

**FAG**



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

User manual

**SCHAEFFLER**



# Foreword

**New designation** The new hydraulic nuts can be identified from the -E in the designation. The E stands for Enhanced and this means that some improvements have been made.

**Measuring the drive-up distance** At first sight, it is not possible to identify the new piston form, 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 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 becomes necessary at any time, the new dismounting screws made from corrosion-resistant steel 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 BA4.

# Contents

	Page
<b>About the user manual</b>	
Symbols .....	4
Availability.....	4
Legal guidelines.....	4
Original user manual.....	4
<b>General safety guidelines</b>	
Usage for the intended purpose .....	5
Usage not for the intended purpose.....	5
Qualified personnel .....	5
Hazards .....	5
Protective equipment .....	5
Safety regulations .....	6
<b>Scope of delivery</b> .....	7
Accessories .....	8
Further information .....	8
Damage during transit.....	8
Defects .....	8
<b>Description</b>	
Press ring.....	9
Annular piston .....	9
Sealing rings.....	9
Red O ring.....	9
Press ring.....	10
Annular piston .....	14
Other components .....	15
Function .....	17
<b>Commissioning</b>	
Checking the hydraulic nut.....	20
Lifting the hydraulic nut out of the transport container and transporting the hydraulic nut .....	21
Preparation for mounting .....	23
Mounting the hydraulic nut .....	25

	Page
Applying the mounting ring .....	32
Applying the intermediate ring .....	33
Selecting and mounting the dial gauge.....	34
Selecting the pressure generation device .....	37
<b>Operation</b> Drive-up distance .....	38
Hydraulic oil .....	38
Maximum pressure .....	39
Mounting the hydraulic hose.....	40
Bleeding.....	42
Pressing the component into place .....	44
Pressing back the annular piston HYDNUT50-E to HYDNUT190-E.....	47
Pressing back the annular piston HYDNUT200-E to HYDNUT1180-E.....	48
<b>Decommissioning</b> Storage .....	54
<b>Troubleshooting</b> .....	55
<b>Maintenance</b> Maintenance plan.....	56
Ordering the seal .....	56
Replacing the seal .....	56
Dismounting the annular piston .....	57
Dismounting the seals .....	58
Cleaning the components .....	59
Mounting the seals .....	60
Mounting the annular piston .....	61
<b>Disposal</b> Regulations .....	63
<b>Technical data, accessories and replacement parts</b> .....	64
<b>Appendix</b> EC Declaration of Conformity.....	65

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

**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 Z535.6-2006.



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



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



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



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.

<b>General safety guidelines</b>	It describes how the hydraulic nut may be used, who may use the hydraulic nut and what must be observed in general during its use.
<b>Usage for the intended purpose</b>	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.
<b>Usage not for the intended purpose</b>	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.
<b>Qualified personnel</b>	The hydraulic nut must only be used by suitably qualified personnel. A person defined as qualified personnel: <ul style="list-style-type: none"> <li>■ has all the necessary knowledge</li> <li>■ has been trained in working on rolling bearings and hydraulic tools</li> <li>■ is aware of all the hazards and safety guidelines</li> <li>■ is authorised to use a hydraulic nut by the safety co-ordinator</li> <li>■ has fully read and understood this user manual.</li> </ul>
<b>Hazards</b>	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.
<b>Protective equipment</b>	Personal protective equipment is intended to protect operating personnel against health hazards. This comprises safety goggles, safety shoes and gloves and these must be used in the interests of personal safety.

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

- 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 38.
- 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:
- 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 56.
- Only original replacement parts may be used.
- Conversion** The hydraulic nut must not be converted.



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

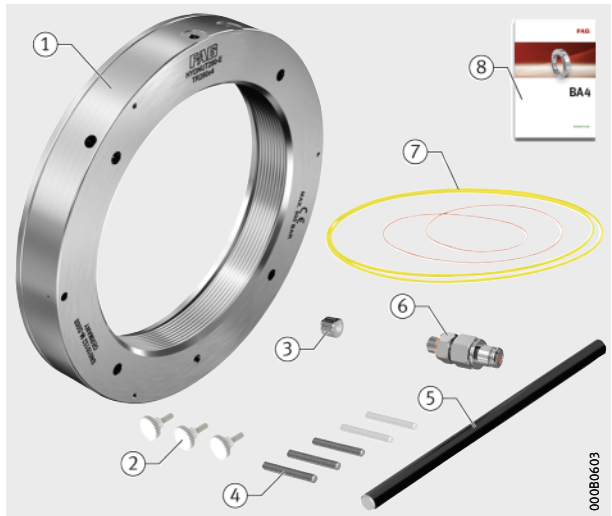
**Hydraulic nut HYDNUT**

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

1) Allocation, see *tables*, page 12.

2) Allocation, see *tables*, page 11.

- 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)

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

**Accessories** Hydraulic nuts are supplied with the appropriate replacement seals. Other accessories are available, see page 64.

**Further information** The scope of delivery does not include the following documents:

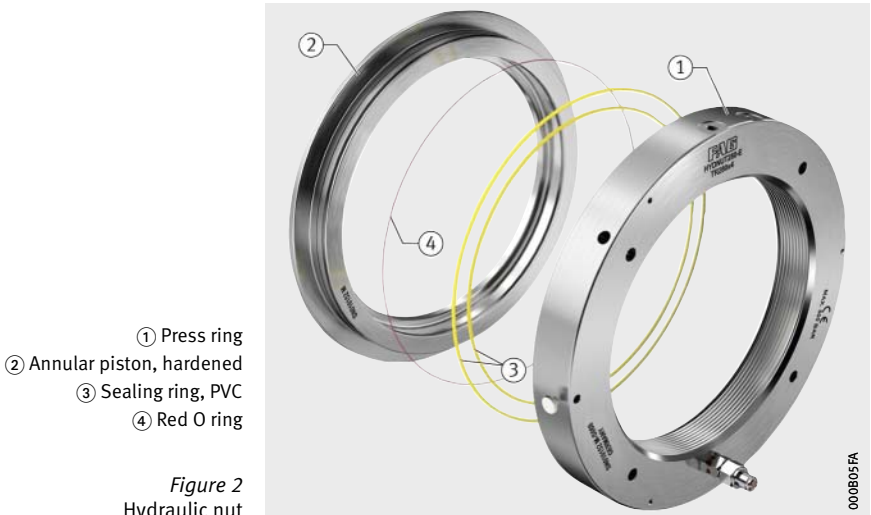
- TPI 195, FAG Pressure Generation Devices
- TPI 196, Hydraulic Nuts HYDNUT
- MH 1, Mounting of Rolling Bearings
- WL 80110, Reduction in Radial Internal Clearance in Mounting of FAG Spherical Roller Bearings with Tapered Bore.

**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.

**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 annular piston. 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 ring gap filled with hydraulic oil. This is sealed by means of two seals, *Figure 2*.



- ① Press ring
- ② Annular piston, hardened
- ③ Sealing ring, PVC
- ④ Red O ring

*Figure 2*  
Hydraulic nut

**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.

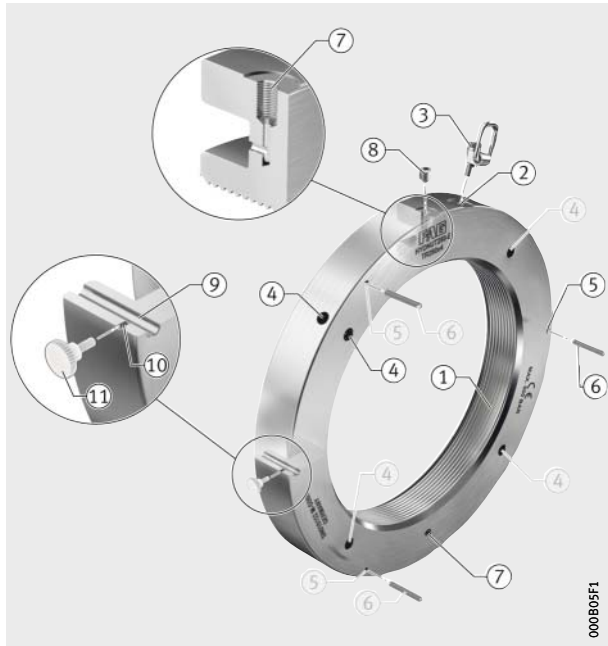
**Sealing rings** Two sealing rings made from soft PVC are inserted in corresponding slots in the annular piston and seal off the ring gap between the annular piston and the press ring. This prevents escape of the hydraulic oil in the ring gap.

**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.

# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

**Press ring** The single piece 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 dismantling screw
- ⑥ Dismantling screw
- ⑦ Threaded hole G<sup>1/4</sup>
- ⑧ Screw plug, SW 6
- ⑨ Hole for dial gauge, diameter 8 mm
- ⑩ Threaded hole for clamping screw
- ⑪ Clamping screw, M4



*Figure 3*  
Press ring

**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.

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

**Folding clevis** The complete hydraulic nut can be transported using a folding clevis of sufficient load carrying capacity (not included in the scope of delivery).

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	HYDNUT195-E	2×2	10
HYDNUT200-E	HYDNUT395-E	4×2	12
HYDNUT400-E	HYDNUT1180-E	6×2	16

**HYDNUT..-E-INCH**

Designation		Quantity	Diameter mm
from	to		
HYDNUT90-E-INCH	HYDNUT195-E-INCH	2×2	10
HYDNUT200-E-INCH	HYDNUT380-E-INCH	4×2	12
HYDNUT400-E-INCH	HYDNUT530-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	HYDNUT190-E	150	10
HYDNUT200-E	HYDNUT395-E	250	12
HYDNUT400-E	HYDNUT1180-E	300	16

**Hand lever  
for HYDNUT..-E-INCH**

Designation		Length mm	Diameter mm
from	to		
HYDNUT90-E-INCH	HYDNUT190-E-INCH	150	10
HYDNUT200-E-INCH	HYDNUT380-E-INCH	250	12
HYDNUT400-E-INCH	HYDNUT530-E-INCH	300	16

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

**Threaded holes for dismantling screws** The press ring has three or five threaded holes for dismantling screws. If all dismantling screws are uniformly tightened, the annular piston is pressed out of the press ring, see page 57.

**Dismounting screws** At the time of delivery, dismantling screws with flat end to ISO 4026, DIN 913 are screwed into the dismantling holes and are used for dismantling of the annular piston. The material selected was corrosion-resistant steel, in order to prevent problems due to corrosion.

### HYDNUT..-E

Designation		Quantity	Thread
from	to		
HYDNUT50-E	HYDNUT195-E	3	M5
HYDNUT200-E	HYDNUT395-E	3	M6
HYDNUT400-E	HYDNUT715-E	5	M8
HYDNUT720-E	HYDNUT1180-E	5	M10

### HYDNUT..-E-INCH

Designation		Quantity	Thread
from	to		
HYDNUT90-E-INCH	HYDNUT190-E-INCH	3	M5
HYDNUT200-E-INCH	HYDNUT380-E-INCH	3	M6
HYDNUT400-E-INCH	HYDNUT530-E-INCH	5	M8

**Threaded holes G<sup>1/4</sup>** The press ring has two oil ducts. The extension of each oil duct has a threaded hole G<sup>1/4</sup>.

At an offset of 15° to the threaded hole for the folding clevis, the outer cylindrical surface has a radial threaded hole G<sup>1/4</sup>. During operation, the hole is used for bleeding. At the time of delivery, a valve nipple is screwed in at this point.

At an offset of 180° to this hole, the end face has a second threaded hole G<sup>1/4</sup>. During operation, the valve nipple is screwed into these holes. At the time of delivery, the screw plug is screwed in at this point.

- Screw plug** One of the two threaded holes  $G^{1/4}$  can be fitted with the screw plug supplied. At the time of delivery, the screw plug is screwed into the axial threaded hole  $G^{1/4}$ .
- 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  $90^\circ$  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**

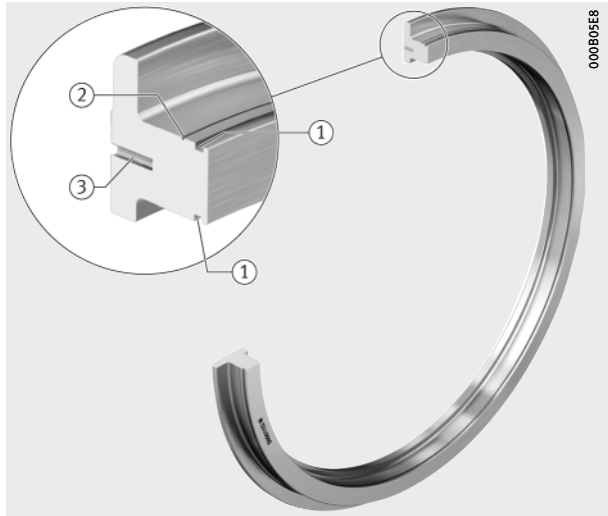
Designation		Length mm	Thread
from	to		
HYDNUT50-E	HYDNUT195-E	6	M4
HYDNUT200-E	HYDNUT925-E	10	M4
HYDNUT930-E	HYDNUT1180-E	15	M4

**HYDNUT..-E-INCH**

Designation		Length mm	Thread
from	to		
HYDNUT90-E-INCH	HYDNUT190-E-INCH	6	M4
HYDNUT200-E-INCH	HYDNUT530-E-INCH	10	M4

# Hydraulic nuts HYD-NUT..-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 HYDNUT410 or larger, there are 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 58.

## HYDNUT..-E

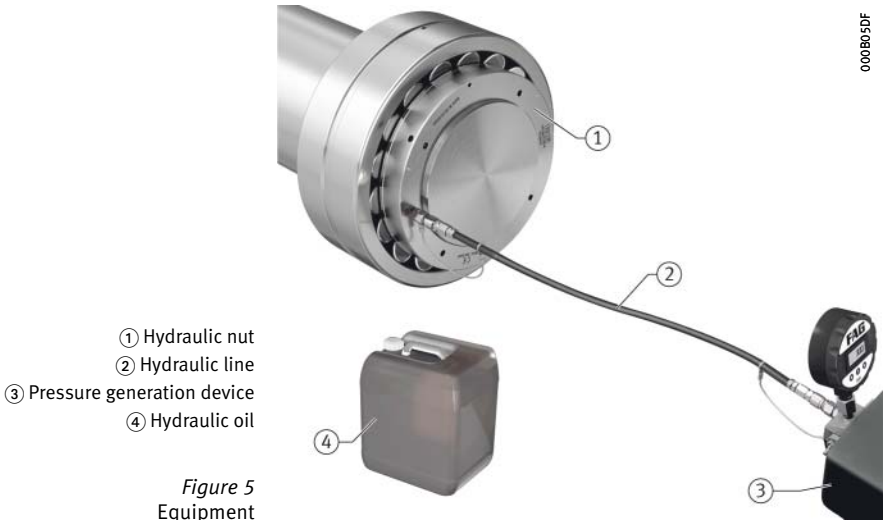
Designation		Thread
from	to	
HYDNUT410-E	HYDNUT595-E	3×M6
HYDNUT600-E	HYDNUT1180-E	3×M8

## HYDNUT..-E-INCH

Designation		Thread
from	to	
HYDNUT410-E-INCH	HYDNUT530-E-INCH	3×M6



**Other components** For operation, the hydraulic nut requires a hydraulic line and a pressure generation device filled with hydraulic oil, *Figure 5*.



000805DF

*Figure 5*  
Equipment

**Hydraulic line** The points stated below are only a selection. Ensure that all guidelines from the manufacturer of the hydraulic line are observed. The hydraulic line:

- 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.

Further information on the hydraulic line used is given in the documentation for the hydraulic line.

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

**Pressure generation device** The points stated below are only a selection. Ensure that all guidelines from the manufacturer of the pressure generation device are observed.

The pressure generation device:

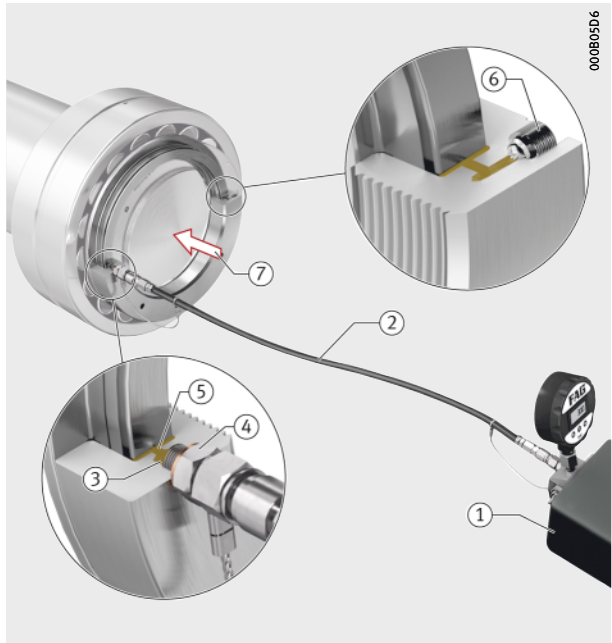
- must fulfil all legal requirements valid at the point of use
- must be checked before each use
- must not be damaged
- may only be operated at a pressure that is lower than the maximum permissible pressure of the hydraulic nut
- must have a sufficiently large tank, see page 37.

Further information on the pressure generation device used is given in the documentation for the pressure generation device.

**Hydraulic oil** The hydraulic oil used must correspond to a particular viscosity class, see page 64.

**Function** The end face threaded hole  $G^{1/4}$  is used for a screwed-in valve nipple  $G^{1/4}$ . The pressure generation device and valve nipple are then connected with each other by means of a hydraulic line. In the pressure generation device, hydraulic oil is placed under high pressure and flows into the hydraulic nut. When oil without air bubbles escapes from the second (upper) threaded hole  $G^{1/4}$ , the hydraulic nut has been bled. The screw plug is then screwed into the upper threaded holes  $G^{1/4}$ . This creates a closed pressure chamber. 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  $G^{1/4}$
- ④ Valve nipple  $G^{1/4}$
- ⑤ Pressure chamber
- ⑥ Screw plug
- ⑦ Direction of movement of annular piston

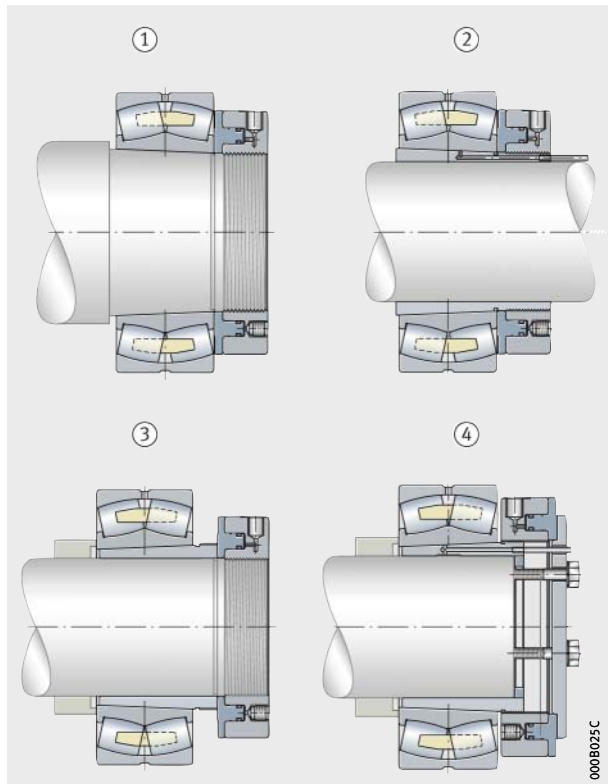


*Figure 6*  
Functional principle

# Hydraulic nuts HYD-NUT..-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.



- ① Mounting on shaft
- ② Mounting on adapter sleeve, oil pressure method
- ③ Mounting on withdrawal sleeve
- ④ Mounting on withdrawal sleeve, oil pressure

*Figure 7*  
Mounting method

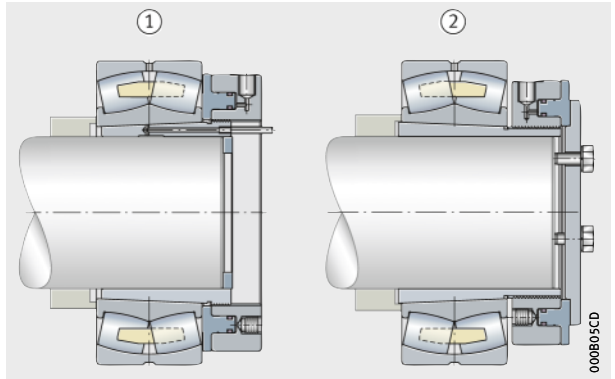
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**Dismounting** If the rolling bearing is mounted on an adapter sleeve or withdrawal sleeve, the bearing can be dismounted from the sleeve using the hydraulic nut, *Figure 8*.

If mounting is carried out directly on the shaft, the hydraulic nut cannot be used for dismounting. However, the hydraulic nut can remain 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

## HYD-NUT..-E, HYDNUT..-E-INCH

- Commissioning** Commissioning is divided into the following actions:
- 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.



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. <



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. <



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. <



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. <

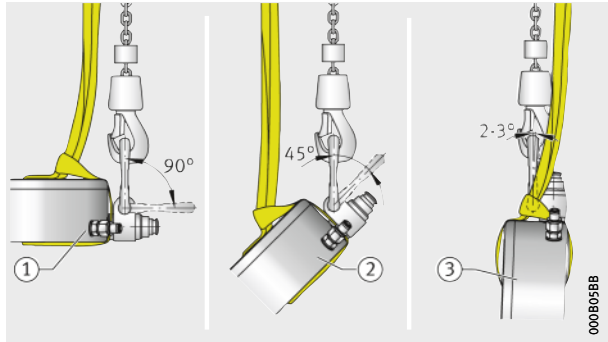
# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH



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

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

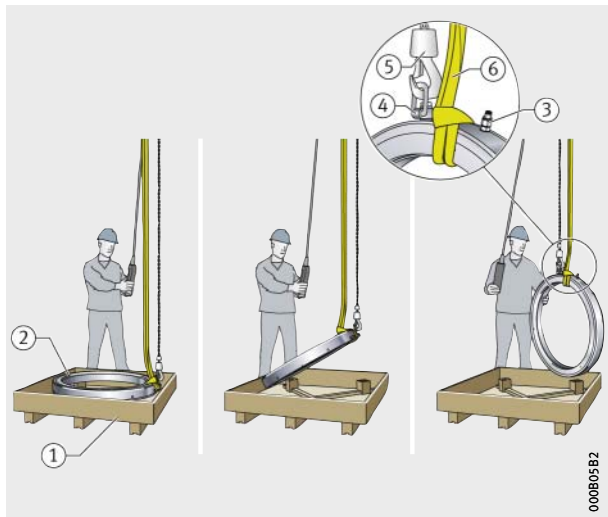
- ① Hydraulic nut, lying flat
- ② Hydraulic nut, lifted half way
- ③ Hydraulic nut, suspended



*Figure 10*  
Lifting positions

- ▶ Screw a folding clevis into the threaded hole for the clevis in the outer cylindrical surface of the press ring.
- ▶ Hang a hook in the 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 Clevis
- ⑤ Hook
- ⑥ Securing belt



*Figure 11*  
Delivered condition

- ▶ Transport the hydraulic nut without shocks or vibration.



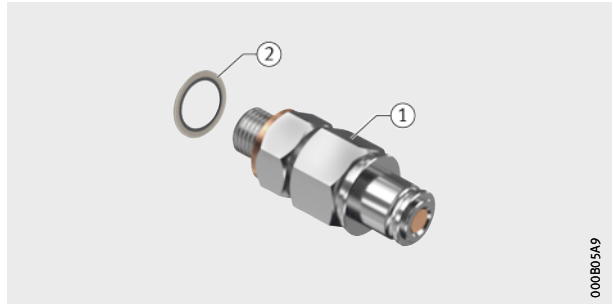
## Preparation for mounting

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

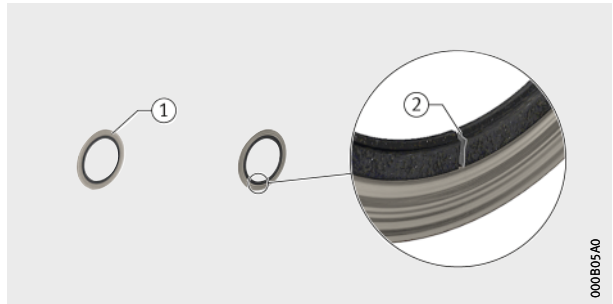


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- ▶ Check optically whether the seal is undamaged, *Figure 13*. Replace any damaged seal.

- ① New
- ② Damaged

*Figure 13*  
Sealing



000B0540

A seal with the following characteristics is suitable:

- type:
  - CEJN rubber/metal seal
- operating pressure:
  - 1500 bar
- dimensions:
  - G<sup>1</sup>/<sub>4</sub> (20,57 mm×13,74 mm×3 mm)
- material:
  - high grade steel/fluoro rubber (FKM).

# Hydraulic nuts

## HYD-NUT..-E, HYDNU..-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

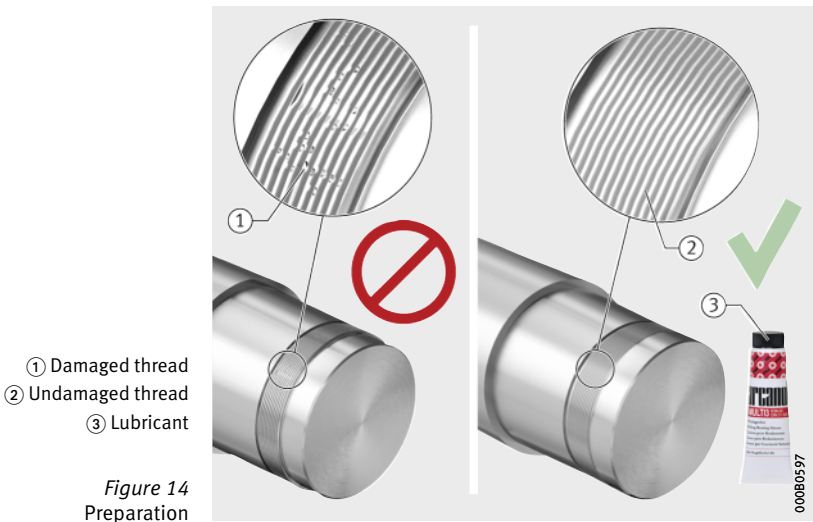
Damage to the mating thread during screw mounting if a thread is damaged.

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. <



## 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. ◀

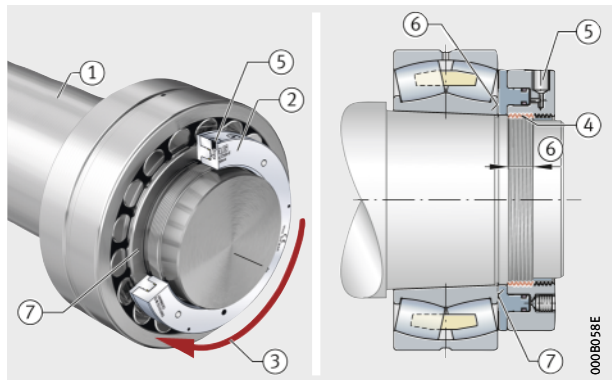
### NOTICE

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 radial threaded hole  $G^{1/4}$  is in the upper position.
- ▶ If necessary, apply a mounting ring, see page 32.
- ▷ 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  $G^{1/4}$ , upper position
- ⑥ Annular piston, end face
- ⑦ Inner ring, end face



*Figure 15*  
Mounting

0009038E

# Hydraulic nuts HYD-NUT..-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

00080585

**⚠ 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*.



- ▶ Remove the securing belt.

# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

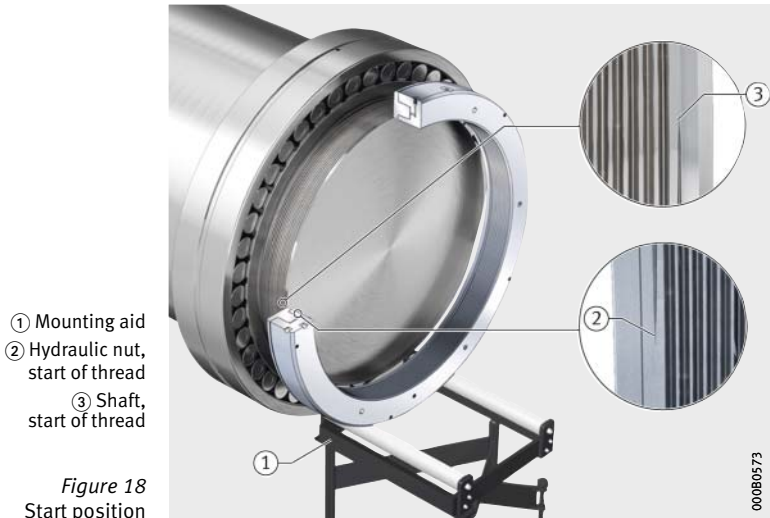
Adjustment of the mounting aid requires precise action.

## 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.
- ▶ Remove the load hook.
- ▶ 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*.

- ① Shaft
- ② Hydraulic nut
- ③ Gap



*Figure 19*  
Displacing the hydraulic nut

0008056A

# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

Repeat the following operations 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 operation must only be carried out once:

- ▶ Loosen the hydraulic nut as necessary until the radial threaded hole  $G^{1/4}$  is in the upper position, *Figure 21*.
- ▶ If necessary, apply a mounting ring, see page 32.
- ▷ The hydraulic nut is mounted and can be bled.



① Radial threaded hole  $G^{1/4}$

*Figure 21*  
Loosening  
the hydraulic nut slightly

00080558

# Hydraulic nuts HYD-NUT..-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

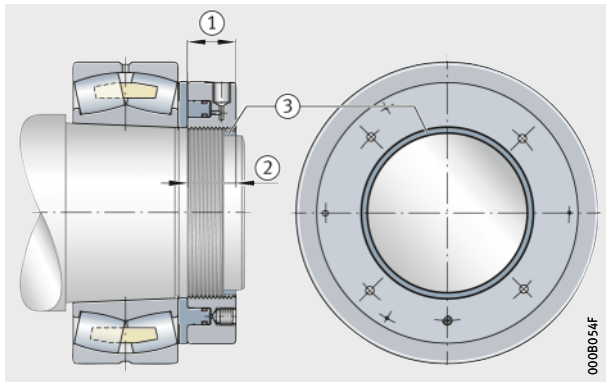
If there is too little interference, the hydraulic nut may buckle and be destroyed.

If there is an interference of less than 90%, 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

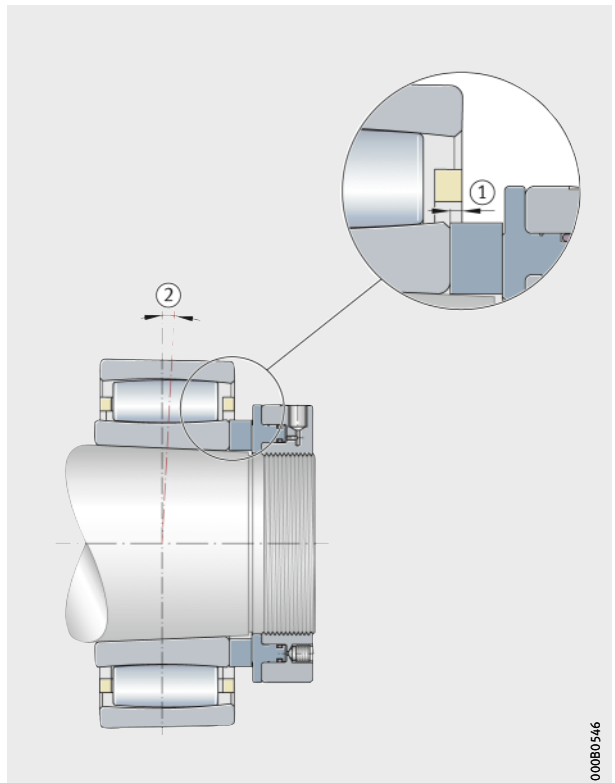
Depending on the nature of the rolling bearing, it may be necessary to apply an intermediate ring.

#### 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

## HYD-NUT..-E, HYDNUT..-E-INCH

### Selecting and mounting the dial gauge

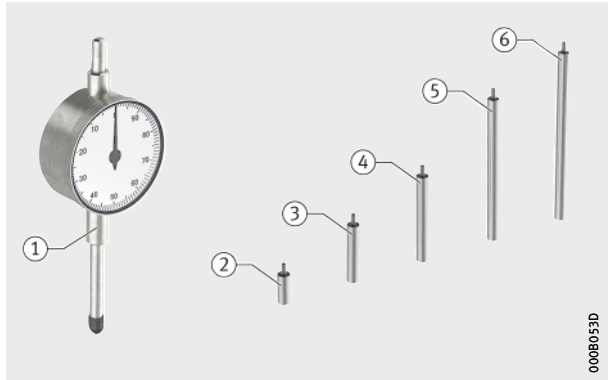
The dial gauge used is selected depending on the dimensions of the hydraulic nut used.

No tools are required for mounting of the dial gauge.

### Selecting the dial gauge

Depending on the hydraulic nut used, the suitable dial gauge is selected. For some hydraulic nuts, it is necessary to use an extension, *Figure 24*.

- ① Dial gauge
- ② Extension 10 mm
- ③ Extension 20 mm
- ④ Extension 30 mm
- ⑤ Extension 50 mm
- ⑥ Extension 60 mm



*Figure 24*  
Dial gauge and extension

A suitable dial gauge has the following characteristics:

- diameter of clamping shank:
  - 8 mm
- repeat precision:
  - 0,01 mm or higher
- interchangeable measuring pin
- oiltight and watertight.

Depending on the hydraulic nut used, the dial gauge must be of certain dimensions and have a suitable measurement range. For some hydraulic nuts, it is necessary to use an extension, see *table*, page 35.

## Characteristics of the dial gauge

Designation		Length of dial gauge		Measurement range	Extension
		min.	max.		
from	to	mm	mm	mm	mm
HYDNUT50-E	HYDNUT85-E	36	40	25	0
HYDNUT90-E(-INCH)	HYDNUT155-E(-INCH)	37	42		
HYDNUT160-E(-INCH)	HYDNUT180-E(-INCH)	40	46		
HYDNUT190-E	HYDNUT205-E	42	50	25	10
HYDNUT190-E(-INCH)	HYDNUT200-E(-INCH)	42	50		
HYDNUT210-E	HYDNUT220-E	43	52		
HYDNUT210-E(-INCH)	–	43	52		
HYDNUT225-E	HYDNUT250-E	44	54		
HYDNUT220-E(-INCH)	HYDNUT240-E(-INCH)	44	54		
HYDNUT260-E(-INCH)	–	45	56		
HYDNUT270-E	HYDNUT270-E(-INCH)	46	58		
HYDNUT290-E	HYDNUT295-E	47	60		
HYDNUT300-E(-INCH)	HYDNUT315-E	52	65		
HYDNUT320-E	HYDNUT350-E	53	67		
HYDNUT320-E(-INCH)	HYDNUT340-E(-INCH)	53	67	25	20
HYDNUT355-E	HYDNUT365-E	54	69		
HYDNUT360-E(-INCH)	–	54	69		
HYDNUT370-E	HYDNUT385-E	55	71		
HYDNUT380-E(-INCH)	–	55	71		
HYDNUT395-E	–	56	73		
HYDNUT400-E(-INCH)	HYDNUT420-E(-INCH)	58	75		
HYDNUT430-E	HYDNUT450-E	63	80		
HYDNUT460-E(-INCH)	HYDNUT470-E	64	82		
HYDNUT480-E(-INCH)	HYDNUT490-E	65	84		
HYDNUT500-E(-INCH)	HYDNUT520-E(-INCH)	66	86	50	20
HYDNUT530-E(-INCH)	HYDNUT560-E	68	90		
HYDNUT570-E	HYDNUT600-E	74	97		
HYDNUT610-E	HYDNUT680-E	75	99		
HYDNUT690-E	HYDNUT740-E	76	101		
HYDNUT750-E	HYDNUT760-E	82	108		
HYDNUT780-E	HYDNUT800-E	84	112		
HYDNUT830-E	HYDNUT900-E	85	114		
HYDNUT930-E	HYDNUT1000-E	86	116		
HYDNUT1060-E	–	88	120		
HYDNUT1080-E	–	89	122	50	60
HYDNUT1120-E	–	92	128		
HYDNUT1180-E	–	95	134		

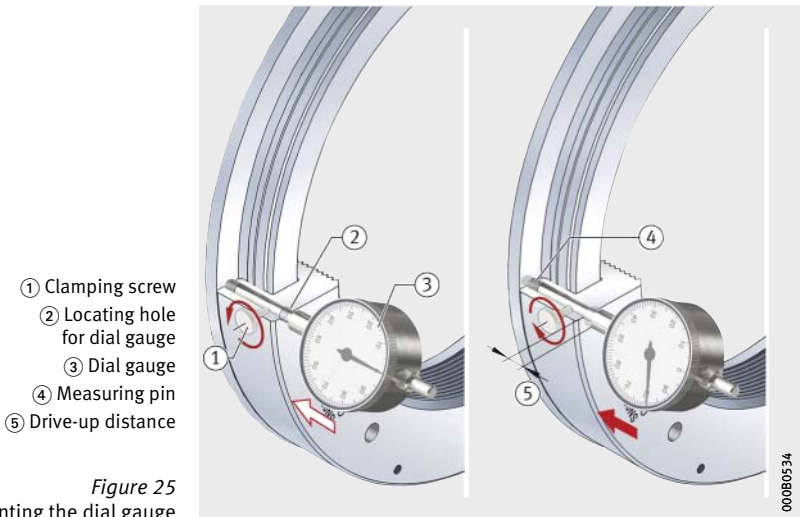
# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

## 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 a hole in the press ring and measures the drive-up distance of the annular piston. A conventional dial gauge can be used, *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.



**Selecting the pressure generation device**

A suitable pressure generation device must have certain characteristics, see page 16. 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 <sup>1)</sup>
from	up to	l
HYDNUT50-E	HYDNUT85-E	0,5
HYDNUT90-E(-INCH)	HYDNUT350-E(-INCH)	0,5
HYDNUT355-E(-INCH)	HYDNUT480-E(-INCH)	1
HYDNUT490-E(-INCH)	HYDNUT530-E(-INCH)	2
HYDNUT530-E	HYDNUT655-E	2
HYDNUT670-E	HYDNUT760-E	3
HYDNUT780-E	HYDNUT900-E	4
HYDNUT930-E	HYDNUT1000-E	5
HYDNUT1060-E	HYDNUT1080-E	6
HYDNUT1120-E	–	8
HYDNUT1180-E	–	9

<sup>1)</sup> Assuming usage of a hydraulic line with a length of 1 m and an inside diameter of 4 mm.

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

**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 64.

**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 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. <



**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 <http://www.schaeffler.de>, menu item Mediathek.

**Further information** ■ TPI 196, Hydraulic Nuts.

# Hydraulic nuts

## HYD-NUT..-E, HYDNUT..-E-INCH

**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 SW 6 for removing screw plug
- tool for mounting valve nipple on the pressure generation device, see instructions for pressure generation devices.

### **WARNING**

Serious injuries due to the spraying 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:

- ▶ Remove the screw plug from the axial threaded hole G<sup>1/4</sup> in the hydraulic nut.
- ▶ Remove the valve nipple from the radial threaded hole.

### **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 G<sup>1/4</sup> (oil connector) in the hydraulic nut, see page 64.

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

- ▶ Screw the valve nipple (CEJN series 116), which was removed from the radial hole, into the axial threaded hole, *Figure 27*.
- ▶ Slide the collar of the hydraulic hose onto the valve nipple.

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

*Figure 27*  
Connector



- ▶ 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. ◀



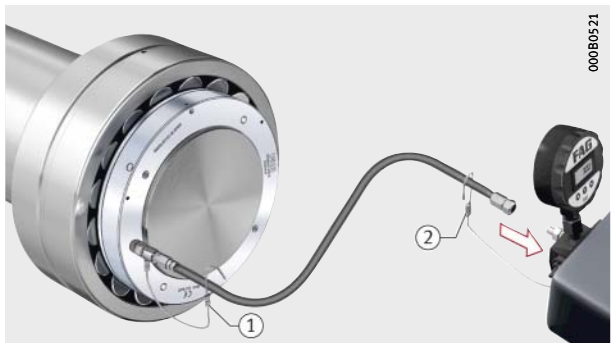
**WARNING**

Serious injuries due to hydraulic oil spraying out of torn hose under high pressure because the 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

## HYD-NUT..-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, since refilling during operation is not permissible.

### **⚠ WARNING**

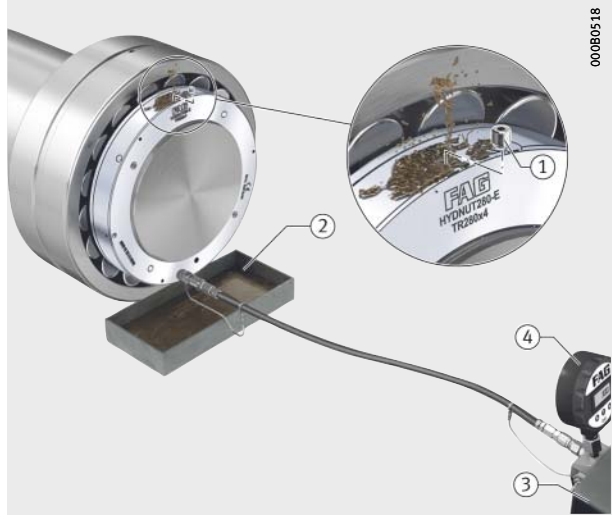
Blinding or injury to eyes due to spraying out of hydraulic oil under high pressure.

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

- ▶ Ensure that the radial threaded hole  $G^{1/4}$  is at the top, *Figure 29*, page 43.
- ▶ 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 64.
- ▶ Remove the collector device.
- ▶ Dispose of the collected hydraulic oil correctly or send for recycling.

- ① Screw plug, threaded hole G<sup>1/4</sup> at top
- ② Collector device
- ③ Pressure generation device
- ④ Manometer

*Figure 29*  
Bleeding



# Hydraulic nuts HYD-NUT..-E, HYDNU..-E-INCH

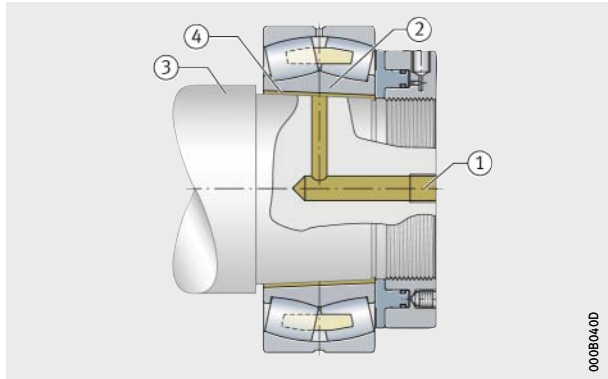
## Pressing the component into place

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

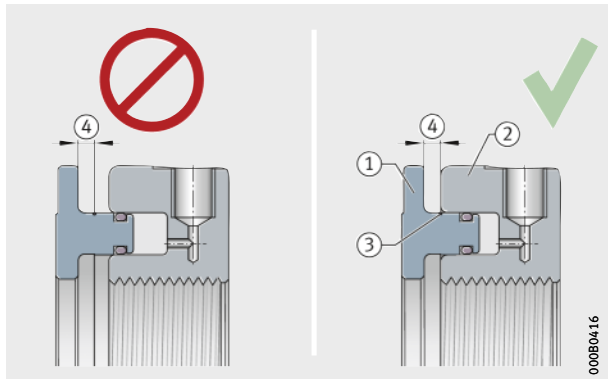


*Figure 30*  
Oil pressure method

### 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 G<sup>1</sup>/<sub>4</sub>.

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

Operate the hydraulic nut only while the red O ring is visible, see page 44. ◀

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 HYD-NUT..-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 if the pressure generation device is not switched to unpressurised and a hydraulic hose is detached.

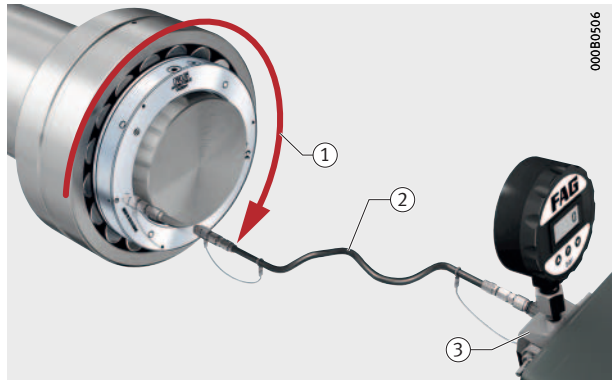
A hydraulic may only be detached after switching to unpressurised. ◀

▶ 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.

- ① Rotary motion
- ② Hydraulic hose
- ③ Pressure generation device, pressure-free



*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 HYD-NUT..-E, HYDNUT..-E-INCH

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

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

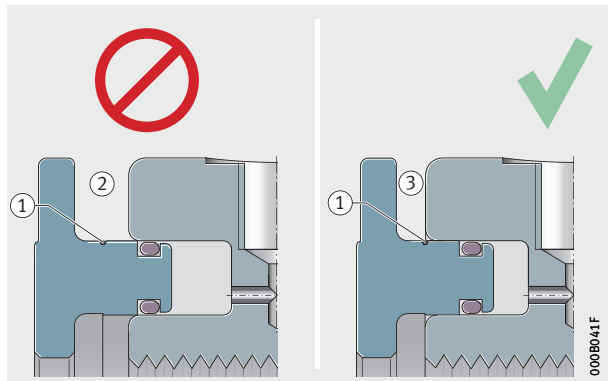
## Checking the stroke

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 53.

- 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.



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

A hydraulic may only be detached after switching 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.



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  $G^{1/4}$ , position above



*Figure 35*  
Unscrewing the hydraulic nut

000B04/FC

# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

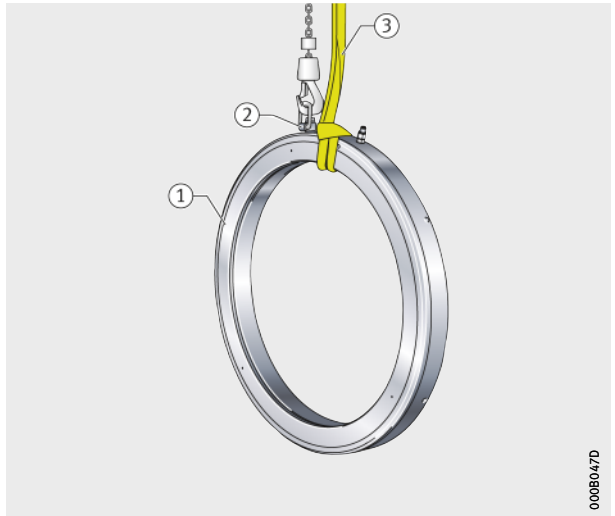
- Transporting the hydraulic nut** The hydraulic nut is prepared for transport as follows, *Figure 36*:
- ▶ Screw a folding clevis into the threaded hole for the clevis in the outer cylindrical surface of the press ring.
  - ▶ Hang a hook in the clevis or thread in a carrying sling.
  - ▶ Fit the securing 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*.



# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

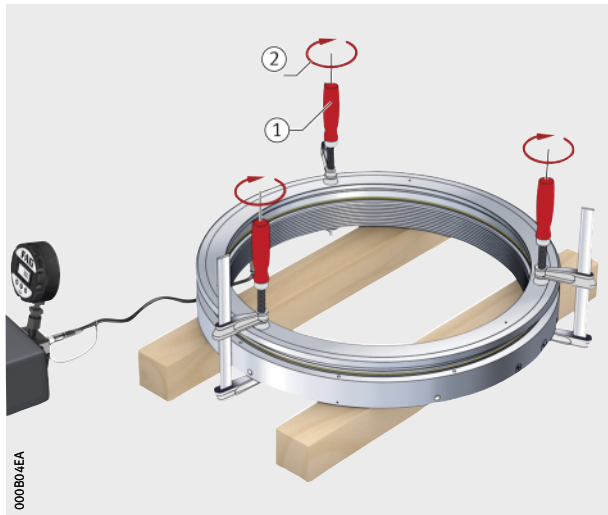
**Pressing back the annular piston** Once the hydraulic nut with the annular piston facing up has been deposited on wooden beams of sufficient load carrying capacity, the annular piston can be pressed back.

## ⚠ 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.

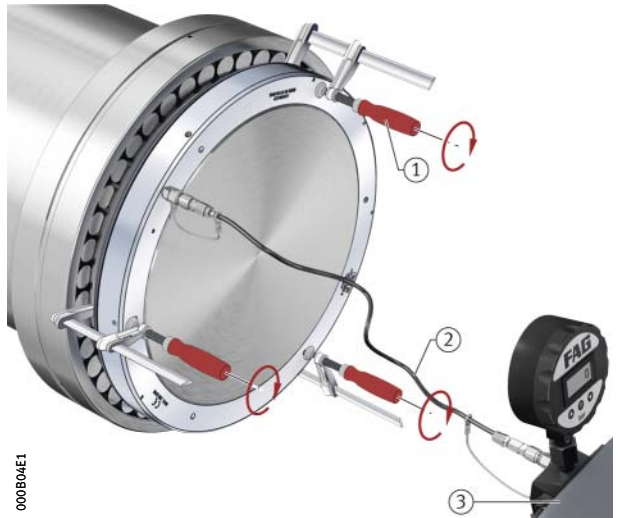
### Pressing back the annular piston at the mounting location

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.

- ① Screw clamp
- ② Hydraulic line
- ③ Pressure generation device



*Figure 39*

Pressing back the annular piston

# Hydraulic nuts

## HYD-NUT..-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.

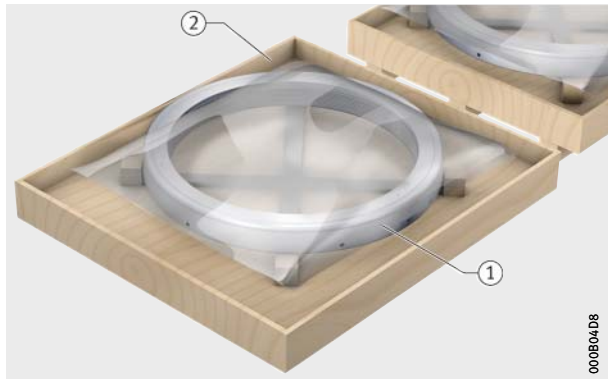
Observe the safety and environmental guidelines of the cleaning agent manufacturer. ◀

**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 56
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 Customer Service at the manufacturer of the pressure generation device.

# Hydraulic nuts

## HYD-NUT..-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	<ul style="list-style-type: none"> <li>■ Visual inspection – check for wear and damage</li> </ul>
After every use	Subassembly	Activity
	Press ring and annular piston	<ul style="list-style-type: none"> <li>■ Clean using cold cleaner or paraffin oil</li> <li>■ Apply oil (rust protection)</li> </ul>
Every 2 years	Subassembly	Activity
	Seal	<ul style="list-style-type: none"> <li>■ Replacement</li> </ul>
As necessary	Subassembly	Activity
	Seal	<ul style="list-style-type: none"> <li>■ Replace if oil is lost</li> </ul>

**Ordering the seal** Order suitable replacement seals before replacement is carried out. The ordering designation of the seal set is the designation of the hydraulic nut, plus .SEAL. The seal set for the hydraulic nut HYTNUT100-E has the following ordering designation.

**Ordering designation** **HYDNUT100-E.SEAL**

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

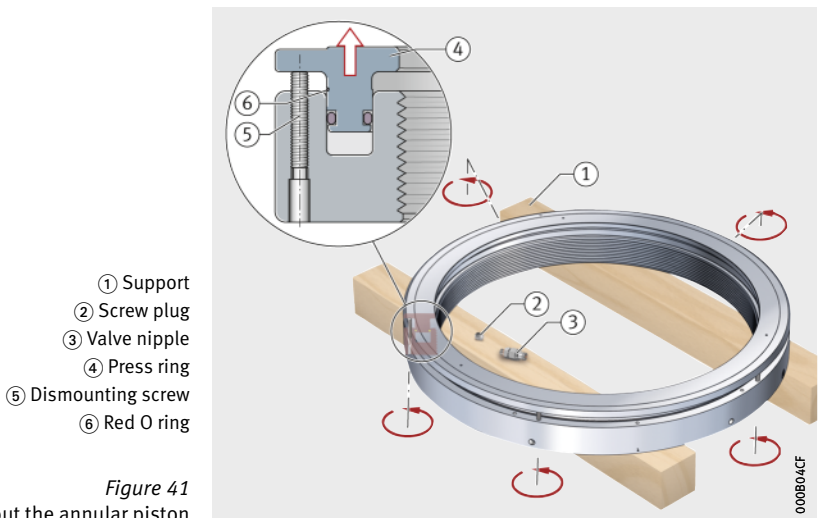
The replacement of seals comprises the following operations:

- 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.

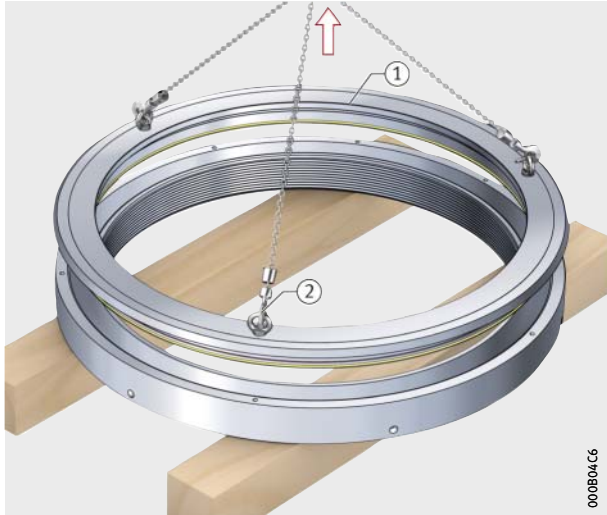
- ▶ Provide support of sufficient load carrying capacity and tilting rigidity.
- ▶ Deposit the hydraulic nut on the prepared support with the annular piston facing up, *Figure 41*.
- ▶ Remove the screw plug and valve nipple.
- ▶ Screw in the dismantling screws consecutively until these are in contact with the annular piston.
- ▶ Screw in each dismantling 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.



# Hydraulic nuts HYD-NUT..-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 dismantled annular piston.

► Remove the annular piston, *Figure 42*.



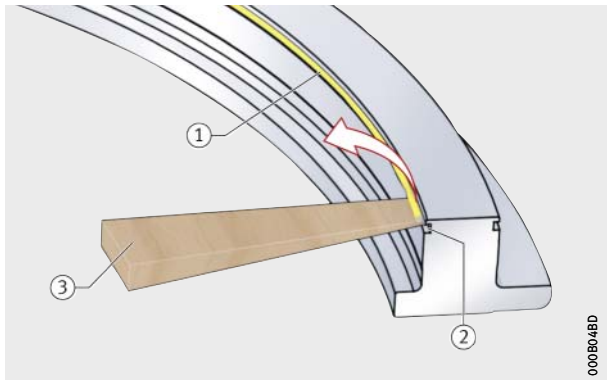
- ① Annular piston
- ② Eye bolt

*Figure 42*  
Removing the annular piston

## Dismounting the seals

When removing the seals, ensure that the seal slots remain undamaged. For dismantling, 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

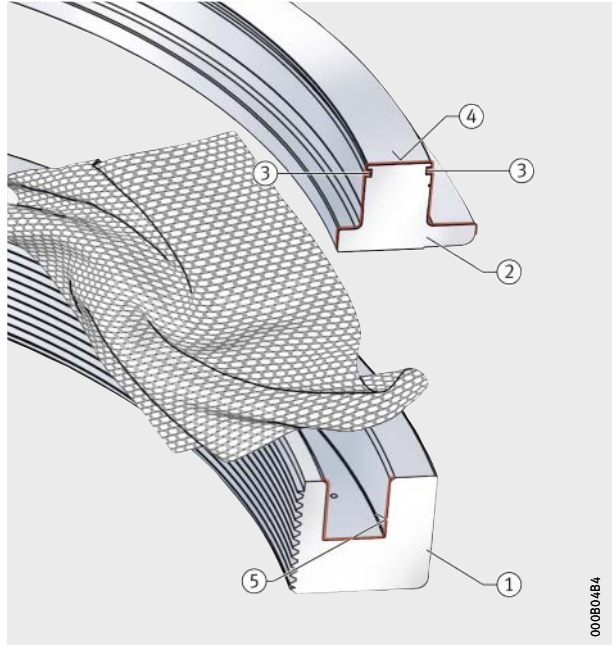
*Figure 43*  
Dismounting the seals

## 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*.

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



*Figure 44*  
Cleaning the components

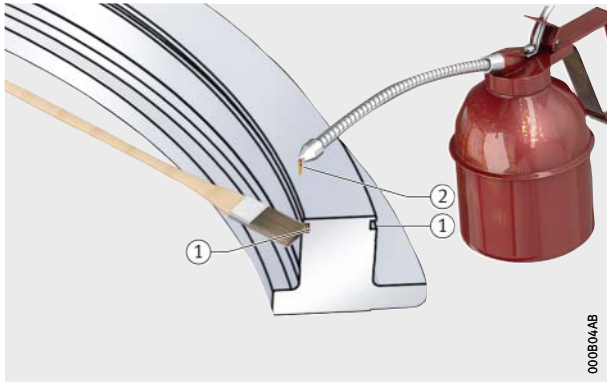
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# Hydraulic nuts HYD-NUT..-E, HYDNUT..-E-INCH

**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

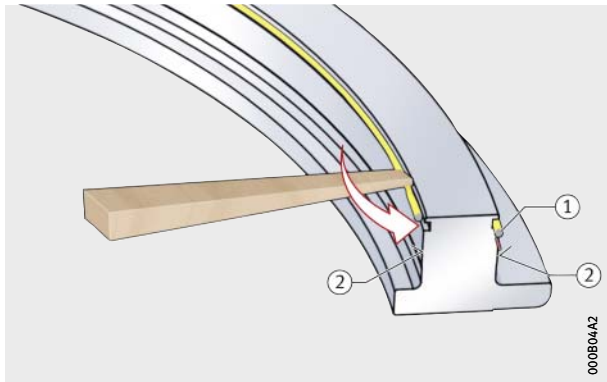
*Figure 45*  
Oiling the seal slots



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

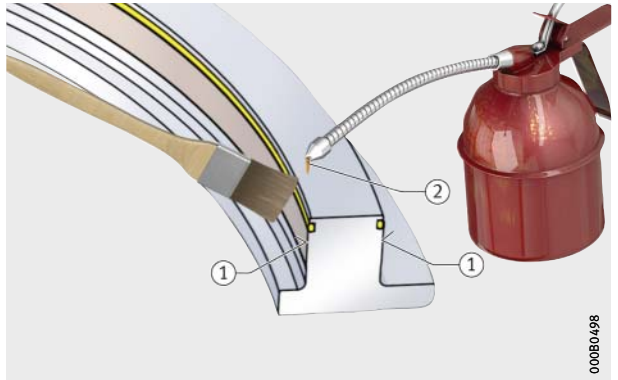
- ① Seal
- ② Piston guide face

*Figure 46*  
Mounting the seals



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

- ① Piston guide faces
- ② Hydraulic oil

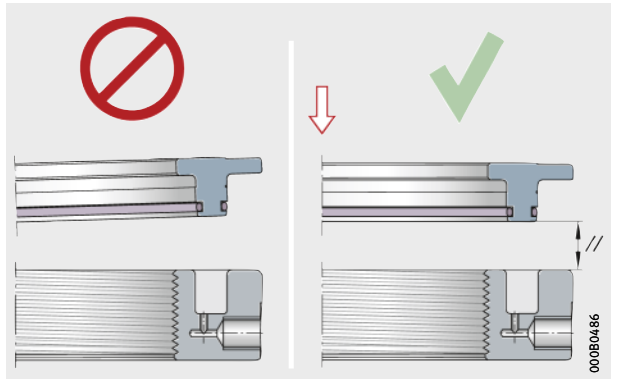


*Figure 47*

Oiling the piston guide faces

### Mounting the annular piston

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



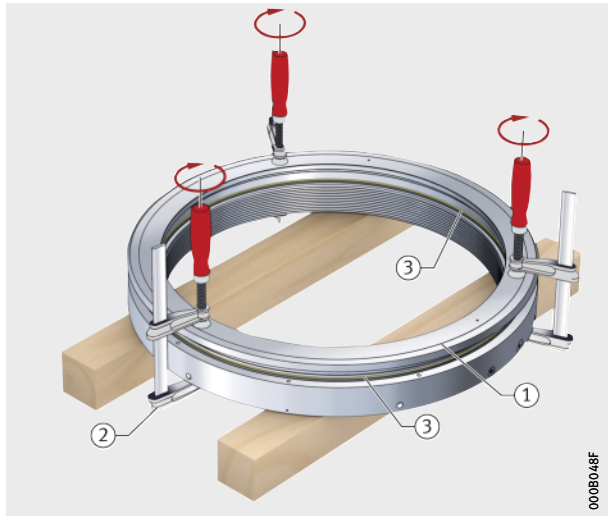
*Figure 48*  
Mounting

## Hydraulic nuts HYD-NUT..-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*.

- ① Annular piston
- ② Screw clamp
- ③ Seal

*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.



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

## HYD-NUT..-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	Max. tightening torque <sup>1)</sup> Nm	Hydraulic oil, viscosity class mm <sup>2</sup> /s	
		from	to
HYDNUT..-E	45	46	68

<sup>1)</sup> The maximum tightening torque is valid for threaded holes G<sup>1</sup>/<sub>4</sub> in the press ring.

#### Accessories

Designation	Description	Mass kg
ARCANOL-MOUNTINGPASTE-70G	Mounting paste	0,1
ARCANOL-MOUNTINGPASTE-250G	Mounting paste	0,3

#### Replacement parts

Designation	Description	Mass kg
HYDNUT.PLUG_G1_4.PRT	Screw plug	0,05
HYDNUT...SEAL	Replacement seals, set	0,2
HYDNUT-HANDHEBEL-D10.PRT	Hand lever, Ø 10	0,2
HYDNUT-HANDHEBEL-D12.PRT	Hand lever, Ø 12	0,3
HYDNUT-HANDHEBEL-D16.PRT	Hand lever, Ø 16	0,4



Only use FAG original accessories.

**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 50.

en

**LUK** **FAG** **TRIP**

**EC Declaration of Conformity**  
in accordance with EC Machinery Directive 2006/42/EG

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

hereby declares that the product described below is in conformity with the applicable health and safety requirements of the EC 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-E  
**Type:** 50 to 1180

**Applicable harmonized standards:**

EN-ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and 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*  
Peter Schuster  
Department Manager Mechatronics and Services

**Place, Date:**  
Schweinfurt, 25.08.2016

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

0008221B

*Figure 50*  
EC Declaration of Conformity

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