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Servicing power assisted steering Dismantling and assembling power assisted steering box (TRW)

Dismantling

- → If not already sealed, seal pipe connections on power assisted steering box.

- 1 - Plastic plug
- 2 - Plastic plug

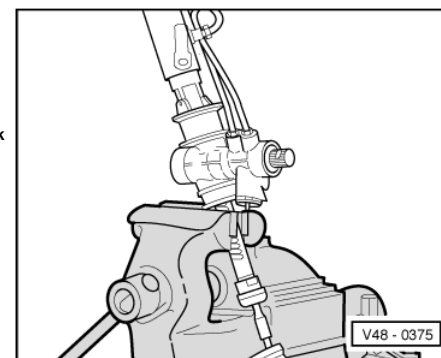
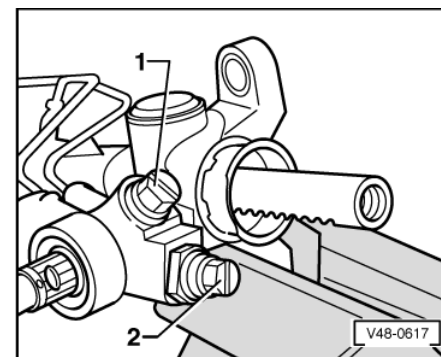
- Clean exterior of power assisted steering box.
- Open clamp and push back bellows.

- → Clamp steering box with rack in a vice and unscrew the track rod.

Note:

Use vice clamps, check vice clamps for impurities e.g. metal filings or similar and thoroughly remove.

If a spanner face is present on the rack then use an open jaw spanner to counter hold. The rack should not then be tensioned in a vice.



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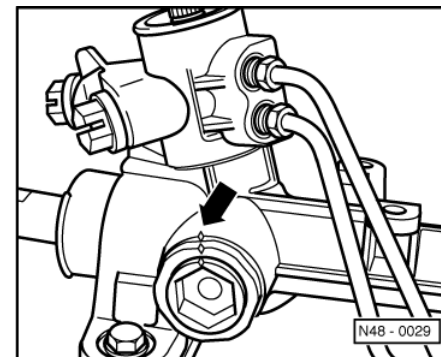
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→ Mark position of adjustment screw and lock nut in relation to housing (arrow).

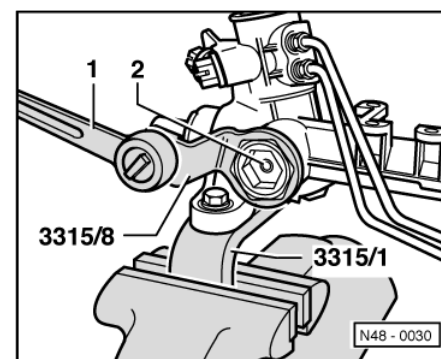


→ Unscrew lock nut together with adjusting screw.

Notes:

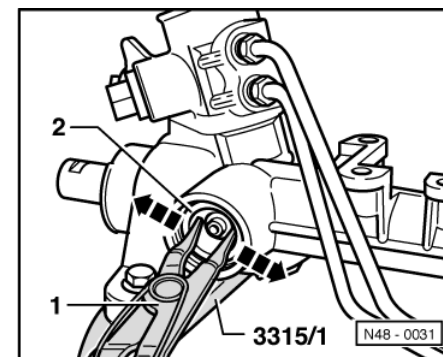
- ◆ Do not move position of adjusting screw in relation to lock nut when unscrewing.
- ◆ If necessary screw out adjusting screw together with lock nut using tool 3115/9.
- ◆ Thrust piece/adjusting screw are lightly spring-loaded.

- 1 - Ratchet (commercial type)
- 2 - Adjusting screw



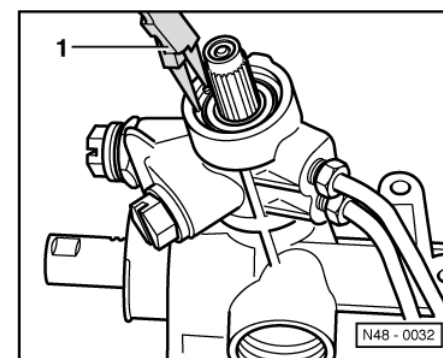
- → Mark installed position of thrust piece and remove.

- 1 - Expanding pliers (commercial type)
- 2 - Thrust piece



- → Remove valve body circlip.

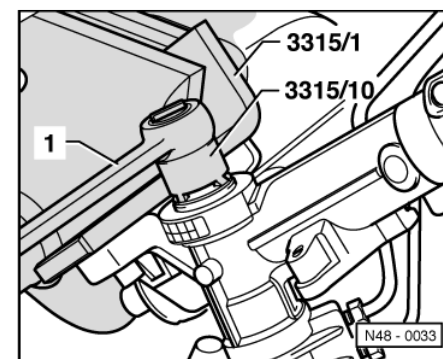
- 1 - Pointed pliers (commercial type)



- → Remove plug from bottom of valve body.

- 1 - Ratchet (commercial type)

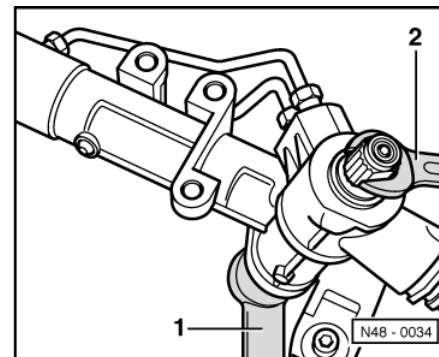
If it is very tight, loosen plug with a hammer and drift.



- → Remove hexagon nut at bottom of valve body.

- 1 - Ratchet (commercial type)
- 2 - Open jaw spanner (commercial type)

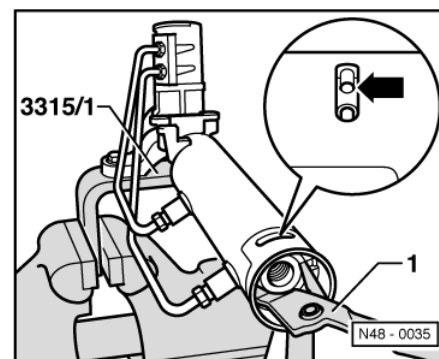
- Knock out valve body upwards from below with drift.
 - Remove grease from the valve body splines.
 - Pull adhesive foil off the housing.
 - Pull rack fully to left.



- → Turn securing ring so that the opening of the circlip (arrow) is positioned in the groove of the housing.
 - Turn securing ring further (clockwise or anti-clockwise), so that the circlip is turned out of the housing.
 - Pull rack with rack guide out of housing, pull off rack guide and place rack so that it and the piston seal is not damaged.

- 1 - Pointed pliers (commercial type)

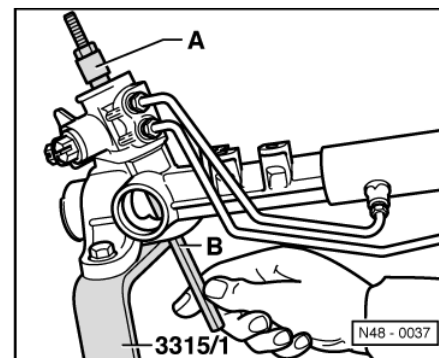
Removing valve body oil seal



- → Drive oil seal out upwards.

- A - Internal puller e.g. Kukko 21/4
- B - Drift

When inserting the puller -A- ensure that the claws (arrow on [illustration](#) Page 48-61) locate properly under the oil seal. The puller must not be spread too far, otherwise the oil seal seating in the housing will be damaged or the oil seal can jam in the housing.

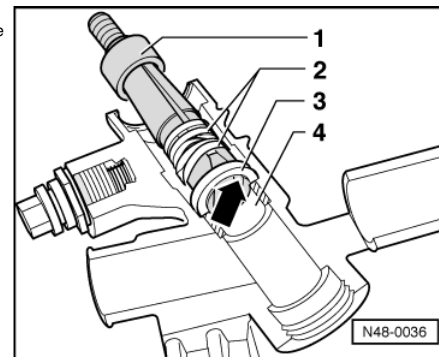


→ To ease fitting the puller it is recommended that a rubber band is placed around the claws. For ease of illustration figure shows the housing sectionalised.

- 1 - Internal puller e.g. Kukko 21/4
- 2 - Rubber band
- 3 - Oil seal
- 4 - Sleeve bearing
do not remove

- Drive out lower ball bearing with VW 439.

Pulling out inner rack oil seal

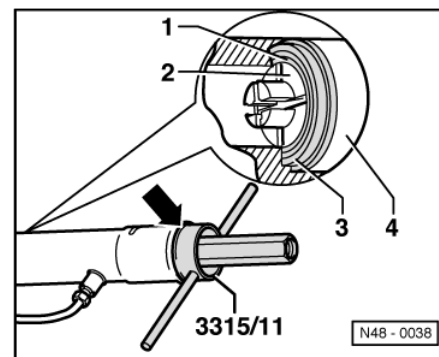


- → Insert oil seal puller until the mark on the tool (arrow) aligns with the edge of the housing.
(Only then will the claws locate behind the support ring).
- Spread tool claws -2- firmly by turning the spindle.

Note:

When inserting the tool ensure that the cylinder bearing surface is not damaged.

- 1 - Support ring
- 2 - Claws
- 3 - Oil seal
- 4 - Tools 3315/11



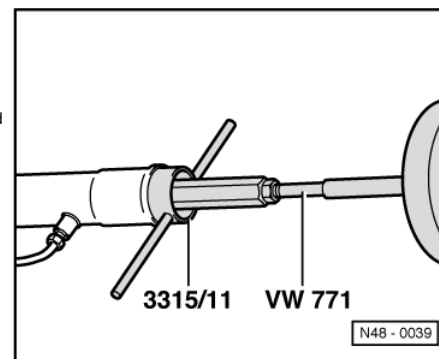
- → Screw tool VW 771 into the puller.
- Pull out oil seal.

Assembling

Before assembling the housing must be checked for impurities ([paint](#) residue, metal particles, dirt) and thoroughly cleaned if necessary.

Notes:

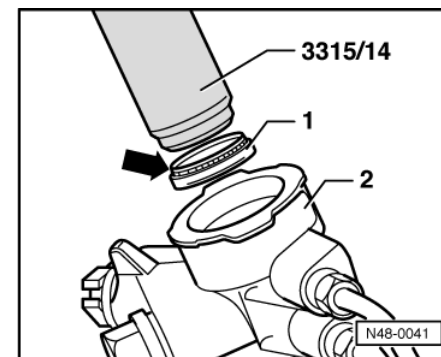
- ◆ Ensure meticulous cleanliness is observed when assembling!
- ◆ Check cylinder bearing surface for scoring or other damage. If scoring can be felt the steering box must be replaced complete.
- ◆ Check rack for scoring
- ◆ Coat oil seals with [hydraulic oil](#) before [installing](#).



- Check that the inside of the valve body housing -2- is scrupulously clean.
- → Knock valve body oil seal in onto stop.

1 - Oil seal

The sealing lip (arrow) faces upwards to tool. [Installation](#) position of oil seal in valve body housing => illustration below

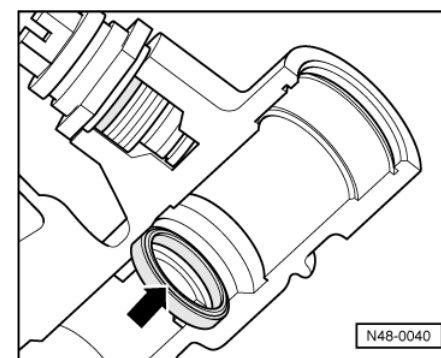


Installation position for valve body oil seal

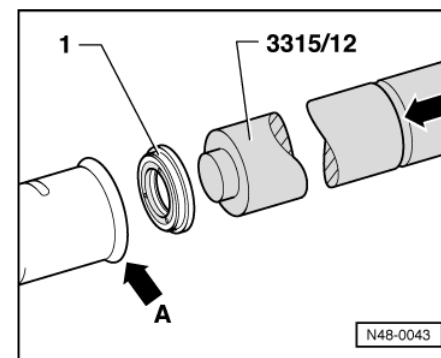
→ The oil seal sealing lip (arrow) faces upwards.

For ease of illustration Fig. shows valve turret sectionalised.

Installing rack inner oil seal



- Place oil seal -1- on tool.
- Coat oil seal -1- with hydraulic oil.
- → Drive oil seal -1- into the cylinder until the groove (arrow) on the tool aligns with edge of housing (arrow A).

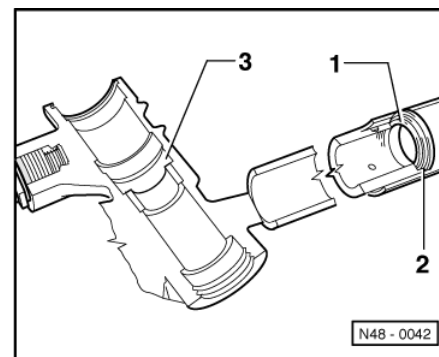


→ Installation position for rack oil seal

The oil seal support ring faces to valve body housing

- 1 - Support ring
- 2 - Oil seal
- 3 - Valve body housing

For ease of illustration the illustration shows the housing sectionalised.



→ Checking rack for scoring

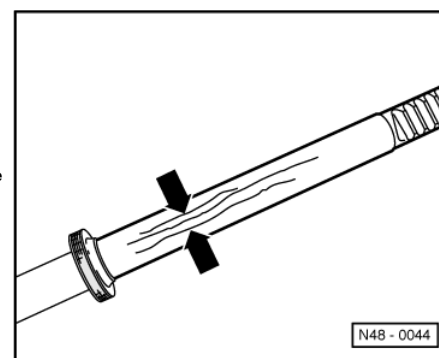
The rack must be replaced if it has corroded areas or visible deep scoring.

Can be supplied as [replacement part](#), allocation

=> [Parts microfiche](#)

With this visual [check it](#) is not possible to assess whether the rack has been damaged by force e.g. damaged during an [accident](#).

If [light](#) scoring (arrows) is visible/perceptible on the rack, which are only so deep that they can be rubbed-out with abrasive paper (grade 350...600), the rack can be reused.

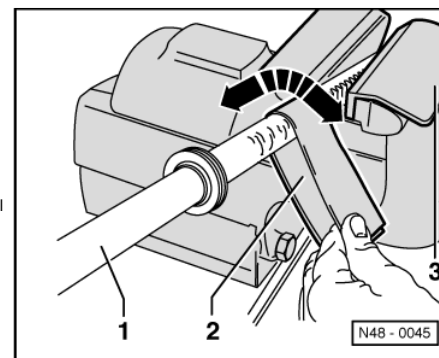


- → Rub down rack with abrasive paper in a radial direction. (This is only possible with light scoring).

Check chamfer on face side of rack for damage, if necessary eliminate with a fine whetstone and/or abrasive paper.

- 1 - Rack
- 2 - Abrasive paper (grade 350...600)
- 3 - Vice clamps

If the old rack is to be used again, check the seal for scoring. If scoring is visible or perceptible the seal and O-ring underneath must be replaced.

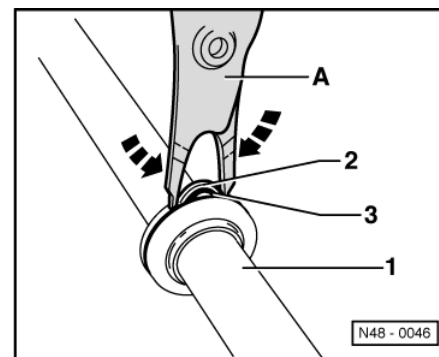


- Coat rack with hydraulic oil (protection against corrosion)

Renewing rack seal

- → Lightly press seal together with pliers.
- Lever out seal and O-ring.

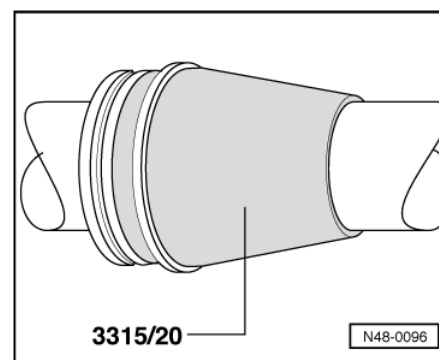
- A - Pointed pliers (commercial type)
- 1 - Rack with piston
- 2 - Seal
- 3 - O-ring



Fitting the seal to the rack piston

- Push fitting sleeve onto rack.
- Pull O-ring over the tool and insert in the piston groove.
- → Coat seal with hydraulic oil, pull over the tool and insert in the piston groove.

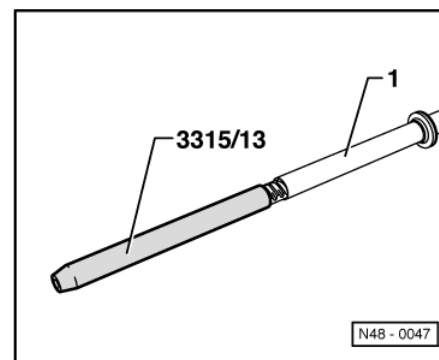
Fitting the rack



- Clean and oil rack (remove old grease from teeth)
- Apply AOF 063 000 04 grease to rack teeth.
- → Push protective tube over rack -1- onto stop.
- Completely wipe off excess grease.

No grease must be allowed to get into the oil circuit!

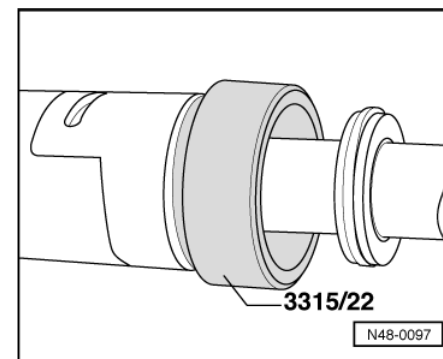
- Coat rack piston and protective tube with hydraulic oil.



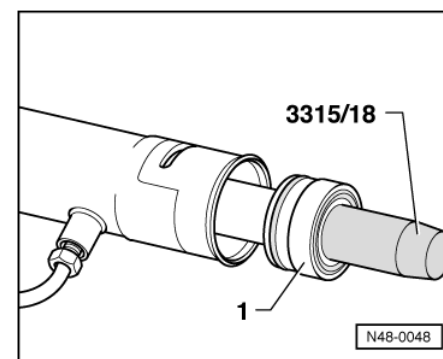
- Place guide sleeve 3315/22 in the housing.
- → Slide rack into the housing.

When sliding in ensure that the seal is pressed into the groove in the piston without jamming.

- Guide rack slowly into the housing.
- Pull protective tube 3315/13 off rack.

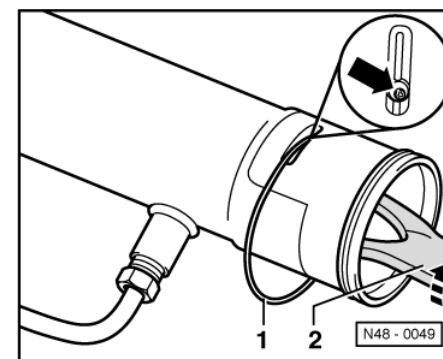


- Align rack teeth so that they face to pinion teeth.
- → Screw fitting sleeve 3315/18 onto rack and coat with hydraulic oil.
- Carefully slide rack guide -1- over the rack into the housing onto the stop.
- Push rack fully into the housing if this has not already been done.



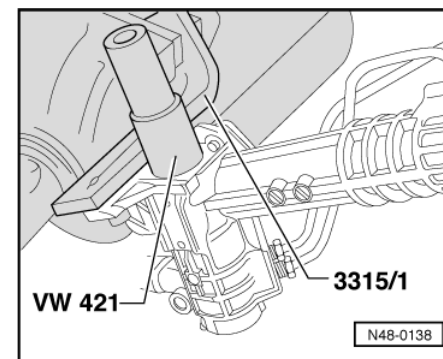
- Place securing ring in housing and push in until the groove in the securing ring is visible in the elongated hole in the housing.
- → Place circlip in the hole in the securing ring (arrow).
- Pull securing wire in by turning the securing ring. (After pulling in turn securing ring approx. 1/2 turn further).

- 1 - Securing wire
is not formed into a ring in repair kit, but supplied as a straight piece of wire.
- 2 - Pliers (commercial type)



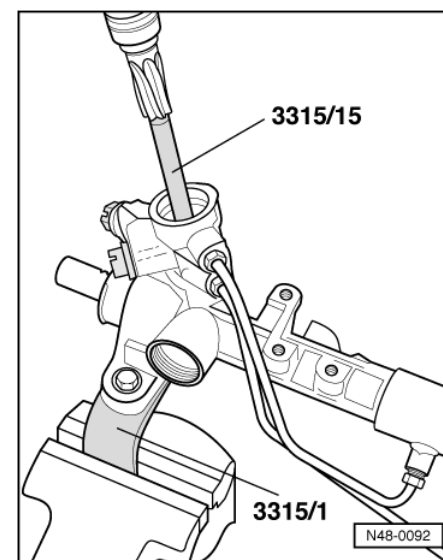
- → Carefully drive-in lower valve body ball bearing onto stop.
- Grease with steering box grease AOF 063 000 04

Ball bearing must not be canted when driving in



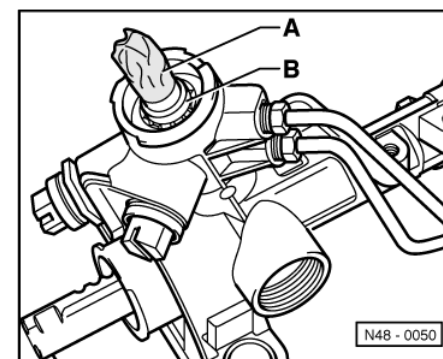
- Screw fitting tool 3315/15 onto valve body.
- → Lubricate valve body with hydraulic oil and carefully insert by hand into valve body housing. (Note position of rack).

Ensure that the seal in housing is not damaged by the rack teeth!

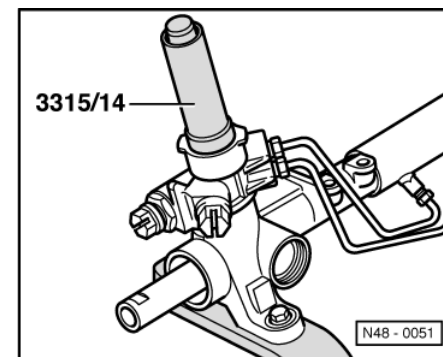


- Cover valve body teeth with sticky tape to protect the seal. Prevent folds.
- Install valve body upper roller bearing. (Lettering on roller bearing faces upwards).

- A - Sticky tape
- B - Valve body



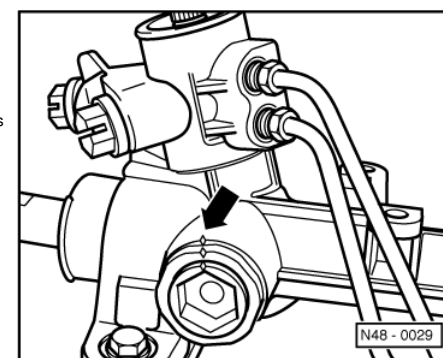
- → Drive seal in until the groove for the circlip is visible in housing.
- Insert circlip.
- Remove sticky tape/sellotape.
- Remove fitting tool 3315/15.
- Fit hexagon nut for valve body and tighten (30 Nm, counterhold with 14 mm AF open jaw spanner).
- Screw plug on (40 Nm).
- Grease thrust piece with grease AOF 063 000 04.



- Insert thrust piece and spring in housing.
- → Fit lock nut together with adjustment screw.

Notes:

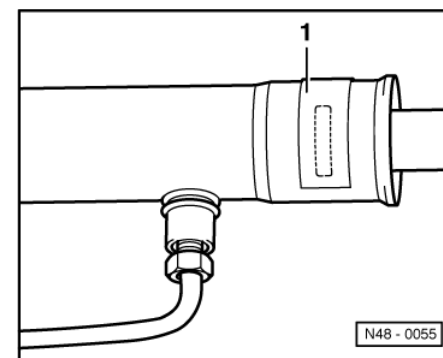
- ◆ The adjustment nut and lock nut markings (arrow) must align after tightening. If a new rack has been used => Page [48-75](#) adjusting power assisted steering box with new rack.
- ◆ Adjusting steering box when installed => Page [48-74](#).



- Clean bonding surface in area of elongated hole with thinners (e.g. Nitro thinners L 160 or methylated spirit).
- Fill elongated hole with sealant AKL 450 005 05.
- → Seal elongated hole with adhesive foil -1-.

If the rack has been replaced then adjust steering box before assembling track rods as described on Page [48-75](#).

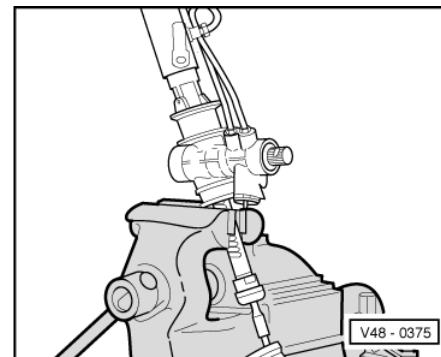
Install ball joints



→ Clamp steering box with rack in a vice and screw track rod on.

Note:

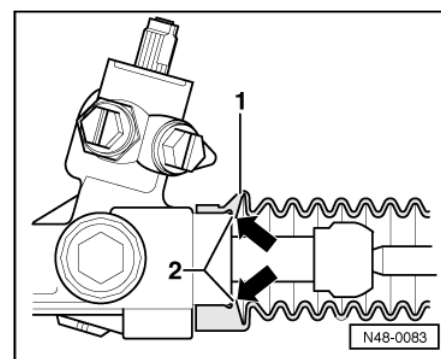
Use vice clamps, check vice clamps for impurities e.g. metal filings or similar and thoroughly remove.



→ Bellows installation position

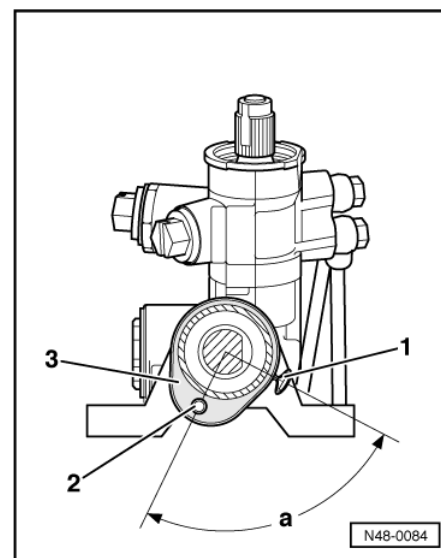
- 1 - Bellows
- 2 - Housing

When installing the bellows ensure that the lip (arrows) lies against the housing

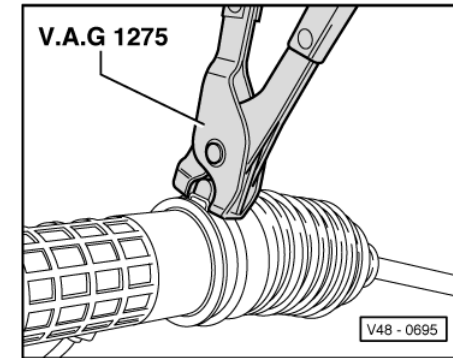


→ Clamp installation position

- 1 - Clamp
- 2 - Pressure balancing pipe
- 3 - Bellows
- a - approx. 90°



→ Tension hose clip with pliers V.A.G 1275.



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