



Workshop Manual

e-up! 2014 ➤ , e-up! 2017 ➤ ,
e-up! 2020 ➤ , up! 2012 ➤ , up! 2017 ➤ ,
up! 2020 ➤

Running gear, axles, steering

Edition 10.2019





List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 40 - Front suspension
- 42 - Rear suspension
- 44 - Wheels, tyres, vehicle geometry
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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 Safety information

(VRL013517; Edition 10.2019)

⇒ [“1.1 Safety measures when working on vehicles with a start/stop system”, page 1](#)

⇒ [“1.2 Safety precautions when working on subframe”, page 1](#)

1.1 Safety measures when working on vehicles with a start/stop system

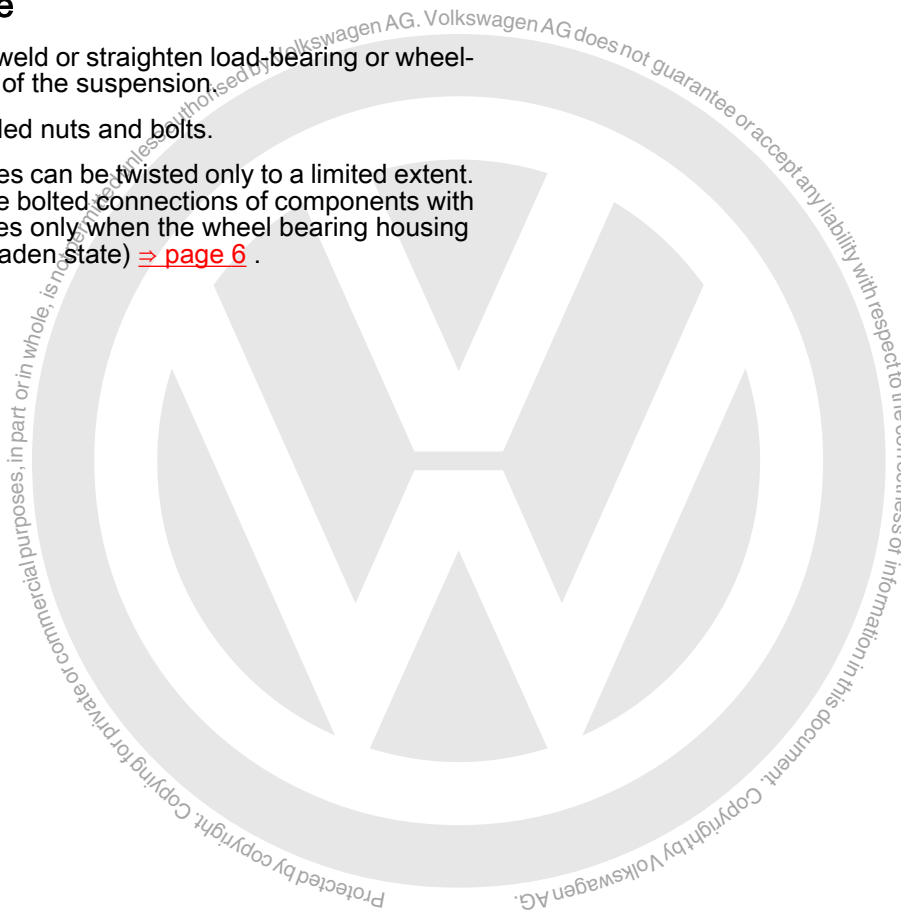
Risk of injury from unexpected engine/motor start

If the vehicle's start/stop system is activated, the engine can start unexpectedly. A message in the dash panel insert indicates whether the start/stop system is activated.

- Deactivate start/stop system by switching off the ignition.

1.2 Safety precautions when working on subframe

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew corroded nuts and bolts.
- ◆ 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 6](#) .





2 Evaluating accident vehicles

⇒ **"2.1 Check list for evaluating running gear on accident vehicles", page 2**

2.1 Check list 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 and functional examination of steering system

- ◆ Visual examination for deformation and cracks
- ◆ Examination for play in track rod joints and steering rack
- ◆ Visual examination for tears in boots
- ◆ Examine electrical and hydraulic lines and hoses for chafing, cuts and kinks.
- ◆ Check hydraulic lines, threaded connections and steering rack for leaks.
- ◆ Check steering rack and lines for secure seating
- ◆ Check for flawless function from lock to lock by moving the steering from stop to stop. In the process, the steering wheel must turn with a constant force without resistance.

Visual inspection and functional check 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.
- ◆ Check tyres for cuts and impact damage in the tread and on the flanks ⇒ Wheels and Tyres Guide - General information; Rep. gr. 44 ; Evaluating tyres .
- ◆ Check tyre inflation pressure; information on mandatory tyre inflation pressure can be found on a sticker attached to B-pillar on driver side or to inside of tank flap.

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.

If in doubt, the following always applies:

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



Complete vehicle

Also check other vehicle systems such as:

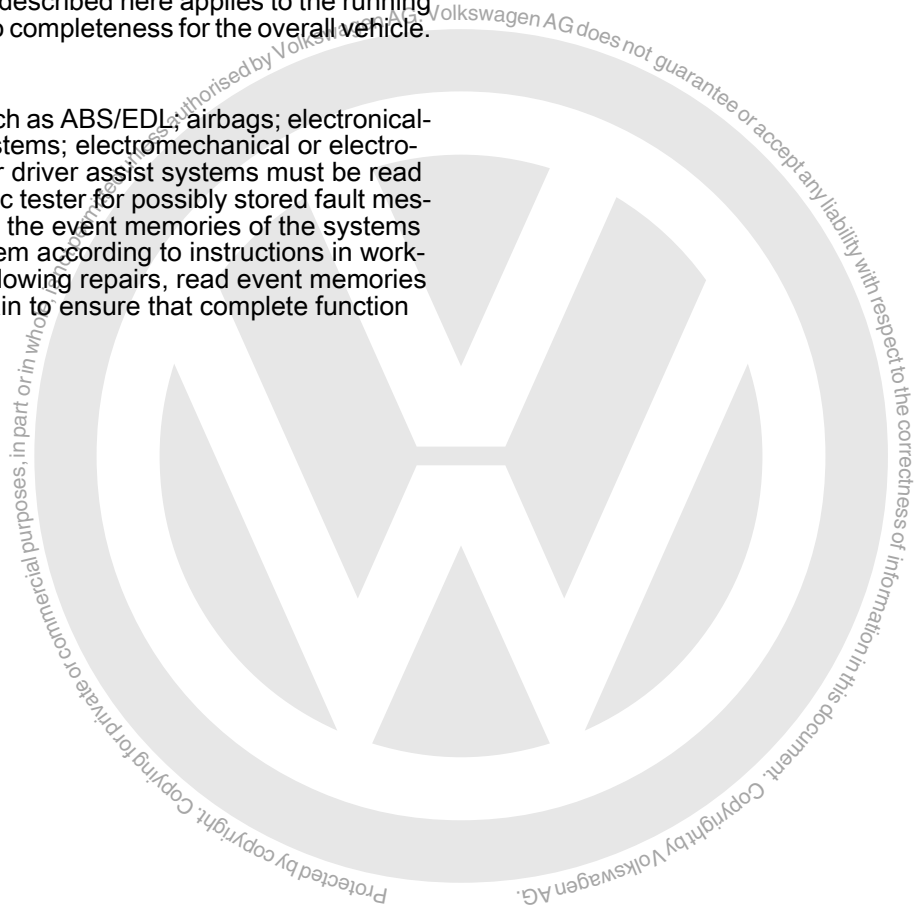
- ◆ Brake system including ABS
- ◆ Visual and functional examination of exhaust system and passenger protection

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

The accident vehicle check described here applies to the running gear. This makes no claim to completeness for the overall vehicle.

Electronic vehicle systems

Safety-relevant systems such as ABS/EDL, airbags; electronically regulated suspension systems; electromechanical or electrohydraulic steering and other driver assist systems must be read with the ⇒ Vehicle diagnostic tester for possibly stored fault messages. If faults are saved in the event memories of the systems mentioned above, repair them according to instructions in workshop manuals in ELSA. Following repairs, read event memories of the affected systems again to ensure that complete function has been restored.





3 Repair instructions

⇒ [“3.1 Leaks at shock absorbers”, page 4](#)

⇒ [“3.2 Noises from shock absorbers”, page 4](#)

⇒ [“3.3 Checking shock absorbers when removed”, page 5](#)

⇒ [“3.4 Steering rack”, page 5](#)

⇒ [“3.5 Gaskets and seals”, page 6](#)

⇒ [“3.6 Nuts and bolts”, page 6](#)

⇒ [“3.7 Electrical components”, page 6](#)

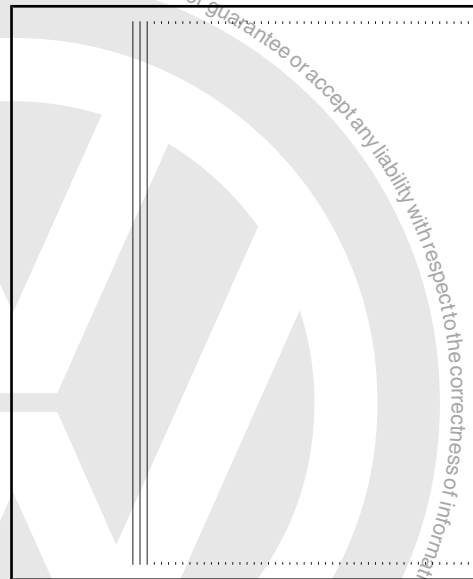
⇒ [“3.8 Raising suspension to unladen position \(vehicles with coil springs\)”, page 6](#)

3.1 Leaks at shock absorbers

Shock absorbers are often replaced because of externally visible leakage. Inspections on the test rig and in the vehicle have shown that in the majority of cases this replacement is not justified.

Slight loss of fluid (“sweating”) at the piston rod seal is not a reason for replacing a shock absorber. An oil sweating shock absorber is deemed OK under the following conditions:

- ◆ Fluid seepage (as shown in the shaded part of the illustration) is visible, but the fluid is dull and possibly dried by dust.
- ◆ The fluid seepage extends only from the top shock absorber seal (piston rod seal) down to the bottom spring plate -arrow-.



3.2 Noises from shock absorbers

Shock absorbers are often replaced because of noises (rumbling, etc.) experienced by the customer. Inspections on the test rig and in the vehicle have shown that in approx. 70% of these cases there is no case for complaint. The replacement was not justified.

In the case of complaints regarding rumbling or knocking noises please proceed as follows.

- Carry out a road test with the customer - if possible on a dry, uneven road - to establish when, where and how the noises occur.



Note

These noises are only very rarely caused by the shock absorbers.



3.3 Checking shock absorbers when removed

Defective shock absorbers can be identified by loud rumbling noises when driving, caused by wheel hopping, especially on bad roads. Heavy fluid leakage is an additional visual indication.



Note

Shock absorbers are maintenance-free; shock absorber fluid cannot be topped up.

After removal, a shock absorber can be checked by hand as follows:

- Compress shock absorber by hand.
- The piston rod should move smoothly over the entire stroke with uniform resistance and without jolts.
- Release piston rod.
- If the shock absorber has sufficient gas pressure the piston rod will return by itself to its original position.



Note

- ◆ *If this is not the case, the shock absorber does not necessarily need to be renewed. Provided there has been no major loss of fluid, it will still be as effective as a conventional shock absorber.*
- ◆ *Even without gas pressure, the shock absorber will provide full damping effect as long as there has been no major loss of fluid. However, it may produce more noise.*

3.4 Steering rack

To achieve the desired results when performing repairs on the steering rack it is important to work with the greatest possible care and cleanliness, and to use proper tools in good condition. Also note the basic rules on safety when performing repair procedures.

A number of general notes on the individual repair procedures, which can otherwise be found in the relevant sections of the workshop manual, are summarised here. They apply for this particular workshop manual.

The design and function of the electromechanical power steering is described in the self-study programme ⇒ Self-study programme No. 317 ; The electromechanical power steering with dual pinion .

- ◆ Thoroughly clean all unions and the adjacent areas before disconnecting.
- ◆ When installing the steering rack, make sure that dowel sleeves between bracket and steering rack are seated correctly.
- ◆ Place removed parts on a clean surface and cover them to prevent them from getting dirty. Use sheeting and paper for this purpose. Use lint-free cloths only.
- ◆ Install only clean parts; do not remove new parts from packaging until immediately before installing.
- ◆ Use only the grease and sealants with specified part numbers.



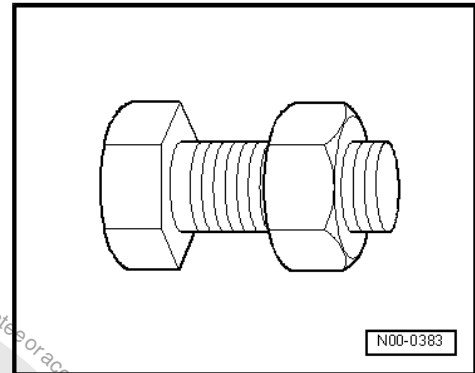
- ◆ If repair work cannot be performed immediately, cover new parts which have been removed from their packing.

3.5 Gaskets and seals

- ◆ Always renew gaskets and seals.
- ◆ When seals have been removed, check contact surface on housings or shafts for burrs and damage and rectify as necessary.
- ◆ Completely remove all residue from liquid sealants from the sealing surfaces, making sure that no residual sealant gets into the steering rack housing.

3.6 Nuts and bolts

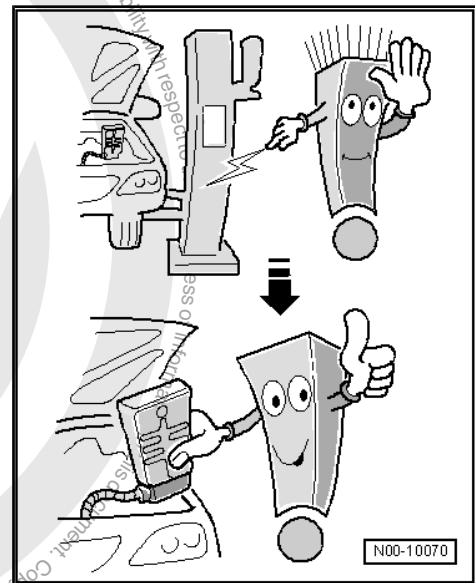
- ◆ Loosen and tighten bolts and securing nuts for covers and housings diagonally.
- ◆ Avoid canting sensitive parts, such as servo motor with control unit. Loosen and tighten them diagonally in stages.
- ◆ Specified torques given are for unlubricated nuts, bolts and screws.
- ◆ Always renew self-locking bolts and nuts.



3.7 Electrical components

You have certainly felt an electric shock when you have touched something metallic. This is due to the electrostatic charge of the human body. This charge can cause malfunctions if you touch the electric steering rack and steering column components.

- Before working on electrical components, touch an earned object, such as a water pipe or a lifting platform. Do not directly touch connector contacts.



3.8 Raising suspension to unladen position (vehicles with coil springs)

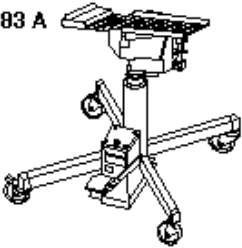
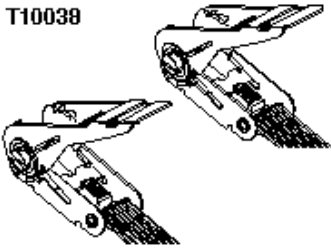
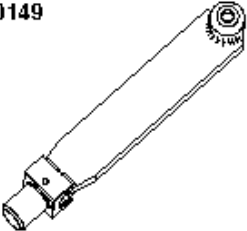
⇒ ["3.8.1 Raising wheel bearing assembly to unladen position \(vehicles with coil springs\), front axle", page 6](#)

⇒ ["3.8.2 Raising wheel bearing assembly to unladen position \(vehicles with coil springs\), rear axle", page 8](#)

3.8.1 Raising wheel bearing assembly to unladen position (vehicles with coil springs), front axle



Special tools and workshop equipment required

| | |
|---|---|
| <p>V.A.G 1383 A</p>  | <p>T10038</p>  |
| <p>T10149</p>  | |
| | <p>W40-0126</p> |

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



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).

Bonded rubber bushes can be twisted only to a limited extent.

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

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.

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 respective wheel suspension is raised, the vehicle must be strapped to the lifting platform arms using tensioning straps - T10038- .



WARNING

If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform!

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt.

Respective nuts and bolts may be tightened only when dimension -a- between the centre of wheel hub and edge of wheel housing has been attained.

The dimension -a- depends on the ride height of the installed running gear:

| Running gear ¹⁾ | Ride height -a- in mm |
|---|-----------------------|
| Standard running gear with power-assisted steering (G01) | 363 ± 10 mm |
| Standard running gear without power-assisted steering (G01) | 363 ± 10 mm |
| Sports running gear (G03) | 348 ± 10 mm |
| Raised running gear (G02) | 378 ± 10 mm |
| e-up! (G04) | 363 ± 10 mm |
| Natural gas (G06) | 363 ± 10 mm |
| cross up! (G02) | 372 ± 10 mm |

¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Allocation of PR number to corresponding running gear ⇒ [page 122](#) .

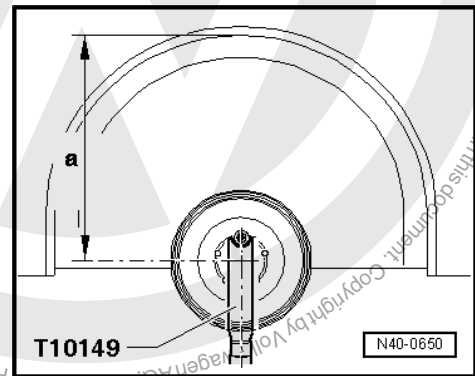
- Raise wheel bearing housing using engine and gearbox jack - V.A.G 1383 A- until dimension -a- is attained.



WARNING

- ◆ *Do not raise or lower the vehicle while the engine and gearbox jack is positioned under the vehicle.*
- ◆ *Do not leave engine and gearbox jack - V.A.G 1383 A- under vehicle longer than necessary.*

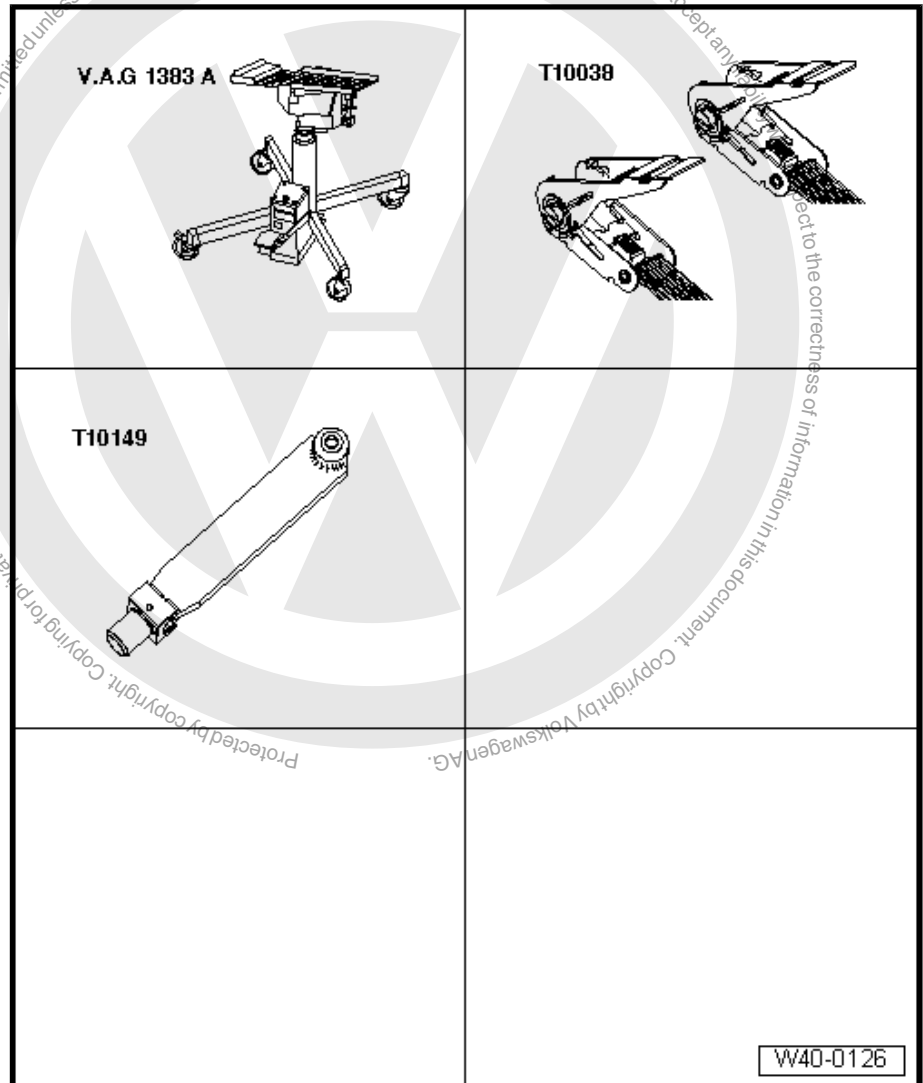
- Tighten respective nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack - V.A.G 1383 A- out from under vehicle.
- Detach support - T10149- .



3.8.2 Raising wheel bearing assembly to unladen position (vehicles with coil springs), rear axle



Special tools and workshop equipment required



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



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).

Bonded rubber bushes can be twisted only to a limited extent.

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

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.

To simulate this position on the lifting platform, raise the axle on one side using 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, there is a danger that the vehicle will 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.

Threaded connections may be tightened only when dimension -a- between the centre of wheel hub and lower edge of wheel housing, measured before starting work, has been attained.

Measuring dimension -a-

The dimension -a- depends on the ride height of the installed running gear:

| Running gear ¹⁾ | Ride height -a- in mm |
|---|-----------------------|
| Standard running gear with power-assisted steering (G01) | 374 ± 10 mm |
| Standard running gear without power-assisted steering (G01) | 374 ± 10 mm |
| Sports running gear (G03) | 359 ± 10 mm |
| Raised running gear (G02) | 389 ± 10 mm |
| e-up! (G04) | 379 ± 10 mm |
| Natural gas (G06) | 379 ± 10 mm |
| cross up! (G02) | 383 ± 10 mm |

¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Allocation of PR number to corresponding running gear ⇒ [page 122](#) .

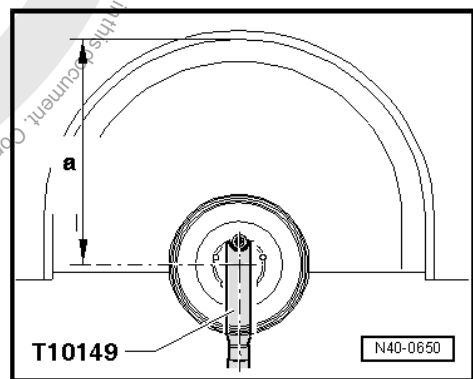
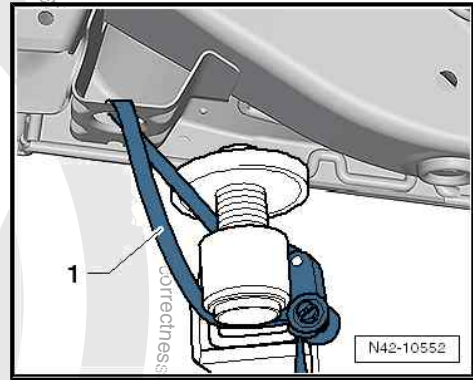
- Raise wheel bearing housing using engine and gearbox jack until dimension -a- is attained.



WARNING

- ◆ *Do not raise or lower the vehicle while the engine and gearbox jack is positioned under the 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- .





4 Waste disposal

⇒ [“4.1 Releasing gas and draining front gas-filled shock absorbers”, page 11](#)

⇒ [“4.2 Releasing gas and draining rear gas-filled shock absorbers”, page 13](#)

4.1 Releasing gas and draining front gas-filled shock absorbers

⇒ [“4.1.1 Releasing gas and draining front gas-filled shock absorbers, conventional shock absorbers”, page 11](#)

⇒ [“4.1.2 Releasing gas and draining front gas-filled shock absorbers, DCC shock absorbers”, page 12](#)

4.1.1 Releasing gas and draining front gas-filled shock absorbers, conventional shock absorbers

- Clamp gas-filled shock absorber vertically in vice, with piston rod pointing downwards.



WARNING

Safety goggles must be worn when drilling.

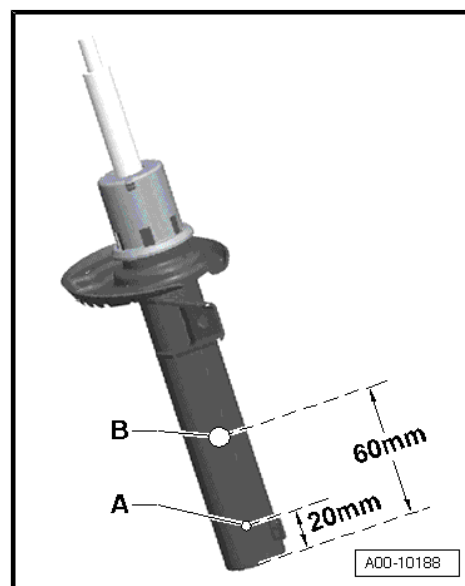
- Drill a 3 mm hole -A- through outer tube of shock absorber.



Note

Gas escapes upon penetration.

- Continue drilling until the inner tube has been penetrated (approx. 25 mm deep).
- Drill a 6 mm hole -B- through outer and inner tube of shock absorber.
- Hold shock absorber over an oil drip tray. Move the piston rod back and forth over its full extension until no further oil escapes.





4.1.2 Releasing gas and draining front gas-filled shock absorbers, DCC shock absorbers

- Clamp gas-filled shock absorber vertically in vice.



WARNING

Safety goggles must be worn when drilling.

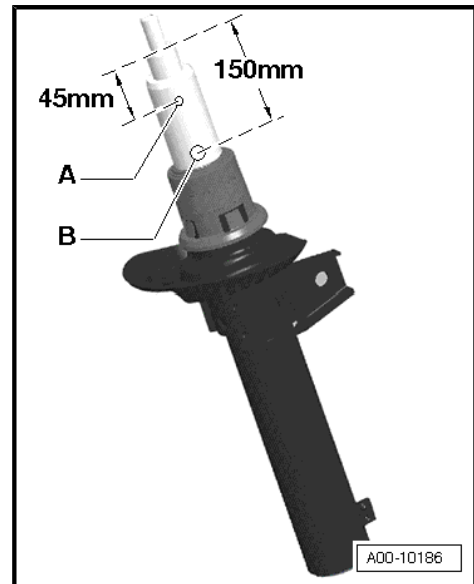
- Drill a 3 mm hole -A- through outer tube of shock absorber.



Note

Gas escapes upon penetration.

- Continue drilling until the inner tube has been penetrated (approx. 25 mm deep).
- Drill a 6 mm hole -B- through outer and inner tube of shock absorber.
- Hold shock absorber over an oil drip tray. Move the piston rod back and forth over its full extension until no further oil escapes.





4.2 Releasing gas and draining rear gas-filled shock absorbers

⇒ ["4.2.1 Releasing gas and draining rear gas-filled shock absorbers, conventional shock absorbers"](#), page 13

⇒ ["4.2.2 Releasing gas and draining rear gas-filled shock absorbers, DCC shock absorbers"](#), page 14

4.2.1 Releasing gas and draining rear gas-filled shock absorbers, conventional shock absorbers

- Clamp gas-filled shock absorber vertically in vice.



WARNING

Safety goggles must be worn when drilling.

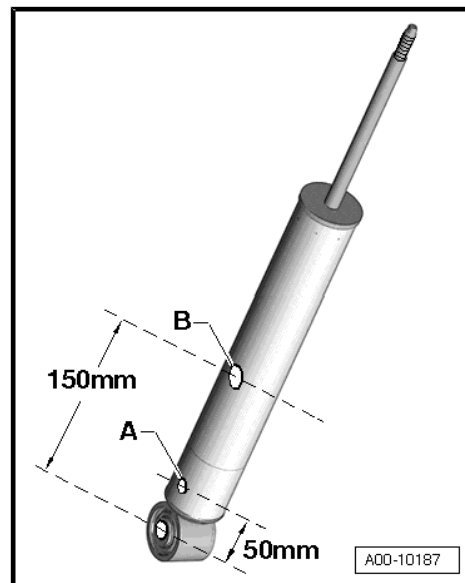
- Drill a 3 mm hole -A- through outer tube of shock absorber.



Note

Gas escapes upon penetration.

- Continue drilling until the inner tube has been penetrated (approx. 25 mm deep).
- Drill a 6 mm hole -B- through outer and inner tube of shock absorber.
- Hold shock absorber over an oil drip tray. Move the piston rod back and forth over its full extension until no further oil escapes.





4.2.2 Releasing gas and draining rear gas-filled shock absorbers, DCC shock absorbers

- Clamp gas-filled shock absorber vertically in vice.



WARNING

Safety goggles must be worn when drilling.

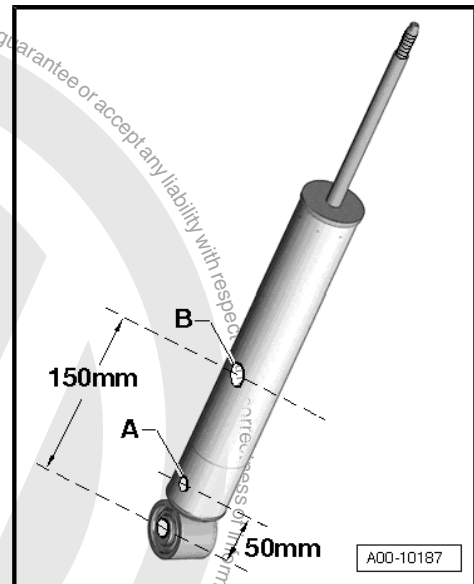
- Drill a 3 mm hole -A- through outer tube of shock absorber.



Note

Gas escapes upon penetration.

- Continue drilling until the inner tube has been penetrated (approx. 25 mm deep).
- Drill a 6 mm hole -B- through outer and inner tube of shock absorber.
- Hold shock absorber over an oil drip tray. Move the piston rod back and forth over its full extension until no further oil escapes.





40 – Front suspension

1 Front axle

⇒ [“1.1 Overview - front axle”, page 15](#)

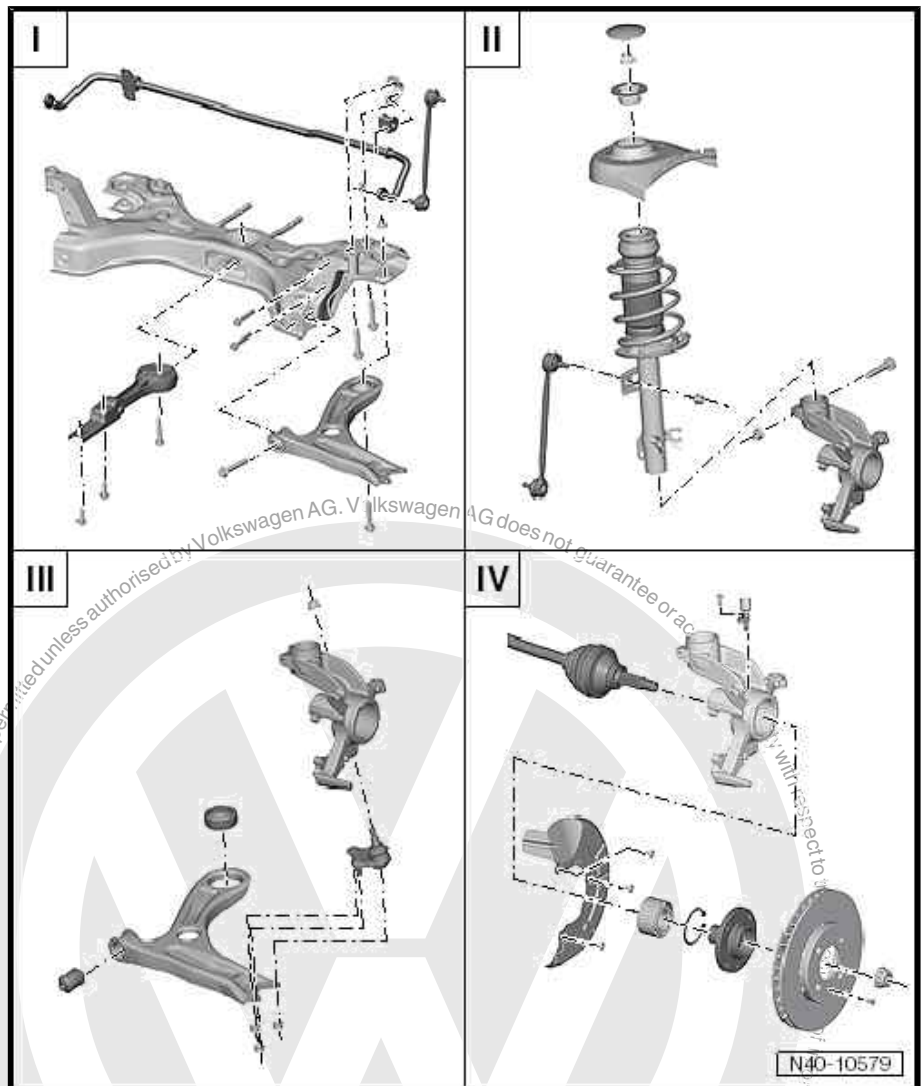
1.1 Overview - front axle

I - ⇒ [“2 Subframe”, page 16](#)

II -
⇒ [“3 Suspension strut, upper suspension link”, page 27](#)

III -
⇒ [“4 Lower suspension link, swivel joint”, page 39](#)

IV -
⇒ [“5 Wheel bearing”, page 53](#)



⇒ [“6 Drive shaft”, page 73](#) .



2 Subframe

⇒ [“2.1 Assembly overview - subframe”, page 16](#)

⇒ [“2.2 Fixing position of subframe”, page 17](#)

⇒ [“2.3 Lowering subframe”, page 19](#)

⇒ [“2.4 Removing and installing subframe without steering rack”, page 20](#)

⇒ [“2.5 Removing and installing anti-roll bar”, page 23](#)

⇒ [“2.6 Renewing anti-roll bar bushes”, page 24](#)

2.1 Assembly overview - subframe

1 - Subframe

- Fixing position
⇒ [page 17](#)
- Removing and installing
⇒ [page 20](#)
- Various versions
- Allocation ⇒ Electronic parts catalogue “ETKA”

2 - Anti-roll bar

- Removing and installing
⇒ [page 23](#)

3 - Clip

4 - Mountings

- Renewing ⇒ [page 24](#)

5 - Nut

- 40 Nm
- Self-locking
- Renew after each removal

6 - Coupling rod

- Link between anti-roll bar and suspension strut

7 - Nut

- Renew after each removal

8 - Bolt

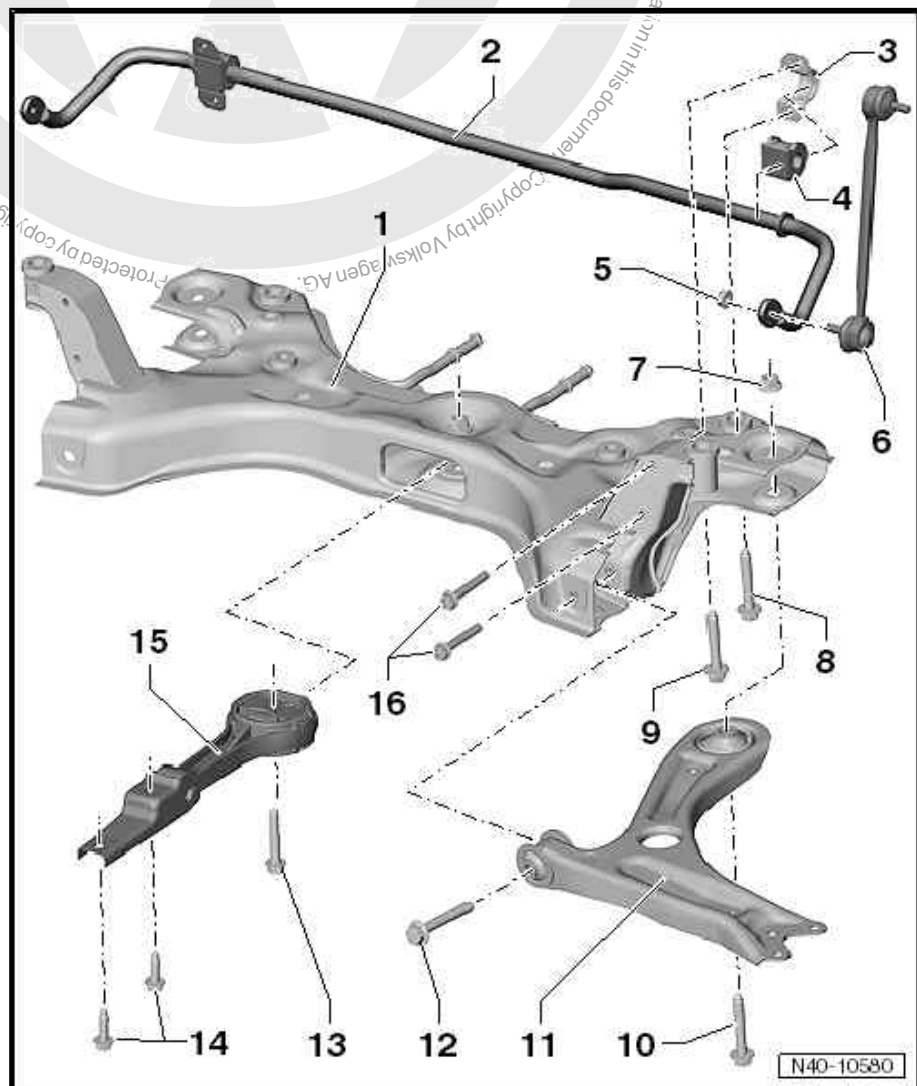
- M12 x 1.5 x 75
- 70 Nm and turn 180° further
- Renew after each removal

9 - Bolt

- M10 x 80
- 50 Nm and turn 180° further
- Renew after each removal

10 - Bolt

- 70 Nm + 90° further





- Renew after each removal

11 - Lower suspension link

- Removing and installing ⇒ [page 39](#)

12 - Bolt

- 70 Nm and turn 180° further
- Renew after each removal

13 - Bolt

- 40 Nm and turn 90° further
- Renew after each removal

14 - Bolt

- 40 Nm and turn 90° further
- Renew after each removal

15 - Pendulum support

- Various versions
- Allocation ⇒ Electronic parts catalogue “ETKA”

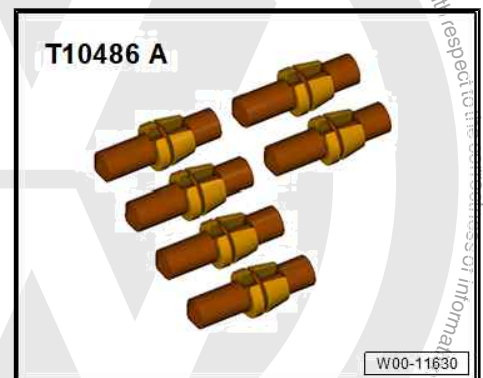
16 - Bolt

- 20 Nm and turn 90° further
- Renew after each removal

2.2 Fixing position of subframe

Special tools and workshop equipment required

- ◆ Locating pins - T10486- Locating pins - T10486A-



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





Caution

The locating pins - T10486- have different threads:

- ◆ **Locating pins - T10486/1- : M12x1.5 (used for locating subframe in rear area)**
- ◆ **Locating pins - T10486/2- : M10 (used for locating subframe in front area)**

- Unscrew the bolts for the pendulum support -1- and -2- from the gearbox.
- Position engine and gearbox jack - V.A.G 1383 A- under subframe.
- Clean threads of locating pin - T10486- .

It is essential to follow specified sequence of work steps below!

To locate subframe in position, locating pins - T10486/2- must be screwed in successively at positions -1-.

At positions -2- locating pins - T10486/1- must be screwed in successively.

Positions -1- must be located first.



Note

The locating pins - T10486/2- may be tightened only to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.

- Replace securing bolts -1- with locating pins - T10486/2- one after the other on both sides of the vehicle and tighten to 20 Nm.
- Replace securing bolts -2- with locating pins - T10486/1- one after the other on both sides of the vehicle and tighten to 20 Nm.
- The process of locating the subframe is complete when all 4 of the bolts have successively been replaced in turn with locating pins - T10486/1- and locating pins - T10486/2- respectively.

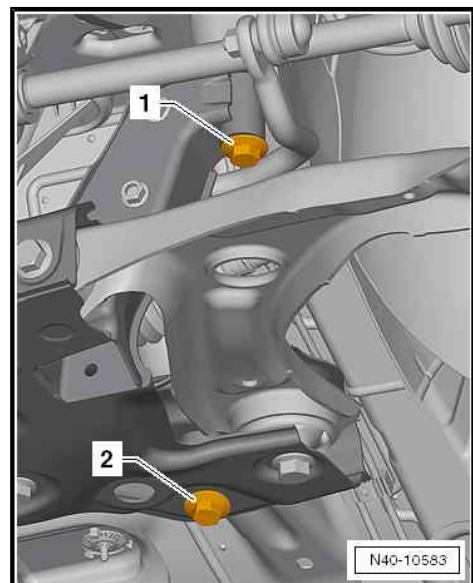
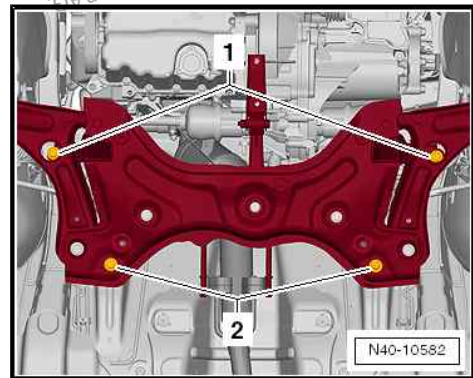
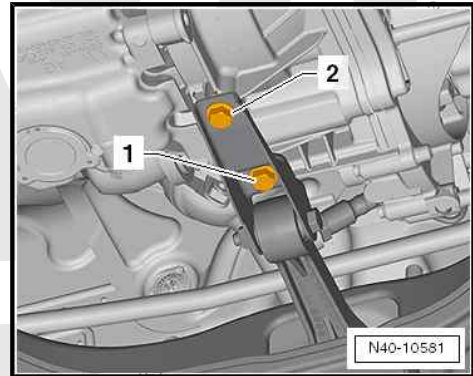
Continue with removal of subframe ⇒ [page 22](#) .

Continue with removal of anti-roll bar ⇒ [page 24](#) .

Continue with removal and installation of steering rack ⇒ [page 186](#) .

Remove locating pins - T10486/1- and locating pins - T10486/2- .

Remove locating pins - T10486/1- and locating pins - T10486/2- in reverse order. During this procedure, observe the following:

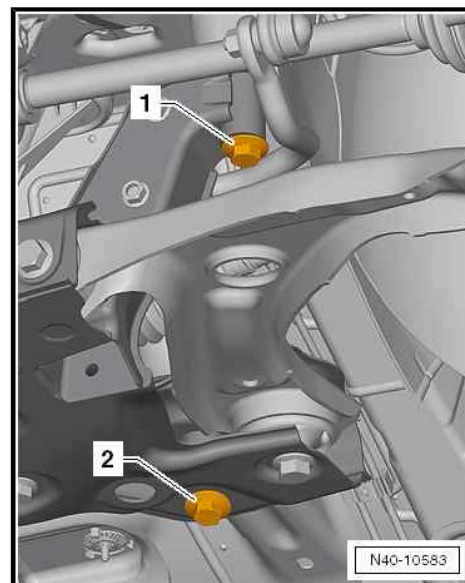




- Only unscrew one locating pin at a time and replace it with a new bolt -1- and -2-.

Specified torques

- ◆ ⇒ ["2.1 Assembly overview - subframe", page 16](#)



2.3 Lowering subframe

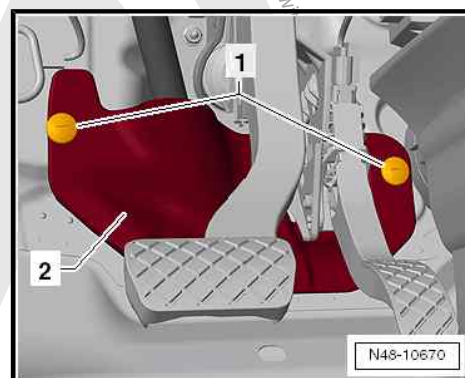
Special tools and workshop equipment required

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



Removing

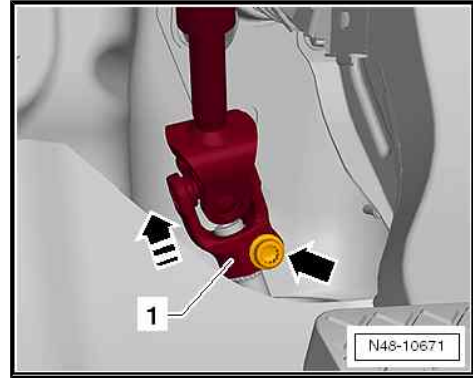
- Turn steering wheel to straight-ahead position and remove ignition key so that the steering lock engages.
- Unscrew bolts -1- and remove footwell trim -2-.



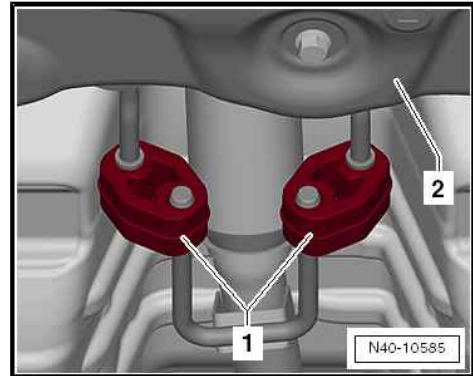
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is prohibited unless authorised by Volkswagen AG. Volkswagen AG does not guarantee acceptability/liability w



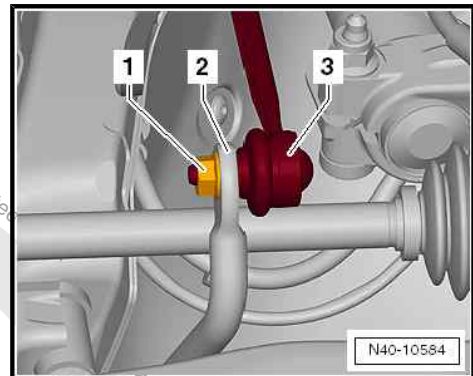
- Unscrew bolt -arrow- from universal joint -1- and pull off universal joint in -direction of arrow-.
- Remove lower noise insulation => General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



- Pull retaining rings -1- for exhaust pipe off subframe.
- Loosen double clamp for exhaust system.



- Remove hexagon nut -1- from coupling rod (left and right sides).
- Pull coupling rod -3- out of anti-roll bar -2- on left and right side.
- Fix position of subframe => [page 17](#) .
- Lower subframe no more than 10 cm.



Installing

Install in reverse order.

- Install noise insulation => General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



Note

Ensure that boot is not damaged or twisted.

Specified torques

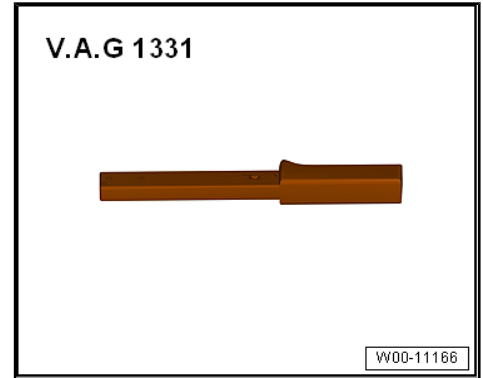
- ◆ => ["2.1 Assembly overview - subframe", page 16](#)
- ◆ => ["3.1 Assembly overview - steering rack", page 183](#)

2.4 Removing and installing subframe without steering rack

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-

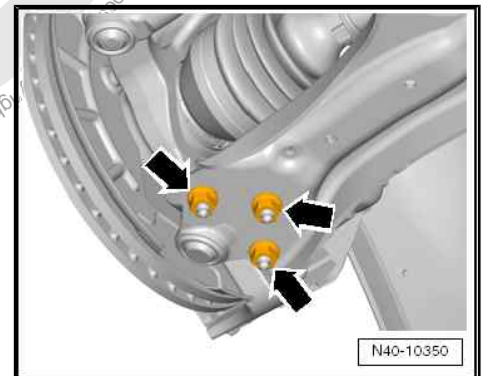


◆ Torque wrench - V.A.G 1332-



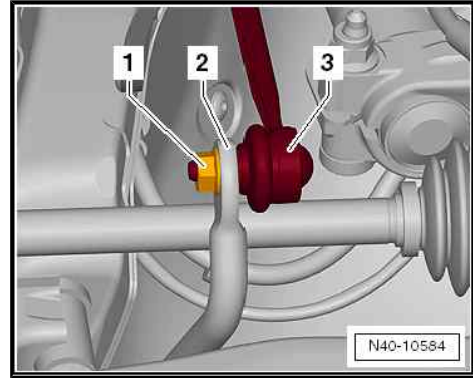
Removing

- Loosen wheel bolts.
- Raise vehicle.
- Remove wheels.
- Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Remove nuts -arrows-

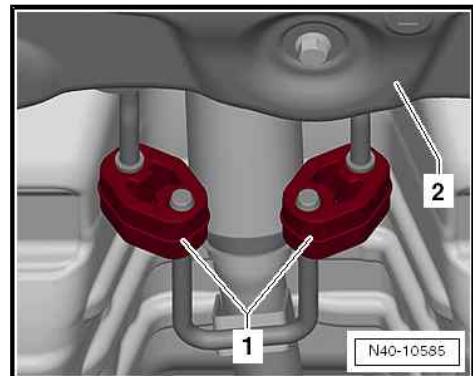




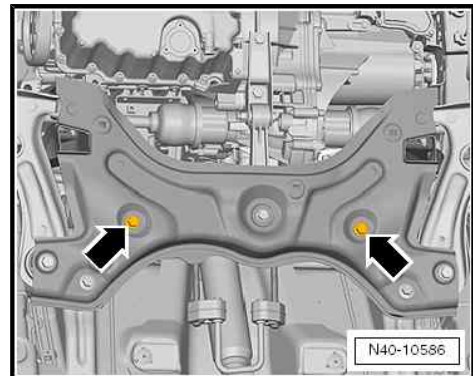
- Remove hexagon nut -1- from coupling rod (left and right sides).
- Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



- Pull retaining rings -1- for exhaust pipe off subframe.

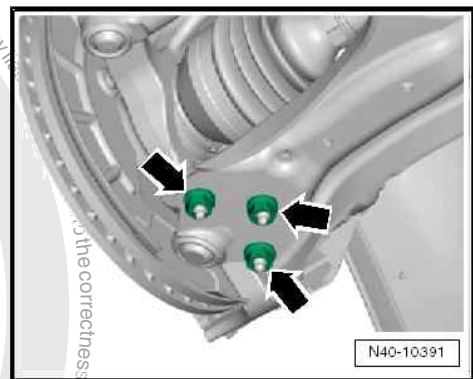


- Unbolt steering rack from subframe -arrows- and tie up with wire (or similar).
- Fix position of subframe ⇒ [page 17](#) .
- Lower subframe using engine and gearbox jack - V.A.G 1383 A- .



Installing

- Secure subframe ⇒ [page 18](#)



- Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#) .

Continue installation in reverse order of removal.

Install wheels and tighten.

Specified torques

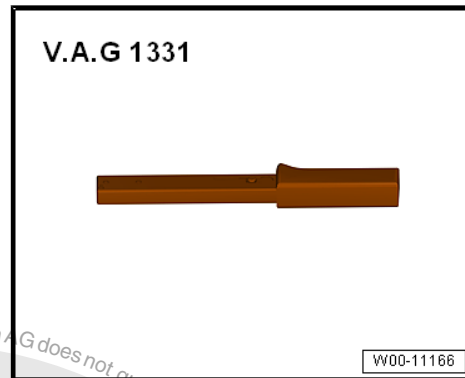
- ◆ ⇒ ["2.1 Assembly overview - subframe", page 16](#)
- ◆ ⇒ ["4.1 Assembly overview - lower suspension link, swivel joint", page 39](#)
- ◆ ⇒ ["3.1 Assembly overview - steering rack", page 183](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts



2.5 Removing and installing anti-roll bar

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

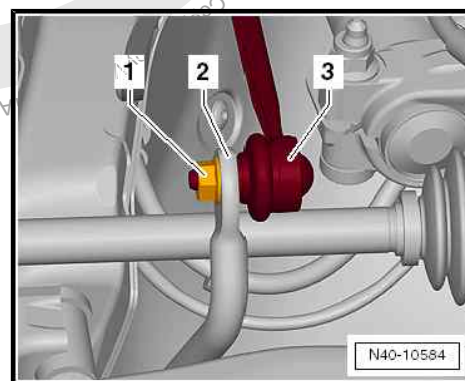


- ◆ Torque wrench - V.A.G 1332-



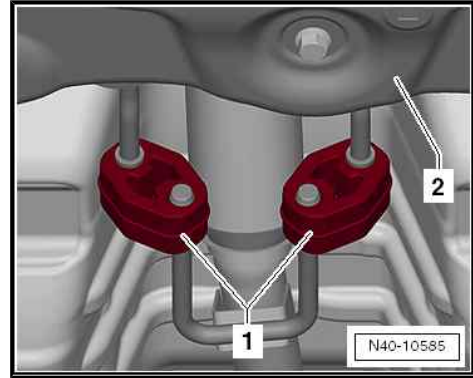
Removing

- Loosen wheel bolts.
- Raise vehicle.
- Remove front wheels.
- Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Remove hexagon nut -1- from coupling rod (left and right sides).
- Pull coupling rod -3- out of anti-roll bar -2- on left and right side.

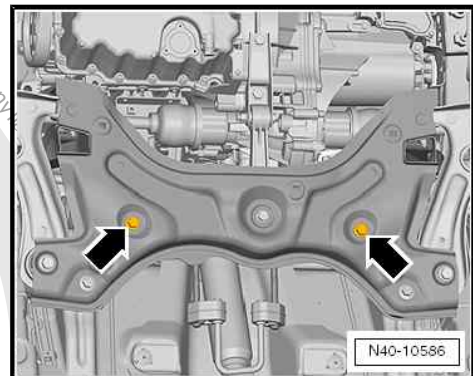




- Pull retaining rings for exhaust pipe from subframe.



- Unbolt steering rack from subframe -arrows- and tie up with wire (or similar).
- Fix position of subframe => [page 17](#) .
- Lower subframe using engine and gearbox jack - V.A.G 1383 A-



Unscrew bolts -arrows-.

- Remove anti-roll bar -1- backwards.

Installing

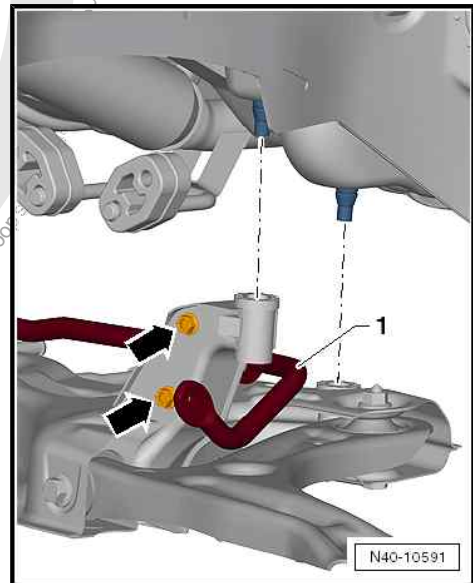
- Insert anti-roll bar and secure to subframe using clamps.
- Secure subframe => [page 18](#) .

Continue installation in reverse order of removal.

- Install wheels and tighten.

Specified torques

- ◆ => ["2.1 Assembly overview - subframe", page 16](#)
- ◆ => ["3.1 Assembly overview - steering rack", page 183](#)
- ◆ Wheel bolts => Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts



2.6 Renewing anti-roll bar bushes

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Raise wheel bearing assembly to unladen position ⇒ [page 6](#) .
- Unscrew bolts -arrows-.
- Pull anti-roll bar clamp off bush.
- Detach bush from anti-roll bar.

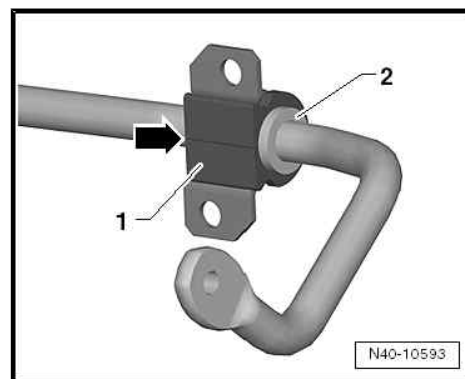
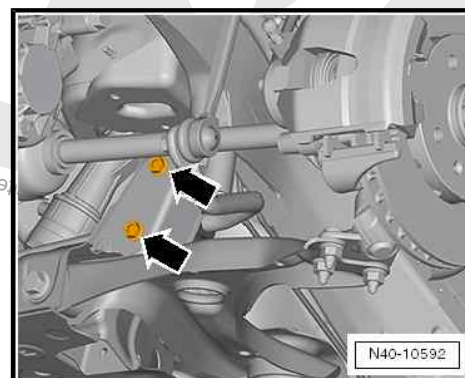
Installing

- Insert new bush -1- on anti-roll bar through opening -arrow-.



Note

- ◆ Ensure that the outer edge of bush -1- lies against stop -2-.
- ◆ Depending on version, the stop -2- can be located on the left or on the right of bush.

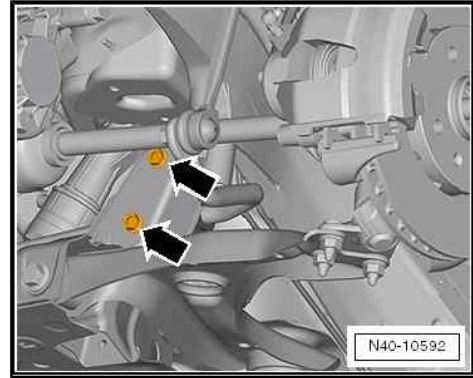




- Secure clamps to subframe -arrows-.
- Install noise insulation => General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

Specified torques

- ◆ => ["2.1 Assembly overview - subframe", page 16](#)





3 Suspension strut, upper suspension link

⇒ [“3.1 Assembly overview - suspension strut, upper suspension link”, page 27](#)

⇒ [“3.2 Removing and installing suspension strut”, page 28](#)

⇒ [“3.3 Repairing suspension strut”, page 34](#)

3.1 Assembly overview - suspension strut, upper suspension link

1 - Cap

- ❑ Allocation ⇒ Electronic parts catalogue “ETKA”

2 - Nut

- ❑ 60 Nm
- ❑ Renew after each removal

3 - Stop

4 - Body - front

5 - Suspension strut

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

6 - Nut

- ❑ 40 Nm
- ❑ Self-locking
- ❑ Renew after each removal

7 - Multi-point socket head bolt

- ❑ Tip of bolt must point in direction of travel

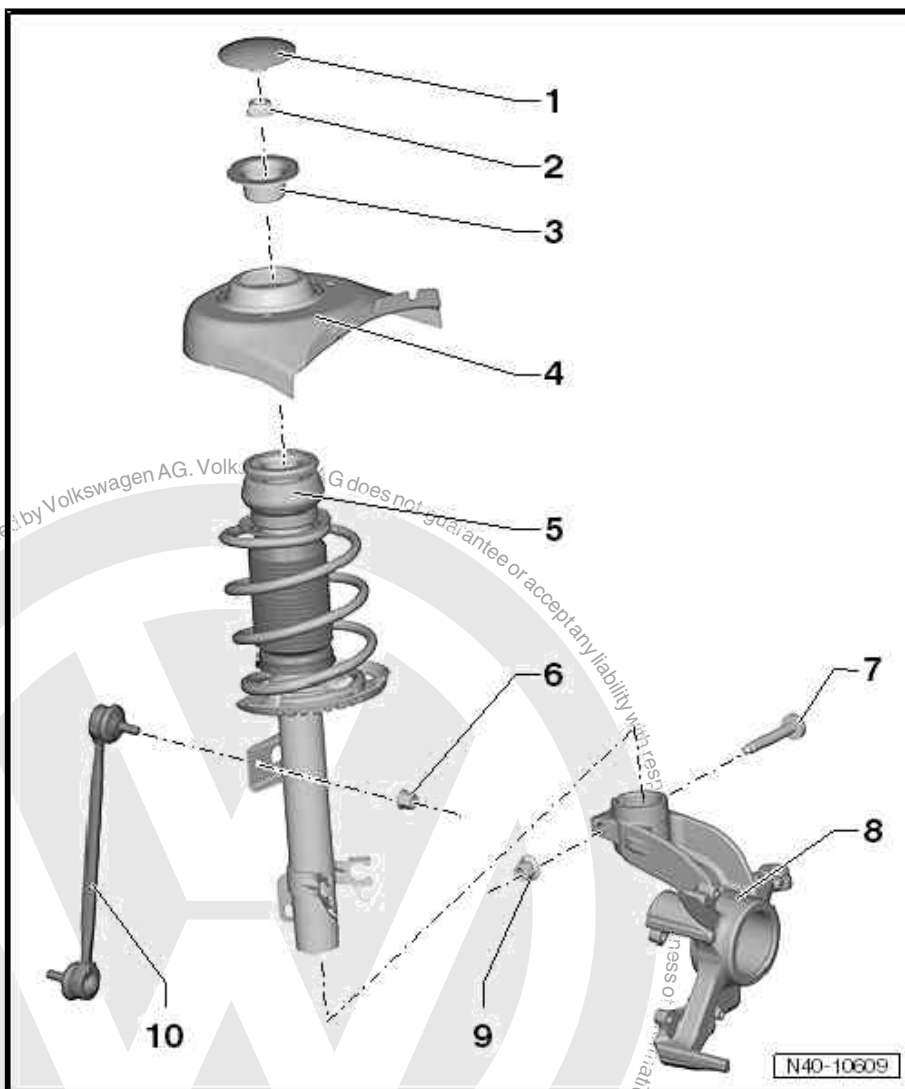
8 - Wheel bearing housing

- ❑ Removing and installing ⇒ [page 66](#)
- ❑ If wheel bearing housing is renewed, wheels must be aligned ⇒ [page 116](#)
- ❑ Various versions
- ❑ Allocation ⇒ Electronic parts catalogue “ETKA”

9 - Nut

- ❑ 70 Nm + 90° further
- ❑ Renew after each removal

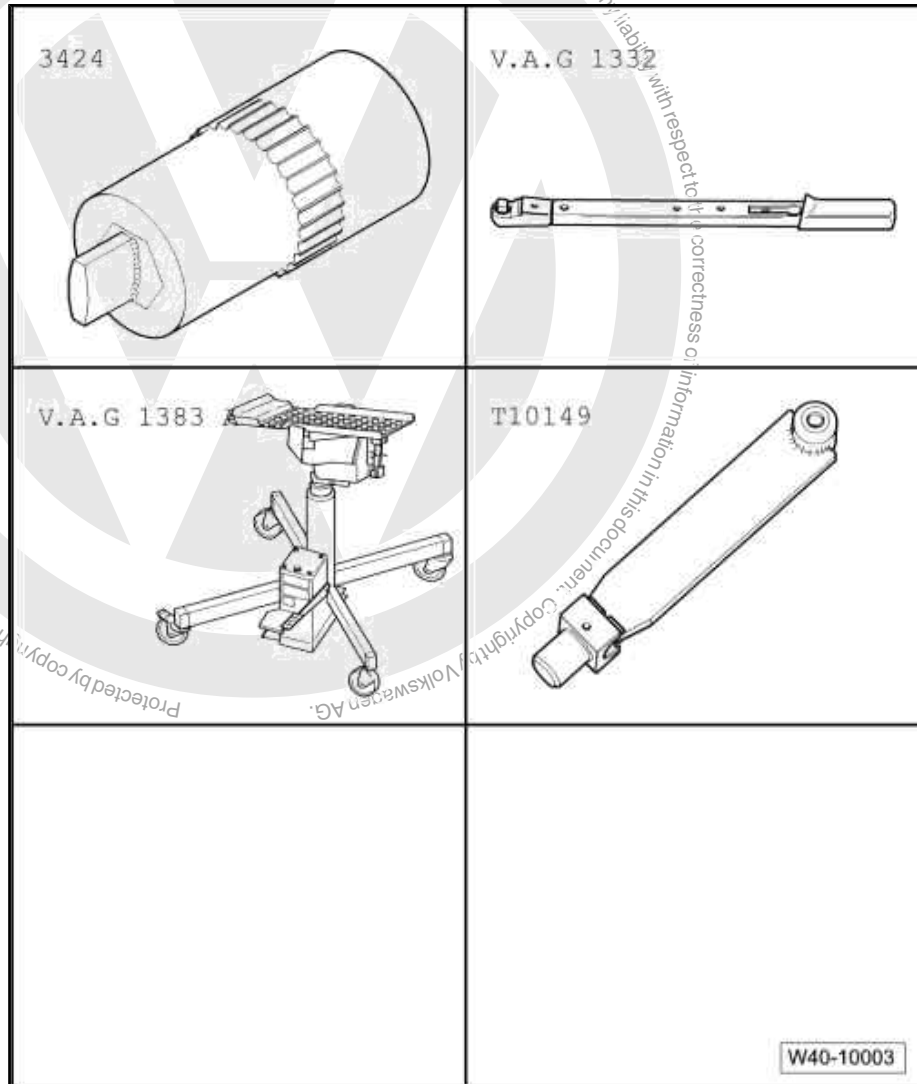
10 - Coupling rod



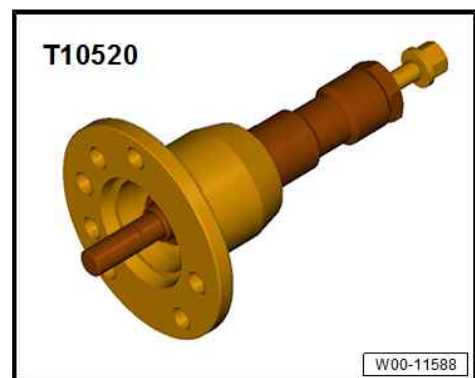


3.2 Removing and installing suspension strut

Special tools and workshop equipment required

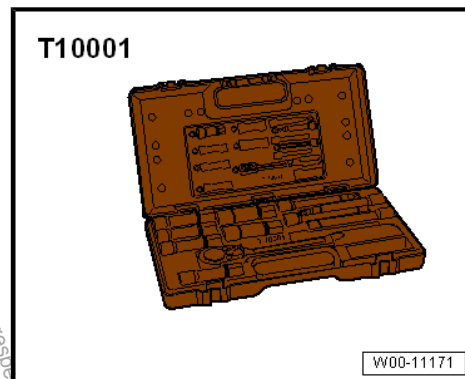


- ◆ Torque wrench - V.A.G 1332-
- ◆ Spreader - 3424-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Support - T10149-
- ◆ Ejector - T10520-





◆ Shock absorber tool set - T10001-



Removing

- Lift vehicle far enough to take weight off front axle.
- Loosen twelve-point nut for drive shaft.



Caution

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

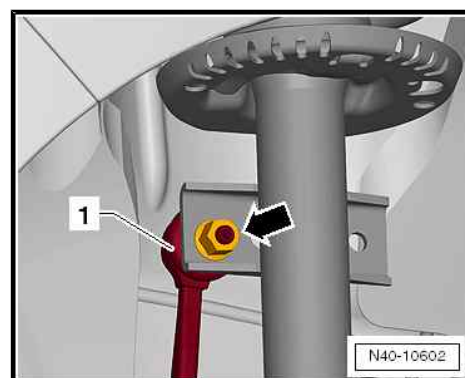
If wheel bearings are loaded with weight of vehicle, wheel bearings will be damaged and service life of wheel bearings will be considerably reduced.

It is not permissible to loosen drive shaft bolt more than 90° if vehicle is standing on its wheels.

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

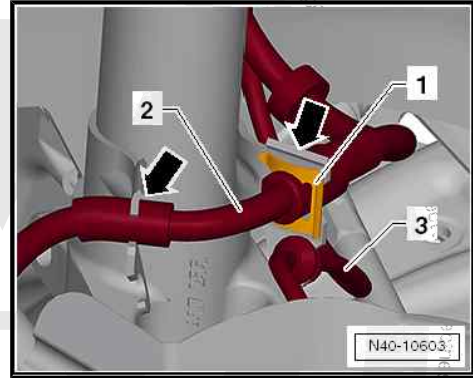
- ◆ *Install an outer joint instead of the drive shaft.*
- ◆ *Tighten outer joint to 120 Nm.*

- Loosen wheel bolts.
- Raise vehicle.
- Remove wheel.
- Unscrew nut -arrow- and pull coupling rod -1- out from suspension strut.



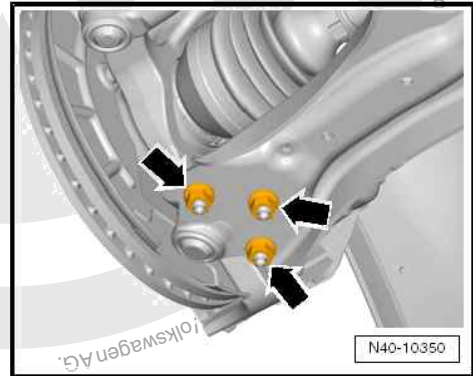


- Remove clip for brake line -1- and brake line -2- and unhook brake line from suspension strut -arrows-.
- Pull connector off ABS speed sensor.
- Remove speed sensor wire -3- from suspension strut.

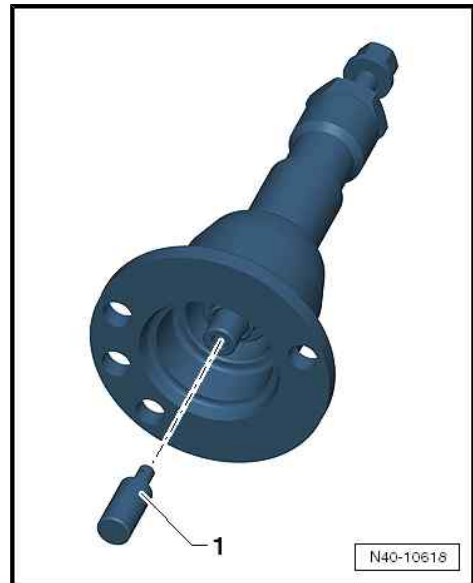


- Remove nuts -arrows-
- Pull swivel joint out of suspension link.
- Pull outer joint of drive shaft out of wheel hub.

If the drive shaft cannot be pulled out of the wheel bearing by hand, use ejector - T10520- .

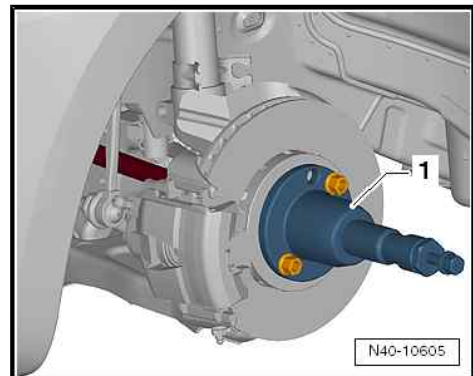


Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

- Secure press tool - T10520- -1- with two wheel bolts to wheel hub.





– It is essential to follow specified sequence.

I - Tighten knurled nut -1- hand-tight.

II - Turn only bolt -2- using a spanner in order to push out drive shaft with press tool - T10520- .



Note

At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.

– Secure drive shaft to body with wire.

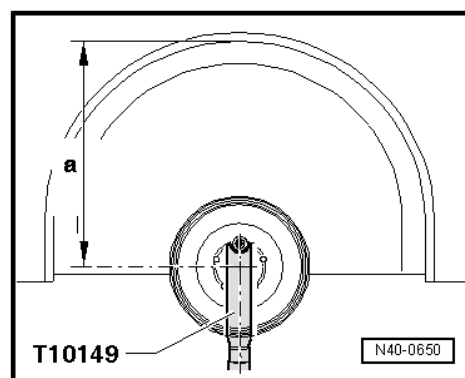
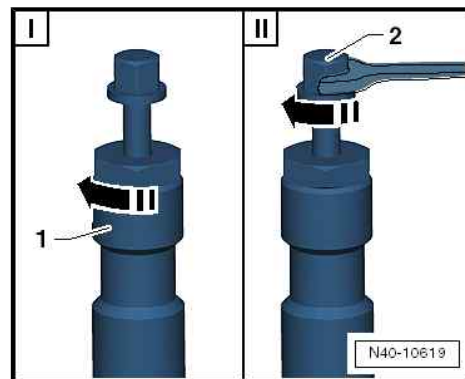
– Bolt swivel joint to suspension link again.

– Use wheel bolt to attach engine and gearbox jack - V.A.G 1383 A- with support - T10149- to wheel hub.

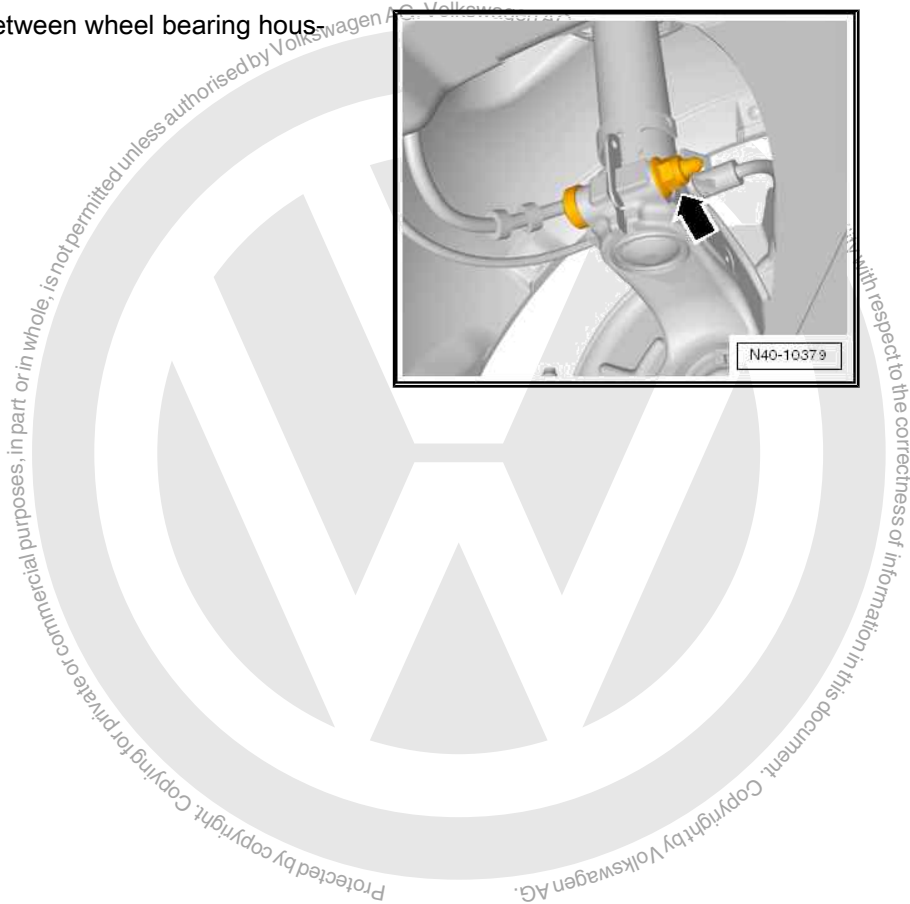
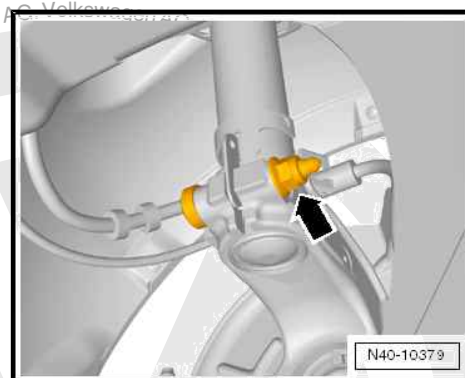


WARNING

- ◆ **Do not raise or lower the vehicle while the engine and gearbox jack - V.A.G 1383 A- is positioned under the vehicle. The vehicle could slip off the lifting platform.**
- ◆ **Do not leave engine and gearbox jack - V.A.G 1383 A- under vehicle longer than necessary.**



– Separate threaded connection between wheel bearing housing and suspension strut -arrow-.

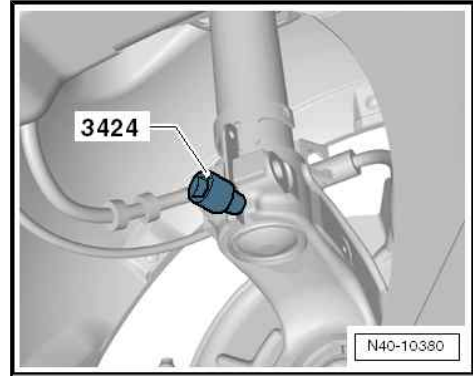




- Insert spreader - 3424- in slot in wheel bearing housing.
- Turn ratchet handle through 90° and pull off from spreader - 3424- .
- Press brake disc towards suspension strut by hand.

Otherwise the shock absorber tube can cant in the bore of the wheel bearing housing.

- Pull wheel bearing housing downwards off shock absorber tube and lower with engine and gearbox jack - V.A.G 1383 A- until shock absorber tube is free.
- Firmly tie wheel bearing housing to subframe.
- Remove support - T10149- from wheel hub and remove engine and gearbox jack - V.A.G 1383 A- from beneath vehicle.



WARNING

- ◆ **Do not leave engine and gearbox jack - V.A.G 1383 A- under vehicle longer than necessary.**

- Remove plenum chamber cover ⇒ General body repairs; exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover

- Unbolt upper shock absorber mounting and remove spring strut downwards.

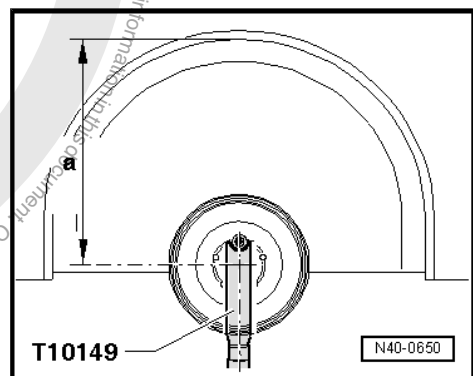
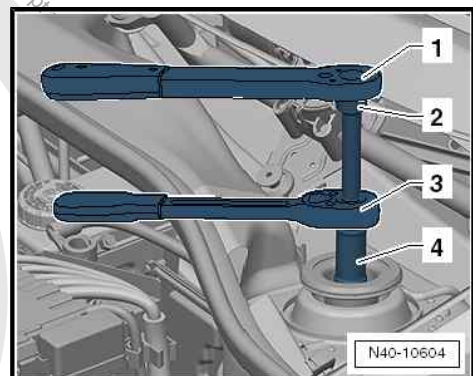
- 1 - Ratchet, commercially available
- 2 - -T10001/8-
- 3 - -T10001/11-
- 4 - -T10001/5-

Installing

- Use wheel bolt to attach engine and gearbox jack - V.A.G 1383 A- with support - T10149- to wheel hub.
- Place suspension strut on wheel bearing housing and fix in place with the multi-point socket head bolt and a new nut.

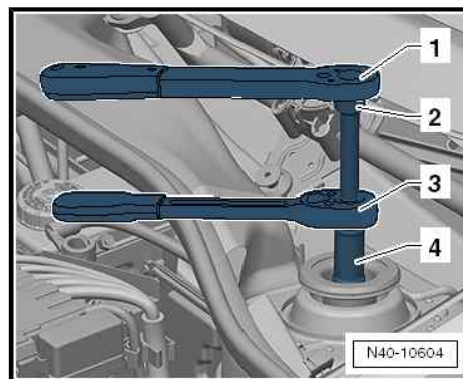
The tip of the multi-point socket head bolt must point in the direction of travel.

- Remove spreader - 3424- .
- Raise wheel bearing housing using engine and gearbox jack until suspension strut lies against inner suspension turret.





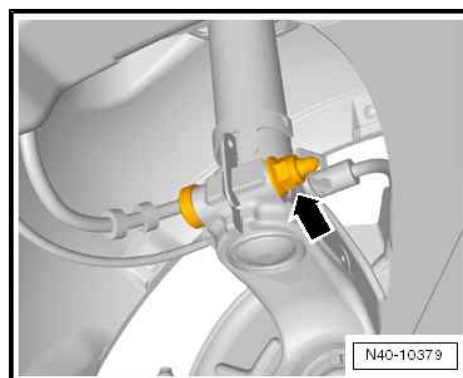
- Position stop on suspension strut turret and tighten nuts for upper shock absorber mounting to tightening torque.
- 1- Torque wrench - V.A.G 1332-
 - 2- -T10001/8-
 - 3- -T10001/11-
 - 4- -T10001/5-
- Remove support - T10149- from wheel hub and remove engine and gearbox jack - V.A.G 1383 A- from beneath vehicle.



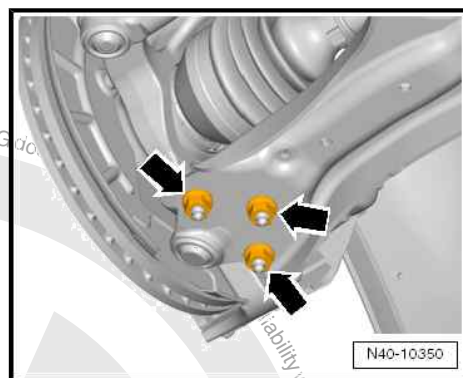
⚠ WARNING

◆ *Do not leave engine and gearbox jack - V.A.G 1383 A- under vehicle longer than necessary.*

- Tighten threaded connection between wheel bearing housing and suspension strut -arrow-



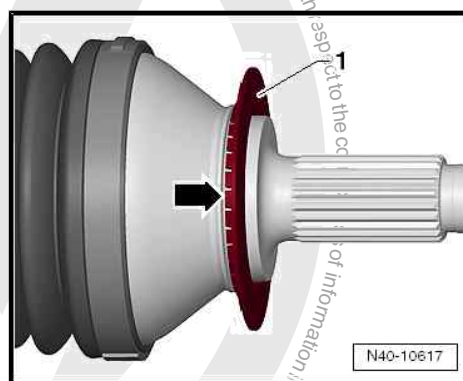
- Remove nuts -arrows-
- Pull swivel joint out of suspension link.



Make sure that deflector ring -1- is clipped completely onto outer joint.

i Note

- ◆ *The lugs of deflector ring -1- must face towards outer joint.*
- ◆ *Deflector ring -1- must lie on contact surface of outer joint -arrow-.*

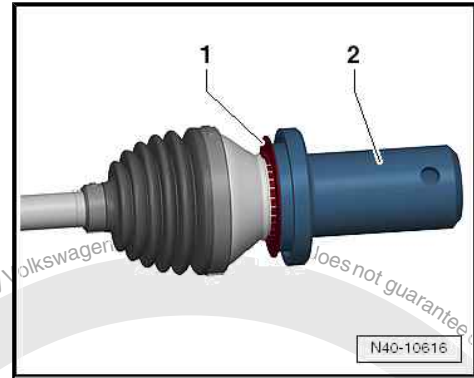




Note

If deflector ring -1- is not positioned correctly or if it fell off outer joint, it must be driven onto outer joint to stop using thrust piece - T10049- .

- Fit drive shaft into wheel bearing.



- Bolt swivel joint to suspension link with new nuts -arrows-.



Note

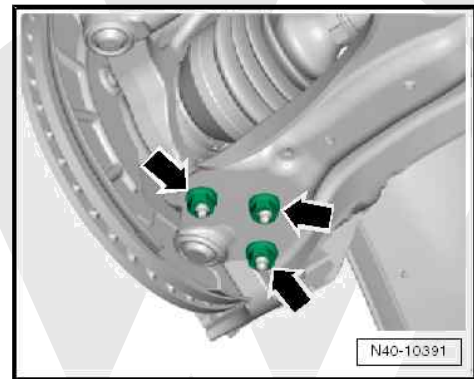
Tighten nuts -arrows- in unladen state ⇒ [page 6](#)

Use new nuts!

Ensure that boot is not damaged or twisted.

Continue installation in reverse order of removal.

- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Install wheel and tighten.
- Tighten twelve-point nut for drive shaft.



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - subframe”, page 16](#)
- ◆ ⇒ [“3.1 Assembly overview - suspension strut, upper suspension link”, page 27](#)
- ◆ ⇒ [“4 Lower suspension link, swivel joint”, page 39](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing”, page 53](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

3.3 Repairing suspension strut



1 - Nut

- 60 Nm
- Self-locking
- Renew after each removal

2 - Suspension strut mounting

- Note installation position ⇒ [page 38](#)

3 - Deep groove ball thrust bearing

4 - Distance piece

- Allocation ⇒ Electronic parts catalogue "ETKA"

5 - Spring plate

6 - Spring

- Removing and installing ⇒ [page 34](#)
- Observe colour coding
- Allocation ⇒ Electronic parts catalogue "ETKA"

The springs can be allocated by means of the PR number. The PR number is indicated on the vehicle data sticker.

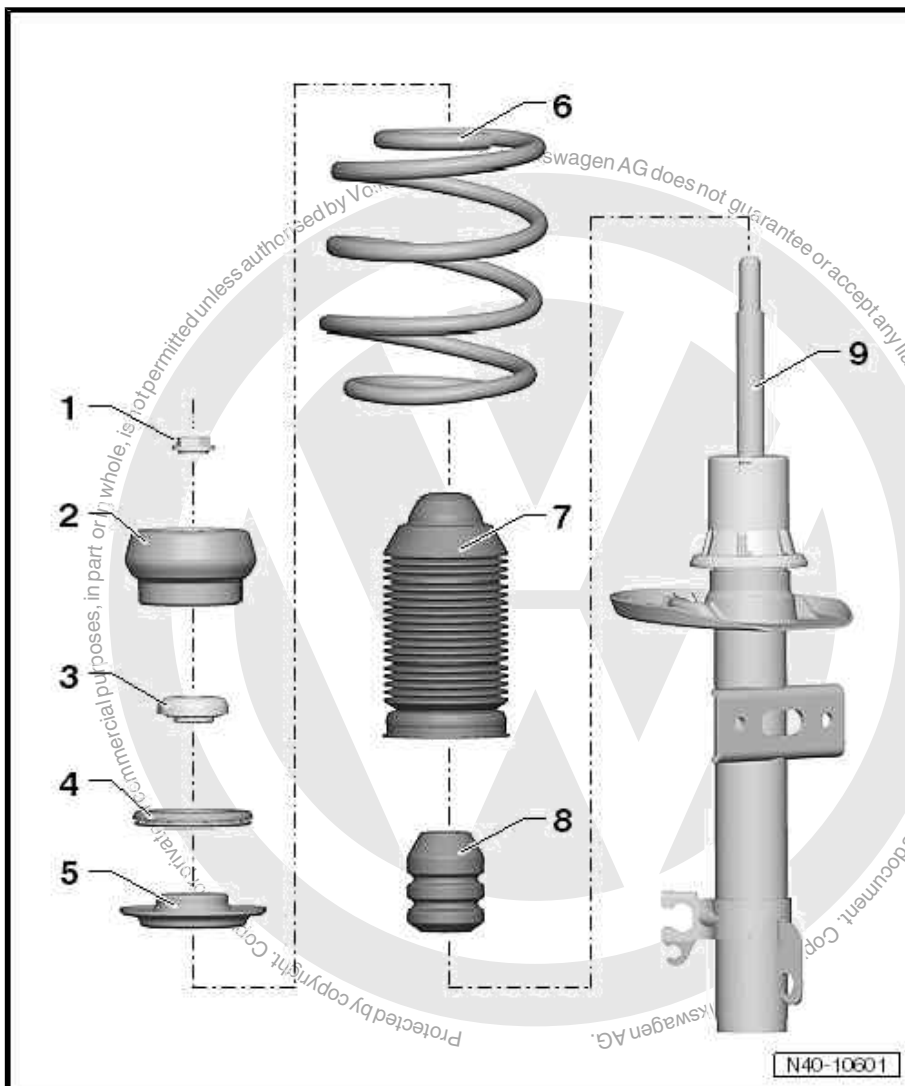
- Surface of coil must not be damaged.

7 - Protective cover

8 - Buffer stop

9 - Damper

- Can be renewed separately
- Allocation ⇒ Electronic parts catalogue "ETKA"



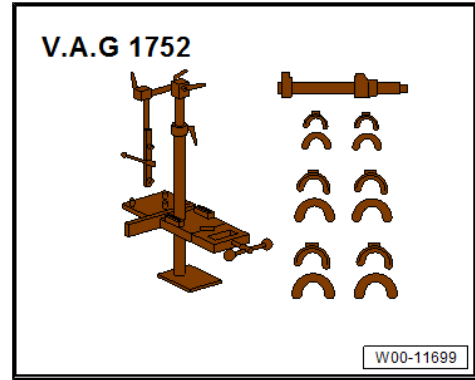
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



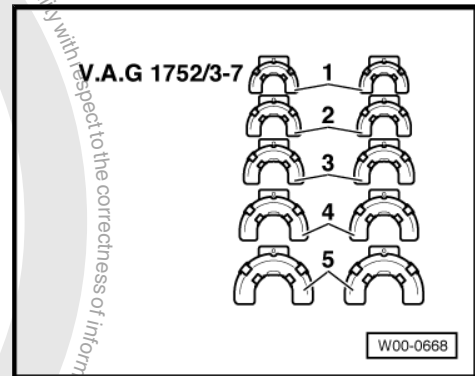


◆ Suspension strut clamp - V.A.G 1752-

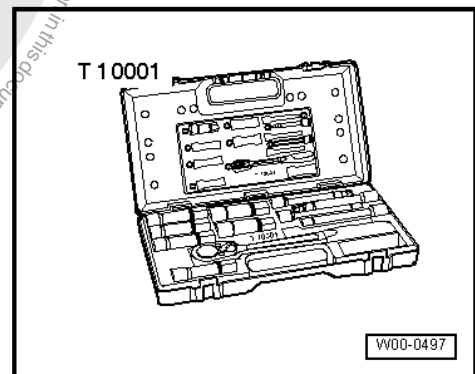


◆ Spring compressor - V.A.G 1752/1-

◆ Spring retainer - V.A.G 1752/7-



◆ Shock absorber tool set - T10001-



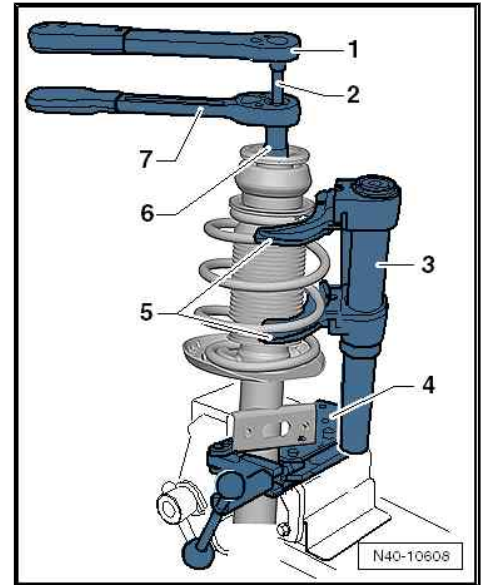
- Remove coil spring strut ⇒ [page 28](#) .



Removing spring

- Clamp suspension strut support clamp - V.A.G 1752/20- -4- in a vice.
- Clamp suspension strut in suspension strut support clamp - V.A.G 1752/20- -4-.
- Pre-tension spring with spring tensioner - V.A.G 1752/1- until deep groove ball thrust bearing is free at top.

- 1 - Torque wrench - V.A.G 1332-
- 2 - Hexagon bit, long reach - T10001/8-
- 3 - Spring compressor - V.A.G 1752/1-
- 4 - Strut support clamp - V.A.G 1752/20-
- 5 - Spring retainer - V.A.G 1752/4-
- 6 - Hexagon bit, long reach - T10001/5-
- 7 - Ratchet wrench - T10001/11-



⚠ WARNING

First compress spring far enough to ensure that upper spring plate is free.

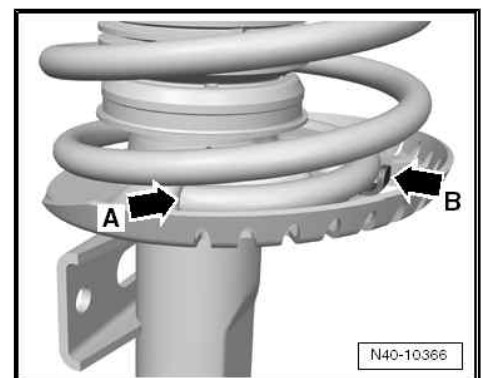
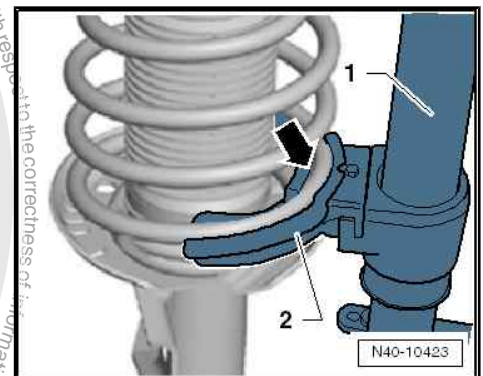
- Ensure that spring is correctly seated in spring retainer - V.A.G 1752/4- -arrow-.
- 1 - Spring compressor - V.A.G 1752/1-
- 2 - Spring retainer - V.A.G 1752/7-
- Unscrew hexagon nut from piston rod.
- Remove individual parts of suspension strut and spring with suspension strut tensioner - V.A.G 1752- .

Installing spring

- Fit spring with suspension strut tensioner - V.A.G 1752- onto bottom spring plate.

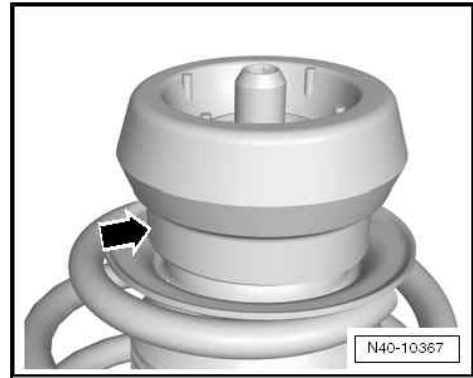
End of spring coil must lie on stop -arrow A- and lug -arrow B-.

- Position spring plate, deep groove ball thrust bearing and suspension strut bearing on spring.





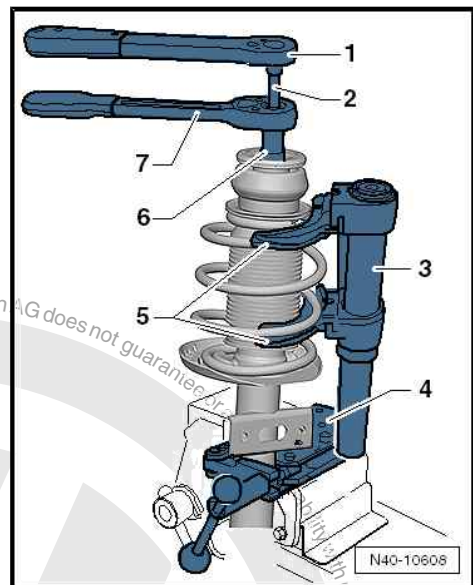
Shoulder of suspension strut bearing -arrow- must point to spring plate.



- Tighten new hexagon nut on piston rod.
- 1- Torque wrench - V.A.G 1332-
- 2- Hexagon bit, long reach - T10001/8-
- 3- Spring compressor - V.A.G 1752/1-
- 4- Strut support clamp - V.A.G 1752/20-
- 5- Spring retainer - V.A.G 1752/4-
- 6- Hexagon bit, long reach - T10001/5-
- 7- Ratchet wrench - T10001/11-
- Relieve tension on suspension strut tensioner - V.A.G 1752- and remove from spring.
- Install suspension strut => [page 32](#) .

Specified torques

- ◆ => ["3.3 Repairing suspension strut", page 34](#)



4 Lower suspension link, swivel joint

⇒ [“4.1 Assembly overview - lower suspension link, swivel joint”, page 39](#)

⇒ [“4.2 Removing and installing lower suspension link”, page 39](#)

⇒ [“4.3 Renewing bonded rubber bush for lower suspension link”, page 41](#)

⇒ [“4.4 Checking swivel joint”, page 47](#)

⇒ [“4.5 Removing and installing swivel joint”, page 47](#)

4.1 Assembly overview - lower suspension link, swivel joint

1 - Front bonded rubber bush

- ❑ Removing and installing
⇒ [page 41](#)

2 - Lower suspension link

- ❑ If damaged, also renew swivel joint.
- ❑ Removing and installing
⇒ [page 39](#)

3 - Rear bonded rubber bush

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

4 - Wheel bearing housing

- ❑ Removing and installing
⇒ [page 66](#)
- ❑ If wheel bearing housing is renewed, wheels must be aligned
⇒ [page 116](#)
- ❑ Various versions
- ❑ Allocation ⇒ Electronic parts catalogue “ETKA”

5 - Nut

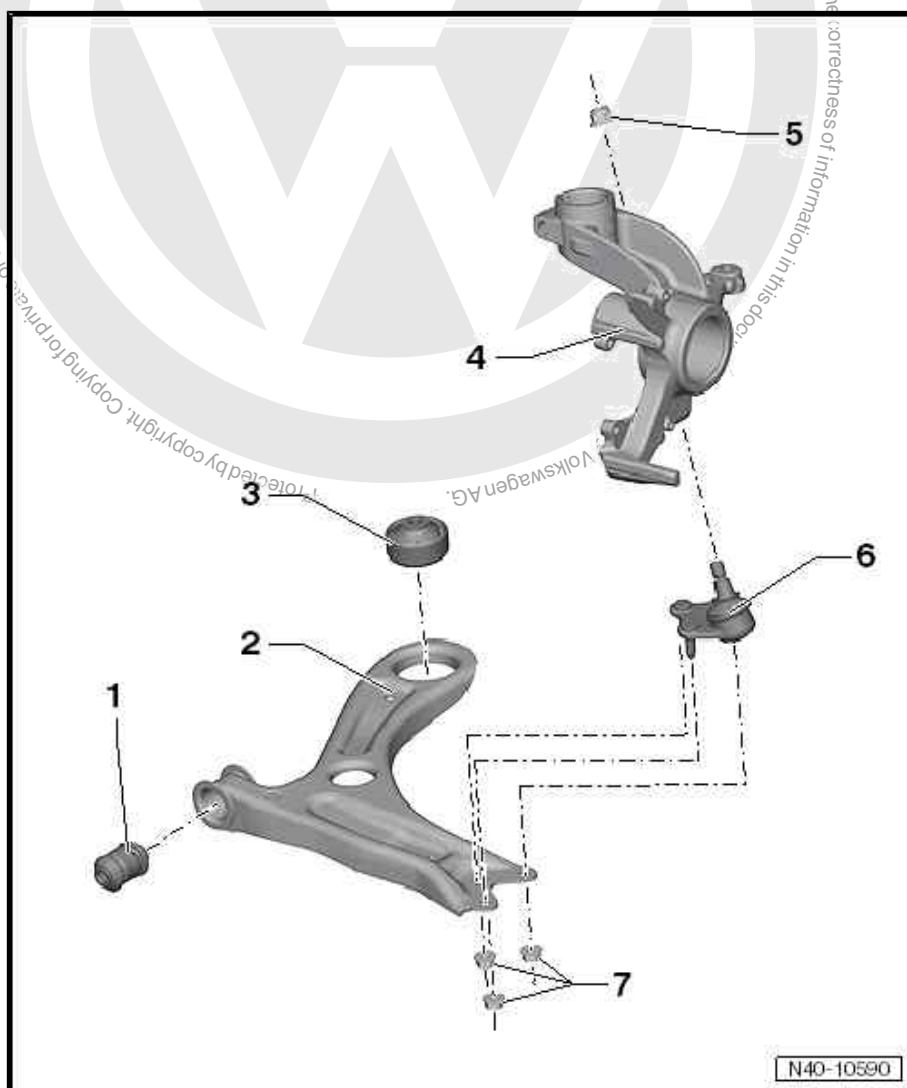
- ❑ Renew after removal
- ❑ 60 Nm

6 - Swivel joint

- ❑ Checking ⇒ [page 47](#)
- ❑ Removing and installing
⇒ [page 47](#)
- ❑ Renew together with suspension link if suspension link is damaged

7 - Nut

- ❑ Renew after removal
- ❑ 40 Nm + 45° further



4.2 Removing and installing lower suspension link

Special tools and workshop equipment required

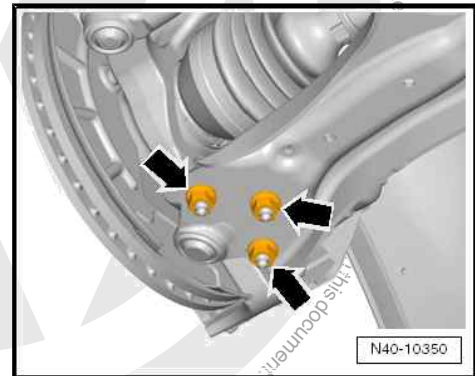


- ◆ Torque wrench - V.A.G 1332-

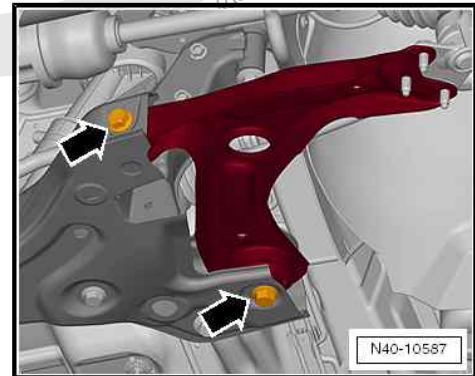


Removing

- Loosen wheel bolts.
- Raise vehicle.
- Remove wheel.
- Remove nuts -arrows-
- Pull suspension link out of swivel joint and turn wheel bearing housing outwards to relieve suspension link.

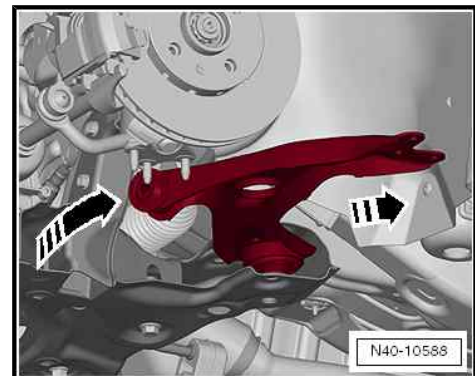


- Unscrew bolts -arrows-



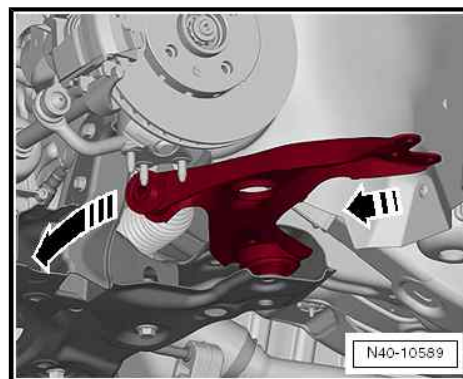
- Swivel suspension link backwards and pull out of subframe in direction of -arrow-

Installing

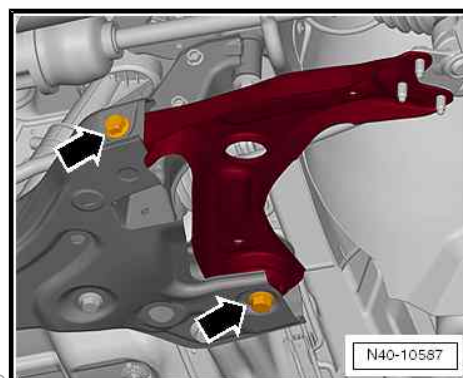




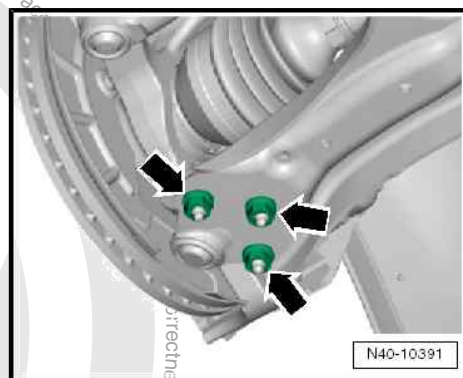
- Insert rear suspension link into subframe in direction of -arrow- and swivel forwards.



- Fit and tighten bolts -arrows-.



- Insert swivel joint in suspension link and tighten bolts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#) .

Use new nuts!

Continue installation in reverse order of removal.

- Install wheel and tighten.

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - subframe”, page 16](#)
- ◆ ⇒ [“4.1 Assembly overview - lower suspension link, swivel joint”, page 39](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

4.3 Renewing bonded rubber bush for lower suspension link

⇒ [“4.3.1 Renewing front bonded rubber bush for lower suspension link”, page 41](#)

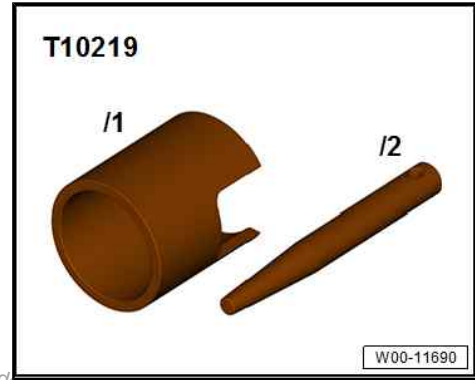
⇒ [“4.3.2 Renewing rear bonded rubber bush for lower suspension link”, page 44](#)

4.3.1 Renewing front bonded rubber bush for lower suspension link

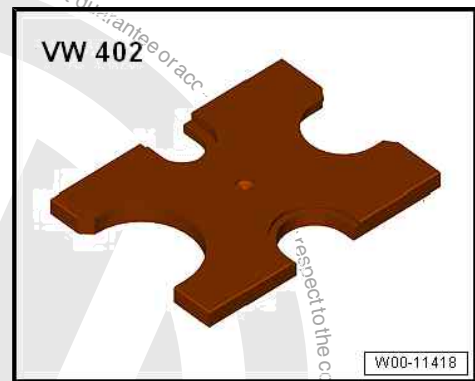
Special tools and workshop equipment required



◆ Pin - T10219/2-



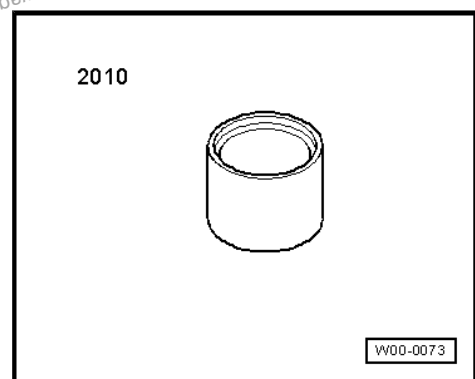
◆ Thrust plate - VW 402-



◆ Press tool - VW 411-

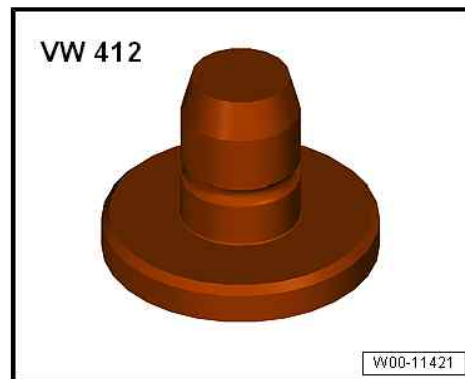


◆ Tube - 2010-





◆ Press tool - VW 412-

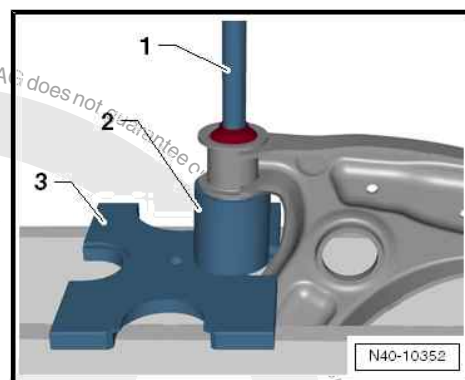


- Remove suspension link ➤ [page 39](#) .

Pressing out bonded rubber bush

- Press out bonded rubber bush as illustrated.

- 1 - Press tool - VW 411-
- 2 - Tube - 2010- (Larger internal diameter of wheel bearing faces suspension link)
- 3 - Thrust plate - VW 402-

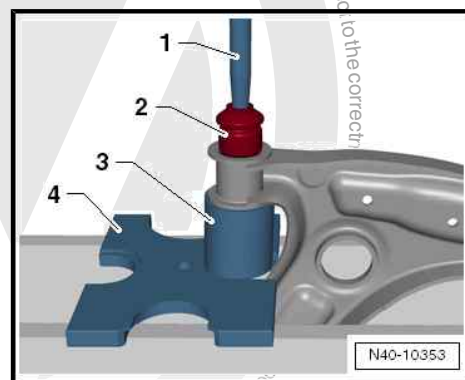


Pressing in bonded rubber bush

- Moisten outer surface of bonded rubber bush with assembly oil - G 294 421 A1- .

- Press in bonded rubber bush as illustrated.

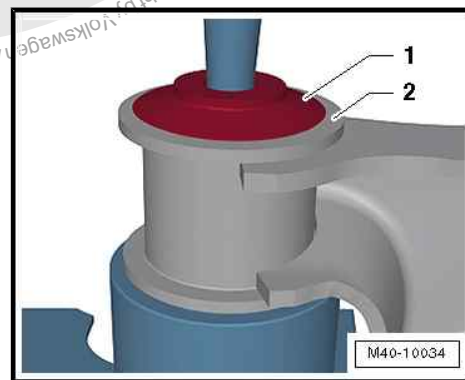
- 1 - Pin - T10219/2-
- 2 - Bonded rubber bush
- 3 - Tube - 2010- (Larger internal diameter of wheel bearing faces suspension link)
- 4 - Thrust plate - VW 402-



Note

At start of pressing-in process, bonded rubber bush is temporarily slanted. During further procedure, the bonded rubber bush then straightens. It does not have to be pushed further.

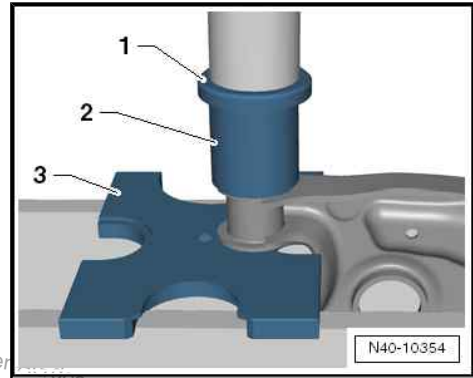
- Press in bonded rubber bush until core of bush -1- and hole in suspension link -2- are flush.





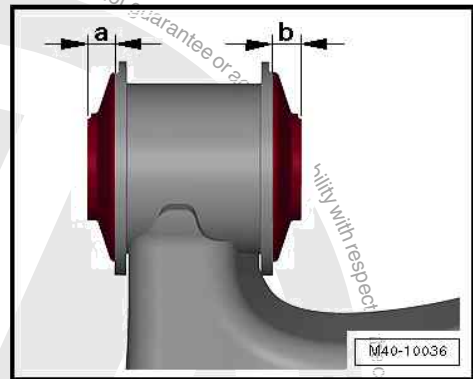
– Press bush back slightly in the suspension link.

- 1 - Press tool - VW 412-
- 2 - Tube - 2010- (Larger internal diameter of wheel bearing faces suspension link)
- 3 - Thrust plate - VW 402-



The dimensions -a- and -b- must be the same.

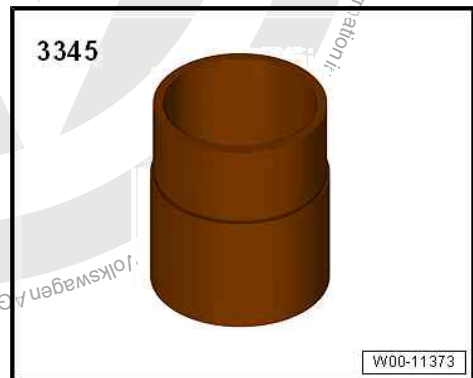
– Install suspension link => [page 40](#)



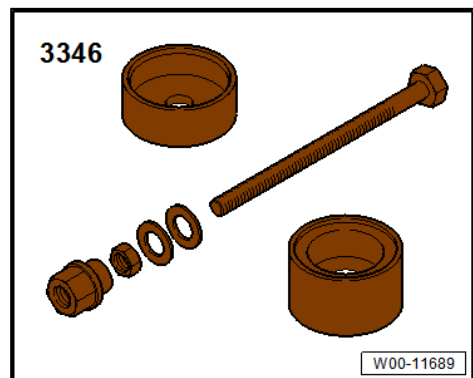
4.3.2 Renewing rear bonded rubber bush for lower suspension link

Special tools and workshop equipment required

- ◆ Tube for wheel bearing - 3345-



- ◆ Assembly tool - 3346-





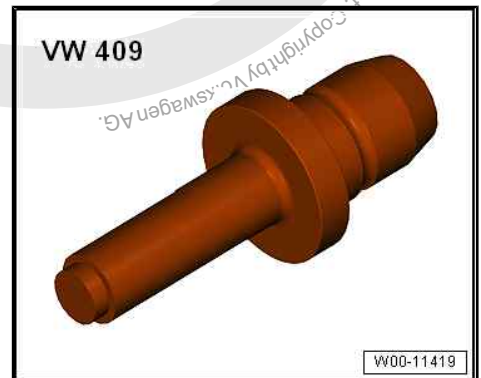
- ◆ Crankshaft seal installing tool - VW 204 B-



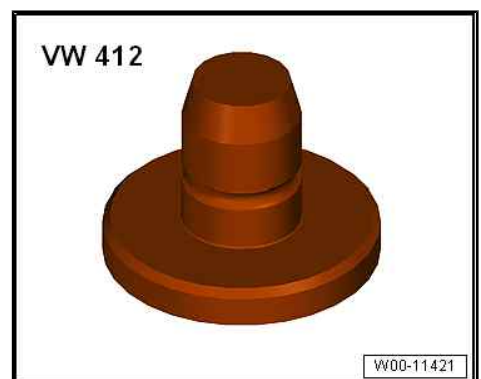
- ◆ Thrust plate - VW 402-



- ◆ Press tool - VW 409-

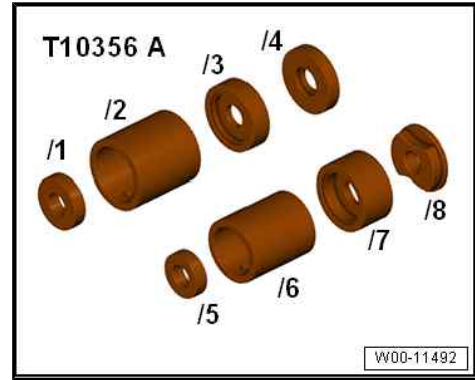


- ◆ Press tool - VW 412-





◆ Assembly tool - T10356A-

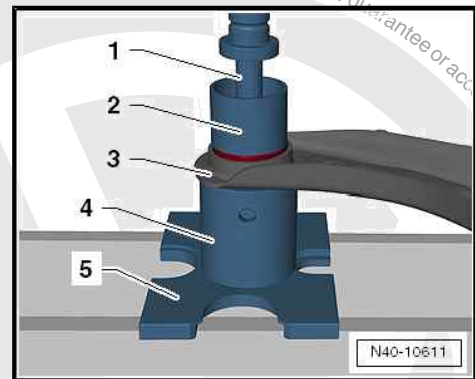


– Remove suspension link ⇒ [page 39](#) .

Pressing out bonded rubber bush

– Press out bonded rubber bush as illustrated.

- 1 - Press tool - VW 409-
- 2 - Thrust piece - 3346/1-
- 3 - Suspension link - the opening of the suspension link must face upwards
- 4 - Thrust piece - T10356/2-
- 5 - Thrust plate - VW 402-



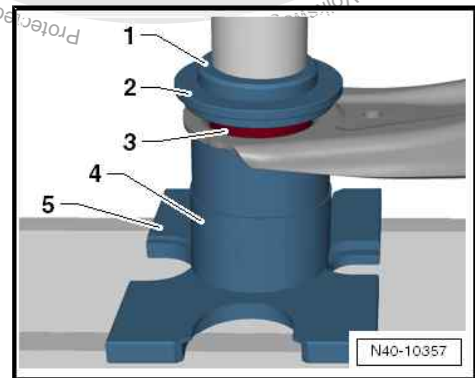
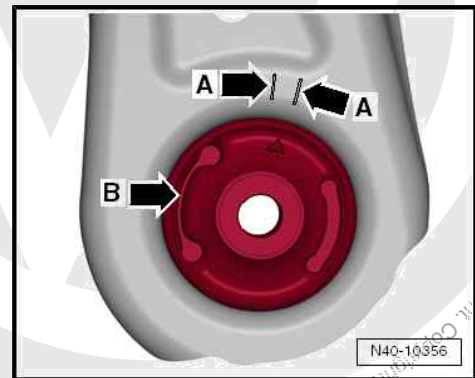
Installation position of rear bush in suspension link

One of the embossed arrows points between the two markings -Arrow A- in the suspension link.

The cam -arrow B- must always point to outside of vehicle.

Pressing in bonded rubber bush

- Press in bonded rubber bush as illustrated.
- 1 - Press tool - VW 412-
- 2 - Crankshaft seal installing tool - VW 204 B-
- 3 - Bonded rubber bush
- 4 - Tube for wheel bearing - 3345- (Smaller outer circumference to suspension link)
- 5 - Thrust plate - VW 402-



Note

Press bonded rubber bush in until thrust piece of crankshaft seal installing tool - VW 204 B- is on the suspension link.

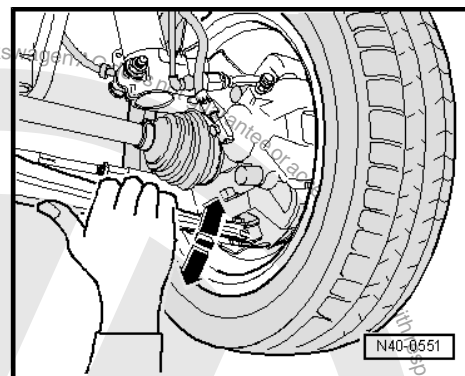
– Install suspension link ⇒ [page 40](#) .



4.4 Checking swivel joint

Checking axial play

- Firmly pull suspension link down in -direction of arrow- and press up again.



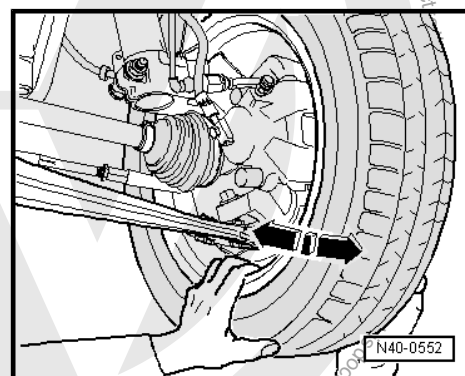
Checking radial play

- Press lower part of wheel forcefully inwards and outwards in -direction of arrow-.



Note

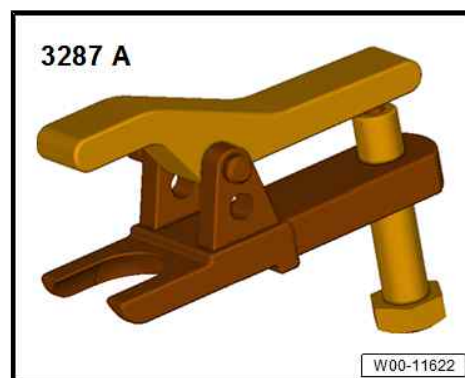
- ◆ There should be no palpable or visible "play" during both tests.
- ◆ Observe swivel joint while performing tests.
- ◆ Take into account possible existing wheel bearing play or "play" in upper suspension strut mounting.
- ◆ Check rubber boot for damage and renew swivel joint if necessary.



4.5 Removing and installing swivel joint

Special tools and workshop equipment required

- ◆ Ball joint puller - 3287A-
- ◆ Torque wrench - V.A.G 1332-

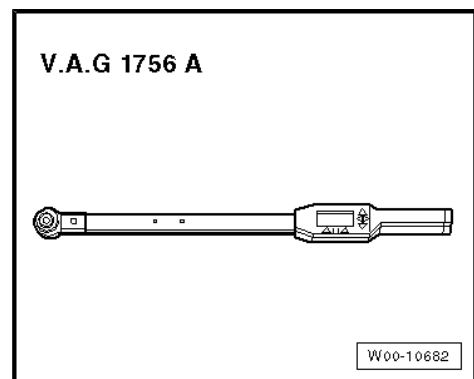




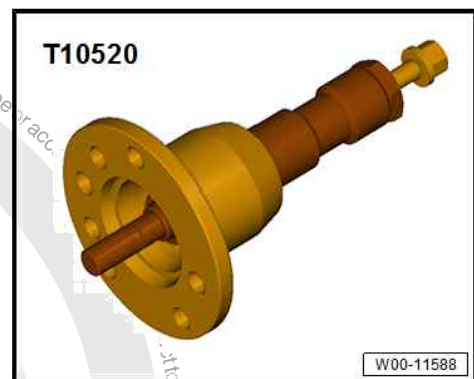
◆ Engine and gearbox jack - V.A.G 1383 A-



◆ Torque angle wrench - V.A.G 1756-



◆ Ejector - T10520-



Removing

- Lift vehicle far enough to take weight off front axle.
- Loosen twelve-point nut for drive shaft.



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, wheel bearings will be damaged and service life of wheel bearings will be considerably reduced.

It is not permissible to loosen drive shaft bolt more than 90° if vehicle is standing on its wheels.

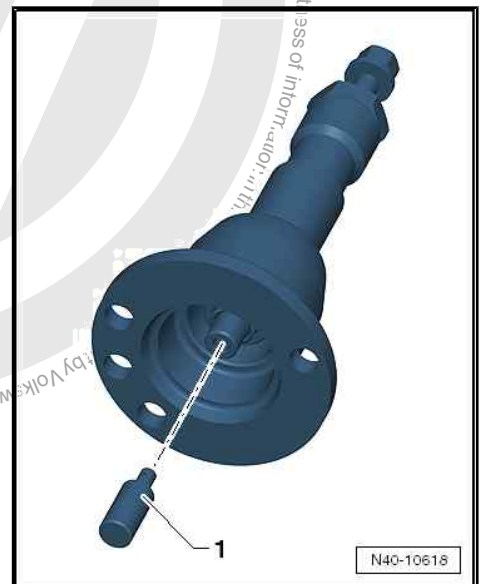
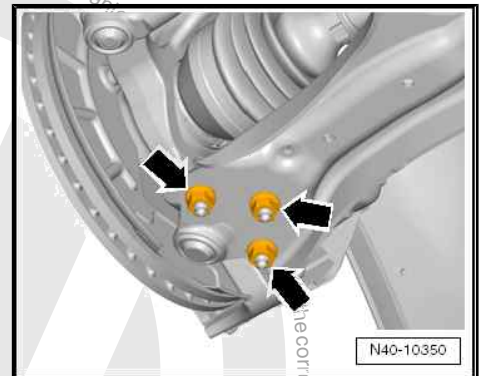
Do not attempt to move the vehicle without the drive shafts fitted as this would damage the wheel bearing. If a vehicle must nevertheless be moved, comply with the following:

- ◆ *Install an outer joint instead of the drive shaft.*
- ◆ *Tighten outer joint to 120 Nm.*

- Loosen wheel bolts.
- Raise vehicle.
- Remove wheel.
- Remove nuts -arrows-
- Pull swivel joint out of suspension link.
- Bend suspension link downwards as far as necessary.
- Pull drive shaft completely out of wheel hub.

If the drive shaft cannot be pulled out of the wheel bearing by hand, use ejector - T10520- .

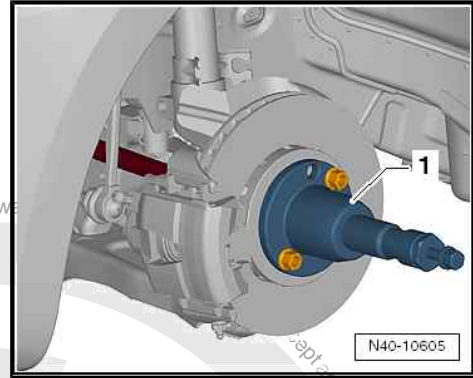
Before using press tool - T10520- ensure that thrust piece -1- is inserted.





Using press tool - T10520- :

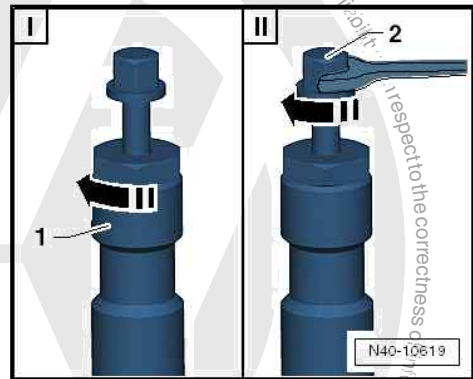
- Secure press tool - T10520- -1- with 2 wheel bolts to wheel hub.



- It is essential to follow specified sequence.
- I - Tighten knurled nut -1- hand-tight.
- II - Turn only bolt -2- using a spanner in order to push out drive shaft with press tool - T10520-.

Note

At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.



- Secure drive shaft to body.

Note

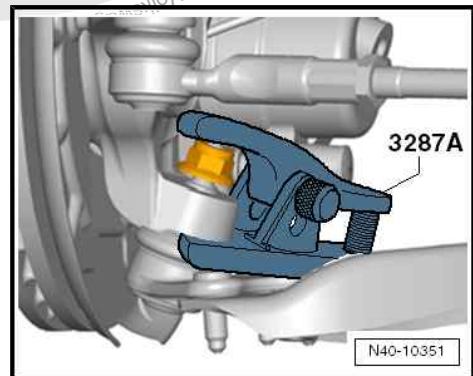
Place engine and gearbox jack - V.A.G 1383 A- or similar underneath (danger of accident through falling parts when pressing out the swivel joint).

- Loosen nut for swivel joint.



Caution

To protect thread, leave nut screwed a few turns onto joint pin.



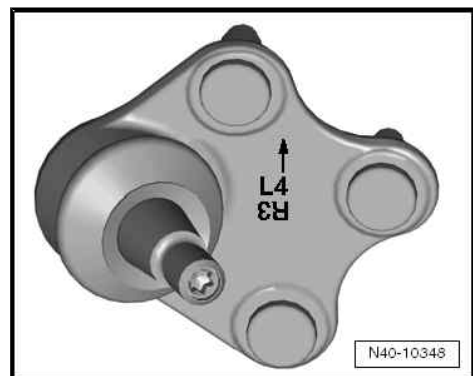
- Apply ball joint splitter - 3287 A- as shown in figure and press out swivel joint.

Installing

Observe installation position of swivel joints!

Left swivel joint

Arrow with marking "L4" to the direction of travel





Right swivel joint

Arrow with marking "R4" to the direction of travel

Observe exact installation position of swivel joints!

Caster will be incorrect if swivel joints are not installed in correct position.

- Fit swivel joint in wheel bearing housing.
- Screw on new self-locking nut and counterhold at swivel joint with -T40- Torx key.
- Fit drive shaft in wheel hub.

Make sure that deflector ring -1- is clipped completely onto outer joint.



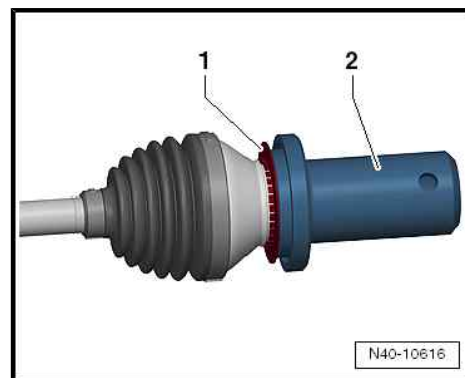
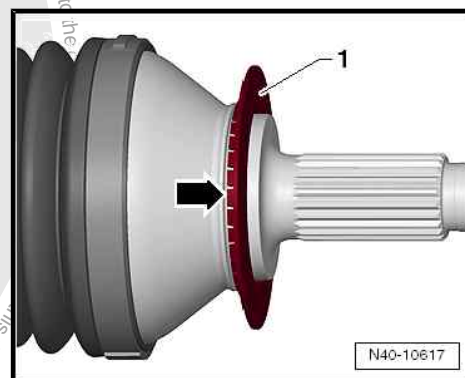
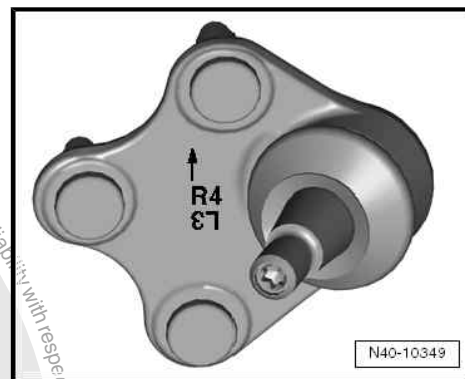
Note

- ◆ The lugs of deflector ring -1- must face towards outer joint.
- ◆ Deflector ring -1- must lie on contact surface of outer joint arrow-



Note

If deflector ring -1- is not positioned correctly or if it fell off outer joint, it must be driven onto outer joint to stop using thrust piece - T10049- .



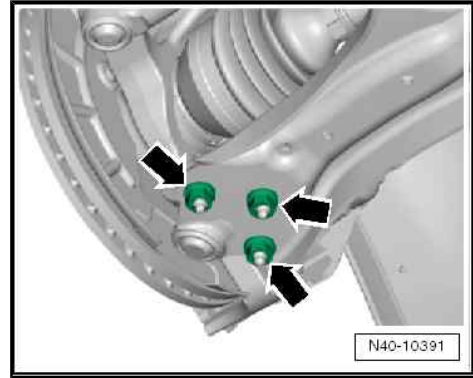


- Tighten nuts -arrows-.



Note

- ◆ Tighten nuts -arrows- in unladen state ⇒ [page 6](#) .
- ◆ Ensure that boot is not damaged or twisted.
- Install wheel and tighten.
- Lightly coat thread and splines of stub axle and contact surfaces of wheel hub/twelve-point nut with pressure-resistant oil Fuchs Renolin B15 VG46.
- Tighten twelve-point nut for drive shaft.



Specified torques

- ◆ ⇒ [“2.1 Assembly overview - subframe”, page 16](#)
- ◆ ⇒ [“4.1 Assembly overview - lower suspension link, swivel joint”, page 39](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing”, page 53](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts





5 Wheel bearing

⇒ ["5.1 Assembly overview - wheel bearing", page 53](#)

⇒ ["5.2 Renewing wheel bearing", page 53](#)

⇒ ["5.3 Removing and installing wheel bearing housing", page 66](#)

5.1 Assembly overview - wheel bearing

1 - Drive shaft

2 - Wheel bearing housing

- ❑ Removing and installing
⇒ [page 66](#)
- ❑ Allocation ⇒ Electronic parts catalogue "ETKA"

3 - Hexagon socket head bolt

- ❑ 8 Nm

4 - Speed sensor

- ❑ Before inserting sensor, clean inner surface of hole, and coat it with high-temperature paste - G052 112 A3- .

5 - Brake disc

6 - Wheel hub

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

7 - Retaining ring

- ❑ Installed with opening facing downwards.

8 - Wheel bearing

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

9 - Bolt

- ❑ 12 Nm

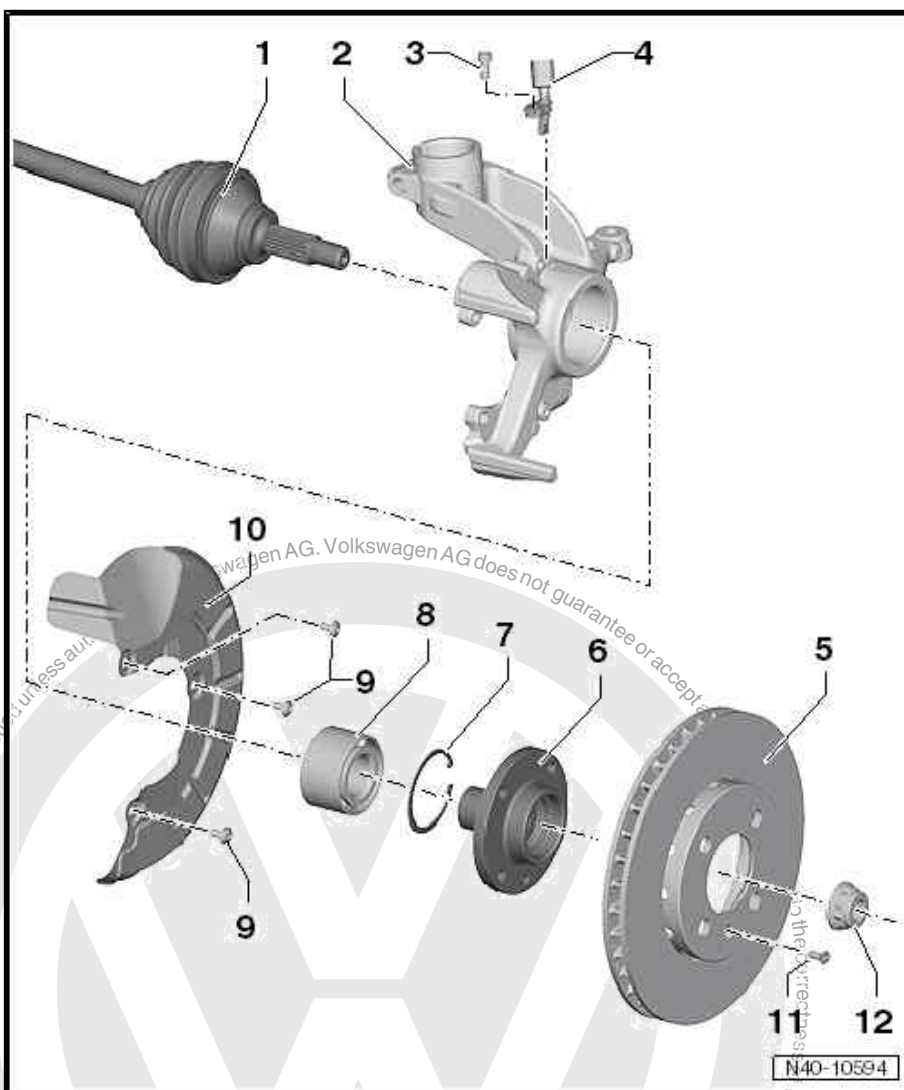
10 - Splash plate for brakes

11 - Bolt

- ❑ 4.5 Nm

12 - 12-point nut (self-locking)

- ❑ Tighten to 200 Nm, then loosen (turn back) 180° and retighten to 50 Nm + 45°
- ❑ Renew after each removal

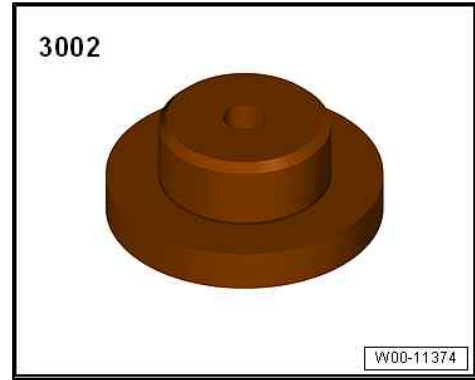


5.2 Renewing wheel bearing

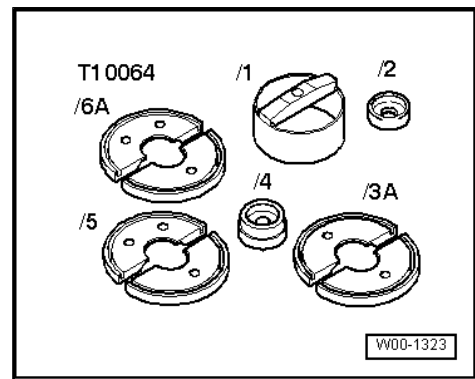
Special tools and workshop equipment required



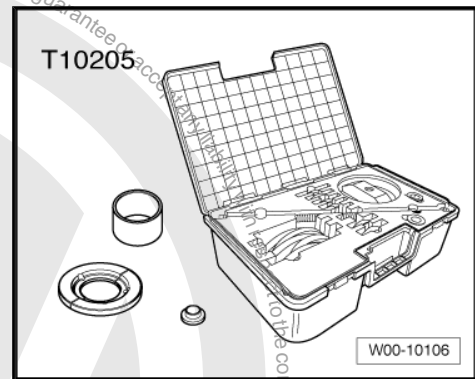
◆ Thrust piece - 3002-



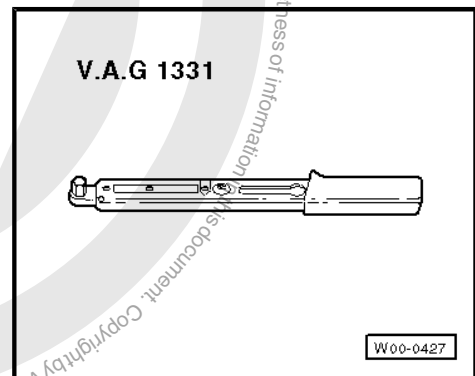
◆ Assembly tool - T10064-



◆ Assembly tool - T10205-



◆ Torque wrench - V.A.G 1331-

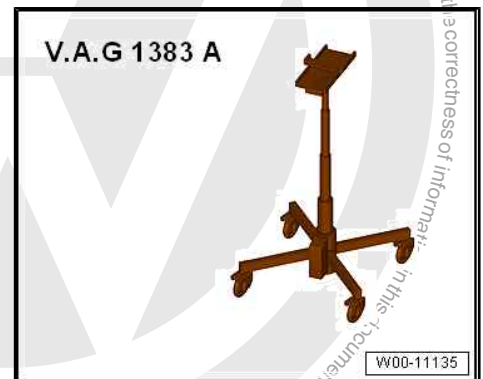




- ◆ Torque wrench - V.A.G 1332-



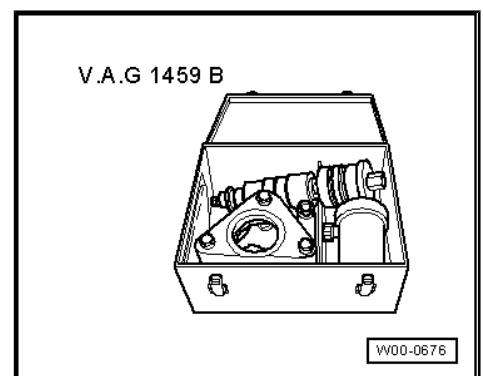
- ◆ Engine and gearbox jack - V.A.G 1383 A-



- ◆ Torque wrench - V.A.G 1410-

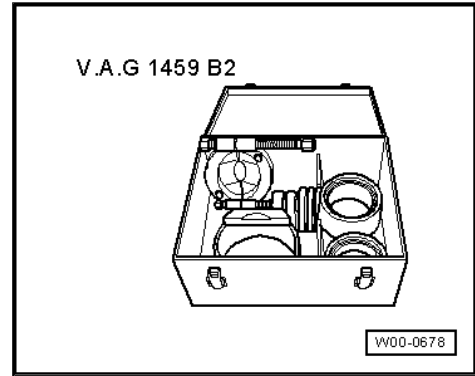


- ◆ Thrust piece - V.A.G 1459B-6- from hydraulic wheel bearing tool - V.A.G 1459B-

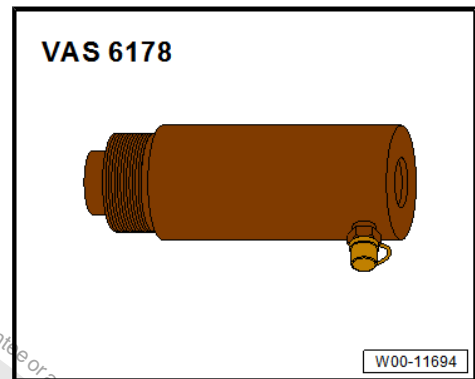




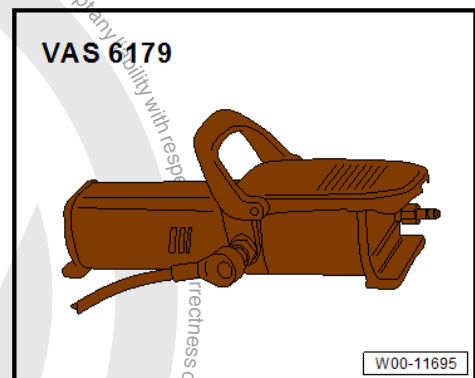
- ◆ Thrust sleeve - V.A.G 1459B/2-8- from supplementary set - V.A.G 1459B/2-



- ◆ Hydraulic cylinder - VAS 6178-

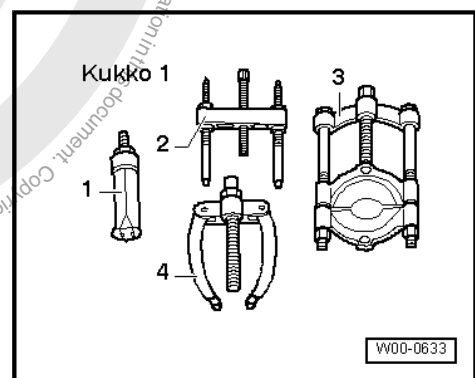


- ◆ Foot pump - VAS 6179-



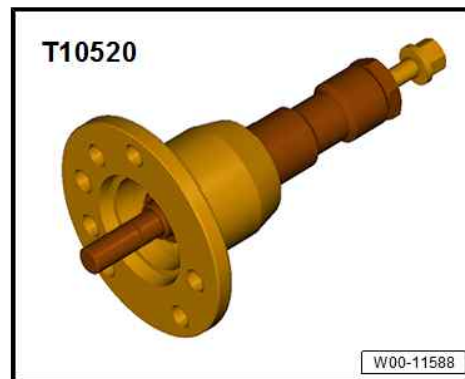
- ◆ -2- Puller - Kukko 18/0-

- ◆ -3- Splitter - Kukko 17/1-





◆ Ejector - T10520-



Removing

- Lift vehicle far enough to take weight off front axle.
- Loosen twelve-point nut for drive shaft.



Caution

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

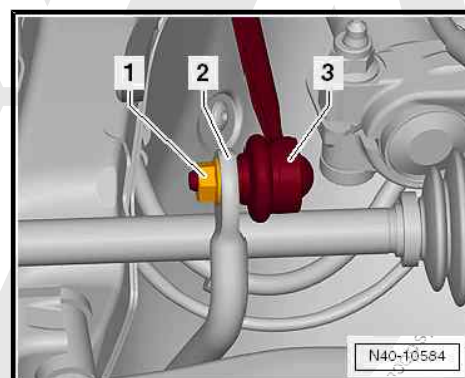
If wheel bearings are loaded with weight of vehicle, wheel bearings will be damaged and service life of wheel bearings will be considerably reduced.

It is not permissible to loosen drive shaft bolt more than 90° if vehicle is standing on its wheels.

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

- ◆ *Install an outer joint instead of the drive shaft.*
- ◆ *Tighten outer joint to 120 Nm.*

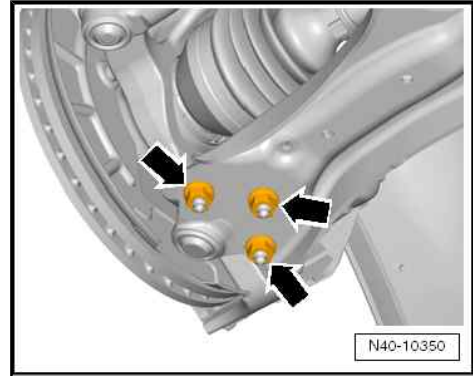
- Loosen wheel bolts.
- Raise vehicle.
- Remove wheel.
- Remove hexagon nut -1- from coupling rod (left and right sides).
- Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



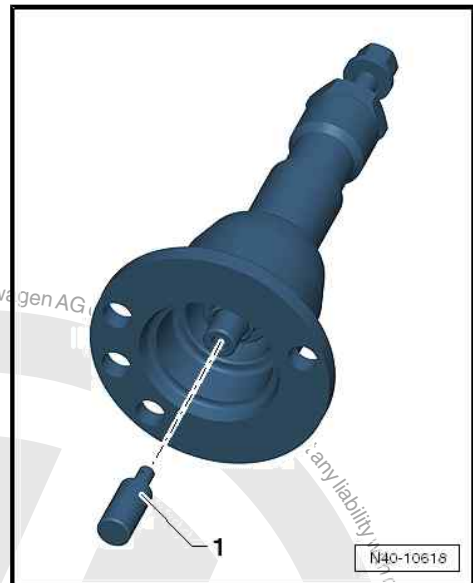


- Remove nuts -arrows-
- Pull swivel joint out of suspension link.
- Pull drive shaft out of wheel hub.

If the drive shaft cannot be pulled out of the wheel bearing by hand, use ejector - T10520- .

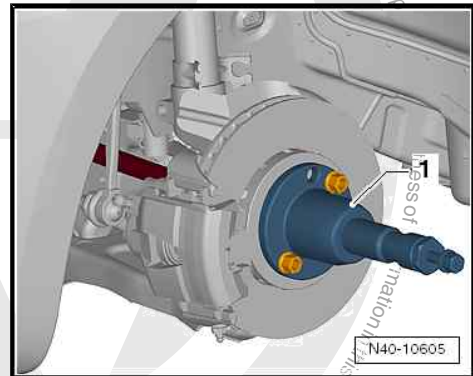


Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

- Secure press tool - T10520- --1- with two wheel bolts to wheel hub.





- It is essential to follow specified sequence.

I - Tighten knurled nut -1- hand-tight.

II - Turn only bolt -2- using a spanner in order to push out drive shaft with press tool - T10520- .



Note

At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.

- Secure drive shaft to body with wire.

The drive shaft must not hang down under its own weight.

Otherwise the inner joint will be bent too far and will be damaged.

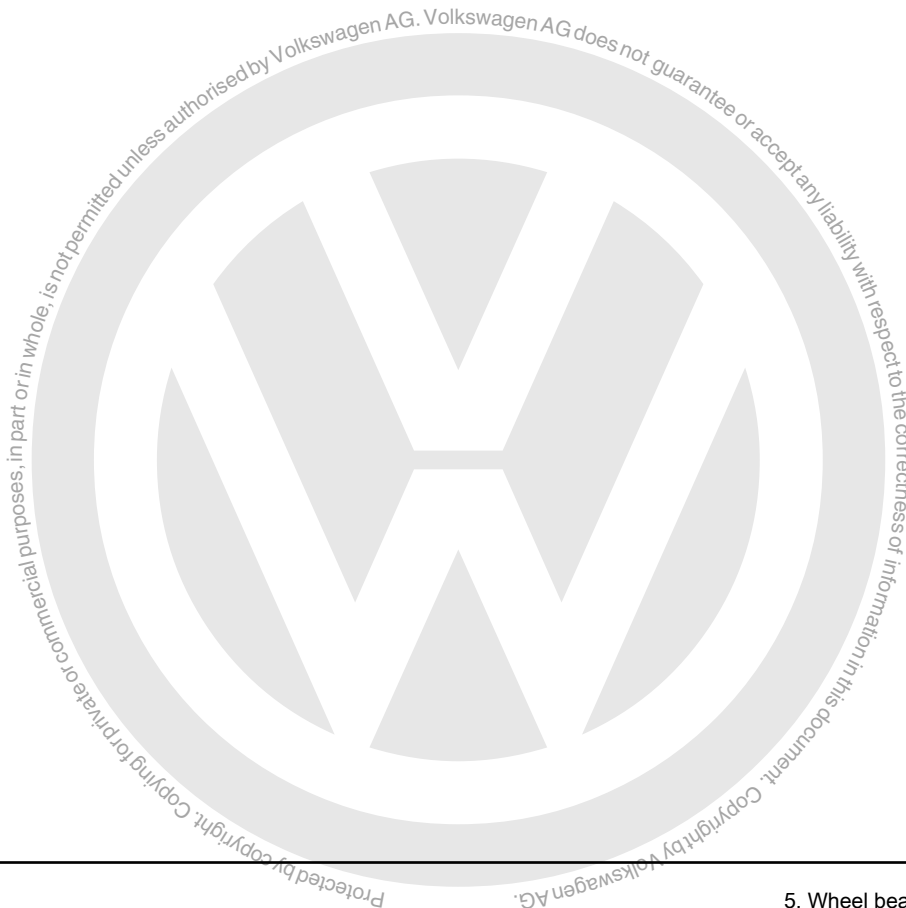
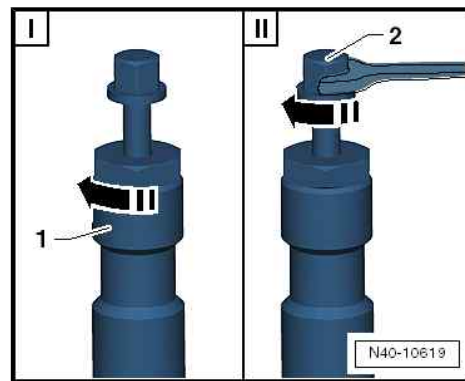
- Remove brake caliper and tie to body using wire ⇒ Brake system; Rep. gr. 46 ; Front brake; Removing and installing brake pads .
- Remove bolt for brake disc and remove brake disc.
- Remove splash plate for brakes.
- Remove ABS speed sensor ⇒ Brake system; Rep. gr. 45 ; Sensors; Removing and installing speed sensor on front axle -G45- / -G47- .

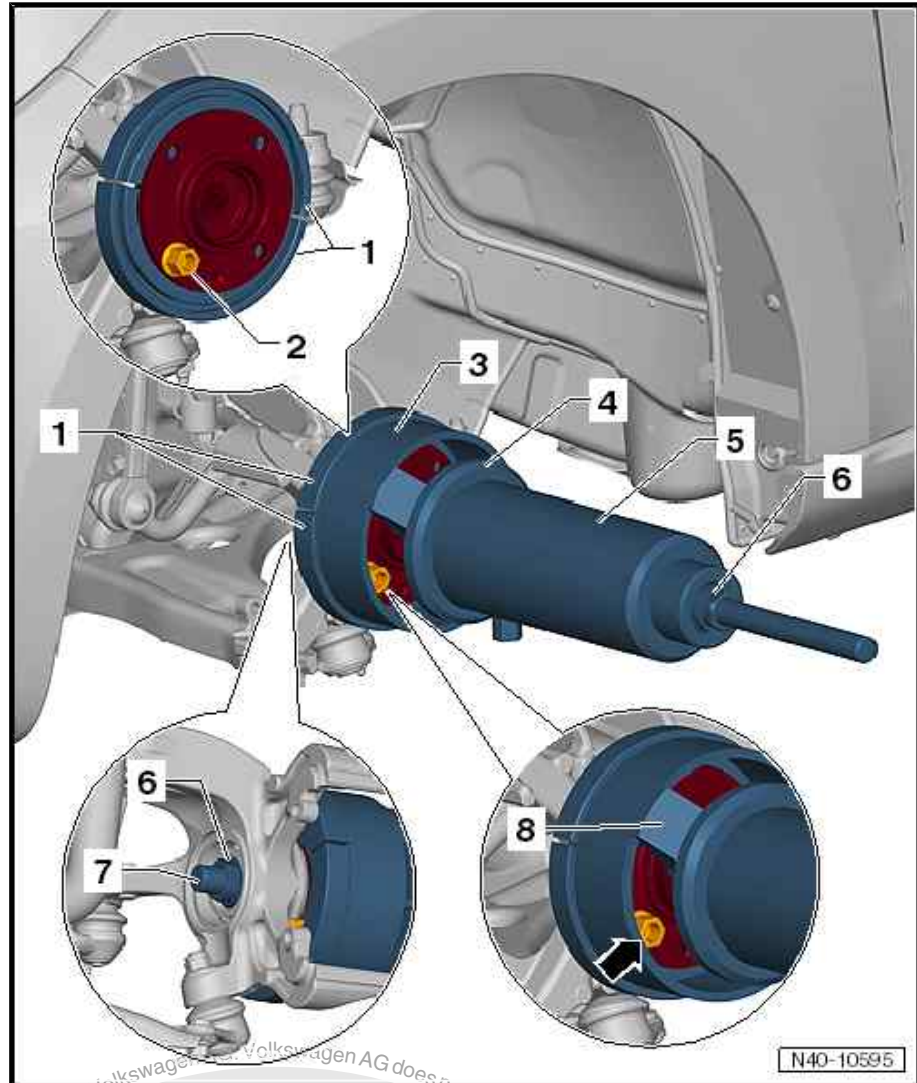


Note

Place engine/gearbox jack - V.A.G 1383/A- underneath (danger of accident from parts dropping out when wheel hub and wheel bearing are pulled out).

Press out wheel hub





- Fit gripping pieces - T10064/6A- -1- to wheel hub.
- Screw wheel bolt -2- into wheel hub and secure lower gripping piece - T10064/6A-.
- Install tools as shown in illustration and preload hydraulic press - VAS 6178- .



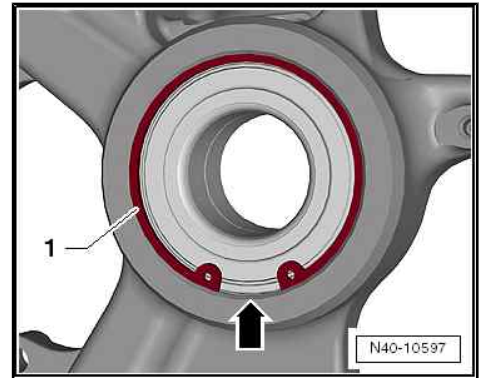
Note

It must be ensured that the wheel bolt -arrow- and bridge -8- are offset.

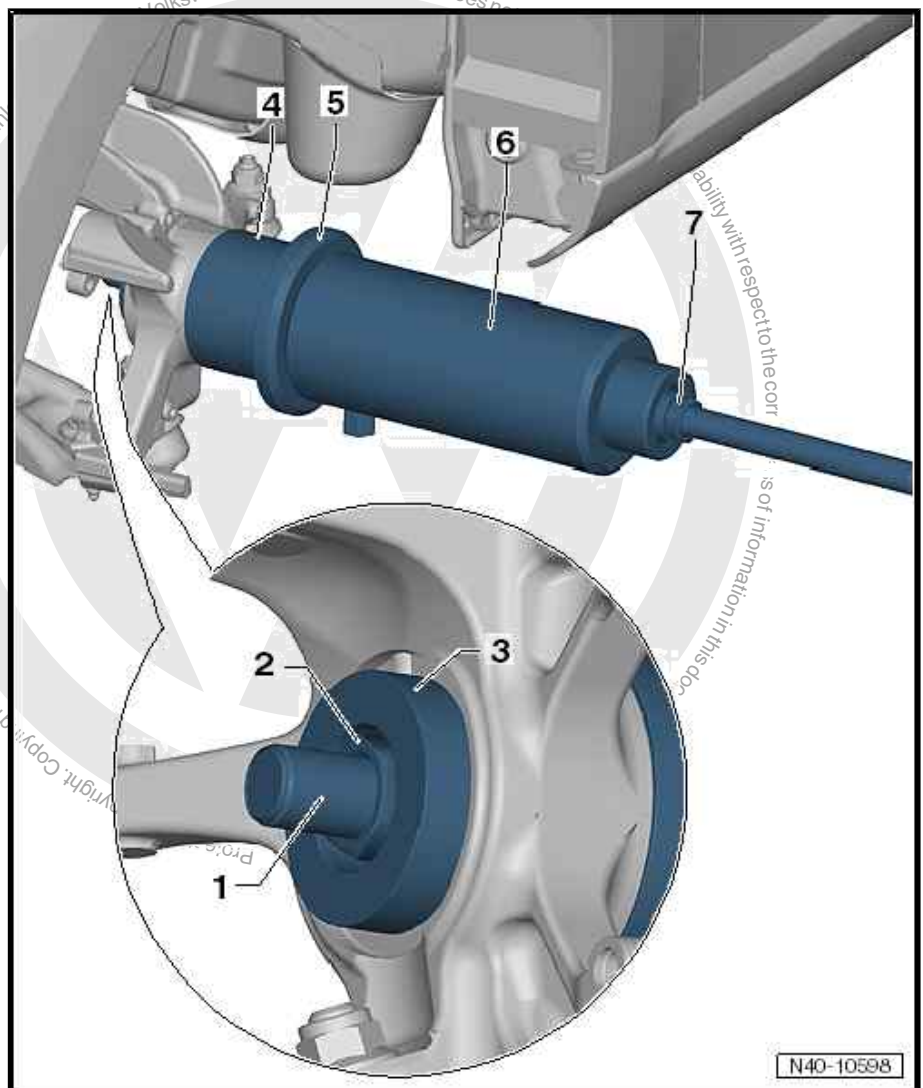
- 1 - Support - T10064/6A-
- 2 - Wheel bolt
- 3 - Tube - T10064/1-
- 4 - Thrust plate - T10205/4-
- 5 - Hydraulic press - VAS 6178- with thrust piece - T10205/13-
- 6 - Nut - T10205/8-2-
- 7 - Spindle - T10205/8-1-
- 8 - Bridge on tube - T10064/1-



- Hold appliance firmly and press out wheel hub.
- Remove circlip -1-.



Pressing out wheel bearing



- 1 - Spindle - T10205/8-1-
- 2 - Nut - T10205/8-2-
- 3 - Thrust piece - V.A.G 1459B-6-
- 4 - Thrust piece - V.A.G 1459B/2-8-



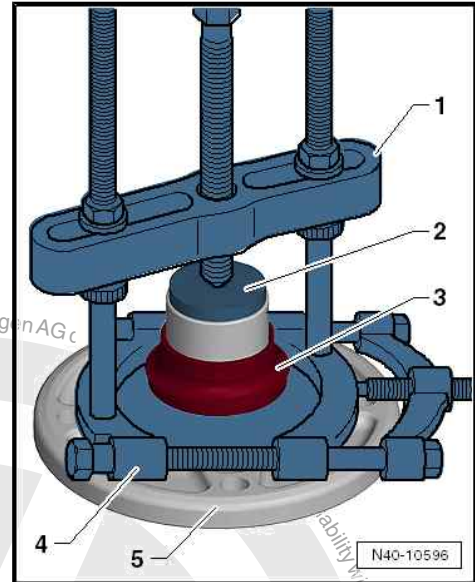
- 5 - Thrust plate - T10205/4-
- 6 - Hydraulic press - VAS 6178- with thrust piece - T10205/13-
- 7 - Nut - T10205/8-2-
- Hold appliance firmly and press out wheel bearing.

Pulling bearing inner race off wheel hub

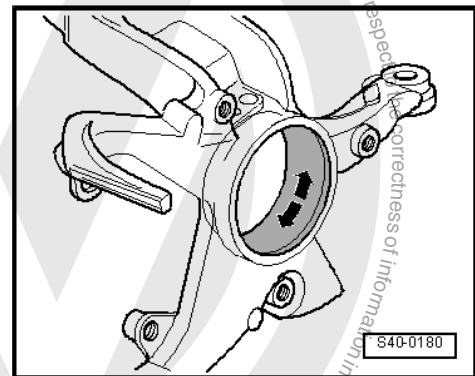
- 1 - Puller , e.g. -Kukko 18/0-
- 2 - Thrust piece - 3002-
- 3 - Inner bearing race
- 4 - Separating tool , e.g. -Kukko 17/1-
- 5 - Wheel hub

Installing

- Clean bore of wheel bearing housing.



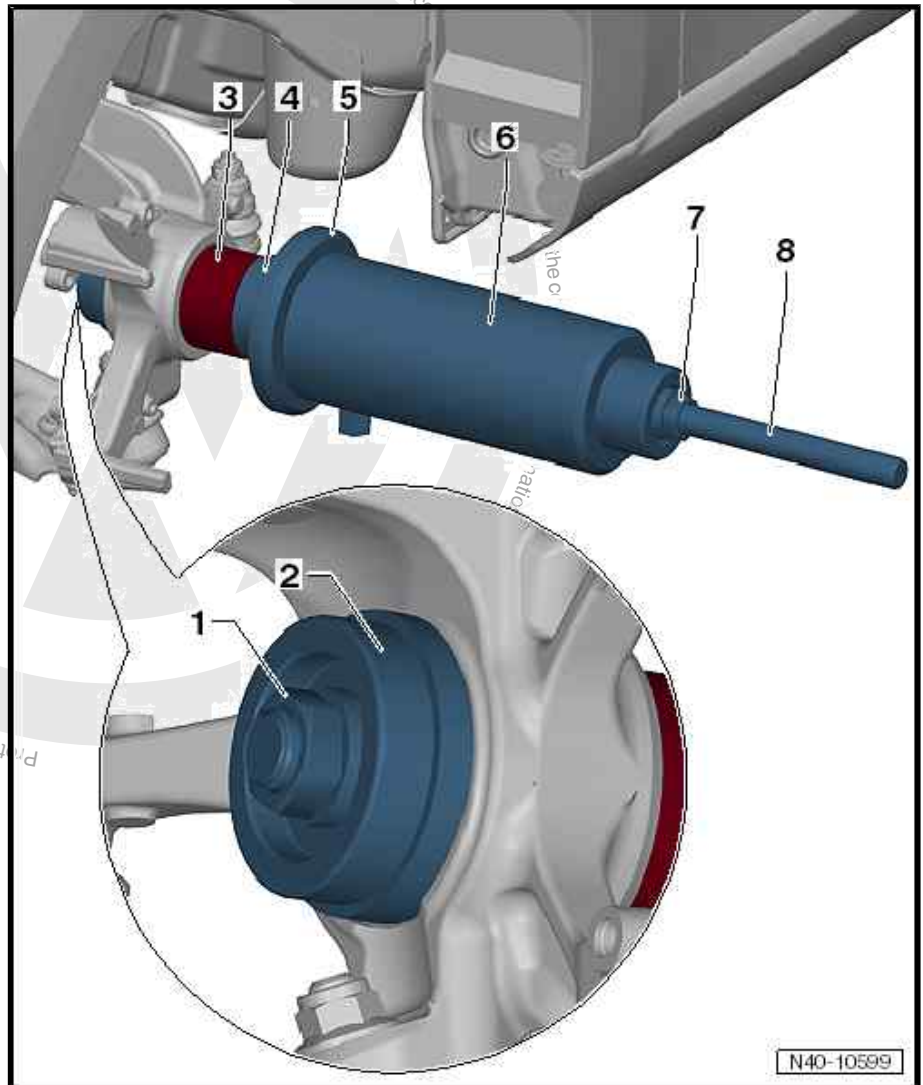
- Fully coat bore with Moly paste - G 052 723 A2- .
- Use grease sachet from repair kit.



Pressing in wheel bearing

Make sure it is installed in correct position:

The black ring of wheel bearing must face towards wheel bearing housing (inside of vehicle).



1 - Nut - T10205/8-2-

2 - Thrust piece - T10064/4- , with large diameter facing towards wheel bearing housing

3 - Wheel bearing

4 - Thrust piece - T10064/2-

5 - Thrust plate - T10205/4-

6 - Hydraulic press - VAS 6178- with thrust piece - T10205/13-

7 - Nut - T10205/8-2-

8 - Spindle - T10205/8-1-

– Press in wheel bearing to stop.



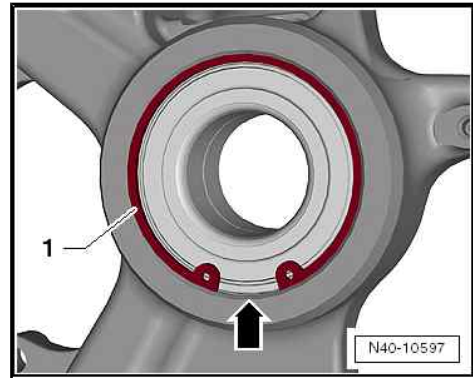
Do not cant wheel bearing when pressing it in.

- Install circlip -1-.

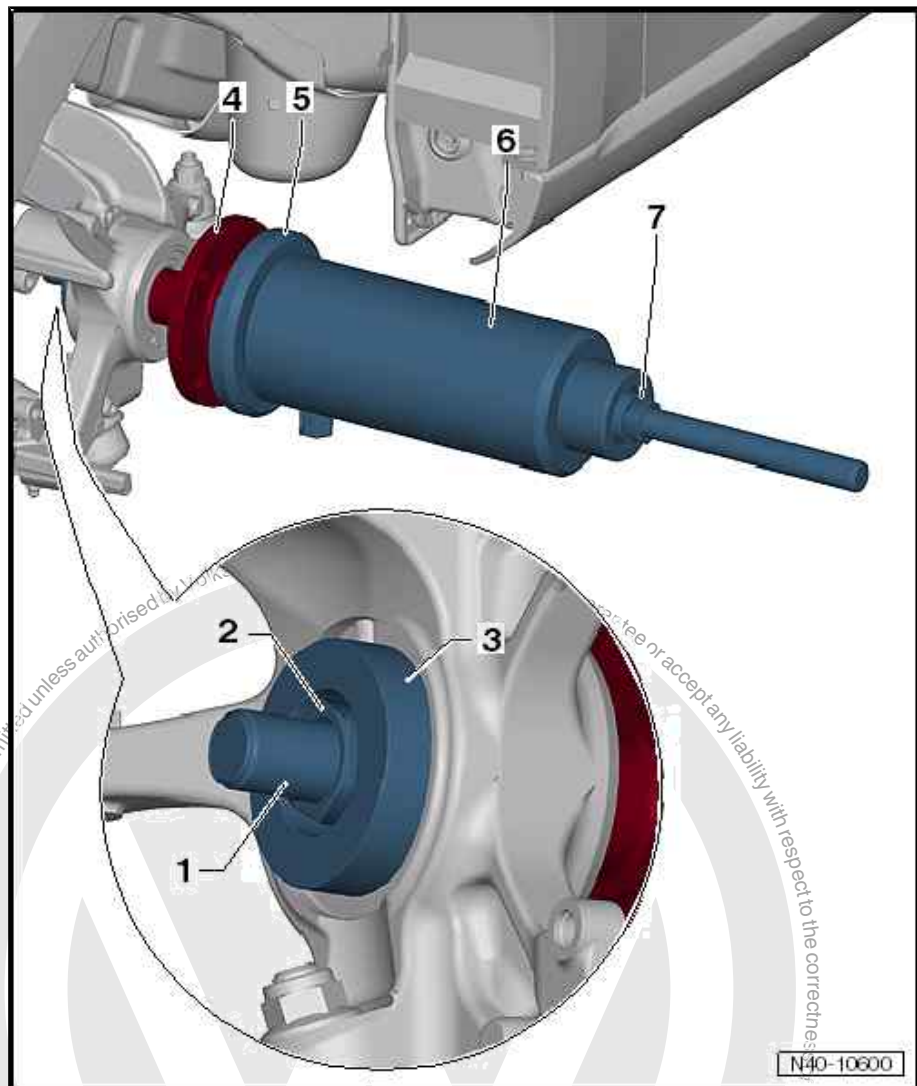


Note

The opening of circlip -1- must face downwards -arrow-.



Press in wheel hub



- 1 - Spindle - T10205/8-1-
- 2 - Nut - T10205/8-2-
- 3 - Thrust piece - V.A.G 1459B-6-
- 4 - Wheel hub



5 - Thrust plate - T10205/4-

6 - Hydraulic press - VAS 6178- with thrust piece - T10205/13-

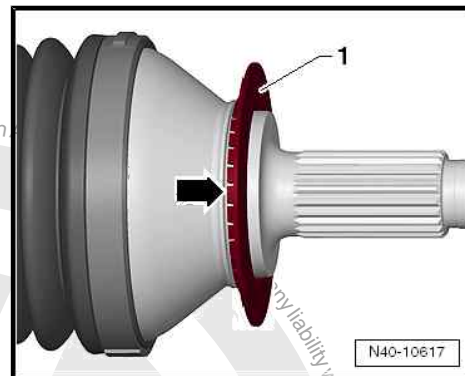
7 - Nut - T10205/8-2-

Press in wheel hub to stop.

Make sure that deflector ring -1- is clipped completely onto outer joint.

i Note

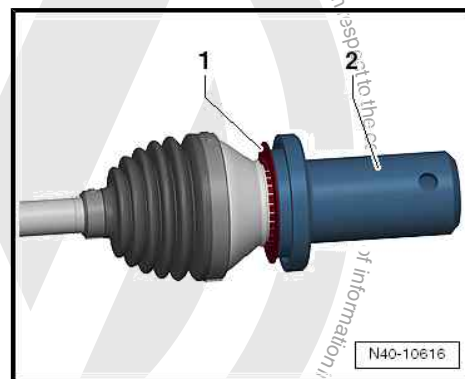
- ◆ The lugs of deflector ring -1- must face towards outer joint.
- ◆ Deflector ring -1- must lie on contact surface of outer joint -arrow-.



i Note

If deflector ring -1- is not positioned correctly or if it fell off outer joint, it must be driven onto outer joint to stop using thrust piece - T10049- .

- Guide outer joint into wheel hub splines of wheel hub as far as possible.





- Bolt swivel joint to suspension link with new nuts -arrows-.



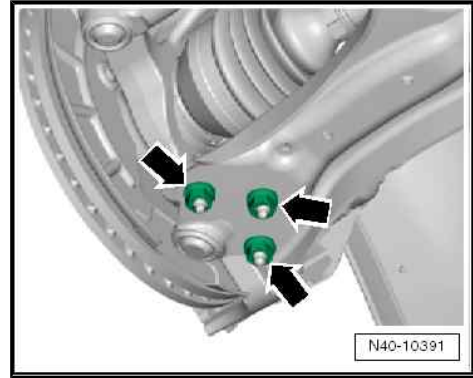
Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#) .

Use new nuts!

Ensure that boot is not damaged or twisted.

- Install ABS speed sensor.
- Install splash plate for brakes, brake disc and brake caliper ⇒ Brake system; Rep. gr. 46 ; Front brake; Assembly overview - front brake .
- Attach bracket for brake hose to wheel bearing housing ⇒ Brake system; Rep. gr. 46 ; Front brake; Assembly overview - front brake .
- Attach coupling rod to anti-roll bar.
- Install wheel and tighten.
- Tighten twelve-point nut for drive shaft.



Note

During this step, vehicle must **not** be standing on its wheels or wheel bearing will be damaged.

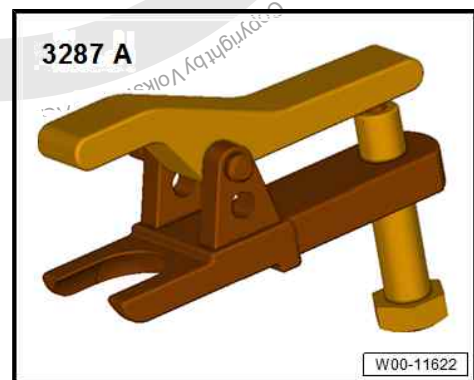
Specified torques

- ◆ ⇒ ["2.1 Assembly overview- subframe"](#), page 16
- ◆ ⇒ ["4 Lower suspension link, swivel joint"](#), page 39
- ◆ ⇒ ["5.1 Assembly overview- wheel bearing"](#), page 53
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

5.3 Removing and installing wheel bearing housing

Special tools and workshop equipment required

- ◆ Ball joint puller - 3287A-





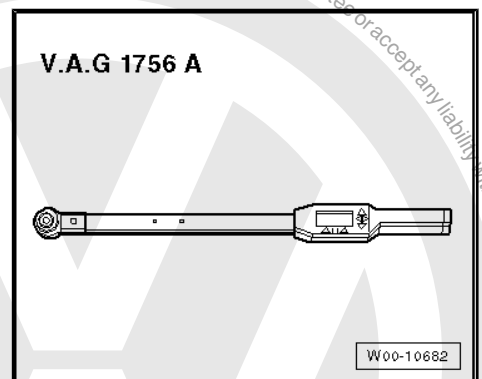
- ◆ Torque wrench - V.A.G 1332-



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



- ◆ Torque angle wrench - V.A.G 1756-



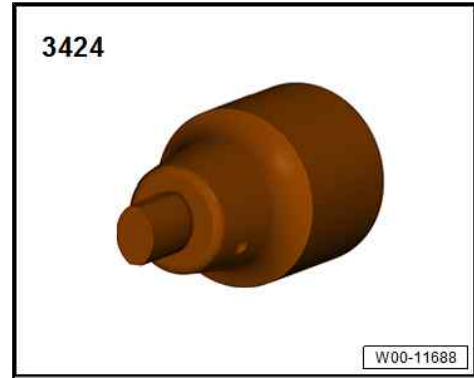
- ◆ Ejector - T10520-



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◆ Spreader - 3424-



Removing

- Lift vehicle far enough to take weight off front axle.
- Loosen twelve-point nut for drive shaft.



Caution

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

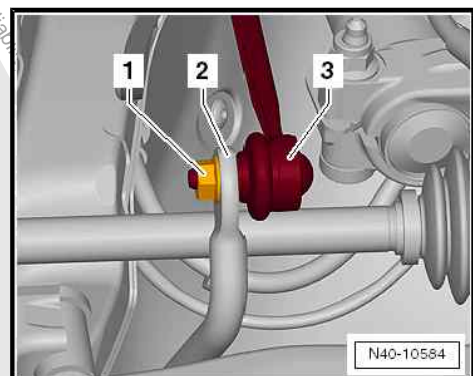
If wheel bearings are loaded with weight of vehicle, wheel bearings will be damaged and service life of wheel bearings will be considerably reduced.

It is not permissible to loosen drive shaft bolt more than 90° if vehicle is standing on its wheels.

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

- ◆ *Install an outer joint instead of the drive shaft.*
- ◆ *Tighten outer joint to 120 Nm.*

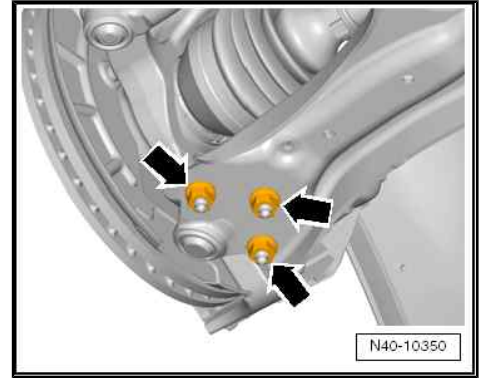
- Loosen wheel bolts.
- Raise vehicle.
- Remove wheel.
- Remove hexagon nut -1- from coupling rod (left and right sides).
- Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



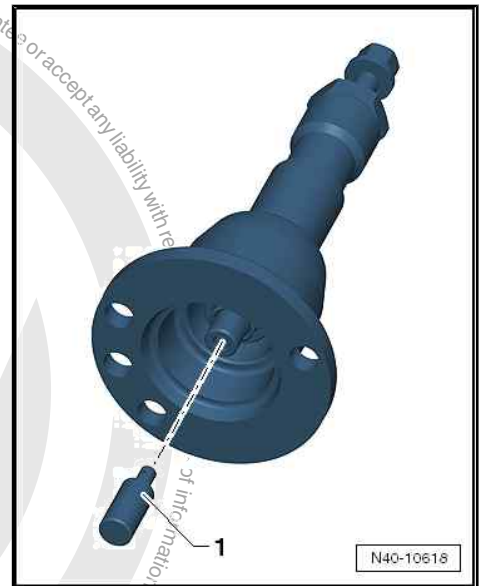


- Remove nuts -arrows-
- Pull swivel joint out of suspension link.
- Pull drive shaft out of wheel hub.

If the drive shaft cannot be pulled out of the wheel bearing by hand, use press tool - T10520- .

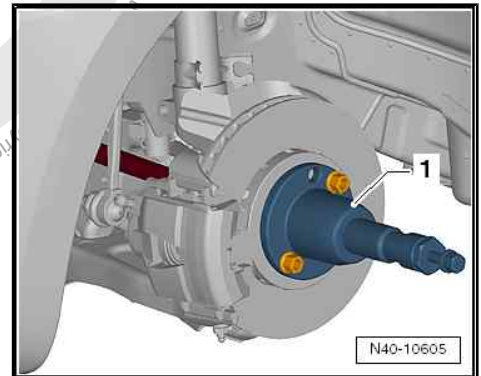


Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

- Secure press tool - T10520- -1- with two wheel bolts to wheel hub.





- It is essential to follow specified sequence.

I - Tighten knurled nut -1- hand-tight.

II - Turn only bolt -2- using a spanner in order to push out drive shaft with press tool - T10520- .



Note

At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.

- Secure drive shaft to body with wire.

The drive shaft must not hang down under its own weight.

Otherwise the inner joint will be bent too far and will be damaged.

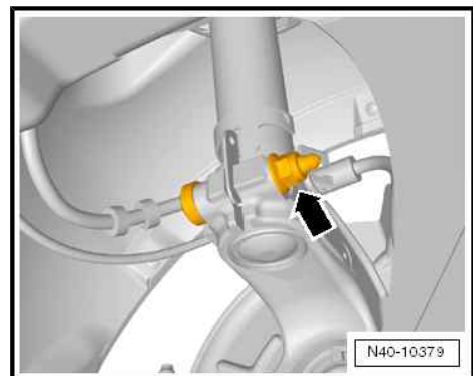
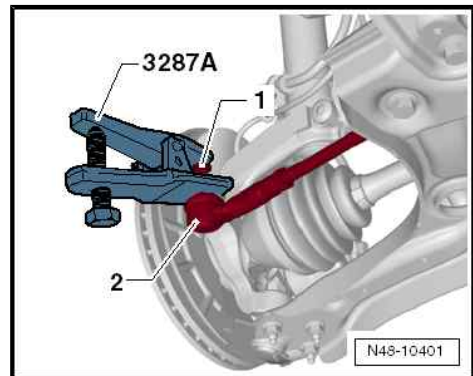
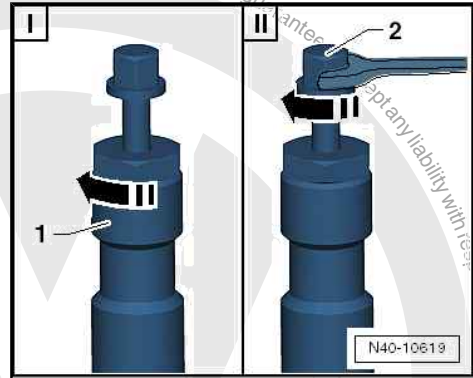
- Remove brake caliper and tie to body using wire => Brake system; Rep. gr. 46 ; Front brake; Removing and installing brake pads .
- Remove ABS speed sensor => Brake system; Rep. gr. 45 ; Sensors; Removing and installing speed sensor on front axle -G45- / -G47- .
- Remove brake disc => Brake system; Rep. gr. 46 ; Front brakes; Assembly overview - front brakes
- Remove splash plate for brakes from wheel bearing housing.
- Loosen nut -1- on track rod end -2- but do not remove completely.



Caution

To protect thread, leave nut screwed a few turns onto joint pin.

- Press track rod ball joint -2- off steering arm.
- Position engine and gearbox jack - V.A.G 1383 A- under wheel bearing housing.
- Remove threaded connection between wheel bearing housing and suspension strut -arrow-.





- Insert spreader - 3424- in slot in wheel bearing housing
- Turn ratchet handle through 90° and detach from spreader - 3424- .
- Pull wheel bearing housing from suspension strut.



Note

If wheel bearing housing is renewed, swivel joint must be transferred. Always use new nuts.

Installing

Carry out installation in the reverse sequence, noting the following:

Make sure that deflector ring -1- is clipped completely onto outer joint.



Note

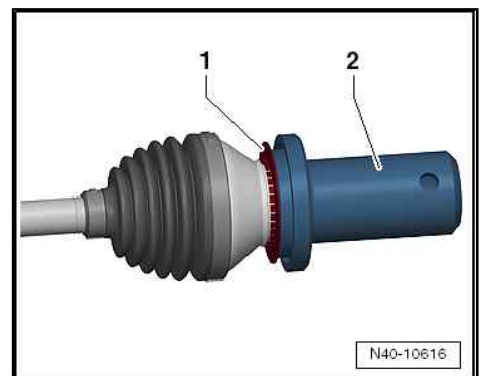
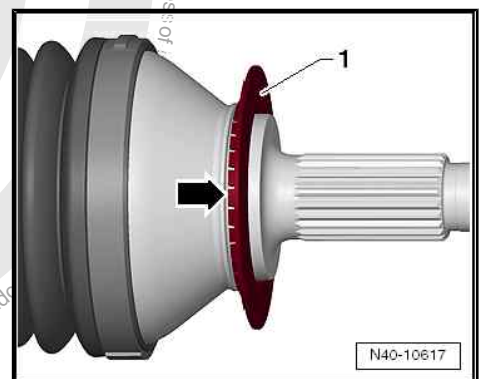
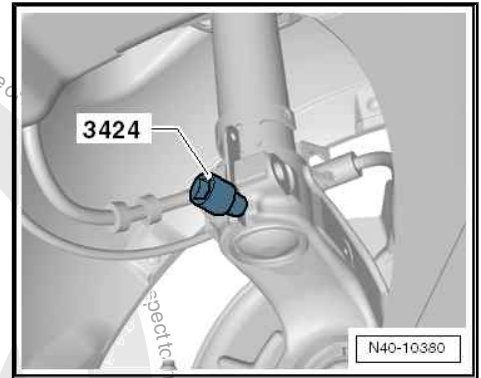
- ◆ *The lugs of deflector ring -1- must face towards outer joint.*
- ◆ *Deflector ring -1- must lie on contact surface of outer joint -arrow-.*



Note

If deflector ring -1- is not positioned correctly or if it fell off outer joint, it must be driven onto outer joint to stop using thrust piece - T10049- .

- Guide outer joint into wheel hub splines of wheel hub as far as possible.





- Bolt swivel joint to suspension link with new nuts -arrows-.



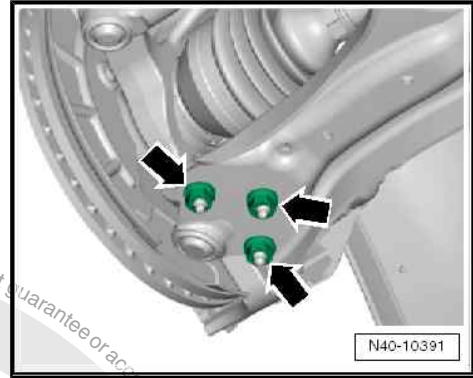
Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#) .

Use new nuts!

Ensure that boot is not damaged or twisted.

- Install ABS speed sensor.
- Attach splash plate for brakes, brake disc and brake caliper ⇒
Brake system; Rep. gr. 46 ; Front brake; Assembly overview
- front brake .
- Attach bracket for brake hose to wheel bearing housing ⇒
Brake system; Rep. gr. 46 ; Front brake; Assembly overview
- front brake .
- Attach coupling rod to anti-roll bar.
- Install wheel and tighten.
- Tighten twelve-point nut for drive shaft.



Note

During this step, vehicle must not be standing on its wheels or
wheel bearing will be damaged.

If wheel bearing housing has been renewed, a vehicle geometry
measurement must be performed ⇒ [page 118](#) .

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - subframe”, page 16](#)
- ◆ ⇒ [“4 Lower suspension link, swivel joint”, page 39](#)
- ◆ ⇒ [“5.1 Assembly overview - wheel bearing”, page 53](#)
- ◆ ⇒ [“3.1 Assembly overview - steering rack”, page 183](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels,
tyres; Specified torque for wheel bolts



6 Drive shaft

⇒ [“6.1 Assembly overview - drive shaft”, page 73](#)

⇒ [“6.2 Removing and installing drive shaft”, page 74](#)

⇒ [“6.3 Removing and installing joint”, page 78](#)

⇒ [“6.4 Dismantling and assembling drive shaft”, page 81](#)

⇒ [“6.5 Checking outer constant velocity joint”, page 86](#)

6.1 Assembly overview - drive shaft

1 - Deflector ring

- Ensure deflector ring is seated correctly before installing drive shaft
⇒ [page 84](#)

2 - Outer constant velocity joint

- Renew only as complete unit
- Removing ⇒ [page 82](#)
- Installing: drive onto shaft with plastic hammer until compressed retaining ring seats
- Checking ⇒ [page 86](#)

3 - Retaining ring

- Insert in groove in shaft

4 - Clip

- Renew after each removal
- Various versions
- Allocation ⇒ Electronic parts catalogue “ETKA”
- Tightening ⇒ [page 83](#)

5 - Boot for constant velocity joint

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)
- Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.

6 - Clip

- Renew after each removal
- Tightening ⇒ [page 84](#)

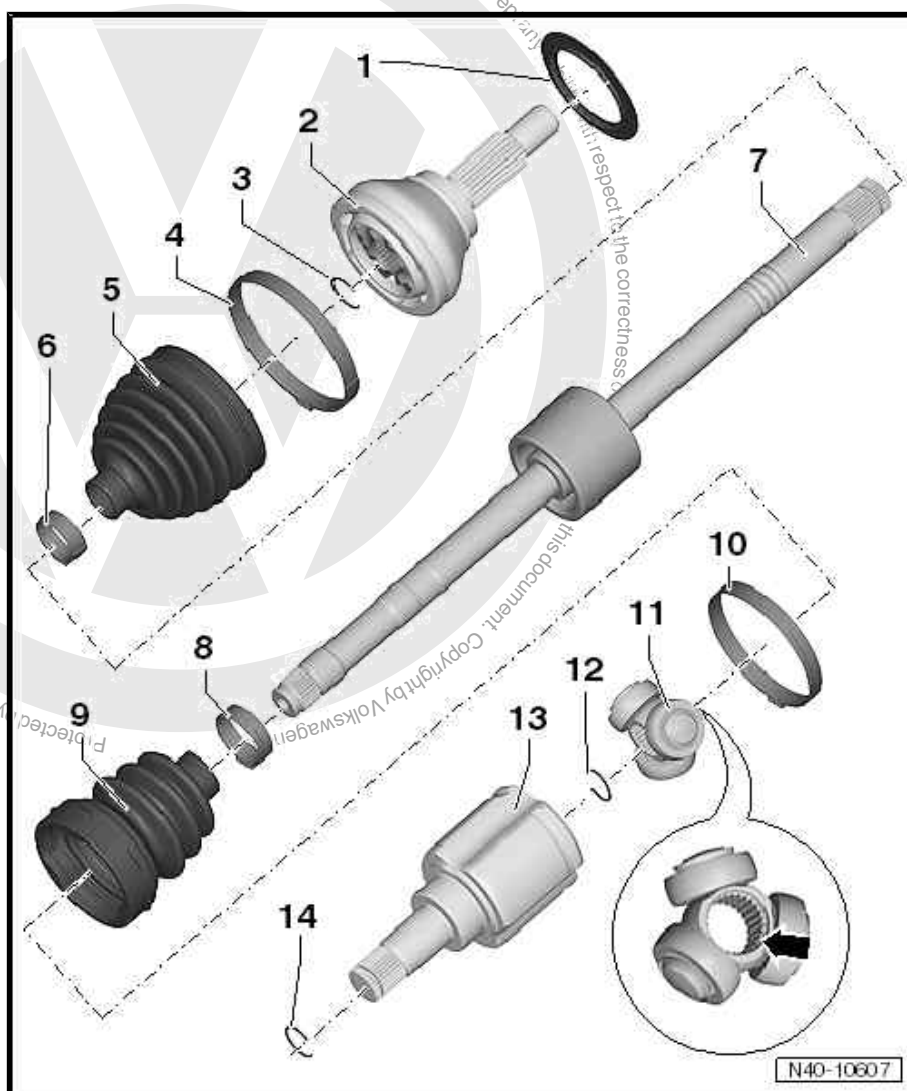
7 - Drive shaft

8 - Clip

- Renew after each removal
- Tightening ⇒ [page 84](#)

9 - Boot for triple roller joint

- Check for splits and chafing





10 - Clip

- Renew after each removal
- Tightening ⇒ [page 83](#)

11 - Triple roller star with rollers

The chamfer-arrow- points towards drive shaft splines.

12 - Retaining ring

- Renew after each removal

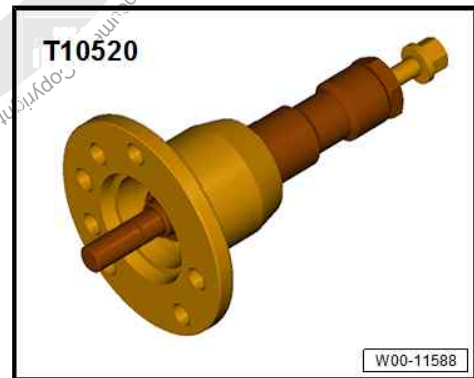
13 - Joint body

14 - Retaining ring

- Insert in groove in joint body.
- Renew after each removal

6.2 Removing and installing drive shaft

Puller - T10520-





Torque angle wrench - V.A.G 1756 A-



Caution

When removing and installing drive shafts, do not allow them to hang free and stop against joints due to over bending.

Removing



Caution

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

If the wheel bearings had to bear the weight of the vehicle, they would be damaged and have a shortened service life.

It is not permissible to loosen drive shaft bolt more than 90° if vehicle is standing on its wheels.

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

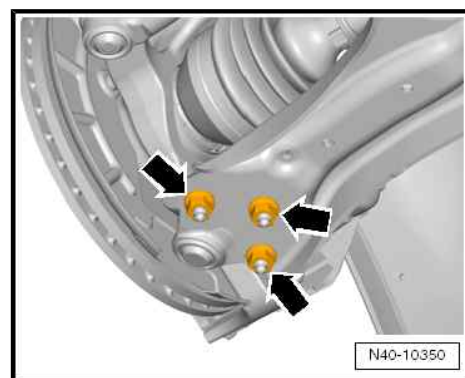
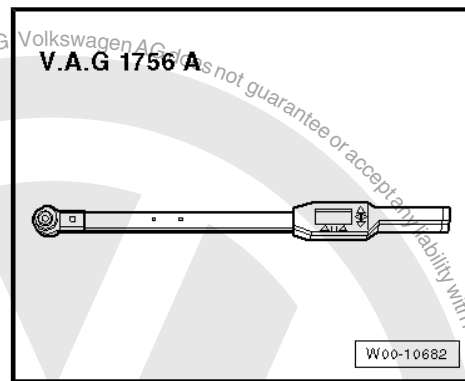
- ◆ *Install an outer joint instead of the drive shaft.*
- ◆ *Tighten outer joint to 120 Nm.*



Note

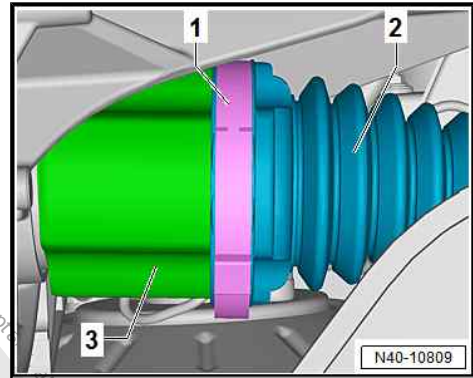
The drive shaft is removed without the joint. Removing joint ⇒ [page 78](#).

- Loosen wheel bolts.
- Lift vehicle far enough to take weight off front axle.
- Loosen twelve-point nut for drive shaft.
- Raise vehicle.
- Remove wheel.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Remove nuts -arrows-.
- Pull swivel joint out of suspension link.





- Open clamp -1-.
- Push bellows -2- off joint body -3-.
- Pull drive shaft out of joint body.
- Pull drive shaft out of wheel bearing and remove.



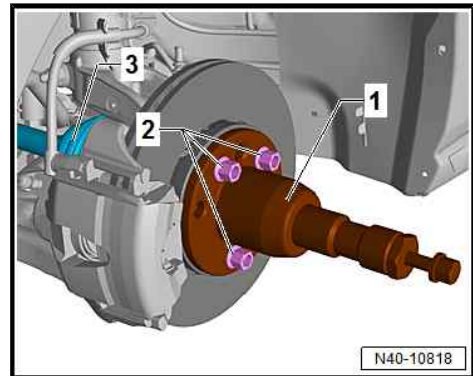
If the drive shaft cannot be pulled out of the wheel bearing by hand, use press tool - T10520- .

Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

- To press out drive shaft -3-, secure press tool - T10520- -1- to wheel hub using 3 wheel bolts -2-.





– It is essential to follow specified sequence.

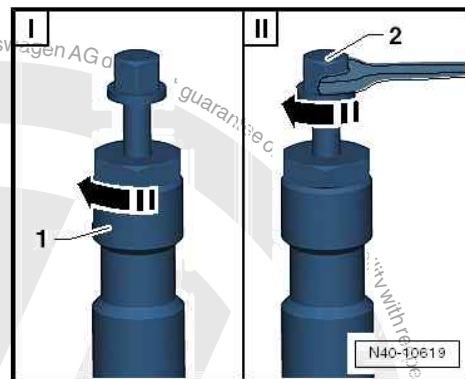
I - Tighten knurled nut -1- hand-tight.

II - Using spanner, turn only bolt -2-, not the press tool itself. Pull out drive shaft using press tool - T10520-



Note

At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.



Installing

Install in reverse order. During this procedure, observe the following:

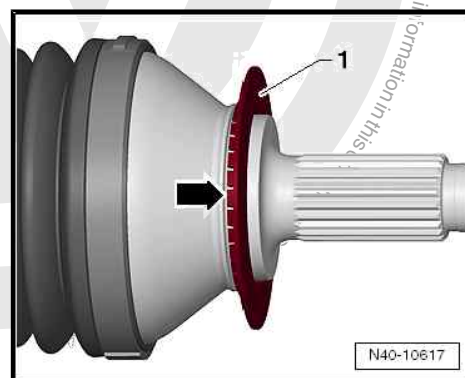
Remove any paint residues and/or corrosion on thread and splines of outer joint.

Make sure that deflector ring -1- is clipped completely onto outer joint.



Note

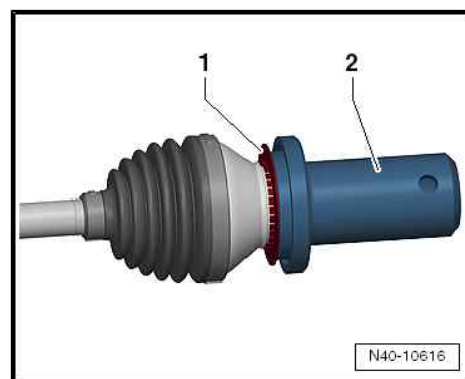
- ◆ *The lugs of deflector ring -1- must face towards outer joint.*
- ◆ *Deflector ring -1- must lie on contact surface of outer joint -arrow-.*



Note

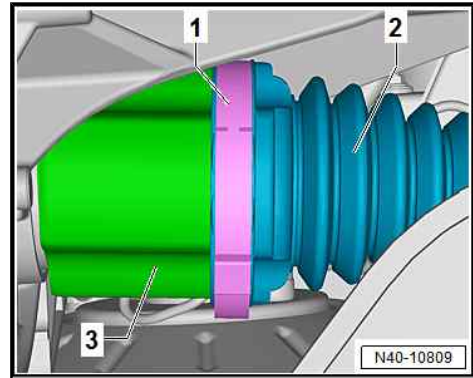
If deflector ring -1- is not positioned correctly or if it fell off outer joint, it must be driven onto outer joint to stop using thrust piece - T10049-.

- Guide outer joint into wheel hub splines as far as possible.
- Secure outer joint in wheel hub splines with 12-point nut of drive shaft.
- Push drive shaft into joint body.
- Press half the drive shaft grease from the repair kit into the joint body.
- Press remaining drive shaft grease from the repair kit into the bellows.





- Push bellows -2- onto joint body -3-.
- Fit new clamp -1- in position.
- Tensioning clamp ⇒ [page 83](#)



- Bolt swivel joint to suspension link with new nuts -arrows-.

Use new nuts!

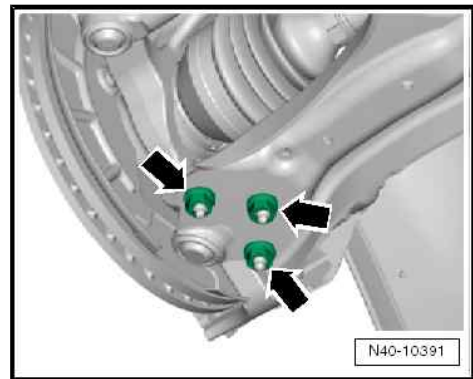
Ensure that boot is not damaged or twisted.



Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#).

- Mount wheel.
- Tighten twelve-point nut for drive shaft.



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

Specified torques

- ◆ ⇒ ["4 Lower suspension link, swivel joint", page 39](#)
- ◆ ⇒ ["5.1 Assembly overview - wheel bearing", page 53](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

6.3 Removing and installing joint

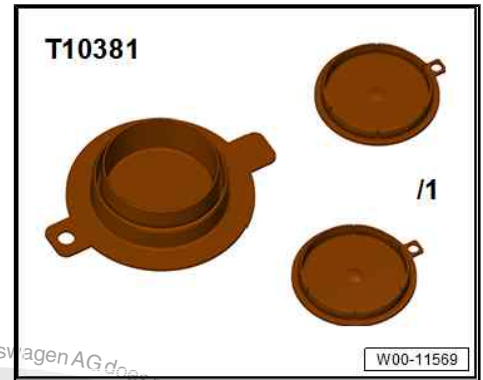
Special tools and workshop equipment required

- ◆ Wedge - T10161-

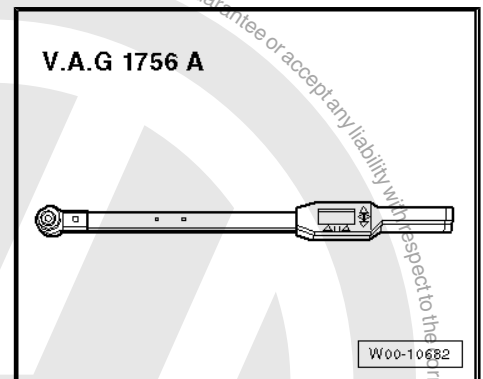




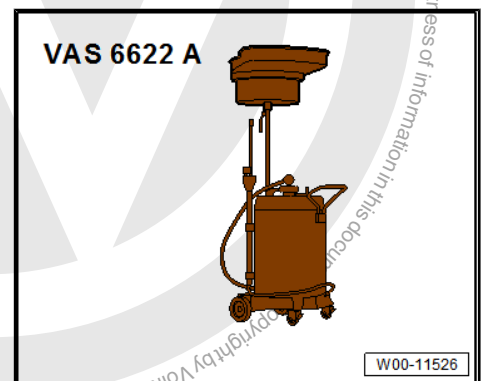
◆ Sealing cap - T10381-



◆ Torque angle wrench - V.A.G 1756 A-

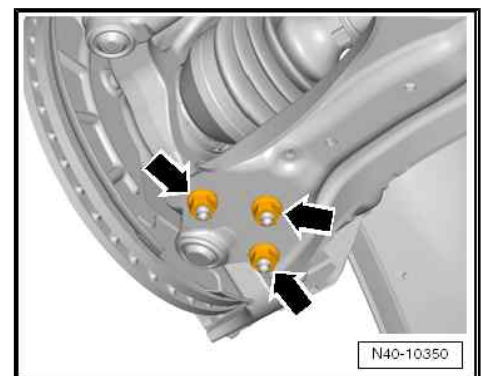


◆ Used oil collection and extraction unit - VAS 6622A-



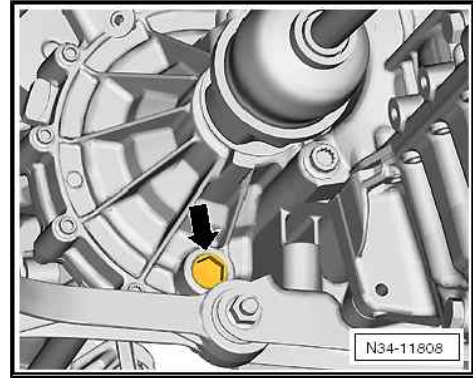
Removing

- Raise vehicle.
- Remove nuts -arrows-.
- Pull swivel joint out of suspension link.

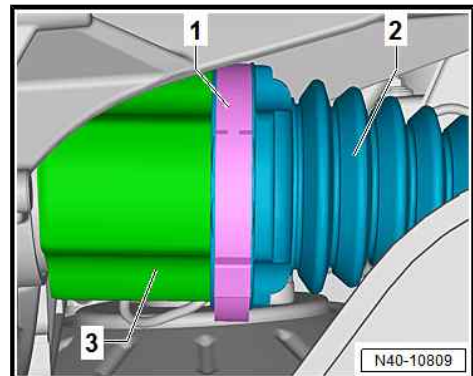




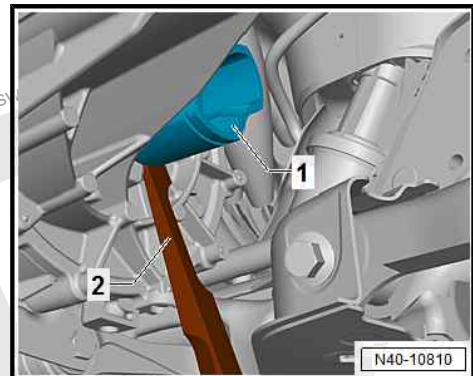
- Drain gearbox oil -arrow- => Rep. gr. 34 ; Gearbox oil; Draining and filling gearbox oil .



- Open clamp -1-.
- Push bellows -2- off joint body -3-.
- Pull drive shaft out of joint body, and lay it to one side.



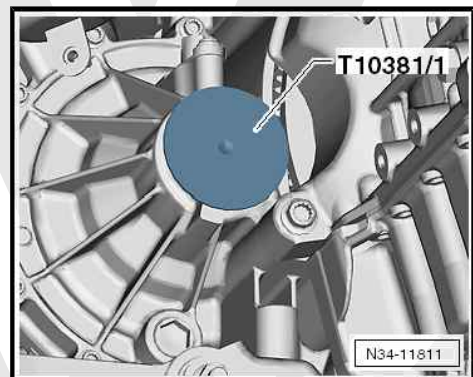
- Insert wedge - T10161- -2- between gearbox housing and triple roller joint -1-.
- Press inner joint -1- out of gearbox by striking wedge - T10161- -1- with a rubber-headed hammer.



- Insert closure cap - T10381/1- into gearbox.

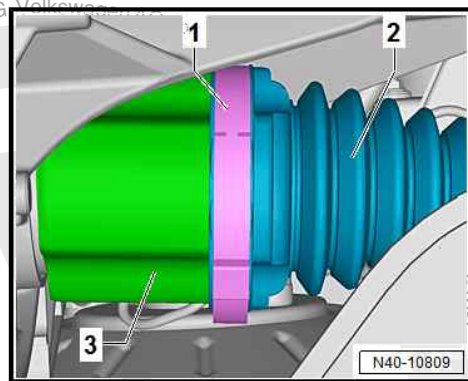
Installing

- Fit new retaining ring into groove of joint pin.
- Mesh outer and inner splines of joint body and gearbox.
- Insert joint into gearbox as far as stop. If necessary, drive in onto stop using a rubber-headed hammer.
- Check if joint body is securely seated in gearbox by pulling joint body against resistance of retaining ring.
- Push drive shaft into joint body.
- Press half the drive shaft grease from the repair kit into the joint body.
- Press remaining drive shaft grease from the repair kit into the bellows.





- Push bellows -2- onto joint body -3-.
- Fit new clamp -1- in position.
- Tensioning clamp ⇒ [page 83](#)



- Bolt swivel joint to suspension link with new nuts -arrows-.

Use new nuts!

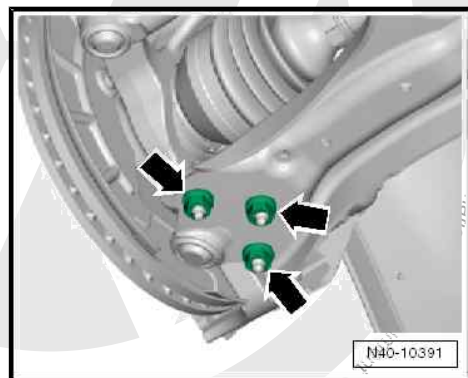
Ensure that boot is not damaged or twisted.



Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#).

- Fill gearbox oil ⇒ Rep. gr. 34 ; Gearbox oil; Draining and filling gearbox oil .



Specified torques

- ◆ ⇒ [“4 Lower suspension link, swivel joint”, page 39](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

6.4 Dismantling and assembling drive shaft

Special tools and workshop equipment required

- ◆ Thrust piece - T10049-

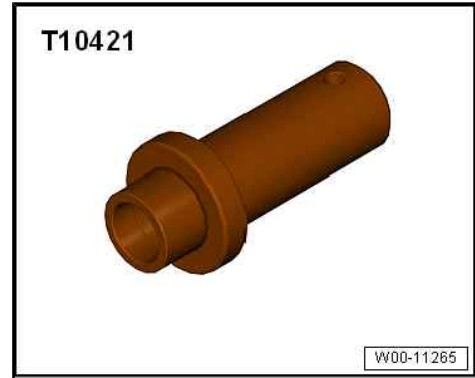


- ◆ Puller - T10382-

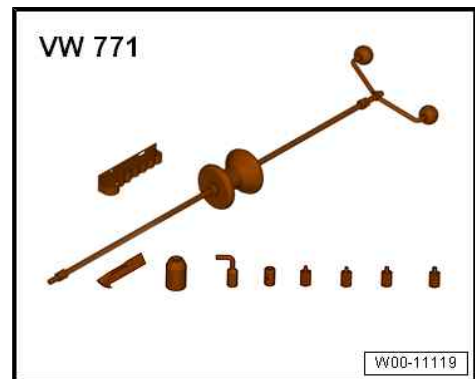




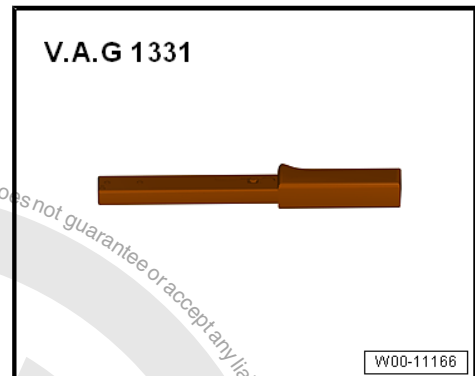
- ◆ Thrust piece - T10421-



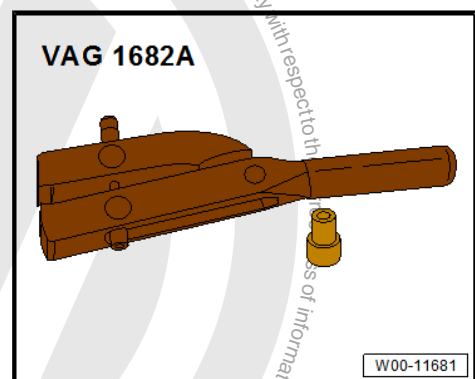
- ◆ Multi-purpose tool - VW 771-



- ◆ Torque wrench - V.A.G 1331-



- ◆ Clamp tensioner - V.A.G 1682-



- ◆ Three-arm puller - Kukko 45-1-

Removing outer constant velocity joint

- Clamp drive shaft in vice using jaw protectors.
- Open O-type clip.
- Fold back boot.

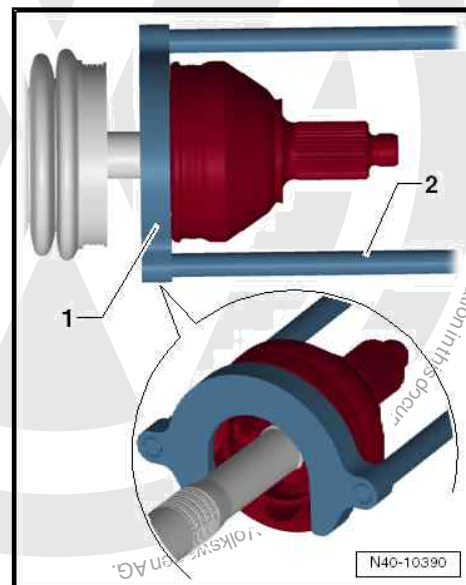


- Set puller - T10382- up so that smooth side of puller plate - T10382/1- points to spindles - T10382/2- .
- Assemble puller - T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller - T10382- and multi-purpose tool - VW 771- .

- 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.
- Drive constant velocity joint onto shaft using plastic hammer until circlip engages.



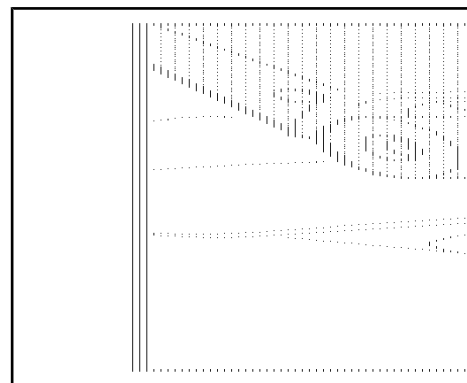
Tightening new clamp on constant velocity joint

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



Note

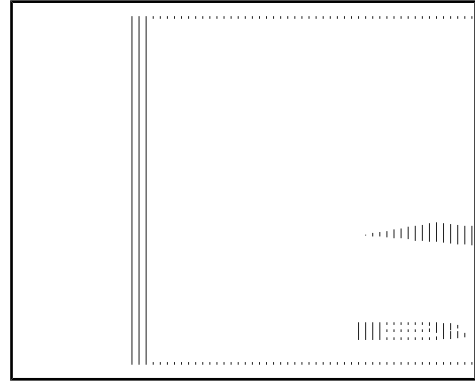
- ◆ *Due to the hard material of the protective bellows (compared to rubber) and the necessity of using a stainless steel clip, it is only possible to tension the clip with clamp tensioner - V.A.G 1682- .*
- ◆ *Specified torque: 25 Nm.*
- ◆ *Use torque wrench -C- with setting range 5 ... 50 Nm (e.g. torque wrench - V.A.G 1331-).*
- ◆ *Ensure that the spindle thread -A- moves smoothly. Lubricate with MOS2 grease if necessary.*
- ◆ *If the spindle is tight owing to the thread being dirty, for example, the force required to tighten the clip will not be attained in spite of correct specified torque specification.*





Tightening new clamp on small diameter

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



Note

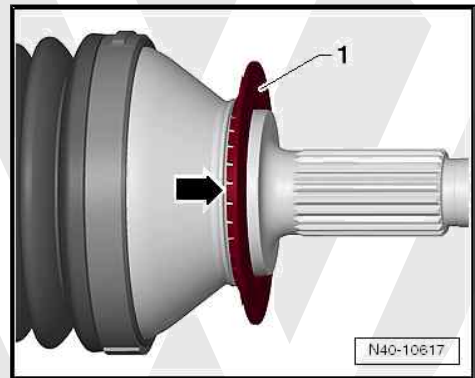
- ◆ Due to the hard material of the protective bellows (compared to rubber) and the necessity of using a stainless steel clip, it is only possible to tension the clip with clamp tensioner - V.A.G 1682- .
- ◆ Specified torque: 25 Nm.
- ◆ Use torque wrench -C- with setting range 5 ... 50 Nm (e.g. torque wrench - V.A.G 1331-).
- ◆ Ensure that the spindle thread -A- moves smoothly. Lubricate with MOS2 grease if necessary.
- ◆ If the spindle is tight owing to the thread being dirty, for example, the force required to tighten the clip will not be attained in spite of correct specified torque specification.

Make sure that deflector ring -1- is clipped completely onto outer joint.



Note

- ◆ The lugs of deflector ring -1- must face towards outer joint.
- ◆ Deflector ring -1- must lie on contact surface of outer joint -arrow-.

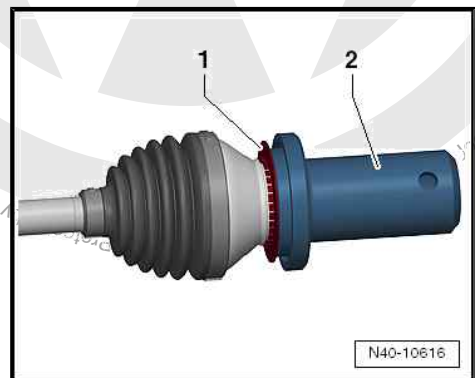


Note

If deflector ring -1- is not positioned correctly or if it fell off outer joint, it must be driven onto outer joint to stop using thrust piece - T10049- .

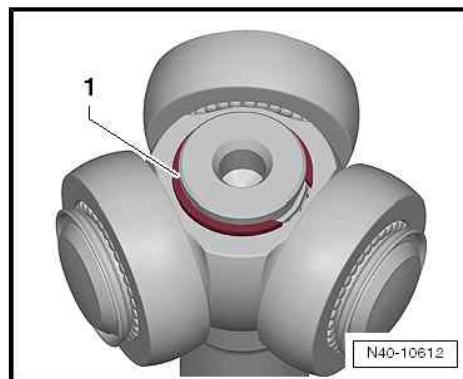
Dismantling

- Open both clip on inner joint and push back boot.
- Pull joint body off drive shaft.





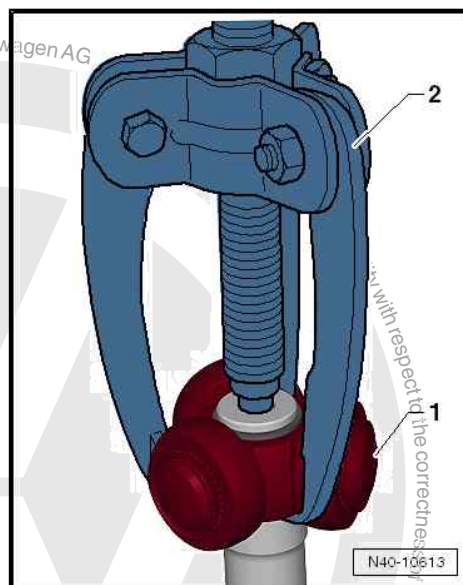
- Remove circlip -1-.



- Pull triple roller star -1- off drive shaft using a three arm puller , e.g. -Kukko 45-1- -2-.
- Pull boot off shaft.
- Clean shaft, joint body and groove for seal.

Installing

- Push small hose clip for boot onto shaft.
- Push joint boot onto shaft.

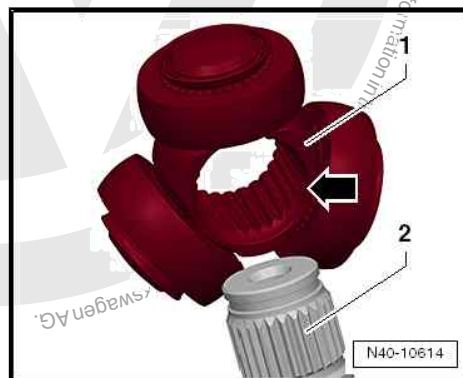


- Fit triple roller star -1- onto drive shaft -2-.



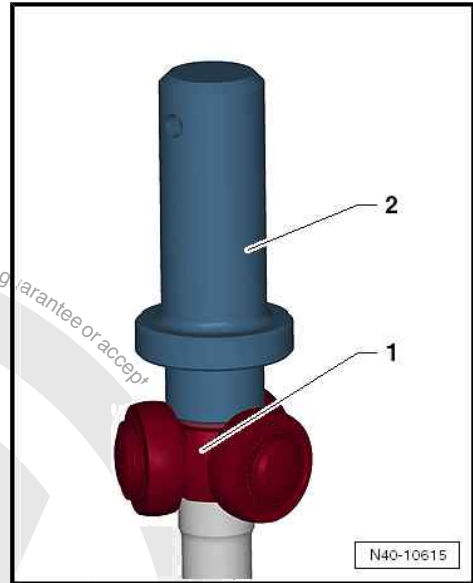
Note

Ensure that chamfer -arrow- of triple roller star -1- faces towards drive shaft -2-.

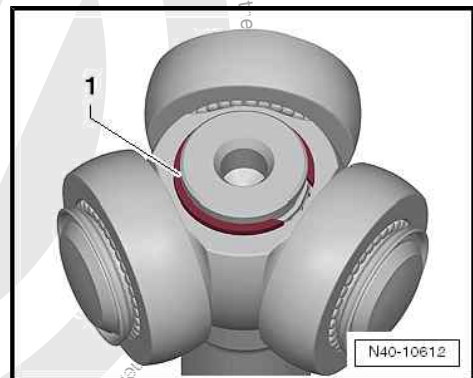




- Drive triple roller star -1- onto drive shaft using thrust piece - T10421- -2-.



- Insert circlip -1-, ensuring that it is seated correctly.
- Press half the drive shaft grease from the repair kit into the triple roller joint.
- Slide joint body over rollers and hold.
- Press the other half of the drive shaft grease from the repair kit into the back of the triple roller joint.
- Install joint boot.
- Tighten clamp on small diameter => [page 84](#) .
- Tighten new clamp on constant velocity joint => [page 83](#) .

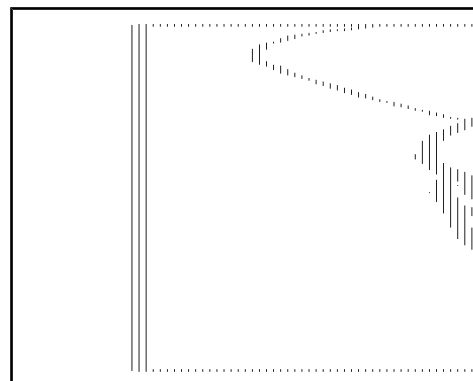


6.5 Checking outer constant velocity joint

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.

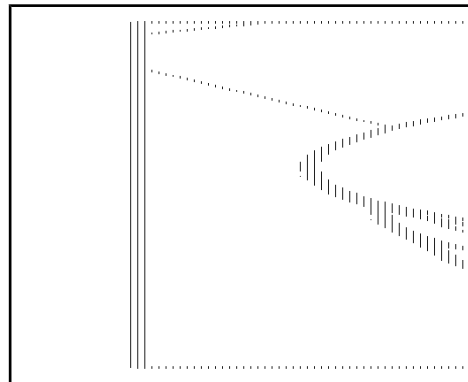
Removing

- 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.

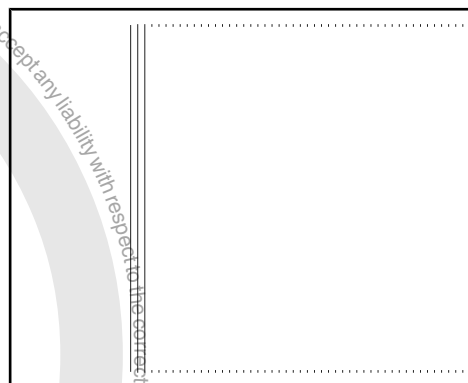


- Swing segment of hub into square cage window.
- Tip hub out of cage.

The six balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and scoring. Excessive circumferential backlash in the joint is noticeable during load change jolts. In this case the joint must be replaced. Smoothing and traces of wear of the balls are no reason to change the joint.

Installing

- Pack half of total grease quantity (40 g) into 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 Overview - rear axle”, page 88](#)

⇒ [“1.2 Lowering rear axle”, page 88](#)

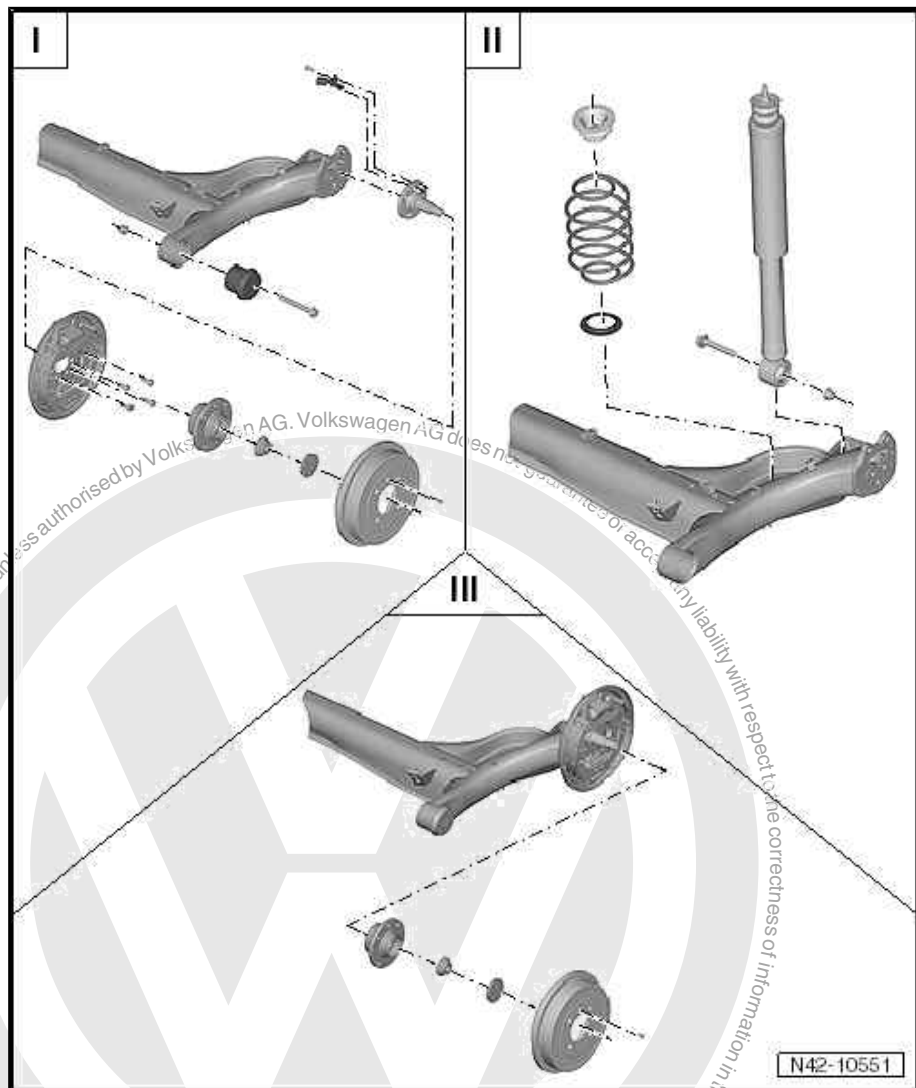
⇒ [“1.3 Removing and installing rear axle”, page 91](#)

1.1 Overview - rear axle

I - ⇒ [“2 Subframe”, page 100](#)

II -
⇒ [“3 Suspension strut, shock absorber, spring”, page 106](#)

III -
⇒ [“4 Wheel bearing assembly, trailing arm”, page 112](#)



1.2 Lowering rear axle

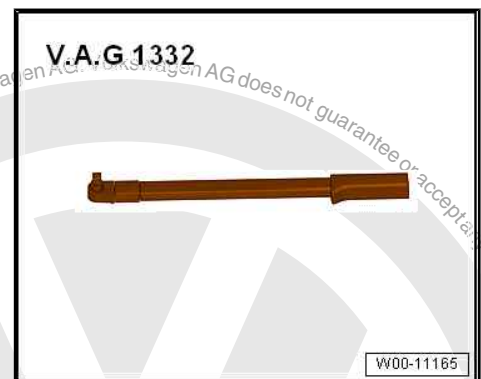
Special tools and workshop equipment required



- ◆ Tensioning strap - T10038-



- ◆ Torque wrench - V.A.G 1332-



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

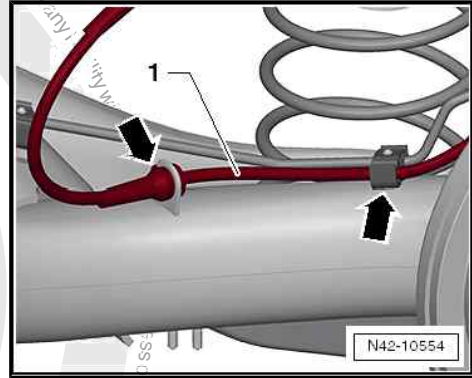


Lowering axle beam

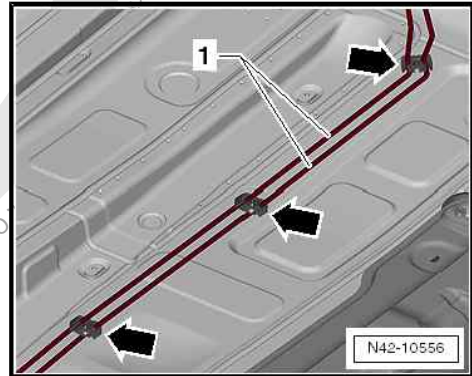
- Loosen wheel bolts.
- Raise vehicle.
- Remove wheels.
- Remove coil springs ⇒ [page 110](#) .
- Pull connector off speed sensor.



- Unclip wire -1- for speed sensor from brackets -arrows-.



- Unclip brake lines -1- from guides on underbody -arrows-.

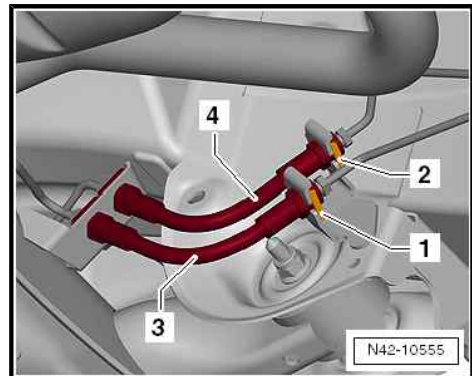


- Lever off retaining springs -1- and -2-.
- Remove brake lines -3- and -4- from mounting bracket.

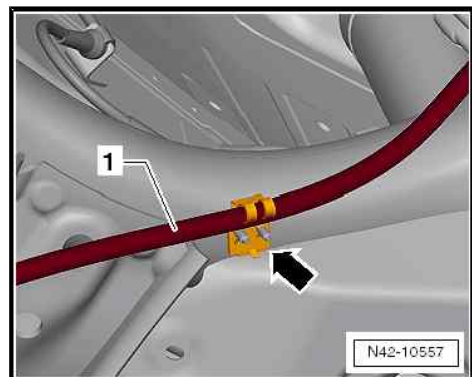


Caution

Brake lines must not be separated or kinked!

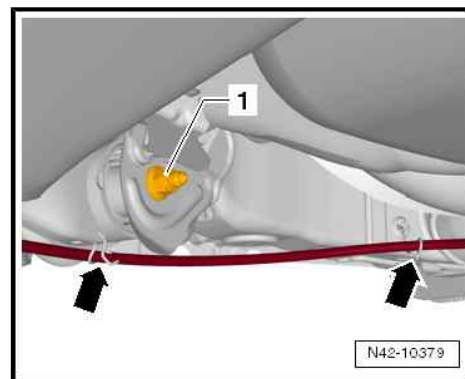


- Remove handbrake cables from retainer -arrow-.





- Remove handbrake cables from retainers -arrows-.
- Position engine and gearbox jack - V.A.G 1383 A- beneath axle beam and support axle beam.
- Unscrew bolts -1- for right and left axle beams.



- Lower axle beam -1- by approx. 20 cm.
- Fit bolt for axle beam back into mounting bracket and secure with nut -2-.
- Secure axle beam using tensioning strap - T10038- -3-.

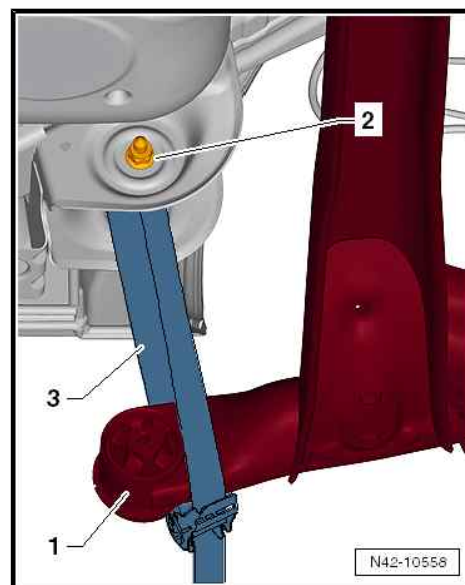
Installing

Install in reverse order.

- Install wheels and tighten.

Specified torques

- ◆ ⇒ ["2.1 Assembly overview - axle beam", page 100](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts
- ◆ Brake lines to brake hose: 14 Nm



1.3 Removing and installing rear axle

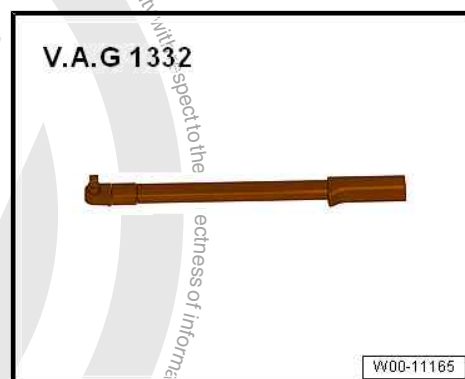
⇒ ["1.3.1 Removing and installing rear axle, up!", page 91](#)

⇒ ["1.3.2 Removing and installing rear axle, e-up!", page 95](#)

1.3.1 Removing and installing rear axle, up!

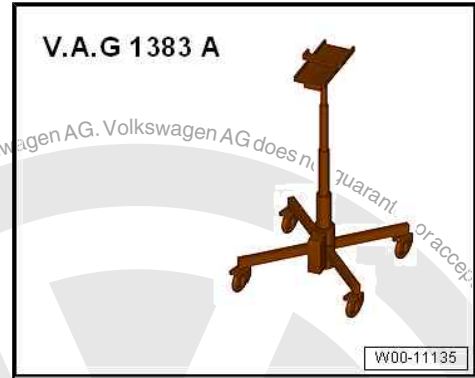
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

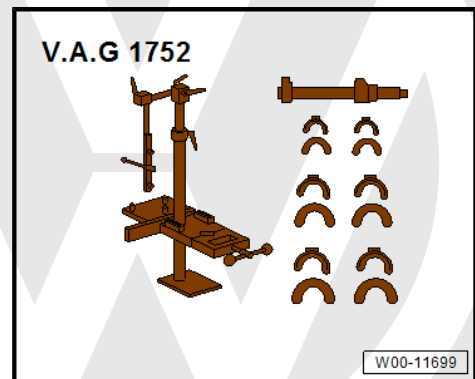




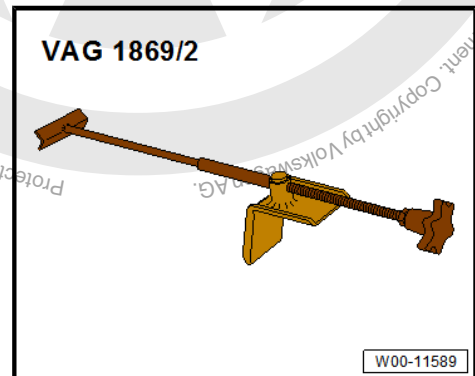
◆ Engine and gearbox jack - V.A.G 1383 A-



◆ Suspension strut clamp - V.A.G 1752-



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



◆ Tensioning strap - T10038-



Removing

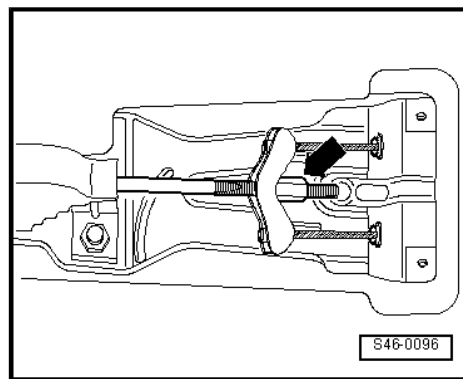
- Remove handbrake lever trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing handbrake lever trim .
- Release handbrake lever.



- Loosen adjustment nut -arrow- until the handbrake cables can be pulled out from the compensator.
- Apply brake pedal depressor - V.A.G 1869/2- .


This prevents the brake pipes and the ABS hydraulic unit from running dry.

- Loosen wheel bolts.
- Raise vehicle.
- Remove wheels.



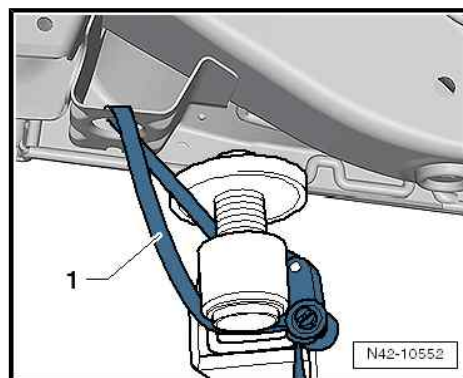
- Secure vehicle to support arms of lifting platform on both sides using tensioning straps - T10038- .

1 - Tensioning strap - T10038-



WARNING

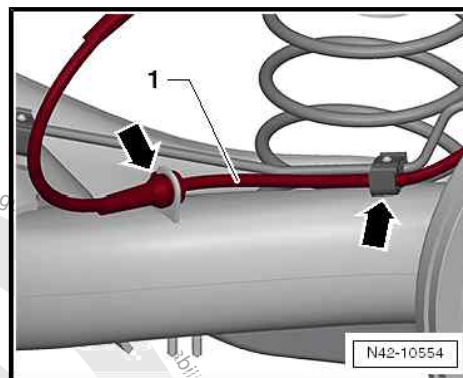
If the vehicle is not strapped down, it may slip off the lifting platform.



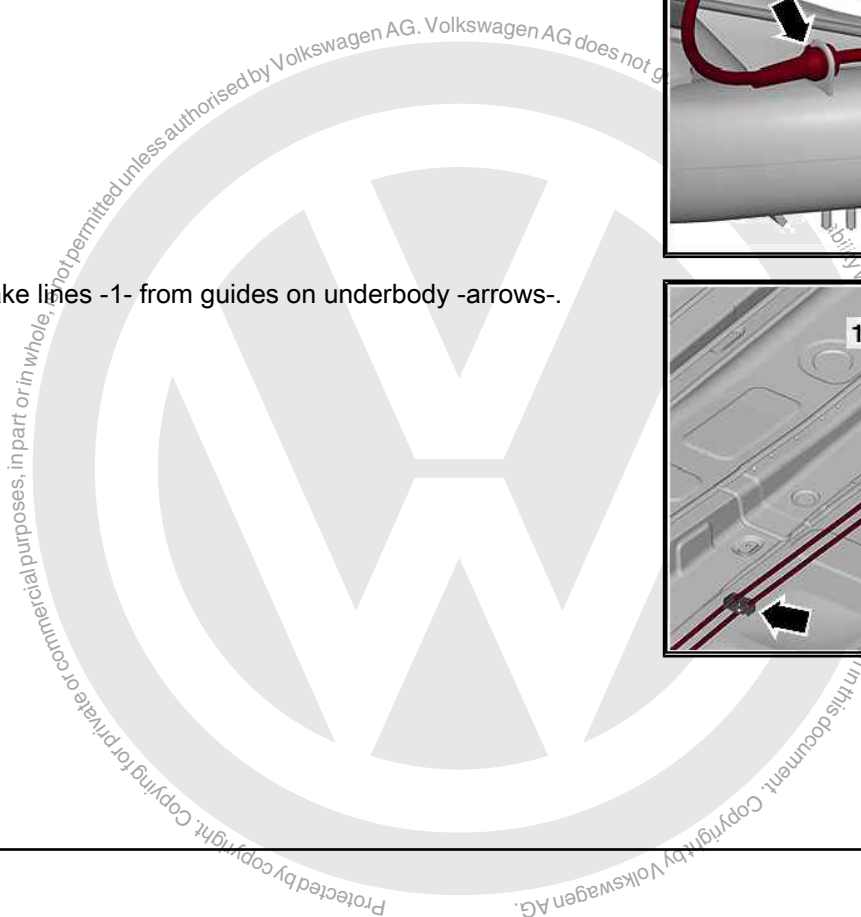
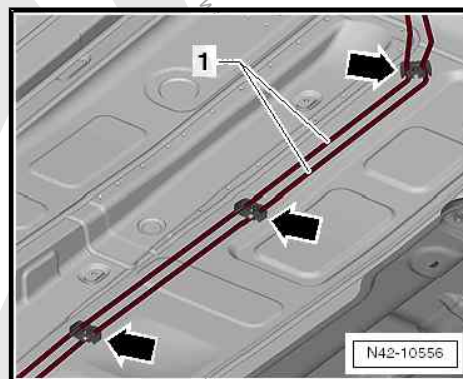
- If fitted, remove wheel housing liner adapter => General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview – rear wheel housing liner .

- Remove coil springs => [page 110](#) .
- Pull connector off speed sensor.

- Unclip wire -1- for speed sensor from brackets -arrows-.

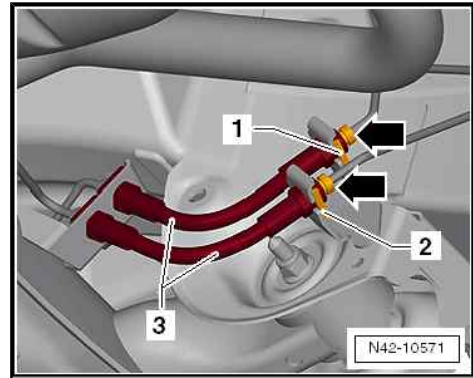


- Unclip brake lines -1- from guides on underbody -arrows-.

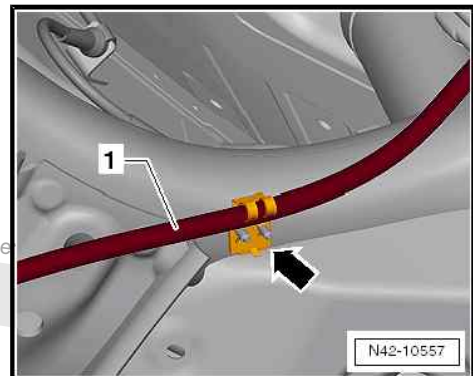




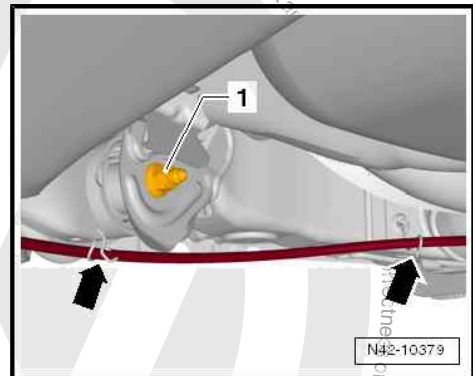
- Disconnect brake lines -arrows-.
- Lever off retaining springs -1- and -2-.
- Pull brake hoses -3- out of mounting brackets.



- Remove handbrake cables -1- from retainer -arrow-.



- Remove handbrake cables from retainers -arrows-.
- Position engine and gearbox jack - V.A.G 1383 A- beneath axle beam and support axle beam.
- Secure rear axle with a strap or similar when lowering and removing.
- Unscrew bolts -1- for right and left axle beams.





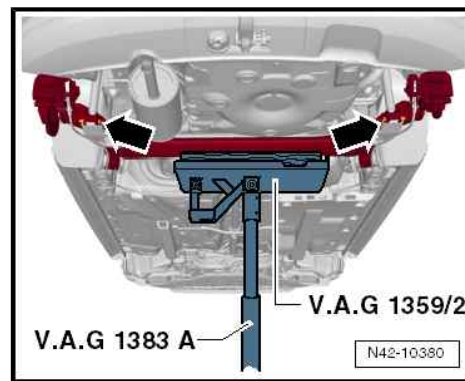
- Unbolt rear axle from shock absorbers -arrows-.
- Lower rear axle with engine and gearbox jack - V.A.G 1383 A-.

Installing

- Tighten rear axle in unladen position ⇒ [page 8](#) .

Continue installation in reverse order of removal.

- Bleed brake system ⇒ Brake system; Rep. gr. 47 ; Hydraulic system; Bleeding hydraulic system following standard procedure .
- Adjust parking brake ⇒ Brake system; Rep. gr. 46 ; Parking brake; Adjusting parking brake .
- Install wheels and tighten.



Specified torques

- ◆ ⇒ [“2.1 Assembly overview - axle beam”, page 100](#)
- ◆ ⇒ [“3.1 Assembly overview - suspension strut, shock absorber, spring”, page 106](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts
- ◆ Brake lines to brake hose: 14 Nm

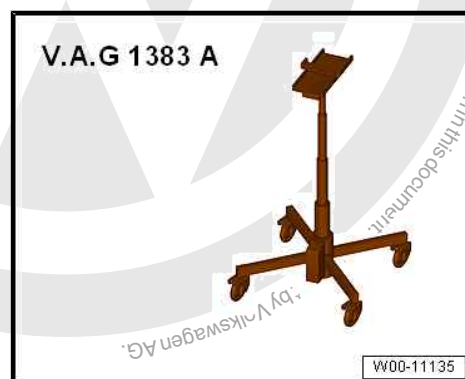
1.3.2 Removing and installing rear axle, e-up!

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

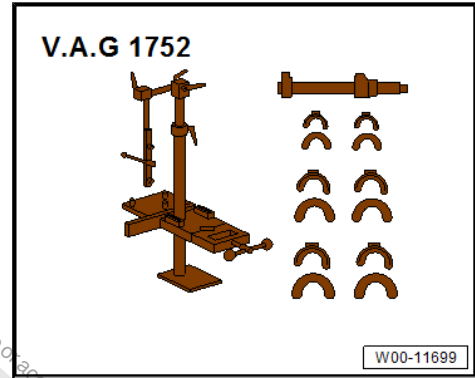


- ◆ Engine and gearbox jack - V.A.G 1383 A-

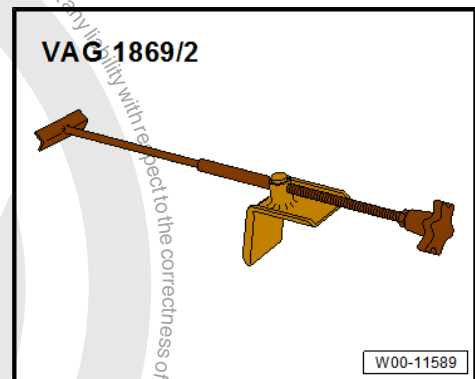




◆ Suspension strut clamp - V.A.G 1752-



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



◆ Tensioning strap - T10038-

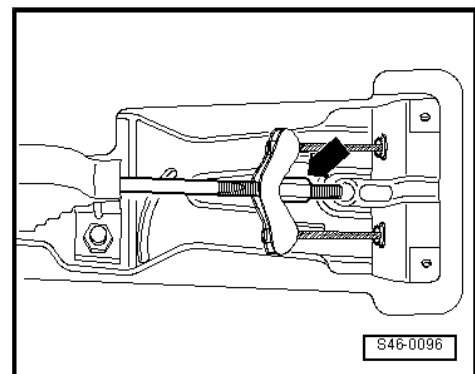


Removing

- Remove handbrake lever trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing handbrake lever trim .
- Release handbrake lever.
- Loosen adjustment nut -arrow- until handbrake cables lie in compensator unattached.
- Apply brake pedal depressor - V.A.G 1869/2- .

This prevents the brake pipes and the ABS hydraulic unit from running dry.

- Loosen wheel bolts.
- Raise vehicle.
- Remove wheels.





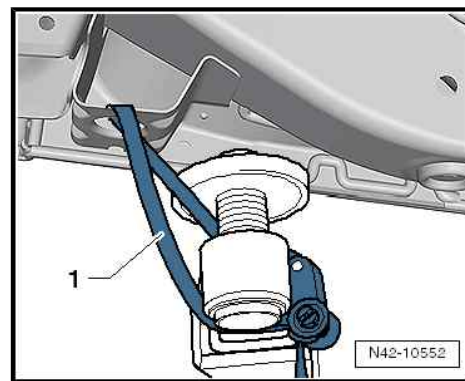
- Secure vehicle to support arms of lifting platform on both sides using tensioning straps - T10038- .

1 - Tensioning strap - T10038-

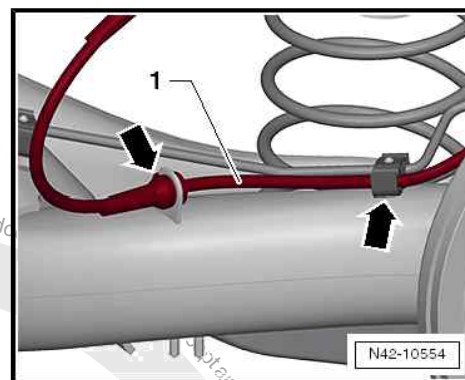


WARNING

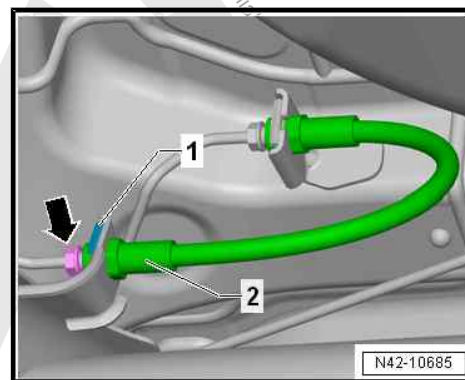
If the vehicle is not strapped down, it may slip off the lifting platform.



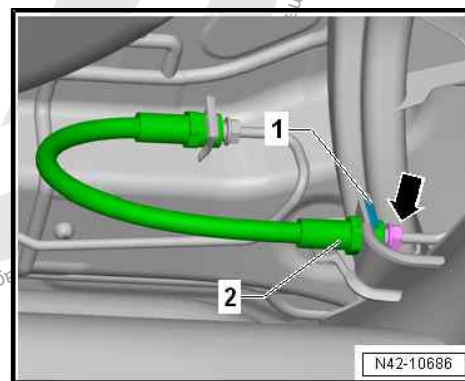
- Remove rear underbody cover ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cover .
- Remove wheel housing liner adapter ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview – rear wheel housing liner .
- Remove coil springs ⇒ [page 110](#) .
- Pull connector off speed sensor.
- Unclip wire -1- for speed sensor from brackets -arrows-.



- Disconnect left brake line -arrow-.
- Lever off retaining spring -1-.
- Pull brake hose -2- out of mounting bracket.

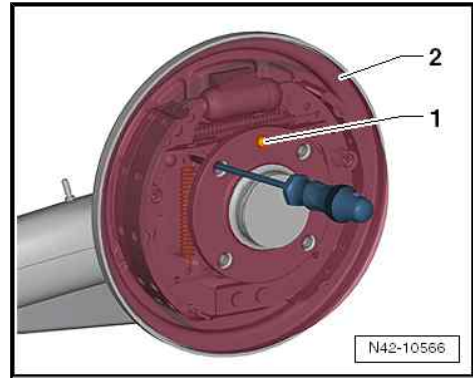


- Disconnect right brake line -arrow-.
- Lever off retaining spring -1-.
- Pull brake hose -2- out of mounting bracket.

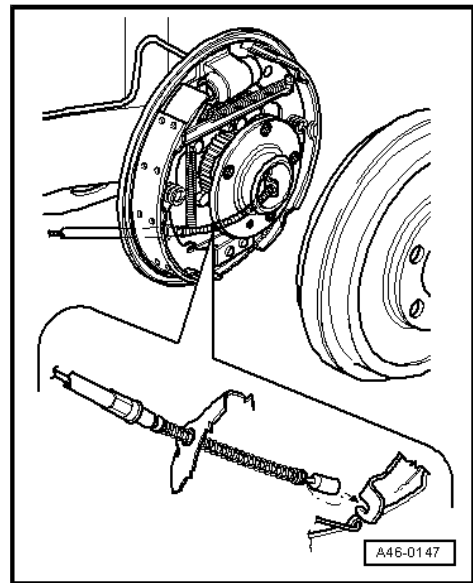




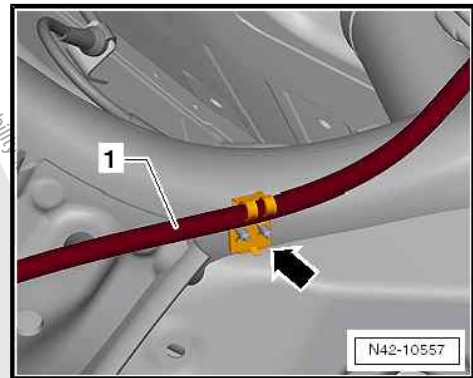
- Release brake.
- To do this, insert a screwdriver through a hole in the brake drum and push the wedge upwards.
- Unscrew bolt -1- and remove brake drum -2-.



- Unhook brake cable from parking brake lever.
- Pull brake cable out of brake carrier.



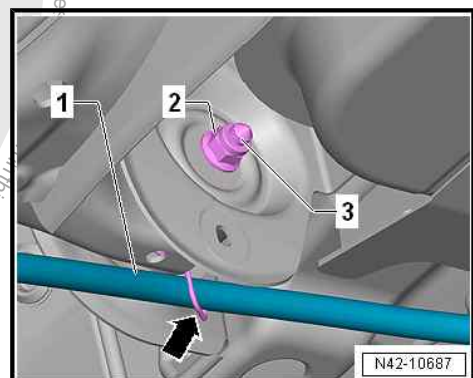
- Remove handbrake cables -1- from retainer -arrow-.



- Remove handbrake cables on right and left -1- from retainer -arrow-.

Position engine and gearbox jack - V.A.G 1383 A- beneath axle beam and support axle beam.

- Secure rear axle with a strap or similar when lowering and removing.
- Unscrew nut -2-, and pull out bolt -3- for axle beam on right and left.





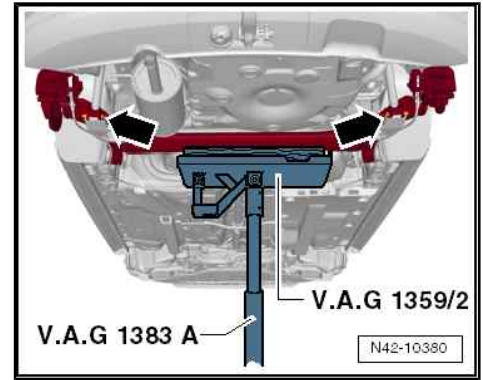
- Unbolt rear axle from shock absorbers -arrows-.
- Lower rear axle with engine and gearbox jack - V.A.G 1383 A- .

Installing

- Tighten rear axle in unladen position ⇒ [page 8](#) .

Continue installation in reverse order of removal.

- Bleed brake system ⇒ Brake system; Rep. gr. 47 ; Hydraulic system; Bleeding hydraulic system following standard procedure .
- Adjust parking brake ⇒ Brake system; Rep. gr. 46 ; Parking brake; Adjusting parking brake .
- Install wheels and tighten.



Specified torques

- ◆ ⇒ [“2.1 Assembly overview - axle beam”, page 100](#)
- ◆ ⇒ [“3.1 Assembly overview - suspension strut, shock absorber, spring”, page 106](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts
- ◆ Brake lines to brake hose: 14 Nm





2 Subframe

⇒ "2.1 Assembly overview - axle beam", page 100

⇒ "2.2 Renewing bonded rubber bush for axle beam", page 101

2.1 Assembly overview - axle beam



Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.
- ◆ 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 8](#).

1 - Subframe

- Keep contact surface and tapped holes for stub axle free from paint and dirt.
- Removing and installing ⇒ [page 91](#)

2 - Bolt

- 8 Nm

3 - ABS speed sensor

- Before inserting sensor, clean inner surface of hole and coat with lubricating paste - G 000 650-.

4 - Stub axle

- Straightening operations are not permitted
- Recutting the thread is not permitted

5 - Bolt

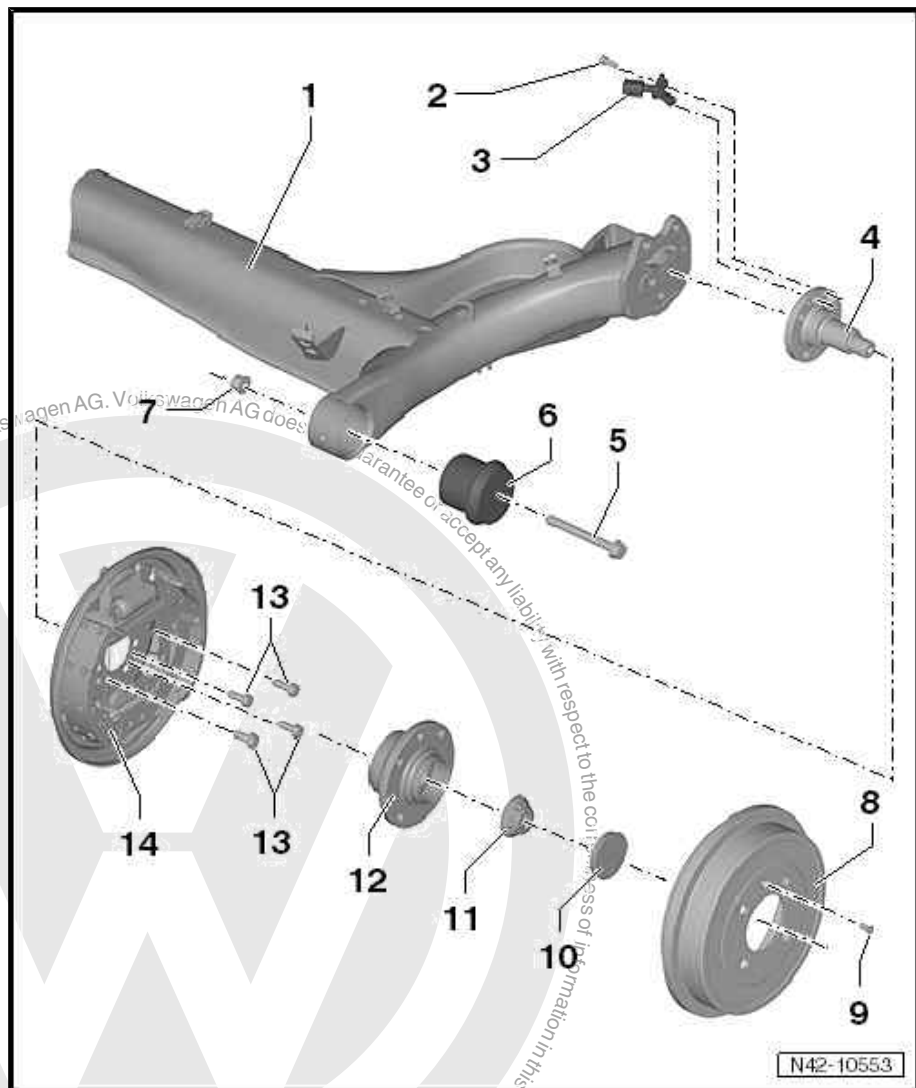
- 50 Nm + 180° further
- Insert from outside.
- Renew after each removal
- Tighten in unladen state ⇒ [page 8](#).

6 - Bonded rubber bush

- Removing and installing ⇒ [page 101](#)

7 - Nut

- Self-locking
- Renew after each removal





8 - Brake drum

9 - Bolt

- 8Nm

10 - Dust cap

- Renew after each removal
- Pressing off and driving in ⇒ [page 113](#)

A proper seal can be achieved only by installing a new grease cap.

This is essential for optimum function and service life of wheel bearing.

11 - 12-point nut

- Self-locking
- 70 Nm + 30° further
- Renew after each removal

12 - Wheel bearing unit

- The ABS sensor ring is installed in the wheel hub
- Removing and installing ⇒ [page 113](#)

The wheel bearing and wheel hub are assembled in one housing.

The wheel hub with wheel bearing unit is maintenance and adjustment-free. Adjustments and repairs are not possible!

13 - Bolt

- 30 Nm and turn 90° further
- Renew after each removal
- With dished spring

14 - Brake backplate with brake shoes

2.2 Renewing bonded rubber bush for axle beam

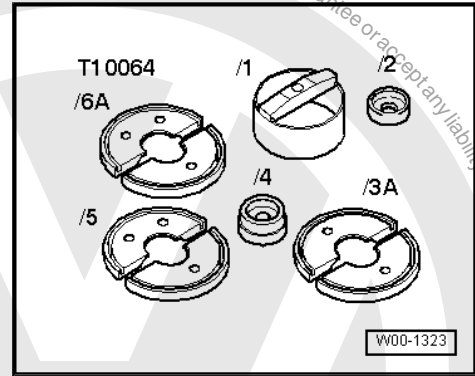
Special tools and workshop equipment required

- ◆ Assembly tool - 3301-





- ◆ Assembly tool - T10064-

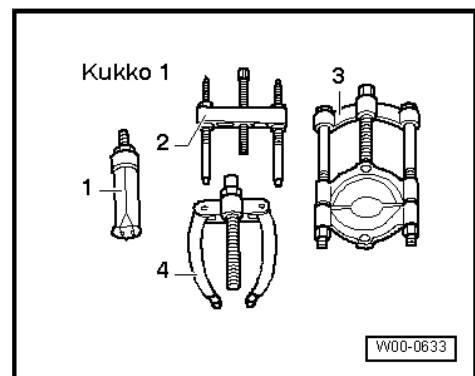


- ◆ Torque wrench - V.A.G 1332-



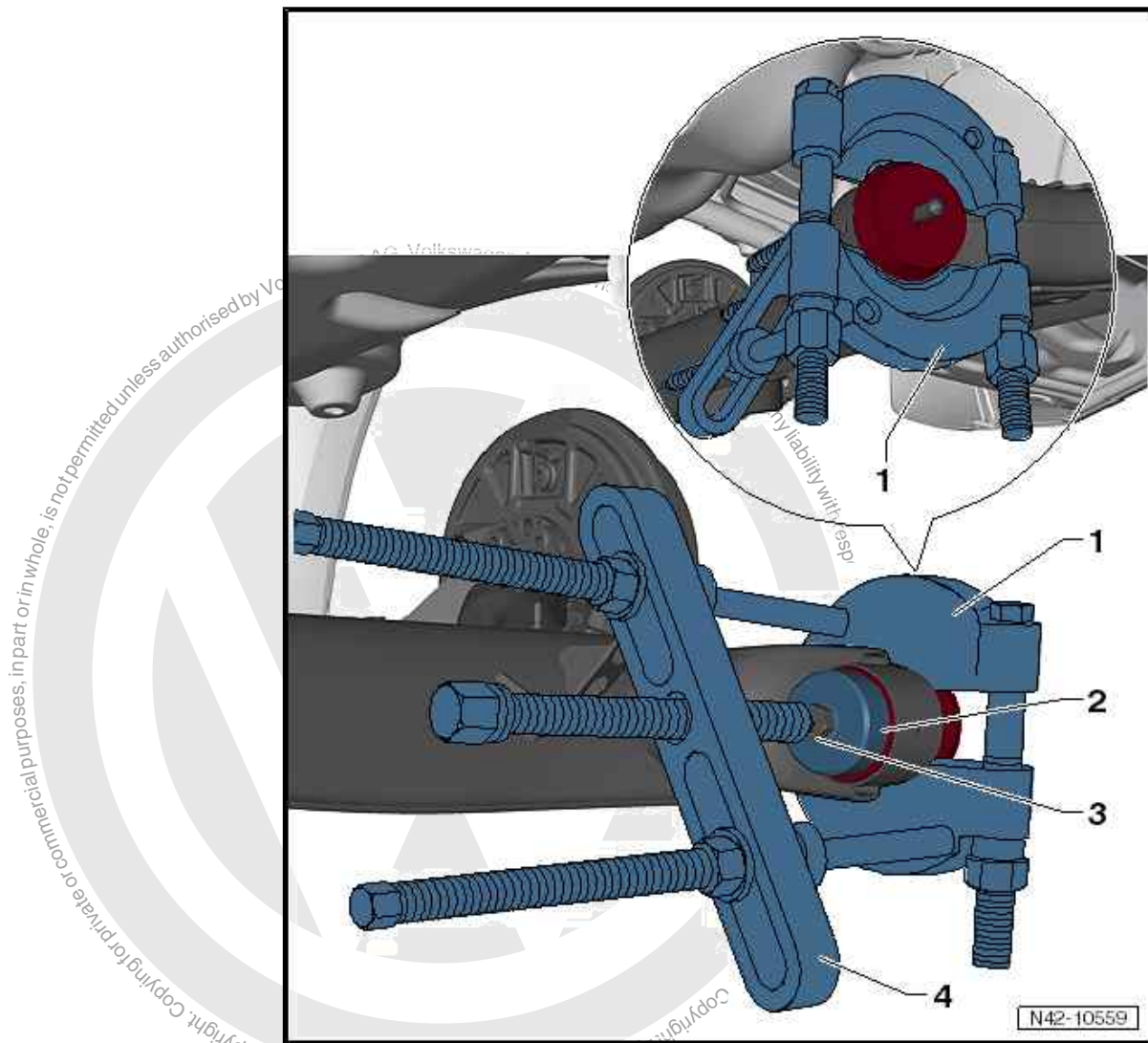
- ◆ -2- Puller - Kukko 18-2-

- ◆ -3- Splitter - Kukko 15-2-



Removing

- Lower rear axle ⇒ [page 88](#) .
- Fit separating tool , e.g. -Kukko 15-2- , to collar of bonded rubber bush and tighten separating tool.



– Install remaining tools as shown in illustration and press out bonded rubber bush.

1 - Separating tool , e.g. -Kukko 15-2-

2 - Thrust piece - 3292/3-

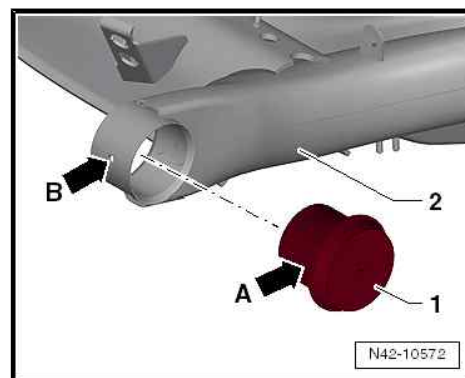
3 - Axle beam bolt

4 - Puller , e.g. -Kukko 18-2-

Installing

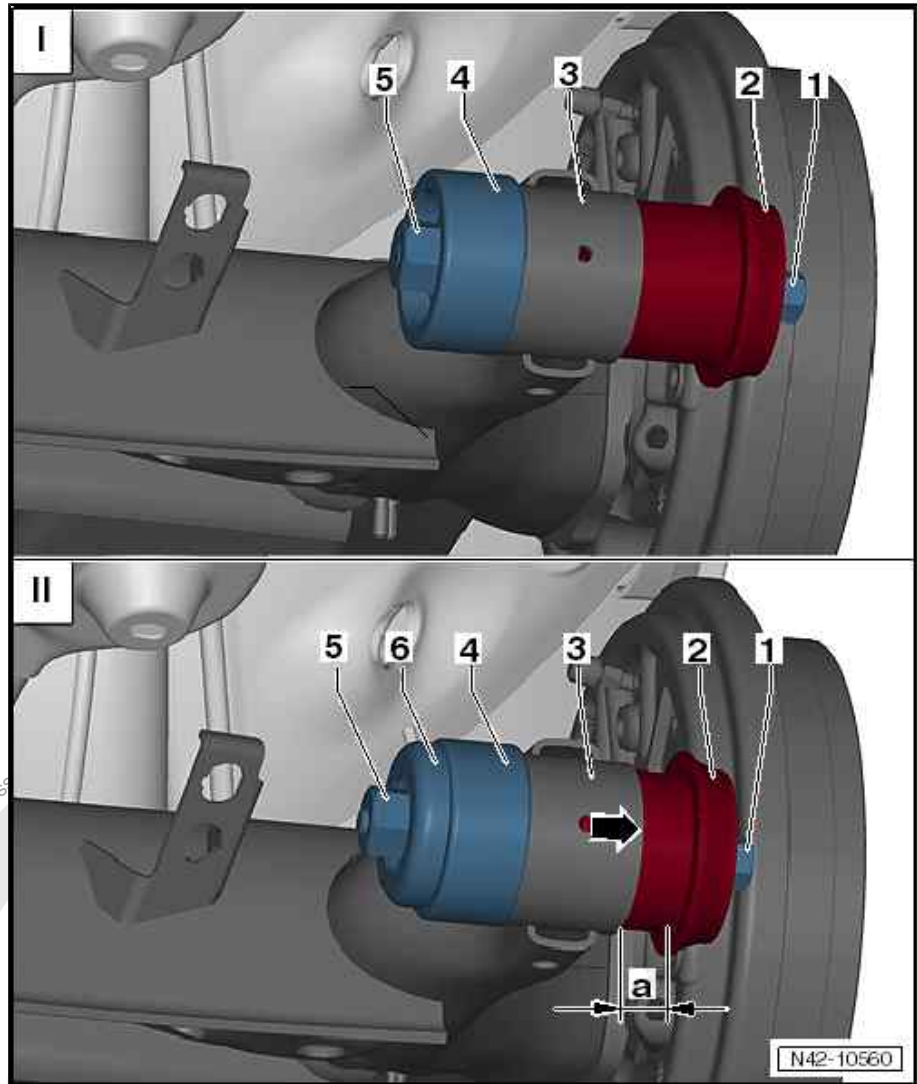
– Ensure correct installation position of bonded rubber bush
 -1- on axle beam -2-.

The notch -arrow A- on bonded rubber bush -1- must face towards eye -arrow B- of axle beam -2-.





- Fit bonded rubber bush -2- in installation position on axle beam and fit tools as shown in illustration -I-.



- 1 - Spindle - 3301/1-
- 2 - Bonded rubber bush
- 3 - Axle beam
- 4 - Thrust piece - T10064/2-
- 5 - Nut - 3301-

- Draw bonded rubber bush -2- into axle beam until distance -a- has been reached.

a = 10 mm

- Unscrew nut - 3301- -5- and install thrust mounting - 3301- -6- as shown in illustration -II-.
- Draw bonded rubber bush -2- into axle beam -3- to stop -arrow-.

Continue installation in reverse order of removal.

- Tighten rear axle in unladen position ⇒ [page 8](#) .
- Install wheels and tighten.



Specified torques

- ◆ ⇒ [“2.1 Assembly overview - axle beam”, page 100](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts





3 Suspension strut, shock absorber, spring

⇒ [“3.1 Assembly overview - suspension strut, shock absorber, spring”, page 106](#)

⇒ [“3.2 Removing and installing shock absorbers”, page 107](#)

⇒ [“3.3 Repairing shock absorber”, page 109](#)

⇒ [“3.4 Removing and installing spring”, page 110](#)

3.1 Assembly overview - suspension strut, shock absorber, spring



Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.
- ◆ 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 8](#).

1 - Subframe

- Keep contact surface and tapped holes for stub axle free from paint and dirt.
- Removing and installing ⇒ [page 91](#)

2 - Carrier

- Check for damage.

3 - Spring

- Observe colour coding
- Allocation ⇒ Electronic parts catalogue “ETKA”
- Take different running gear designs into account ⇒ [page 122](#).
- Surface of coil must not be damaged.
- Removing and installing ⇒ [page 110](#)

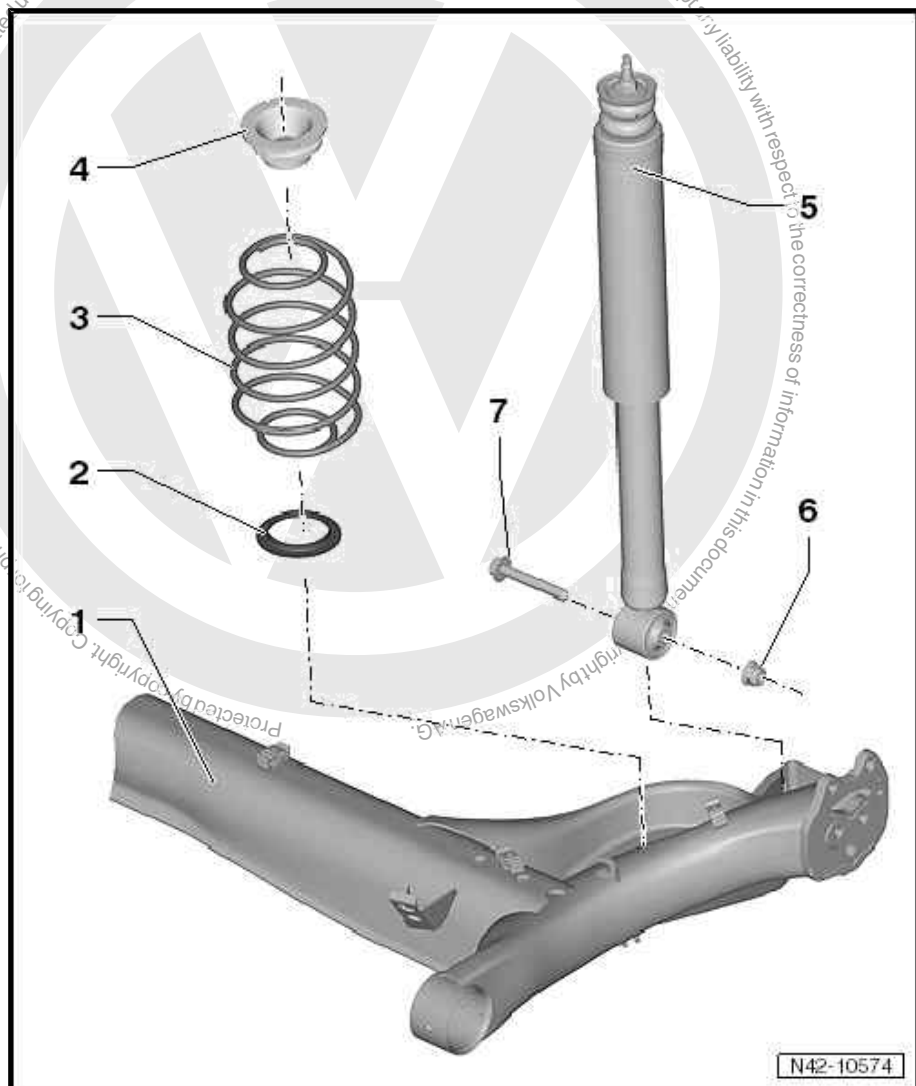
4 - Spring seat

5 - Shock absorbers

- Removing and installing ⇒ [page 107](#)
- Allocation ⇒ Electronic parts catalogue “ETKA”

6 - Nut

- Self-locking
- Renew after each removal





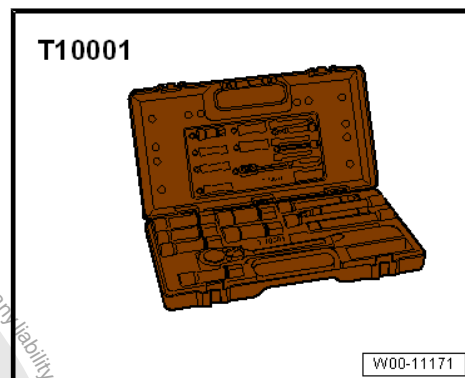
7 - Bolt

- 50 Nm + 180° further
- Tighten in unladen state ⇒ [page 8](#) .
- Renew after each removal

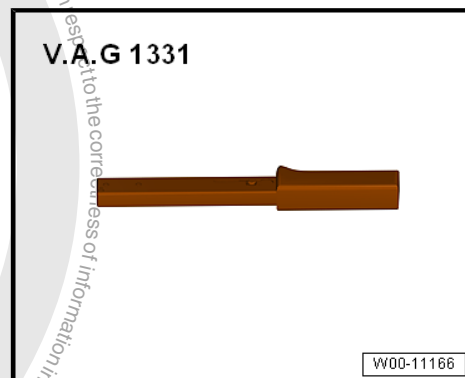
3.2 Removing and installing shock absorbers

Special tools and workshop equipment required

- ◆ Shock absorber tool set - T10001-



- ◆ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - V.A.G 1332-



Removing

- Remove side panel trim in luggage compartment ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing side panel trim for luggage compartment .



Only left side for vehicles with parking aid.

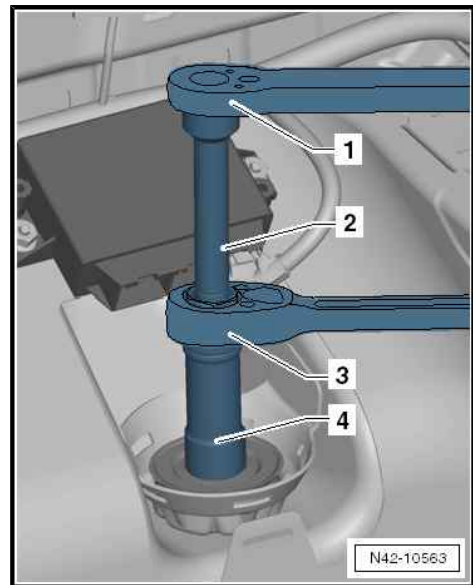
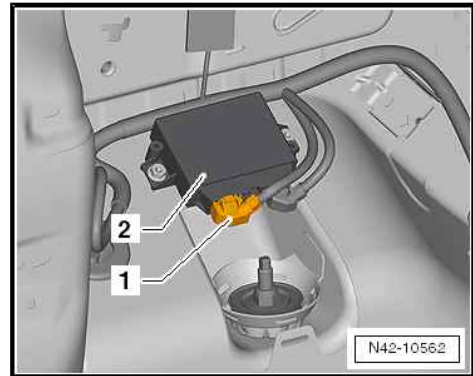
- Disconnect connector -1- from parking aid control unit - J446-2-.

Continued for all vehicles

- Unscrew upper shock absorber mounting.

- 1 - Ratchet, commercially available
- 2 - -T10001/9-
- 3 - -T10001/11-
- 4 - -T10001/1-

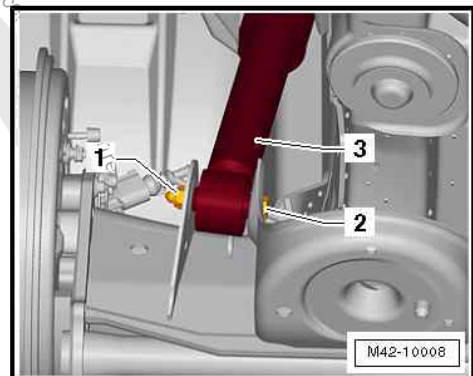
- Raise vehicle to working height.



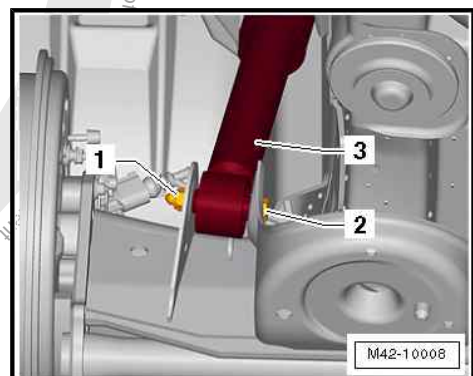
- Unscrew and remove nut -1-, take out hexagon bolt -2- for shock absorber -3- from rear axle.
- Take out shock absorber.

Installing

- Fit shock absorber.

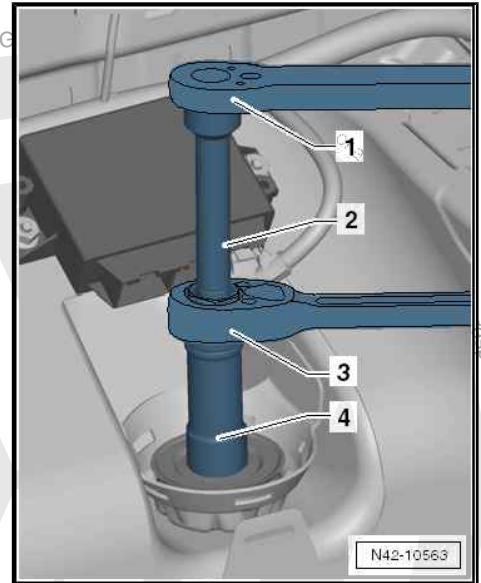


- Bolt shock absorber -3- to rear axle using new hexagon bolt -2- and new nut -1-.





- Bolt shock absorber to body.
- 1 - Torque wrench - V.A.G 1332-
- 2 - -T10001/9-
- 3 - -T10001/11-
- 4 - -T10001/1-

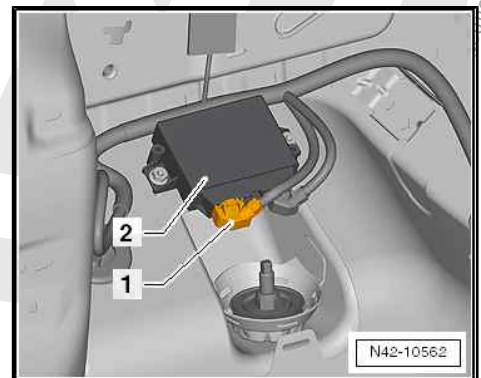


Only left side for vehicles with parking aid.

- Connect connector -1- to parking aid control unit - J446- -2-.

Continued for all vehicles

- Tighten bolts in unladen state ⇒ [page 8](#)
- Install side panel trim in luggage compartment ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing side panel trim for luggage compartment .



Specified torques

- ◆ ⇒ [“3.1 Assembly overview - suspension strut, shock absorber, spring”, page 106](#)
- ◆ ⇒ [“3.3 Repairing shock absorber”, page 109](#)

3.3 Repairing shock absorber



1 - Nut

- 20 Nm
- Self-locking
- Renew after each removal
- Unscrewing
=> [page 110](#)

2 - Bearing ring

3 - Buffer stop

4 - Body

5 - Spacer tube

6 - Bearing ring

7 - Protective tube

8 - Gas-filled shock absorber

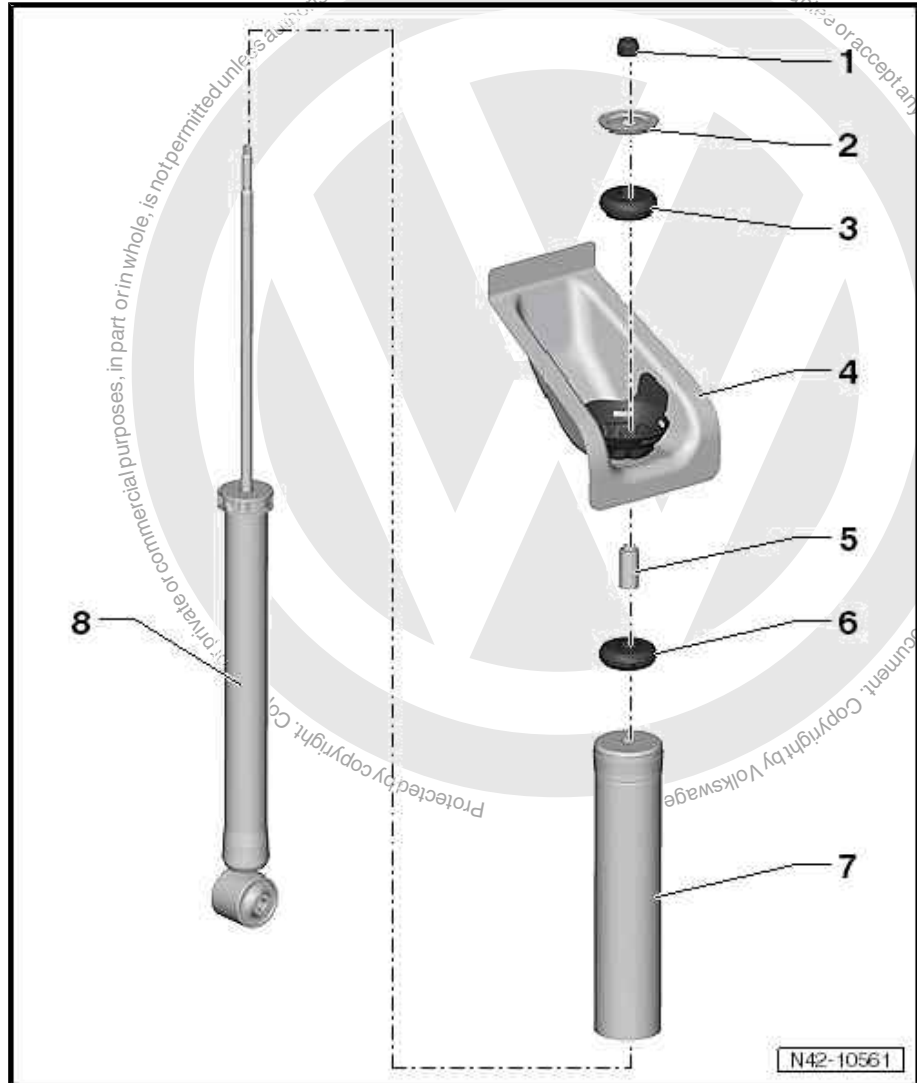
- Can be renewed separately
- Allocation => Electronic parts catalogue "ETKA"

Checking function

Compress shock absorber by hand. It should be possible to press in the piston rod smoothly and with uniform force over the full travel.

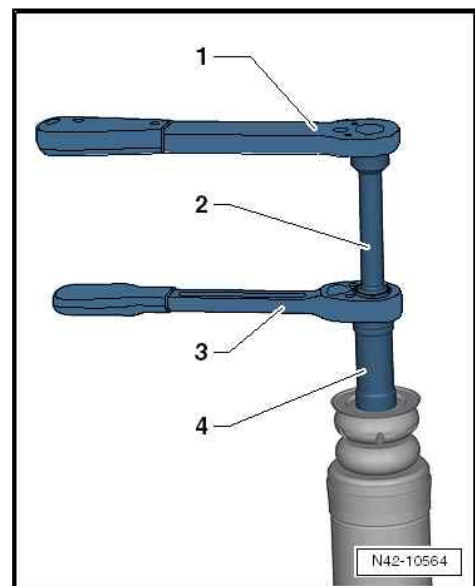
The piston rod will return to its initial position if there is sufficient gas pressure in the shock absorber.

If the piston rod does not return to its initial position by itself, the shock absorber may still be usable, provided there is no loss of fluid.



Remove hexagon nut from gas-filled shock absorber.

- 1 - Ratchet, commercial type
- 2 - Insert - T10001/9-
- 3 - -T10001/11-
- 4 - Insert - T10001/1-

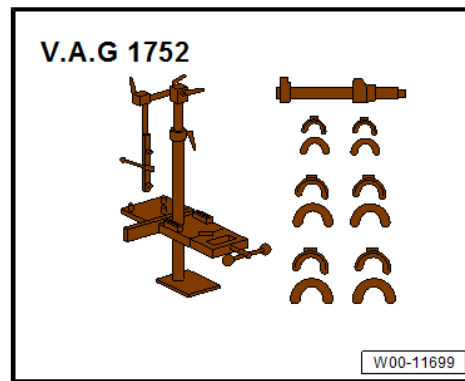


3.4 Removing and installing spring

Special tools and workshop equipment required



◆ Suspension strut clamp - V.A.G 1752-



Removing

- Raise vehicle.

Only vehicles natural gas engines

Remove underbody cover => General body repairs, exterior; Rep. gr. 66 ; Underbody cover

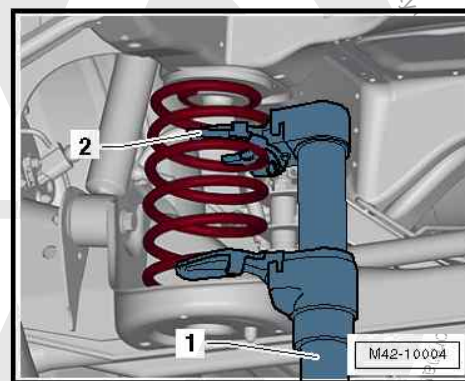
Continued for all vehicles

- Insert spring compressor -1-
- 1 - Spring compressor - V.A.G 1752/1-
- 2 - Spring retainer - V.A.G 1752/3A-



WARNING

Ensure that spring is correctly seated in spring retainers - V.A.G 1752/3A- -2- (danger of accidents).



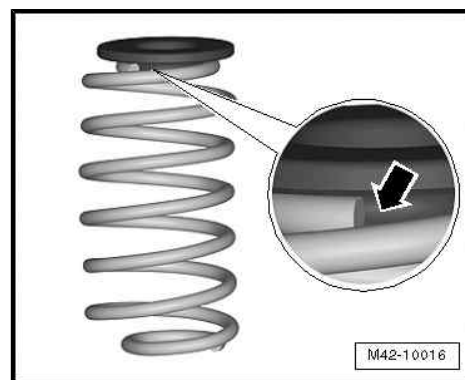
- Compress spring until it can be removed.

Note

Use a spanner or a reversible ratchet handle to compress spring compressor.

Installing

- Check that the lower spring plate is not damaged. Renew if necessary.
- Insert upper spring seat into upper end of spring.
- The bead of the spring seat -arrow- must lie against the spring correctly.
- Release tension on spring while locating upper spring seat on lug on body.
- Remove spring compressor .





4 Wheel bearing assembly, trailing arm

⇒ "4.1 Assembly overview - wheel bearing", page 112

⇒ "4.2 Removing and installing wheel bearing unit", page 113

4.1 Assembly overview - wheel bearing

1 - Subframe

- Removing and installing
⇒ [page 91](#)

2 - Brake backplate with brake shoes

3 - Bolt

- 30 Nm and turn 90° further
- Renew after each removal

4 - Stub axle

- Must not be straightened
- Recutting the thread is not permitted

5 - Wheel hub with wheel bearing

- The ABS sensor ring is installed in the wheel hub
- Removing and installing
⇒ [page 113](#)

The wheel bearing and wheel hub are assembled in one housing.

The wheel hub with wheel bearing unit is maintenance and adjustment-free. Adjustments and repairs are not possible!

6 - 12-point nut

- Self-locking
- 70 Nm + 30° further
- Renew after each removal

7 - Dust cap

- Renew after each removal
- Pressing off and driving in ⇒ [page 113](#)

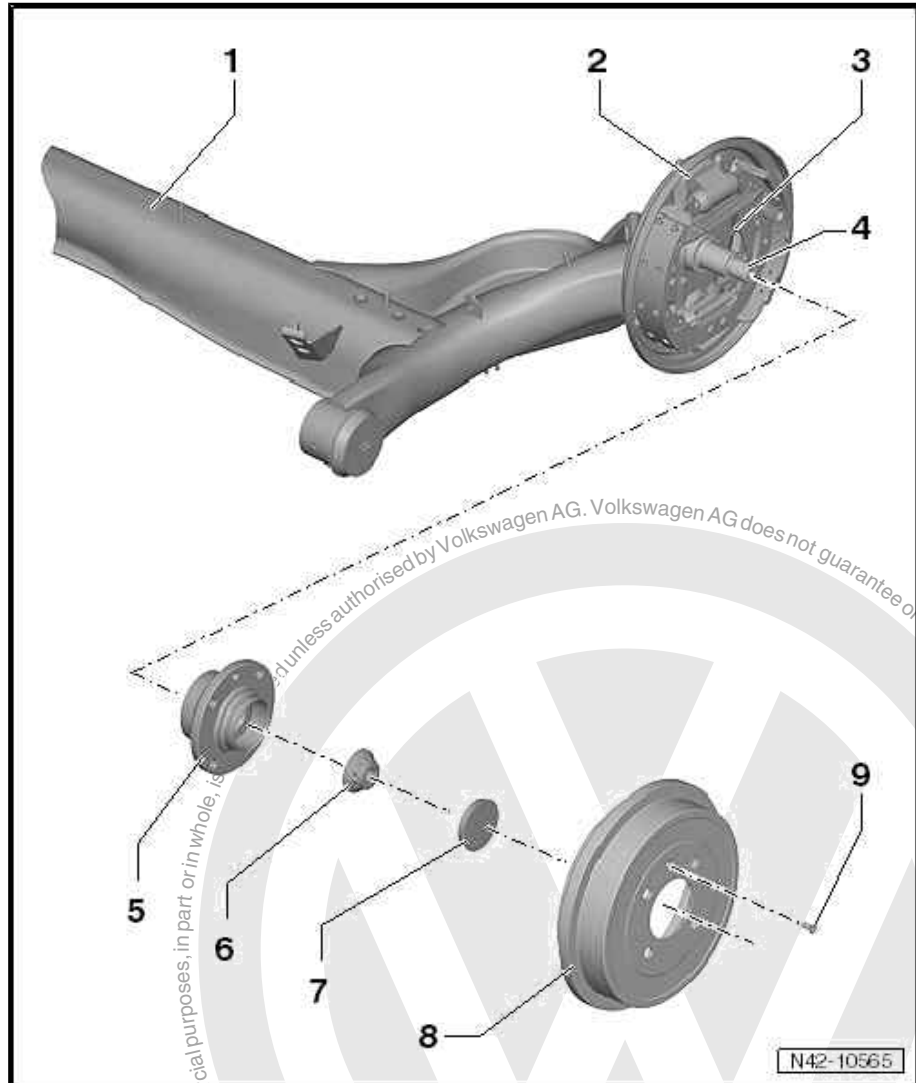
A proper seal can be achieved only by installing a new grease cap.

This is essential for optimum function and service life of wheel bearing.

8 - Brake drum

9 - Bolt

- 8 Nm





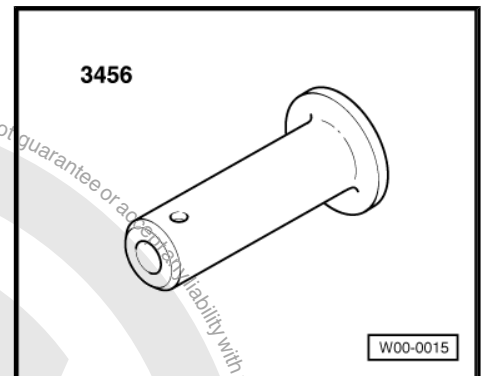
4.2 Removing and installing wheel bearing unit

Special tools and workshop equipment required

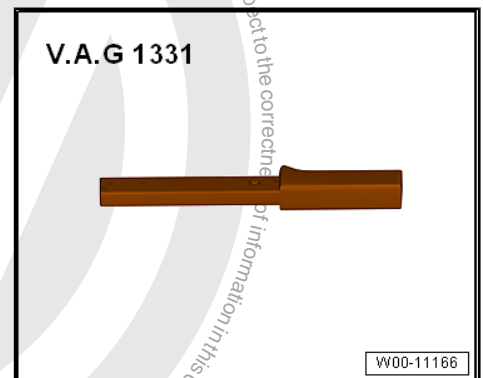
- ◆ Hub grease cap puller - VW 637/2-



- ◆ Drift sleeve - 3456-



- ◆ Torque wrench - V.A.G 1332-



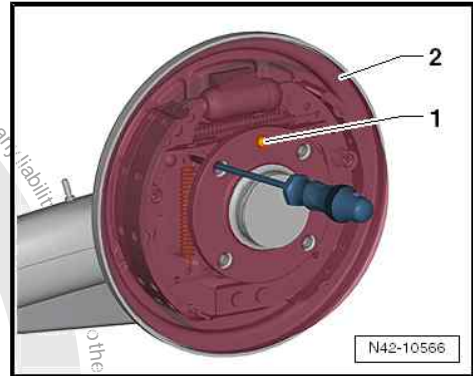
- ◆ Torque wrench - V.A.G 1410-



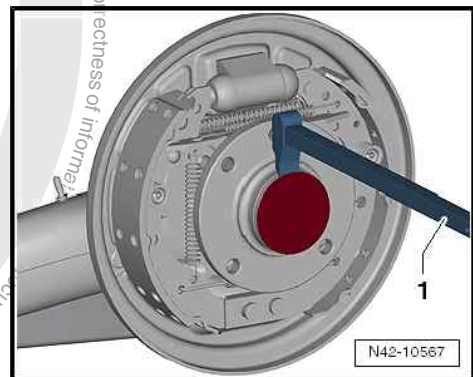


Removing

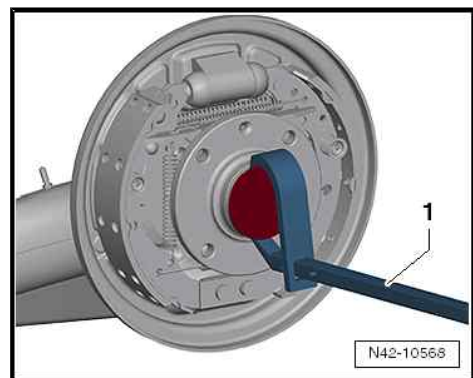
- Loosen wheel bolts.
- Raise vehicle.
- Remove wheel.
- Release brake.
- To do this, insert a screwdriver through a hole in the brake drum and push the wedge upwards.
- Unscrew bolt -1- and remove brake drum -2-.



- Loosen grease cap from seat by tapping lightly on claw of hub grease cap puller - VW 637/2- -1-.



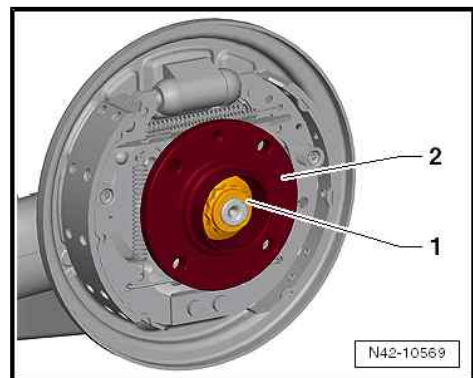
- Pry off grease cap.
- 1 - Hub grease cap puller - VW 637/2-



- Unscrew twelve-point nut -1-.
- Pull wheel hub/wheel bearing unit -2- from stub axle.

Installing

Install in reverse order. During this procedure, observe the following:





- Carefully push wheel hub/wheel bearing unit -2- onto stub axle.



Caution

Ensure that the wheel hubs/wheel bearing unit does not cant!

- Screw on new twelve-point nut -1- and tighten to specified torque.

- Drive in new grease cap using thrust piece - 3456- -1-.

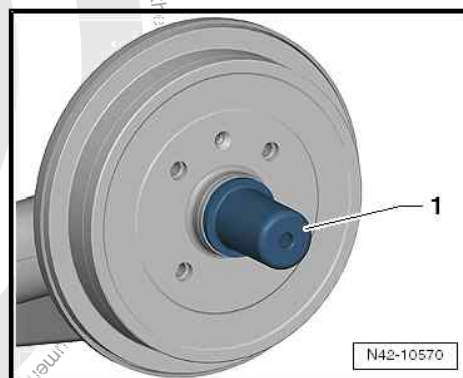
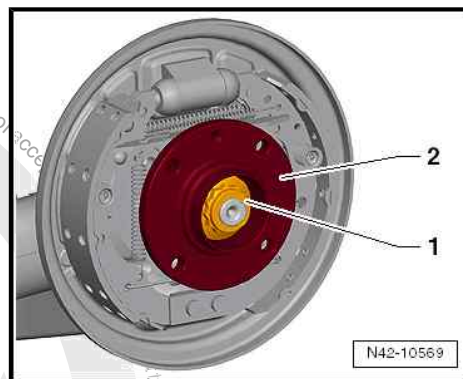
Always renew removed grease caps.

Damaged grease caps may allow moisture to enter the bearing. Therefore, always use the tool shown in the illustration.

- Install wheel and tighten.

Specified torques

- ◆ ⇒ ["4.1 Assembly overview - wheel bearing", page 112](#)
- ◆ Brake drum to wheel hub ⇒ Brake system; Rep. gr. 46 ; Rear brake; Assembly overview – rear brake
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts





44 – Wheels, tyres, vehicle geometry

1 Wheel alignment

- ⇒ [“1.1 Notes for wheel alignment”, page 116](#)
- ⇒ [“1.2 Conditions for testing”, page 117](#)
- ⇒ [“1.3 Test preparations”, page 117](#)
- ⇒ [“1.4 Specifications for wheel alignment”, page 118](#)
- ⇒ [“1.5 Wheel alignment procedure”, page 120](#)
- ⇒ [“1.6 Necessity of wheel alignment”, page 121](#)
- ⇒ [“1.7 Vehicle data sticker”, page 122](#)
- ⇒ [“1.8 Adjusting camber at front wheels”, page 123](#)
- ⇒ [“1.9 Adjusting camber on rear axle”, page 124](#)
- ⇒ [“1.10 Adjusting toe at rear axle”, page 124](#)
- ⇒ [“1.11 Adjusting front axle toe”, page 125](#)
- ⇒ [“1.12 Wheel runout compensation”, page 125](#)
- ⇒ [“1.13 Checking maximum wheel lock”, page 125](#)

1.1 Notes for wheel alignment

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.

- Carry alignment out with the wheel alignment computer.

All the information on wheel alignment can be found in the wheel alignment computer.

Current data »updates« are located in VW ServiceNet.

- ⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Beissbarth
- ⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Hunter
- ⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Corghi
- ⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; John Bean



Note

- ◆ *Wheel alignment should not be checked before the vehicle has completed 2000 km because the coil springs must settle.*
- ◆ *When making adjustments, adhere to the relevant specifications as closely as possible.*

Crabbing and accident damaged vehicles

This may be due to the rack in the steering rack not being exactly centred when vehicle is driven in a straight line.

Power steering assistance is thereby slightly one sided, rather than central. The vehicle will pull to one side as a consequence.



When checking the alignment of a "vehicle which pulls to one side", always ensure that the steering rack is centred.

Observe

⇒ "1.2 Safety precautions when working on subframe", page 1 .

1.2 Conditions for testing

- Check suspension, wheel bearing, steering and steering linkage for excessive play and damage.
- Tread depth difference of no more than 2 mm on one axle.
- Tyres inflated to correct pressures.
- Vehicle unladen.
- Fuel tank must be full.
- Spare wheel and vehicle tools are stowed in correct locations.
- The fluid reservoir for the windscreen/headlight washer system must be full.
- When checking wheel alignment, ensure that sliding plates and turn tables are not touching end stop.

Please note the following:

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

If necessary, ask the manufacturer to show you how to use the wheel alignment machine.

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

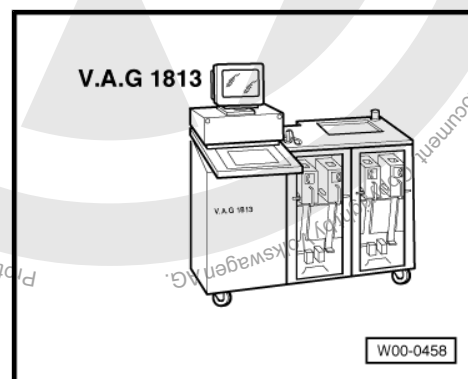
Wheel alignment platforms and alignment units and computers should be checked and adjusted as necessary during inspection and maintenance at least once per year!

- Handle these highly sensitive devices carefully and conscientiously.

1.3 Test preparations

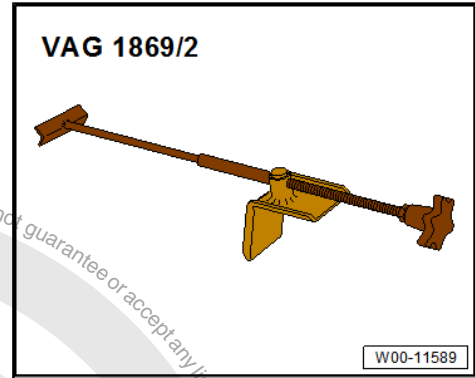
Special tools and workshop equipment required

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

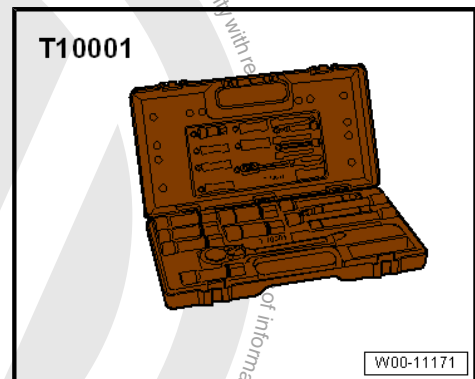




- ◆ Brake pedal depressor - V.A.G 1869/2-



- ◆ Shock absorber tool set - T10001-



The existing lateral runout of the wheel must be compensated for. Otherwise, the result of the measurement will be incorrect.

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

Please follow the instructions of the manufacturer of the wheel alignment equipment.

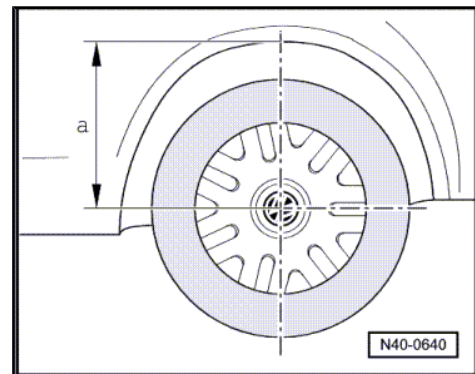
- Carry out wheel runout compensation.
- Apply brake pedal depressor - V.A.G 1869/2- .
- Use brake pedal depressor to depress brake pedal.

1.4 Specifications for wheel alignment

These specifications apply to all engines.

- ◆ Explanation of PR numbers can be found here ⇒ [page 122](#) .

The ride heights shown in the table refer to dimension -a-.





| Front axle | Standard running gear | Sports running gear | Raised running gear | Standard running gear |
|---|------------------------------|---------------------|---------------------|---------------------------------|
| | With power-assisted steering | | | Without power-assisted steering |
| PR numbers | G01 | G03/G13 | G02 | G01 |
| Total toe (without load) | +15' +5/-10' | +15' +5/-10' | +15' +5/-10' | +15' +5/-10' |
| Camber (in straight-ahead position) | -30' ± 30' | -40' ± 30' | -17' ± 30' | -30' ± 30' |
| Maximum permissible difference between sides | max. 30' | max. 30' | max. 30' | max. 30' |
| Toe-out on turns at 20° left and right lock ¹⁾ | 1° 13' ± 20' | 1° 14' ± 20' | 1° 12' ± 20' | 45' ± 20' |
| Castor (not adjustable) | +4° 42'+30'/-10' | +4° 57'+30'/-10' | +4° 28'+30'/-10' | +3° 17'+30'/-10' |
| Maximum permissible difference between sides | max. 30' | max. 30' | max. 30' | max. 30' |
| Ride height | 363 ± 10 mm | 348 ± 10 mm | 378 ± 10 mm | 363 ± 10 mm |

1) Toe-out on turns can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

| Front axle | Natural gas | e-up! | Cross up! | |
|---|------------------|------------------|------------------|--|
| PR numbers | G06 | G04 | G02 | |
| Total toe (without load) | +15' +5/-10' | +15' +5/-10' | +15' +5/-10' | |
| Camber (in straight-ahead position) | -30' ± 30' | -30' ± 30' | -17' ± 30' | |
| Maximum permissible difference between sides | max. 30' | max. 30' | max. 30' | |
| Toe-out on turns at 20° left and right lock ¹⁾ | 1° 13' ± 20' | 1° 13' ± 20' | 1° 12' ± 20' | |
| Castor (not adjustable) | +4° 36'+30'/-10' | +4° 36'+30'/-10' | +4° 28'+30'/-10' | |
| Maximum permissible difference between sides | max. 30' | max. 30' | max. 30' | |
| Ride height | 363 ± 10 mm | 363 ± 10 mm | 372 ± 10 mm | |

1) Toe-out on turns can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

These specifications are valid for all engines at "zero position" of transverse vehicle inclination.

◆ Explanation of "zero position" of transverse vehicle inclination
⇒ [page 120](#)

◆ Explanation of PR numbers can be found here ⇒ [page 122](#)

| Rear axle | Standard running gear | Sports running gear | Raised running gear | Standard running gear |
|--|------------------------------|---------------------|---------------------|---------------------------------|
| | With power-assisted steering | | | Without power-assisted steering |
| Camber | -1° ± 10' | -1° ± 10' | -1° ± 10' | -1° ± 10' |
| Maximum permissible difference between sides | max. 30' | max. 30' | max. 30' | max. 30' |
| Total track (at prescribed camber) | +20' ± 10' | +24' ± 10' | +16' ± 10' | +20' ± 10' |



| Rear axle | Standard running gear | Sports running gear | Raised running gear | Standard running gear |
|---|------------------------------|---------------------|---------------------|---------------------------------|
| | With power-assisted steering | | | Without power-assisted steering |
| Max. permissible deviation from direction of travel | max. 20' | max. 20' | max. 20' | max. 20' |
| Ride height | 374 ± 10 mm | 359 ± 10 mm | 389 ± 10 mm | 374 ± 10 mm |

| Rear axle | Natural gas | e-up! | Cross up! | |
|---|-------------|-------------|-------------|--|
| Camber | -1° ± 10' | -1° ± 10' | -1° ± 10' | |
| Maximum permissible difference between sides | max. 30' | max. 30' | max. 30' | |
| Total track (at prescribed camber) | +19' ± 10' | +19' ± 10' | +16' ± 10' | |
| Max. permissible deviation from direction of travel | max. 20' | max. 20' | max. 20' | |
| Ride height | 379 ± 10 mm | 379 ± 10 mm | 383 ± 10 mm | |

If measured values are outside specified tolerances, this may be because the vehicle is inclined.

Right-hand drive vehicles or e.g. vehicles with an automatic gear-box may lean to one side slightly.

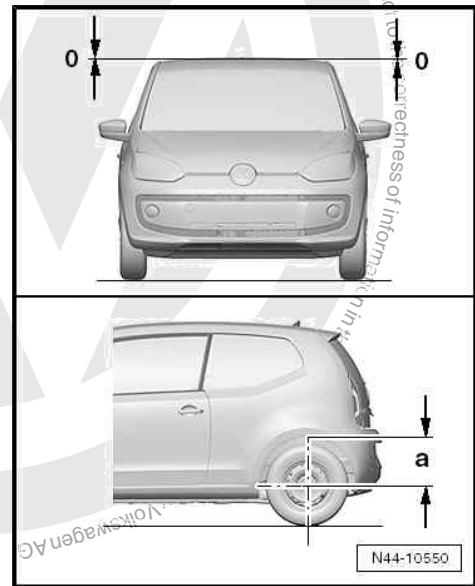
This is due to the installation position of the assemblies and their associated weight transfer and is normal.

- Then make sure to check the distance -a- on the left and right at the rear.
- Correct any difference if there is any.

On the front axle, compensate by adding weights to the top of the respective suspension turret.

On the rear axle, compensate by adding weights to the respective side of the luggage compartment.

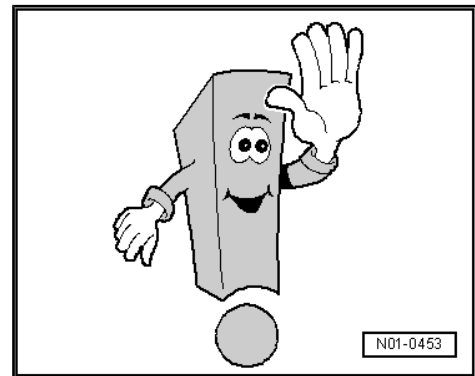
Sand-filled sacks (weighing approx. 10 kg) are suitable for this.



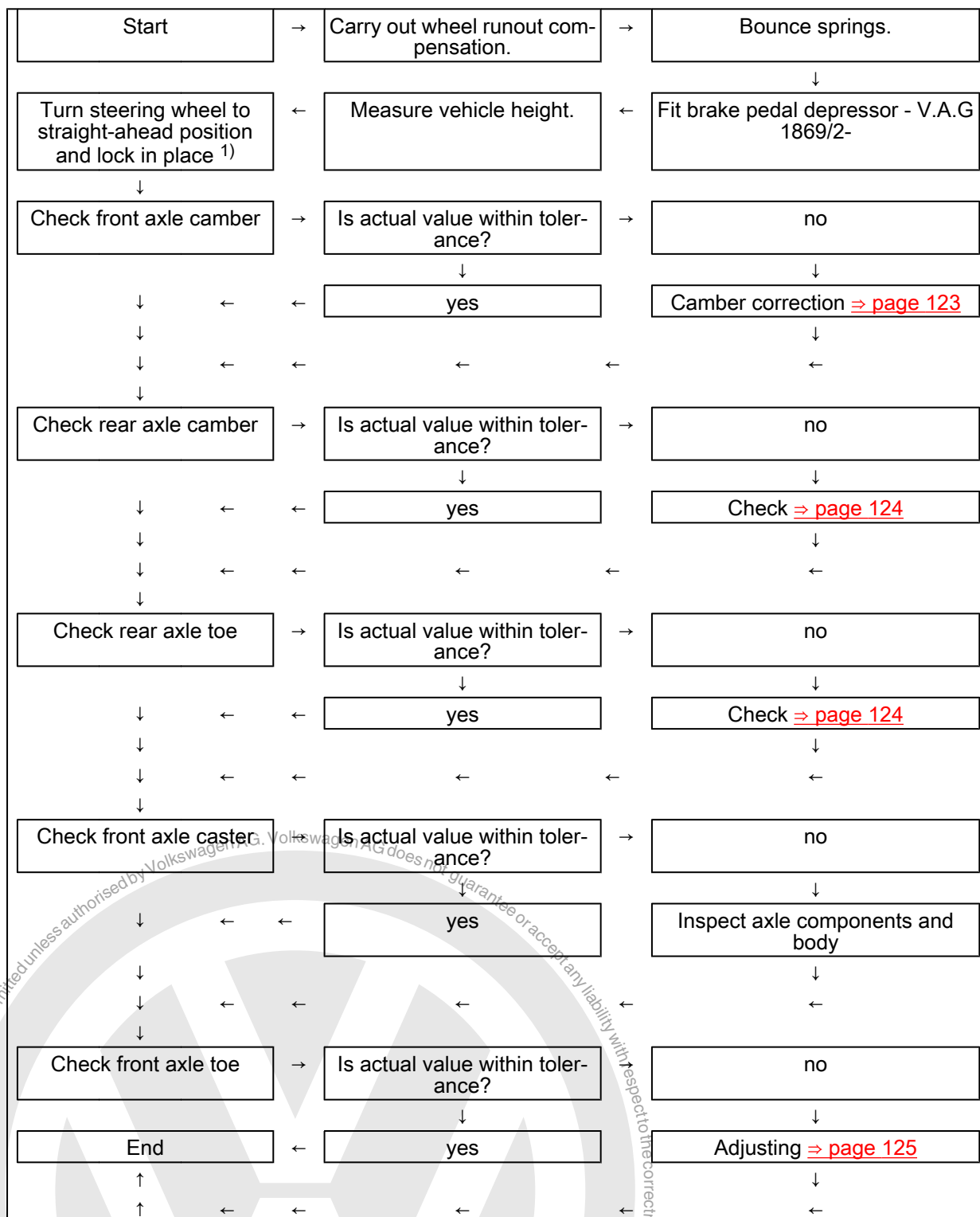
1.5 Wheel alignment procedure

Always adhere to the following procedure!

- Take note of the information in the wheel alignment unit.



Alignment procedure



1) If steering wheel is not centred, it must be straightened after wheel alignment is finished. Then perform basic settings for steering angle sensor - G85- using vehicle diagnosis, testing and information system - VAS 5051- .

1.6 Necessity of wheel alignment

Wheel alignment is necessary if:

- ◆ 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 wear on one side.

Components have been renewed

| Front axle component was renewed. | Alignment necessary | | Rear axle component renewed | Alignment necessary | |
|-----------------------------------|---------------------|----|-----------------------------|---------------------|----|
| | yes | no | | yes | no |
| Suspension link | | X | Shock absorbers | | X |
| Wheel bearing housing | X | | Spring | | X |
| Track rod/track rod ball joint | X | | Torsion beam axle | X | |
| Steering rack | X | | | | |
| Subframe | X | | | | |
| Suspension strut | | X | | | |
| Anti-roll bar | X | | | | |

Components removed and installed

| Front axle component removed and reinstalled | Alignment necessary | | Rear axle component removed and reinstalled | Alignment necessary | |
|--|---------------------|-----------------|---|---------------------|----|
| | yes | no | | yes | no |
| Suspension link | | X | Shock absorbers | | X |
| Wheel bearing housing | | X | Spring | | X |
| Track rod/track rod ball joint | X | | Torsion beam axle | | X |
| Steering rack | X | | | | |
| Subframe | | X ¹⁾ | | | |
| Suspension strut | | X | | | |
| Anti-roll bar | X | | | | |

1) Prerequisite: the position of the subframe was fixed before the part was removed ⇒ [page 17](#) .

1.7 Vehicle data sticker

Explanation of "PR numbers" on vehicle data sticker

Various types of running gear are installed depending on engine and equipment level. These are identified by the PR numbers.

The PR numbers are critical in determining the wheel alignment specifications.

The running gear version fitted in the vehicle is indicated on the vehicle data sticker by the PR number for the front axle.

The vehicle data sticker can be found in the spare wheel well and in the service booklet.



Example of a vehicle data sticker

In this example the vehicle is equipped with standard running gear G01 -arrow-.

| | | | |
|--|------|-------------------------|---------------------|
| FAHRTZEUG-IDENTIFIKATION VEHICLE IDENTIFICATION | | X000 19-7-2022 NU | |
| L-SCHEIN, INNLÄNDISCH PLATE NUMBER | | www zzz AA z C D 000154 | |
| KILLOMETERZAHL MILEAGE | | 121 3D1 | |
| up! 1,0 | move | 55 KW | |
| | M5F | | |
| MOTORRAD, GETRIEBE ENGINE CODE, TRANSMISSION CODE | | CHY | NTL |
| L-SCHEIN, INNLÄNDISCH PLATE NUMBER | | LC9X | JM |
| M-ANBAUOPTIONEN | | | |
| XOA | BOA | C1L | GOC H9Y JOA DG2 XOA |
| 1AT | 1G1 | 1ME 1NL | SRG 5SL TH4 |
| 3SO | 3U4 | OGO | 8UA 8GG 8ZG |
| 1KM | 1LA | - | G01 7MG |
| OY1 | 4UF | 4X1 4R1 | N4H 3MB |
| BRL | 2JG | EOA | |
| 1JA | LO3 | OYA | |

1.8 Adjusting camber at front wheels

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



Note

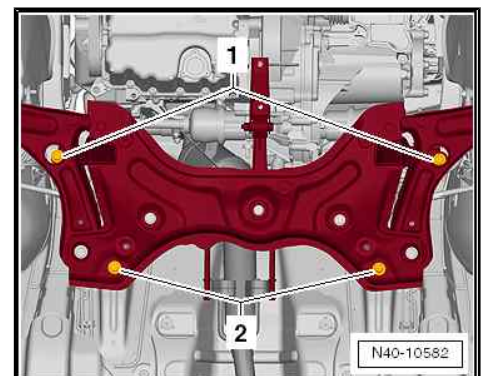
- ◆ *Camber correction is necessary only after body repairs. Camber cannot be adjusted. However, it can be mediated by shifting the subframe!*
- ◆ *Move subframe only to left or right, but never in or opposite to direction of normal travel!*

- Remove noise insulation.
- Remove bolts -1- and -2- for the subframe on the body.

The camber adjustment range is limited by the tolerances of the holes in the subframe. If the specified value is not reached by shifting the subframe, this and the body must be inspected ⇒ [page 2](#) .

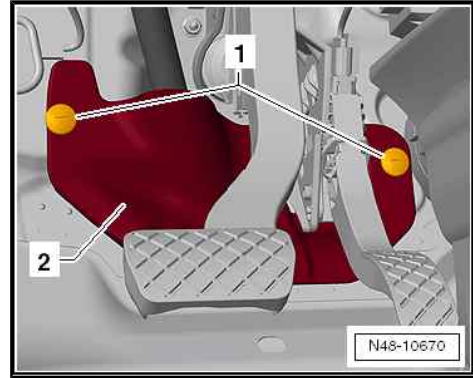
- Now camber may be adjusted to specification by moving subframe.
- Tighten new bolts for subframe to body to specified torque plus extra turn angle.

After shifting subframe, check clearance between steering column universal joint and cut-out in bulkhead.





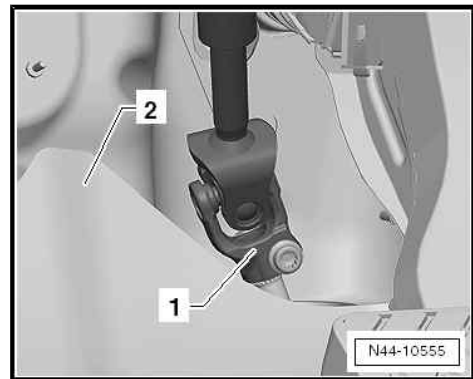
- Unscrew bolts -1- and remove footwell trim -2-.



There must be a clearance of 5 mm all round between universal joint -1- and cut-out in bulkhead -2-.

Specified torques

- ◆ ⇒ ["2.1 Assembly overview - subframe", page 16](#)



1.9 Adjusting camber on rear axle

Camber cannot be adjusted.

If a value lies outside the tolerances, the vehicle's transverse inclination must be checked and, if necessary, compensated for ⇒ [page 120](#) .

If the measured values lie outside the permitted tolerances, the axle beam must be checked for damage and if necessary renewed.

1.10 Adjusting toe at rear axle

Toe cannot be adjusted.

If a value lies outside the tolerances, the vehicle's transverse inclination must be checked and, if necessary, compensated for ⇒ [page 120](#) .

If the measured values lie outside the permitted tolerances, the axle beam must be checked for damage and if necessary renewed.



1.11 Adjusting front axle toe

- Loosen lock nut -1-.
- Adjust toe by turning left and/or right track rod.

To do this use an open-end spanner on the hexagon -arrow- on the track rod.

After turning track rods, ensure that boots are not twisted.

Twisted boots wear out quickly.

- Tighten lock nut -1-.
- Check toe values again.

It is possible that the value will change slightly when lock nut -1- is tightened.

However, if the measured toe value lies within the tolerance, the adjustment is correct.

Specified torques

- ◆ => ["3.3 Repairing steering rack", page 188](#)

1.12 Wheel runout compensation

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

The existing lateral runout of the wheel must be compensated for. Otherwise, the result of the measurement will be incorrect.

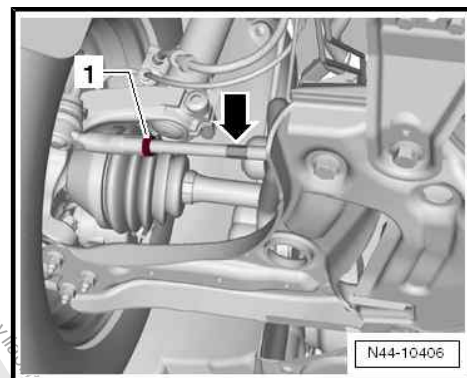
The specified toe-in tolerance may already be exceeded by the permitted amount of axial runout at the wheel rims. In such cases it is not possible to set the toe-in correctly without first compensating for the wheel runout.

Please follow the instructions of the manufacturer of the wheel alignment equipment.

1.13 Checking maximum wheel lock

This check is only necessary, if:

- ◆ the wheel locks differ by more than 2° from one another from the steering centre point,
- ◆ on one side there is contact between tyre and a front axle component or body at full lock,
- ◆ the left and right turning circles differ.





The distance between suspension link and tyres -arrow- must be equal at full wheel lock.

If the distances are unequal then this can be corrected by turning the left and right-hand track rods.

Example:

Left wheel lock distance less than on right

- Loosen track rod lock nuts.
- Turn left-hand track rod (unscrew out of track rod ball joint).
- Turn right-hand track rod same amount in opposite direction (screw into track rod ball joint).
- Check complete toe.

Check total toe is still set to prescribed specifications after completing adjustments.

- Tighten lock nuts.

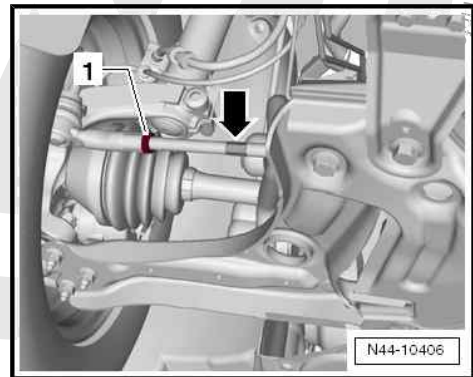
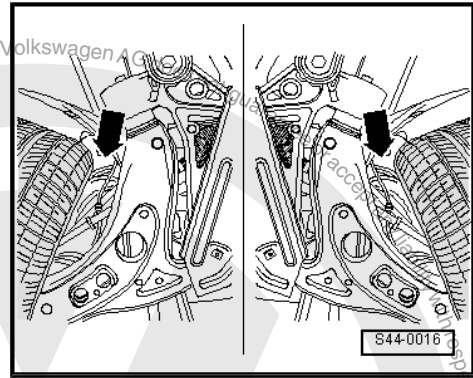
It is possible that the value will change slightly when lock nut -1- is tightened.

If the set value does not deviate by more than 2' from specification, the setting is OK.

After turning track rods, ensure that boots are not twisted.

Specified torques

- ◆ ⇒ ["3.3 Repairing steering rack", page 188](#)





48 – Steering

1 Steering wheel

⇒ [“1.1 Assembly overview - steering wheel”, page 127](#)

⇒ [“1.2 Removing and installing steering wheel”, page 127](#)

1.1 Assembly overview - steering wheel

1 - Steering column

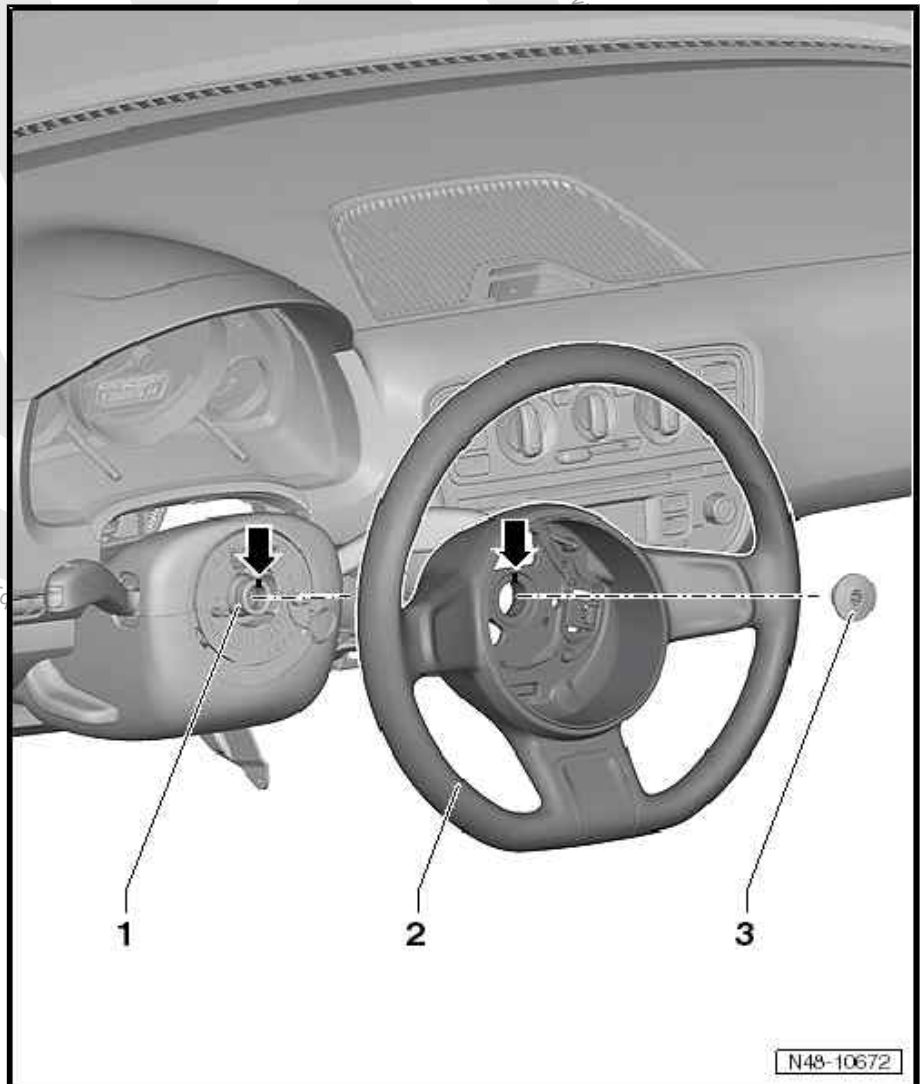
- ❑ Removing and installing
⇒ [page 137](#)

2 - Steering wheel

- ❑ Removing and installing
⇒ [page 127](#)
- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue

3 - Bolt

- ❑ 30 Nm + 90° further
- ❑ Renew after each removal

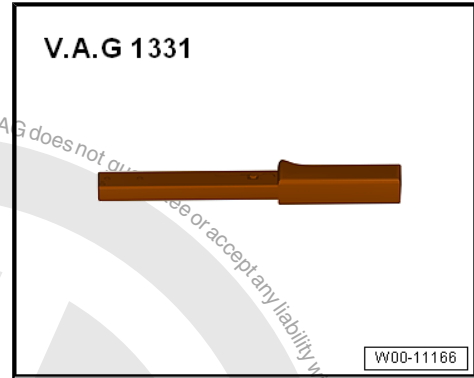


1.2 Removing and installing steering wheel

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-



Removing up! only



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 ; Battery; Disconnecting and reconnecting the battery .*
- ◆ *The wheels must be in straight-ahead position.*

Failure to comply with these precautions may lead to subsequent failure of the airbag system!

e-up! only



WARNING

The following conditions must be met before starting work on the electrical system and removing the steering wheel:

- ◆ *Danger of injury! Observe warnings and safety regulations ⇒ Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .*
- ◆ *Disconnect earth strap from battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .*
- ◆ *The wheels must be in straight-ahead position.*

Failure to comply with these precautions may lead to subsequent failure of the airbag system!

Continued for all vehicles

- Move steering column to middle height position.
- Remove airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .
- Turn wheels to straight-ahead position.



i Note

The steering wheel must be removed/installed in the middle position (wheels facing straight ahead).

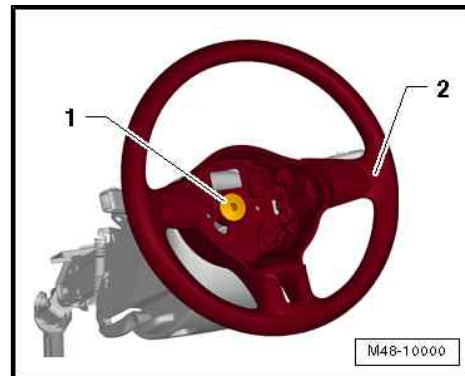
- Remove bolt -1-.
- Mark position of steering wheel/steering column with a felt-tipped pen.
- Pull steering wheel -2- off steering column.

Installing

Install in reverse order. During this procedure, observe the following:

Make sure that the wheels are pointing straight ahead before fitting the steering wheel.

- When installing a steering wheel that has been removed, make sure that the markings on the steering column and steering wheel are in line.
- When installing a new steering wheel (without marking), the steering wheel must be mounted in middle position (steering wheel spoke must be horizontal and wheels in straight position).
- Install steering wheel.
- Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .



WARNING

When connecting battery ensure that no people are in the vehicle!

up! only

- Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

e-up! only



WARNING

- ◆ ***Danger of injury! Observe warnings and safety regulations ⇒ Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .***
- ◆ ***Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .***

- Carry out road test.
- If the steering wheel is skewed, the steering wheel must be removed again and refitted onto the splines of the steering column.

Specified torques

- ◆ ⇒ **[“1.1 Assembly overview - steering wheel”, page 127](#)**



2 Steering column

⇒ [“2.1 Assembly overview - steering column”, page 130](#)

⇒ [“2.2 Removing and installing steering column”, page 137](#)

⇒ [“2.3 Handling and transporting steering column”, page 168](#)

⇒ [“2.4 Removing and installing power steering control unit J500”, page 170](#)

⇒ [“2.5 Removing and installing intermediate steering shaft”, page 181](#)

2.1 Assembly overview - steering column

⇒ [“2.1.1 Assembly overview – steering column, electric steering column, LHD vehicles, up!”, page 130](#)

⇒ [“2.1.2 Assembly overview – steering column, electric steering column, LHD vehicles, e-up!”, page 132](#)

⇒ [“2.1.3 Assembly overview – steering column, electric steering column, RHD vehicles”, page 133](#)

⇒ [“2.1.4 Assembly overview – steering column, steel steering column”, page 134](#)

⇒ [“2.1.5 Assembly overview – steering column, repairing electric steering column, NSK”, page 135](#)

⇒ [“2.1.6 Assembly overview – steering column, repairing electric steering column, TRW”, page 136](#)

⇒ [“2.1.7 Renewing assembly aid”, page 136](#)

2.1.1 Assembly overview – steering column, electric steering column, LHD vehicles, up!



Note

- ◆ *It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.*
- ◆ *Always renew self-locking nuts.*
- ◆ *Always renew corroded nuts and bolts.*



1 - Central tube for dash panel

2 - Nut

3 - Bolt

- 20 Nm
- Observe tightening sequence ⇒ [page 142](#)

4 - Steering column

- Removing and installing ⇒ [page 137](#)
- Can be tested in guided fault finding using ⇒ Vehicle diagnostic tester



Note

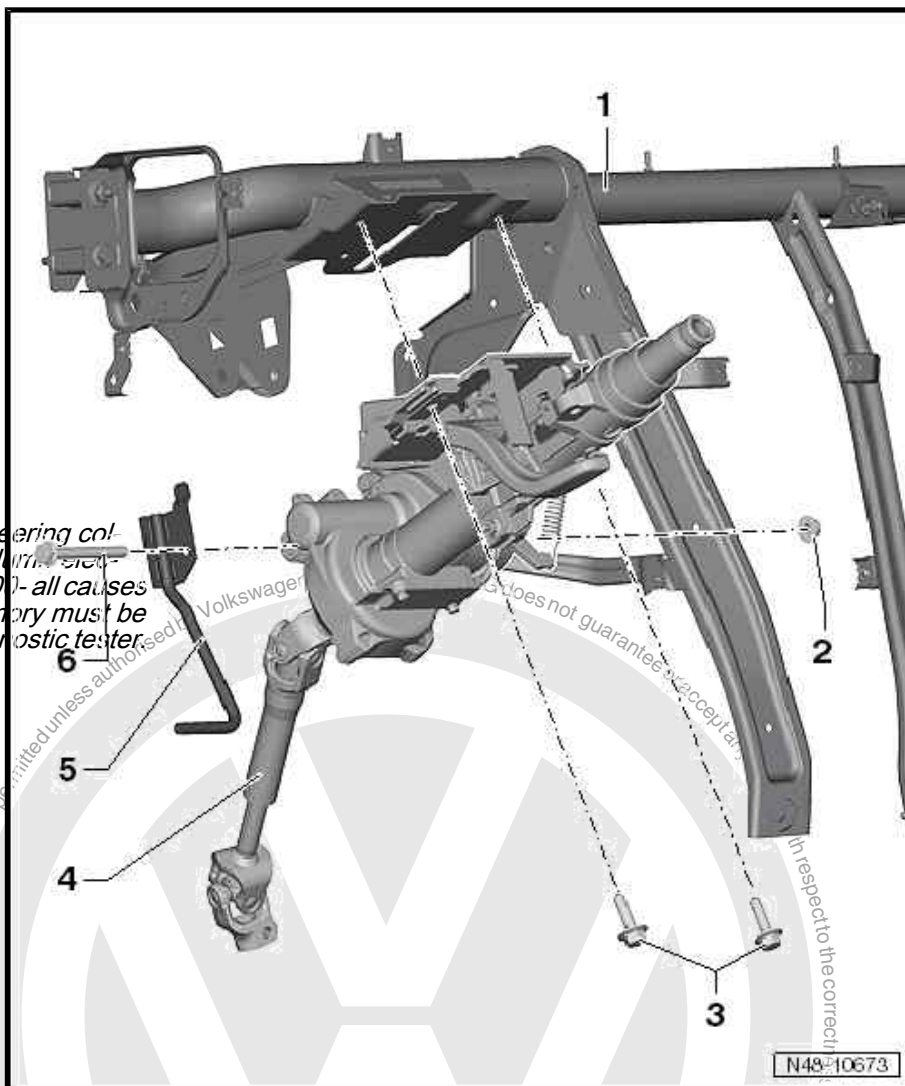
Before renewing the steering column or the steering column electronics control unit - J500 - all causes of entries in event memory must be rectified ⇒ Vehicle diagnostic tester

5 - Crash bar

- Allocation ⇒ Electronic parts catalogue "ETKA"

6 - Bolt

- 20 Nm
- Observe tightening sequence ⇒ [page 142](#)





2.1.2 Assembly overview – steering column, electric steering column, LHD vehicles, e-up!



Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.

1 - Central tube for dash panel

2 - Crash bar

- Allocation ⇒ Electronic parts catalogue "ETKA"

3 - Bolt

- 20 Nm
- Observe tightening sequence ⇒ [page 149](#)

4 - Steering column

- Removing and installing ⇒ [page 145](#)
- Can be tested in guided fault finding using ⇒ Vehicle diagnostic tester

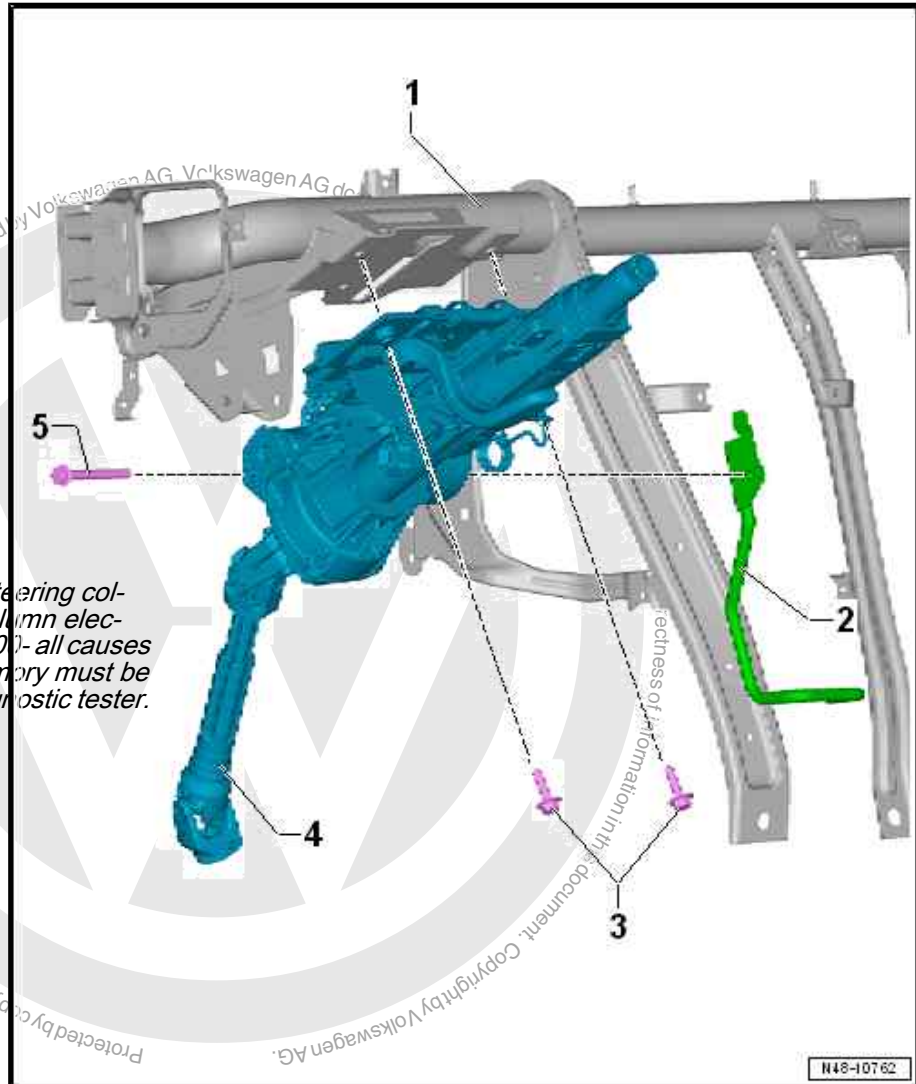


Note

Before renewing the steering column or the steering column electronics control unit - J500 - all causes of entries in event memory must be rectified ⇒ Vehicle diagnostic tester.

5 - Bolt

- 20 Nm
- Observe tightening sequence ⇒ [page 149](#)





2.1.3 Assembly overview – steering column, electric steering column, RHD vehicles

Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.

1 - Central tube for dash panel

2 - Bolt

- 20 Nm
- Observe tightening sequence ⇒ [page 158](#)

3 - Steering column

- Removing and installing ⇒ [page 152](#)
- Can be tested in guided fault finding using ⇒ Vehicle diagnostic tester

Note

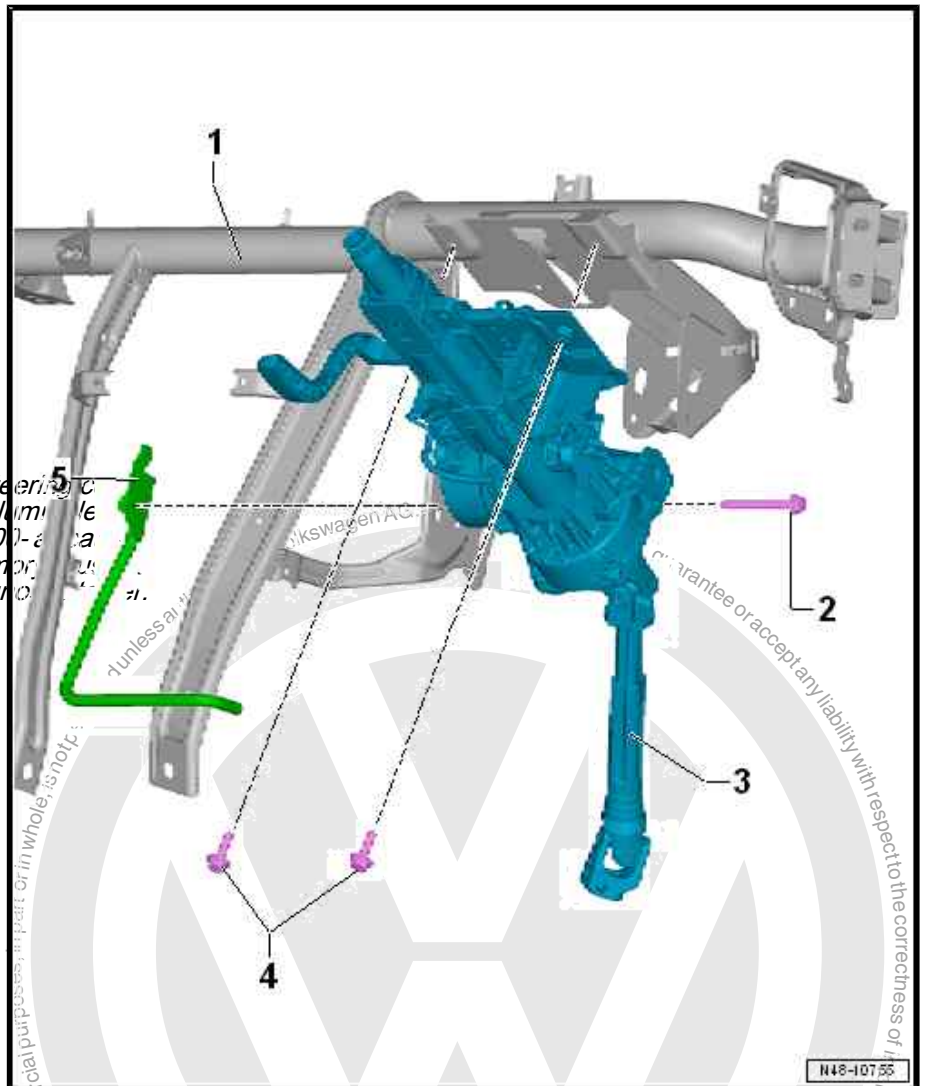
Before renewing the steering column or the steering column electronics control unit - J500 - a check of entries in event memory must be rectified ⇒ Vehicle diagnostic tester

4 - Bolt

- 20 Nm
- Observe tightening sequence ⇒ [page 158](#)

5 - Crash bar

- Allocation ⇒ Electronic parts catalogue "ETKA"





2.1.4 Assembly overview – steering column, steel steering column



Note

- ◆ *It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.*
- ◆ *Always renew self-locking nuts.*
- ◆ *Always renew corroded nuts and bolts.*

1 - Central tube for dash panel

2 - Nut

3 - Bolt

- ❑ 20 Nm
- ❑ Observe tightening sequence ⇒ [page 166](#)

4 - Steering column

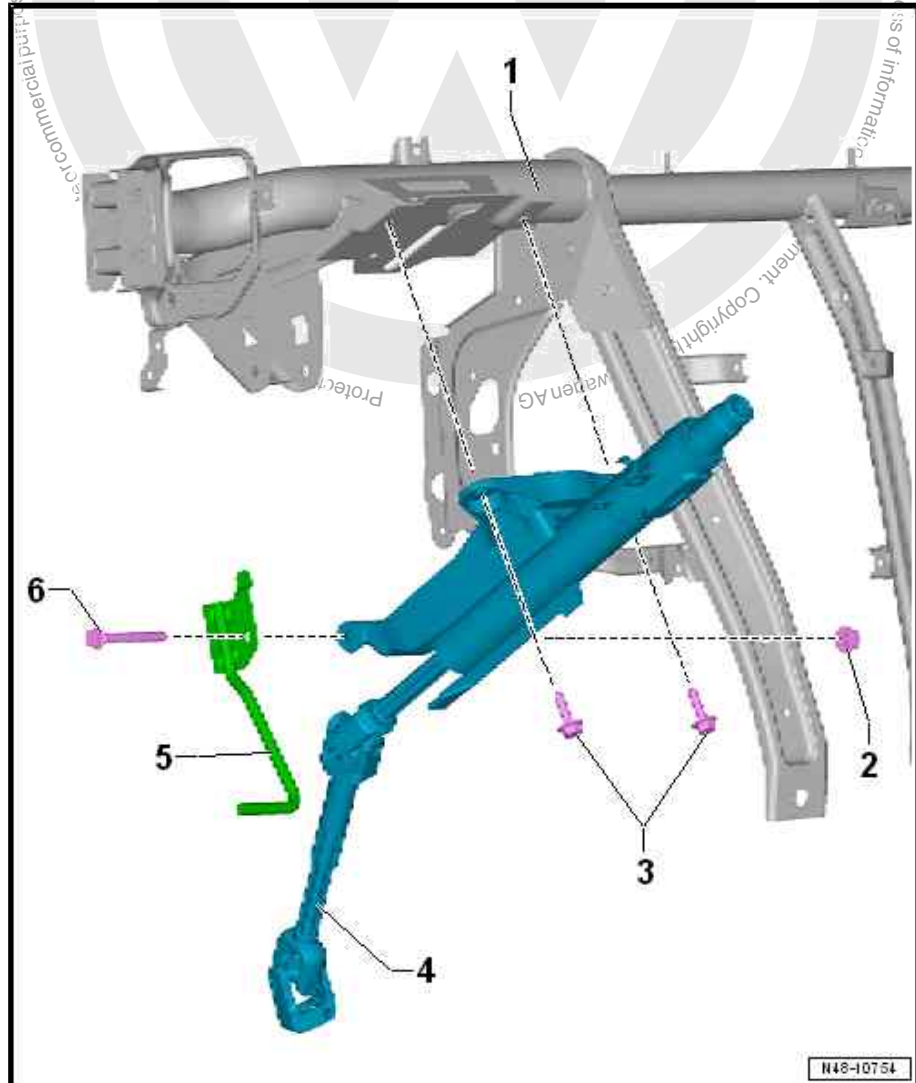
- ❑ Removing and installing ⇒ [page 161](#)

5 - Crash bar

- ❑ Allocation ⇒ Electronic parts catalogue "ETKA"

6 - Bolt

- ❑ 20 Nm
- ❑ Observe tightening sequence ⇒ [page 166](#)





2.1.5 Assembly overview – steering column, repairing electric steering column, NSK

1 - Cap

2 - Bolt

- 4 Nm
- Renew after each removal

3 - Steering column electronics control unit - J500-

- Removing and installing
 ⇒ [page 170](#)

4 - Bolt

- 20 Nm
- Renew after each removal

5 - Bolt

- 2 Nm
- Renew after each removal

6 - Assembly aid

- Removing and installing
 ⇒ [page 136](#)

7 - Steering column

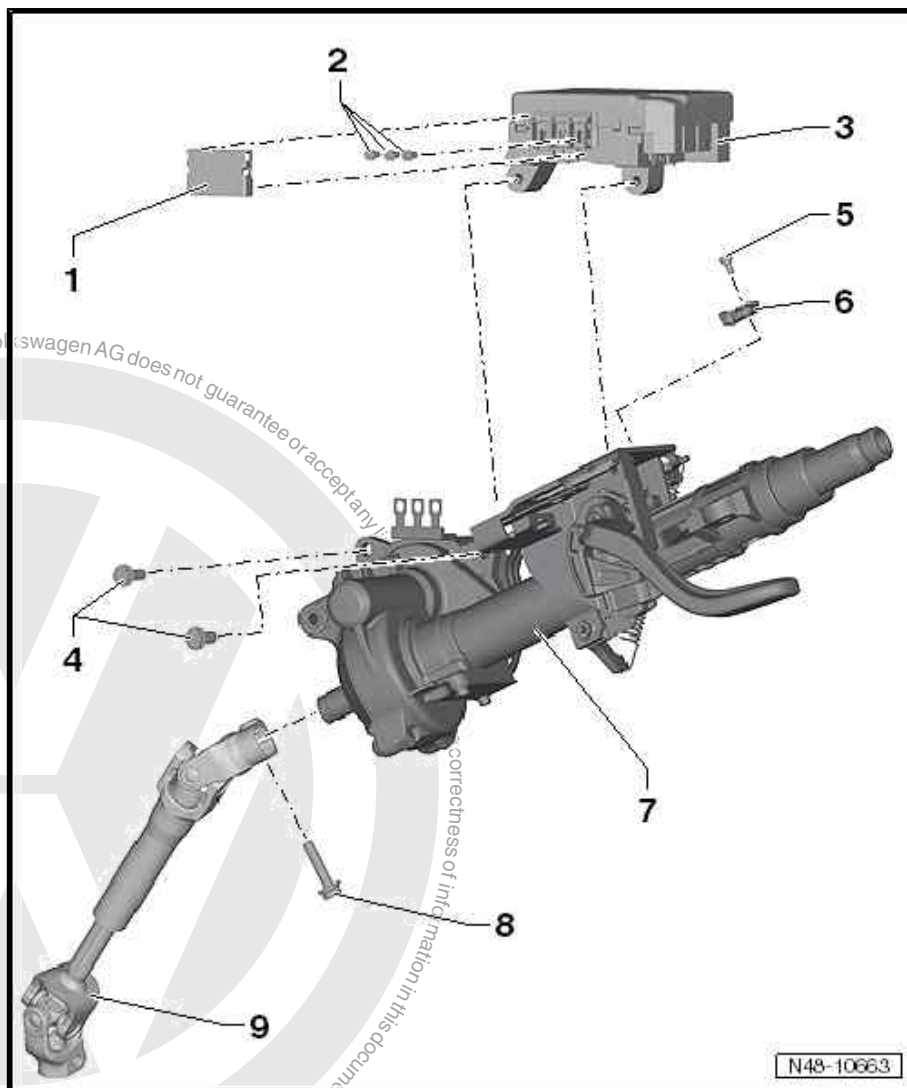
- Removing and installing
 ⇒ [page 137](#)

8 - Bolt

- 20 Nm + 180° further
- Renew after each removal

9 - Drive shaft

- Removing and installing
 ⇒ [page 181](#)

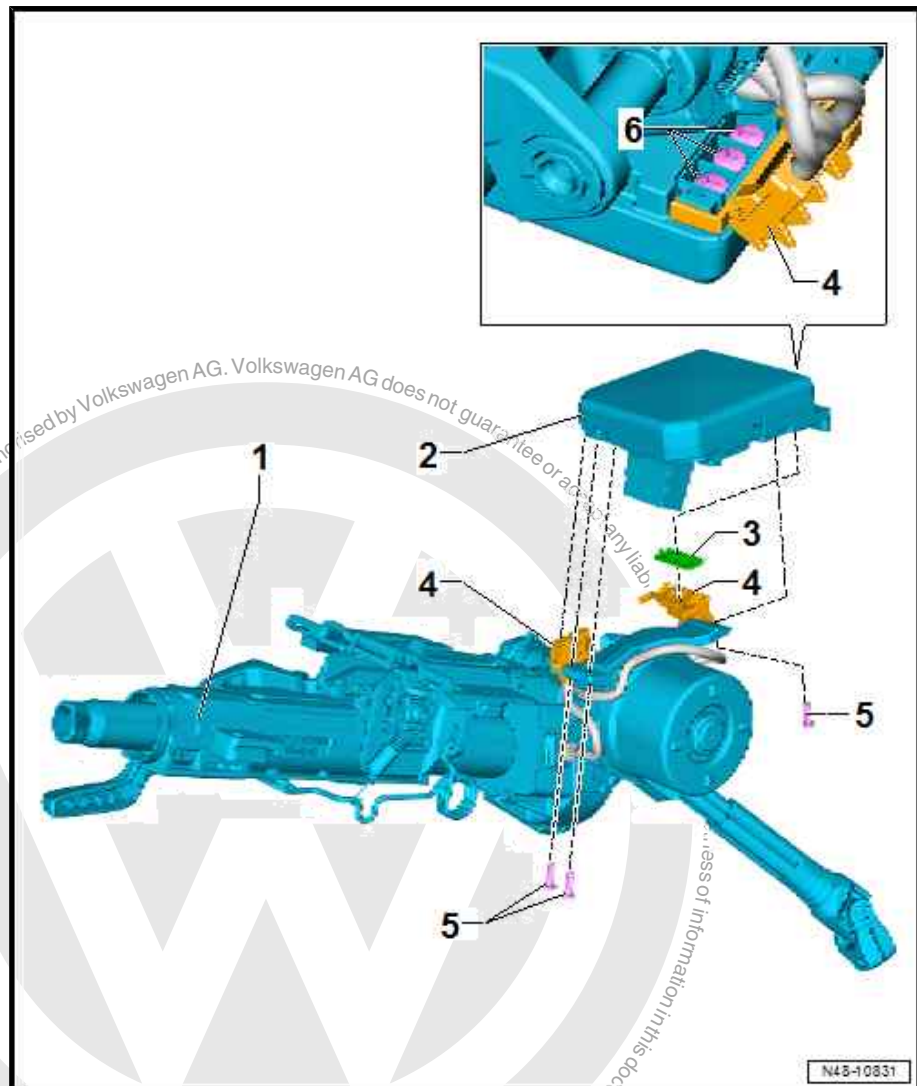


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2.1.6 Assembly overview – steering column, repairing electric steering column, TRW

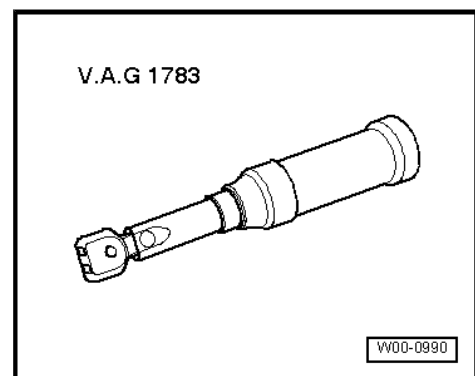
- 1 - Steering column
 - Removing and installing
⇒ [page 137](#)
- 2 - Power steering control unit - J500-
 - Removing and installing
⇒ [page 170](#)
- 3 - Cap
 - Renew after each removal
 - Allocation ⇒ Electronic parts catalogue "ETKA"
- 4 - Wiring harness
- 5 - Bolt
 - Renew after each removal
 - Allocation ⇒ Electronic parts catalogue "ETKA"
 - Qty. 3
 - 6 Nm
- 6 - Bolt
 - Renew after each removal
 - Allocation ⇒ Electronic parts catalogue "ETKA"
 - Qty. 3
 - 2.75 Nm



2.1.7 Renewing assembly aid

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Removing

- Remove steering column ⇒ [page 137](#) .



- Unscrew bolt -1- and remove assembly aid -2- from steering column.

Installing

- Insert lug -arrow A- on assembly aid -1- into hole -arrow B- of steering column -2-.



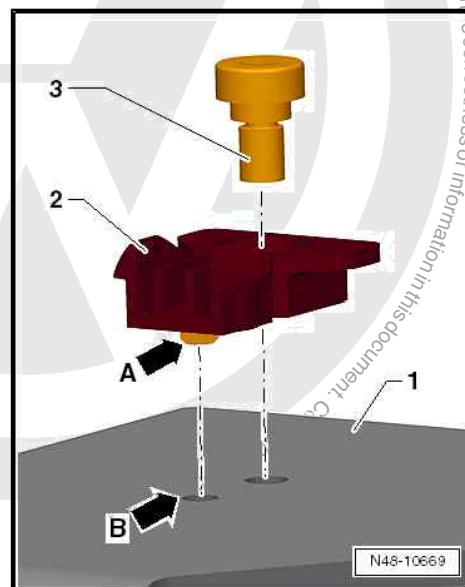
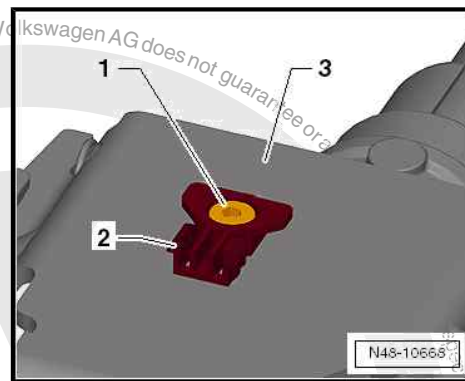
Note

The hole of assembly aid -1- must face towards splines of steering column -2-.

- Screw in bolts -3- and tighten to specified torque.

Specified torques

| Component | Specified torque |
|---------------------------------|------------------|
| Assembly aid to steering column | 2 Nm |



2.2 Removing and installing steering column

⇒ [“2.2.1 Removing and installing steering column, electric steering column, LHD vehicles, up!”](#), page 137

⇒ [“2.2.2 Removing and installing steering column, electric steering column, LHD vehicles, e-up!”](#), page 145

⇒ [“2.2.3 Removing and installing steering column, electric steering column, RHD vehicles”](#), page 152

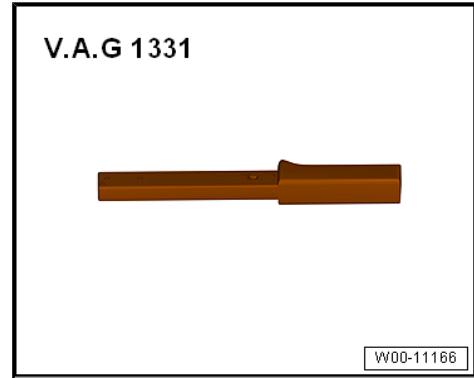
⇒ [“2.2.4 Removing and installing steering column, steel steering column”](#), page 161

2.2.1 Removing and installing steering column, electric steering column, LHD vehicles, up!

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



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 ; Battery; Disconnecting and reconnecting the battery .*
- ◆ *The wheels must be in straight-ahead position.*

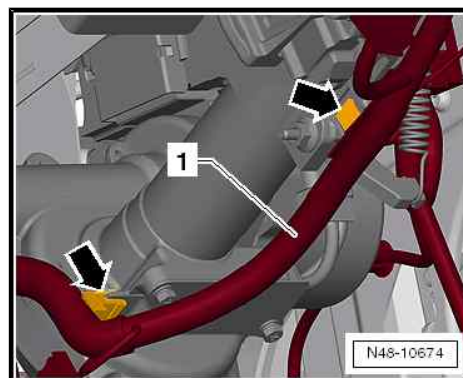
Failure to comply with these precautions may lead to subsequent failure of the airbag system!

- Turn wheels to straight-ahead position.
- Pull down lever on side of steering column.
- Swing steering column down as far as possible and pull out.
- Press lever on side of steering column back up.
- Remove driver side airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .
- Remove steering wheel ⇒ [page 127](#) .
- Remove steering column combination switch - E595- ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .
- Remove dash panel trim below steering column ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .



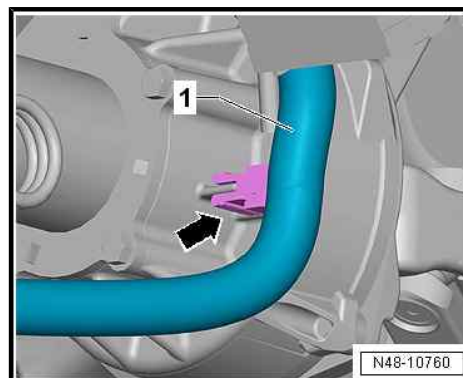
Vehicles with steering column from NSK

- Unclip wiring harness -1- from steering column -arrows-.



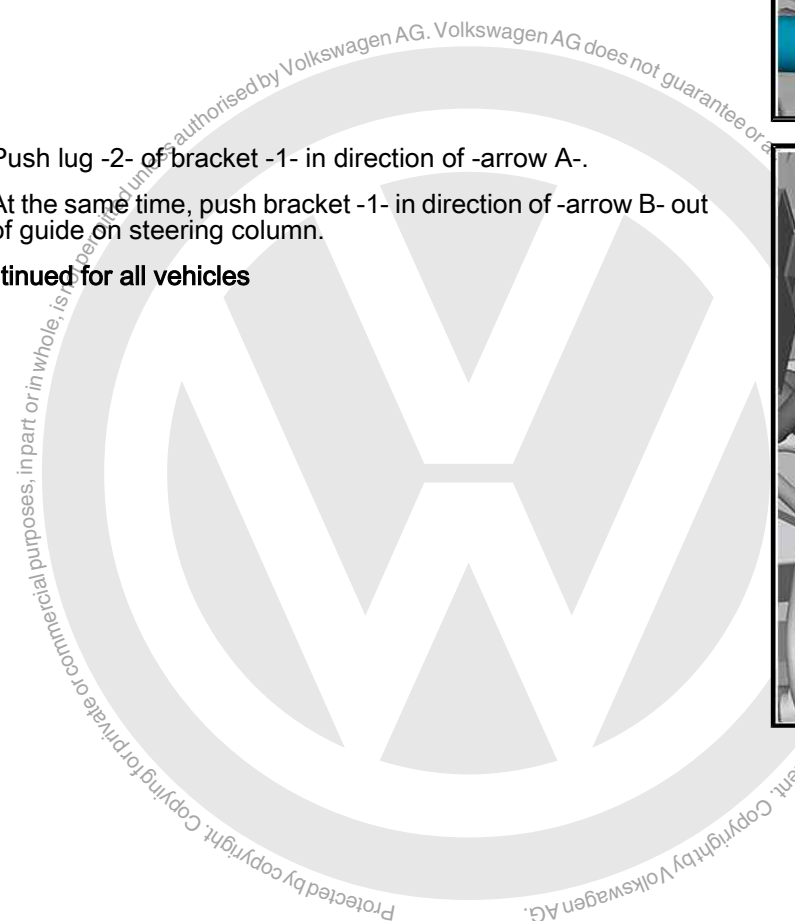
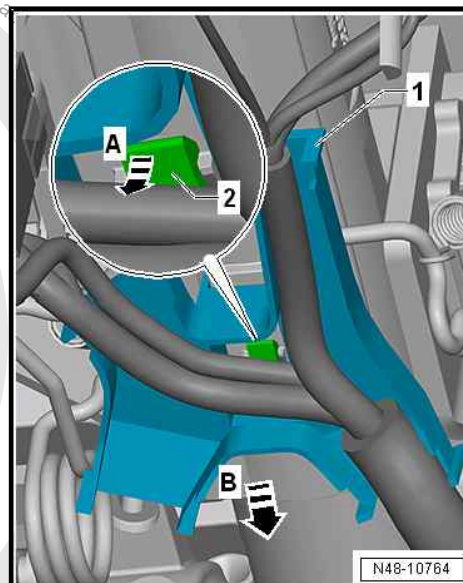
Vehicles with steering column from TRW

- Unclip wiring harness -1- from steering column -arrow-.



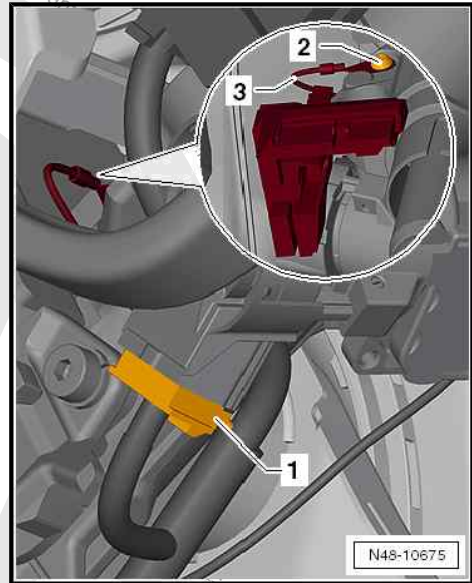
- Push lug -2- of bracket -1- in direction of -arrow A-.
- At the same time, push bracket -1- in direction of -arrow B- out of guide on steering column.

Continued for all vehicles

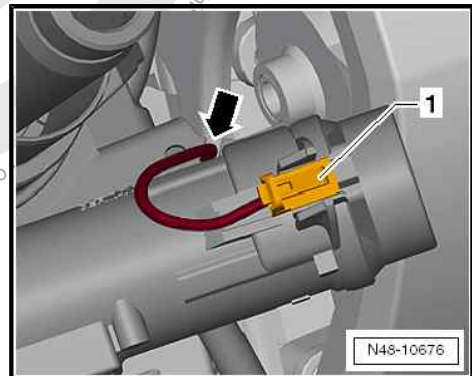




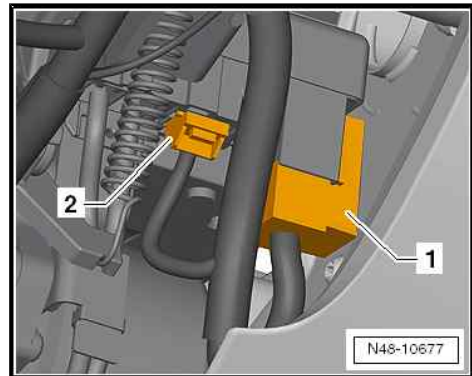
- Disconnect connector -1- from steering lock.
- Unscrew bolt -2- and remove earth wire from steering column -3-.



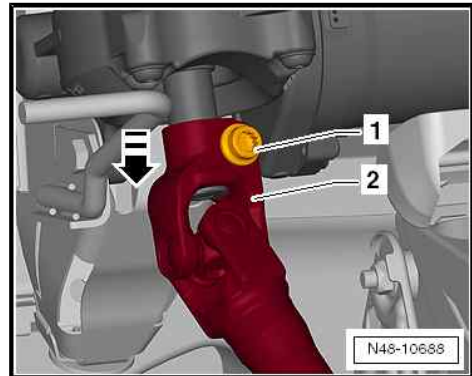
- Unplug connector -1- from immobiliser reader coil - D2- .
- Remove wire from retainer -arrow-.



- Disconnect connectors -1- and -2- from steering column electronics control unit - J500- .

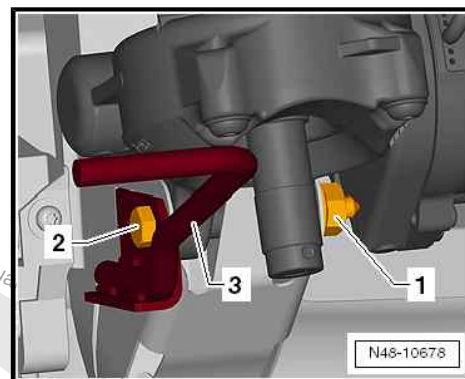


- Unscrew bolt -1-.
- Pull steering column articulated shaft -2- in -direction of arrow- off steering column and lay to side.

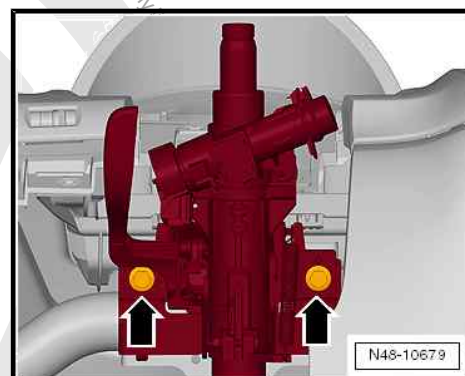




- Unscrew nut -1-.
- Pull out bolt -2- and remove crash bar -3-.

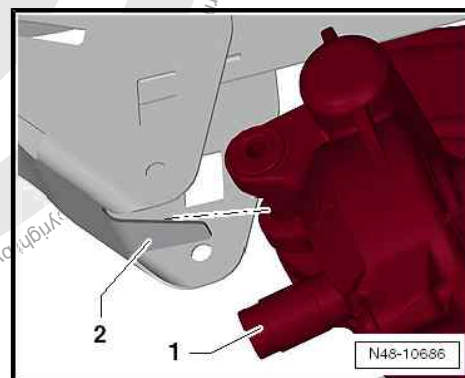


- Unscrew bolts -arrows- from steering column and hold steering column.



- Lower steering column -1- slightly and carefully pull forwards out of guide -2- on cross member.

Caution
Take great care to ensure the steering column is handled and transported correctly ⇒ [page 168](#) .



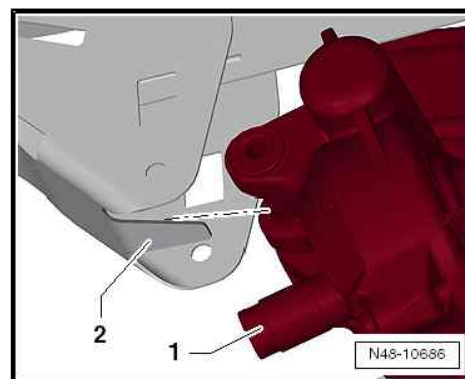
Installing

- Fit new assembly aid to steering column ⇒ [page 136](#) .

Note

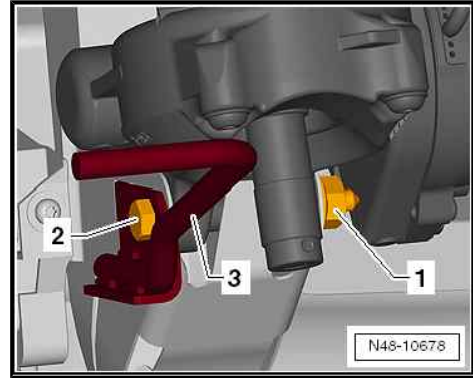
When installing steering column, adhere strictly to bolting sequence.

- Insert steering column -1- carefully into guide -2- on cross member.

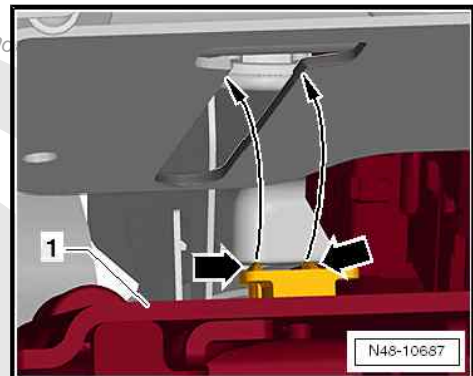




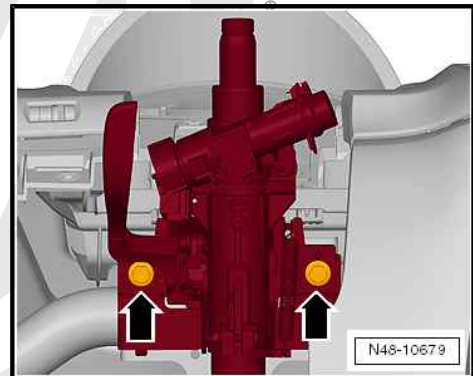
- Insert bolt -2- and crash bar -3-.
- Start nut -1-.



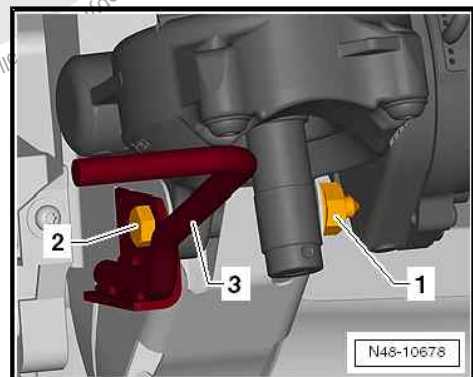
- Swivel steering column upwards until it engages in cross member.
- The lugs of assembly aid -arrows- must engage in cross member.



- Start steering column bolts -arrows-.

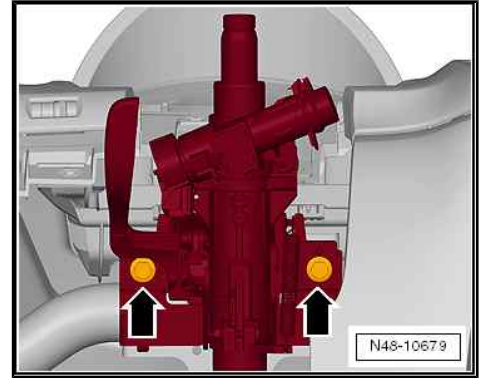


- Tighten bolt -2-.

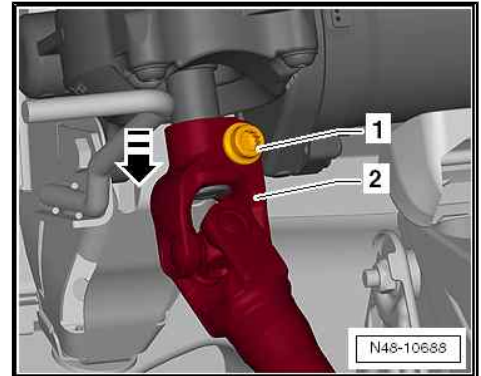




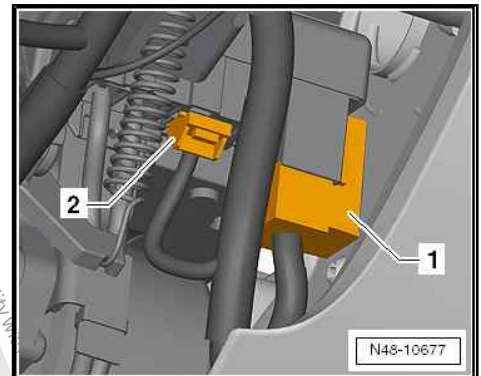
- Tighten steering column bolts -arrows-.



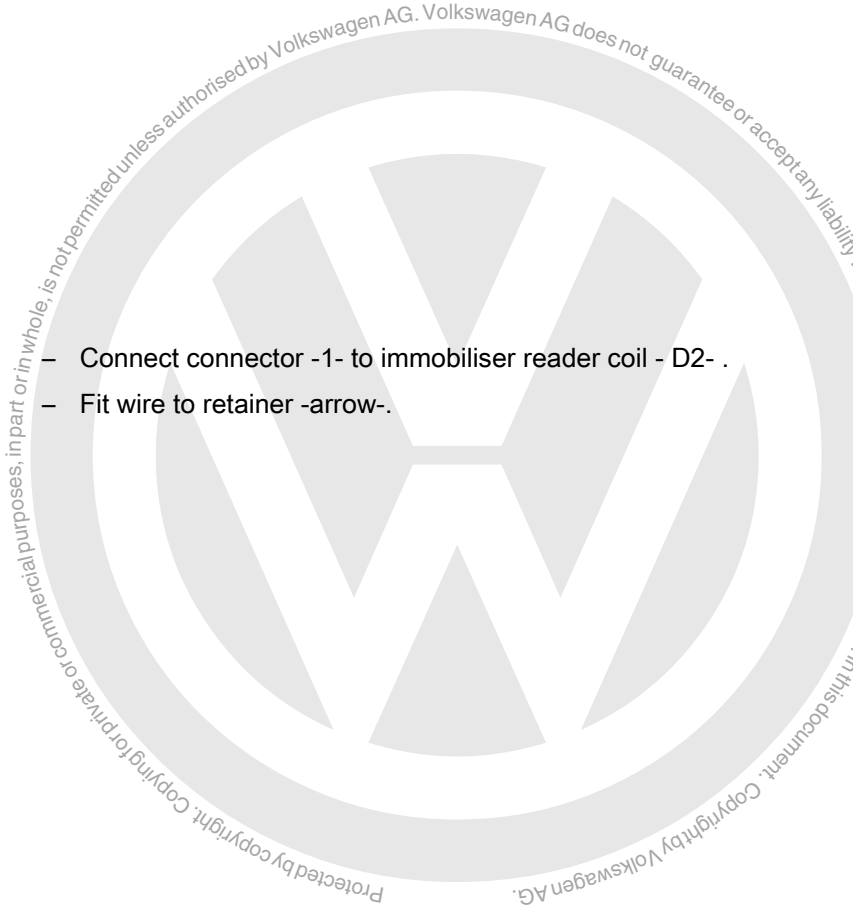
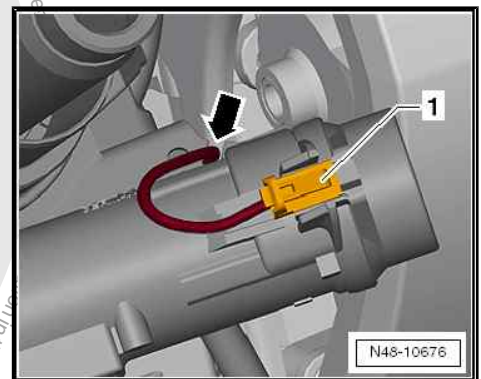
- Fit steering column articulated shaft -2- to steering column in opposite -direction of arrow- and tighten new bolt -1- to specified torque.



- Connect connectors -1- and -2- to steering column electronics control unit - J500- .



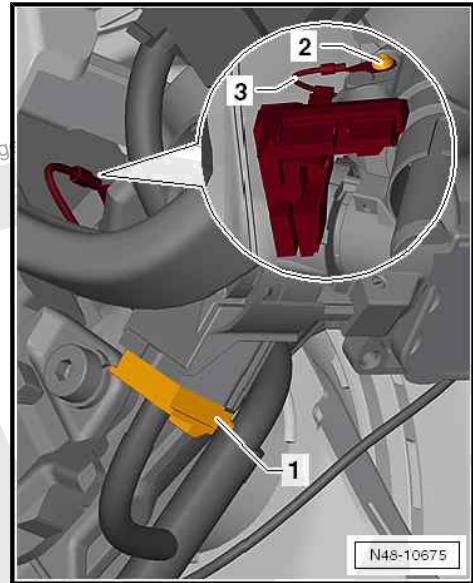
- Connect connector -1- to immobiliser reader coil - D2- .
- Fit wire to retainer -arrow-.





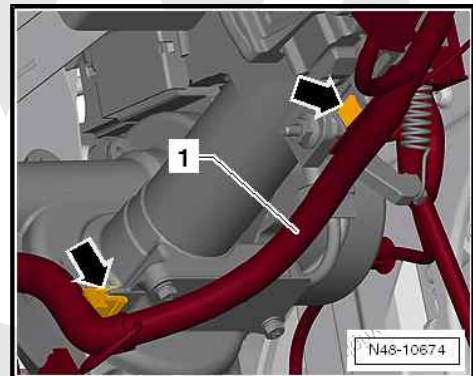
- Secure earth wire to steering column -3- by means of bolt -2-.
- Connect connector -1- to steering lock.

Vehicles with steering column from NSK

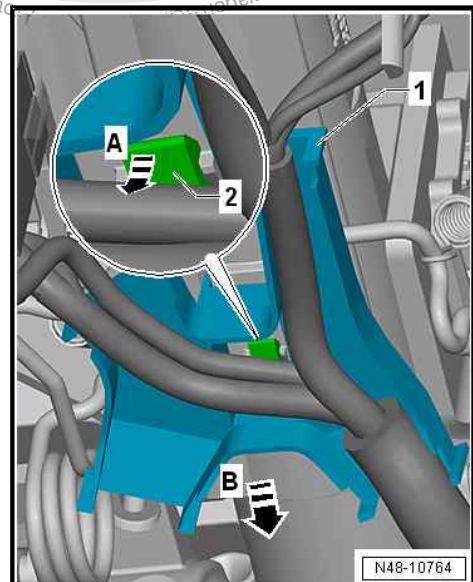


- Clip in wiring harness -1- on steering column -arrows-.

Vehicles with steering column from TRW



- Push bracket -1- in opposite direction of -arrow B- into guide on steering column.
- Make sure that lug -2- of bracket -1- engages in steering column.

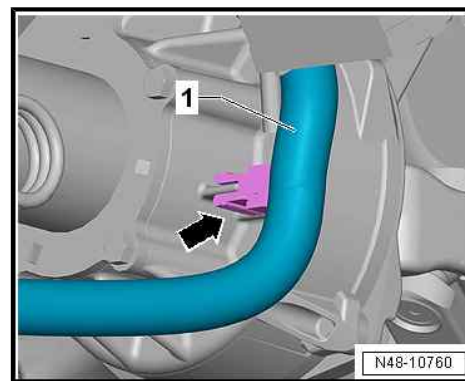




- Clip in wiring harness -1- on steering column -arrow-.

Continued for all vehicles

- Install dash panel trim below steering column ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Install steering column combination switch - E595- ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .
- Install upper steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .
- Install lower steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .
- Install steering wheel ⇒ [page 127](#) .
- Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .
- Steering mechanism needs to be re-adapted every time after the steering column has been renewed or reinstalled after removal ⇒ Vehicle diagnostic tester.



WARNING

When connecting battery ensure that no people are in the vehicle!

- Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Specified torques

- ◆ ⇒ ["1.1 Assembly overview - steering wheel", page 127](#)
- ◆ ⇒ ["2.1.1 Assembly overview – steering column, electric steering column, LHD vehicles, up!", page 130](#)
- ◆ ⇒ ["2.1.5 Assembly overview – steering column, repairing electric steering column, NSK", page 135](#)

2.2.2 Removing and installing steering column, electric steering column, LHD vehicles, e-up!

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166



◆ Torque wrench - V.A.G 1332-



Removing



WARNING

The following conditions must be met before starting work on the electrical system and removing the steering wheel:

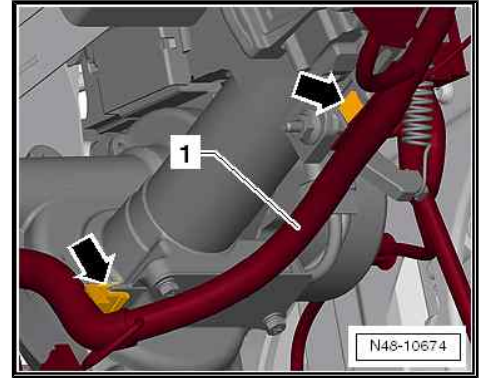
- ◆ **Danger of injury! Observe warnings and safety regulations**
⇒ *Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .*
- ◆ **Disconnect earth strap from battery** ⇒ *Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .*
- ◆ **The wheels must be in straight-ahead position.**

Failure to comply with these precautions may lead to subsequent failure of the airbag system!

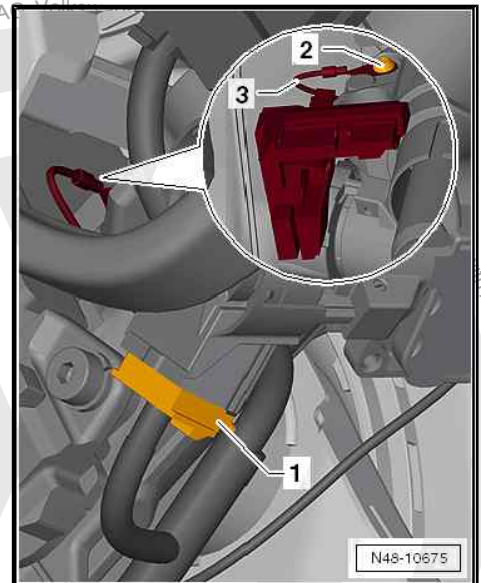
- Turn wheels to straight-ahead position.
- Pull down lever on side of steering column.
- Swing steering column down as far as possible and pull out.
- Press lever on side of steering column back up.
- Remove driver side airbag unit ⇒ *General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .*
- Remove steering wheel ⇒ [page 127](#) .
- Remove steering column combination switch - E595- ⇒ *Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .*
- Remove dash panel trim below steering column ⇒ *General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .*



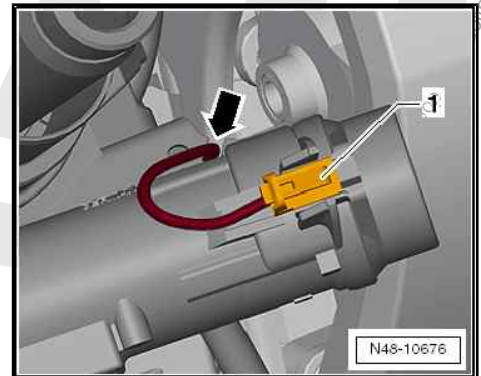
- Unclip wiring harness -1- from steering column -arrows-.



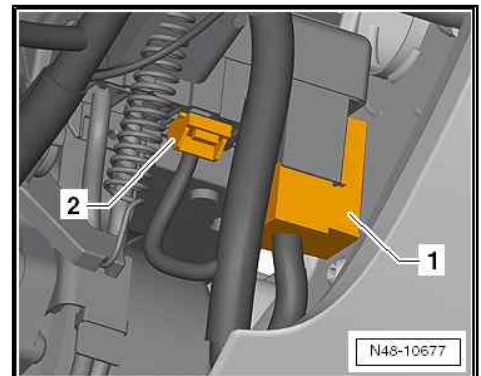
- Disconnect connector -1- from steering lock.
- Unscrew bolt -2- and remove earth wire from steering column -3-.



- Unplug connector -1- from immobiliser reader coil - D2- .
- Remove wire from retainer -arrow-.

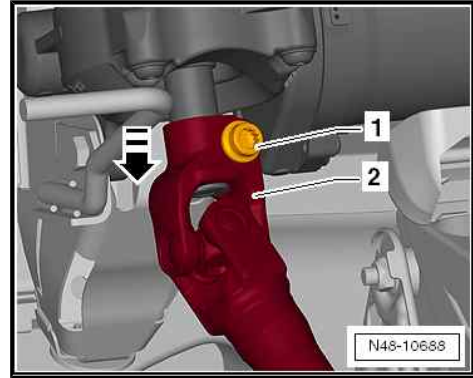


- Disconnect connectors -1- and -2- from steering column electronics control unit - J500- .

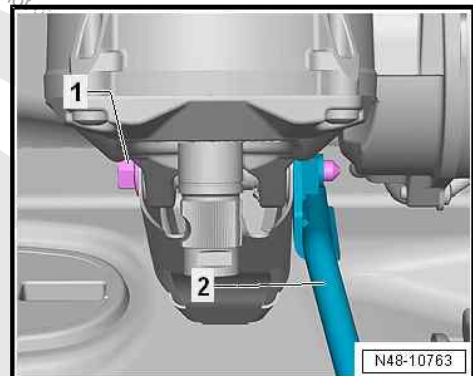




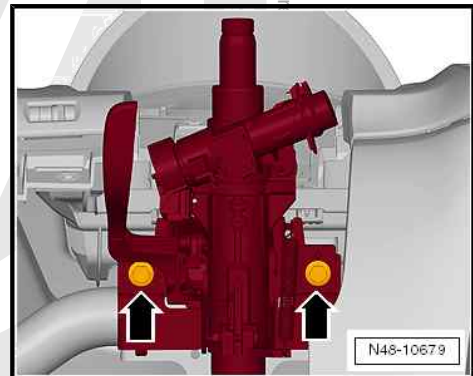
- Unscrew bolt -1-.
- Pull steering column articulated shaft -2- in -direction of arrow- off steering column and lay to side.



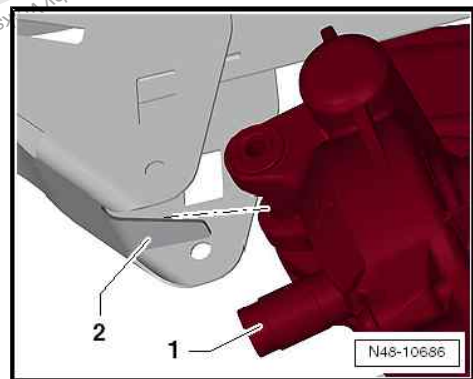
- Unscrew bolt -1-, and, while doing so, remove crash bar -2-.



- Unscrew bolts -arrows- from steering column and hold steering column.



- Lower steering column -1- slightly and carefully pull forwards out of guide -2- on cross member.



Caution

Take great care to ensure the steering column is handled and transported correctly => [page 168](#).

Installing

- Fit new assembly aid to steering column => [page 136](#).

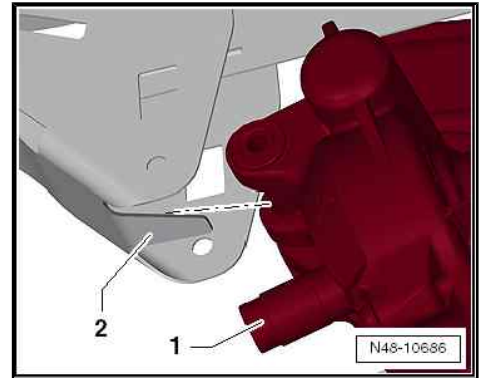


Note

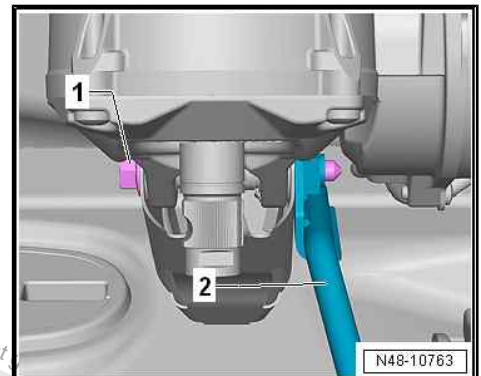
When installing steering column, adhere strictly to bolting sequence.



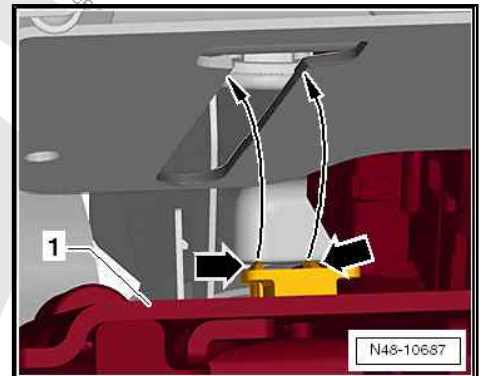
- Insert steering column -1- carefully into guide -2- on cross member.



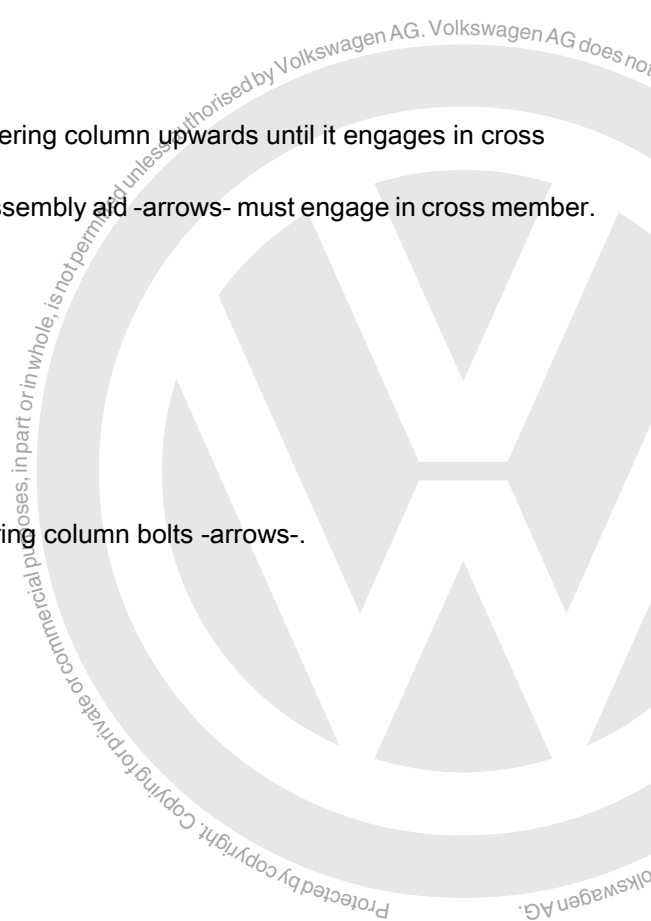
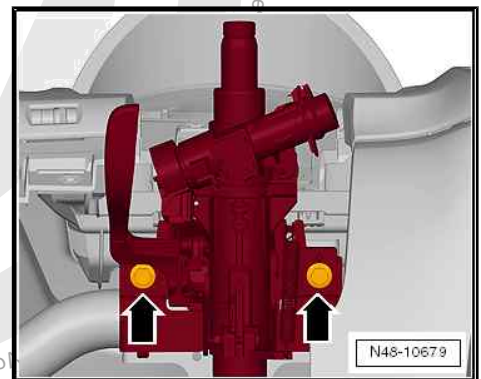
- Insert crash bar -2-, and tighten bolt -1-.



- Swivel steering column upwards until it engages in cross member.
The lugs of assembly aid -arrows- must engage in cross member.

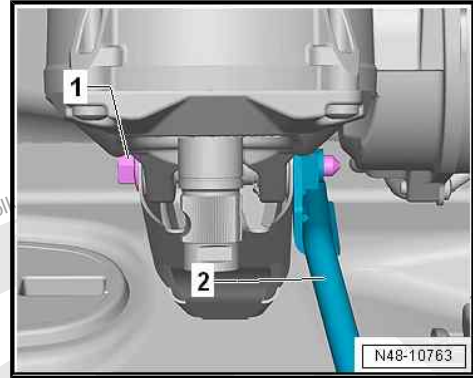


- Start steering column bolts -arrows-.

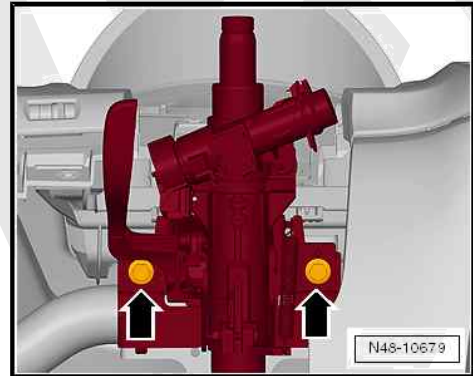




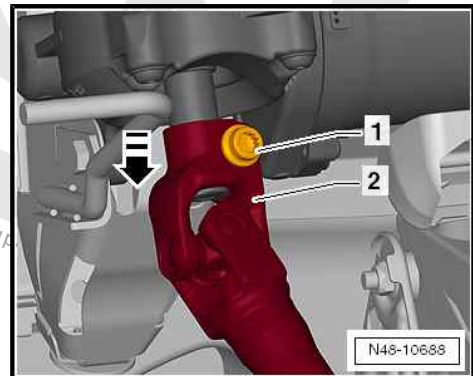
- Tighten bolt -1-.



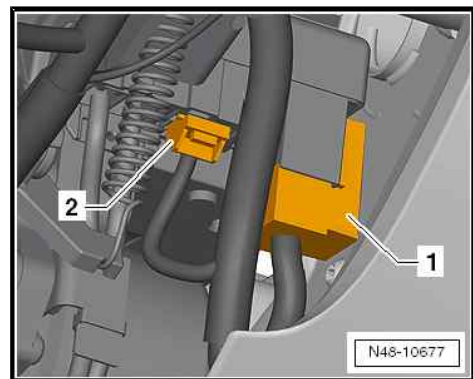
- Tighten steering column bolts -arrows-.



- Fit steering column articulated shaft -2- to steering column in opposite -direction of arrow- and tighten new bolt -1- to specified torque.

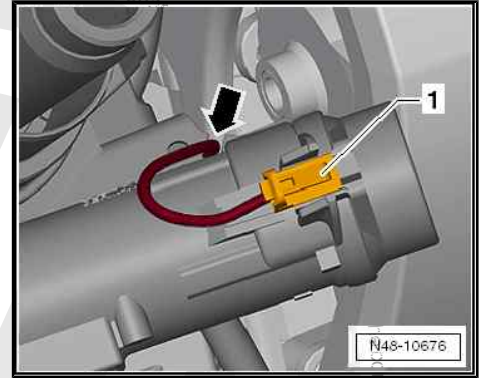


- Connect connectors -1- and -2- to steering column electronics control unit - J500- .

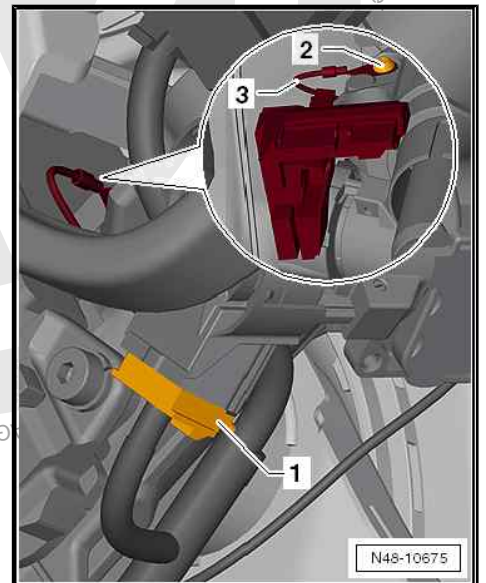




- Connect connector -1- to immobiliser reader coil - D2- .
- Fit wire to retainer -arrow-.

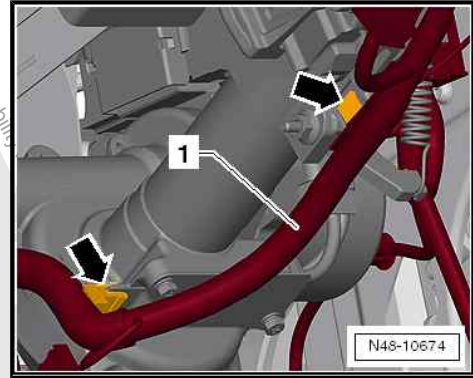


- Secure earth wire to steering column -3- by means of bolt -2-.
- Connect connector -1- to steering lock.





- Clip in wiring harness -1- on steering column -arrows-.
- Install dash panel trim below steering column ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Install steering column combination switch - E595- ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .
- Install upper steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .
- Install lower steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .
- Install steering wheel ⇒ [page 127](#) .
- Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .
- Steering mechanism needs to be re-adapted every time after the steering column has been renewed or reinstalled after removal ⇒ Vehicle diagnostic tester.



WARNING

When connecting battery ensure that no people are in the vehicle!



WARNING

- ◆ **Danger of injury! Observe warnings and safety regulations ⇒ Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .**
- ◆ **Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .**

Specified torques

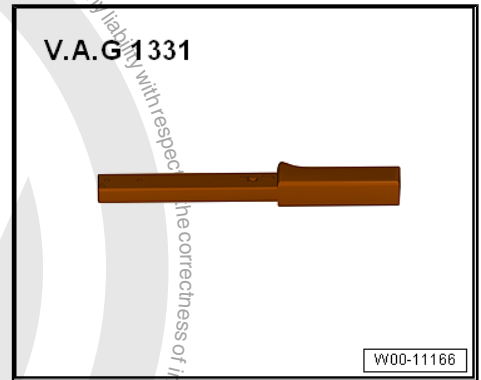
- ◆ ⇒ [“1.1 Assembly overview - steering wheel”, page 127](#)
- ◆ ⇒ [“2.1.2 Assembly overview – steering column, electric steering column, LHD vehicles, e-up!”, page 132](#)
- ◆ ⇒ [“2.1.5 Assembly overview – steering column, repairing electric steering column, NSK”, page 135](#)

2.2.3 Removing and installing steering column, electric steering column, RHD vehicles

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - V.A.G 1332-



Removing up! only



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 ; Battery; Disconnecting and reconnecting the battery .*
- ◆ *The wheels must be in straight-ahead position.*

Failure to comply with these precautions may lead to subsequent failure of the airbag system!



e-up! only



WARNING

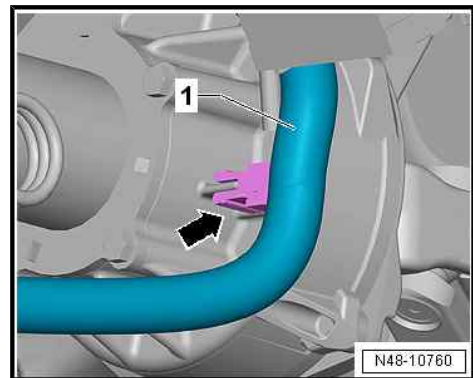
The following conditions must be met before starting work on the electrical system and removing the steering wheel:

- ◆ **Danger of injury! Observe warnings and safety regulations**
⇒ *Electrical system, general information; Rep. gr. 27 ;
Battery; Warnings and safety regulations .*
- ◆ **Disconnect earth strap from battery** ⇒ *Electrical system;
Rep. gr. 27 ; Battery; Disconnecting and connecting bat-
tery - A- .*
- ◆ **The wheels must be in straight-ahead position.**

**Failure to comply with these precautions may lead to subse-
quent failure of the airbag system!**

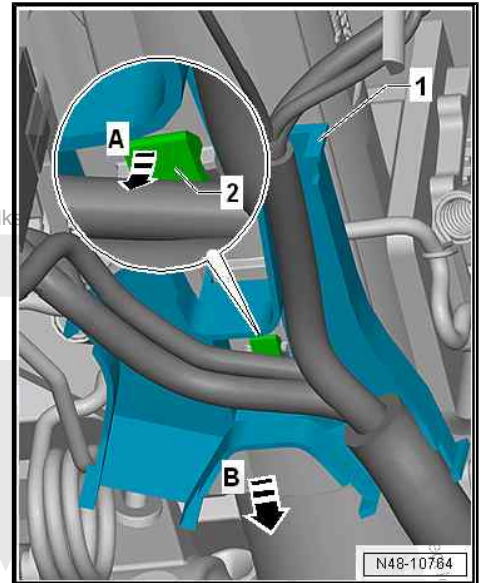
Continued for all vehicles

- Turn wheels to straight-ahead position.
- Pull down lever on side of steering column.
Swing steering column down as far as possible and pull out.
Press lever on side of steering column back up.
- Remove driver side airbag unit ⇒ *General body repairs, inter-
ior; Rep. gr. 69 ; Driver side airbag; Removing and installing
airbag unit with igniter .*
- Remove steering wheel ⇒ [page 127](#) .
- Remove steering column combination switch - E595- ⇒ *Elec-
trical system; Rep. gr. 94 ; Steering column switch module;
Assembly overview - steering column switch module .*
- Remove dash panel trim below steering column ⇒ *General
body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly
overview - dash panel .*
- Unclip wiring harness -1- from steering column -arrow-.

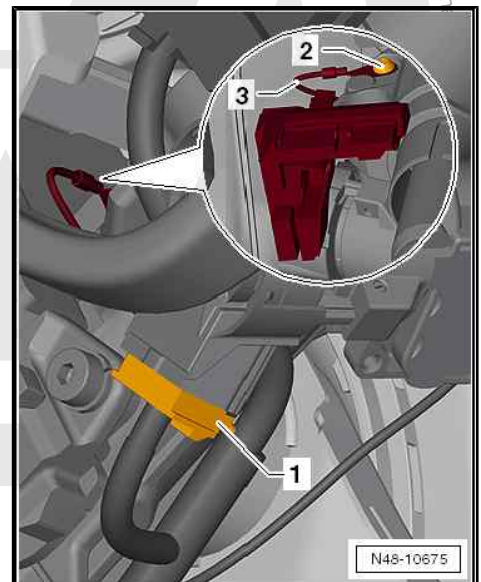




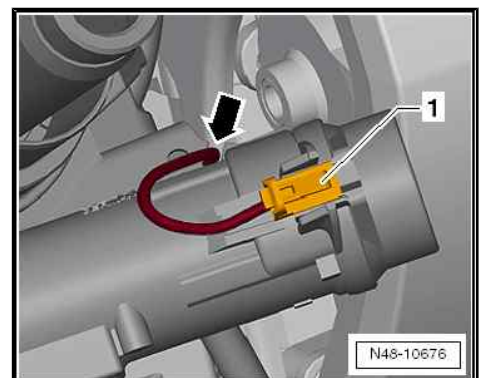
- Push lug -2- of bracket -1- in direction of -arrow A-.
- At the same time, push bracket -1- in direction of -arrow B- out of guide on steering column.



- Disconnect connector -1- from steering lock.
- Unscrew bolt -2- and remove earth wire from steering column -3-.

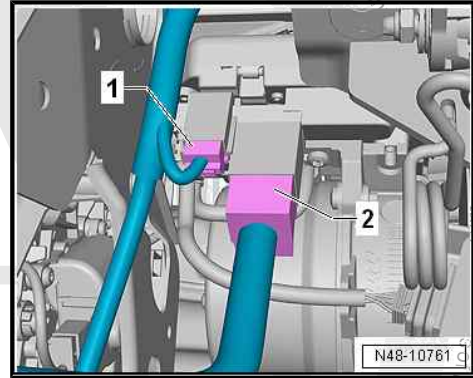


- Unplug connector -1- from immobiliser reader coil - D2- .
- Remove wire from retainer -arrow-.

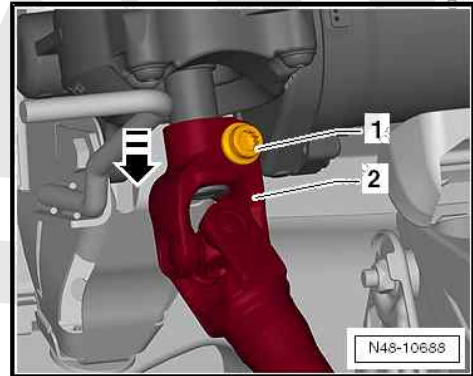




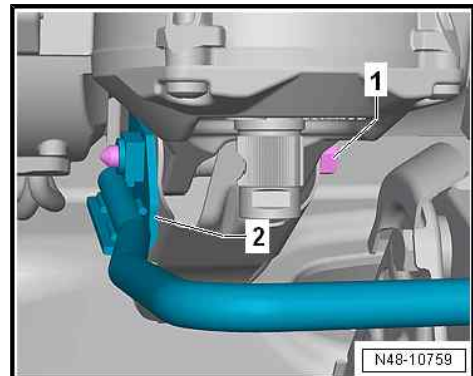
- Disconnect connectors -1- and -2- from steering column electronics control unit - J500- .



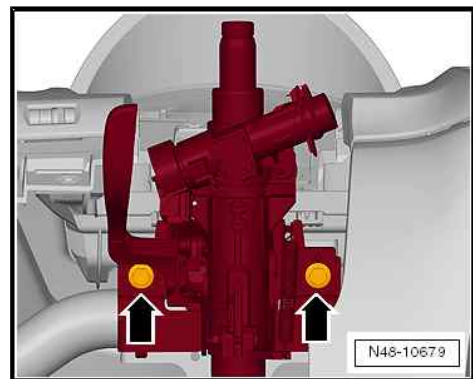
- Unscrew bolt -1-.
- Pull steering column articulated shaft -2- in -direction of arrow- off steering column and lay to side.



- Unscrew bolt -1-, and, while doing so, remove crash bar -2-.



- Unscrew bolts -arrows- from steering column and hold steering column.





- Lower steering column -1- slightly and carefully pull forwards out of guide -2- on cross member.



Caution

Take great care to ensure the steering column is handled and transported correctly => [page 168](#) .

Installing

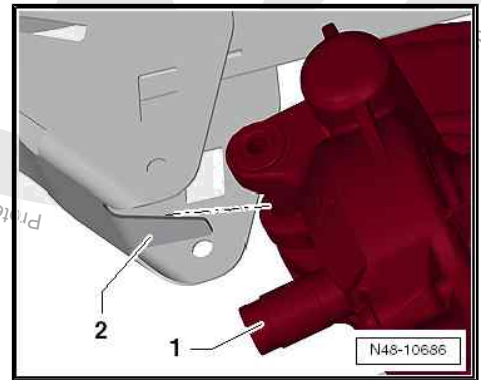
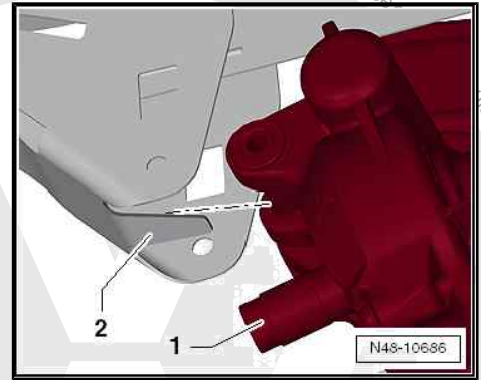
- Fit new assembly aid to steering column => [page 136](#) .



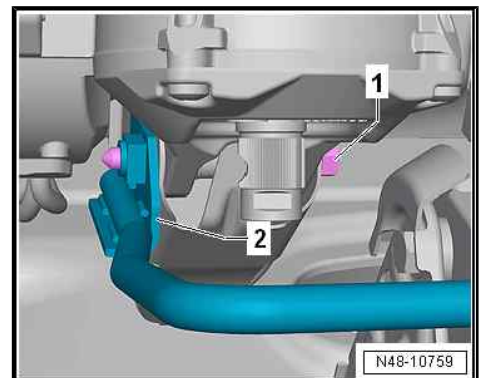
Note

When installing steering column, adhere strictly to bolting sequence.

- Insert steering column -1- carefully into guide -2- on cross member.

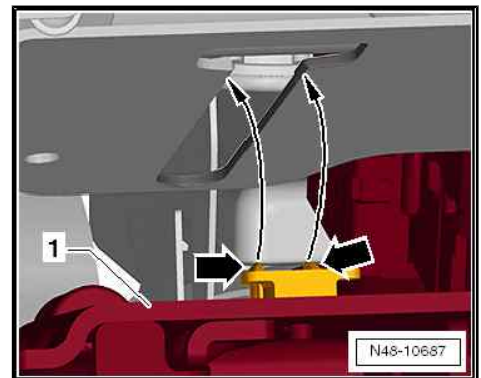


- Insert crash bar -2-, and tighten bolt -1-.



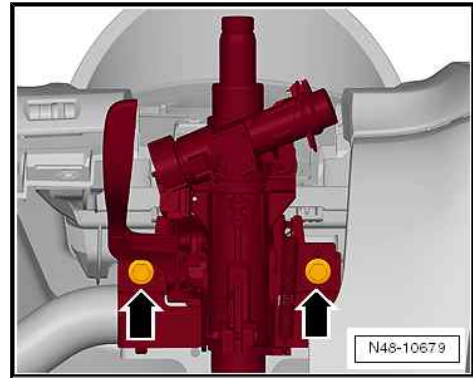
- Swivel steering column upwards until it engages in cross member.

The lugs of assembly aid -arrows- must engage in cross member.

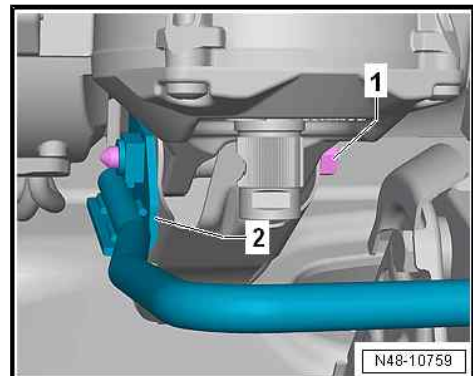




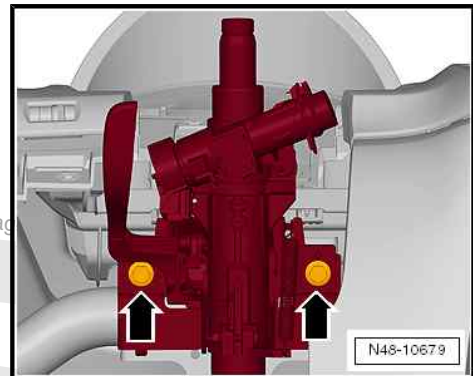
- Start steering column bolts -arrows-.



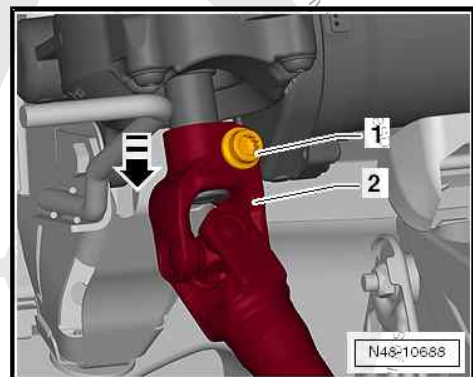
- Tighten bolt -1-.



- Tighten steering column bolts -arrows-.

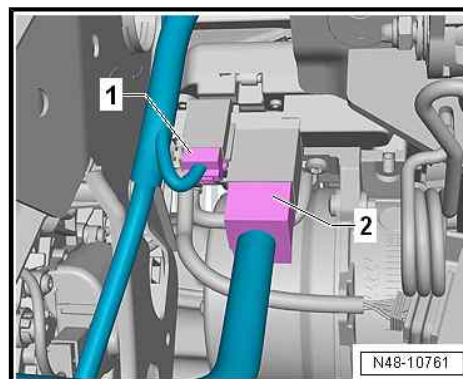


- Fit steering column articulated shaft -2- to steering column in opposite -direction of arrow- and tighten new bolt -1- to specified torque.

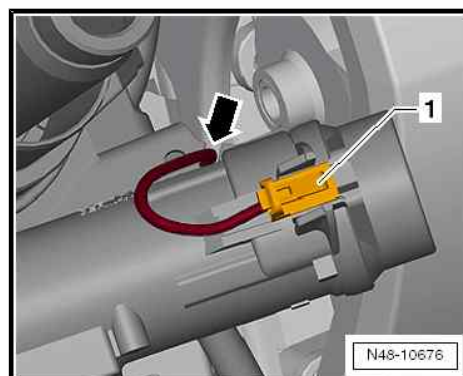




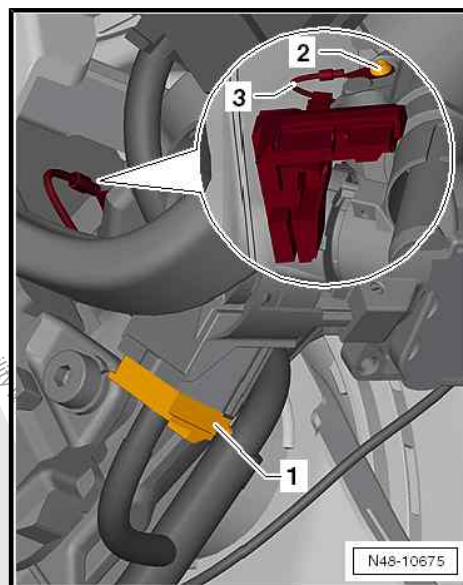
- Connect connectors -1- and -2- to steering column electronics control unit - J500- .



- Connect connector -1- to immobiliser reader coil - D2- .
- Fit wire to retainer -arrow-.

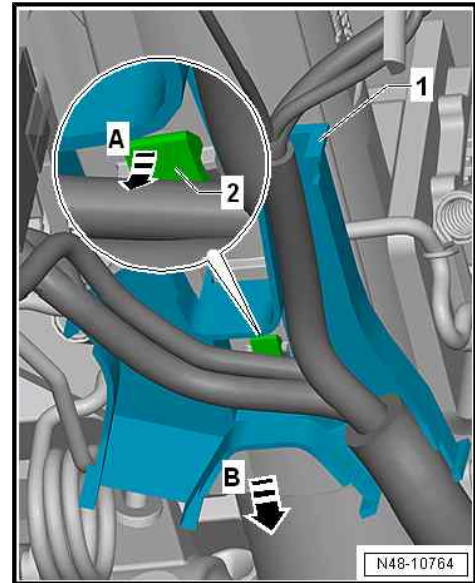


- Secure earth wire to steering column -3- by means of bolt -2-.
- Connect connector -1- to steering lock.



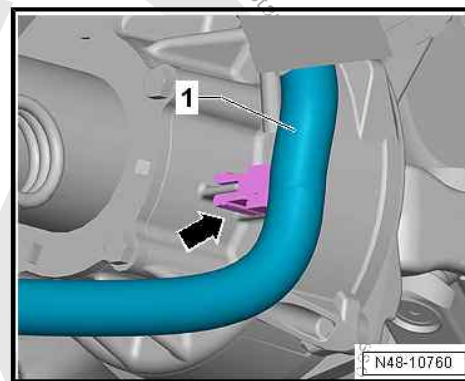


- Push bracket -1- in opposite direction of -arrow B- into guide on steering column.
- Make sure that lug -2- of bracket -1- engages in steering column.





- Clip in wiring harness -1- on steering column -arrow-.
- Install dash panel trim below steering column ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Install steering column combination switch - E595- ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .
- Install upper steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .
- Install lower steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .
- Install steering wheel ⇒ [page 127](#) .
- Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .
- Steering mechanism needs to be re-adapted every time after the steering column has been renewed or reinstalled after removal ⇒ Vehicle diagnostic tester.



WARNING

When connecting battery ensure that no people are in the vehicle!

up! only

- Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

e-up! only



WARNING

- ◆ *Danger of injury! Observe warnings and safety regulations ⇒ Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .*
- ◆ *Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .*

Specified torques

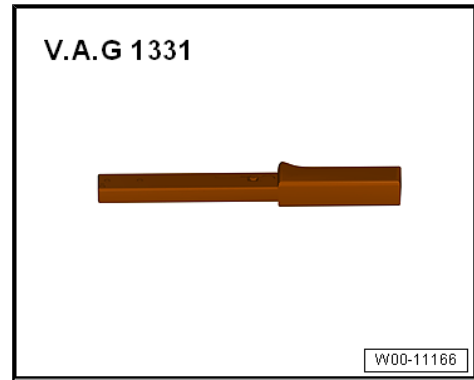
- ◆ ⇒ [“1.1 Assembly overview - steering wheel”, page 127](#)
- ◆ ⇒ [“2.1.3 Assembly overview – steering column, electric steering column, RHD vehicles”, page 133](#)
- ◆ ⇒ [“2.1.5 Assembly overview – steering column, repairing electric steering column, NSK”, page 135](#)

2.2.4 Removing and installing steering column, steel steering column

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - V.A.G 1332-



Removing up! only



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 ; Battery; Disconnecting and reconnecting the battery .**
- ◆ **The wheels must be in straight-ahead position.**

Failure to comply with these precautions may lead to subsequent failure of the airbag system!



e-up! only

⚠ WARNING

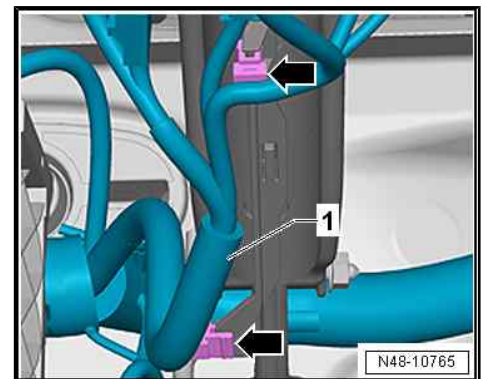
The following conditions must be met before starting work on the electrical system and removing the steering wheel:

- ◆ **Danger of injury! Observe warnings and safety regulations**
⇒ *Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .*
- ◆ **Disconnect earth strap from battery** ⇒ *Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .*
- ◆ **The wheels must be in straight-ahead position.**

Failure to comply with these precautions may lead to subsequent failure of the airbag system!

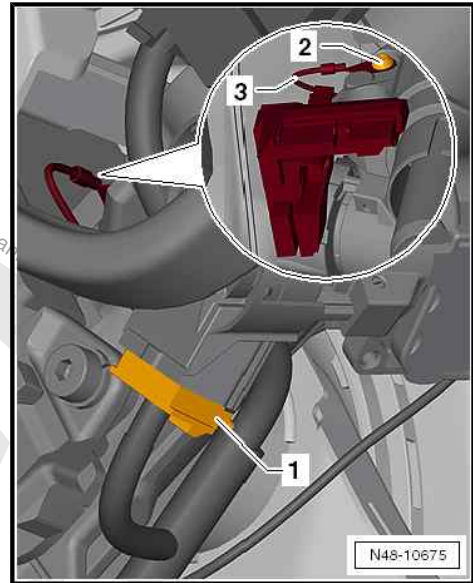
Continued for all vehicles

- Turn wheels to straight-ahead position.
- Remove driver side airbag unit ⇒ *General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .*
- Remove steering wheel ⇒ [page 127](#) .
- Remove steering column combination switch - E595- ⇒ *Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .*
- Remove dash panel trim below steering column ⇒ *General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .*
- Unclip wiring harness -1- from steering column -arrows-.

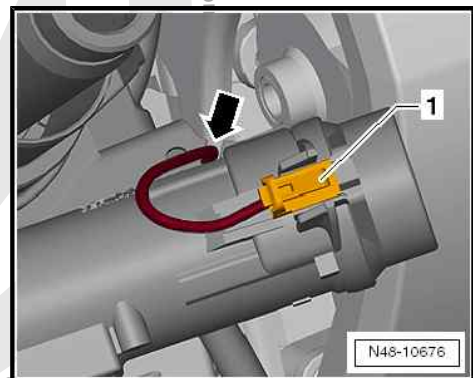




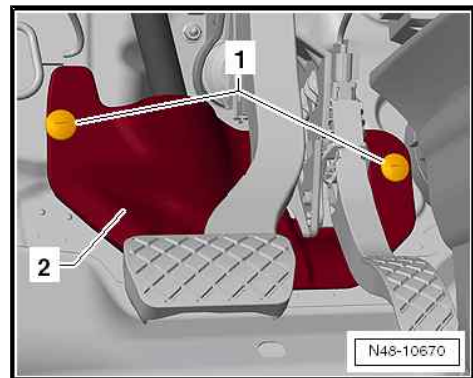
- Disconnect connector -1- from steering lock.
- Unscrew bolt -2- and remove earth wire from steering column -3-.



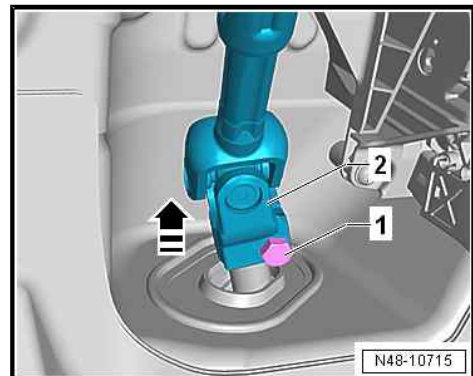
- Unplug connector -1- from immobiliser reader coil - D2- .
- Remove wire from retainer -arrow-.



- Unscrew bolts -1- and remove footwell trim -2-.

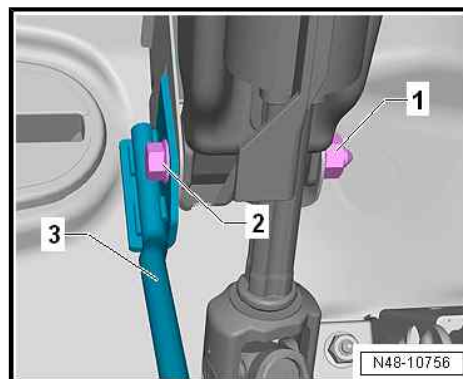


- Unscrew bolt -1- from universal joint -2- and pull off universal joint in -direction of arrow-.

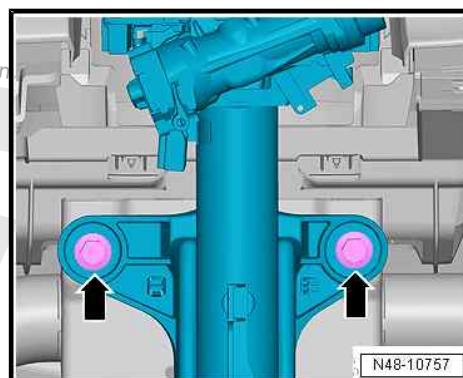




- Unscrew nut -1-.
- Pull out bolt -2- and remove crash bar -3-.



- Unscrew bolts -arrows- from steering column and hold steering column.



- Lower steering column -1- slightly and carefully pull forwards out of guide -2- on cross member.

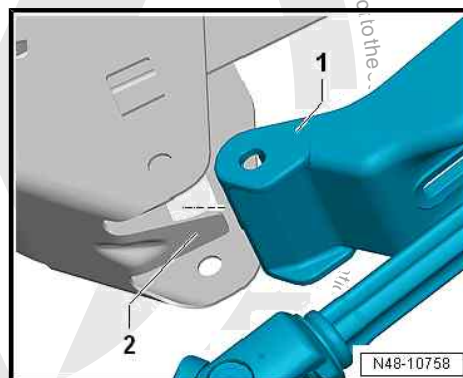
Installing

- Fit new assembly aid to steering column => [page 136](#) .

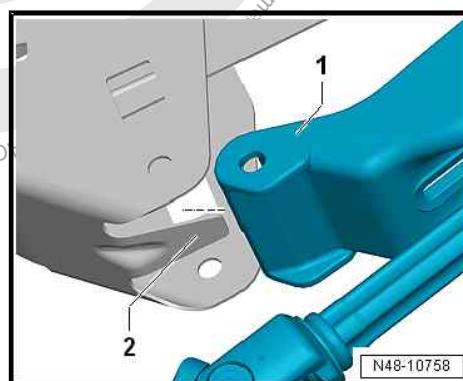


Note

When installing steering column, adhere strictly to bolting sequence.

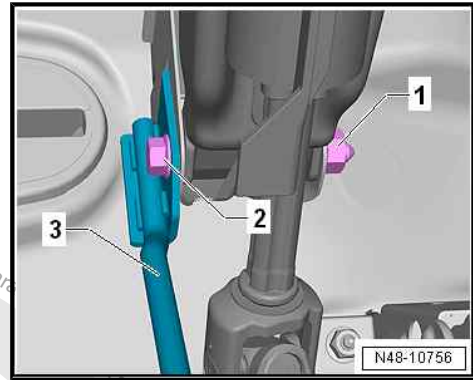


- Insert steering column -1- carefully into guide -2- on cross member.

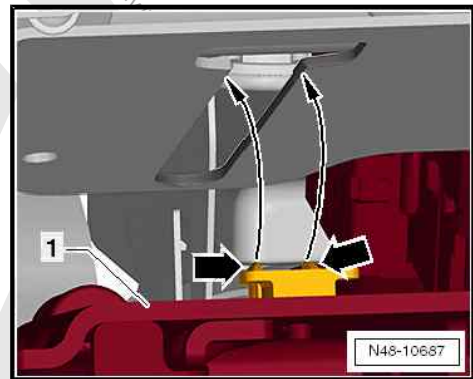




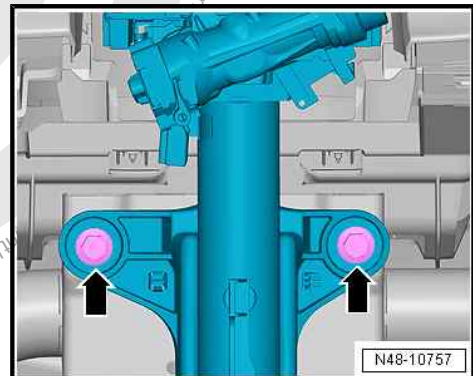
- Insert bolt -2- and crash bar -3-.
- Start nut -1-.



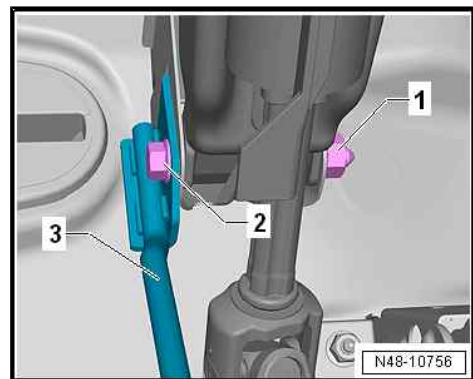
- Swivel steering column upwards until it engages in cross member.
- The lugs of assembly aid -arrows- must engage in cross member.



- Start steering column bolts -arrows-.

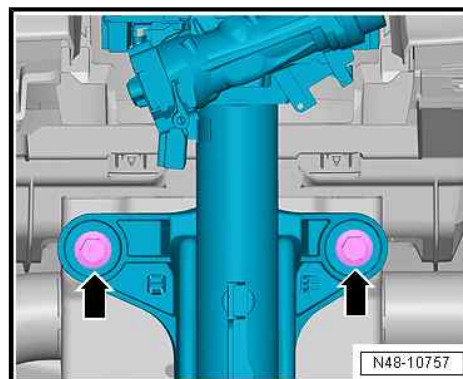


- Tighten bolt -2-.

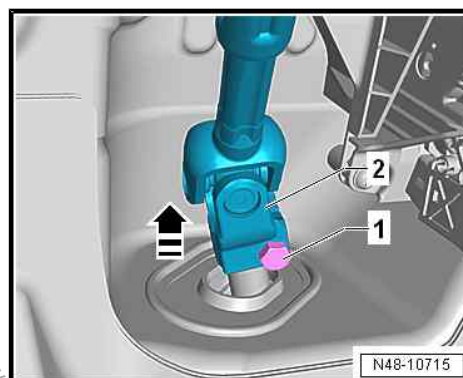




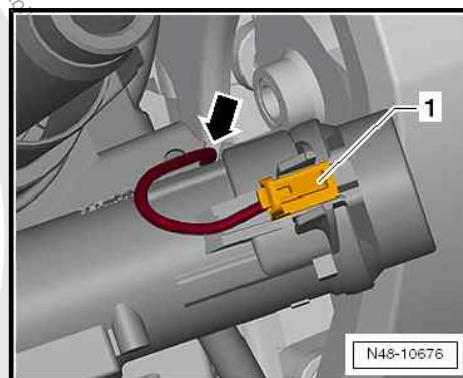
- Tighten steering column bolts -arrows-.



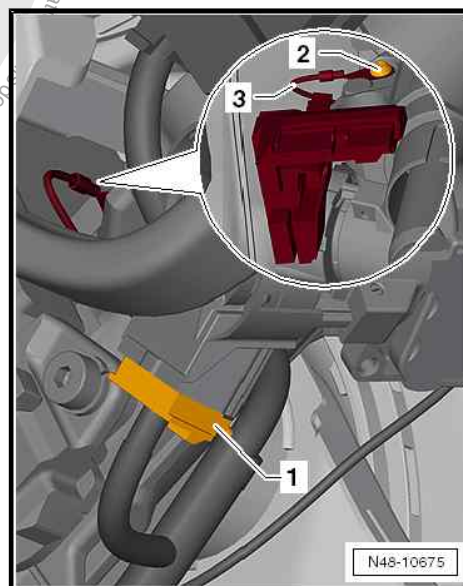
- Fit universal joint -2- to steering rack in opposite direction of -arrow-, and tighten new bolt -1- to specified torque.



- Connect connector -1- to immobiliser reader coil - D2 - .
- Fit wire to retainer -arrow-.



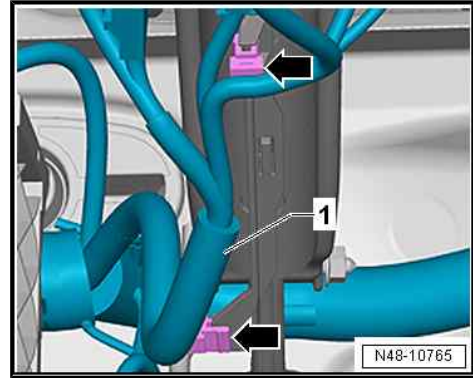
- Secure earth wire to steering column -3- by means of bolt -2-.
- Connect connector -1- to steering lock.



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- Clip in wiring harness -1- on steering column -arrows-.
- Install dash panel trim below steering column ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Install steering column combination switch - E595- ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Assembly overview - steering column switch module .
- Install upper steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .
- Install lower steering column trim ⇒ Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .
- Install steering wheel ⇒ [page 127](#) .
- Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Removing and installing airbag unit with igniter .



WARNING

When connecting battery ensure that no people are in the vehicle!

up! only

- Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

e-up! only



WARNING

- ◆ *Danger of injury! Observe warnings and safety regulations ⇒ Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .*
- ◆ *Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .*

Specified torques

- ◆ ⇒ [“1.1 Assembly overview - steering wheel”, page 127](#)
- ◆ ⇒ [“2.1.4 Assembly overview – steering column, steel steering column”, page 134](#)
- ◆ ⇒ [“3.1 Assembly overview - steering rack”, page 183](#)

2.3 Handling and transporting steering column



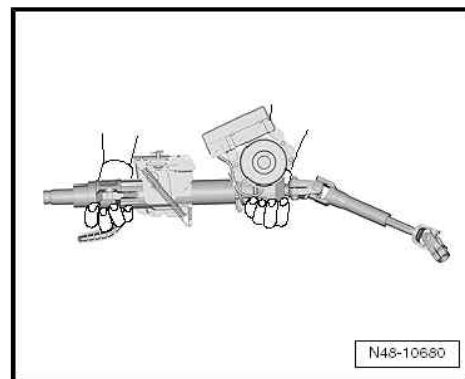
WARNING

- ◆ *Adherence to proper steering column handling is essential.*
- ◆ *Improper handling of steering column may damage the steering column, leading to safety risks.*



Proper steering column handling and transport

- ◆ Use both hands to transport steering column.
- ◆ Hold steering column on upper jacket tube and in area below gearbox housing.

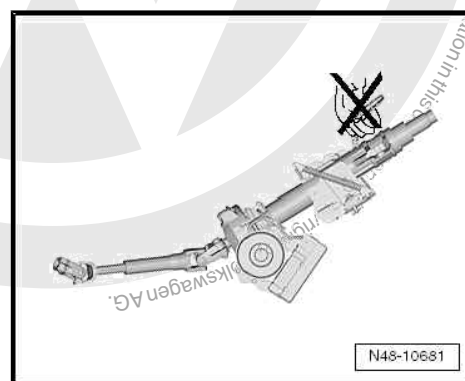
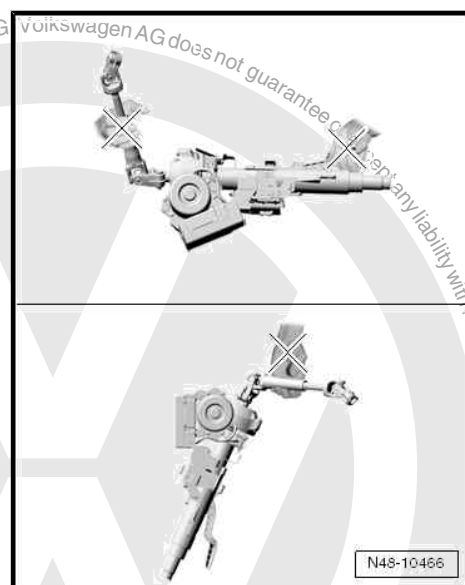


Improper handling of steering column with safety risks

Following methods of handling will damage universal joint bushes and lower steering column bearing:

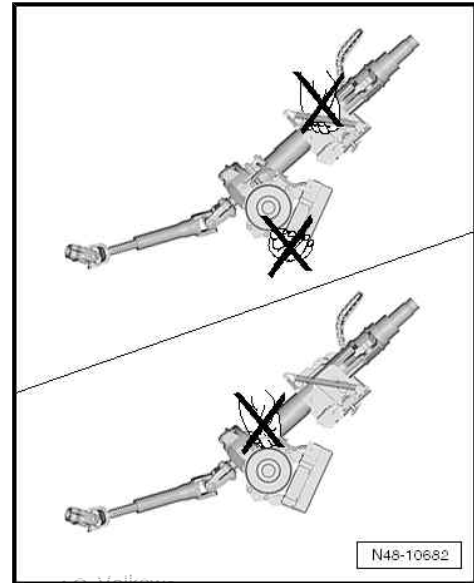
- ◆ Transporting steering column with one hand on jointed shaft.
- ◆ Bending joints more than 90°.

Preliminary damage is caused when the steering column is being handled as follows:





- ◆ Picking up and carrying steering column on clamping lever.
- ◆ Picking up and carrying steering column on counterbalance spring.
- ◆ Picking up and carrying steering column on motor/ steering column electronics control unit - J500- .
- ◆ Picking up and carrying steering column on wiring of steering column electronics control unit - J500- .



2.4 Removing and installing power steering control unit - J500-

⇒ [“2.4.1 Removing and installing power steering sensor J500 , NSK”, page 170](#)

⇒ [“2.4.2 Distinguishing features of left-hand and right-hand drive, TRW”, page 173](#)

⇒ [“2.4.3 Removing and installing power steering control unit J500 , TRW”, page 173](#)

⇒ [“2.4.4 Removing and installing power steering control unit J500 , TRW”, page 177](#)

2.4.1 Removing and installing power steering sensor - J500- , NSK

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-

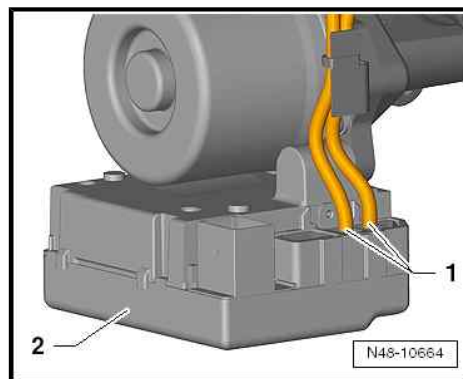


Removing

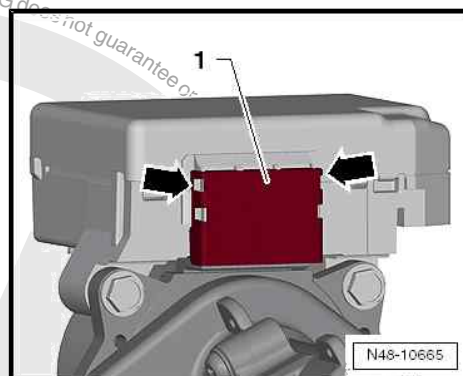
- Remove steering column ⇒ [page 137](#) .



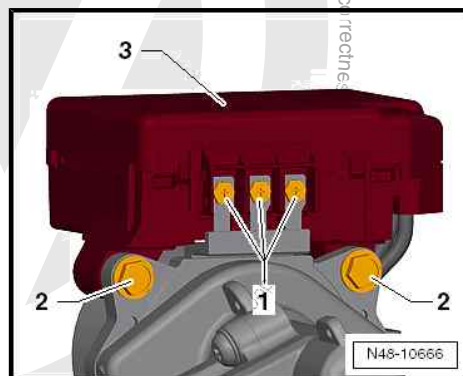
- Disconnect connectors -1- from steering column electronics control unit - J500- -2-.



- Lever off cap -1-.



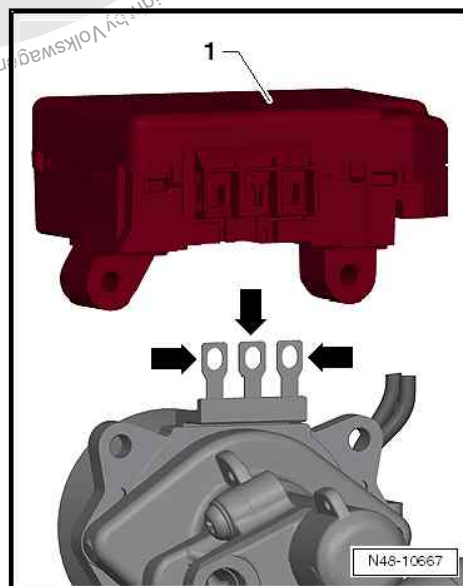
- Remove screws -1-.
- Unscrew bolts -2- and remove steering column electronics control unit - J500- -3-.



i Note

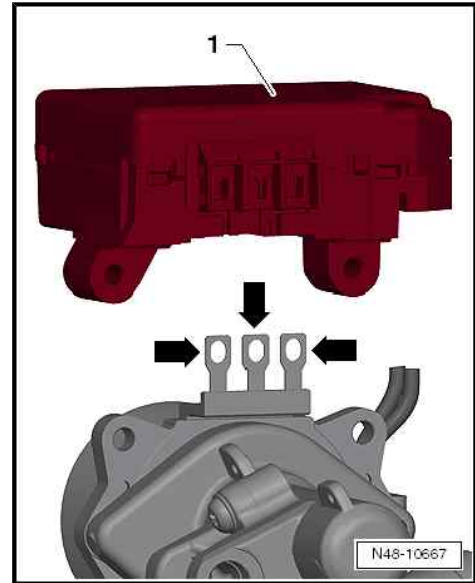
- ◆ After removal of steering column electronics control unit - J500- do not place steering column onto contacts -arrows-.
- ◆ This will damage the contacts and the steering column will have to be renewed completely.

Installing

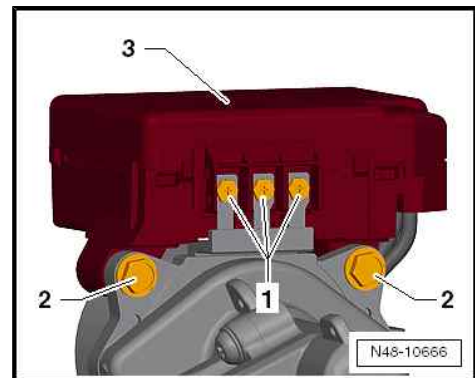




- Properly fit steering column electronics control unit - J500-1- onto contacts -arrows-.



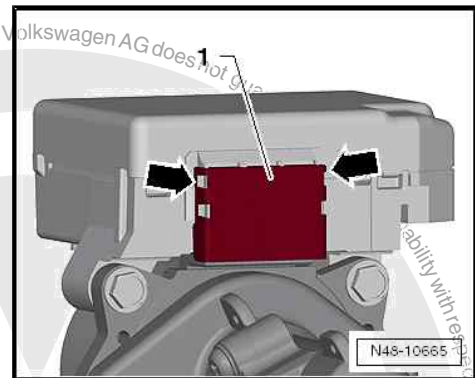
- Screw in bolts -1-.
- Screw in bolts -2- and tighten to specified torque.
- Tighten bolts -1- to specified torque.



- Fit and engage new cap -1- -arrows-.
- Install steering column => [page 137](#) .
- Perform steps to initiate => Vehicle diagnostic tester.

Specified torques

- ◆ => ["2.1.5 Assembly overview – steering column, repairing electric steering column, NSK", page 135](#)

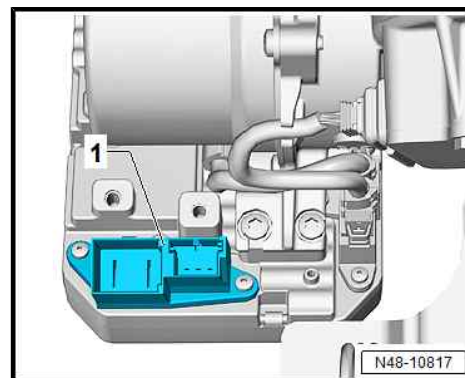




2.4.2 Distinguishing features of left-hand and right-hand drive, TRW

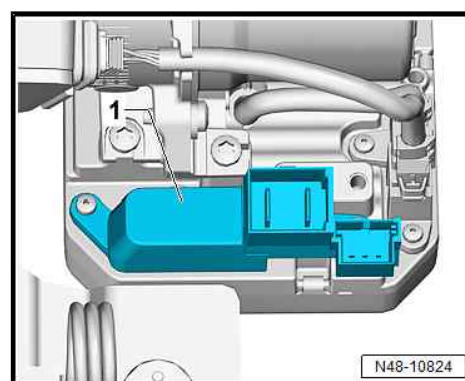
LHD vehicles

The socket for connectors -1- for the power steering control unit - J500- is on the left side.



RHD vehicles

The socket for connectors -1- for the power steering control unit - J500- is on the right side.



2.4.3 Removing and installing power steering control unit - J500- , TRW

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



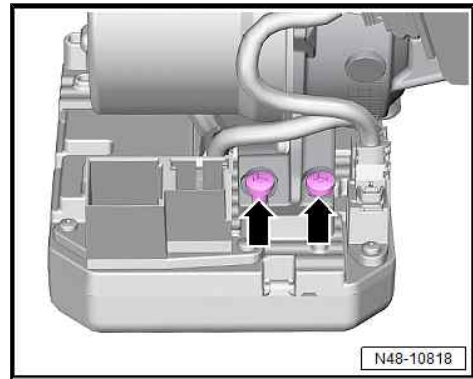
- ◆ ESD workplace - VAS 6613-

Removing

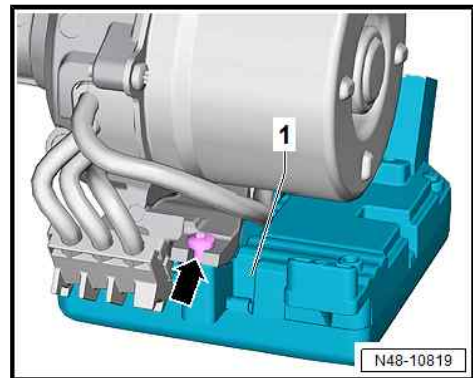
- The failure of the power steering control unit - J500- must be determined using ⇒ Vehicle diagnostic tester.
 - Something other than an accident has caused the system failure.
 - The steering column and the power steering control unit - J500- are undamaged.
 - The power steering control unit - J500- has not been renewed before.
- Remove steering column ⇒ [page 137](#) .



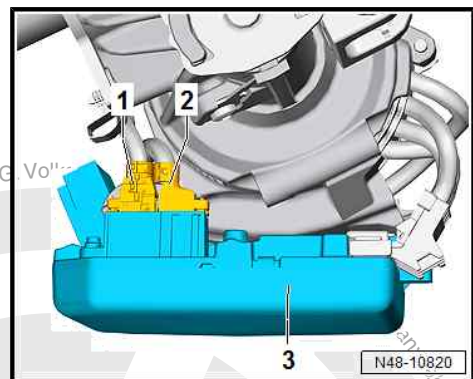
- Distinguishing features of left-hand and right-hand drive
=> [page 173](#)
- Unscrew bolts -arrows-.



- Unscrew bolt -arrow- and remove power steering control unit - J500- -1-



- Disconnect connectors -1- and -2- from power steering control unit - J500- -3-.

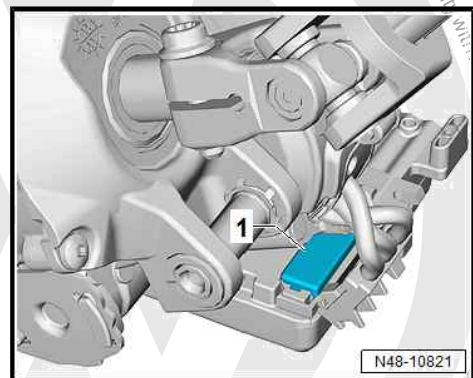


- Lever off cap -1-.



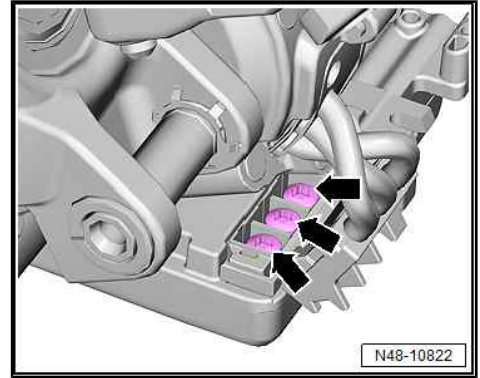
Note

The cap -1- will be damaged during removal and must be renewed.





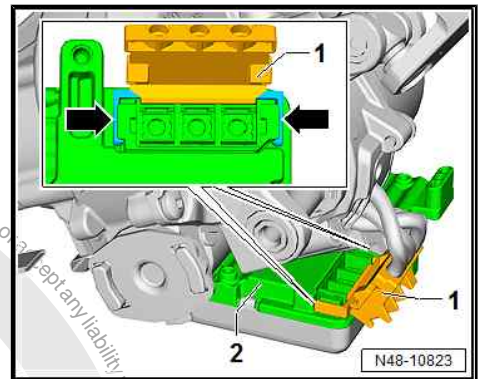
- Unscrew bolts -arrows-.



- Raise lugs -arrows- slightly.

Caution

- ◆ *Lugs -arrows- can break off!*
- ◆ *If one or both lugs break off, the entire steering column must be renewed!*



- Disconnect connector -1- from power steering control unit - J500- -2-

Caution

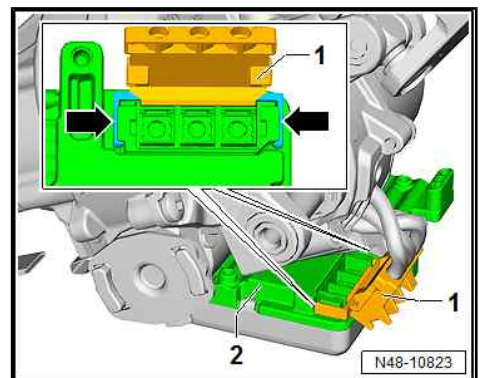
- ◆ *Do not damage the contacts.*
- ◆ *In the event of damage, the entire steering column must be renewed.*

Installing

Caution

- ◆ *A power steering control unit - J500- from another steering column cannot be used.*
- ◆ *Use only a new power steering control unit - J500- as a replacement.*

- Connect connector -1- to power steering control unit - J500- -2-.
- Lugs -arrows- must engage.

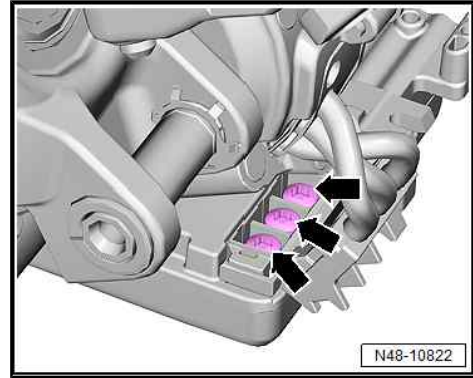


Caution

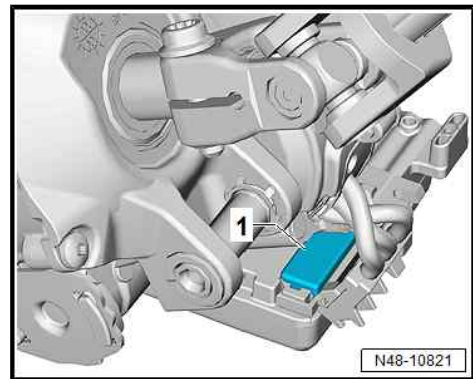
- ◆ *Do not damage the contacts.*
- ◆ *In the event of damage, the entire steering column must be renewed.*



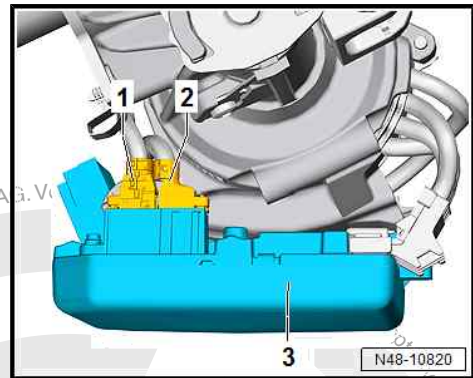
- Screw in new bolts -arrows- and tighten to specified torque.



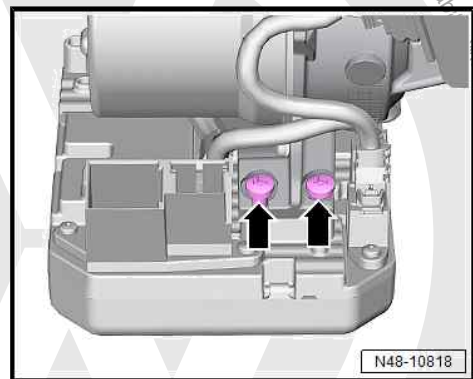
- Fit new cap -1-, making certain that it engages audibly.



- Connect connectors -1- and -2- to power steering control unit - J500- -3-.
- Hold power steering control unit - J500- in place.

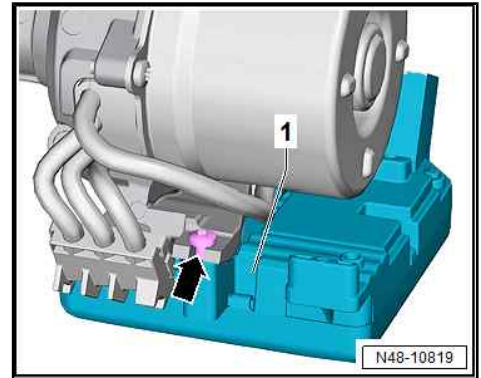


- Start bolts -arrows- but do not tighten yet.






- Start bolt -arrow- but do not tighten yet.
- Position power steering control unit - J500- -1-.
- Tighten bolt -arrow- to specified torque.

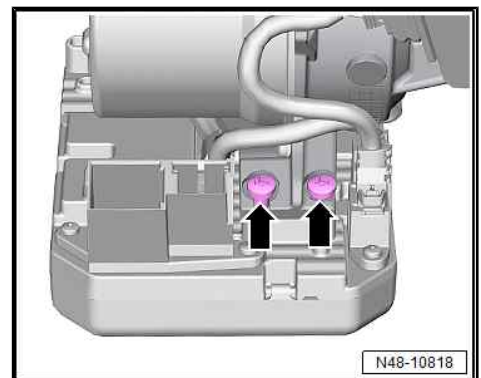


- Tighten bolts -arrows- to specified torque.
- Install steering column ⇒ [page 137](#) .
- Perform steps to initiate ⇒ Vehicle diagnostic tester.



DANGER!

The vehicle cannot be driven on public roads until after it has been sufficiently tested in the workshop.



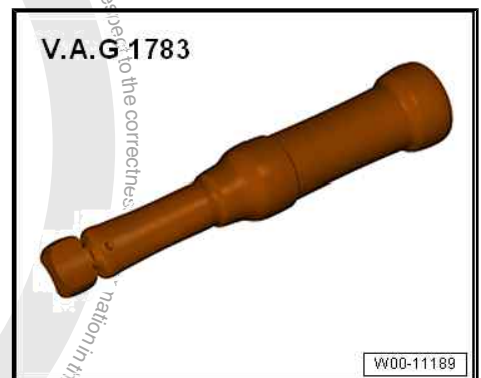
Specified torques

- ◆ ⇒ ["2.1.6 Assembly overview – steering column, repairing electric steering column, TRW"](#), page 136

2.4.4 Removing and installing power steering control unit - J500- , TRW

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



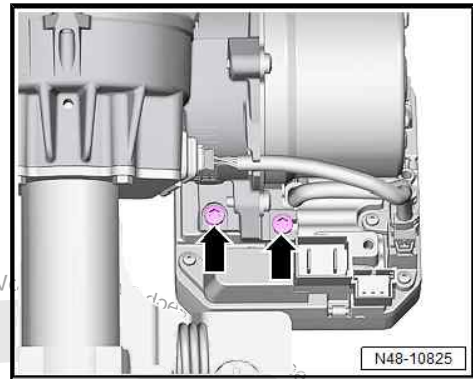
- ◆ ESD workplace - VAS 6613-

Removing

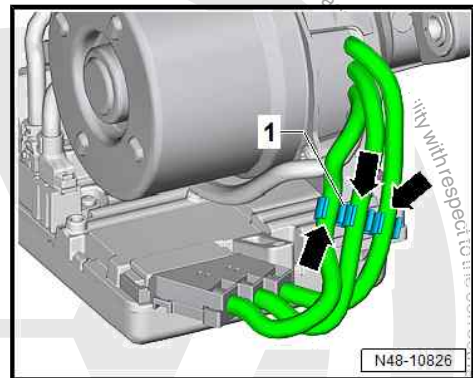
- The failure of the power steering control unit - J500- must be determined using ⇒ Vehicle diagnostic tester.
- Something other than an accident has caused the system failure.
- The steering column and the power steering control unit - J500- are undamaged.
- The power steering control unit - J500- has not been renewed before.
- Remove steering column ⇒ [page 137](#) .



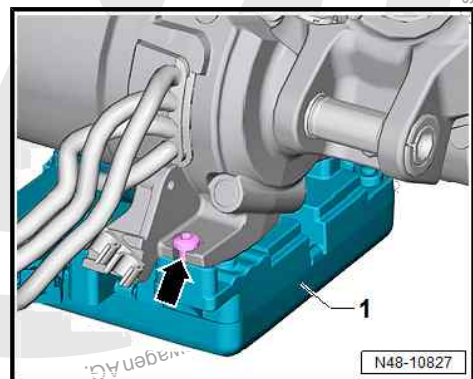
- Distinguishing features of left-hand and right-hand drive
=> [page 173](#)
- Unscrew bolts -arrows-.



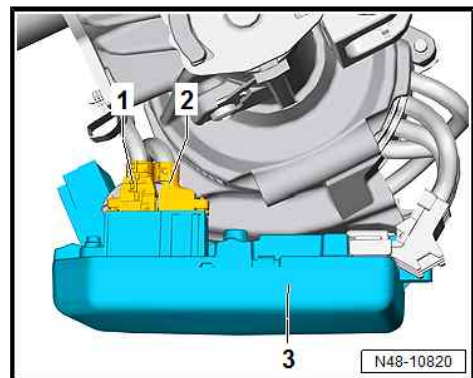
- Unclip lines -arrows- from retainer -1-.



- Unscrew bolt -arrow- and remove power steering control unit - J500- -1-



- Disconnect connectors -1- and -2- from power steering control unit - J500- -3-.

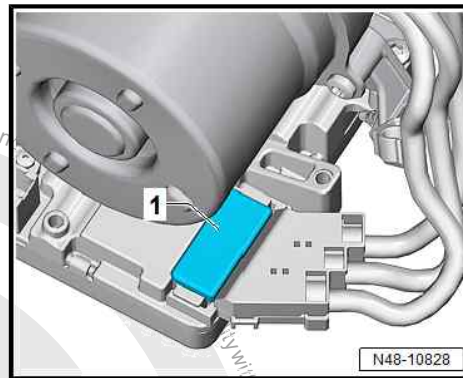




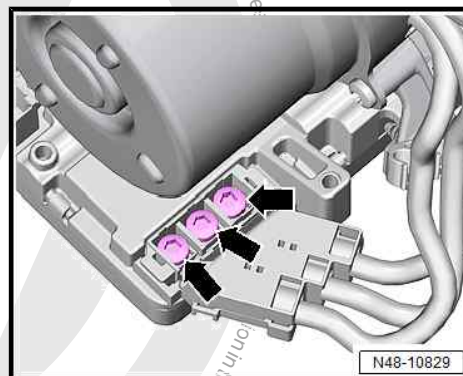
- Lever off cap -1-.

i Note

The cap -1- will be damaged during removal and must be renewed.



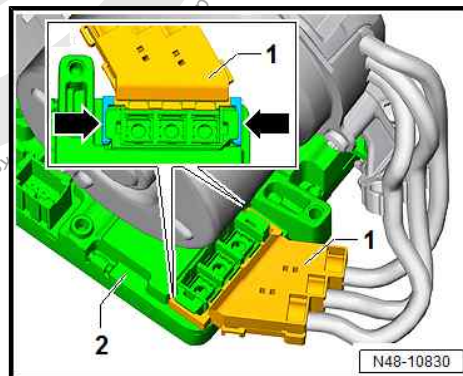
- Unscrew bolts -arrows-.



- Raise lugs -arrows- slightly.

! Caution

- ◆ *Lugs -arrows- can break off!*
- ◆ *If one or both lugs break off, the entire steering column must be renewed!*



- Disconnect connector -1- from power steering control unit - J500- -2-.

! Caution

- ◆ *Do not damage the contacts.*
- ◆ *In the event of damage, the entire steering column must be renewed.*

Installing

! Caution

- ◆ *A power steering control unit - J500- from another steering column cannot be used.*
- ◆ *Use only a new power steering control unit - J500- as a replacement.*

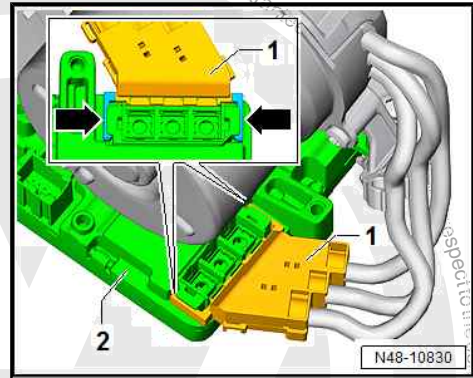


- Connect connector -1- to power steering control unit - J500-
-2-.
- Lugs -arrows- must engage.

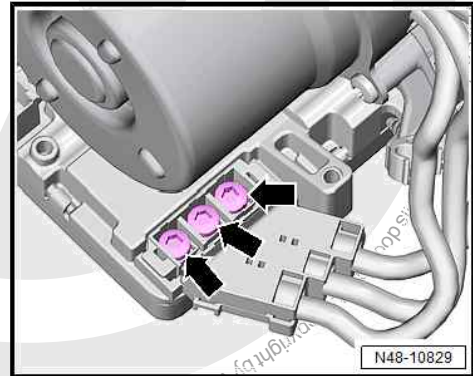


Caution

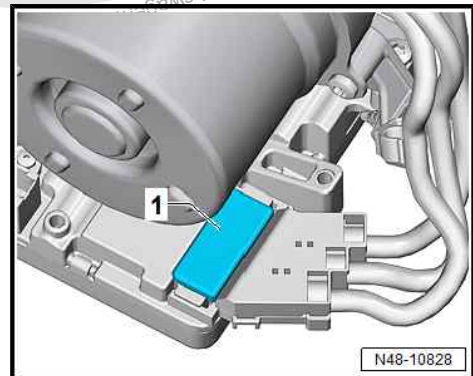
- ◆ *Do not damage the contacts.*
- ◆ *In the event of damage, the entire steering column must be renewed.*



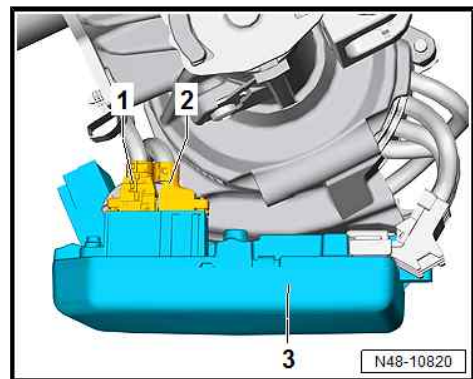
- Screw in new bolts -arrows- and tighten to specified torque.



- Fit new cap -1-, making certain that it engages audibly.

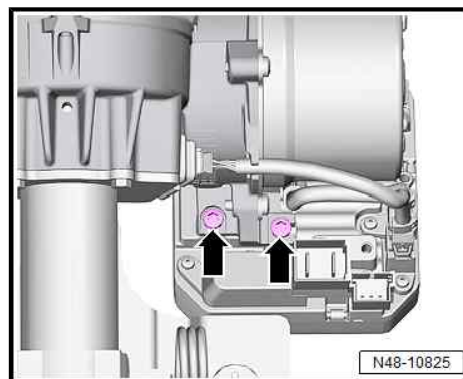


- Connect connectors -1- and -2- to power steering control unit - J500- -3-.
- Hold power steering control unit - J500- in place.

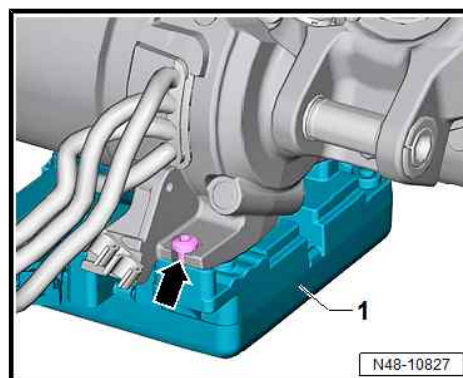




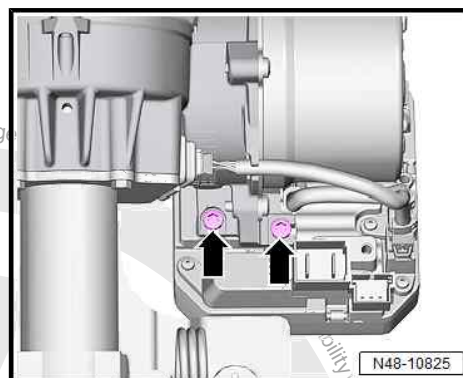
- Start bolts -arrows- but do not tighten yet.



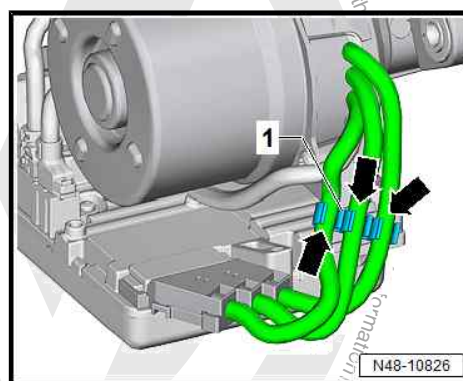
- Start bolt -arrow- but do not tighten yet.
- Position power steering control unit - J500- -1-.
- Tighten bolt -arrow- to specified torque.



- Tighten bolts -arrows- to specified torque.



- Clip lines -arrows- into retainer -1-.
- Install steering column => [page 137](#) .
- Perform steps to initiate → Vehicle diagnostic tester.



DANGER!

The vehicle cannot be driven on public roads until after it has been sufficiently tested in the workshop.

Specified torques

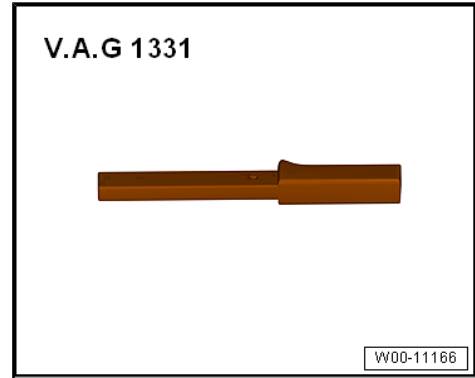
⇒ [“2.1.6 Assembly overview – steering column, repairing electric steering column, TRW”, page 136](#)

2.5 Removing and installing intermediate steering shaft

Special tools and workshop equipment required

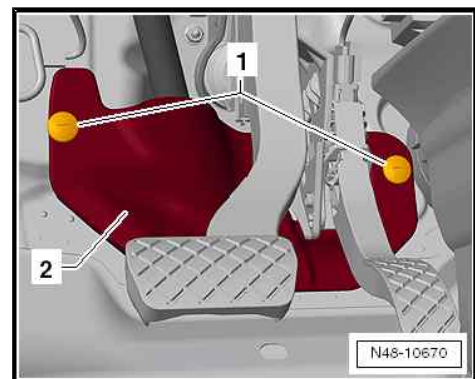


- ◆ Torque wrench - V.A.G 1331-

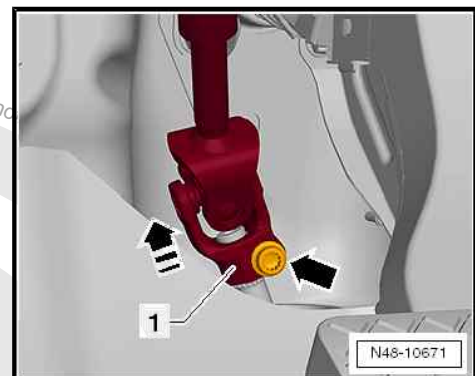


Removing

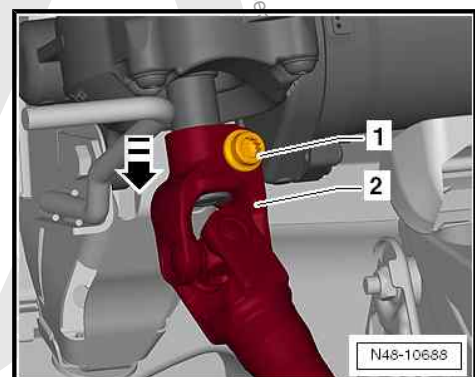
- Unscrew bolts -1- and remove footwell trim -2-.



- Unscrew bolt -arrow- from universal joint -1- and pull off universal joint in -direction of arrow-.



- Unscrew bolt -1-.
- Pull steering column articulated shaft -2- in -direction of arrow- off steering column and remove.



Installing

- Install in reverse order.
- ◆ ⇒ ["2.1.5 Assembly overview – steering column, repairing electric steering column, NSK", page 135](#)
- ◆ ⇒ ["3.1 Assembly overview - steering rack", page 183](#)



3 Steering rack

⇒ [“3.1 Assembly overview - steering rack”, page 183](#)

⇒ [“3.2 Removing and installing steering rack”, page 184](#)

⇒ [“3.3 Repairing steering rack”, page 188](#)

⇒ [“3.4 Removing and installing track rod”, page 190](#)

⇒ [“3.5 Removing and installing track rod ball joint”, page 192](#)

⇒ [“3.6 Adjusting steering rack”, page 193](#)

3.1 Assembly overview - steering rack

- ◆ The steering rack is not intended to be repaired. In the event of concerns the steering rack must be renewed.
- ◆ To lubricate steering rack, only use steering rack grease - AOF 063 000 04- . However, do not over-apply grease to steering rack. Air equalisation bores must remain free. Otherwise the boot will be damaged.

1 - Steering rack

- Removing and installing
 ⇒ [page 184](#)

2 - Steering column

3 - Bolt

- Allocation ⇒ Electronic parts catalogue “ETKA”
- Renew after each removal
- Electric steering column to steering rack: 20 Nm + turn 180° further
- Steel steering column to steering rack, 20 Nm + turn 90° further

4 - Wheel bearing housing

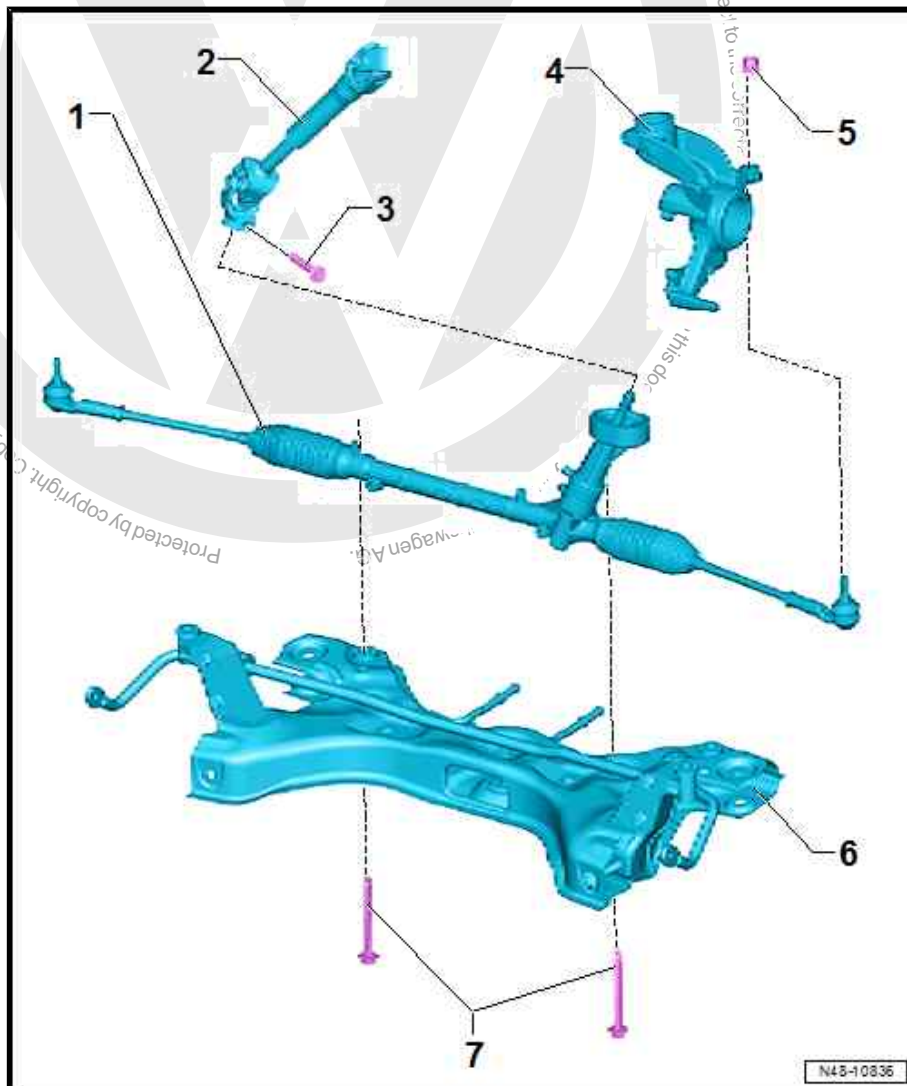
5 - Nut

- 20 Nm and turn 90° further
- Renew after each removal

6 - Subframe

7 - Bolt

- 50 Nm + 180° further
- Renew after each removal

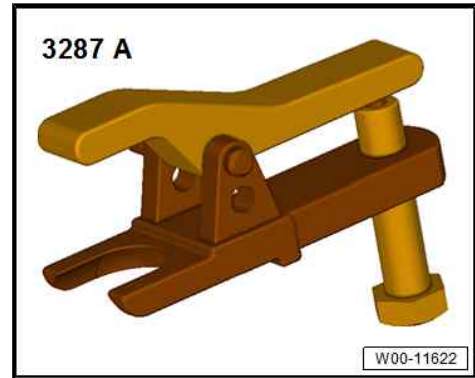




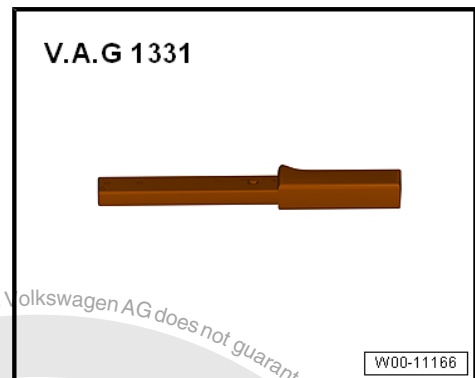
3.2 Removing and installing steering rack

Special tools and workshop equipment required

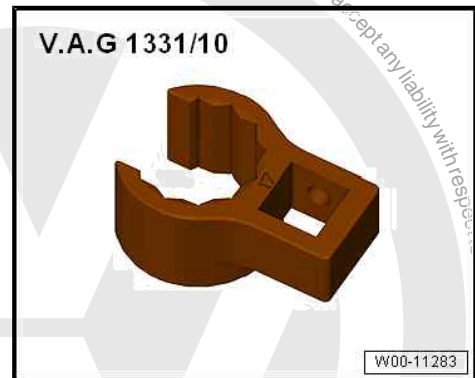
- ◆ Ball joint puller - T10187- Ball joint puller - 3287 A-



- ◆ Torque wrench - V.A.G 1331-



- ◆ Flared ring spanner tool insert AF 17 - V.A.G 1331/10-



- ◆ Torque wrench - V.A.G 1332-





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




Removing

up! only

- Disconnect earth strap from battery → Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting the battery .

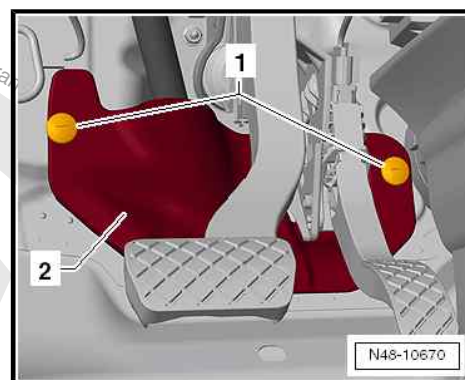
e-up! only

 **WARNING**

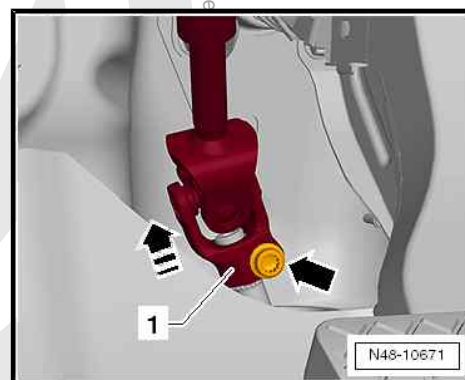
- ◆ *Danger of injury! Observe warnings and safety regulations → Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .*
- ◆ *Disconnect earth strap from battery → Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .*

Continued for all vehicles

- Unscrew bolts -1- and remove footwell trim -2-.

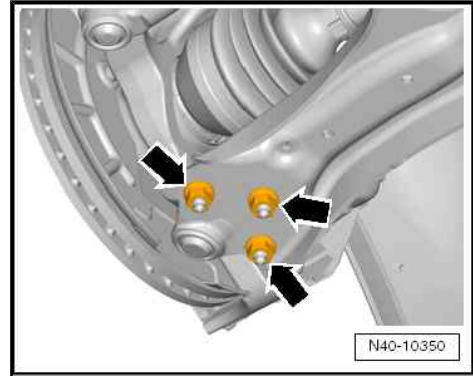


- Unscrew bolt -arrow- from universal joint -1- and pull off universal joint in -direction of arrow-.
- Loosen wheel bolts.
- Raise vehicle.
- Remove front wheels.






- Remove nuts -arrows-
- Pull swivel joint out of suspension link.

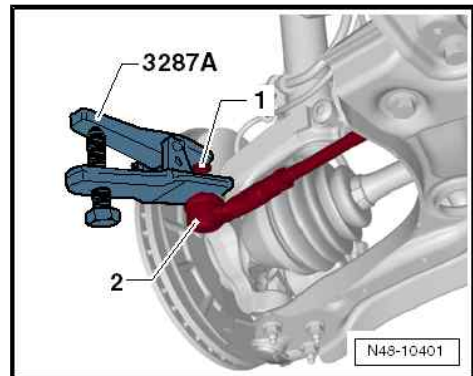


- Loosen nut -1- on track rod end -2- but do not remove completely.

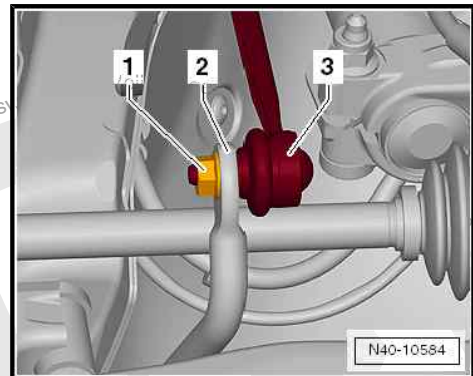


Caution
To protect thread, leave nut screwed a few turns onto joint pin.

- Press track rod ball joint -2- off steering arm.



- Remove hexagon nut -1- from coupling rod (left and right sides).
- Pull coupling rod -3- out of anti-roll bar -2- on left and right side.

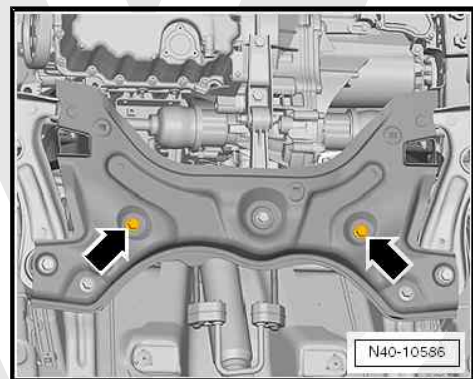


- Remove steering rack bolts -arrows- from subframe.
- Fix position of subframe => [page 17](#) .
- Lower subframe using engine and gearbox jack - V.A.G 1383 A- .
- Take out steering rack towards the rear.

Installing

Install in reverse order. During this procedure, observe the following:

Steering rack must be moved to centre position before installing steering rack.



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- Slide rack until dimension -a- is reached.

Dimension -a- = 76.5 mm

- ◆ After fitting the steering rack to the universal joint shaft ensure that the seal is not kinked against the assembly plate on the steering rack. The opening to the footwell must seal correctly. Otherwise, this can result in water leaks and/or noise.
- ◆ Ensure sealing surface is clean.
- ◆ When renewing the steering rack also install new boots on the track rods.

Before inserting subframe bolts, position steering rack on subframe and insert bolts for steering rack.

- Secure subframe ⇒ [page 17](#) .
- Bolt swivel joint to suspension link with new nuts -arrows-.

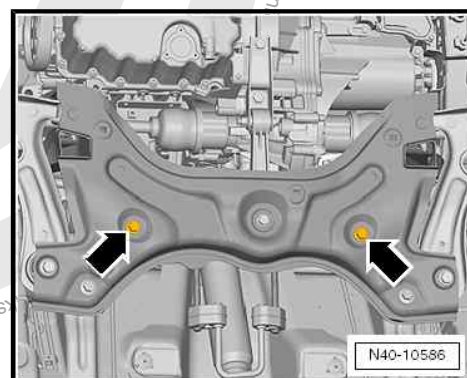
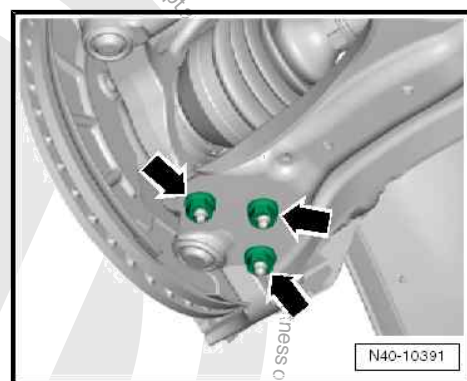
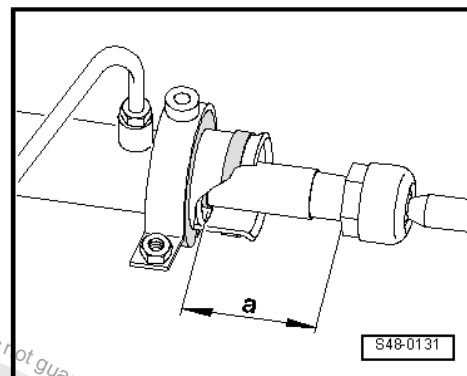


Note

Tighten nuts -arrows- in unladen state ⇒ [page 6](#) .

Ensure that boot is not damaged or twisted.

- Bolt steering rack to subframe -arrows-.
- Bolt track rod to steering arm.





- Position universal joint -1- onto steering pinion.
- Insert new bolt -arrow- and tighten.

up! only

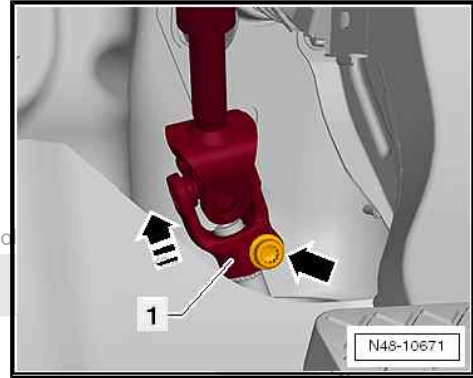
- Connect earth strap to battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

e-up! only



WARNING

- ◆ **Danger of injury! Observe warnings and safety regulations** ⇒ Electrical system, general information; Rep. gr. 27 ; Battery; Warnings and safety regulations .
- ◆ **Connect earth strap to battery** ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery - A- .



Continued for all vehicles

- Install wheels and tighten.

After installation, position of steering wheel must be checked during road test.

If steering wheel is not in straight-ahead position or if a new steering rack was installed, front axle tracking must be checked and adjusted if necessary!

- Check toe adjustment ⇒ [page 116](#) .

Specified torques

- ◆ ⇒ [“4.1 Assembly overview - lower suspension link, swivel joint”, page 39](#)
- ◆ ⇒ [“3.1 Assembly overview - steering rack”, page 183](#)
- ◆ Wheel bolts ⇒ Wheels and Tyres Guide; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts

3.3 Repairing steering rack



1 - Right track rod ball joint

- Marked with "A"
- Removing and installing
⇒ [page 192](#)
- Checking ⇒ [page 189](#)
- Fitting position
⇒ [page 193](#)

2 - Nut

- 50 Nm

3 - Clip

4 - Boot

- Must not be twisted after adjusting toe.
- Remove steering rack to renew.

5 - Clip

- Renew
- Tightening ⇒ [page 192](#)

6 - Seal

- Allocation ⇒ Electronic parts catalogue "ETKA"

7 - Right track rod

- 80 Nm
- Removing and installing
⇒ [page 190](#)
- Replacement parts are supplied pre-adjusted.
- Adjusting toe
⇒ [page 116](#) .

8 - Steering rack

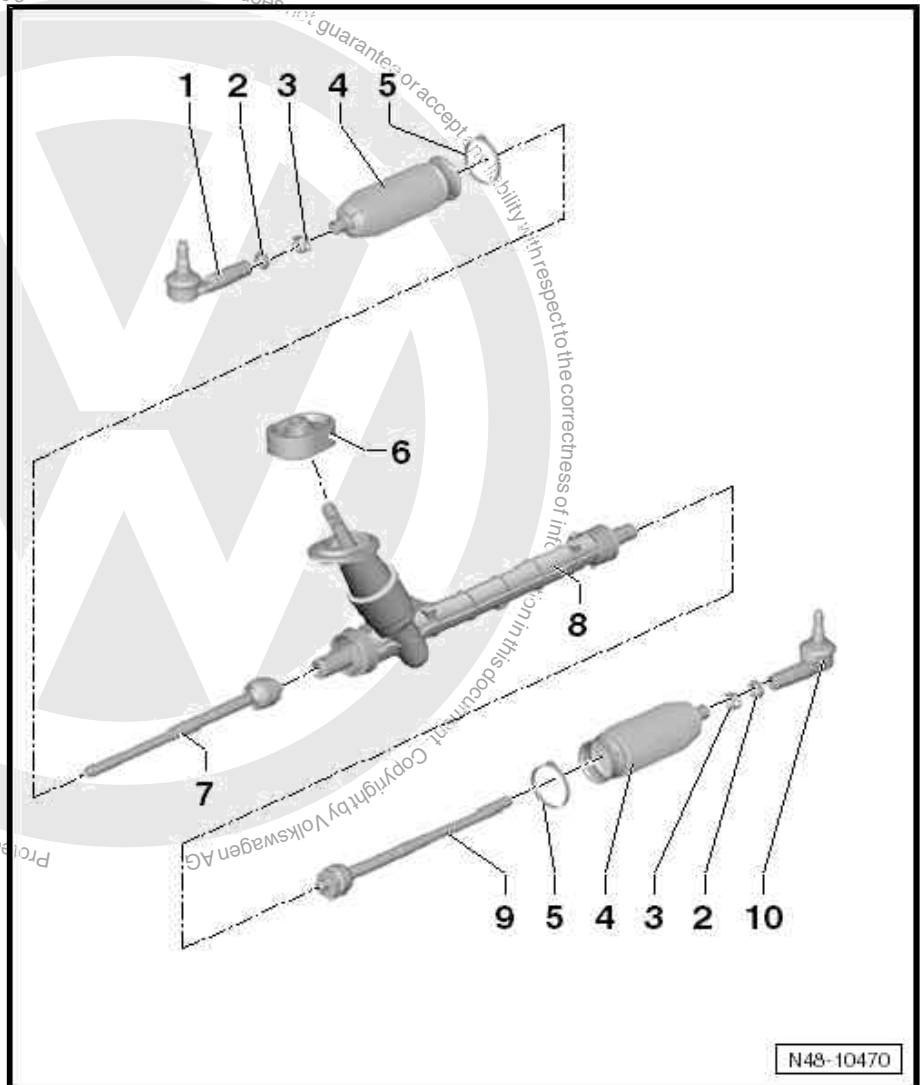
- Allocation ⇒ Electronic parts catalogue "ETKA"
- Removing and installing ⇒ [page 184](#)

9 - Left track rod

- 80 Nm
- Removing and installing ⇒ [page 190](#)
- Replacement parts are supplied pre-adjusted.
- Checking length and adjusting ⇒ [page 191](#)

10 - Left track rod ball joint

- Marked with "B"
- Removing and installing ⇒ [page 192](#)
- Checking ⇒ [page 189](#)
- Fitting position ⇒ [page 193](#)



Checking play, security and boots of track rod ends

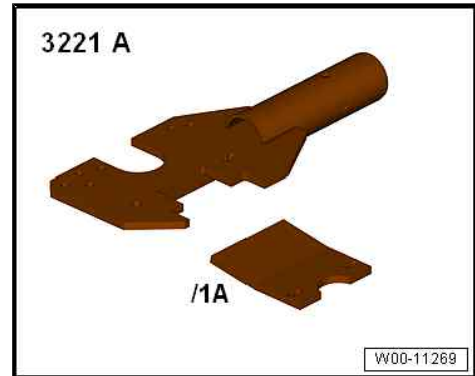
- Check play by moving track rods and wheels with the vehicle raised (wheels hanging free). Clearance: zero clearance
- Check attachment.
- Check boots are not damaged and are seated correctly.



3.4 Removing and installing track rod

Special tools and workshop equipment required

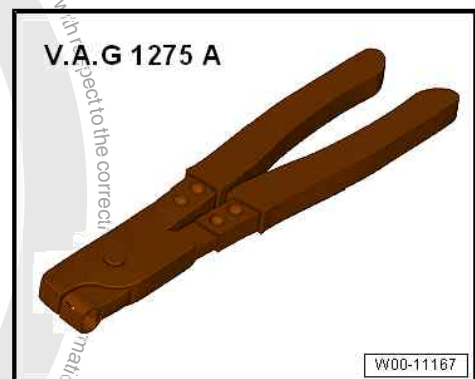
- ◆ Gearbox support - 3221 A-



- ◆ Support clamp - VW 313-



- ◆ Hose clip pliers - V.A.G 1275-

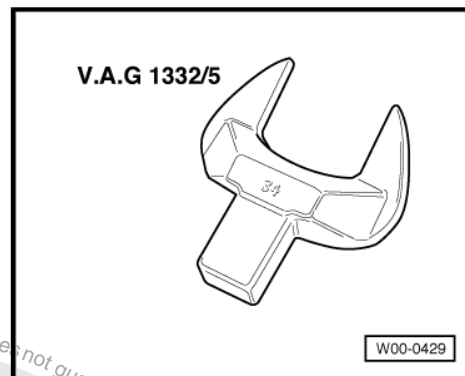


- ◆ Torque wrench - V.A.G 1332-





- ◆ Open-end insert, 34 mm - V.A.G 1332/5-



Removing

The track rods can only be removed/installed with the steering rack removed.

- Remove steering rack ⇒ [page 184](#) .
- Clean outside of steering rack in vicinity of boot.

Clamp and hose clamp of left boot must be opened and boot must be pushed back to remove right track rod. Counterhold on spanner section at left steering rack to release right track rod.

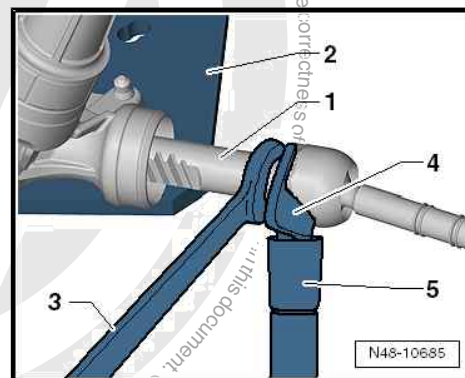
- Tension steering rack on the gearbox support - T10108- .
- Open clamp and spring-type clip and slide boot back.
- Unscrew track rod from steering rack -1-. To do this, counterhold on spanner section at steering rack using spanner -3-.

2 - Gearbox support T10108-

3 - Spanner AF 21

4 - Open-end spanner insert, AF 34 - V.A.G 1332/5-

5 - Torque wrench - V.A.G 1332-



Installing

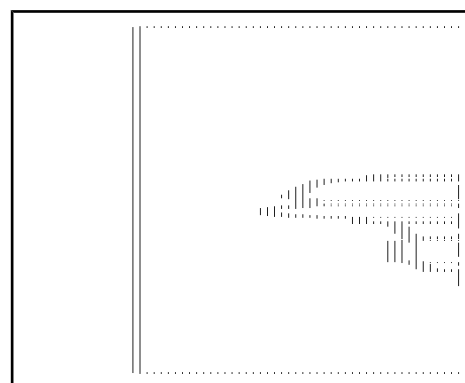
- Check boots for wear (splits, tears) and check sealing surfaces for soiling.
- Push boot onto track rod.

- Check dimension "a" on track rod and if necessary adjust.

Dimension -a- = 367 mm ± 1 mm

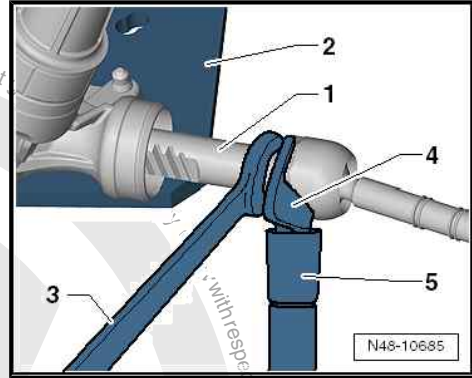
Check dimension "a" on new track rods and adjust if necessary.

Afterwards check overall toe-in on wheel alignment measuring rig and adjust as required; Wheel alignment ⇒ [page 116](#) .





- Bolt track rod to steering rack -1-. To do this, counterhold on spanner section at steering rack using spanner 3-
- 2 - Gearbox support - T10108-
- 3 - Spanner AF 21
- 4 - Open-end spanner insert, AF 34 - V.A.G 1332/5-
- 5 - Torque wrench - V.A.G 1332-
- Turn track rod so that journal of track rod end is in installation position.



- Install boot.
- Tighten hose clip using hose clip pliers - V.A.G 1275- .

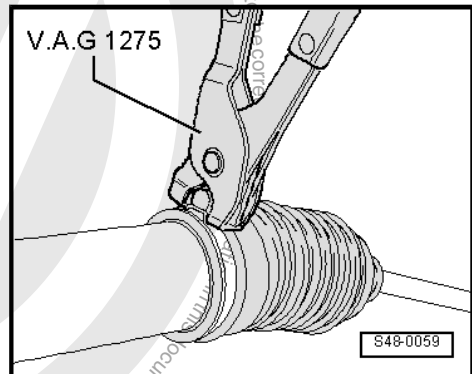
Only use genuine clamps.

The boot must not be twisted after installation.

- Install steering rack => [page 184](#) .

Specified torques

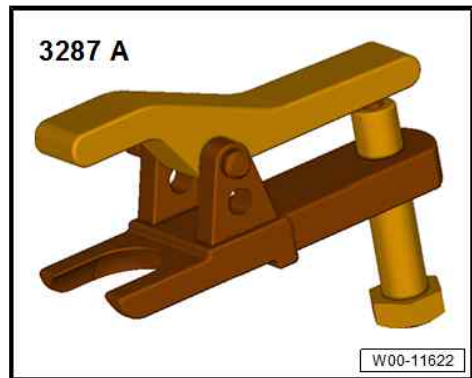
- ◆ => ["3.3 Repairing steering rack", page 188](#)



3.5 Removing and installing track rod ball joint

Special tools and workshop equipment required

- ◆ Ball joint puller - T10187- Ball joint puller - 3287 A-



- ◆ Torque wrench - V.A.G 1332-



Removing

- Loosen wheel bolts.

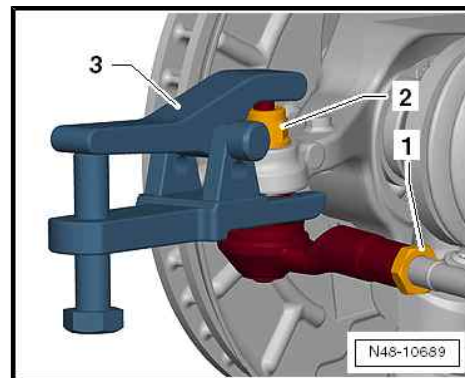


- Raise vehicle.
- Remove wheel.
- Loosen nut -1-.
- Mark position of track rod ball joint on track rod.
- Loosen nut -2- on track rod ball joint but do not remove completely.



Caution

To protect thread, leave nut screwed a few turns onto joint pin.



- Push track rod off wheel bearing housing and remove nut.

1 - Ball joint puller - T10187-

- Unscrew track rod ball joint from track rod.

Installing

Install in reverse order. During this procedure, observe the following:

- Make sure that correct track rod ball joint is installed on each side.

I - Track rod ball joint on right marked with an "A"

II - Track rod ball joint on left marked with a "B"

- Screw track rod ball joint onto track rod as far as previously applied mark and secure with lock nut.

Insert track rod ball joint into wheel bearing housing.

Bolt track rod ball joint with new nut.

Install wheels and tighten.

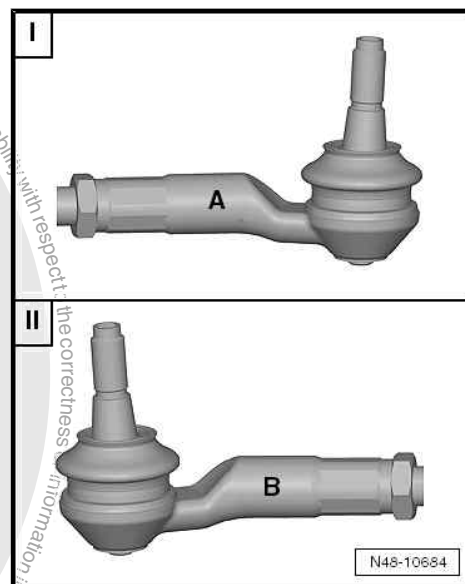
Check wheel alignment ⇒ [page 116](#) .

Specified torques

◆ ⇒ ["3.1 Assembly overview - steering rack"](#), [page 183](#)

◆ ⇒ ["3.3 Repairing steering rack"](#), [page 188](#)

◆ Wheel bolts ⇒ [Wheels and Tyres Guide](#); Rep. gr. 44 ; [Wheels, tyres](#); Specified torque for wheel bolts



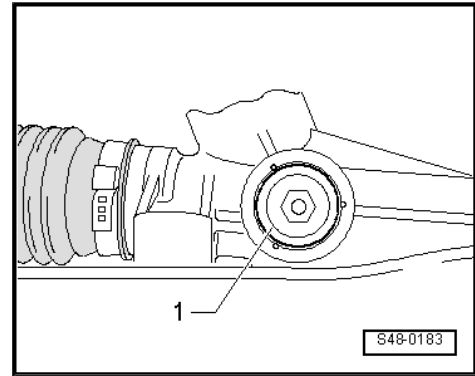
3.6 Adjusting steering rack

Two mechanics are required to perform adjustment. Perform adjustment with engine switched off.

- Raise vehicle on lifting platform.
- Wheels in straight-ahead position.
- If there is excessive play in the steering, a knocking noise will be audible when the steering wheel is rocked back and forth (about 30° either side of centre position).



- In this case, have the second mechanic carefully screw in the adjusting screw -1- into the cover until the knocking noise can no longer be heard inside the vehicle.
- Carry out road test. During this, ensure that the steering independently resets itself to the straight-ahead position after cornering, without catching.



- Secure adjusting screw -1- with three punch marks -arrows-.

