

Mount hose fasteners in order to prevent whipping by the hydraulic hose. ◀

⚠️ WARNING

Serious injuries due to hydraulic oil spraying out of torn hydraulic hose under high pressure because the hydraulic hose was laid with an excessively small bending radius.

Lay the hydraulic hose with the specified bending radius to the pressure generation device. Observe the instructions for the hydraulic hose. 



- ① Hose fastener on hydraulic nut
- ② Hose fastener on pressure generation device

Figure 28
Connecting
the pressure generation device

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Bleeding Bleeding is necessary since compressed air will endanger the safety of the user. The hydraulic oil escaping during bleeding must be collected and disposed of correctly in accordance with the regional regulations.

► Check whether the oil volume in the pressure generation device is adequate to bleed the pressure generation device, hydraulic hose and hydraulic nut. Furthermore, the oil volume must be sufficient for the drive-up distance of the annular piston. Where necessary, hydraulic oil must be refilled before bleeding. Refilling during operation is not permissible.

⚠ WARNING

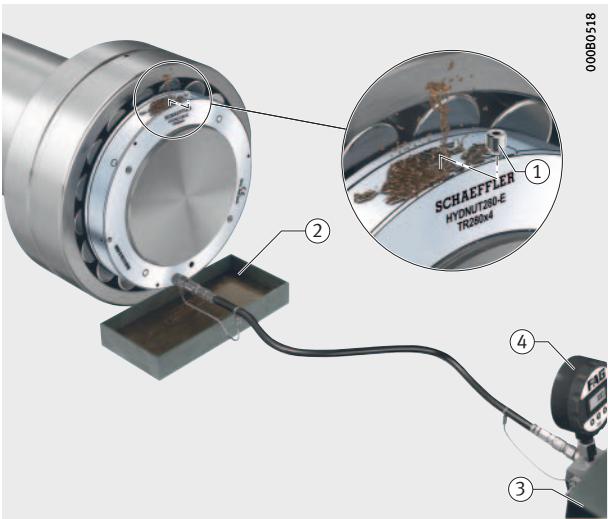
Blinding or injury to eyes due to spraying out of hydraulic oil under high pressure.

Ensure that the plug-in coupling is securely connected and the hose fasteners are fitted. Always wear safety goggles. ◀

- Ensure that the screw plug is at the top, *Figure 29*, page 47.
- Apply the device for collection of hydraulic oil.
- Remove the screw plug from the upper threaded hole G¹/₄.
- Start the pressure generation device.
- Wait until the hydraulic oil escapes without air bubbles.
- Stop the pressure generation device.
- Screw the screw plug back into the upper threaded hole G¹/₄ and observe the tightening torque, see page 68.
- Remove the collector device.
- Dispose of the collected hydraulic oil correctly or send for recycling.

- ① Screw plug, threaded hole G¹/₄ at top
- ② Collector device
- ③ Pressure generation device
- ④ Manometer

Figure 29
Bleeding



Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Pressing the component into place

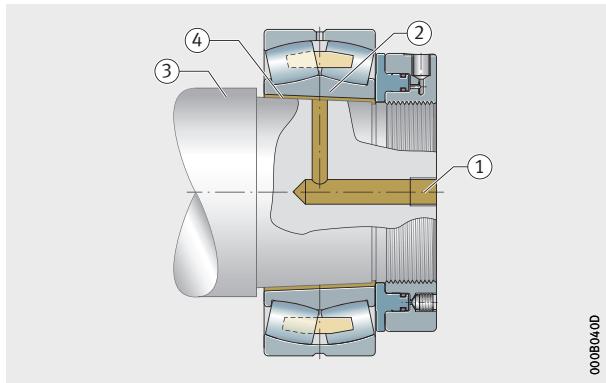
Pressing into place can be carried out either with or without the oil pressure method. The oil pressure method is explained in the Mounting Handbook MH 1.

Oil pressure method

In order to reduce the pressing force, the oil pressure method can be used. In the oil pressure method, an additional pressure generation device is used to press hydraulic oil between the fit surfaces of the component and shaft or sleeve, *Figure 30*.

- ① Additional pressure generation device, connection
- ② Rolling bearing inner ring
- ③ Shaft
- ④ Fit surface

Figure 30
Oil pressure method

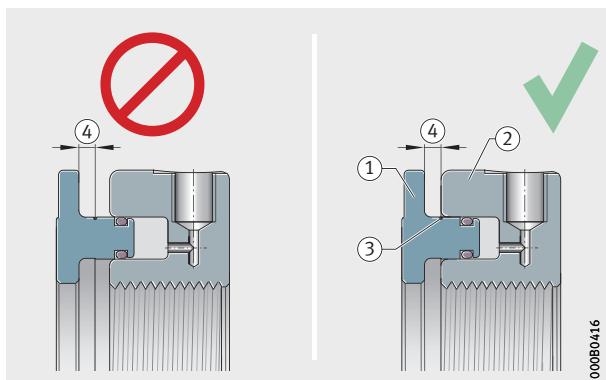


Red O-ring

The maximum drive-up distance of the press ring is indicated by a red O-ring. The press ring can only be pressed out while the red O-ring is visible, *Figure 31*.

- ① Annular piston
- ② Press ring
- ③ Red O-ring
- ④ Drive-up distance, maximum

Figure 31
Red O-ring



Pressure build-up As a result of pressure build-up, the component is pressed off the hydraulic nut.

- When using the oil pressure method, pressure is first built up using the additional pressure generation device and then maintained during the whole mounting procedure.

WARNING

Serious injuries due to spraying out of hydraulic oil under high pressure.

The reasons for this may be as follows:
missing screw plug, defective seal, overshoot of maximum operating pressure, excessive pressing out of the press ring.

Screw in the screw plug in the radial threaded hole G¹/4.

Measure the operating pressure continuously. The operating pressure must never exceed the maximum permissible pressure, *Figure 32*.

Operate the hydraulic nut only while the red O-ring is visible, see page 48. ◀



① Maximum pressure information

Figure 32
Maximum permissible pressure

WARNING

Serious injuries due to bursting or loosening of hydraulic nut in case of component failure.

Stand to one side, not directly behind the hydraulic nut. ◀

- Build up pressure in the hydraulic nut. Press the requisite volume into the hydraulic nut until the requisite drive-up distance is reached.

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Pressure decrease in oil pressure method	The following steps are only carried out if the oil pressure method is used: ► Switch the pressure generation device for the oil pressure method to unpressurised. ► Wait 5 min. ► Measure the radial or axial internal clearance. ► Wait 30 min so that the oil can escape.
Pressure decrease in hydraulic nut	The following steps are always carried out: ► Switch the pressure generation device for the hydraulic nut to unpressurised. ► Measure the radial or axial internal clearance.

Pressing back the piston HYDNUT50-E to HYDNUT190-E

Once mounting or dismounting of smaller hydraulic nuts is complete, switch the pressure generation device to unpressurised and press the annular piston completely into the press ring by rotation until it stops. The hydraulic oil will run back into the pressure generation device.

► CAUTION

Risk of slippage and contamination of the environment with hydraulic oil if oil is prevented from returning to the tank of the pressure generation device.

Ensure the return of oil to the tank of the pressure generation device. ◀

► WARNING

Serious injuries due to spraying out of hydraulic oil under high pressure if the pressure generation device is not switched to unpressurised and a hydraulic hose is detached.

A hydraulic hose may only be detached after switching the system to unpressurised. ◀

- Switch the system to unpressurised, see the user manual of the pressure generation device.
- Screw the hydraulic nut on further until the annular piston is completely pressed back, *Figure 33*.
- ▷ The hydraulic oil is pressed back into the pressure generation device.

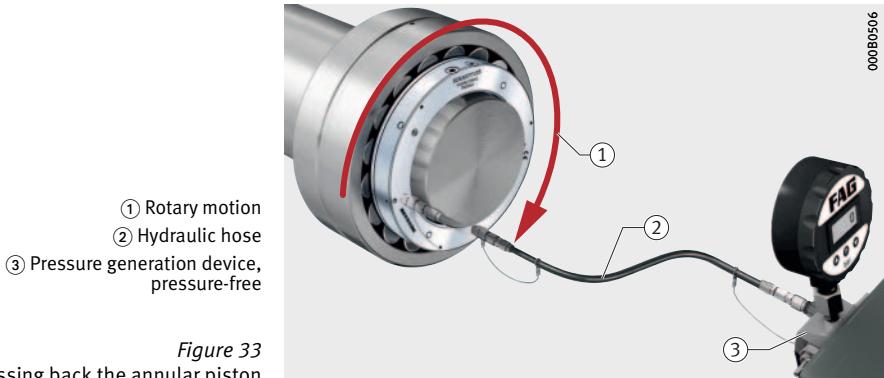


Figure 33
Pressing back the annular piston

- Loosen the hose fastener.
- Remove the hydraulic hose.
- ▷ The hydraulic nut can now be removed and transported away.

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Pressing back the annular piston HYDNUT200-E to HYDNUT1180-E

In the case of larger hydraulic nuts, the hydraulic nut is transported after completion of mounting or dismounting to a suitable location, at which the annular piston is pressed back completely into the press ring using suitable tools until it stops.

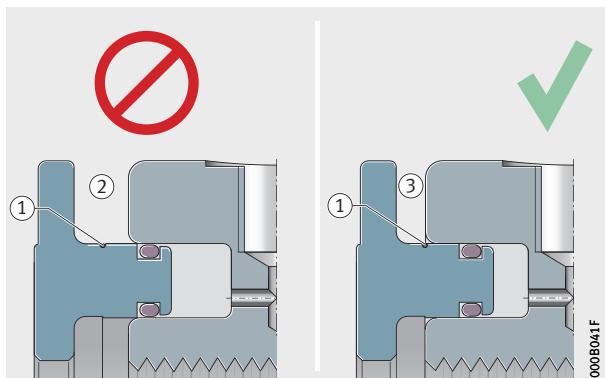
Checking the stroke

If the annular piston has been pressed out further than the red O-ring, the hydraulic nut must not be transported. In this case, the annular piston must be pressed back while the hydraulic nut is still on the shaft.

- ▶ Check optically how far the annular piston has been extended, *Figure 34*.
- ▶ If the annular piston has been extended too far, omit the following sections and go directly to page 57.

① Red O-ring
② Extended too far
③ Maximum permissible extension

Figure 34
Checking the stroke



Removing the hydraulic hose

Before transporting the hydraulic nut, the hydraulic hose is removed. The pressure generation device and hydraulic hose are connected again before the annular piston is pressed back.

WARNING

Serious injuries due to spraying out of hydraulic oil under high pressure if the pressure generation device is not switched to unpressurised and a hydraulic hose is detached.

A hydraulic hose may only be detached after switching the system to unpressurised. 

- ▶ Switch the system to unpressurised, see the user manual of the pressure generation device.
- ▶ Undo the hose fastener on the hydraulic nut, then remove the hose.

Detaching the hydraulic nut from the shaft

The hydraulic nut is first detached from the shaft and then transported.

WARNING

Risk of crushing due to a falling hydraulic nut because this was loosened too quickly.

When unscrewing the last thread turn, rotate the hydraulic nut very slowly. 

Repeat the following operations as often as necessary until the hydraulic nut is no longer screwed onto the shaft, *Figure 35*:

- ▶ As necessary, position the mounting aid at the end of the shaft.
- ▶ Insert the hand lever into the lower handling hole.
- ▶ Rotate the hydraulic nut until the next handling hole is in the lower position.
- ▷ The hydraulic nut is now on the smooth end of the shaft or mounting aid.

The following operation must only be carried out once:

- ▶ Rotate the hydraulic nut until the threaded hole for the folding clevis is in the upper position.

- ① Shaft
- ② Mounting aid
- ③ Rotary motion
- ④ Radial threaded hole G1/4, upper position

Figure 35
Unscrewing the hydraulic nut



Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Transporting the hydraulic nut

The hydraulic nut is prepared for transport as follows, *Figure 36*:

- Screw in the folding clevis (if there is a threaded hole for the folding clevis in the outer cylindrical surface of the press ring).
- Hang a hook in the folding clevis or thread in a carrying sling.
- Fit the securing belt.

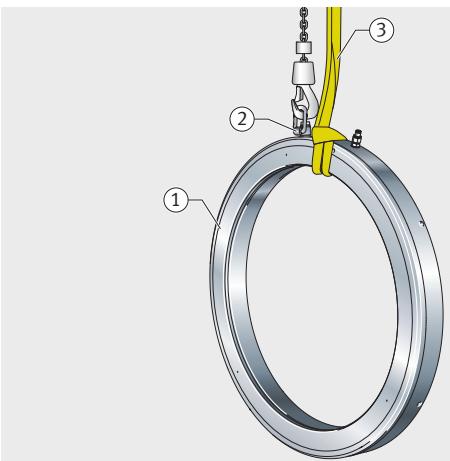
► The hydraulic nut can now be transported.

- ① Folding clevis
- ② Hook
- ③ Securing belt

Figure 36
Preparation for transport



► Transport the hydraulic nut without shocks or vibration,
Figure 37.



- ① Hydraulic nut
- ② Folding clevis
- ③ Securing belt

Figure 37
Transport

00008047D

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Pressing back the annular piston

Once the hydraulic nut with the annular piston facing up has been deposited on wooden beams of sufficient load carrying capacity, the annular piston can be pressed back.

⚠ CAUTION

Risk of slippage and contamination of the environment with hydraulic oil if oil is prevented from returning to the tank of the pressure generation device.

Ensure the return of oil to the tank of the pressure generation device. ◀

- ▶ Connect the hose and the unpressurised pressure generation device again.
- ▶ Press in the annular piston by means of screw clamps until it stops, *Figure 38*.
- ▷ The hydraulic oil is pressed back into the pressure generation device.

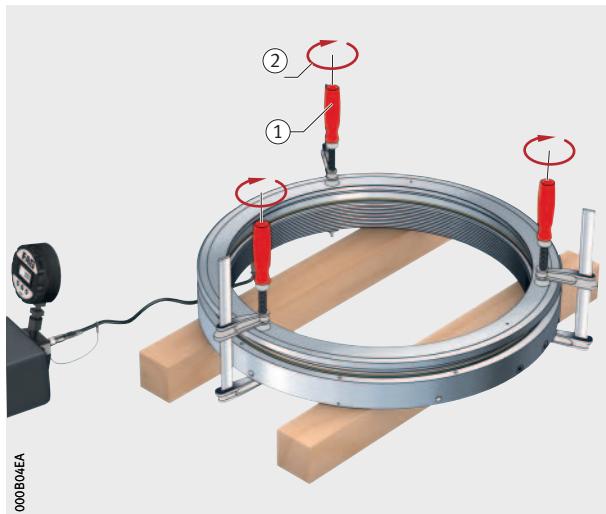


Figure 38

Pressing back the annular piston

- ▶ Remove the hydraulic hose.
- ▷ The hydraulic nut can now be transported away.

Pressing back the annular piston at the mounting location

The annular piston can only be pressed out while the red O-ring is visible. If the annular piston has been pressed out too far, the hydraulic nut must not be transported. The annular piston must then be pressed back on site.

In the case of larger hydraulic nuts, the friction can be so great that the annular piston cannot be pressed back through rotation by hand. In this case, suitable tools such as screw clamps can be used.

- ▶ Loosen the hydraulic nut until there is sufficient space for suitable tools such as screw clamps, *Figure 39*.
- ▶ Connect the unpressurised pressure generation device and ensure that hydraulic oil can flow back into the pressure generation device.
- ▶ Press the annular piston back until the red O-ring is no longer visible.
- ▷ Once the annular piston has been pressed back far enough that the red O-ring is no longer visible, the hydraulic nut can be transported.

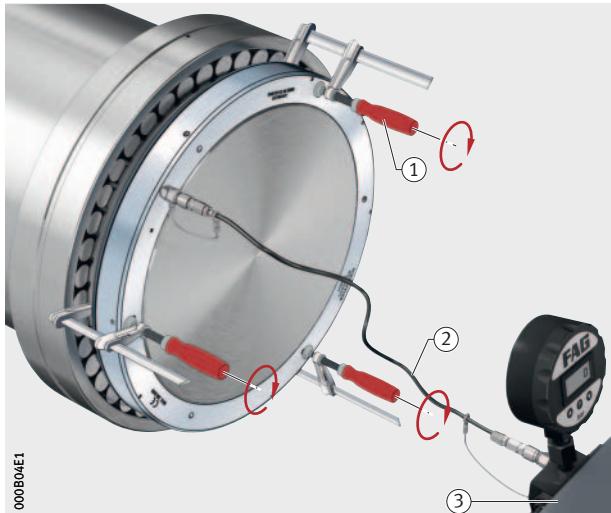


Figure 39

Pressing back the annular piston

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Decommissioning

If the hydraulic nut will not be used for an extended period, it should be decommissioned:

- Press the annular piston in completely.
- Screw in the screw plug and valve nipple.
- Clean the hydraulic nut using cold cleaner or paraffin oil.
- Oil the surface of the hydraulic nut, for example using ARCANOL-ANTICORROSIONOIL-400G.

WARNING

Disease of the respiratory organs through inhalation of vapours of the cleaning agent used.

Observe the safety and environmental guidelines of the cleaning agent manufacturer. 

Storage

All parts should be stored under the specified conditions, see page 6.

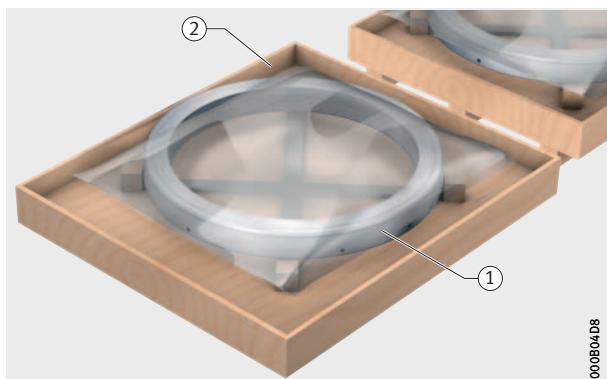
NOTICE

The press ring of the hydraulic nut may become deformed due to its own weight if it is stored standing up. As a result of storage standing up, the hydraulic nut may thus become unusable.

Store the hydraulic nut lying flat with the annular piston facing up in the delivery packaging, *Figure 40*. 

① Hydraulic nut
② Box or wooden transport crate

Figure 40
Decommissioning



Alternatively, a hydraulic nut can be stored lying on wooden ledges and covered.

Troubleshooting Malfunctions become apparent in operation of the hydraulic nut. Once the malfunction has been eliminated, the hydraulic nut is normally ready for use again.

Troubleshooting
Hydraulic nut

Malfunction	Possible cause	Remedy
Hydraulic oil escaping in the area of the seal	Seals damaged	Replace seals, see page 60
Hydraulic oil is contaminated		
Annular piston jammed	Annular piston tilted	Do not use force. Collect the escaping hydraulic oil. Loosen the screw plug, then press the annular piston back into the press ring.

If the defect cannot be eliminated, please contact Schaeffler Customer Service.

Troubleshooting
Pressure generation device

Malfunction	Possible cause	Remedy
Annular piston moves out abruptly	Air in system	Bleed oil circuit
Pressure does not increase	Escape valve is open	Close escape valve
Other malfunction	–	See the user manual of the pressure generation device

If the defect cannot be eliminated, please contact the manufacturer of the pressure generation device.

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Maintenance The hydraulic nut must be checked before every use.

NOTICE

Damage to the hydraulic nut in the case of defective maintenance. If seals are damaged, contamination can reach the pressure chamber of the hydraulic nut.

If oil is lost, replace the seals immediately. 

Maintenance plan The maintenance items are stated in the maintenance plan, see *tables*.

Before every use

Subassembly	Activity
Hydraulic nut	<input type="checkbox"/> Visual inspection – check for wear and damage

After every use

Subassembly	Activity
Press ring and annular piston	<input type="checkbox"/> Clean using cold cleaner or paraffin oil
	<input type="checkbox"/> Apply oil (rust protection)

Every 2 years

Subassembly	Activity
Seal	<input type="checkbox"/> Replacement

As necessary

Subassembly	Activity
Seal	<input type="checkbox"/> Replace if oil is lost

Ordering the seal Order suitable replacement seals before replacement is carried out. The ordering number of the seal set is listed in a table, page 68.

Replacing the seal Before replacing the seals, check whether suitable replacement seals are available.

The replacement of seals comprises the following steps:

- dismount the annular piston
- dismount the seals
- clean the components
- mount the seals
- mount the annular piston

Dismounting the annular piston

During dismounting, ensure that the annular piston is not positioned obliquely.

- ▶ Provide support of sufficient load carrying capacity and tilting rigidity.
- ▶ Deposit the hydraulic nut on the prepared support with the annular piston facing up, *Figure 41*.
- ▶ Remove the screw plug and valve nipple.
- ▶ Screw in the dismounting screws consecutively until these are in contact with the annular piston.
- ▶ Screw in each dismounting screw in turn by one revolution until the red O-ring is visible.
- ▶ If the annular piston is positioned obliquely, strike the raised point lightly using a plastic hammer.

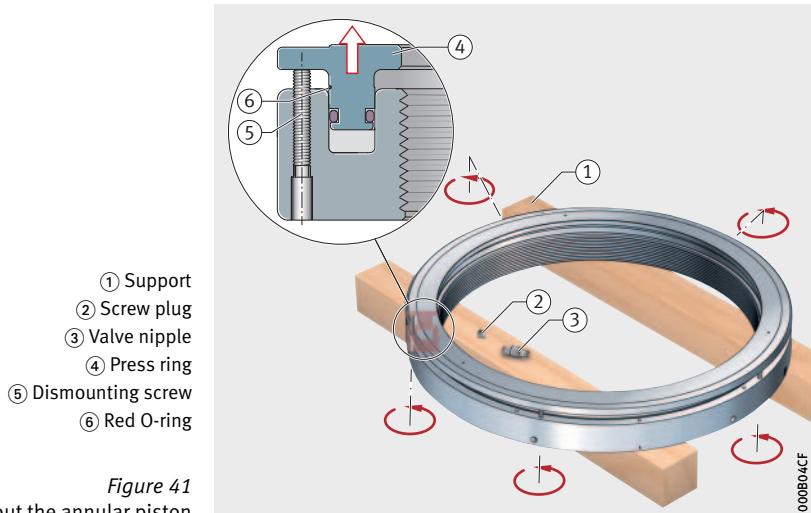


Figure 41

Pressing out the annular piston

Hydraulic nuts

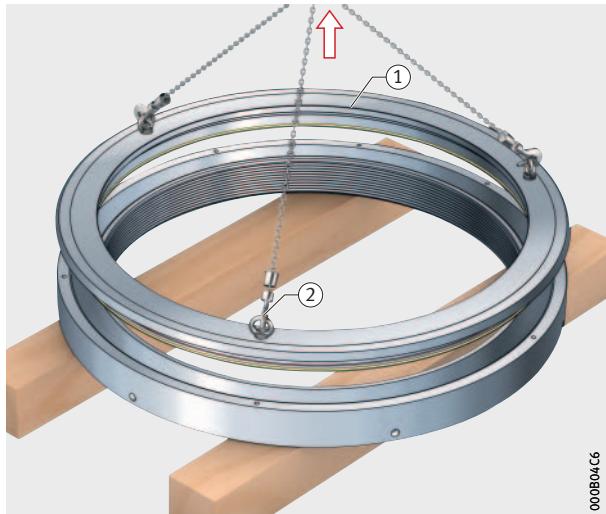
HYDNUT..-E, HYDNUT..-E-INCH

Note Starting from HYDNUT400, eye bolts can be screwed into the annular piston and a crane can be used to lift and transport the dismounted annular piston.

► Remove the annular piston, *Figure 42*.

- ① Annular piston
- ② Eye bolt

Figure 42
Removing the annular piston



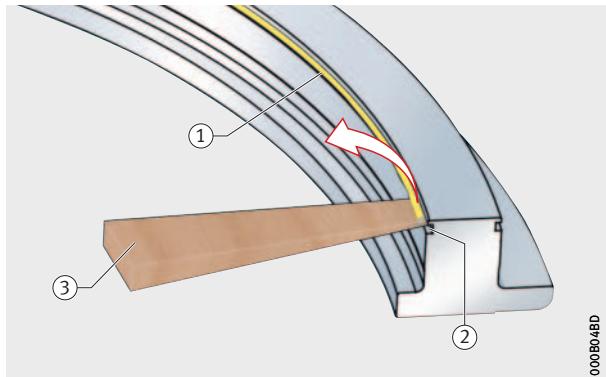
Dismounting the seals

When removing the seals, ensure that the seal slots remain undamaged. For dismounting, use a soft tool made from wood or plastic.

► Lever the seals out of the seal slots, *Figure 43*.

- ① Seal
- ② Seal slot
- ③ Wooden or plastic tool

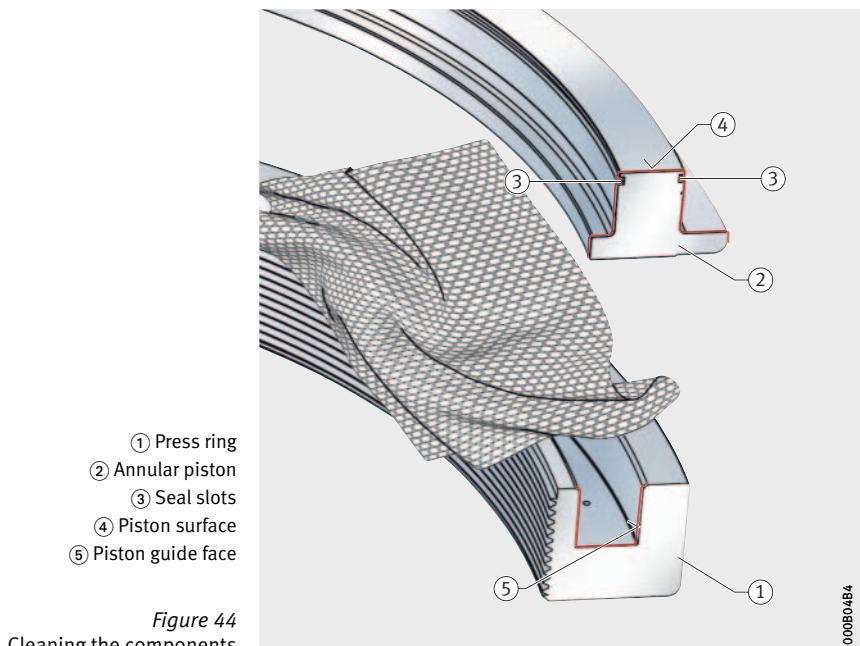
Figure 43
Dismounting the seals



Cleaning the components

As cleaning agents, cold cleaners and paraffin oil have proved effective.

- ▶ Clean the press ring and annular piston. Carry out particularly thorough cleaning of the seal slots, piston surface and piston guide face, *Figure 44*.



Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

Mounting the seals

During mounting, ensure that the seals remain undamaged.

- Oil both seal slots using hydraulic oil, *Figure 45*.

① Seal slot
② Hydraulic oil

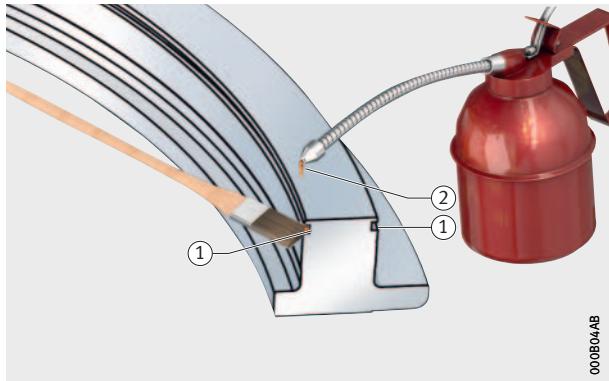


Figure 45
Oiling the seal slots

- Insert new seals in the annular piston, *Figure 46*.

① Seal
② Piston guide face

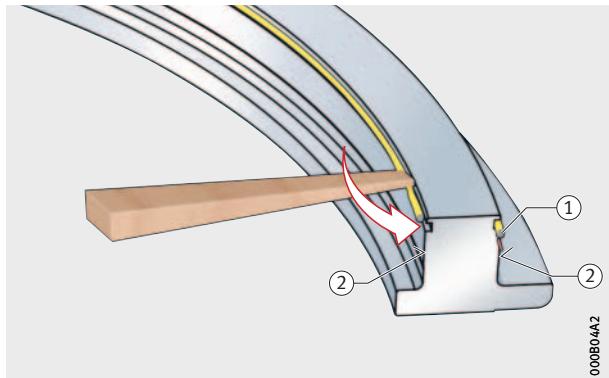


Figure 46
Mounting the seals

Oil the piston guide face using hydraulic oil, *Figure 47*.

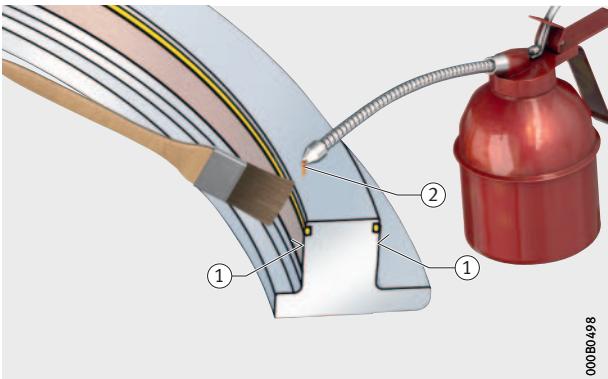


Figure 47

Oiling the piston guide faces

Mounting the annular piston

During mounting, ensure that the annular piston is fitted straight, *Figure 48*.

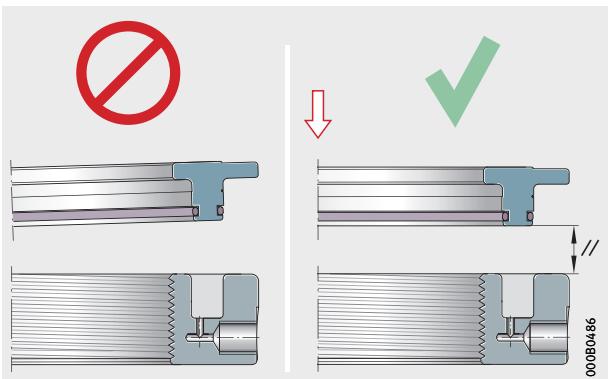


Figure 48
Mounting

Hydraulic nuts HYDNUT..-E, HYDNUT..-E-INCH

- ▶ Position the annular piston above the press ring.
- ▶ Oil the sealing rings using hydraulic oil.
- ▶ Carefully lower the annular piston until this is lying on the press ring.
- ▶ Press the annular piston into the press ring uniformly using three screw clamps until both seals have disappeared in the press ring, *Figure 49*.

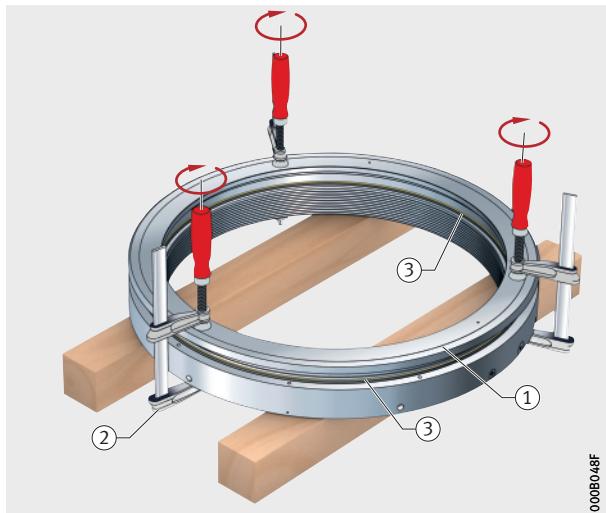


Figure 49
Mounting the annular piston

- ▶ Remove the screw clamps.
- ▶ Strike the annular piston lightly using a plastic hammer at a spacing of 120°, until the annular piston is completely in contact with the press ring.

Disposal A hydraulic nut can be returned to Schaeffler for disposal.



CAUTION Risk of injury due to skin contact with hydraulic oil.

Wear gloves when dismantling the hydraulic nut. 

After dismounting, the press ring and annular piston can be disposed of together with other steel parts. The seals are made from plastic (PVC). Hydraulic oil must be collected and disposed of correctly or recycled. Aids such as oil-soaked cleaning cloths must be disposed of correctly.

Regulations Disposal must be carried out in accordance with locally applicable regulations.

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Technical data, accessories and replacement parts

The technical data give information that is valid for each hydraulic nut. Accessories and replacement parts are available, see *tables*.

Technical data

Designation	Maximum tightening torque ¹⁾ Nm	Hydraulic oil, viscosity class mm ² /s	
		from	to
HYDNUT..-E-(INCH)	45	46	68

¹⁾ The maximum tightening torque is valid for threaded holes G¹/₄ in the press ring.

Accessories

Designation	Description	Mass kg
HYDNUT.GAUGE-ANALOG	Dial gauge, analogue	0,7
HYDNUT.GAUGE-DIGITAL	Dial gauge, digital	0,7
HYDNUT.GAUGE-EXTENSION-SET	Extensions, set	0,04
ARCANOL-MOUNTINGPASTE-70G	Mounting paste	0,1
ARCANOL-MOUNTINGPASTE-250G	Mounting paste	0,3

Replacement parts

It is advisable to have a screw plug available on site as a replacement part. Experience has shown that this part cannot always be found when it is needed. Since the seals are replaced after a specified period, the replacement seals should be ordered well in advance of the maintenance date.

Note

Only use Schaeffler original replacement parts.

Screw plug

Designation	Ordering number
HYDNUT.PLUG	038487659-0000-10

Hydraulic nuts and seals
HYDNUT..-E
(metric thread)

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
50-E	092186300-0000-10	50.SEAL	038858193-0000-02
55-E	089705254-0000-10	55.SEAL	022473726-0000-02
60-E	092186521-0000-10	60.SEAL	038858231-0000-02
65-E	092186505-0000-10	65.SEAL	038858240-0000-02
70-E	092186483-0000-10	70.SEAL	038858266-0000-02
75-E	086435205-0000-10	75.SEAL	038858282-0000-02
80-E	092186440-0000-10	80.SEAL	038858304-0000-02
85-E	092186416-0000-10	85.SEAL	019270208-0000-02
90-E	089903218-0000-10	90.SEAL	054408270-0000-10
95-E	092186394-0000-10	95.SEAL	038858320-0000-02
100-E	089705297-0000-10	100.SEAL	038857880-0000-02
105-E	092192475-0000-10	105.SEAL	039620190-0000-02
110-E	092192343-0000-10	110.SEAL	038857898-0000-02
115-E	092192220-0000-10	115.SEAL	038857901-0000-10
120-E	089961072-0000-10	120.SEAL	038857910-0000-02
125-E	092192181-0000-10	125.SEAL	039620204-0000-02
130-E	092192092-0000-10	130.SEAL	038857936-0000-02
135-E	092191932-0000-10	135.SEAL	039620212-0000-10
140-E	089961137-0000-10	140.SEAL	038857944-0000-02
145-E	092191894-0000-10	145.SEAL	038857952-0000-02
150-E	089705319-0000-10	150.SEAL	038857960-0000-02
155-E	092191843-0000-10	155.SEAL	039620220-0000-02
160-E	089961170-0000-10	160.SEAL	038857979-0000-10
165-E	092191797-0000-10	165.SEAL	019268548-0000-02
170-E	089961234-0000-10	170.SEAL	038857987-0000-02
180-E	089907507-0000-10	180.SEAL	038857995-0000-10
190-E	092191509-0000-10	190.SEAL	038858002-0000-02
200-E	089961340-0000-10	200.SEAL	038858010-0000-02

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Hydraulic nuts and seals HYDNUT..-E (trapezoidal thread)

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
205-E	092194370-0000-10	205.SEAL	076209652-0000-10
210-E	092194362-0000-10	210.SEAL	039708772-0000-02
215-E	092194346-0000-10	215.SEAL	039620247-0000-02
220-E	089705335-0000-10	220.SEAL	038858029-0000-02
225-E	092193935-0000-10	225.SEAL	019268734-0000-02
230-E	086435361-0000-10	230.SEAL	039620255-0000-02
235-E	092205712-0000-10	235.SEAL	038858045-0000-02
240-E	089907710-0000-10	240.SEAL	038858053-0000-02
250-E	092205704-0000-10	250.SEAL	038858061-0000-02
260-E	089961390-0000-10	260.SEAL	038858070-0000-02
270-E	092205690-0000-10	270.SEAL	038858088-0000-02
275-E	092205682-0000-10	275.SEAL	069728852-0000-10
280-E	089961420-0000-10	280.SEAL	038858096-0000-02
290-E	092205674-0000-10	290.SEAL	038858100-0000-02
295-E	092205666-0000-10	295.SEAL	092672523-0000-10
300-E	089705351-0000-10	300.SEAL	038858118-0000-10
310-E	092205658-0000-10	310.SEAL	039620263-0000-10
315-E	092205640-0000-10	315.SEAL	092672558-0000-10
320-E	092205631-0000-10	320.SEAL	038858126-0000-10
330-E	092205623-0000-10	330.SEAL	039620271-0000-10
335-E	092205615-0000-10	335.SEAL	092672663-0000-10
340-E	092205836-0000-10	340.SEAL	038858134-0000-10
345-E	092205828-0000-10	345.SEAL	039620280-0000-10
350-E	092205810-0000-10	350.SEAL	038858142-0000-10
355-E	092205801-0000-10	355.SEAL	092679870-0000-10
360-E	089907817-0000-10	360.SEAL	039049396-0000-10
365-E	092205798-0000-10	365.SEAL	038384671-0000-10
370-E	092205780-0000-10	370.SEAL	089975880-0000-10
375-E	092205771-0000-10	375.SEAL	092679919-0000-10
380-E	089961471-0000-10	380.SEAL	038858150-0000-10
385-E	092205755-0000-10	385.SEAL	088096777-0000-10
395-E	092205720-0000-10	395.SEAL	039620301-0000-10
400-E	089961536-0000-10	400.SEAL	038858169-0000-10
410-E	092217427-0000-10	410.SEAL	038456435-0000-10
415-E	092217419-0000-10	415.SEAL	092680097-0000-10
420-E	089907850-0000-10	420.SEAL	038858177-0000-10
430-E	092217400-0000-10	430.SEAL	087022486-0000-10
435-E	092217389-0000-10	435.SEAL	092680178-0000-10

continued ▾

Hydraulic nuts and seals
HYDNUT..-E
(trapezoidal thread)

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
440-E	092217362-0000-10	440.SEAL	039620310-0000-10
450-E	092217354-0000-10	450.SEAL	039620328-0000-10
460-E	089705483-0000-10	460.SEAL	039620336-0000-10
470-E	092217338-0000-10	470.SEAL	038456443-0000-10
480-E	089961676-0000-10	480.SEAL	038858185-0000-10
490-E	092217273-0000-10	490.SEAL	092680232-0000-10
500-E	089961846-0000-10	500.SEAL	038858207-0000-10
510-E	092217265-0000-10	510.SEAL	085295078-0000-10
520-E	092217133-0000-10	520.SEAL	064017621-0000-10
530-E	089961919-0000-10	530.SEAL	039716538-0000-10
540-E	092217109-0000-10	540.SEAL	068895453-0000-10
550-E	092217095-0000-10	550.SEAL	038858215-0000-10
560-E	089705513-0000-10	560.SEAL	038858223-0000-10
570-E	092217079-0000-10	570.SEAL	092680267-0000-10
580-E	092222323-0000-10	580.SEAL	054408598-0000-10
590-E	092222315-0000-10	590.SEAL	054759030-0000-02
600-E	092222307-0000-10	600.SEAL	039620344-0000-10
610-E	092222293-0000-10	610.SEAL	092681530-0000-10
625-E	092222285-0000-10	625.SEAL	058657916-0000-10
630-E	092222277-0000-10	630.SEAL	039620352-0000-10
650-E	089907892-0000-10	650.SEAL	054408385-0000-10
655-E	092222145-0000-10	655.SEAL	092681565-0000-10
670-E	092222137-0000-10	670.SEAL	038858258-0000-10
680-E	092222129-0000-10	680.SEAL	092681581-0000-10
690-E	092222110-0000-10	690.SEAL	092681603-0000-10
695-E	092230075-0000-10	695.SEAL	092681760-0000-10
710-E	089865979-0000-10	710.SEAL	038858274-0000-10
720-E	092232965-0000-10	720.SEAL	092681778-0000-10
740-E	092232930-0000-10	740.SEAL	092681794-0000-10
750-E	092232922-0000-10	750.SEAL	038858290-0000-10
760-E	092232914-0000-10	760.SEAL	092681816-0000-10
780-E	092232892-0000-10	780.SEAL	072469170-0000-10
800-E	092232876-0000-10	800.SEAL	038858312-0000-10
830-E	092232868-0000-10	830.SEAL	039698211-0000-10
850-E	089705521-0000-10	850.SEAL	065253205-0000-10
880-E	092237746-0000-10	880.SEAL	092680283-0000-10
900-E	092237738-0000-10	900.SEAL	038456451-0000-10
930-E	092237720-0000-10	930.SEAL	058964088-0000-10
950-E	089907930-0000-10	950.SEAL	080688780-0000-10

continued ▲▼

Hydraulic nuts

HYDNUT..-E, HYDNUT..-E-INCH

Hydraulic nuts and seals HYDNUT..-E (trapezoidal thread)

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
1000-E	092237703-0000-10	1000.SEAL	060584734-0000-10
1060-E	092237690-0000-10	1060.SEAL	092680356-0000-10
1080-E	092237681-0000-10	1080.SEAL	092681840-0000-10
1120-E	089705556-0000-10	1120.SEAL	092661769-0000-10
1180-E	089866118-0000-10	1180.SEAL	087022613-0000-10

continued ▾

Hydraulic nuts and seals HYDNUT..-E-INCH

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
50-E-INCH	093932677-0000-10	50.SEAL	038858193-0000-02
55-E-INCH	093934165-0000-10	55.SEAL	022473726-0000-02
60-E-INCH	093934998-0000-10	60.SEAL	038858231-0000-02
65-E-INCH	093935633-0000-10	65.SEAL	038858240-0000-02
70-E-INCH	093936907-0000-10	70.SEAL	038858266-0000-02
75-E-INCH	093937199-0000-10	75.SEAL	038858282-0000-02
80-E-INCH	093997965-0000-10	80.SEAL	038858304-0000-02
85-E-INCH	094000638-0000-10	85.SEAL	019270208-0000-02
90-E-INCH	092427022-0000-10	90.SEAL	054408270-0000-10
95-E-INCH	092524397-0000-10	95.SEAL	038858320-0000-02
100-E-INCH	092400760-0000-10	100.SEAL	038857880-0000-02
105-E-INCH	092418341-0000-10	105.SEAL	039620190-0000-02
110-E-INCH	092525296-0000-10	110.SEAL	038857898-0000-02
120-E-INCH	092441297-0000-10	120.SEAL	038857910-0000-02
130-E-INCH	092525520-0000-10	130.SEAL	038857936-0000-02
140-E-INCH	092526284-0000-10	140.SEAL	038857944-0000-02
150-E-INCH	092412360-0000-10	150.SEAL	038857960-0000-02
160-E-INCH	092527809-0000-10	160.SEAL	038857979-0000-02
170-E-INCH	092531466-0000-10	170.SEAL	038857987-0000-02
180-E-INCH	092431364-0000-10	180.SEAL	038857995-0000-10
190-E-INCH	092531768-0000-10	190.SEAL	038858002-0000-02
200-E-INCH	092423779-0000-10	200.SEAL	038858010-0000-02
220-E-INCH	092377785-0000-10	220.SEAL	038858029-0000-02
240-E-INCH	092532489-0000-10	240.SEAL	038858053-0000-02
260-E-INCH	092425488-0000-10	260.SEAL	038858070-0000-02
280-E-INCH	092426166-0000-10	280.SEAL	038858096-0000-02

continued ▾

Hydraulic nuts and seals
HYDNUT..-E-INCH

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
300-E-INCH	092416403-0000-10	300.SEAL	038858118-0000-10
320-E-INCH	092534759-0000-10	320.SEAL	038858126-0000-10
340-E-INCH	092407021-0000-10	340.SEAL	038858134-0000-10
360-E-INCH	092536808-0000-10	360.SEAL	039049396-0000-10
380-E-INCH	092426662-0000-10	380.SEAL	038858150-0000-10
400-E-INCH	092417043-0000-10	400.SEAL	038858169-0000-10
420-E-INCH	092538800-0000-10	420.SEAL	038858177-0000-10
440-E-INCH	092543200-0000-10	440.SEAL	039620310-0000-10
460-E-INCH	092402844-0000-10	460.SEAL	039620336-0000-10
480-E-INCH	092546323-0000-10	480.SEAL	038858185-0000-10
500-E-INCH	092549640-0000-10	500.SEAL	038858207-0000-10
530-E-INCH	092413102-0000-10	530.SEAL	039716538-0000-10
560-E-INCH	093759932-0000-10	560.SEAL	038858223-0000-10
600-E-INCH	093757824-0000-10	600.SEAL	039620344-0000-10
630-E-INCH	093762178-0000-10	630.SEAL	039620352-0000-10
670-E-INCH	093453531-0000-10	670.SEAL	038858258-0000-10
710-E-INCH	093763662-0000-10	710.SEAL	038858274-0000-10
750-E-INCH	093765215-0000-10	750.SEAL	038858290-0000-10
800-E-INCH	093765754-0000-10	800.SEAL	038858312-0000-10
850-E-INCH	093768710-0000-10	850.SEAL	065253205-0000-10
900-E-INCH	093769091-0000-10	900.SEAL	038456451-0000-10
950-E-INCH	093741693-0000-10	950.SEAL	080688780-0000-10

continued ▾

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Hydraulic nuts HYDNUT..-HEAVY

Scope of delivery

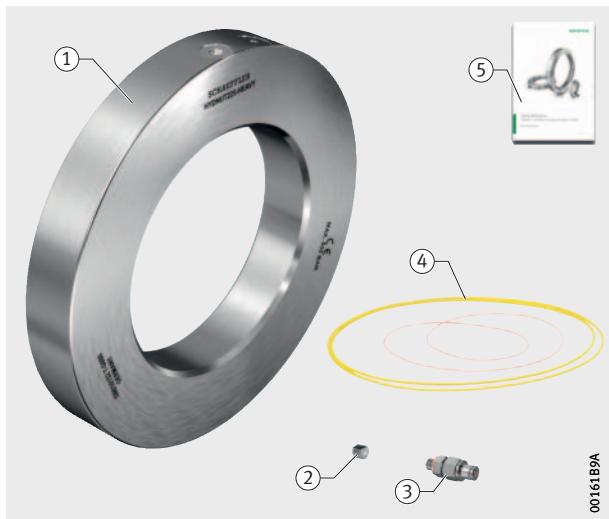
The scope of delivery comprises the hydraulic nut, accessories and user manual, see *table* and *Figure 1*.

Hydraulic nuts HYDNUT..-HEAVY

Component	Designation	Quantity
Hydraulic nut	HYDNUT	1
Screw plug (G ¹ / ₄)	HYDNUT.PLUG	2
Valve nipple (G ¹ / ₄)	PUMP1000.VALVE-NIPPLE	1
Seal set (replacement outer seal, replacement inner seal and red O-ring)	HYDNUT..-HEAVY.SEAL	1
User manual	-	1

- ① Hydraulic nut
- ② Screw plug
- ③ Valve nipple
- ④ Replacement seals for outer side,
inner side and red O-ring
- ⑤ User manual

Figure 1
Scope of delivery
HYDNUT..-HEAVY



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Accessories	Hydraulic nuts are supplied with the appropriate replacement seals.
Further information	The scope of delivery does not include the following documents: <ul style="list-style-type: none">■ TPI 195, Pressure Generation Devices■ TPI 196, Hydraulic Nut HYDNUT■ MH 1, Mounting of Rolling Bearings
Damage during transit	Any damage during transit must be reported as a complaint to the carrier.
Defects	Any defects must be reported promptly to Schaeffler Technologies AG & Co. KG.

Hydraulic nuts HYDNUT..-HEAVY

Description

A hydraulic nut comprises a press ring, in which a movable annular piston is located. Between these two components is a pressure chamber filled with hydraulic oil. This is sealed by means of two seals, *Figure 2*. Accessories are necessary for operation.

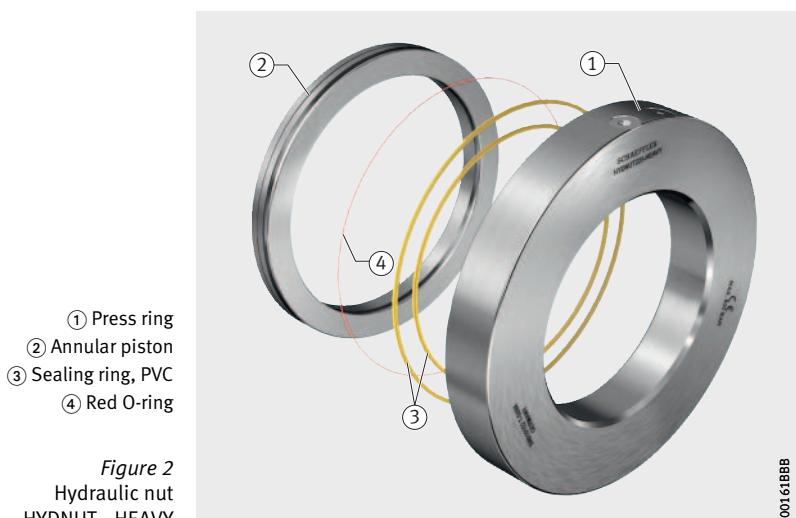


Figure 2
Hydraulic nut
HYDNUT..-HEAVY

Press ring

The single piece press ring made from steel supports the movable annular piston.

Annular piston

The single piece annular piston is made from steel. The annular piston has two slots for sealing rings, one flat slot for the red O-ring and three threaded holes.

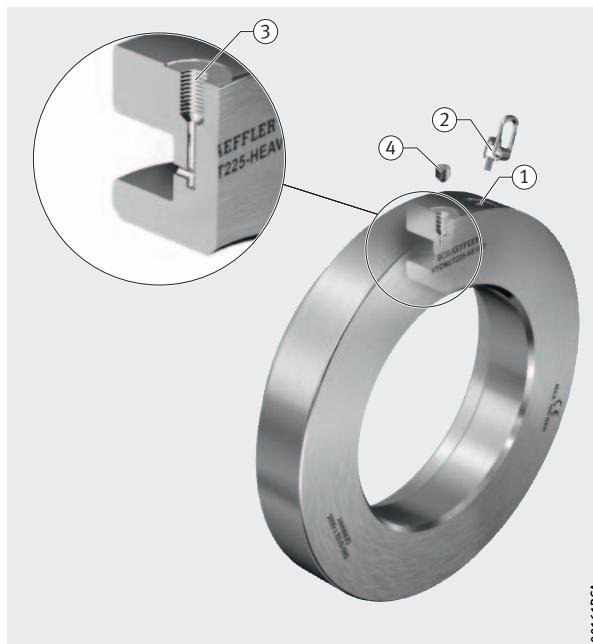
Sealing rings

Two sealing rings made from soft PVC are inserted in corresponding slots in the annular piston and seal off the pressure chamber between the annular piston and the press ring. This prevents escape of the hydraulic oil from the pressure chamber.

Red O-ring

The red O-ring is made from PVC and indicates that the annular piston may only be moved out as far as this position.

Press ring The single piece press ring made from steel supports the movable annular piston and has three threaded holes: one for the folding clevis and two at the end of the oil ducts, *Figure 3*.



- ① Threaded hole for folding clevis
- ② Folding clevis
- ③ Threaded hole G¹/₄
- ④ Screw plug, W 6

Figure 3
Press ring
HYDNUT..-HEAVY

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Hydraulic nuts HYDNUT..-HEAVY

Threaded hole for folding clevis A suitable folding clevis can be screwed into this threaded hole in the outer cylindrical surface.

HYDNUT..-HEAVY

Designation		Thread
from	to	
HYDNUT100-HEAVY	HYDNUT325-HEAVY	M8
HYDNUT350-HEAVY	HYDNUT600-HEAVY	M12
HYDNUT625-HEAVY	HYDNUT900-HEAVY	M16

Folding clevis If there is a threaded hole for a folding clevis, then a folding clevis of sufficient load carrying capacity (not included in the scope of delivery) can be used to transport the complete hydraulic nut. Alternatively, a round sling or steel rope of sufficient load carrying capacity can be used for transport. The steel rope may only be wrapped around the outer cylindrical surface of the press ring.

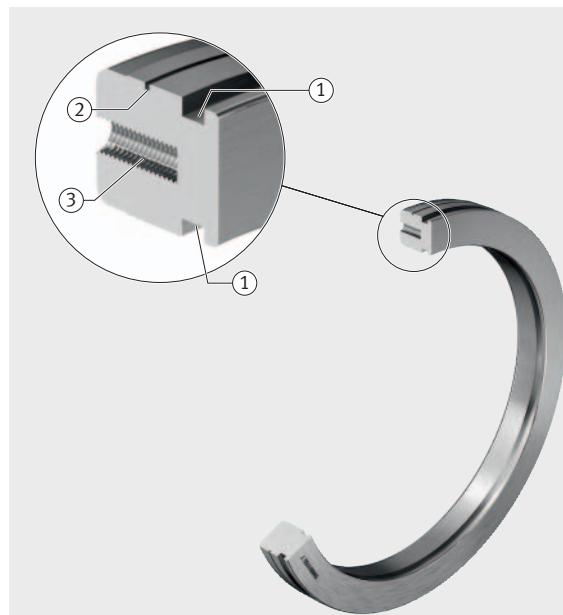
Threaded holes G¹/₄ The press ring has two oil ducts. Each oil duct runs to the outside and ends in a threaded hole G¹/₄. The two radial threaded holes in the outer cylindrical surface are offset by 180°.

At the time of delivery, a valve nipple is screwed into one radial threaded hole G¹/₄. The second threaded hole G¹/₄ is provided with a screw plug.

Screw plug At the time of delivery, a screw plug is screwed into one of the two radial threaded holes G¹/₄. A second screw plug is included in the scope of delivery.

Annular piston

The single piece annular piston is made from steel. The annular piston has two slots for sealing rings, one flat slot for the red O-ring and three threaded holes, *Figure 4*.



① Slot for sealing ring

② Slot for red O-ring

③ Threaded hole for eye bolt

Figure 4
Annular piston

Slots for sealing rings

Two slots support the sealing rings made from soft PVC.

Slot for red O-ring

A flat slot supports the red O-ring made from PVC.

Threaded holes for eye bolts

The annular piston has three threaded holes. At the pitch circle, the holes have a spacing of 120° to each other. If eye bolts are screwed into these threaded holes, the annular piston can be raised or transported by means of a lifting device, see page 125.

HYDNUT..-HEAVY

Designation	Thread
from	to
HYDNUT100-HEAVY	HYDNUT525-HEAVY
HYDNUT550-HEAVY	HYDNUT900-HEAVY

Hydraulic nuts HYDNUT..-HEAVY

Other components

In addition to the hydraulic nut, fasteners (nut or washer), a hydraulic hose and a pressure generation device filled with hydraulic oil are required for operation, *Figure 5*.

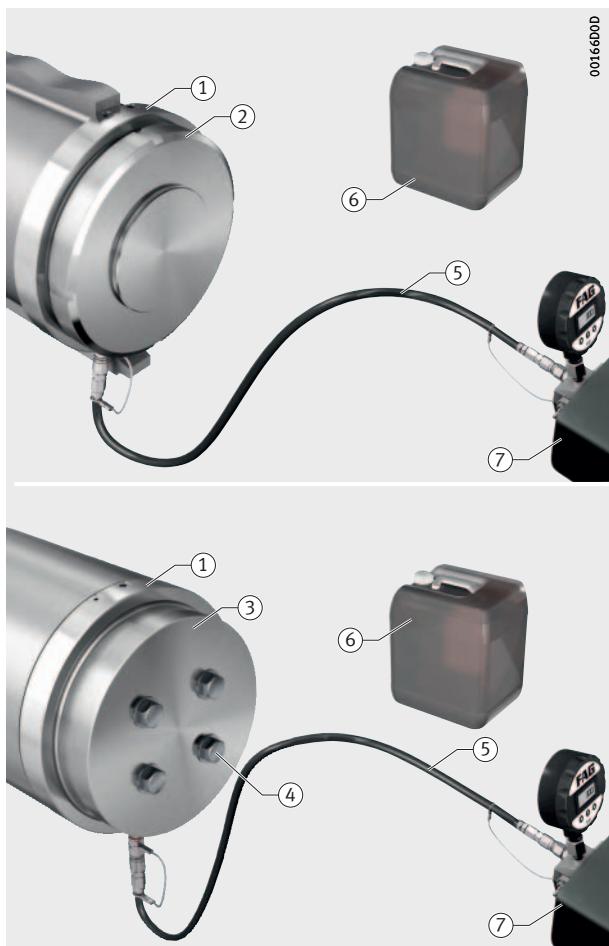


Figure 5
Equipment

Fasteners

If the end of the shaft is threaded, the hydraulic nut can be secured with a nut. If the end of the shaft is not threaded, a washer is used, which is attached to the end face of the shaft.

Hydraulic hose	<p>The following specifications are only a selection. Ensure that all guidelines from the manufacturer are observed.</p> <p>The hydraulic hose:</p> <ul style="list-style-type: none">■ must fulfil all legal requirements valid at the point of use■ must be checked before each use■ must not be damaged■ must be approved for the operating pressure■ must be suitable for the hydraulic oil used■ must not exceed the maximum permissible operating period <p>Further information on the hydraulic hose used is given in the documentation for the hydraulic hose.</p>
Pressure generation device	<p>The points stated below are only a selection. Ensure that all guidelines from the manufacturer of the pressure generation device are observed.</p> <p>The pressure generation device:</p> <ul style="list-style-type: none">■ must fulfil all legal requirements valid at the point of use■ must be checked before each use■ must not be damaged■ may only be operated at a pressure that is lower than the maximum permissible pressure of the hydraulic nut■ must have a sufficiently large tank, see page 103 <p>Further information on the pressure generation device used is given in the documentation for the pressure generation device.</p>
Hydraulic oil	<p>The hydraulic oil used must correspond to a particular viscosity class, see page 132.</p>

Hydraulic nuts HYDNUT..-HEAVY

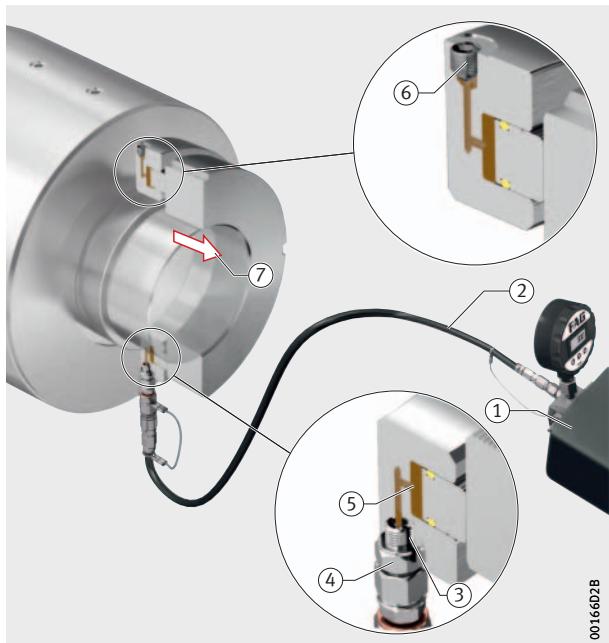
Function

The sealing rings in the annular piston create an outwardly sealed pressure chamber between the press ring and annular piston. A pressure generation device filled with hydraulic oil is connected to this pressure chamber via a hydraulic hose.

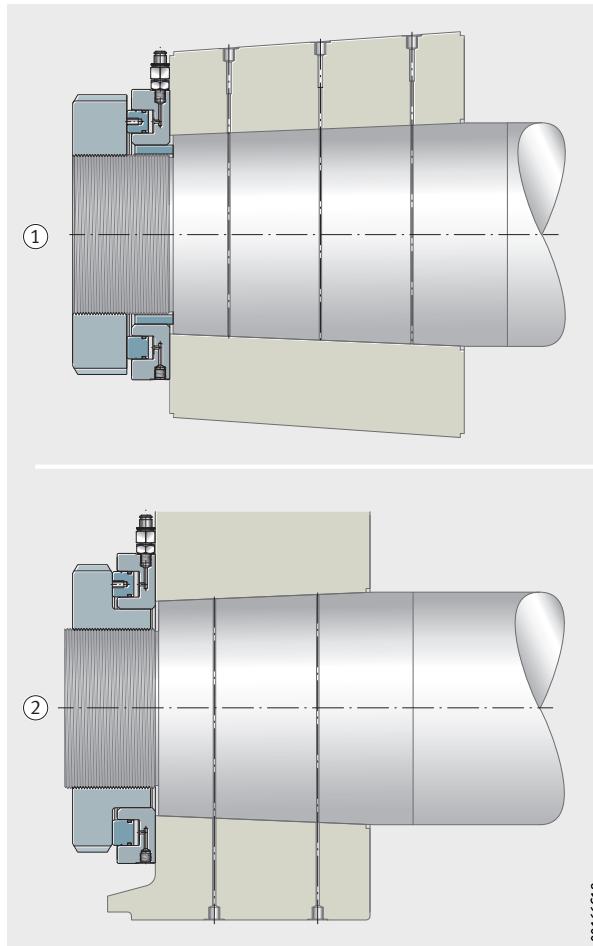
In the pressure generation device, hydraulic oil is placed under high pressure and flows into the pressure chamber. The annular piston undergoes movement, *Figure 6*.

- ① Pressure generation device
- ② Hydraulic line
- ③ Hydraulic nut, threaded hole G1/4
- ④ Valve nipple G1/4
- ⑤ Pressure chamber
- ⑥ Screw plug
- ⑦ Direction of movement of annular piston

Figure 6
Functional principle



Mounting A hydraulic nut HYDNUT..-HEAVY is used to mount a ship's propeller shaft and rudder spindle/blade arrangement, *Figure 7*.



① Mounting the ship's propeller
② Mounting the rudder blade

Figure 7
Mounting

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Further press fits, such as shaft couplings and gears, can also be mounted.

Hydraulic nuts HYDNUT..-HEAVY

Commissioning

Commissioning comprises the following steps:

- checking the hydraulic nut
- lifting the hydraulic nut out of the transport container and transporting the hydraulic nut
- preparation for mounting
- mounting the hydraulic nut
- selecting the pressure generation device

Checking the hydraulic nut

Before use, it is advisable to check whether the diameter of the hydraulic nut is suitable for the shaft present. The press ring has the diameter engraved on the surface, *Figure 8*.

① Diameter information
Figure 8
Checking the hydraulic nut



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Lifting the hydraulic nut out of the transport container and transporting the hydraulic nut

A hydraulic nut can be delivered lying flat either in a rigid box or a wooden crate. Smaller hydraulic nuts can be lifted out of the box and carried due to their low mass. Larger and thus heavier hydraulic nuts must be lifted using a suitable lifting tool. Lifting must always be carried out by the press ring, the threads of the annular piston are not suitable for transport of the complete hydraulic nut.

WARNING

If a hydraulic nut is lifted by the annular piston and transported horizontally, the press ring may become loose and fall. A falling press ring can cause serious injury. Always transport hydraulic nuts vertically. ◀

CAUTION

If a small hydraulic nut is carried horizontally with the annular piston facing down, the annular piston may become loose and fall. A falling annular piston can cause injury to legs and feet. Hydraulic nuts should always be transported with the annular piston facing up or vertically. ◀

WARNING

If the annular piston is moved out further than the red O-ring, it may become loose during transport. The falling annular piston can cause injury. Before transport, press in the annular piston until the red O-ring is no longer visible. ◀

WARNING

An unsuitable lifting tool can fail. A falling hydraulic nut can cause injury. Use a suitable lifting tool that can safely support the mass of the hydraulic nut. Ensure that nobody is underneath the hydraulic nut at any time during transport. Secure the hazard area. ◀

Hydraulic nuts HYDNUT..-HEAVY

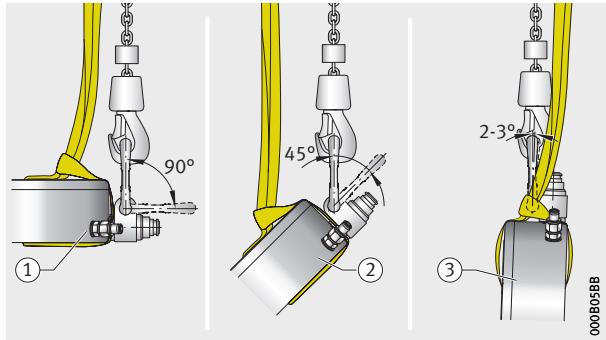
⚠ WARNING

Serious injury caused by a falling hydraulic nut due to failure of an unsuitable clevis.

Only use a folding clevis that is suitable for all lifting positions (angles), *Figure 9*. □

- ① Hydraulic nut, lying flat
- ② Hydraulic nut, lifted half way
- ③ Hydraulic nut, suspended

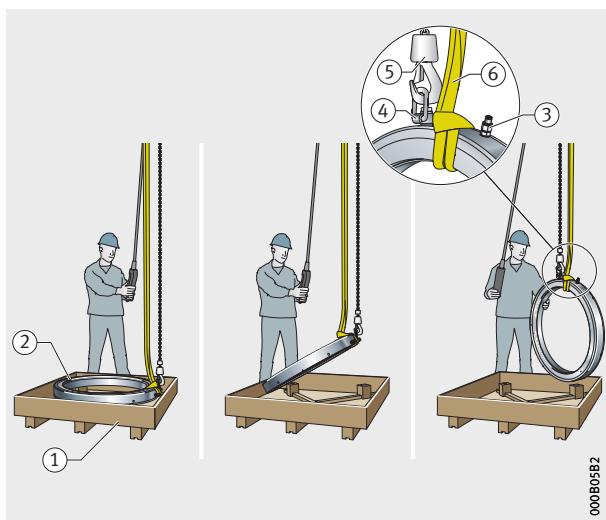
Figure 9
Lifting positions



- Screw in the folding clevis (if there is a threaded hole for the clevis in the outer cylindrical surface of the press ring).
- Hang a hook in the folding clevis or thread in a carrying sling.
- Fit the securing belt.
- Slowly lift the hydraulic nut until it hangs vertical, *Figure 10*.

- ① Wooden crate
- ② Hydraulic nut
- ③ Valve nipple
- ④ Folding clevis
- ⑤ Hook
- ⑥ Securing belt

Figure 10
Delivered condition



- Transport the hydraulic nut without shocks or vibration.

Preparation for mounting

The valve nipple is checked as follows:

- ▶ Check optically whether the thread of the valve nipple is damaged. If the thread is damaged, use a new valve nipple, *Figure 11*.

① Valve nipple
② Seal

Figure 11
Valve nipple

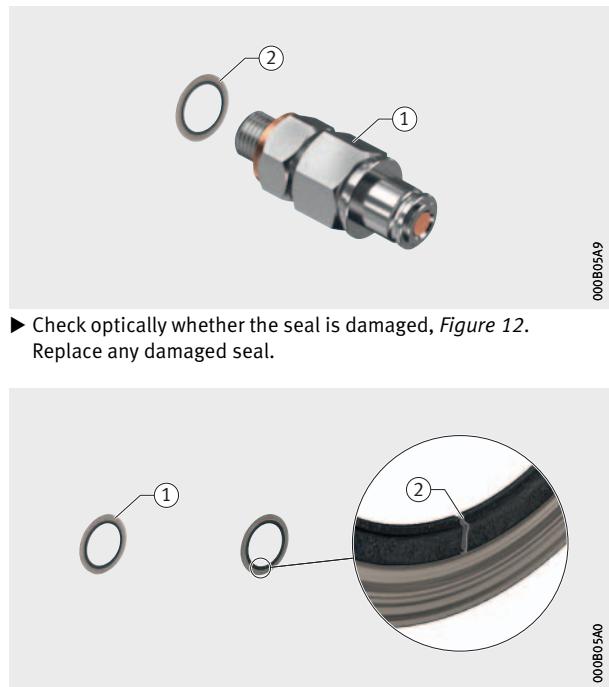
- ▶ Check optically whether the seal is damaged, *Figure 12*. Replace any damaged seal.

① New
② Damaged

Figure 12
Sealing

A seal with the following characteristics is suitable:

- Type:
 - CEJN rubber/metal seal
- Operating pressure:
 - 1000 bar
- Dimensions:
 - G¹/₄ (20,57 mm×13,74 mm×3 mm)
- Material:
 - high grade steel/fluoro rubber (FKM)



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Hydraulic nuts HYDNUT..-HEAVY

Mounting the hydraulic nut

In mounting, the method used depends on the mass of the hydraulic nut.

Light hydraulic nut, fixing nut or washer

A light hydraulic nut can be mounted manually and located with a fixing nut or washer, for example, *Figure 13*:

- Slide the hydraulic nut on the shaft until the press ring is in contact with the component to be mounted.
- If necessary, turn the hydraulic nut until one threaded hole $G^{1/4}$ is in the upper position.
- Screw the fixing nut into place on the thread of the shaft or attach the washer to the end face of the shaft.
- The hydraulic nut is mounted and can be bled.



Light hydraulic nut, stepped fixing nut

A light hydraulic nut can be mounted manually and located using a stepped fixing nut, for example, *Figure 14*:

- ▶ Slide the hydraulic nut onto the stepped fixing nut until the end face of the annular piston is in contact with the collar of the nut.
- ▶ Screw the stepped fixing nut into place until the press ring is in contact with the component to be mounted.
- ▶ If necessary, turn the hydraulic nut until one threaded hole G¹/₄ is in the upper position.
- ▶ The hydraulic nut is mounted and can be bled.



Hydraulic nuts HYDNUT..-HEAVY

Heavy hydraulic nut, fixing nut or washer

A heavy hydraulic nut cannot be mounted manually. A mounting aid should be used on which the hydraulic nut is supported with the facility for axial displacement.

⚠ WARNING

If the hydraulic nut tilts or falls from the mounting aid, this can cause serious crushing of body parts.

Use an auxiliary device that has sufficient load carrying capacity and tilting rigidity to assist with the sliding operation. During mounting, secure the hydraulic nut against tilting and falling. 

- Align the mounting aid at 90° and concentrically to the axis,
Figure 15.

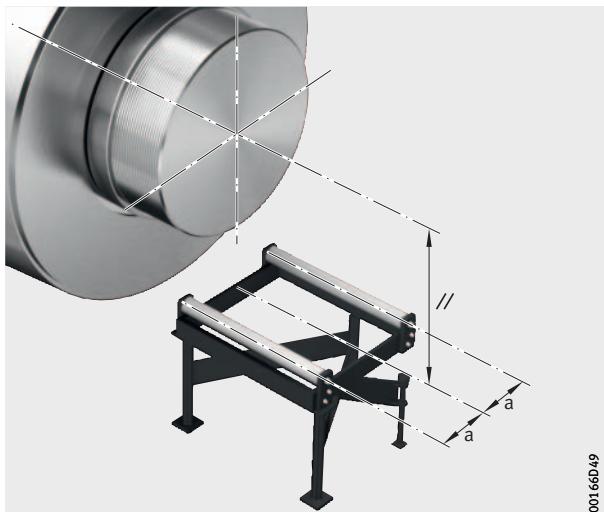


Figure 15
Aligning the mounting aid

WARNING

Serious crushing in setting down of the hydraulic nut.

When setting down the hydraulic nut, ensure that no body parts are located in the gap between the hydraulic nut and shaft or adjacent construction. 

- ▶ Set down the hydraulic nut carefully on the mounting aid using a crane, *Figure 16*.



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Figure 16
Setting down the hydraulic nut

- ▶ Remove the securing belt.

Hydraulic nuts HYDNUT..-HEAVY

When displacing the hydraulic nut, there is an increased risk of injury, especially to the hands.

⚠ WARNING

Serious crushing in displacement of the hydraulic nut.

When displacing the hydraulic nut, ensure that no body parts are located in the gap between the hydraulic nut and shaft or adjacent construction. ▲

- ▶ Push the hydraulic nut onto the shaft until the press ring is in contact with the component to be mounted, *Figure 17*.



One threaded hole $G^{1/4}$ must be located at the top, with no gap permissible between the hydraulic nut and the fixing nut or washer:
► Turn the hydraulic nut until one threaded hole $G^{1/4}$ is in the upper position, *Figure 18*.



Figure 18
Threaded hole at the top

The hydraulic nut is attached to the shaft using either a fixing nut or a washer, *Figure 19*, page 96.

⚠ WARNING

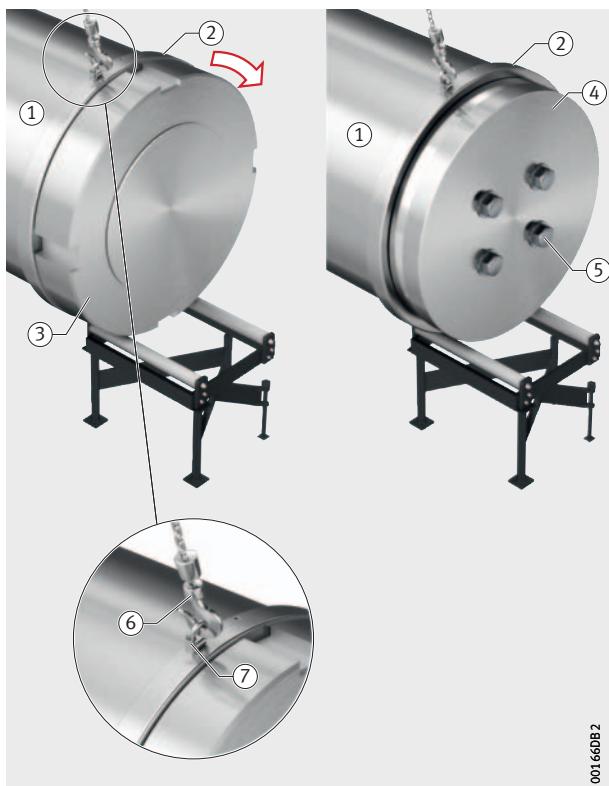
Injuries due to a washer becoming loose from the shaft and falling because too few screws were used.

Determine the load and use an appropriate number of screws. ◀

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Hydraulic nuts HYDNUT..-HEAVY

- Use suitable lifting and transport tools to transport the fixing nut or washer to the assembly area.
- Rotate the fixing nut until this is in contact with the hydraulic nut or screw mount the washer on to the end face of the shaft.
- Remove the hook.
- Remove the folding clevis.
- The hydraulic nut is mounted and can be bled.



**Heavy hydraulic nut,
stepped fixing nut**

A heavy hydraulic nut cannot be mounted manually. A mounting aid should be used on which the hydraulic nut is supported with the facility for axial displacement.

WARNING

If the hydraulic nut tilts or falls from the mounting aid, this can cause serious crushing of body parts.

Use an auxiliary device that has sufficient load carrying capacity and tilting rigidity. During mounting, secure the hydraulic nut against tilting and falling. 

- Align the mounting aid at 90° and concentrically to the axis,
Figure 20.

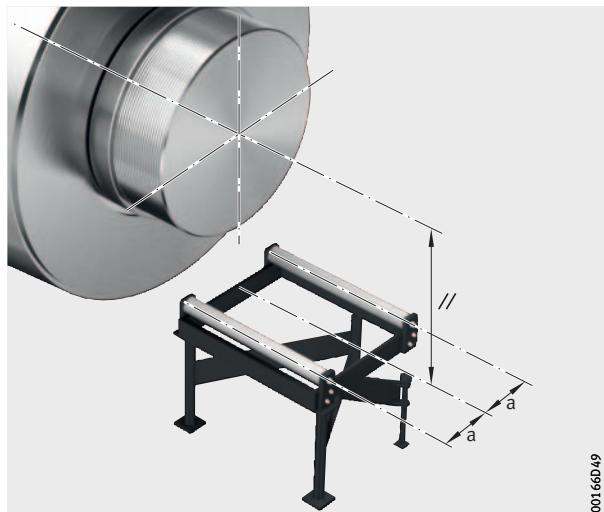


Figure 20
Aligning the mounting aid

Hydraulic nuts HYDNUT..-HEAVY

⚠ WARNING

Serious crushing in setting down of the hydraulic nut.

When setting down the hydraulic nut, ensure that no body parts are located in the gap between the hydraulic nut and shaft or adjacent construction. ◀

► Set down the fixing nut, onto the shoulder of which the hydraulic nut is pushed, carefully on the mounting aid using a crane, *Figure 21.*



► Remove the securing belt.

Adjustment of the mounting aid requires precise action.

- ▶ Adjust the height of the mounting aid.
- ▶ Align the fixing nut, with the hydraulic nut pushed into position, exactly parallel and concentrically to the shaft, *Figure 22*.

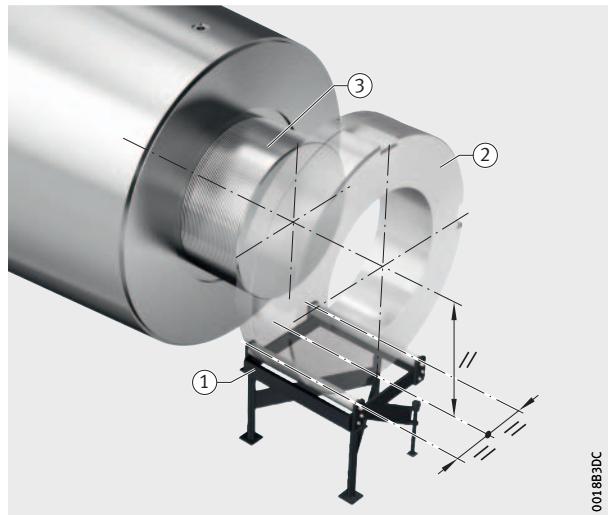


Figure 22
Start position

Hydraulic nuts HYDNUT..-HEAVY

When displacing the hydraulic nut, there is an increased risk of injury, especially to the hands.

⚠ WARNING

Serious crushing in displacement of the hydraulic nut.

When displacing the hydraulic nut, ensure that no body parts are located in the gap between the hydraulic nut and shaft or adjacent construction. ▲

- Displace the fixing nut, with the hydraulic nut pushed into position, until the press ring is in contact with the component to be mounted, *Figure 23*.

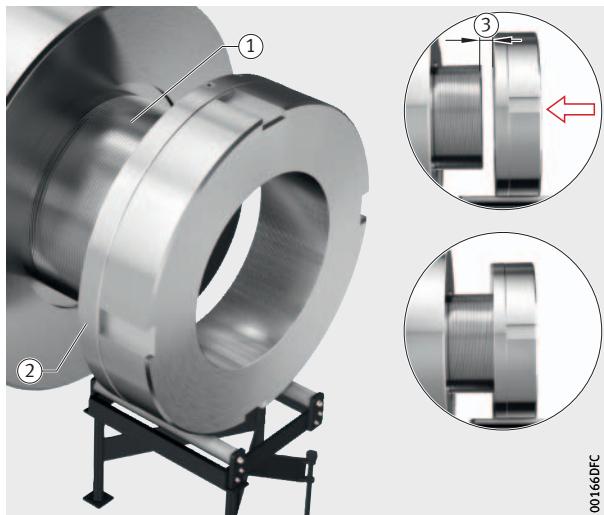


Figure 23
Displacing the hydraulic nut

During this mounting step, it is very important that the hydraulic nut is positioned exactly concentrically to the shaft. The stepped fixing nut should only be tightened to the point that the hydraulic nut can still be turned:

- Rotate the stepped fixing nut on the thread of the shaft until the flange slightly abuts the hydraulic nut, *Figure 24*.

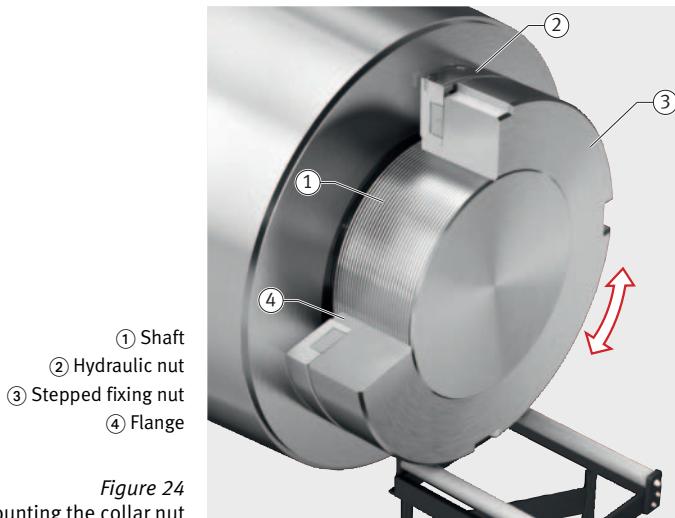


Figure 24
Mounting the collar nut

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Hydraulic nuts HYDNUT..-HEAVY

In order to be able to turn the hydraulic nut, the collar nut should not be overtightened:

- Turn the hydraulic nut until one threaded hole $G^{1/4}$ is in the upper position, *Figure 25*.
- Remove the hook.
- Remove the folding clevis.
- ▷ The hydraulic nut is mounted and can be bled.



Selecting the pressure generation device

A suitable pressure generation device must have certain characteristics, see page 83. It must have a sufficiently large tank containing at least the requisite oil quantity, since it is not possible to refill with hydraulic oil during operation.

Oil quantity For the maximum drive-up distance, a certain oil quantity is required, see *table*.

HYDNUT..-HEAVY

Hydraulic nut		Oil quantity ¹⁾ l
from	up to	
HYDNUT100-HEAVY	HYDNUT250-HEAVY	0,5
HYDNUT275-HEAVY	HYDNUT350-HEAVY	1
HYDNUT375-HEAVY	HYDNUT450-HEAVY	2
HYDNUT475-HEAVY	HYDNUT500-HEAVY	3
HYDNUT525-HEAVY	HYDNUT575-HEAVY	4
HYDNUT600-HEAVY	–	5
HYDNUT625-HEAVY	–	6
HYDNUT650-HEAVY	HYDNUT675-HEAVY	7
HYDNUT700-HEAVY	–	8
HYDNUT750-HEAVY	–	10
HYDNUT800-HEAVY	–	12
HYDNUT850-HEAVY	–	15
HYDNUT900-HEAVY	–	17

¹⁾ Assuming usage of a hydraulic hose with a length of 1 m and an inside diameter of 4 mm.

Hydraulic nuts HYDNUT..-HEAVY

Operation After bleeding, the pressure is built up in order to mount the component.

Hydraulic oil The hydraulic oil used in operation must be clean and of the specified viscosity class, see page 132.



Severe burns due to ignition of hydraulic oil.

Avoid sources of ignition, including in particular cutting, welding and soldering work, in the vicinity of escaping hydraulic oil. ◀



Hydraulic oil can cause irritation to skin and respiratory organs.

Avoid skin contact if possible. Wear gloves. Protect uncovered skin by means of oil-based skin cream. Do not inhale vapours or fumes. ◀



Contaminated hydraulic oil can damage seals. Damaged seals must be replaced promptly.

Only use clean hydraulic oil. ◀

Maximum pressure

The maximum permissible pressure must be observed throughout operation.



Serious injuries due to the spraying out of hydraulic oil under high pressure and damage to the hydraulic nut if the maximum permissible pressure is exceeded.

Measure the operating pressure continuously. The operating pressure must never exceed the maximum permissible pressure, *Figure 26*. ◀

① Maximum pressure information

Figure 26
Maximum permissible pressure,
engraved



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Technical data such as dimensions and the permissible pressure for hydraulic nuts can be found in a Technical Product Information. This is available as a PDF file on the Internet under the address <https://www.schaeffler.de>, menu item Mediathek.

Further information ■ TPI 196, Hydraulic Nut HYDNUT

Hydraulic nuts HYDNUT..-HEAVY

Mounting the hydraulic hose

Mounting of the hydraulic hose connects the pressure generation device and hydraulic nut with each other.

The following accessories are required:

- hose fasteners
- tool for mounting hose fasteners, see instructions for hose fasteners
- Allen key W 6 for fitting and removing the screw plug

WARNING

Serious injuries due to the spraying out of hydraulic oil as a result of an unsuitable, damaged or old hydraulic hose.

Only mount a hydraulic hose that is approved for use with the pressure generation device. The hydraulic hose must be free from damage. Observe the storage life date of the hydraulic hose. ◀

NOTICE

Damage to the pressure generation device and seals in the hydraulic nut due to contaminants.

Remove any contaminants from the pressure generation device, hydraulic hose and hydraulic nut. All work must be carried out under extreme cleanliness. ◀

Mounting the hydraulic hose:

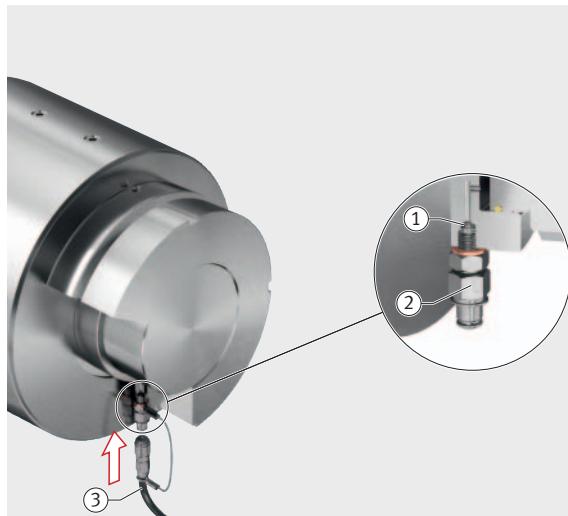
- Rotate the hydraulic nut until the valve nipple is at the bottom.

⚠ WARNING

Serious injuries due to the spraying out of hydraulic oil under high pressure due to the loosening of a screw connection.

Observe the maximum tightening torque for the oil connector on the pressure generation device. ◀

- Slide the collar of the hydraulic hose onto the valve nipple, *Figure 27.*



① Hydraulic nut,
lower threaded hole G¹/₄
② Valve nipple
③ Hydraulic hose

Figure 27
Connector

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Hydraulic nuts HYDNUT..-HEAVY

- ▶ Slide the collar of the hydraulic hose onto the valve nipple of the pressure generation device, *Figure 28*.
- ▶ Apply the hose fasteners.

⚠ WARNING

Serious injuries due to detached hose whipping back and forth. Mount hose fasteners in order to prevent whipping by the hydraulic hose. ◀

⚠ WARNING

Serious injuries due to hydraulic oil spraying out of torn hydraulic hose under high pressure because the hydraulic hose was laid with an excessively small bending radius.

Lay the hydraulic hose with the specified bending radius to the pressure generation device. Observe the instructions for the hydraulic hose. ◀



- ① Hose fastener on hydraulic nut
- ② Hose fastener on pressure generation device

Figure 28
Connecting
the pressure generation device

Bleeding Bleeding is necessary since compressed air will endanger the safety of the user. The hydraulic oil escaping during bleeding must be collected and disposed of correctly in accordance with the regional regulations.

- ▶ Check whether the oil volume in the pressure generation device is adequate to bleed the pressure generation device, hydraulic hose and hydraulic nut. Furthermore, the oil volume must be sufficient for the drive-up distance of the annular piston. Where necessary, hydraulic oil must be refilled before bleeding. Refilling during operation is not permissible.

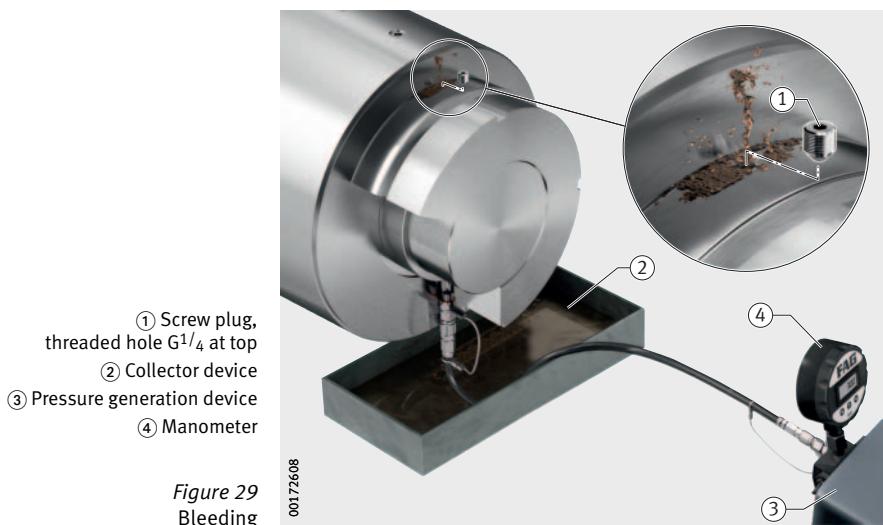
⚠ WARNING

Blinding or injury to eyes due to spraying out of hydraulic oil under high pressure.

Ensure that the plug-in coupling is securely connected and the hose fasteners are fitted. Always wear safety goggles. ◀

- ▶ Ensure that the screw plug is at the top, *Figure 29*, page 110.
- ▶ Apply the device for collection of hydraulic oil.
- ▶ Remove the screw plug from the upper threaded hole $G^{1/4}$.
- ▶ Start the pressure generation device.
- ▶ Wait until the hydraulic oil escapes without air bubbles.
- ▶ Stop the pressure generation device.
- ▶ Screw the screw plug back into the upper threaded hole $G^{1/4}$ and observe the tightening torque, see page 132.
- ▶ Remove the collector device.
- ▶ Dispose of the collected hydraulic oil correctly or send for recycling.

Hydraulic nuts HYDNUT..-HEAVY



Pressing the component into place

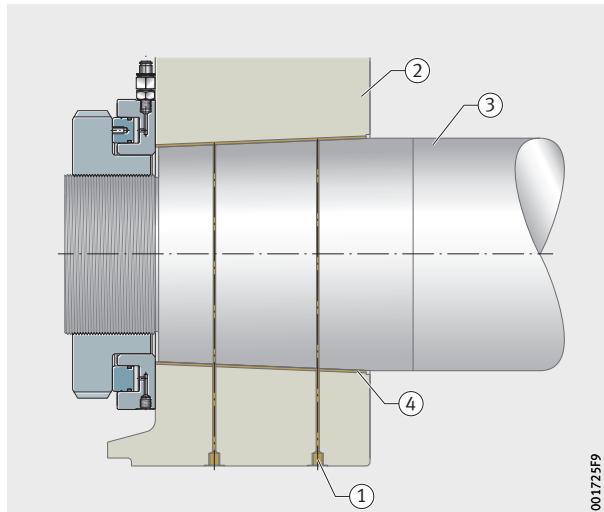
Pressing into place can be carried out either with or without the oil pressure method. The oil pressure method is explained in the Mounting Handbook MH 1.

Oil pressure method

In order to reduce the pressing force, the oil pressure method can be used. In the oil pressure method, an additional pressure generation device is used to press hydraulic oil between the fit surfaces, *Figure 30*.

- ① Additional pressure generation device, connection
- ② Component to be pressed into place
- ③ Shaft
- ④ Fit surface

Figure 30
Oil pressure method



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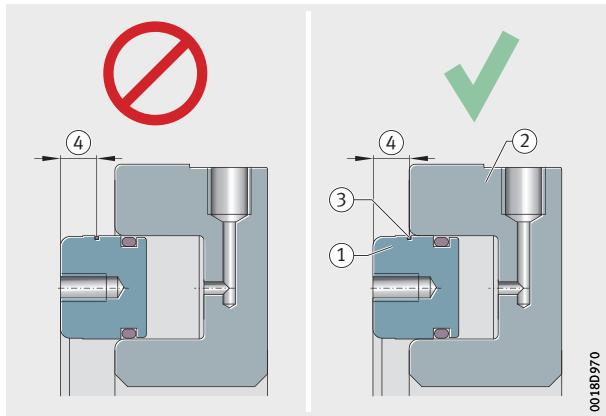
Hydraulic nuts HYDNUT..-HEAVY

Red O-ring

The maximum drive-up distance of the press ring is indicated by a red O-ring. The press ring can only be pressed out while the red O-ring is visible, *Figure 31*.

- ① Annular piston
- ② Press ring
- ③ Red O-ring
- ④ Drive-up distance, maximum

Figure 31
Red O-ring



Pressure build-up As a result of pressure build-up, the component is pressed off the hydraulic nut.

- When using the oil pressure method, pressure is first built up using the additional pressure generation device and then maintained during the whole mounting procedure.

⚠ WARNING

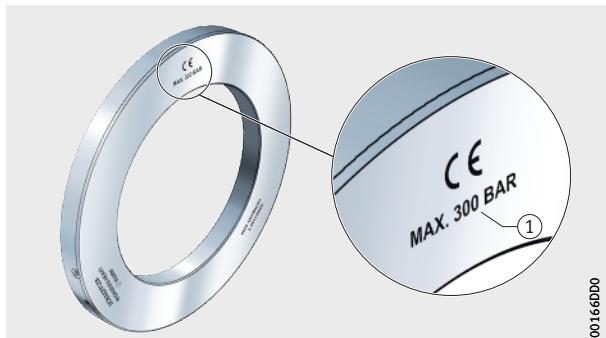
Serious injuries due to spraying out of hydraulic oil under high pressure.

The reasons for this may be as follows:
missing screw plug, defective seal, overshoot of maximum operating pressure, excessive pressing out of the press ring.

Screw in the screw plug in the upper threaded hole G¹/₄.

Measure the operating pressure continuously. The operating pressure must never exceed the maximum permissible pressure, *Figure 32*.

Operate the hydraulic nut only while the red O-ring is visible, see page 48. ◀



① Maximum pressure information

Figure 32
Maximum permissible pressure

⚠ WARNING

Serious injuries due to bursting or loosening of hydraulic nut in case of component failure.

Stand to one side, not directly behind the hydraulic nut. ◀

- Build up pressure in the hydraulic nut. Press the requisite volume into the hydraulic nut until the requisite drive-up distance is reached.

Hydraulic nuts HYDNUT..-HEAVY

Pressure decrease in oil pressure method

The following steps are only carried out if the oil pressure method is used:

- ▶ Switch the pressure generation device for the oil pressure method to unpressurised.
- ▶ Wait 5 min.
- ▶ Measure the radial or axial internal clearance.
- ▶ Wait 30 min so that the oil can escape.

Pressure decrease in hydraulic nut

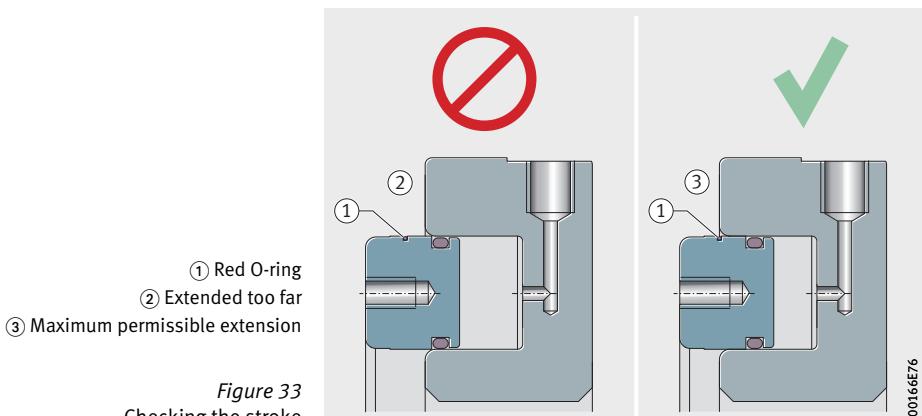
Once the component is pressed into place:

- ▶ Switch the pressure generation device for the hydraulic nut to unpressurised.

Checking the stroke

If the annular piston has been pressed out further than the red O-ring, the hydraulic nut must not be transported. In this case, the annular piston must be pressed back while the hydraulic nut is still on the shaft.

- ▶ Check optically how far the annular piston has been extended, *Figure 33*.



Pressing back the annular piston at the mounting location

If the annular piston has been pressed out too far, it must be pressed back in on site.

- Loosen the hydraulic nut until there is sufficient space for suitable tools such as screw clamps, *Figure 34*.
- Connect the unpressurised pressure generation device and ensure that hydraulic oil can flow back into the pressure generation device.
- Press the annular piston back until the red O-ring is no longer visible.
- Once the annular piston has been pressed back far enough that the red O-ring is no longer visible, the hydraulic nut can be transported.

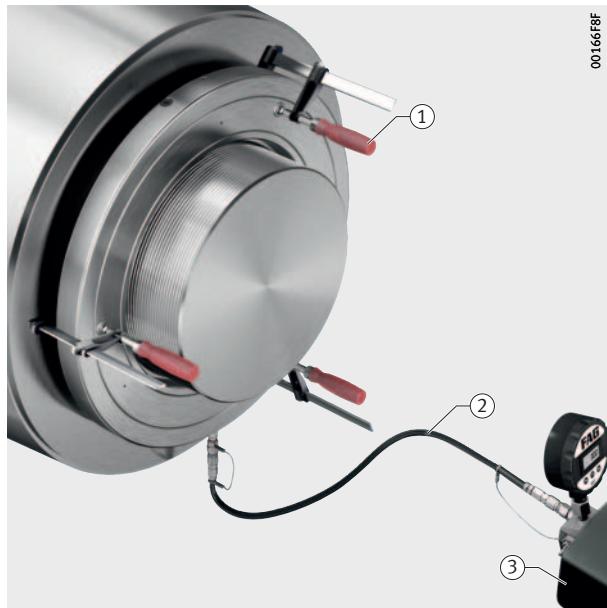


Figure 34
Pressing back the annular piston

Hydraulic nuts HYDNUT..-HEAVY

Removing the hydraulic hose

Before transporting the hydraulic nut, the hydraulic hose is removed. The pressure generation device and hydraulic hose are connected again before the annular piston is pressed back.



Serious injuries due to spraying out of hydraulic oil under high pressure if the pressure generation device is not switched to unpressurised and a hydraulic hose is detached.

A hydraulic hose may only be detached after switching the system to unpressurised. 

- ▶ Switch the system to unpressurised, see the user manual of the pressure generation device.
- ▶ Undo the hose fastener on the hydraulic nut, then remove the hose.

Detaching the hydraulic nut from the shaft

The hydraulic nut is first detached from the shaft and then transported.

Before loosening the fastener, the hydraulic nut is secured, *Figure 35*, page 117:

- ▶ Loosen the fastener to the point that the hydraulic nut can be rotated.
- ▶ Rotate the hydraulic nut until the threaded hole for the folding clevis is at the top.
- ▶ Screw in the folding clevis.
- ▶ Hang a hook in the folding clevis or thread in a carrying sling.
- ▷ The fastener can now be removed.

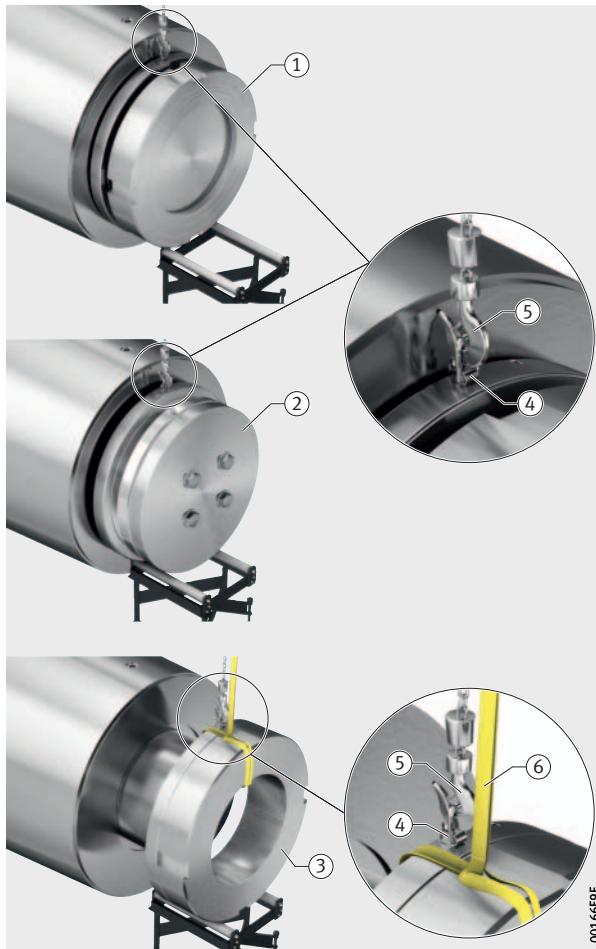


Figure 35
Securing the hydraulic nut

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Hydraulic nuts HYDNUT..-HEAVY



Risk of crushing due to a falling fastener (nut, washer or collar nut) because this was not secured.

Secure fastener against falling.

Before the hydraulic nut can be removed, the fastener must be removed, *Figure 36*:

- When fastening with a stepped collar nut, lift the nut slightly with a dismounting aid or by the folding clevis.
- Remove the fastener.
- Where necessary, protect the thread with sheet metal.
- The hydraulic nut can now be removed.



Figure 36
Removing the fastener

The hydraulic nut can be transported immediately after removal from the shaft, *Figure 37*:

- Screw a folding clevis into the threaded hole for the clevis in the outer cylindrical surface of the press ring.
- Hang a hook in the folding clevis or thread in a carrying sling.
- Fit the securing belt.
- Remove the hydraulic nut from the shaft.
- ▷ The hydraulic nut can now be transported.



Hydraulic nuts HYDNUT..-HEAVY

Transporting the hydraulic nut

► Transport the hydraulic nut without shocks or vibration, *Figure 38.*

- ① Hydraulic nut
- ② Folding clevis
- ③ Securing belt

Figure 38
Transport



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Pressing back the annular piston

Once the hydraulic nut with the annular piston facing up has been deposited on wooden beams of sufficient load carrying capacity, the annular piston can be pressed back.

⚠ CAUTION

Risk of slippage and contamination of the environment with hydraulic oil if oil is prevented from returning to the tank of the pressure generation device.

Ensure the return of oil to the tank of the pressure generation device. ◀

▶ Connect the hydraulic hose and the unpressurised pressure generation device again.

▶ Press in the annular piston by means of screw clamps until it stops, *Figure 39*.

▷ The hydraulic oil is pressed back into the pressure generation device.

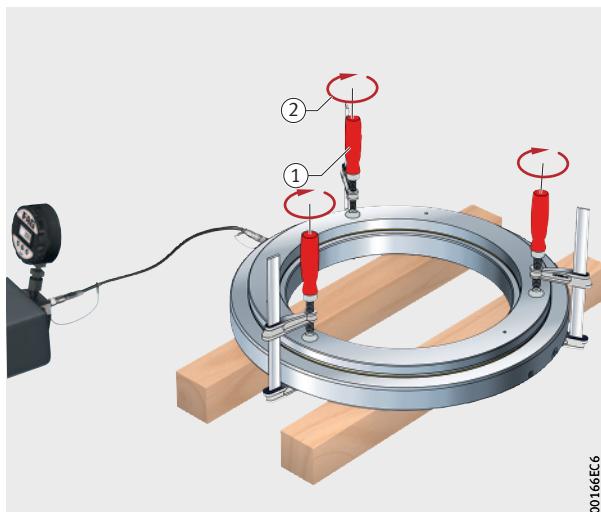


Figure 39
Pressing back the annular piston

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- ▶ Remove the hydraulic hose.
- ▷ The hydraulic nut can now be transported away.

Hydraulic nuts HYDNUT..-HEAVY

Decommissioning

If the hydraulic nut will not be used for an extended period, it should be decommissioned:

- Press the annular piston in completely.
- Screw in the screw plug and valve nipple.
- Clean the hydraulic nut using cold cleaner or paraffin oil.
- Oil the surface of the hydraulic nut, for example using ARCANOL-ANTICORROSIONOIL-400G.

WARNING

Disease of the respiratory organs through inhalation of vapours of the cleaning agent used.

Observe the safety and environmental guidelines of the cleaning agent manufacturer. 

Storage

All parts should be stored under the specified conditions, see page 6.

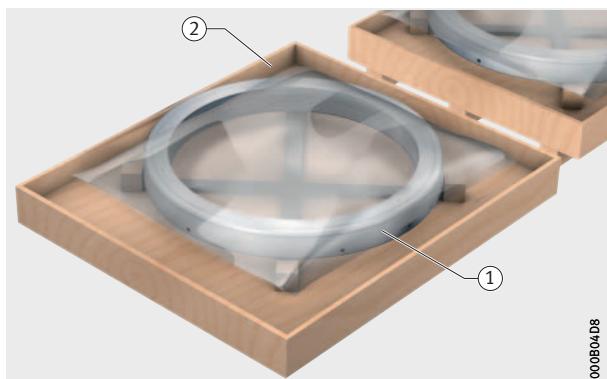
NOTICE

The press ring of the hydraulic nut may become deformed due to its own weight if it is stored standing up. As a result of storage standing up, the hydraulic nut may thus become unusable.

Store the hydraulic nut lying flat with the annular piston facing up in the delivery packaging, *Figure 40*. 

① Hydraulic nut
② Box or wooden transport crate

Figure 40
Decommissioning



Alternatively, a hydraulic nut can be stored lying on wooden ledges and covered.

Troubleshooting Malfunctions become apparent in operation of the hydraulic nut. Once the malfunction has been eliminated, the hydraulic nut is normally ready for use again.

**Troubleshooting
Hydraulic nut**

Malfunction	Possible cause	Remedy
Hydraulic oil escaping in the area of the seal	Seals damaged	Replace seals, see page 124
Hydraulic oil is contaminated		
Annular piston jammed	Annular piston tilted	Do not use force. Collect the escaping hydraulic oil. Loosen the screw plug, then press the annular piston back into the press ring.

If the defect cannot be eliminated, please contact Schaeffler Customer Service.

**Troubleshooting
Pressure generation device**

Malfunction	Possible cause	Remedy
Annular piston moves out abruptly	Air in system	Bleed oil circuit
Pressure does not increase	Escape valve is open	Close escape valve
Other malfunction	–	See the user manual of the pressure generation device

If the defect cannot be eliminated, please contact the manufacturer of the pressure generation device.

Hydraulic nuts HYDNUT..-HEAVY

Maintenance The hydraulic nut must be checked before every use.

NOTICE

Damage to the hydraulic nut in the case of defective maintenance. If seals are damaged, contamination can reach the pressure chamber of the hydraulic nut.

If oil is lost, replace the seals immediately. 

Maintenance plan The maintenance items are stated in the maintenance plan, see *tables*.

Before every use

Subassembly	Activity
Hydraulic nut	<input type="checkbox"/> Visual inspection – check for wear and damage

After every use

Subassembly	Activity
Press ring and annular piston	<input type="checkbox"/> Clean using cold cleaner or paraffin oil <input type="checkbox"/> Apply oil (rust protection)

Every 2 years

Subassembly	Activity
Seal	<input type="checkbox"/> Replacement

As necessary

Subassembly	Activity
Seal	<input type="checkbox"/> Replace if oil is lost

Ordering the seal Order suitable replacement seals before replacement is carried out. The ordering number of the seal set is listed in a table, page 133.

Replacing the seal Before replacing the seals, check whether suitable replacement seals are available.

The replacement of seals comprises the following steps:

- dismount the annular piston
- dismount the seals
- clean the components
- mount the seals
- mount the annular piston

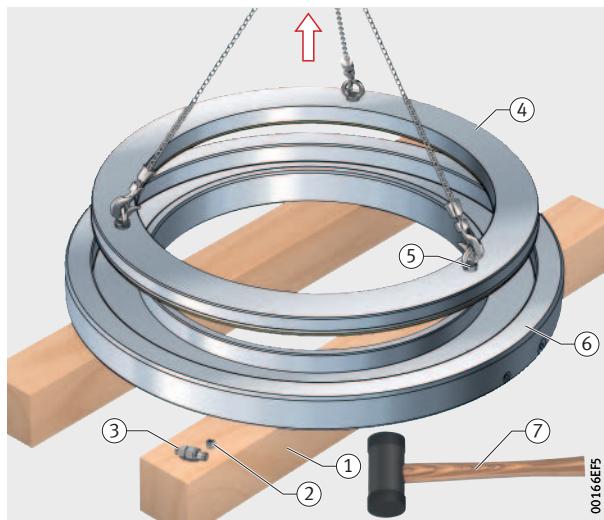
Dismounting the annular piston

During dismounting, ensure that the annular piston is not positioned obliquely.

- ▶ Provide support of sufficient load carrying capacity and tilting rigidity.
- ▶ Deposit the hydraulic nut on the prepared support with the annular piston facing up, *Figure 41*.
- ▶ Remove the screw plug and valve nipple.
- ▶ Screw the eye bolts into the annular piston.
- ▶ Lift the hydraulic nut by the annular piston by a few centimetres.
- ▶ Wait until the press ring separates from the annular piston under its own weight.
- ▶ As soon as the press ring is in contact with the support, lift again by a few centimetres and repeat the process until the annular piston has become completely detached.
- ▶ Remove the annular piston.

- ① Support
- ② Screw plug
- ③ Valve nipple
- ④ Annular piston
- ⑤ Eye bolt
- ⑥ Press ring
- ⑦ Plastic hammer

Figure 41
Knocking out
the annular piston



Hydraulic nuts HYDNUT..-HEAVY

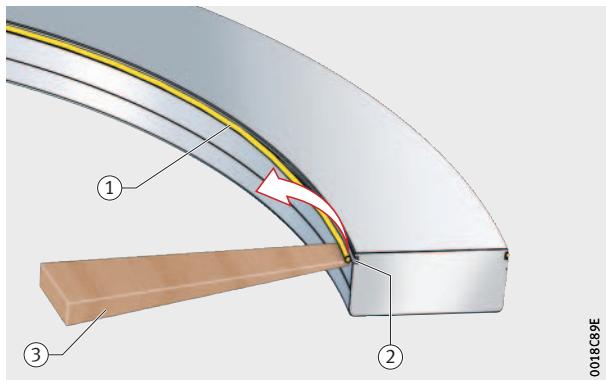
Dismounting the seals

When removing the seals, ensure that the seal slots remain undamaged. For dismounting, use a soft tool made from wood or plastic.

► Lever the seals out of the seal slots, *Figure 42*.

- ① Seal
- ② Seal slot
- ③ Wooden or plastic tool

Figure 42
Dismounting the seals



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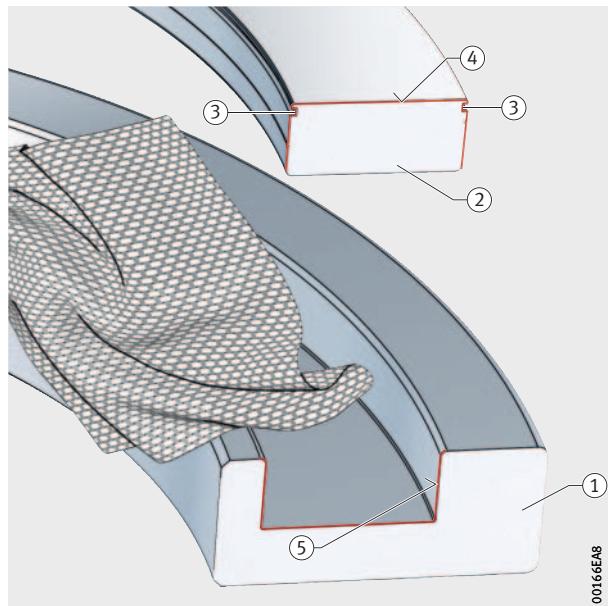
Cleaning the components

As cleaning agents, cold cleaners and paraffin oil have proved effective.

- ▶ Clean the press ring and annular piston. Carry out particularly thorough cleaning of the seal slots, piston surface and piston guide face, *Figure 43*.

- ① Press ring
- ② Annular piston
- ③ Seal slots
- ④ Piston surface
- ⑤ Piston guide face

Figure 43
Cleaning the components



Hydraulic nuts HYDNUT..-HEAVY

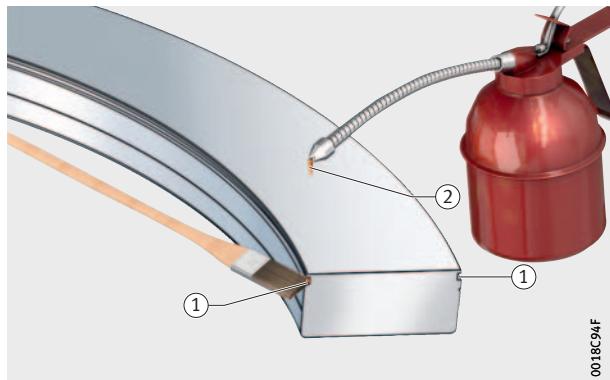
Mounting the seals

During mounting, ensure that the seals remain undamaged.

► Oil both seal slots using hydraulic oil, *Figure 44*.

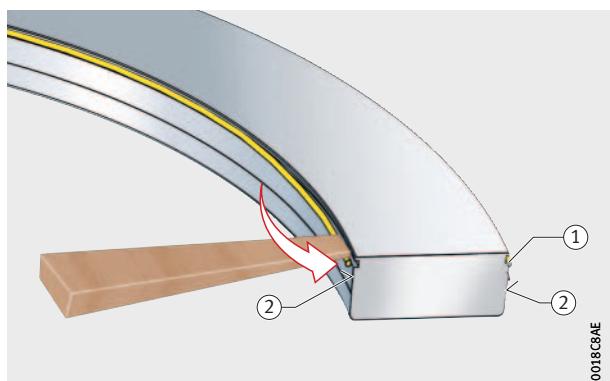
① Seal slot
② Hydraulic oil

Figure 44
Oiling the seal slots



① Seal
② Piston guide face

Figure 45
Mounting the seals



► Oil the piston guide face using hydraulic oil, *Figure 46*.

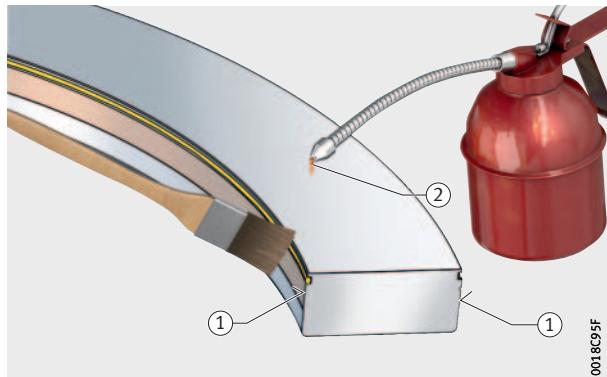


Figure 46

Oiling the piston guide faces

Mounting the annular piston

During mounting, ensure that the annular piston is fitted straight, *Figure 47*.

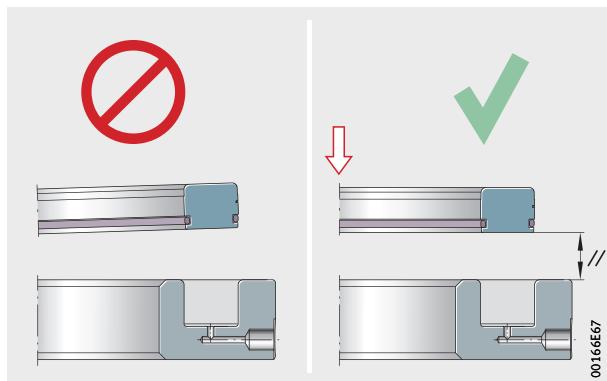


Figure 47
Mounting

Hydraulic nuts HYDNUT..-HEAVY

- ▶ Position the annular piston above the press ring.
- ▶ Oil the sealing rings using hydraulic oil.
- ▶ Carefully lower the annular piston until this is lying on the press ring.
- ▶ Press the annular piston into the press ring uniformly using three screw clamps until both seals have disappeared in the press ring, *Figure 48*.

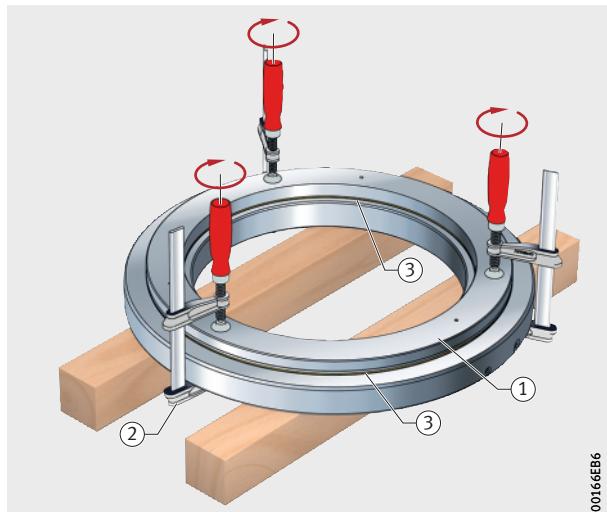


Figure 48
Mounting the annular piston

- ▶ Remove the screw clamps.
- ▶ Strike the annular piston lightly using a plastic hammer at a spacing of 120°, until the annular piston is completely in contact with the press ring.

Disposal A hydraulic nut can be returned to Schaeffler for disposal.



CAUTION Risk of injury due to skin contact with hydraulic oil.

Wear gloves when dismantling the hydraulic nut. 

After dismantling, the press ring and annular piston can be disposed of together with other steel parts. The seals are made from plastic (PVC). Hydraulic oil must be collected and disposed of correctly or recycled. Aids such as oil-soaked cleaning cloths must be disposed of correctly.

Regulations Disposal must be carried out in accordance with locally applicable regulations.

Hydraulic nuts HYDNUT..-HEAVY

Technical data and replacement parts

The technical data give information that is valid for each hydraulic nut. Replacement parts are available, see *tables*.

Technical data

Designation	Maximum tightening torque ¹⁾ Nm	Hydraulic oil, viscosity class mm ² /s	
		from	to
HYDNUT..-HEAVY	45	46	68

1) The maximum tightening torque is valid for threaded holes G¹/₄ in the press ring.

Replacement parts

It is advisable to have a screw plug available on site as a replacement part. Experience has shown that this part cannot always be found when it is needed. Since the seals are replaced after a specified period, the replacement seals should be ordered well in advance of the maintenance date.



Only use Schaeffler original replacement parts.

Screw plug

Designation	Ordering number
HYDNUT.PLUG	038487659-0000-10

Hydraulic nuts and seals
HYDNUT..-HEAVY

Hydraulic nut		Seal (set)	
HYDNUT	Ordering number	HYDNUT	Ordering number
100-HEAVY	087022893-0000-10	100-HEAVY.SEAL	093204000-0000-10
125-HEAVY	039083403-0000-02	125-HEAVY.SEAL	054409772-0000-02
150-HEAVY	087023067-0000-10	150-HEAVY.SEAL	069290482-0000-10
175-HEAVY	038456427-0000-02	175-HEAVY.SEAL	093204051-0000-10
200-HEAVY	054758947-0000-10	200-HEAVY.SEAL	039620239-0000-02
225-HEAVY	061190012-0000-10	225-HEAVY.SEAL	038858037-0000-02
250-HEAVY	039620182-0000-10	250-HEAVY.SEAL	054409713-0000-02
275-HEAVY	093097921-0000-10	275-HEAVY.SEAL	059279273-0000-10
300-HEAVY	061569933-0000-10	300-HEAVY.SEAL	061178675-0000-10
325-HEAVY	054409489-0000-10	325-HEAVY.SEAL	064188442-0000-10
350-HEAVY	093244614-0000-10	350-HEAVY.SEAL	093204299-0000-10
375-HEAVY	055315348-0000-10	375-HEAVY.SEAL	039620298-0000-10
400-HEAVY	088547701-0000-10	400-HEAVY.SEAL	093204329-0000-10
425-HEAVY	093250630-0000-10	425-HEAVY.SEAL	064189007-0000-10
450-HEAVY	062207180-0000-10	450-HEAVY.SEAL	087414414-0000-10
475-HEAVY	069844852-0000-10	475-HEAVY.SEAL	064189449-0000-10
500-HEAVY	093253460-0000-10	500-HEAVY.SEAL	094107475-0000-10
525-HEAVY	093253931-0000-10	525-HEAVY.SEAL	094107483-0000-10
550-HEAVY	093265514-0000-10	550-HEAVY.SEAL	094107491-0000-10
575-HEAVY	054551315-0000-10	575-HEAVY.SEAL	039079520-0000-10
600-HEAVY	093265859-0000-10	600-HEAVY.SEAL	094107505-0000-10
625-HEAVY	093266022-0000-10	625-HEAVY.SEAL	094107513-0000-10
650-HEAVY	093266170-0000-10	650-HEAVY.SEAL	079987702-0000-10
675-HEAVY	093266235-0000-10	675-HEAVY.SEAL	053955064-0000-10
700-HEAVY	093266383-0000-10	700-HEAVY.SEAL	094107521-0000-10
750-HEAVY	093266421-0000-10	750-HEAVY.SEAL	094107530-0000-10
800-HEAVY	093266570-0000-10	800-HEAVY.SEAL	094107548-0000-10
850-HEAVY	093266642-0000-10	850-HEAVY.SEAL	094107556-0000-10
900-HEAVY	092764592-0000-10	900-HEAVY.SEAL	039062775-0000-10

HYDNUT..-HEAVY

Hydraulic nuts HYDNUT

Appendix This appendix contains the Declaration of Conformity for hydraulic nuts.

EC Declaration of Conformity

EC Declaration of Conformity for hydraulic nuts HYDNUT..-E,
Figure 1.

SCHAEFFLER

en

EC Declaration of Conformity

in accordance with Machinery Directive 2006/42/EG

The manufacturer: Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Straße 30
D-97421 Schweinfurt

hereby declares that the product described below is in conformity with the applicable health and safety requirements of following EC Directives: Machinery Directive 2006/42/EG in terms of its design and type and in the execution the manufacturer has brought into circulation. This declaration shall cease to be valid if any modification is made to the product without the agreement of the manufacturer.

The sole responsibility for the issuing of this declaration of conformity is within the charge of the manufacturer.

Product description: Hydraulic nut
Product name: HYDNUT
Type: 50 to 1180

Applicable harmonized standards:

EN-ISO 12100:2010: Safety of Machinery - General principles for design: Risk Assessment & Risk Reduction

EN-ISO 4413:2010: Hydraulic fluid power - General rules and safety requirements for systems and their components

Name and address of the authorized person for the technical documentation:

Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Straße 30
D-97421 Schweinfurt



Peter Schuster
Department Manager Mechatronic

Place, Date:
Schweinfurt, 14.05.2019

This declaration certifies conformity with the stated directives but does not represent a guarantee of characteristics. The safety guidelines in the user manual must be observed.

Schaeffler Technologies AG & Co. KG • Georg-Schäfer-Straße 30 • D-97421 Schweinfurt • Tel.: +49 9721 91-0

001600 CD

Figure 1
EC Declaration of Conformity

Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Straße 30
97421 Schweinfurt
Germany
www.schaeffler.de/en/services

Technical support:
www.schaeffler.de/en/technical-support

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