

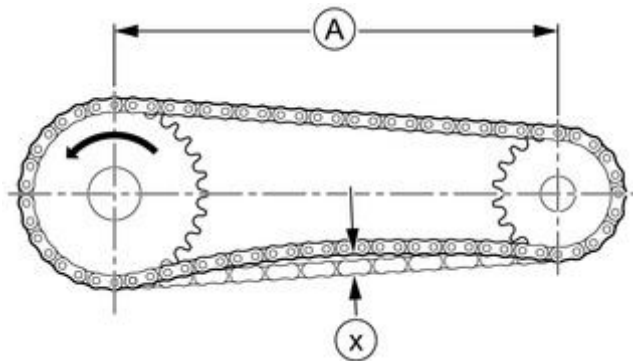
**VARIO 930 / 770 / 680 / 620 / 560 / 500**

**CERIO 930 / 770 / 680 / 620 / 560**

## **Repair Manual**

## Steel roller chains

### Tensioning



Checking the tension of steel roller chains:

- ▶ Apply a small load to the tight span.
- ▶ Push down the slack span in the middle between the sprockets with your thumb.

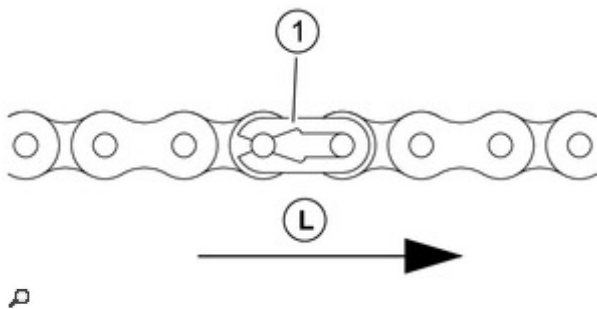
You should be able to push down the slack span around 2 % of the spacing between the axes.

Example:

Axle spacing (A) = **500 mm**

Pushing distance (x) of slack span = approx. **10 mm**

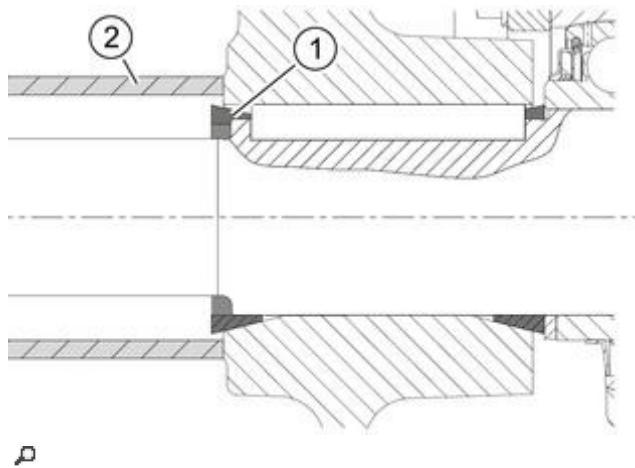
### Chain connector



- ▶ The closed side of chain connector (1) must point in running direction (L)!

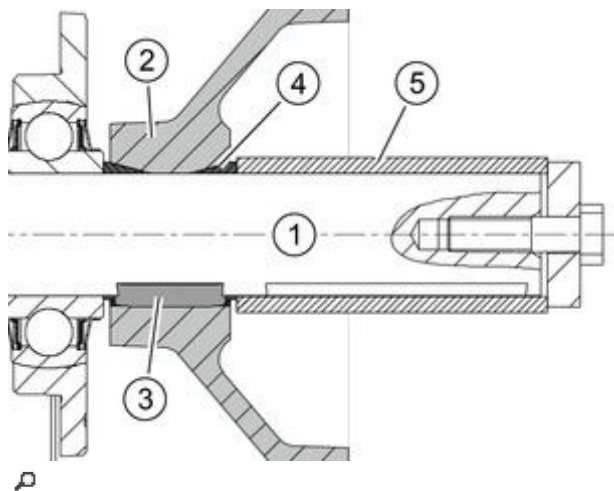
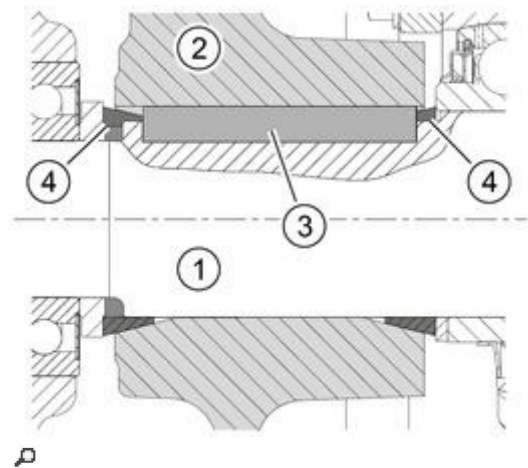
## Taper ring fasteners

### Dismounting



- ▶ Slacken off tapered ring (1) with a blow.
  - ▶ Use an auxiliary tool (2) if required.

### Installing



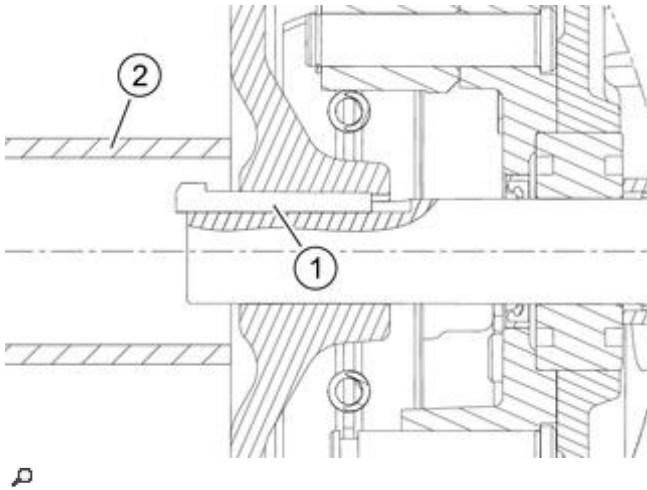
**NOTICE!** Sticking together at the taper ring fasteners. The joint cannot be loosened or comes off only with difficulty.

- ▶ Do not install parts with tough grease.
- ▶ Clean the shaft (1), hub (2), parallel key (3) and taper ring (4) thoroughly and coat them with grease as specified in the Operator's Manual.

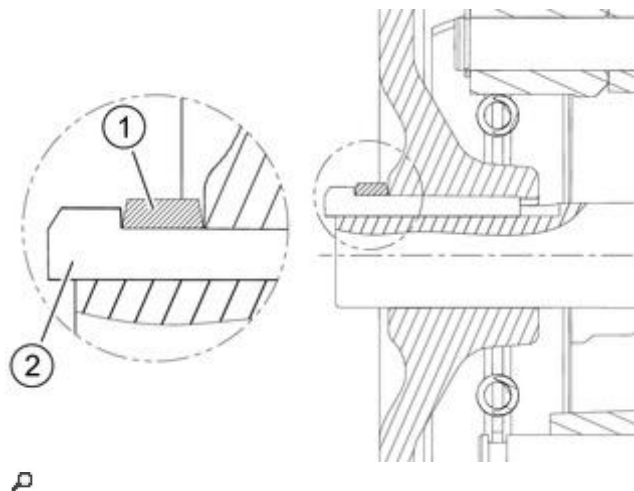
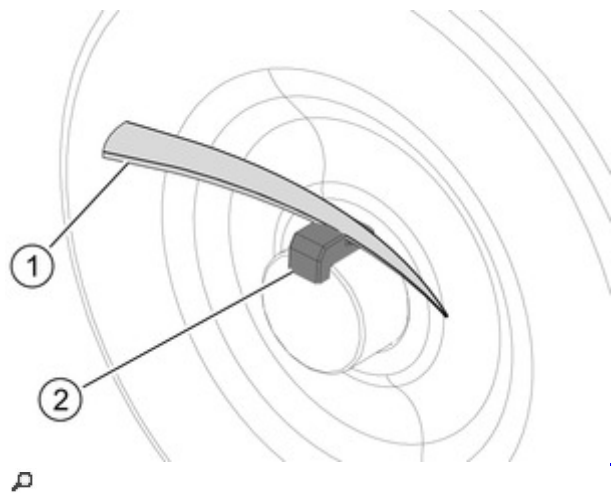
- ▶ Tighten to the specified torque.
- ▶ In case of several taper ring fasteners fitted behind one another, tighten those separately. Use an auxiliary tool (5) if required.

## Gib head key joints

### Dismounting



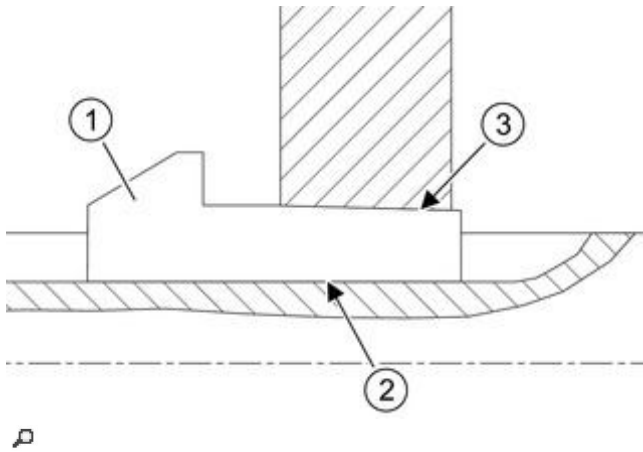
- ▶ Slacken off gib head key (1) with a blow if possible.
- ▶ Use an auxiliary tool (2) if required.



- ▶ Drive out the gib head key (2) with a key drawer (1).
- ▶ Ensure that the key drawer is used as shown in the figure.

### Installation

The gib head key (1) comes in raw condition as a spare part and must be machined to suit the application by milling or grinding.



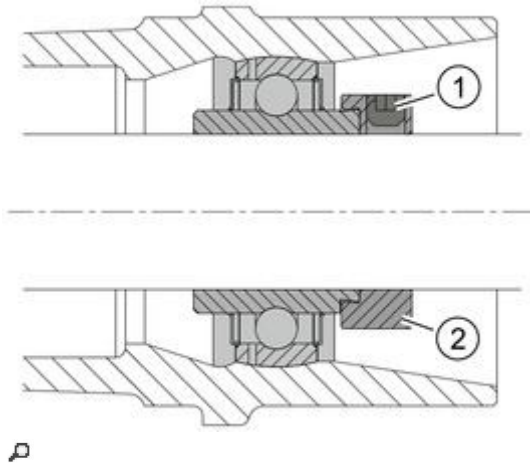
- ▶ Grind the gib head key (1) to suit the application at surface (2).
  - ▶ Surface (3) must **not** be machined.
- ▶ Clean shaft, hub and keyway to be free of grease, paint and rust prior to assembly.

**NOTICE!** Excessive force employed when installing the gib head key. Damage to the gib head key joint. The gib head key cannot be removed any more.

- ▶ Drive in the gib head key carefully with a suitable and not too heavy hammer.
- ▶ Ensure that the gib head key is driven in only so far that it can still be removed without problems, using a key extractor.

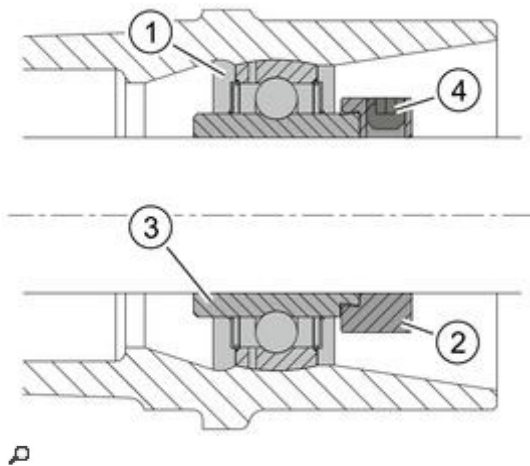
## Lock collar bearing

### Dismounting



- ▶ Slacken off set screw (1).
- ▶ Drive off eccentric ring (2) against the shaft's sense of rotation.
- ▶ Remove bearing.

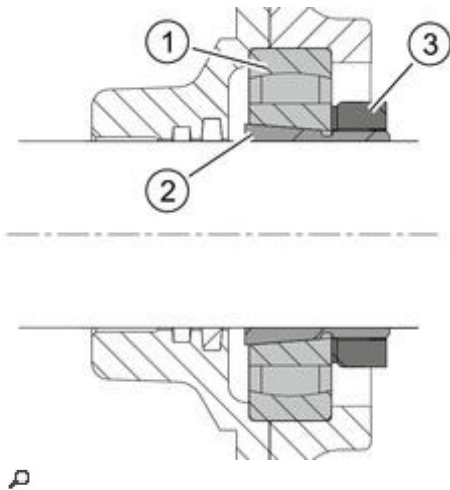
### Installing



- ▶ Tighten lock collar bearing (1) on the shaft by twisting eccentric ring (2) over the bearing inner race (3).
  - ▶ Arrest the eccentric ring with moderate force in the sense of rotation of the shaft.
  - ▶ To make dismounting easier, the inner ring and the shaft can be coated with grease as specified in the Operator's Manual.
- ▶ Tighten set screw (4).

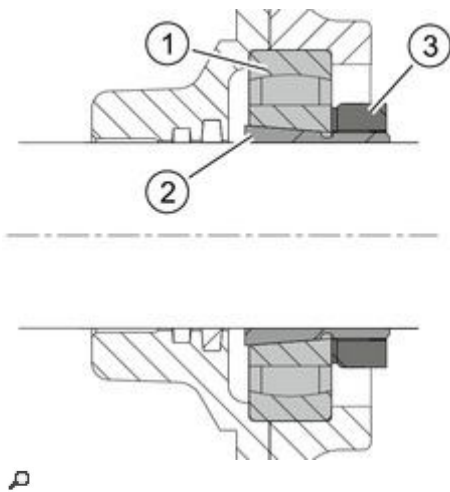
## Adapter sleeve bearings

### Dismounting



- ▶ Loosen the tab of sleeve nut (3).
- ▶ Slacken off sleeve nut by some turns only.
  - ▶ Ensure that the thread is still completely engaged.
- ▶ Slacken off expansion pin (2) with a firm blow.
- ▶ Pull off adapter sleeve bearing (1) completely.

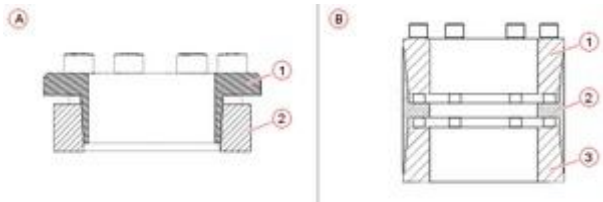
### Installation



- ▶ Clean expansion pin (2) and shaft and check easy movement of the sleeve nut (3).
- ▶ Install adapter sleeve bearing (1) according to the conical inside ring (2).
- ▶ Tighten the sleeve nut with the suitable special tool and to the prescribed torque.
- ▶ Continue tightening the sleeve nut to the specified degrees.
- ▶ Tighten sleeve nut until the nearest tab can be applied.
- ▶ Secure sleeve nut with the tab.



## Chuck bushing



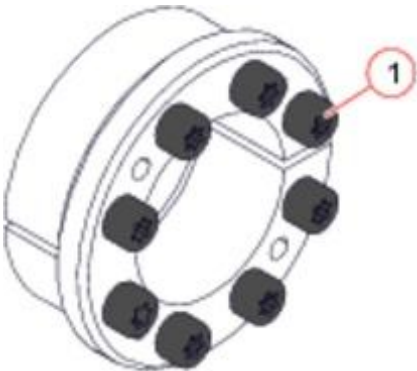
2 chuck bushing versions are used:

- ▶ Version A: 2-piece chuck bushing
- ▶ Version B: 3-piece chuck bushing

## Removal

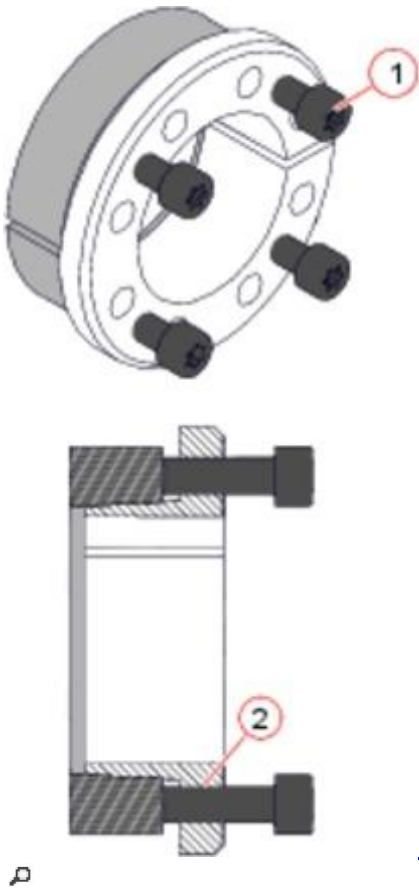
The removal method of the two chuck bushings differs.

- ▶ **Caution:**  
Observe the removal procedure of the respective chuck bushing precisely.  
Avoid damage to the chuck bushings and the components joined to them.



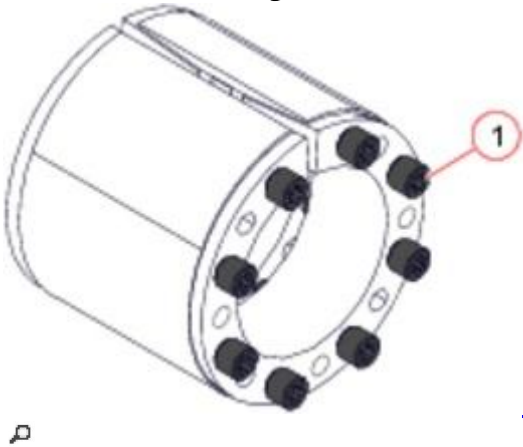
## Removing version A

- ▶ Unscrew all bolts (1).
- ▶ Remove cloggings from and thoroughly clean all drilled holes and tapped holes.



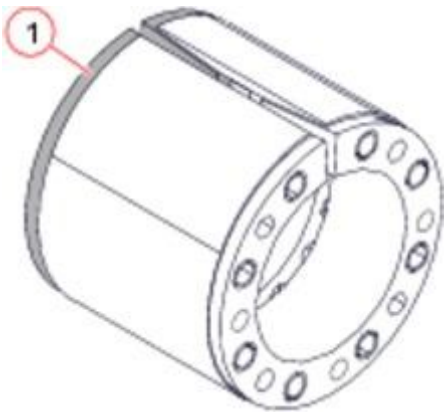
- ▶ Screw bolts (1) hand-tight into tapped holes (2) in the front part.
- ▶ Continue screwing in bolts (1) crosswise until the front section of the chuck bushing is loose.

*The chuck bushing is now loose and can be removed.*



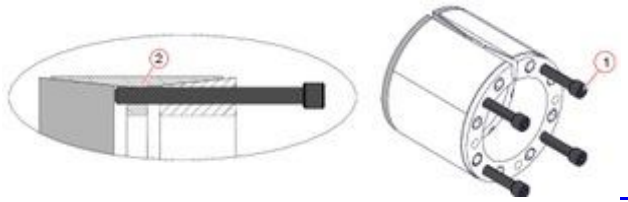
### Removing version B

- ▶ Unscrew all bolts (1).
- ▶ Remove cloggings from and thoroughly clean all drilled holes and tapped holes.



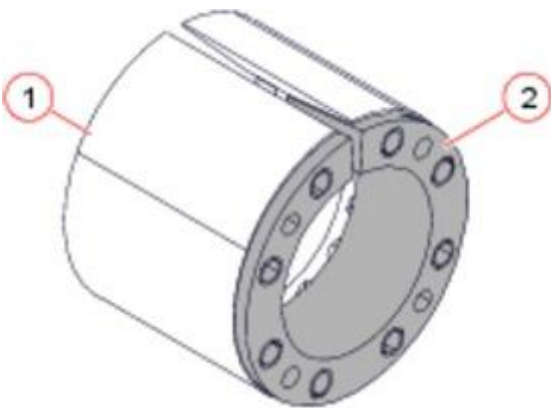
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Always slacken off the rear part (1) of the chuck bushing first.



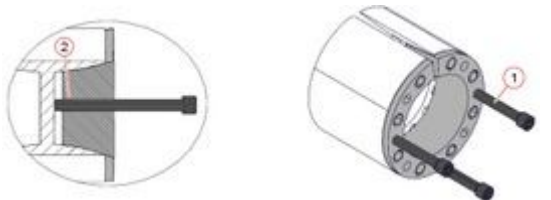
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- ▶ Slide bolts (1) through the drilled holes in the front part. Screw bolts (1) hand-tight into threads (2) in the centre part.
- ▶ Continue screwing in bolts (1) crosswise until the rear section of the chuck bushing is loose.



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When the rear part (1) of the chuck bushing is loose, then slacken off the front part (2).



p

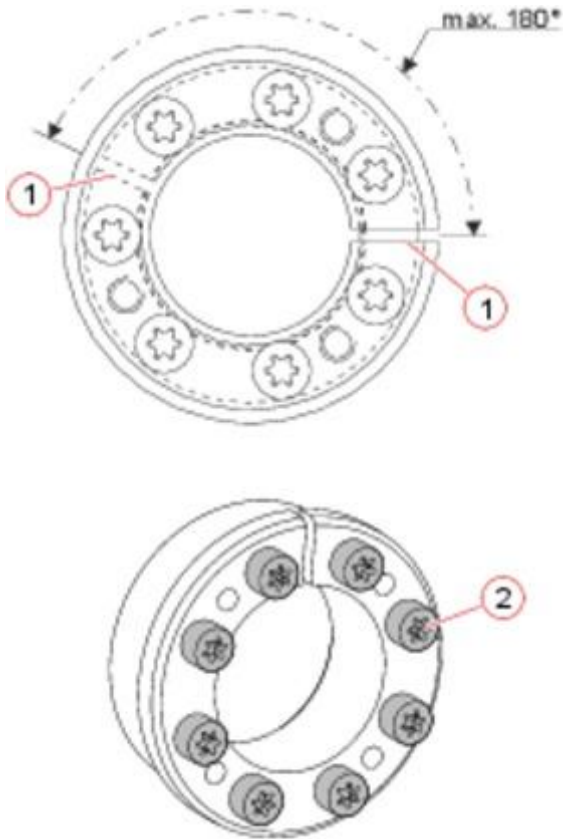
- ▶ Screw bolts (1) hand-tight into tapped holes (2) in the front part.
- ▶ Continue screwing in bolts (1) crosswise until the front section of the chuck bushing is loose.

*The chuck bushing is now loose and can be removed.*

## Installation

The installation method of the two chuck bushings differs.

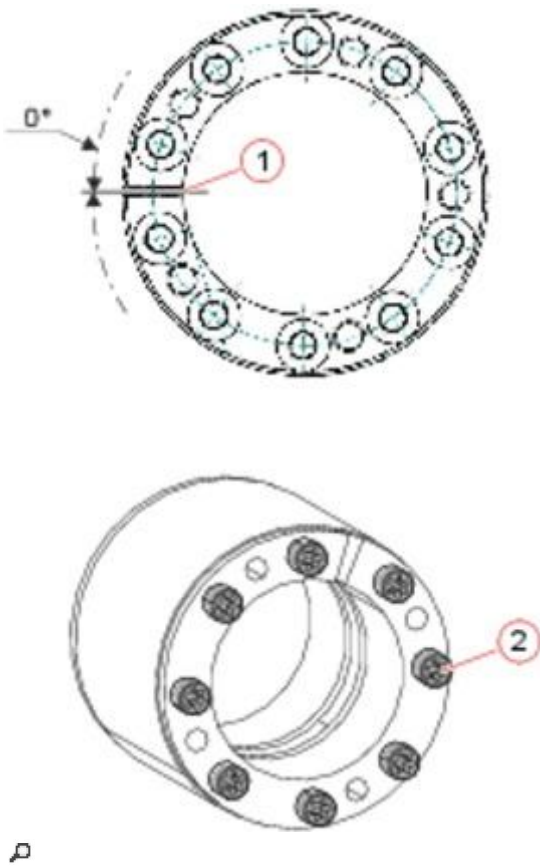
- ▶ **Caution:**  
Observe the installation procedure of the respective chuck bushing precisely.  
Avoid damage to the chuck bushings and the components joined to them.



Ⓟ

### Version A chuck bushing

- ▶ Clean the chuck bushing and the shaft thoroughly.
- ▶ Apply a little oil to contact faces, threads and head connecting faces of the bolts.
- ▶ Insert chuck bushing.
  - ▶ Ensure that slots (1) are installed with the biggest possible angular offset.
- ▶ Tighten bolts (2) evenly crosswise in three steps.
  - ▶ Observe the specified torques of the respective steps.



### Version B chuck bushing

- ▶ Clean the chuck bushing and the shaft thoroughly.
- ▶ Apply a little oil to contact faces, threads and head connecting faces of the bolts.
- ▶ Insert chuck bushing.
  - ▶ Ensure that slots (1) are installed without an angular offset.
- ▶ Tighten bolts (2) evenly crosswise in three steps.
  - ▶ Observe the specified torques of the respective steps.

## Circlips

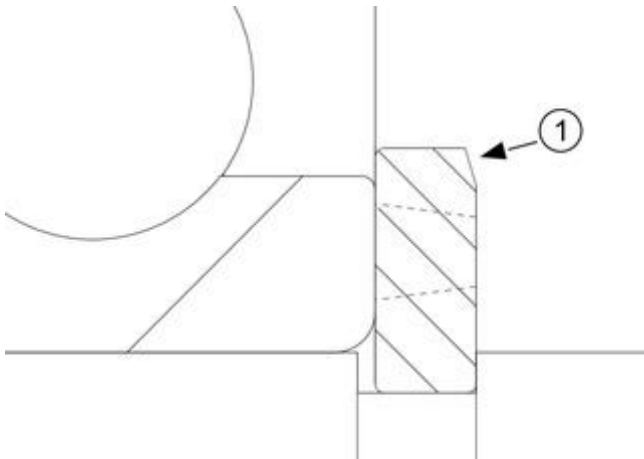
### *NOTICE!*

Overspreading the circlip.

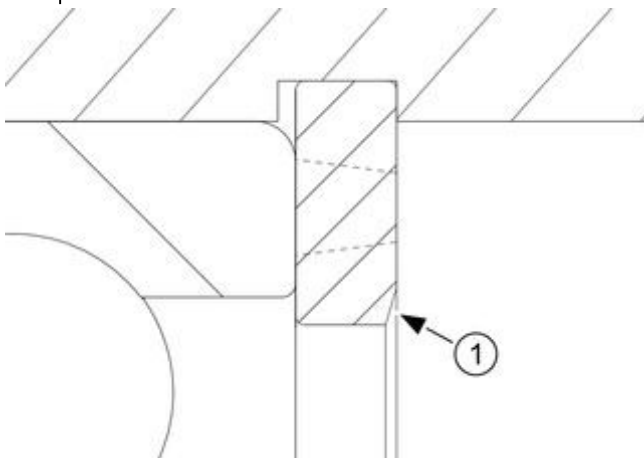
Plastic material deformation.

No safe fixing of component.

- ▶ Spread circlip only as far as needed for installation and dismantling.
- ▶ Do not use any circlip already overspread before.



Circlip DIN 471



Circlip DIN 472

- ▶ Insert circlips as shown in the figures.
  - ▶ Ensure that chamfer (1) does **not** make contact with the component to be secured.
  - ▶ If required, make circlip engage with a slight blow.

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