



## Workshop Manual Crafter 2006 ➤

Running gear, axles, steering

Edition 12.2015



## List of Workshop Manual Repair Groups

### Repair Group

00 - Technical data

40 - Front suspension

42 - Rear suspension

44 - Wheels, tyres, vehicle geometry

48 - Steering

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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## 00 – Technical data

### 1 General information

(VRL008764; Edition 12.2015)

⇒ [“1.1 General notes on tyre pressure indicator”, page 1](#)

#### 1.1 General notes on tyre pressure indicator

- It is extremely important to adhere to the instructions and warnings in the following descriptions.
- Check whether the tyre pressure sensor should also be replaced ⇒ Vehicle diagnostic tester.



#### Note

- ◆ *Ensure that the tyre does not contact the tyre pressure sensor during removal or fitting.*
- ◆ *The tyre pressure sensor must not come into contact with water or be blown upon with compressed air when the rim is cleaned.*



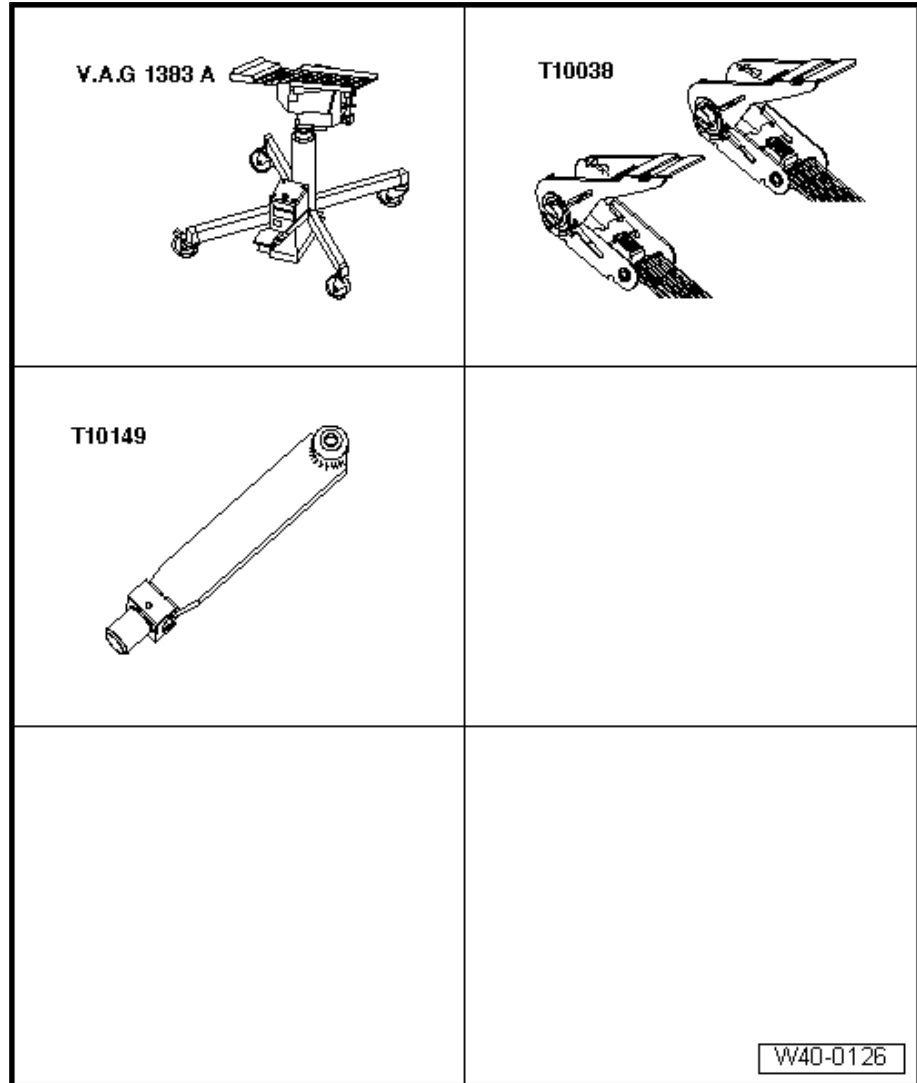
## 2 Repair instructions

⇒ ["2.1 Raising wheel suspension to unladen position", page 2](#)

### 2.1 Raising wheel suspension to unladen position

#### Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap - T10038-
- ◆ Support - T10149-





- Before starting work, measure distance -a- from centre of wheel to edge of wheel housing using, e.g., a measuring tape

**The measurement must be performed in the unladen position (normal position).**

- Note measured value. This will be needed when the nuts and bolts are tightened.

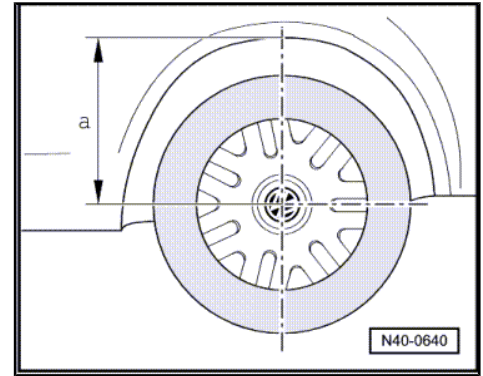
**Raise wheel suspension:**



**Caution**

*All bolts on running gear components with bonded rubber bushes may be tightened only when the component is in the unladen position (normal position).*

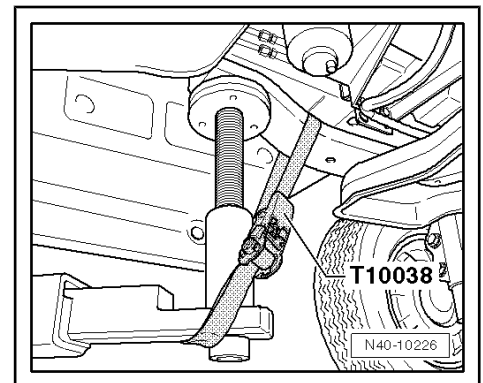
*The bonded rubber bushes are otherwise constantly tensioned and have a shorter service life.*



Axle components with bonded rubber bushes must therefore be brought to a position equivalent to the operating (unladen) position before tightening.

To simulate this position on the lifting platform, raise the respective wheel suspension with the engine and gearbox jack - V.A.G 1383 A- and support - T10149- .

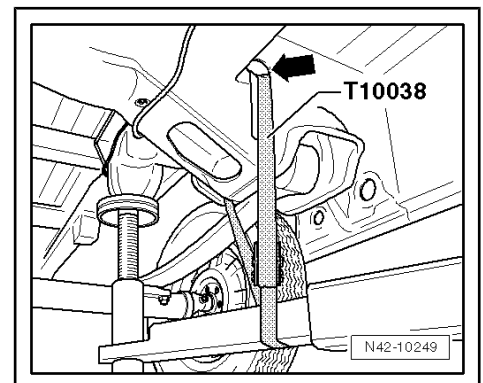
**Before the axle on one side is raised, both sides of the vehicle must be strapped to the lifting platform arms with tensioning straps - T10038- .**



**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

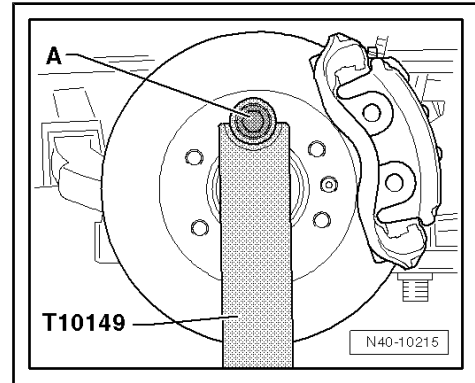
- Turn wheel hub until one of the wheel bolt holes is at the top.





- Attach support - T10149- with a wheel bolt -A-

Respective nuts and bolts may be tightened only when dimension -a- between the centre of wheel hub and edge of wheel housing, measured before starting work, has been attained ⇒ [page 3](#) .

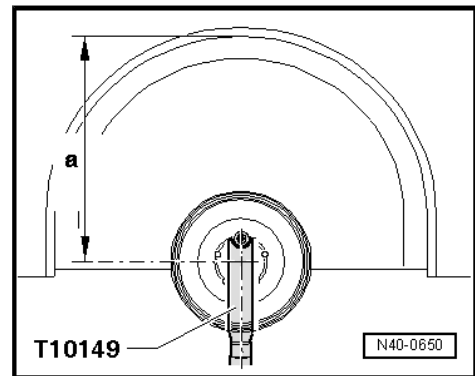


- Raise wheel bearing housing using engine and gearbox jack until dimension -a- is attained.



**WARNING**

- ◆ *Do not lift or lower vehicle while engine and gearbox jack is under vehicle.*
- ◆ *Do not leave engine and gearbox jack under vehicle longer than necessary.*



- Tighten respective nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack out from under vehicle.
- Remove support - T10149- .



## 3 Evaluating accident vehicles

⇒ [“3.1 Checklist for evaluating running gear on accident vehicles”, page 5](#)

### 3.1 Checklist for evaluating running gear on accident vehicles

Damage to running gear may go unnoticed during repairs to load-bearing and suspension parts of accident vehicles. Under certain circumstances, this undiscovered damage could lead to serious consequential damage during later vehicle operation. Therefore, the following parts of accident vehicles must be examined in the manner and order described independent of wheel alignment which may have to be performed. If no deviations from specifications are measured during wheel alignment, there are no deformations of the running gear.

#### Visual inspection and functional check of steering system

- ◆ Visual examination for cracks and deformation.
- ◆ Examination for play in track rod joints and steering rack.
- ◆ Visual examination for defective boots and bellows.
- ◆ Examination of electrical wiring and hydraulic lines and hoses for chafing, cuts and kinks.
- ◆ Check of hydraulic lines, threaded connections and steering rack for leaks.
- ◆ Check of steering rack and lines for secure seating.
- ◆ Check for perfect function over total steering lock. Operate steering from lock to lock. In the process, the steering wheel must turn with a constant force without resistance.

#### Visual and functional examination of running gear

- Adhere to the sequence of the following inspection steps!
- ◆ Check all components shown in the assembly overviews for deformation, cracks and other damage.
- ◆ Renew damaged parts.
- ◆ Align wheels on a Volkswagen AG-approved wheel alignment stand

#### Visual and functional check of wheels and tyres

- ◆ Check for true running and imbalance ⇒ VW ServiceNet; Technical information; Reference guides; Wheel and Tyre Guide; General; Imbalance due to wheels and tyres .
- ◆ Check tread and sidewalls of tyres for cuts and damage from blows ⇒ VW ServiceNet; Technical information; Reference guides; Wheel and Tyre Guide; General; Tyre damage .
- ◆ Check tyre pressure; see tyre inflation pressure sticker in fuel tank flap or ⇒ Maintenance ; Booklet 10.2 .

If rim of wheel and/or tyre is damaged, renew tyre. This also applies if the circumstances of the accident and the damage to the vehicle indicate possible damage which is not visible.

A further factor in the decision is the age of the tyre. Tyres should not be older than 6 years.

#### Generally, in case of doubt:

- Whenever a safety risk cannot be excluded, the tyre(s) must be renewed.



### Entire vehicle

Also check other vehicle systems such as:

- ◆ Brake system including ABS
- ◆ Visual and functional examination of exhaust system and passenger protection

Specifications and notes for testing and adjusting can be found in the respective workshop manual in ELSA.

The examination for accident vehicles described here refers to the running gear and does not purport to be a complete examination of the entire vehicle.

### Electronic vehicle systems

Systems relevant to safety including, for example, ABS/EDL, air-bag systems, electronically regulated running gear systems and driver assist systems must be checked for possible saved fault messages using the ⇒ Vehicle diagnostic tester. If faults are saved in the event memories of the systems mentioned above, repair the faults according to the instructions in workshop manuals in ELSA. Following repairs, read event memories of the affected systems again to ensure that complete function has been restored.



## 40 – Front suspension

### 1 Front axle

⇒ [“1.1 Overview - front axle”, page 7](#)

⇒ [“1.2 Overview - front axle, Crafter 4MOTION with Achleitner four-wheel drive”, page 8](#)

#### 1.1 Overview - front axle

I -

⇒ [“2.1 Assembly overview - subframe”, page 9](#)

II -

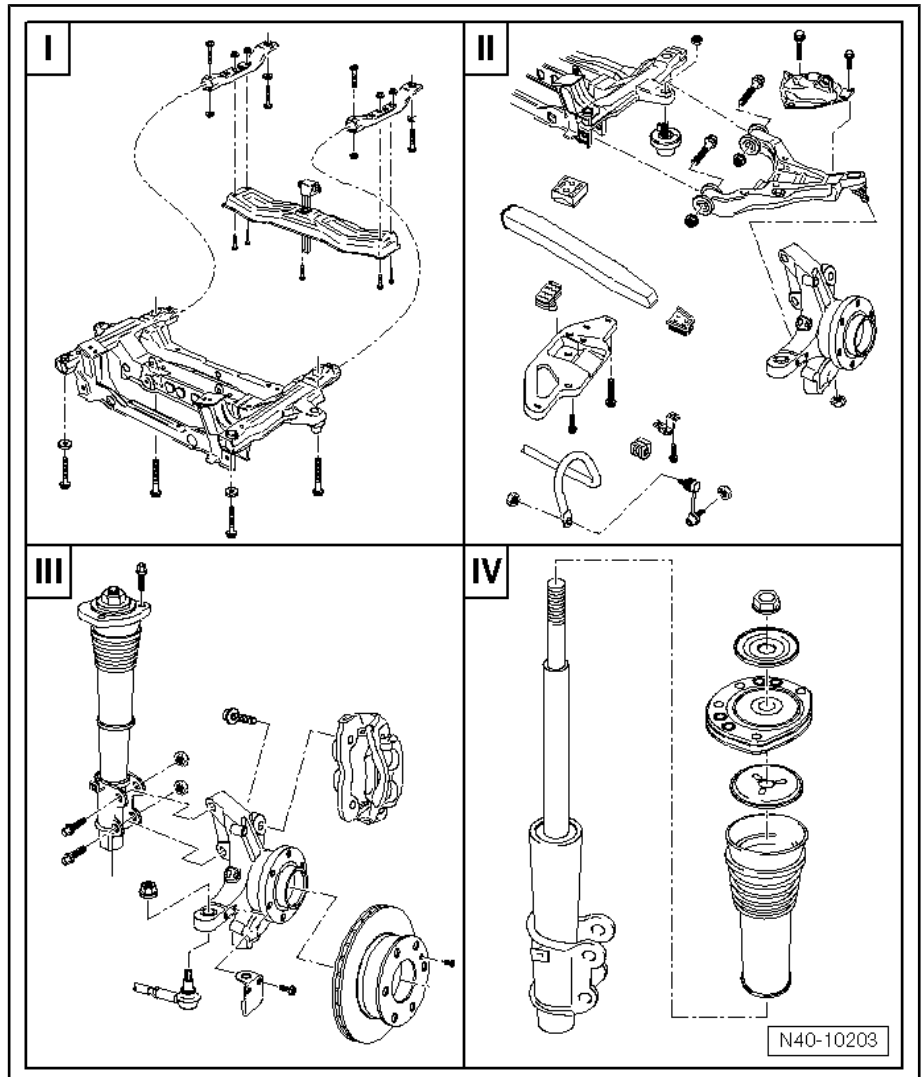
⇒ [“4.1 Assembly overview - lower suspension link, swivel joint - Crafter”, page 47](#)

III -

⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)

IV -

⇒ [“3.1 Assembly overview - suspension strut, upper suspension link”, page 36](#)





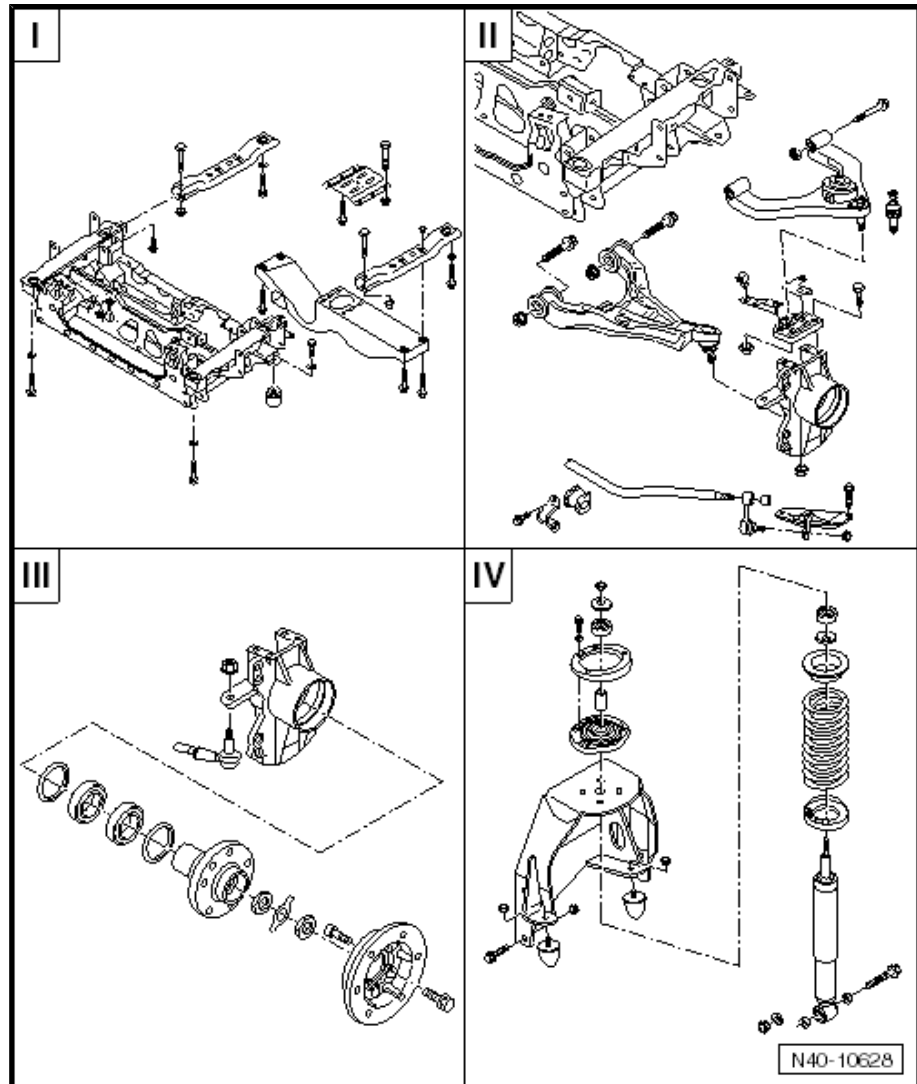
## 1.2 Overview - front axle, Crafter 4MOTION with Achleitner four-wheel drive

I -  
⇒ [“2.1 Assembly overview - subframe”, page 9](#)

II -  
⇒ [“4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive”, page 49](#)

III -  
⇒ [“5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive”, page 63](#)

IV -  
⇒ [“3.2 Assembly overview - suspension strut, upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive”, page 37](#)





## 2 Subframe

⇒ [“2.1 Assembly overview - subframe”, page 9](#)

⇒ [“2.2 Removing and installing subframe with steering rack”, page 12](#)

⇒ [“2.3 Removing and installing anti-roll bar”, page 26](#)

⇒ [“2.4 Removing and installing coupling rod”, page 28](#)

⇒ [“2.5 Removing and installing saddle plate”, page 30](#)

⇒ [“2.6 Removing and installing leaf spring”, page 31](#)

### 2.1 Assembly overview - subframe

⇒ [“2.1.1 Assembly overview - subframe, Crafter”, page 9](#)

⇒ [“2.1.2 Assembly overview - subframe, Crafter 4MOTION with Achleitner four-wheel drive”, page 10](#)

#### 2.1.1 Assembly overview - subframe, Crafter

##### 1 - Subframe

- Removing and installing  
⇒ [page 12](#)

##### 2 - Bolt

- Can only be renewed  
with subframe removed.

##### 3 - Nut

- Always renew after re-  
moving

##### 4 - Extension for subframe

##### 5 - Nut

- Always renew after re-  
moving
- Does not have to be re-  
leased to remove and  
install subframe
- 170 Nm

##### 6 - Bolt

- Always renew after re-  
moving
- 170 Nm

##### 7 - Washer

##### 8 - Gearbox mounting

##### 9 - Rear final drive carrier

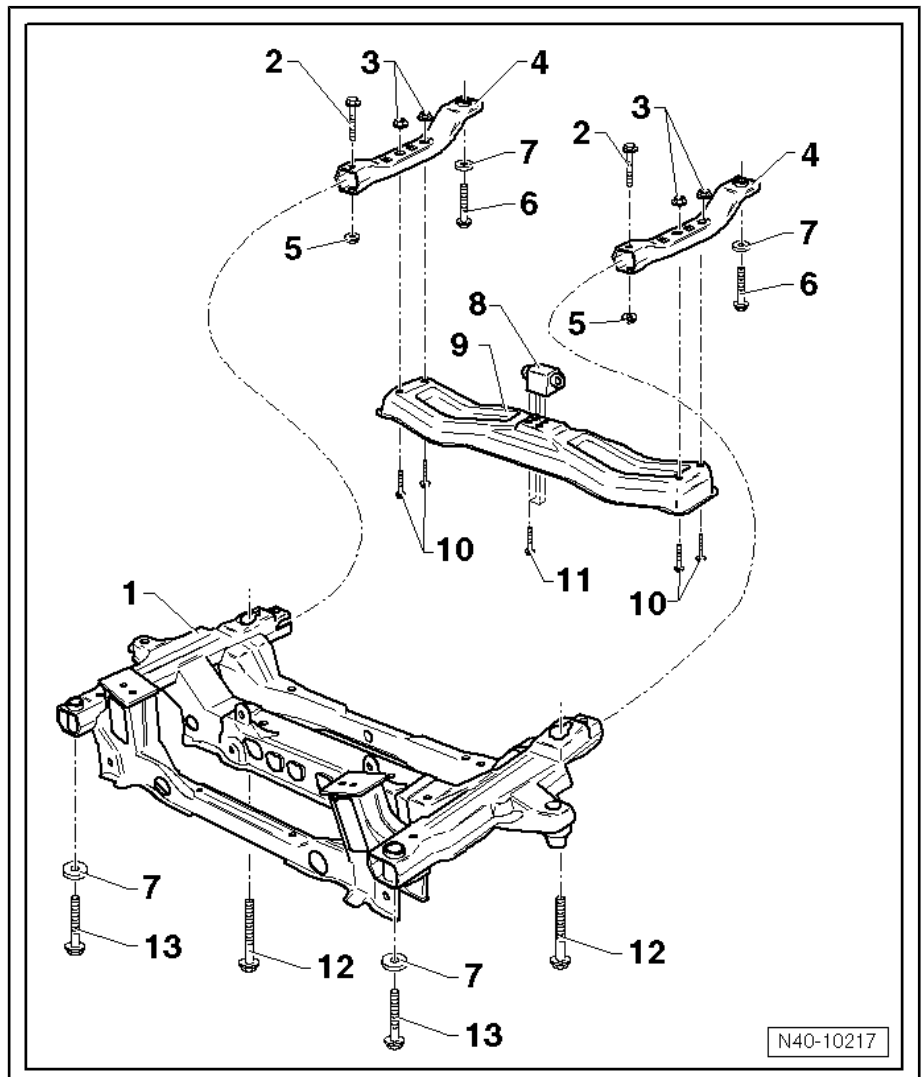
- Bolted to subframe ex-  
tension

##### 10 - Bolt

- Always renew after re-  
moving
- 60 Nm

##### 11 - Bolt

- For gearbox mounting ⇒ [Item 8 \(page 9\)](#) ⇒ Rep. gr. 39
- Always renew after removing





### 12 - Bolt

- Always renew after removing
- 120 Nm +270°

### 13 - Bolt

- Always renew after removing
- 170 Nm

## 2.1.2 Assembly overview - subframe, Crafter 4MOTION with Achleitner four-wheel drive



### WARNING

*It is not permitted to carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.*

*Always renew self-locking nuts.*

*Always renew corroded nuts and bolts.*

### 1 - Subframe

- Removing and installing  
⇒ [page 16](#).



### Note

*The identification plate of the front final drive is located on the right side of the subframe.*

### 2 - Bolt

- Always renew after removing
- 120 Nm +270°

### 3 - Nut

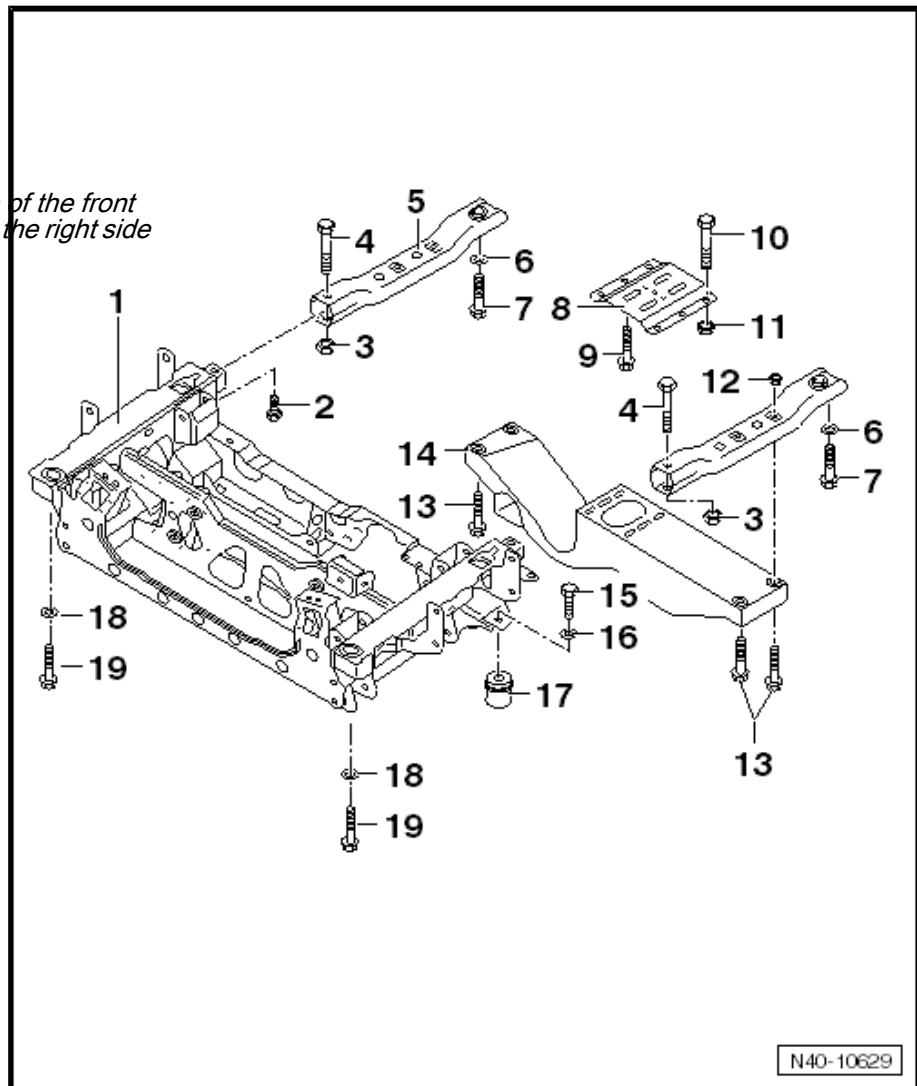
- Always renew after removing
- Does not have to be released to remove and install subframe
- 170 Nm

### 4 - Bolt

- Always renew after removing
- Can only be renewed with subframe removed.
- 170 Nm

### 5 - Extension for subframe

- Can only be renewed with subframe removed.



N40-10629



**6 - Washer**

**7 - Bolt**

- Always renew after removing.
- 170 Nm

**8 - Adapter**

**9 - Bolt**

- Always renew after removing
- 30 Nm

**10 - Bolt**

- Always renew after removing
- When loosening and tightening, counterhold at nut ⇒ [Item 11 \(page 11\)](#)

**11 - Nut**

- Always renew after removing
- 50 Nm

**12 - Nut**

- Always renew after removing

**13 - Bolt**

- Always renew after removing
- 60 Nm

**14 - Rear final drive carrier**

- Bolted to subframe extension

**15 - Bolt**

- Always renew after removing
- 40 Nm

**16 - Washer**

**17 - Bump stop**

**18 - Washer**

**19 - Bolt**

- Always renew after removing
- 170 Nm



## 2.2 Removing and installing subframe with steering rack

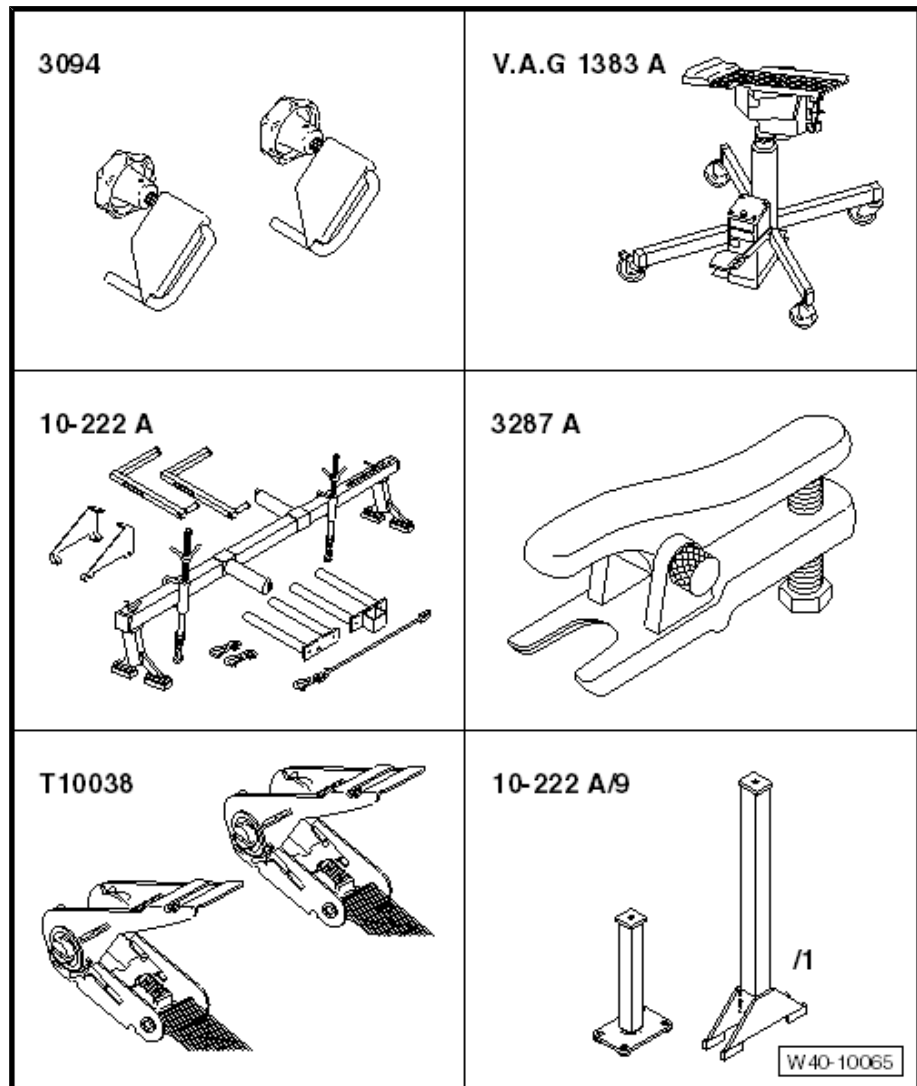
⇒ ["2.2.1 Removing and installing subframe, Crafter", page 12](#)

⇒ ["2.2.2 Removing and installing subframe, Crafter 4MOTION with Achleitner all-wheel drive", page 16](#)

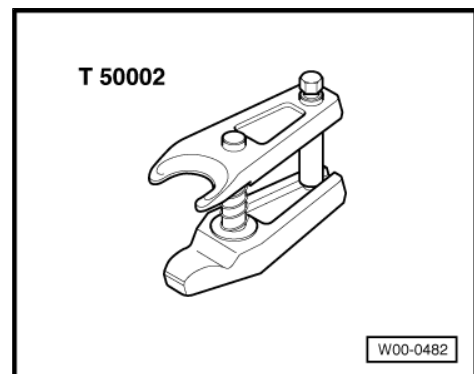
### 2.2.1 Removing and installing subframe, Crafter

#### Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-
- ◆ Engine and gearbox jack - V.A.G 1383 A- with universal support - V.A.G 1359/2- .
- ◆ Support bracket - 10 - 222 A-
- ◆ Ball joint puller - 3287 A-
- ◆ Tensioning strap - T10038-
- ◆ Adapter - 10 - 222 A 9/1- (2x)

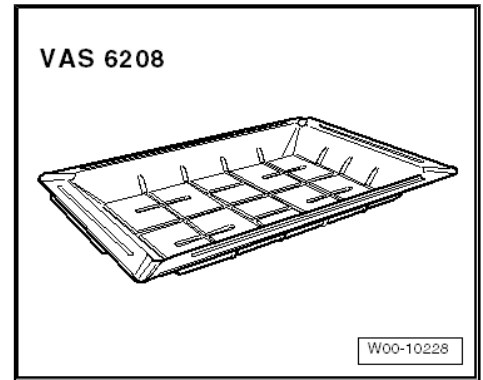


- ◆ Ball joint puller - T50002-





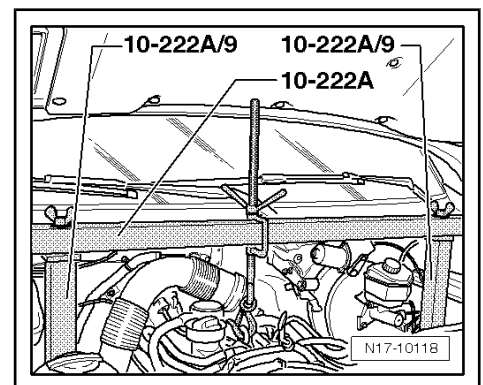
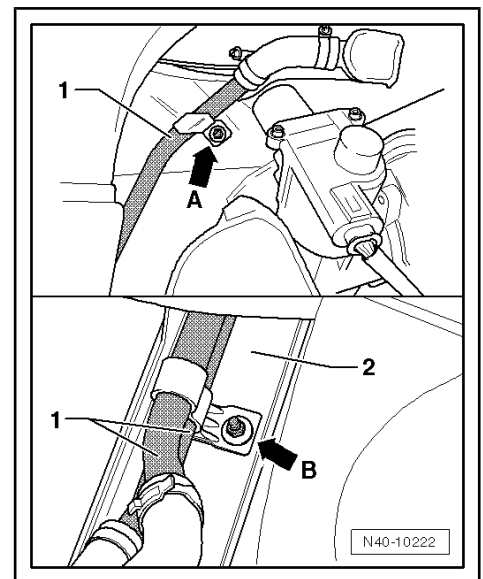
- ◆ Drip tray for workshop hoist - VAS 6208-



## Removing

### Note

- ◆ *Remove subframe together with steering rack.*
- ◆ *Remove steering rack from subframe.*
- Remove complete air filter housing ⇒ Rep. gr. 23 .
- Remove coolant pipe -1- from plenum chamber bulkhead -arrow A-.
- Then remove clamp -arrow B- for coolant pipes -1- from right longitudinal member -2-.
- Remove washer fluid reservoir from left longitudinal member ⇒ Electrical system; Rep. gr. 92 ; Repairing windscreen washer system .
- Insert support bracket - 10-222A- with adapters - 10-222A/9/1- .

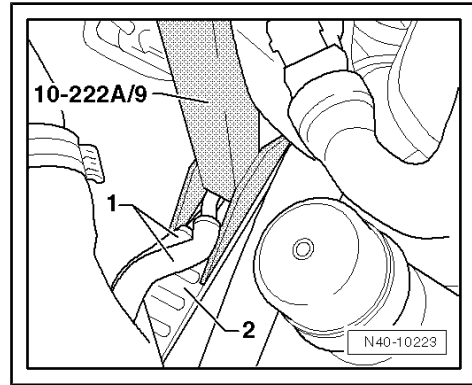




**Note**

When inserting adapter - 10-222A/9/1- , do not damage coolant pipes -1- on right longitudinal member -2-.

- Remove left and right saddle plates ⇒ [page 30](#) .
- Turn wheels to straight-ahead position.
- Remove ignition key with steering wheel in centre position.
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheels.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Unscrew bolt -arrow- for steering column universal joint.
- Then pull universal joint off steering rack.



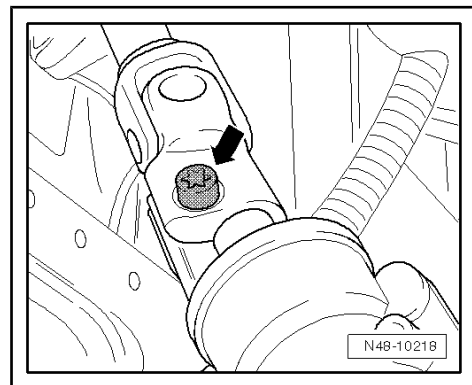
**Note**

The following work sequence is described for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

- Loosen nut -A- on track rod ball joint but do not remove completely.

**Leave nut screwed on a few turns to protect thread on pin.**

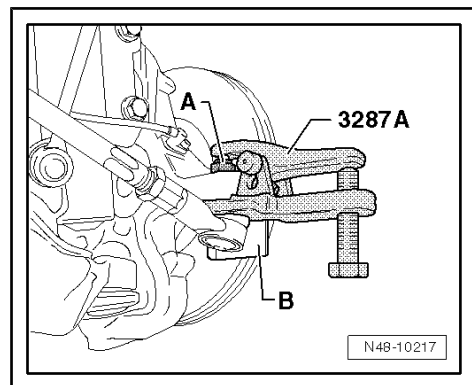
- Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- . Now unscrew nut -4-.



**Note**

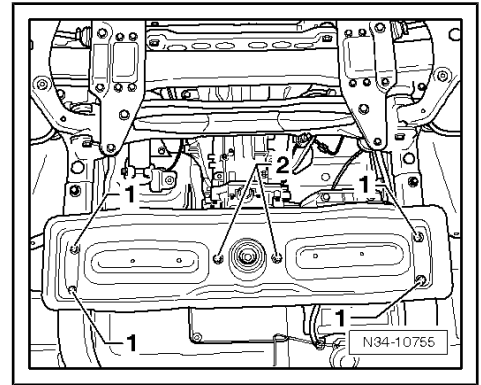
When pressing off, do not damage rubber grommet or heat shield -B-.

- Then remove leaf spring ⇒ [page 31](#) .
- Position engine and gearbox jack - V.A.G 1383 A- with universal support - V.A.G 1359/2- under right suspension link.
- Remove right wheel bearing housing.
- Removing right suspension link.
- Clamp off pressure line for steering rack with hose clamps, up to 25 mm - 3094- . Remove pressure line from steering rack.
- Position engine and gearbox jack - V.A.G 1383 A- under gearbox and apply slight pressure.

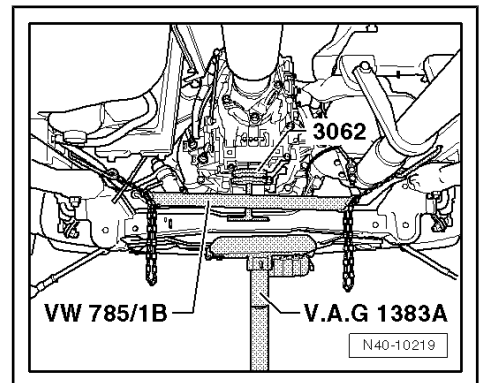




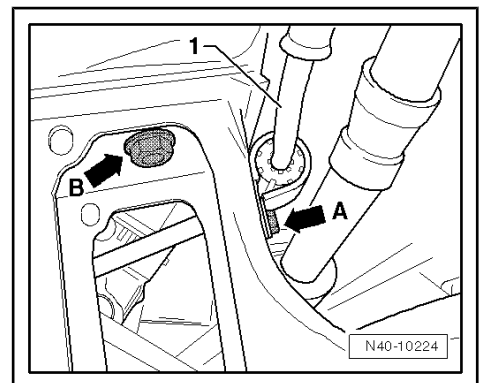
- Remove gearbox carrier from gearbox and subframe (extension for subframe), unscrew bolts -1- and -2-.



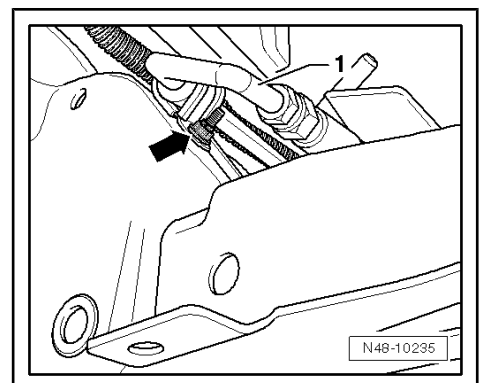
- Secure engine/gearbox assembly to body with retaining tool - VW 785/1 B- .
- In doing so, position thrust pad - 3062- (smaller diameter of -3062- points to pressure plate) between pressure plate of retaining tool and gearbox.
- Remove engine/gearbox jack - V.A.G 1383 A- from gearbox.
- Position engine and gearbox jack - V.A.G 1383 A- with universal support - V.A.G 1359/2- under subframe.
- Remove wires, bracket for speed sensor cable and brake wear indicator from subframe.



- Remove power steering line -1- from subframe -arrow A-.
- Unscrew bolt -arrow B- from left and right engine mounting.



- Detach pressure line -1- from subframe -arrow-.





- Unscrew securing bolts -1- to -3- for subframe Carefully lower subframe.

### Installing

Install in reverse order. Note the following points:



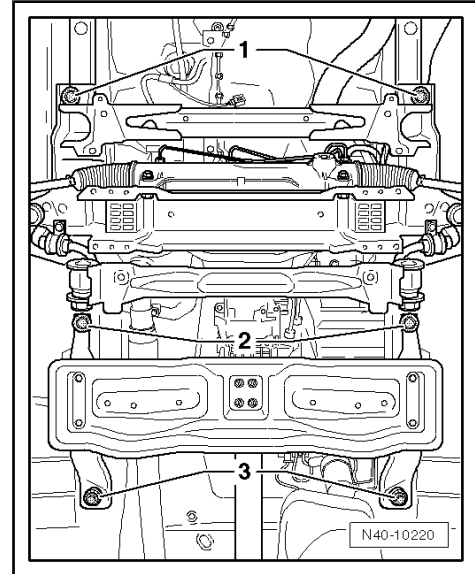
### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen state) ⇒ [page 2](#).*

- Install noise insulation beneath subframe ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Install front wheels.

### Specified torques

- ◆ ⇒ [“2.1 Assembly overview - subframe”, page 9](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)
- ◆ ⇒ [“3.1 Assembly overview - steering rack”, page 169](#)
- ◆ ⇒ [“3.2 Repairing steering rack”, page 172](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)
- ◆ Noise insulation; Assembly overview - noise insulation ⇒ Rep. gr. 50 ; Assembly overview - noise insulation .

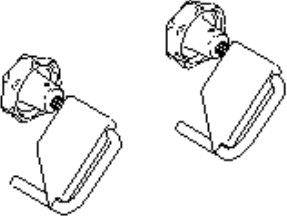
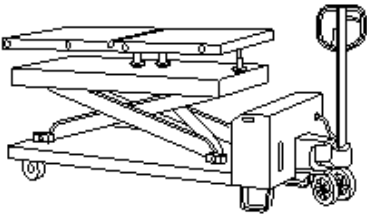
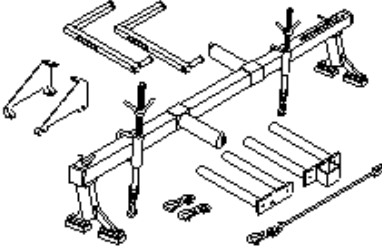
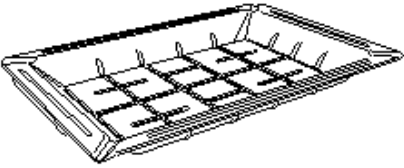
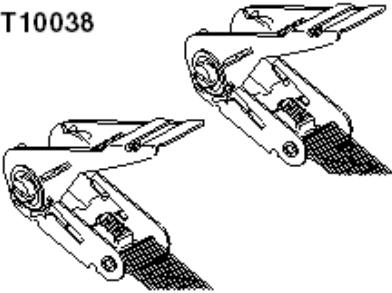
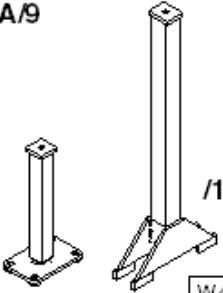


## 2.2.2 Removing and installing subframe, Crafter 4MOTION with Achleitner all-wheel drive

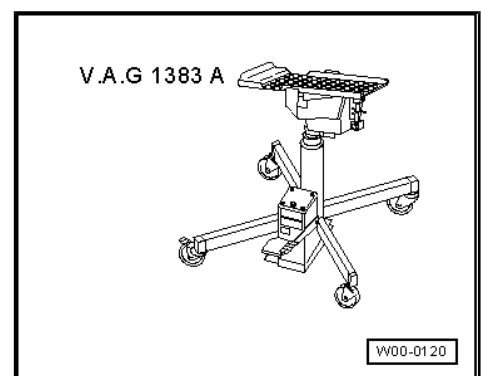


**Special tools and workshop equipment required**

- ◆ Hose clamps, up to 25 mm - 3094-
- ◆ Support bracket - 10 - 222 A-
- ◆ Tensioning strap - T10038-
- ◆ Adapter - 10 - 222 A /9-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Scissor-type assembly platform - VAS 6131 A-

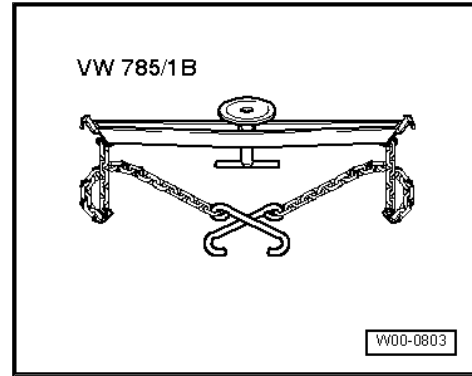
<p><b>3094</b></p> 	<p><b>VAS 6131 A</b></p> 
<p><b>10-222 A</b></p> 	<p><b>VAS 6208</b></p> 
<p><b>T10038</b></p> 	<p><b>10-222 A/9</b></p>  <p style="text-align: right;">W40-10067</p>

- ◆ Engine and gearbox jack - V.A.G 1383 A- with universal support - V.A.G 1359/2- .

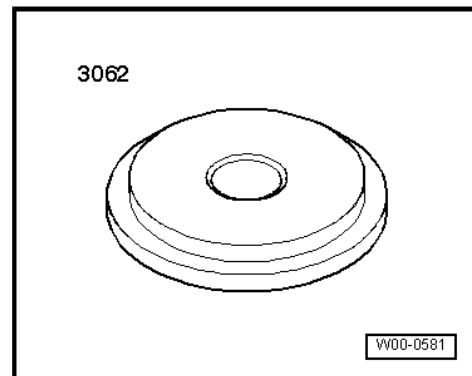




- ◆ Retaining tool - VW 785/1 B-



- ◆ Thrust washer - 3062-



## Removing



### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#) .*

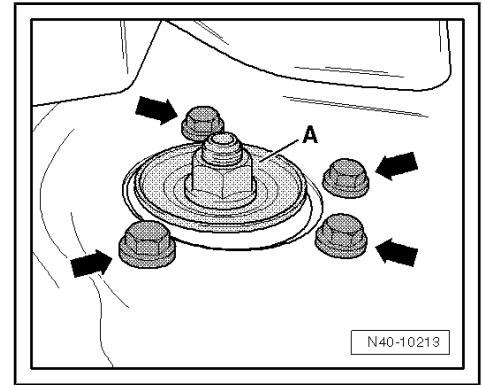
- Remove left and right floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Cab floor covering .



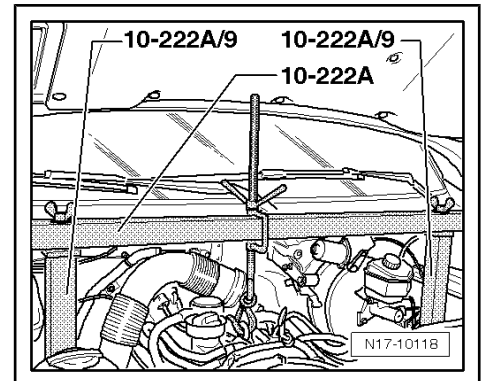
- Unscrew securing bolts -arrows- for shock absorber -A-.
- Draw off brake fluid using brake filling and bleeding equipment - VAS 5234- or extraction unit upgrade kit - V.A.G 1869/4- => Maintenance ; Booklet 10.2 .

**WARNING**

- ◆ *Do not under any circumstances allow brake fluid to come into contact with fluids that contain mineral oils (e.g. oil, petrol, cleaning agents). Mineral oils damage the seals and rubber grommets in the brake system.*
- ◆ *Brake fluid is poisonous. Also due to its corrosive effect brake fluid must not come into contact with paintwork.*
- ◆ *Brake fluid is hygroscopic, which means it absorbs moisture from the ambient air and should therefore always be stored in air-tight containers.*
- ◆ *Rinse off spilled brake fluid using plenty of water.*
- ◆ *Always observe the relevant environmental regulations for disposal*



- Remove air filter housing => Rep. gr. 23 .
- Remove washer fluid reservoir from left longitudinal member => Electrical system; Rep. gr. 92 ; Repairing windscreen washer system .
- Insert support bracket - 10 - 222 A- with adapters - 10 - 222 A 9/1 - .

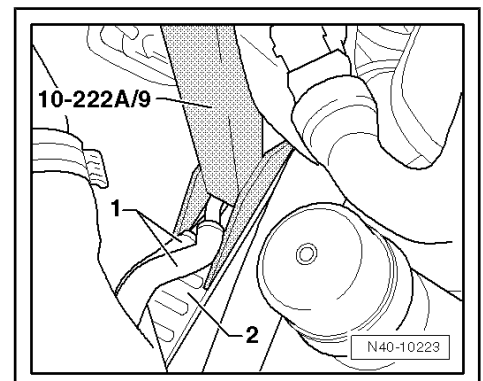
**Note**

*When inserting adapter - 10 - 222 A /9- , do not damage lines -1- on right longitudinal member -2-.*

- Turn wheels to straight-ahead position.
- Remove ignition key with steering wheel in centre position.
- Raise vehicle and strap it down => Maintenance ; Booklet 10.2 .

**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*



- Remove front wheel housing liner => General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners .



- Disconnect left and right connectors -1- and unclip wiring harness.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Remove transfer box => Controls, housing; Rep. gr. 34 ; Transfer box, Crafter 4MOTION with Achleitner four-wheel drive .

**Is it necessary to renew the subframe?**



**Note**

*If the subframe must be renewed, the front final drive must be removed beforehand. Later the front final drive cannot be removed anymore without additional efforts!*

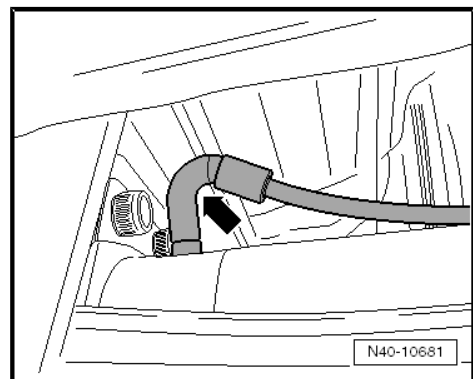
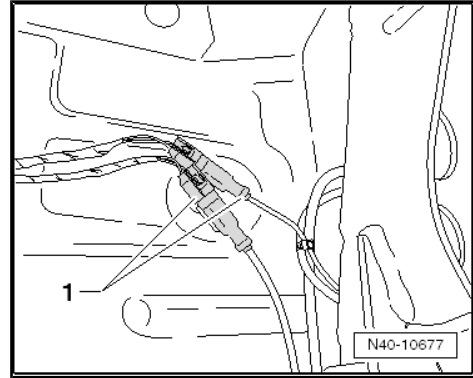
- Yes: => [page 20](#)
- No: => [page 20](#)

**Subframe must be renewed**

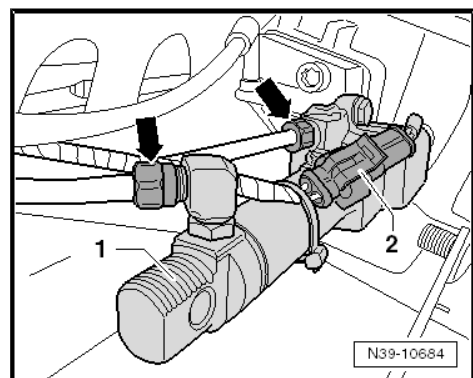
- Remove front final drive => Final drive, front differential; Rep. gr. 39 ; Front final drive .

**Subframe is not to be renewed**

- Pull off bleeder hose -arrow- and attach it on side.



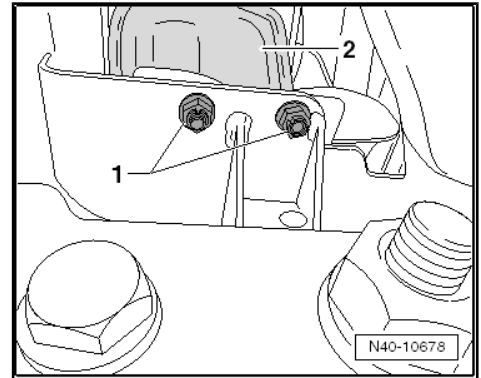
- Disconnect pneumatic lines -arrows- for front differential lock solenoid valve - N571- -1- => Power transmission; Rep. gr. 39 ; Final drive, differential, differential lock .
- Disconnect connector -2- for front axle final drive differential lock switch - F101- => Power transmission; Rep. gr. 39 ; Final drive, differential, differential lock .
- Carefully cut through any cable ties. Lay cable for front axle final drive differential lock switch - F101- to side.



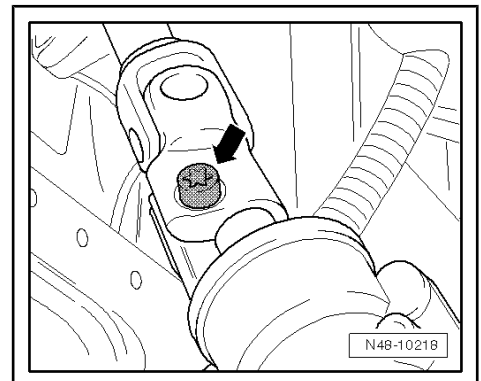
**Continuation for all vehicles**



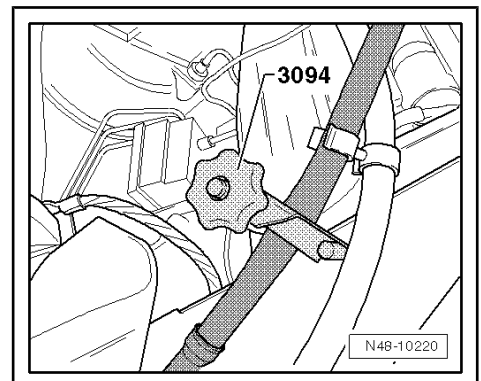
- Unscrew nuts -1- and remove diesel particulate filter -2- from subframe.



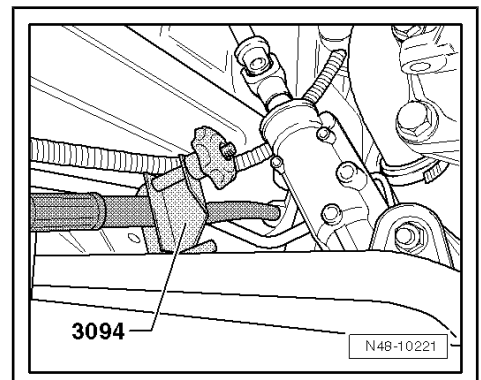
- Unscrew bolt -arrow- for steering column universal joint.
- Pull universal joint off steering rack.



- Clamp off return line using hose clamp, up to 25 mm - 3094- .

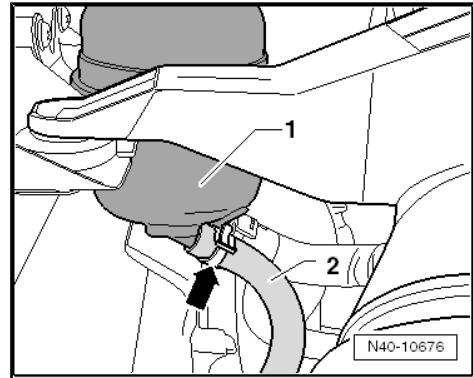


- Clamp off pressure line using hose clamps, up to 25 mm - 3094- .
- Use drip tray for workshop hoist - VAS 6208- to catch hydraulic oil that runs out.
- Seal or cover open lines/connections.

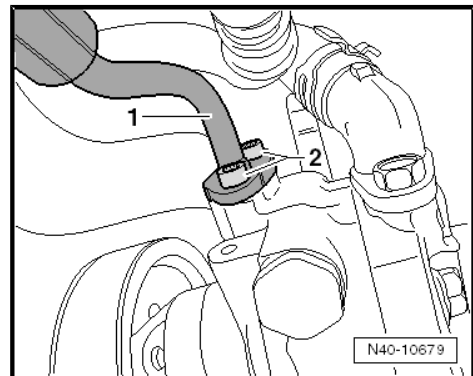




- Open clamp -arrow- and pull hose -1- off reservoir for power-assisted steering -1-.



- Unscrew bolts -2- and pull line -1- off power-assisted steering vane pump.
- Unclip wiring harness -1- and lay it to side.

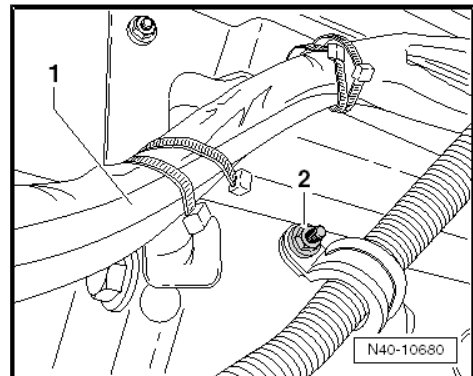


- Unscrew nut -2-, pull off wiring harness and lay it to side.

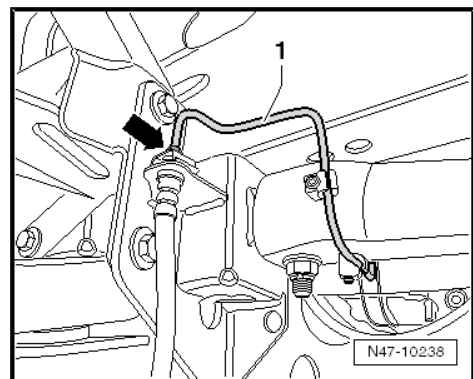


**Note**

*On the right side of the vehicle the threaded coupling is located behind the guard plate for the brake line.*



- Unbolt brake lines -1- from brake hose -arrow-. Seal brake hose and brake line using sealing plugs from repair kit - 1H0 698 311 A- .
- Unbolt guard plate for brake line on right side.



**WARNING**

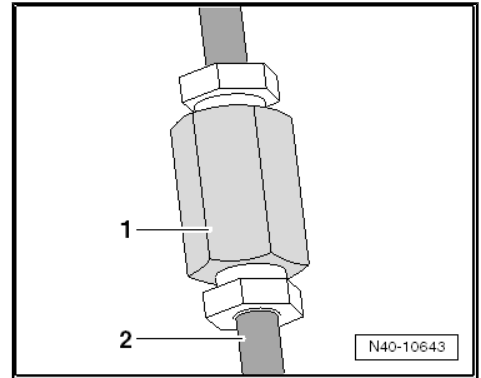
*Danger of burns.*

*Parts of the exhaust system may be hot.*

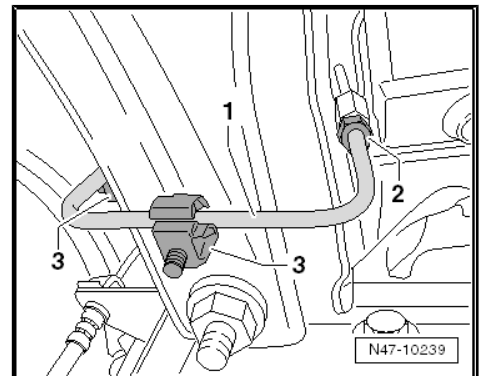
*Let exhaust system cool off prior to removal.*



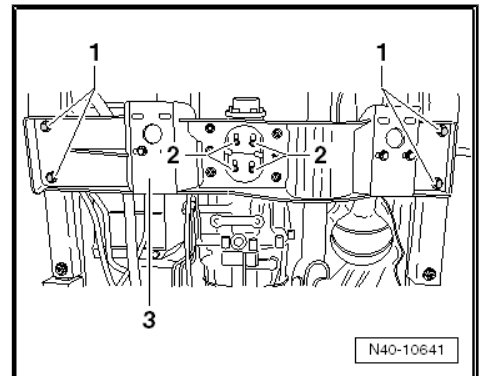
- Disconnect brake line -2- from connecting piece -1-.
- Seal connecting piece -2- using sealing plugs from repair kit - 1H0 698 311 A- .



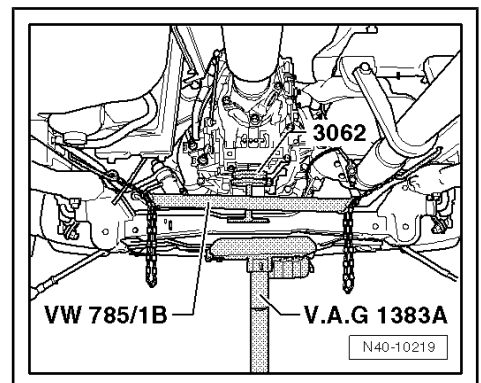
- Unclip brake line -1- from clips -3-.
- Position engine and gearbox jack - V.A.G 1383 A- under gearbox and apply slight pressure.



- Remove gearbox carrier from gearbox and subframe (extension for subframe) -3-. Unscrew bolts -1- and -2-.

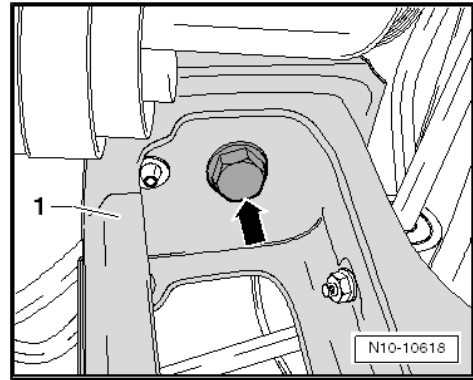


- Secure engine/gearbox assembly to body with retaining tool - VW 785/1 B- .
- In doing so, position thrust pad - 3062- (smaller diameter of -3062- points to pressure plate) between pressure plate of retaining tool and gearbox.
- Remove engine/gearbox jack - V.A.G 1383 A- from gearbox.





- Unscrew bolt -arrow- from engine mounting on left and right -1-.
- Place scissor-type assembly platform - VAS 6131 A- underneath vehicle and align it.





- Unscrew bolts -1- to -3- for subframe Carefully lower subframe onto scissor-type assembly platform - VAS 6131 A - .

### Installing

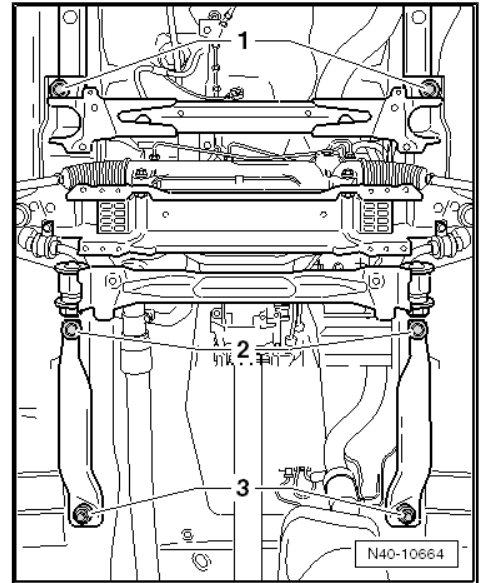
Install in reverse order. Note the following points:



#### WARNING

*Pay attention to the following when doing any repair work:*

- ◆ *To avoid damage to any lines/wires (e.g. line for power-assisted steering or wire for front right speed sensor - G45-), route all the various lines/wires so that they are in their original positions.*
- ◆ *To prevent damage to the lines/wires, make sure there is an adequate clearance from all moving or hot components.*
- ◆ *Cut through cable ties carefully and fit them at the same locations during installation.*



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#) .*

- Install transfer box ⇒ Rep. gr. 39 ; Transfer box; Removing and installing transfer box .
- Install air filter housing ⇒ Rep. gr. 23 .
- Install washer fluid reservoir from left longitudinal member ⇒ Electrical system; Rep. gr. 92 ; Repairing windscreen washer system .
- Install front wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Bleed brake system ⇒ Maintenance ; Booklet 10.2 .
- Bleed steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Bleeding steering after conversion .
- Perform wheel alignment ⇒ [page 149](#) .

#### Specified torques

- ◆ ⇒ [“2.1.2 Assembly overview - subframe, Crafter 4MOTION with Achleitner four-wheel drive”, page 10](#)
- ◆ ⇒ [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

Component	Specified torque
Input shaft of front axle differential lock	76 Nm



## 2.3 Removing and installing anti-roll bar

⇒ [“2.3.1 Removing and installing anti-roll bar, Crafter”, page 26](#)

⇒ [“2.3.2 Removing and installing anti-roll bar, Crafter 4MOTION with Achleitner four-wheel drive”, page 26](#)

### 2.3.1 Removing and installing anti-roll bar, Crafter



#### Note

Renew anti-roll bar if corrosion protective layer is damaged.

#### Removing

- Remove leaf spring ⇒ [page 31](#) .
- Loosen coupling rod on anti-roll bar ⇒ [page 47](#) .
- Unscrew bolts -arrows- and remove clamps -A-.
- Remove anti-roll bar -C- with anti-roll bar bush -B- to left out of vehicle.
- Check anti-roll bar -B- and clamps -A- for wear and damage and renew if necessary.

#### Installing

Install in reverse order. Note the following points:



#### Note

Whilst installing the anti-roll bar ensure that the surface is not damaged. Rectify paint work damage if necessary and protect against corrosion with underseal.

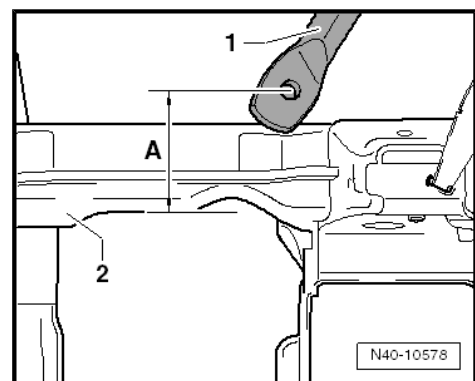
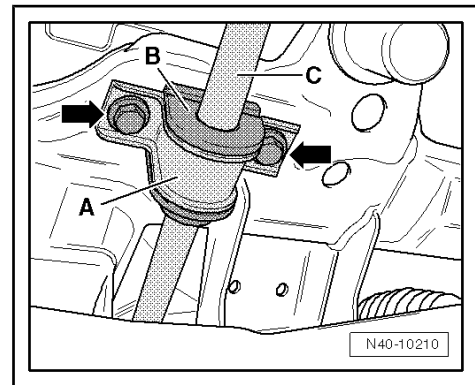
- Install bolts for anti-roll bar.
- Align anti-roll bar.

Dimension -A- between anti-roll bar -1- and subframe -2- must be 59.5 mm.

- Tighten anti-roll bar bolts.
- Install leaf spring ⇒ [page 31](#) .

#### Specified torques

- ♦ ⇒ [“4.1 Assembly overview - lower suspension link, swivel joint - Crafter”, page 47](#)



### 2.3.2 Removing and installing anti-roll bar, Crafter 4MOTION with Achleitner four-wheel drive



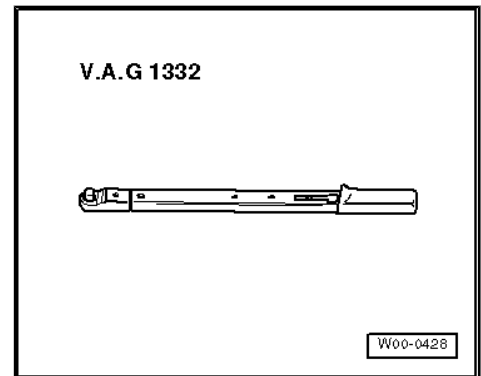
#### Note

Renew anti-roll bar if corrosion protective layer is damaged.

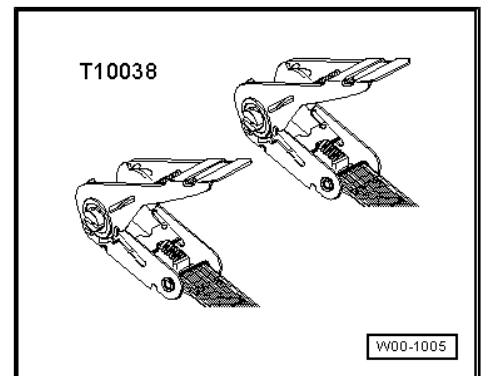


### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



- ◆ Tensioning strap - T10038-



### Removing



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

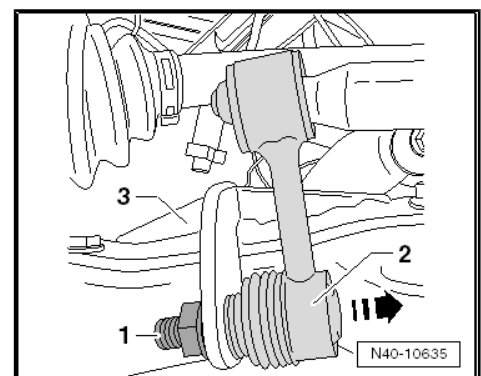
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Loosen coupling rod nuts -2- on both sides. Counterhold on thread -1- using a Torx socket.





- Unscrew bolts -arrows- and remove clamps -A-.
- Remove anti-roll bar -C- with anti-roll bar bearing -B- and coupling rods.
- Check anti-roll bar -B- and clamps -A- for wear and damage and renew if necessary.

### Installing

Install in reverse order. Note the following points:



#### Note

- ◆ *Tighten bolted connections to coupling rods only if the vehicle is standing on its wheels and is unladen or if the vehicle is raised and is in the unladen position (normal position)*  
⇒ [page 2](#).
  - ◆ *Whilst installing the anti-roll bar ensure that the surface is not damaged. Rectify paint work damage if necessary and protect against corrosion with underseal.*
  - ◆ *When installing, ensure that the outer edges of the rubber bush ⇒ [Item 22 \(page 50\)](#) lie against stop of anti-roll bar.*
- Tighten anti-roll bar bolts hand-tight.
  - Centre anti-roll bar.
  - Fit coupling rods on coupling rod bracket.
  - Tighten anti-roll bar bolts.

### Specified torques

- ◆ ⇒ [“4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive”, page 49](#)

## 2.4 Removing and installing coupling rod

⇒ [“2.4.1 Removing and installing coupling rod, Crafter”, page 28](#)

⇒ [“2.4.2 Removing and installing coupling rod, Crafter 4MOTION with Achleitner all-wheel drive”, page 29](#)

### 2.4.1 Removing and installing coupling rod, Crafter

#### Removing

- Unbolt coupling rod -A- from saddle plate and anti-roll bar.

#### Installing

Install in reverse order. Note the following points:

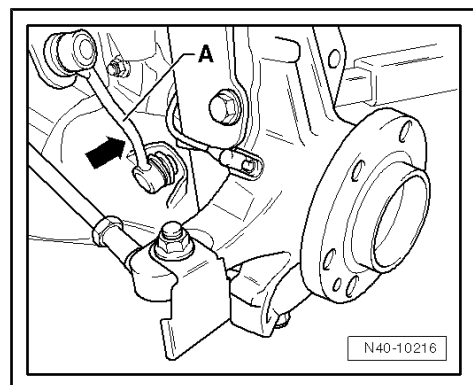
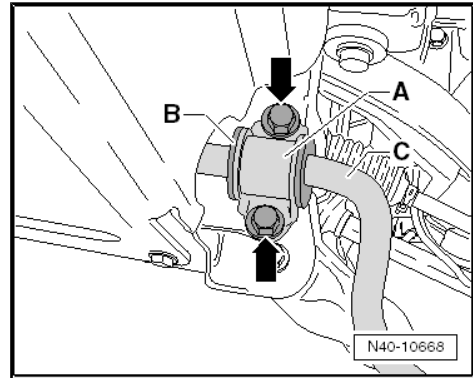


#### Note

- ◆ *When installing coupling rod, note correct installation position:*
- ◆ *Bend is located in lower area -arrow- and points backwards (towards rear axle).*

### Specified torques

- ◆ ⇒ [“4 Lower suspension link, swivel joint”, page 47](#)

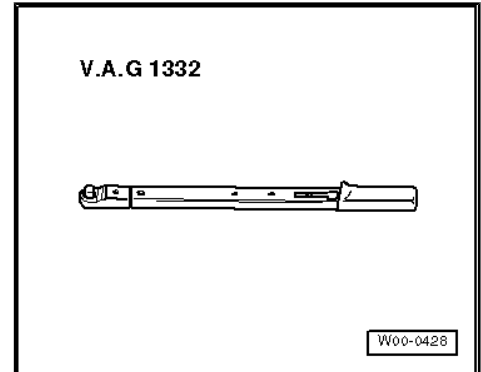




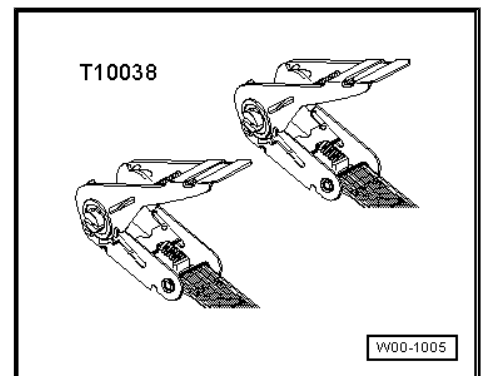
## 2.4.2 Removing and installing coupling rod, Crafter 4MOTION with Achleitner all- wheel drive

### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



- ◆ Tensioning strap - T10038-



### Removing



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2.

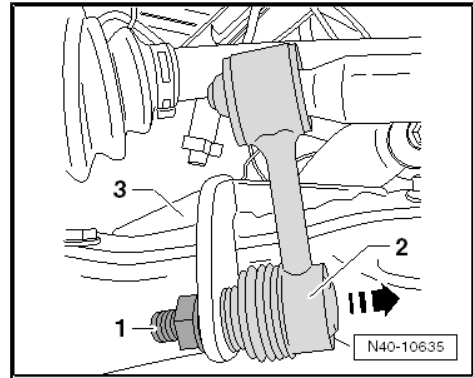


#### WARNING

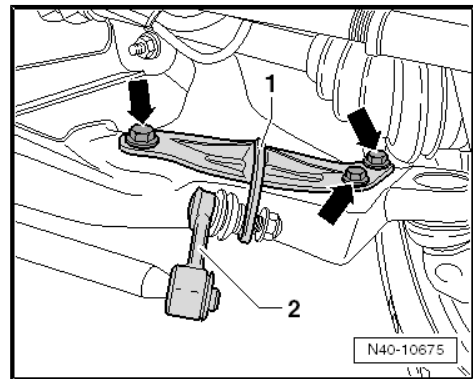
*If the vehicle is not strapped down, it may slip off the lifting platform.*



- Loosen coupling rod nut -2-. Counterhold on thread -1- using a Torx socket.



- Unscrew bolt -arrows- and remove coupling rod bracket -1-.



- Press coupling rod -2- off anti-roll bar.
- Rubber may remain on coupling rod. If so, lever off coupling rod rubber from anti-roll bar using a small screw driver.

### Installing

Install in reverse order. Note the following points:



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) => [page 2](#).*

- Press coupling rod rubber into coupling rod.
- Press coupling rod with rubber installed onto anti-roll bar.
- Continue installation in reverse order.

### Specified torques

- ◆ => ["4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive", page 49](#)

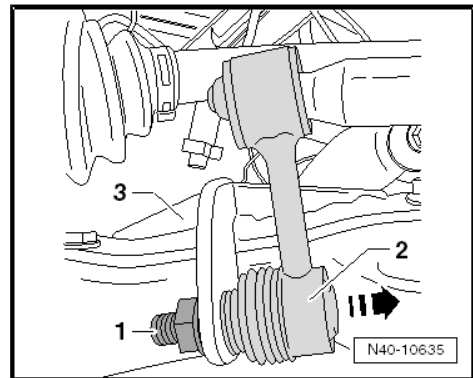
## 2.5 Removing and installing saddle plate

### Removing



#### WARNING

*Leaf spring is tensioned!*





**i** Note

*The saddle plate can only be removed when the vehicle is standing on its wheels.*

- Remove bolts -1-.
- Then remove bolts -2-.
- Remove saddle plate -3- together with lower spring bearing.

**Installing**

Install in reverse order. Note the following points:

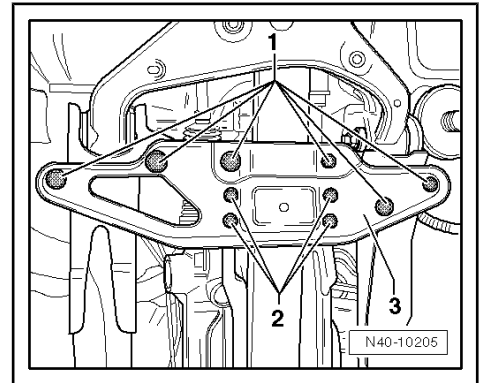
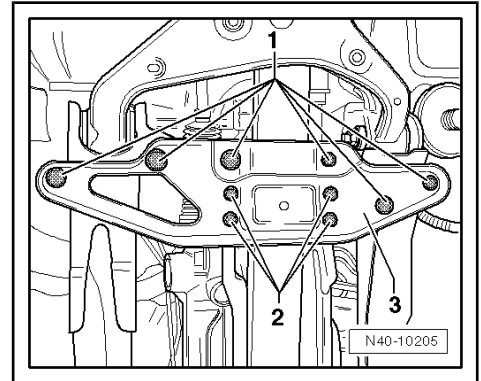
**i** Note

*The saddle plate can only be installed correctly when the vehicle is standing on its wheels.*

- Install saddle plate -3- together with lower spring bearing. Tighten bolts -1- and -2-.

**Specified torques**

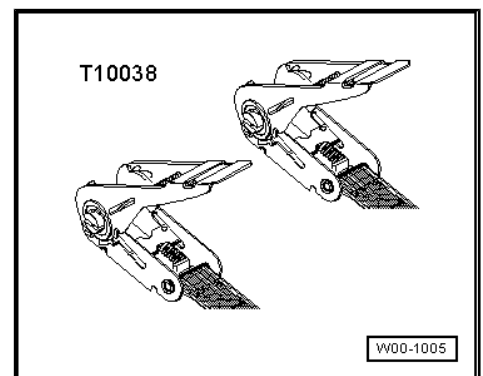
- ◆ => ["4.1 Assembly overview - lower suspension link, swivel joint - Crafter", page 47](#)



## 2.6 Removing and installing leaf spring

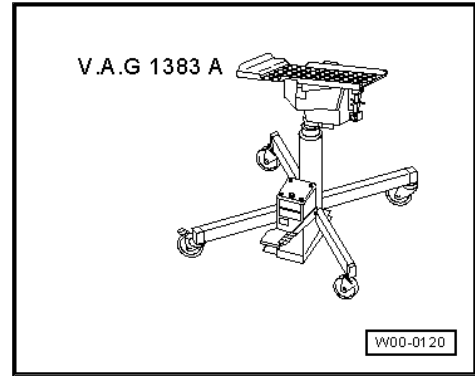
**Special tools and workshop equipment required**

- ◆ Tensioning strap - T10038-





◆ Engine and gearbox jack - V.A.G 1383 A-



## Removing



### Note

- ◆ *Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen state) ⇒ [page 2](#) .*
- ◆ *Before inserting leaf spring, coat spring bearing with lubricant, e.g. soft soap.*
- ◆ *Before installing leaf spring, check that upper spring bearings are attached to subframe.*
- Remove left and right saddle plates ⇒ [page 30](#) .
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheels.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Detach brake caliper and tie to body with wire ⇒ Brake systems; Rep. gr. 46 .



- Then attach left saddle plate -A- (with lower spring bearing installed) to subframe with 3 bolts M12 × 1.5, approx. 60 mm long -arrows 1-.

**i** Note

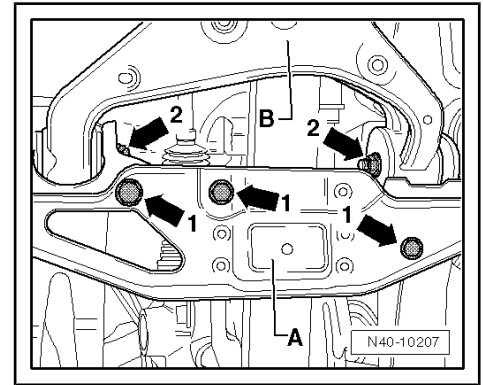
- ◆ Do not use original bolts again
- ◆ Do not tighten bolts!

- Tighten the 3 bolts until the saddle plate lies on the leaf spring.



**Caution**

- ◆ Always make sure that the bolts are screwed far enough into the thread to avoid damaging the thread.
- ◆ If the thread is damaged (e.g. torn out), the subframe must be renewed.

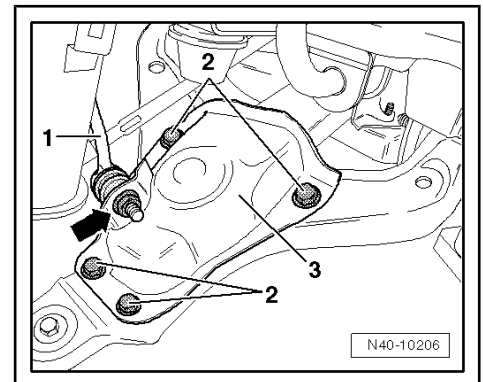


- Only loosen threaded connections -arrows 2- for suspension link -B- to subframe to relieve pre-tension from rubber bushes of suspension link.
- Remove left wheel bearing housing ⇒ [page 65](#) .
- Unscrew nut -arrow- from spring stop plate -3- for left and right coupling rod on anti-roll bar -1-.
- Unscrew left and right spring stop plate bolts -2- from suspension link.
- Remove spring stop plates -3-.

**i** Note

*Both spring stop plates must be removed because otherwise damage may occur when the leaf spring is refitted.*

- Remove left suspension link ⇒ [page 51](#) .





- Support leaf spring -1- with engine and gearbox jack - V.A.G 1383 A- .
- Remove left saddle plate again, by alternately unscrewing the 3 × M12 × 1.5 bolts of approx. 60 mm in length ⇒ [page 33](#) .
- Lower engine and gearbox jack - V.A.G 1383 A- together with leaf spring.
- Remove leaf spring to left from subframe.

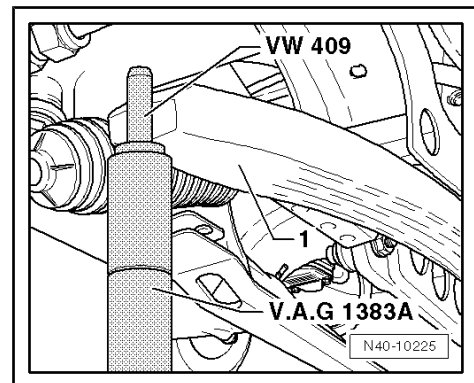
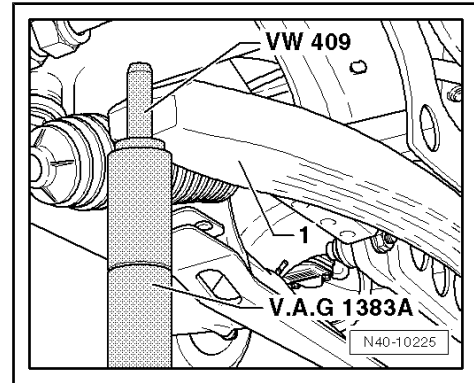
### Installing

Install in reverse order. Note the following points:



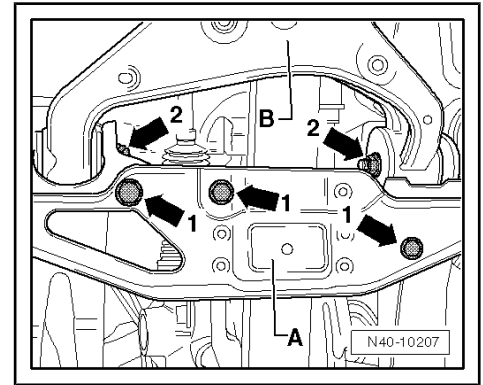
### Note

- ◆ *Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen state) ⇒ [page 2](#) .*
  - ◆ *Before inserting leaf spring, coat spring bearing with lubricant, e.g. soft soap.*
  - ◆ *Before installing leaf spring, check that upper spring bearings are attached to subframe.*
- 
- When installing, push leaf spring -1- onto right outer spring bearing to stop.
  - Insert press tool - V.A.G 1383 A- into engine and gearbox jack - VW 409- so that the spring is guided on insertion.
  - Position engine/gearbox jack - V.A.G 1383 A- under left side of leaf spring. Tension leaf spring by carefully raising the engine and gearbox jack - V.A.G 1383 A- .





- Then attach left saddle plate -A- (with installed lower spring bearing) to subframe with 3 × M12 × 1.5 bolts of approx. 60 mm long -arrows 1-.
- Tighten the 3 bolts until the saddle plate lies on the leaf spring.
- Install left suspension link -B- ⇒ [page 51](#) .
- Then install spring stop plates.
- Install left wheel bearing housing ⇒ [page 65](#) .
- Then remove left saddle plate again, by alternately unscrewing the 3 × M12 × 1.5 bolts of approx. 60 mm long ⇒ [page 33](#) .
- Fit left and right brake caliper with brake carrier ⇒ Brake systems; Rep. gr. 46 .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Install front wheels.
- Install left and right saddle plates ⇒ [page 30](#) .



#### Specified torques

- ◆ ⇒ [“4.1 Assembly overview - lower suspension link, swivel joint - Crafter”, page 47](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)



### 3 Suspension strut, upper suspension link

⇒ [“3.1 Assembly overview - suspension strut, upper suspension link”, page 36](#)

⇒ [“3.2 Assembly overview - suspension strut, upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive”, page 37](#)

⇒ [“3.3 Removing and installing suspension strut”, page 39](#)

⇒ [“3.4 Removing and installing suspension strut, Crafter 4MOTION with Achleitner four-wheel drive”, page 40](#)

⇒ [“3.5 Removing and installing upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive”, page 44](#)

#### 3.1 Assembly overview - suspension strut, upper suspension link

##### 1 - Nut

- Always renew after removing
- Removing and installing ⇒ [page 37](#) .
- 110 Nm

##### 2 - Upper spring plate

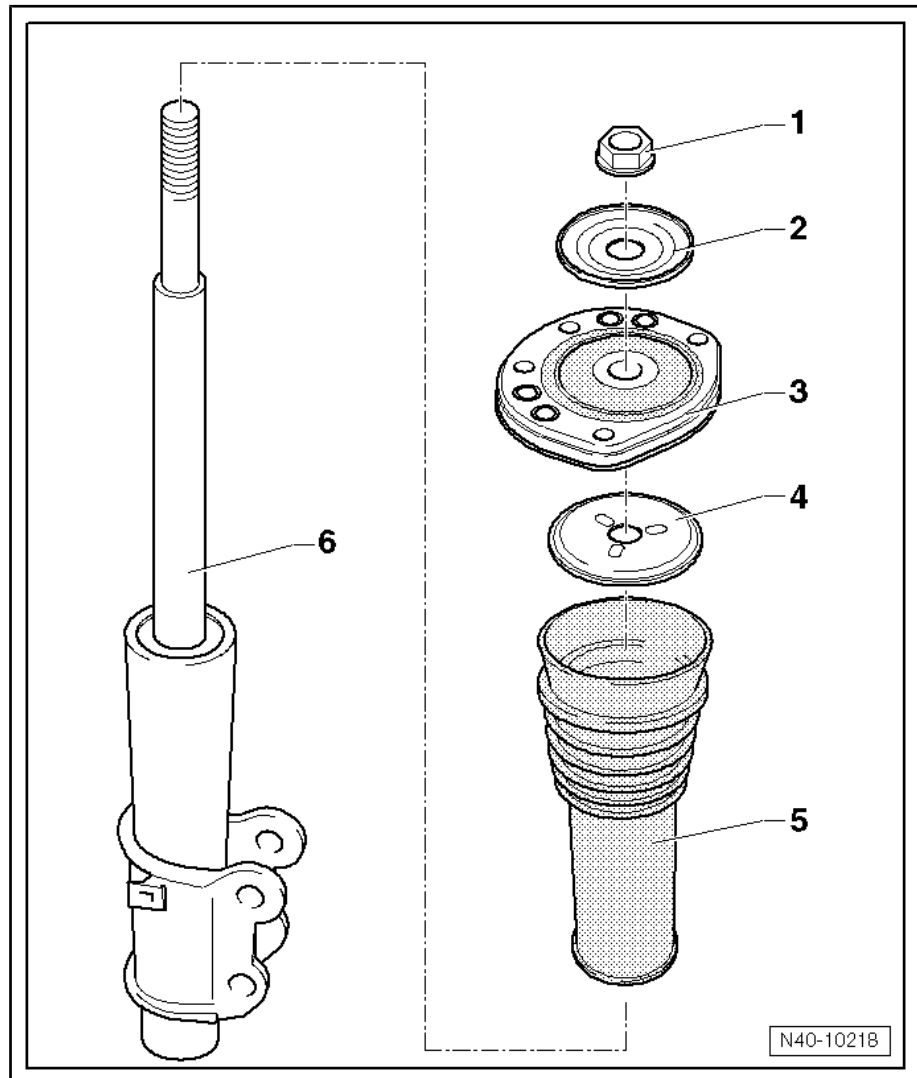
##### 3 - Bonded rubber bush

##### 4 - Lower spring plate

##### 5 - Protective sleeve

##### 6 - Shock absorber

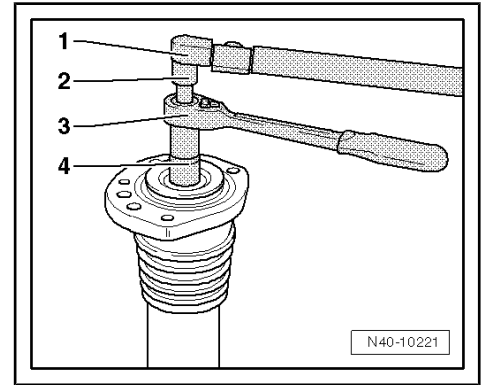
- Can be renewed separately
- Removing and installing ⇒ [page 39](#)





### Unbolting and bolting nut for shock absorber piston rod.

- 1 - Torque wrench
- 2 - Tool insert - T10001/8-
- 3 - Ratchet handle - T10001/11-
- 4 - Tool insert - T50013-



### 3.2 Assembly overview - suspension strut, upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive



#### WARNING

*It is not permitted to carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.*

*Always renew self-locking nuts.*

*Always renew corroded nuts and bolts.*



**1 - Nut**

- Always renew after removing
- Projection 18 mm

**2 - Washer**

**3 - Bump stop**

**4 - Bolt**

- Always renew after removing
- 28 Nm +60°

**5 - Washer**

**6 - Spring plate**

**7 - Sleeve**

**8 - Suspension strut mounting**

**9 - Shock absorber mounting**

**10 - Nut**

- Always renew after removing
- 30 Nm

**11 - Bump stop**

- Allocation ⇒ Electronic Parts Catalogue "ETKA".

**12 - Nut**

- Always renew after removing

**13 - Bolt**

- Always renew after removing
- 85 Nm

**14 - Washer**

**15 - Spring seat**

**16 - Coil spring**

- Surface of spring coil must not be damaged.
- Allocation ⇒ Electronic Parts Catalogue "ETKA"
- Removing and installing ⇒ [page 40](#)

**17 - Spring plate**

**18 - Gas-filled shock absorber**

- Removing and installing ⇒ [page 40](#)

**19 - Bolt**

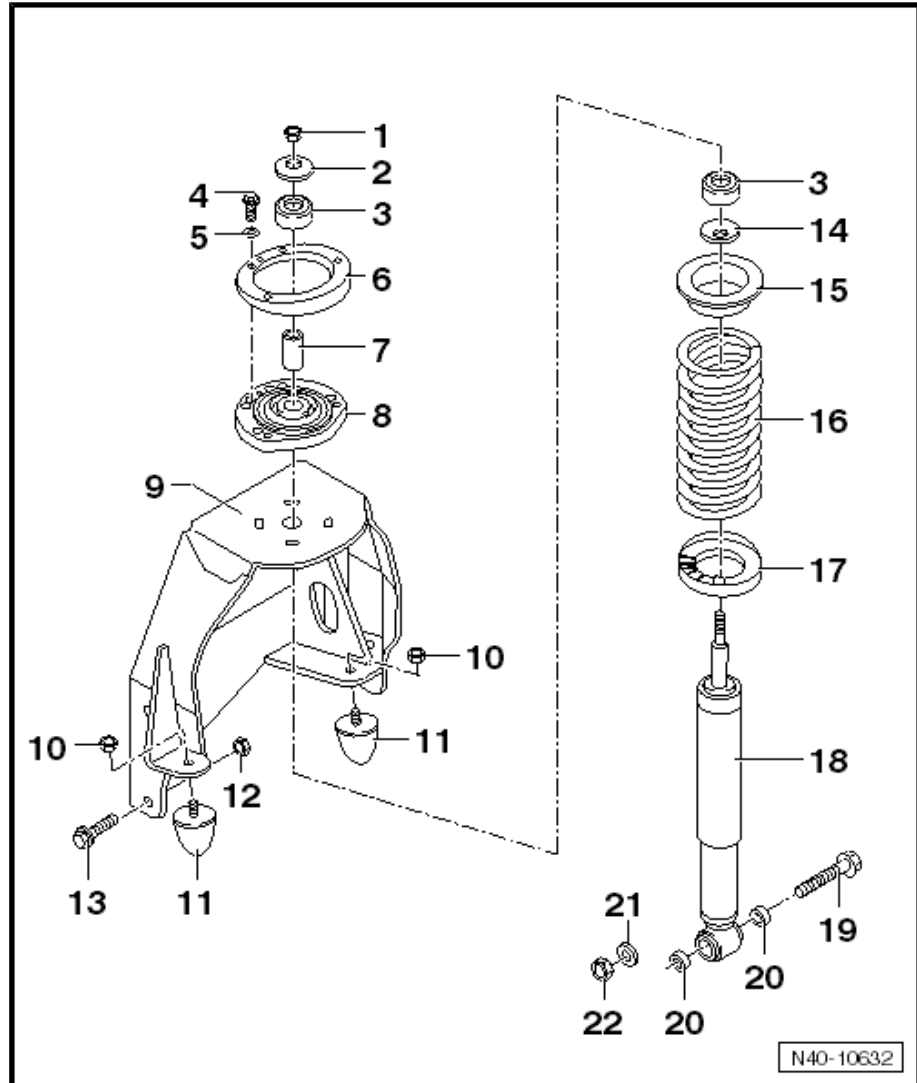
- Always renew after removing
- When loosening and tightening, counterhold at nut ⇒ [Item 22 \(page 38\)](#)
- 116 Nm

**20 - Shim**

**21 - Washer**

**22 - Nut**

- Always renew after removing

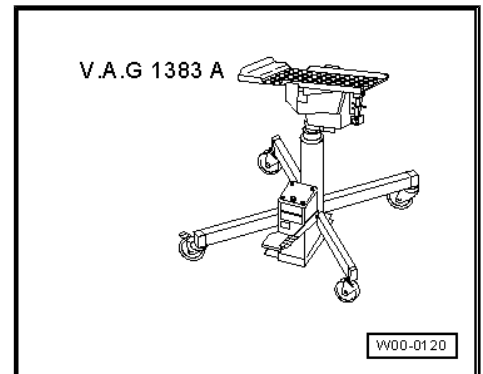




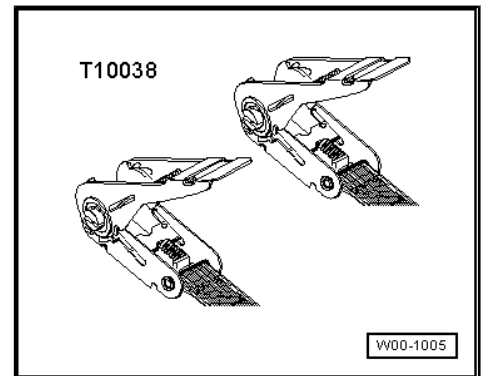
### 3.3 Removing and installing suspension strut

#### Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-




- ◆ Tensioning strap - T10038-



#### Removing

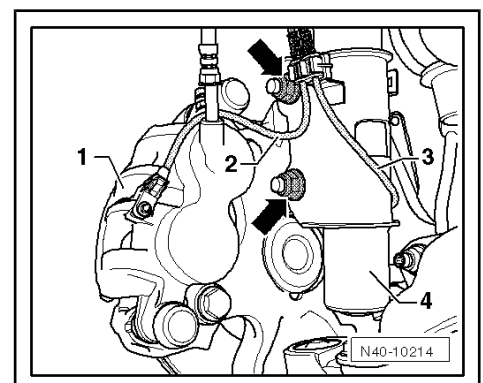
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.
- Remove front wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners .
- Release electrical wiring from retainer on shock absorber -4- for brake wear indicator -2- and speed sensor -3-.
- Remove brake caliper -1- and secure it to body ⇒ Repairing front brake; Rep. gr. 46 ; Removing and installing brake caliper, Brembo .
- Position engine and gearbox jack - V.A.G 1383 A- beneath suspension link on wheel bearing housing and exert slight counter-pressure.
- Mark installation position of wheel bearing housing on shock absorber, e.g. with a felt-tip pen.
- If fitted, remove shock absorber upper cover in cab.





- Remove securing bolts -arrows- for shock absorber -A-.
- Lower engine and gearbox jack - V.A.G 1383 A- slightly and remove shock absorber from front wheel housing.

### Installing

Install in reverse order. Note the following points:



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) => [page 2](#).*

- Install front wheel housing liner => General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners .
- Install front wheel.

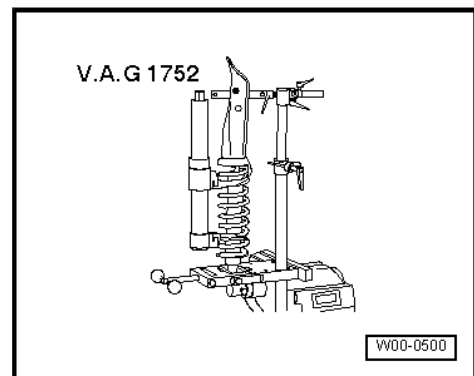
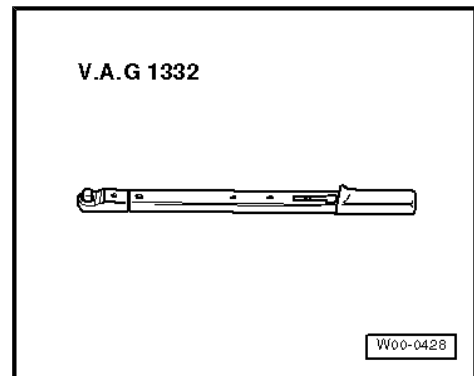
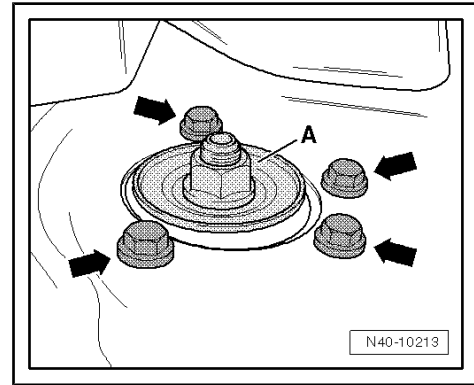
### Specified torques

- ◆ => ["3.1 Assembly overview - suspension strut, upper suspension link", page 36](#)
- ◆ => ["5.1 Assembly overview - wheel bearing assembly", page 61](#)
- ◆ => ["1.1 Specified torque for wheel bolts", page 135](#)

## 3.4 Removing and installing suspension strut, Crafter 4MOTION with Achleitner four-wheel drive

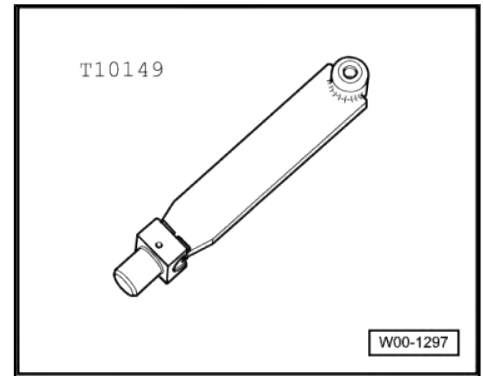
### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-
- ◆ Strut holder - V.A.G 1752/1- with spring retainer - V.A.G 1752/7-

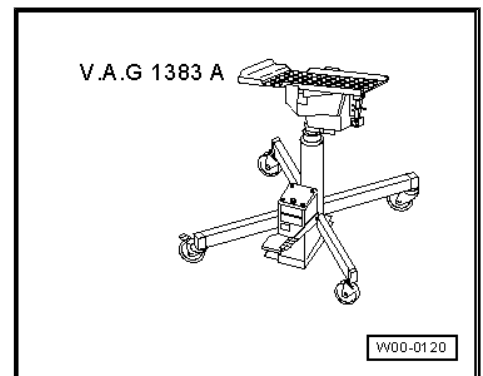




◆ Support - T10149-



◆ Engine and gearbox jack - V.A.G 1383 A-



Removing

 Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Remove left and right floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Cab floor covering .



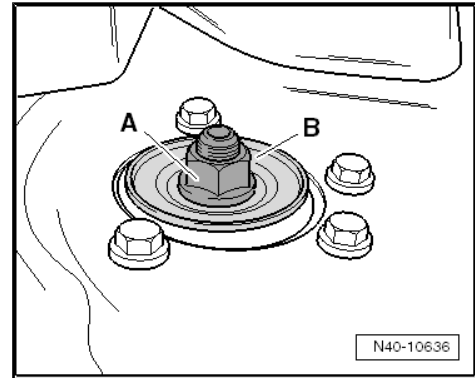
- Unscrew nut -A- and remove washer -B-.
- Raise vehicle and strap it down => Maintenance ; Booklet 10.2 .



**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

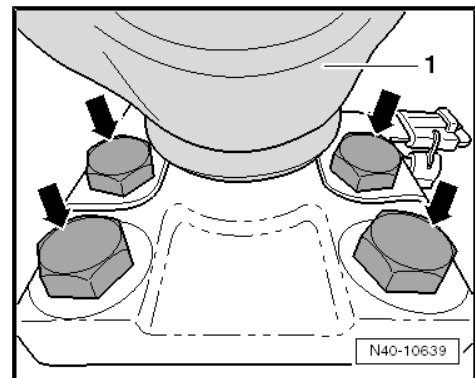
- Remove front wheel.
- Remove rear stop buffer => [Item 11 \(page 38\)](#) .
- Install support - T10149- on brake disc or on wheel flange.
- Raise support - T10149- by approx. 10 mm using engine and gearbox jack - V.A.G 1383 A- .



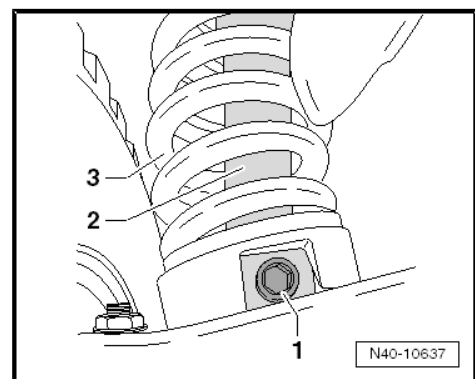
**Note**

*Raising the support releases the tensile force from the suspension strut and damage to the thread is avoided.*

- Compress coil spring using strut holder - V.A.G 1752/1- .
- Loosen 2 inner bolts -arrows- for wiring harness retainer from upper suspension link -1- and lay brackets aside.




- Loosen bolt -1-.
- Loosen engine and gearbox jack - V.A.G 1383 A- and lower it.
- Pull gas-filled shock absorber -2- downwards.
- Remove coil spring -3- upwards.





- Remove gas-filled shock absorber -2- upwards.



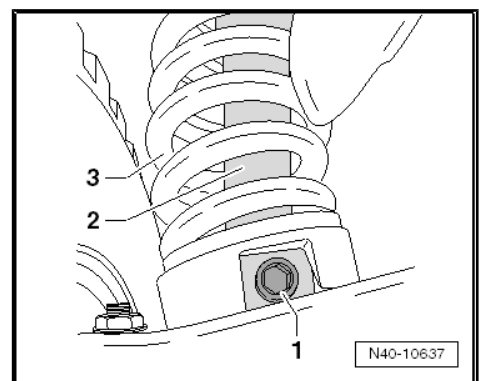
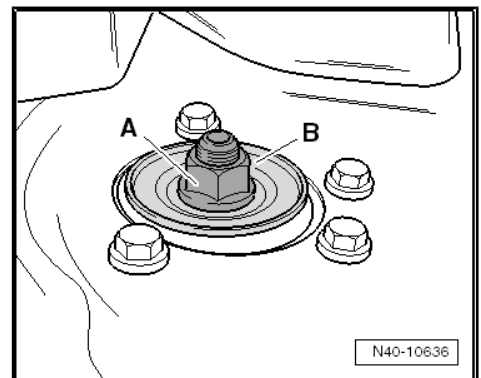
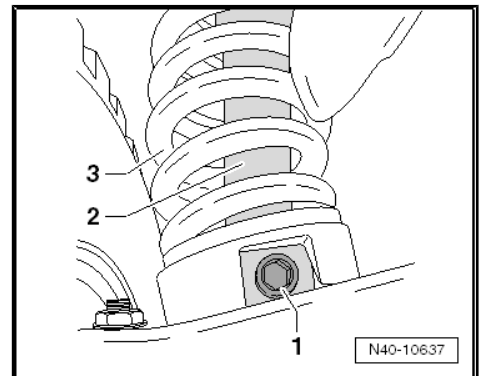
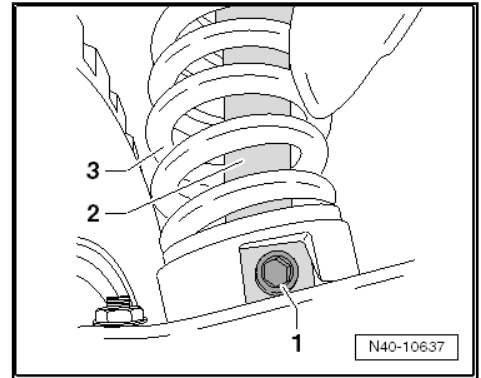
**WARNING**

*Always observe the relevant environmental regulations for disposal of gas-filled shock absorber!*

**Installing**

Install in reverse order. Note the following points:

- Insert gas-filled shock absorber -2-.
- Fit coil spring, washer and stop buffer onto gas-filled shock absorber.
- Fit washer -B- and tighten nut -2- only hand-tight.
- Raise support - T10149- using engine and gearbox jack - V.A.G 1383 A- .
- Start bolt -1- and tighten by hand.





- Tighten the two inner bolts -arrows- of upper swivel joint -1- first hand-tight and then to specified torque.
- Release tension from coil spring using strut holder - V.A.G 1752/1- .



#### Note

- ◆ *Ensure coil spring is seated correctly.*
- ◆ *Always renew self-locking nuts and bolts.*
- Install front wheel.
- Lower vehicle »onto its wheels«.
- Tighten upper shock absorber nut ⇒ [Item 1 \(page 38\)](#) .
- Install left and right floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Cab floor covering .

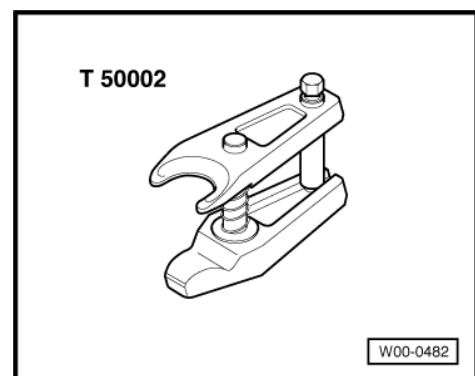
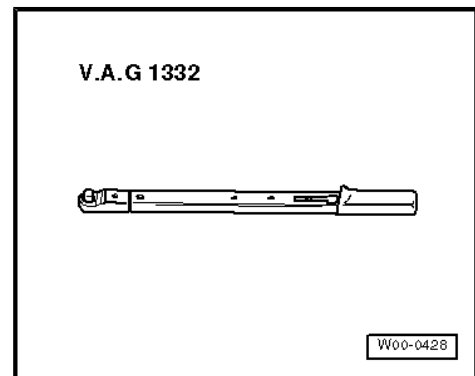
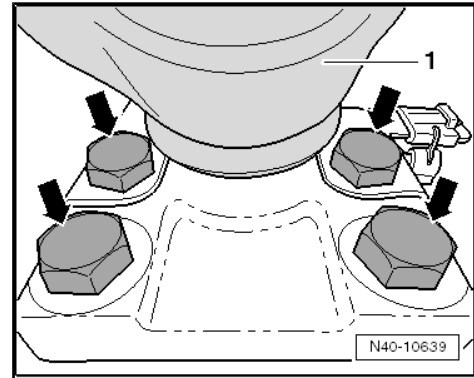
#### Specified torques

- ◆ ⇒ [“3.2 Assembly overview - suspension strut, upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive”, page 37](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

### 3.5 Removing and installing upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive

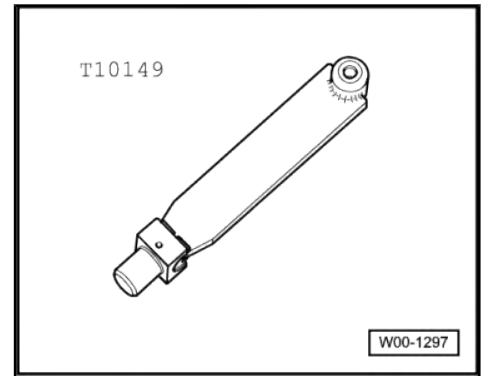
#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-
- ◆ Ball joint puller - T50002-

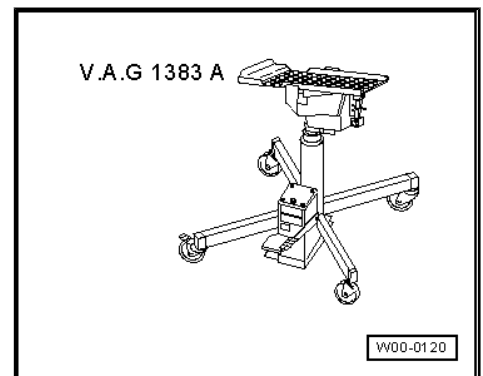




◆ Support - T10149-



◆ Engine and gearbox jack - V.A.G 1383 A-



### Removing

 Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



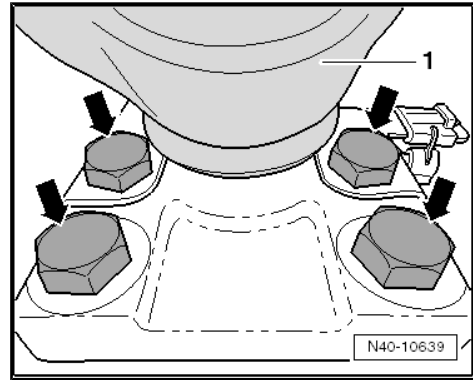
**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.
- If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Remove gas-filled shock absorber with coil spring ⇒ [page 40](#) .



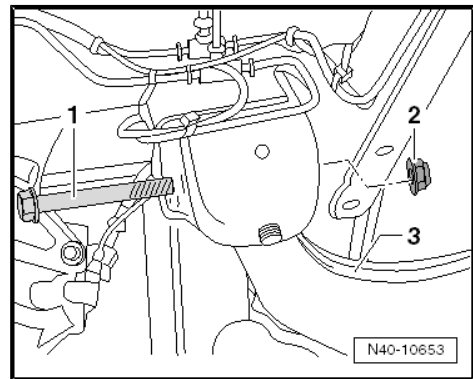
- Loosen the two front bolts -arrows- of upper swivel joint -1-.



- Unscrew both nuts -2- from bolts -1- (front and rear), pull out both bolts -1- and remove upper suspension link -3-.
- Leave support - T10149- and engine and gearbox jack - V.A.G 1383 A- installed on vehicle to support the weight.

#### Suspension link must be renewed:

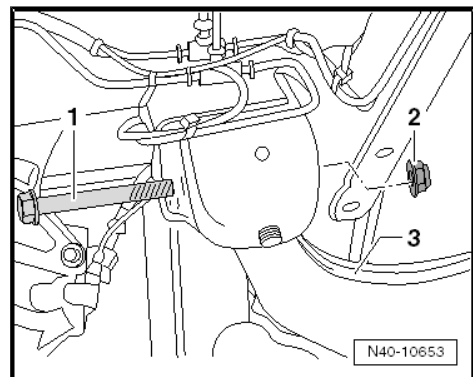
- Loosen nut => [Item 12 \(page 49\)](#) .
- Remove swivel joint from adapter plate using ball joint puller - T50002- .



#### Installing

Install in reverse order. Note the following points:

- Coat suspension link rubber bushes with assembly oil.
- Press upper suspension link -3- into its mountings and insert bolt -1-. Tighten nut -2- first hand-tight and then to specified torque.



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) => [page 2](#) .*

- Install gas-filled shock absorber with coil spring => [page 40](#) .
- Install front wheel.

#### Specified torques

- ◆ => [“4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive”, page 49](#)
- ◆ => [“3.2 Assembly overview - suspension strut, upper suspension link, Crafter 4MOTION with Achleitner four-wheel drive”, page 37](#)
- ◆ => [“1.1 Specified torque for wheel bolts”, page 135](#)



## 4 Lower suspension link, swivel joint

⇒ [“4.1 Assembly overview - lower suspension link, swivel joint - Crafter”, page 47](#)

⇒ [“4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive”, page 49](#)

⇒ [“4.3 Removing and installing lower suspension link”, page 51](#)

⇒ [“4.4 Removing and installing lower suspension link, Crafter 4MOTION with Achleitner four-wheel drive”, page 53](#)

⇒ [“4.5 Removing and installing bonded rubber bushes for lower suspension link”, page 57](#)

### 4.1 Assembly overview - lower suspension link, swivel joint - Crafter

#### 1 - Subframe

- ❑ Removing and installing ⇒ [page 12](#) .

#### 2 - Nut

- ❑ Always renew after removing
- ❑ 20 Nm for 8.8
- ❑ 25 Nm for 10.9

#### 3 - Bolt

- ❑ Always renew after removing
- ❑ When loosening and tightening, counterhold at nut ⇒ [Item 9 \(page 48\)](#)

#### 4 - Bolt

- ❑ Always renew after removing
- ❑ Longer bolt, points to centre of vehicle
- ❑ Do not interchange with bolt ⇒ [Item 5 \(page 47\)](#)
- ❑ 105 Nm +90°

#### 5 - Bolt

- ❑ Always renew after removing
- ❑ Shorter bolt, points outwards
- ❑ Do not interchange with bolt ⇒ [Item 4 \(page 47\)](#)
- ❑ 60 Nm

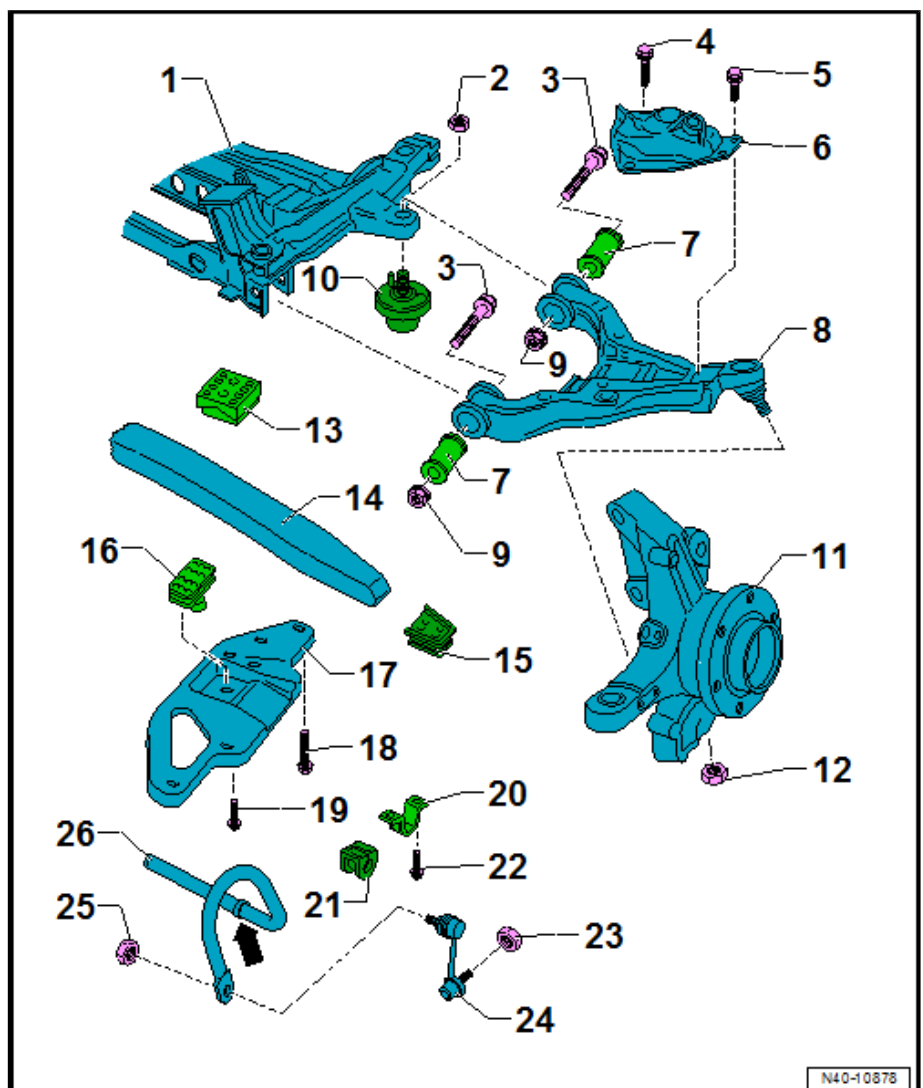
#### 6 - Saddle plate

#### 7 - Bonded rubber bush

- ❑ Renewing ⇒ [page 57](#) .

#### 8 - Suspension link

- ❑ Removing and installing ⇒ [page 51](#) .





#### 9 - Nut

- Always renew after removing
- 170 Nm +90°

#### 10 - Bump stop

#### 11 - Wheel bearing housing

- Removing and installing ⇒ [page 65](#) .

#### 12 - Nut

- Always renew after removing
- M20 x 1.5
- 170 Nm

#### 13 - Upper spring bearing

- Insert into subframe

#### 14 - Leaf spring

- Removing and installing ⇒ [page 31](#)

#### 15 - Outer spring bearing

- To renew, remove saddle plate and spring stop plate and release securing bolts for suspension link.

#### 16 - Lower spring bearing

- Insert into saddle plate

#### 17 - Saddle plate



#### Note

*Can only be removed and installed  
when vehicle is standing on its  
wheels.*

- Removing and installing ⇒ [page 30](#)

#### 18 - Bolt, M12

- Always renew after removing
- Qty. 3
- 105 Nm +90°

#### 19 - Bolt, M8

- Qty. 7
- 25 Nm

#### 20 - Clamp

#### 21 - Anti-roll bar bush

- Position on mark -arrow- on anti-roll bar ⇒ [Item 26 \(page 48\)](#)

#### 22 - Bolt

- 58 Nm

#### 23 - Nut

- 105 Nm

#### 24 - Coupling rod

- Removing and installing ⇒ [page 26](#) .

#### 25 - Nut

- 105 Nm

#### 26 - Anti-roll bar

- Removing and installing ⇒ [page 26](#)



## 4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive



### WARNING

*It is not permitted to carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.*

*Always renew self-locking nuts.*

*Always renew corroded nuts and bolts.*

### 1 - Subframe

- Removing and installing  
⇒ [page 16](#).



### Note

*The identification plate for the final drive is located on the top of the subframe.*

### 2 - Upper suspension link

- Removing and installing  
⇒ [page 44](#)

### 3 - Nut

- Always renew after removing
- 125 Nm

### 4 - Bolt

- Always renew after removing
- When loosening and tightening, counterhold at nut  
⇒ [Item 3 \(page 49\)](#)

### 5 - Nut

- Always renew after removing
- 140 Nm

### 6 - Swivel joint

### 7 - Clip

### 8 - Retainer

- For ABS line.

### 9 - Bracket

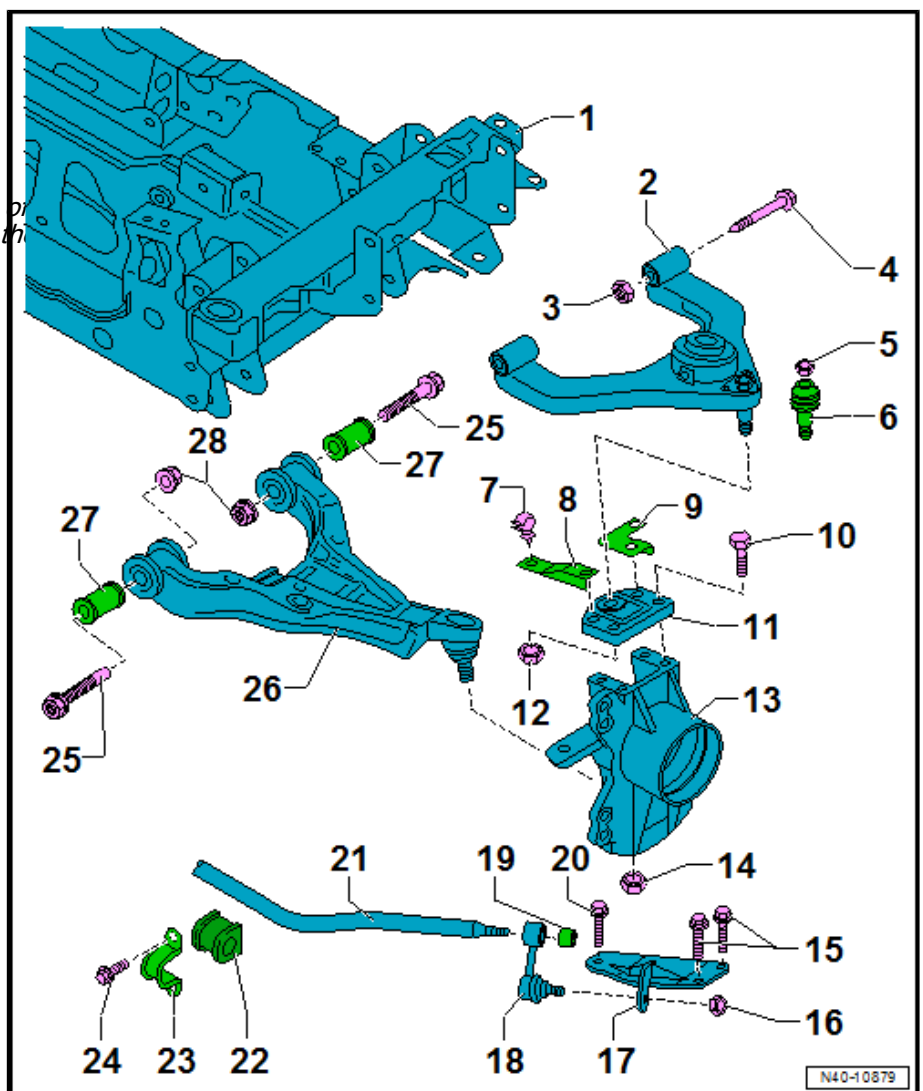
### 10 - Bolt

- Always renew after removing
- 182 Nm

### 11 - Adapter

### 12 - Nut

- Always renew after removing





- 170 Nm

### 13 - Wheel bearing housing

- Tapered hole must be free of oil and grease.
- If necessary, clean with a dry cloth but do not use cleaning solutions.
- Removing and installing ⇒ [page 67](#)



#### Note

- ◆ *The wheel bearing housing provides two holes for securing front right speed sensor - G45- or front left speed sensor - G47- . Turning the front right speed sensor - G45- or front left speed sensor - G47- during installation may result in malfunction. Mark installation position prior to removal.*
- ◆ *Before inserting front right speed sensor - G45- or front left speed sensor - G47- , clean inner surfaces of hole and coat them with lubricating paste ⇒ Electronic Parts Catalogue (ETKA) .*

### 14 - Nut

- Always renew after removing
- M20 x 1.5
- 170 Nm

### 15 - Bolt

- Always renew after removing
- 60 Nm

### 16 - Nut

- Always renew after removing
- 105 Nm

### 17 - Bracket

- For coupling rod

### 18 - Coupling rod

- Removing and installing ⇒ [page 28](#)

### 19 - Rubber mounting

### 20 - Bolt

- Renew after removing
- 105 Nm +90°

### 21 - Anti-roll bar

- Removing and installing ⇒ [page 26](#) .

### 22 - Rubber mounting

### 23 - Clamp

### 24 - Bolt

- Always renew after removing
- 75 Nm

### 25 - Bolt

- Always renew after removing



- When loosening and tightening, counterhold at nut ⇒ [Item 28 \(page 51\)](#)

#### 26 - Lower suspension link

- Removing and installing ⇒ [page 53](#)

#### 27 - Bonded rubber bush

- Renewing ⇒ [page 57](#) .

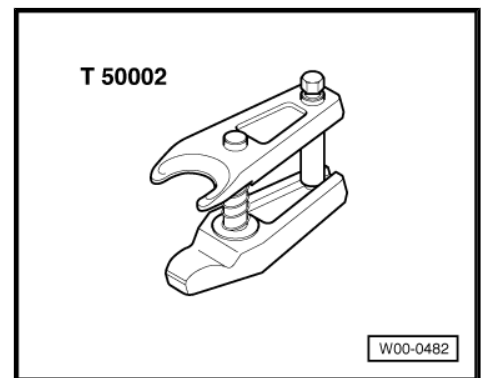
#### 28 - Nut

- Always renew after removing
- 200 Nm

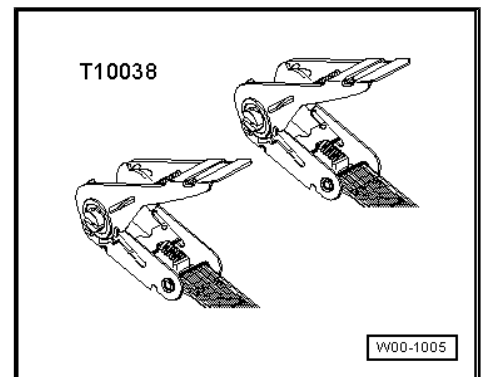
### 4.3 Removing and installing lower suspension link

#### Special tools and workshop equipment required

- ◆ Ball joint puller - T50002-



- ◆ Tensioning strap - T10038-



#### Removing



*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#) .*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .

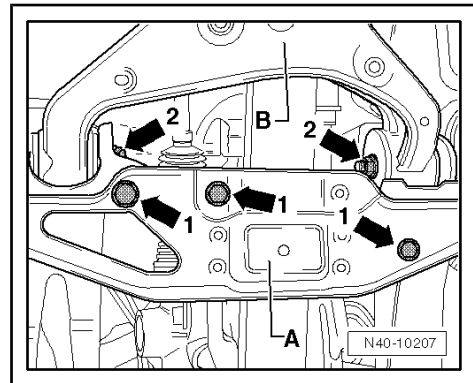


#### WARNING

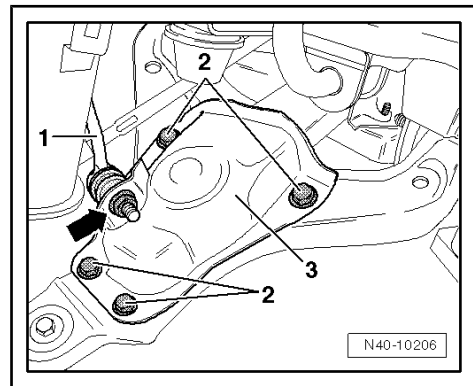
*If the vehicle is not strapped down, it may slip off the lifting platform.*



- Remove front wheel.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Only loosen threaded connections -arrows 2- for suspension link -B- to subframe to relieve pre-tension from rubber bushes of suspension link.
- Remove wheel bearing housing => [page 65](#) .



- Unscrew nut -arrow- from spring stop plate -3- for coupling rod on anti-roll bar -1-.
- Unscrew spring stop plate bolts -2- from suspension link.
- Remove spring stop plate -3-.





- Pull out bolts -arrows 2- and remove suspension link -B- from subframe.

**i** Note

*The saddle plate -A- remains installed during the removal and installation of the suspension link.*

**Installing**

Install in reverse order. Note the following points:

**i** Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Install wheel bearing housing ⇒ [page 65](#).
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Install front wheel.

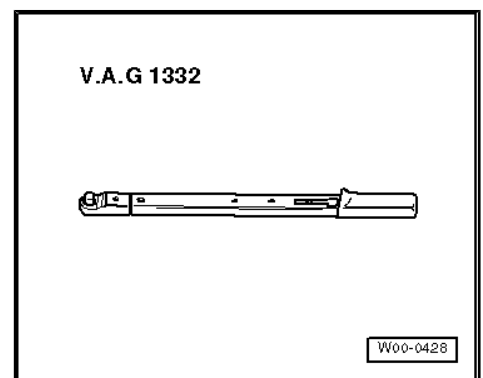
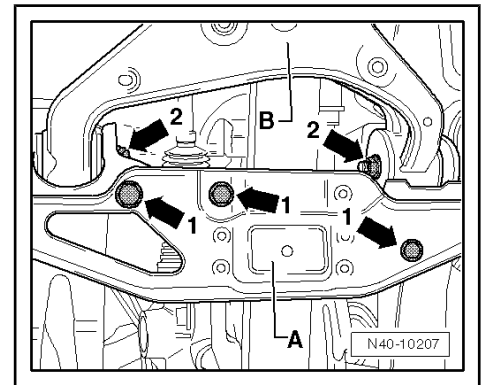
**Specified torques**

- ◆ ⇒ [“4.1 Assembly overview - lower suspension link, swivel joint - Crafter”, page 47](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

#### 4.4 Removing and installing lower suspension link, Crafter 4MOTION with Achleitner four-wheel drive

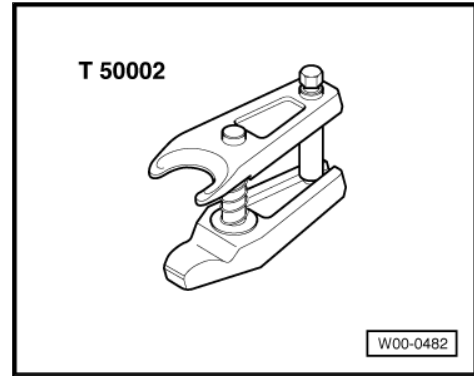
**Special tools and workshop equipment required**

- ◆ Torque wrench - V.A.G 1332-

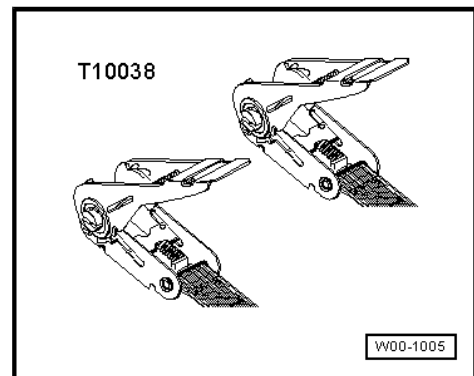




- ◆ Ball joint puller - T50002-



- ◆ Tensioning strap - T10038-



- ◆ Claw spanner - T50034-

#### Removing



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.



#### Note

*The wheel bearing housing provides two holes for securing front right speed sensor - G45- or front left speed sensor - G47- . Turning the front right speed sensor - G45- or front left speed sensor - G47- during installation may result in malfunction. Mark installation position prior to removal.*

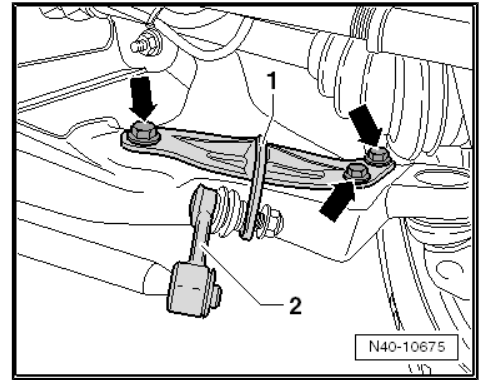
- Remove front right speed sensor - G45- or front left speed sensor - G47- ⇒ Brake system; Rep. gr. 45 ; Electrical and electronic components and their locations ABS/TCS/ESP .



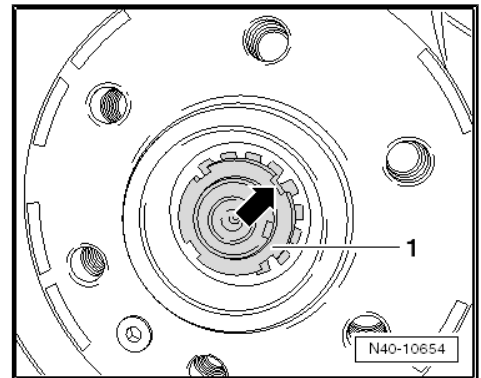
- Unscrew bolt -arrows- and remove coupling rod bracket -1-.
- Loosen track rod ball joint ⇒ [page 189](#) .
- Remove any dirt from hub cap.
- Lever off hub cap using a commercially available chisel.

**i** Note

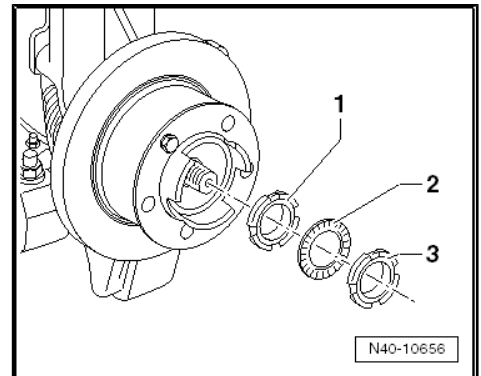
- ◆ *The hub cap will be damaged during removal and must be renewed.*
- ◆ *The hub cap is bonded in which makes removal difficult.*



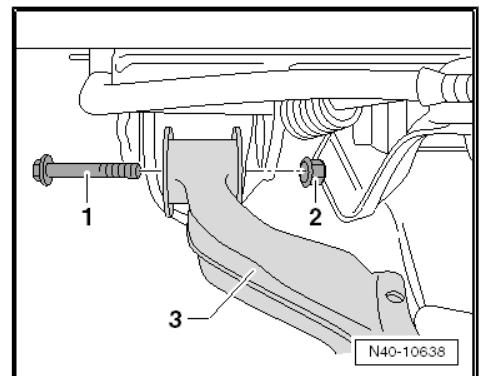
- Release outer slotted nut -1- by bending locking plate -arrow- back.



- Unscrew outer slotted nut -3-, remove locking plate -2- and unscrew slotted nut -1-.

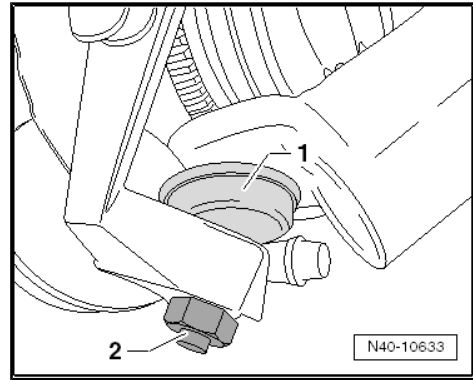


- Unscrew both nuts -2- from bolts -1- (front and rear), pull out both bolts -1- and pull lower suspension link -3- out of sub-frame.
- Pull wheel bearing housing towards outside and pull outer constant velocity joint out of wheel bearing.
- Tie up constant velocity joint on side.





- Slightly loosen nut -2- of swivel joint -1-.



- Fit ball joint puller - T50002- and press swivel joint out of wheel bearing housing.
- Remove lower suspension link.

### Installing

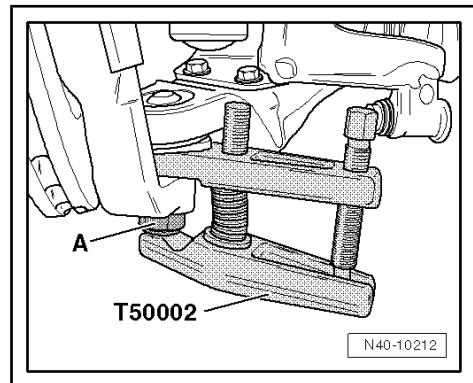
Install in reverse order. Note the following points:



### Note

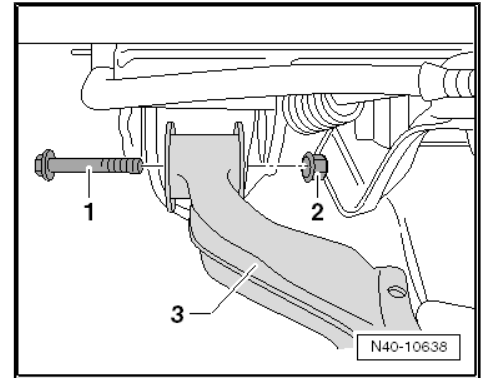
*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) => [page 2](#).*

- Coat suspension link rubber bushes with assembly oil.
- Fit lower suspension link, press swivel joint into wheel bearing housing and screw on nut by hand.
- Insert outer constant velocity joint into wheel bearing.
- Press lower suspension link -3- into its mountings and insert bolt -1-.





- Tighten nut -2- first hand-tight and then to specified torque.
- Tighten swivel joint nut.
- Install coupling rod bracket to suspension link.
- Install track rod ball joint ⇒ [page 189](#) .
- Install front right speed sensor - G45- or front left speed sensor - G47- ⇒ Brake system; Rep. gr. 45 ; Electrical and electronic components and their locations ABS/TCS/ESP .
- Install slotted nuts and locking plate.
- Setting wheel bearing play ⇒ [page 74](#) .
- Install new hub cap.
- Install front wheel.



#### Specified torques

- ◆ ⇒ [“4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive”](#), page 49
- ◆ ⇒ [“5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive”](#), page 63
- ◆ ⇒ [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”](#), page 170
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”](#), page 135

## 4.5 Removing and installing bonded rubber bushes for lower suspension link

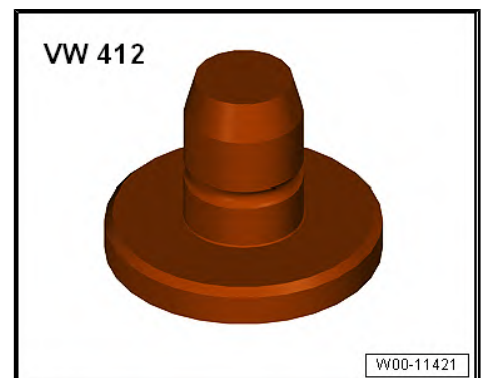


#### Note

*The work procedure applies for Crafter and Crafter 4MOTION models with Achleitner all-wheel drive!*

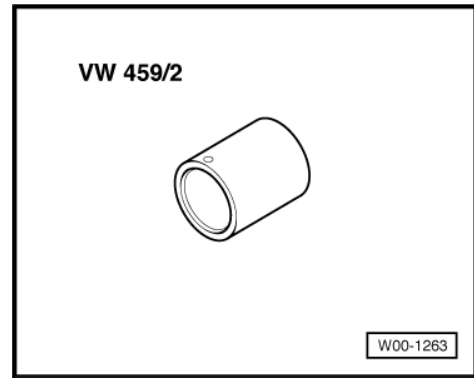
#### Special tools and workshop equipment required

- ◆ Press tool - VW 412-

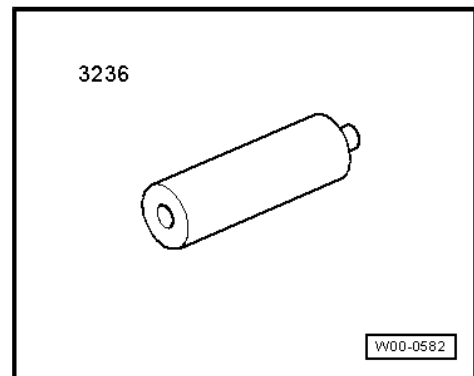




- ◆ Removing and installing tool - VW459/2-



- ◆ Thrust piece - 3236-



- ◆ Thrust plate - VW401-



### Removing

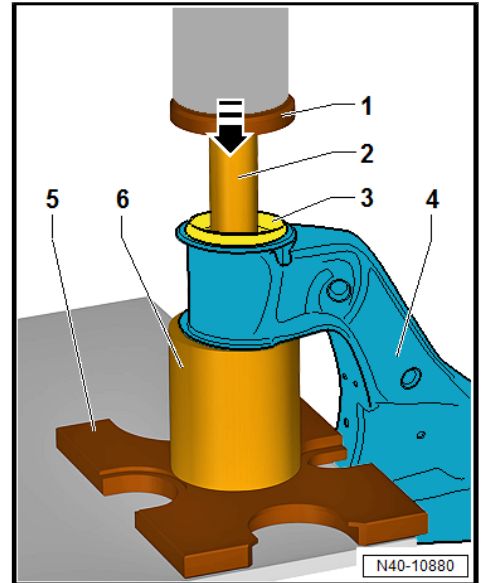
- Remove lower suspension link.
- ◆ Crafter ⇒ [page 51](#)
- ◆ Crafter 4MOTION with Achleitner all-wheel drive ⇒ [page 53](#)



### Pressing out bonded rubber bush

– Press out bonded rubber bush as illustrated.

- 1 - Press tool - VW412-
- 2 - Thrust piece - 3236-
- 3 - Bonded rubber bush
- 4 - Suspension link
- 5 - Removing and installing tool - VW459/2-
- 6 - Thrust plate - VW401-

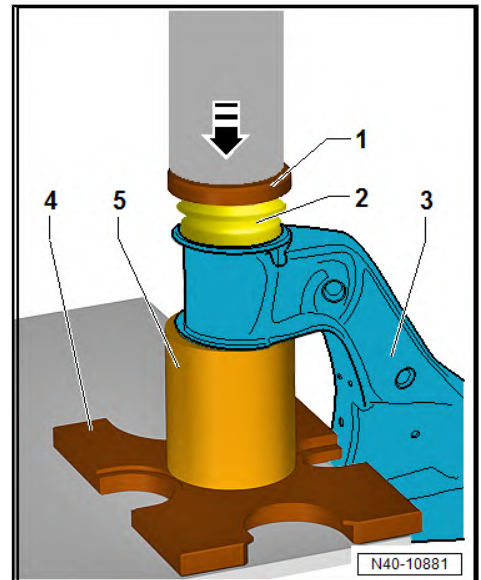


### Pressing in bonded rubber bush

– Apply tyre assembly paste to bonded rubber bush.

– Align bonded rubber bush centrally to suspension link and press in as shown in diagram.

- 1 - Press tool - VW412-
- 2 - Bonded rubber bush
- 3 - Suspension link
- 4 - Removing and installing tool - VW459/2-
- 5 - Thrust plate - VW401-

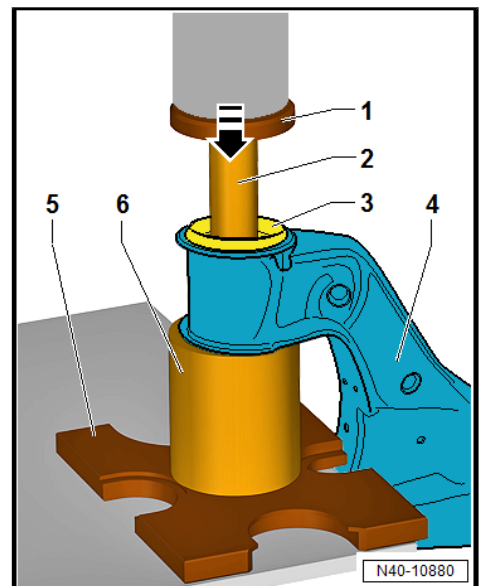


– Carefully press in bonded rubber bush until press tool - VW412- comes into contact with shoulder of bonded rubber bush.

– Push in bonded rubber bush further using thrust piece - 3236-2-, as shown in diagram, in order to force out shoulder on rubber bush out of suspension link eye on thrust piece side.

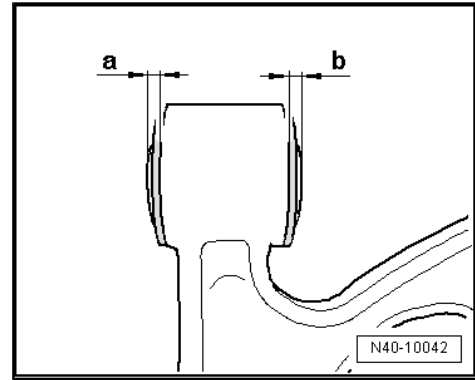
**i** Note

*Bonded rubber bush is not yet in its installation position and must be pressed back slightly.*





- Press bush back until it projects evenly on both sides -a- and -b-.





## 5 Wheel bearing assembly

- ⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)
- ⇒ [“5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive”, page 63](#)
- ⇒ [“5.3 Removing and installing wheel bearing housing”, page 65](#)
- ⇒ [“5.4 Removing and installing wheel bearing housing, Crafter 4MOTION with Achleitner four-wheel drive”, page 67](#)
- ⇒ [“5.5 Removing and installing wheel hub, Crafter 4MOTION with Achleitner four-wheel drive”, page 69](#)
- ⇒ [“5.6 Checking wheel bearing play, Crafter 4MOTION with Achleitner four-wheel drive”, page 72](#)
- ⇒ [“5.7 Adjusting wheel bearing play, Crafter 4MOTION with Achleitner four-wheel drive”, page 74](#)
- ⇒ [“5.8 Removing and installing outer tapered roller bearing, Crafter 4MOTION with Achleitner four-wheel drive”, page 75](#)
- ⇒ [“5.9 Removing and installing inner tapered roller bearing, Crafter 4MOTION with Achleitner four-wheel drive”, page 78](#)

### 5.1 Assembly overview - wheel bearing assembly



**1 - Shock absorber**

- Can be renewed separately
- Dismantling and assembling => [page 36](#) .
- Removing and installing => [page 39](#)

**2 - Bolt**

- => Brake system; Rep. gr. 46

**3 - Brake caliper**

**4 - Wheel bearing housing**

- Removing and installing => [page 65](#) .

**5 - Brake disc**

**6 - Bolt**

- => Brake system; Rep. gr. 46

**7 - Wheel bolt**

- Only for vehicles with twin wheels on rear axle.
- Removing and installing => [page 135](#)

**8 - Wheel flange**

- Only for vehicles with twin wheels on rear axle.
- Removing and installing => [page 135](#)

**9 - Bolt**

- Always renew after removing
- 170 Nm

**10 - Bolt**

- For securing heat shield to wheel bearing housing.
- 10 Nm

**11 - Heat shield**

- For track rod ball joint

**12 - Track rod ball joint**

**13 - Nut**

- Always renew after removing
- M14 x 1.5
- 50 Nm +60°

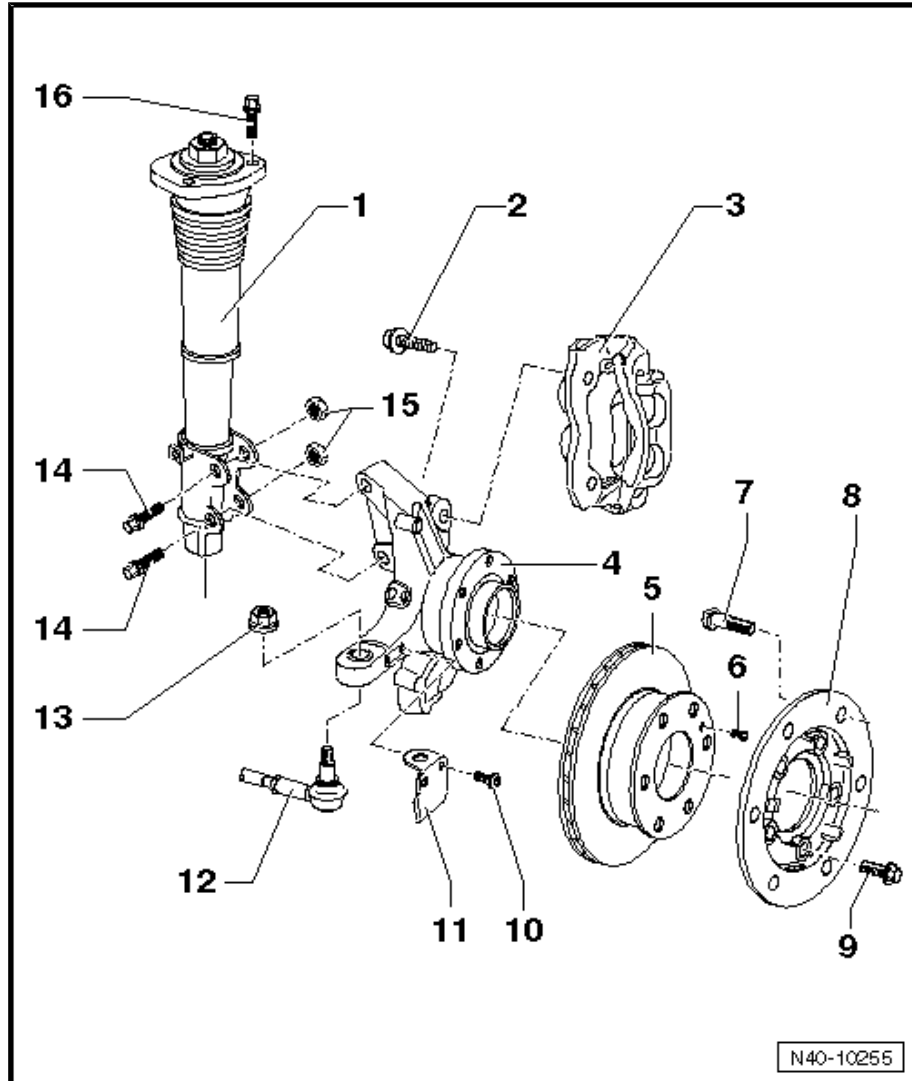
**14 - Bolt**

**15 - Nut**

- Always renew after removing
- M14 x 1.5
- 140 Nm +120°

**16 - Bolt**

- Always renew after removing





- 28 Nm +60°

## 5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive



### WARNING

*It is not permitted to carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.*

*Always renew self-locking nuts.*

*Always renew corroded nuts and bolts.*

### 1 - Wheel bearing housing

- Removing and installing  
⇒ [page 67](#)



### Note

*The wheel bearing housing provides two holes for securing front right speed sensor - G45- or front left speed sensor - G47-. Turning the front right speed sensor - G45- or front left speed sensor - G47- during installation may result in malfunction. Mark installation position prior to removal.*

### 2 - Nut

- Always renew after removing
- 50 Nm +60°

### 3 - Track rod ball joint

- Check that dust caps are undamaged and correctly seated.
- Tapered pin must be free of oil and grease.
- If necessary, clean with a dry cloth but do not use cleaning solutions.
- Removing and installing  
⇒ [page 189](#)

### 4 - Radial shaft seal

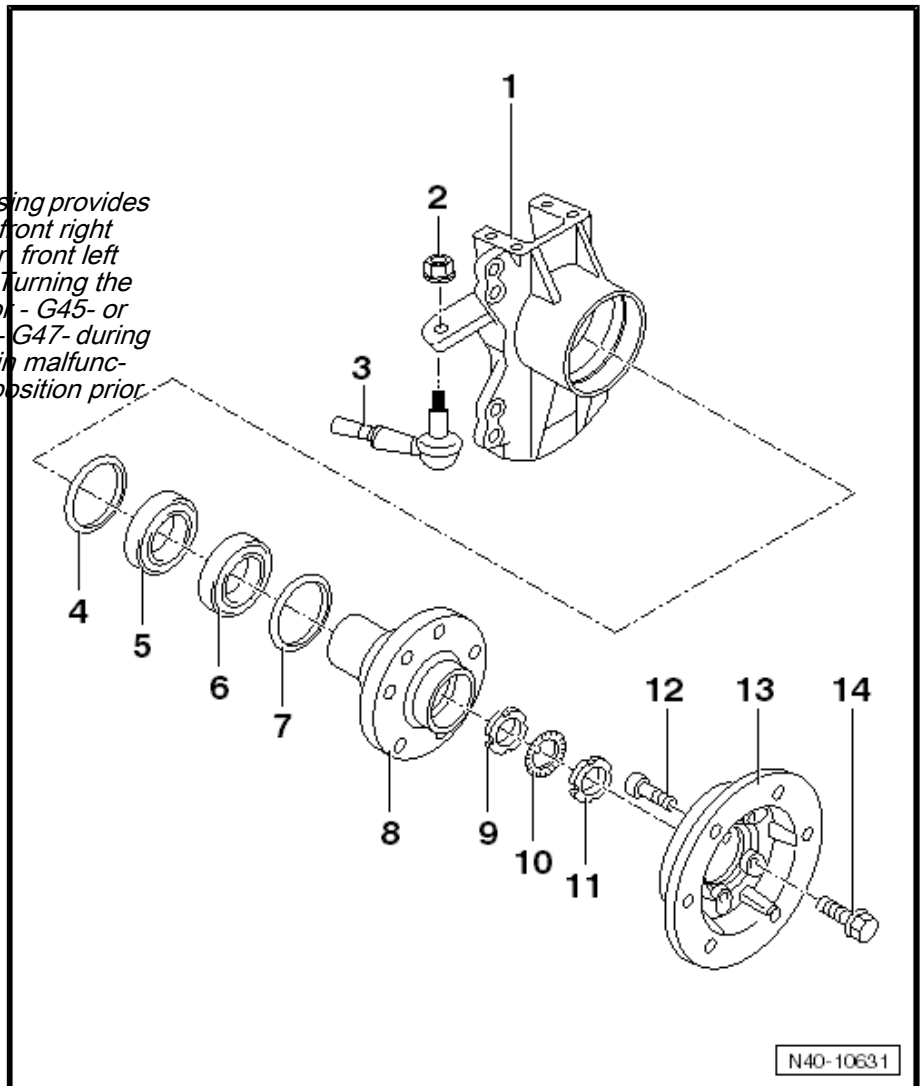


### Caution

*Do not damage or soil radial shaft seal during installation.*

### 5 - Inner tapered roller bearing

- Renew if damaged.





- Removing and installing ⇒ [page 78](#)



**Note**

*Only reinstall clean bearings, do not wash bearings.*

### 6 - Outer tapered roller bearing


- Renew if damaged.
- Removing and installing ⇒ [page 75](#)



**Note**


*Only reinstall clean bearings, do not wash bearings.*

### 7 - Radial shaft seal

 <b>Caution</b> <i>Do not damage or soil radial shaft seal during installation.</i>
---

### 8 - Wheel hub

- Renew if damaged.
- Removing and installing ⇒ [page 69](#)

 <b>Caution</b> <i>Wheel bearings must not be subjected to load after bolt securing drive shaft to wheel hub has been loosened.</i>  <i>If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing.</i>  <i>Do not attempt to move the vehicle without the drive shafts fitted as this would damage the wheel bearing. If a vehicle nevertheless has to be moved, comply with the following:</i>  <i>Install an outer joint instead of the drive shaft.</i>
---

### 9 - Slotted nut

- Initial torque specification: 200 Nm
- Turn back by 160°.
- Final torque setting: 200 Nm.

### 10 - Locking plate

- Always renew after removing



**11 - Slotted nut**

- 200 Nm

**12 - Wheel bolt**

- Specified torque => [page 135](#)

**13 - Wheel flange**

- Not for 3.5 t vehicles

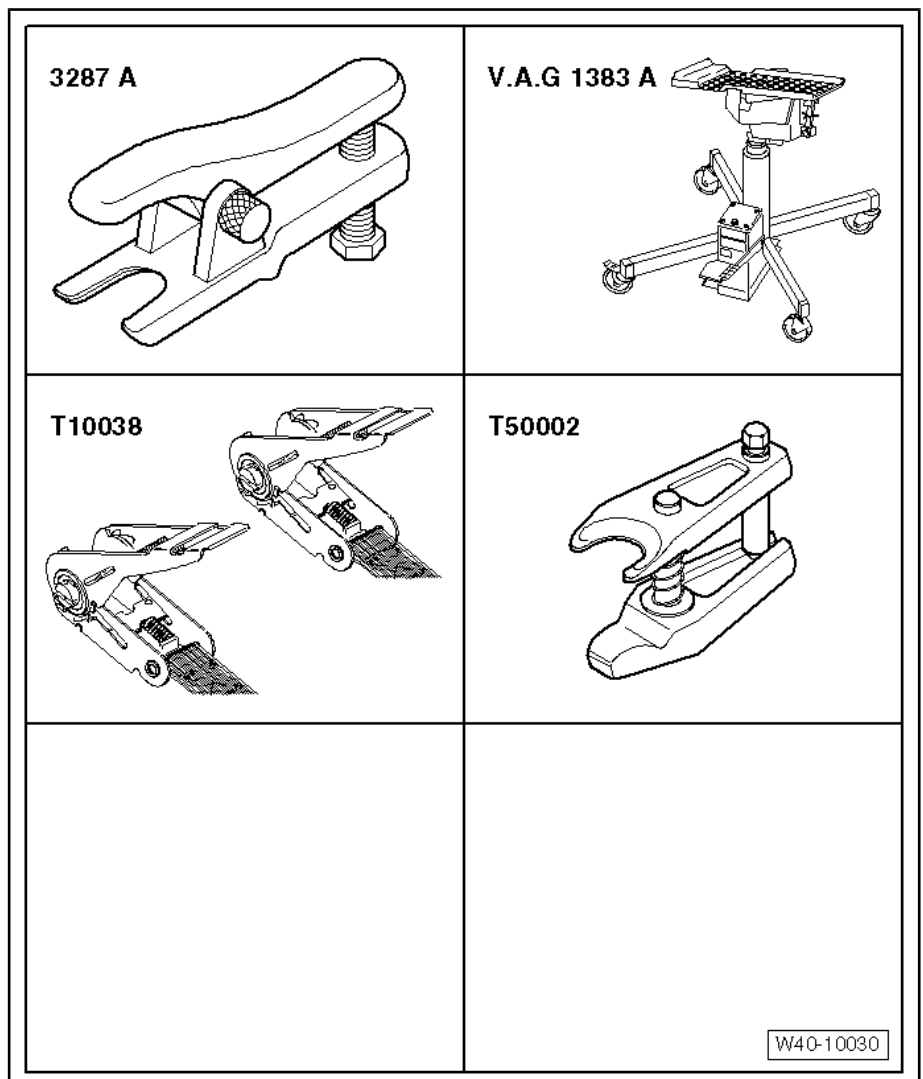
**14 - Bolt**

- Always renew after removing
- Not for 3.5 t vehicles
- 190 Nm

**5.3 Removing and installing wheel bearing housing**

**Special tools and workshop equipment required**

- ◆ Ball joint puller - 3287 A-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap - T10038-
- ◆ Ball joint puller - T50002-



**Removing**

- Raise vehicle and strap it down => Maintenance ; Booklet 10.2.



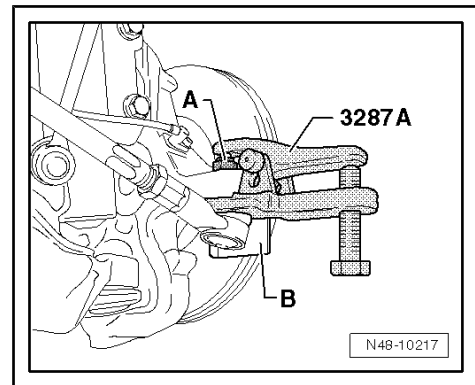
**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Loosen nut -A- on track rod ball joint but do not remove completely.

**Leave nut screwed on a few turns to protect thread on pin.**

- Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- and now remove nut -A-.



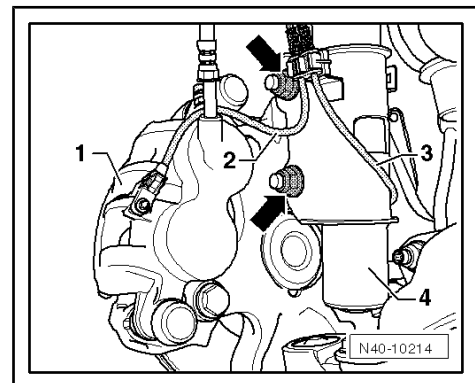
**Note**

- ◆ *When pressing off, do not damage rubber grommet or heat shield -B-.*
- ◆ *If wheel bearing housing is renewed, heat shield -B- must be attached to new wheel bearing housing.*

- Loosen securing nut for suspension link to wheel bearing housing until it is flush with swivel joint thread.
- Remove wire -2- for brake pad wear indicator and speed sensor wire -3- from wheel bearing housing and shock absorber -4-.
- Detach brake caliper -1- and tie to body with wire.

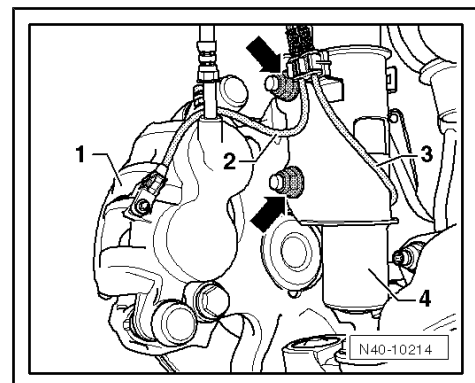
**Wheel bearing housing is to be renewed**

- Remove brake disc from wheel bearing housing => Brake systems; Rep. gr. 46 ; Repairing front brakes .



**Continuation for all vehicles**

- Position engine and gearbox jack - V.A.G 1383 A- beneath suspension link on wheel bearing housing and exert slight counter pressure.
- Unscrew nuts -arrows- and pull out bolts.





- Press wheel bearing housing off swivel joint of suspension link.
- Lower engine and gearbox jack - V.A.G 1383 A- and remove from suspension link.
- Completely unscrew nut -A- from swivel joint and remove wheel bearing housing.

### Installing

Install in reverse order. Note the following points:



### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Attach brake caliper and brake disc to wheel bearing housing ⇒ Brake systems; Repair group 46; Repairing front brakes .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Install front wheel.
- Check wheel alignment ⇒ [page 149](#) .

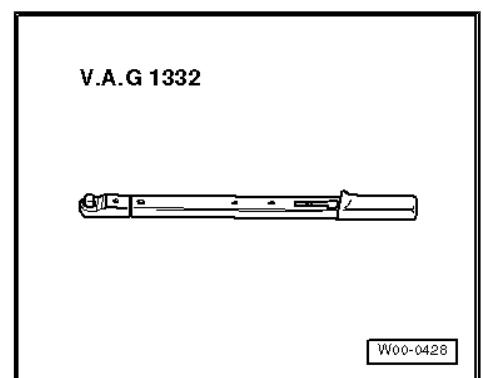
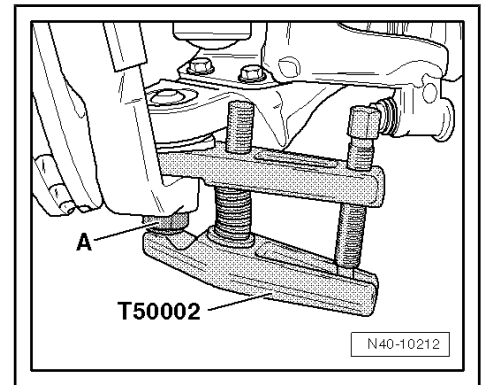
### Specified torques

- ◆ ⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

## 5.4 Removing and installing wheel bearing housing, Crafter 4MOTION with Achleitner four-wheel drive

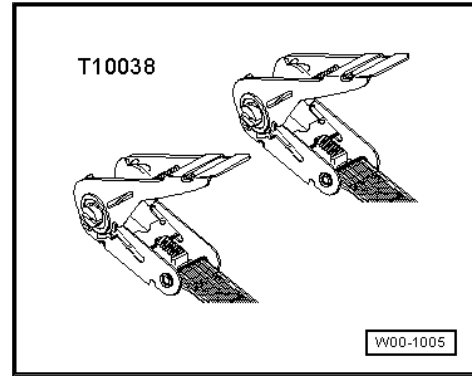
### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

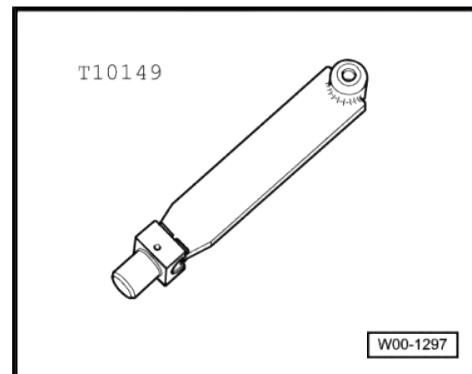




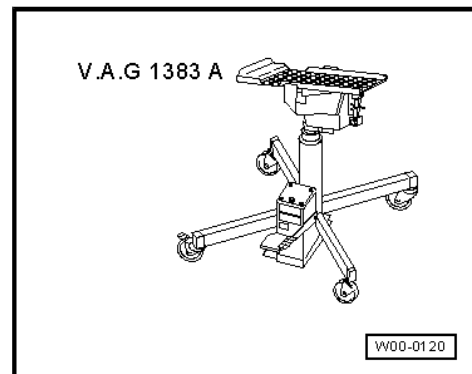
◆ Tensioning strap - T10038-



◆ Support - T10149-



◆ Engine and gearbox jack - V.A.G 1383 A-



◆ Claw spanner - T50034-

Removing



Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.

**i** Note

The wheel bearing housing provides two holes for securing front right speed sensor - G45- or front left speed sensor - G47- . Turning the front right speed sensor - G45- or front left speed sensor - G47- during installation may result in malfunction. Mark installation position prior to removal.

- Remove front right speed sensor - G45- or front left speed sensor - G47- ⇒ Brake system; Rep. gr. 45 ; Electrical and electronic components and their locations ABS/TCS/ESP .
- If fitted, remove wheel flange ⇒ [page 135](#) .
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Remove brake disc ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Loosen track rod ball joint ⇒ [page 189](#) .
- Remove lower suspension link ⇒ [page 53](#) .
- Slightly raise wheel bearing housing with engine and gearbox jack - V.A.G 1383 A- and support - T10149- .
- Loosen bolts -arrows- of upper swivel joint -1-.
- Remove wheel bearing housing towards front.

**Installing**

Install in reverse order. Note the following points:

**i** Note

Tighten bolted connections to wheel bearing housing only if the vehicle is standing on its wheels and is unladen or if the vehicle is raised and is in the unladen position (normal position) ⇒ [page 2](#) .

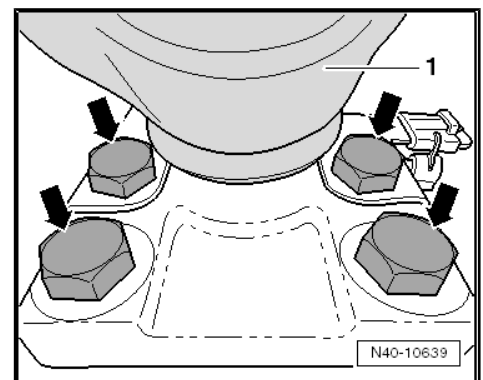
- Install front wheel.
- Check wheel bearing play ⇒ [page 72](#) .

**Specified torques**

- ◆ ⇒ [“5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive”](#), [page 63](#)
- ◆ ⇒ [“4.2 Assembly overview - lower suspension link, swivel joint, Crafter 4MOTION with Achleitner four-wheel drive ”](#), [page 49](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”](#), [page 135](#)

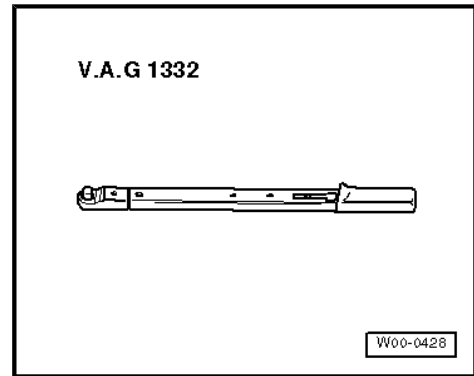
## 5.5 Removing and installing wheel hub, Crafter 4MOTION with Achleitner four-wheel drive

Special tools and workshop equipment required





- ◆ Torque wrench - V.A.G 1332-



- ◆ Claw spanner - T50034-
- ◆ Commercially available plastic head hammer

### Removing



#### Note

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#) .*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.
- If fitted, remove wheel flange ⇒ [page 135](#) .
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Remove brake disc ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Remove any dirt from hub cap.
- Lever off hub cap using a commercially available chisel.

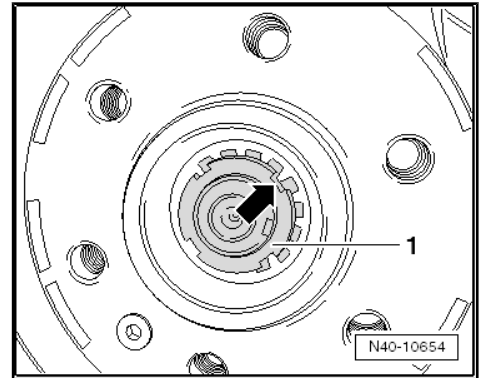


#### Note

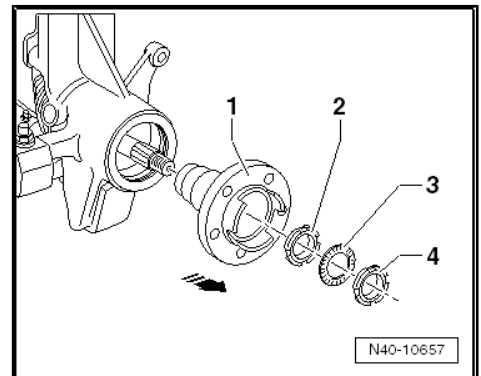
- ◆ *The hub cap will be damaged during removal and must be renewed.*
- ◆ *The hub cap is bonded in which makes removal difficult.*



- Release outer slotted nut -1- by bending locking plate -arrow- back.



- Remove outer slotted nut -4- using claw spanner - T50034- .
- Remove locking plate -3- and unscrew inner slotted nut -2- using special wrench - T50034- .
- Pull off wheel hub -1- in -direction of arrow-. To do this, carefully knock against wheel hub from behind using a plastic head hammer.
- Check wheel hub and wheel bearing for damage and renew if necessary.



### Installing

Install in reverse order. Note the following points:



#### Caution

*When placing parts down or when fitting them, ensure that there is no dirt on the parts.*

- Apply sufficient universal grease => Electronic Parts Catalogue (ETKA) to outer tapered roller bearing -2-.



- Fit wheel hub -1- with outer tapered roller bearing -2- on wheel bearing housing.
- Coat contact surface of slotted nut to wheel hub with universal grease ⇒ Electronic Parts Catalogue (ETKA) , and tighten nut using special wrench - T50034- .
- Setting wheel bearing play ⇒ [page 74](#) .
- Coat contact surfaces of new hub cap with sealant ⇒ Electronic Parts Catalogue (ETKA) .



#### Note

*Due to the air-tight conditions and the metal contact, the sealant starts to cure immediately after the installation of the hub cap to the wheel bearing housing ⇒ Electronic Parts Catalogue (ETKA).*

- Install new hub cap.
- Installing brake disc ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Install brake caliper with brake carrier ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- If fitted, install wheel flange ⇒ [page 135](#) .
- Install front wheel.

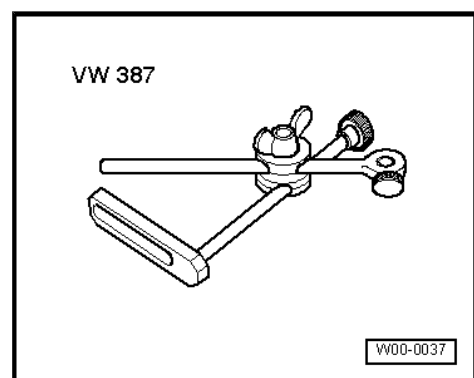
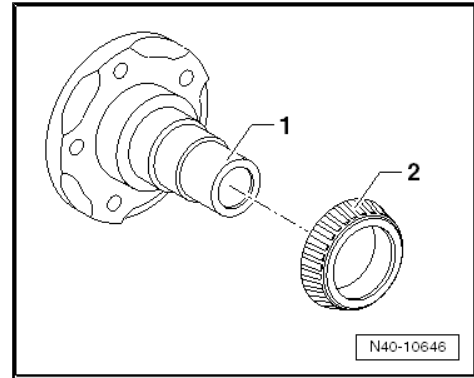
#### Specified torques

- ◆ ⇒ ["5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive", page 63](#)
- ◆ ⇒ ["1.1 Specified torque for wheel bolts", page 135](#)

## 5.6 Checking wheel bearing play, Crafter 4MOTION with Achleitner four-wheel drive

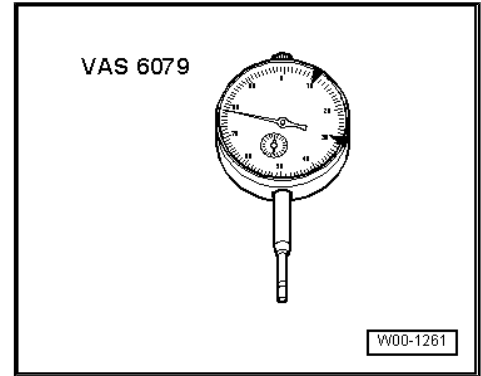
#### Special tools and workshop equipment required

- ◆ Universal dial gauge holder - VW 387-

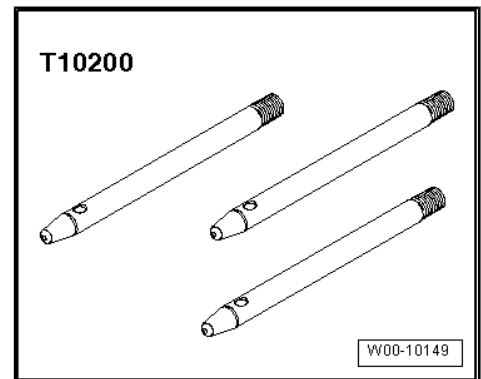




◆ Dial gauge - VAS 6079-



◆ Guide pin - T10200-



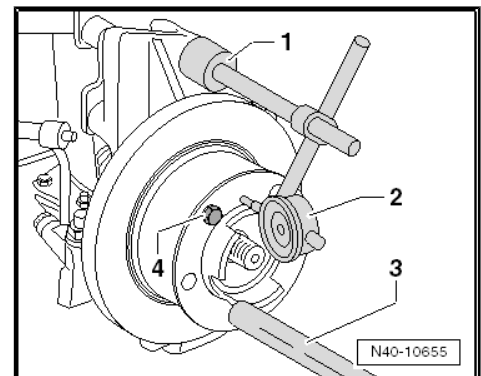
- Remove front wheel.
- If fitted, remove wheel flange ⇒ [page 135](#) .
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Secure dial gauge - VAS 6079- -2- with universal dial gauge holder - VW 387- -1- to wheel bearing housing.
- Screw in a guide pin - T10200- -3- on the opposite side of the measuring point of universal dial gauge holder - VW 387- -1-.
- Screw in a commercially available bolt "M 14 × 1.5" -4- on opposite side of guide pin - T10200- -3-.
- »Tilt« wheel bearing back and forth and read wheel bearing play on universal dial gauge holder - VW 387- -1-.

**Wheel bearing play on front axle: 0.01 ... 0.02 mm**

- If the specified values are not achieved, adjust wheel bearing play ⇒ [page 74](#) .
- Install brake caliper with brake carrier ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- If fitted, install wheel flange ⇒ [page 135](#) .
- Install front wheel.

**Specified torques**

- ◆ ⇒ "1.1 Specified torque for wheel bolts", [page 135](#)





## 5.7 Adjusting wheel bearing play, Crafter 4MOTION with Achleitner four-wheel drive

### Special tools and workshop equipment required

- ◆ Claw spanner - T50034-

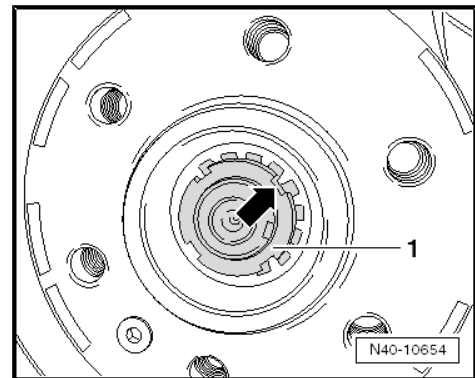
### Removing

- Remove front wheel.
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Lever off hub cap using a commercially available chisel.



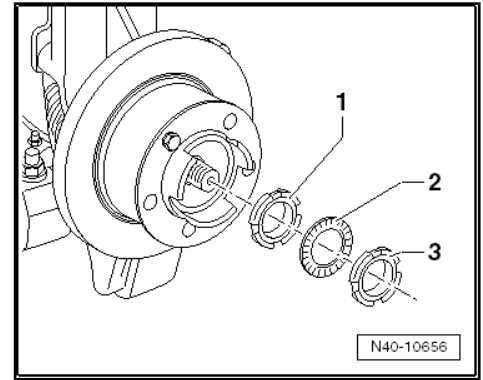
### Note

- ◆ *The hub cap will be damaged during removal and must be renewed.*
- ◆ *The hub cap is bonded in which makes removal difficult.*
- Release outer nut -1- by bending locking plate -arrow- back.





- Unscrew outer slotted nut -3- using claw spanner - T50034- and remove locking plate -2-.
- Unscrew inner slotted nut -1- using claw spanner - T50034- .
- Coat contact surface of inner slotted nut -1- to wheel hub with universal grease ⇒ Electronic Parts Catalogue (ETKA) , and tighten nut to pre-tightening torque ⇒ [Item 9 \(page 64\)](#) .
- Loosen inner slotted nut -1-, turn wheel hub, and loosen wheel hub by carefully knocking against wheel hub using e.g. a commercially available plastic head hammer.
- Tighten inner slotted nut -1- until there is no more wheel bearing play.
- Loosen inner slotted nut -1- by 160°. Then, tighten it ⇒ [Item 9 \(page 64\)](#) .
- Insert brake locking plate -2-.



### **i** Note

*Locking plate -2- must be renewed (⇒ Electronic Parts Catalogue "ETKA").*

- Grease outer slotted nut -3- with universal grease ⇒ Electronic Parts Catalogue (ETKA) and tighten it.
- Check wheel bearing play. If necessary, repeat the work procedure ⇒ [page 74](#) .

### **i** Note

*Do only measure wheel bearing play with outer slotted nut -3-!*

- Secure outer slotted nut -3- with locking plate -2-.
- Coat contact surfaces of new hub cap with sealant ⇒ Electronic Parts Catalogue (ETKA) .

### **i** Note

*Due to the air-tight conditions and the metal contact, the sealant starts to cure immediately after the installation of the hub cap to the wheel bearing housing ⇒ Electronic Parts Catalogue (ETKA).*

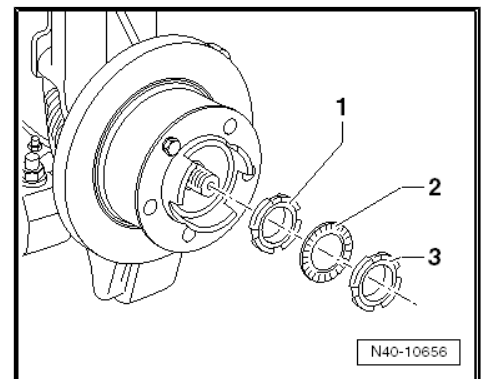
- Install new hub cap.
- Install front wheel.

### Specified torques

- ◆ ⇒ ["5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive", page 63](#)
- ◆ ⇒ ["1.1 Specified torque for wheel bolts", page 135](#)

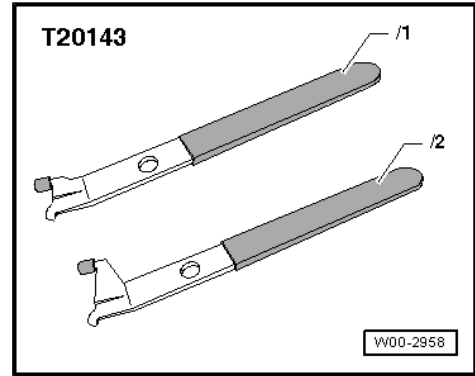
## 5.8 Removing and installing outer tapered roller bearing, Crafter 4MOTION with Achleitner four-wheel drive

Special tools and workshop equipment required



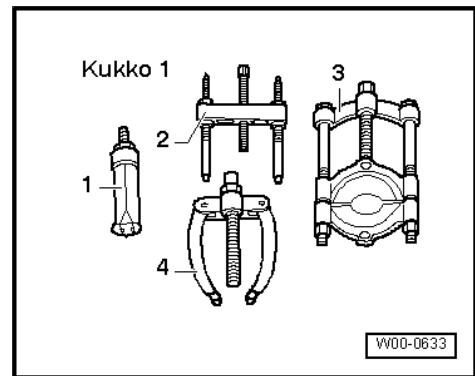


◆ Extractor hook - T20143-

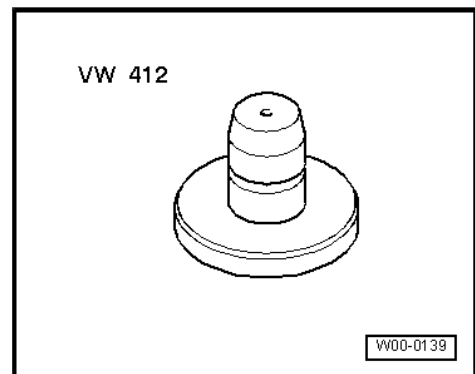


◆ -2- Splitter - KUKKO 18-2-

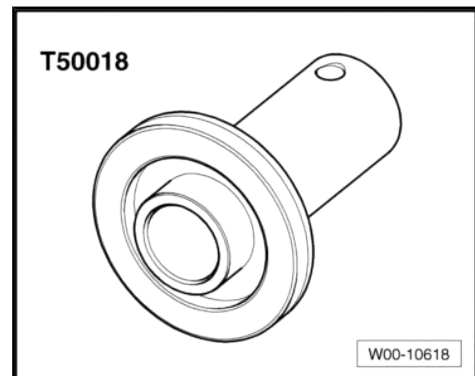
◆ -3- Splitter - KUKKO 17-2-



◆ Press tool - VW 412-

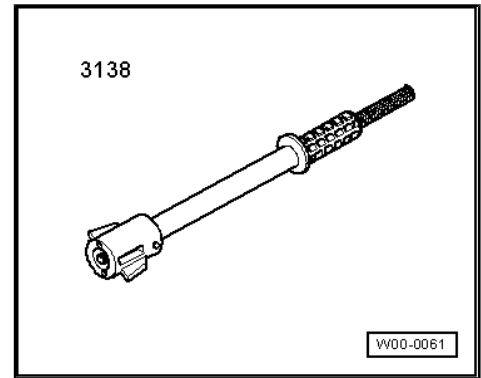


◆ Thrust piece - T50018-





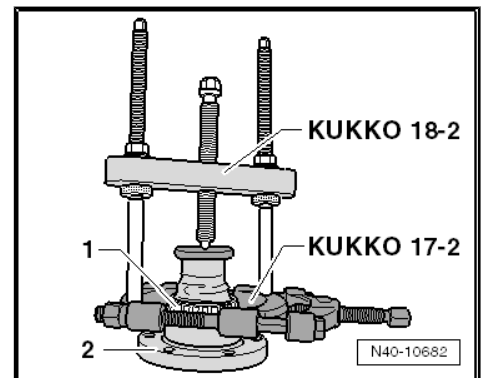
◆ Drift - 3138-



◆ Commercially available plastic head hammer

**Removing**


- Remove wheel hub ⇒ [page 69](#) .
- Pull tapered roller bearing -1- off wheel hub -2- using splitter - KUKKO 18-2- , splitter - KUKKO 17-2- and press tool - VW 412- .
- Lever out seal using extractor hook - T20143/2- .



- Drive tapered roller bearing outer race -1- out of wheel bearing housing -2- using drift - 3138- .
- Remove any dirt in wheel bearing housing.

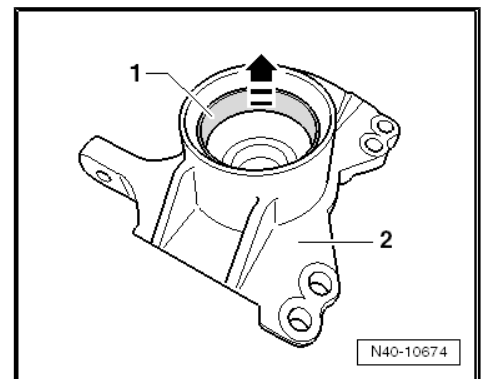
**Installing**

Install in reverse order. Note the following points:

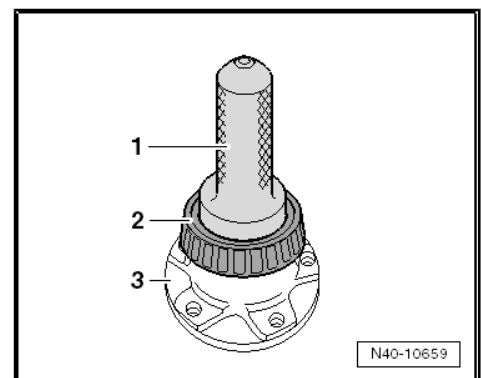


**Caution**

*When placing parts down or when fitting them, ensure that there is no dirt on the parts.*



- Clean wheel hub, check it for damage and renew if necessary.
- Place tapered roller bearing -2- onto wheel hub -3-.





- Drive tapered roller bearing -2- into wheel hub -3- to stop -arrow- using thrust piece - T50018- -1-.



**Caution**

*The force for pressing in the tapered roller bearing must only be applied on inner race!*

- Apply sufficient universal grease ⇒ Electronic Parts Catalogue (ETKA) on tapered roller bearing.
- Drive tapered roller bearing outer race -1- into wheel bearing housing -2- using a commercially available plastic head hammer and a commercially available copper drift.

- Drive radial shaft seal -1- flush into wheel bearing housing -2- using a commercially available plastic head hammer and thrust piece - T50018- .



**Caution**

*Do not damage or soil radial shaft seal during installation.*



**Note**

Renew inner tapered roller bearing if necessary ⇒ [page 78](#) .

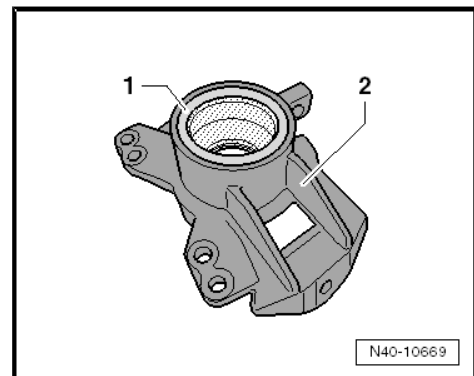
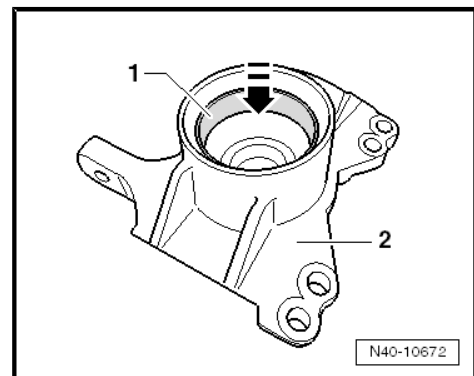
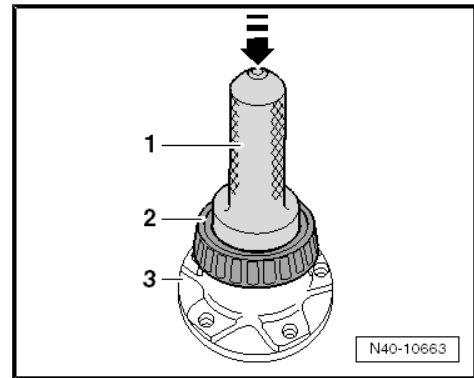
Install wheel hub ⇒ [page 69](#) .

**Specified torques**

- ◆ ⇒ [“5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive”, page 63](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

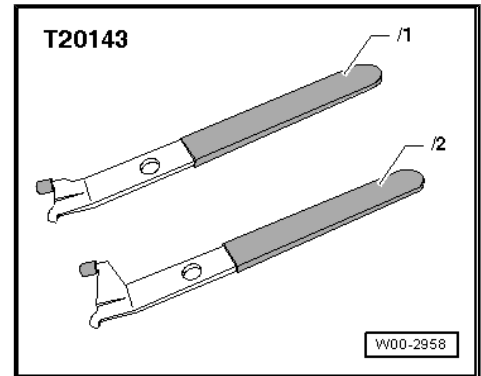
## 5.9 Removing and installing inner tapered roller bearing, Crafter 4MOTION with Achleitner four-wheel drive

Special tools and workshop equipment required

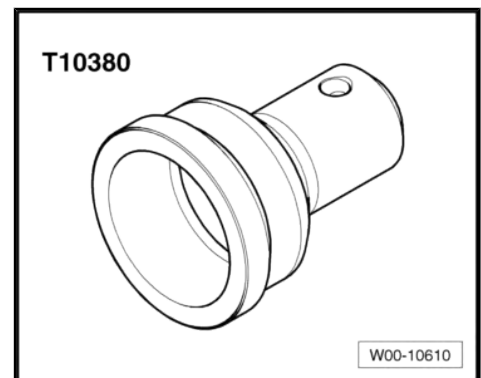




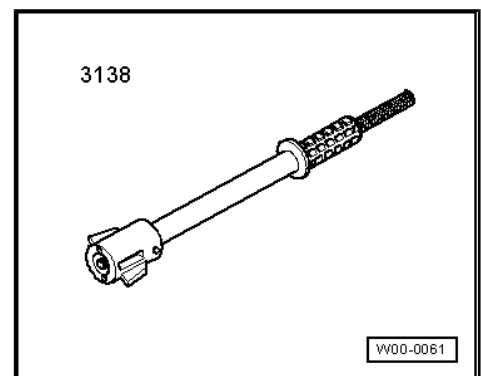
- ◆ Extractor hook - T20143-



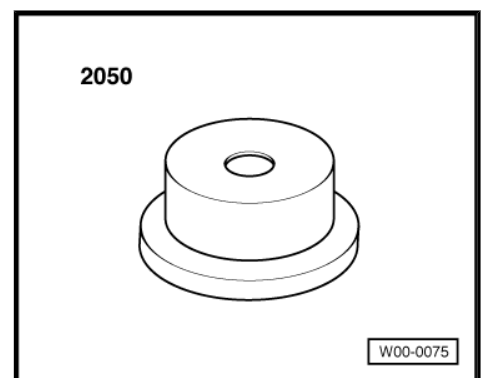
- ◆ Thrust piece - T10380-



- ◆ Drift - 3138-



- ◆ Thrust piece - 2050-



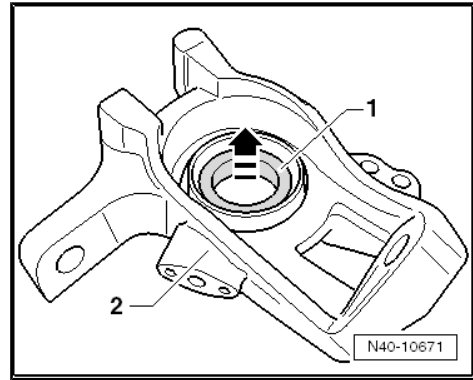
- ◆ Commercially available plastic head hammer

#### Removing

- Remove wheel bearing housing => [page 67](#) .
- Lever out radial shaft seal using extractor hook - T20143- .



- Drive tapered roller bearing -1- in -direction of arrow- out of wheel bearing housing -2-.

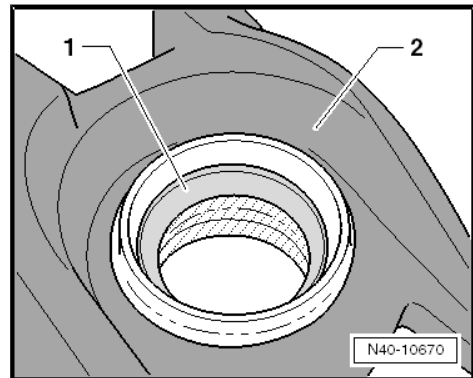
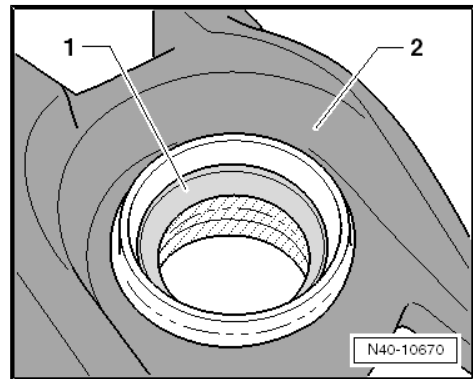


- Drive tapered roller bearing outer race -1- out of wheel bearing housing -2- using drift - 3138- .
- Remove any dirt in wheel bearing housing.

### Installing

Install in reverse order. Note the following points:

- Drive tapered roller bearing outer race -1- into wheel bearing housing -2- to stop using a commercially available plastic head hammer and thrust piece - 2050- .
- Apply sufficient universal grease => Electronic Parts Catalogue (ETKA) on tapered roller bearing, and place it in wheel bearing housing.



- Drive radial shaft seal -1- flush into wheel bearing housing -2- using thrust piece - T10380- .



### Caution

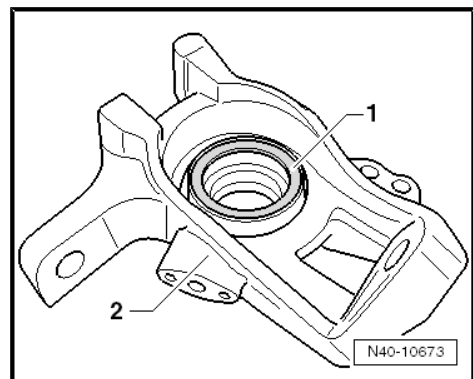
*Do not damage or soil radial shaft seal during installation.*

- Install wheel bearing housing => [page 67](#) .

Install wheel hub => [page 69](#) .

### Specified torques

- ◆ => ["5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive"](#), page 63
- ◆ => ["1.1 Specified torque for wheel bolts"](#), page 135





## 6 Drive shaft

⇒ [“6.1 Assembly overview - drive shaft, Crafter 4MOTION with Achleitner four-wheel drive”, page 81](#)

⇒ [“6.2 Removing and installing drive shaft, Crafter 4MOTION with Achleitner four-wheel drive”, page 82](#)

⇒ [“6.3 Dismantling and assembling drive shaft, Crafter 4MOTION with Achleitner four-wheel drive”, page 86](#)

⇒ [“6.4 Checking outer constant velocity joint, Crafter 4MOTION with Achleitner four-wheel drive”, page 90](#)

### 6.1 Assembly overview - drive shaft, Crafter 4MOTION with Achleitner four-wheel drive

#### 1 - Nut

- Always renew after removing
- Checking wheel bearing play ⇒ [page 72](#) .
- Specified torque ⇒ [page 63](#)

When bolt is loosened or tightened, vehicle must not be standing on its wheels.

#### 2 - Outer constant velocity joint

- Including ABS sensor ring.
- Renew only as complete unit
- Checking ⇒ [page 90](#)
- Removing ⇒ [page 88](#) .
- Installing: drive onto shaft as far as stop using a plastic head hammer

#### 3 - Retaining ring

- Always renew after removing
- Insert in groove in shaft

#### 4 - Clamp

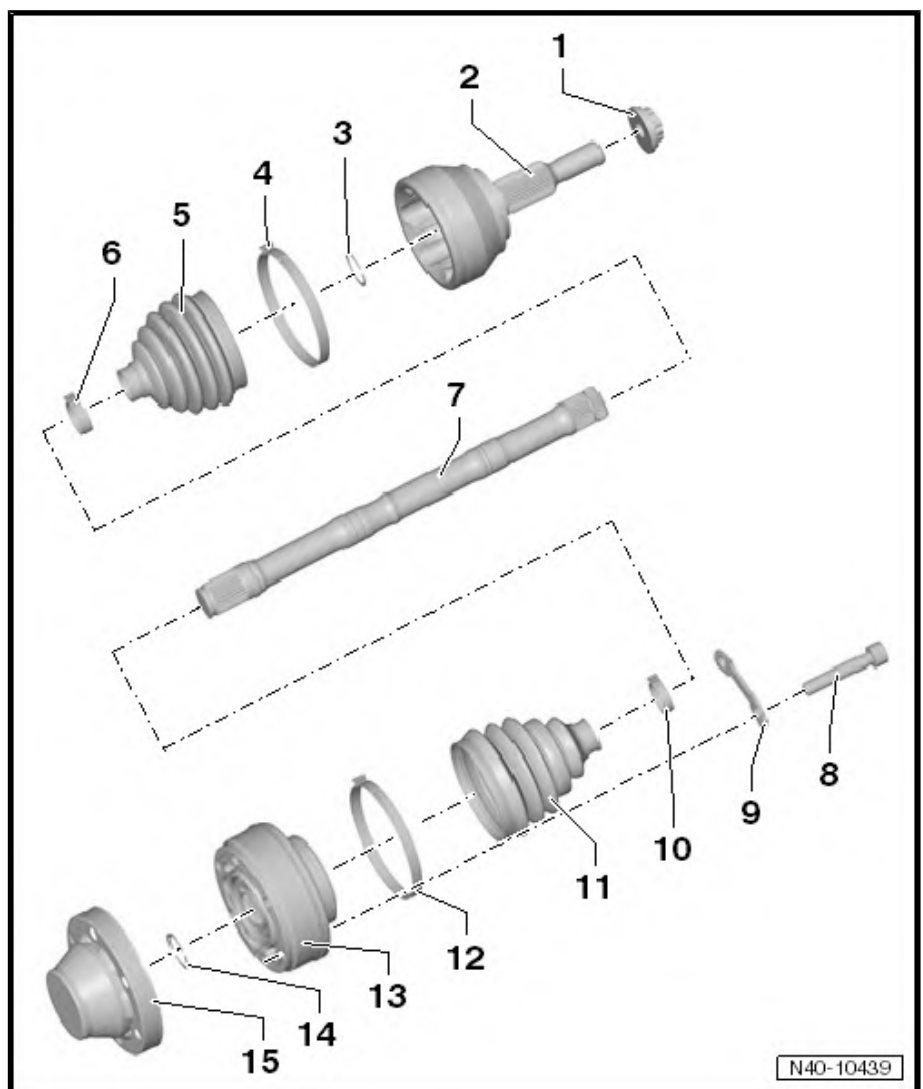
- Always renew after removing
- Tightening ⇒ [page 90](#)

#### 5 - Boot

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)

#### 6 - Clamp

- Always renew after removing
- Tightening ⇒ [page 90](#)





## 7 - Drive shaft

### 8 - Multi-point socket head bolt

- Always renew after removing
- Initial torque specification: 10 Nm
- 76 Nm

### 9 - Locking plate

### 10 - Clamp

- Always renew after removing
- Tightening ⇒ [page 90](#)

### 11 - Boot for constant velocity joint

- Material: Arnitel (polyester elastomer).
- Without breather hole
- Check for splits and chafing
- Drive off constant velocity joint with a drift
- Before installing to constant velocity joint, coat sealing surface with sealant ⇒ Electronic Parts Catalogue (ETKA) .

### 12 - Clamp

- Always renew after removing
- Tightening ⇒ [page 90](#)

### 13 - Inner constant velocity joint

- Renew only as complete unit
- Pressing off ⇒ [page 89](#)
- Pressing on ⇒ [page 89](#)

### 14 - Retaining ring

- Remove and install with circlip pliers - VW 161 A-

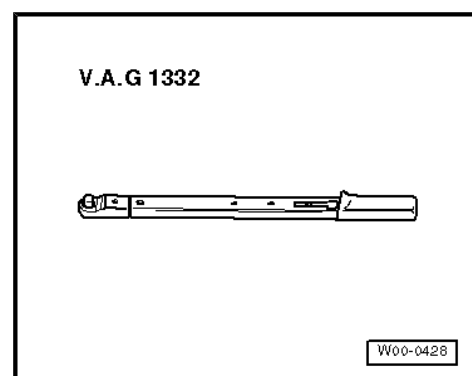
### 15 - Cover

- Always renew after removing
- Pressing off ⇒ [page 89](#)

## 6.2 Removing and installing drive shaft, Crafter 4MOTION with Achleitner four- wheel drive

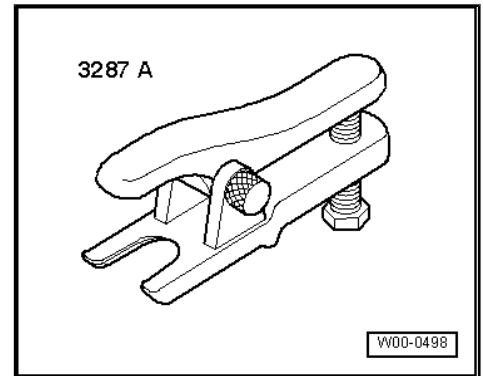
### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-





- ◆ Ball joint puller - 3287 A-




- ◆ Claw spanner - T50034-
- ◆ Commercially available plastic head hammer

### Removing



*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing has been raised (unladen position) ⇒ [page 2](#).*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.



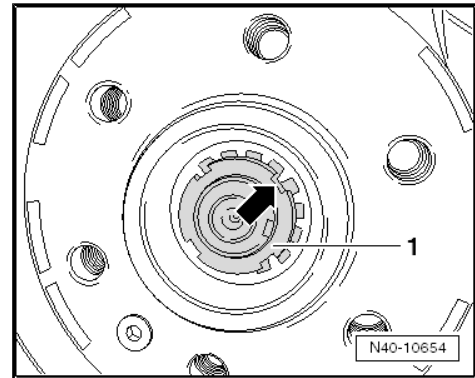
*The wheel bearing housing provides two holes for securing front right speed sensor - G45- or front left speed sensor - G47- . Turning the front right speed sensor - G45- or front left speed sensor - G47- during installation may result in malfunction. Mark installation position prior to removal.*

- Remove front right speed sensor - G45- or front left speed sensor - G47- ⇒ Brake system; Rep. gr. 45 ; Electrical and electronic components and their locations ABS/TCS/ESP .
- Remove brake caliper together with brake carrier and secure with wire so that weight of brake caliper does not stress or damage brake hose ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Loosen track rod ball joint ⇒ [page 189](#) .
- Remove any dirt from hub cap.
- Lever off hub cap using a commercially available chisel.

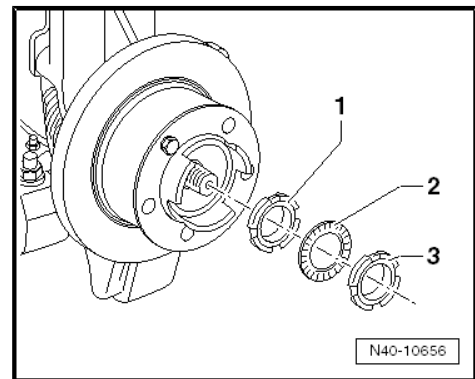


Note

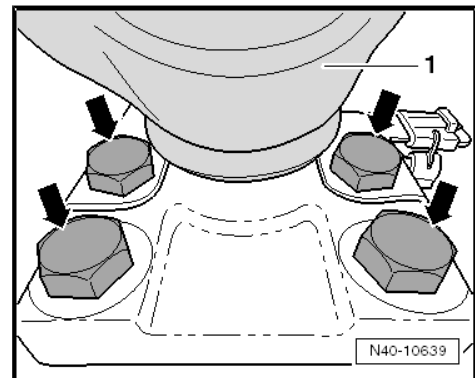
- ◆ *The hub cap will be damaged during removal and must be renewed.*
- ◆ *The hub cap is bonded in which makes removal difficult.*
- Release outer slotted nut -1- by bending locking plate -arrow- back.



- Remove outer slotted nut -3- and locking plate -2-.
- Unscrew slotted nut -1-.



- Unscrew bolts -arrows- of upper swivel joint -1-.

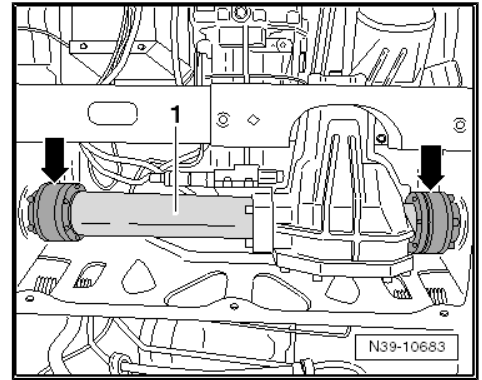




- Loosen multi-point socket head bolts -arrows- (right or left) on final drive -1-.
- Turn steering wheel to right or left in order to free more space for working.
- Pull drive shaft out of wheel bearing housing and remove it.

**i** Note

*If necessary, screw on slotted nut and drive out constant velocity joint by carefully knocking constant velocity joint using a commercially available plastic head hammer.*



**Caution**

*Wheel bearings must not be subjected to load after bolt securing drive shaft to wheel hub has been loosened.*

*If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing.*

*Do not attempt to move the vehicle without the drive shafts fitted as this would damage the wheel bearing. If a vehicle nevertheless has to be moved, comply with the following:*

- *Install an outer joint instead of the drive shaft.*

### Installing

Install in reverse order. Note the following points:



**Caution**

*When placing parts down or when fitting them, ensure that there is no dirt on the parts.*

- In case of soiling or damage on wheel bearing housing ⇒ [Item 1 \(page 63\)](#) , radial shaft seal ⇒ [Item 4 \(page 63\)](#) or wheel hub ⇒ [Item 8 \(page 64\)](#) , clean parts or renew them.
- Insert drive shaft and guide outer constant velocity joint into wheel bearing.



- Tighten the two inner bolts -arrows- of upper swivel joint -1- first hand-tight and then to specified torque.



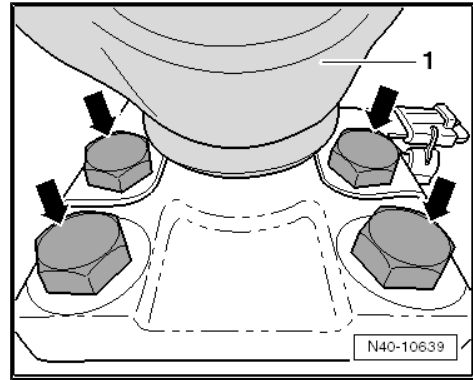
#### Note

*Check that dust caps are undamaged and correctly seated.*

- Tighten multi-point socket head bolts first hand-tight and then to specified torque.
- Secure track rod ball joint ⇒ [page 189](#) .
- Install front right speed sensor - G45- or front left speed sensor - G47- ⇒ Brake system; Rep. gr. 45 ; Electrical and electronic components and their locations ABS/TCS/ESP .
- Check and adjust wheel bearing play ⇒ [page 72](#) .
- Install new hub cap.
- Install brake caliper with brake carrier ⇒ Brake systems; Rep. gr. 46 ; Brakes - mechanism .
- Install front wheel.

#### Specified torques

- ◆ ⇒ [“6.1 Assembly overview - drive shaft, Crafter 4MOTION with Achleitner four-wheel drive”, page 81](#)
- ◆ ⇒ [“5.2 Assembly overview - wheel bearing unit, Crafter 4MOTION with Achleitner four-wheel drive”, page 63](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

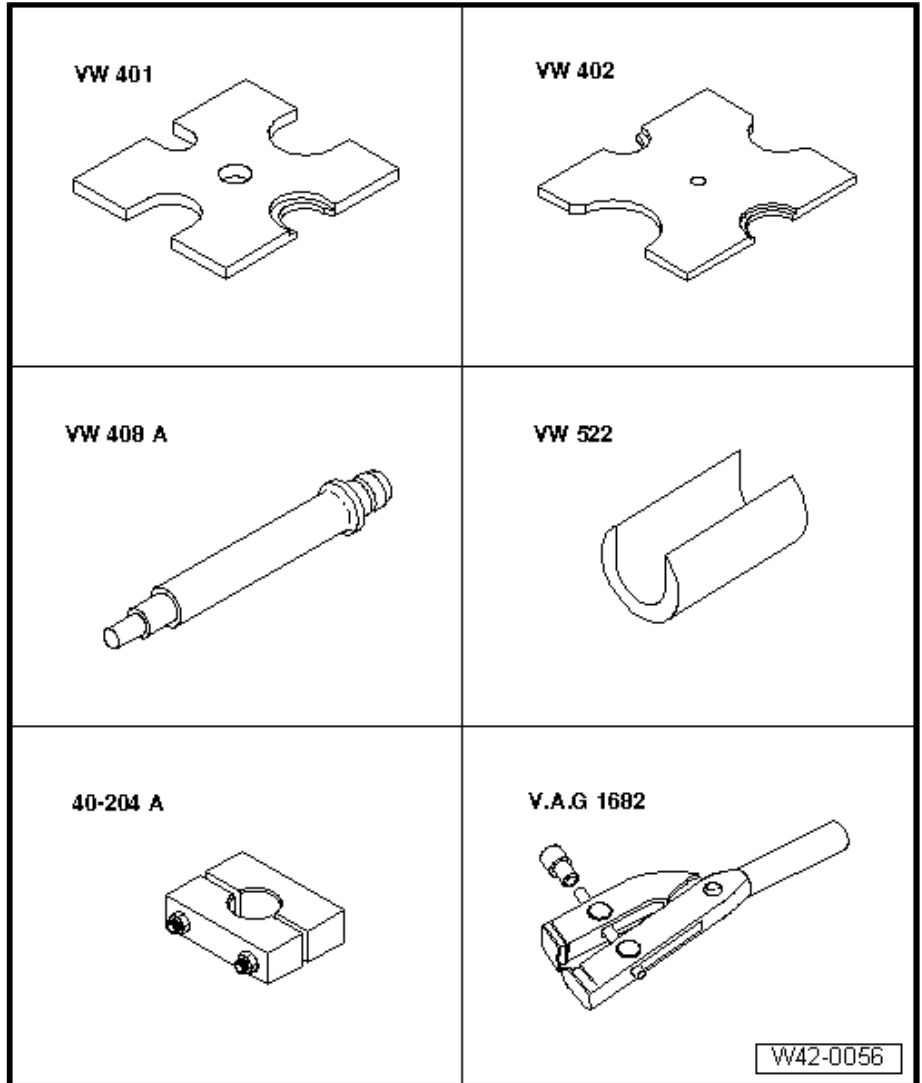


## 6.3 Dismantling and assembling drive shaft, Crafter 4MOTION with Achleitner four-wheel drive

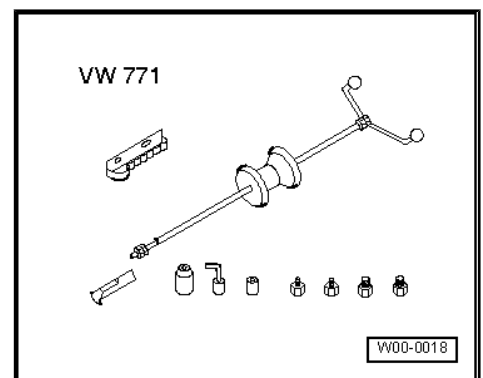


**Special tools and workshop equipment required**

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Support sleeve - VW 522-
- ◆ Tensioner - 40 - 204 A-
- ◆ Special pliers - V.A.G 1682-

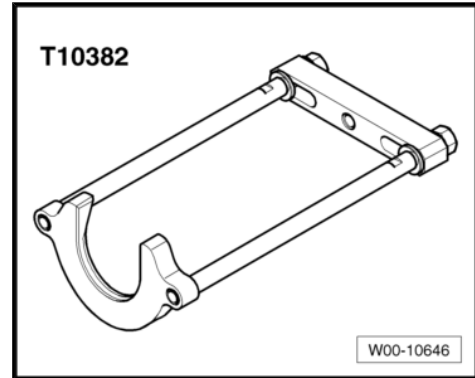


- ◆ Multi-purpose tool - VW 771-

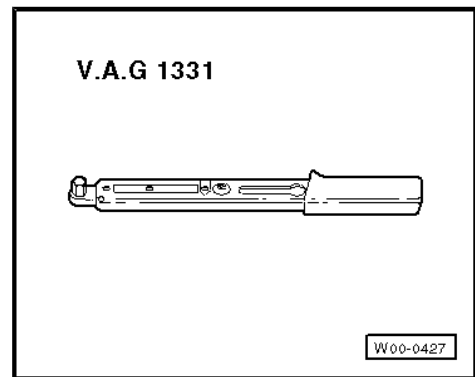




◆ Puller - T10382-



◆ Torque wrench - V.A.G 1331-



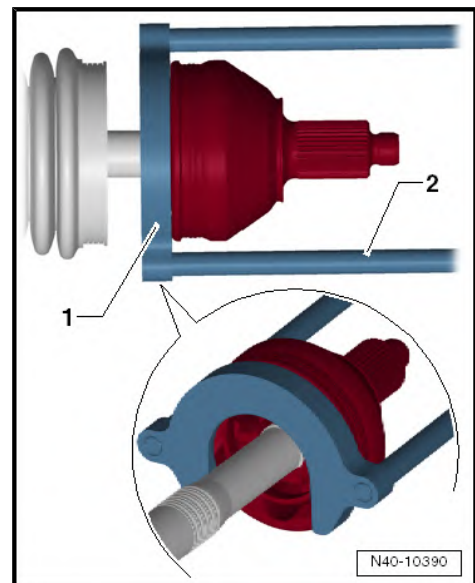
**Removing outer constant velocity joint**

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller - T10382- up so that smooth side of puller plate - T10382/1- points to spindles - T10382/2- .
- Assemble puller - T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller - T10382- and multi-purpose tool - VW 771- .

- 1 - Puller plate - T10382/1-
- 2 - Spindles - T10382/2-

**Driving on outer constant velocity joint:**

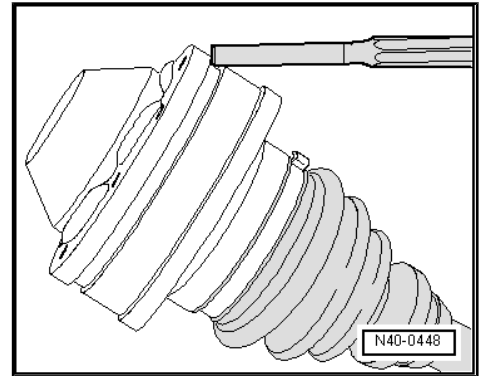
- Install new retaining ring.
- If necessary, push new joint boot onto drive shaft.
- Knock onto shaft with plastic hammer until circlip engages.





### Driving off cover for inner joint

- Remove retaining ring.
- Remove both clamps and slide boot towards outer joint.
- Drive off boot with drift.

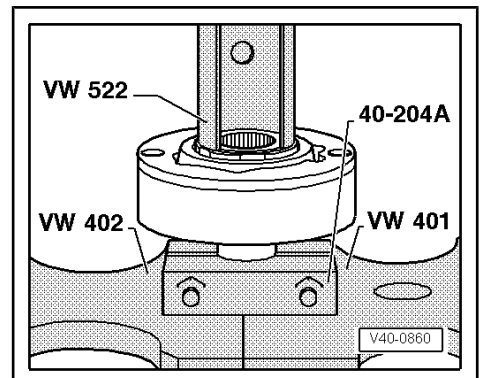
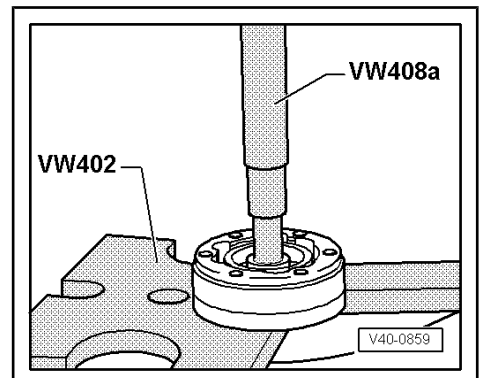


### Pressing off inner constant velocity joint

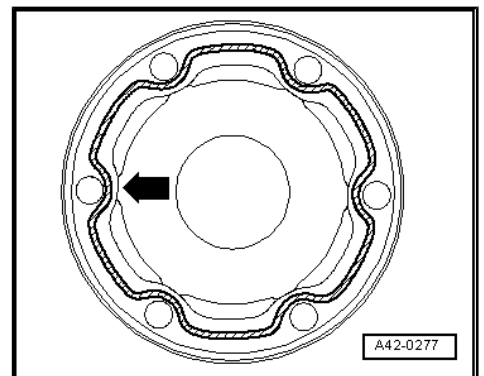
#### Assembling

### Pressing on inner constant velocity joint

- Press joint on to stop.
- Install retaining ring.



- Coat sealing surface of cover with sealant ⇒ Electronic Parts Catalogue (ETKA) .
- Apply an unbroken bead of sealant of 2...3 mm in diameter onto clean surface of cover in area of inner holes -arrow-.

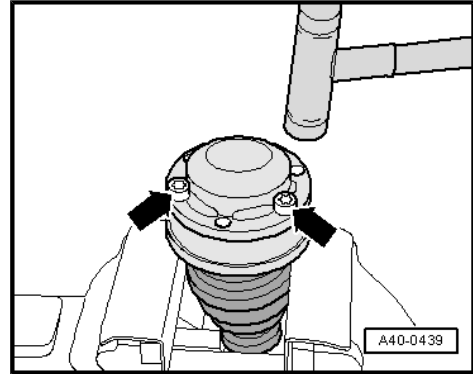




- Using bolts -arrows-, align new cover in relation to bolt holes.

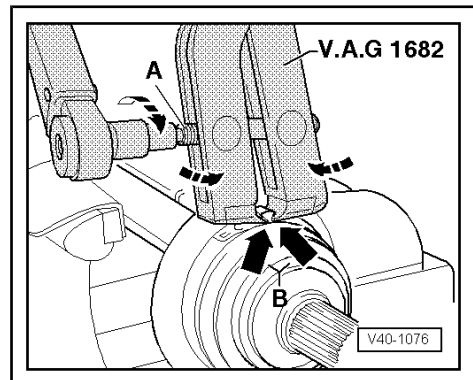
The alignment must be very accurate, because no further alignment is possible once the part has been hammered on.

- Drive on cover using a plastic hammer.
- Wipe off surplus sealant.



#### Tighten clamp on outer joint

- Position clamp tensioner - V.A.G 1682- as shown in diagram. Ensure jaws of tensioner lie in corners -arrows B- of ears on O-type clip.
- Tighten clamp by turning spindle with a torque wrench (do not cant pliers).



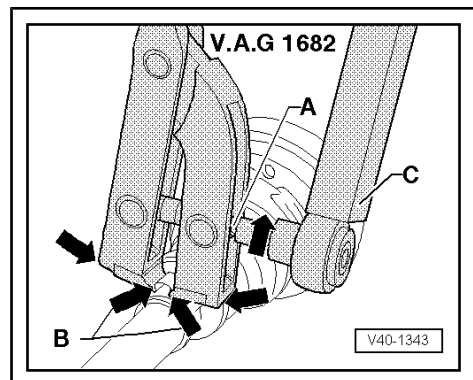
#### Note

- ◆ Due to the hard material of the protective boot (compared to rubber) and the necessity of using a stainless steel clamp, it is only possible to tension the clamp with clamp tensioner - V.A.G 1682-.
- ◆ Use torque wrench -C- with adjustment range 5... 50 Nm, (e.g. torque wrench - V.A.G 1331-).
- ◆ Make sure thread of spindle -A- on pliers moves freely. Lubricate with MoS2 grease if necessary.
- ◆ If the thread is tight (e.g. due to dirt), the required clamping force for the clamp will not be attained although the specified tightening torque is applied.

#### Tightening clamp on small diameter

##### Specified torque

Component	Specified torque
Clamp	25 Nm



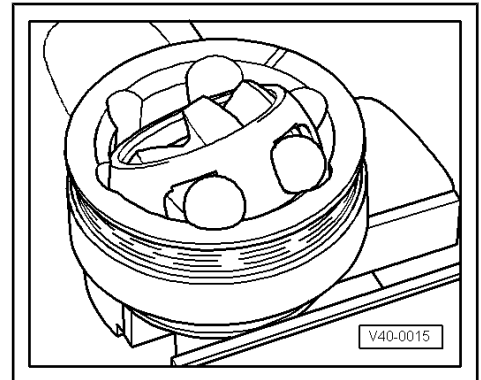
## 6.4 Checking outer constant velocity joint, Crafter 4MOTION with Achleitner four-wheel drive

The joint is to be dismantled to renew the grease if it is heavily soiled, or to check the running surfaces of the balls for wear and damage.

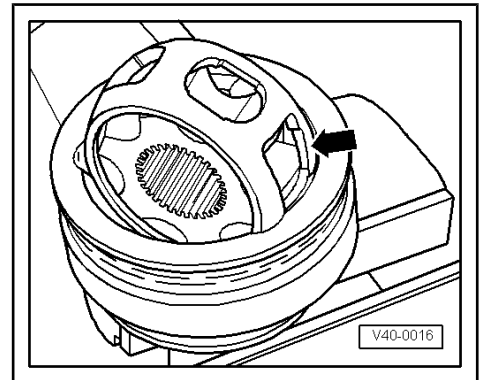


### Removing

- Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scribe or oil stone.
- Swing ball hub and ball cage.
- Remove balls one at a time.



- Turn cage until the two rectangular windows -arrow- lie on joint body.
- Take out cage with hub.



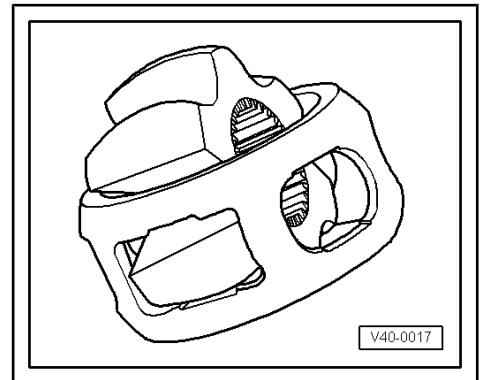
- Swing segment of hub into square cage window.
- Tip hub out of cage.

The six balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and traces of seizing. Too much circumferential backlash in the joint becomes noticeable during load change jolts; in such cases, the joint must be renewed. Smoothing and traces of wear of the balls are no reason to change the joint.

### Installing

Install in reverse order. Note the following points:

- Pack half the total quantity of grease into the joint body.
- Fit cage with hub into joint body.
- Press in opposing balls one after the other; the original position of the hub relative to the cage and joint body must be restored.
- Fit new retaining ring into hub.
- Distribute remaining grease in boot.





## 42 – Rear suspension

### 1 Rear axle

- ⇒ [“1.1 Assembly overview - rear axle”, page 92](#)
- ⇒ [“1.2 Assembly overview - rear axle, vehicles with twin wheels”, page 95](#)
- ⇒ [“1.3 Measuring length on U-bolt”, page 97](#)
- ⇒ [“1.4 Removing and installing leaf spring stop buffer”, page 98](#)
- ⇒ [“1.5 Removing and installing leaf spring”, page 98](#)
- ⇒ [“1.6 Removing and installing leaf spring, vehicles with twin wheels”, page 100](#)
- ⇒ [“1.7 Renewing leaf spring rubber bush”, page 102](#)
- ⇒ [“1.8 Renewing leaf spring rubber bush”, page 104](#)
- ⇒ [“1.9 Removing and installing shackle, vehicles with twin wheels”, page 106](#)
- ⇒ [“1.10 Renewing shackle rubber bush, vehicles with twin wheels”, page 107](#)
- ⇒ [“1.11 Removing and installing spring bracket”, page 109](#)
- ⇒ [“1.12 Removing and installing rear axle shaft”, page 110](#)
- ⇒ [“1.13 Removing and installing rear axle shaft, vehicles with twin wheels”, page 112](#)
- ⇒ [“1.14 Renewing shrink ring, vehicles with twin wheels”, page 113](#)

#### 1.1 Assembly overview - rear axle



##### WARNING

- ◆ *It is not permitted to carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.*
- ◆ *Always renew self-locking nuts and bolts.*
- ◆ *Always renew corroded nuts and bolts.*



##### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) ⇒ [page 2](#).*



**1 - Bolt**

- Renew after removing
- M14 × 1.5 × 110

**2 - Spring bracket**

- Installed in certain vehicles, e.g. drop-side vehicles
- Removing and installing ⇒ [page 109](#).

**3 - Nut**

- Always renew after removing
- M14 × 1.5: 172 Nm

**4 - Nut**

- Renew after removing
- M12 × 1.5: 60 Nm + 180°
- M16 × 1.5: 240 Nm

**5 - Bolt**

- Renew after removing
- M14 × 1.5 × 50: 172 Nm

**6 - Bolt**

- Renew after removing

**7 - Bump stop**

- Allocation ⇒ Electronic Parts Catalogue "ETKA".



**Note**

*The stop buffer for the Crafter 4MOTION with Achleitner four-wheel drive is bigger in size, but the removal and installation procedure is identical.*

- Removing and installing ⇒ [page 98](#).

**8 - U bolt**

- Different sizes. To allocate correctly, length must be measured ⇒ [page 97](#)
- Allocation ⇒ Electronic Parts Catalogue "ETKA".



**Note**

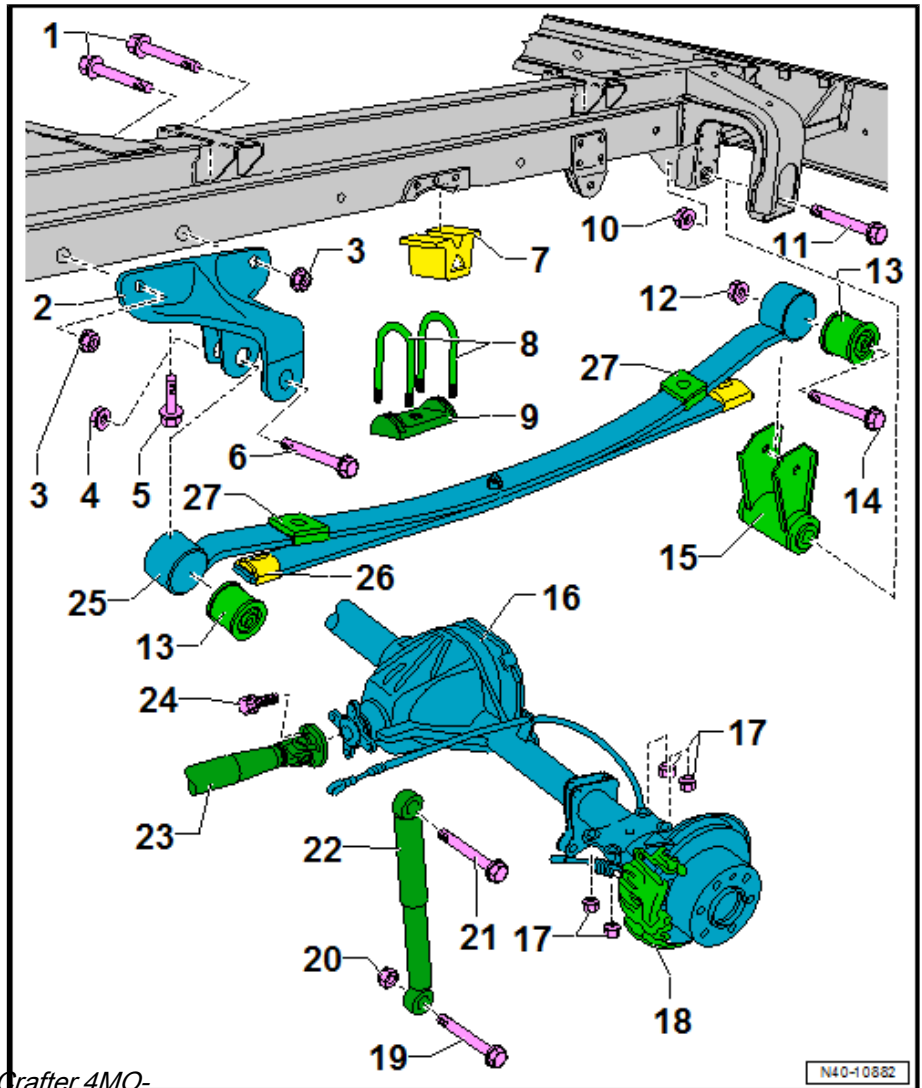
*The U bolt for the Crafter 4MOTION with Achleitner four-wheel drive is bigger in size, but the removal and installation procedure is identical.*

**9 - Saddle plate**

- Allocation ⇒ Electronic Parts Catalogue "ETKA".

**10 - Nut**

- Always renew after removing
- M12 × 1.5: 70 Nm + 180°
- M16 × 1.5: 240 Nm





#### 11 - Bolt

- Always renew after removing

#### 12 - Self-locking nut

- Always renew after removing
- M12 × 1.5: 70 Nm + 180°
- M16 × 1.5: 240 Nm

#### 13 - Bonded rubber bush

- Renewing ⇒ [page 104](#) .

#### 14 - Bolt

- Always renew after removing

#### 15 - Shackle

- Before installing leaf spring, secure to leaf spring in installation position (must be positioned vertically to leaf spring)

#### 16 - Rear axle

- With rear axle shafts and wheel bearings
- Removing and installing ⇒ Rep. gr. 39 ; rear axle
- Removing and installing final drive ⇒ Rep. gr. 39 ; Final drive

#### 17 - Nut

- Renew after removing
- M14 × 1.5: 160 Nm

#### 18 - Brake caliper

- Removing and installing ⇒ Rep. gr. 46 ; Repairing rear brakes

#### 19 - Bolt

- Always renew after removing

#### 20 - Nut

- Always renew after removing
- 105 Nm

#### 21 - Bolt

- Always renew after removing
- M14 × 1.5 × 110: 106 Nm
- M14 × 1.5 × 160: 135 Nm

#### 22 - Shock absorber

- Allocation ⇒ Electronic Parts Catalogue "ETKA"

#### 23 - Propshaft

- Before removing, mark position relative to final drive flange.

#### 24 - Bolt

- Always renew after removing
- Specified torque: ⇒ Rep. gr. 39 ; propshaft

#### 25 - Leaf spring

- Removing and installing ⇒ [page 98](#) .
- Allocation ⇒ Electronic Parts Catalogue "ETKA"

#### 26 - Bump stop

- Can be removed from or pushed onto leaf spring support position

#### 27 - Damper weight

- Pressed onto leaf spring
- Not available as replacement part



## 1.2 Assembly overview - rear axle, vehicles with twin wheels



### WARNING

- ◆ *It is not permitted to carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.*
- ◆ *Always renew self-locking nuts and bolts.*
- ◆ *Always renew corroded nuts and bolts.*



### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) ⇒ [page 2](#).*

### 1 - Bump stop

- Allocation ⇒ Electronic Parts Catalogue "ET-KA".



#### Note

*The stop buffer for the Crafter 4MOTION with Achleitner four-wheel drive is bigger in size, but the removal and installation procedure is identical.*

- Removing and installing ⇒ [page 98](#)

### 2 - U bolt

- Different sizes. To allocate correctly, length must be measured ⇒ [page 97](#)
- Allocation ⇒ Electronic Parts Catalogue "ET-KA".

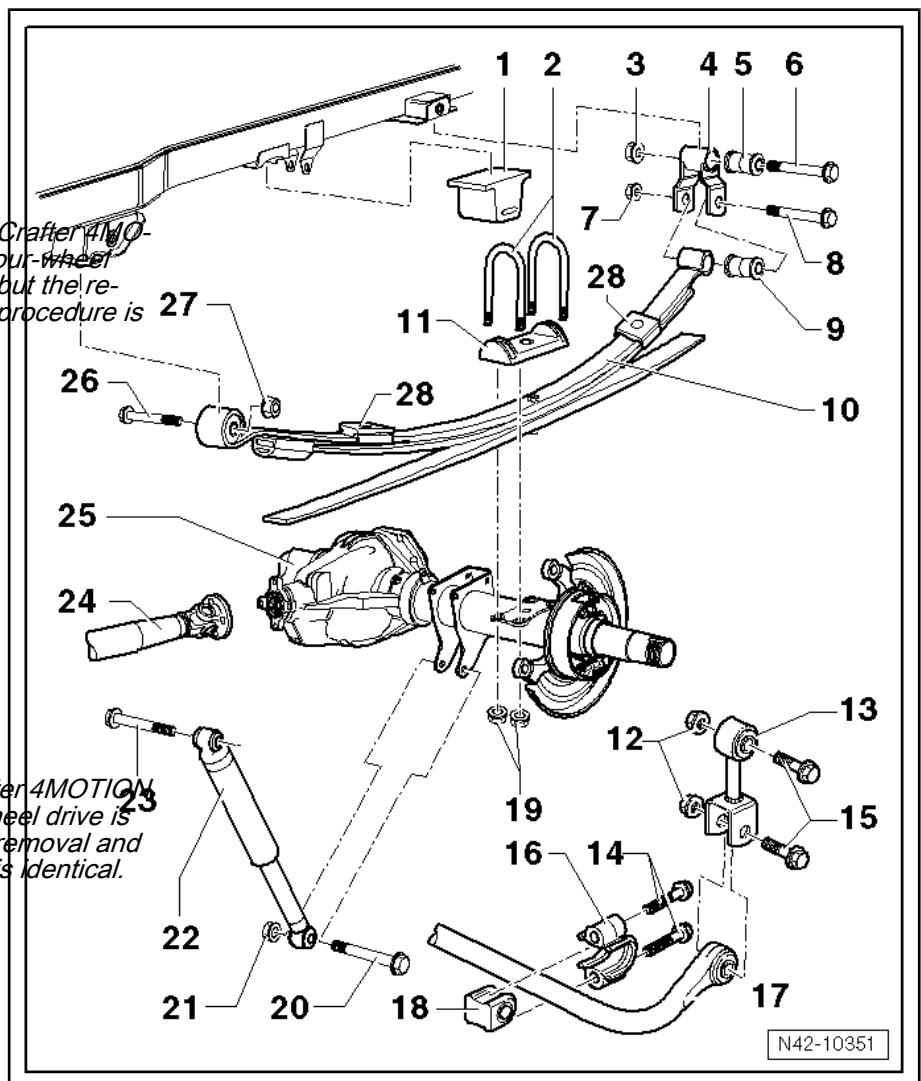


#### Note

*The U bolt for the Crafter 4MOTION with Achleitner four-wheel drive is bigger in size, but the removal and installation procedure is identical.*

### 3 - Nut

- Always renew after removing
- M12 × 1.5: 90 Nm
- M16 × 1.5: 185 Nm





#### 4 - Shackle

- Removing and installing ⇒ [page 106](#)

#### 5 - Rubber bush for shackle

- Renewing ⇒ [page 107](#) .

#### 6 - Bolt

- Always renew after removing

#### 7 - Nut

- Always renew after removing
- M12 × 1.5: 85 Nm
- M16 × 1.5: 185 Nm

#### 8 - Bolt

- Always renew after removing

#### 9 - Rubber bush for leaf spring

- Renewing ⇒ [page 104](#) .

#### 10 - Leaf spring

- Allocation ⇒ Electronic Parts Catalogue “ETKA” .
- Removing and installing ⇒ [page 100](#)

#### 11 - Saddle plate

- Allocation ⇒ Electronic Parts Catalogue “ETKA” .

#### 12 - Nut

- Always renew after removing
- 106 Nm

#### 13 - Coupling rod

- Allocation ⇒ Electronic Parts Catalogue “ETKA”



#### Note

*The coupling rods must have the same length on both sides.*

- Removing and installing ⇒ [page 116](#)
- Removing and installing, Crafter 4MOTION with Achleitner four-wheel drive ⇒ [page 118](#) .

#### 14 - Bolt

- Always renew after removing
- M10 × 1.5: 60 Nm
- M12 × 1.5: 120 Nm

#### 15 - Bolt

- Always renew after removing

#### 16 - Clamp

#### 17 - Anti-roll bar

- Removing and installing ⇒ [page 116](#)

#### 18 - Rubber mounting

#### 19 - Nut

- Always renew after removing
- 160 Nm

#### 20 - Bolt

- Always renew after removing



### 21 - Nut

- Always renew after removing
- M12 × 1.5: 106 Nm
- M14 × 1.5: 135 Nm

### 22 - Shock absorber

- Allocation ⇒ Electronic Parts Catalogue "ETKA" .
- Removing and installing ⇒ [page 124](#) .

### 23 - Bolt

- Always renew after removing
- M14 × 1.5 × 110: 106 Nm
- M14 × 1.5 × 160: 135 Nm

### 24 - Propshaft

- Before removing, mark position relative to final drive flange.
- Removing and installing ⇒ Rep. gr. 39 ; propshaft

### 25 - Rear axle

- Removing and installing ⇒ Rep. gr. 39 ; rear axle
- Removing and installing final drive ⇒ Rep. gr. 39 ; Final drive

### 26 - Bolt

- Always renew after removing

### 27 - Nut

- Always renew after removing
- 185 Nm

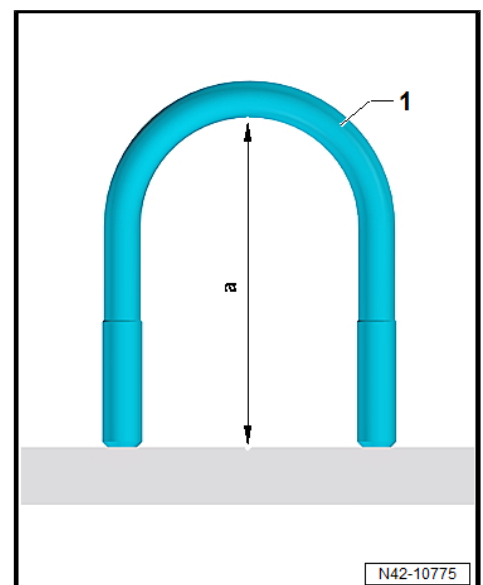
### 28 - Damper weight

- Pressed onto leaf spring
- Not available as replacement part

## 1.3 Measuring length on U-bolt

To allocate U-bolt in ⇒ Electronic parts catalogue "ETKA" , length of U-bolt must be measured.

- U-bolt removed
- Place U-bolt upwards on a level surface.
- Measure dimension -a- between inner radius and level surface.
- Used measured dimension -a- to allocate U-bolt in ⇒ Electronic parts catalogue "ETKA" .





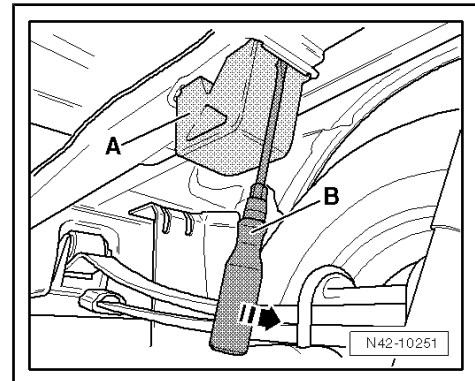
## 1.4 Removing and installing leaf spring stop buffer

### Removing

- Position screwdriver -B- along side between bump stop -A- and mounting on chassis.
- Push bump stop -A- in direction of -arrow- and remove from mounting on chassis.

### Installing

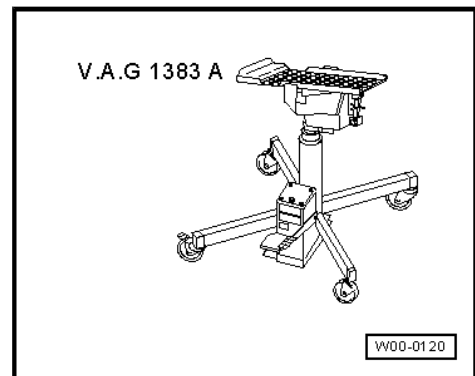
- Insert bump stop -5- into mounting on chassis.
- Compress base of bump stop -A- together, in direction of -arrow- using a screwdriver -B-, and lock it into mounting.



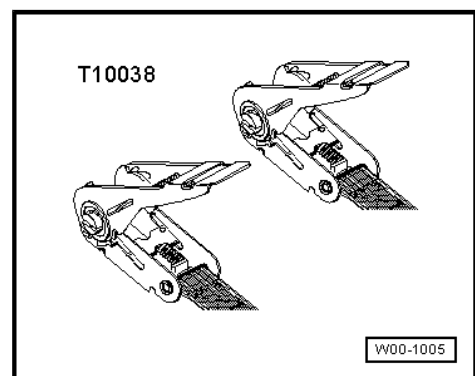
## 1.5 Removing and installing leaf spring

### Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-



- ◆ Tensioning strap - T10038-





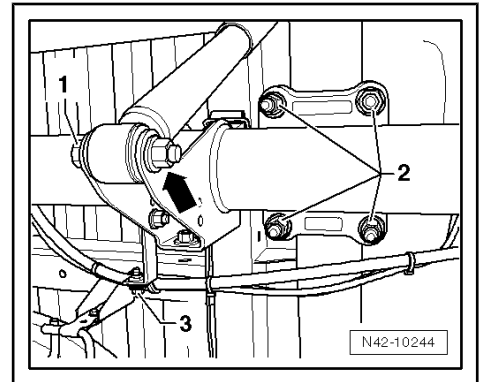
## Removing

- Undo nut -arrow- from bolt -1-.
- Remove bolt -1- with vehicle standing on its wheels.
- Loosen flange nuts -2- approx. 2 turns. Unscrew bolt -3- for parking brake cable retainer.
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

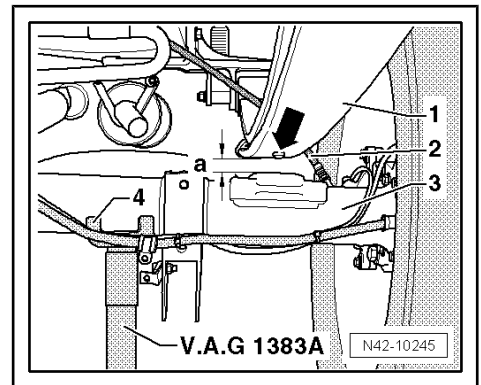


- Insert support -4- from trolley jack in engine and gearbox jack - V.A.G 1383 A- .
- Position engine and gearbox jack - V.A.G 1383 A- under rear axle and slightly take up the weight of the rear axle.
- Unscrew flange nuts from spring U-bolts.
- Remove U-bolts and saddle plate from leaf spring -1-.
- Lower axle beam -3- to dimension -a- ≈ 20 mm.



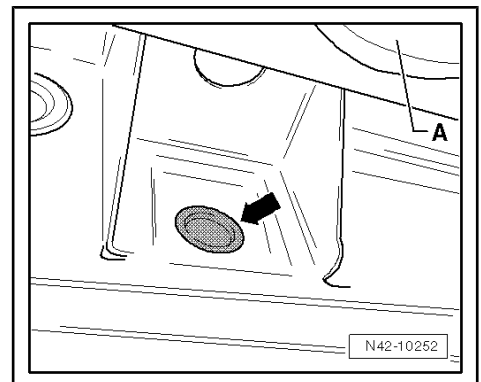
### Note

- ◆ *Leaf spring bolt -arrow- must slide out of hole in axle beam; lever out if necessary.*
- ◆ *The brake hose -2- must not be twisted.*
- Unbolt leaf spring from mounting points on frame.



### Note

*In certain vehicles, cover cap -arrow- must be removed to enable removal of rear securing bolt for leaf spring -A-.*





- Then turn leaf spring -1- 180° and remove to rear.

### Installing

Install in reverse order. Note the following points:



#### Note

Install larger mounting eye forwards.



#### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in unladen position) => [page 2](#).*

- The spring bolt of the leaf spring must be inserted into the aperture in the axle beam.

#### Specified torques

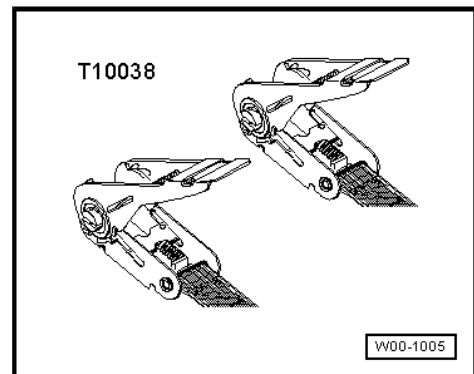
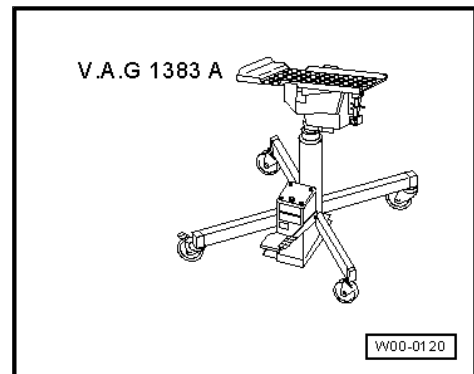
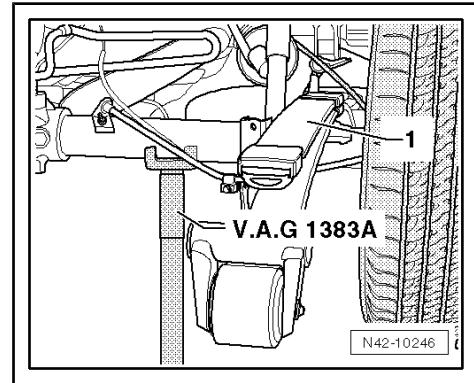
- ◆ => ["1.1 Assembly overview - rear axle", page 92](#)

## 1.6 Removing and installing leaf spring, vehicles with twin wheels

#### Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-

- ◆ Tensioning strap - T10038-





## Removing



### Note

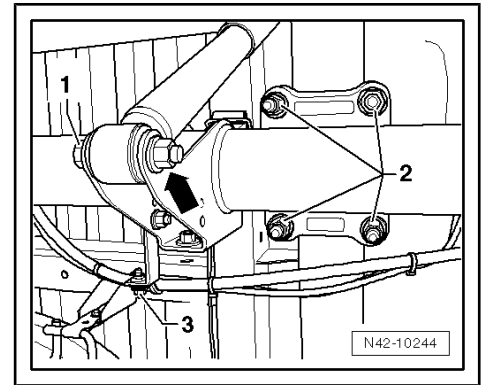
If components with bonded rubber bushes are renewed or nuts or bolts on these components are loosened, the unladen position must be measured before starting work ⇒ [page 2](#).

- Remove nut -arrow- from shock absorber bolt -1-.
- Remove bolt -1- with vehicle standing on its wheels.
- Loosen nuts -2- approx. 2 turns.
- Loosen wheel nuts.
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2.

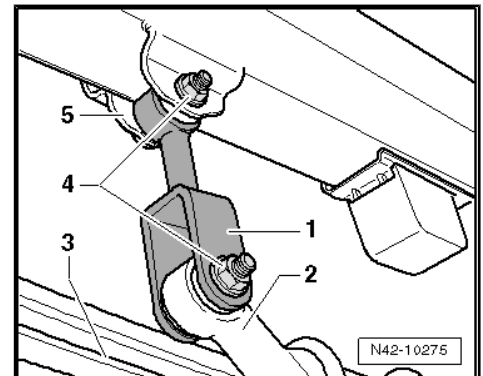


### WARNING

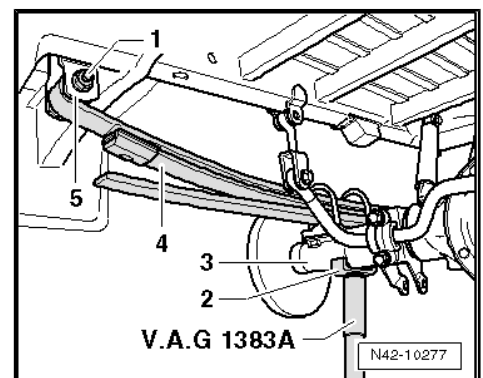
If the vehicle is not strapped down, it may slip off the lifting platform.



- Remove wheel.
- Remove brake caliper ⇒ Brake system; Rep. gr. 46 .
- Unscrew upper nut -4- and remove coupling rod -1- from bracket -5-.

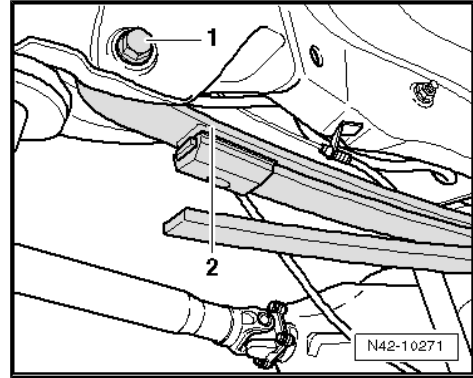


- Insert support -2- from trolley jack in engine and gearbox jack - V.A.G 1383 A- .
- Position engine and gearbox jack - V.A.G 1383 A- beneath axle beam -3- and exert slight counter pressure.
- Remove nuts from U-bolts.
- Remove bolt -1- from shackle -5-.
- Remove U-bolts and saddle plate from leaf spring -4-.





- Remove front bolt -1- from leaf spring -2-.



- Lower axle beam until leaf spring -1- can be turned 180°.
- Remove leaf spring rearwards.

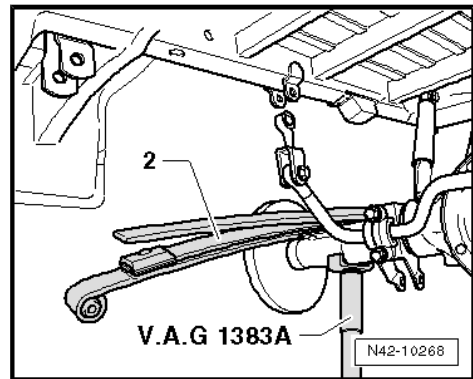
### Installing

Install in reverse order. Note the following points:



#### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) ⇒ [page 2](#) .*



#### Note

*If the springs eyes differ in size, the larger spring eye must always point forwards in direction of travel.*

- The spring bolt of the leaf spring must be inserted into the aperture in the axle beam.
- Install brake caliper ⇒ Brake system; Rep. gr. 46 .
- Fit wheel ⇒ [page 135](#) .

### Specified torques

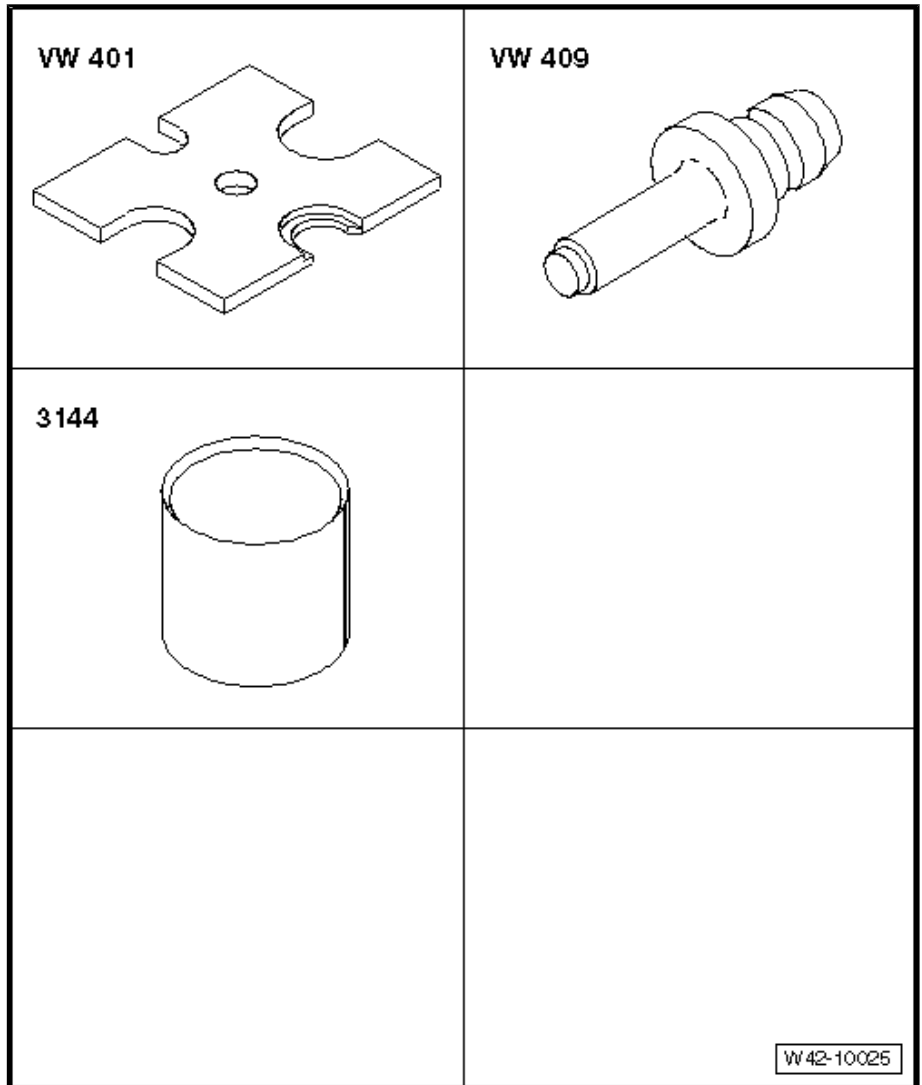
- ♦ ⇒ ["1.2 Assembly overview - rear axle, vehicles with twin wheels"](#), [page 95](#)

## 1.7 Renewing leaf spring rubber bush

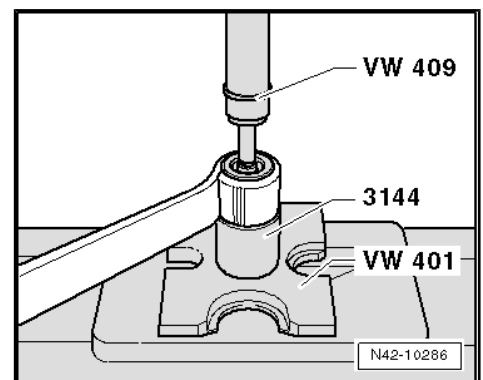


**Special tools and workshop equipment required**

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 409-
- ◆ Sleeve - 3144-



- Remove rear leaf spring ⇒ [page 98](#) .
- Press out rubber bush.



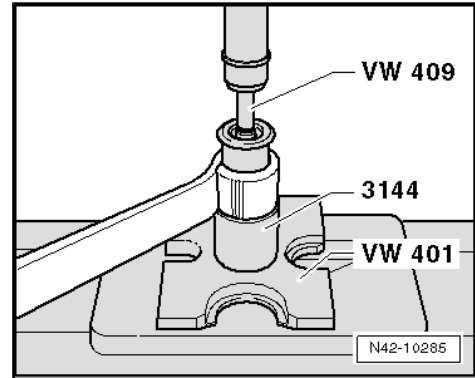


Before pressing in new rubber bush, coat it with acid-free lubricant, e.g. soft soap.

- Press rubber bush in until shoulders project evenly on both sides.
- Install rear leaf spring ⇒ [page 98](#) .

#### Specified torques

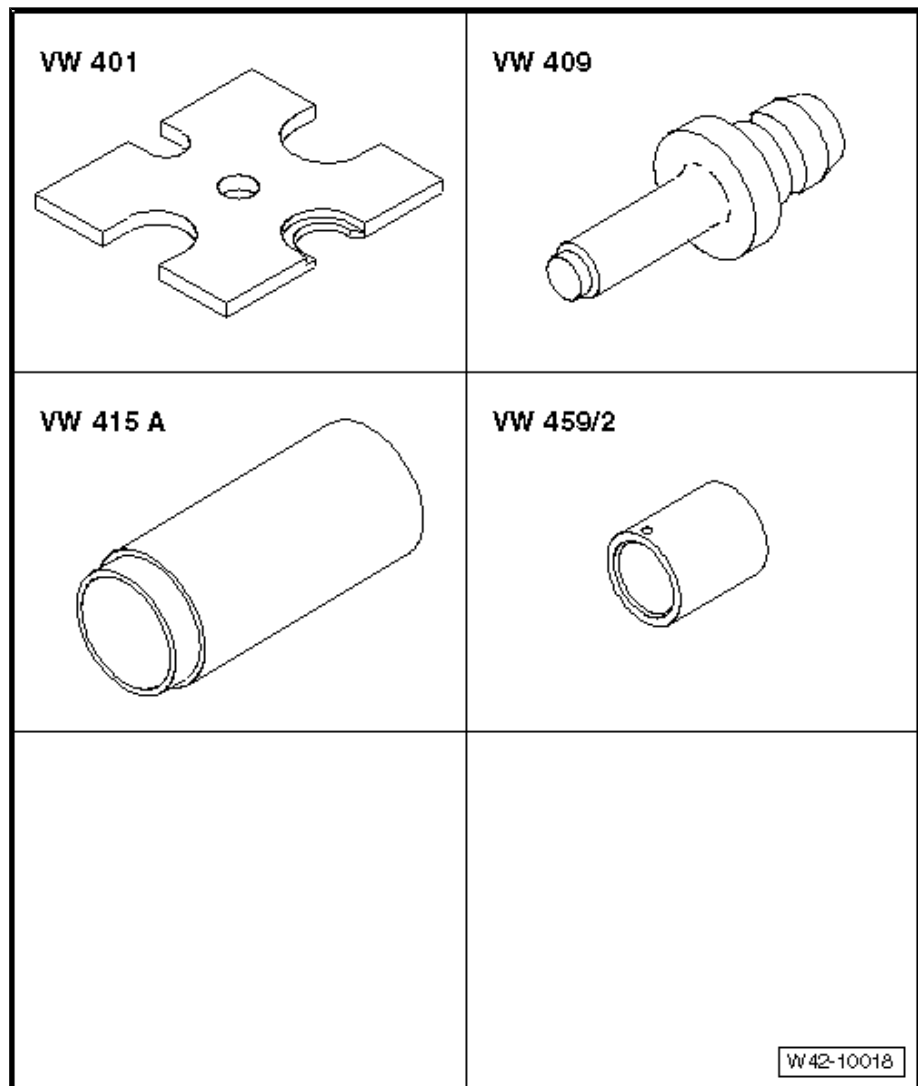
- ◆ ⇒ ["1.1 Assembly overview - rear axle", page 92](#)



## 1.8 Renewing leaf spring rubber bush

#### Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 409-
- ◆ Tube - VW 415 A-
- ◆ Removing and installing tool - VW 459/2-

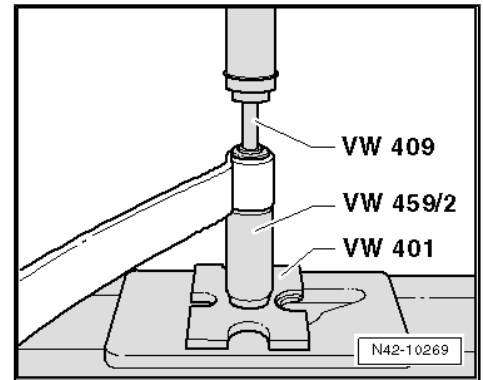


- Remove rear leaf spring ⇒ [page 100](#) .



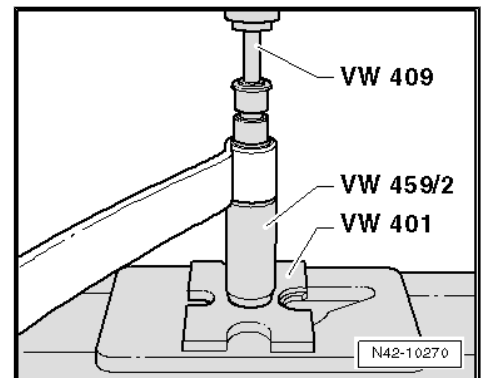
### Renewing large rubber bush:

- Press out rubber bush.



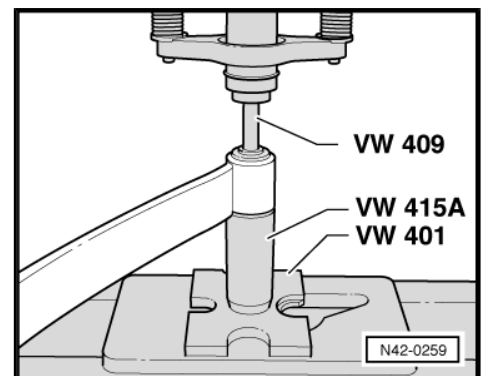
Before pressing in new rubber bush, coat it with acid-free lubricant, e.g. soft soap.

- Press in rubber bush until shoulders project evenly on both sides.



### Renewing small rubber bush:

- Press out rubber bush.

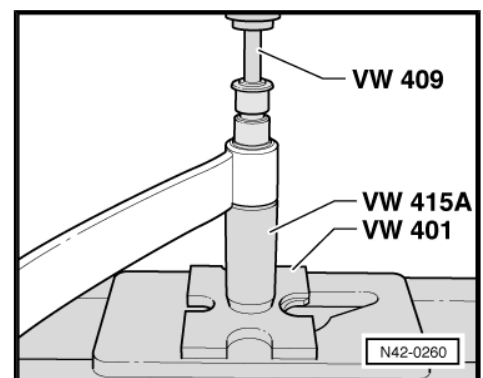


Before pressing in new rubber bush, coat it with acid-free lubricant, e.g. soft soap.

- Press in rubber bush until shoulders project evenly on both sides.
- Install rear leaf spring ⇒ [page 100](#) .

### Specified torques

- ◆ ⇒ [“1.2 Assembly overview - rear axle, vehicles with twin wheels”, page 95](#)





## 1.9 Removing and installing shackle, vehicles with twin wheels

### Removing



#### Note

If components with bonded rubber bushes are renewed or nuts or bolts on these components are loosened, the unladen position must be measured before starting work ⇒ [page 2](#).

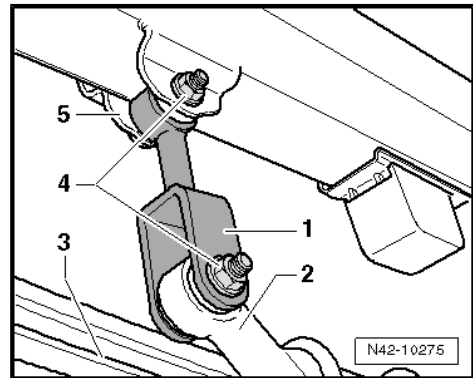
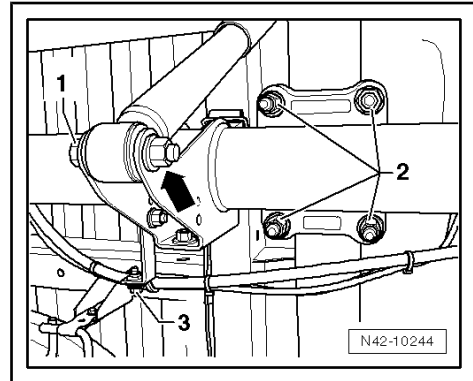
- Remove nut -arrow- from shock absorber bolt -1-.
- Remove bolt -1- with vehicle standing on its wheels.
- Loosen wheel nuts.
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



#### WARNING

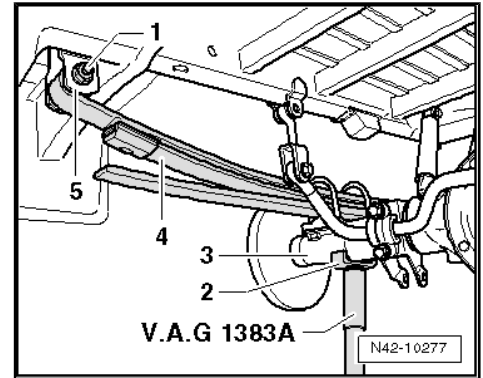
If the vehicle is not strapped down, it may slip off the lifting platform.

- Remove wheel.
- Remove brake caliper ⇒ Brake system; Rep. gr. 46 .
- Unscrew upper nut -4- and remove coupling rod -1- from bracket -5-.





- Insert support -2- from trolley jack in engine and gearbox jack - V.A.G 1383 A- .
- Position engine and gearbox jack - V.A.G 1383 A- beneath axle beam -3- and exert slight counter pressure.
- Remove bolt -1- from shackle -5-.
- Lower axle beam -3- together with leaf spring -4-.
- Unscrew upper bolt from shackle and remove shackle.



### Installing

Install in reverse order. Note the following points:



#### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) ⇒ [page 2](#) .*

- The spring bolt of the leaf spring must be inserted into the aperture in the axle beam.
- Install brake caliper ⇒ Brake system; Rep. gr. 46 .
- Fit wheel ⇒ [page 135](#) .

### Specified torques

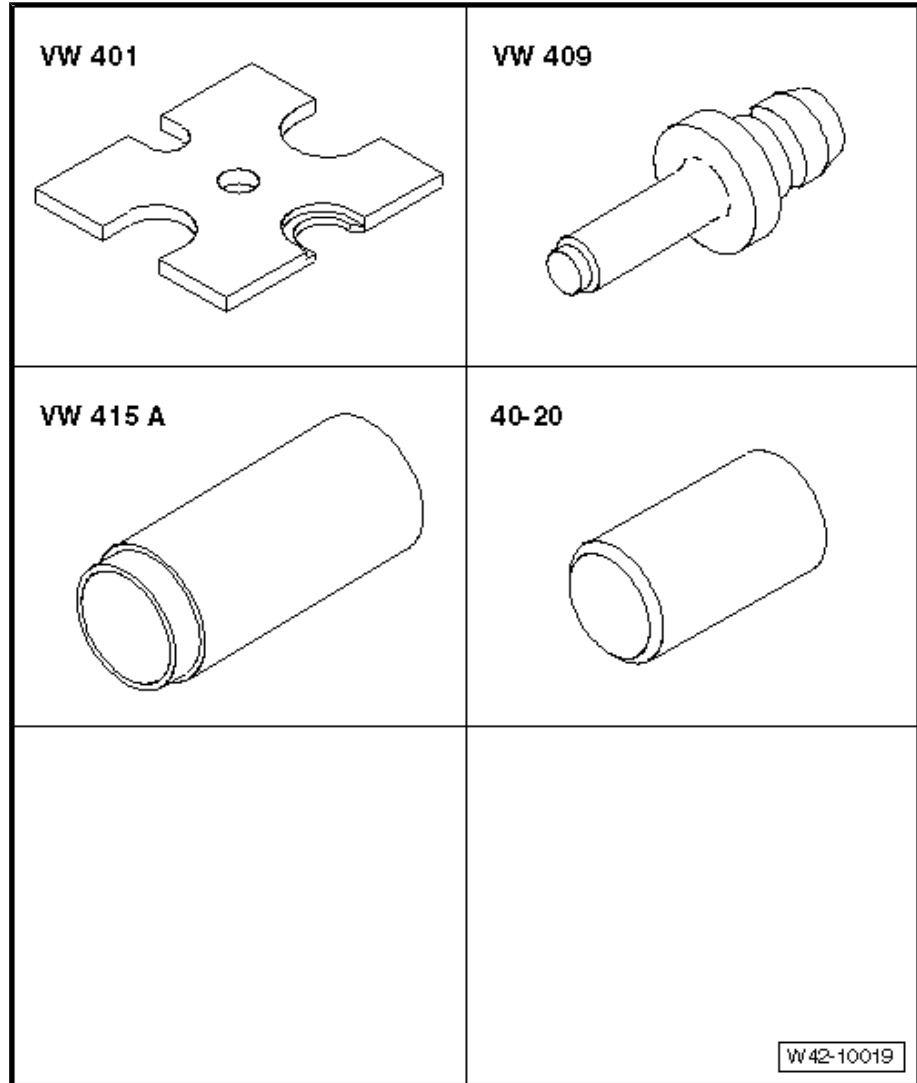
- ◆ ⇒ [“1.2 Assembly overview - rear axle, vehicles with twin wheels”, page 95](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

## 1.10 Renewing shackle rubber bush, vehicles with twin wheels

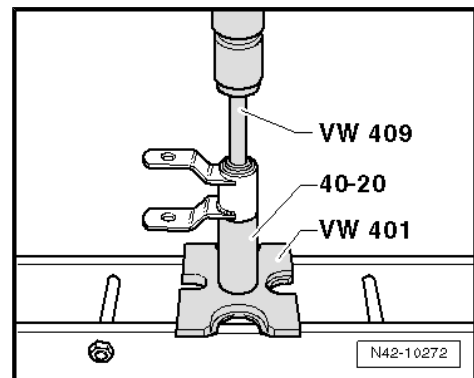


**Special tools and workshop equipment required**

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 409-
- ◆ Tube - VW 415 A-
- ◆ Drift sleeve - 40-20-



- Remove shackle ⇒ [page 106](#) .
- Press out rubber bush.



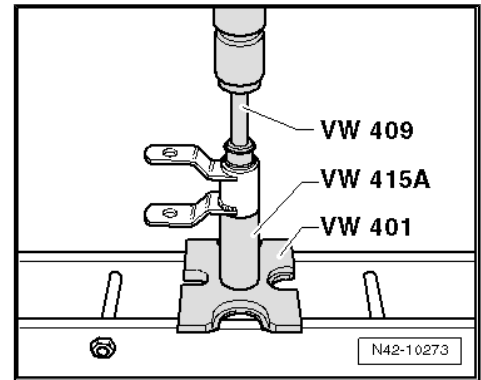


Before pressing in new rubber bush, coat it with acid-free lubricant, e.g. soft soap.

- Press in rubber bush until shoulders project evenly on both sides.
- Install shackle ⇒ [page 106](#) .

#### Specified torques

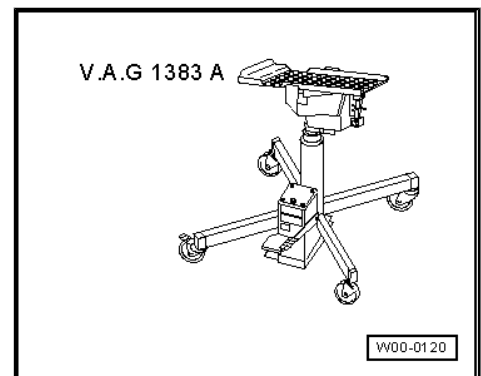
- ◆ ⇒ [“1.2 Assembly overview - rear axle, vehicles with twin wheels”, page 95](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)



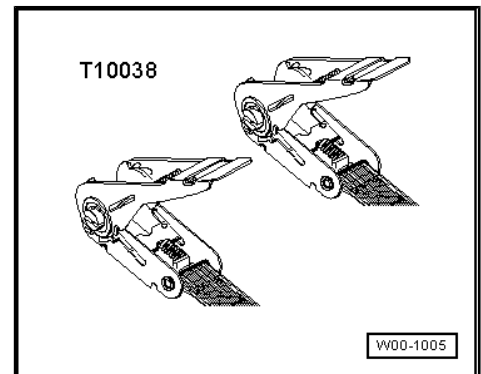
## 1.11 Removing and installing spring bracket

### Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-



- ◆ Tensioning strap - T10038-



### Removing

- Remove lower securing bolt for shock absorber ⇒ [page 99](#) .
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



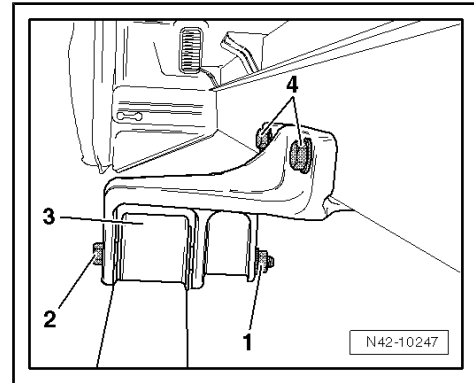
#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Insert support from trolley jack in engine and gearbox jack - V.A.G 1383 A- ⇒ [page 99](#) .
- Position engine and gearbox jack - V.A.G 1383 A- beneath axle beam and exert slight counter pressure.



- Unscrew nut -1- from bolt -2-.
- Then lower axle beam with leaf spring -3- using engine and gearbox jack - V.A.G 1383 A- until bolt -2- can be pulled out.
- Remove bolts -4-; counterhold at nuts to do this.



- Unscrew last bolt -arrow- and remove spring bracket -A-.

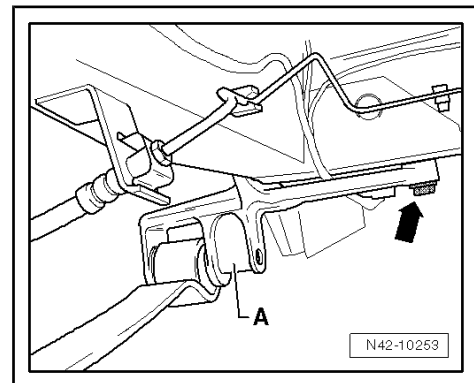
### Installing

Install in reverse order. Note the following points:



### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) => [page 2](#).*



### Note

*Always renew self-locking nuts and bolts.*

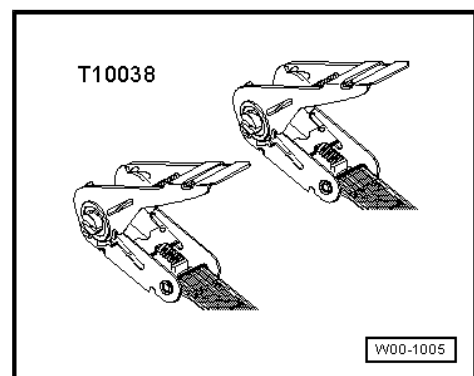
### Specified torques

- ◆ => ["1.1 Assembly overview - rear axle", page 92](#)
- ◆ => ["1.1 Specified torque for wheel bolts", page 135](#)

## 1.12 Removing and installing rear axle shaft

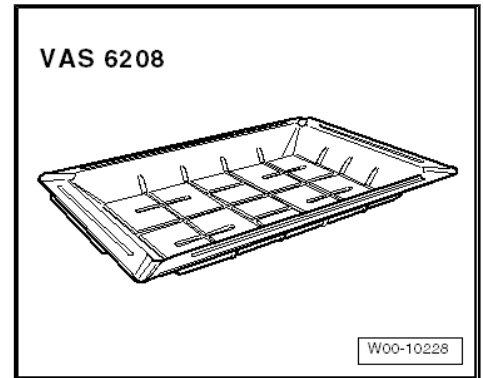
### Special tools and workshop equipment required

- ◆ Tensioning strap - T10038-






- ◆ Drip tray for workshop hoist - VAS 6208-



### Removing

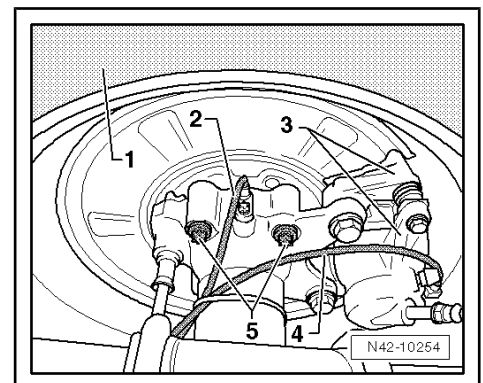
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove wheel -1-.
- Release speed sensor wiring -2- from axle beam.
- Remove brake caliper complete with brake carrier -3- and secure it to body ⇒ Brake systems; Rep. gr. 46 ; Front wheel brake; Removing and installing brake caliper .



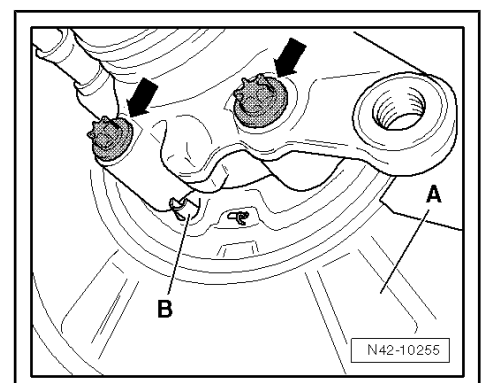
### Note

*When doing this ensure that the electrical wiring for the brake wear indicator -4- is not damaged.*

- Remove brake disc and brake shoes for handbrake ⇒ Braking system; Rep. gr. 46 ; Rear brake; Removing and installing brake shoes .
- Remove bolts -5-.
- Remove bolts -arrows-.
- Place a drip tray for workshop hoist - VAS 6208- under area of rear axle shaft and pull rear axle shaft out of axle beam.
- Remove brake disc splash plate -A- from axle beam.

### Note

*Clean oil drain channel -B- before re-installing rear axle shaft.*



### Installing

Install in reverse order. Note the following points:

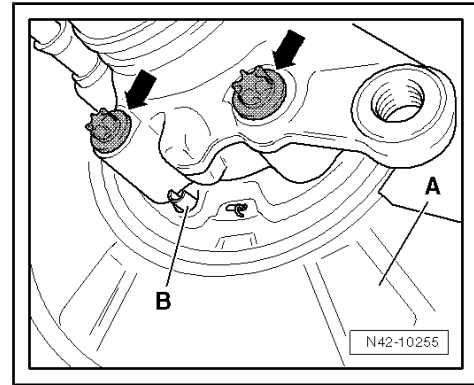


- Position brake disc splash plate -A- on axle beam.
- Install rear axle shaft in axle beam.
- Tighten new bolts -arrows- diagonally.



#### Note

- ◆ *When installing rear axle shaft, oil drain channel -B- must be guided through splash plate for brake disc. Oil drain channel points downwards.*
- ◆ *After installing shaft in rear axle beam, check oil level in rear final drive and replenish as necessary ⇒ Rep. gr. 39 ; Axle oil; Checking axle oil level .*



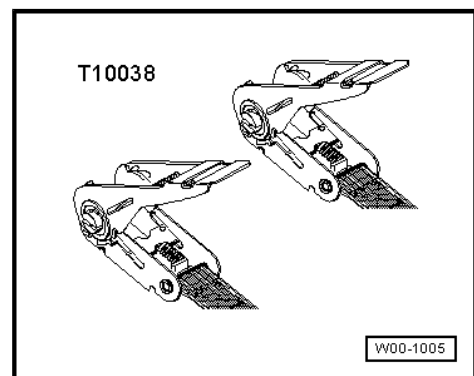
#### Specified torques

- ◆ ⇒ ["4.1 Assembly overview - wheel bearing assembly", page 126](#)
- ◆ ⇒ ["1.1 Specified torque for wheel bolts", page 135](#)

### 1.13 Removing and installing rear axle shaft, vehicles with twin wheels

#### Special tools and workshop equipment required

- ◆ Tensioning strap - T10038-



#### Removing

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*



- Remove nuts -1-.
- Position dip tray under rear axle shaft area and pull rear axle shaft -2- out of axle beam.

### Installing

Install in reverse order. Note the following points:



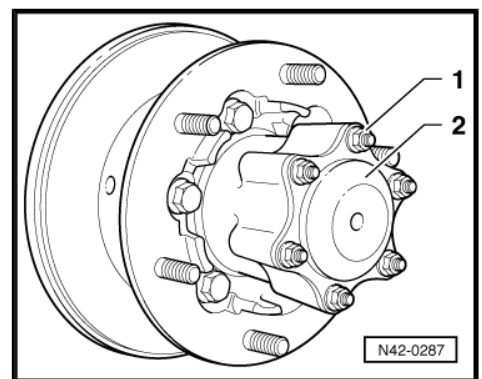
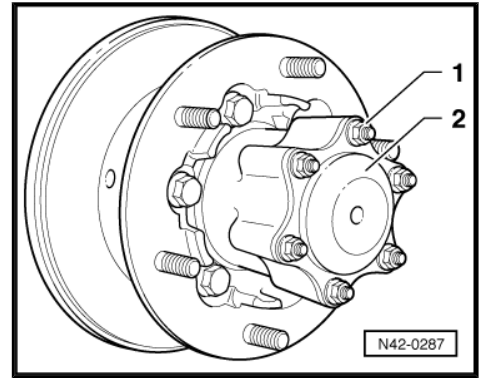
#### Note

- ◆ Always renew self-locking nuts and bolts.
- ◆ After installing shaft in rear axle beam, check oil level in rear final drive and replenish as necessary ⇒ Transmission; Rep. gr. 39 ; Checking oil in rear final drive .

- Coat sealing surface of rear axle shaft with sealant ⇒ Electronic Parts Catalogue (ETKA) .
- Install rear axle shaft -2- and tighten new nuts -1- diagonally.

### Specified torques

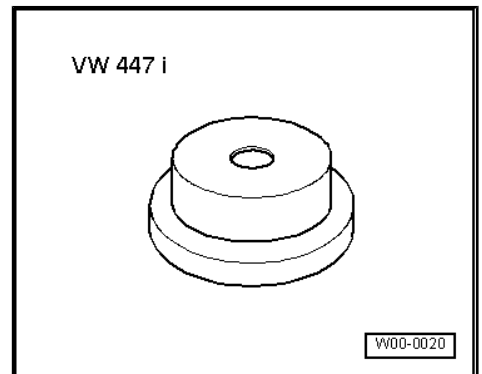
- ◆ ⇒ [“4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels”, page 127](#)



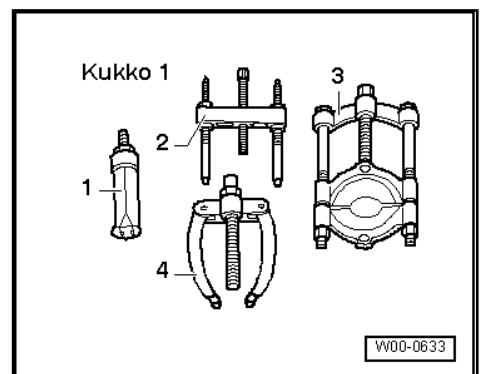
## 1.14 Renewing shrink ring, vehicles with twin wheels

### Special tools and workshop equipment required

- ◆ Thrust washer - VW 447 i-



- ◆ -3- Splitter - Kukko 17/2-





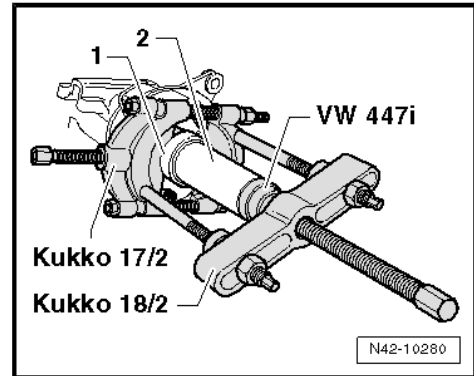
- ◆ -2- Puller - Kukko 18/2-
- Remove brake shoes for handbrake ⇒ Brakes - mechanism; Rep. gr. 46 ; Removing and installing brake shoes for handbrake .
- Remove rear wheel hub ⇒ [page 131](#) .

Position separator - Kukko 17/2- and puller - Kukko 18/2- as illustrated and pull shrink ring -1- off axle tube -2-.

- Heat new shrink ring to approx. 80 °C and push onto axle tube to stop.
- Install brake shoes for handbrake ⇒ Brakes - mechanism; Rep. gr. 46 ; Removing and installing brake shoes for handbrake .
- Install rear wheel hub ⇒ [page 131](#) .

#### Specified torques

- ◆ ⇒ [“4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels”, page 127](#)





## 2 Anti-roll bar

- ⇒ [“2.1 Assembly overview - anti-roll bar”, page 115](#)
- ⇒ [“2.2 Assembly overview - anti-roll bar, vehicles with twin wheels”, page 116](#)
- ⇒ [“2.3 Removing and installing anti-roll bar”, page 116](#)
- ⇒ [“2.4 Removing and installing anti-roll bar, vehicles with twin wheels”, page 117](#)
- ⇒ [“2.5 Removing and installing coupling rods, Crafter 4MOTION with Achleitner four-wheel drive”, page 118](#)
- ⇒ [“2.6 Renewing anti-roll bar bushes, vehicles with twin wheels”, page 120](#)
- ⇒ [“2.7 Renewing coupling rod bushes, vehicles with twin wheels”, page 122](#)

### 2.1 Assembly overview - anti-roll bar

#### 1 - Bolt

- Always renew after removing
- 106 Nm

#### 2 - Coupling rod



#### Note

*Coupling rods are adjustable. They must have the same length on both sides.*

- Removing and installing  
⇒ [page 116](#)
- Removing and installing, only Crafter 4MOTION with Achleitner four-wheel drive  
⇒ [page 118](#).

#### 3 - Nut

- Always renew after removing
- 106 Nm

#### 4 - Bolt

#### 5 - Bolt

- Always renew after removing
- M10: 60 Nm
- M12: 120 Nm

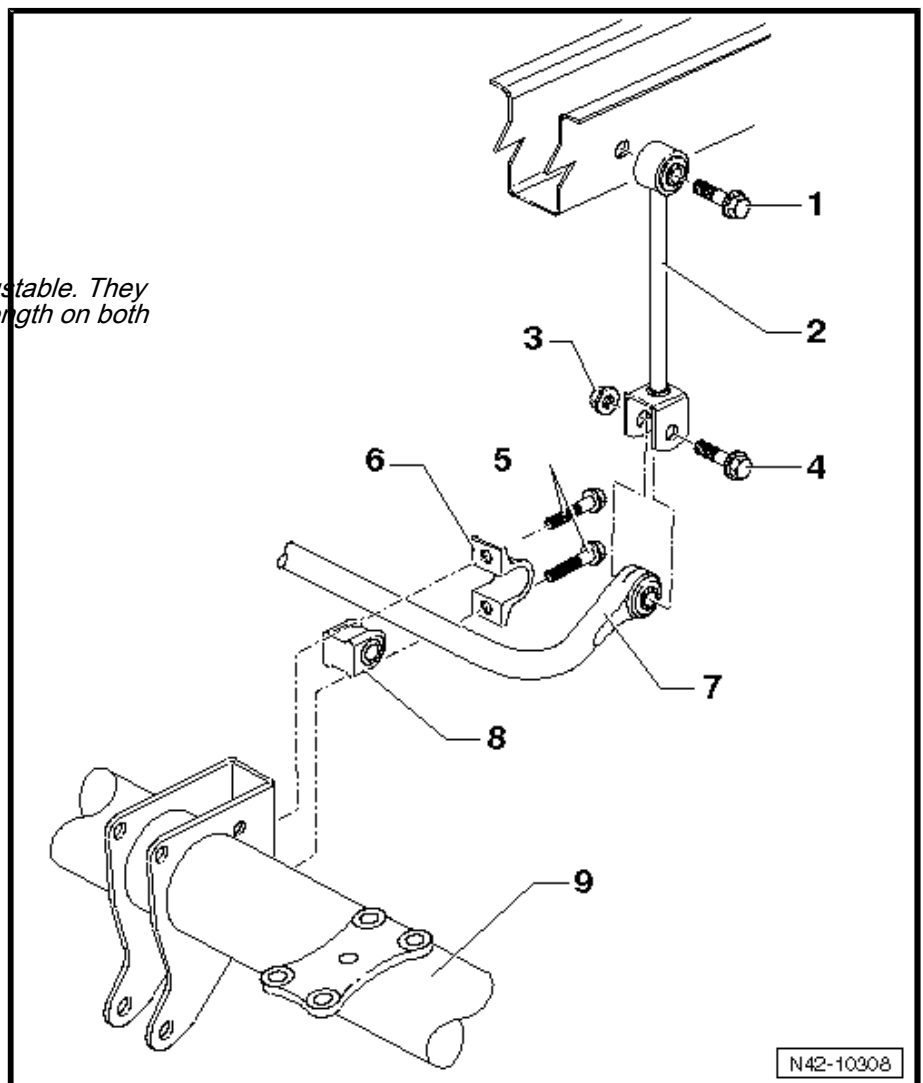
#### 6 - Clamp

#### 7 - Anti-roll bar

- Removing and installing  
⇒ [page 116](#)

#### 8 - Rubber mounting

#### 9 - Rear axle





## 2.2 Assembly overview - anti-roll bar, vehicles with twin wheels

### 1 - Bracket for coupling rod

- ❑ Welded to vehicle frame.

### 2 - Nut

- ❑ Always renew after removing
- ❑ 106 Nm

### 3 - Bolt

### 4 - Clamp

### 5 - Bolt

- ❑ Always renew after removing
- ❑ M10: 60 Nm
- ❑ M12: 120 Nm

### 6 - Coupling rod

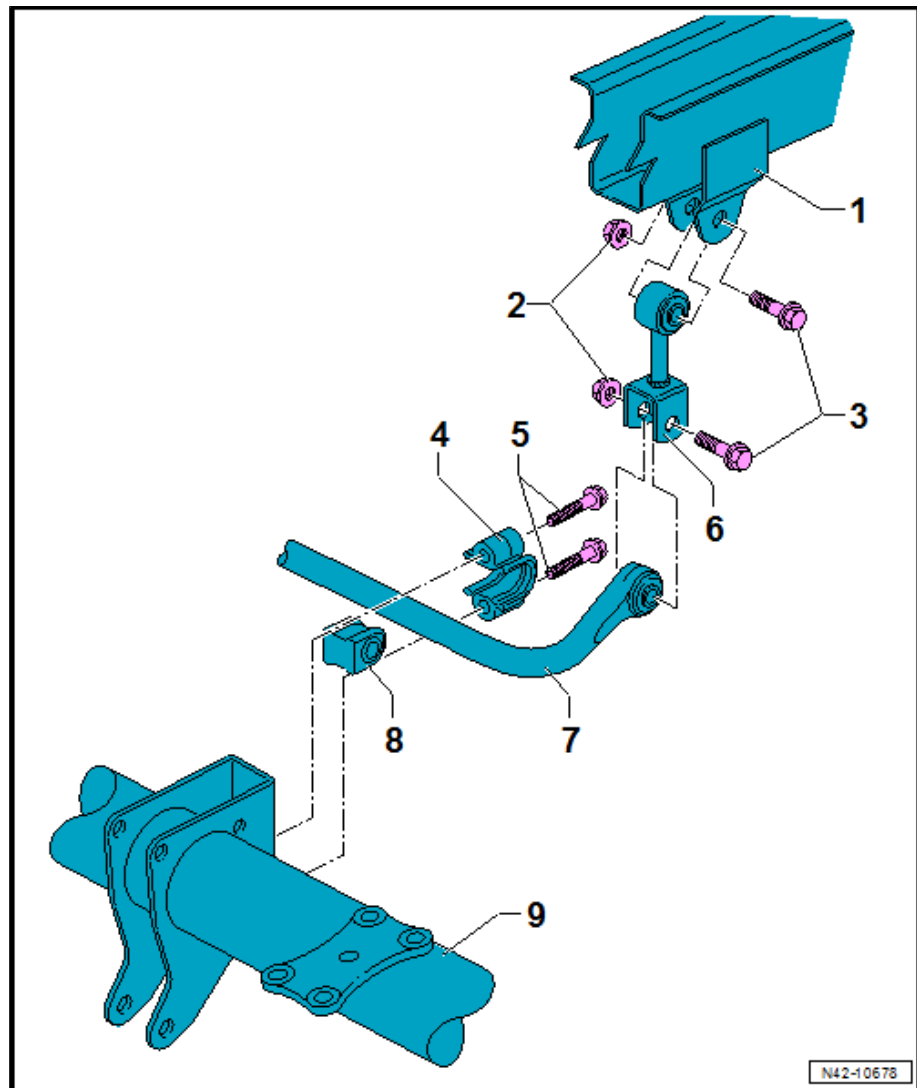
- ❑ Renewing rubber bush  
⇒ [page 122](#)
- ❑ Removing and installing  
⇒ [page 117](#)

### 7 - Anti-roll bar

- ❑ Renewing rubber bush  
⇒ [page 120](#)
- ❑ Removing and installing  
⇒ [page 117](#)

### 8 - Rubber mounting

### 9 - Rear axle



## 2.3 Removing and installing anti-roll bar

### Removing



#### Note

- ◆ Renew anti-roll bar if corrosion protective layer is damaged.
  - ◆ If components with bonded rubber bushes are renewed or nuts or bolts on these components are loosened, the unladen position must be measured before starting work ⇒ [page 2](#).
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2.

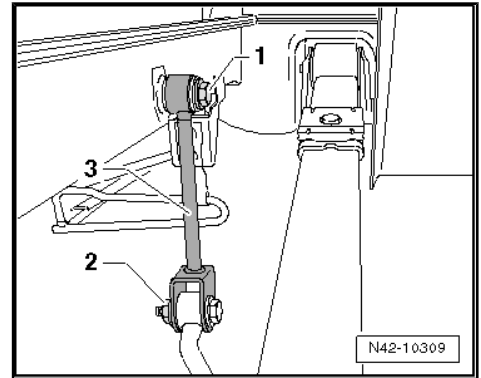


#### WARNING

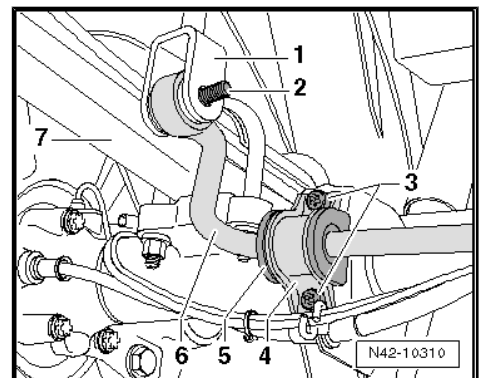
If the vehicle is not strapped down, it may slip off the lifting platform.



- Remove bolt -1-.
- Unscrew nut -2-.
- 3 - Coupling rod



- Swing anti-roll bar -5- together with coupling rod -1- downwards until lower bolt -2- can be pulled out (past spring -6-).
- Remove bolts -3-.
- Remove clamp -4- and rubber bush -5-.
- Remove anti-roll bar downwards.



### Installing

Install in reverse order. Note the following points:

**Caution**

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) ⇒ [page 2](#).*

- Centre anti-roll bar before tightening clamps. The anti-roll bar must be aligned at 90° to contact surface and installed.
- Then connect the anti-roll bar to the coupling rod.

### Specified torques

- ◆ ⇒ [“2.1 Assembly overview - anti-roll bar”, page 115](#)

## 2.4 Removing and installing anti-roll bar, vehicles with twin wheels

### Removing

**Note**

*If components with bonded rubber bushes are renewed or nuts or bolts on these components are loosened, the unladen position must be measured before starting work ⇒ [page 2](#).*

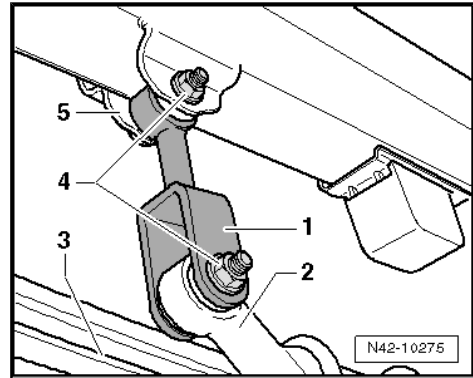
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2.

**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*



- Unscrew nuts -4-.
- Remove upper bolt from coupling rod bracket -5- and swing anti-roll bar -2- together with coupling rod -1- downwards until lower bolt can be pulled out (past spring -3-).



- Remove bolts -4-.
- Take off clamp -1- and rubber bush -3-.
- Remove anti-roll bar from below.

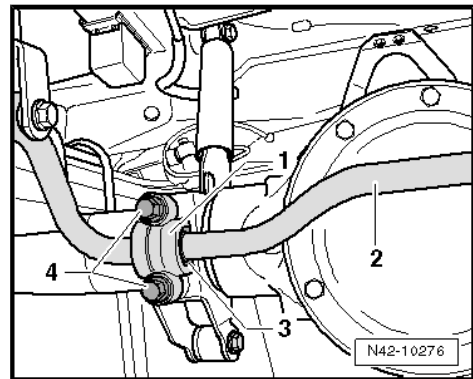
### Installing

Install in reverse order. Note the following points:



#### Caution

*Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) => [page 2](#).*



- Centre anti-roll bar before tightening clamps. The anti-roll bar must be aligned at 90° to contact surface and installed.
- Then connect the anti-roll bar to the coupling rod.



#### Note

*The coupling rods are adjustable, they must have the same length on both sides.*

### Specified torques

- ◆ => ["2.2 Assembly overview - anti-roll bar, vehicles with twin wheels", page 116](#)

## 2.5 Removing and installing coupling rods, Crafter 4MOTION with Achleitner four-wheel drive



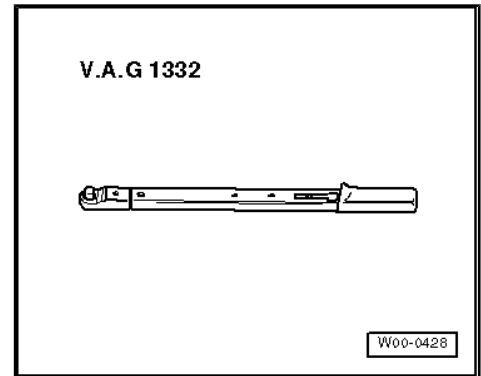
#### Note

- ◆ *Coupling rods are adjustable. They must have the same length on both sides.*
- ◆ *Renew anti-roll bar if corrosion protective layer is damaged.*
- ◆ *If components with bonded rubber bushes are renewed or nuts or bolts on these components are loosened, the unladen position must be measured before starting work => [page 2](#).*

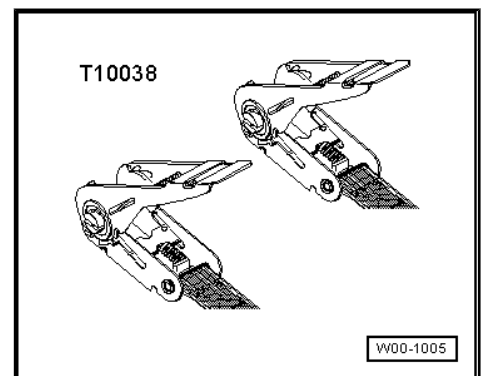
### Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1332-



- ◆ Tensioning strap - T10038-



## Removing



### Note

*The following procedure is for the left side of the vehicle. The procedure for the right side is identical.*

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*



- Remove bolt -1-.
- Unscrew nut -3-.
- Remove coupling rod -2-.

### Installing

Install in reverse order. Note the following points:



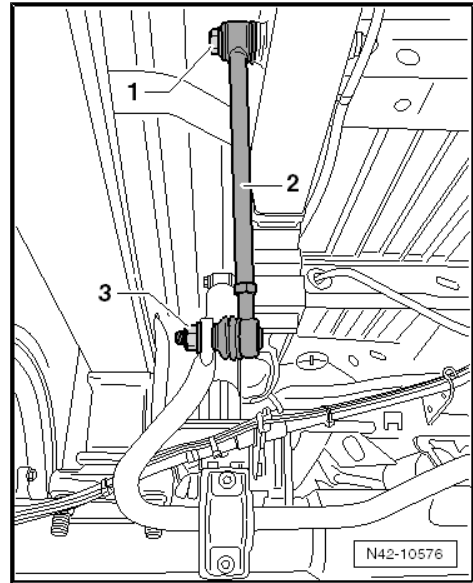
#### Note

- ◆ Check that dust caps are undamaged and correctly seated.
- ◆ Tapered pin must be free of oil and grease.
- ◆ If necessary, clean with a dry cloth but do not use cleaning solutions.



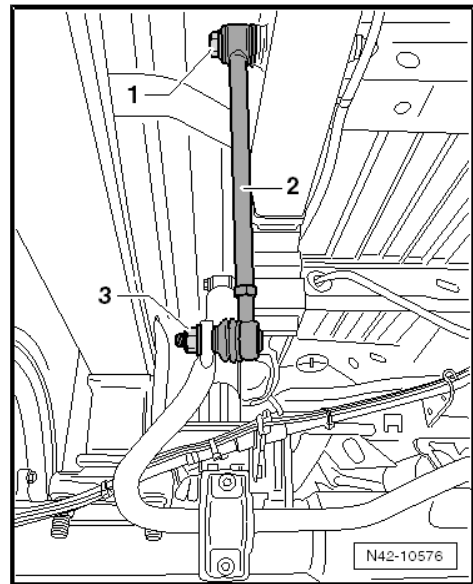
#### Caution

**Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the axle beam is raised or when the vehicle is standing on its wheels (in the unladen position) ⇒ page 2 .**



- Fit coupling rod -2-, insert bolt -1- and tighten nut first hand-tight and then to specified torque.
- Insert coupling rod -2- into anti-roll bar and tighten nut -3- first hand-tight and then to specified torque.

### Specified torques



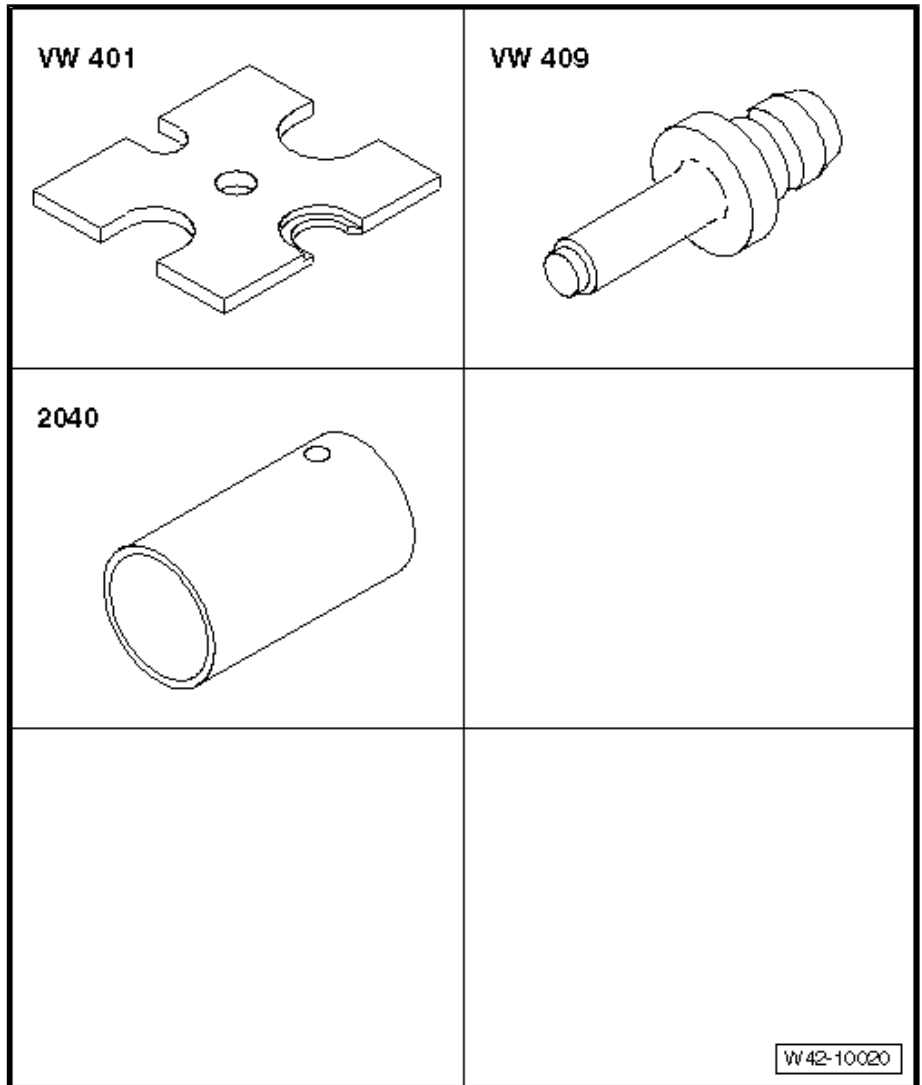
Components	Specified torque
Upper bolt with nut -1- on coupling rod ◆ Use new nut ◆ When loosening and tightening, counterhold nut.	106 Nm
Coupling rod nut -3- ◆ Use new nut	106 Nm

## 2.6 Renewing anti-roll bar bushes, vehicles with twin wheels

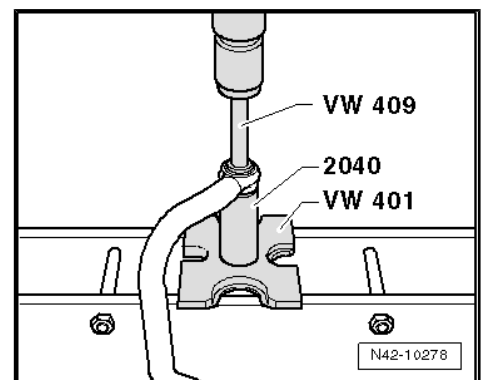


**Special tools and workshop equipment required**

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 409-
- ◆ Tube - 2040-



- Remove anti-roll bar ⇒ [page 117](#) .
- Press out rubber bush.



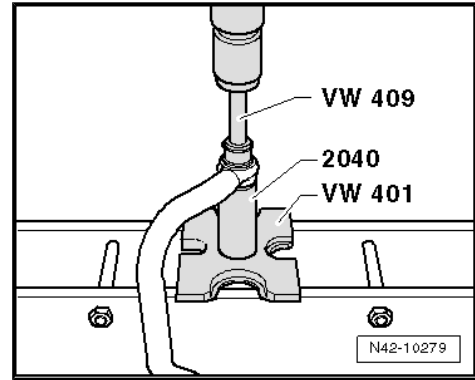


Before pressing in new rubber bush, coat it with acid-free lubricant, e.g. soft soap.

- Press in rubber bush until shoulders project evenly on both sides.
- Install anti-roll bar ⇒ [page 117](#) .

#### Specified torques

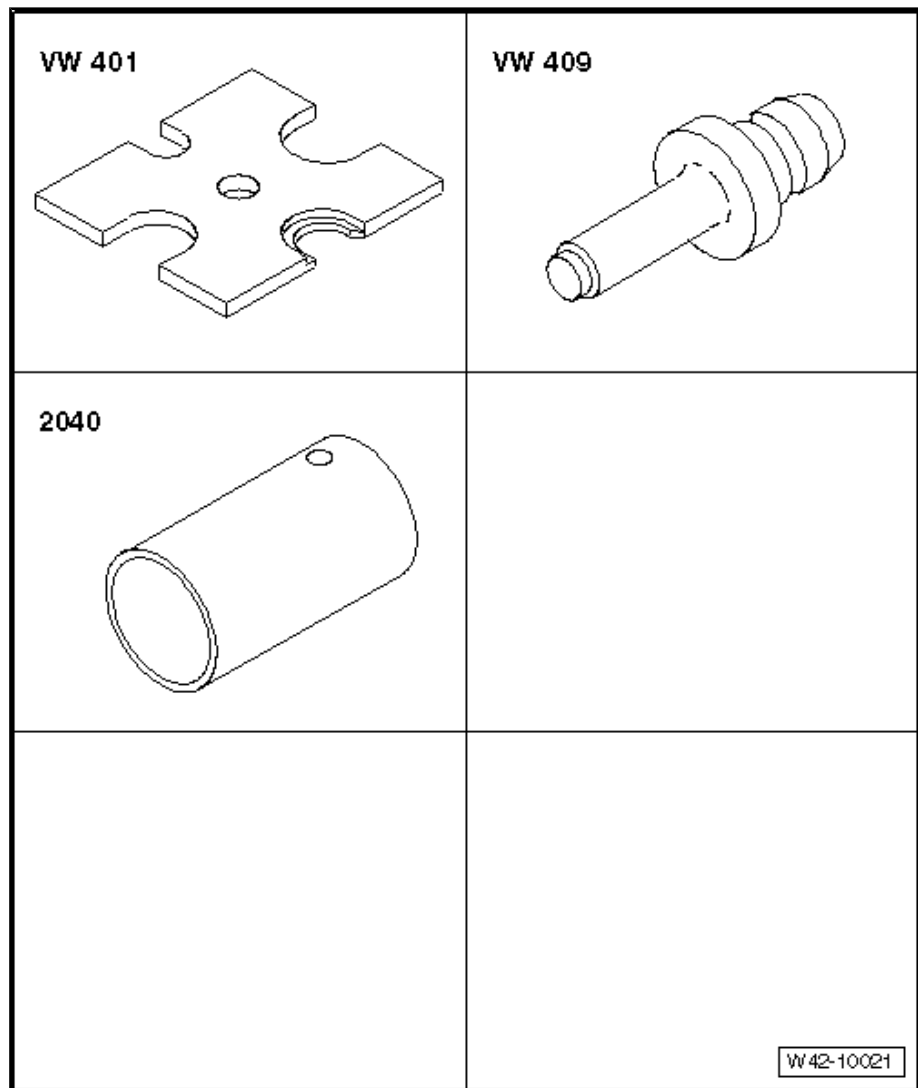
- ◆ ⇒ ["2.2 Assembly overview - anti-roll bar, vehicles with twin wheels"](#), [page 116](#)



## 2.7 Renewing coupling rod bushes, vehicles with twin wheels

#### Special tools and workshop equipment required

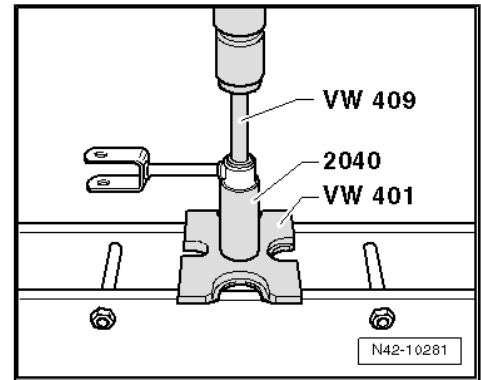
- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 409-
- ◆ Tube - 2040-



- Remove coupling rod ⇒ [page 117](#) .



- Press out rubber bush.

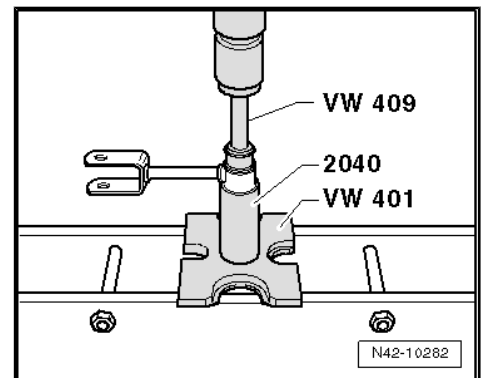


Before pressing in new rubber bush, coat it with acid-free lubricant, e.g. soft soap.

- Press in rubber bush until shoulders project evenly on both sides.
- Install coupling rod ⇒ [page 117](#) .

#### Specified torques

- ◆ ⇒ [“2.2 Assembly overview - anti-roll bar, vehicles with twin wheels”, page 116](#)





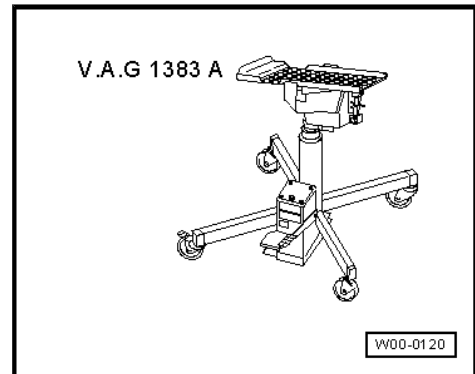
### 3 Suspension strut, shock absorber, spring

⇒ [“3.1 Removing and installing shock absorbers”, page 124](#)

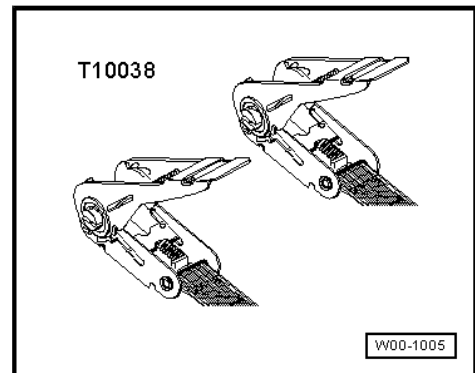
#### 3.1 Removing and installing shock absorbers

Special tools and workshop equipment required

◆ Engine and gearbox jack - V.A.G 1383 A-



◆ Tensioning strap - T10038-



#### Removing

– Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

– Raise rear axle slightly using engine and gearbox jack - V.A.G 1383 A- to relieve shock absorber



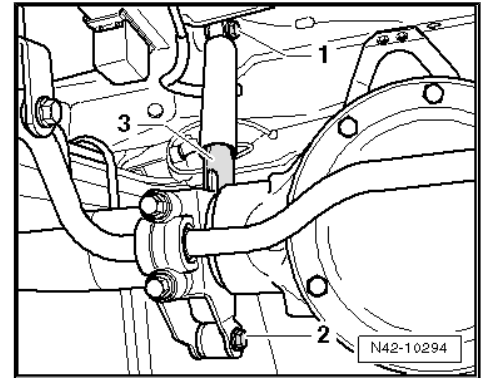
- Unscrew bolt -2- and remove shock absorber from mounting.
- Unscrew bolt -1- from longitudinal member and remove shock absorber -3- from vehicle.

### Installing

Install in reverse order. Note the following points:

### Specified torques

- ◆ ⇒ ["1.1 Assembly overview - rear axle", page 92](#)
- ◆ ⇒ ["1.2 Assembly overview - rear axle, vehicles with twin wheels", page 95](#)





## 4 Wheel bearing assembly, trailing arm

⇒ [“4.1 Assembly overview - wheel bearing assembly”, page 126](#)

⇒ [“4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels”, page 127](#)

⇒ [“4.3 Removing and installing wheel bearing unit, vehicles with twin wheels”, page 128](#)

⇒ [“4.4 Removing and installing wheel hub, vehicles with twin wheels”, page 131](#)

⇒ [“4.5 Adjusting wheel bearing play, vehicles with twin wheels”, page 132](#)

### 4.1 Assembly overview - wheel bearing assembly

#### 1 - Rear axle shaft

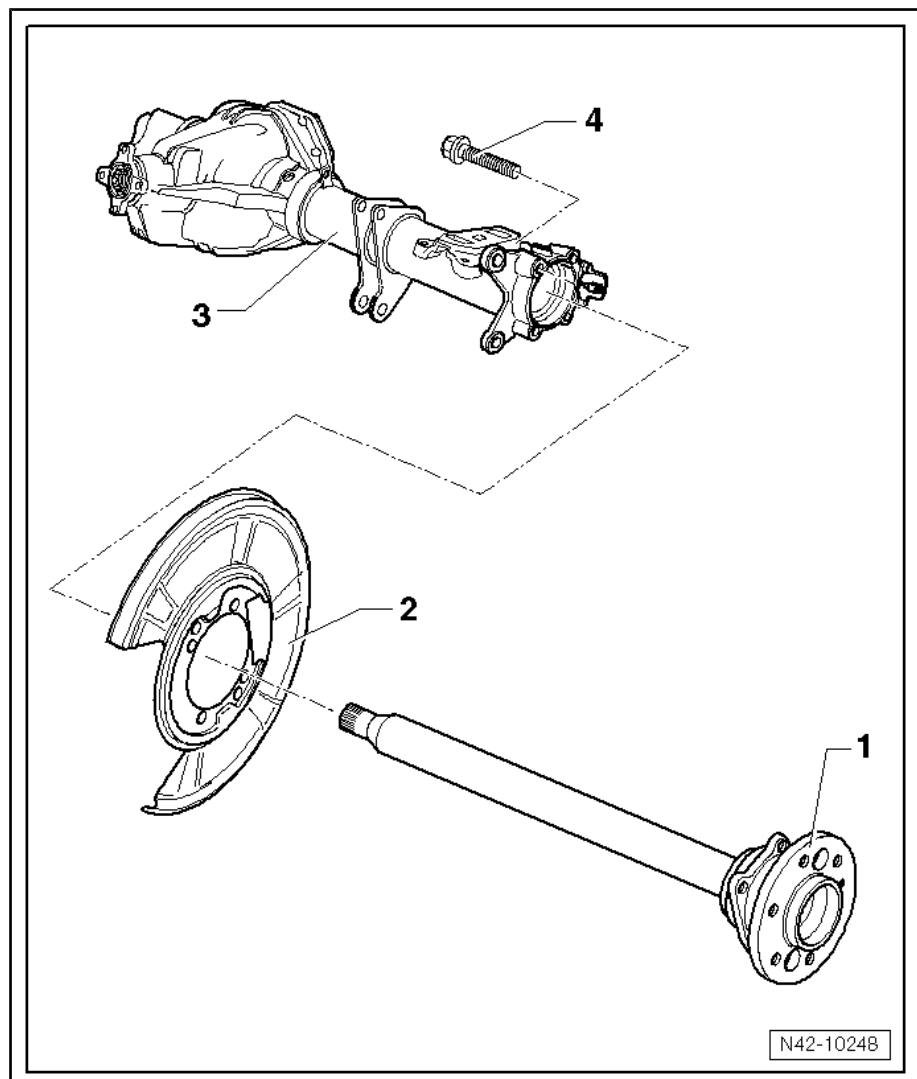
- With wheel bearing/ wheel bearing unit
- ABS sensor ring is installed in wheel bearing.
- Removing and installing ⇒ [page 110](#).

#### 2 - Splash plate for brakes

#### 3 - Rear axle

#### 4 - Bolt

- Always renew after removing



– Tighten bolts in stages in the sequence shown:

stage	Bolts	Specified torque/turning further angle
1.	-4-	30 Nm
2.	-4-	100 Nm
3.	-4-	Loosening bolt



stage	Bolts	Specified torque/turning further angle
4.	-4-	30 Nm
5.	-4-	Tighten further to 45°.

## 4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels

### 1 - Rear axle

### 2 - Shrink ring

- Check for scoring.
- Removing and installing  
⇒ [page 113](#)

### 3 - Rotor for speed sensor

- Removing and installing  
⇒ [page 128](#)

### 4 - Sealing ring

- Renewing ⇒ [page 128](#) .

### 5 - Shielding ring

### 6 - Inner wheel bearing

- Renewing ⇒ [page 128](#) .

### 7 - Wheel hub

- Removing and installing  
⇒ [page 131](#)

### 8 - Brake disc

- Removing and installing  
⇒ Brake systems; Rep. gr. 46 .

### 9 - Flange

- Removing and installing  
⇒ [page 135](#)

### 10 - Bolt

- Always renew after removing
- 80 Nm +40°

### 11 - Stud

### 12 - Wheel bolt

- Renewing ⇒ [page 135](#) .

### 13 - Wheel nut

- Specified torque: ⇒ [page 135](#)

### 14 - Outer wheel bearing

- Renewing ⇒ [page 128](#) .

### 15 - Thrust washer

### 16 - Inner slotted nut

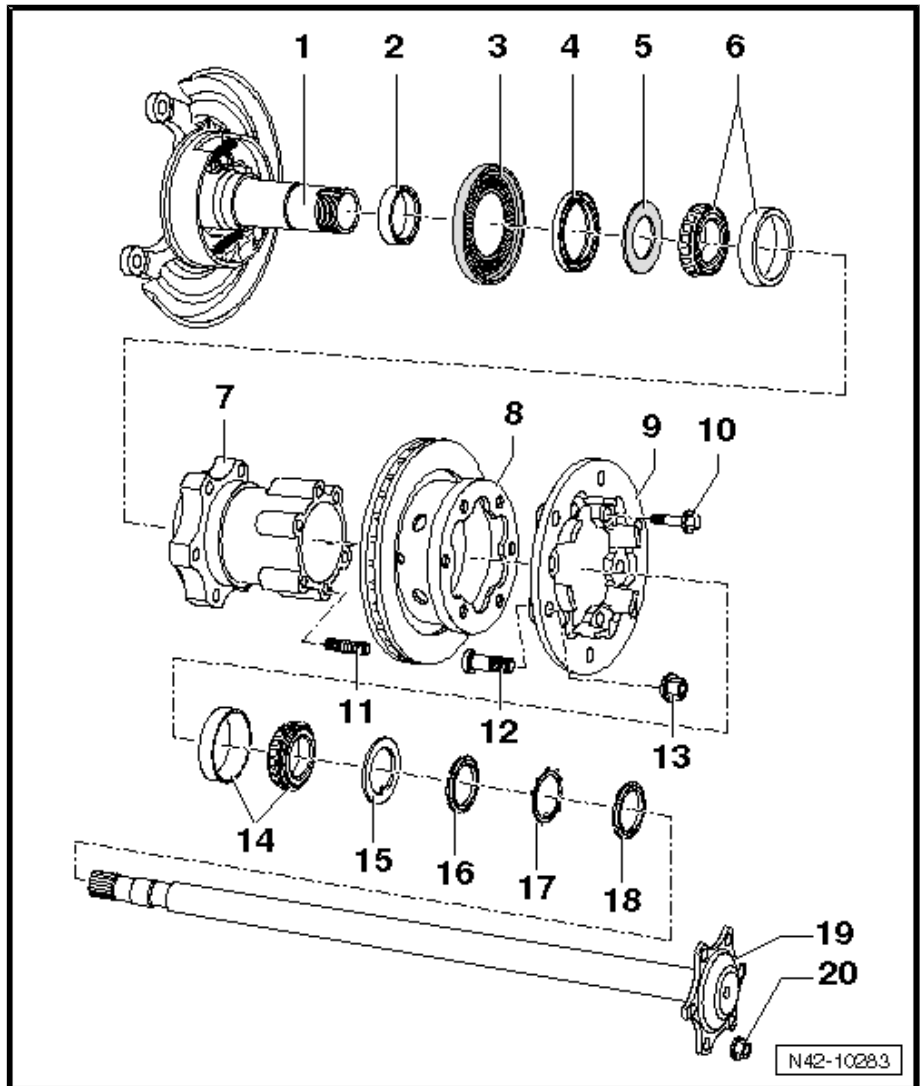
- Chamfer points outwards
- Setting wheel bearing play ⇒ [page 132](#) .

### 17 - Locking plate

- Always renew after removing

### 18 - Outer slotted nut

- Chamfer points inwards





- Setting wheel bearing play ⇒ [page 132](#) .
- 250 Nm

#### 19 - Rear axle shaft

- Removing and installing ⇒ [page 112](#)

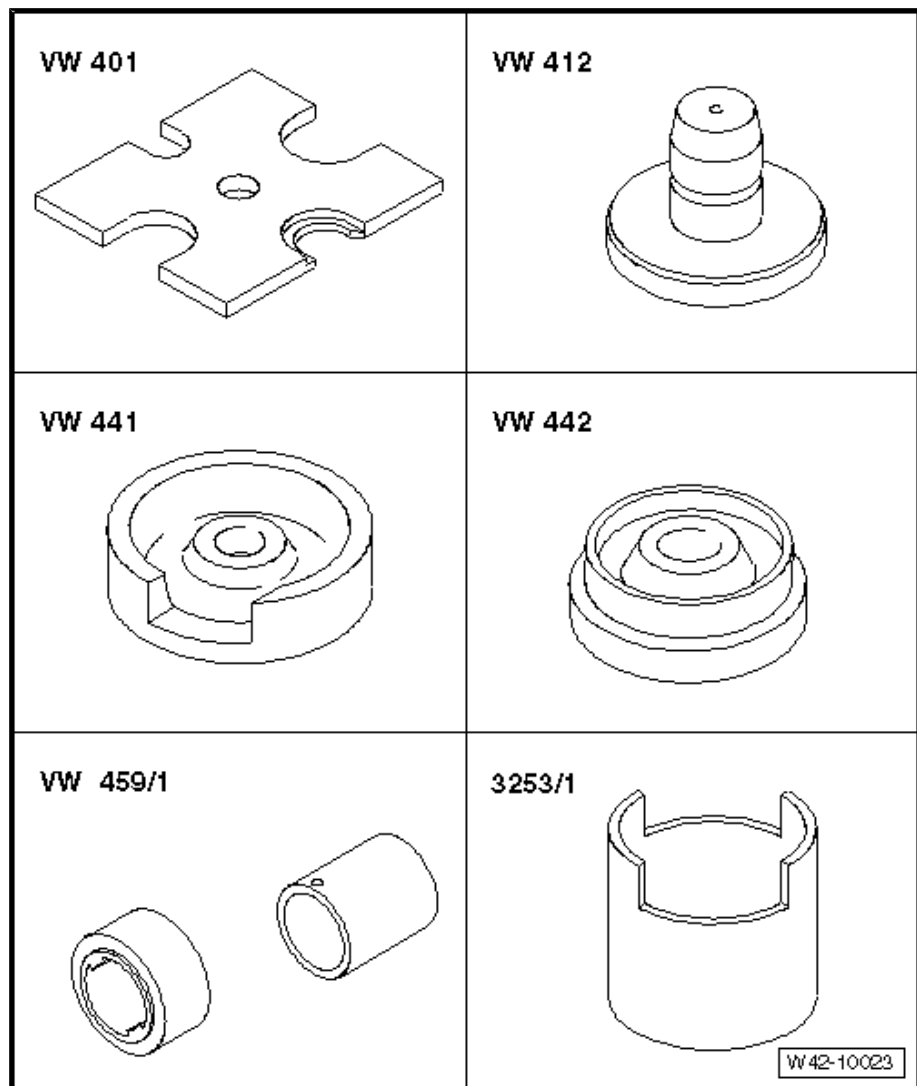
#### 20 - Self-locking nut

- Always renew after removing
- 70 Nm

### 4.3 Removing and installing wheel bearing unit, vehicles with twin wheels

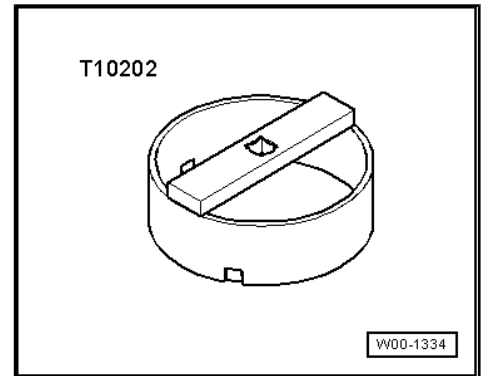
#### Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 412-
- ◆ Support - VW 441-
- ◆ Thrust piece - VW 442-
- ◆ Removing and installing tool - VW 459/1-
- ◆ Assembly tool - 3253/1-

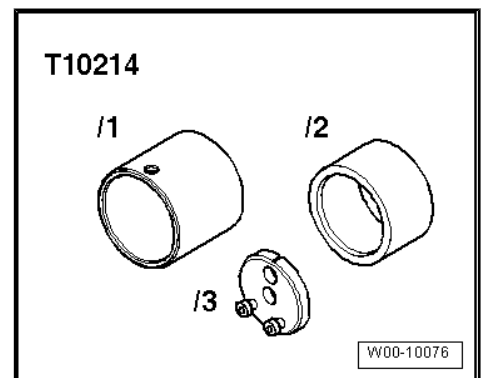




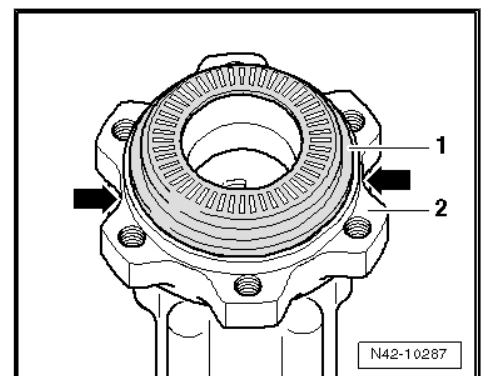
- ◆ Special wrench - T10202-



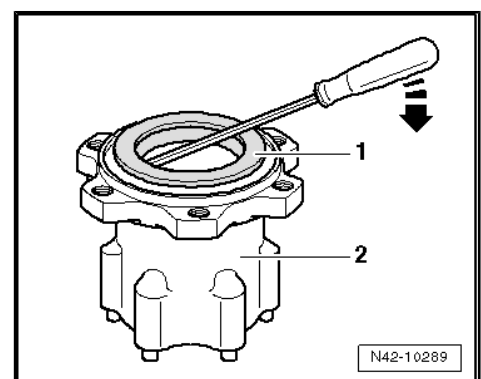
- ◆ Assembly tool - T10214/3-



- Remove rear wheel hub ⇒ [page 131](#) .
- Insert suitable punch in both holes -arrows- of wheel hub.
- Drive rotor -1- out of wheel hub -2-.

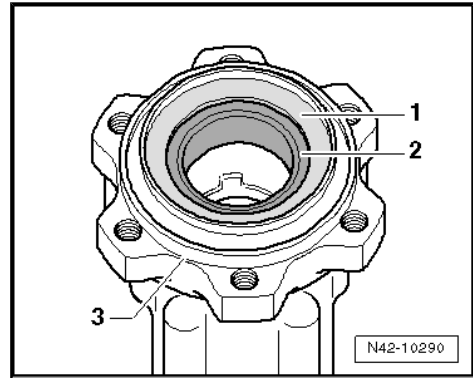


- Prize sealing ring -1- out of wheel hub using a screwdriver out of wheel hub -2-.

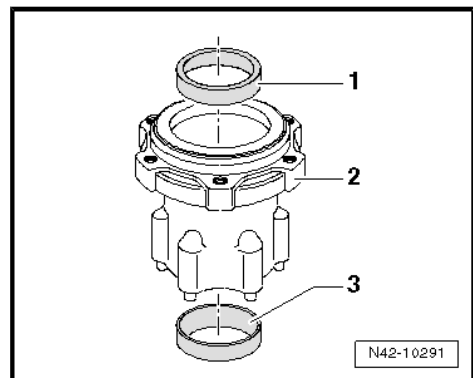




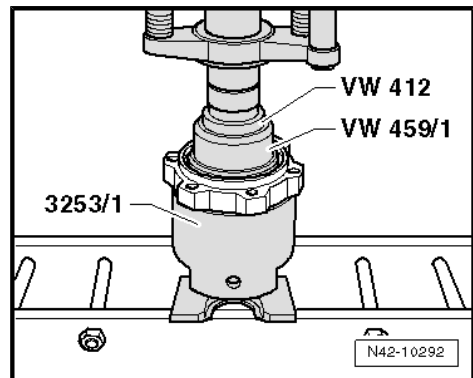
- Remove shielding ring -1- and inner wheel bearing -2- from wheel hub -3-.



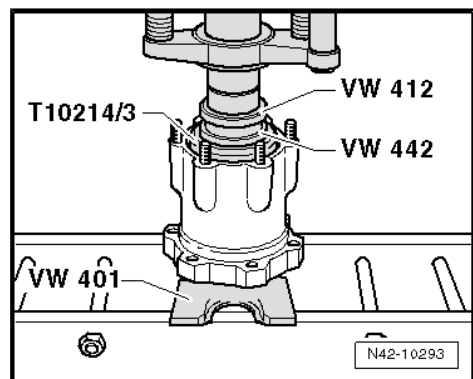
- Drive outer race of inner wheel bearing -1- and outer wheel bearing -3- with a copper drift out of wheel hub -2-.



- Press in new outer race for inner wheel bearing.

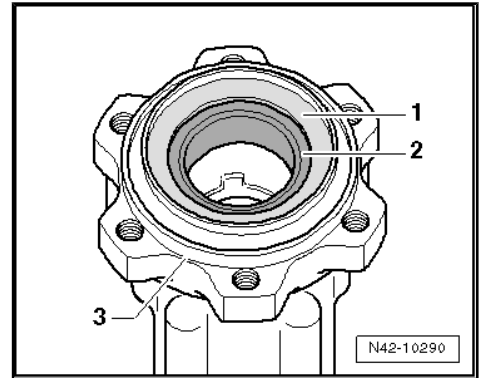


- Press in new outer race for outer wheel bearing.

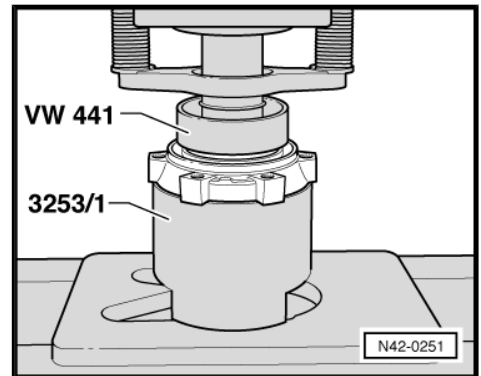




- Before installing, grease new wheel bearing with universal grease ⇒ Electronic Parts Catalogue (ETKA) .
  - Fit new wheel bearing -2- and shielding ring -1-.
- Renew shielding ring if damaged.



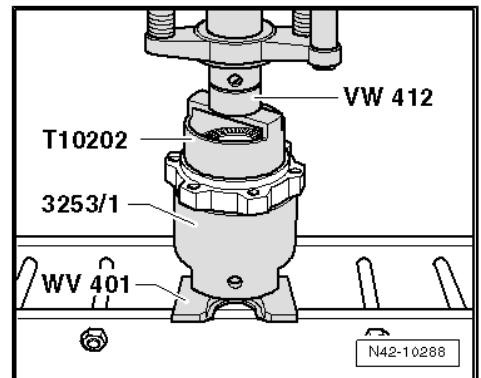
- Press in new sealing ring.



- Press in new rotor.
- Install rear wheel hub ⇒ [page 131](#) .

**Specified torques**

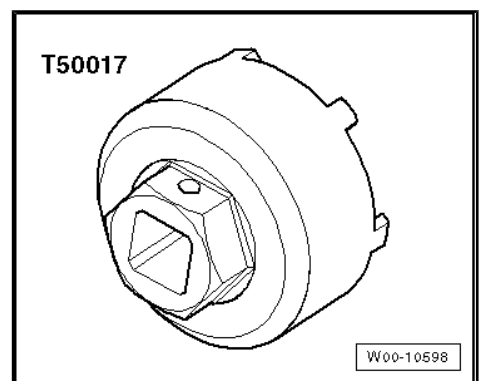
- ◆ ⇒ [“4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels”, page 127](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)



**4.4 Removing and installing wheel hub, vehicles with twin wheels**

**Special tools and workshop equipment required**

- ◆ Special wrench - T50017-

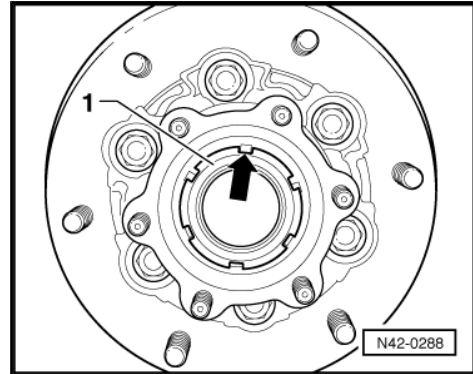


**Removing**

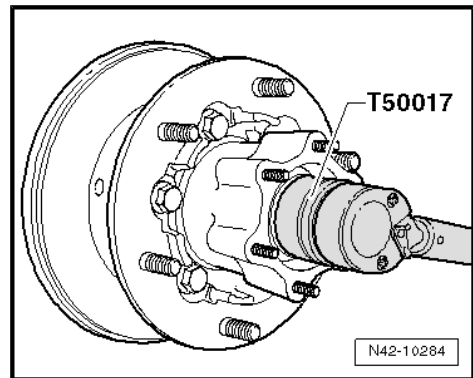
- Remove rear axle shaft ⇒ [page 112](#)



- Remove wheel.
- Remove brake caliper together with brake carrier, and secure it with wire so that weight of brake caliper does not stress or damage brake hose ⇒ brake systems; Rep. gr. 46 .
- If fitted, remove wheel flange ⇒ [page 135](#) .
- Remove brake disc ⇒ Brake systems; Rep. gr. 46 .
- Release outer nut -1- by bending locking plate -arrow- back.



- Unscrew outer slotted nut with special wrench - T50017- .
- Remove locking plate.
- Unscrew inner slotted nut with special wrench - T50017- .
- Remove thrust plate and outer tapered roller bearing from axle tube.
- Pull wheel hub off axle tube.



### Installing

Install in reverse order. Note the following points:



#### Note

*Always use a new locking plate for the outer slotted nut.*

- Setting wheel bearing play ⇒ [page 132](#) .
- Installing rear axle shaft ⇒ [page 112](#) .
- If fitted, install wheel flange ⇒ [page 135](#) .
- Install brake disc ⇒ Brake systems; Rep. gr. 46 .
- Install brake carrier and brake caliper ⇒ Brake systems; Rep. gr. 46 .
- Fitting wheel ⇒ [page 135](#) .

### Specified torques

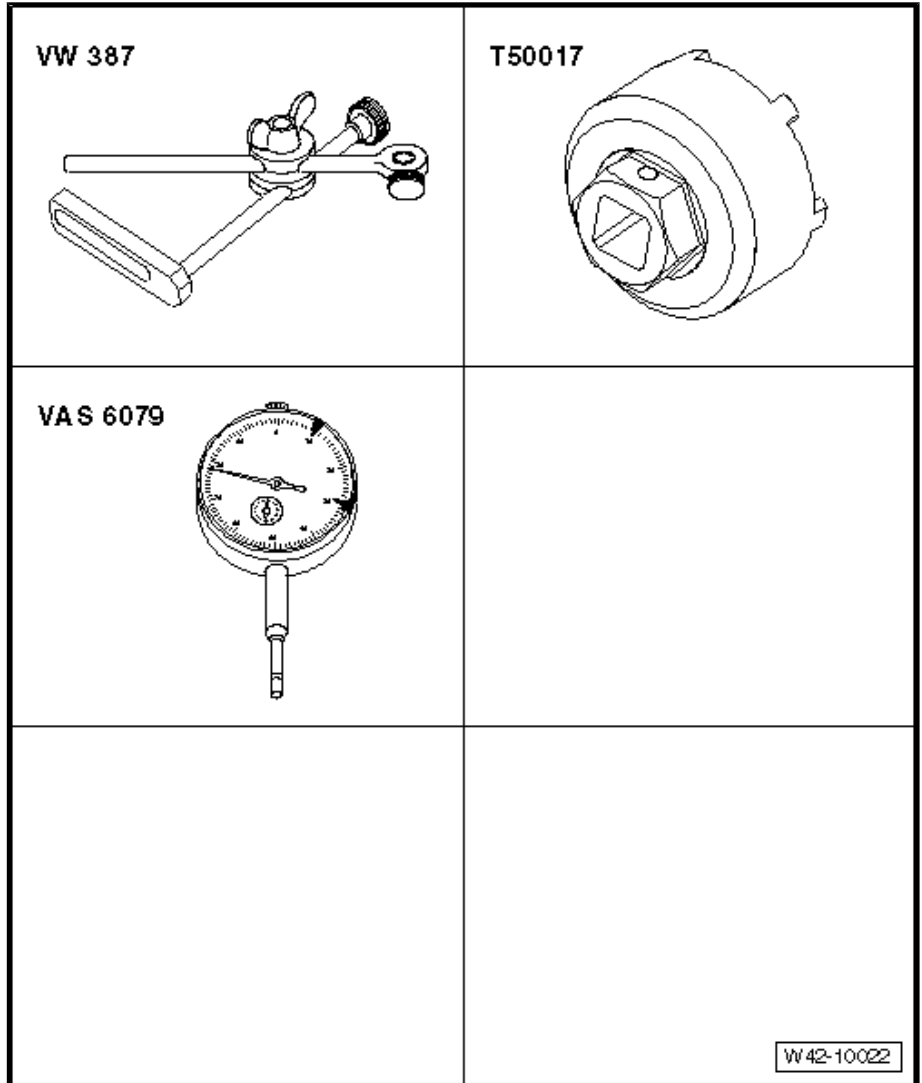
- ◆ ⇒ [“4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels”, page 127](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

## 4.5 Adjusting wheel bearing play, vehicles with twin wheels



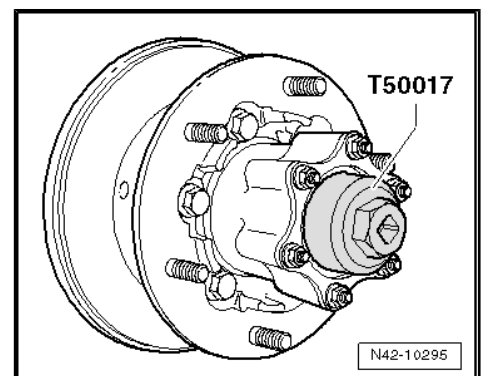
**Special tools and workshop equipment required**

- ◆ Universal dial gauge holder - VW 387-
- ◆ Special wrench - T50017-
- ◆ Dial gauge - VAS 6079-



- Remove rear axle shaft ⇒ [page 112](#) .
- Loosen outer slotted nut and remove locking plate ⇒ [page 131](#) .
- 1 - Tighten inner slotted nut to 300 Nm using special wrench - T50017- (when doing this, turn wheel hub so that wheel bearing does not become jammed).
- 2 - Loosen inner slotted nut 1/2 turn with wrench - T50017- (when doing this, turn wheel hub so that wheel bearing does not become jammed).
- Tighten inner slotted nut with special wrench - T50017- by hand until it rests against thrust plate (now wheel bearing has zero play).
- Loosen inner slotted nut 1/8 turn.
- Fit new locking plate.
- Fit outer slotted nut and tighten it.

Component	Specified torque
Outer slotted nut	250 Nm





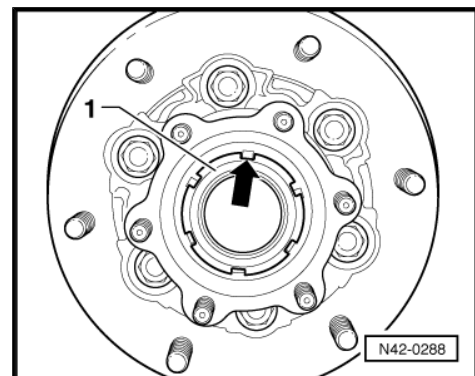
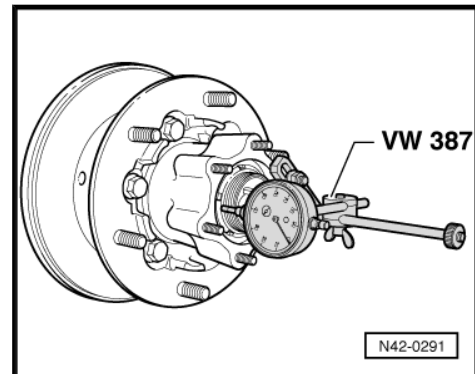
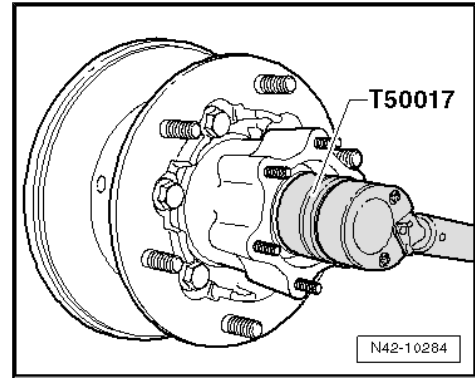
- Secure dial gauge - VAS 6079- with universal dial gauge holder - VW 387- to wheel hub.
- Create 2 mm preload on dial gauge and set adjuster ring to "0".
- Measure wheel bearing play by firmly moving wheel hub backwards and forwards in axial direction.
- Set wheel bearing play to 0.02 ... 0.04 mm by turning inner slotted nut.



**Note**

*When measuring the wheel bearing play, ensure that the outer slotted nut is tightened to specified torque!*

- Bend down locking plate -arrow-.
- 1 - Outer slotted nut
- Installing rear axle shaft ⇒ [page 112](#)





## 44 – Wheels, tyres, vehicle geometry

### 1 Wheels, tyres

⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)

⇒ [“1.2 Renewing wheel bolts, vehicles with twin wheels”, page 135](#)

#### 1.1 Specified torque for wheel bolts

When installing wheel, adhere to the following assembly sequence under all circumstances, as imbalance may otherwise occur in the vehicle.

- 1 - Position wheel
- 2 - Install wheel bolts or wheel nuts.
- 3 - To centre, pre-tighten wheel bolts or wheel nuts diagonally by hand.
- 4 - Tighten wheel bolts or wheel nuts diagonally.

##### Specified torque

Component	Specified torque
Wheel bolt to wheel hub for steel wheels	240 Nm
Wheel bolt to wheel hub for alloy wheels	180 Nm
Wheel nuts to wheel bolts/studs	180 Nm



##### WARNING

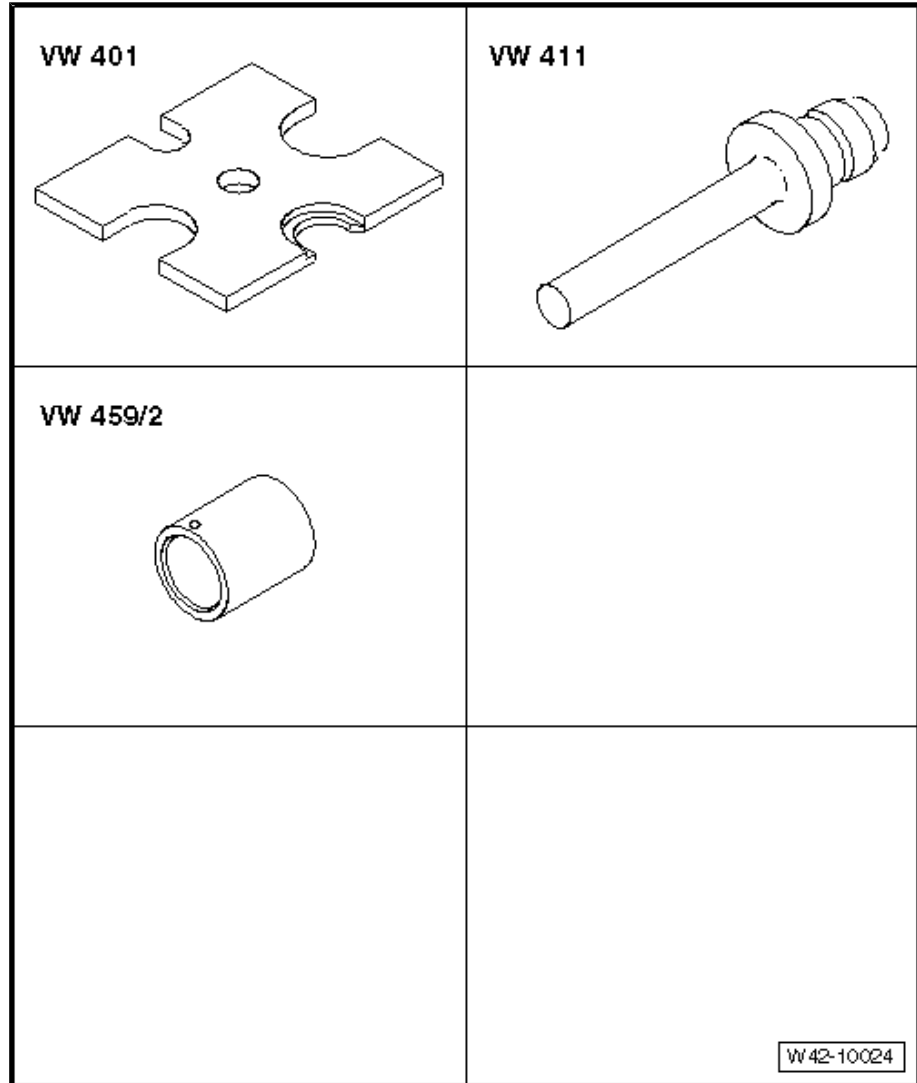
*After the vehicle has been driven 50 km, the wheel nuts or bolts must be retightened.*

#### 1.2 Renewing wheel bolts, vehicles with twin wheels



**Special tools and workshop equipment required**

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 411-
- ◆ Removing and installing tool - VW 459/2-



- Loosen wheel nuts.
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .

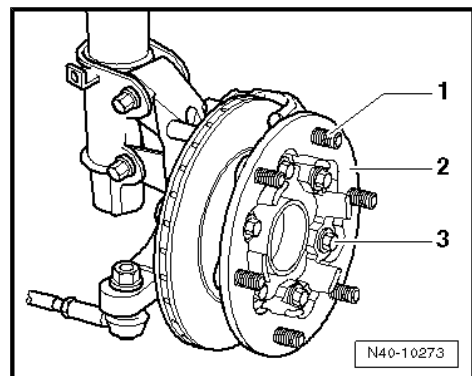


**WARNING**

*If the vehicle is not strapped down, it may slip off the lifting platform.*

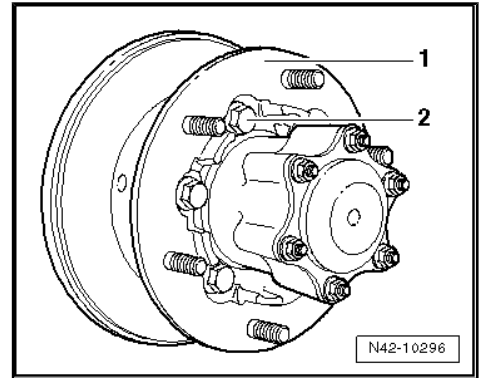
- Remove wheel.
- Unscrew bolts -3- and remove wheel flange -2-.

**Rear axle**

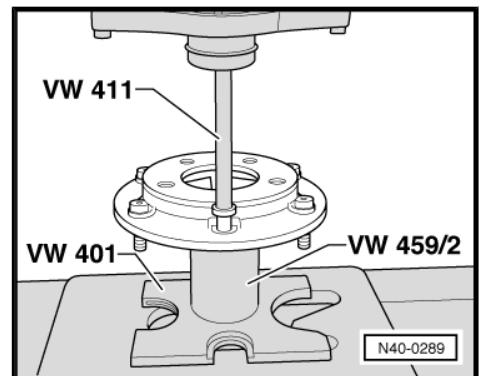




- Unscrew bolts -2- and remove flange -1-.
- Drive out wheel bolts -1-, e.g. using an aluminium hammer.

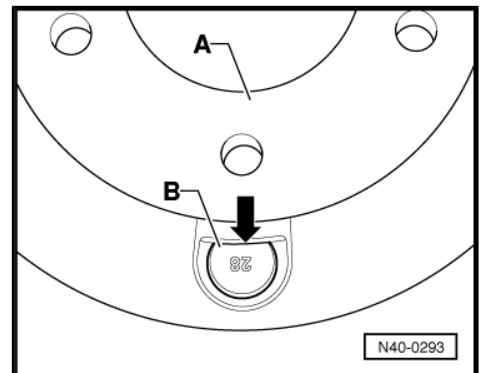


- Press in wheel bolts.



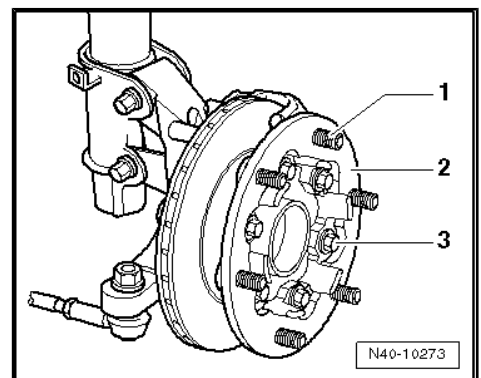
When pressing in, ensure that milled side of wheel bolt comes into contact with wheel flange edge -arrow-.

- A - Wheel flange
- B - Wheel bolt



- Tighten new bolts -3-.

#### Rear axle

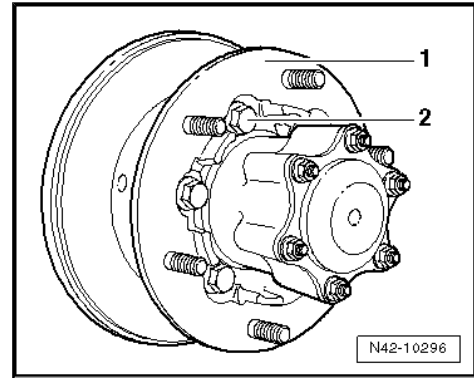




- Tighten new bolts -2-.
- Fit wheel ⇒ [page 135](#) .

#### Specified torques

- ◆ ⇒ [“4.2 Assembly overview - wheel bearing unit, vehicles with twin wheels”, page 127](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing assembly”, page 61](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)





## 2 Tyre pressure monitoring system

⇒ [“2.1 Assembly overview - tyre pressure sensor”, page 139](#)

⇒ [“2.2 Removing and installing tyre pressure sensor G222 / G223 / G224 / G225”, page 141](#)

⇒ [“2.3 Changing wheels on vehicles with Tyre Pressure Monitoring System”, page 144](#)

⇒ [“2.4 Changing tyres on vehicles with tyre pressure monitoring system”, page 145](#)

### 2.1 Assembly overview - tyre pressure sensor

⇒ [“2.1.1 Assembly overview - tyre pressure sensor, Schrader”, page 139](#)

⇒ [“2.1.2 Assembly overview - tyre pressure sensor, Siemens”, page 141](#)

#### 2.1.1 Assembly overview - tyre pressure sensor, Schrader



#### Note

*The nominal pressures are stored in the tyre pressure monitor control unit - J502- and only require changing on switching tyre dimensions, e.g. in the case of different summer and winter tyres. New or different tyre pressure sensors are automatically taught-in by the system.*



### 1 - Tyre pressure sensor

- Front left tyre pressure sensor. - G222-
- Front right tyre pressure sensor - G223-
- Rear left tyre pressure sensor - G224-
- Rear right tyre pressure sensor - G225-
- With metal valve
- Removing and installing  
⇒ [page 141](#) .

### 2 - Valve core

- Always renew when changing tyre

### 3 - Rim

### 4 - Union nut

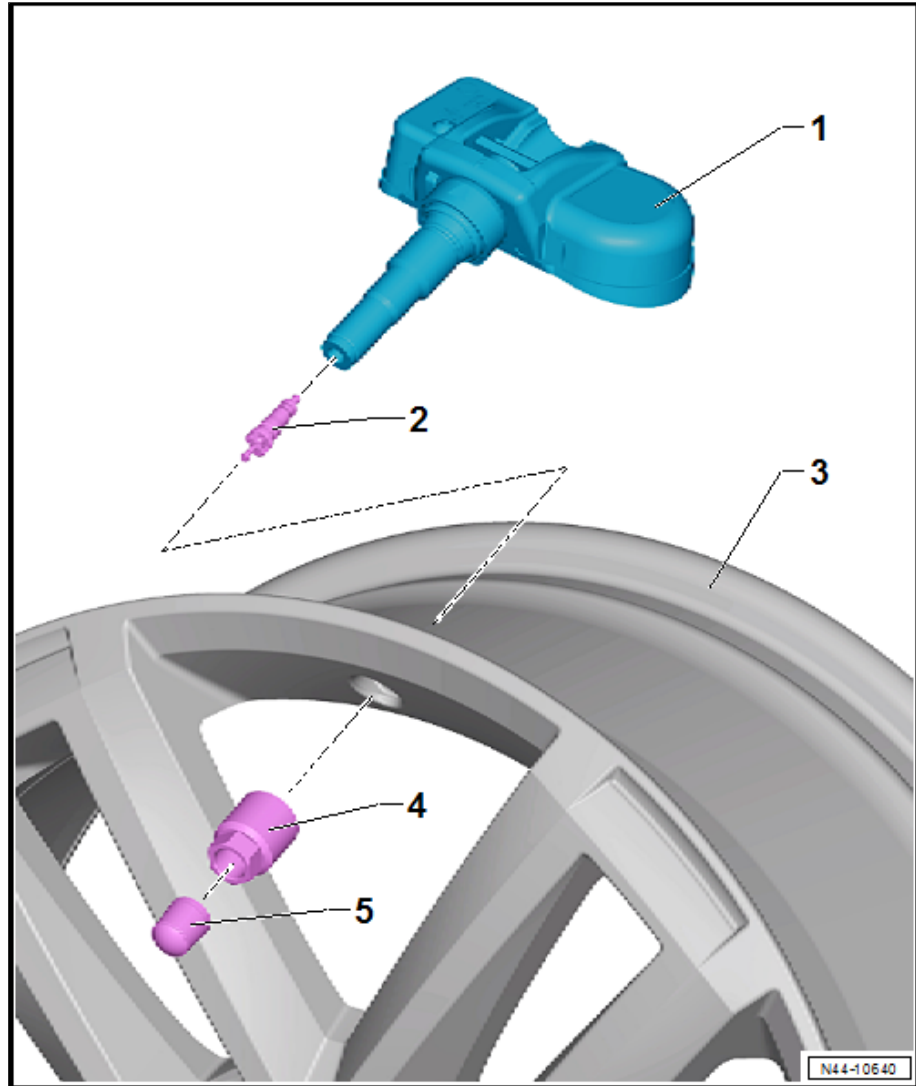
- 6 Nm

◆ In the union nut is a micro-encapsulation with locking fluid that is activated when tightening the nut. This durably locks the union nut to the metal valve.

◆ The union nut must be replaced after loosening from the metal valve.

- Always renew after removing.

### 5 - Valve cap





## 2.1.2 Assembly overview - tyre pressure sensor, Siemens

### 1 - Tyre pressure sensor

- Front left tyre pressure sensor - G222-
- Front right tyre pressure sensor - G223-
- Rear left tyre pressure sensor - G224-
- Rear right tyre pressure sensor - G225-
- Removing and installing  
⇒ [page 142](#) .

### 2 - Bolt

- Square-head bolt with flat head
- Is supplied as a replacement part complete with the tyre pressure sensor  
⇒ Electronic Parts Catalogue "ETKA"

### 3 - Metal valve

- Is supplied as a replacement part complete with the tyre pressure sensor  
⇒ Electronic Parts Catalogue "ETKA"

### 4 - Valve core

- Always renew when changing tyre

### 5 - Rim

### 6 - Union nut

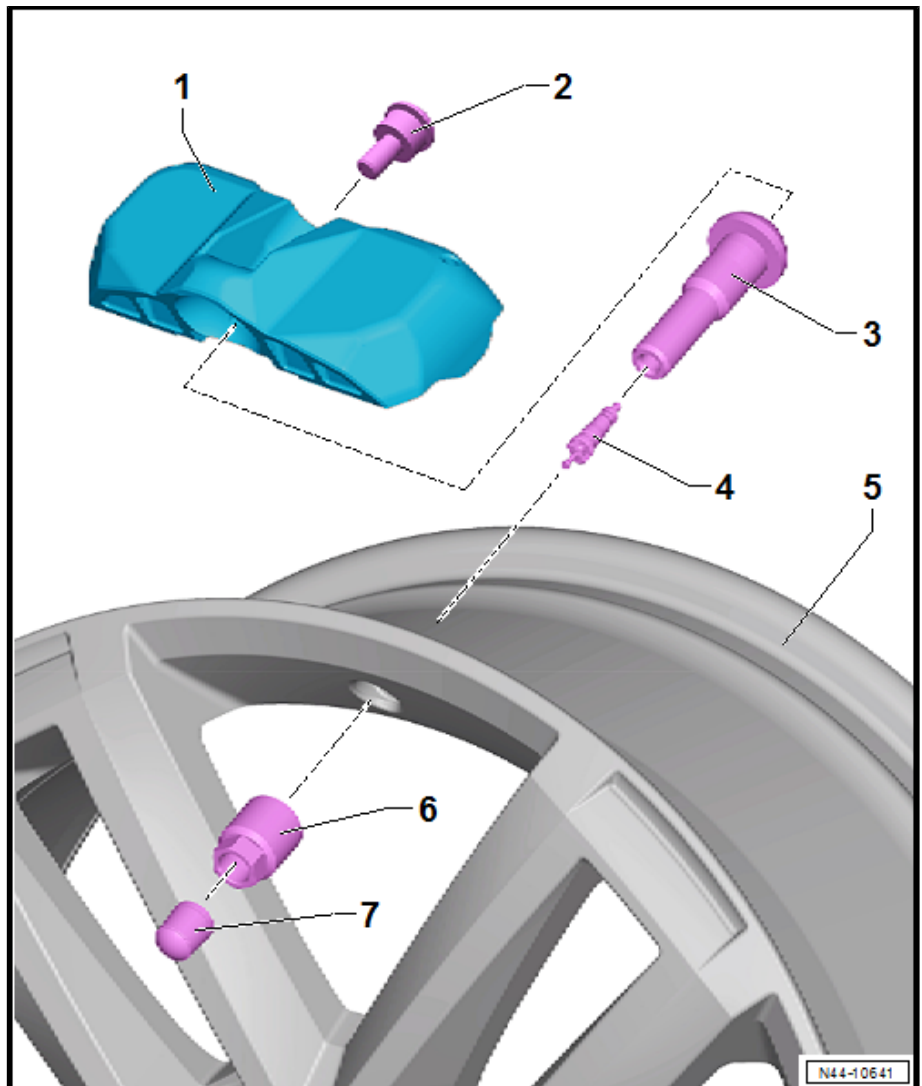
- 6 Nm

- ◆ When tightening, do not use metal valve as a counterhold.

- ◆ The result of a disc being placed in the union nut is that the metal valve is first screwed onto the tyre pressure sensor when the nut is tightened. The tyre pressure sensor is screwed onto the rim after the disc breaks.

- Always renew after removing.

### 7 - Valve cap



## 2.2 Removing and installing tyre pressure sensor -G222- / -G223- / -G224- / -G225-

⇒ ["2.2.1 Removing and installing tyre pressure sensor, Schrader", page 141](#)

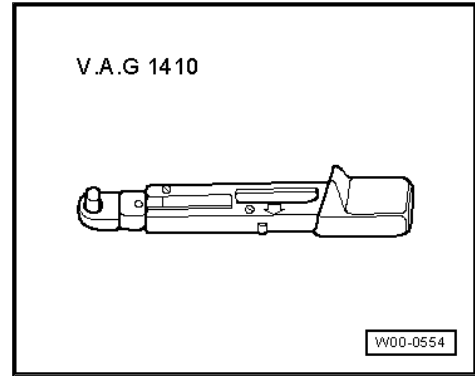
⇒ ["2.2.2 Removing and installing tyre pressure sensor, Siemens", page 142](#)

### 2.2.1 Removing and installing tyre pressure sensor, Schrader

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1410-



### Removing

- Remove tyre from rim ⇒ [page 139](#) .
- Turn nut -1- anti-clockwise until tyre pressure sensor -2- can be removed.

### Installing



#### Caution

- ◆ *Before installing tyre pressure sensor , clean valve hole.*

- Insert metal valve into valve hole in rim.



#### Caution

- ◆ *In the union nut is a micro-encapsulation with locking fluid that is activated when tightening the nut. This durably locks the union nut to the metal valve.*
- ◆ *The union nut must be replaced after loosening from the metal valve.*

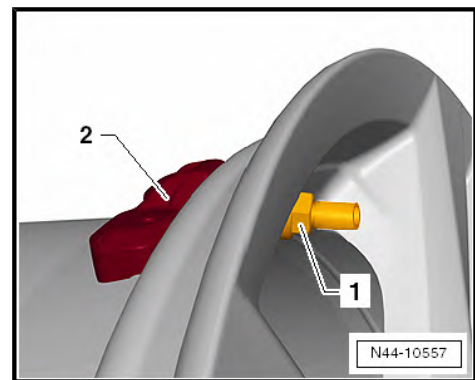
- Tighten new union nut to specified torque.
- Install tyre on rim ⇒ [page 139](#) .

### Specified torques

- ◆ ⇒ ["2.1.1 Assembly overview - tyre pressure sensor, Schrader"](#), [page 139](#)

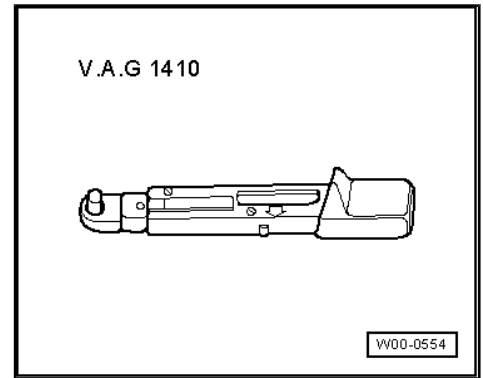
## 2.2.2 Removing and installing tyre pressure sensor, Siemens

Special tools and workshop equipment required





- ◆ Torque wrench - V.A.G 1410-



### Removing

- Remove tyre from rim ⇒ [page 139](#) .
- Turn nut -1- anti-clockwise until tyre pressure sensor -2- can be removed.



### Note

*When the nut -1- is turned, the valve turns as well.*

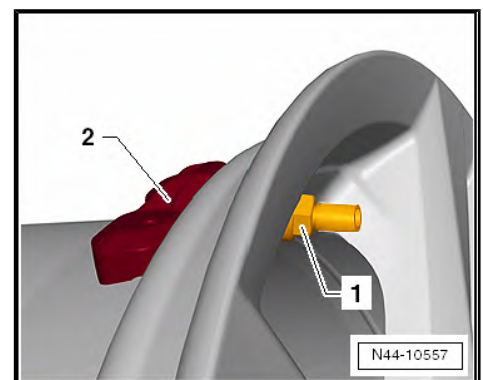
### Installing

Install in reverse order. Note the following points:



### Caution

- ◆ *Always completely renew tyre pressure sensor and metal valve*
- ◆ *Before installing tyre pressure sensor , clean valve hole.*





- The metal valve -3- is bolted to the tyre pressure sensor using bolt -5-.



#### Note

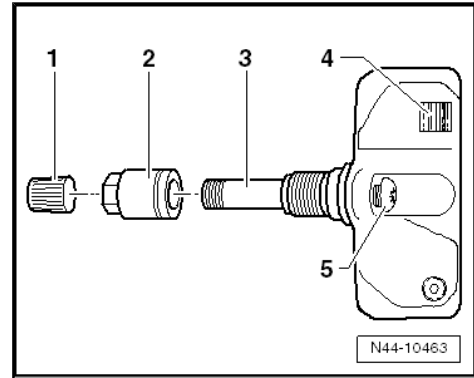
When doing this, ensure the metal valve is not bolted tight on the sensor.

- Insert metal valve into valve hole in rim.



#### Caution

- ◆ When tightening, do not use metal valve as a counterhold.
- ◆ The result of a washer being placed in the union nut -2- is that the metal valve is first screwed onto the tyre pressure sensor when the nut is tightened. The tyre pressure sensor is screwed onto the rim after the disc breaks.



- Tighten new union nut until the rupture disc breaks
- Tighten new union nut to specified torque.
- Install tyre on rim ⇒ [page 139](#) .

#### Specified torques

- ◆ ⇒ [“2.1.2 Assembly overview - tyre pressure sensor, Siemens”](#), [page 141](#)

## 2.3 Changing wheels on vehicles with Tyre Pressure Monitoring System

If the wheels are changed (e.g. switch from summer to winter tyres), the tyre pressure sensors transmit data as soon as the speed of the new wheels exceeds 25 km/h. The ID numbers of the new tyre pressure sensors are automatically detected and entered by the control unit.

The tyre pressure monitoring control unit - J502- must first switch to learning mode before it can automatically train the tyre pressure sensors.

To do this, the vehicle must remain stationary for 20 minutes. Following the detection of a flat tyre, this time is 5 minutes.

If the stationary time is not maintained and the control unit consequently does not switch to learning mode, the system detects interference in transmission and will learn the tyre pressure sensors automatically only after a stationary period of 20 minutes.

**Note**

- ◆ *When changing wheels, note that only Volkswagen-approved wheel and tyre combinations with the tyre inflation pressure specified in the tank flap may be installed.*
- ◆ *If unapproved wheel and tyre combinations are installed, they must possess a certificate from the responsible technical inspection authority (in Germany, TÜV) for the respective vehicle, and a second wheel set must be learned via the ⇒ Vehicle diagnostic tester ⇒ [page 145](#).*
- ◆ *Learning is also necessary if the tyre inflation pressure deviates from the tyre inflation pressure specified in the tank flap ⇒ [page 145](#).*

**Tyre sets with other specified tyre inflation pressures**

If a vehicle is fitted with tyres requiring nominal tyre inflation pressures other than those specified on the tank flap sticker, these tyres (second wheel set) can also be monitored with the TPM system.

Nominal tyre inflation pressures for the second wheel set must be specified to the system with the ⇒ Vehicle diagnostic tester.

The tyre pressure sensors for the wheels of the second wheel set are not automatically detected and trained by the TPM system (unlike the tyre pressure sensors for the wheel set with Volkswagen-approved wheel and tyre combinations).

The following work has to be performed to switch to the second wheel set:

- ◆ Read ID numbers (IDs) of the tyre pressure sensors prior to installation.
- ◆ Switch the TPM to wheel set 2.
- ◆ Enter the necessary nominal tyre pressures and the IDs of the tyre pressure sensors in the system.

## 2.4 Changing tyres on vehicles with tyre pressure monitoring system

**Pressing tyre off wheel rim****Caution**

- ◆ *Comply with the notes on safety and conditions ⇒ [page 1](#)*

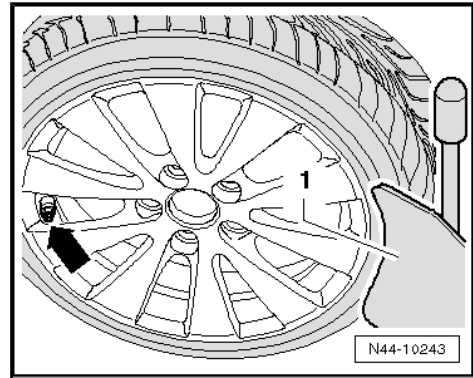
- Remove air from tyre by screwing out the nickel-plate valve element.



- When pressing off a tyre using tyre fitting equipment with a press-off plate, always ensure that the tyre valve/ tyre pressure sensor -arrow- is directly opposite the bead breaker -1-.

The bead breaker must be positioned no more than 2 cm from wheel rim flange.

- Remove balancing weights and dirt from wheel rim.



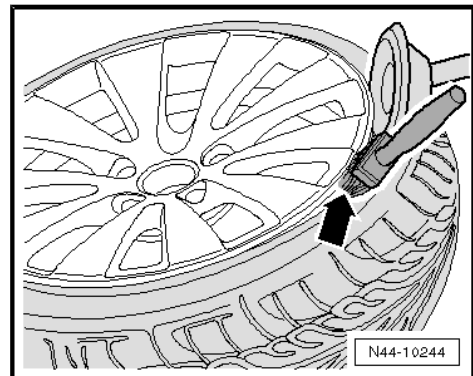
- Press both tyre beads off all round and liberally coat tyre and wheel rim flange with tyre assembly paste -arrow-.

#### Removing tyre from wheel rim



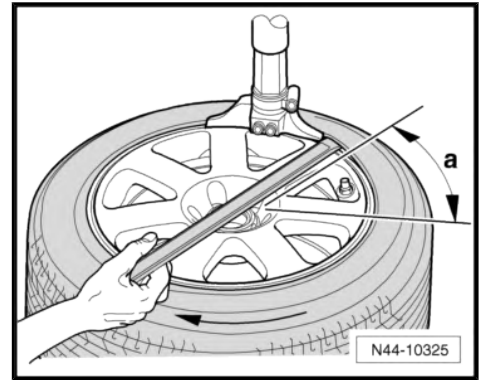
#### Caution

- ◆ *Comply with the notes on safety and conditions  
=> [page 1](#)*
- ◆ *The assembly head must never be within area -a- of tyre valve/tyre pressure sensor, or the assembly head will damage the tyre pressure sensor .*





- Position wheel on tyre assembly unit so that the tyre valve/ tyre pressure sensor is located in front of assembly head.
- Position assembly head near tyre valve/ tyre pressure sensor so that an assembly lever can be inserted approx. 30° next to the tyre valve/ tyre pressure sensor .
- Lever tyre bead over assembly finger on assembly head using assembly lever then remove assembly lever.
- Run tyre fitting unit clockwise until upper bead lies completely above wheel rim flange.
- Position wheel on tyre assembly unit so that the tyre valve/ tyre pressure sensor is located in front of assembly head.



**i** Note

*If the tyre pressure sensor is damaged or loose, then replace the complete item => [page 141](#) .*

**Fitting tyres**



**Caution**

- ◆ *Comply with the notes on safety and conditions  
=> [page 1](#)*

**i** Note

*If the tyre pressure sensor is damaged or loose, then replace the complete item => [page 141](#) .*

- Liberally apply tyre assembly paste to wheel rim flanges, tyre beads and inner side of the upper tyre beads.

The inside of the tyre must be fitted first.



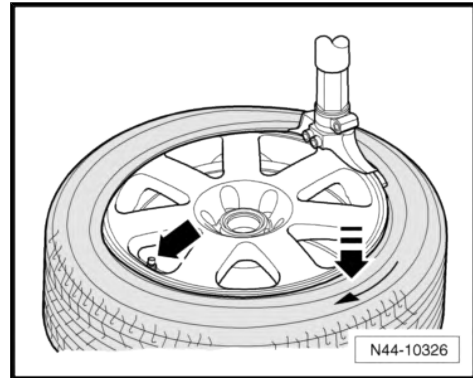
- Turn rim on tyre fitting unit so that tyre valve with tyre pressure sensor -arrow- is directly opposite assembly head.
- Press tyre into drop centre in -direction of arrow- between tyre valve with tyre pressure sensor and assembly head.
- Allow the tyre fitting unit to turn in a clockwise direction.
- Stop the fitting of lower bead before reaching tyre valve/ tyre pressure sensor to prevent damage to tyre pressure sensor .

The tyre bead will now slide over the wheel rim flange. The wheel rim may be turned only until the assembly head is just before the tyre valve/ tyre pressure sensor .

- Check to ensure that tyre bead is seated correctly on assembly head and run tyre fitting machine clockwise.
- Stop the fitting of upper bead before reaching tyre valve/ tyre pressure sensor to prevent damage to tyre pressure sensor .

The tyre bead will now slide over the wheel rim flange. The wheel rim may be turned only until the assembly head is just before the tyre valve/ tyre pressure sensor .

- Fill tyres to a maximum tyre pressure of 3.3 bar (bead seating pressure).



#### Caution

***Never increase the inflation pressure when the tyre bead does not lie completely against the wheel rim flange.***

***This would lead to prior damage to the tyre and/or the wheel rim.***

- When the tyre bead does not lie completely against the wheel rim flange: deflate the tyre, press tyre bead off wheel rim flange and generously coat again with tyre assembly paste.
- Fill tyres to a maximum tyre pressure of 3.3 bar (bead seating pressure).
- If the tyre beads seat perfectly against the shoulder of the wheel rim, increase inflation pressure to 4 bar to »seat« the tyre.
- Screw in new nickel-plated valve core and fill tyre to the prescribed tyre pressure.
- Then, balance the wheel.
- Fit wheel.

#### Specified torques

- ◆ ⇒ ["1.1 Specified torque for wheel bolts", page 135](#)



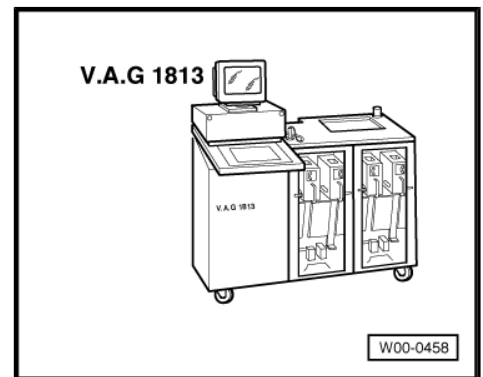
### 3 Wheel alignment

- ⇒ [“3.1 Notes for wheel alignment”, page 149](#)
- ⇒ [“3.2 Necessity of wheel alignment”, page 150](#)
- ⇒ [“3.3 Test preparations”, page 151](#)
- ⇒ [“3.4 Test prerequisites”, page 152](#)
- ⇒ [“3.5 Determining ride height”, page 152](#)
- ⇒ [“3.6 Specified values for wheel alignment”, page 153](#)
- ⇒ [“3.7 Specified values for wheel alignment”, page 157](#)
- ⇒ [“3.8 Adjusting camber on front axle”, page 157](#)
- ⇒ [“3.9 Adjusting toe on front axle”, page 158](#)
- ⇒ [“3.10 Adjusting caster on front axle”, page 159](#)

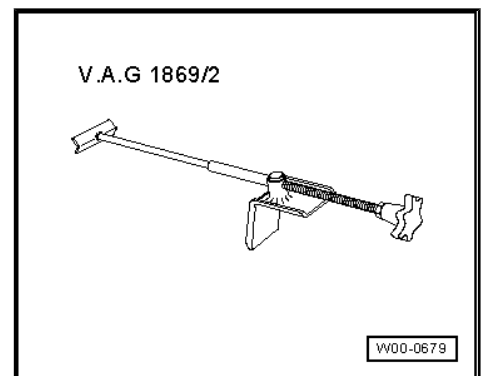
#### 3.1 Notes for wheel alignment

##### Special tools and workshop equipment required

- ◆ Wheel alignment computer - V.A.G 1813- or VW/Audi-approved wheel alignment units



- ◆ Brake pedal depressor - V.A.G 1869/2-



Wheel alignment must be performed only using a VW/AUDI-approved wheel alignment unit!

Whenever wheels are aligned, both the front and rear axles must be measured.

Otherwise, the steering rack may not be centred!

- Carry out alignment with the wheel alignment computer.

All the information required to perform alignment can be found in the wheel alignment computer.

- ⇒ VW Service Net; Systems; Software wheel alignment computer; Beissbarth



⇒ VW Service Net; Systems; Software wheel alignment computer; Hunter

⇒ VW Service Net; Systems; Software wheel alignment computer; Corghi

⇒ VW Service Net; Systems; Software wheel alignment computer; John Bean

### 3.2 Necessity of wheel alignment

- ◆ The vehicle does not handle properly.
- ◆ Vehicle has been involved in an accident and components have been renewed.
- ◆ Axle components are removed or renewed.
- ◆ Tyres are worn more on one side.

Front axle component was renewed.	Alignment necessary	
	Yes	No
Lower suspension link	X	
Wheel bearing housing	X	
Track rod/track rod ball joint	X	
Steering rack	X	
Subframe	X	
Front shock absorber	X	
Anti-roll bar	X	
Front leaf spring	X	

Front axle component removed and reinstalled	Alignment necessary	
	Yes	No
Lower suspension link	X	
Wheel bearing housing	X	
Track rod/track rod ball joint	X	
Steering rack	X	
Subframe	X	
Front shock absorber	X	
Anti-roll bar	X	

#### Rear axle

All camber and toe values on the rear axle are prescribed by the design. If measured values exceed tolerances, they can only be corrected/restored by replacing defective/damaged components.

#### (Crafter 4MOTION with Achleitner four-wheel drive)

- ◆ The vehicle does not handle properly.
- ◆ Vehicle has been involved in an accident and components have been renewed.
- ◆ Axle components are removed or renewed.
- ◆ Tyres are worn more on one side.



Front axle component was renewed.	Alignment necessary	
	Yes	No
Lower suspension link	X	
Wheel bearing housing	X	
Track rod/track rod ball joint	X	
Steering rack	X	
Subframe	X	
Front shock absorber		X
Anti-roll bar		X

Front axle component removed and reinstalled	Alignment necessary	
	Yes	No
Lower suspension link		X
Wheel bearing housing		X
Track rod/track rod ball joint	X	
Steering rack	X	
Subframe	X	
Front shock absorber		X
Anti-roll bar		X

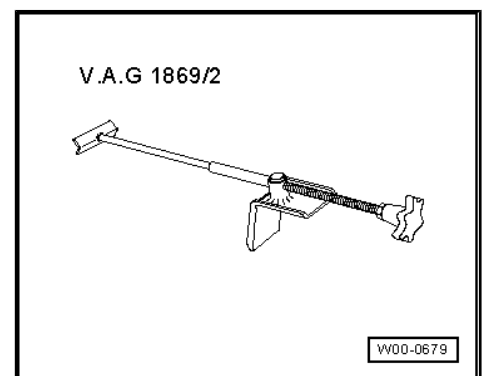
### Rear axle

All camber and toe values on the rear axle are prescribed by the design. If measured values exceed tolerances, they can only be corrected/restored by replacing defective/damaged components.

## 3.3 Test preparations

### Special tools and workshop equipment required

- ◆ Brake pedal depressor - V.A.G 1869/2-



**The existing lateral runout of the wheel must be compensated for, otherwise the result will be falsified.**

**If runout compensation is not performed, it is not possible to adjust toe-in correctly!**

Observe information provided by the manufacturer of the wheel alignment unit:

- Carry out wheel runout compensation.
- Fit brake pedal depressor - V.A.G 1869/2-
- Use brake pedal depressor to depress brake pedal



### 3.4 Test prerequisites

- Measuring equipment correctly adjusted
- Tyres inflated to correct pressures.
- Vehicle accurately aligned, suspension bounced and rocked several times
- Suspension, steering and steering linkage checked for excessive play and damage
- Tread depth difference does not exceed 2 mm on one axle.
- The vehicle ride height at the front and rear has a great influence on the test and adjustment figures. Therefore always measure vehicle ride height before starting measurements.
- When performing adjustment operations, aim as closely as possible to the respective specified values.
- It is not a good practice to perform vehicle alignment until the vehicle has been driven 1000 - 2000 km for only then are the settling operations completed.
- When checking wheel alignment, ensure that sliding plates and turntables are not touching end stop.

#### Please note:

- The test equipment must be properly adjusted and attached to the vehicle; observe device manufacturer's operating instructions.

If necessary, contact the manufacturer for familiarisation with the proper use of the wheel alignment equipment.

Wheel alignment platforms and wheel alignment units and computers can lose their calibration over a period of time.

**Wheel alignment platforms and alignment units and computers should be checked and adjusted as necessary during inspection and maintenance at least once per year!**

- Treat these highly sensitive units carefully and conscientiously!

### 3.5 Determining ride height



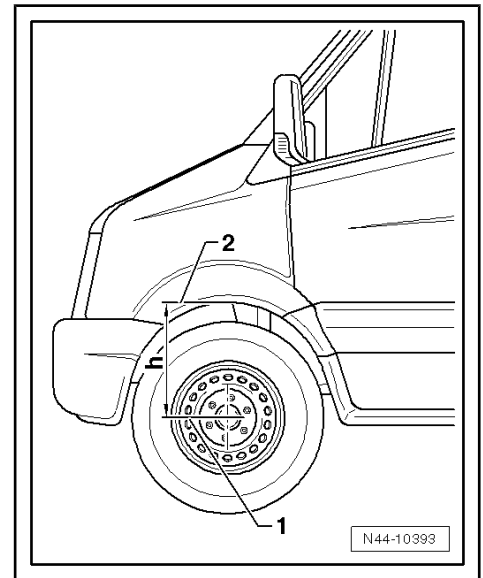
#### Note

- ◆ *The vehicle ride height at the front and rear has a great influence on the test and adjustment figures. Therefore always measure vehicle ride height before starting vehicle alignment measurements.*
- ◆ *Measure both versions of vehicle ride height when calculating vehicle specification data.*
- ◆ *The more exact the vehicle ride height is calculated, the more exact the vehicle can be located in the specifications tables.*



**Measuring vehicle ride height with wheel housing edge as a reference point:**

- Measure vehicle ride height between centre of wheel (measured on wheel hub with no wheel cover fitted) -1- and edge of wheel housing -2-.



**3.6 Specified values for wheel alignment**

⇒ [“3.6.1 Specifications tables for front axle of 3.0 t and 3.5 t vehicles \(max. permitted front axle loading 1,650 kg\)”, page 153](#)

⇒ [“3.6.2 Specification tables for front axle of 3.5 t and 3.88 t vehicles \(max. permitted front axle loading 1800 kg\)”, page 154](#)

⇒ [“3.6.3 Specification tables for front axle of 4.6 t and 5.0 t vehicles \(max. permitted front axle loading 1,850 kg\)”, page 155](#)

⇒ [“3.6.4 Specification tables for front axle of 4.6 t and 5.0 t vehicles \(max. permitted front axle loading 2,000 kg\)”, page 155](#)

⇒ [“3.6.5 Specification table for rear axle, vehicles from 3.0 t to 3.88 t”, page 156](#)

⇒ [“3.6.6 Specification table for rear axle, vehicles from 4.6 t to 5.0 t”, page 156](#)

**3.6.1 Specifications tables for front axle of 3.0 t and 3.5 t vehicles (max. permitted front axle loading 1,650 kg)**



**Note**

*These specification tables are only valid for these vehicles.*

- Compare the measured height of wheel housing edge -h- to values in specification table. Measure ride height ⇒ [page 152](#)
- Then, select specifications or adjustment figures for the respective vehicle, and adjust vehicle to these figures.

Height of wheel housing edge -h- in mm ⇒ <a href="#">page 153</a>	Toe-in per wheel	Camber	Caster angel	Toe-out on turns with steering angle of inner wheel of 20°
460.2	00°02'	00°00'	05°04'	01°36'
465.0	00°04'	00°07'	05°01'	01°32'
469.8	00°06'	00°14'	04°59'	01°28'
474.6	00°08'	00°22'	04°56'	01°24'
479.4	00°10'	00°29'	04°54'	01°20'
484.2	00°12'	00°37'	04°51'	01°16'



Height of wheel housing edge -h- in mm ⇒ <a href="#">page 153</a>	Toe-in per wheel	Camber	Caster angel	Toe-out on turns with steering angle of inner wheel of 20°
489.1	00°14'	00°46'	04°49'	01°12'
493.9	00°16'	00°54'	04°46'	01°09'
498.7	00°18'	01°03'	04°44'	01°06'
503.5	00°19'	01°12'	04°42'	01°02'

**Tolerances:**

Toe-in per wheel	Individual figures +/- 5'	Permissible deviation le/ri +/- 10'
Camber	Individual figures +/- 35'	Permissible deviation le/ri +/- 60'
Caster angel	Individual figures +/- 30'	Permissible deviation le/ri +/- 30'

### 3.6.2 Specification tables for front axle of 3.5 t and 3.88 t vehicles (max. permitted front axle loading 1800 kg)



*These specification tables are only valid for these vehicles.*

- Compare the measured height of wheel housing edge -h- to values in specification table. Measure ride height  
⇒ [page 152](#)
- Then, select specifications or adjustment figures for the respective vehicle, and adjust vehicle to these figures.

Height of wheel housing edge -h- in mm ⇒ <a href="#">page 153</a>	Toe-in per wheel	Camber	Caster angel	Toe-out on turns with steering angle of inner wheel of 20°
464.7	00°02'	00°00'	05°02'	01°36'
468.9	00°04'	00°06'	04°59'	01°32'
473.0	00°06'	00°12'	04°57'	01°29'
477.2	00°07'	00°19'	04°55'	01°25'
481.3	00°09'	00°25'	04°53'	01°22'
485.5	00°11'	00°32'	04°51'	01°19'
489.6	00°13'	00°39'	04°48'	01°15'
493.8	00°14'	00°46'	04°46'	01°12'
498.0	00°16'	00°53'	04°44'	01°09'
502.1	00°17'	01°01'	04°42'	01°06'
506.3	00°19'	01°08'	04°40'	01°03'
510.4	00°20'	01°16'	04°38'	01°01'
514.6	00°22'	01°24'	04°37'	00°58'

**Tolerances:**

Toe-in per wheel	Individual figures +/- 5'	Permissible deviation le/ri +/- 10'
Camber	Individual figures +/- 35'	Permissible deviation le/ri +/- 60'



Caster angel	Individual figures +/- 30'	Permissible deviation le/ri +/- 30'
--------------	----------------------------	-------------------------------------

### 3.6.3 Specification tables for front axle of 4.6 t and 5.0 t vehicles (max. permitted front axle loading 1,850 kg)



Note

*These specification tables are only valid for these vehicles.*

- Compare the measured height of wheel housing edge -h- to values in specification table. Measure ride height  
⇒ [page 152](#)
- Then, select specifications or adjustment figures for the respective vehicle, and adjust vehicle to these figures.

Height of wheel housing edge -h- in mm ⇒ <a href="#">page 153</a>	Toe-in per wheel	Camber	Caster angel	Toe-out on turns with steering angle of inner wheel of 20°
482.5	00°02'	00°00'	04°52'	01°38'
486.7	00°03'	00°07'	04°50'	01°36'
490.8	00°04'	00°14'	04°48'	01°33'
495.0	00°05'	00°21'	04°46'	01°31'
499.1	00°07'	00°29'	04°44'	01°29'
503.3	00°08'	00°37'	04°42'	01°27'
507.4	00°09'	00°44'	04°40'	01°25'
511.6	00°09'	00°52'	04°38'	01°23'
515.8	00°10'	01°01'	04°36'	01°22'
519.9	00°11'	01°09'	04°34'	01°20'
524.1	00°12'	01°17'	04°32'	01°19'
528.2	00°13'	01°26'	04°31'	01°18'

#### Tolerances:

Toe-in per wheel	Individual figures +/- 5'	Permissible deviation le/ri +/- 10'
Camber	Individual figures +/- 35'	Permissible deviation le/ri +/- 60'
Caster angel	Individual figures +/- 30'	Permissible deviation le/ri +/- 30'

### 3.6.4 Specification tables for front axle of 4.6 t and 5.0 t vehicles (max. permitted front axle loading 2,000 kg)



Note

*These specification tables are only valid for these vehicles.*

- Compare the measured height of wheel housing edge -h- to values in specification table. Measure ride height  
⇒ [page 152](#)
- Then, select specifications or adjustment figures for the respective vehicle, and adjust vehicle to these figures.



Height of wheel housing edge -h- in mm ⇒ <a href="#">page 153</a>	Toe-in per wheel	Camber	Caster angel	Toe-out on turns with steering angle of inner wheel of 20°
482.5	00°02'	00°00'	04°52'	01°38'
486.4	00°03'	00°07'	04°50'	01°36'
490.3	00°04'	00°13'	04°48'	01°33'
494.2	00°05'	00°20'	04°46'	01°31'
498.1	00°06'	00°27'	04°44'	01°29'
502.0	00°07'	00°34'	04°42'	01°27'
505.9	00°08'	00°41'	04°41'	01°26'
509.8	00°09'	00°49'	04°39'	01°24'
513.6	00°10'	00°56'	04°37'	01°23'
517.5	00°11'	01°04'	04°35'	01°21'
521.4	00°11'	01°12'	04°34'	01°20'
525.3	00°12'	01°20'	04°32'	01°19'
529.2	00°13'	01°28'	04°33'	01°18'
533.1	00°13'	01°36'	04°29'	01°17'
537.0	00°14'	01°45'	04°27'	01°16'

**Tolerances:**

Toe-in per wheel	Individual figures +/- 5'	Permissible deviation le/ri +/- 10'
Camber	Individual figures +/- 35'	Permissible deviation le/ri +/- 60'
Caster angel	Individual figures +/- 30'	Permissible deviation le/ri +/- 30'

### 3.6.5 Specification table for rear axle, vehicles from 3.0 t to 3.88 t



Note

*These specification tables are only valid for these vehicles.*

Permitted vehicle gross weight in (kg)	Toe-in/total toe	Camber
Up to 3,500	0°07.5' ± 15'	-0°35'+ 5'

### 3.6.6 Specification table for rear axle, vehicles from 4.6 t to 5.0 t



Note

*These specification tables are only valid for these vehicles.*

Permitted vehicle gross weight in (kg)	Toe-in/total toe	Camber
Up to 5000	0°00'± 15'	-0°35'+ 5'



### 3.7 Specified values for wheel alignment

Crafter 4MOTION with Achleitner four-wheel drive



*These specification tables are only valid for these vehicles.*

Wheelbase (mm)	3250	3665	4325
Wheel angle / opposite angle	33.4° / 30.5°		
Min. turning circle (m)	15.5	17.0	19.4
Toe-in	0° 0' ± 10'		
Camber	0° 25' ± 15'		
Caster	2° 15' ± 20'		
Steering knuckle pivot inclination	6°		
Steering arm (mm)	137		
Steering wheel diameter (mm)	390		



- ◆ *The castor and the camber cannot be adjusted on front axle.*
- ◆ *However, castor or camber must be measured when checking total running gear geometry and figures checked in respective specifications table.*

### 3.8 Adjusting camber on front axle

Setting on Crafter 4MOTION



*The camber can not be adjusted on Crafter 4MOTION with Achleitner four-wheel drive.*

Setting on Crafter



- ◆ *For repairs, adjustment of camber is possible using replacement part eccentric bolt.*
- ◆ *Always measure vehicle ride height before starting camber measurements and select respective specifications table according to figures measured. Measuring ride height:  
⇒ [page 152](#)*
- Remove bolt -A- and replace it with a new eccentric bolt ⇒ Electronic Parts Catalogue "ETKA" .



**i** Note

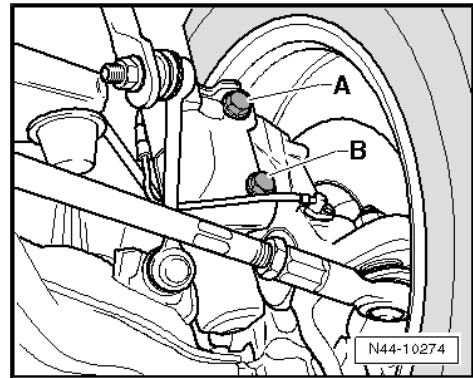
*But do not fully tighten eccentric bolt.*

- Unscrew nut from bolt -B- and renew it ⇒ Electronic Parts Catalogue "ETKA" .

**i** Note

*Tighten nut for bolt -B- slightly.*

- Always carry out the steps below in the sequence as listed here.
- Look up the camber value in the respective specifications table ⇒ [page 153](#) and set this value using bolt -A-.
- Tighten nuts of bolt -B- to specified torque.
- Tighten nuts of bolt -A- to specified torque.



**i** Note

*Bolt -A- must not turn when the nuts are tightened!*

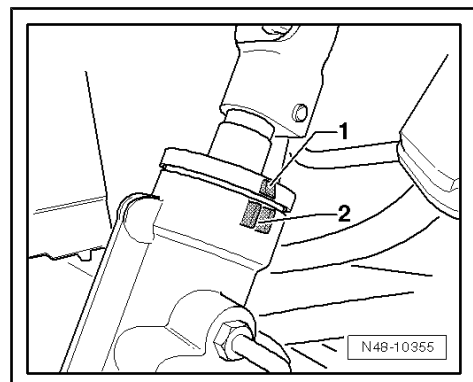
- Check adjusted camber value and repeat procedure if necessary ⇒ [page 157](#) .
- Check front axle toe and adjust if necessary ⇒ [page 158](#) .

**Specified torques**

- ◆ ⇒ ["5.1 Assembly overview - wheel bearing assembly", page 61](#)

### 3.9 Adjusting toe on front axle

- Set steering rack to central position, until marks -1- and -2- align over one another.





- Loosen lock nut -A- on left and right track rods and hold track rod ball joint with an open-end spanner.
- Turn both track rods until specification is attained.

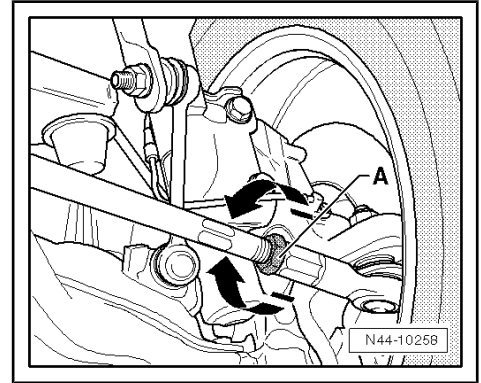
**i** Note

*The steering rack must remain in the centre position.*

- Tighten left and right track rod lock nuts to prescribed torque.

**i** Note

- ◆ *After completing adjustments, ensure track rod boots are not twisted. Twisted boots have a shorter service life.*
- ◆ *If steering wheel is not in centre position on completion of track rod adjustments, reposition it in "straight" position on steering tube. Removing and installing steering wheel => [page 164](#).*



**Specified torques**

- ◆ => ["3.2 Repairing steering rack", page 172](#)

### 3.10 Adjusting caster on front axle

**i** Note

- ◆ *Caster on front axle cannot be adjusted.*
- ◆ *However, caster must be measured when checking total running gear geometry and figures checked in respective specifications table.*



## 4 Front camera for driver assist systems

⇒ ["4.1 Calibrating front camera for driver assist systems"](#),  
[page 160](#)

### 4.1 Calibrating front camera for driver assist systems



#### Note

*The following situations can cause the camera function to be impaired by sustained poor visibility of the lane marker lines:*

- ◆ The field of view of the camera is soiled or iced over. In this case, clean the affected area.
- ◆ The field of view of the camera is fogged over.

**The camera's viewing window must be cleaned manually if there is heavy soiling on the inside of the windscreen in the field of view of the camera. To do this, the control unit and lens hood must be removed and the windscreen cleaned using cleaning solution. Remove control unit and lens hood ⇒ Electrical system; Rep. gr. 96 ; Front camera for driver assist systems .**

**Correct calibration is a basic precondition for the front camera for driver assist systems - R242- to function without faults.**

**The front camera for driver assist systems - R242- must be recalibrated if:**

- ◆ "No or incorrect basic setting/adaptation" entry is stored in the event memory.
- ◆ The front camera for driver assist systems - R242- was renewed.
- ◆ Windscreen has been renewed or removed.
- ◆ Modifications having an effect on the body height have been made to the car's running gear.



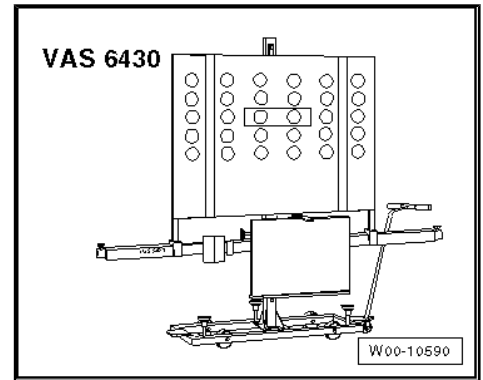
#### Note

- ◆ *Before calibrating the front camera for driver assist systems, read out event memory and rectify faults as necessary.*
- ◆ *Calibration of the driver assistant system's front camera is permitted only with the setting device - VAS 6430- !*

**Special tools and workshop equipment required**



◆ Setting device - VAS 6430-



- ◆ Calibration board for lane departure warning - VAS 6430/11-
- ◆ ⇒ Vehicle diagnostic tester

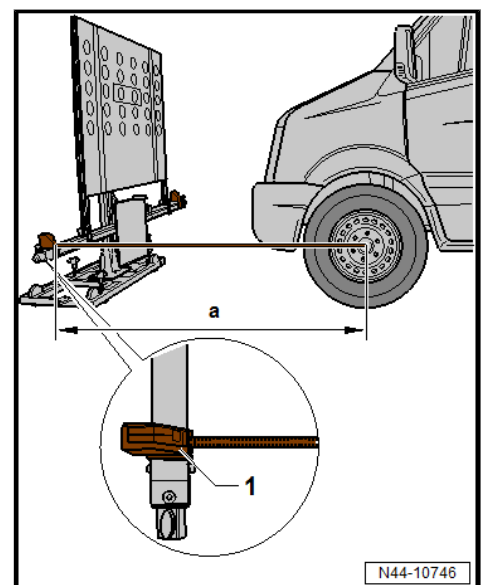
**i** Note

- ◆ *The front camera for driver assist systems - R242- must be correctly located in the holder.*
- ◆ *The field of view of the camera must be clean and clear.*
- ◆ *The distance between the setting device - VAS 6430- and the centre point of the hub of the front wheels must be 1,800 mm ± 25 mm.*
- ◆ *The calibration board must be positioned centrally on the setting device.*
- ◆ *Choose a light area with neutral background for calibration, e.g. headlight adjusting station or wheel alignment station.*
- ◆ *During the calibration procedure, make sure that all the car doors remain closed and that the car's exterior lighting is switched off.*
- ◆ *Setting device - VAS 6430- is not allowed to be moved on alignment beam.*

- Move front wheels to straight-ahead position.
- Turn setting device - VAS 6430- upwards so that alignment beam is parallel to middle of measurement transducers on front wheels, in order to perform a correct measurement with distance measuring unit -1-.
- 1 - Distance measuring unit with tape measure and socket pin
- Position setting device - VAS 6430- at distance -a- of 1,800 mm ± 25 mm from centre point of hub of front wheels to beam of setting device - VAS 6430- .

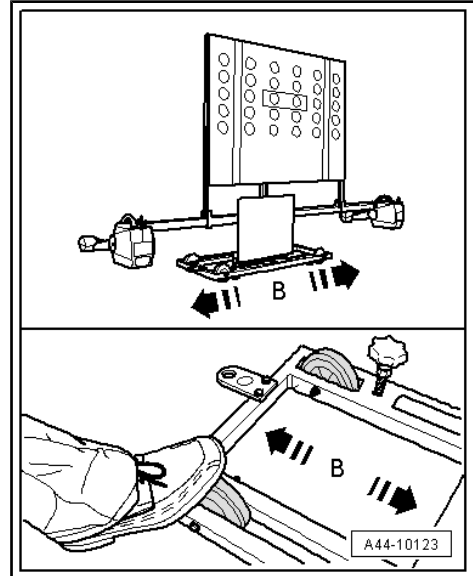
**⚠ Caution**

- ◆ *Distance -a- of 1,800 mm ± 25 mm must be measured on both sides of vehicle and setting device - VAS 6430- must then be aligned.*
- ◆ *Distance -a- must be same on both sides of car.*

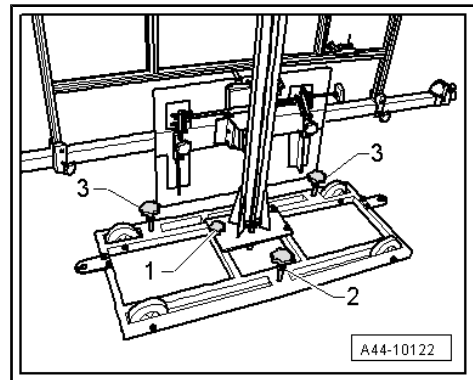




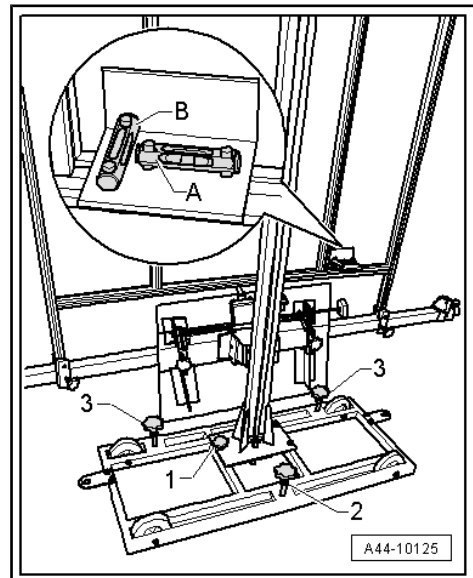
- Move setting device - VAS 6430- sideways -arrows B- until device is located centrally in vehicle longitudinal axis.



- Screw down adjuster screws -2- and -3- slightly to secure setting device - VAS 6430- against rolling away.

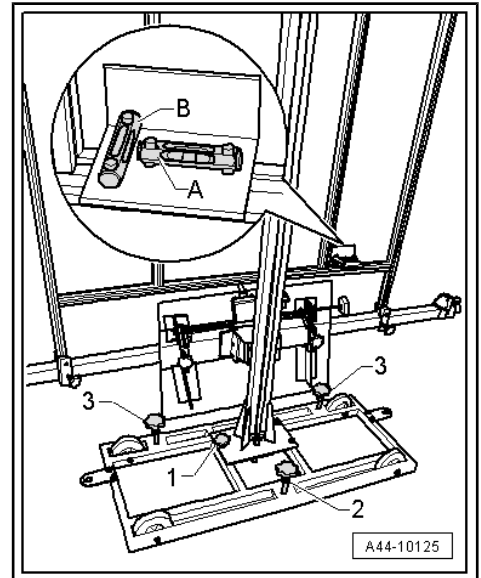


- Use adjuster screw -1- to level spirit level -A-.

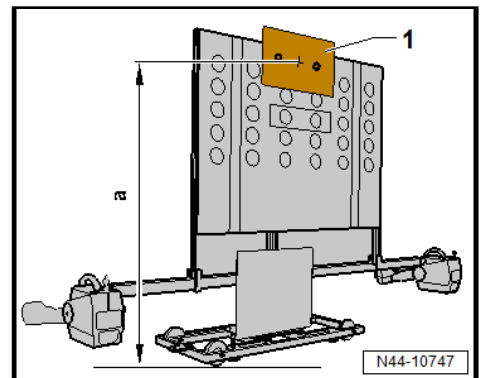




- Use adjuster screws -2- and -3- to level spirit level -B-.



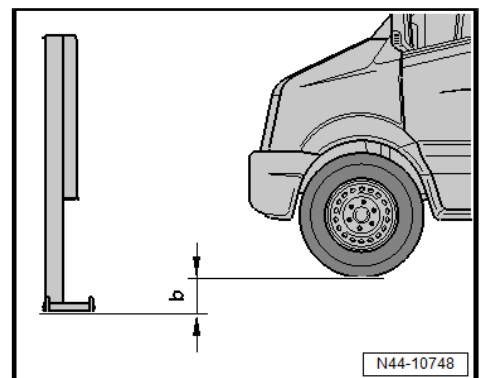
- Attach calibrating board for lane departure warning - VAS 6430/11- -1- centrally to setting device - VAS 6430- .
- Position calibrating board for lane departure warning - VAS 6430/11- -1- with a spacing -a- of 1700 mm.
- To do this, adjust height of setting device - VAS 6430- until dimension -a- of 1700 mm is reached from ground up to cross-hairs.



- If vehicle is on a wheel alignment platform, height -b- between surface on which setting device - VAS 6430- stands and surface on which vehicle stands on wheel alignment platform must be determined. Calculated value must be added to height of calibration board for lane departure warning - VAS 6430/11- of 1700 mm.
- Connect battery charger ⇒ Electrical system; General information; Rep. gr. 27 ; Charging battery .

**Concluding work is carried out via ⇒ Vehicle diagnostic tester.**

- Switch on ignition.
- On ⇒ Vehicle diagnostic tester, select “Guided Fault Finding”.



Body (Rep. Gr. 01;27;50...97)

General body repairs

01-Self-diagnosis capable systems

0087 - Lane departure warning control unit - MMPC906

0087 - Functions

0087 - Control unit - Calibrated

Follow instructions on screen to perform calibration.



## 48 – Steering

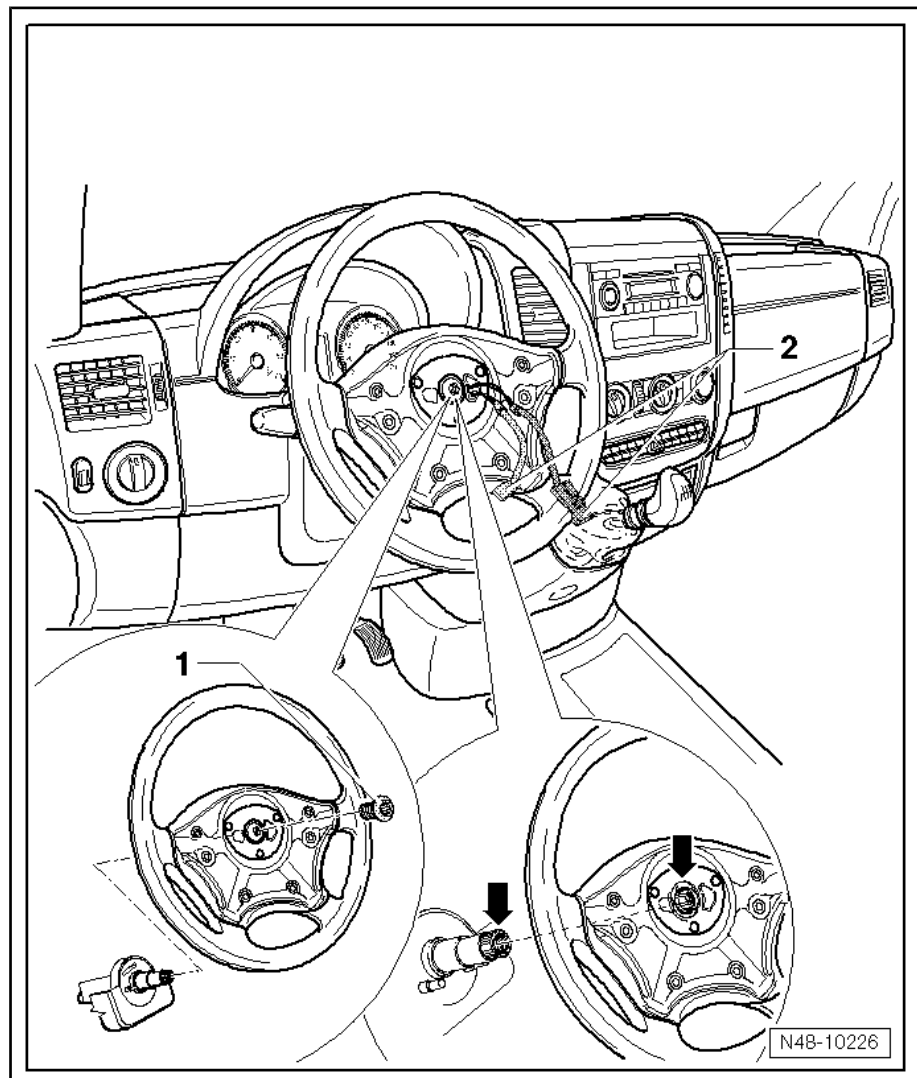
### 1 Steering wheel

⇒ [“1.1 Removing and installing steering wheel”, page 164](#)

#### 1.1 Removing and installing steering wheel

##### Removing

- Remove airbag unit on driver side ⇒ General body repairs, exterior; Rep. gr. 69 ; Passenger protection; Driver side airbag .
- Turn steering wheel to centre position (wheels in straight-ahead position).
- Unscrew bolt -1- and pull steering wheel off steering column.



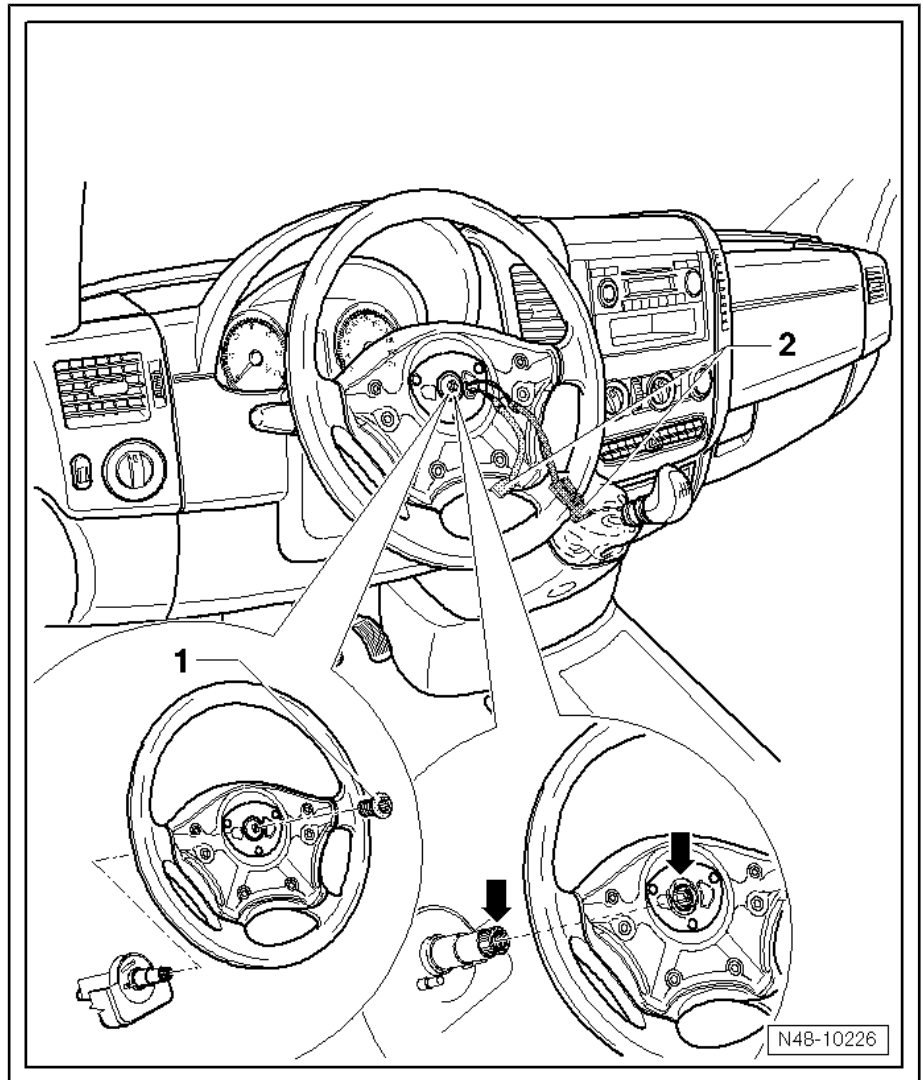
- Guide connectors for airbag unit -2- through aperture in steering wheel.

##### Installing

Install in reverse order. Note the following points:



- Guide connectors for airbag -2- through aperture in steering wheel.
- Put steering wheel onto steering column.
- Centre markings of steering wheel and steering column -arrows- must align.



- Secure steering wheel with bolt -1-.
- Mark bolt with a centre punch mark.

The bolt may be used 5 times.

**Specified torque**

Component	Specified torque
Bolt for steering wheel	80 Nm



## 2 Steering column

⇒ ["2.1 Assembly overview - steering column"](#), page 166

⇒ ["2.2 Removing and installing steering column"](#), page 167

⇒ ["2.3 Removing and installing control unit for electronic steering column lock J764"](#), page 168

### 2.1 Assembly overview - steering column

#### 1 - Steering column

- ❑ Removing and installing  
⇒ [page 167](#) .

#### 2 - Nuts

- ❑ Always renew after removing
- ❑ Qty. 4
- ❑ 21 Nm

#### 3 - Eccentric bolt

#### 4 - Intermediate steering shaft

- ❑ Removing and installing  
⇒ [page 167](#) .

#### 5 - Bolt

- ❑ 28 Nm

#### 6 - Nut

- ❑ Always renew after removing
- ❑ 21 Nm

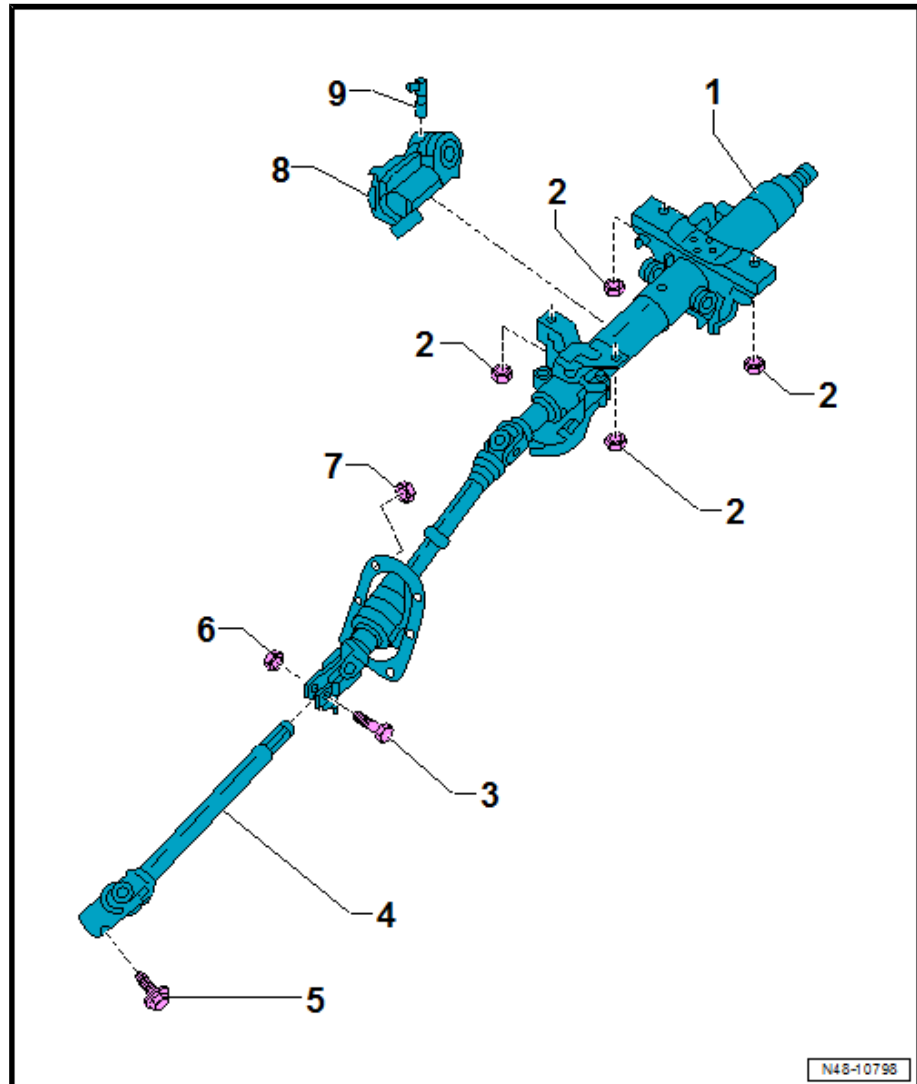
#### 7 - Nuts

- ❑ Qty. 4
- ❑ 8 Nm

#### 8 - Control unit for electronic steering column lock - J764-

- ❑ Removing and installing  
⇒ [page 168](#) .

#### 9 - Fastening bolts





## 2.2 Removing and installing steering column

### Removing



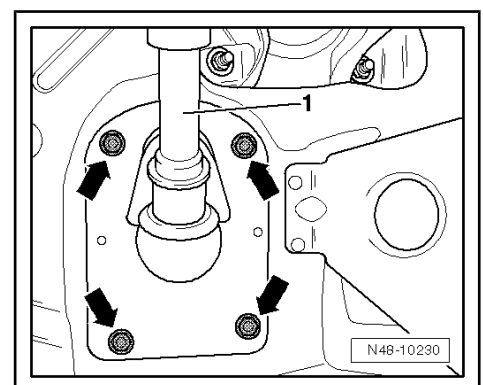
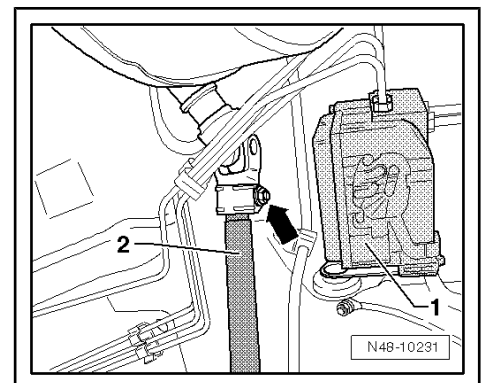
#### WARNING

*The following conditions must be met before starting work on the electrical system and removing the steering wheel:*

- ◆ *Disconnect earth strap from battery ⇒ Electrical system; Rep. gr. 27 ; Disconnecting and reconnecting battery .*
- ◆ *Wheels must be in straight-ahead position.*

*Failure to comply with these precautions may lead to subsequent failure of the airbag system!*

- Note or request radio code on vehicles with coded radio if necessary.
- Turn wheels to straight-ahead position.
- Remove ignition key with steering wheel in centre position.
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Disconnecting and reconnecting battery .
- Remove nut -arrow- from universal joint behind ABS unit -1- and remove bolt.
- Pull intermediate shaft -2- out of universal joint.
- Remove steering wheel ⇒ [page 164](#) .
- Remove steering column switch ⇒ Electrical system; Rep. gr. 94 .
- Remove driver footwell cover ⇒ General body repairs, interior; Rep. gr. 70 .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 70 .
- Remove nuts -arrows- securing steering column -1- from plenum chamber bulkhead.
- Disconnect connector of electric steering column lock.





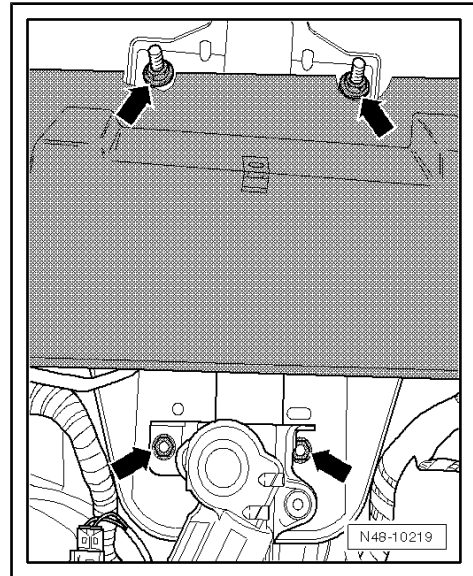
- Remove nuts -arrows-.
- Pull steering column out of guides.
- Turn steering column 180° so that electronic steering column lock points upwards.
- Remove steering column from vehicle.

### Installing

Install in reverse order. Note the following points:

#### Specified torques

- ◆ ⇒ [“2.1 Assembly overview - steering column”, page 166](#)
- ◆ ⇒ [“3.1 Assembly overview - steering rack”, page 169](#)
- ◆ ⇒ [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)
- ◆ ⇒ [“3.2 Repairing steering rack”, page 172](#)



## 2.3 Removing and installing control unit for electronic steering column lock - J764-

### Removing

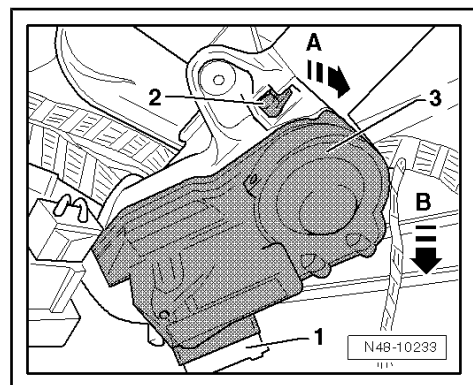
- Battery voltage at least 11.5 V
- Turn wheels to straight-ahead position.
- Switch off ignition.



#### Note

Switch off ignition only. Ignition key must remain in ignition lock.

- Remove cover in footwell on driver side ⇒ General body repairs, interior; Rep. gr. 70 .
- Remove front left footwell vent ⇒ Heater, air conditioning system; Rep. gr. 80 ; Air duct; Removing and installing footwell vent on driver side .
- Turn pin -2- in direction of -arrow A-.
- Hold electronic steering column lock control unit - J764- -3- tightly and pull pin -2- out.
- Lower electronic steering column lock control unit - J764- -3- in direction of -arrow B- and remove.
- Disconnect connector -1-.



### Installing

Install in reverse order. Note the following points:



#### Note

If electronic steering column lock/ electronic steering column lock control unit - J764- has been replaced, new component must be adapted/coded using ⇒ Vehicle diagnostic tester.



### 3 Steering rack

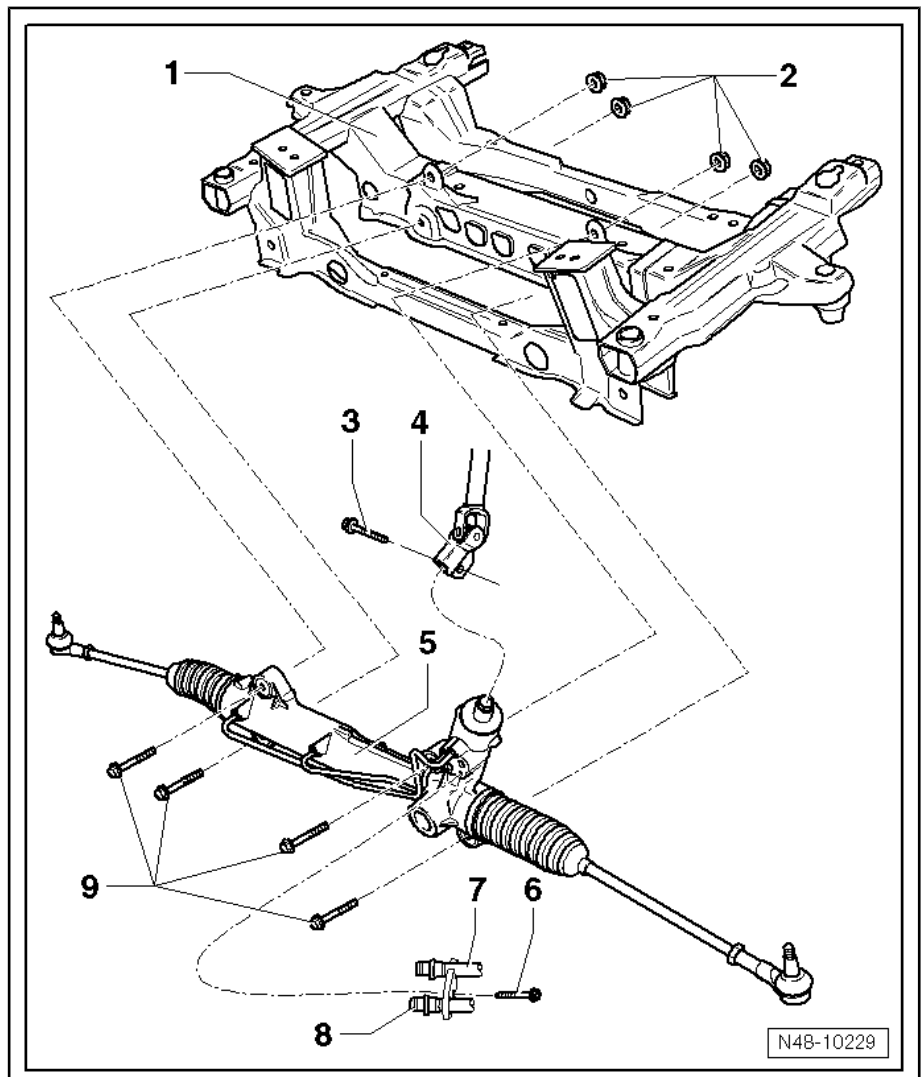
- ⇒ [“3.1 Assembly overview - steering rack”, page 169](#)
- ⇒ [“3.2 Repairing steering rack”, page 172](#)
- ⇒ [“3.3 Adjusting steering rack”, page 173](#)
- ⇒ [“3.4 Removing and installing steering rack”, page 178](#)
- ⇒ [“3.5 Removing and installing steering stop limit, Crafter 4MOTION with Achleitner four-wheel drive”, page 181](#)
- ⇒ [“3.6 Removing and installing track rod”, page 185](#)
- ⇒ [“3.7 Removing and installing track rod ball joint”, page 189](#)
- ⇒ [“3.8 Removing and installing boot”, page 191](#)

#### 3.1 Assembly overview - steering rack

- ⇒ [“3.1.1 Assembly overview - steering rack, Crafter”, page 169](#)
- ⇒ [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)

##### 3.1.1 Assembly overview - steering rack, Crafter

- 1 - Subframe
- 2 - Nut
  - Always renew after removing
- 3 - Bolt
  - 28 Nm
- 4 - Universal joint
- 5 - Steering rack
  - Note scope of delivery.
  - Removing and installing ⇒ [page 178](#)
- 6 - Bolt
  - 20 Nm
- 7 - Pressure line
- 8 - Return line
- 9 - Bolt
  - Always renew after removing
  - Initial torque specification: 25 Nm
  - 80 Nm +90°





### 3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive

#### 1 - Track rod ball joint

- Right.
- Check that dust caps are undamaged and correctly seated.
- Tapered pin must be free of oil and grease.
- If necessary, clean with a dry cloth but do not use cleaning solutions.
- Removing and installing ⇒ [page 189](#)

#### 2 - Nut

- Counterhold on track rod ball joint with a spanner when loosening or tightening nut.
- 65 Nm

#### 3 - Spring-type clip

- Always renew after removing

#### 4 - Boot

- Check for damage
- Must not be twisted after toe setting has been adjusted.
- Removing and installing ⇒ [page 191](#)

#### 5 - Clamp

- Always renew after removing
- Secure new hose clip using locking pliers for Phaeton steering rack - VAS 6199- .

#### 6 - Track rod

- Right.
- 115 Nm
- Removing and installing ⇒ [page 185](#)

#### 7 - Steering stop limit

- The right steering stop limit must be bonded on with adhesive sealant ⇒ Electronic Parts Catalogue (ETKA) .
- Removing and installing ⇒ [page 181](#)

#### 8 - Steering rack housing

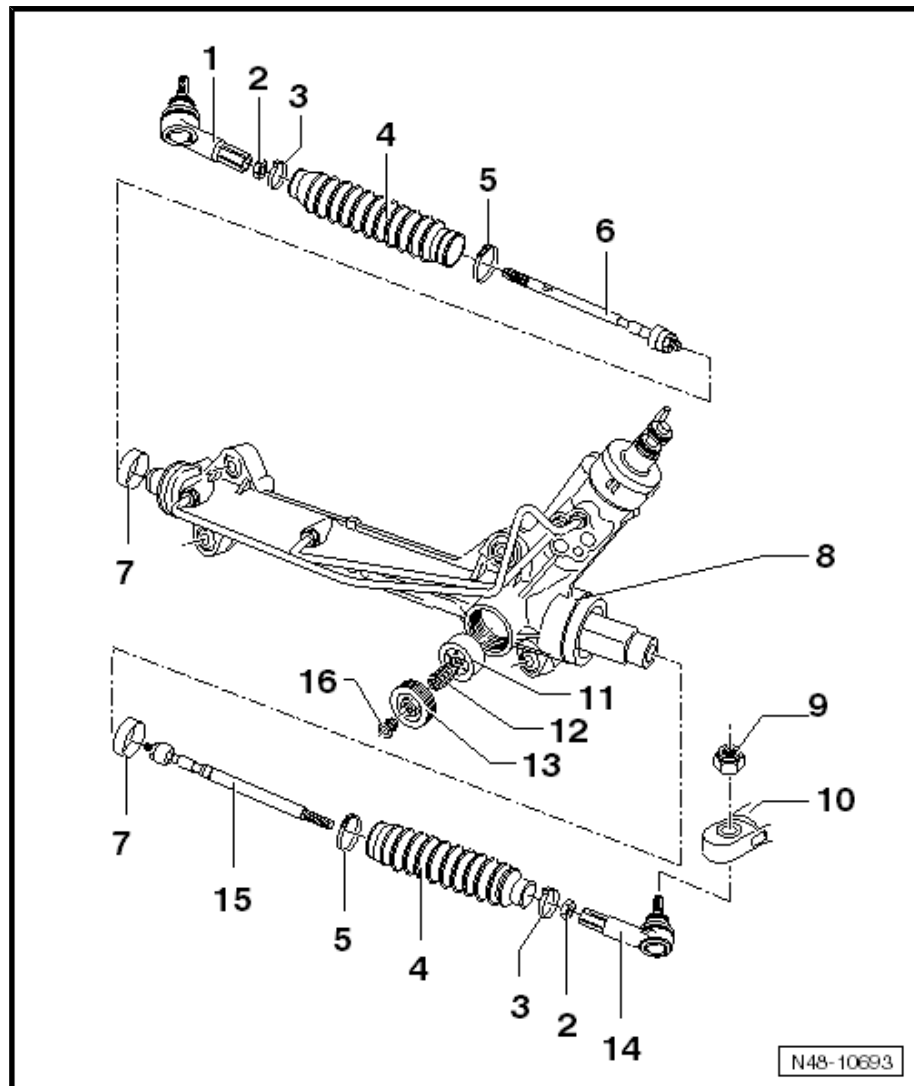
Checking and adjusting steering rack ⇒ [page 173](#) .

#### 9 - Nut

- Always renew after removing
- 50 Nm +60°

#### 10 - Wheel bearing housing

- Tapered hole must be free of oil and grease.





- If necessary, clean with a dry cloth but do not use cleaning solutions.

#### 11 - Thrust piece

- Renewing ⇒ [page 173](#) .

#### 12 - Spring

- Renewing ⇒ [page 173](#) .

#### 13 - Adjustment bolt

Checking and adjusting steering rack ⇒ [page 173](#) .

#### 14 - Track rod ball joint

- Left.
- Check that dust caps are undamaged and correctly seated.
- Tapered pin must be free of oil and grease.
- If necessary, clean with a dry cloth but do not use cleaning solutions.
- Removing and installing ⇒ [page 189](#)

#### 15 - Track rod

- Left.
- 115 Nm
- Removing and installing ⇒ [page 185](#)

#### 16 - Sealing plug set

## 3.2 Repairing steering rack

### 1 - Track rod ball joint

- Right.
- Check that dust caps are undamaged and correctly seated.
- Tapered pin must be free of oil and grease.
- If necessary, clean with a dry cloth but do not use cleaning solutions.
- Removing and installing ⇒ [page 189](#)

### 2 - Nut

- Counterhold on track rod ball joint with a spanner when loosening or tightening nut.
- 65 Nm

### 3 - Spring-type clip

### 4 - Boot

- Check for damage
- Must not be twisted after toe setting has been adjusted.
- Removing and installing ⇒ [page 191](#)

### 5 - Clamp

- Always renew after removing
- Secure new hose clip using locking pliers for Phaeton steering rack - VAS 6199- .

### 6 - Track rod

- Right.
- The hexagon on the track rod has been changed from AF 41 to AF 40. The series parts, replacement parts and parts in repair kits are the same. The axial joints are compatible amongst each other, and AF 41 joints are replaced by AF 40 joints.
- Removing and installing ⇒ [page 185](#)
- 115 Nm

### 7 - Steering rack housing

Checking and adjusting steering rack ⇒ [page 173](#) .

### 8 - Nut

- Always renew after removing
- 50 Nm +60°

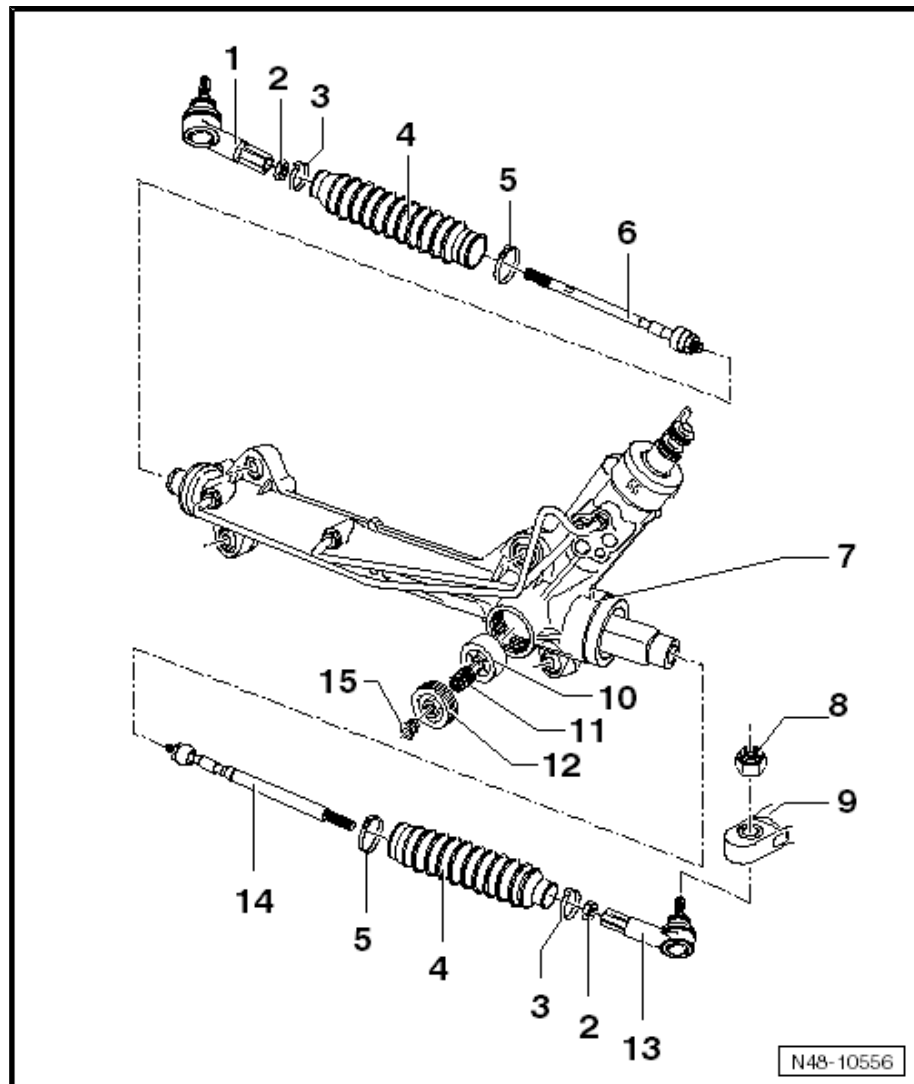
### 9 - Wheel bearing housing

### 10 - Thrust piece

- Renewing ⇒ [page 173](#) .

### 11 - Adjustment bolt

Checking and adjusting steering rack ⇒ [page 173](#) .





**12 - Spring**

- Renewing ⇒ [page 173](#) .

**13 - Track rod ball joint**

- Left.
- Check that dust caps are undamaged and correctly seated.
- Tapered pin must be free of oil and grease.
- If necessary, clean with a dry cloth but do not use cleaning solutions.
- Removing and installing ⇒ [page 189](#)

**14 - Track rod**

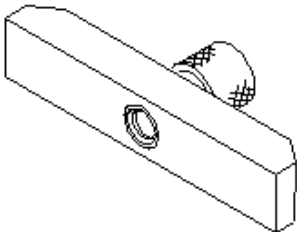
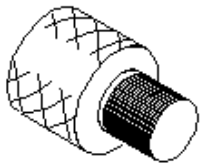

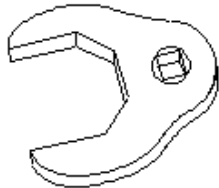

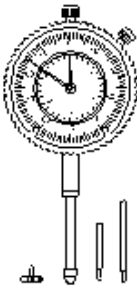
- Left.
- The hexagon on the track rod has been changed from AF 41 to AF 40. The series parts, replacement parts and parts in repair kits are the same. The axial joints are compatible amongst each other, and AF 41 joints are replaced by AF 40 joints.
- Removing and installing ⇒ [page 185](#)
- 115 Nm

**15 - Sealing plug set**

**3.3 Adjusting steering rack**

**Special tools and workshop equipment required**

- ◆ Measuring bridge - VW 382/7-
- ◆ Measuring needle - VW 382/10-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Open-end socket wrench - V.A.G 1331/11-
- ◆ Dial gauge - VAS 6080-
- ◆ Dial gauge extension, 30 mm - VAS 6341/3-

<p><b>VW 382/7</b></p> 	<p><b>VW 382/10</b></p> 
<p><b>V.A.G. 1331</b></p> 	<p><b>V.A.G. 1331/11</b></p> 
<p><b>6080</b></p> 	<p><b>VAS 6341</b></p>  <p style="text-align: right; font-size: small;">W48-10021</p>



### Procedure

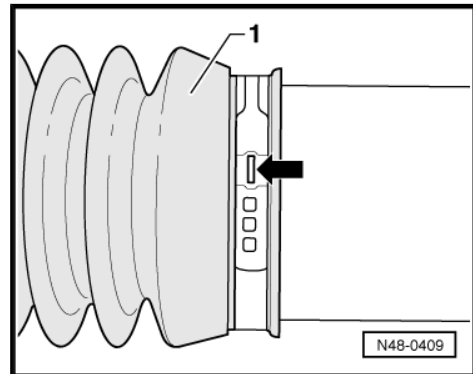
- Raise vehicle and strap it down => Maintenance ; Booklet 10.2 .



### WARNING

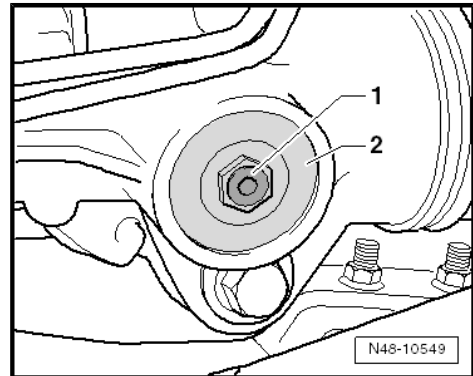
*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Wheels in straight-ahead position and not subject to load.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Open clamp -arrow- and pull boot -1- from left track rod.

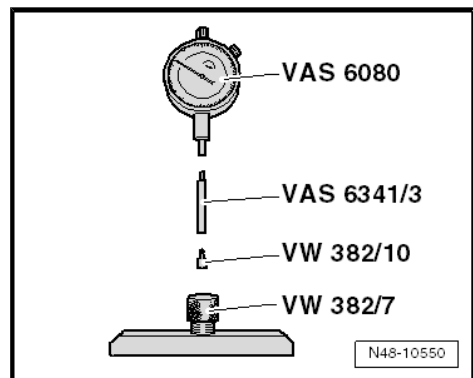


- Pull sealing plug -1- off adjuster screw -2- of steering rack.

Determine test value:

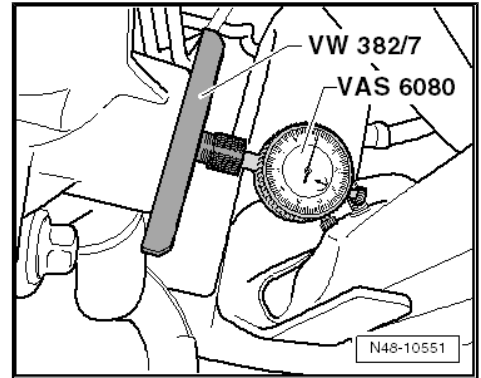


- Insert dial gauge - VAS 6080- together with dial gauge extension, 30 mm - VAS 6341/3- into measuring device - VW 382- .

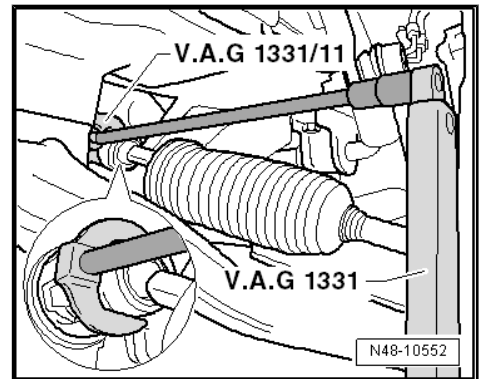




- Fit dial gauge - VAS 6080- together with measuring tool - VW 382- on steering rack.
- Push dial gauge - VAS 6080- into measuring device - VW 382- until the measuring pin touches the thrust piece.
- Set dial gauge - VAS 6080- to »zero«.



- Fit torque wrench - V.A.G 1331- together with extension and open-end socket wrench - V.A.G 1331/11- to swivel joint.
- Apply a torque of 22 Nm when turning left. Read value on gauge - VAS 6080- .
- Apply a torque of 22 Nm when turning right. Read value on gauge - VAS 6080- .
- Calculate test value from sum of the two values shown.



Example:

1st value shown	0.03 mm
+ 2nd value shown	0.04 mm
= Test value	0.07 mm

- The following table indicates what action has to be taken.

Test value	Action
Less than 0.04 mm	Adjust steering rack ⇒ <a href="#">page 175</a> .
0.04 ... 0.08 mm	No adjustment necessary
0.09 ... 0.30 mm	Adjust steering rack ⇒ <a href="#">page 175</a> .
0.31 ... 0.60 mm	Renew thrust piece ⇒ <a href="#">page 176</a> .
Greater than 0.60 mm	Renew steering rack ⇒ <a href="#">page 178</a> .

### Adjusting steering rack

- Test value determined ⇒ [page 174](#)
- Test value less than 0.04 mm or between 0.09 and 0.30 mm

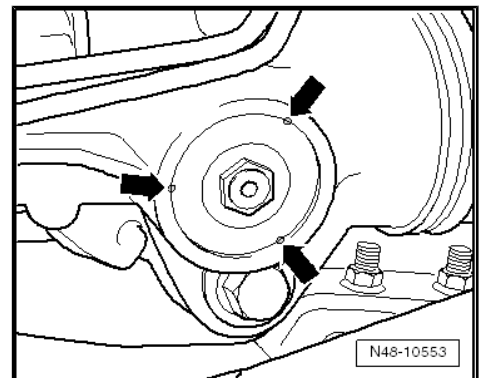
### Note

*Steering racks that have already been adjusted are marked with 3 punch marks -arrows-. It is not permissible to adjust marked steering racks again.*

### Procedure

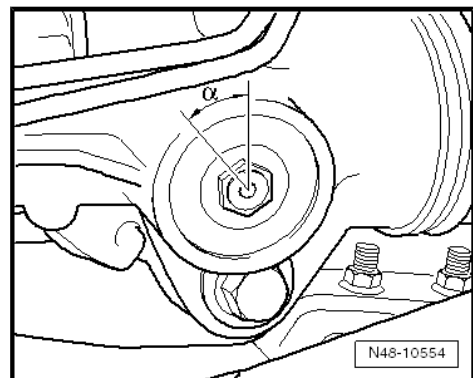
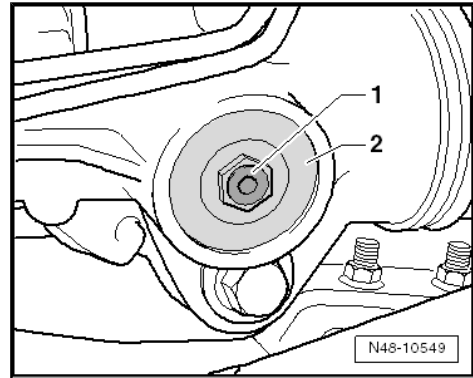
- Tighten adjuster screw -2-.

Component	Specified torque
Adjustment bolt	60 Nm

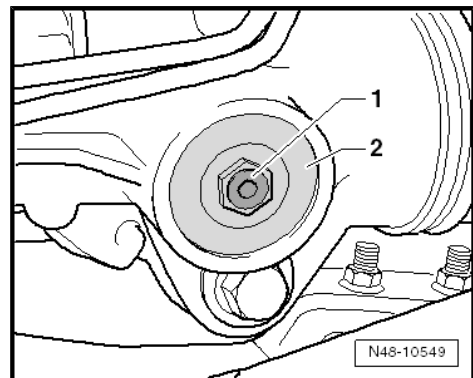




- Loosen adjuster screw 45°.
- Determine test value ⇒ [page 174](#) .
- Adjust steering rack by turning adjuster screw.  
Setting: 0.04...0.08 mm



- Insert new sealing plug -1-.

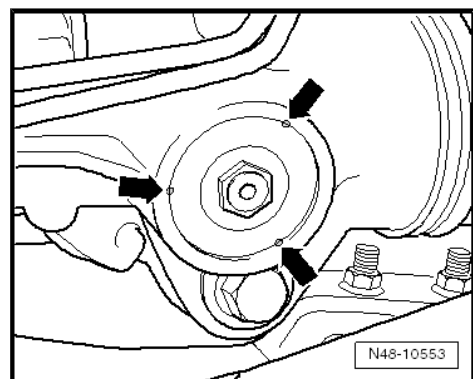


- Mark adjusting screw by making 3 centre punch marks -arrows-.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Carry out a road test.
- The power steering must independently return to the straight-ahead position after manoeuvring or cornering, without catching.

#### Renew thrust piece

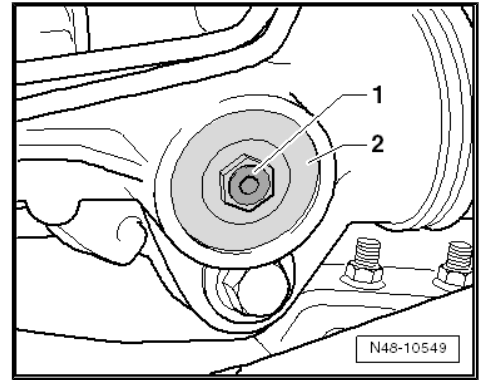
- Test value determined ⇒ [page 174](#)
- Test value between 0.3 and 0.60 mm

#### Procedure





- Undo and remove adjusting screw -2-.

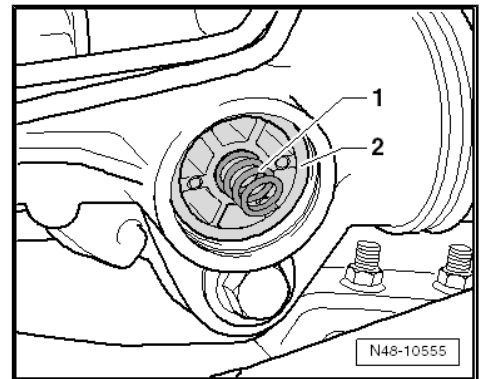


- Pull out spring -1- and thrust piece -2-.
- Clean seat of thrust piece.
- Grease new thrust piece and insert it into steering rack.

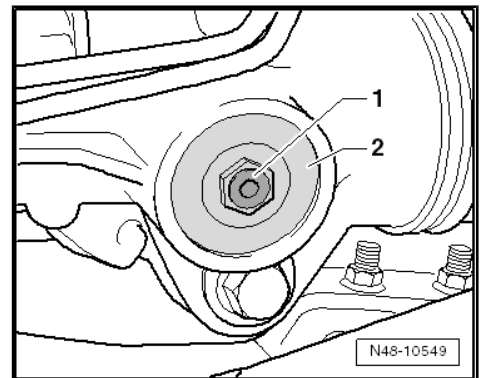
**i** Note

*The repair kit contains grease.*

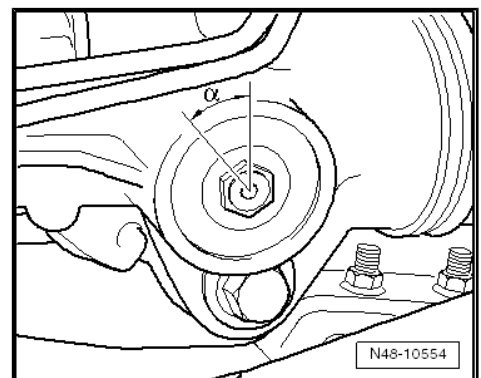
- Insert new spring into thrust piece.
- Tighten adjuster screw -1-.



Component	Specified torque
Adjustment bolt	60 Nm



- Loosen adjuster screw 45°.
- Determine test value ⇒ [page 174](#) .
- Adjust steering rack by turning adjuster screw.  
Setting: 0.040.08 mm
- Insert new sealing plug -1-.
- Mark adjusting screw by making 3 centre punch marks -arrows-.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Carry out a road test.
- The power steering must independently return to the straight-ahead position after manoeuvring or cornering, without catching.

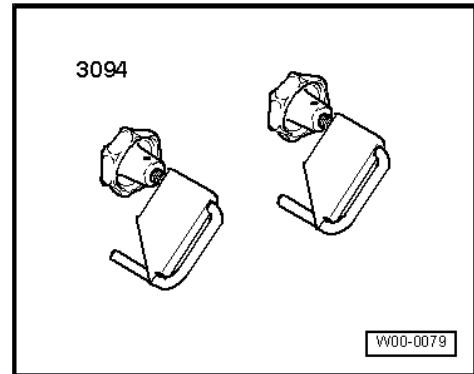




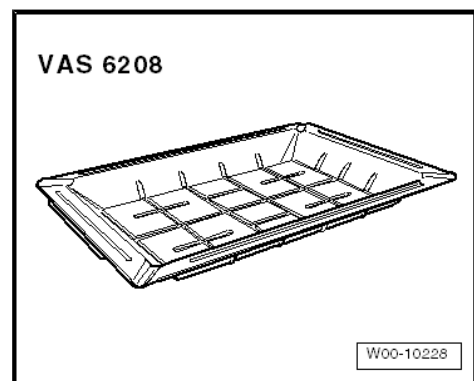
### 3.4 Removing and installing steering rack

#### Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Drip tray for workshop hoist - VAS 6208-



#### Observe the following important points when working on the steering rack:

- ◆ Absolute cleanliness is required when working on power steering system
- ◆ Thoroughly clean all unions and the adjacent areas before disconnecting
- ◆ After removal, place parts on a clean surface and cover them over if repairs are not to be performed immediately
- ◆ Only use lint-free cloths
- ◆ If repairs cannot be carried out immediately, carefully cover or seal open components.
- ◆ Only unpack replacement parts immediately prior to fitting
- ◆ Only use genuine packed parts
- ◆ Do not work with compressed air if the system is open.
- ◆ Do not move the vehicle.

#### Removing

- Remove saddle plates ⇒ [page 30](#) . Not installed in Crafter 4MOTION with Achleitner four-wheel drive.
- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .

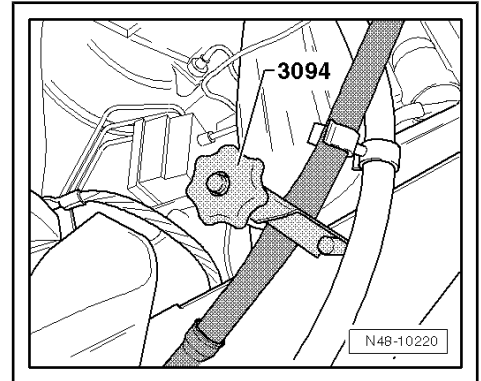


#### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*



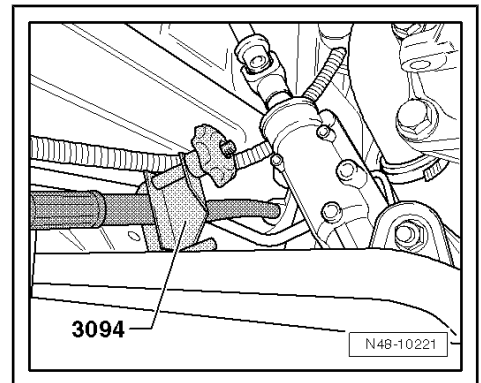
- Remove front wheels.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Remove left track rod ball joint.
- Press right track rod ball joint off wheel bearing housing.
- Clamp off return line using hose clamp, up to 25 mm - 3094- .



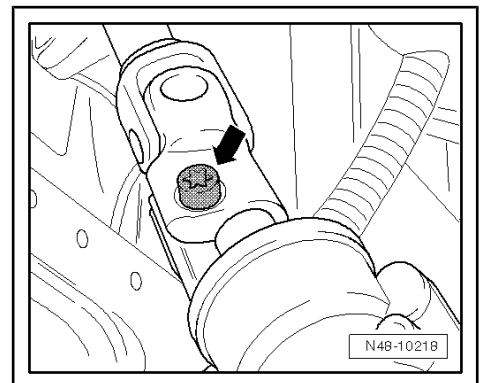
- Clamp off pressure line using hose clamps, up to 25 mm - 3094- .
- Turn steering wheel clockwise as far as it will go.

**i** Note

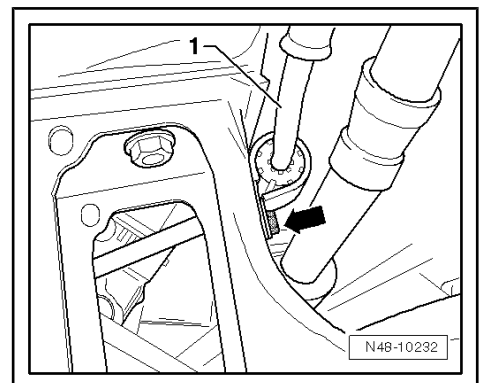
*Make sure that the steering wheel remains in this position during the assembly work. This ensures that the airbag coil connector and return ring with slip ring - F138- does not move/twist.*



- Undo bolt -arrow- and remove it from universal joint.
- Pull universal joint off steering rack.

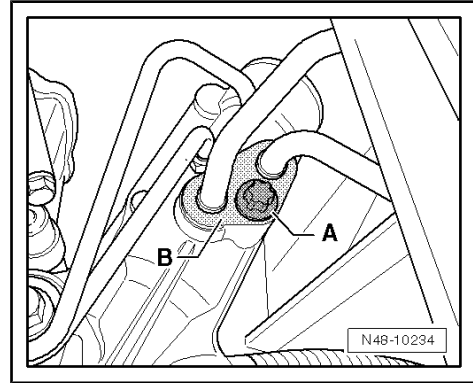


- Detach return line -1- from subframe -arrows-.

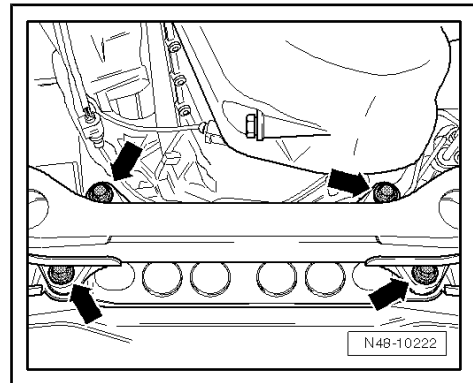




- Undo bolt -A- and push plate -B- backwards on return line.
- Carefully pull pressure line out of steering rack.
- Catch escaping hydraulic fluid.
- Seal or cover open lines/connections.



- Unscrew bolts from steering rack -arrow-.



- Counter-hold nuts -arrows- using an open-end spanner when removing bolts.
- Remove steering rack from subframe.

### Installing

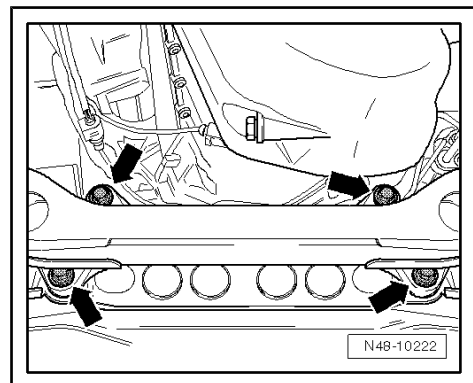
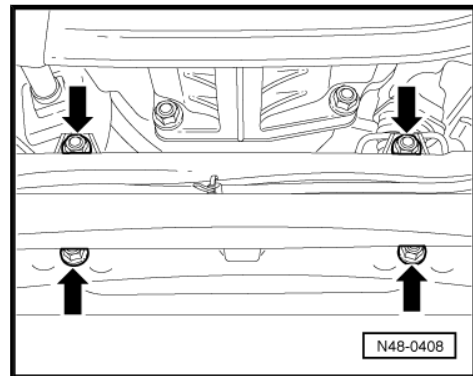
Install in reverse order. Note the following points:



### Note

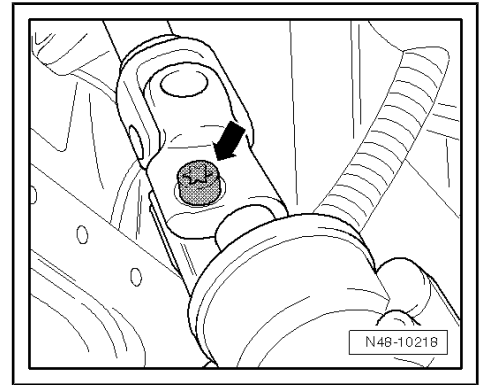
*If the steering rack is new, remove the right track rod ball joint.*

- Turn steering rack clockwise on steering pinion as far as it will go.
- Insert steering rack into subframe.
- Fit universal joint onto steering pinion.
- Firmly bolt steering rack to subframe -arrows-, counterholding at nuts => [page 180](#) .

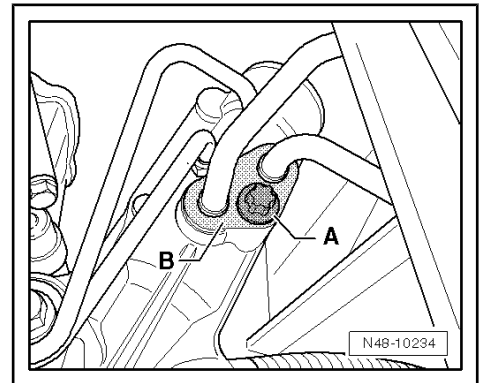




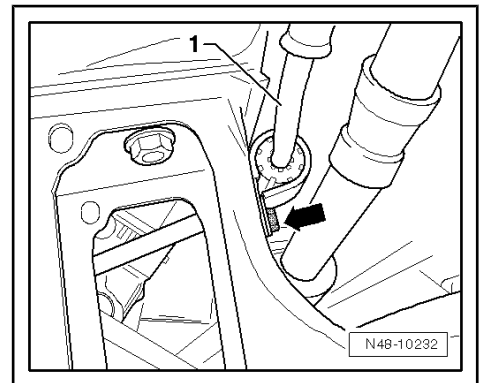
- Install and tighten bolt for universal joint -arrow-.
- Renew seals on pressure line.



- Carefully press pressure line into steering rack, fit plate -B-. Tighten bolt -A- for pressure lines.



- Attach return line -1- to subframe -arrow-.
- Install track rod ball joints.
- Remove hose clamps, up to 25 mm - 3094- from pressure line.
- Install noise insulation => General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Checking power steering fluid level => [page 197](#)
- Install front wheels.
- Fit saddle plate => [page 30](#) .
- Check wheel alignment => [page 149](#) .



#### Specified torques

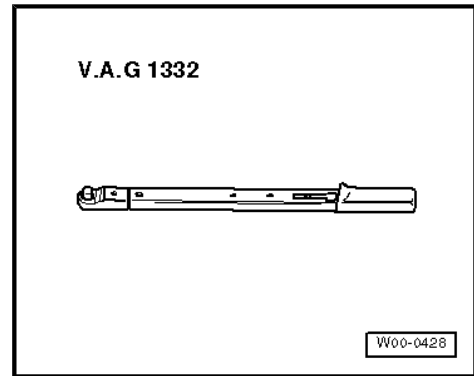
- ◆ => ["2.1 Assembly overview - steering column", page 166](#)
- ◆ => ["3.1 Assembly overview - steering rack", page 169](#)
- ◆ => [page 170](#)
- ◆ => ["3.2 Repairing steering rack", page 172](#)
- ◆ => ["2.1 Assembly overview - subframe", page 9](#)
- ◆ => ["2.1.2 Assembly overview - subframe, Crafter 4MOTION with Achleitner four-wheel drive", page 10](#)

### 3.5 Removing and installing steering stop limit, Crafter 4MOTION with Achleitner four-wheel drive

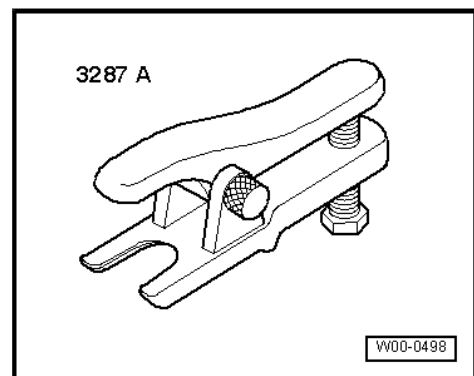
Special tools and workshop equipment required



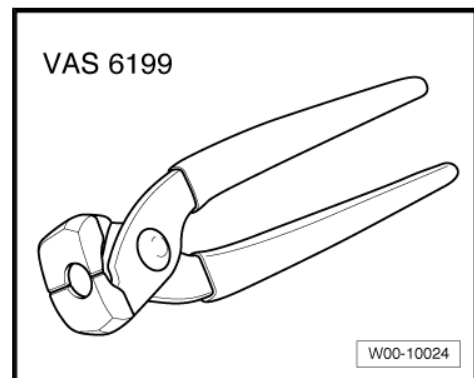
- ◆ Torque wrench - V.A.G 1332-



- ◆ Ball joint puller - 3287 A-



- ◆ Locking pliers for Phaeton steering rack - VAS 6199-



- ◆ Steering rack grease ⇒ Electronic Parts Catalogue (ETKA) .
- ◆ Adhesive sealant ⇒ Electronic Parts Catalogue (ETKA) .

### Removing

- Turn steering wheel to straight-ahead position.
- Remove wheel.
- Clean outside of steering rack in vicinity of boot ⇒ Maintenance ; Booklet 10.2 .



### Note

*Dirt must be prevented from entering the steering rack.*

- Unscrew track rod ball joint ⇒ [page 189](#) .
- Loosen spring-type clip on boot and push onto track rod.



- Open clamp -arrow- and pull boot -1- off steering rack.
- Remove track rod ⇒ [page 185](#) .

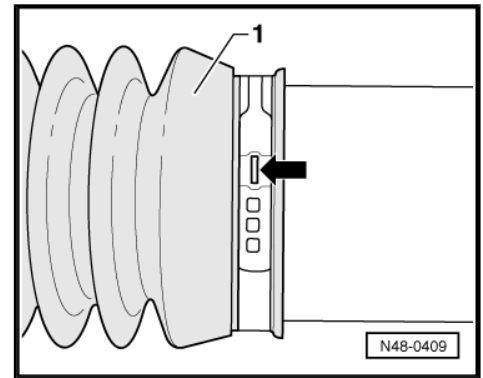
**i** Note

- ◆ *If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering rack.*
- ◆ *Likewise, if there is no film of grease on the steering rack, the steering rack must be renewed.*

- Remove damaged or loose steering stop limit.

**Installing (left side):**

- Turn steering wheel to full right lock.
- Clean any grease or oil from steering rack of power-assisted steering.





- Slide steering stop limit -1- loosely onto shoulder -2- of steering rack of steering rack -3-.



**Note**

*The steering stop limit -1- will be secured when left track rod is tightened.*

**Installing (right side):**



**Note**

*Observe manufacturer's instructions enclosed in the packaging and minimum curing period.*

- Turn steering wheel to full "left" lock.
- Clean any grease or oil from steering rack of power-assisted steering.
- Apply an adhesive bead of 2 to 3 mm thickness on the inside of the steering stop limit.



**WARNING**

*Observe the safety data sheet for the adhesive sealant → Electronic Parts Catalogue (ETKA) .*

- Slide steering stop limit -1- onto steering rack -3- of steering rack until it is flush.
- Spread adhesive sealant → Electronic Parts Catalogue (ETKA) -2-.

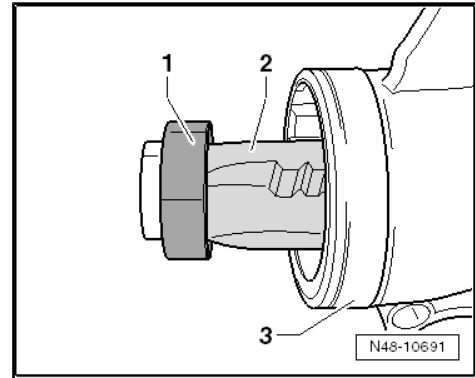


**Caution**

*Adhesive sealant → Electronic Parts Catalogue (ETKA) is inflammable.*

*Adhesive sealant → Electronic Parts Catalogue (ETKA) is harmful by inhalation.*

*Adhesive sealant → Electronic Parts Catalogue (ETKA) is irritating to eyes and skin.*



The minimum curing period is the period between bonding in the part and using the vehicle.

During the minimum curing period room and object temperature must be at least +18 °C.



Bonding surfaces may not be loaded until at least 24 hours after installation has elapsed.

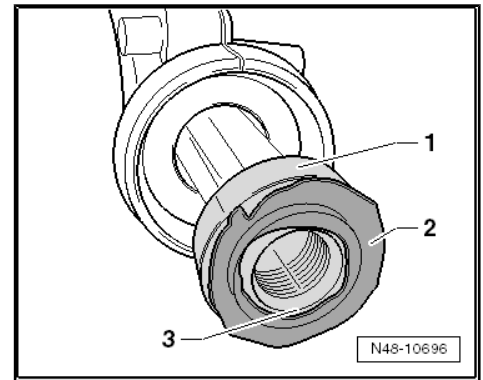
**WARNING**  
*Vehicle is safe to use only after the curing period is completed.*

**Installation (both sides):**

- Install track rod => [page 185](#) .

**Note**

*Before installation, steering rack must be coated with steering rack grease => Electronic Parts Catalogue (ETKA) .*



**Caution**  
*No other type of grease may be used.*

- Turn steering to full lock on each side in succession.
- Grease steering rack on toothed side using steering rack grease => Electronic Parts Catalogue (ETKA) .
- Turn steering wheel to straight-ahead position.

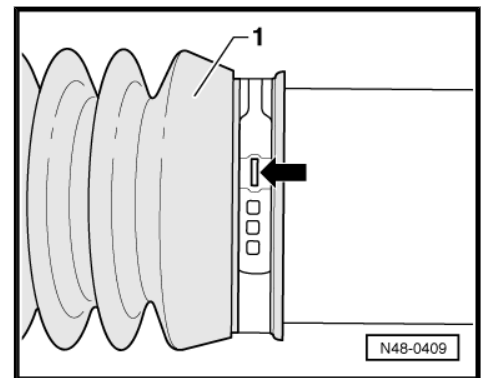
**Note**

*Position spring-type clip onto boot.*

- Slide boot -1- onto track rod and steering rack. Secure boot with new clamp -arrow-.
- Install track rod ball joint => [page 189](#) .
- Fit wheel.
- Check wheel alignment => [page 149](#) .

**Specified torques**

- ◆ => [“3.1 Assembly overview - steering rack”, page 169](#)
- ◆ => [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)
- ◆ => [“3.2 Repairing steering rack”, page 172](#)



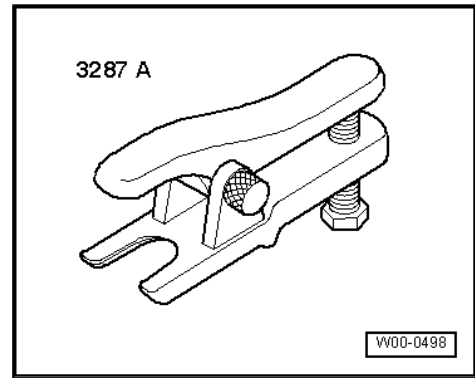
**3.6 Removing and installing track rod**

**Caution**  
*The hexagon on the track rod has been changed from AF 41 to AF 40. The series parts, replacement parts and parts in repair kits are the same. The axial joints are compatible amongst each other, and AF 41 joints are replaced by AF 40 joints.*

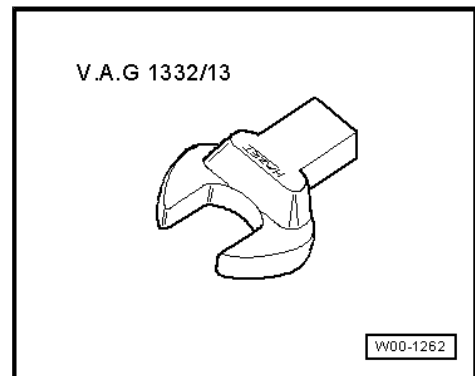
Special tools and workshop equipment required



- ◆ Ball joint puller - 3287 A-



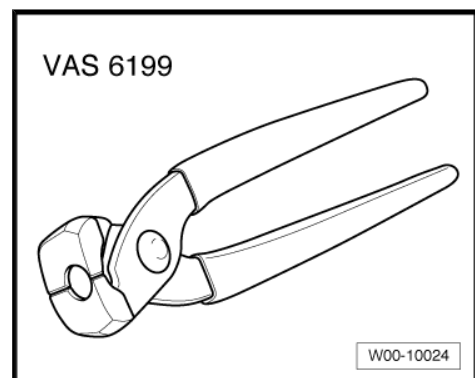
- ◆ Open-end spanner insert AF 41 - V.A.G 1332/13-



- ◆ Open-end spanner insert AF 40 - T50063-



- ◆ Locking pliers for Phaeton steering rack - VAS 6199-





- ◆ Torque wrench - V.A.G 1332-



### Removing

- Raise vehicle and strap it down ⇒ Maintenance ; Booklet 10.2 .



### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove front wheel.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front; Noise insulation .
- Loosen nut -A- on track rod ball joint but do not remove completely.

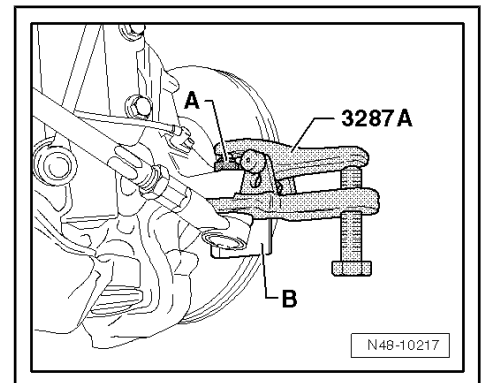
**Leave nut -A- screwed on a few turns on track rod ball joint threads to protect threads.**

- Pull track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- . Unscrew nut -A-.



### Note

*When pressing off track rod ball joint, do not damage rubber boot or heat shield -B-.*





- Open clamp -arrows-. Slide boot -1- down off steering rack.
- Loosen spring-type clamp on boot and push onto track rod.

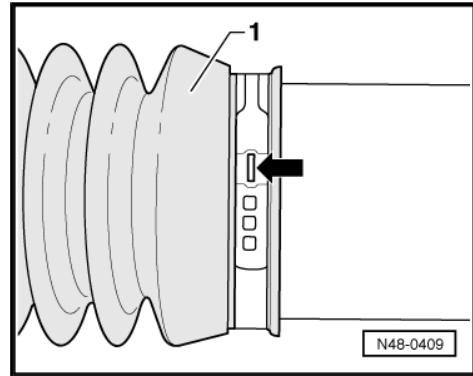
**Left track rod:**

- Turn steering rack to right (as viewed when looking forwards) to stop.

**Right track rod:**

- Turn steering rack to left (as viewed when looking forwards) to stop.

**Continuation for both sides**



**Caution**

*The hexagon on the track rod has been changed from AF 41 to AF 40. Select and use the appropriate open-end spanner insert.*

**Vehicles with AF 41 track rod**

- Unscrew track rod from steering rack.
- 1 - Open-end spanner insert AF 41 - V.A.G 1332/13-
- 2 - Torque wrench - V.A.G 1332-

**Vehicles with AF 40 track rod**

- Unscrew track rod from steering rack.
- 1 - Open-end spanner insert AF 40 - T50063-
- 2 - Torque wrench - V.A.G 1332-

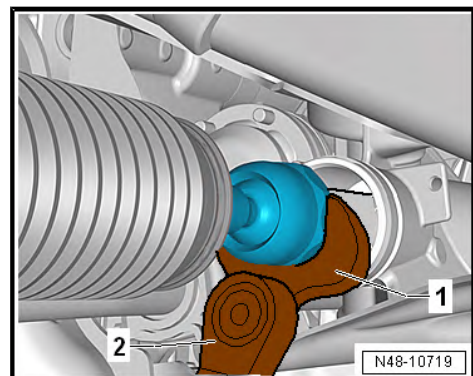
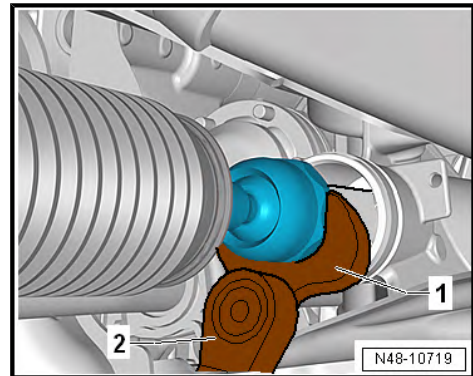
**Installing**

Install in reverse order. Note the following points:



**Caution**

*The hexagon on the track rod has been changed from AF 41 to AF 40. Select and use the appropriate open-end spanner insert.*

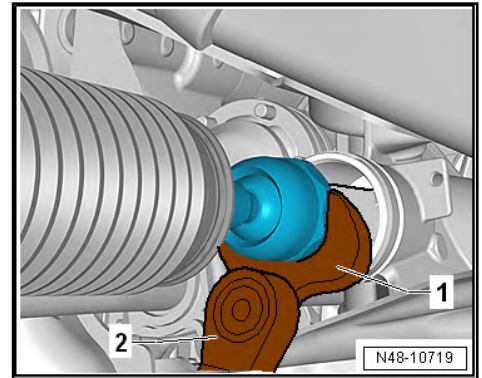


**Vehicles with AF 41 track rod**



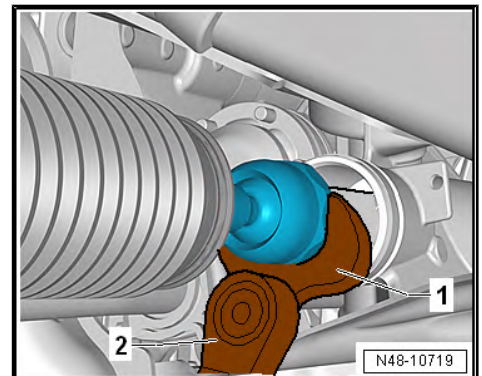
- Tighten track rod on steering rack.
- 1 - Open-end spanner insert AF 41 - V.A.G 1332/13-
- 2 - Torque wrench - V.A.G 1332-

**Vehicles with AF 40 track rod**

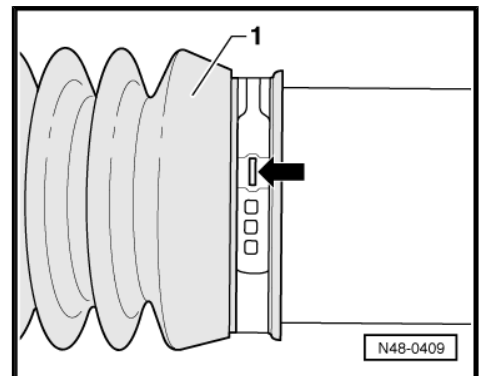


- Tighten track rod on steering rack.
- 1 - Open-end spanner insert AF 40 - T50063-
- 2 - Torque wrench - V.A.G 1332-

**Continuation for all vehicles**



- Slide boot -1- with new clamp -arrow- onto steering rack housing.
- Secure clamp using locking pliers for Phaeton steering rack - VAS 6199- .
- Fit spring-type clamp onto boot.
- Install track rod ball joint to wheel bearing housing (use new nut).



**Note**

*If track rod ball joint has been removed from track rod, vehicle steering geometry must be checked after installing => page 149 .*

**Specified torques**

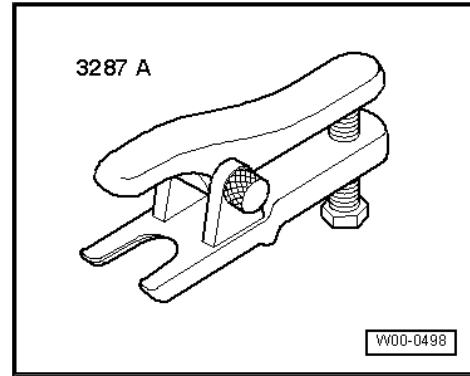
- ◆ => [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)
- ◆ => [“3.2 Repairing steering rack”, page 172](#)
- ◆ => [“1.1 Specified torque for wheel bolts”, page 135](#)

**3.7 Removing and installing track rod ball joint**

Special tools and workshop equipment required



◆ Ball joint puller - 3287 A-



### Removing

- Raise vehicle and strap it down => Maintenance ; Booklet 10.2 .



### WARNING

*If the vehicle is not strapped down, it may slip off the lifting platform.*

- Remove wheel.
- Loosen nut -1- on track rod ball joint but do not remove completely.

### Leave nut screwed on a few turns to protect thread on pin.

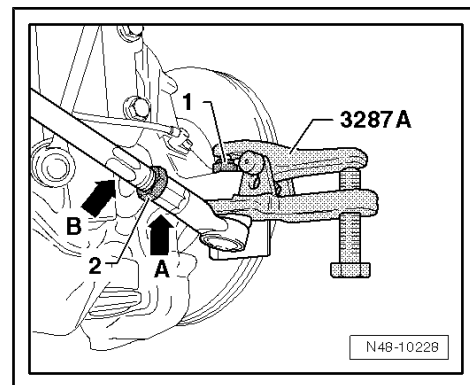
- Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- . Now unscrew nut -1-.



### Note

*When pressing off, do not damage rubber grommet or heat shield.*

- Loosen lock nut -2-.
- Mark position of track rod ball joint on track rod.
- Unscrew track rod ball joint from track rod. Use at flattened sides of track rod ball joint -arrow A- and track rod -arrow B- for this.



### Installing

Install in reverse order. Note the following points:

- Screw track rod ball joint onto mark (made previously) on track rod. Secure ball joint with lock nut.
- Bolt track rod ball joint with new nut.
- Install wheel and tighten to specified torque.
- Perform wheel alignment => [page 149](#) .

### Specified torques

- ◆ => [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)
- ◆ => [“3.2 Repairing steering rack”, page 172](#)
- ◆ => [“1.1 Specified torque for wheel bolts”, page 135](#)



### 3.8 Removing and installing boot

#### Removing



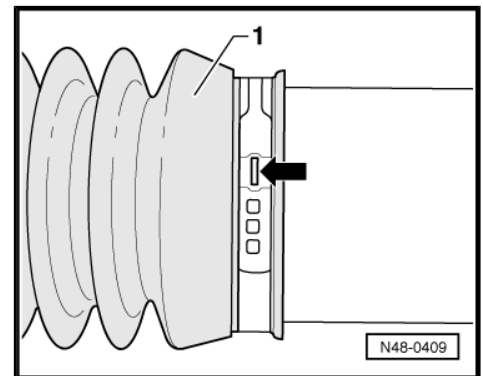
#### Note

*If boot is defective, moisture and dirt will enter steering rack. There must be a palpable film of grease in the area of the teeth on the steering rack. If there is no film of grease, the steering rack must be renewed. Also renew steering rack if there are signs of corrosion, damage or wear to the steering rack.*

- Turn steering wheel to straight-ahead position.
- Remove wheel.
- Clean outside of steering rack in vicinity of boot.

**No dirt must be allowed to enter the steering rack through a defective rubber boot during this operation.**

- Remove track rod ball joint ⇒ [page 189](#) .
- Loosen spring-type clip on boot and push onto track rod.
- Open clamp -arrow- and pull boot -1- from track rod.
- Remove clamp and pull boot from steering rack housing.
- Turn track rod out of ball joint.
- Pull boot with spring-type clip off track rod.



#### Note

- ◆ *If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering rack.*
- ◆ *Likewise, if there is no film of grease on the steering rack, the steering rack must be renewed.*

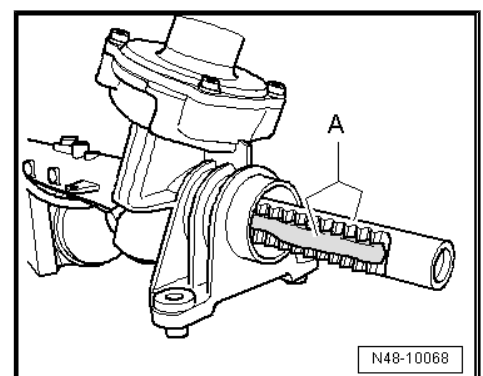
#### Installing

Install in reverse order. Note the following points:



To grease, turn steering to full lock on each side in succession.

- Coat steering rack with grease.
- Turn steering wheel to straight-ahead position.

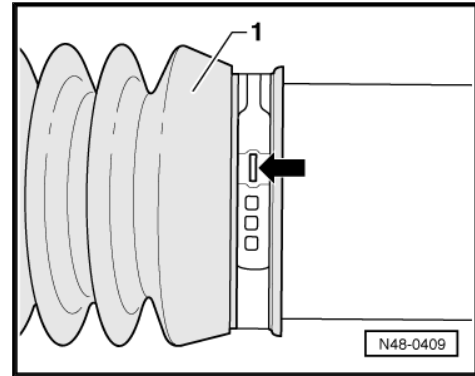




- Slide boot -1- onto track rod and steering rack. Secure boot with new clamp -arrow-.
- Position spring-type clip onto boot.
- Install track rod ball joint ⇒ [page 189](#) .

#### Specified torques

- ◆ ⇒ [“3.1.2 Assembly overview - steering rack, Crafter 4MOTION with Achleitner all-wheel drive”, page 170](#)
- ◆ ⇒ [“3.2 Repairing steering rack”, page 172](#)
- ◆ ⇒ [“1.1 Specified torque for wheel bolts”, page 135](#)





## 4 Hydraulic power steering

⇒ [“4.1 Assembly overview - hydraulic lines, reservoir, 4-cylinder diesel engine”, page 193](#)

⇒ [“4.2 Assembly overview - vane pump, 4-cylinder diesel engine”, page 195](#)

⇒ [“4.3 Assembly overview - vane pump, 5-cylinder diesel engine”, page 196](#)

⇒ [“4.4 Checking power steering fluid level”, page 197](#)

⇒ [“4.5 Bleeding steering system”, page 198](#)

⇒ [“4.6 Check steering for leaks”, page 198](#)

⇒ [“4.7 Checking vane pump delivery pressure, 4-cylinder diesel engine”, page 199](#)

⇒ [“4.8 Checking vane pump delivery pressure, 5-cylinder diesel engine”, page 201](#)

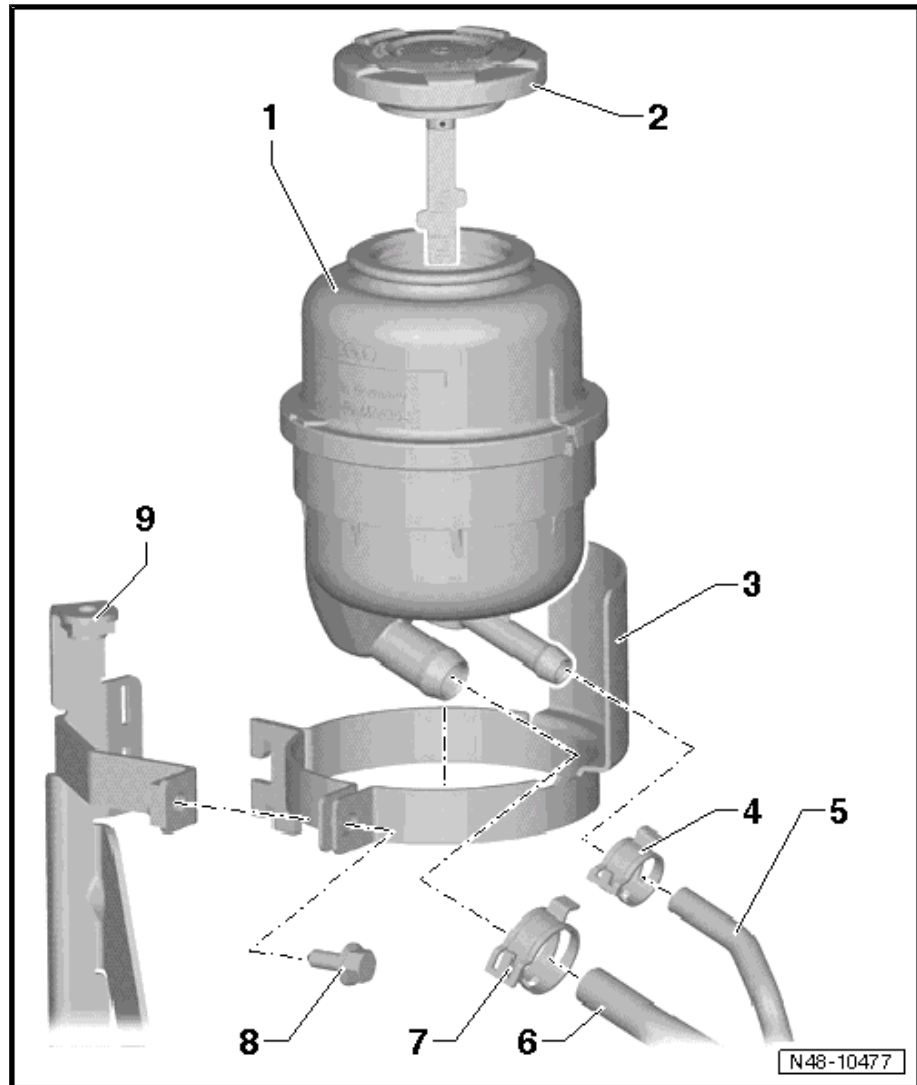
⇒ [“4.9 Removing and installing vane pump, 4-cylinder diesel engine”, page 204](#)

⇒ [“4.10 Removing and installing vane pump, 5-cylinder diesel engine”, page 206](#)

### 4.1 Assembly overview - hydraulic lines, reservoir, 4-cylinder diesel engine



- 1 - Reservoir
- 2 - Sealing cover with dipstick
  - Checking power steering fluid level  
=> [page 197](#) .
- 3 - Bracket
  - For reservoir
- 4 - Clamp
- 5 - Return hose
- 6 - Suction hose
- 7 - Clamp
- 8 - Bolt
  - 9 Nm
- 9 - Bracket
  - For engine control unit





## 4.2 Assembly overview - vane pump, 4-cylinder diesel engine

### Note

- ◆ *There is no provision for repairing the vane pump. If problems are reported, determine the cause by means of a pressure test and a leakage test. If a fault is found, the vane pump unit must be renewed.*
- ◆ *Renew sealing rings.*
- ◆ *Always check steering system for leaks if fluid level in reservoir is low.*
- ◆ *If leakage appears near pipe connections, first check lines and connections for leaks, tighten connections as necessary and wipe dry.*
- ◆ *Vane pumps taken from parts stock contain no fluid. Therefore it is essential to fill vane pump with hydraulic fluid ⇒ Electronic Parts Catalogue (ETKA) and to rotate pump by hand prior to installation. Otherwise vane pump may be damaged or be noisy during operation.*
- ◆ *Do not re-use hydraulic fluid which has been drained off.*

### 1 - Bracket

### 2 - Bush

- Drive bush back slightly when installing vane pump.

### 3 - Bolt

- 24 Nm


### 4 - Bolt

- 9 Nm

### 5 - Pressure line



### Note

*When installing, press on to  on vane pump.*

- Contains ⇒ [Item 8 \(page 195\)](#)

### 6 - Suction hose

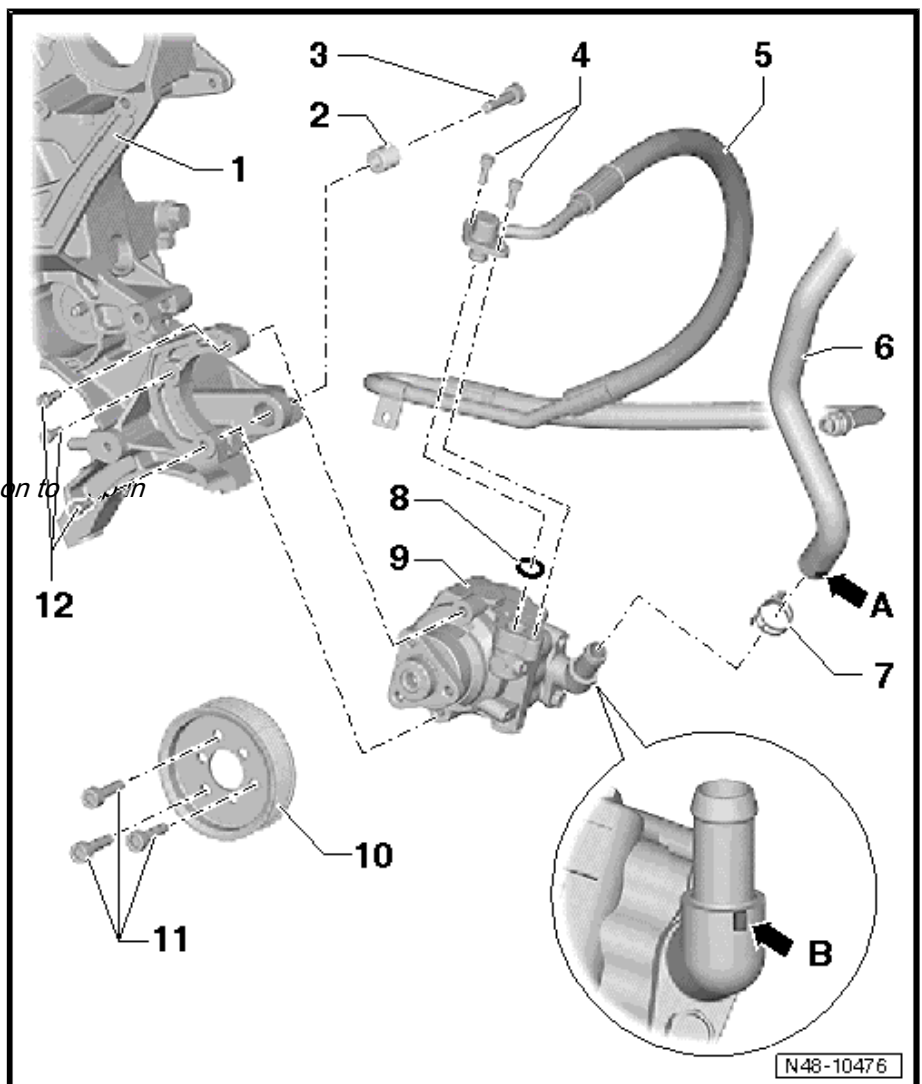
- Note installation position on vane pump: marking -arrow A- must align with marking -arrow B- on vane pump.

### 7 - Clamp

- Install on marking on suction hose.

### 8 - Sealing ring

- Always renew after removing





### 9 - Vane pump

- Allocation ⇒ Electronic Parts Catalogue “ETKA” .
- Fill with hydraulic fluid before installing.
- Removing and installing ⇒ [page 204](#)

### 10 - Belt pulley

### 11 - Bolt

- 23 Nm

### 12 - Bolt

- 24 Nm

## 4.3 Assembly overview - vane pump, 5-cylinder diesel engine



### Note

- ◆ *Renew sealing rings.*
- ◆ *Pumps taken from parts stock contain no fluid. Therefore it is essential to fill vane pump with hydraulic fluid ⇒ Electronic Parts Catalogue (ETKA) and to rotate pump by hand prior to installation. Otherwise vane pump may be damaged or be noisy during operation.*
- ◆ *There is no provision for repairing the vane pump. If complaints are received, determine cause with the help of pressure test . If a fault in component exists, vane pump must be renewed.*
- ◆ *Do not re-use hydraulic fluid which has been drained off.*
- ◆ *Make sure to use new hydraulic fluid ⇒ Electronic Parts Catalogue (ETKA) .*



**1 - Vane pump**

- Fill with hydraulic fluid before installing.
- Checking delivery pressure => [page 201](#)
- Removing and installing => [page 206](#).

**2 - Belt pulley**

**3 - Bolt**

- 25 Nm

**4 - Bracket**

**5 - Bolt**

- 25 Nm

**6 - Banjo bolt**

- 38 Nm

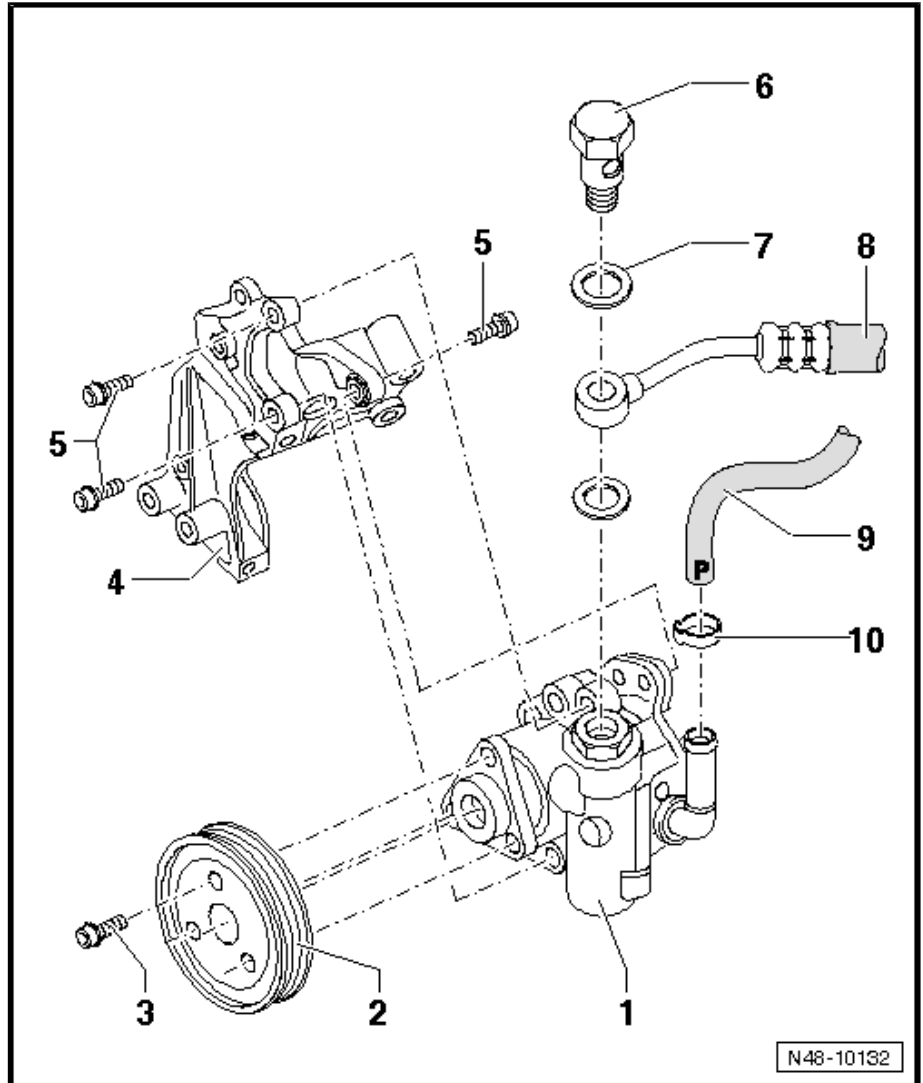
**7 - Sealing rings**

- Always renew after removing

**8 - Pressure hose**

**9 - Suction hose**

**10 - Spring-type clip**



**4.4 Checking power steering fluid level**

**Procedure**

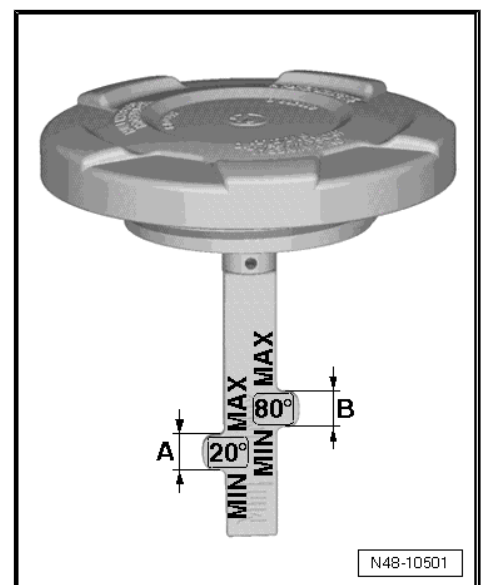
When fluid is cold: (approx. 20°C):

- Unscrew filler cap.
- Wipe dipstick with a clean, lint-free cloth.
- Screw filler cap on hand tight and unscrew again.



The cap must be fully screwed on in order to obtain an accurate fluid level reading.

- Check fluid level: fluid level should be in area -A-.





#### When fluid is at operating temperature (approx. 80 °C):

- Unscrew filler cap.
- Wipe dipstick with a clean, lint-free cloth.
- Screw filler cap on hand tight and unscrew again.



#### Note

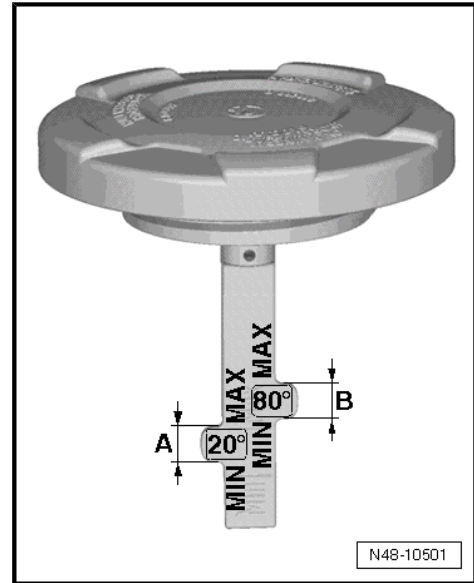
*The cap must be fully screwed on in order to obtain an accurate fluid level reading.*

- Check fluid level: fluid level should be in area -B-.



#### Note

- ◆ *If fluid level is above specified area, excess fluid must be extracted.*
- ◆ *If fluid is below specified range, hydraulic system must be checked for leaks. It is not sufficient just to top up with fluid.*
- ◆ *Do not re-use hydraulic fluid which has been drained off.*



## 4.5 Bleeding steering system

- Check hydraulic fluid level and top up if necessary.
- Raise vehicle until front wheels are free.
- With engine switched off, turn steering wheel 10 times from lock to lock.
- Check hydraulic fluid level and top up if necessary.
- Lower vehicle.
- Start engine.
- Turn steering wheel 10 times from lock to lock.
- Check hydraulic fluid level and top up if necessary  
⇒ [page 197](#) .

Any air remaining in steering system will dissipate by itself over the next 10 to 20 km driven.

## 4.6 Check steering for leaks



#### Note

*If hydraulic fluid level in reservoir is low after repairs are completed, steering system must be checked for leaks.*

- Start engine.
- Turn steering wheel left and right to lock and hold briefly.

This develops the maximum possible pressure.

**In this position, the following components must be checked for leaks:**

- ◆ Steering rack: steering pinion on valve block, connection point between valve and steering rack housing, housing
- ◆ All hose and pipe connections.

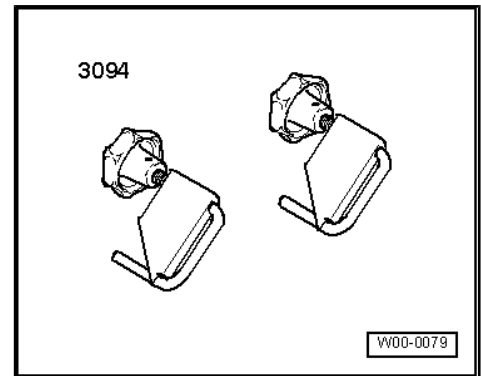


- ◆ Vane pump: shaft seal, all threaded connections, housing
- ◆ Reservoir

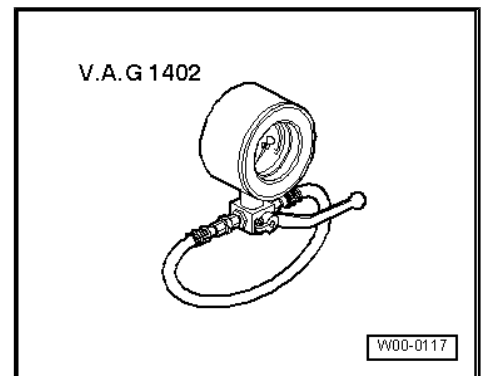
#### 4.7 Checking vane pump delivery pressure, 4-cylinder diesel engine

##### Special tools and workshop equipment required

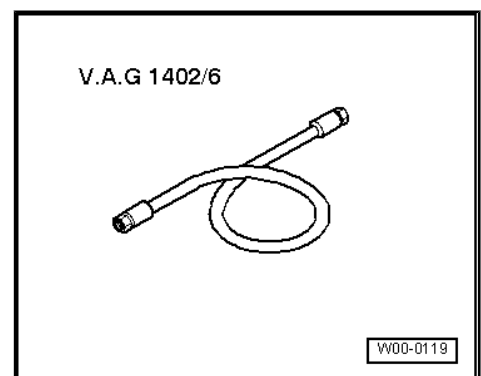
- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Power steering tester - V.A.G 1402-



- ◆ Adapter set - V.A.G 1402/6-



- ◆ Adapter - V.A.G 1402/18-
  - Clamp off suction hose at vane pump with hose clamp to 25 mm - 3094- .
  - Remove pressure line from vane pump.

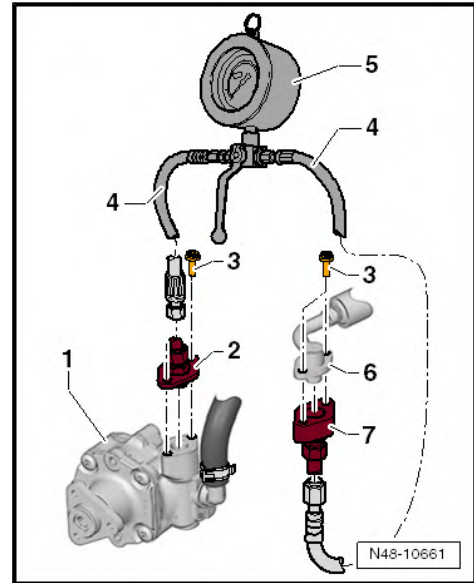


– Fit special tools as shown in illustration.

- 1 - Vane pump
- 2 - Adapter - V.A.G 1402/18-1- <sup>1)</sup>
- 3 - Securing bolt of pressure line ⇒ [Item 4 \(page 195\)](#)
- 4 - Hose from adapter set - V.A.G 1402/6-
- 5 - Power steering tester - V.A.G 1402-
- 6 - Pressure line
- 7 - Adapter - V.A.G 1402/18-2-

1) If seal is leaking or damaged on adapter - V.A.G 1402/18-1- , replace with new seal ⇒ [Item 8 \(page 195\)](#) ⇒ Electronic Parts Catalogue .

– Remove hose clamp, up to 25 mm - 3094- from suction hose.

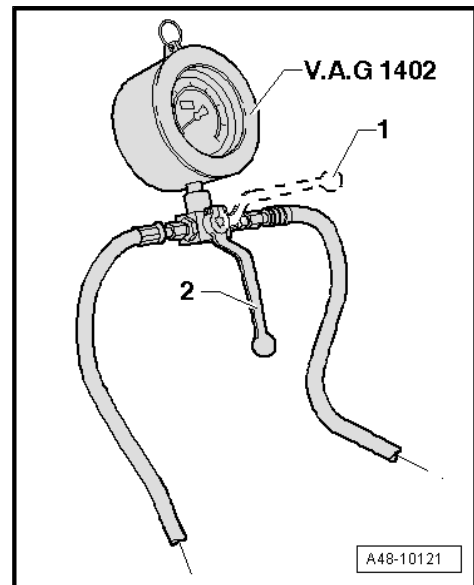


Lever on power steering tester - V.A.G 1402- must be in position -2-.

- Top up hydraulic fluid in reservoir if necessary ⇒ [page 197](#) .
- Start engine.
- Turn steering wheel approx. 10 times from lock to lock.
- Check delivery pressure

**Test prerequisites:**

- System must be free of leaks
- Hoses and lines must not be not kinked or restricted.





- With engine idling, close shut-off valve on pressure gauge (position -1-) for no longer than 5 seconds. Read pressure on power steering tester - V.A.G 1402- .



**Note**

*Ensure that the shut-off valve is not closed in position -1- for more than 5 seconds to avoid damage to the vane pump.*

**Specification for delivery pressure:**

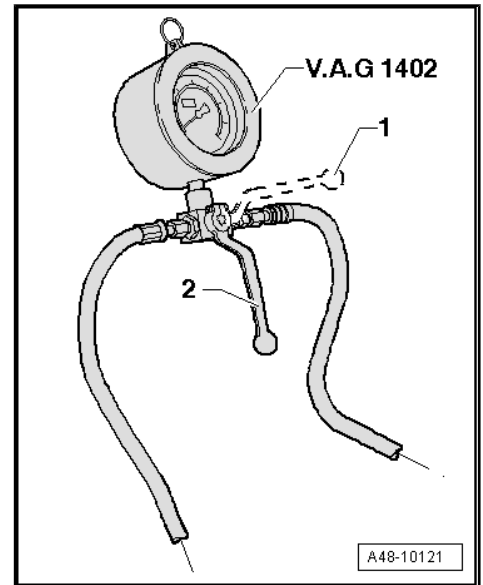
110...120 bar

If specification is not attained, renew vane pump ⇒ [page 204](#) .

- Remove pressure gauge and adapter.
- Bleed steering system ⇒ [page 198](#) .
- Check hydraulic fluid level and top up with hydraulic fluid if necessary ⇒ [page 197](#) .
- Check steering system for leaks ⇒ [page 198](#) .

**Specified torques**

- ◆ ⇒ ["4.2 Assembly overview - vane pump, 4-cylinder diesel engine"](#), [page 195](#)

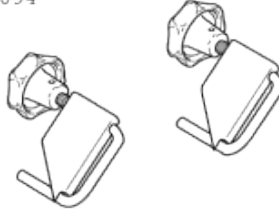

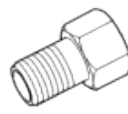



## 4.8 Checking vane pump delivery pressure, 5-cylinder diesel engine



**Special tools and workshop equipment required**

- ◆
- ◆ Hose clamp, up to 25 mm - 3094-
- ◆ Power steering tester - V.A.G 1402-
- ◆ Adapter - V.A.G 1402/2-
- ◆ Adapter set - V.A.G 1402/6-

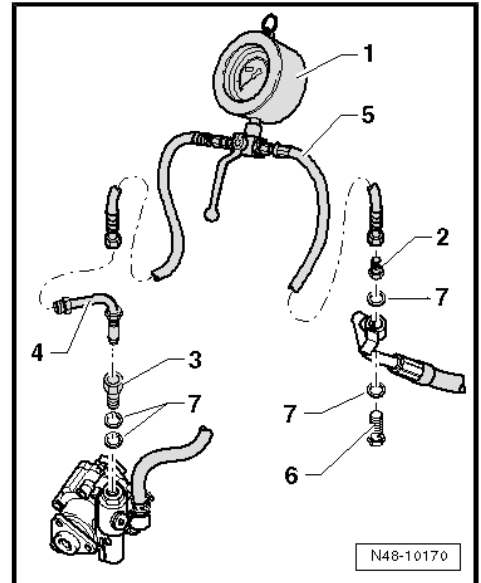
<p>3094</p> 	<p>V.A.G 1402</p> 
<p>V.A.G 1402/2</p> 	<p>V.A.G 1402/6</p> 
	<p>W48-0033</p>

**Test prerequisites:**

- Poly V-belt and poly V-belt tension OK.
- System must be free of leaks
- Hoses and lines must not be kinked or restricted
- Remove noise insulation below subframe ⇒ Rep. gr. 50 ; Noise insulation; Assembly overview - noise insulation .
- Clamp off suction hose using hose clamps, up to 25 mm - 3094- .
- Unscrew pressure line from vane pump.



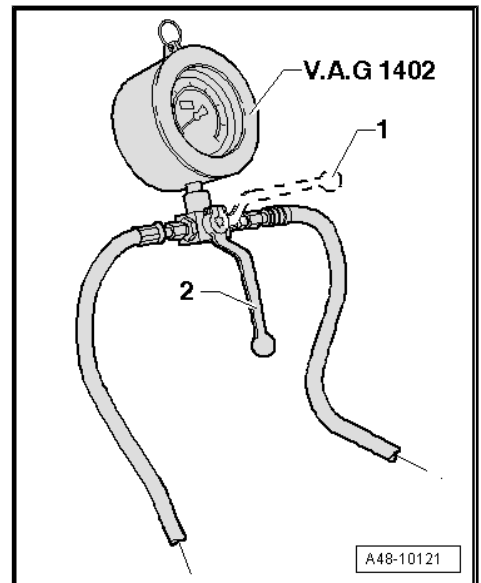
- Assemble adapter as shown in figure.
- 1 - Power steering tester - V.A.G 1402-
- 2 - Adapter - V.A.G 1402/2-
- 3 - Adapter from adapter set - V.A.G 1402/6-
- 4 - Adapter from adapter set - V.A.G 1402/6-
- 5 - Hose from adapter set - V.A.G 1402/6-
- 6 - Banjo bolt
- 7 - Sealing ring
- Remove hose clamp, up to 25 mm - 3094- from suction hose.



- Lever on pressure gauge must be in position -2-.
- Start engine and if necessary replenish hydraulic fluid in reservoir.
- Turn steering wheel approx. 10 times from lock to lock.
- Now check delivery pressure.

**Test prerequisites:**

- System must be free of leaks
- Hoses and lines must not be kinked or restricted



- With engine idling, close shut-off valve on pressure gauge (position -1-) for no longer than 5 seconds, and read pressure.

**Specification for delivery pressure:**

120 bar

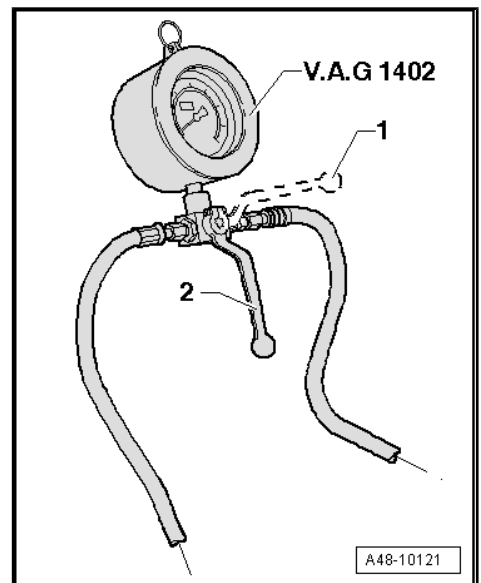
If specification is not attained, renew vane pump ⇒ [page 206](#) .

- Remove pressure gauge and adapter.
- Bleed steering system ⇒ [page 198](#) .
- Check hydraulic fluid level and top up if necessary ⇒ [page 197](#) .
- Check steering system for leaks ⇒ [page 198](#) .

**Specified torques**

◆ ⇒ [“4.3 Assembly overview - vane pump, 5-cylinder diesel engine”, page 196](#)

Component	Specified torque
Pressure line to vane pump	38 Nm

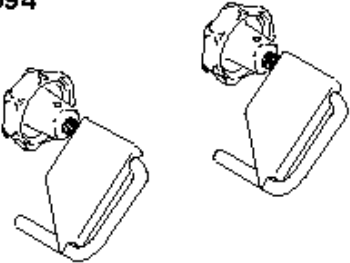

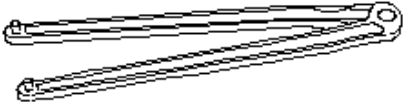
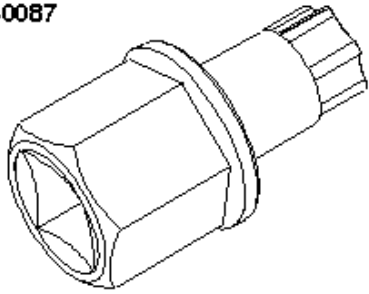




## 4.9 Removing and installing vane pump, 4-cylinder diesel engine

### Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Pin wrench - 3212-
- ◆ Tool insert - T40087-

<p><b>3094</b></p> 	<p><b>V.A.G 1331</b></p> 
<p><b>3212</b></p> 	<p><b>T40087</b></p> 
	<p>W48-10010</p>

### Removing



#### WARNING

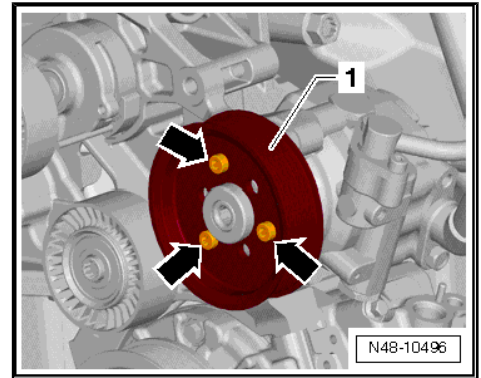
*Please note the following points during all assembly work, in particular in the engine compartment, due to the narrow installation conditions:*

- ◆ *Route lines of all kinds (for example for fuel, hydraulic fluid, activated charcoal filter system, coolant, refrigerant, brake fluid, vacuum) and electrical cables so that the original line/cable routing is re-established.*
- ◆ *Make sure there is adequate clearance from all moving or hot components.*

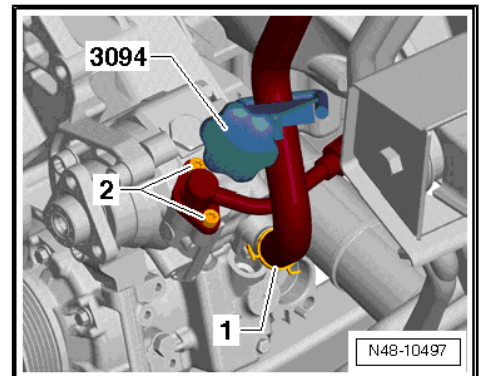
- Remove air filter ⇒ Power unit; Rep. gr. 13 ; Fuel supply line; Air filter .
- Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .



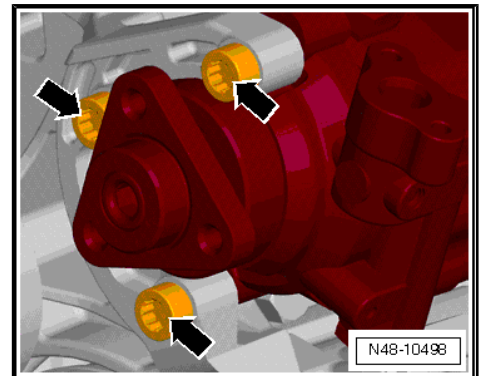
- Unscrew bolts -arrows-, counterhold poly V-belt pulley -1- with pin wrench - 3212- for this.



- Clamp off suction hose using hose clamps, up to 25 mm - 3094- .
- Open spring-type clip -1- and pull suction hose off vane pump.
- Close off suction hose with a plastic bag and adhesive tape.
- Remove bolts -2- and pull pressure line out of vane pump.
- Close off pressure line with a plastic bag and adhesive tape.



- Remove bolts -arrows-.

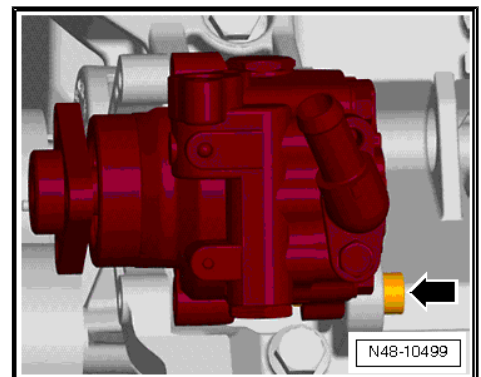


- Remove bolt -arrow- and remove vane pump from retainer.

### Installing

Install in reverse order. Note the following points:

- Fill vane pump with hydraulic oil.
- Fill hydraulic oil in through inlet connection of vane pump.
- Turn hub by hand until oil emerges from pressure side.
- Install vane pump, initially tightening only front bolts.





- Install suction hose -1- so that marks -arrow A- and -arrow B- aline with one another.
- Mount clamp -2- on mark -arrow A-.
- Install poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Install air filter ⇒ Power unit; Rep. gr. 13 ; Fuel supply line; Air filter .
- Bleed steering system ⇒ [page 198](#) .
- Check hydraulic fluid level ⇒ [page 197](#) .
- Check steering system for leaks ⇒ [page 198](#) .

#### Specified torques

- ◆ ⇒ [“4.2 Assembly overview - vane pump, 4-cylinder diesel engine”, page 195](#)

## 4.10 Removing and installing vane pump, 5-cylinder diesel engine

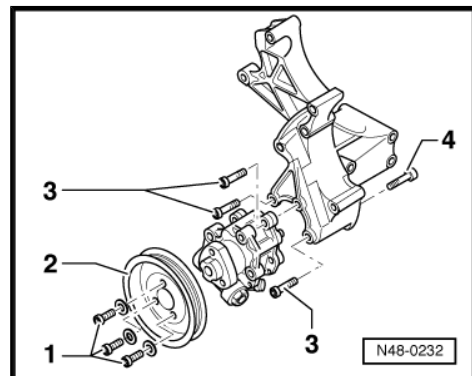
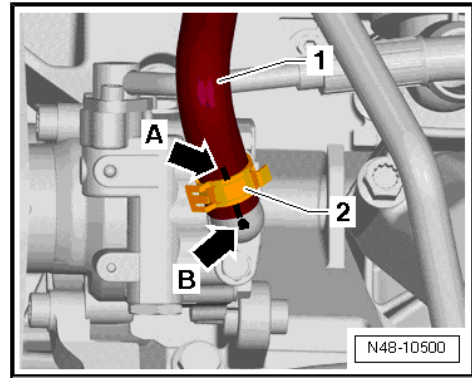
### Removing

- Loosen pulley bolts -1-.
- Unscrew expansion hose from vane pump.
- Catch escaping hydraulic fluid.
- Unscrew return line from vane pump.
- Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Unscrew pulley bolts -1- from vane pump and remove pulley.
- Unscrew bolts -3- and -4- and remove vane pump from bracket.

### Installing

Install in reverse order. Note the following points:

- Insert vane pump into bracket.





- Tighten bolts -3- and -4-.
- Install pulley -2- on vane pump and tighten bolts -1-.
- Screw expansion hose to vane pump.
- Screw return line to vane pump.
- Install poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Make sure to use new hydraulic fluid ⇒ Electronic Parts Catalogue (ETKA) .

Observe oil level in reservoir after filling with hydraulic fluid and starting engine. The oil level must sink.

If this is not the case, switch off engine, disconnect expansion hose from steering rack, and wait until hydraulic fluid escapes.

- Catch escaping hydraulic fluid and screw line on again.
- Start engine and if necessary replenish fluid in reservoir. Check hose connections for leaks.
- Switch engine off and check fluid level of power steering ⇒ [page 197](#) .

**Specified torques**

- ◆ ⇒ [“4.3 Assembly overview - vane pump, 5-cylinder diesel engine”, page 196](#)

