Workshop Manual
Tiguan 2016 ➤
Tiguan RUS 2017 ➤
Running gear, axles, steering

Edition 12.2016

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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

(VRL009746; Edition 12.2016)

⇒ “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 due to unexpected motor start

If the vehicle's start/stop system is activated, the engine could 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 carry out welding and straightening operations on load-bearing or wheel-guiding suspension components.
- 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 .

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2 Evaluating accident vehicles

⇒ "2.1 Checklist for evaluating running gear on accident vehicles", page 2

2.1 Checklist for evaluating running gear on accident vehicles

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

Visual 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 tread and on flanks. ⇒ page 275
- ♦ 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.

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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.

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3 Repair notes

⇒ “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

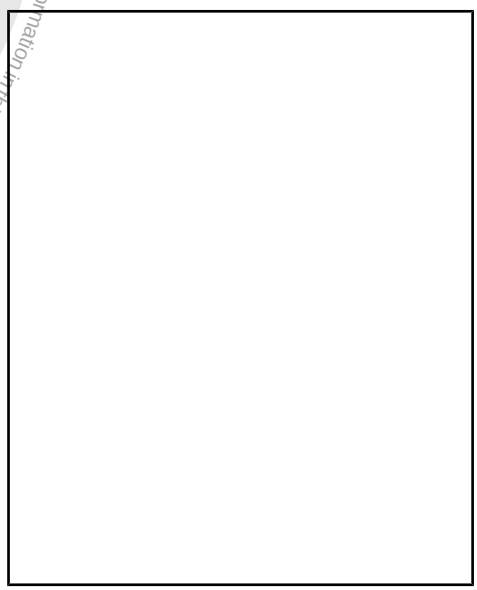
⇒ “3.8 Raising suspension to unladen position (vehicles with coil springs)”, page 6

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.

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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 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.

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

3.5 Gaskets and seals

- Always renew seals and gaskets.
- 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.

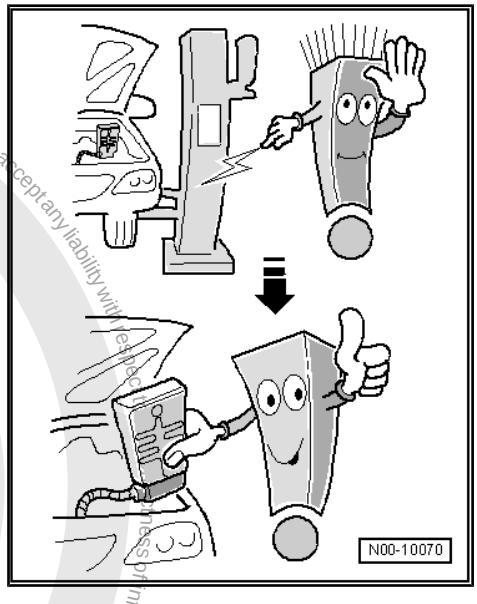
3.6 Nuts and bolts

- 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 unoiled nuts, bolts and screws.
- Always renew self-locking nuts and bolts.

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

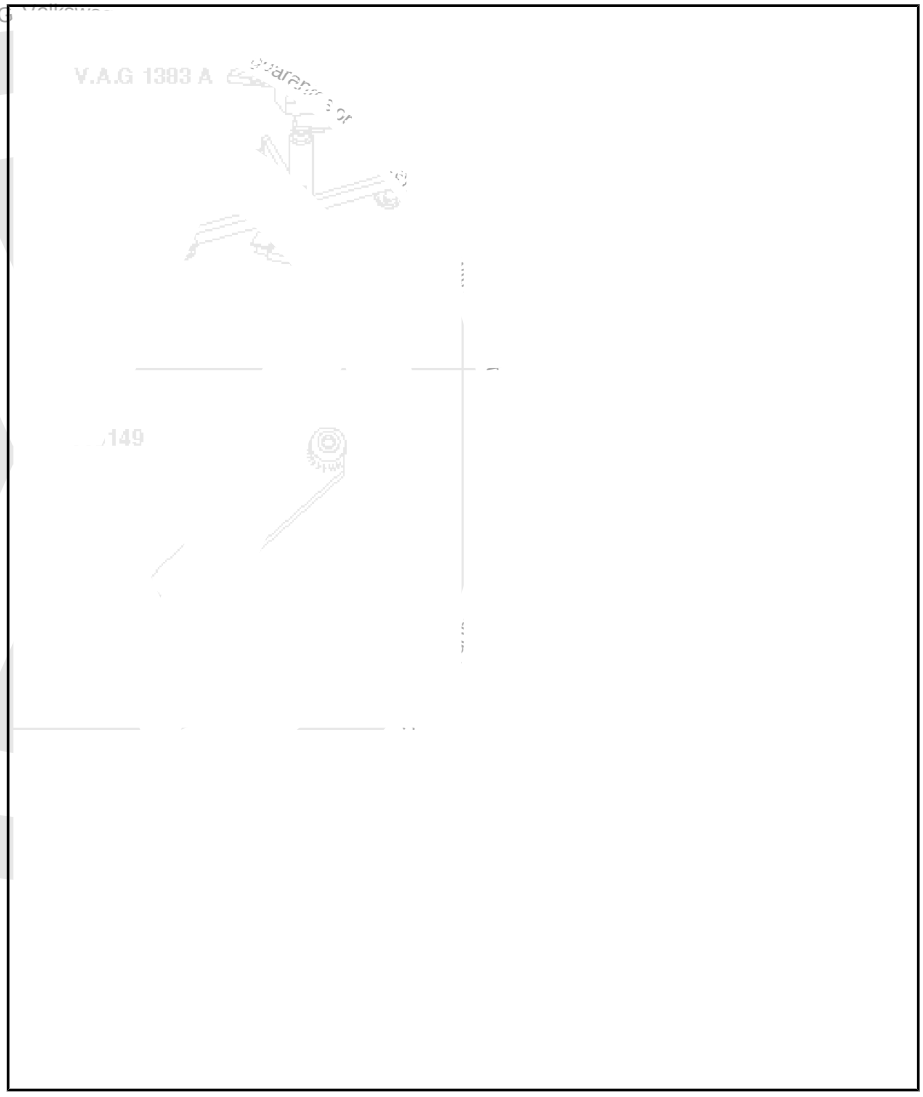
⇒ “3.8.2 Raising wheel bearing assembly to unladen position (vehicles with coil springs), rear axle”, page 8

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

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Special tools and workshop equipment required

- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- Tensioning strap - T10038-
- Support - T10149-



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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 suspension with the engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- and support - T10149- .

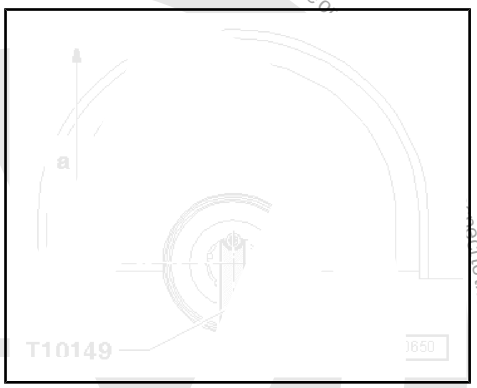
Before the respective wheel suspension is raised, the vehicle must be strapped to the lifting platform arms using tensioning straps - T10038- .

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/adaptive chassis control DCC, front-wheel drive (G02/G03/G05)	433 ± 10 mm
Standard/adaptive chassis control DCC, all-wheel drive (G01/G04/G06/G07/G08)	443 ± 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 268 .

– Raise wheel bearing housing using engine and gearbox jack - VAS 6931- or 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 the engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under the vehicle longer than necessary.*

– Tighten respective nuts and bolts.

– Lower wheel bearing housing.

– Pull out engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- from underneath the vehicle.

– Detach support - T10149- .

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

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Special tools and workshop equipment required

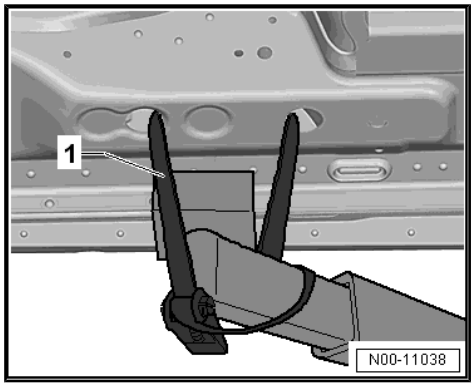
- ♦ Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- ♦ Tensioning strap - T10038-
- ♦ Support - T10149-

> ⚠ **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 axle with the engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- and support - T10149- .

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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- .



1 - Tensioning strap - 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.

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/adaptive chassis control DCC, front-wheel drive (G02/G03/G05)	445 ± 10 mm
Standard/adaptive chassis control DCC, all-wheel drive (G01/G04/G06/G07/G08)	455 ± 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 268 .

– 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 out engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- from underneath the vehicle.

– Remove support - T10149- .

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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

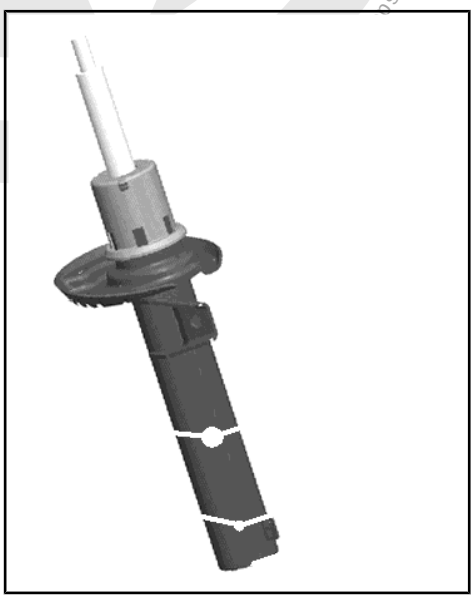
⇒ “4.1.2 Releasing gas and draining front gas-filled shock absorbers, DCC shock absorbers”, page 12

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.

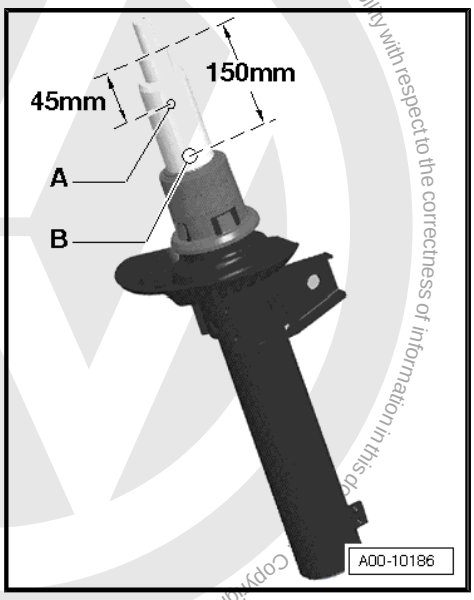
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4.1.2 Releasing gas and draining front gas-filled shock absorbers, DCC shock absorbers

– 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.

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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

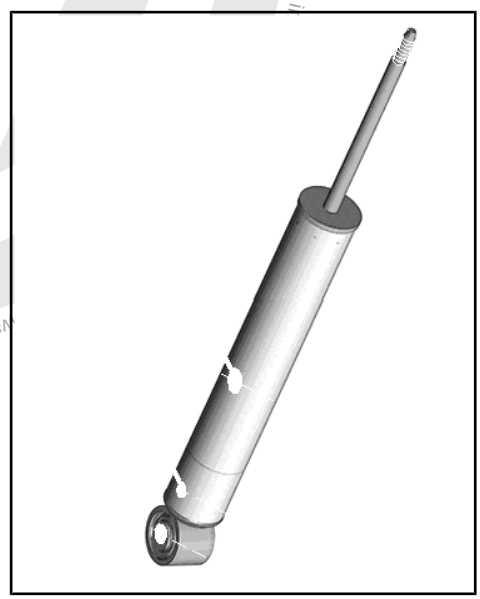
⇒ “4.2.2 Releasing gas and draining rear gas-filled shock absorbers, DCC shock absorbers”, page 14

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

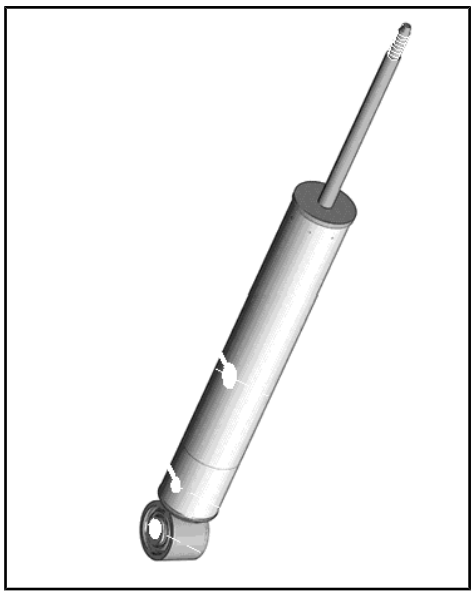
Gas escapes upon penetration.

– 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.

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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.

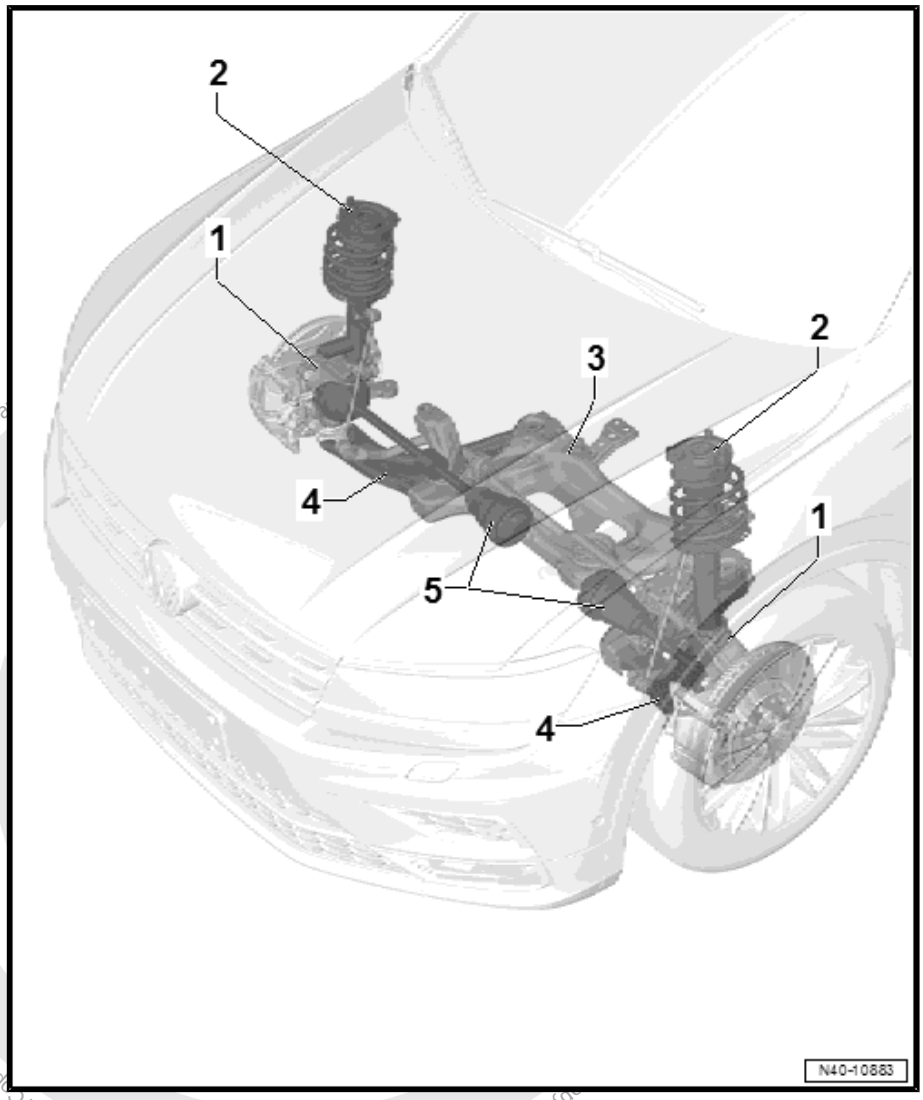
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40 – Front suspension

1 Front axle

⇒ “1.1 Overview of fitting locations - front axle”, page 15

1.1 Overview of fitting locations - front axle



1 - Wheel bearing

- ❑ Assembly overview ⇒ page 77
- ❑ Removing and installing wheel bearing housing ⇒ page 78
- ❑ Removing and installing wheel bearing unit ⇒ page 82

2 - Suspension strut

- ❑ Assembly overview ⇒ page 48
- ❑ Removing and installing ⇒ page 49

3 - Subframe

- ❑ Assembly overview ⇒ page 16
- ❑ Removing and installing subframe without steering rack ⇒ page 17
- ❑ Removing and installing subframe with steering rack ⇒ page 21
- ❑ Removing and installing anti-roll bar with rubber mounting ⇒ page 35
- ❑ Removing and installing coupling rod ⇒ page 39

4 - Lower suspension link

- ❑ Assembly overview ⇒ page 59
- ❑ Removing and installing ⇒ page 60

5 - Drive shaft

- ❑ Assembly overview ⇒ page 87
- ❑ Removing and installing ⇒ page 94

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2 Subframe

⇒ “2.1 Assembly overview - subframe”, page 16

⇒ “2.2 Removing and installing subframe without steering rack”, page 17

⇒ “2.3 Removing and installing subframe with steering rack”, page 21

⇒ “2.4 Repairing subframe”, page 28

⇒ “2.5 Removing and installing anti-roll bar”, page 35

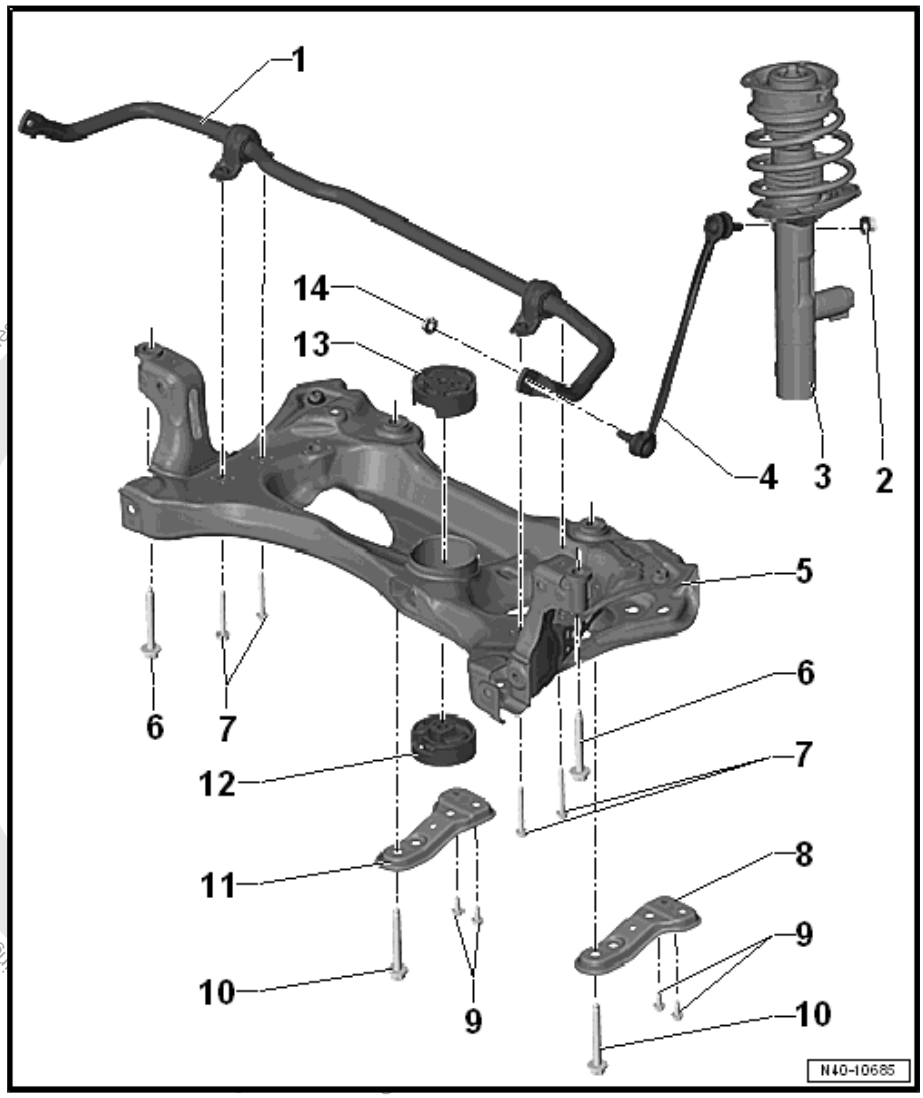
⇒ “2.6 Removing and installing coupling rod”, page 39

⇒ “2.7 Repairing thread in longitudinal member”, page 40

⇒ “2.8 Fixing position of subframe”, page 40

⇒ “2.9 Lowering subframe”, page 44

2.1 Assembly overview - subframe



1 - Anti-roll bar with rubber bush

- ❑ Removing and installing ⇒ page 35

2 - Nut

- ❑ When tightening, counterhold on multipoint socket of joint stub.
- ❑ Renew after removal
- ❑ 65 Nm

3 - Suspension strut

4 - Coupling rod

- ❑ Removing and installing ⇒ page 39

5 - Subframe

- ❑ Fixing position ⇒ page 40
- ❑ Lowering ⇒ page 44
- ❑ Removing and installing without steering rack ⇒ page 17
- ❑ Removing and installing with steering rack ⇒ page 21

6 - Bolt

- ❑ Renew after removal
- ❑ 70 Nm +180°

7 - Bolt

- ❑ Renew after removal
- ❑ 20 Nm +180°

8 - Left support

9 - Bolt

- ❑ Renew after removal
- ❑ 50 Nm +90°

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10 - Bolt

- ❑ Renew after removal
- ❑ 70 Nm +180°

11 - Right support

12 - Lower bonded rubber bush for pendulum support

- ❑ Replacing ⇒ page 28

13 - Upper bonded rubber bush for pendulum support

- ❑ Replacing ⇒ page 28

14 - Nut

- ❑ When tightening, counterhold on multipoint socket of joint stub.
- ❑ Renew after removal
- ❑ 65 Nm

2.2 Removing and installing subframe without steering rack

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-



- ♦ Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



Removing

Note

The subframe is removed together with the suspension links.

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheels.

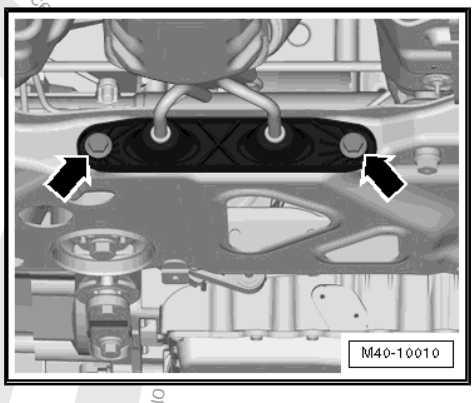
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– Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

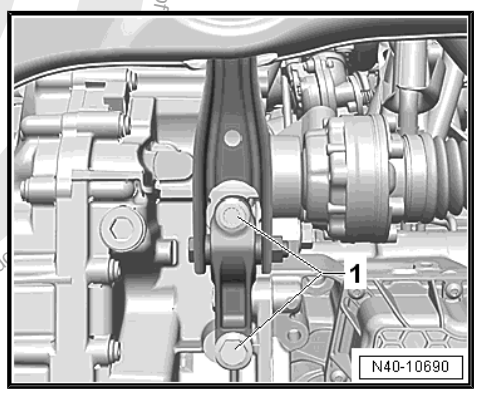
– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

– Detach exhaust system bracket from subframe -arrows-.

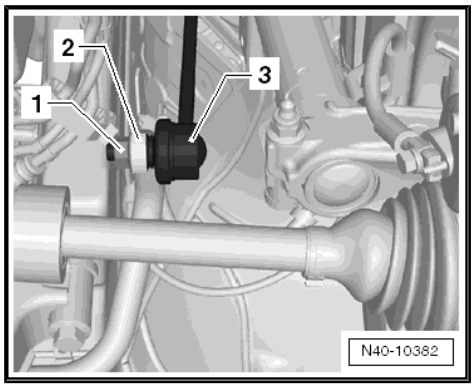


– Remove bolts -1- for pendulum support.



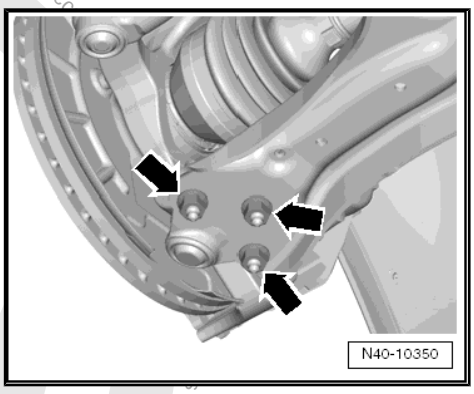
– Remove hexagon nut -1- from coupling rod -3- (left and right sides).

– Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



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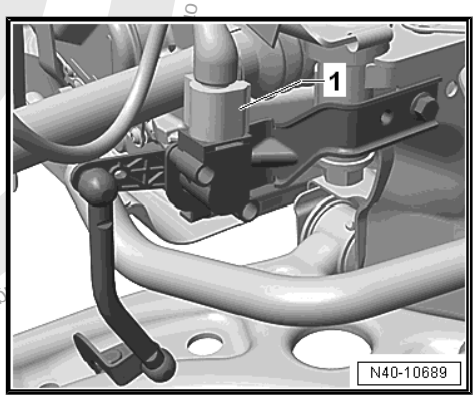
– Remove nuts -arrows- on left and right sides of vehicle.



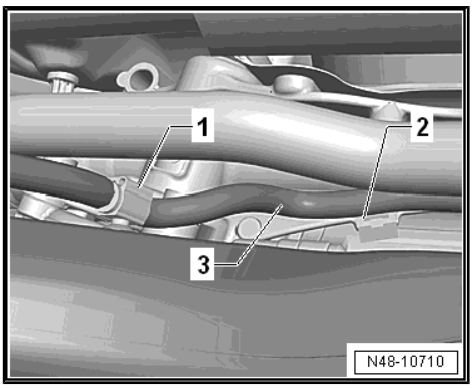
Vehicles with vehicle level sender.

– Disconnect connector -1- on front left vehicle level sender - G78- and/or front right vehicle level sender - G289- , as applicable.

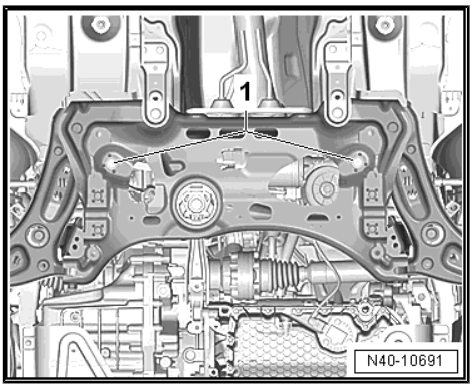
Continued for all vehicles:



– Pull wiring harness -3- clips -1- and -2- off subframe and steering rack.

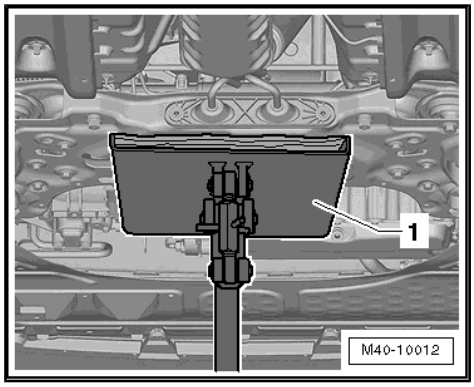


– Remove bolts -1- for steering rack.
– Prise steering rack out of dowel sleeves of subframe.

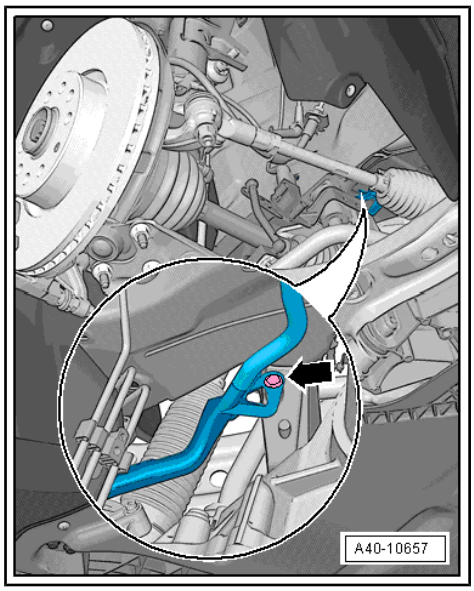


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– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under subframe.
– Fix position of subframe ⇒ page 40 and lower approx. 10 cm.



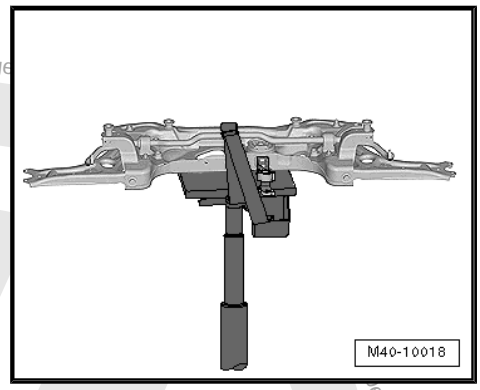
– Pull out spreader clip -arrow-.
– Lower subframe using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .



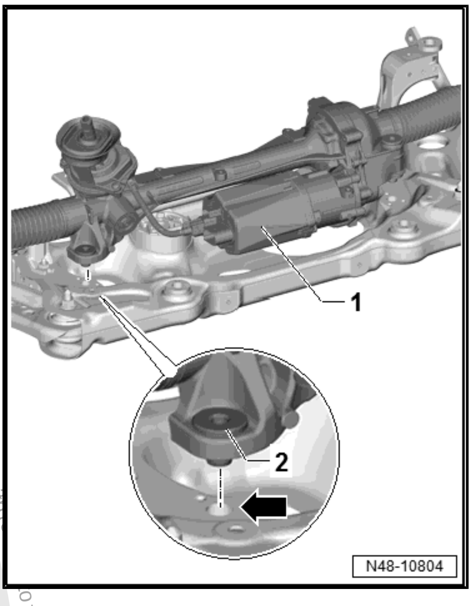
– Secure subframe on engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .
– Secure steering rack to body.

Installing

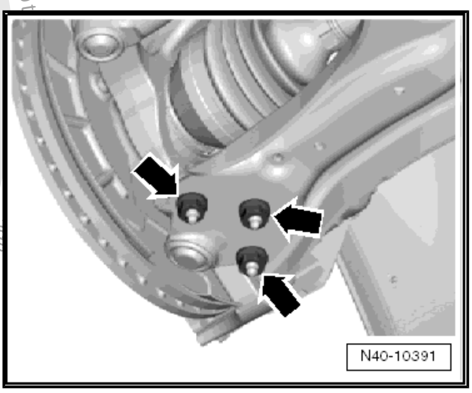
Install in the reverse order of removal, observing the following:



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– Position steering rack -1- on subframe.
– Threaded sleeves -2- of steering rack must be inserted in holes in subframe -arrow-.



– Tighten nuts -arrows-.

Note

Tighten nuts -arrows- in unladen state *⇒ page 6* .

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “3.1 Assembly overview - steering rack”, page 313
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding
- Exhaust system to subframe ⇒ Rep. gr. 26 ; Exhaust pipes/ silencers; Assembly overview - silencer .
- Dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side

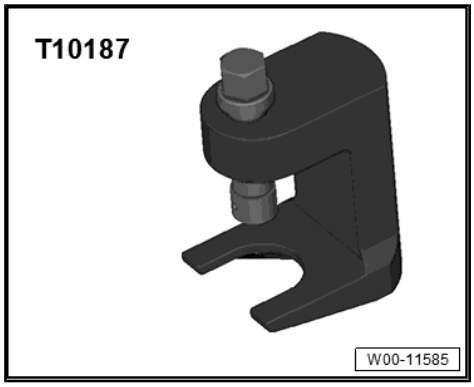
If a crooked steering wheel is determined during the road test even though locating pins - T10486/1- were used, check wheel alignment. In this case the wheel alignment test results must be archived in the vehicle files.

2.3 Removing and installing subframe with steering rack

Special tools and workshop equipment required

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♦ Ball joint puller - T10187-



♦ Torque wrench - V.A.G 1332-



Removing

– Turn steering wheel to straight-ahead position.

Vehicles with mechanical ignition lock

– Pull off ignition key so that steering lock engages.

Vehicles with electronic ignition lock

– Switch off ignition and open driver's door so that the steering lock engages.

– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

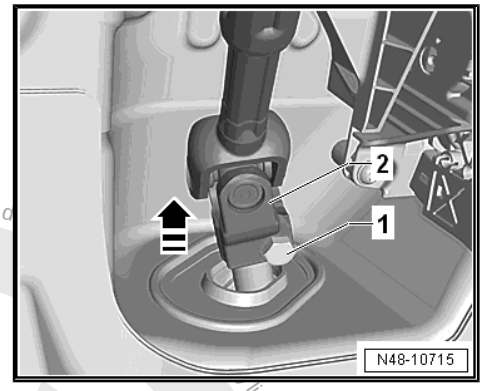
Continued for all vehicles:

– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .

– Fold floor covering to the rear.

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– Unscrew bolt -1- from universal joint -2- and pull off universal joint in -direction of arrow-.



Caution

The following work must not be performed while the universal joint is separated from the steering rack:

- ***Connect battery***
- ***Switch on ignition***
- ***Turn steering mechanism***
- ***Turn steering column***

These points must absolutely be heeded because otherwise, irreparable damage may be caused.

– Loosen wheel bolts.

– Raise vehicle on lift.

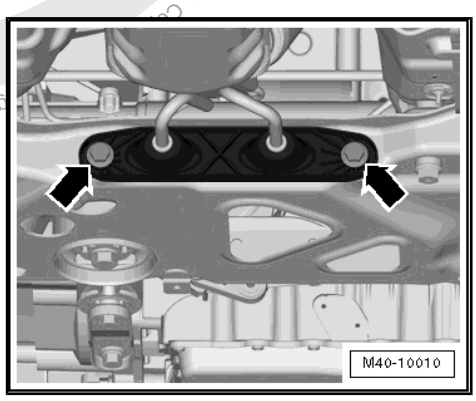
– Remove wheels.

– Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

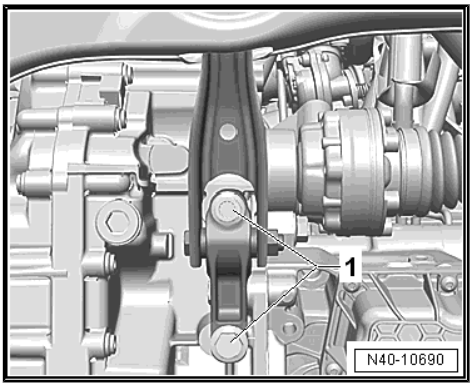
– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

– Detach exhaust system bracket from subframe -arrows-.

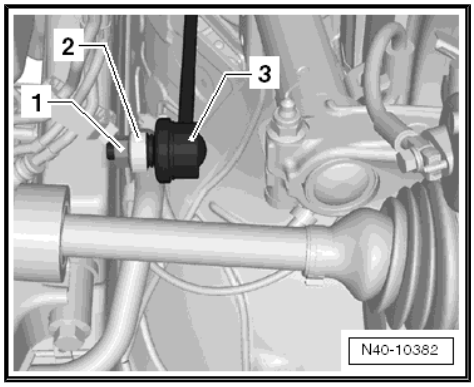


– Remove bolts -1- for pendulum support.

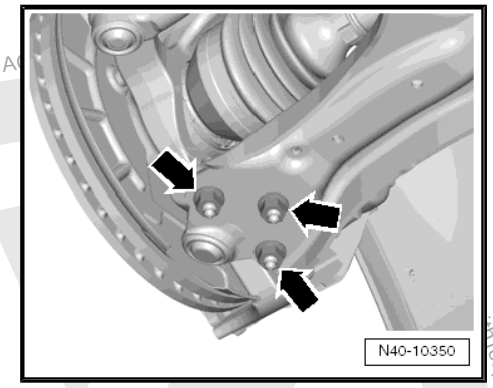


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– Remove hexagon nut -1- from coupling rod -3- (left and right sides).
– Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



– Remove nuts -arrows- on left and right sides of vehicle.
– Pull swivel joint out of suspension link.



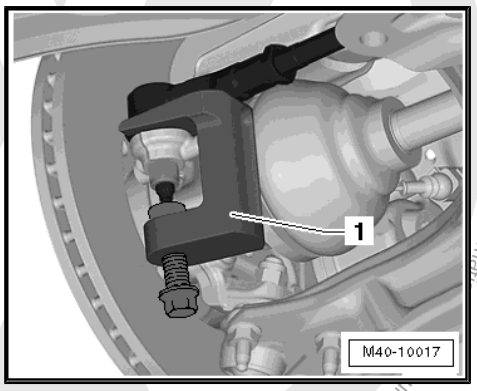
– Loosen nut on track rod ball joint but do not remove completely.

Caution

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

– Push track rod ball joint off wheel bearing housing and remove nut.

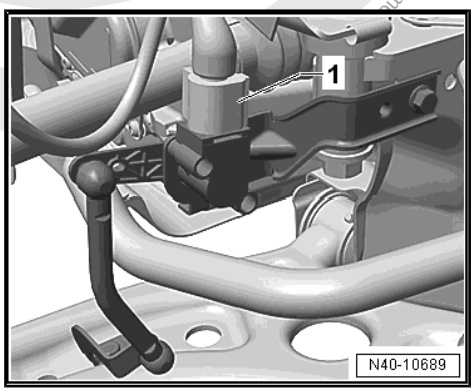
1 - Ball joint puller - T10187-



Vehicles with vehicle level sender.

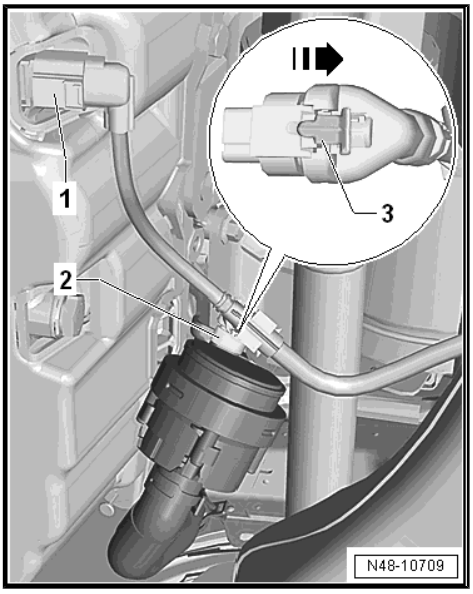
– Disconnect connector -1- on front left vehicle level sender - G78- and/or front right vehicle level sender - G289-, as applicable.

Continued for all vehicles:

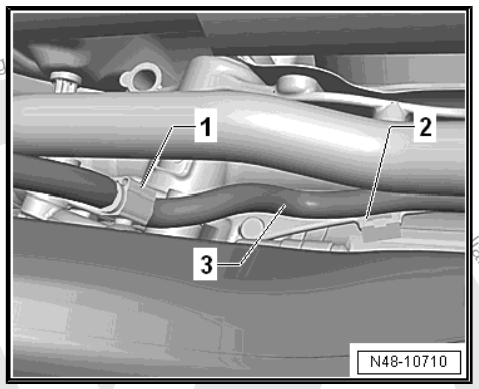


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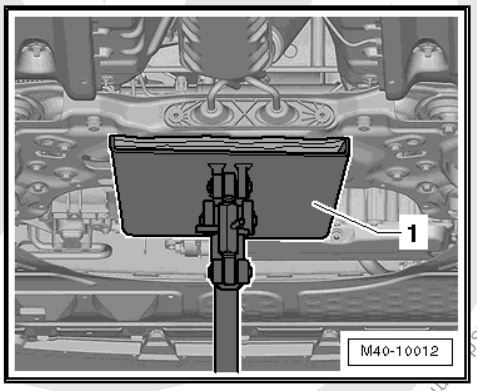
– Disconnect connector -1- for oil level and oil temperature sender - G266- .
– If installed, disconnect connector -2- on continued coolant circulation pump - V51- . To do this, open locking device -3- by pressing in direction of -arrow- and release connector.



– Pull wiring harness -3- clips -1- and -2- off subframe and steering rack.



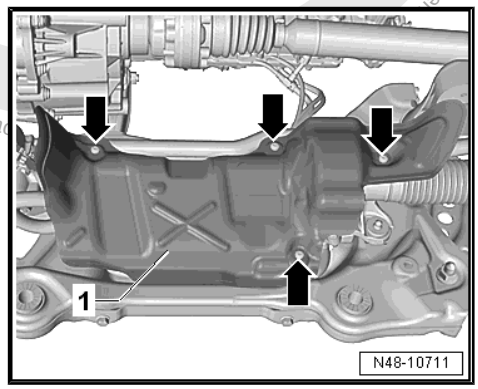
– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under subframe.
– Fix position of subframe ⇒ page 40 and lower approx. 10 cm.



LHD only

Vehicles with longer head shield

– Unscrew bolts -arrows- and remove heat shield -1- from steering rack.



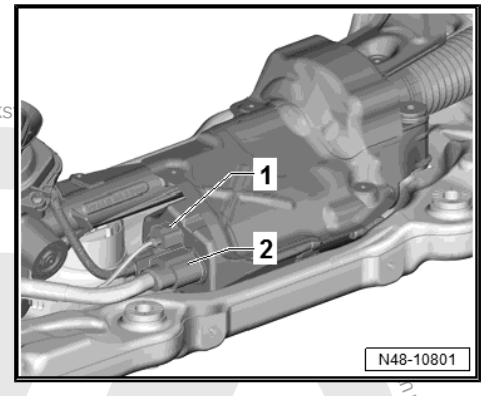
Note

Different heat shields -1- are installed depending on the engine. On some engines it is possible to access the connectors for the steering rack without removing the heat shield.

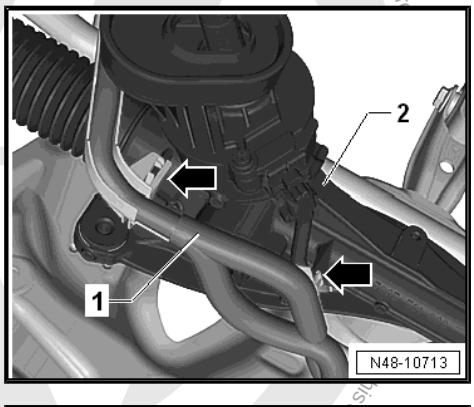
Continuation for all scenarios

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liability with respect to the correctness of information in this

– Disconnect connectors -1- and -2- from steering rack.

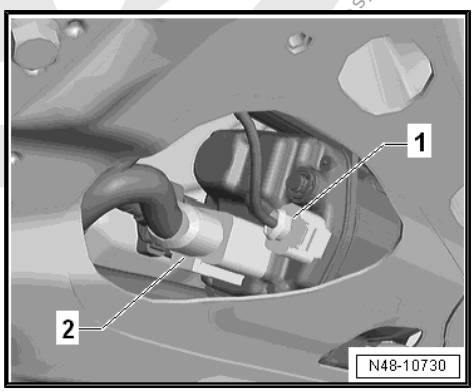


– Unclip wiring harness -1- from steering rack -2- -arrows-.



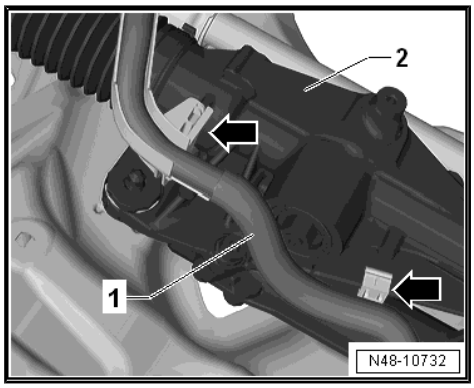
RHD only

– Disconnect connectors -1- and -2- from steering rack.



– Unclip wiring harness -1- from steering rack -2- -arrows-.

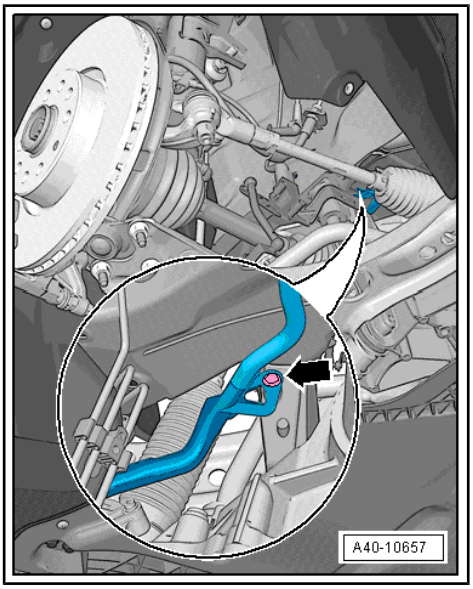
Continuation for both sides



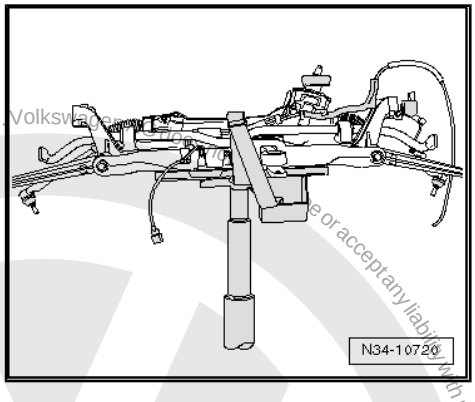
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– Pull out spreader clip -arrow-.

– Lower subframe using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .



– Secure subframe to engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- using the included tensioning strap.



Installing

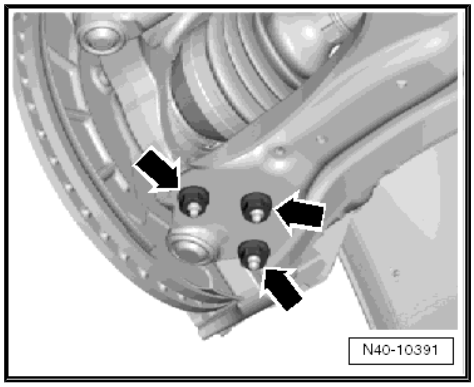
Install in reverse order of removal. During this step, observe the following:

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After fitting the steering rack to the universal joint ensure that the seal is not kinked against the assembly plate on the steering rack. The opening to the footwell must be sealed correctly. Otherwise, this can result in water leaks and/or noise.*
- *Ensure sealing surfaces are clean.*

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– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “5.1 Assembly overview - wheel bearing”, page 77
- ⇒ “3.1 Assembly overview - steering rack”, page 313
- ⇒ “2.1 Assembly overview - steering column”, page 300
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding
- Exhaust system bracket to subframe ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .
- Dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side

If a crooked steering wheel is determined during the road test even though locating pins -T10486/1- were used, check wheel alignment. In this case the wheel alignment test results must be archived in the vehicle files.

2.4 Repairing subframe

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Special tools and workshop equipment required

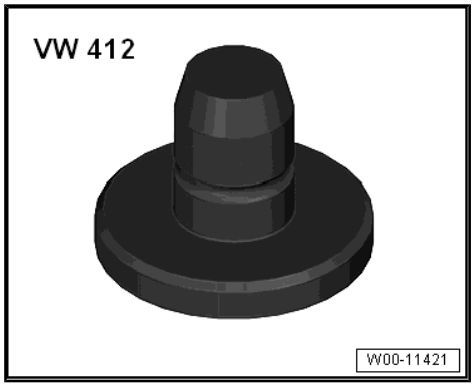
- Assembly tool - T10205-
- Torque wrench - V.A.G 1332-
- Hydraulic cylinder - VAS 6178-
- Foot pump - VAS 6179-
- Assembly tool - VAS 6779-

- Pressure plate - VW 401-



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♦ Press piece - VW 412-



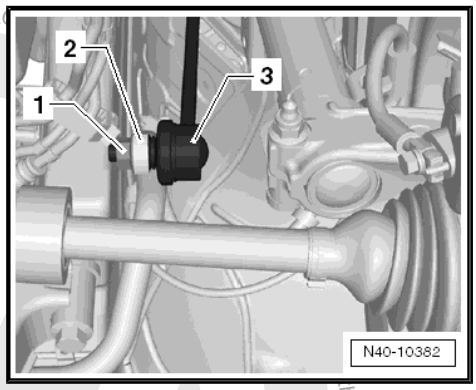
Renewing bonded rubber bushes for pendulum support

– Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove hexagon nut -1- from coupling rod -3- (left and right sides).

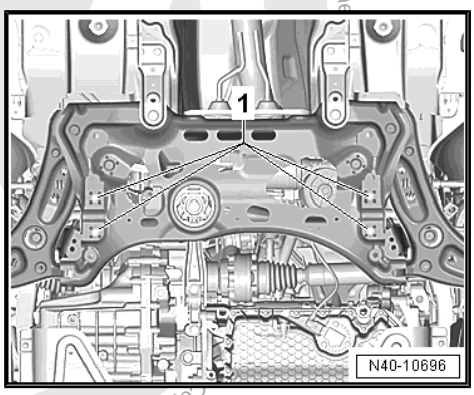
– Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



– Remove bolts -1- for anti-roll bar.

• Leave the anti-roll bar in its installation position in the vehicle.

– Remove pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing pendulum support .

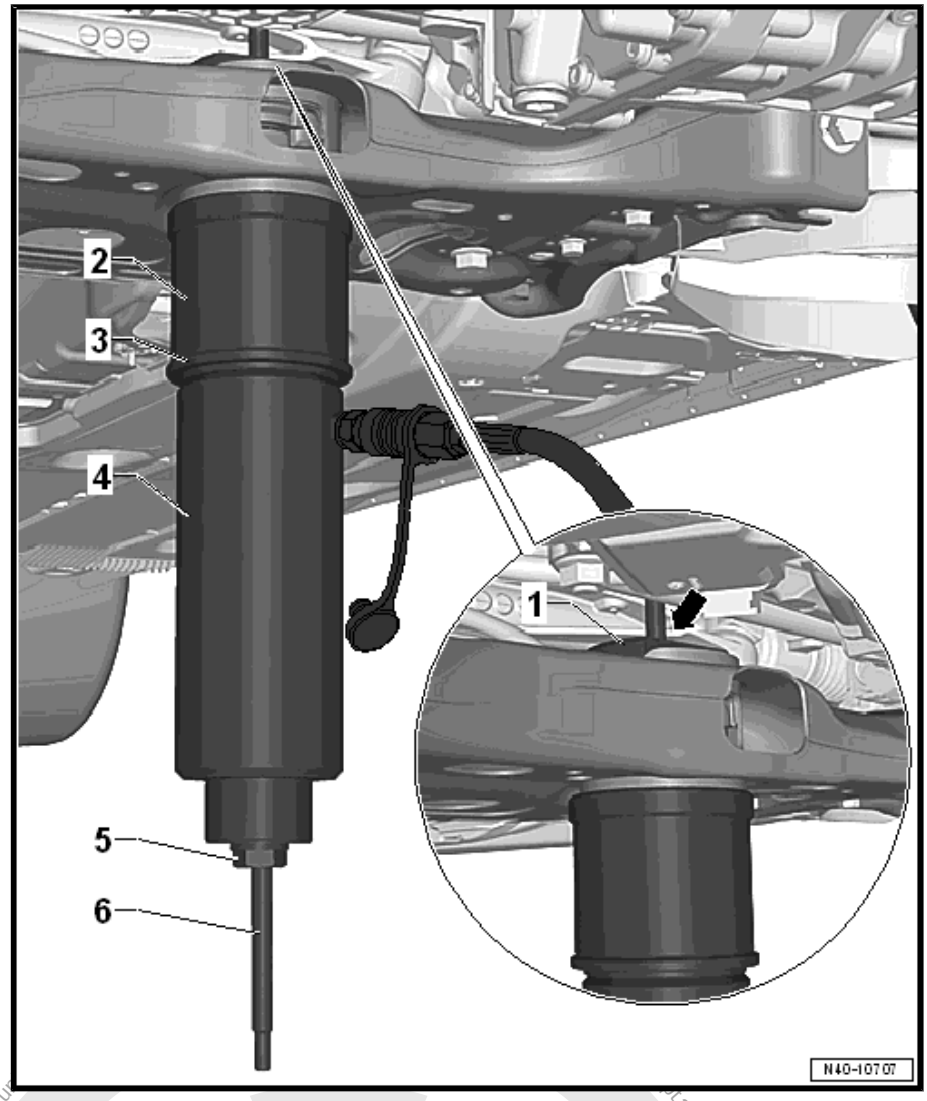


Pressing out bonded rubber bush

– Fit assembly tool - VAS 6779- to subframe as shown in illustration.

– Place thrust piece for removal - VAS 6779-1- -1- on bonded rubber bush so that flattened side -arrow- faces to direction of travel.

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1 - Thrust piece for removal - VAS 6779/1-

2 - Tube - VAS 6779/4-

3 - Thrust piece - VAS 6779/5-

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

5 - Hexagon nut - VAS 6779/3-

6 - Threaded spindle - VAS 6779/2-

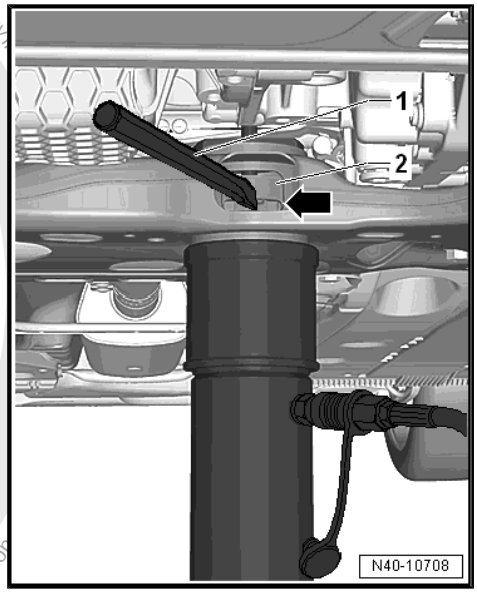
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– Press out both bonded rubber bushes until upper bonded rubber bush -2- is visible in pendulum support opening -arrow- in subframe.

– Carry out visual check of outer ring of upper bonded rubber bush -2-.

• If outer ring of upper bonded rubber bush -2- is deformed, destroy it through opening of pendulum support -arrow- in pendulum support.

– Using a chisel or similar -1-, create a break in the outer ring of the upper bonded rubber bush -2-.



Note

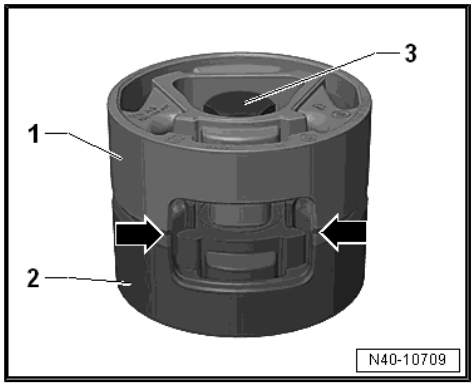
This process is necessary to prevent the canting of the outer ring of the upper bonded rubber bush in the area of the opening of the pendulum support in the subframe.

– Press out both bonded rubber bushes together.

Preparing bonded rubber bush for pressing in

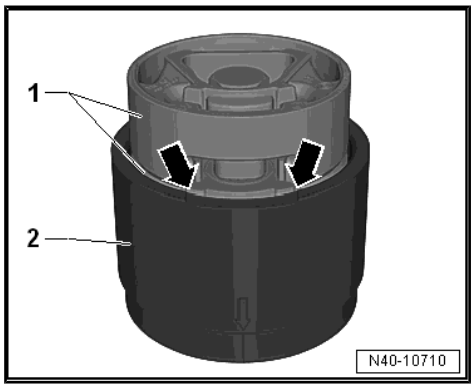
– Place both bonded rubber bushes -1- and -2- together so that the cut-outs -arrows- line up precisely.

– Bolt bonded rubber bushes -1- and -2- hand-tight together using original bolt -3-.



– Insert bonded rubber bushes -1- into larger diameter of tube - VAS 6779/6- -2- with bolt head facing upwards.

– Align bonded rubber bushes -1- in tube - VAS 6779/6- -2-. The cut-out in the bonded rubber bush must align exactly with the recess -arrow- in the tube - VAS 6779/6- -2-.



– Press in bonded rubber bush -3- in tube - VAS 6779/6- to stop, as illustrated.

1 - Press tool - VW 412-

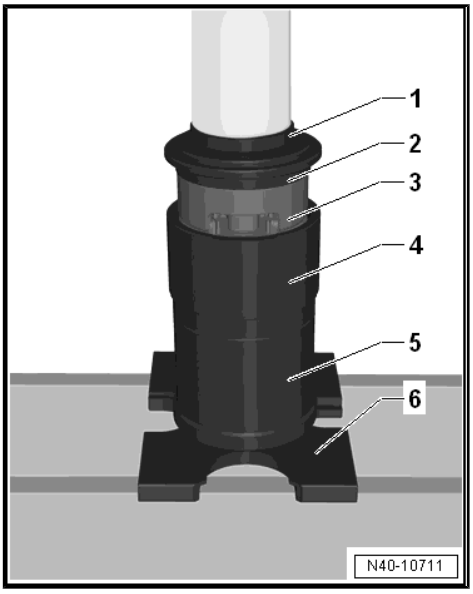
2 - Thrust piece - VAS 6779/5- , the side with the lettering »A« must face upwards.

3 - Bonded rubber bush

4 - Funnel - VAS 6779/6-

5 - Tube - VAS 6779/4-

6 - Thrust plate - VW 401-

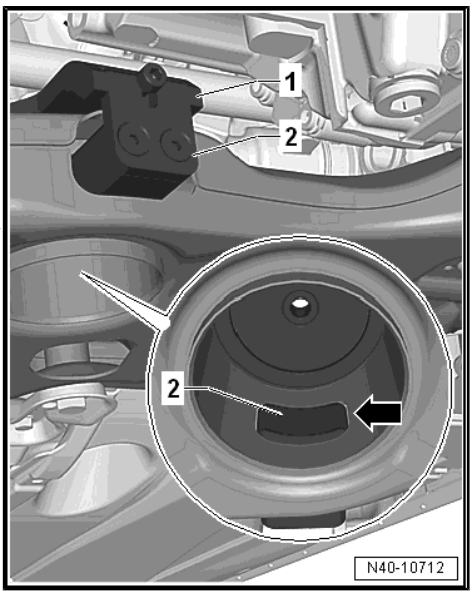


– Insert counterhold - VAS 6779/7- -1- into subframe.

– Insert counterhold attachment - VAS 6779/7-1A- -2- into pendulum support opening in subframe.

– Bolt insert - VAS 6779/7-1A- to counterhold - VAS 6779/7- -1-.

– Ensure that the insert - VAS 6779/7-1A- -2- is correctly seated in the pendulum support opening of the subframe -arrow-.

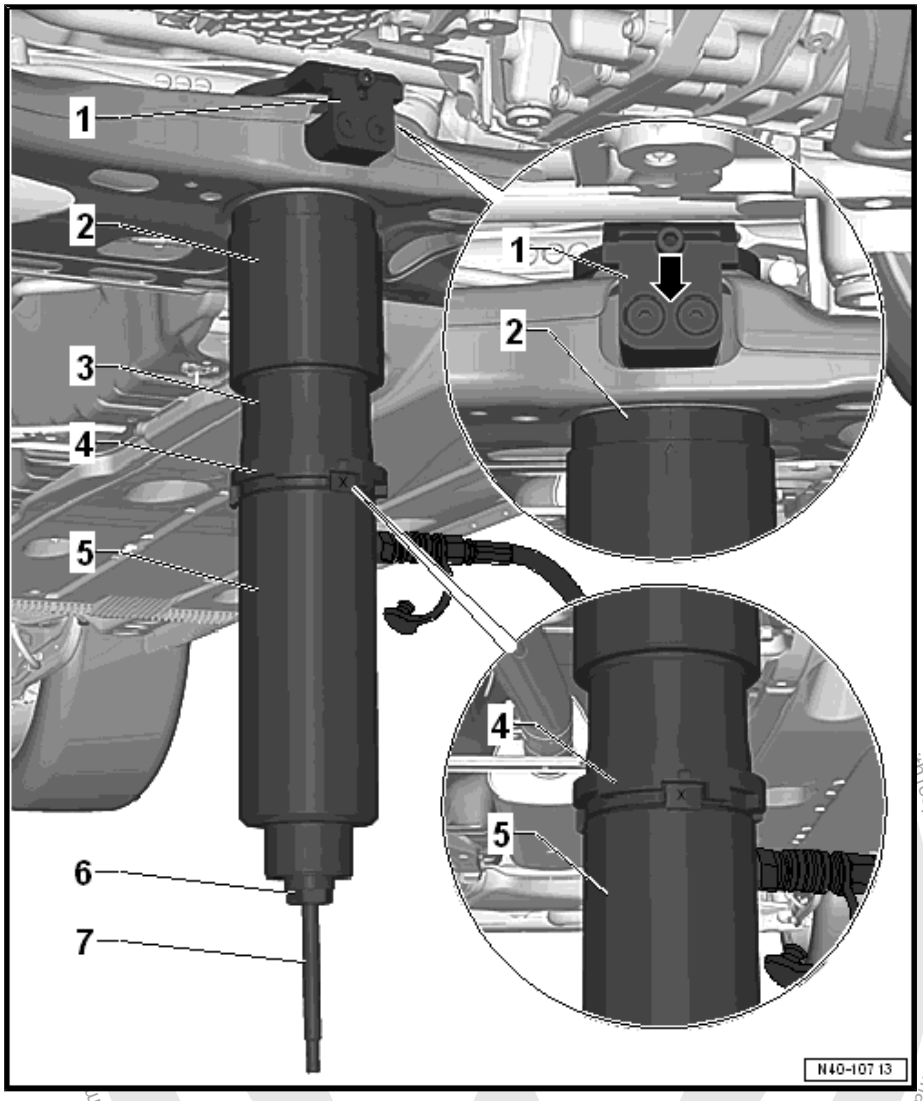


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Pressing in bonded rubber bush

– Screw threaded spindle - VAS 6779/2- -7- into counterhold - VAS 6779/7- -1-

– Fit assembly tool - VAS 6779- to subframe as shown in illustration.



1 - Counterhold tool - VAS 6779/7-

2 - Tube - VAS 6779/6- , -arrow mark- on tube must align centrally between both bolts -arrow-.

3 - Thrust piece - VAS 6779/9-

4 - Stepped ring - VAS 6779/8- ; mark -I- on stepped ring must align with mark -X- on thrust piece - VAS 6779/9-

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

6 - Hexagon nut - VAS 6779/3-

7 - Threaded spindle - VAS 6779/2-

– Press in both bonded rubber bushes together.

– Remove assembly tool - VAS 6779- from subframe and check pressed-in bonded rubber bushes are properly seated.

– Bolt anti-roll bar to subframe and coupling rods.

– Install pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing pendulum support .

– Install noise insulation at rear to subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

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– Install front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

2.5 Removing and installing anti-roll bar

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



Removing

– Loosen wheel bolts.

– Raise vehicle on lift.

– Remove wheels.

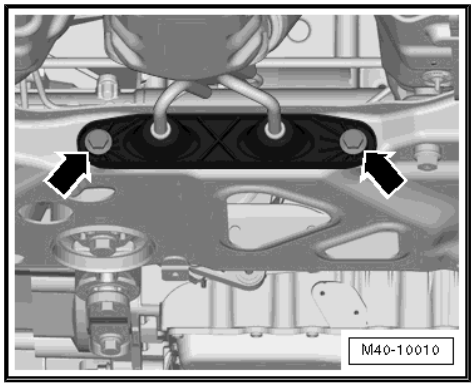
– Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

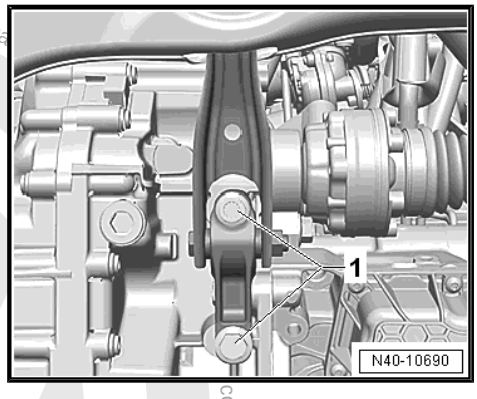
– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

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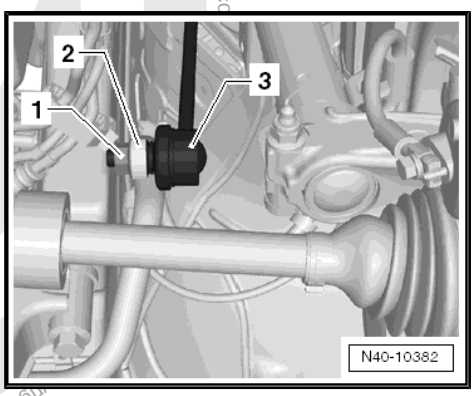
– Detach exhaust system bracket from subframe -arrows-.



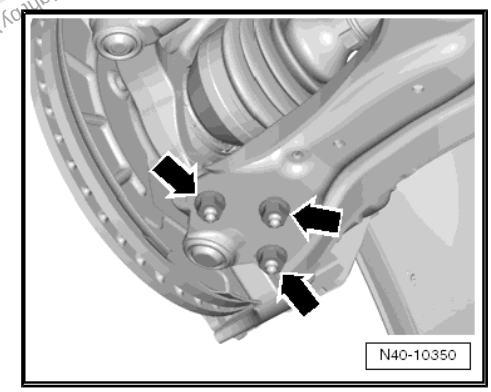
– Remove bolts -1- for pendulum support.



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



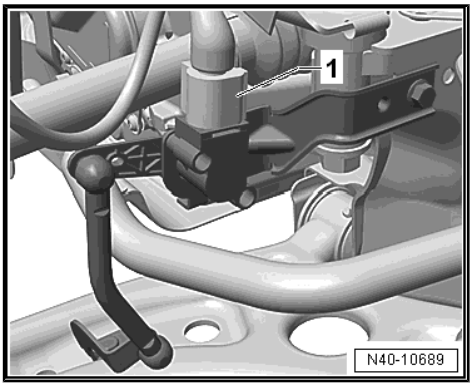
– Remove nuts -arrows- on left and right sides of vehicle.



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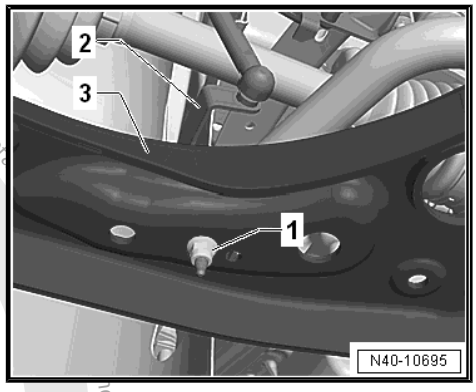
Vehicles with vehicle level sender.

– Disconnect connector -1- on front left vehicle level sender - G78- and/or front right vehicle level sender - G289- , as applicable.



– Undo nuts -1-.

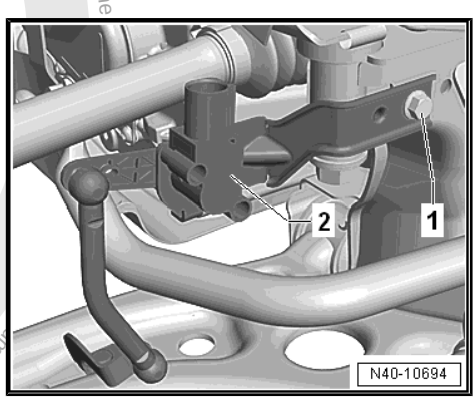
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.



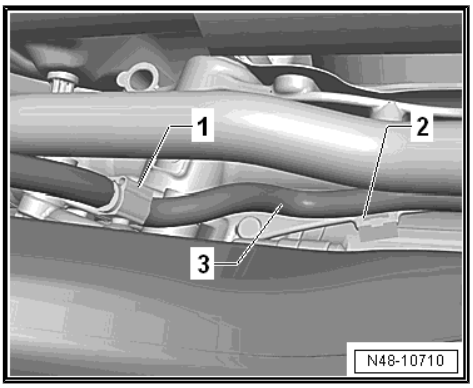
– Unscrew bolt -1-.

– Remove front left vehicle level sender - G78- -2- and/or front right vehicle level sender - G289- , as applicable.

Continued for all vehicles:

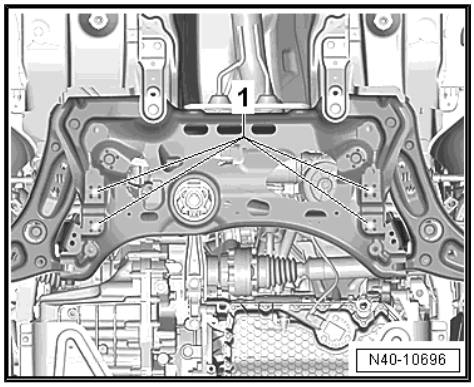


– Pull wiring harness -3- clips -1- and -2- off subframe and steering rack.

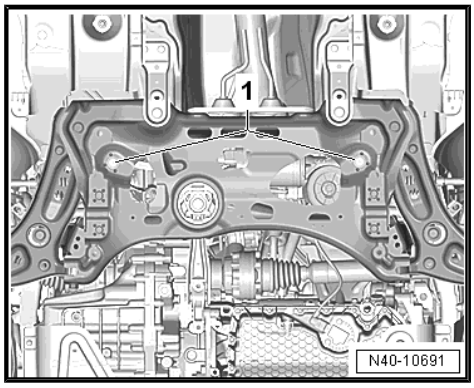


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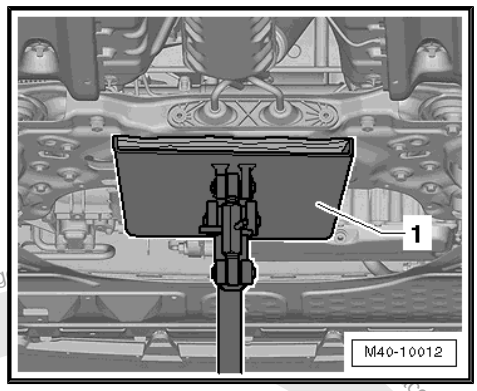
– Remove bolts -1- for anti-roll bar.



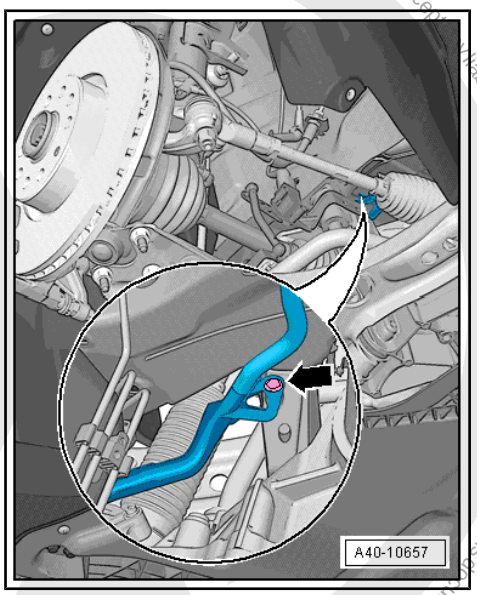
– Remove bolts -1- for steering rack.
– Prise steering rack out of dowel sleeves of subframe.



– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under subframe.
– Fix position of subframe ⇒ page 40 and lower approx. 10 cm.



– Pull out spreader clip -arrow-.
– Lower subframe using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- far enough to remove anti-roll bar rearwards.



Installing

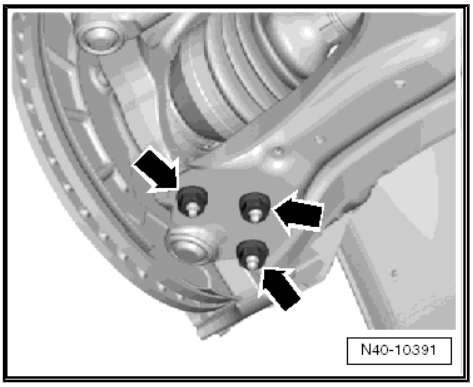
Install in the reverse order of removal, observing the following:

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

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– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “2.1 Assembly overview - steering column”, page 300
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

If a crooked steering wheel is determined during the road test even though locating pins -T10486/1- were used, check wheel alignment. In this case the wheel alignment test results must be archived in the vehicle files.

2.6 Removing and installing coupling rod

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-

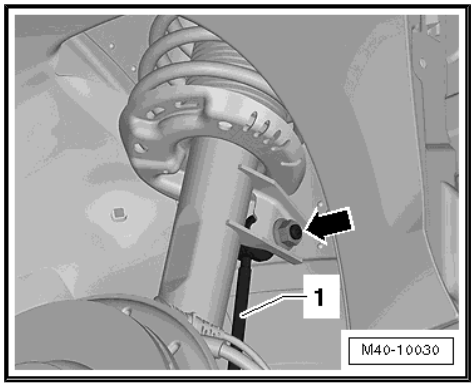


Removing

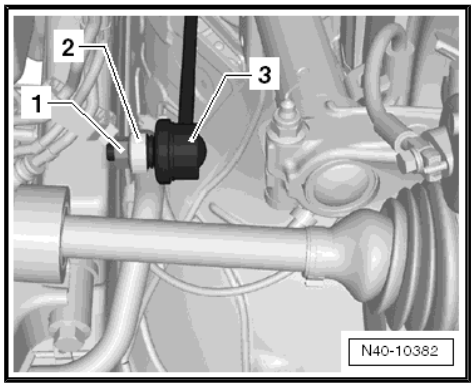
– Raise vehicle on lift.

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– Unscrew nut -arrow- and pull coupling rod -1- off suspension strut.



– Unscrew hexagon nut -1- from coupling rod -3-.
– Pull coupling rod -3- out of anti-roll bar -2-.



Installing

Install in the reverse order of removal, observing the following:

- Tighten nuts of coupling rod on suspension strut/anti-roll bar, if necessary, counterhold at multi-point socket head.

Torque settings

◆ ⇒ “2.1 Assembly overview - subframe”, page 16

2.7 Repairing thread in longitudinal member

Repairing the thread in welded nuts in the longitudinal member is possible under certain conditions; Body repair ⇒ Body Repairs; Rep. gr. 50 .

2.8 Fixing position of subframe

Note

- *Certain repairs on vehicles require the removal of the subframe or the entire front axle.*
- *The original position of the subframe relative to the body can be retained with the aid of qty. 4 locating pins - T10486/1- .*
- *Qty. 2 locating pins - T10486/1- are a part of locating device - T10486- . When locating device - T10486- is already being employed, then only the addition of qty. 2 locating pins - T10486/1- are required.*
- *If the locating device - T10486- is not being employed, then use locating device - T10486 A- . This contains qty. 4 locating pins - T10486/1- and qty. 2 locating pins - T10486/2- . The locating pins - T10486/2- are not required for the following process.*

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Special tools and workshop equipment required

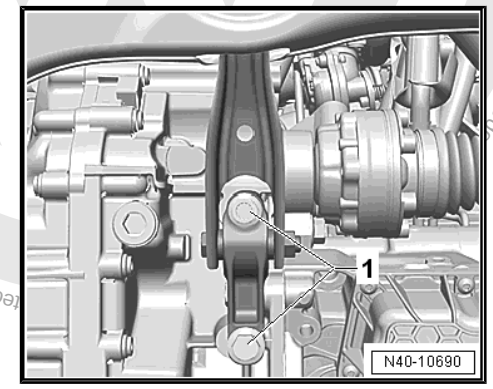
- Qty. 4 locating pins - T10486/1-
- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- Torque wrench - V.A.G 1332-

– Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

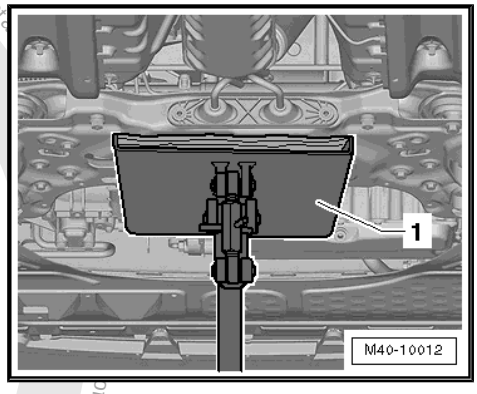
– Unbolt pendulum support bolts -1- from gearbox.



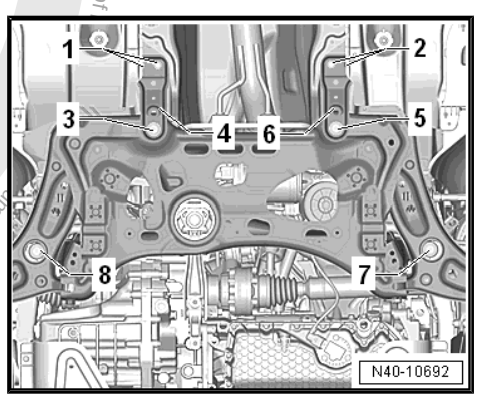
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– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under subframe.

– If necessary, clean thread of locating pins - T10486/1- .



• To fix position of subframe, locating pins - T10486/1- must be screwed one after the other into positions -3-, -5-, -7- and -8-.



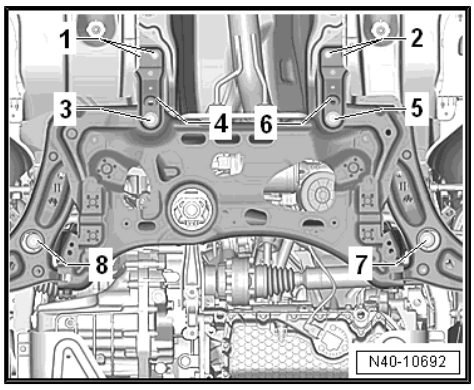
Note

The locating pins - T10486/1- must NOT be tightened to more than 20 Nm, otherwise the threads of the locating pin will be damaged.

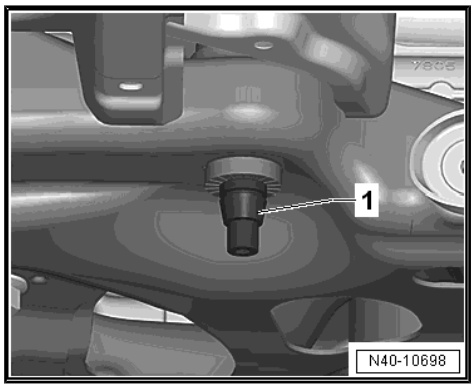
Fixing position of subframe at rear

– Remove screws -1-.

– Remove bolt -3- and remove support -4-.

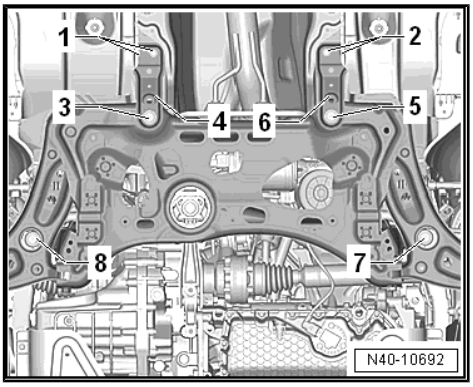


– Insert locating pins - T10486/1- -1- and tighten to 20 Nm.

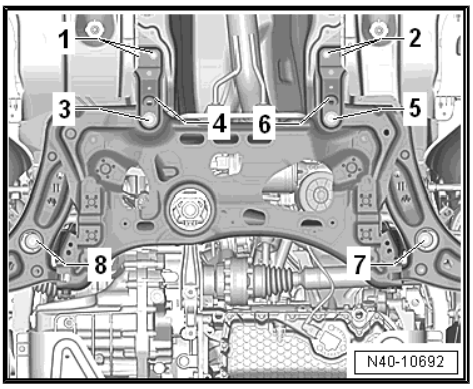


– Unscrew bolts -2-.
– Remove bolt -5- and remove support -6-.
– Insert locating pins - T10486/1- and tighten to 20 Nm.

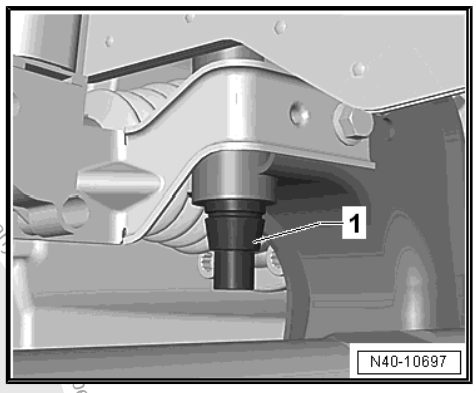
Fixing position of subframe at front



– Remove screw -8-.



– Insert locating pins - T10486/1- -1- and tighten to 20 Nm.

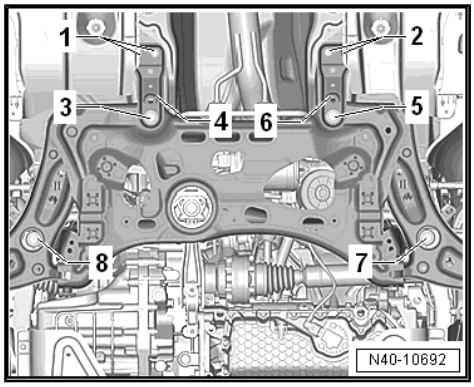


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– Remove screw -7-.

– Insert locating pins - T10486/1- and tighten to 20 Nm.

- The fixing of the subframe is completed when all the above mentioned bolts have been replaced consecutively with the locating pins - T10486/1- .
- The position of the subframe is now fixed.



Remove locating pins - T10486/1-

Removal is carried out in the reverse sequence, noting the following:

– Always only unscrew one locating pin at a time and replace it with a new bolt.

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding

If a crooked steering wheel is determined during the road test even though locating pins - T10486/1- were used, check wheel alignment. In this case the wheel alignment test results must be archived in the vehicle files.

2.9 Lowering subframe

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



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- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



Removing

– Turn steering wheel to straight-ahead position.

Vehicles with mechanical ignition lock

– Pull off ignition key so that steering lock engages.

Vehicles with electronic ignition lock

– Switch off ignition and open driver's door so that the steering lock engages.

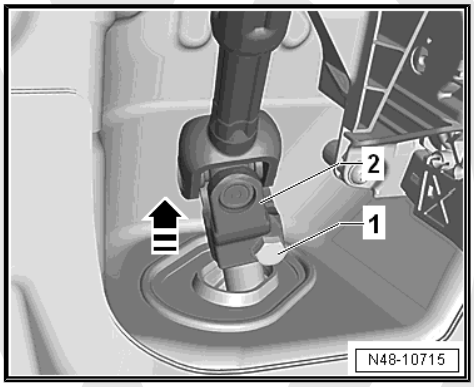
– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Continued for all vehicles:

– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .

– Fold floor covering to the rear.

– Unscrew bolt -1- from universal joint -2- and pull off universal joint in -direction of arrow-.



Caution

The following work must not be performed while the universal joint is separated from the steering rack:

- ***Connect battery***
- ***Switch on ignition***
- ***Turn steering mechanism***
- ***Turn steering column***

These points must absolutely be heeded because otherwise, irreparable damage may be caused.

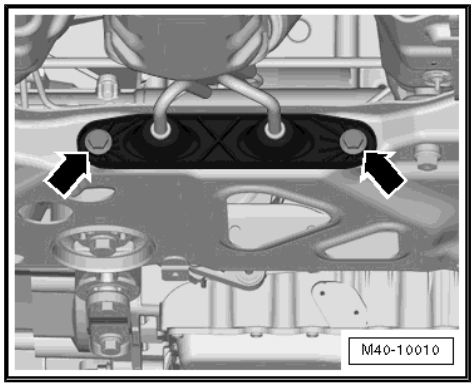
– Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

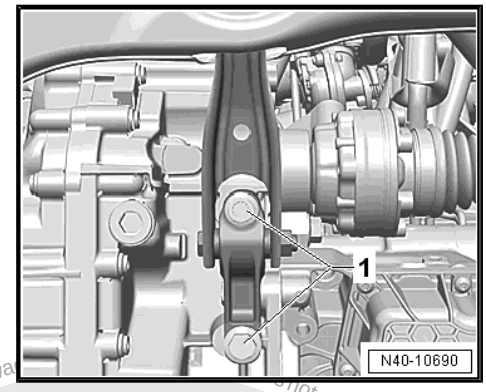
– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

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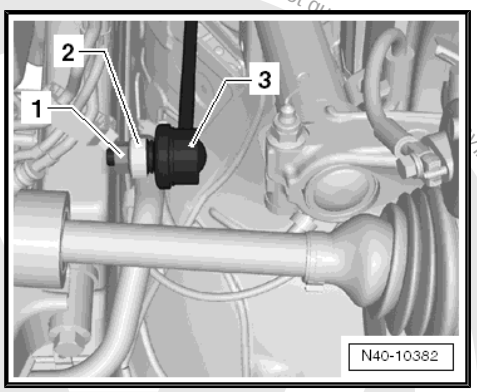
– Detach exhaust system bracket from subframe -arrows-.



– Remove bolts -1- for pendulum support.



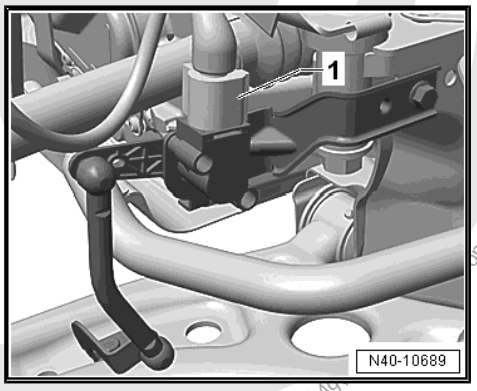
– Remove hexagon nut -1- from coupling rod -3- (left and right sides).
– Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



Vehicles with vehicle level sender.

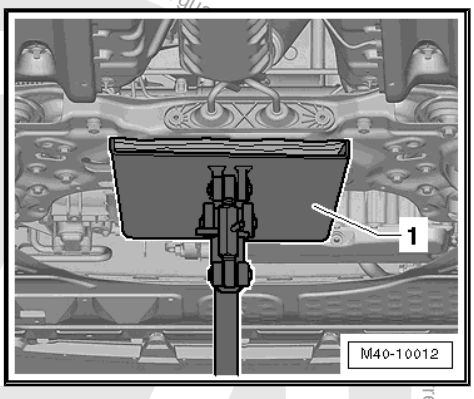
– Disconnect connector -1- on front left vehicle level sender - G78- and/or front right vehicle level sender - G289- , as applicable.

Continued for all vehicles:



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liability with respect to the correctness of information in this do

– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under subframe.
– Fix position of subframe ⇒ page 40 and lower approx. 10 cm.



Note

Be sure to observe the electrical wiring of the steering and the wiring of oil level and oil temperature senders - G266- to avoid overstretching them.

Installing

Install in the reverse order of removal, observing the following:

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After fitting the steering rack to the universal joint 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 surfaces are clean.*

– Removing locating pins - T10486/1- ⇒ page 44 .
– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “3.1 Assembly overview - steering rack”, page 313
- ⇒ “2.1 Assembly overview - steering column”, page 300
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding
- Exhaust system to subframe ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

If a crooked steering wheel is determined during the road test even though locating pins - T10486/1- were used, check wheel alignment. In this case the wheel alignment test results must be archived in the vehicle files.

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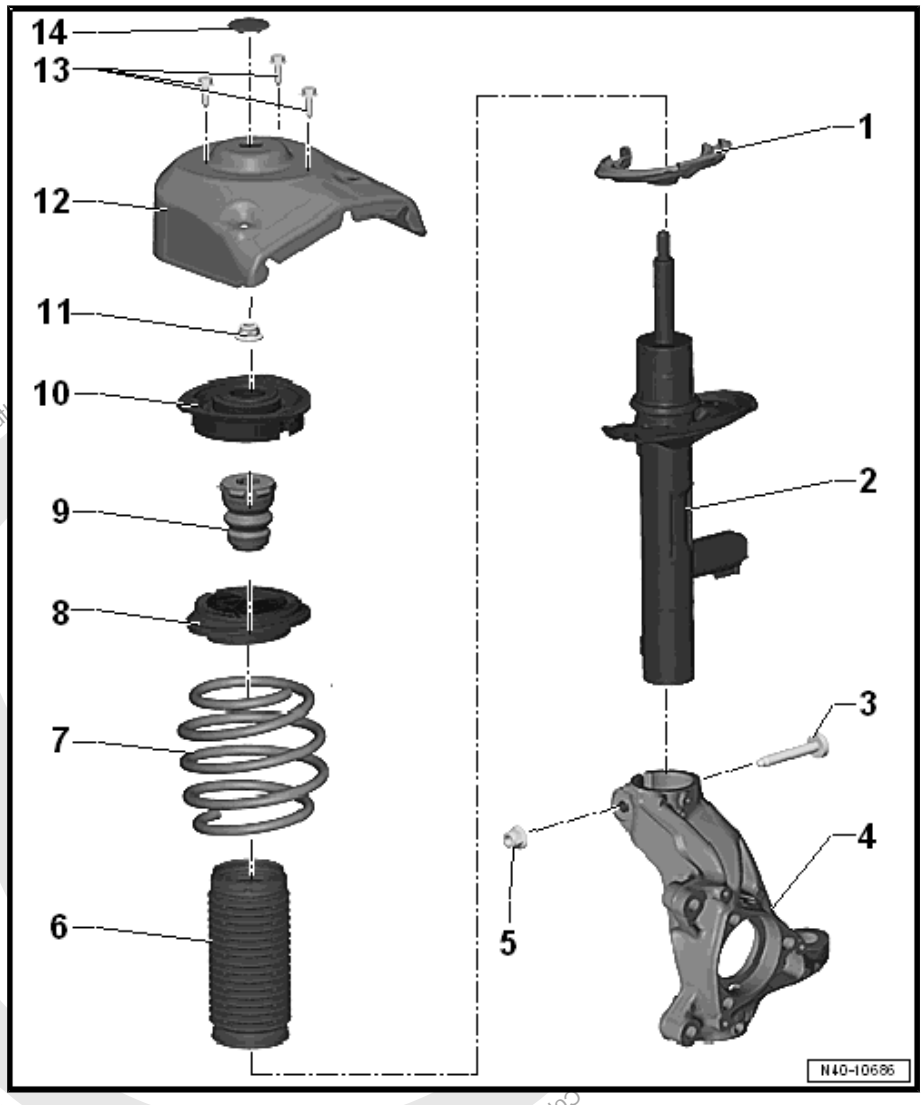
3 Suspension strut, upper suspension link

⇒ “3.1 Assembly overview - suspension strut, upper suspension link”, page 48

⇒ “3.2 Removing and installing suspension strut”, page 49

⇒ “3.3 Repairing suspension strut”, page 57

3.1 Assembly overview - suspension strut, upper suspension link



1 - Spring seat

- ❑ Observe installation position

2 - Shock absorbers

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”

3 - Bolt

- ❑ Renew after removal
- ❑ Tip of bolt must point in direction of travel.
- ❑ 70 Nm +180°

4 - Wheel bearing housing

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”

5 - Nut

- ❑ Renew after removal

6 - Protective cover

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”

7 - Coil spring

- ❑ Removing and installing ⇒ page 57
- ❑ Surface of spring coil must not be damaged.
- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”

8 - Deep groove ball thrust bearing

9 - Buffer stop

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”

10 - Suspension strut mounting

- ❑ Note correct installation position ⇒ page 54 .

11 - Nut

- ❑ Renew after removal
- ❑ 60 Nm

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12 - Body - front

13 - Bolt
- ❑ Renew after removal
- ❑ 15 Nm +90°

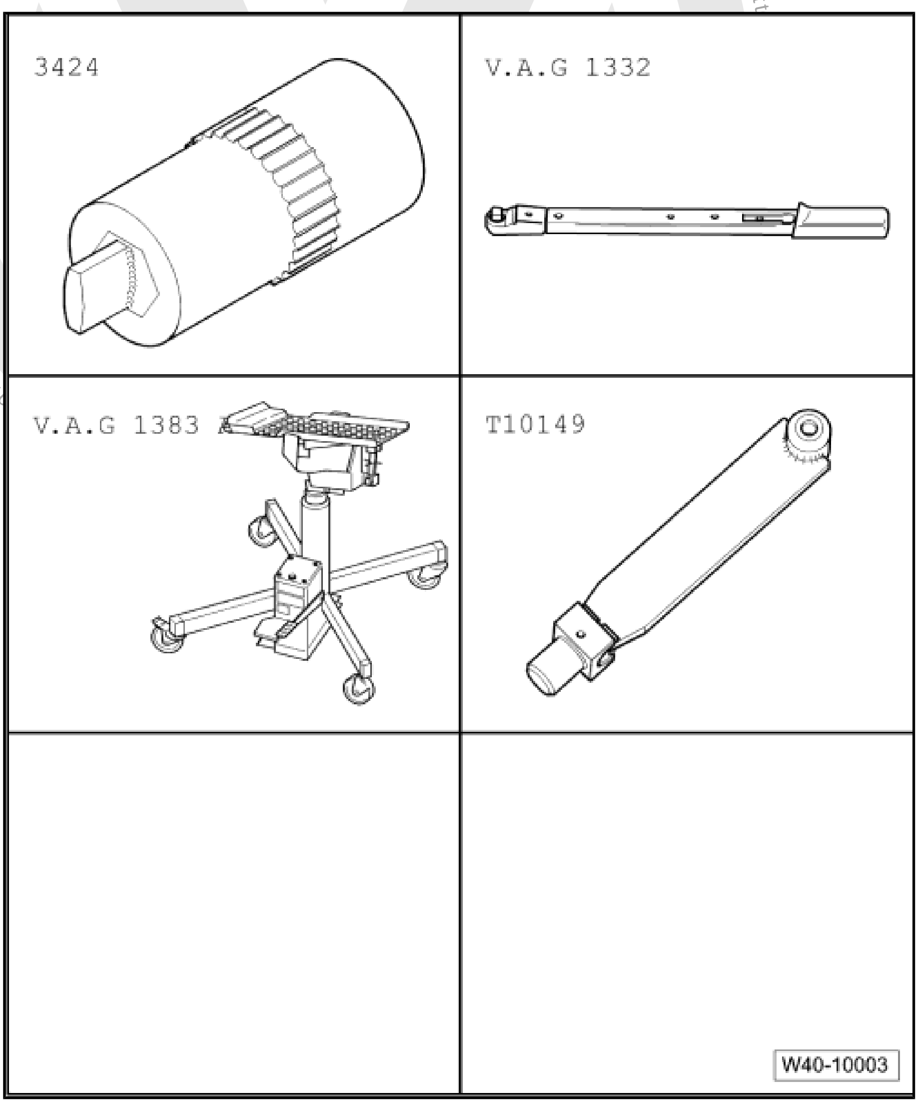
14 - Cover

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3.2 Removing and installing suspension strut

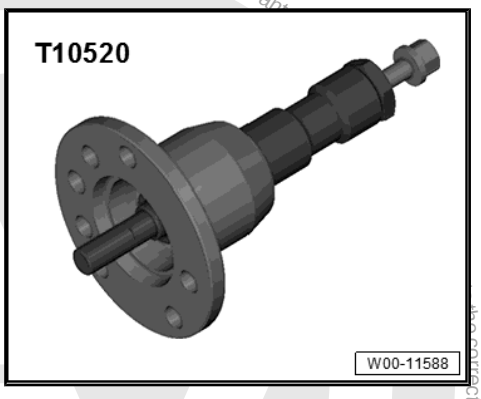
Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-
- ♦ Spreader - 3424-
- ♦ Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- ♦ Support - T10149-



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- Press tool - T10520-



Removing

– Loosen drive shaft bolt at wheel hub ⇒ page 111 .

Caution

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

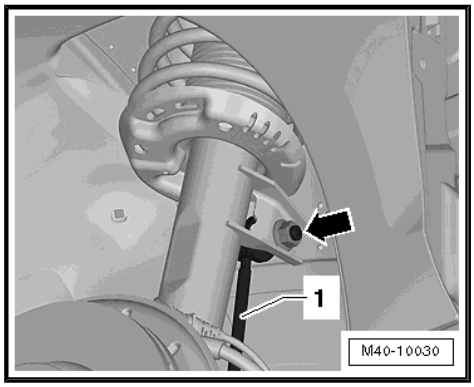
If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing.

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.*

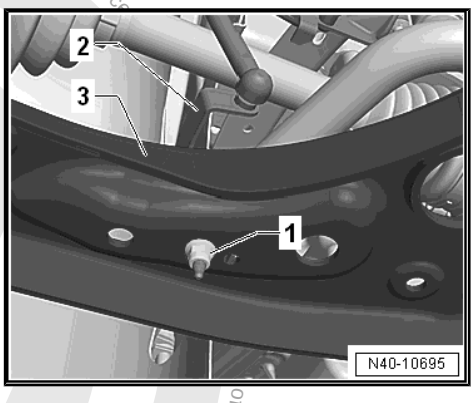
– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.
– Unscrew nut -arrow- and pull coupling rod -1- off suspension strut.
– Detach wire for ABS speed sensor from suspension strut.



Vehicles with vehicle level sender.

– Undo nuts -1-.

– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

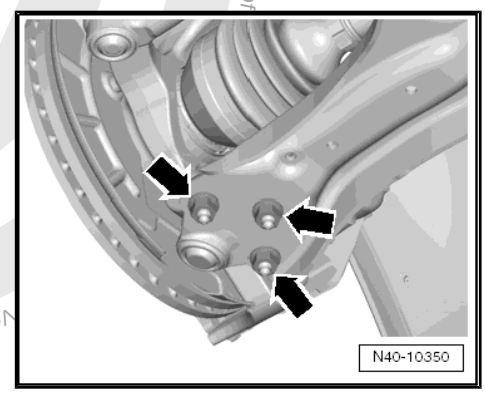


Continued for all vehicles:

– Unscrew nuts -arrows-.

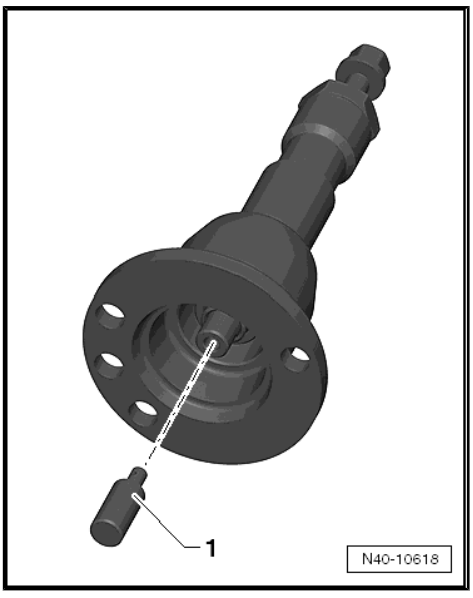
– Pull wheel bearing housing with swivel joint out of suspension link.

– Pull outer joint of drive shaft out of wheel hub.



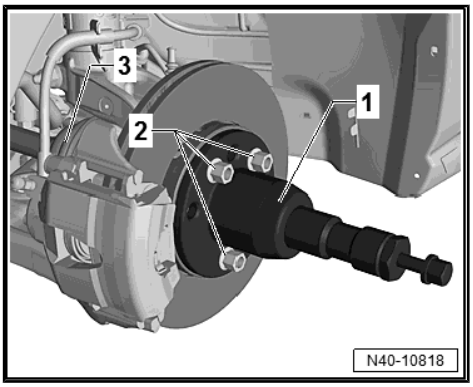
If the drive shaft cannot be pulled out of the wheel bearing by hand, use press tool - T10520- .

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-.

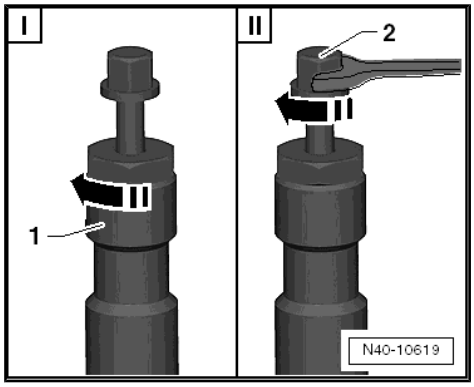


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– It is essential to follow specified sequence.

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

II - Turn only bolt -2- using a spanner in order to press 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.

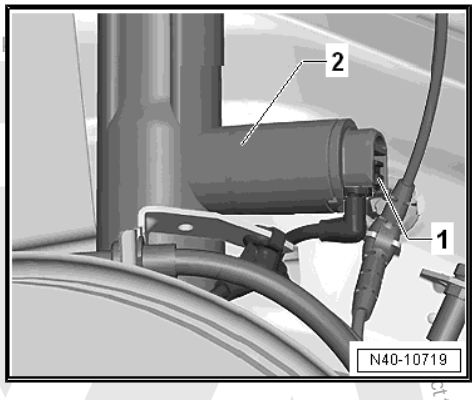
– Secure drive shaft to body with wire.

Caution

Do not allow the drive shaft to hang down under its own weight, for this would allow the inner joint to bend too far and be damaged.

Vehicles with adaptive chassis control DCC

– Disconnect connector -1- on shock absorber -2-.



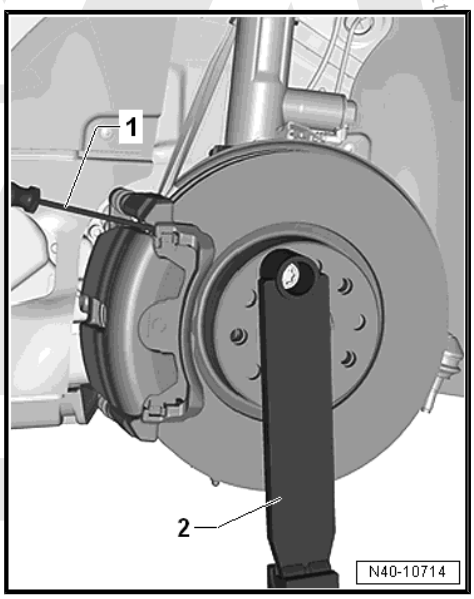
Note

If there is moisture in the area of the connector, blow compressed air on the contacts on the shock absorber and the connector.

Continued for all vehicles:

– Insert a screwdriver -1- into brake disc between brake caliper and brake carrier.

– Secure engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -2- to wheel hub using a wheel bolt.

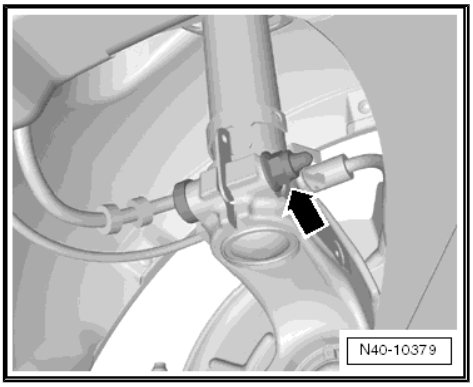


WARNING

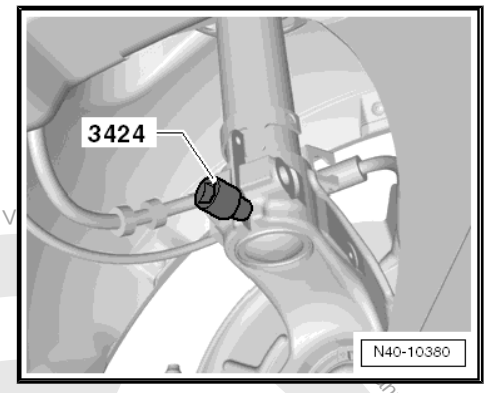
- ***Do not lift or lower the vehicle while the engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- is under the vehicle. The vehicle could slip off the lifting platform.***
- ***Do not leave the engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under the vehicle longer than necessary.***

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



– Insert spreader - 3424- in slot in wheel bearing housing.



Note

Make sure that the spreader - 3424- is only inserted into the wheel bearing housing. Insert sufficiently to ensure that the metal tab of the suspension strut is not damaged.

– Turn ratchet handle through 90° and detach from spreader - 3424- .

– Press brake disc towards suspension strut by hand.

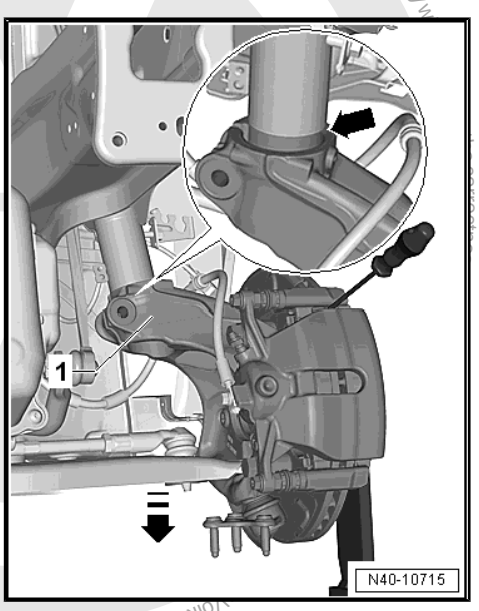
Otherwise the shock absorber tube can cant in the bore of the wheel bearing housing.

– Lower wheel bearing housing -1- in -direction of arrow- using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .

– Lower wheel bearing housing -1- until shock absorber is hanging free -arrow-.

– Bolt swivel joint to suspension link again and tighten wheel bearing housing to subframe.

– Remove engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



WARNING

- ***Do not leave the engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under the vehicle longer than necessary.***

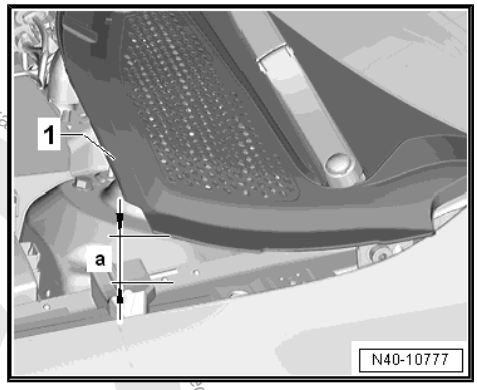
– Pull seal off entire length of plenum chamber cover.

– Detach clips.

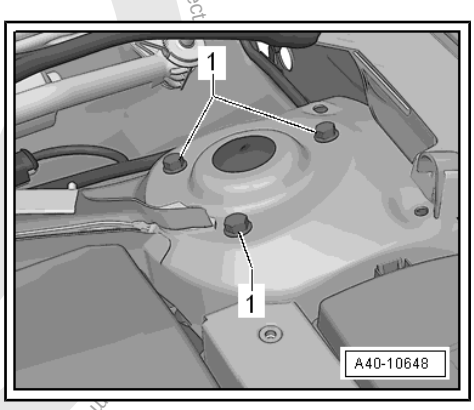
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– Lift plenum chamber cover -1- not more than 60 mm.

a - 60 mm



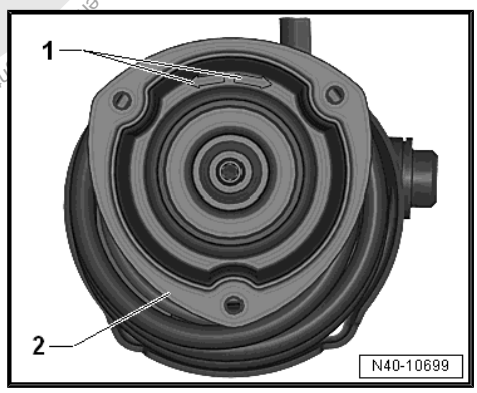
– Unscrew bolts -1- for upper shock absorber mounting and remove suspension strut.



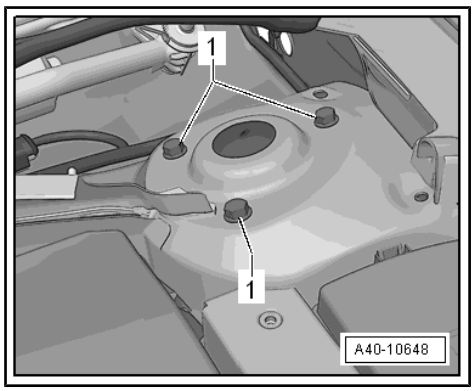
Installing

– Position suspension strut so that the arrows -1- are always on the inner side.

– One of the two arrows -1- on the spring plate -2- must point in direction of travel.

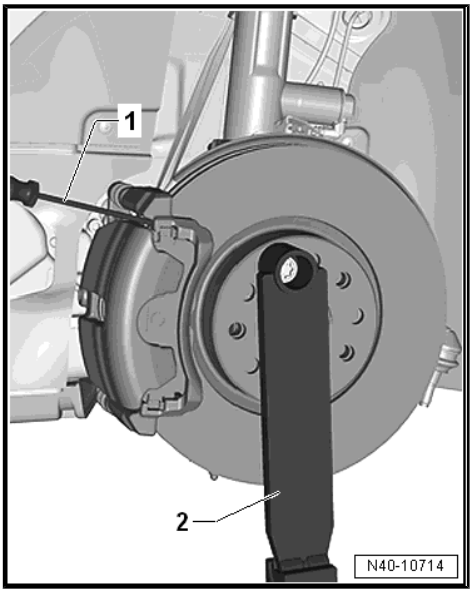


– Insert suspension strut and bolt bolts -1- to body.

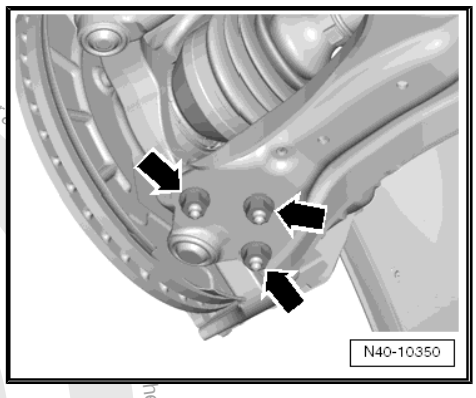


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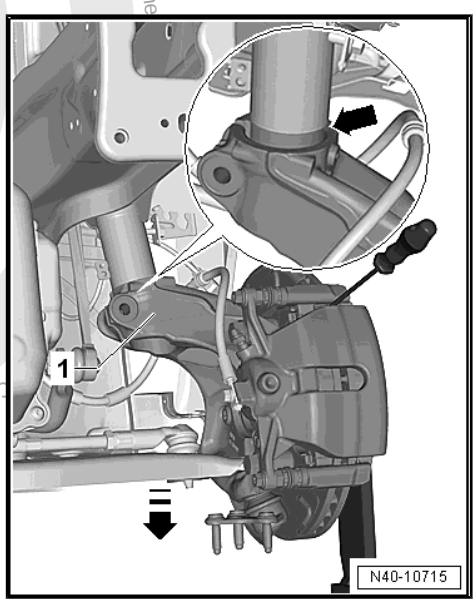
– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under support - T10149- and secure wheel bearing housing.
– Untie wheel bearing housing from subframe.



– Unscrew nuts -arrows-.
– Pull wheel bearing housing with swivel joint out of suspension link.

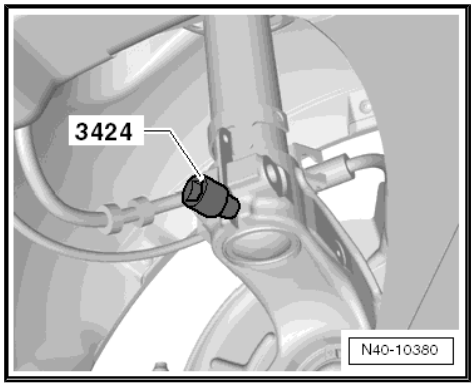


– Lower wheel bearing housing -1- in -direction of arrow- using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .
– Raise wheel bearing housing using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- , guiding it onto suspension strut.
– Bolt swivel joint to suspension link again and continue to press wheel bearing housing upwards until final position is reached on suspension strut.

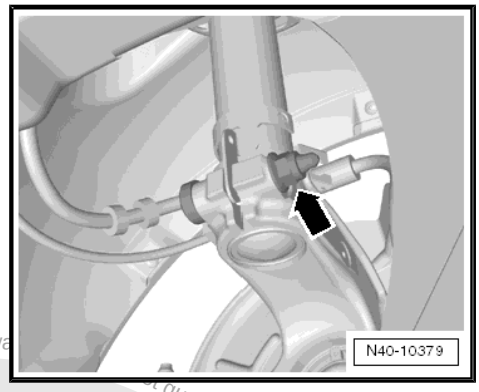


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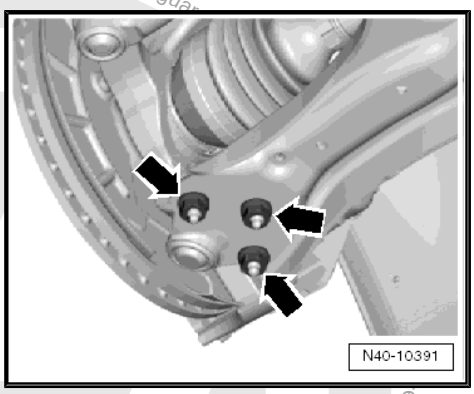
– Remove spreader - 3424- .



– Insert new bolts, tip of bolt must point in direction of travel.
– Attach wheel bearing housing to suspension strut using new nut -arrow-.



– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

Further assembly is carried out in the reverse order. During this step, observe the following:

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

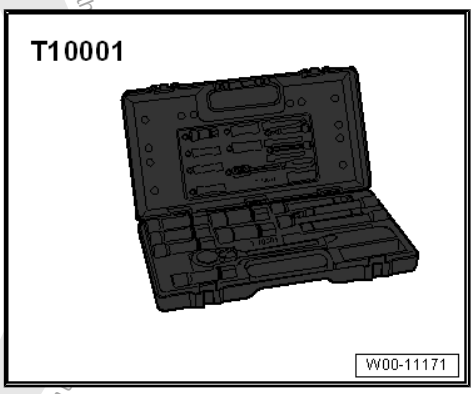
- ⇒ “3.1 Assembly overview - suspension strut, upper suspension link”, page 48
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

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3.3 Repairing suspension strut

Special tools and workshop equipment required

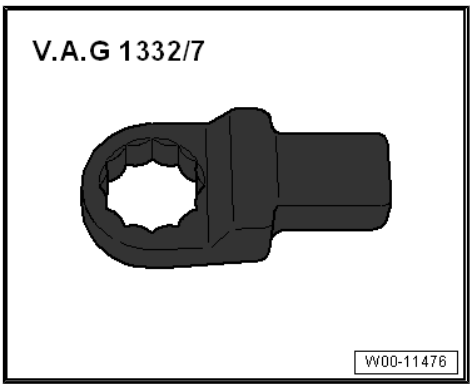
- Shock absorber set - T10001-



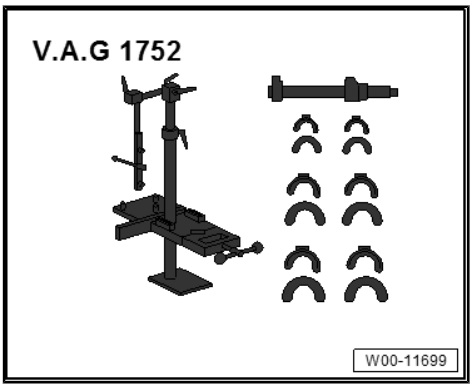
- Torque wrench - V.A.G 1332-



- Ring spanner insert - V.A.G 1332/7-



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



- Commercially available ratchet handle

– Remove coil spring strut ⇒ page 50 .

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 coil spring with spring compressor - 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-

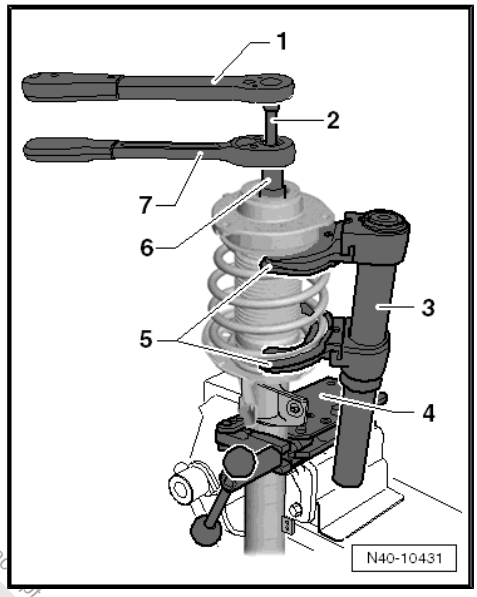
3 - Spring compressor - V.A.G 1752/1-

4 - Strut support clamp - V.A.G 1752/20-

5 - Spring retainer - V.A.G 1752/4-

6 - Hexagon bit, long reach - T10001/5-

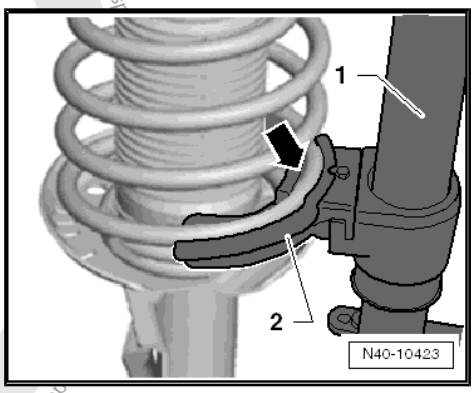
7 - Ratchet wrench - T10001/11-



WARNING

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

– Ensure that coil spring is correctly seated in spring retainer - V.A.G 1752/4- -arrow-.

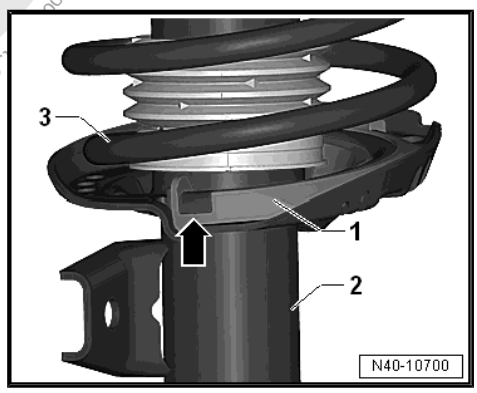


Installing spring

– Insert spring seat -1- into shock absorber -2-.

– Fit coil spring -3- with spring compressor - V.A.G 1752/1- onto lower spring seat.

The end of the coil spring must lie against the stop -arrow-.



– Assemble all other parts and use new nut on piston rod.

– Relieve tension on spring compressor - V.A.G 1752/1- and remove from coil spring.

– Remove suspension strut from suspension strut support clamp - V.A.G 1752/20- .

– Install suspension strut ⇒ page 49 .

Torque settings

◆ ⇒ “3.1 Assembly overview - suspension strut, upper suspension link”, page 48

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4 Lower suspension link, swivel joint

⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59

⇒ “4.2 Removing and installing lower suspension link”, page 60

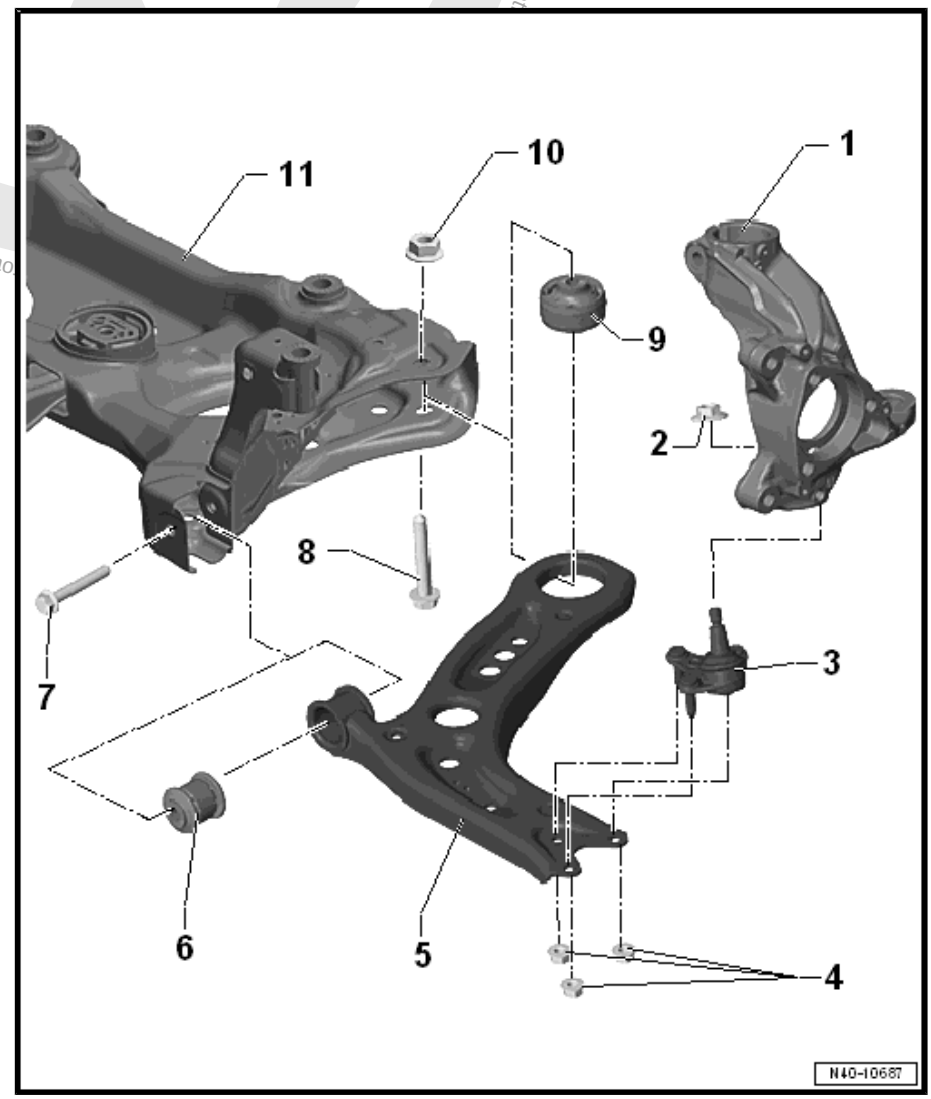
⇒ “4.3 Checking swivel joint”, page 67

⇒ “4.4 Removing and installing swivel joint”, page 67

⇒ “4.5 Renewing front bonded rubber bush for lower suspension link”, page 72

⇒ “4.6 Renewing rear bonded rubber bush for lower suspension link”, page 74

4.1 Assembly overview - lower suspension link, swivel joint



1 - Wheel bearing housing

- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 78

2 - Nut

- ❑ Renew after removal
- ❑ 60 Nm

3 - Swivel joint

- ❑ Removing and installing ⇒ page 67

4 - Nut

- ❑ Renew after removal
- ❑ Tighten in unladen position ⇒ page 6 .
- ❑ 40 Nm +45°

5 - Lower suspension link

- ❑ Removing and installing ⇒ page 60

6 - Front bonded rubber bush

- ❑ Replacing ⇒ page 72

7 - Bolt

- ❑ Renew after removal
- ❑ Tighten in unladen position ⇒ page 6 .
- ❑ 70 Nm +180°

8 - Bolt

- ❑ Renew after removal
- ❑ 70 Nm +180°

9 - Rear bonded rubber bush

- ❑ Replacing ⇒ page 74

10 - Nut

11 - Subframe

4.2 Removing and installing lower suspension link

⇒ “4.2.1 Removing and installing lower suspension link, vehicle with manual gearbox or dual clutch gearbox 0CW”, page 60

⇒ “4.2.2 Removing and installing lower suspension link, vehicles with dual clutch gearbox 0DL”, page 62

4.2.1 Removing and installing lower suspension link, vehicle with manual gearbox or dual clutch gearbox 0CW

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



Removing

– Loosen wheel bolts.

– Raise vehicle on lift.

– Remove wheel.

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

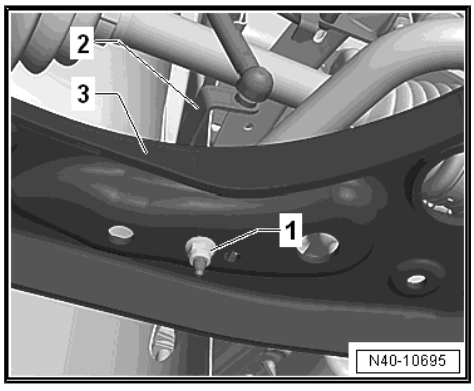
– Release rear section of wheel housing liner and fold it forwards.

Vehicles with vehicle level sender.

– Undo nuts -1-.

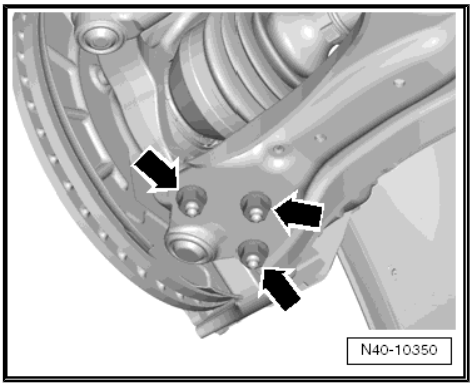
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

Continued for all vehicles:

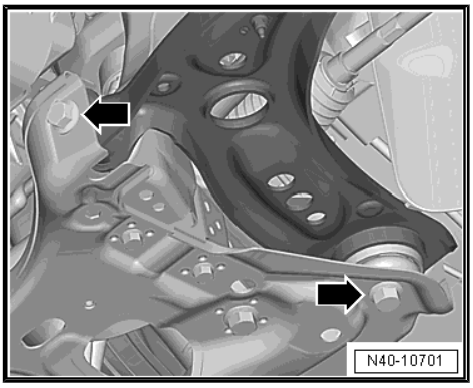


– Unscrew nuts -arrows-.

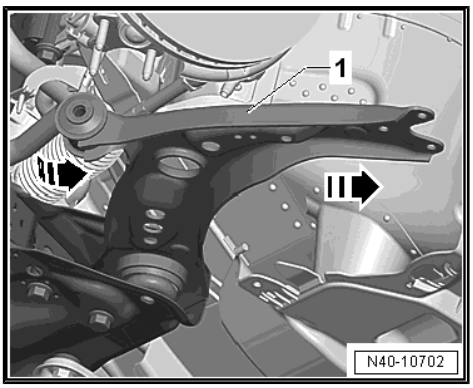
– Pull suspension link out of swivel joint and turn wheel bearing housing outwards to relieve suspension link.



– Unscrew bolts -arrows-.



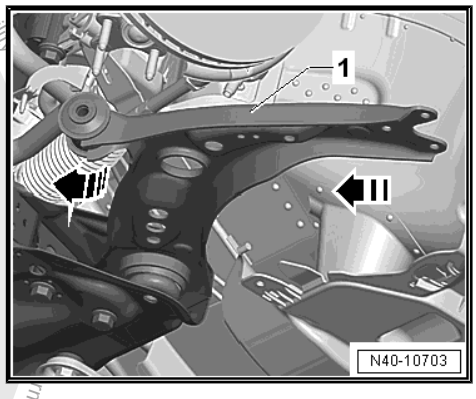
– Swivel suspension link -1- to rear and pull out of subframe in -direction of arrow-.



Installing

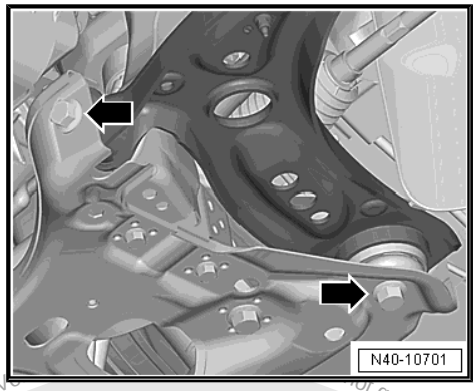
Install in reverse order of removal. During this step, observe the following:

– Insert rear suspension link -1- into subframe in -direction of arrow- and swivel forwards.



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– Tighten bolts -arrows-.



Note

Tighten nuts and bolts -arrows- in unladen state ⇒ page 6 .

Further assembly is carried out in the reverse order. During this step, observe the following:

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding

4.2.2 Removing and installing lower suspension link, vehicles with dual clutch gearbox 0DL

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



Removing

– Turn steering wheel to straight-ahead position.

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Vehicles with mechanical ignition lock

– Pull off ignition key so that steering lock engages.

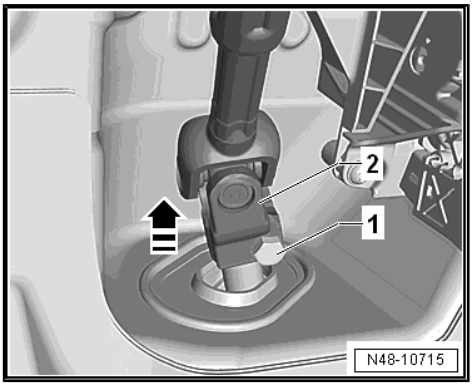
Vehicles with electronic ignition lock

– Switch off ignition and open driver's door so that the steering lock engages.

Continued for all vehicles:

– Fold floor covering to the rear.

– Unscrew bolt -1- from universal joint -2- and pull off universal joint in -direction of arrow-.



Caution

The following work must not be performed while the universal joint is separated from the steering rack:

- ***Connect battery***
- ***Switch on ignition***
- ***Turn steering mechanism***
- ***Turn steering column***

These points must absolutely be heeded because otherwise, irreparable damage may be caused.

– Loosen wheel bolts.

– Raise vehicle on lift.

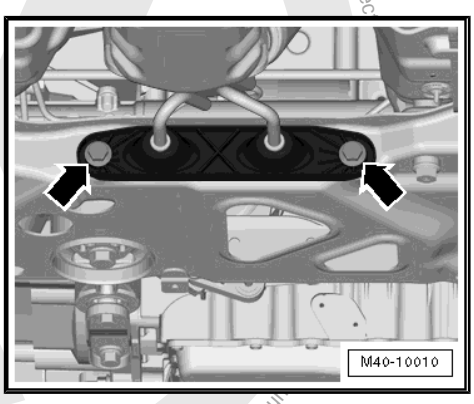
– Remove wheels.

– Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

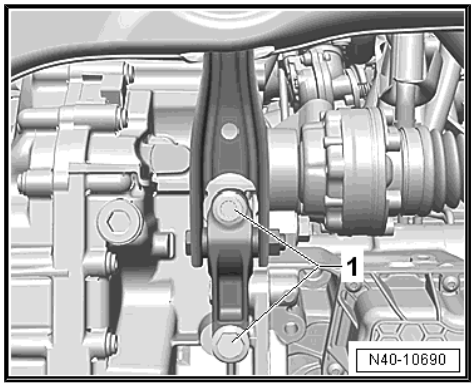
– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

– Detach exhaust system bracket from subframe -arrows-.

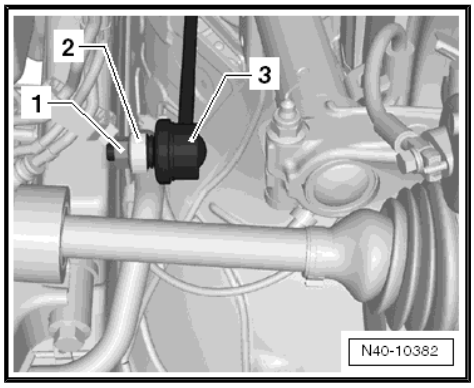


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– Remove bolts -1- for pendulum support.



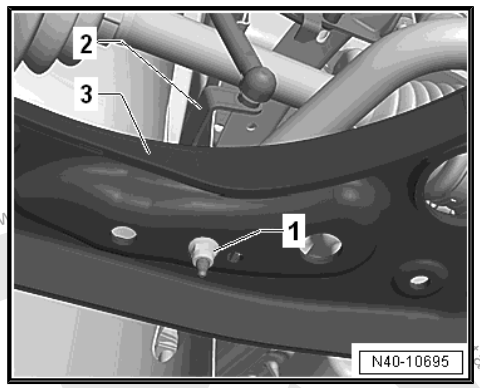
– Remove hexagon nut -1- from coupling rod -3- (left and right sides).
– Pull coupling rod -3- out of anti-roll bar -2- on left and right side.
– Release rear section of wheel housing liner and fold it forwards.



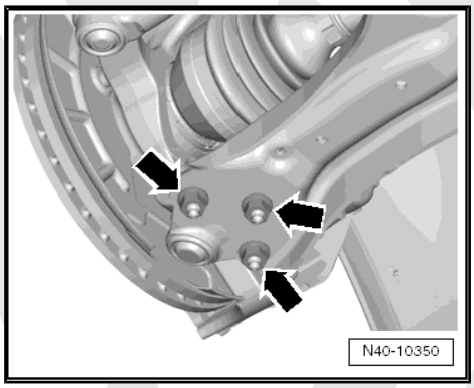
Vehicles with vehicle level sender.

– Undo nuts -1-.
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

Continued for all vehicles:

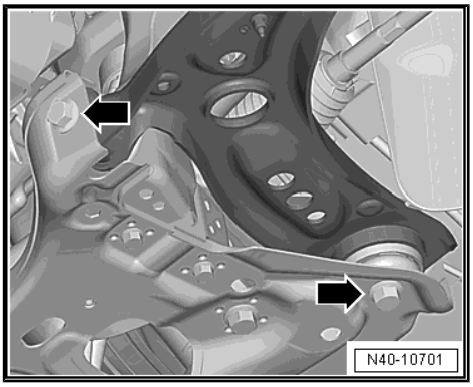


– Unscrew nuts -arrows-.
– Pull suspension link out of swivel joint and turn wheel bearing housing outwards to relieve suspension link.
– Fix position of subframe ⇒ page 40 and lower approx. 10 cm.

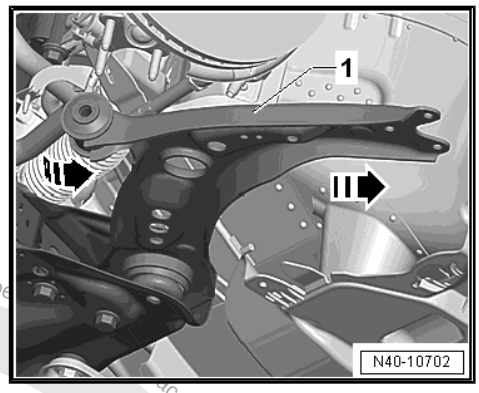


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– Unscrew bolts -arrows-.



– Swivel suspension link -1- to rear and pull out of subframe in -direction of arrow-.



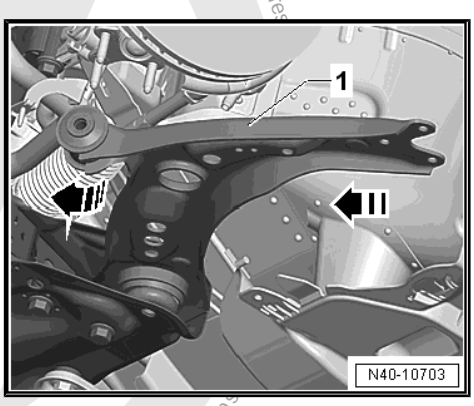
Installing

Install in reverse order of removal. During this step, observe the following:

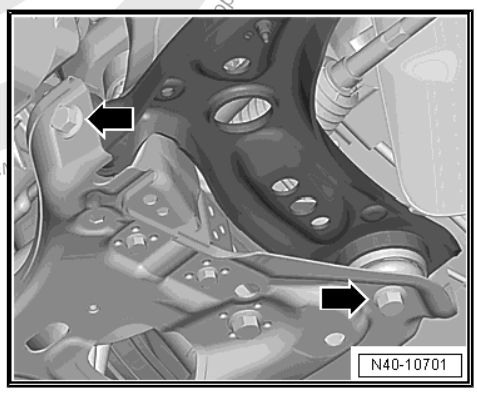
Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After fitting the steering rack to the universal joint ensure that the seal is not kinked against the assembly plate on the steering rack. The opening to the footwell must be sealed correctly. Otherwise, this can result in water leaks and/or noise.*
- *Ensure sealing surfaces are clean.*

– Insert rear suspension link -1- into subframe in -direction of arrow- and swivel forwards.



– Tighten bolts -arrows-.



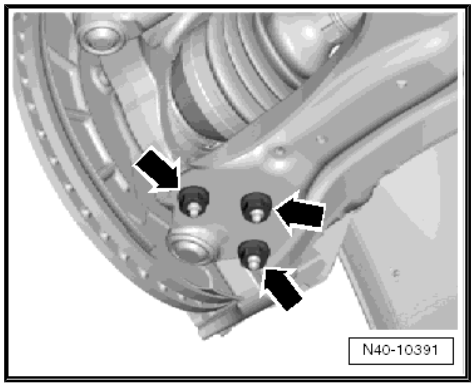
Note

Tighten nuts and bolts -arrows- in unladen state ⇒ page 6 .

– Bolt subframe to body.

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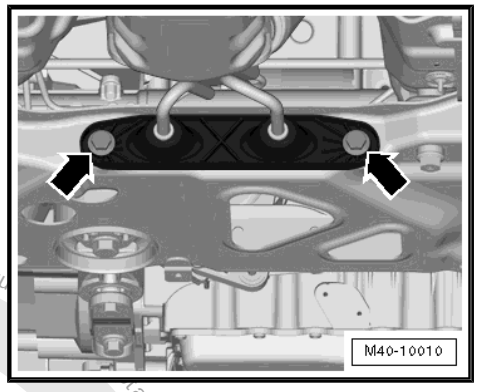
– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

– Attach exhaust system bracket to subframe -arrows-.



Further assembly is carried out in the reverse order. During this step, observe the following:

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

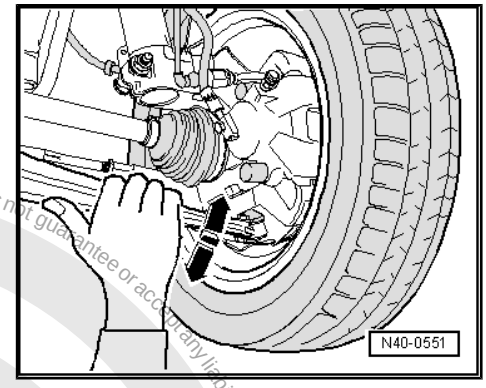
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding
- Exhaust system to subframe ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

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4.3 Checking swivel joint

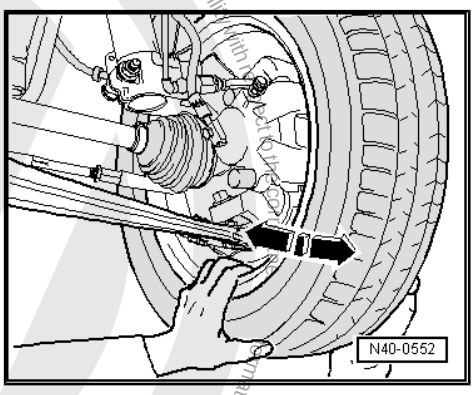
Checking axial play

– 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

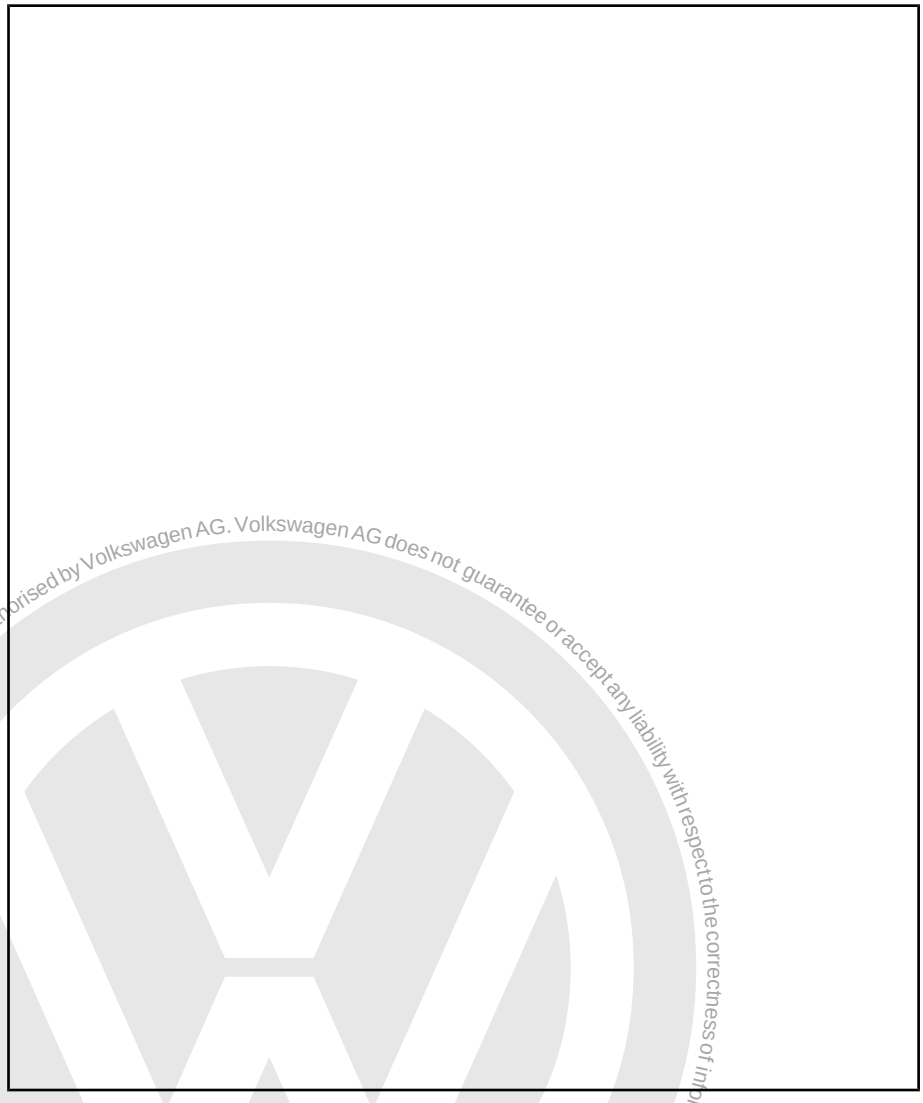
- *There should be no palpable or visible “play” during both tests.*
- *Observe swivel joint while performing tests.*
- *Take into account possible existing wheel bearing play or “play” in upper suspension strut mounting.*
- *Check rubber boot for damage and renew swivel joint if necessary.*

4.4 Removing and installing swivel joint

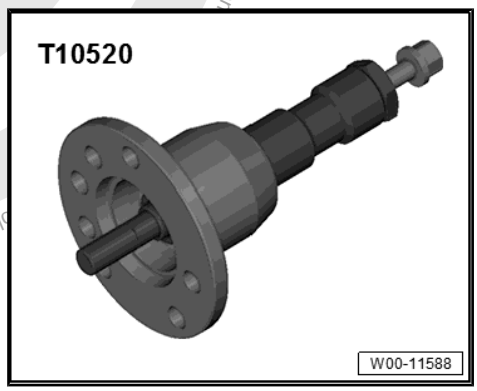
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Special tools and workshop equipment required

- Ball joint puller - 3287 A-
- Torque angle wrench - V.A.G 1756-
- Ring spanner insert - V.A.G 1332/10-



- Press tool - T10520-



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Removing

– Loosen drive shaft bolt at wheel hub ⇒ page 111 .

Caution

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

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

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 on lift.

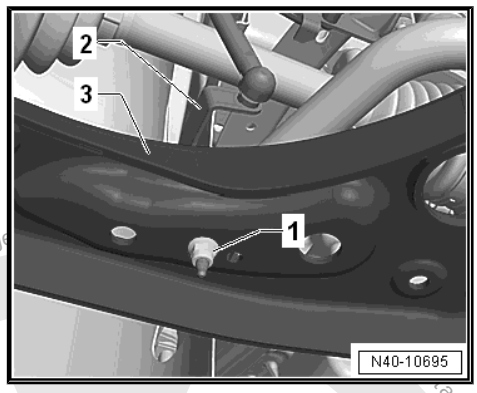
– Remove wheel.

Vehicles with vehicle level sender.

– Undo nuts -1-.

– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

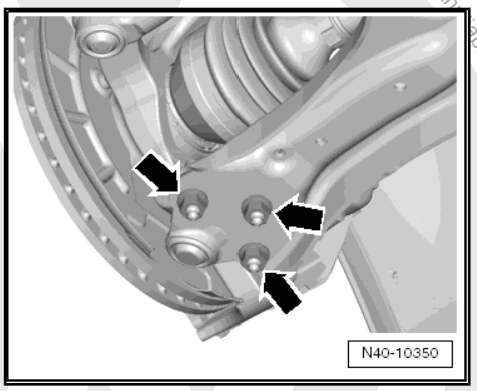
Continued for all vehicles:



– Unscrew nuts -arrows-.

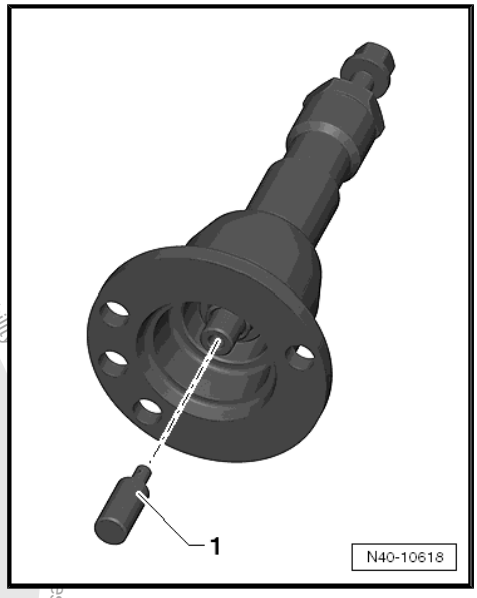
– Pull drive shaft slightly out of wheel hub.

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



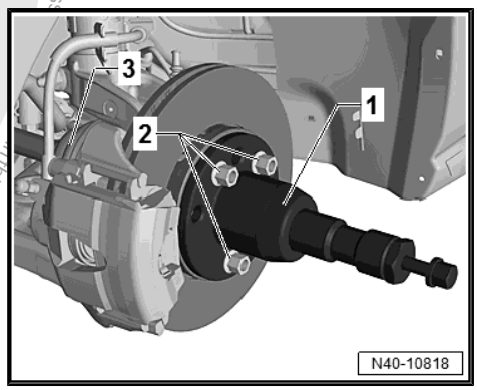
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Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

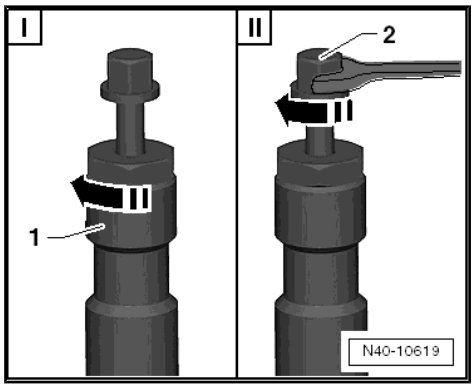
– To press out drive shaft -3-, secure press tool - T10520- -1- to wheel hub using 3 wheel bolts -2-.



– It is essential to follow specified sequence.

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

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



Note

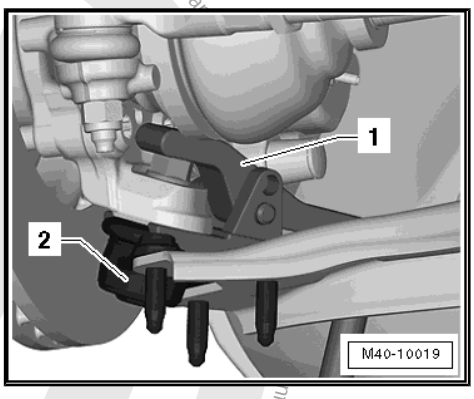
At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.

– Pull swivel joint out of suspension link.

– Bend suspension link downwards as far as necessary.

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– Loosen nut from suspension link -2- but do not remove completely.



Caution

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

– Press swivel joint off wheel bearing housing, undo nut and remove swivel joint -2-.

1 - Ball joint puller - 3287 A-

Installing

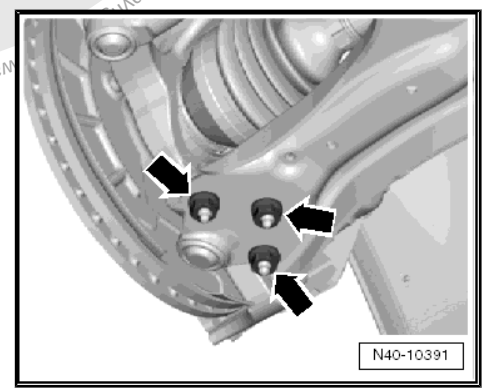
Install in the reverse order of removal, observing the following:

– Fit swivel joint in wheel bearing housing.

– Fit drive shaft in wheel hub.

– Screw on new self-locking nut and counterhold with Torx key - T40- .

– Tighten nuts -arrows-.



Note

- *Tighten nuts -arrows- in unladen state ⇒ page 6 .*
- *Ensure that boot is not damaged or twisted.*

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– Install wheel and tighten.

– Tighten drive shaft bolt at wheel hub ⇒ page 111 .

Note

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

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

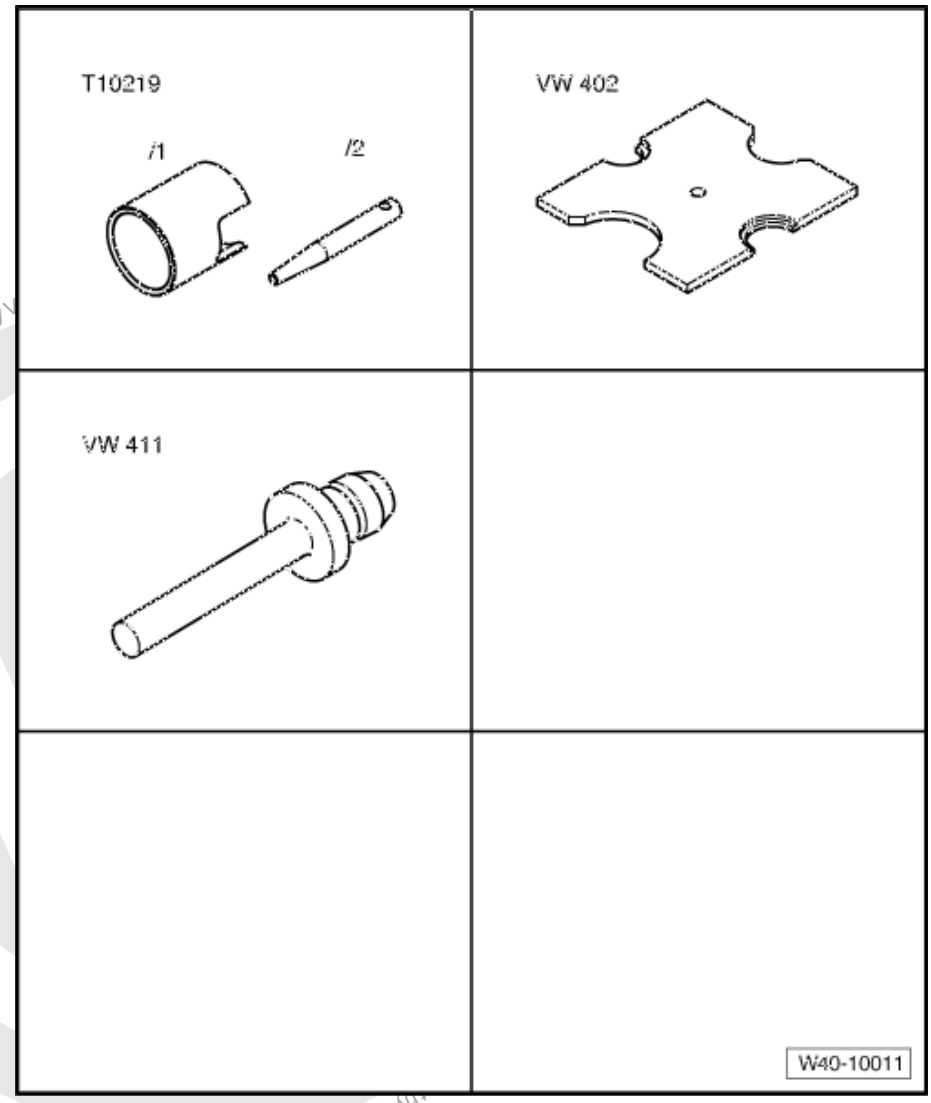
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

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4.5 Renewing front bonded rubber bush for lower suspension link

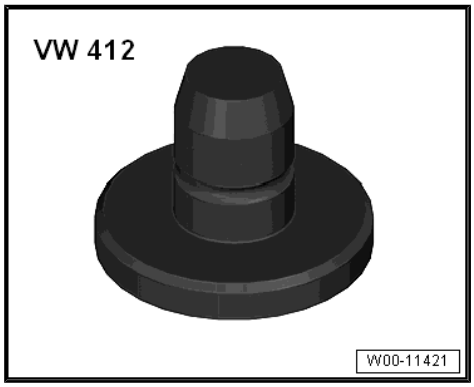
Special tools and workshop equipment required

- Assembly tool - T10219-
- Pressure plate - VW 402-
- Press piece - VW 411-



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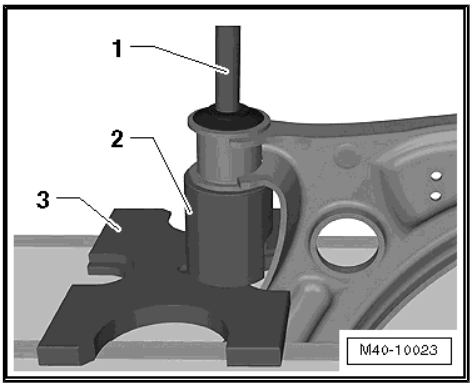
- Press piece - VW 412-



– Remove lower suspension link ⇒ page 60 .

Pressing out bonded rubber bush

– Press out bonded rubber bush as illustrated.



1 - Press tool - VW 411-

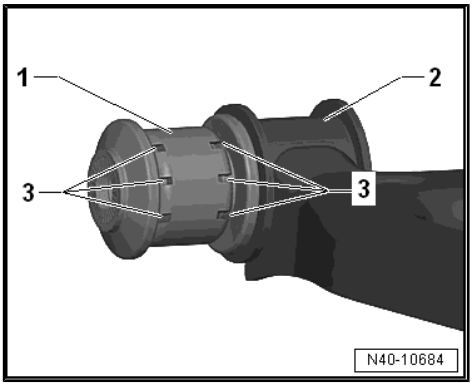
2 - Tube - T10219/1- (the cut-out must face the suspension link)

3 - Thrust plate - VW 402-

Pressing in bonded rubber bush

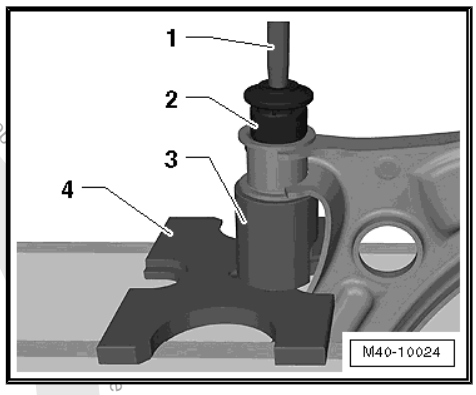
– Align bonded rubber bushes -1- to suspension link -2-.

The grooves -3- must face towards suspension link -2- as shown in illustration.



– 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

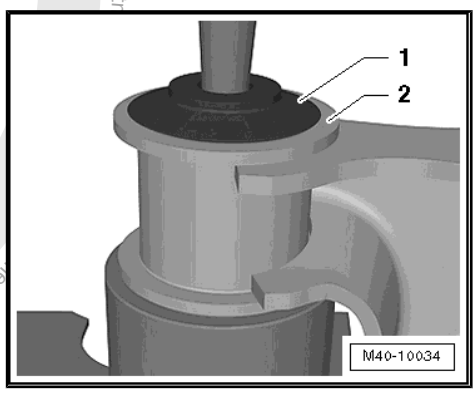
3 - Tube - T10219/1- (the cut-out must face the suspension link)

4 - Thrust plate - VW 402-

Note

At start of pressing-in process, bonded rubber bush is temporarily slanted. During further procedure, it 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.



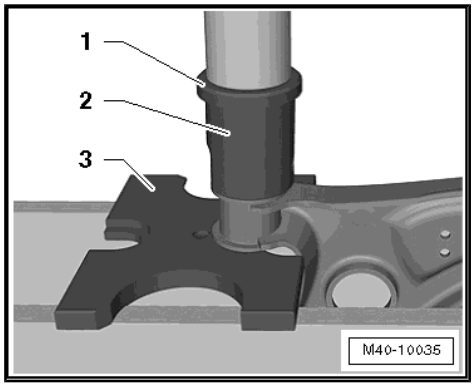
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– Press bush back slightly in the suspension link.

1 - Press tool - VW 412-

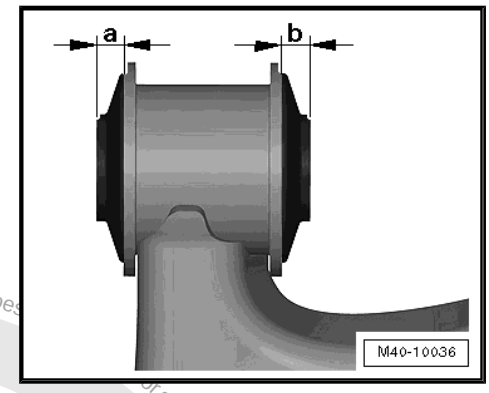
2 - Tube - T10219/1-

3 - Thrust plate - VW 402-



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

– Install lower suspension link ⇒ page 60 .



4.6 Renewing rear bonded rubber bush for lower suspension link

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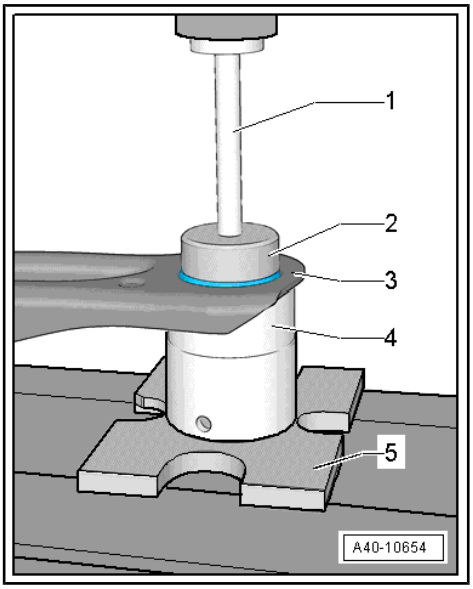
Special tools and workshop equipment required

- Tube for wheel bearing - 3345-
- Assembly tool - 3348-
- Pressure plate - VW 401-
- Press piece - VW 411-
- Press piece - VW 412-
- Removing and installing tool - VW 459-

– Remove lower suspension link ⇒ page 60 .

Pressing out bonded rubber bush

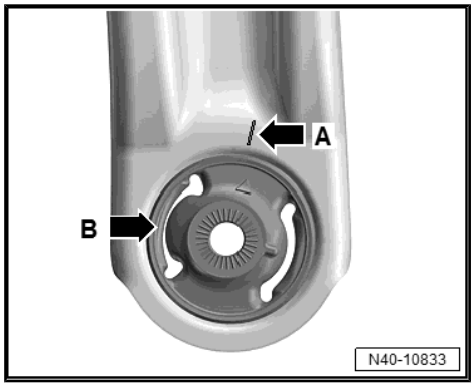
– Press out bonded rubber bush as illustrated.



1 - Press tool - VW 411-
2 - Assembly tool - 3348-
3 - Suspension link
4 - Tube for wheel bearing - 3345-
5 - Thrust plate - VW 401-

Installation position of bonded rubber bush

- The embossed arrow points to the marking -arrows A- in the suspension link.
- The cam -arrow B- must always point to outside of vehicle. Open kidney faces to centre of vehicle.



Pressing in bonded rubber bush

– Press in bonded rubber bush as illustrated.

1 - Press tool - VW 412-

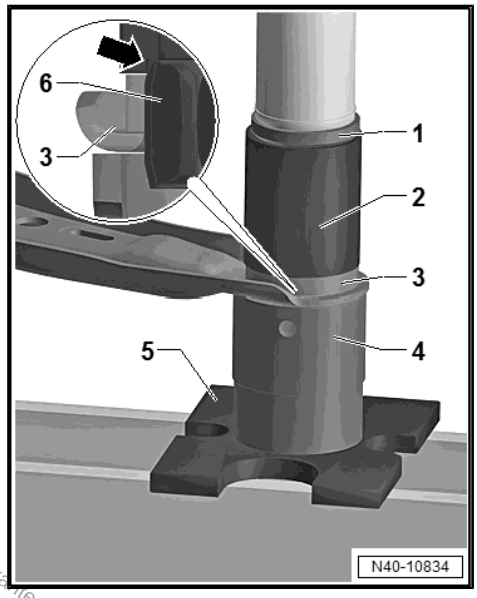
2 - Sleeve - VW 459/2- , inner shoulder of sleeve -arrow- faces downwards

3 - Suspension link

4 - Tube for wheel bearing - 3345-

5 - Thrust plate - VW 401-

6 - Bonded rubber bush



Note

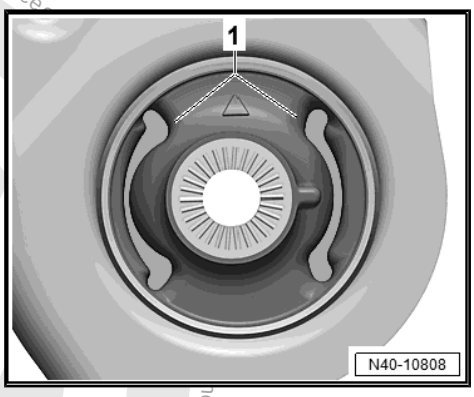
Press in the bonded rubber bush until sleeve -VW 459/2- rests against the suspension link -arrow-.

Greasing bonded rubber bush:

The kidney-shaped area -1- of the bonded rubber bush must be greased.

– Grease must be applied to the kidney-shaped area -1- from above.

– Use grease -G 052 150 A2-



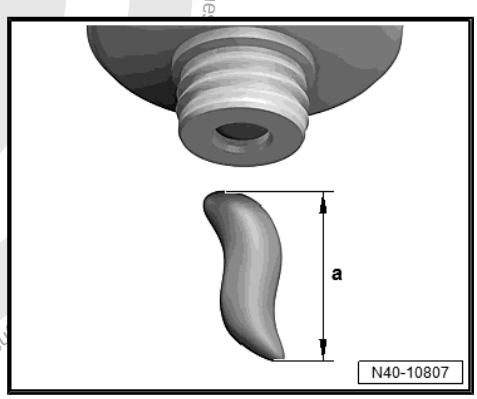
– The total quantity of grease required for both sides is, as shown, about 1 cm -dimension a-.

- Half of the quantity of grease (about 0.5 cm) must be applied to each kidney-shaped area.

– The grease must be applied to the top using a commercially available brush.

– No grease may be applied to the area contacting the suspension link.

– Install lower suspension link ⇒ page 60 .



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5 Wheel bearing

⇒ “5.1 Assembly overview - wheel bearing”, page 77

⇒ “5.2 Removing and installing wheel bearing housing”, page 78

⇒ “5.3 Removing and installing wheel bearing unit”, page 82

5.1 Assembly overview - wheel bearing

1 - Splash plate

2 - Bolt

- ❑ 12 Nm

3 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 82
- ❑ Cannot be repaired

4 - Bolt

- ❑ Renew after removal
- ❑ Loosening and tightening ⇒ page 111
- ❑ 200 Nm +180°

5 - Wheel bearing housing

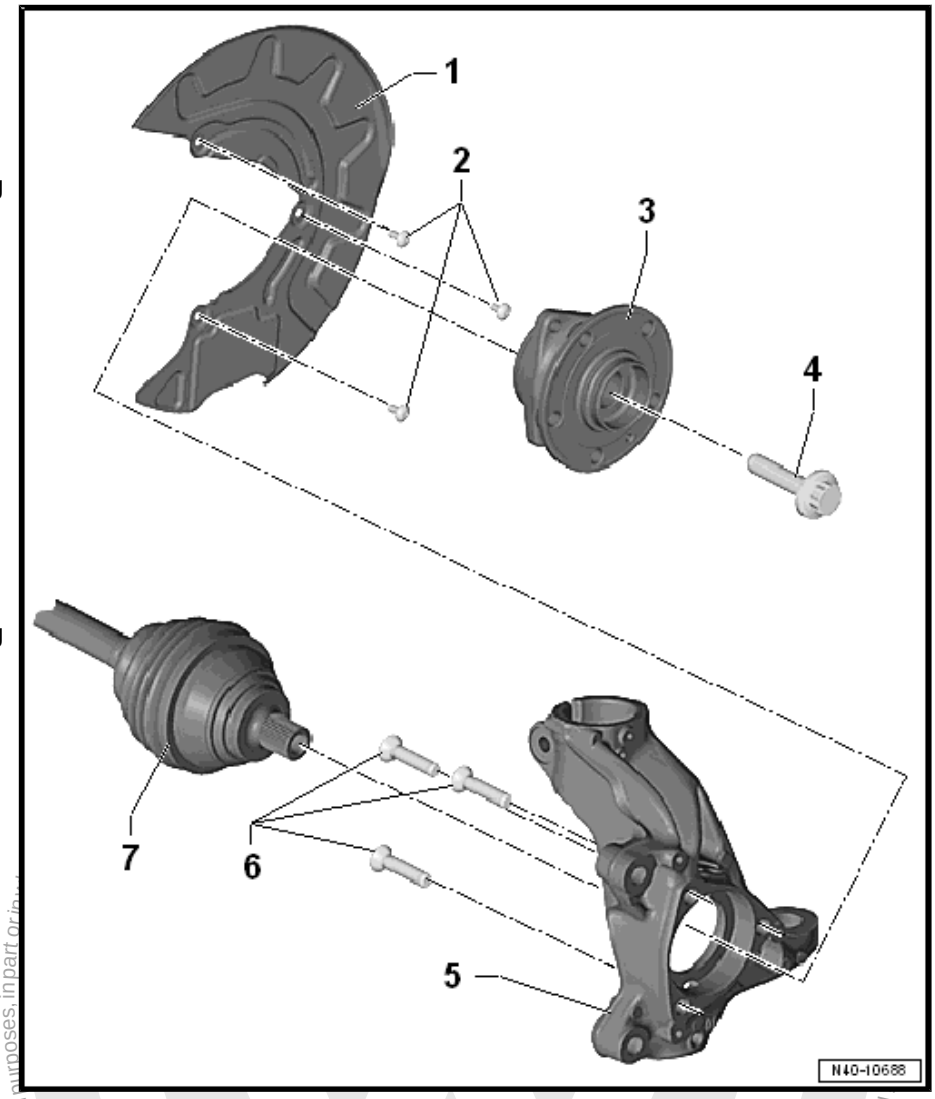
- ❑ Different versions. For allocation see ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 78

6 - Bolt

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

7 - Drive shaft

- ❑ Do not let drive shaft hang down under its own weight when performing repair work, as otherwise excessive bending could damage inner CV joint



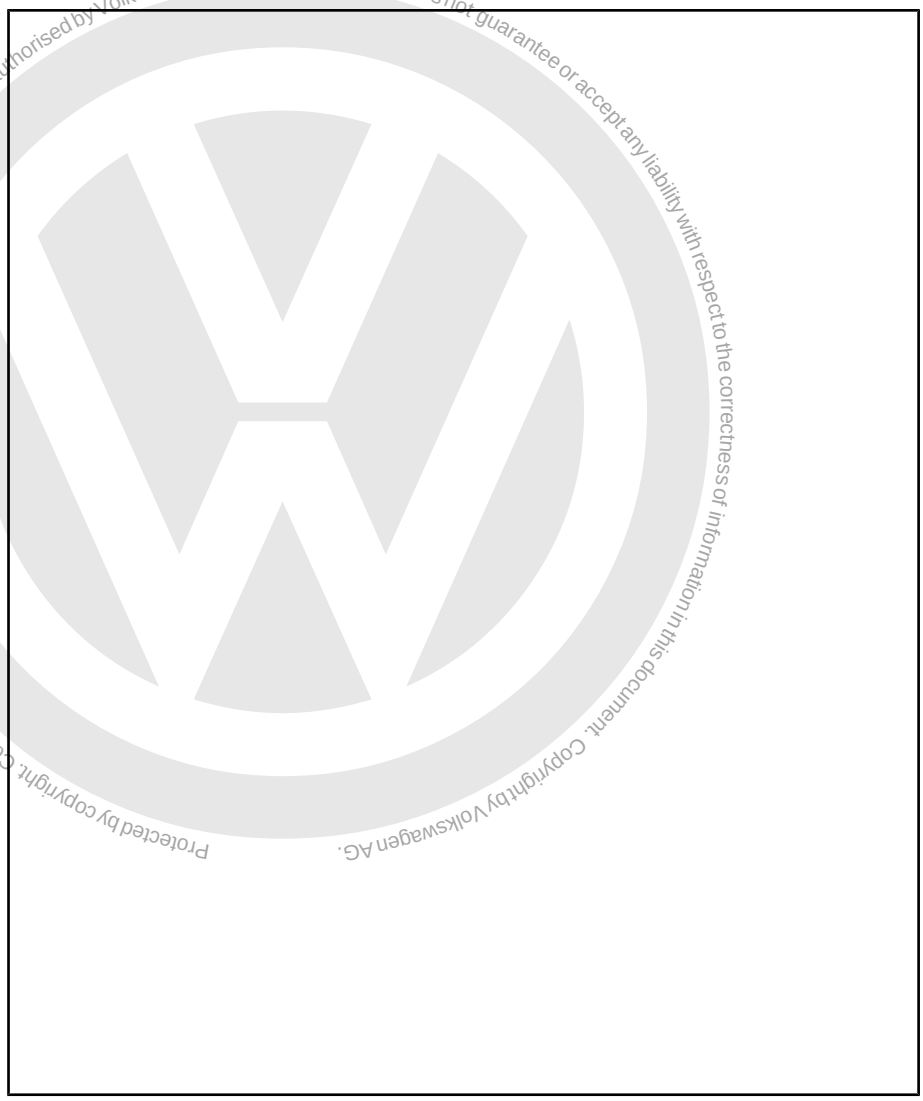
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5.2 Removing and installing wheel bearing housing

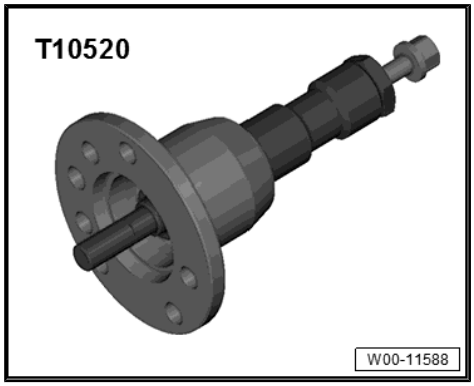
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Special tools and workshop equipment required

- Ball joint puller - 3287A-
- Spreader - 3424-
- Ball joint puller - T10187-
- Torque wrench - V.A.G 1332-
- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- Torque angle wrench - V.A.G 1756-



- Press tool - T10520-



Removing

– Remove bolt for drive shaft ⇒ page 111 .

Caution

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

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

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 on lift.

– Remove wheel.

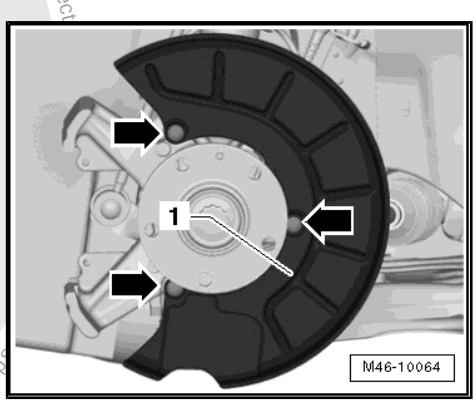
– Detach brake caliper and tie to body with wire ⇒ Brake system; Rep. gr. 46 ; Front brakes; Assembly overview - front brakes .

– 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 bracket for brake line and wires from wheel bearing housing, and lay it to one side.

– Remove splash plate -1- from wheel bearing housing -arrows-.



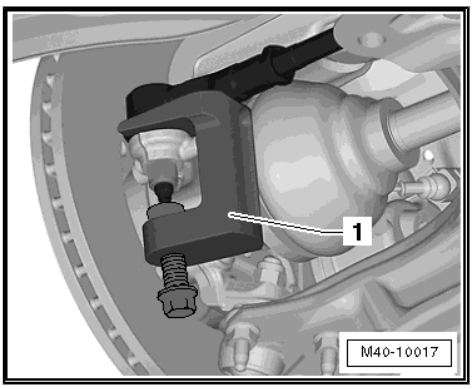
– Loosen nut on track rod ball joint but do not remove completely.

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-

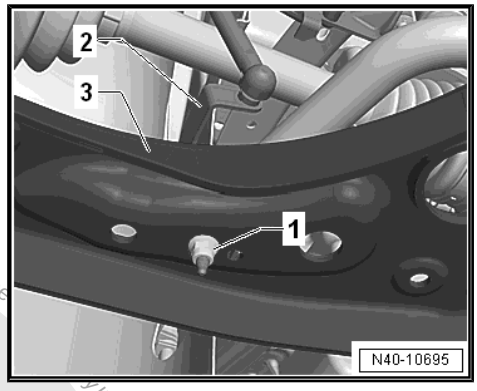


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Vehicles with vehicle level sender.

– Undo nuts -1-.

– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

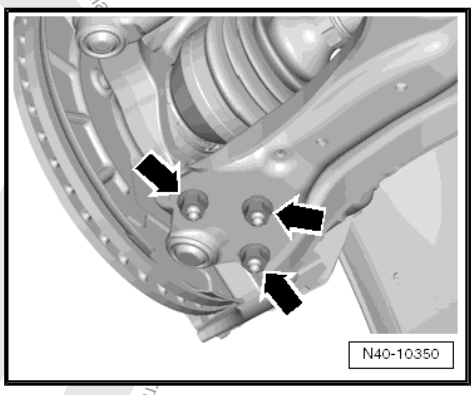


Continued for all vehicles:

– Loosen nuts -arrows-.

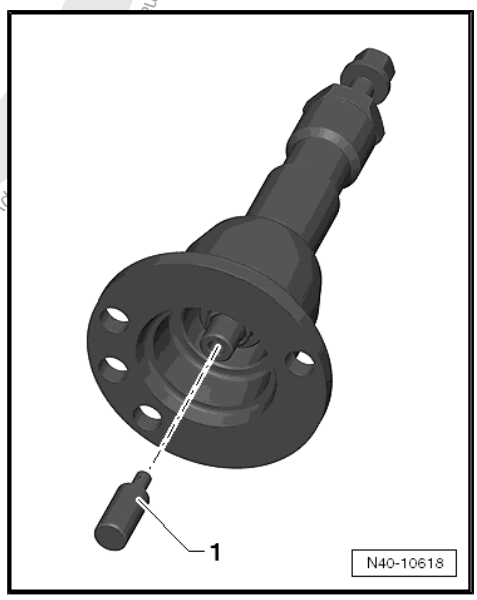
– Pull swivel joint out of suspension link.

– Pull outer joint of drive shaft out of wheel hub.



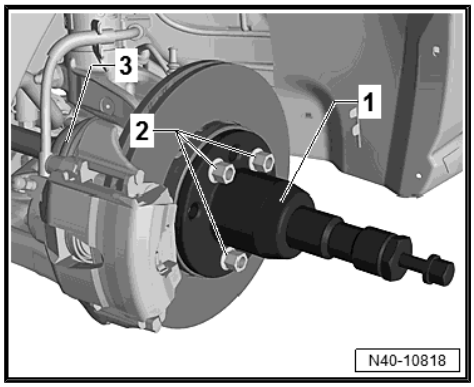
If the drive shaft cannot be pulled out of the wheel bearing by hand, use press tool - T10520- .

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-.

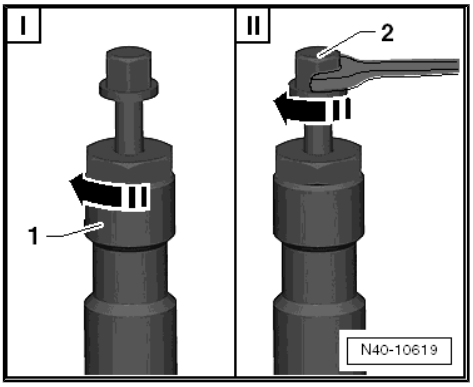


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– It is essential to follow specified sequence.

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

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



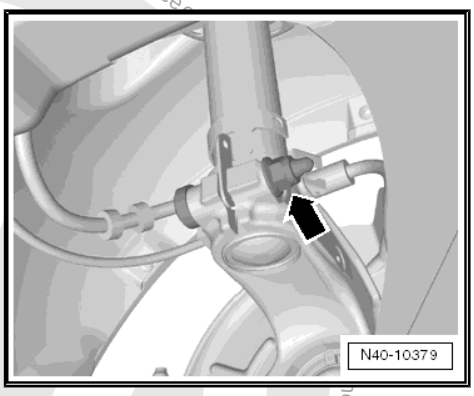
Note

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.

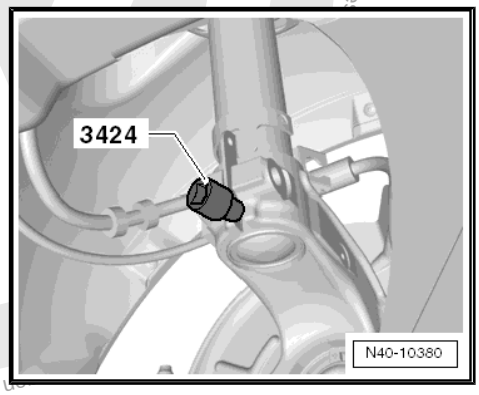
– Secure drive shaft to body with wire.

– Place engine and gearbox jack - VAS 6931- or 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.



Note

Make sure that the spreader - 3424- is only inserted into the wheel bearing housing. Insert sufficiently to ensure that the metal tab of the suspension strut is not damaged.

– Turn ratchet handle through 90° and detach from spreader - 3424- .

– Pull wheel bearing housing from suspension strut.

Note

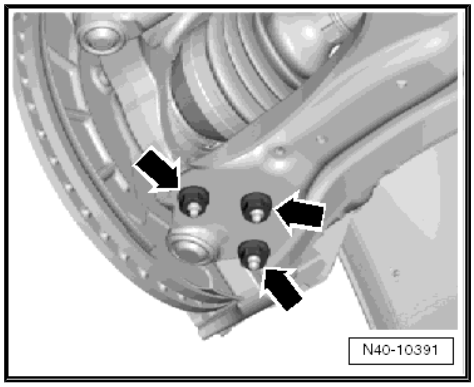
If wheel bearing housing is renewed, swivel joint must be transferred. Always use new nuts.

Installing

Install in the reverse order of removal, observing the following:

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– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “5.1 Assembly overview - wheel bearing”, page 77
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “3.1 Assembly overview - suspension strut, upper suspension link”, page 48
- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Speed sensor bolt ⇒ Brake system; Rep. gr. 45 ; Sensors; Assembly overview - speed sensor on front axle
- Bolts for splash plate, brake caliper, brake disc ⇒ Brake system; Rep. gr. 46 ; Front brakes; Assembly overview - front brakes

5.3 Removing and installing wheel bearing unit

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



Removing

– Remove bolt for drive shaft ⇒ page 111 .

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Caution

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

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

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 on lift.

– Remove wheel.

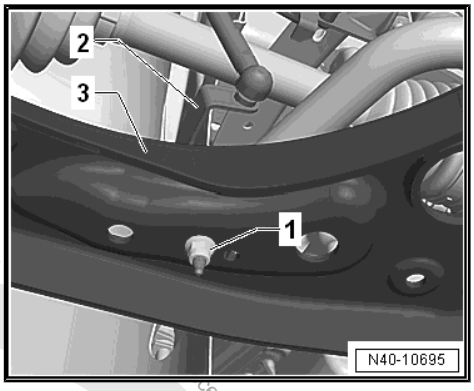
– Detach brake caliper and tie to body with wire ⇒ Brake system; Rep. gr. 46 ; Front brakes; Assembly overview - front brakes .

– Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Front brakes; Assembly overview - front brakes

Vehicles with vehicle level sender.

– Undo nuts -1-.

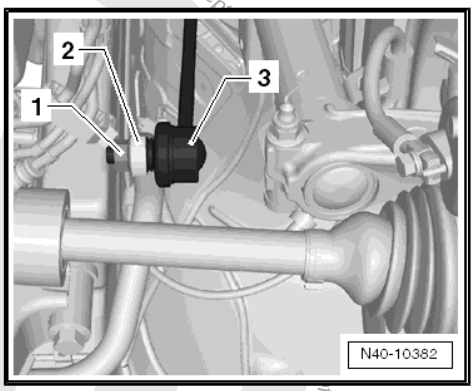
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.



Continued for all vehicles:

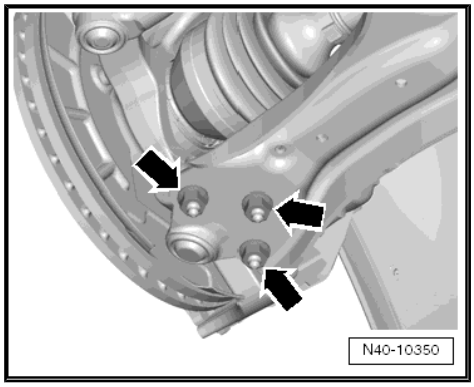
– Unscrew hexagon nut -1- from coupling rod -3-.

– Pull coupling rod -3- out of anti-roll bar -2-.



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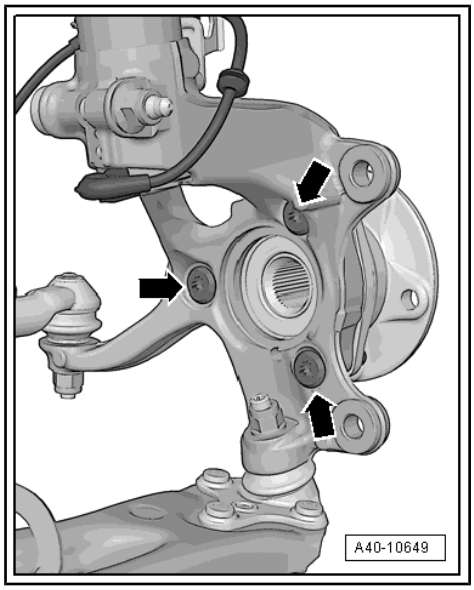
– Unscrew nuts -arrows-.
– Pull swivel joint out of suspension link.
– Pull outer joint of drive shaft out of wheel hub.
– Secure drive shaft to body with wire.
– Bolt swivel joint to suspension link -arrows- again.

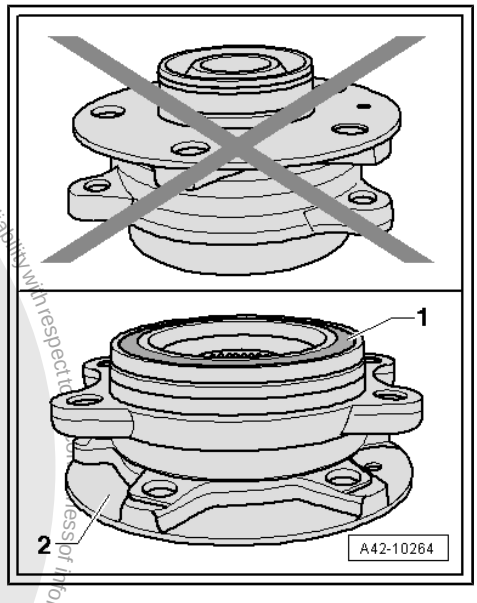


– Unscrew bolts -arrows-.
– Take wheel bearing unit out of wheel bearing housing.

Caution

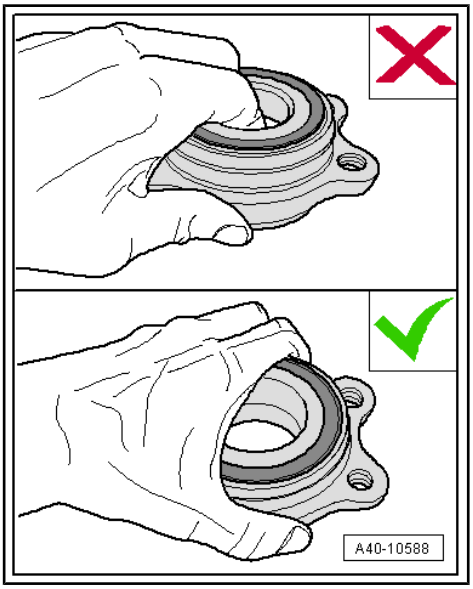
- ***Prevent damage to seal through soiling or when mounting, storing or placing on a surface.***





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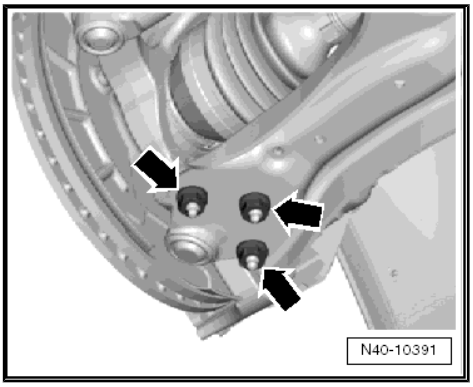
- When placing wheel bearing unit down, wheel bearing -1- must always face upwards.
- Always set wheel bearing unit on hub -2- when placing on a surface.
- When picking wheel bearing up, never grasp inner side.
- Grasp only outer side of wheel bearing.



Installing

Install in reverse order of removal. During this step, observe the following:

– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “5.1 Assembly overview - wheel bearing”, page 77
- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- Brake disc bolt ⇒ Brake system; Rep. gr. 46 ; Front brakes; Assembly overview - front brakes

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6 Drive shaft

⇒ “6.1 Overview - drive shaft”, page 86

⇒ “6.2 Assembly overview - drive shaft”, page 87

⇒ “6.4 Loosening and tightening threaded connections of drive shaft”, page 111

⇒ “6.5 Removing and installing drive shaft heat shield”, page 113

⇒ “6.3 Removing and installing drive shaft”, page 94

⇒ “6.6 Dismantling and assembling drive shaft”, page 113

⇒ “6.7 Checking outer constant velocity joint”, page 128

⇒ “6.8 Checking inner constant velocity joint”, page 129

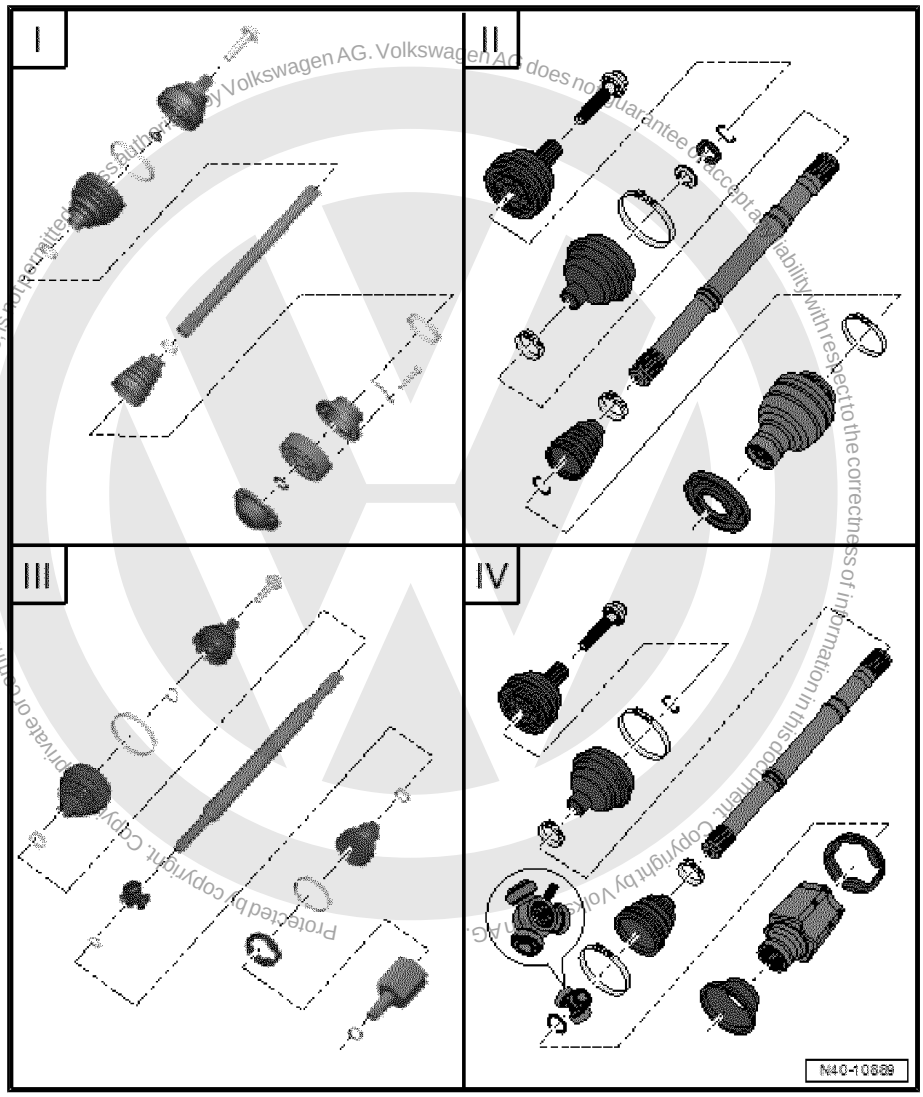
6.1 Overview - drive shaft

I -
⇒ “6.2.1 Assembly overview – drive shaft, constant velocity joint VL107, threaded connection”, page 87

II -
⇒ “6.2.2 Assembly overview – drive shaft, constant velocity joint VL107, plug-in connection”, page 90

III -
⇒ “6.2.3 Assembly overview - drive shaft, triple roller joint AAR3300i pushed into gearbox”, page 91

III -
⇒ “6.2.4 Assembly overview - drive shaft, triple roller joint AAR3300i pushed onto flange shaft”, page 93



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Distinguishing between drive shafts when installed

	VL107 (bolt-on)	VL107 (inserted)	AAR3300i
Diameter of inner joint in mm	107	107	-

	VL107 (bolt-on)	VL107 (inserted)	AAR3300i
Cover between inner joint and drive flange	X	-	-
Inner joint fitted in gearbox (dual clutch gearbox)	-	-	X
Inner joint fitted onto gearbox (dual clutch gearbox)	-	-	X
Inner joint fitted onto gearbox (6-speed manual gearbox OA6, all-wheel drive)	-	X	-

6.2 Assembly overview - drive shaft

⇒ “6.2.1 Assembly overview – drive shaft, constant velocity joint VL107, threaded connection”, page 87

⇒ “6.2.2 Assembly overview – drive shaft, constant velocity joint VL107, plug-in connection”, page 90

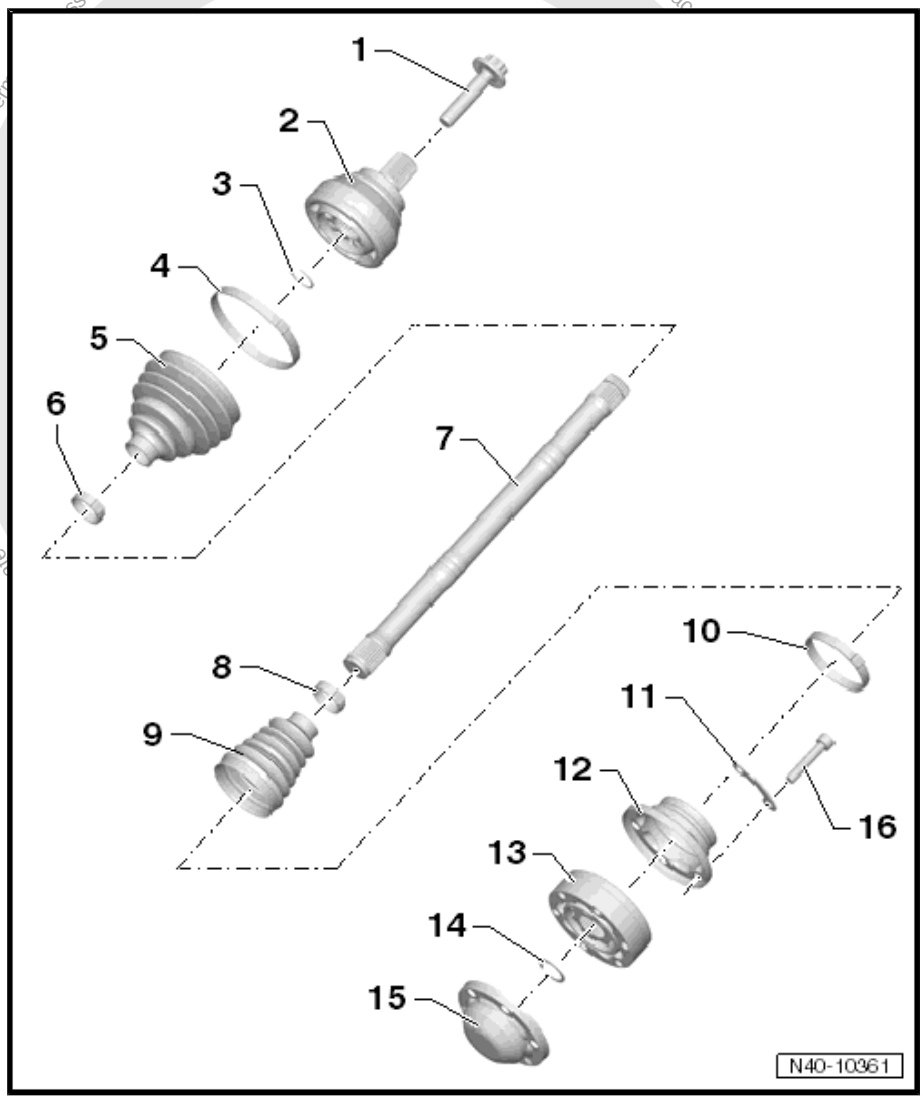
⇒ “6.2.3 Assembly overview - drive shaft, triple roller joint AAR3300i pushed into gearbox”, page 91

⇒ “6.2.4 Assembly overview - drive shaft, triple roller joint AAR3300i pushed onto flange shaft”, page 93

6.2.1 Assembly overview – drive shaft, constant velocity joint VL107, threaded connection

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1 - Bolt

- ❑ Renew after removal
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap.
- ❑ 200 Nm +180°

2 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 115
- ❑ Installing: drive onto shaft to stop using plastic hammer
- ❑ Checking ⇒ page 128

3 - Locking ring

- ❑ Renew after removal
- ❑ Insert in groove in shaft

4 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 117

5 - Boot

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

6 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 118

7 - Drive shaft

8 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 118

9 - Boot for constant velocity joint

- ❑ Material: Hytrel (polyester elastomer)
- ❑ Without breather hole
- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.

10 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 117

11 - Locking plate

12 - Cap

- ❑ Drive off carefully with drift
- ❑ Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.
- ❑ Adhesive surface must be free of oil and grease!

13 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Pressing off ⇒ page 116
- ❑ Pressing on ⇒ page 116
- ❑ Checking ⇒ page 129

14 - Locking ring

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

15 - Cover

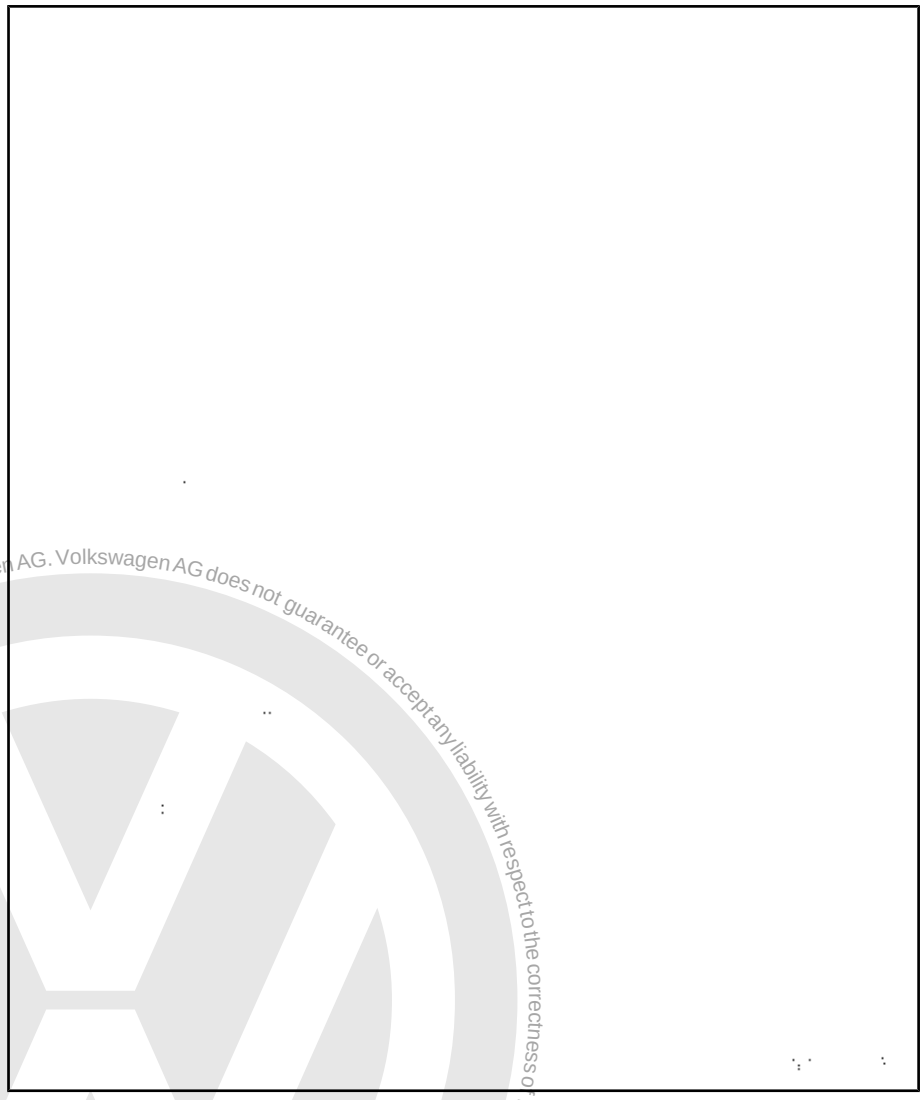
- ❑ Renew after removal
- ❑ Always renew
- ❑ Pressing off ⇒ page 116

16 - Multi-point socket head bolt

- ❑ Renew after removal
- ❑ M10 x 52
- ❑ Pre-tighten diagonally to 10 Nm and then tighten diagonally to specified torque
- ❑ 70 Nm

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6.2.2 Assembly overview – drive shaft, constant velocity joint VL107, plug-in connection



1 - Outer constant velocity joint
- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 115
- ❑ Installing: drive onto shaft to stop using plastic hammer
- ❑ Checking ⇒ page 128

2 - Bolt
- ❑ Renew after removal
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap.
- ❑ 200 Nm +180°

3 - Locking ring
- ❑ Renew after removal
- ❑ Insert in groove in shaft

4 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 117

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

6 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 118

7 - Drive shaft

8 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 118

9 - Boot for constant velocity joint
- ❑ Material: Hytrel (polyester elastomer)
- ❑ Without breather hole
- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.

10 - Locking ring
- ❑ Remove and install with circlip pliers - VW 161 A- .

11 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 117

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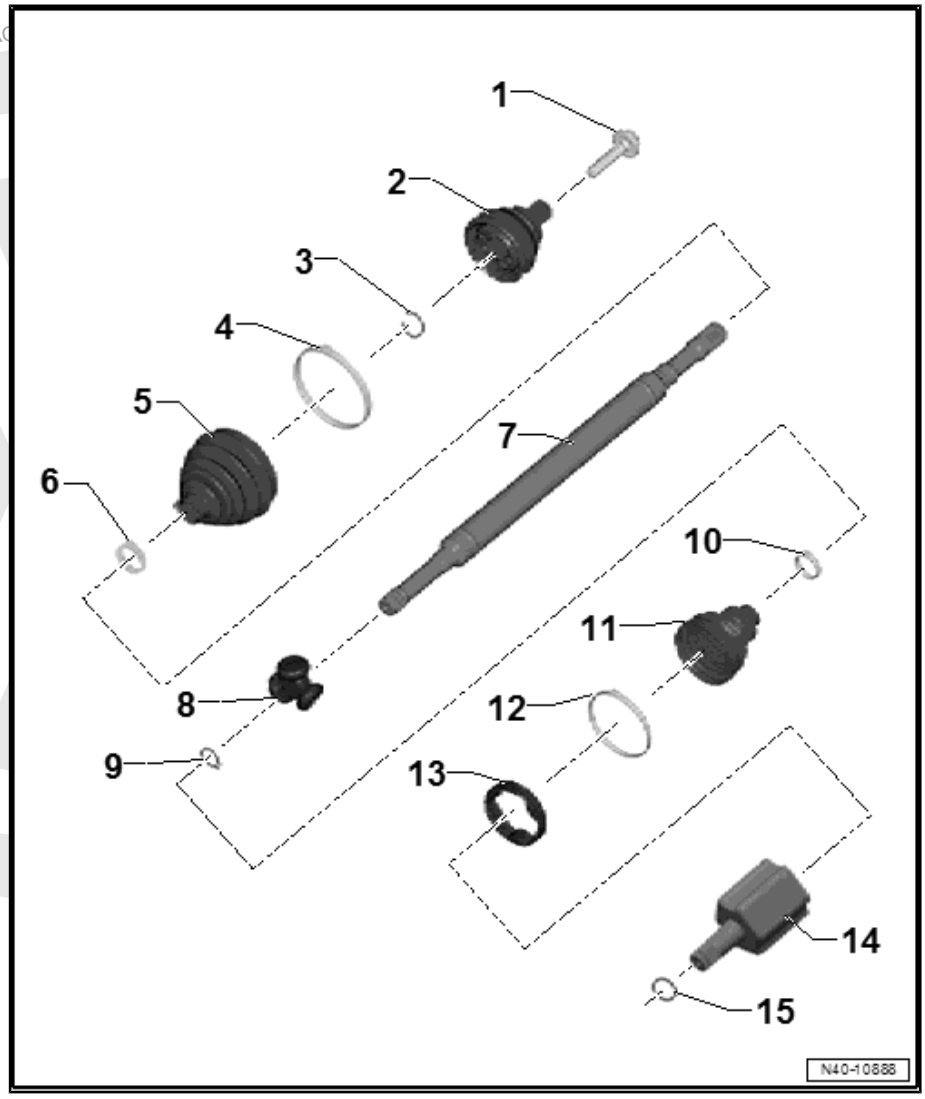
12 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Pressing off ⇒ page 116
- ❑ Pressing on ⇒ page 116
- ❑ Checking ⇒ page 129

13 - Protective cap

- ❑ Pulling off ⇒ page 118
- ❑ Driving on ⇒ page 118

6.2.3 Assembly overview - drive shaft, triple roller joint AAR3300i pushed into gearbox



1 - Bolt

- ❑ Renew after removal
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap.
- ❑ 200 Nm +180°

2 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 121
- ❑ Installing: drive onto shaft with plastic hammer until compressed circlip seats
- ❑ Checking ⇒ page 128

3 - Locking ring

- ❑ Renew after removal
- ❑ Insert in groove in shaft

4 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 123

5 - Boot for constant velocity joint

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

6 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 124

7 - Drive shaft

8 - Triple roller star with rollers

The chamfer -arrow- points towards drive shaft splines.

- ❑ Removing ⇒ page 121

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9 - Locking ring

- ❑ Renew after removal
- ❑ Insert in groove in shaft

10 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 124

11 - Boot for triple roller joint

- ❑ Check for splits and chafing

12 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 123

13 - adapters

14 - Joint body

- ❑ Removing ⇒ page 121

15 - Locking ring

- ❑ Renew after removal
- ❑ Insert in groove in shaft

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6.2.4 Assembly overview - drive shaft, triple roller joint AAR3300i pushed onto flange shaft

1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 126
- ❑ Installing: drive onto shaft with plastic hammer until compressed circlip seats
- ❑ Checking ⇒ page 128

2 - Bolt

- ❑ Renew after removal
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap.
- ❑ 200 Nm +180°

3 - Locking ring

- ❑ Renew each time after removing
- ❑ Insert in groove in shaft

4 - Clamping piece

- ❑ Renew each time after removing
- ❑ Tightening ⇒ page 123

5 - Boot for constant velocity joint

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

6 - Clamping piece

- ❑ Renew each time after removing
- ❑ Tightening ⇒ page 124

7 - Drive shaft

8 - Clamping piece

- ❑ Renew each time after removing
- ❑ Tightening ⇒ page 124

9 - Boot for triple roller joint

- ❑ Check for splits and chafing

10 - Clamping piece

- ❑ Renew each time after removing
- ❑ Tightening ⇒ page 123

11 - Triple roller star with rollers

The chamfer -arrow- points towards drive shaft splines.

12 - Locking ring

- ❑ Renew each time after removing

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❑ Insert in groove in shaft

13 - adapters

14 - Joint body

15 - Protective cap

❑ Pulling off ⇒ page 128

❑ Driving on ⇒ page 128

6.3 Removing and installing drive shaft

⇒ “6.3.1 Removing and installing drive shaft, left drive shaft, constant velocity joint VL107, bolted”, page 94

⇒ “6.3.2 Removing and installing drive shaft, right drive shaft, constant velocity joint VL107, bolted”, page 98

⇒ “6.3.3 Removing and installing drive shaft, triple roller joint AAR3300i pushed into gearbox”, page 101

⇒ “6.3.4 Removing and installing drive shaft, constant velocity joint VL107 and triple roller joint AAR3300i pushed onto flange shaft”, page 106

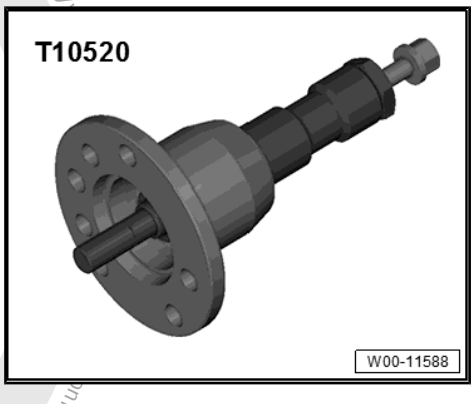
6.3.1 Removing and installing drive shaft, left drive shaft, constant velocity joint VL107, bolted

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



♦ Press tool - T10520-



Caution

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

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Removing

– Remove bolt for drive shaft ⇒ page 111 .

Caution

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

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

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.

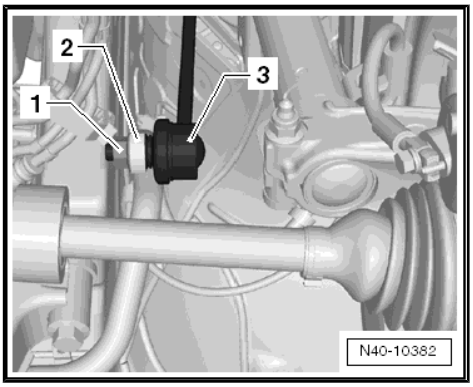
– Raise vehicle on lift.

– Remove wheel.

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Unscrew hexagon nut -1- from coupling rod -3-.

– Pull coupling rod -3- out of anti-roll bar -2-.

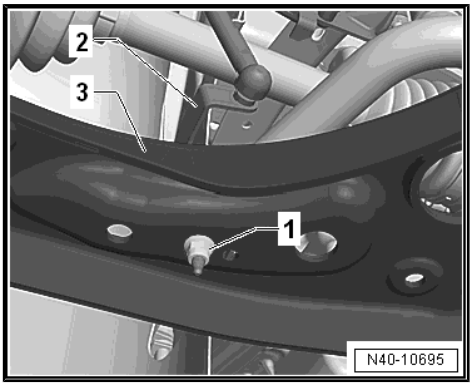


Vehicles with vehicle level sender.

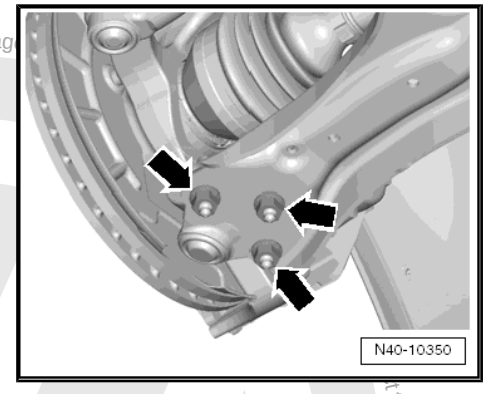
– Undo nuts -1-.

– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

Continued for all vehicles:

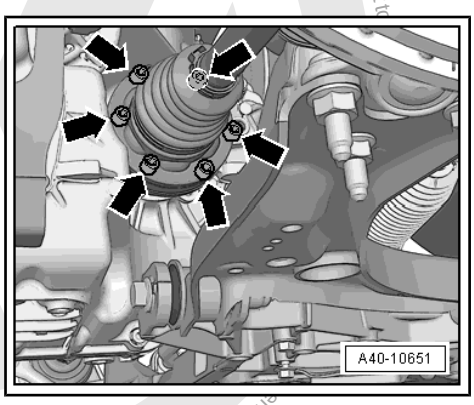


– Remove nuts -arrows- on suspension link.
– Detach suspension link from swivel joint.

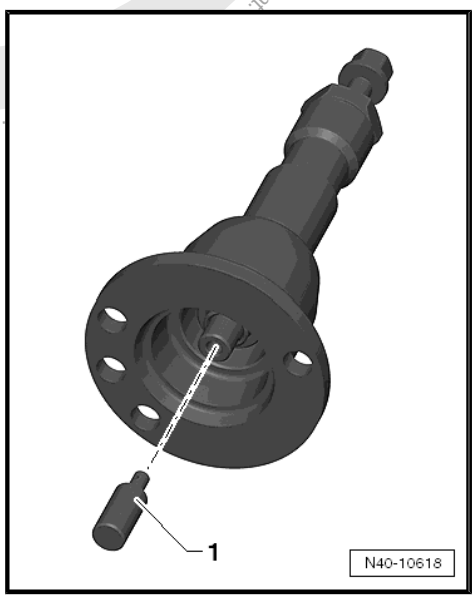


– Unbolt drive shaft from gearbox flange shaft -arrows-.
– Turn wheel bearing housing to left.
– Pull drive shaft out of wheel hub.

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

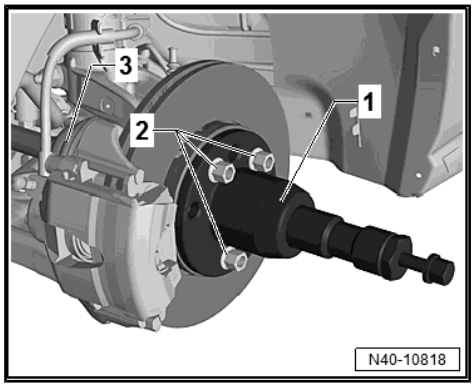


Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

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

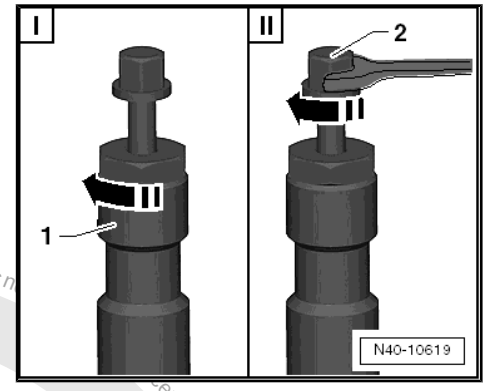


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– It is essential to follow specified sequence.

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

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



Note

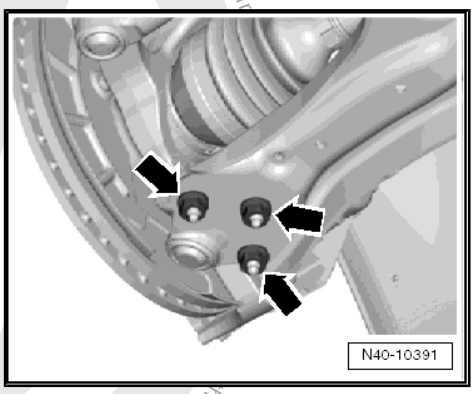
At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.

– Remove drive shaft.

Installing

Install in the reverse order of removal, observing the following:

– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “6.4 Loosening and tightening threaded connections of drive shaft”, page 111
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

• On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

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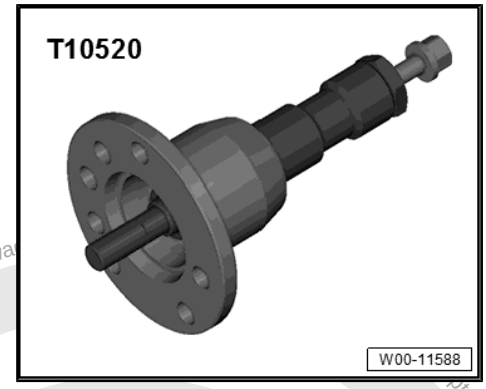
6.3.2 Removing and installing drive shaft, right drive shaft, constant velocity joint VL107, bolted

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



- Press tool - T10520-



Caution

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

Removing

– Remove bolt for drive shaft ⇒ page 111 .

Caution

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

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

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

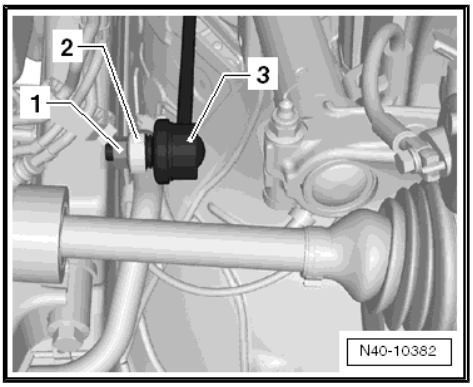
Do not attempt to move the vehicle without the drive shafts fitted as this would damage the wheel bearing. If a vehicle must nevertheless be moved, comply with the following:

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

– Loosen wheel bolts.

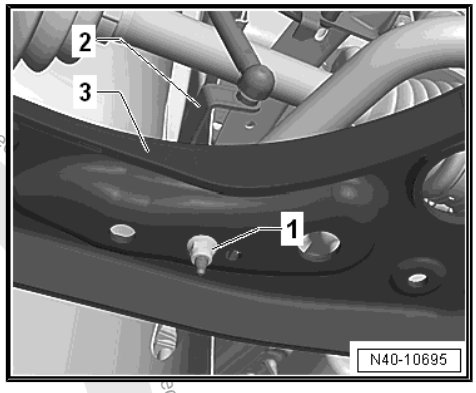
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– Raise vehicle on lift.
– Remove wheel.
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
– Unscrew hexagon nut -1- from coupling rod -3-.
– Pull coupling rod -3- out of anti-roll bar -2-.



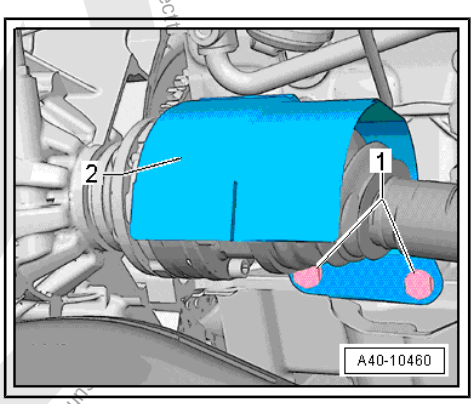
Vehicles with vehicle level sender.

– Undo nuts -1-.
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.



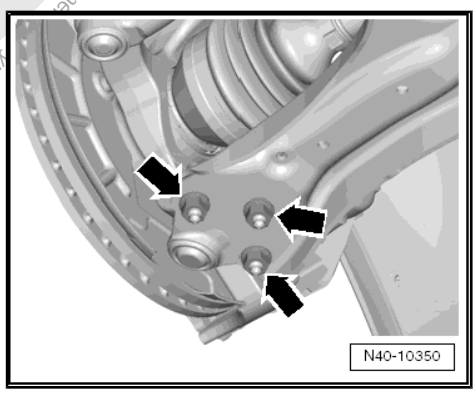
Continued for all vehicles:

– If fitted, remove bolts -1- and detach heat shield -2-.
– Unbolt drive shaft from gearbox flange.



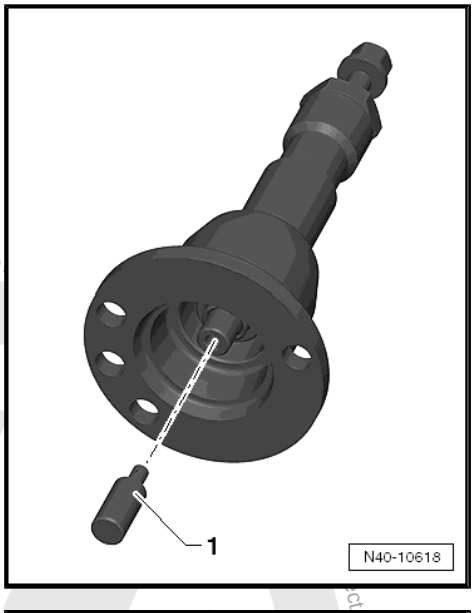
– Remove nuts -arrows- on suspension link.
– Detach suspension link from swivel joint.
– Swivel suspension strut outwards and at the same time press drive shaft out of wheel bearing unit.

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



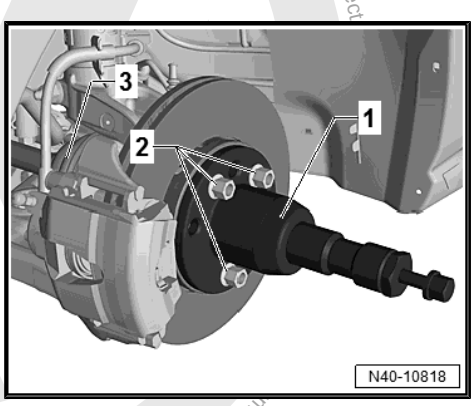
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Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

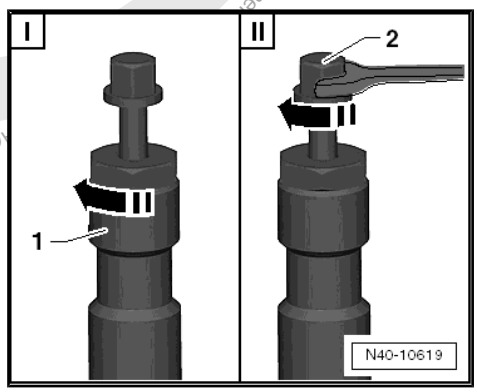
– To press out drive shaft -3-, secure press tool - T10520- -1- to wheel hub using 3 wheel bolts -2-.



– It is essential to follow specified sequence.

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

II - Turn only bolt -2- using a spanner in order to press 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.

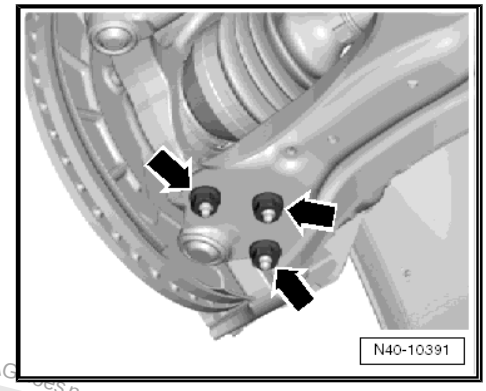
– Remove drive shaft.

Installing

Install in the reverse order of removal, observing the following:

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– Tighten nuts -arrows-.



Note

Tighten nuts -arrows- in unladen state ⇒ page 6 .

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “6.4 Loosening and tightening threaded connections of drive shaft”, page 111
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

• On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

6.3.3 Removing and installing drive shaft, triple roller joint AAR3300i pushed into gearbox

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Special tools and workshop equipment required

- Aluminium wedge - T10161-
- Press tool - T10520-
- Torque wrench - V.A.G 1332-



Caution

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

Removing

– Remove bolt for drive shaft ⇒ page 111 .

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Caution

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

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

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.

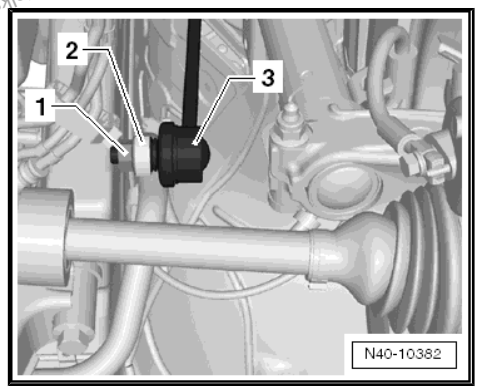
– Raise vehicle on lift.

– Remove wheel.

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Unscrew hexagon nut -1- from coupling rod -3-.

– Pull coupling rod -3- out of anti-roll bar -2-.

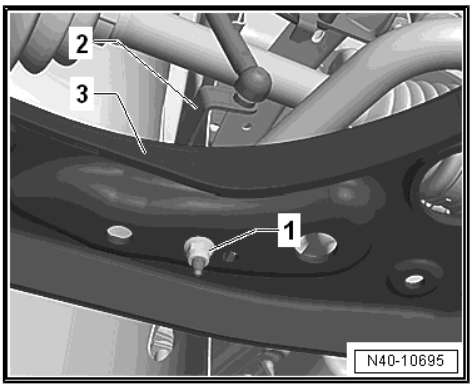


Vehicles with vehicle level sender.

– Undo nuts -1-.

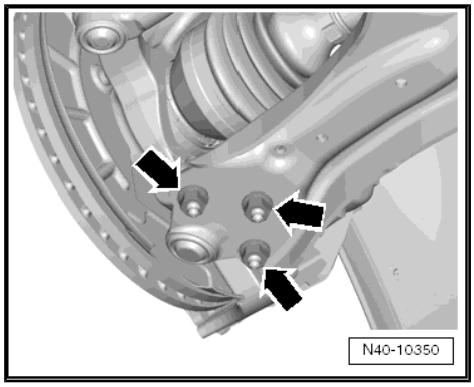
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

Continued for all vehicles:

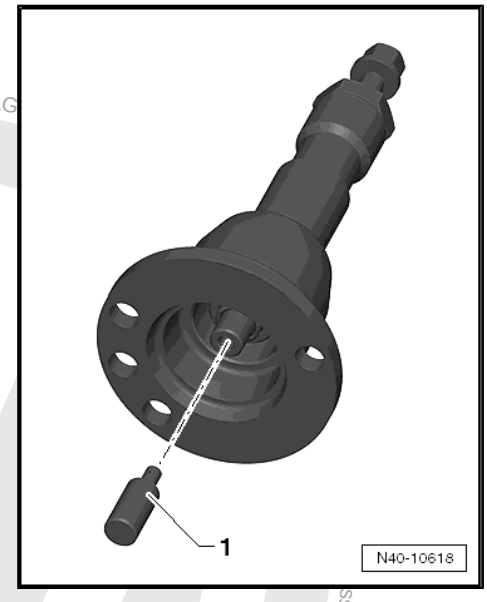


– Unscrew nuts -arrows-.
– Pull wheel bearing housing with swivel joint out of suspension link.
– Pull drive shaft out of wheel hub and tie up to body.

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

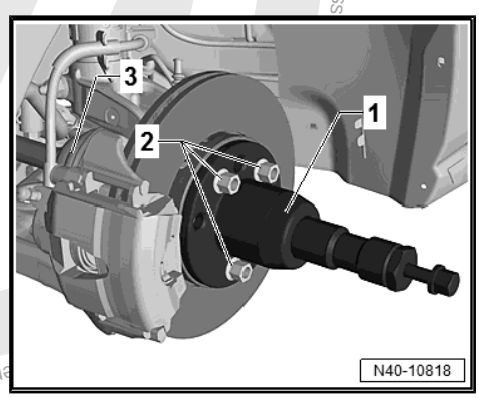


Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

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



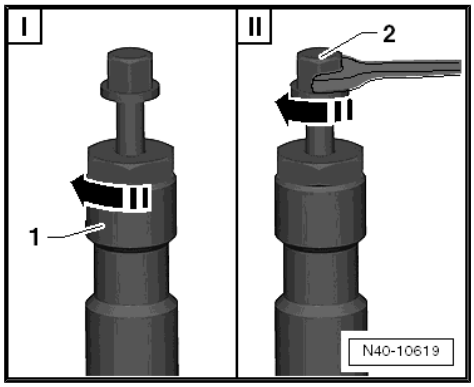
– It is essential to follow specified sequence.

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

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

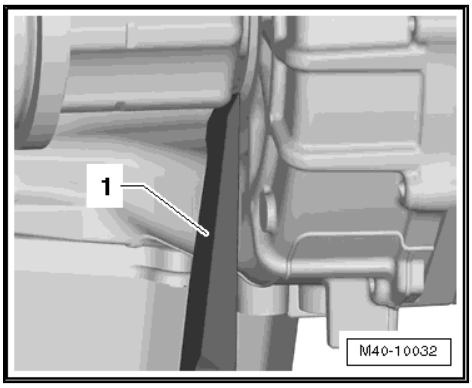
Note

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.



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– Insert wedge - T10161- -1- between gearbox housing and triple roller joint.

– Press inner joint out of gearbox with a blow to wedge - T10161- using a rubber hammer.

– Remove drive shaft.

Installing

Install in reverse order of removal. During this step, observe the following:

– Fit new retaining ring into groove of joint pin.

– Mesh outer and inner splines of joint body and gearbox.

– Slide drive shaft into joint body to stop by hand.

– Now »suddenly« push joint body into gearbox.

The joint travel can be used for the »sudden push«. Do not, however, pull the drive shaft too far out of the joint body.

> ⚠ Caution
>
> *Never use a hammer or other driving tools.*

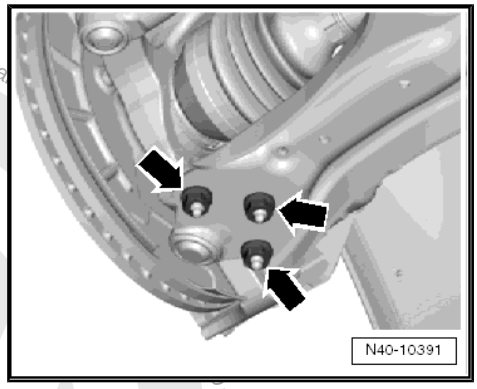
– Check that the drive shaft is securely seated in the gearbox by pulling the joint body against the resistance of retaining ring.

> ⚠ Caution
>
> *For this check, pull only on joint body and not on drive shaft.*

– Guide outer joint into wheel hub splines as far as possible.

– Install lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Tighten nuts -arrows-.



Note

- *Tighten nuts -arrows- in unladen state ⇒ page 6 .*
- *Ensure that boot is not damaged or twisted.*

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “6.4 Loosening and tightening threaded connections of drive shaft”, page 111
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

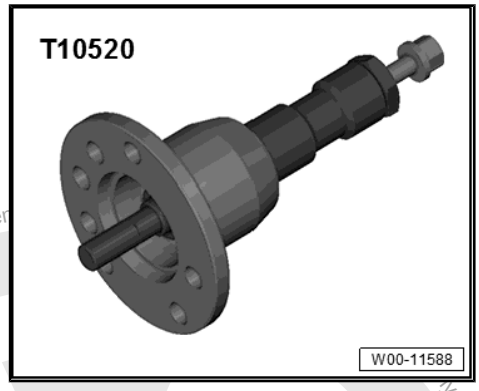
• On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

6.3.4 Removing and installing drive shaft, constant velocity joint VL107 and triple roller joint AAR3300i pushed onto flange shaft

Special tools and workshop equipment required

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- Press tool - T10520-



- Torque wrench - V.A.G 1332-



Caution

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

Removing

– Remove bolt for drive shaft ⇒ page 111 .

Caution

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

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

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.*

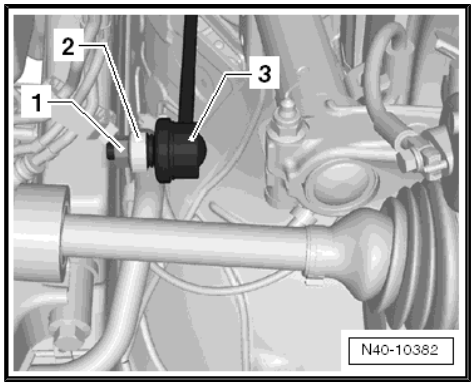
– Loosen wheel bolts.

– Raise vehicle on lift.

– Remove wheel.

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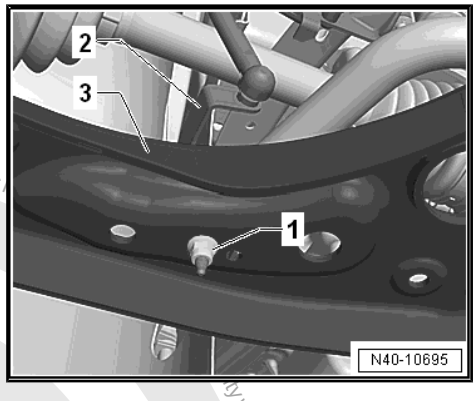
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
– Unscrew hexagon nut -1- from right coupling rod -3-.
– Pull coupling rod -3- out of anti-roll bar -2-.



Vehicles with vehicle level sender.

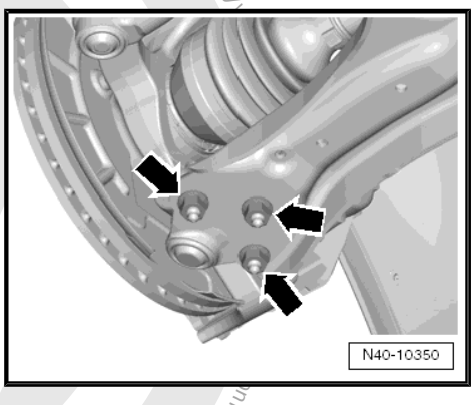
– Undo nuts -1-.
– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.

Continued for all vehicles:



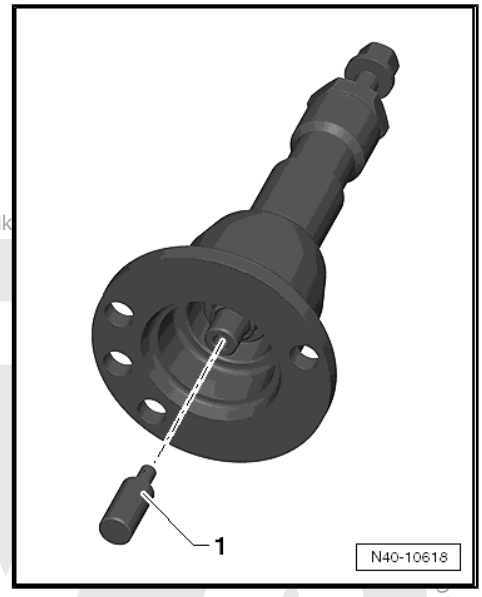
– Unscrew nuts -arrows-.
– Pull wheel bearing housing with swivel joint out of suspension link.
– Pull drive shaft out of wheel hub and tie up to body.

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



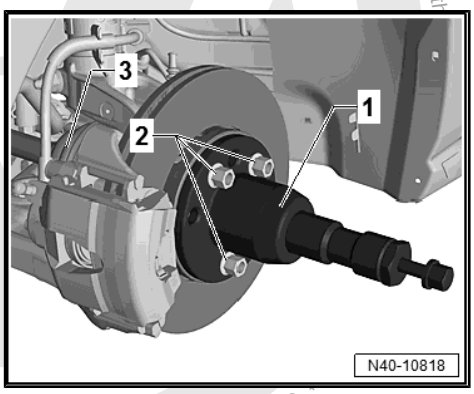
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Before using press tool - T10520- ensure that thrust piece -1- is inserted.



Using press tool - T10520- :

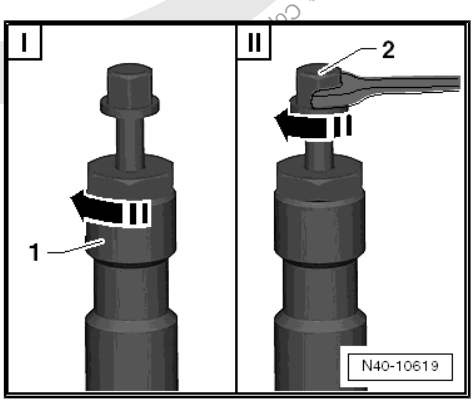
– To press out drive shaft -3-, secure press tool - T10520- -1- to wheel hub using 3 wheel bolts -2-.



– It is essential to follow specified sequence.

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

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



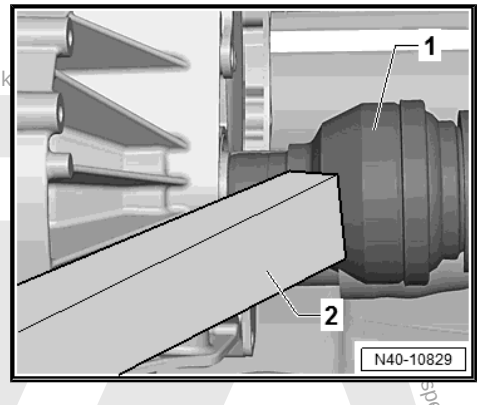
Note

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.

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– Using suitable tool, e.g. wooden block -2-, drive the drive shaft -1- off gearbox stub shaft.

– Remove drive shaft from vehicle.



Installing

Install in reverse order of removal. During this step, observe the following:

– Fit new retaining ring into groove of joint pin.

– Mesh outer and inner splines of joint body and gearbox.

– Slide drive shaft into joint body to stop by hand.

– Now »suddenly« push joint body into gearbox.

The joint travel can be used for the »sudden push«. Do not, however, pull the drive shaft too far out of the joint body.

Caution

Never use a hammer or other driving tools.

– Check that the drive shaft is securely seated in the gearbox by pulling the joint body against the resistance of retaining ring.

Caution

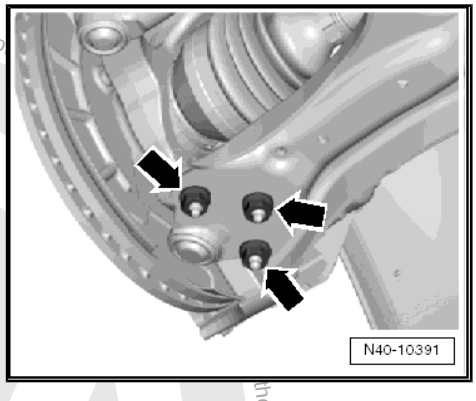
For this check, pull only on joint body and not on drive shaft.

– Guide outer joint into wheel hub splines as far as possible.

– Install lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

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– Tighten nuts -arrows-.



Note

- *Tighten nuts -arrows- in unladen state ⇒ page 6 .*
- *Ensure that boot is not damaged or twisted.*

Note

- *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

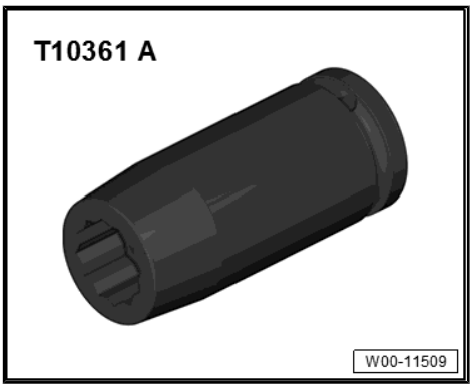
Torque settings

- ⇒ “6.2 Assembly overview - drive shaft”, page 87
- ⇒ “6.4 Loosening and tightening threaded connections of drive shaft”, page 111
- ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

6.4 Loosening and tightening threaded connections of drive shaft

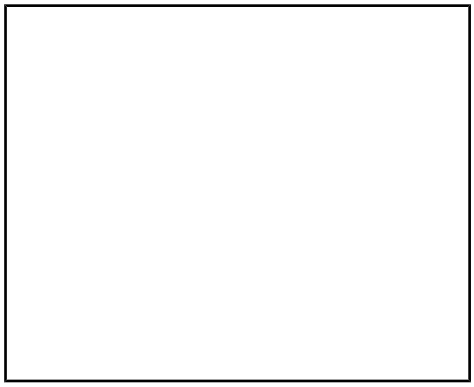
Special tools and workshop equipment required

- Socket AF 24 - T10361A-



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



Caution

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

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

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.*

Loosening twelve-point head bolt

– To avoid damage to wheel bearing, do not loosen twelve-point bolt using 24 mm socket - T10361A- further than 90° with vehicle still standing on its wheels.

– Raise vehicle so that wheels are off the ground.

– Have second mechanic apply brakes.

– Remove twelve-point head bolt -arrow-.



Fitting twelve-point head bolt

– Renew twelve-point bolt.

Note

It must be ensured that the wheels do not yet touch the floor when the drive shaft is being tightened. Otherwise the wheel bearing may be damaged.

– Have second mechanic apply brakes.

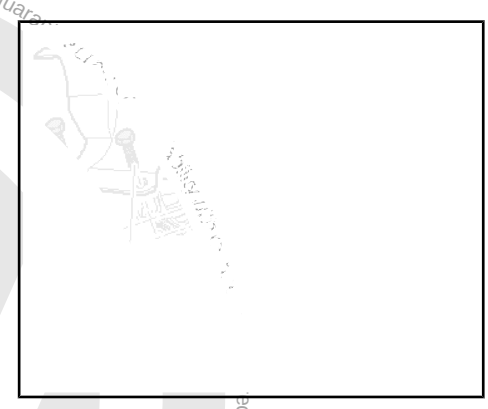
– Tighten twelve-point bolt to 200 Nm.

– Lower vehicle onto its wheels.

– Turn twelve-point head bolt 180° further.

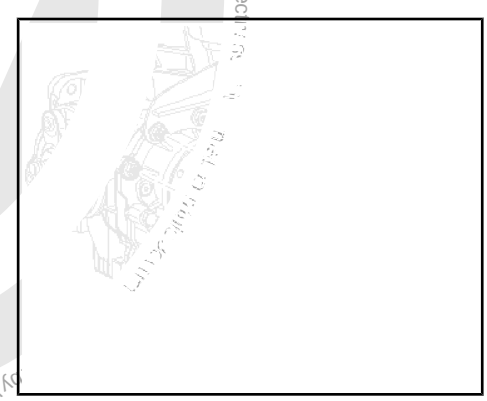
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6.5 Removing and installing drive shaft heat shield



Front-wheel drive:

Component	Torque setting
Bolts -1-	25 Nm



All-wheel drive:

Component	Torque setting
Nuts -1-	20 Nm

6.6 Dismantling and assembling drive shaft

⇒ “6.6.1 Dismantling and assembling drive shaft, constant velocity joint VL107”, page 113

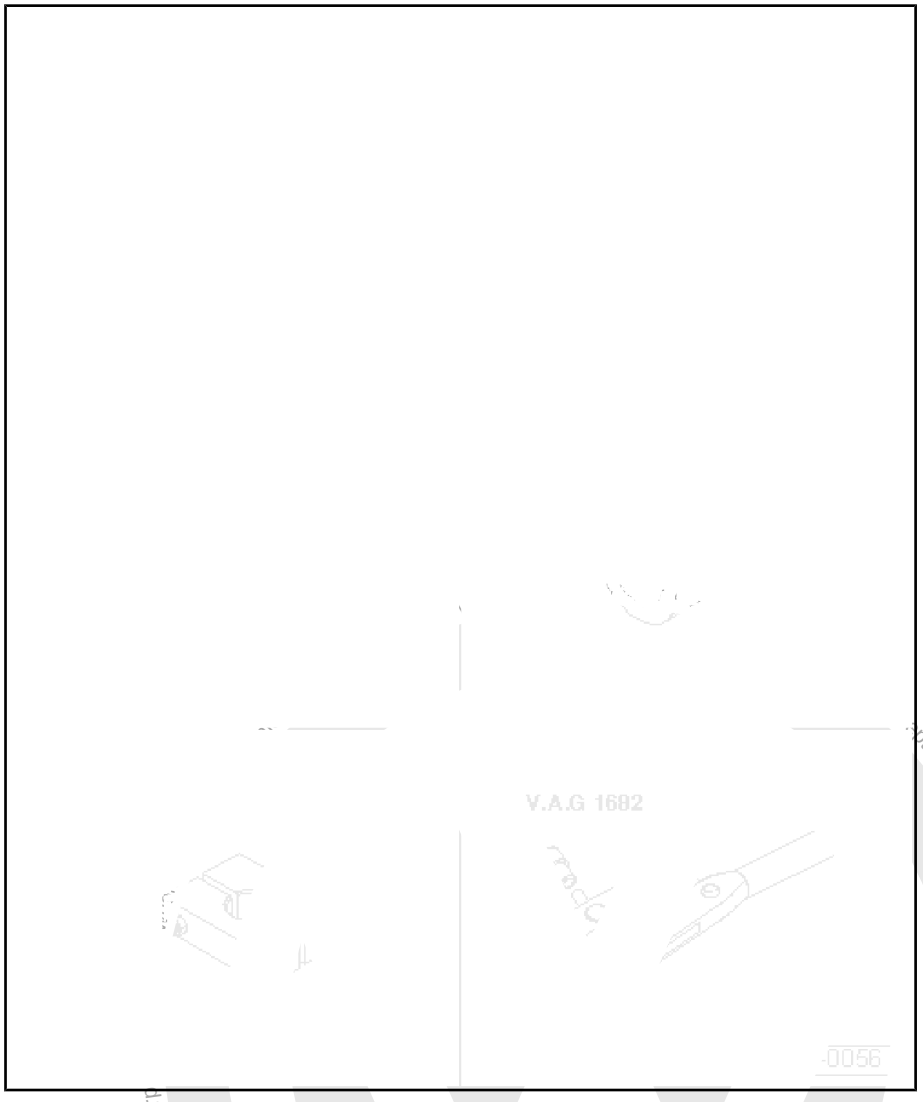
⇒ “6.6.2 Dismantling and assembling drive shaft, triple roller joint AAR3300i pushed into gearbox”, page 118

⇒ “6.6.3 Dismantling and assembling drive shaft, triple roller joint AAR3300i pushed onto flange shaft”, page 124

6.6.1 Dismantling and assembling drive shaft, constant velocity joint VL107

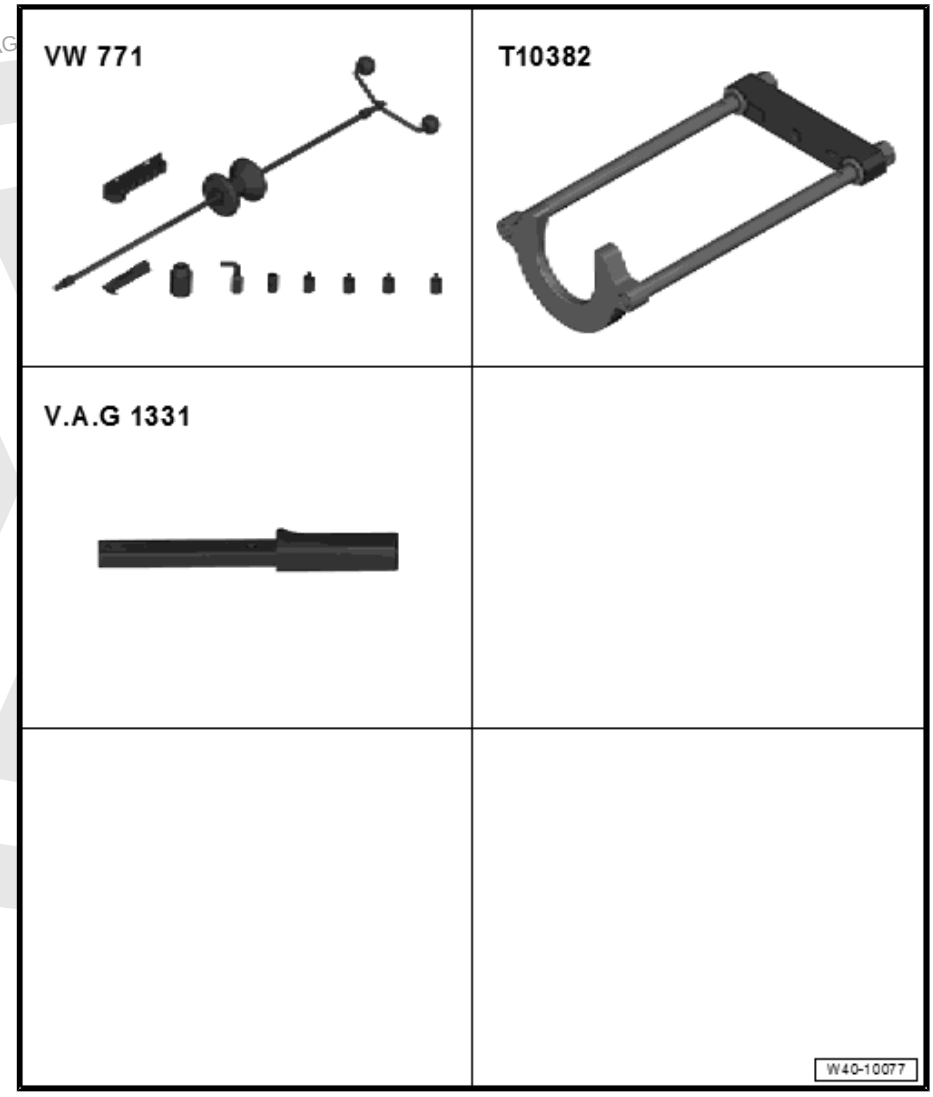
Special tools and workshop equipment required

- Pressure plate - VW 401-
- Pressure plate - VW 402-
- Press piece - VW 408 A-
- Support sleeve - VW 522-
- Tensioner - 40 - 204 A-
- Hose clip pliers - V.A.G 1682-



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- Multipurpose tool - VW 771-
- Puller - T10382-
- Torque wrench - V.A.G 1331-



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Removing outer constant velocity joint

– Clamp drive shaft in vice using jaw protectors.

– Loosen clamp.

– Fold back boot.

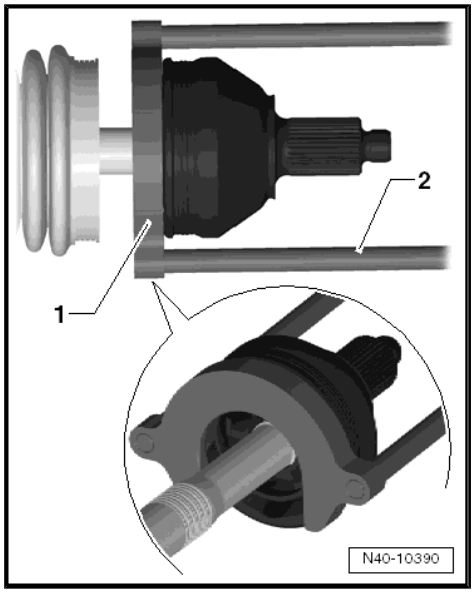
– Set puller - T10382- up so that smooth side of puller plate - T10382/1- points to spindles - T10382/2- .

– Assemble puller - T10382- complete with multi-purpose tool - VW 771- .

– Pull constant velocity joint from drive shaft with puller - T10382- and multi-purpose tool - VW 771- .

1 - Puller plate - T10382/1-

2 - Spindles - T10382/2-



Driving on outer constant velocity joint

– Install new retaining ring.

– If necessary, push new joint boot onto drive shaft.

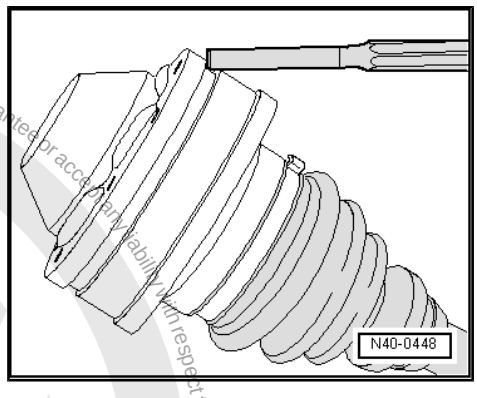
– Knock onto shaft with plastic hammer until circlip engages.

Driving off cover for inner joint

– Remove retaining ring.

– Remove both clamps and slide boot towards outer joint.

– Drive off joint boot with a drift.



Pressing off inner constant velocity joint

Installing

Pressing on inner constant velocity joint

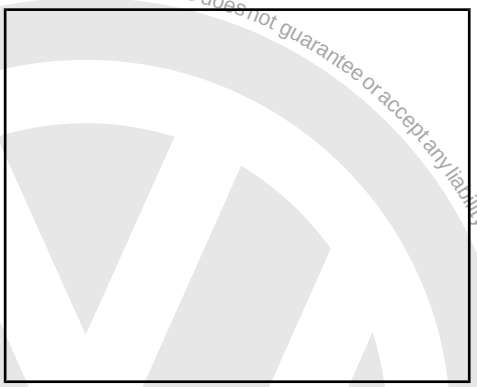
– Press joint on to stop.

– Install retaining ring.

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– Coat sealing surface of cover with -D 454 300 A2- .

– Apply an unbroken bead of sealant of 2 … 3 mm in diameter onto clean surface of cover in area of inner holes -arrow-.

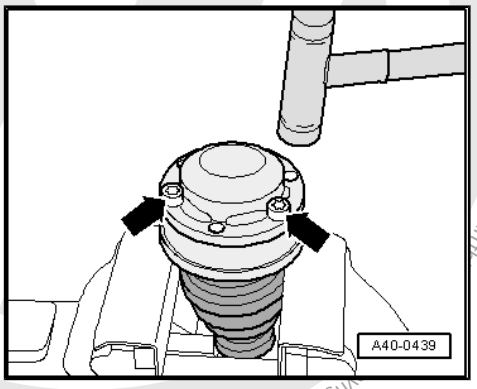


– Using bolts -arrows-, align new cover in relation to bolt holes.

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

– Drive on cap with a plastic hammer.

– Wipe off surplus sealant.



Tighten clamp on outer joint

– Apply special pliers -V.A.G 1682- as shown in diagram. Ensure jaws of tensioner lie in corners -arrows B- of ear on O-type clip.

– Tighten clamp by turning spindle with a torque wrench (do not cant pliers).



Note

- *Due to the hard material of the protective bellows (compared to rubber) and the necessity of using a stainless steel clamp, it is only possible to tension the clamp with clamp tensioner - V.A.G 1682- .*
- *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 clamp will not be attained in spite of correct specified torque specification.*

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Tightening clamp on small diameter

Checking outer constant velocity joint ⇒ page 128

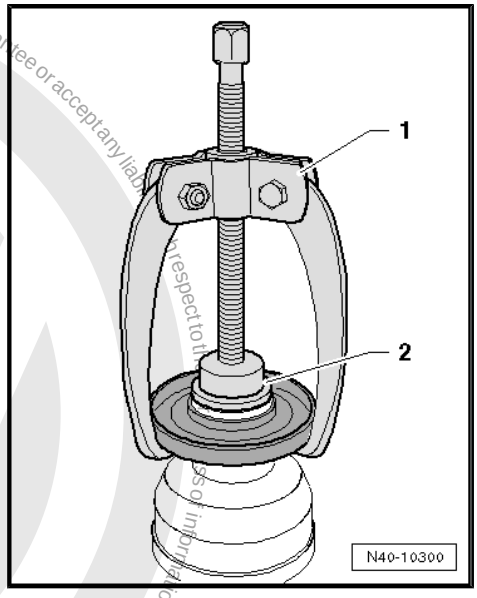
Checking inner constant velocity joint ⇒ page 129

Checking function of constant velocity joint ⇒ page 131

Pulling deflector cap off constant velocity slip joint

1 - Three arm puller, e.g. Kukko 45-2

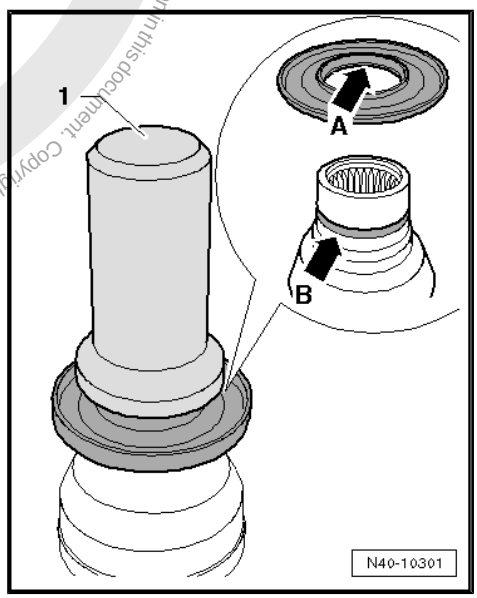
2 - Thrust pad - VW 447 H-



Driving deflector cap onto constant velocity slip joint

1 - Press tool - T10243-

Drive deflector cap onto joint until shoulder -arrow A- engages in groove -arrow B-.

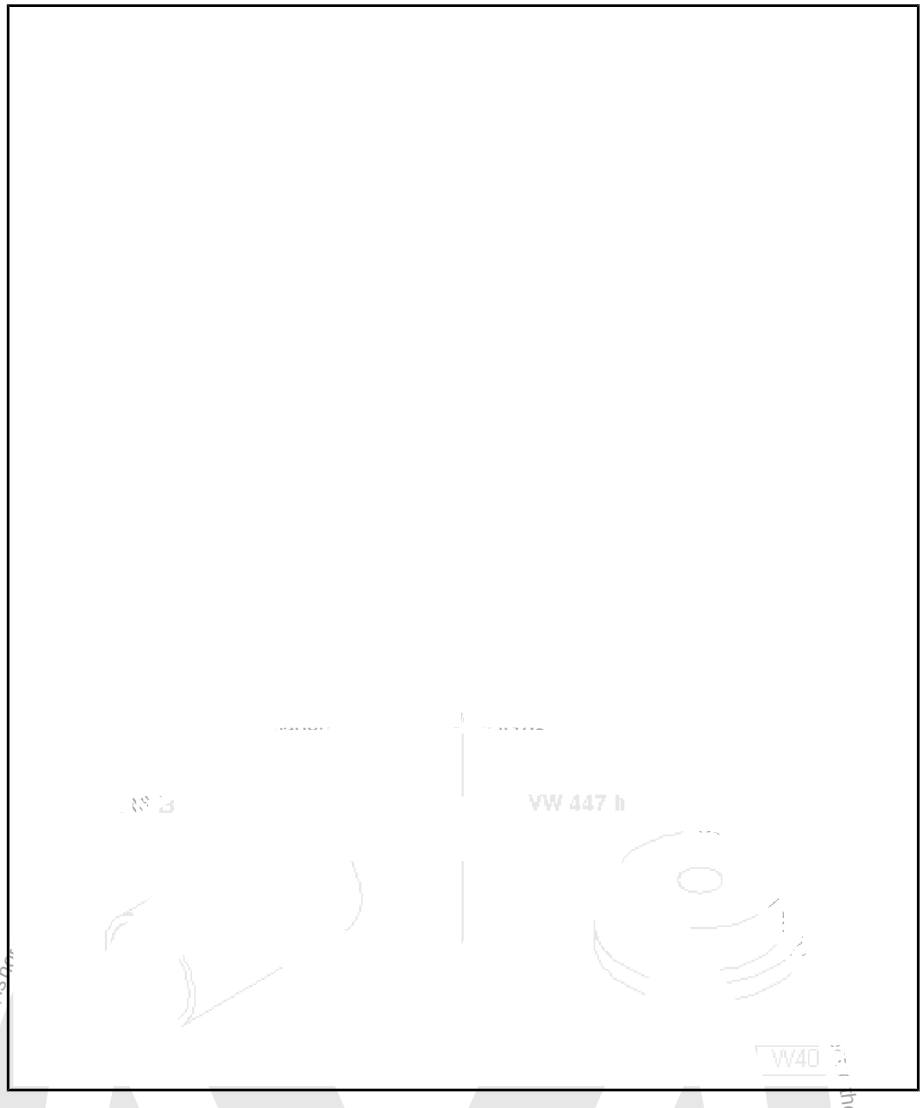


6.6.2 Dismantling and assembling drive shaft, triple roller joint AAR3300i pushed into gearbox

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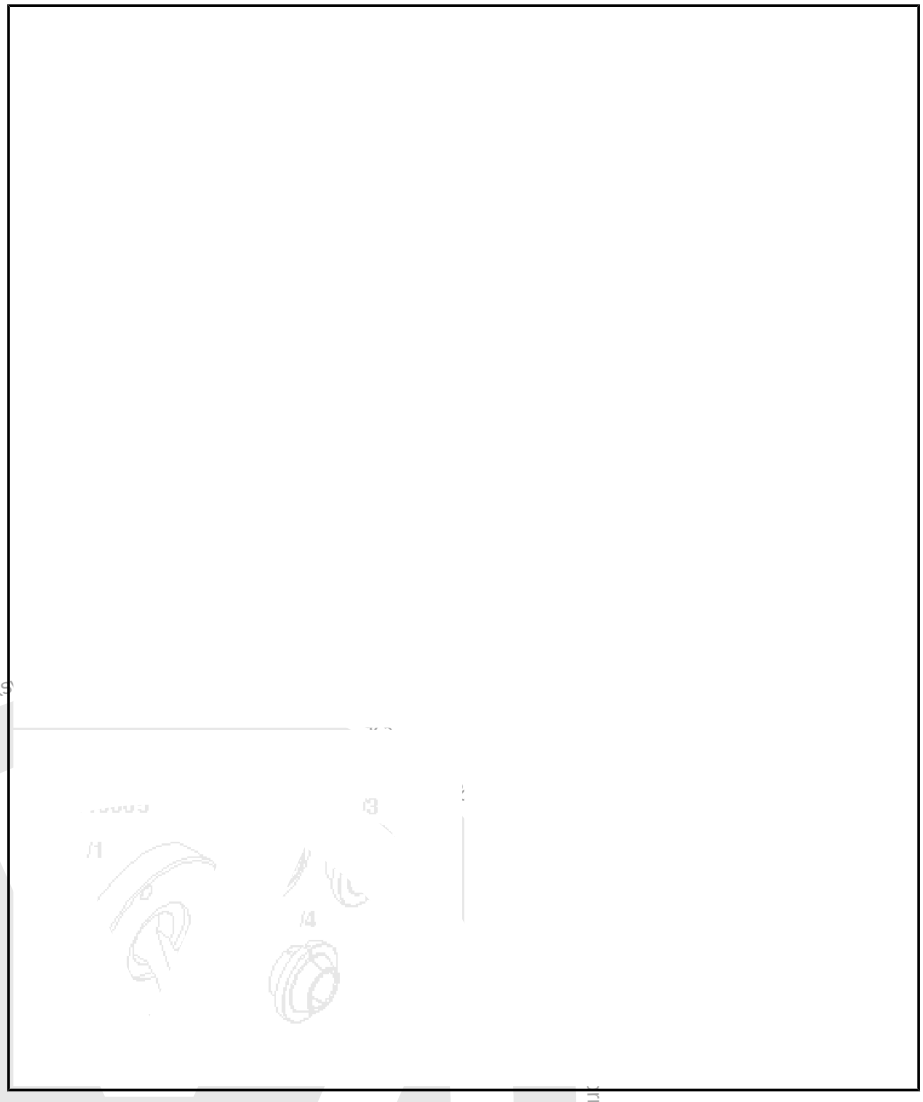
Special tools and workshop equipment required

- Pressure plate - VW 401-
- Pressure plate - VW 402-
- Press piece - VW 408 A-
- Press piece - VW 411-
- Tube - VW 416 B-
- Thrust washer - VW 447 H-

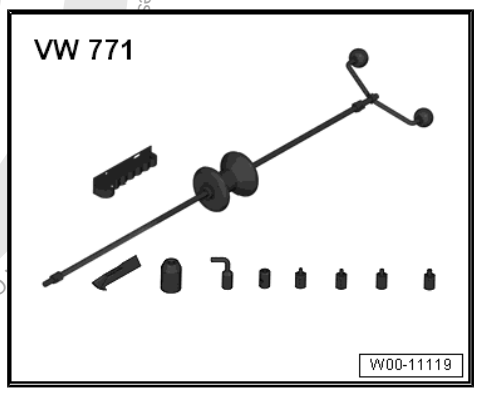


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- Hose clip pliers - V.A.G 1275-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Hose clip pliers - V.A.G 1682-
- Assembly tool - T10065-

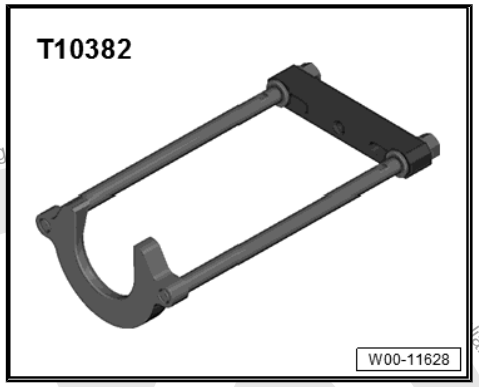


- Multipurpose tool - VW 771-



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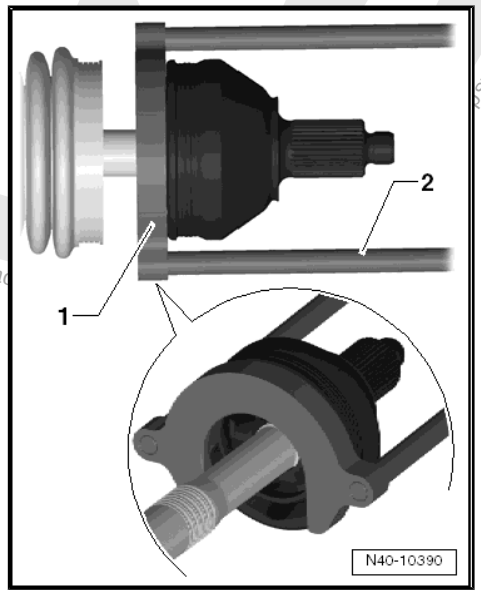
♦ Puller - T10382-



Removing outer constant velocity joint

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

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



Driving on outer constant velocity joint

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

Dismantling triple roller joint

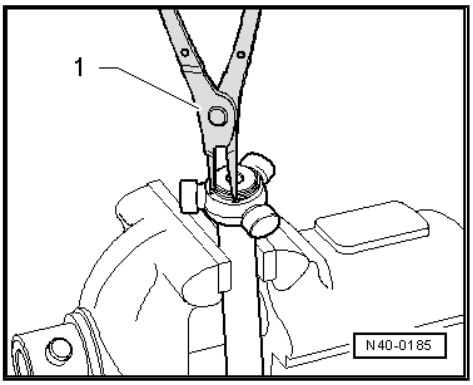
– Clamp drive shaft in vice using jaw protectors.
– Unfasten both clamps on inner joint and push back boot.
– Pull joint body off drive shaft.

– Remove retaining ring.

1 - Pliers (commercially available)

- or -VW 161 A-

– Set drive shaft into press.



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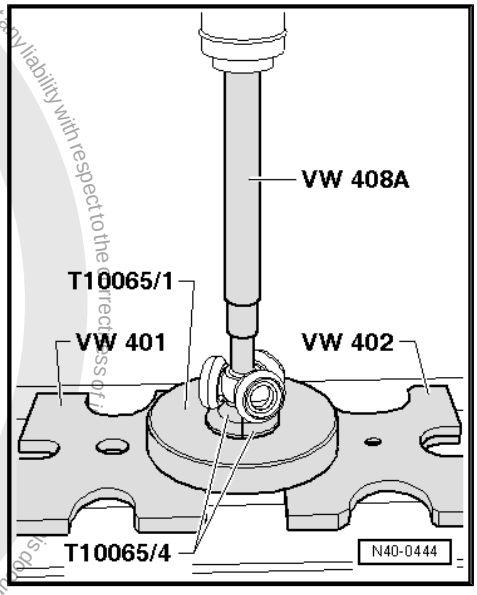
– Press drive shaft off triple roller star.
– Pull boot off shaft.
– Clean shaft, joint body and groove for seal.

Assembling triple roller joint

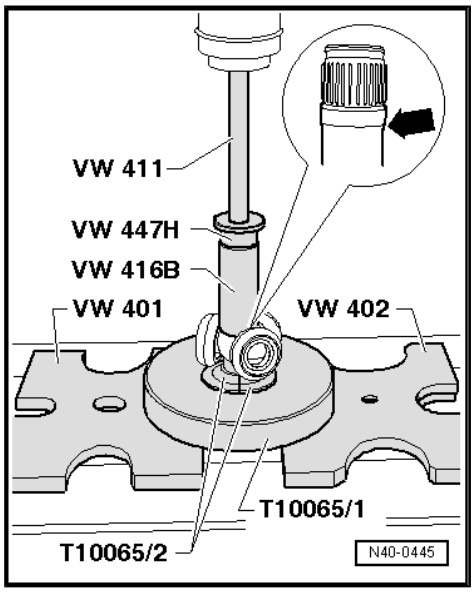
– Push small hose clip for boot onto shaft.
– Push joint boot onto shaft.

Fit triple roller star

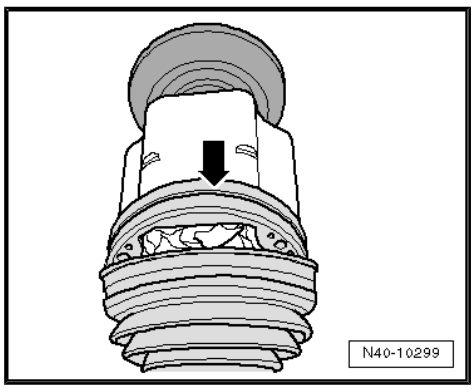
Chamfer on triple roller star faces towards shaft and serves as an assembly aid.



– Fit triple roller star onto shaft and press on to stop.
– Ensure that pressure does not exceed 3.0 t.
– If necessary, coat splines of drive shafts and triple roller star with lubricating paste - G 052 142 A2- .
– Insert retaining ring, ensuring that it is seated correctly.
– Press half of total amount of grease from repair kit into triple roller joint.
– Place boot adapter onto joint.
– Slide joint body over rollers and hold.
– Press remaining amount of grease from repair kit into rear of triple roller joint.



– Slide boot onto boot adapter and ensure that boot engages correctly in groove -arrow- of adapter.



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– Install clamp.

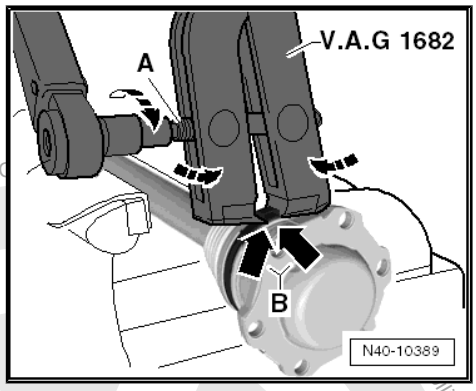
Note

Clamping lug of clamp -arrow A- must be located between securing flanges of joint body -arrows B-. This is the only way of assuring that the multi-point socket head bolts can be guided correctly when installing the drive shaft.

Tightening clamp on large diameter of inner joint

– Position clamp tensioner - V.A.G 1682- as shown in illustration. Ensure jaws of tensioner lie in corners -arrows B- of ear on O-type clip.

– Tighten clamp by turning spindle with a torque wrench (do not cant pliers).



Note

- *Due to the hard material of the protective bellows (compared to rubber) and the necessity of using a stainless steel clamp, it is only possible to tension the clamp with clamp tensioner - V.A.G 1682- .*
- *Specified torque: 25 Nm.*
- *Use torque wrench with setting range of 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 clamp will not be attained in spite of correct specified torque specification.*

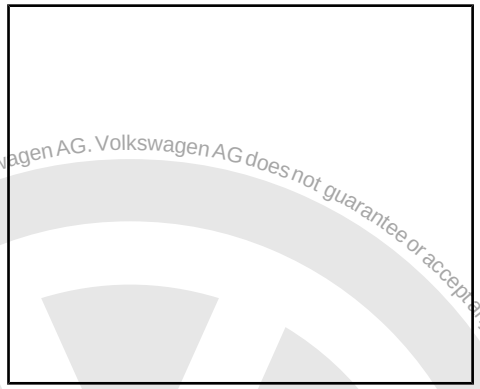
Tighten clamp on outer joint

– Position clamp tensioner - V.A.G 1682- as shown in diagram. Ensure jaws of tensioner lie in corners -arrows B- of ear on O-type clip.

– Tighten clamp by turning spindle with a torque wrench (do not cant pliers).

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Tightening clamp on small diameter of inner/outer joint



6.6.3 Dismantling and assembling drive shaft, triple roller joint AAR3300i pushed onto flange shaft

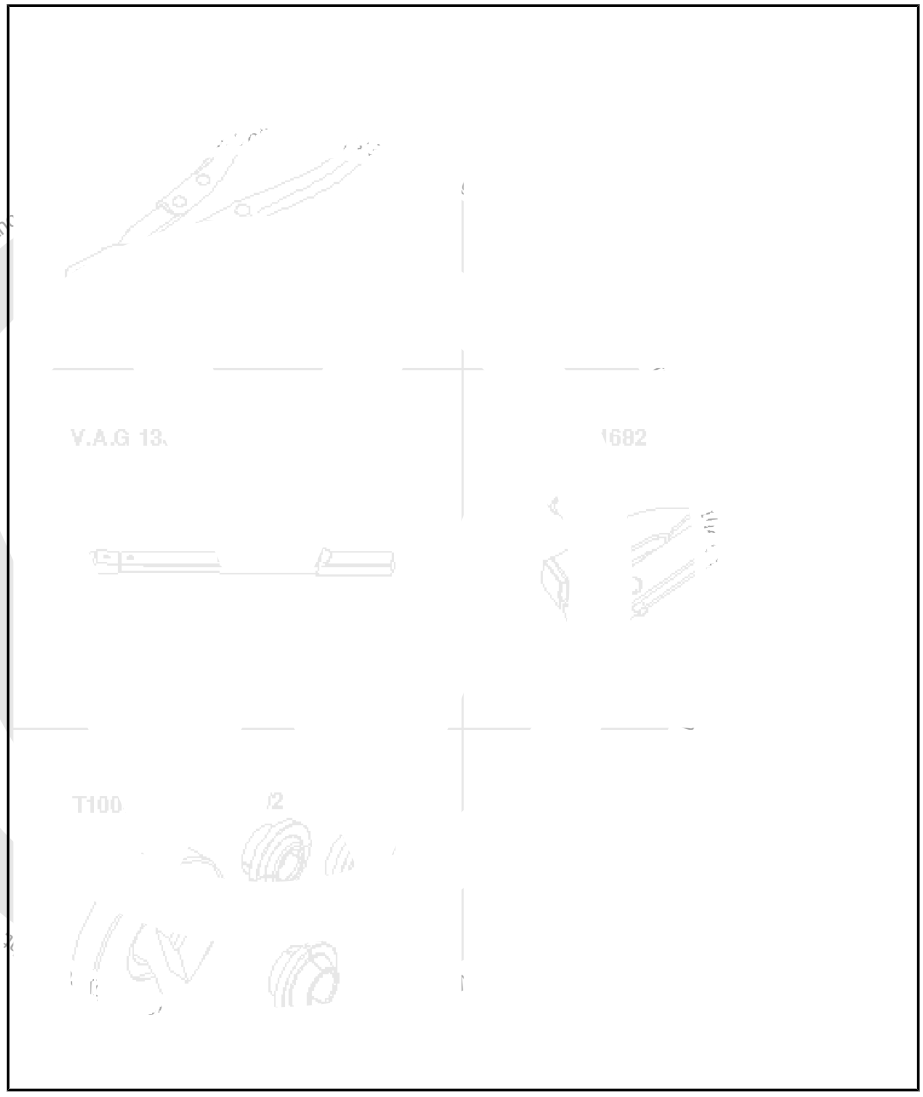
Special tools and workshop equipment required

- Pressure plate - VW 401-
- Pressure plate - VW 402-
- Press piece - VW 408 A-
- Press piece - VW 411-
- Tube - VW 416 B-
- Thrust washer - VW 447 H-

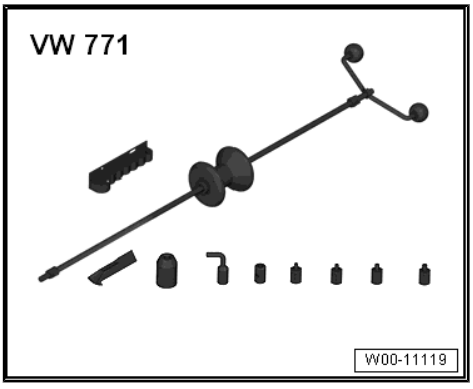


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- Hose clip pliers - V.A.G 1275-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Hose clip pliers - V.A.G 1682-
- Assembly tool - T10065-

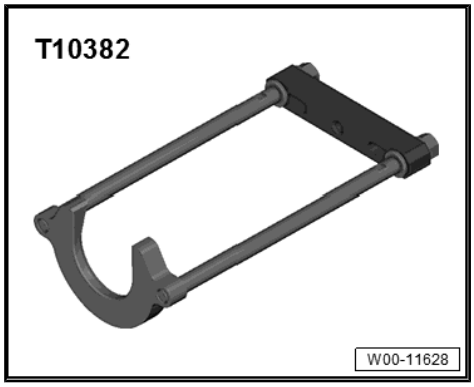


- Multipurpose tool - VW 771-



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♦ Puller - T10382-



Removing outer constant velocity joint

– Clamp drive shaft in vice using jaw protectors.

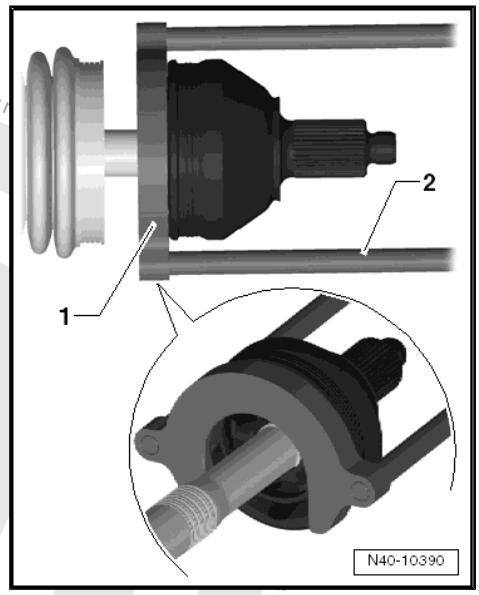
– Loosen clamp.

– Fold back boot.

– Set puller - T10382- up so that smooth side of puller plate - T10382/1- points to spindles - T10382/2- .

– Assemble puller - T10382- complete with multi-purpose tool - VW 771- .

– Pull constant velocity joint from drive shaft with puller - T10382- and multi-purpose tool - VW 771- .



1 - Puller plate - T10382/1-

2 - Spindles - T10382/2-

Driving on outer constant velocity joint

– Install new retaining ring.

– If necessary, push new joint boot onto drive shaft.

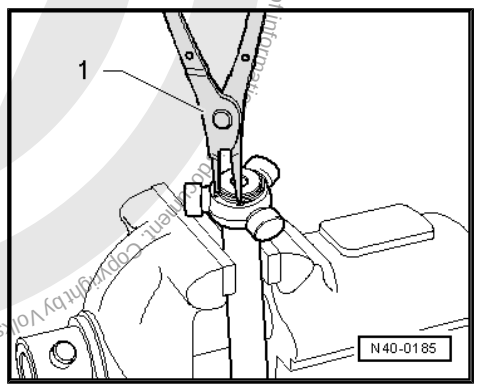
– Knock onto shaft with plastic hammer until circlip engages.

Dismantling

– Open clamp on inner joint and push boot back off adapter.

– Pull joint body off drive shaft.

– Remove retaining ring.



1 - Pliers (commercially available)

– Set drive shaft into press.

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– Press drive shaft off triple roller star.
– Pull boot off shaft.
– Clean shaft, joint body and groove for seal.

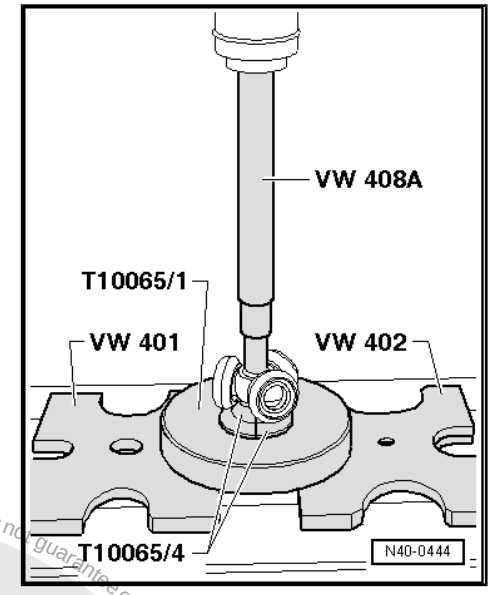
Installing

– Push small hose clip for boot onto shaft.
– Push joint boot onto shaft.
– Push joint body onto shaft.

Fitting triple roller star

Drive shaft (tapered version)

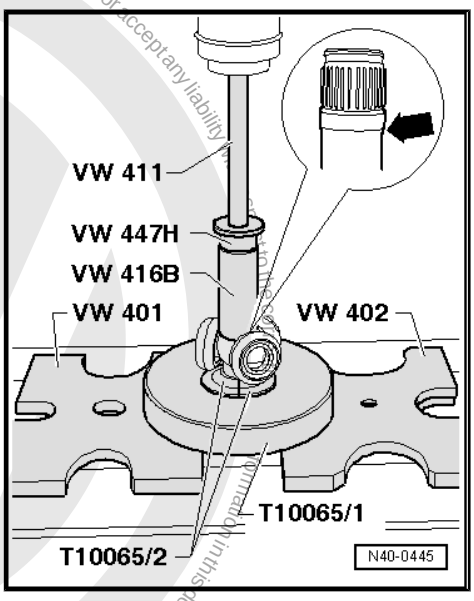
Chamfer on star faces towards shaft and is used as an assembly aid.



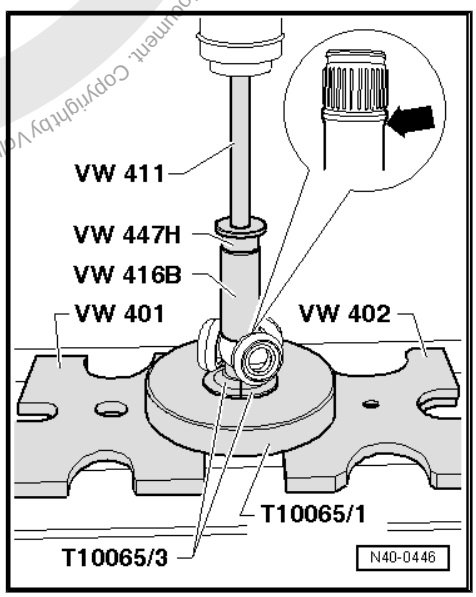
– Fit triple roller star onto shaft and press on to stop.
– Ensure that pressure does not exceed 3.0 t.
– If necessary, coat splines of drive shafts and triple roller star with lubricating paste - G 052 142 A2- .
– Insert retaining ring, ensuring that it is seated correctly.
– Press half the drive shaft 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.

Fitting triple roller star

Drive shaft (cylindrical version)

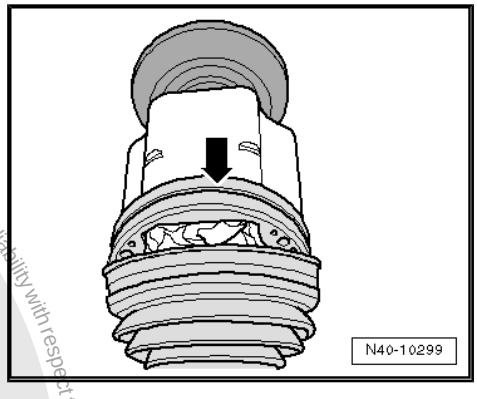


– Fit triple roller star onto shaft and press on to stop.
– Ensure that pressure does not exceed 3.0 t.
– If necessary, coat splines of drive shafts and triple roller star with lubricating paste - G 052 142 A2- .
– Insert retaining ring, ensuring that it is seated correctly.
– Press half the drive shaft 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.



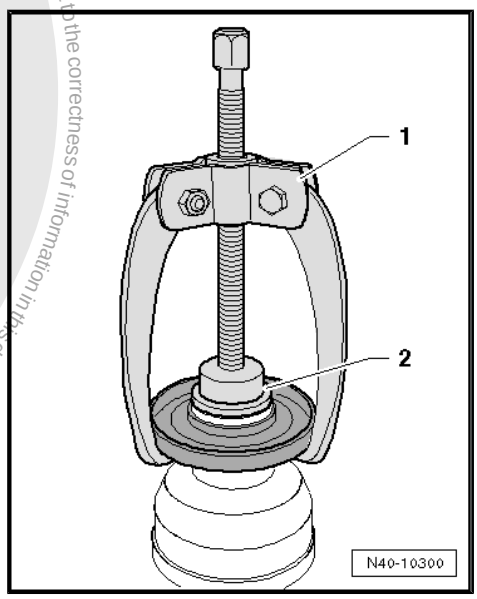
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– Slide boot onto adapter and ensure that boot engages correctly in groove -arrow- of adapter!
– Install clamp and tighten it sufficiently that a seal can be guaranteed ⇒ page 123 .



Pulling deflector cap off triple roller joint

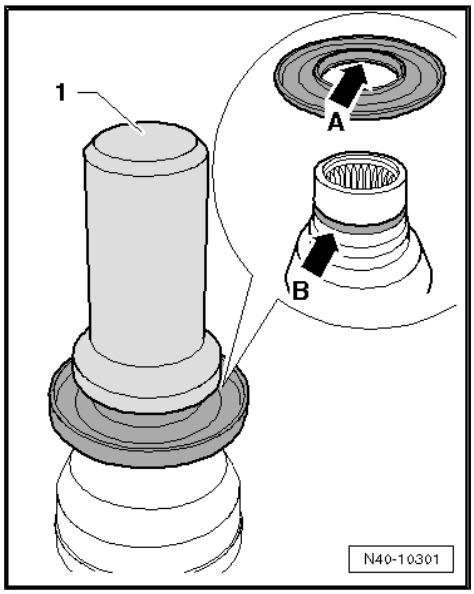
1 - Three arm puller, e.g. Kukko 45-2
2 - Thrust pad - VW 447 H-



Driving deflector cap onto triple roller joint

1 - Press tool - T10243-

Drive deflector cap onto joint until shoulder -arrow A- engages in groove -arrow B-.



6.7 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.

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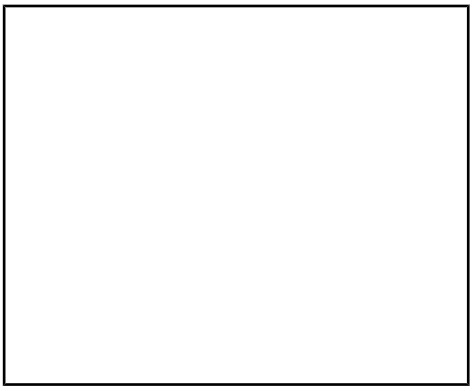
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Removing

– Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scriber or oil stone.

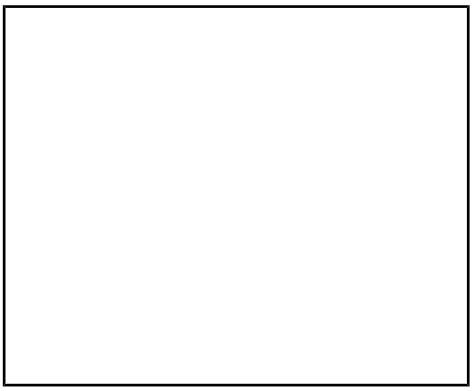
– Swing ball hub and ball cage.

– Remove balls one at a time.



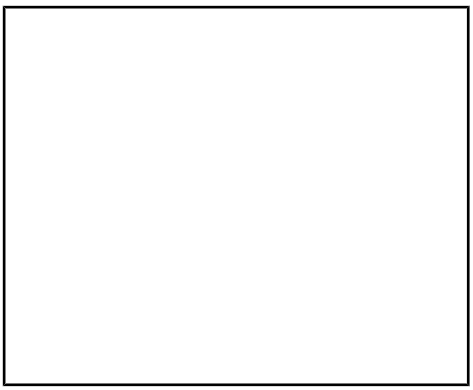
– Turn cage until the two rectangular windows -arrow- lie on joint body.

– Take out cage with hub.



– Swing segment of hub into square cage window.

– Tip hub out of cage.



The 6 balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and traces of seizing. 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.

6.8 Checking inner constant velocity joint

Removing

The joint is to be dismantled when following work is done:

- Replacement of grease if very contaminated
- Check of running surfaces for wear
- Check of balls for wear

– Swing ball hub and ball cage.
– Press out joint body in direction of arrow.
– Press balls out of cage.

Note

The ball hub and joint body are paired. Do not interchange them.

– Tip ball hub out of ball cage via ball track -arrows-.
– Check joint body, ball hub, ball cage and balls for pitting and traces of seizing.

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 renew the joint.

Installing

– Insert hub into cage via the two chamfers. The hub can be installed in any position. Press balls into cage.

The ball hub has two different distances between the ball tracks: a smaller one and a larger one.

– Insert hub with cage and balls at a right angle to joint body.

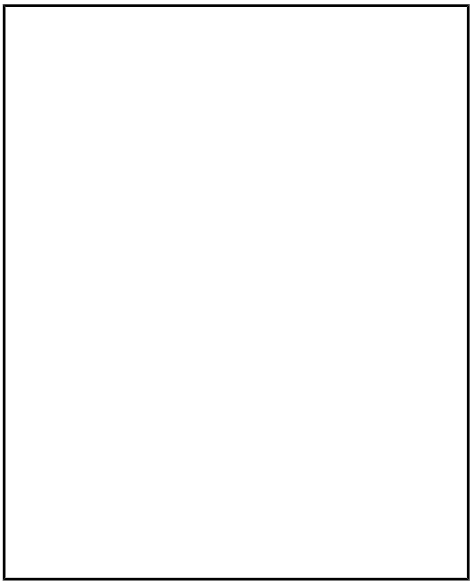
When inserting, ensure that the wide spacing -a- on the joint body is aligned with the narrow spacing -b- on the hub after it is swung in.

Chamfer on internal diameter of ball hub (splines) must face large diameter of joint body.

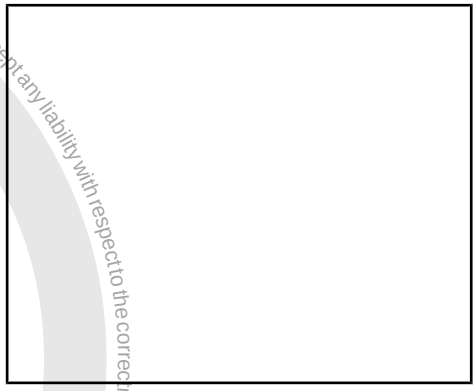
– Also take note of chamfer on interior diameter of ball hub. It must be visible after swivelling in.

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– Swivel the hub into the joint body; at the same time the hub must be swivelled out of the cage -arrows- far enough to allow the balls to fit into the ball tracks.



– Swivel in hub with balls by applying firm pressure to cage -arrow-.



Checking function of constant velocity joint

The constant velocity joint is correctly assembled if the ball hub can be moved by hand backwards and forwards over its entire range of axial movement.

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42 – Rear suspension

1 Rear axle

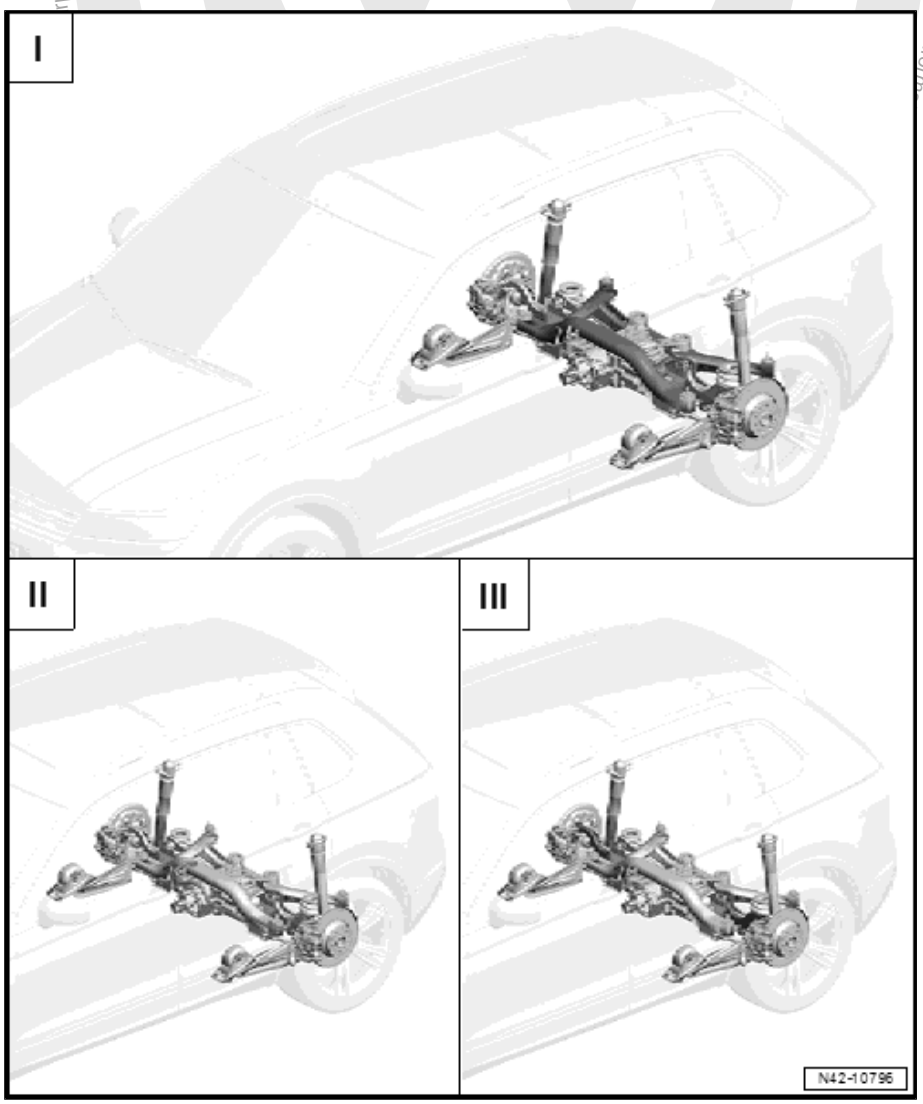
⇒ “1.1 Overview - rear axle”, page 132
⇒ “1.2 Lowering rear axle”, page 133
⇒ “1.3 Removing and installing rear axle”, page 138
⇒ “1.4 Removing and installing shield for rear axle”, page 146

1.1 Overview - rear axle

I - ⇒ “2 Subframe”, page 147

II - ⇒ “3 Anti-roll bar”, page 170

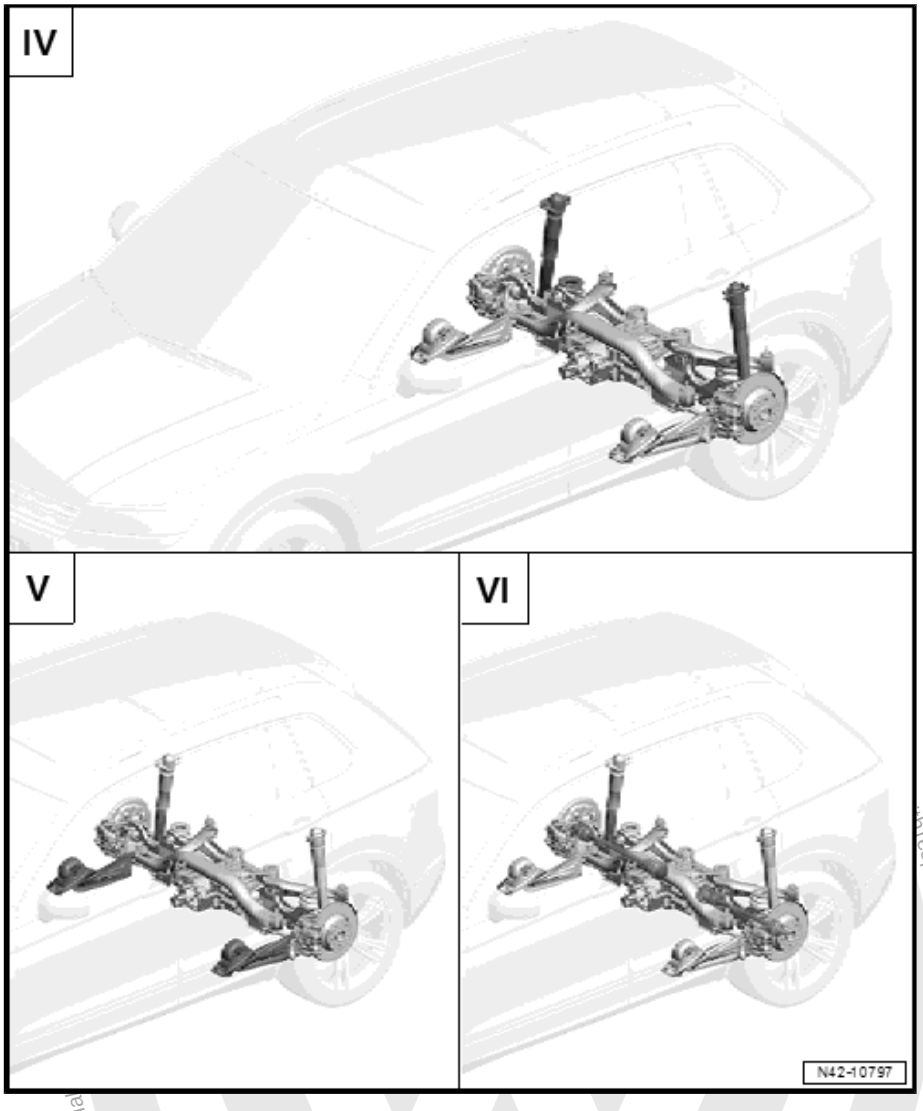
III - ⇒ “4 Suspension link, track rod”, page 174



IV -
⇒ “5 Suspension strut, shock absorber, spring”, page 180

V -
⇒ “6 Wheel bearing assembly, trailing arm”, page 191

VI -
⇒ “7 Drive shaft”, page 219



1.2 Lowering rear axle

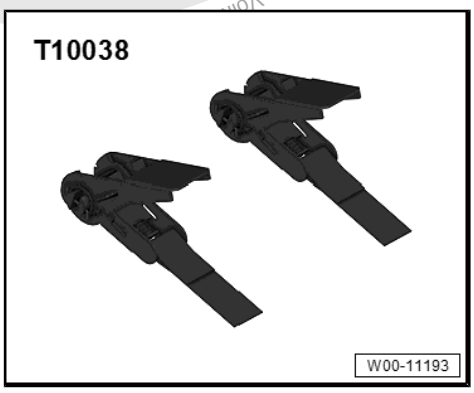
⇒ “1.2.1 Lowering rear axle, front-wheel drive”, page 133

⇒ “1.2.2 Lowering rear axle, four-wheel drive”, page 135

1.2.1 Lowering rear axle, front-wheel drive

Special tools and workshop equipment required

- Tensioning strap - T10038-



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♦ Torque wrench - V.A.G 1332-



Lowering subframe with attachments

– Loosen wheel bolts.

– Raise vehicle on lift.

– Remove wheels.

– Unbolt brake calipers on both sides of vehicle and suspend from body.

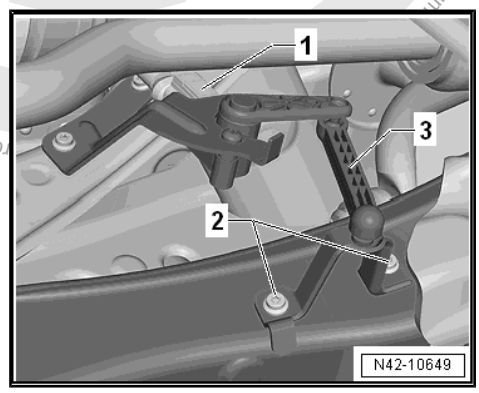
– Remove springs ⇒ page 186 .

– If necessary, remove rear silencer of exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

Vehicles with vehicle level sender.

– Disconnect connector -1-.

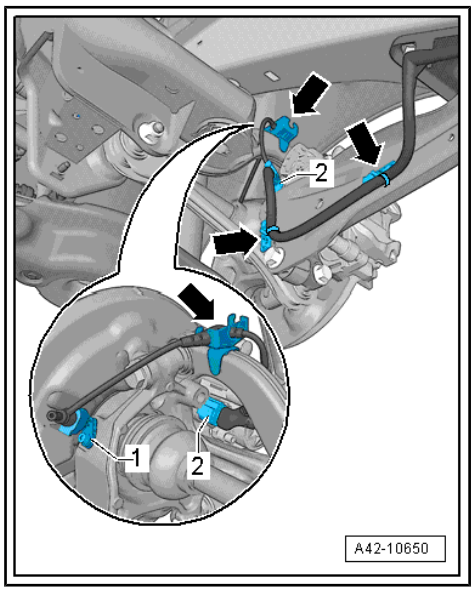
Continued for all vehicles:



– Unplug electrical connector -1- from ABS speed sensor on both sides and move clear.

– Unplug electrical connector -2- from electromechanical parking brake motor on brake caliper on both sides.

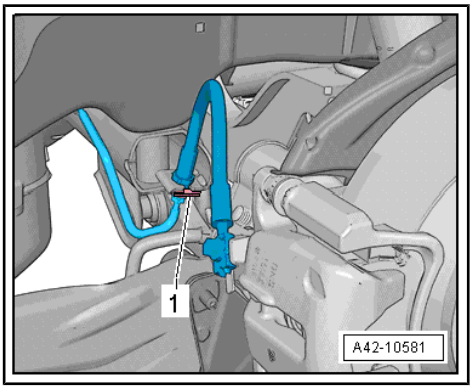
– Detach wiring harness from retainers -arrows-, and lay it to one side.



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– Pull out retaining clip -1- on both sides of vehicle.

– Free brake lines from holder.

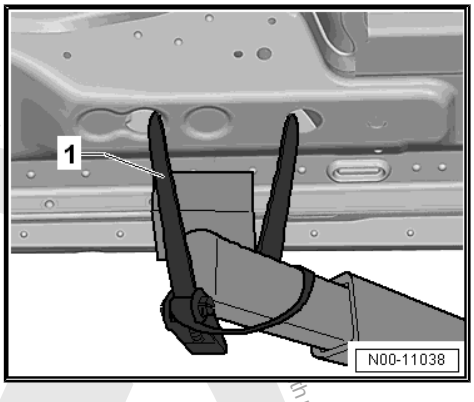


Note

Do not open brake line.

– 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 underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .

– Fix position of subframe ⇒ page 150 .

– Carefully lower subframe with attachments about 20 mm.

Installing subframe with attachments

Install in reverse order of removal. During this step, observe the following:

Torque settings

- ⇒ “2 Subframe”, page 147
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Double clamp for exhaust pipes ⇒ Rep. gr. 26 ; Exhaust pipes/ silencers; Assembly overview - silencer .
- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– When does wheel alignment have to be checked ⇒ page 268 ?

1.2.2 Lowering rear axle, four-wheel drive

Special tools and workshop equipment required

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♦ Tensioning strap - T10038-



♦ Torque wrench - V.A.G 1332-

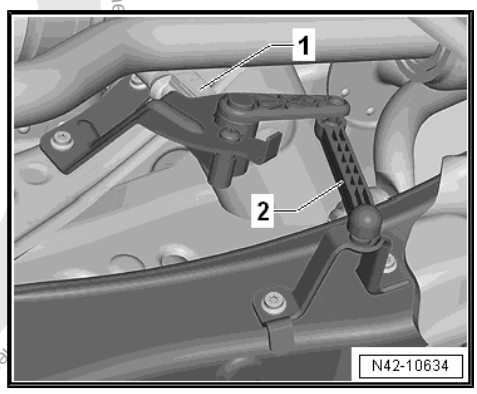


Lowering subframe with attachments

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheels.
– Unbolt brake calipers on both sides of vehicle and suspend from body.
– Remove springs ⇒ page 186 .
– Remove rear silencer of exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

Vehicles with vehicle level sender.

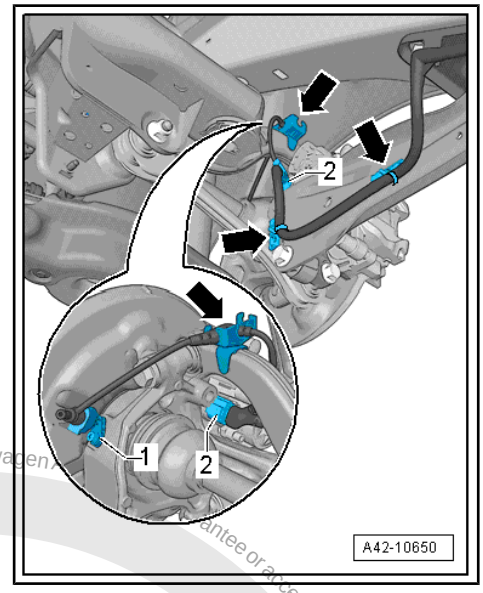
– Disconnect connector -1- from vehicle level sender -2-.



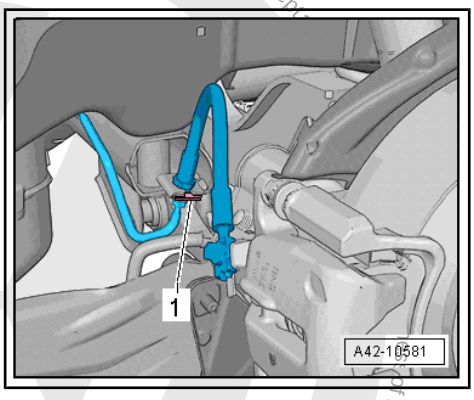
Continued for all vehicles:

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– Unplug electrical connector -1- from ABS speed sensor on both sides and move clear.
– Unplug electrical connector -2- from electromechanical parking brake motor on brake caliper on both sides.
– Detach wiring harness from retainers -arrows-, and lay it to one side.



– Pull out retaining clip -1- on both sides of vehicle.
– Free brake lines from holder.

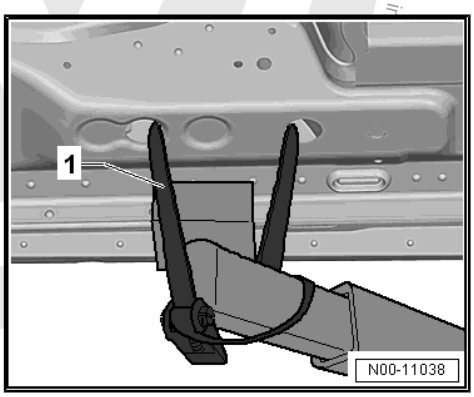


Note

Do not open brake line.

– Disconnect propshaft from rear final drive and secure ⇒ Rep. gr. 39 ; Propshaft; Assembly overview - propshaft .

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



1 - Tensioning strap - T10038-

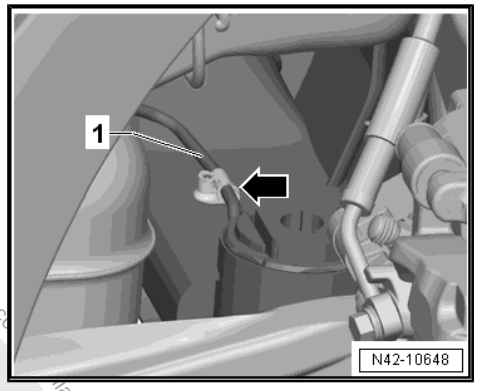
WARNING

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

– If fitted, remove underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .
– Fix position of subframe ⇒ page 154 .
– Carefully lower subframe with attachments about 20 mm.
– Disconnect connector on Haldex coupling above final drive.

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– Unclip brake line -1- from clip -arrow- on left side.



Note

The clip will be destroyed and must be renewed.

– Lower subframe with attachments about 140 mm.

Installing subframe with attachments

Install in reverse order of removal. During this step, observe the following:

Torque settings

- ⇒ “2.1.2 Assembly overview - subframe, multi-link suspension, four-wheel drive”, page 148
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Double clamp for exhaust pipes ⇒ Rep. gr. 26 ; Exhaust pipes/ silencers; Assembly overview - silencer .
- Propshaft ⇒ Rep. gr. 39 ; Propshaft; Assembly overview - propshaft .

• On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.

• On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– When does wheel alignment have to be checked ⇒ page 268 ?

1.3 Removing and installing rear axle

⇒ “1.3.1 Removing and installing rear axle, front-wheel drive”, page 138

⇒ “1.3.2 Removing and installing rear axle, four-wheel drive”, page 141

1.3.1 Removing and installing rear axle, front-wheel drive

Special tools and workshop equipment required

- Tensioning strap - T10038-



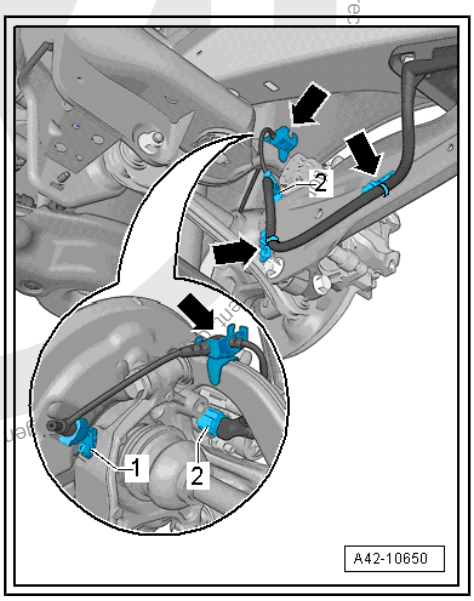
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♦ Torque wrench - V.A.G 1332-



Removing subframe with attachments

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheels.
– Unplug electrical connector -1- from ABS speed sensor on both sides and move clear.
– Unplug electrical connector -2- from electromechanical parking brake motor on brake caliper on both sides.
– Detach wiring harness from retainers -arrows-, and lay it to one side.

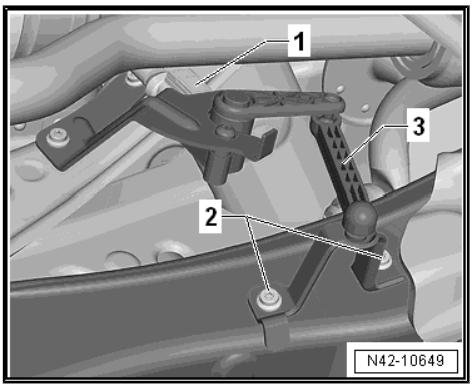


Vehicles with vehicle level sender.

– Disconnect connector -1-, and unclip line from retainer.
– Unscrew bolts -2-.
– Remove rear left vehicle level sender - G76- -3- from transverse link.

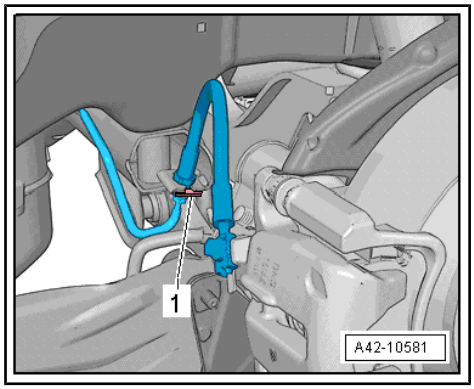
Continued for all vehicles:

– Remove springs ⇒ page 186 .



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– Pull out retaining clip -1- on both sides of vehicle.
– Free brake lines from holder.



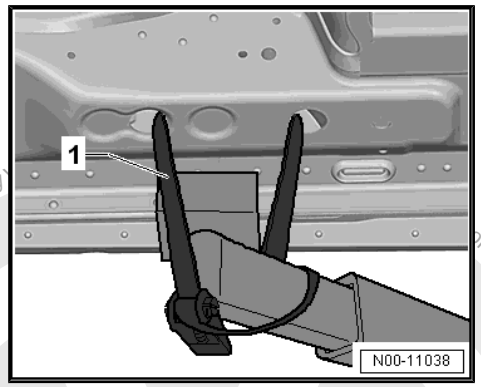
Note

Do not open brake line.

– Remove brake calipers on both sides and tie to body with brake lines connected ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .
– Remove rear silencer of exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .
– If fitted, remove underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .

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

1 - Tensioning strap - T10038-

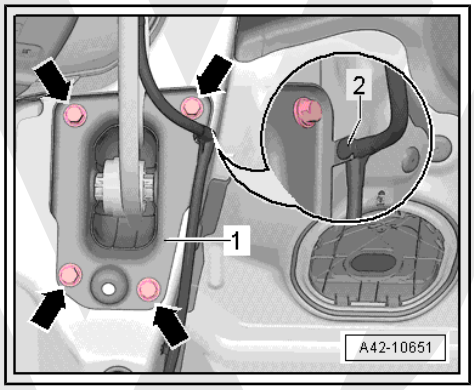


WARNING

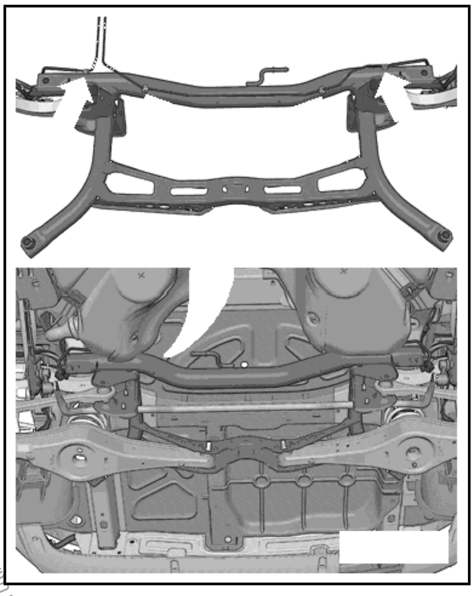
If the vehicle is not strapped down, it may slip off the lifting platform.

– Fix position of subframe ⇒ page 150 .

– Unclip wire -2- on mounting bracket -1-, and lay it to one side.
– Mark installation position of mounting bracket -1- on body.
– Unscrew bolts -arrows-.
– Carefully lower subframe with attachments by maximum of 30 mm.



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– Unclip brake line from clips -arrows-.

Note

- *The clips will be destroyed and must be renewed.*
- *For reasons of clarity, the illustration shows the subframe from above in removed state.*
- *The number of clips may vary.*

– Lower subframe with attachments.

Note

When lowering, ensure sufficient clearance to brake lines and electrical wiring.

Installing subframe with attachments

Install in reverse order of removal. During this step, observe the following:

Torque settings

- ⇒ “2 Subframe”, page 147
- ⇒ “6.2 Assembly overview - trailing arm”, page 193
- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for brake caliper and brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes
- Double clamp for exhaust pipes ⇒ Rep. gr. 26 ; Exhaust pipes/ silencers; Assembly overview - silencer .

• On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

• On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

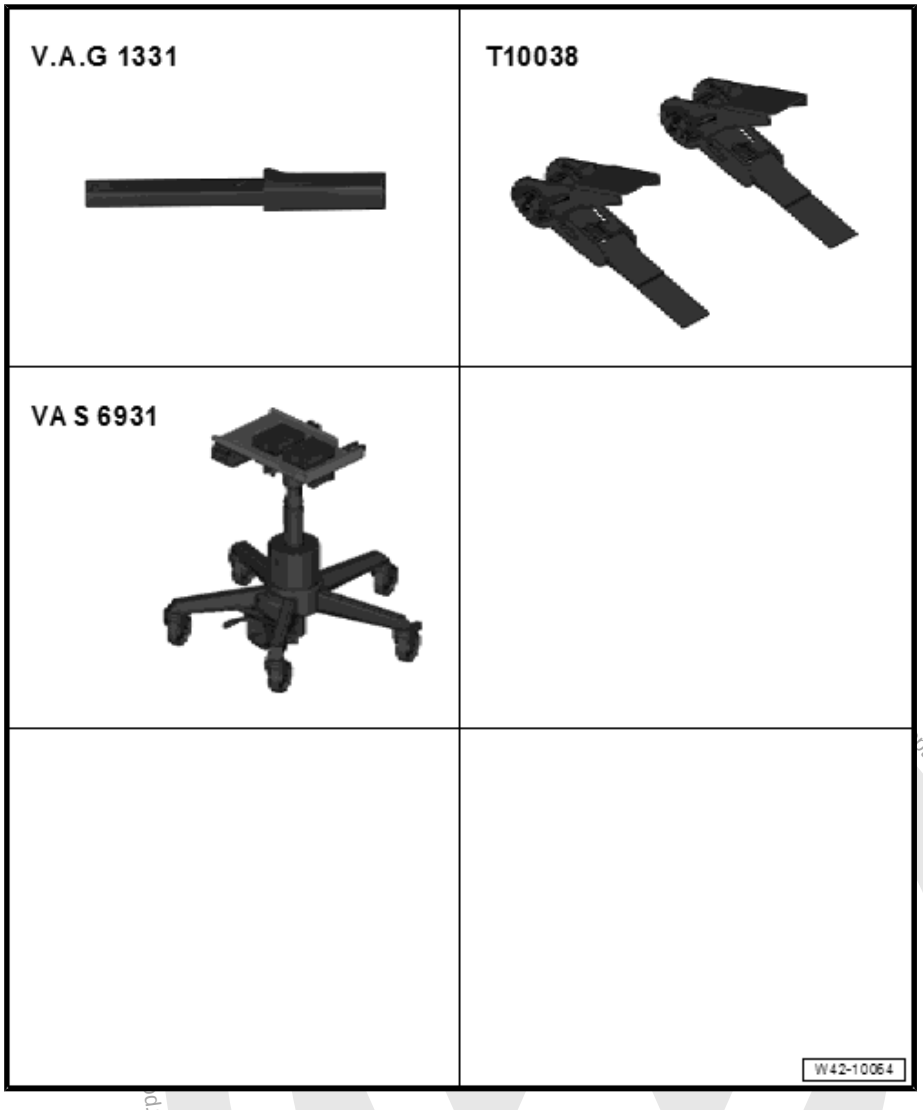
– When does wheel alignment have to be checked ⇒ page 268 ?

1.3.2 Removing and installing rear axle, four-wheel drive

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Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Tensioning strap - T10038-
- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



- Torque wrench - V.A.G 1332-

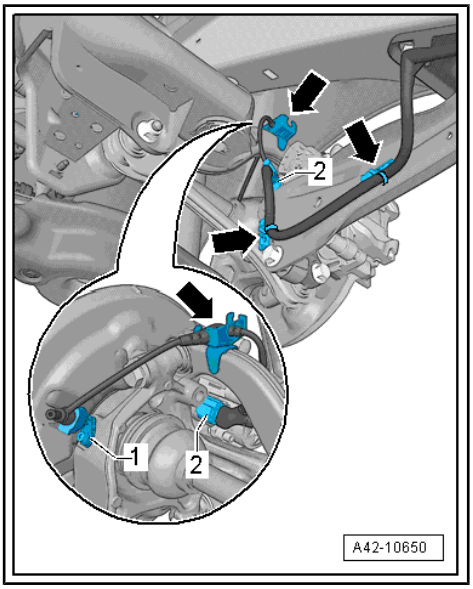


Removing subframe with attachments

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheels.

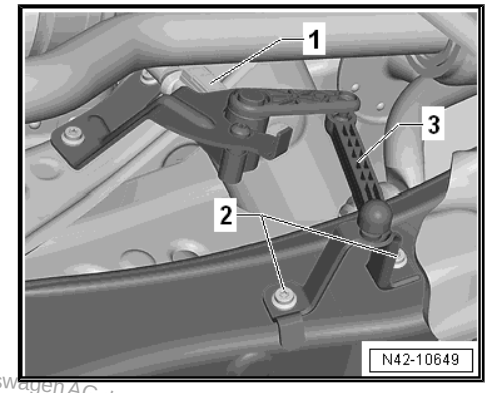
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– Unplug electrical connector -1- from ABS speed sensor on both sides and move clear.
– Unplug electrical connector -2- from electromechanical parking brake motor on brake caliper on both sides.
– Detach wiring harness from retainers -arrows-, and lay it to one side.



Vehicles with vehicle level sender.

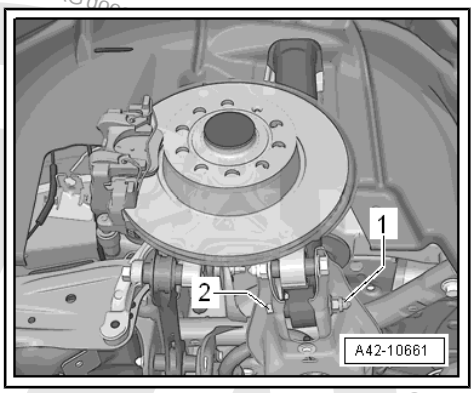
– Disconnect connector -1-.
– Unscrew bolts -2-.
– Remove rear left vehicle level sender - G76- -3- from transverse link.



Continued for all vehicles:

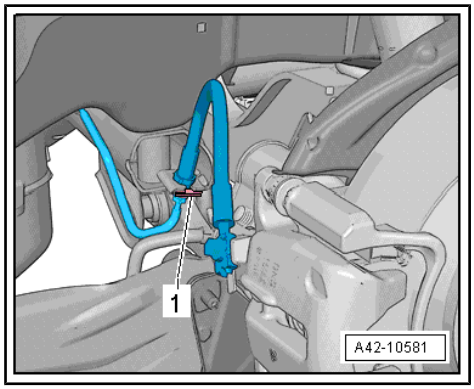
– Remove springs ⇒ page 186 .

– Unscrew nut -1- and remove bolt -2-.



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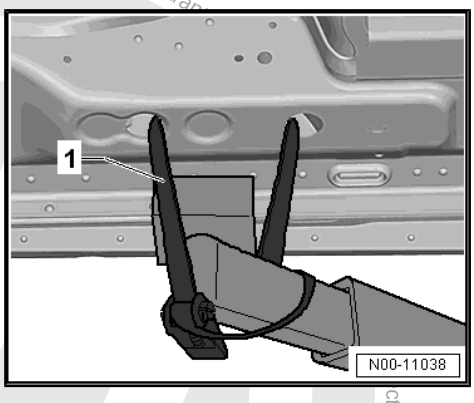
– Pull out retaining clip -1- on both sides of vehicle.
– Free brake lines from holder.



Note

Do not open brake line.

– Disconnect propshaft from rear final drive and secure ⇒ Rep. gr. 39 ; Propshaft; Assembly overview - propshaft .
– Remove brake calipers on both sides and tie to body with brake lines connected ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .
– Remove rear silencer of exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .
– If fitted, remove underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .
– Secure vehicle to support arms of lifting platform on both sides using tensioning straps - T10038- .

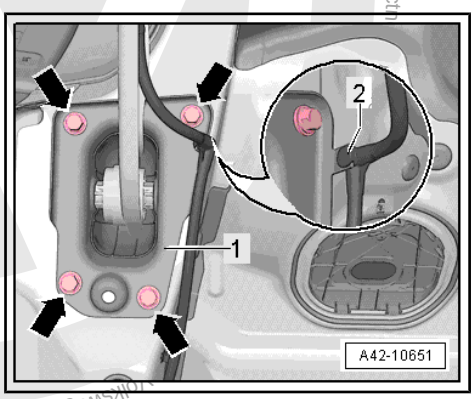


1 - Tensioning strap - T10038-

WARNING

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

– Fix position of subframe ⇒ page 150 .



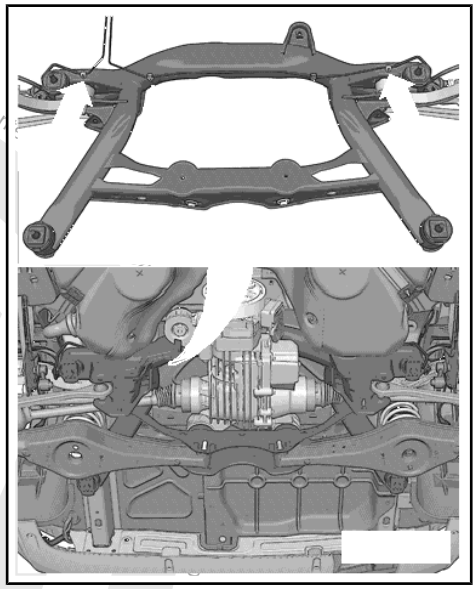
– Unclip wire -2- on mounting bracket -1-, and lay it to one side.
– Mark installation position of mounting bracket -1- on body.
– Unscrew bolts -arrows-.
– Carefully lower subframe with attachments about 20 mm.
– Disconnect connector on Haldex coupling above final drive.
– Carefully lower subframe with attachments another 30 mm.

Note

When lowering components, make sure there is enough clearance for brake lines, electrical wiring and propshaft centring pin.

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– Unclip brake lines from clips on both sides -arrows-.



Note

- *The clips will be destroyed and must be renewed.*
- *For reasons of clarity, the illustration shows the subframe from above in removed state.*
- *The number of clips may vary.*

– Carefully lower subframe with attachments.

Note

When lowering, ensure sufficient clearance to brake lines, electrical cables and centring pin to propshaft.

Installing subframe with attachments

Install in reverse order of removal. During this step, observe the following:

Torque settings

- ⇒ “2.1.2 Assembly overview - subframe, multi-link suspension, four-wheel drive”, page 148
- ⇒ “6.2 Assembly overview - trailing arm”, page 193
- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Propshaft ⇒ Rep. gr. 39 ; Propshaft; Assembly overview - propshaft .
- Bolts for brake caliper and brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes
- Double clamp for exhaust pipes ⇒ Rep. gr. 26 ; Exhaust pipes/ silencers; Assembly overview - silencer .

- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– When does wheel alignment have to be checked ⇒ page 268 ?

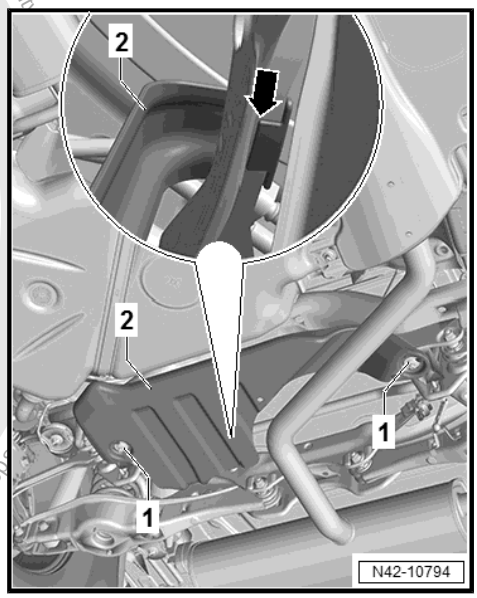
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1.4 Removing and installing shield for rear axle

Removing

– Unscrew nuts -1-.

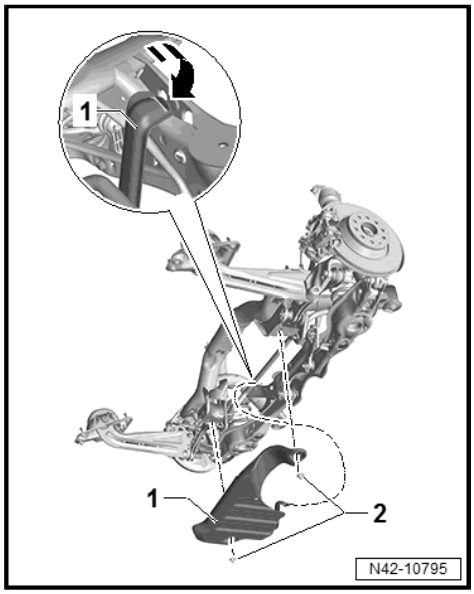
– Pull off shield -2- downwards from subframe and, at the same time, detach at top -arrow-.



Installing

– Hook in shield -1- in direction of -arrow- and swivel in so that it engages into top part of subframe.

– Tighten nuts -2-.



Note

After installing shield, check again whether shield lug -2- has engaged properly in subframe -arrow-.

Torque settings

◆ ⇒ “2.2 Assembly overview - add-on parts for subframe”, page 149

2 Subframe

⇒ “2.1 Assembly overview - subframe”, page 147

⇒ “2.2 Assembly overview - add-on parts for subframe”, page 149

⇒ “2.3 Fixing position of subframe”, page 150

⇒ “2.4 Repairing subframe”, page 158

2.1 Assembly overview - subframe

⇒ “2.1.1 Assembly overview - subframe, multi-link suspension, front-wheel drive”, page 147

⇒ “2.1.2 Assembly overview - subframe, multi-link suspension, four-wheel drive”, page 148

2.1.1 Assembly overview - subframe, multi-link suspension, front-wheel drive

1 - Subframe

- ❑ Removing and installing subframe with attachments ⇒ page 138

2 - Rear bonded rubber bush

- ❑ Replacing ⇒ page 163

3 - Front bonded rubber bush

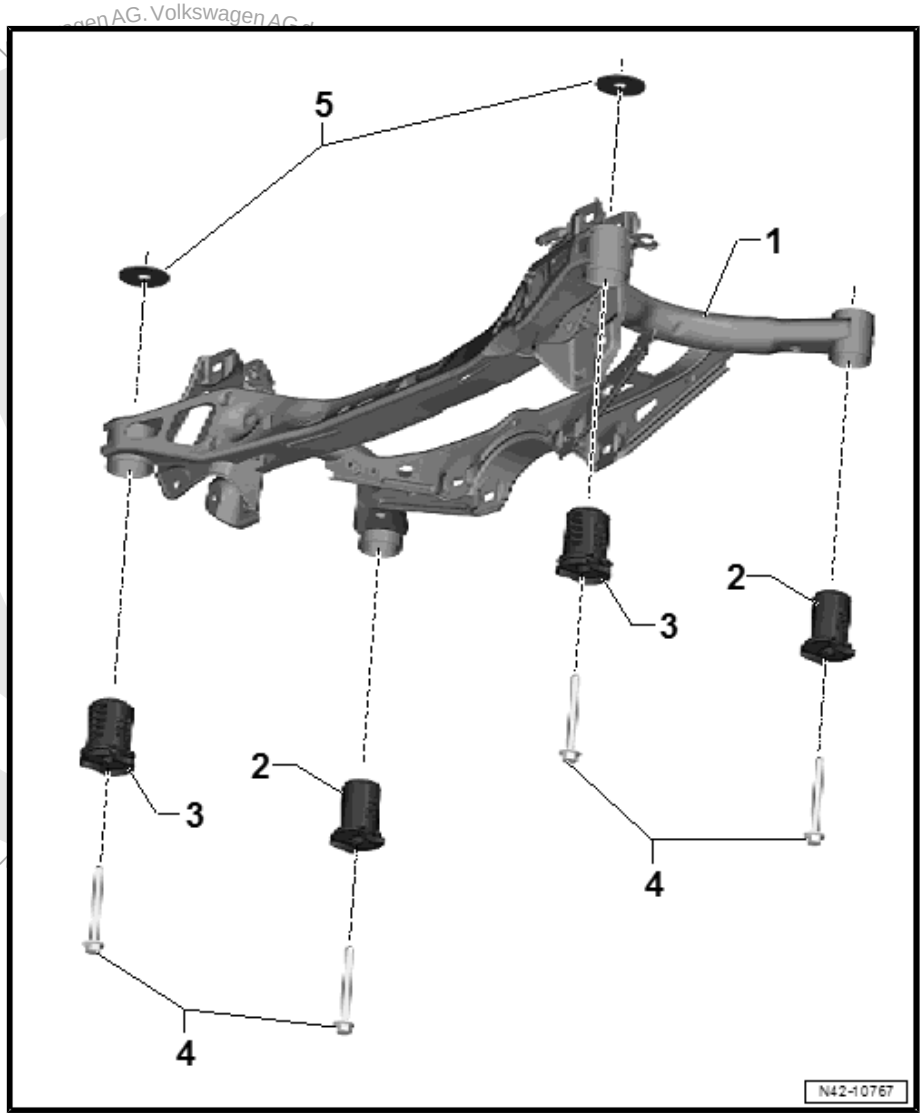
- ❑ Replacing ⇒ page 158

4 - Bolt

- ❑ Renew after removal
- ❑ 70 Nm +180°

5 - Washer

- ❑ Only for Passat GTE



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2.1.2 Assembly overview - subframe, multi-link suspension, four-wheel drive

1 - Subframe

- ❑ Removing and installing subframe with attachments ⇒ page 141 .

2 - Rear bonded rubber bush

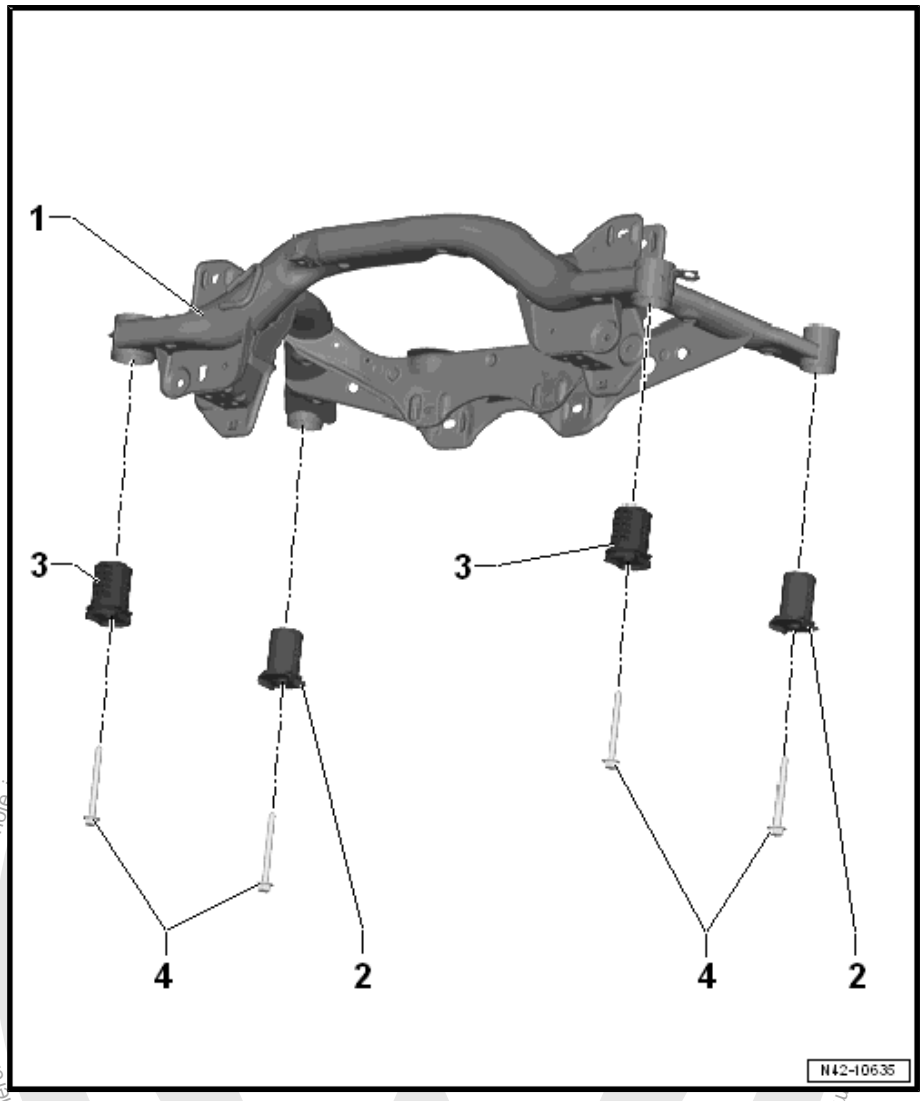
- ❑ Replacing ⇒ page 163

3 - Front bonded rubber bush

- ❑ Replacing ⇒ page 158

4 - Bolt

- ❑ Renew after removal
- ❑ 70 Nm +180°



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2.2 Assembly overview - add-on parts for subframe

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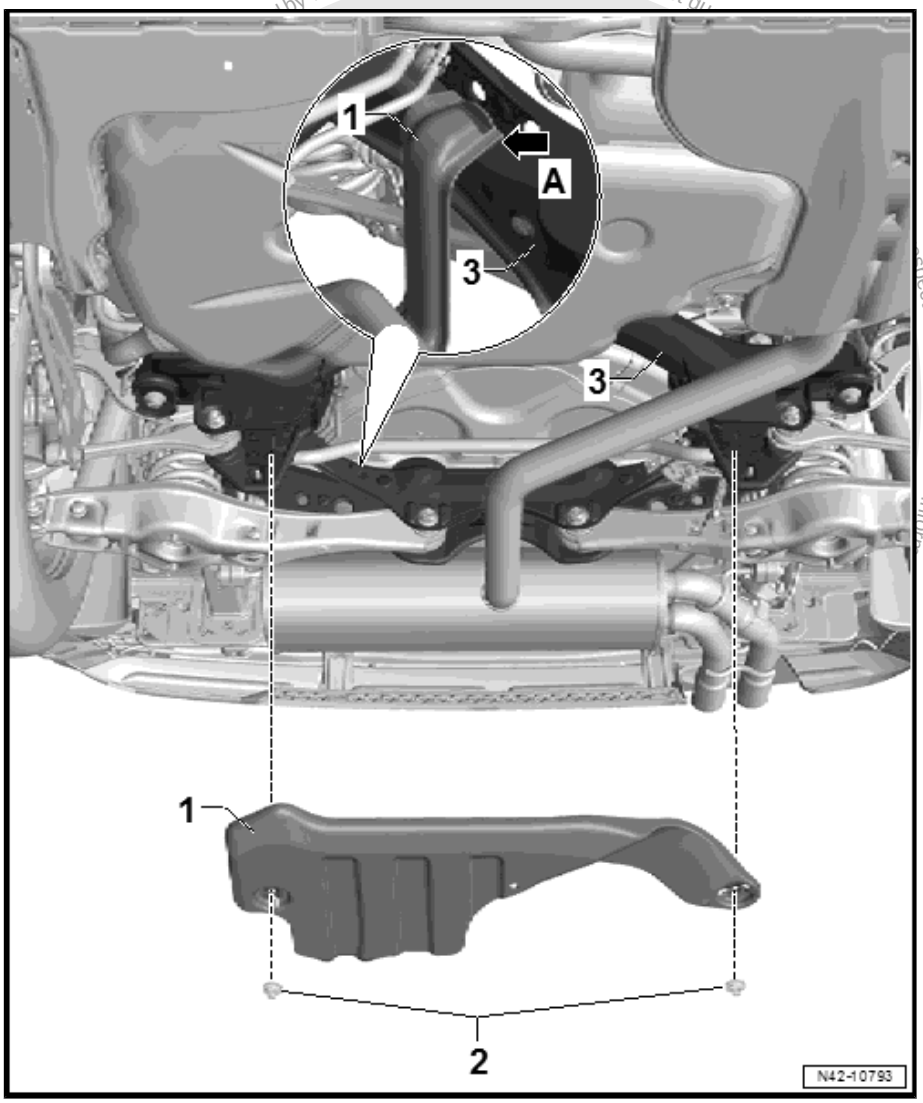
1 - Shield

- ❑ Removing and installing ⇒ page 146
- ❑ When installing, the trim must be attached to the subframe ⇒ Item 3 (page 149) from below -arrow A-.

2 - Nut

- ❑ 2 Nm

3 - Subframe



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2.3 Fixing position of subframe

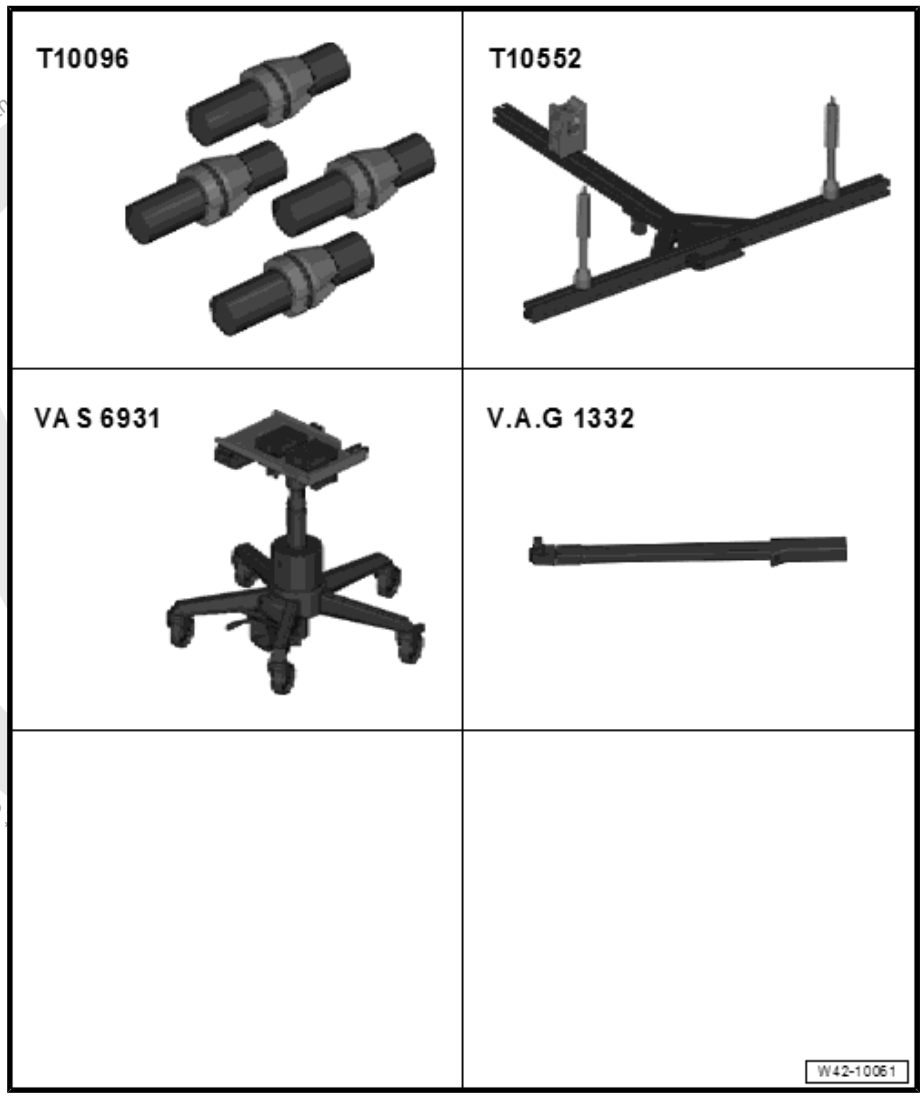
⇒ “2.3.1 Fixing position of subframe, front-wheel drive”, page 150

⇒ “2.3.2 Fixing position of subframe, four-wheel drive”, page 154

2.3.1 Fixing position of subframe, front-wheel drive

Special tools and workshop equipment required

- Locating pins - T10096-
- Rear axle support - T10552-
- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- Torque wrench - V.A.G 1332-

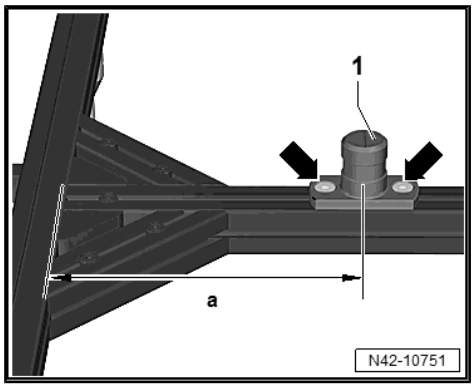


Preparing rear axle support - T10552-

– Loosen bolts -arrows- and set dimension -a-.

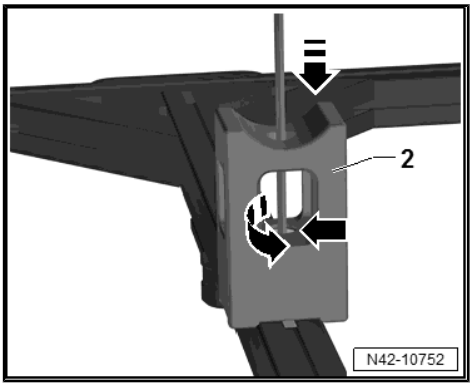
a - 250 mm

Tighten bolts -arrows-.



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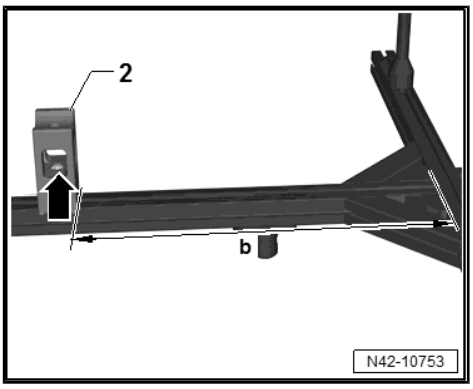
– Loosen bolt -arrow- for support - T10552/2- -2-.



– Turn support - T10552/2- -2- in such a way that hollow points in direction of travel.
– Set dimension -b-.

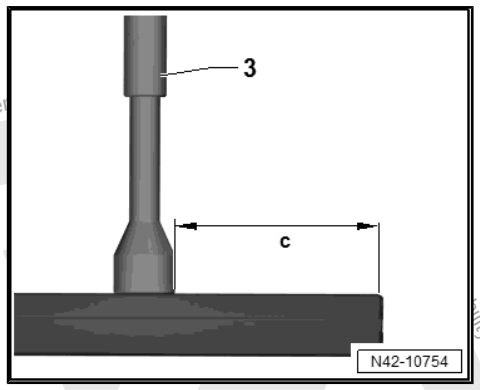
b - 350 mm

Tighten bolt -arrow- to 30 Nm.



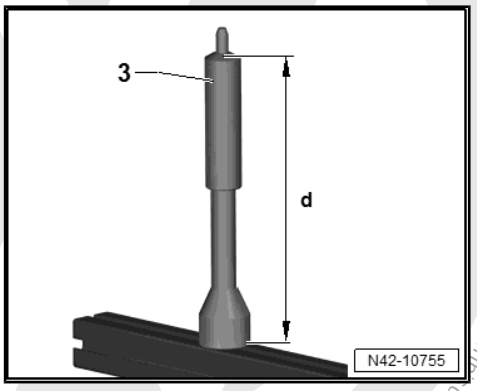
– Loosen mounting pins - T10552/1- -3- at bottom on both sides.
– Set dimension -c-.

c - 47 mm



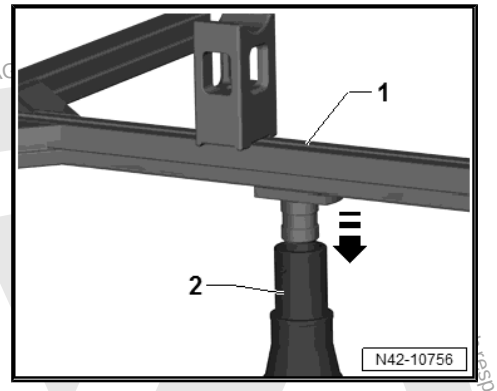
– Turn threaded sleeve of mounting pins - T10552/1- -3- on both sides to set dimension -d-.

d - 175 mm

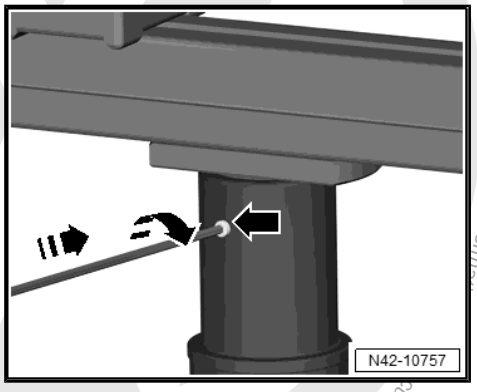


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– Place rear axle support - T10552- -1- on engine and gearbox jack - V.A.G 1383 A- or engine and gearbox jack - VAS 6931- .



– Tighten bolt -arrow- to 30 Nm.

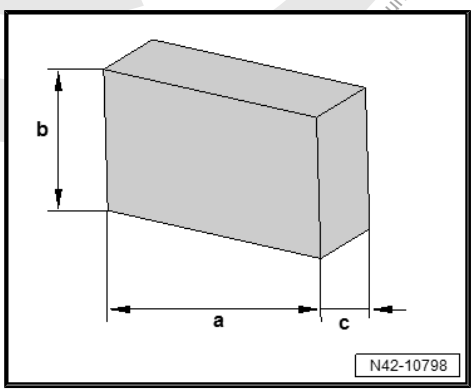


– Manufacture a wooden block with the following dimensions:

  a = 200 mm

  b = 120 mm

  c = 70 mm



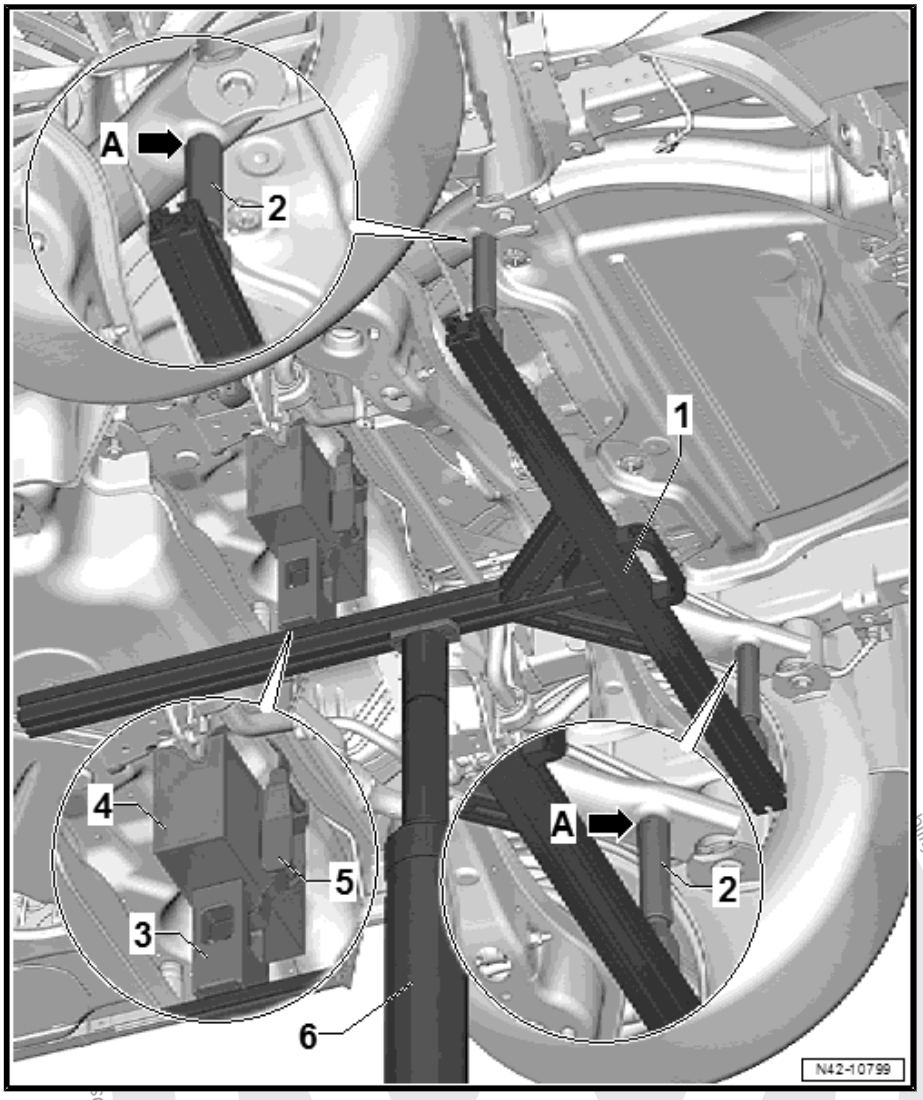
Vehicles with trim for rear axle

– Remove rear axle cladding ⇒ page 146

Continued for all vehicles:

– Position rear axle support - T10552- -1- with engine and gearbox jack - V.A.G 1383 A- or engine and gearbox jack - VAS 6931- -6- under rear axle and jack up.

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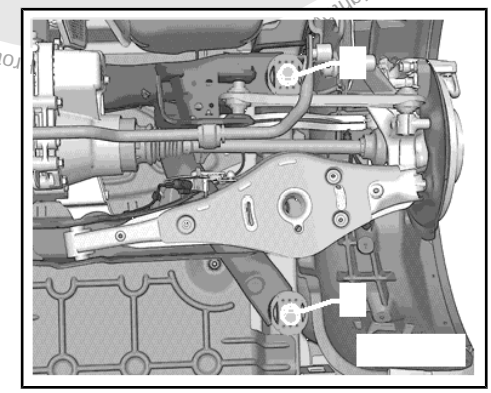


– Insert mounting pins - T10552/1- -2- in holes of rear axle -arrows A-.
– Place wooden block -4- which has been manufactured previously onto support - T10552/2- -3- and make it rest against rear axle.
– Use tensioning strap -5- to secure support - T10552/2- -3- together with wooden block on rear axle.

Installing locating pins - T10096-

To fix position of subframe, locating pins - T10096- must be screwed in successively at positions -1- on both sides of vehicle.

– Remove one hexagon bolt -1- on each side.

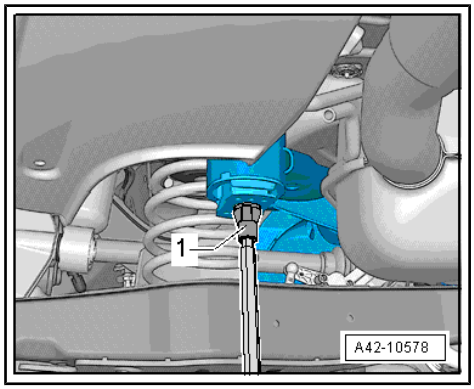


Note

Only the left side of vehicle is shown to improve clarity.

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– Screw in locating pins - T10096- -1-.



Note

The locating pins - T10096- may be tightened only to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.

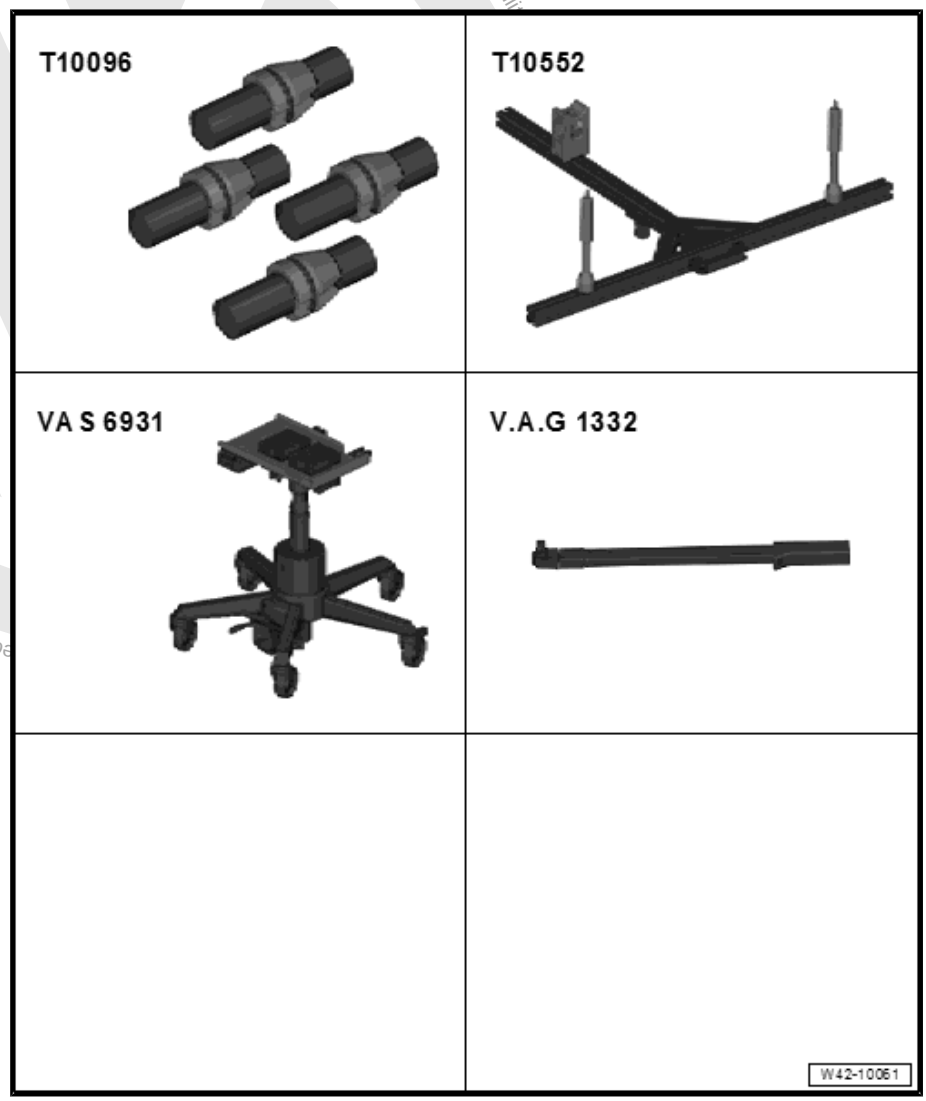
– Replace securing bolts on subframe one after the other on both sides with a locating pin from the locating pin set - T10096- -1- and tighten to 20 Nm.

The position of the subframe is now fixed.

2.3.2 Fixing position of subframe, four-wheel drive

Special tools and workshop equipment required

- Locating pins - T10096-
- Rear axle support - T10552-
- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-
- Torque wrench - V.A.G 1332-



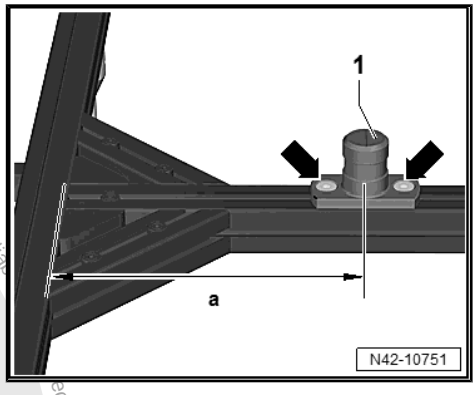
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Preparing rear axle support - T10552-

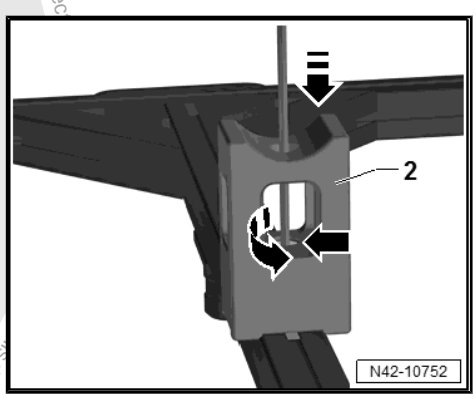
– Loosen bolts -arrows- and set dimension -a-.

a - 250 mm

Tighten bolts -arrows-.



– Loosen bolt -arrow- for support - T10552/2- -2-.

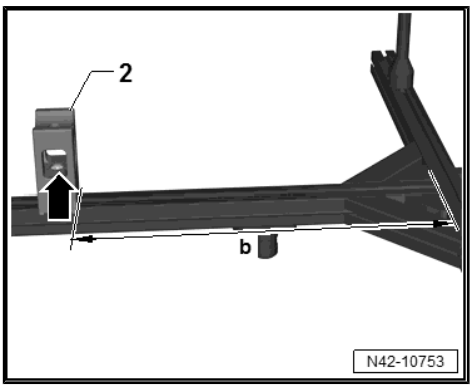


– Turn support - T10552/2- -2- in such a way that hollow points in direction of travel.

– Set dimension -b-.

b - 410 mm

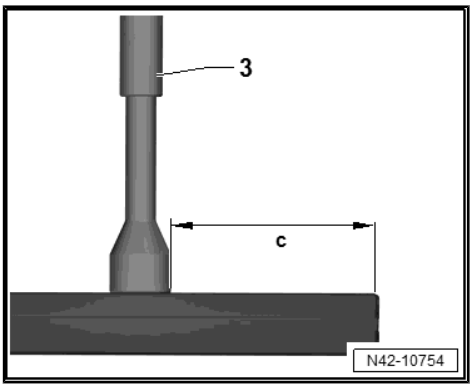
Tighten bolt -arrow- to 30 Nm.



– Loosen mounting pins - T10552/1- -3- at bottom on both sides.

– Set dimension -c-.

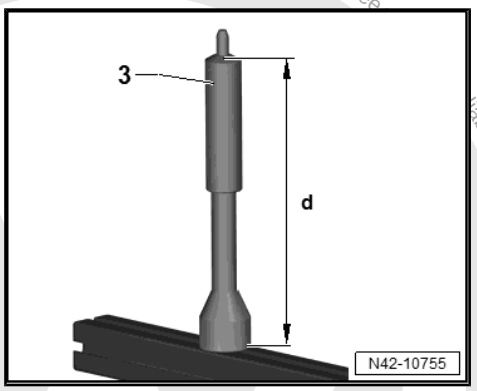
c - 47 mm



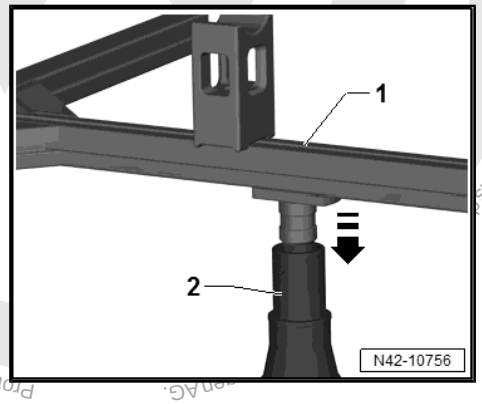
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– Turn threaded sleeve of mounting pins - T10552/1- -3- on both sides to set dimension -d-.

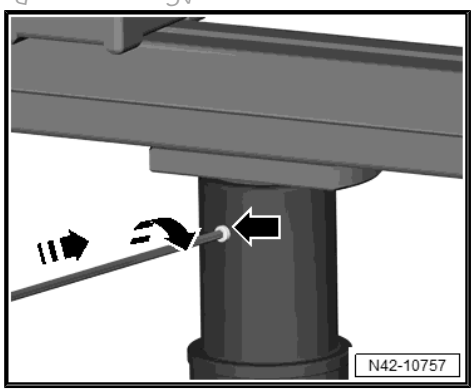
d - 215 mm



– Place rear axle support - T10552- -1- on engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .

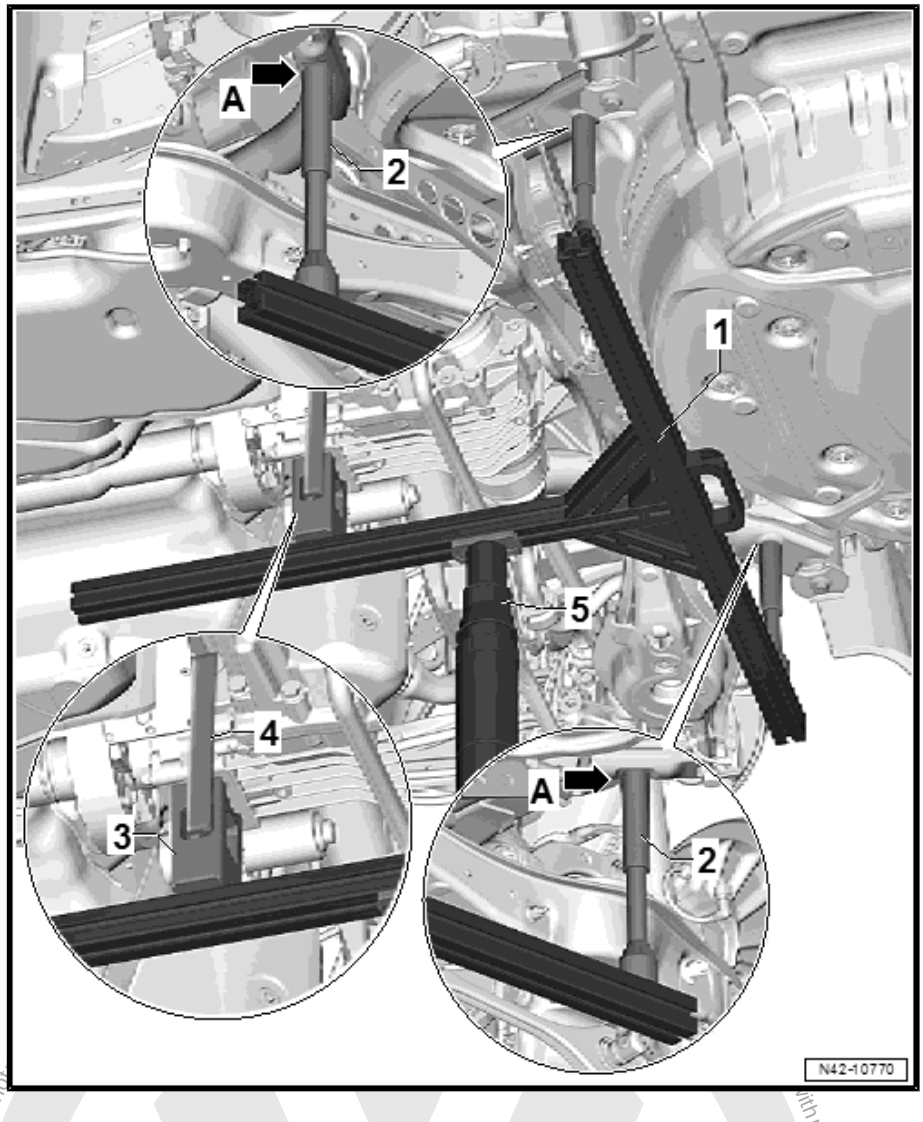


– Tighten bolt -arrow- to 30 Nm.



– Position rear axle support - T10552- -1- with engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under rear axle and jack up.

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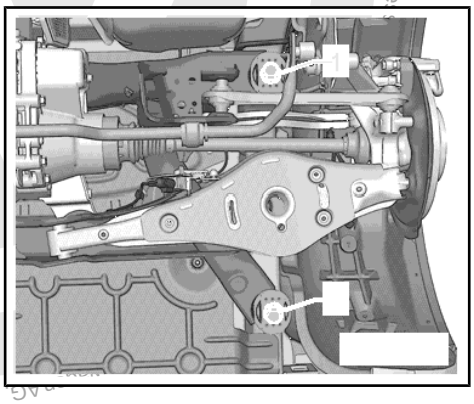


– Insert mounting pins - T10552/1- -2- in holes of rear axle -arrows A-.
– Secure support - T10552/2- -3- on rear axle using tensioning strap -4-.

Installing locating pins - T10096-

To fix position of subframe, locating pins - T10096- must be screwed in successively at positions -1- on both sides of vehicle.

– Remove one hexagon bolt -1- on each side.

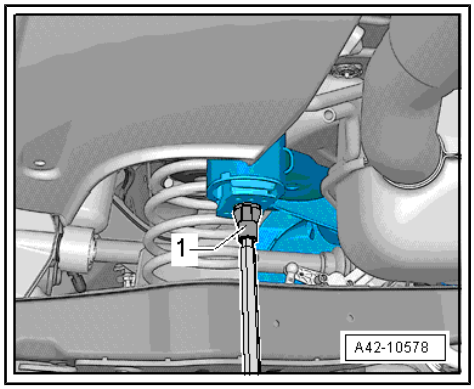


Note

Only the left side of vehicle is shown to improve clarity.

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– Screw in locating pins - T10096- -1-.



Note

The locating pins - T10096- may be tightened only to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.

– Replace securing bolts on subframe one after the other on both sides with a locating pin from the locating pin set - T10096- -1- and tighten to 20 Nm.

The position of the subframe is now fixed.

2.4 Repairing subframe

⇒ “2.4.1 Renewing bonded rubber bush”, page 158

⇒ “2.4.2 Renewing rear bonded rubber bush”, page 163

2.4.1 Renewing bonded rubber bush

Special tools and workshop equipment required

- Tensioning strap - T10038-
- Assembly tool - T10263-
- Assembly tool - T10356-
- Torque wrench - V.A.G 1332-
- Hydraulic press - VAS 6178- and thrust piece - T10205/13-
- Foot pump - VAS 6179-

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♦ Assembly tool - T10205A-

Note

♦ *If a bonded rubber bush is defective, the bonded rubber bush on the opposite side must also be renewed; allocation ⇒ Electronic parts catalogue "ETKA" .*

♦ *Before replacing a defective bonded rubber bush, check the other bonded rubber bushes.*

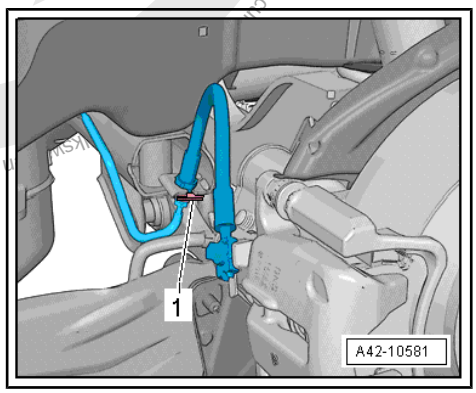
♦ *If cracks or other damage is visible, these bonded rubber bushes must be renewed also.*

♦ *To renew bonded rubber bushes, the subframe must be lowered at the front or the rear. The removal of the subframe is not required.*

♦ *Mark position of bonded rubber bushes in relation to subframe before removing.*

Pressing out front bonded rubber bush

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheels.
– Remove spring ⇒ page 186 .
– Remove rear silencer of exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .
– Unscrew bolt for track rod on wheel bearing housing.
– Push track rod downwards, and screw in bolt again.
– Push back track rod as far as possible.
– Pull out retaining clip -1- on both sides of vehicle.



Note

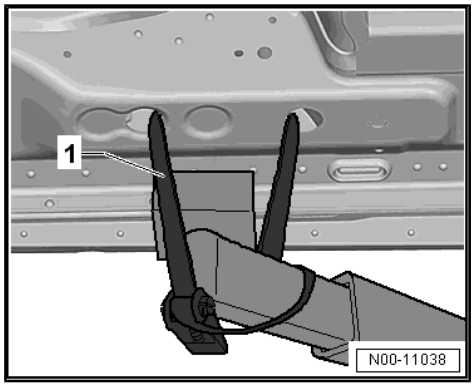
Do not open brake line.

– If fitted, remove underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .

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

1 - Tensioning strap - T10038-

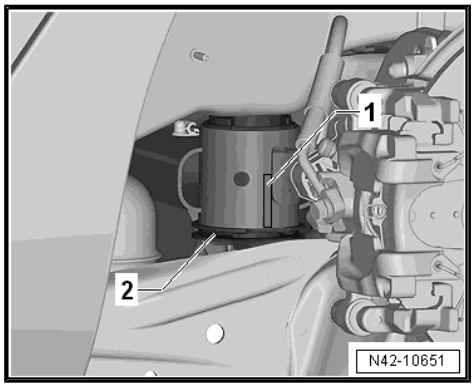


WARNING

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

– Fix position of subframe ⇒ page 150 .

– Mark installation position of bonded rubber bush in relation to subframe with e.g. a felt-tip pen -1-.

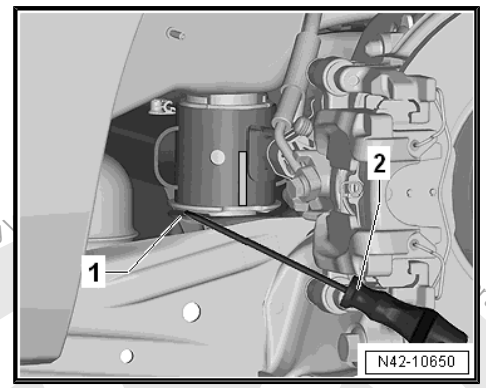


Note

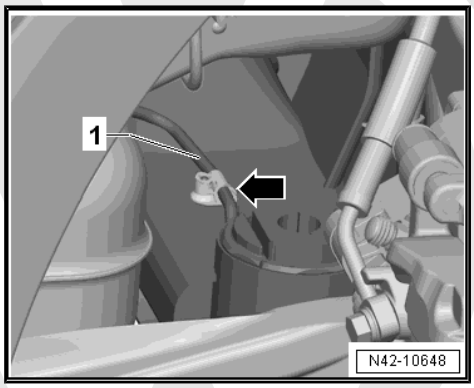
Make a mark -1- on subframe centred on cut-out in bonded rubber bush -2-.

– Lever anti-twist device -1- off bonded rubber bush near retaining lug using, for example, a screwdriver -2-.

– Lower subframe approx. 100 mm using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .



– Unclip brake line -1- from clip -arrow- on left side.



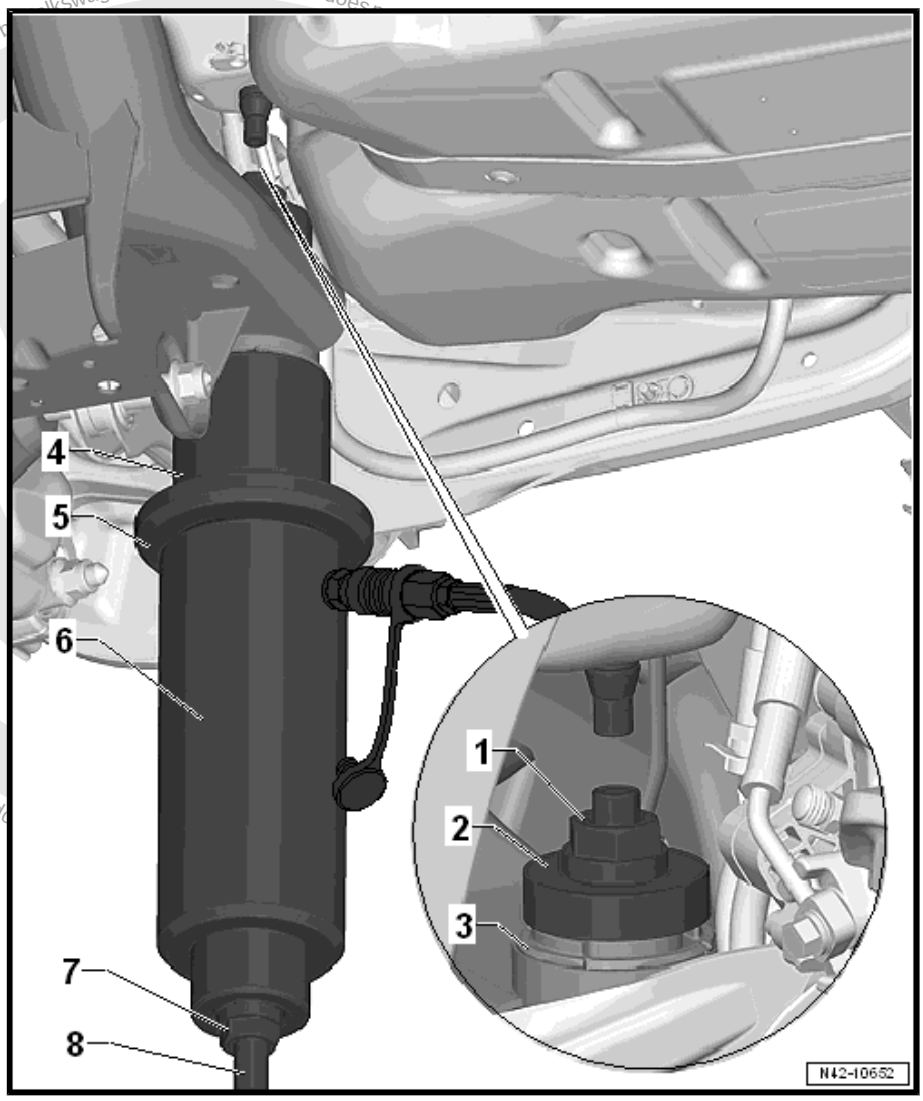
Note

The clip will be destroyed and must be renewed.

– Fit special tools as shown in illustration.

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1 - Hexagon nut - T10263/5-

2 - Thrust piece - T10356/1-

3 - Subframe

4 - Tube - T10356/2- , side with recess faces subframe

5 - Thrust plate - T10205/1-

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

7 - Hexagon nut - T10263/5-

8 - Threaded spindle - T10263/4-

– Take up play in special tools.

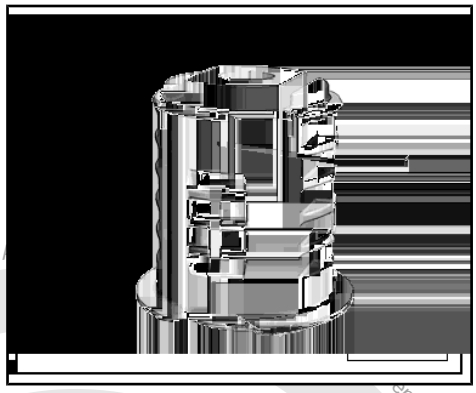
– Press out bonded rubber bush.

Note

- *The collar of the outer ring of the bonded rubber bush will be sheared off by the mounting when the bush is pulled out. This occurs with a loud bang.*
- *After the bush has been pulled out, the collar must be removed from the tube - T10356/2- with light hammer blows.*

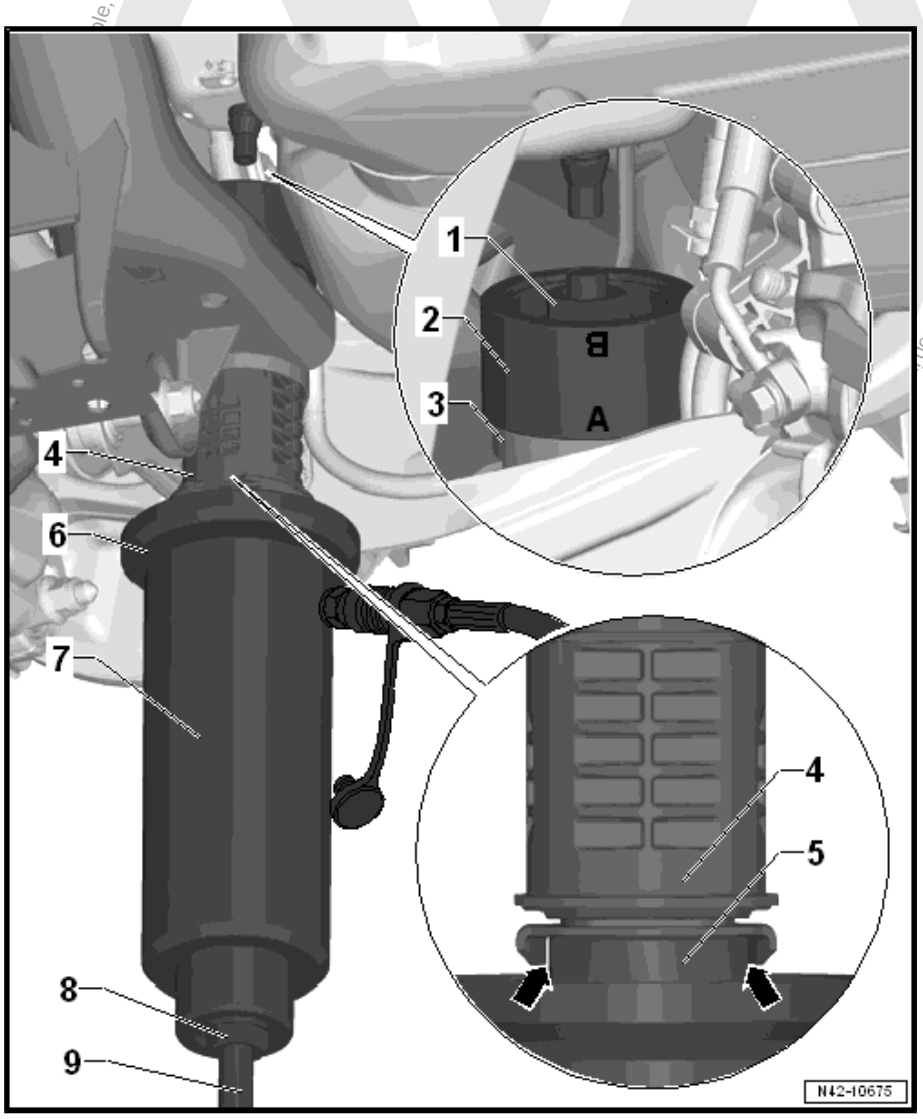
Pressing in front bonded rubber bush

– As an assembly aid, draw a line -1- on the vertical rib of the bonded rubber bush.



– Coat outer edge of bonded rubber bush with assembly paste.

– Set up special tools with bonded rubber bush on subframe as shown.



1 - Hexagon nut - T10263/5-

2 - Thrust piece - T10356/7- - the marking -A- points towards subframe

3 - Subframe

4 - Align bonded rubber bush on mark, made for this purpose (the marks must align with one another)

5 - Thrust piece - T10356/8- - the flattened sides must engage in cover of bonded rubber bush -arrows-.

6 - Thrust plate - T10205/1-

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

8 - Hexagon nut - T10263/5-

9 - Threaded spindle - T10263/4-

– Check position of bonded rubber bush, realign if necessary and preload bonded rubber bush using special tools.

Note

- *Ensure that the hose from the hydraulic cylinder - VAS 6178- to the foot pump - VAS 6179- is routed between the trailing arm and the fuel tank while pressing in the bush.*
- *Ensure that the bonded rubber bush does not cant at the start of the pressing action. Otherwise, the outer ring could be damaged.*

– Operate pump to press bonded rubber bush in until collar lies »flush« on subframe.

Further assembly is carried out in the reverse order. During this step, observe the following:

Torque settings

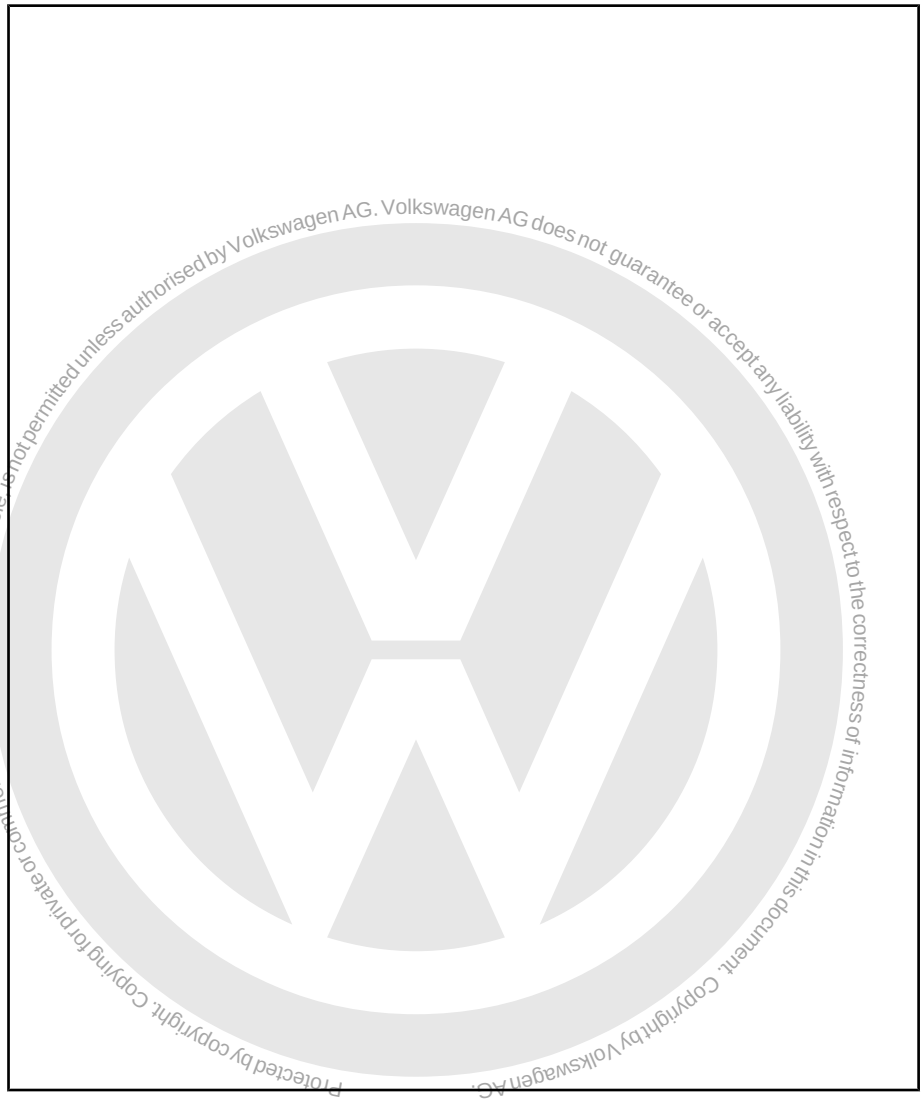
- ⇒ “2.1.2 Assembly overview - subframe, multi-link suspension, four-wheel drive”, page 148
- ⇒ “4.2 Assembly overview - track rod”, page 175
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer

2.4.2 Renewing rear bonded rubber bush

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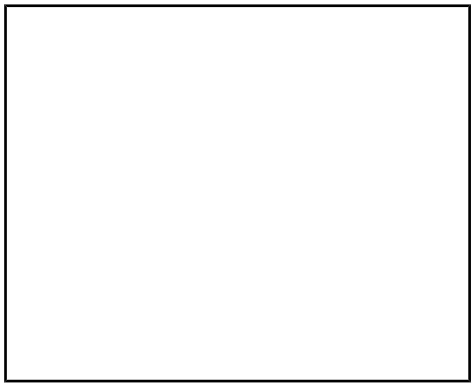
Special tools and workshop equipment required

- Tensioning strap - T10038-
- Assembly tool - T10263-
- Assembly tool - T10356-
- Torque wrench - V.A.G 1332-
- Hydraulic press - VAS 6178- and thrust piece - T10205/13-
- Foot pump - VAS 6179-



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- Assembly tool - T10205A-



Note

- *If a bonded rubber bush is defective, the bonded rubber bush on the opposite side must also be renewed; allocation ⇒ Electronic parts catalogue "ETKA" .*
- *Before replacing a defective bonded rubber bush, check the other bonded rubber bushes.*
- *If cracks or other damage is visible, these bonded rubber bushes must be renewed also.*
- *To renew bonded rubber bushes, the subframe must be lowered at the front or the rear. The removal of the subframe is not required.*
- *Mark position of bonded rubber bushes in relation to subframe before removing.*

Pressing out rear bonded rubber bush

– Loosen wheel bolts.

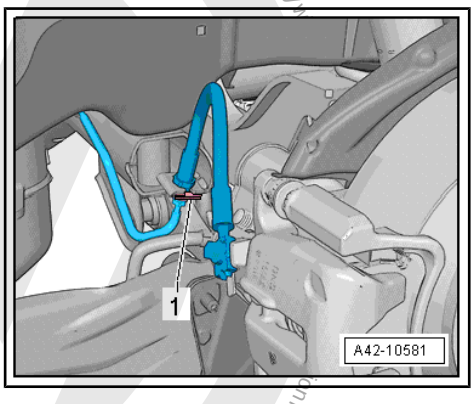
– Raise vehicle on lift.

– Remove wheels.

– Remove spring ⇒ page 186

– Remove rear silencer of exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

– Pull out retaining clip -1- on both sides of vehicle.



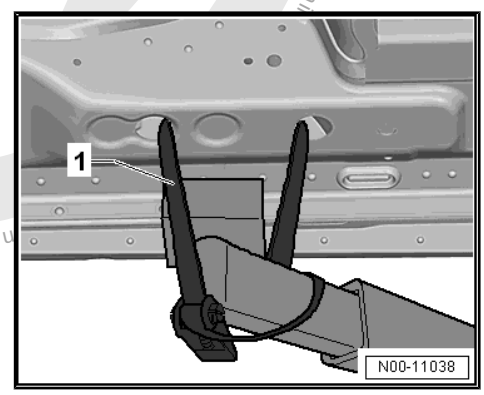
Note

Do not open brake line.

– If fitted, remove underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .

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

1 - Tensioning strap - T10038-



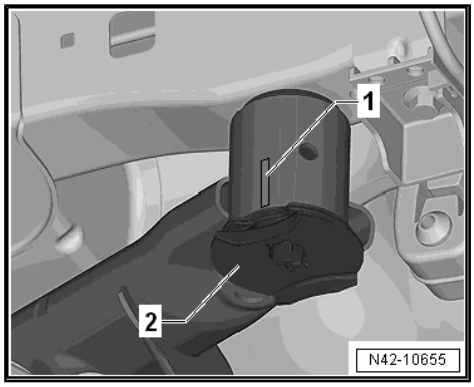
WARNING

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

– Fix position of subframe ⇒ page 150 .

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– Mark installation position of bonded rubber bush in relation to subframe with e.g. a felt-tip pen -1-.

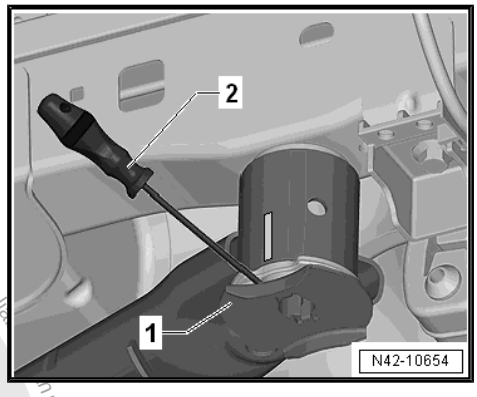


Note

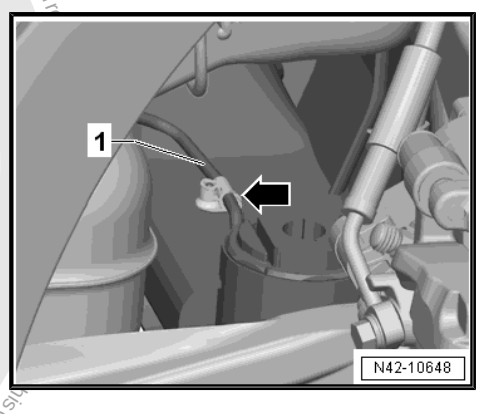
Make a mark -1- on subframe centred on cut-out in bonded rubber bush -2-.

– Lever anti-twist device -1- off bonded rubber bush near retaining lug using, for example, a screwdriver -2-.

– Lower subframe approx. 100 mm using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .



– Unclip brake line -1- from clip -arrow- on left side.

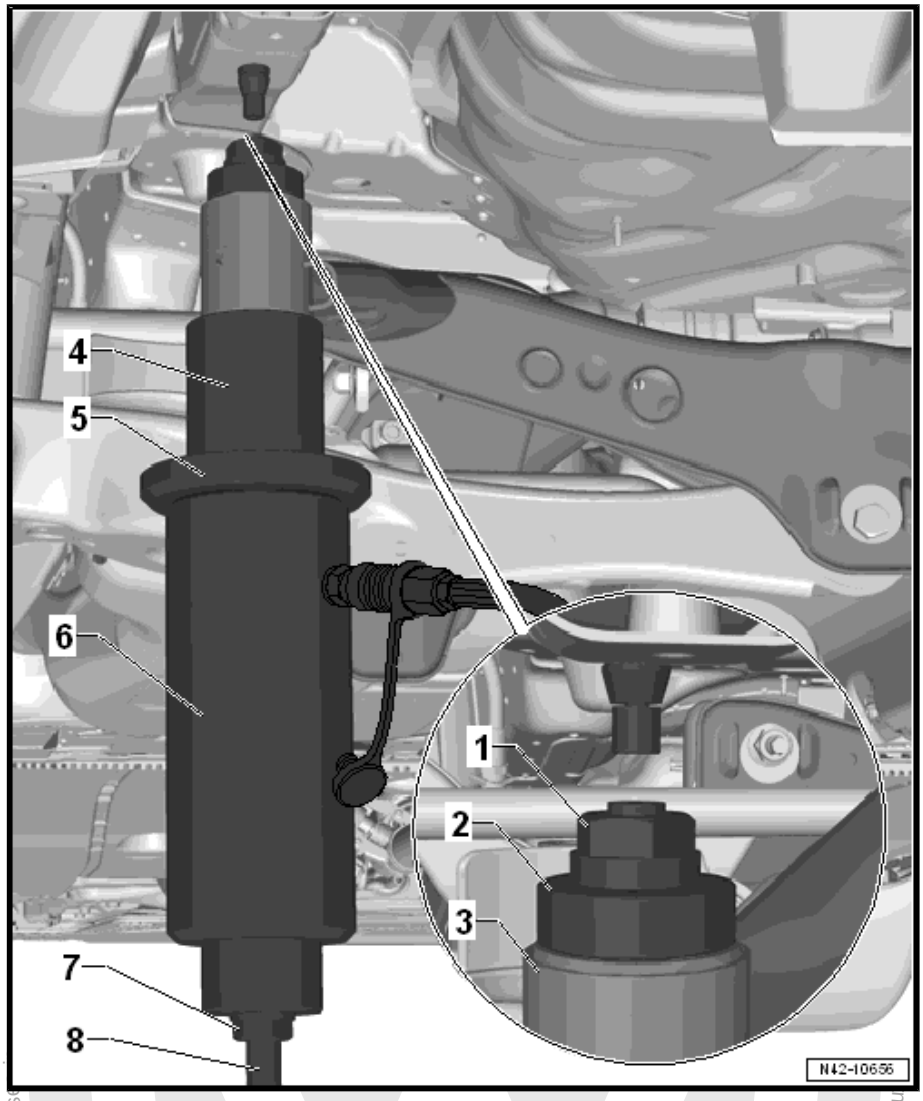


Note

The clip will be destroyed and must be renewed.

– Fit special tools as shown in illustration.

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1 - Hexagon nut - T10263/5-

2 - Thrust piece - T10356/5-

3 - Subframe

4 - Tube - T10356/6- , side with recess faces subframe

5 - Thrust plate - T10205/1-

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

7 - Hexagon nut - T10263/5-

8 - Threaded spindle - T10263/4-

– Take up play in special tools.

– Press out bonded rubber bush.

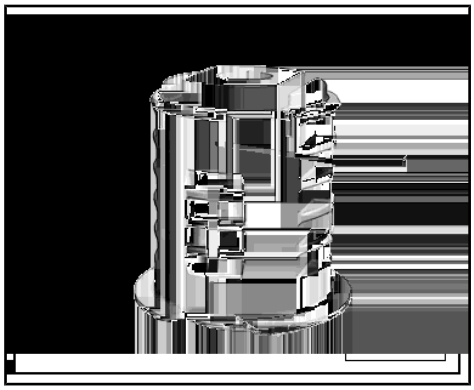
Note

- *The collar of the outer ring of the bonded rubber bush will be sheared off by the mounting when the bush is pulled out. This occurs with a loud bang.*
- *After the bush has been pulled out, the collar must be removed from the tube - T10356/6- with light hammer blows.*

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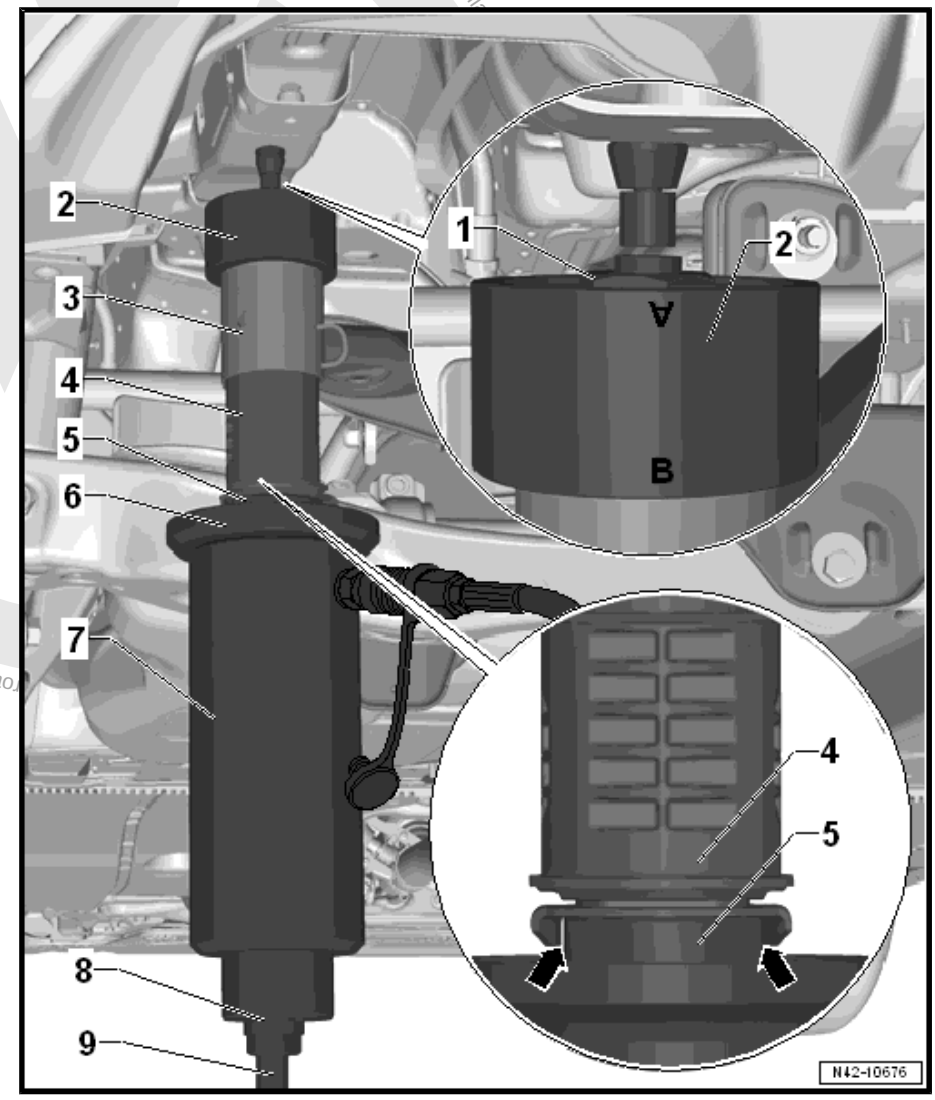
Pressing in rear bonded rubber bush

– As an assembly aid, draw a line -1- on the vertical rib of the bonded rubber bush.



– Coat outer edge of bonded rubber bush with assembly paste.

– Set up special tools with bonded rubber bush on subframe as shown.



1 - Hexagon nut - T10263/5-

2 - Thrust piece - T10356/7- - the marking -B- points towards subframe

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3 - Subframe

4 - Align bonded rubber bush on mark, made for this purpose (the marks must align with one another)

5 - Thrust piece - T10356/8- - the flattened sides must engage in cover of bonded rubber bush -arrows-.

6 - Thrust plate - T10205/1-

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

8 - Hexagon nut - T10263/5-

9 - Threaded spindle - T10263/4-

– Check position of bonded rubber bush, realign if necessary and preload bonded rubber bush using special tools.

Note

Ensure that the bonded rubber bush does not cant at the start of the pressing action. Otherwise, the outer ring could be damaged.

– Operate pump to press bonded rubber bush in until collar lies »flush« on subframe.

Further assembly is carried out in the reverse order. During this step, observe the following:

Torque settings

- ⇒ “2.1.2 Assembly overview - subframe, multi-link suspension, four-wheel drive”, page 148
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer

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3 Anti-roll bar

⇒ “3.1 Assembly overview - anti-roll bar”, page 170

⇒ “3.2 Removing and installing anti-roll bar”, page 170

⇒ “3.3 Removing and installing coupling rod”, page 172

3.1 Assembly overview - anti-roll bar

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1 - Lower transverse link

2 - Nut

- ❑ Renew after removal
- ❑ 20 Nm +180°

3 - Coupling rod

- ❑ Removing and installing ⇒ page 172

4 - Bolt

- ❑ Tighten evenly.
- ❑ Renew after removal
- ❑ 20 Nm +90°

5 - Bolt

- ❑ Renew after removal

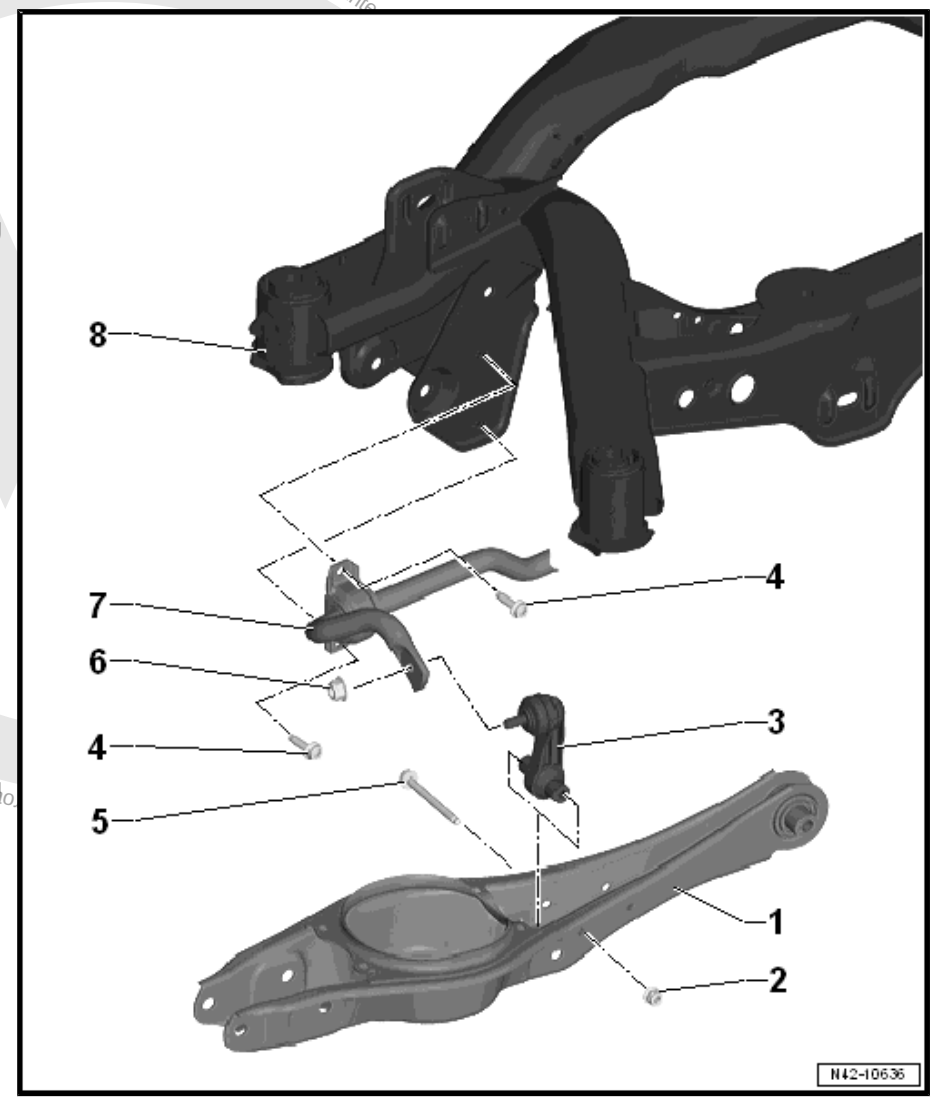
6 - Nut

- ❑ When tightening, counterhold at multi-point socket of coupling rod
- ❑ 55 Nm

7 - Anti-roll bar

- ❑ With rubber bushes
- ❑ Removing and installing ⇒ page 170

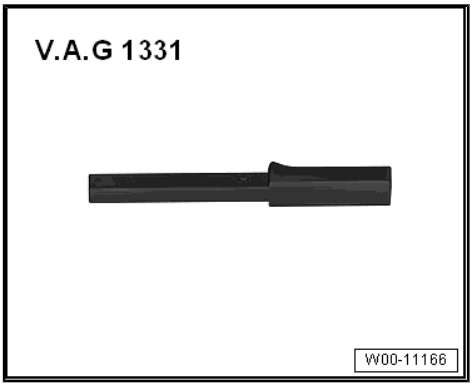
8 - Subframe



3.2 Removing and installing anti-roll bar

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



Removing

Note

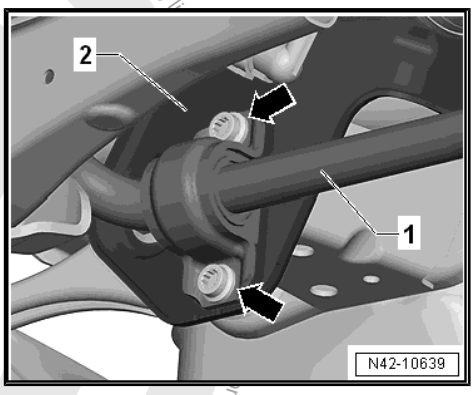
The following procedure is for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

Vehicles with trim for rear axle

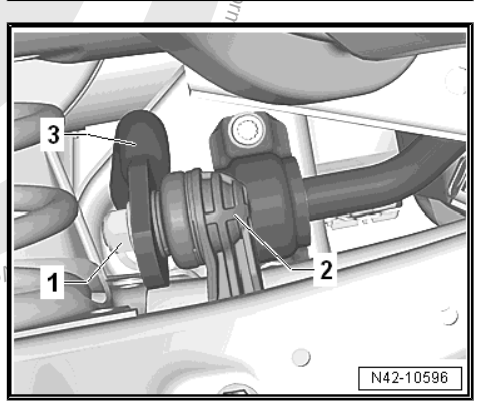
– Remove rear axle cladding ⇒ page 146

Continued for all vehicles:

– Remove bolts -arrows- for anti-roll bar -1-.



– Unscrew nut -1- from coupling rod -2-.
– Pull coupling rod -2- out of anti-roll bar -3-.
– Remove anti-roll bar -3- from subframe.



All-wheel drive vehicles

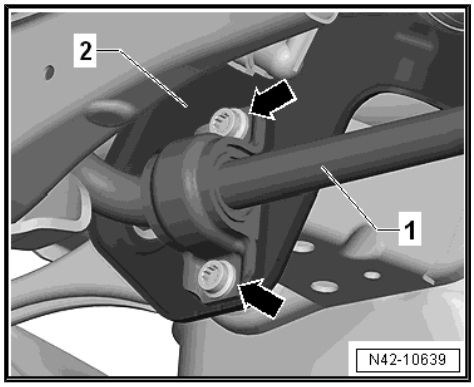
– Guide out anti-roll bar over exhaust system.

Installing

Install in the reverse order of removal, observing the following:

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– Tighten bolts -arrows- for anti-roll bar -1- evenly on subframe -2-.



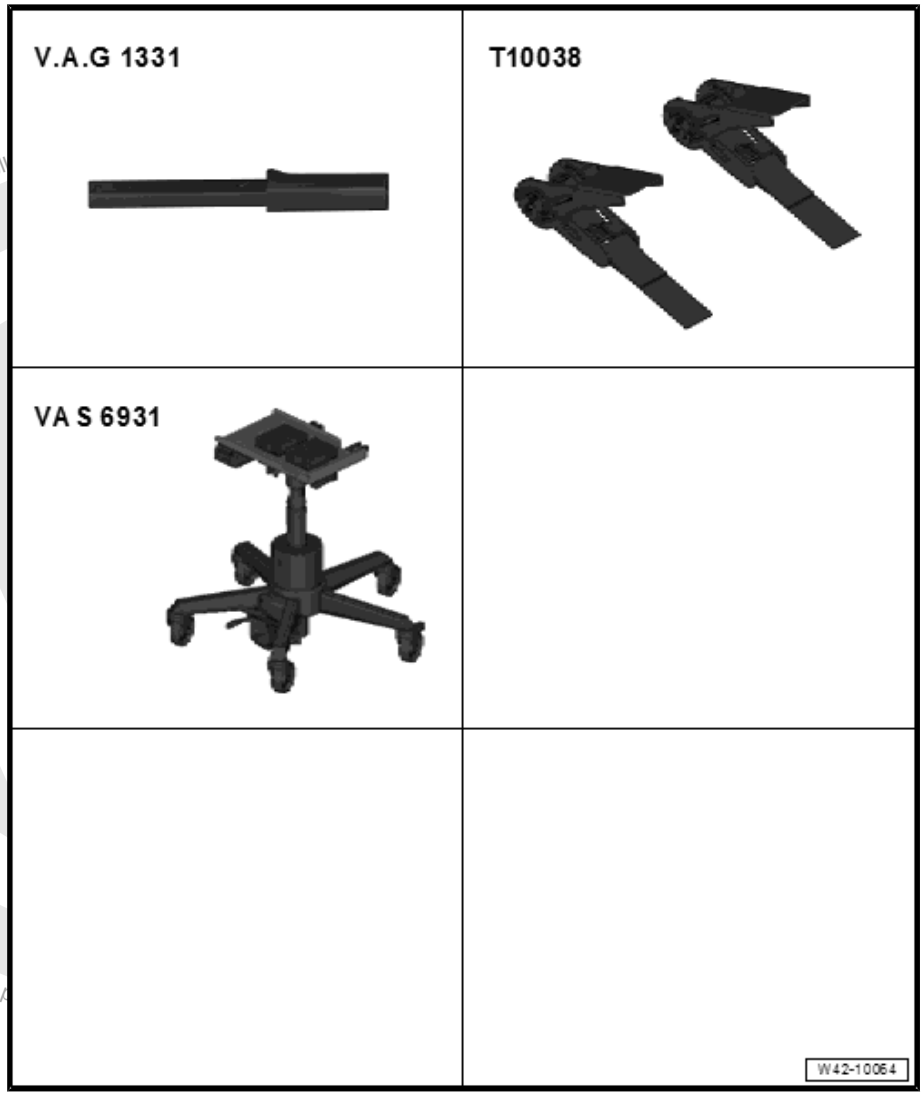
Torque settings

- ⇒ “3.1 Assembly overview - anti-roll bar”, page 170
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

3.3 Removing and installing coupling rod

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Tensioning strap - T10038-
- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-

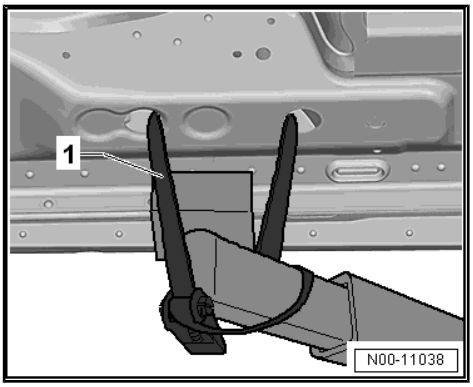


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Removing

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

1 - Tensioning strap - T10038-



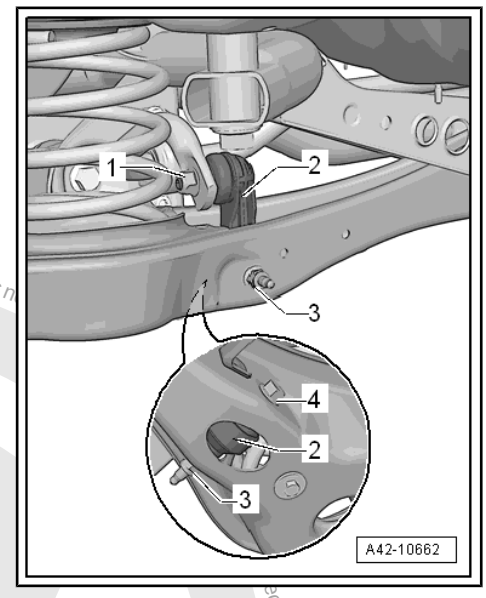
> **WARNING**
>
> ***If the vehicle is not strapped down, it may slip off the lifting platform.***

– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under lower transverse link.

– Press transverse suspension link upwards slightly.

– Undo nuts -1- and -3- and pull out bolt -4-.

– Pull coupling rod -2- out of anti-roll bar and trailing arm.

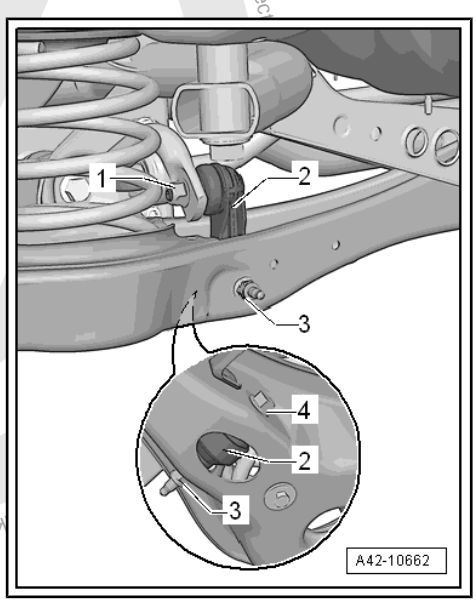


Installing

Install in the reverse order of removal, observing the following:

– Insert coupling rod -2-, fit nuts -1- and -3- and tighten in unladen position ⇒ page 8 .

– When tightening nut -1-, counterhold at multi-point socket of bolt.



Torque settings

- ⇒ “3.1 Assembly overview - anti-roll bar”, page 170
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

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4 Suspension link, track rod

⇒ “4.1 Assembly overview - transverse link”, page 174

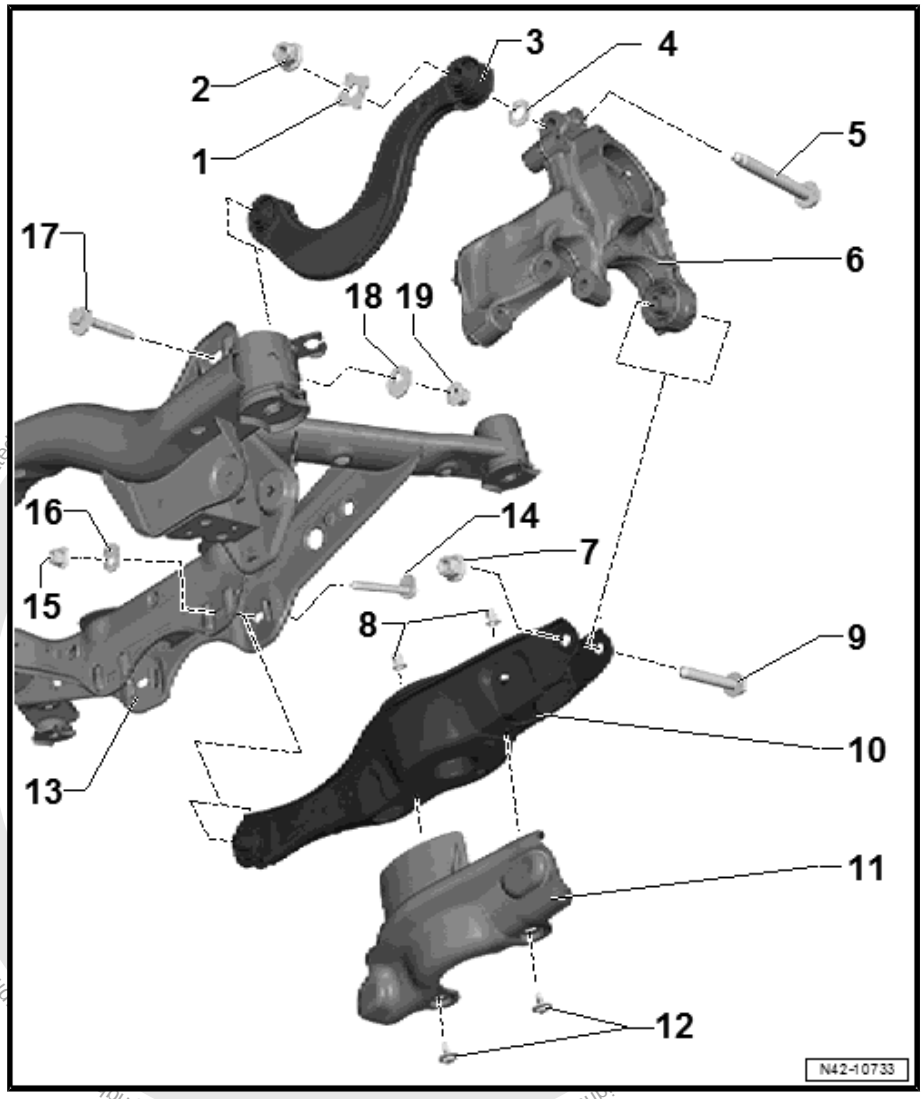
⇒ “4.2 Assembly overview - track rod”, page 175

⇒ “4.3 Removing and installing upper transverse link”, page 176

⇒ “4.4 Removing and installing lower transverse link”, page 177

⇒ “4.5 Removing and installing track rod”, page 178

4.1 Assembly overview - transverse link



1 - Washer

2 - Nut

- ❑ Renew after removal

3 - Upper transverse link

- ❑ Removing and installing ⇒ page 176

4 - Washer

5 - Bolt

- ❑ Renew after removal
- ❑ Always tighten threaded connections in unladen position ⇒ page 8
- ❑ 130 Nm +180°

6 - Wheel bearing housing

- ❑ Different versions for front-wheel drive and all-wheel drive ⇒ Electronic Parts Catalogue “ETKA”

7 - Nut

- ❑ Renew after removal

8 - Spreader rivet

9 - Bolt

- ❑ Renew after removal
- ❑ Always tighten threaded connections in unladen position ⇒ page 8
- ❑ 70 Nm +180°

10 - Lower transverse link

- ❑ Removing and installing ⇒ page 177

11 - Stone deflector

12 - Bolt

- ❑ 8 Nm

13 - Subframe

14 - Eccentric bolt

- ❑ A wheel alignment check must be performed if loosened ⇒ page 262
- ❑ Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position).

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15 - Nut

- ❑ Renew after removal
- ❑ Always tighten threaded connections in unladen position ⇒ page 8
- ❑ 95 Nm

16 - Eccentric washer

- ❑ Inner hole with lug

17 - Eccentric bolt

- ❑ A wheel alignment check must be performed if loosened ⇒ page 262
- ❑ Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

18 - Eccentric washer

- ❑ Inner hole with lug

19 - Nut

- ❑ Renew after removal
- ❑ Always tighten threaded connections in unladen position ⇒ page 8
- ❑ 95 Nm

4.2 Assembly overview - track rod

1 - Subframe

2 - Bolt

- ❑ Renew after removal

3 - Wheel bearing housing

- ❑ Different versions for front-wheel drive and all-wheel drive ⇒ Electronic Parts Catalogue “ETKA”

4 - Track rod

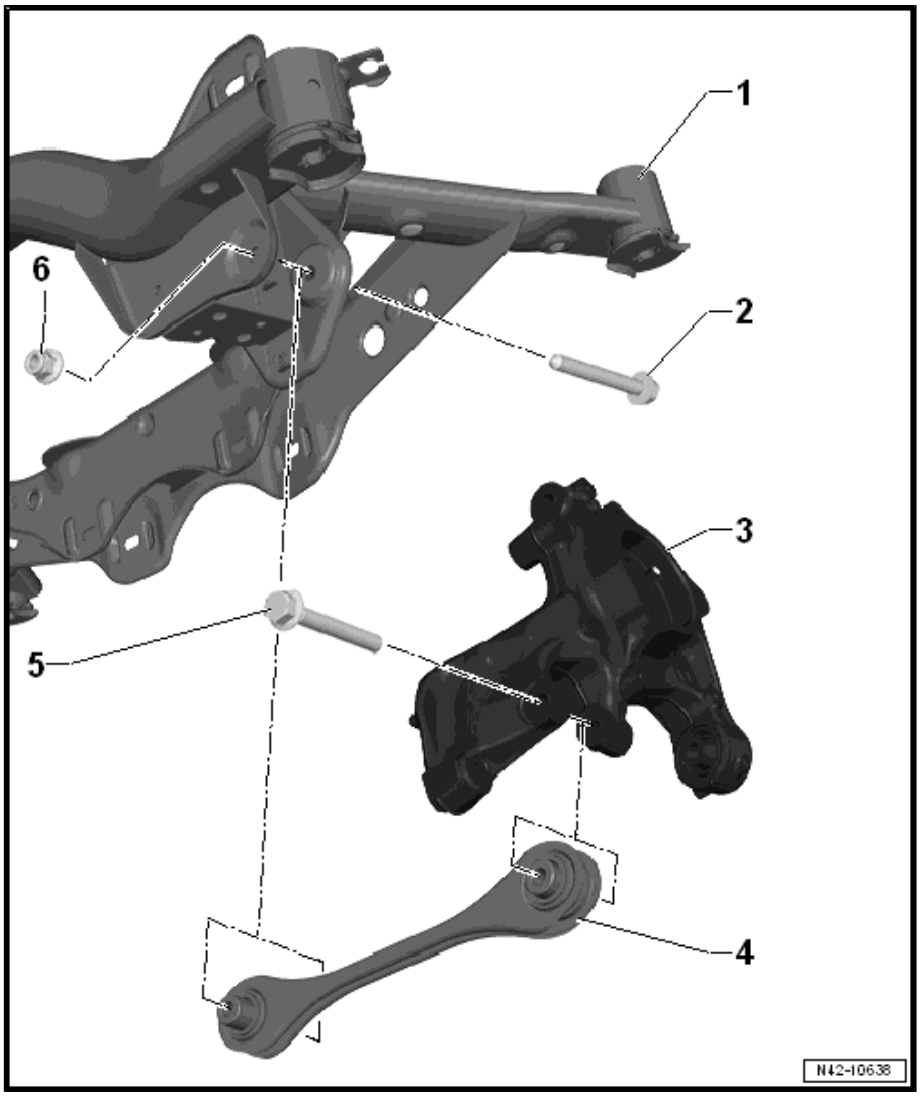
- ❑ Removing and installing ⇒ page 178

5 - Bolt

- ❑ Renew after removal
- ❑ Always tighten threaded connections in unladen position ⇒ page 8
- ❑ 70 Nm +180°

6 - Nut

- ❑ Renew after removal
- ❑ 70 Nm +180°



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4.3 Removing and installing upper transverse link

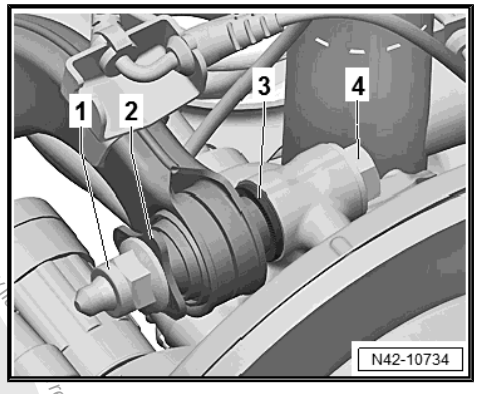
Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-

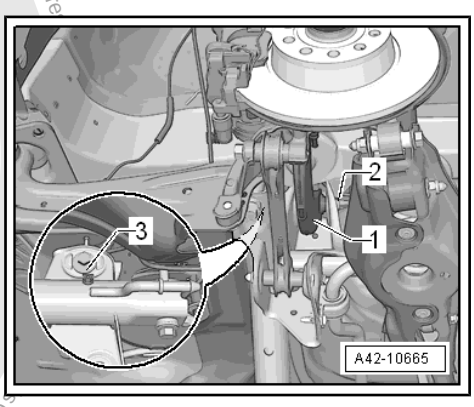


Removing

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheels.
– Remove spring ⇒ page 186 .
– If fitted, detach line from retainer on transverse link.
– Unscrew nut -1- and remove washer -2-.
– Unscrew bolt -4-.
– Remove shim -3-.



– Use felt-tip pen or similar to mark position of eccentric bolt -3- in relation to subframe.
– Unscrew nut -2- and pull out eccentric bolt -3-.
– Take out upper transverse link -1-.



Installing

Install in the reverse order of removal, observing the following:

- The threaded connections of the suspension link may only be loosened and tightened in the unladen weight position ⇒ page 8 .

Torque settings

- ⇒ “4.1 Assembly overview - transverse link”, page 174
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

– Perform wheel alignment ⇒ page 268 .

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4.4 Removing and installing lower transverse link

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



Removing

– Loosen wheel bolts.

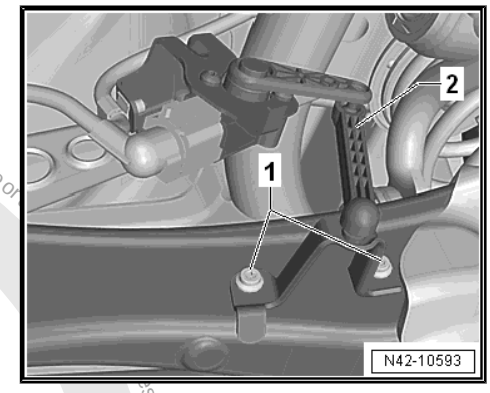
– Raise vehicle on lift.

– Remove wheel.

Vehicles with vehicle level sender.

– Remove screws -1-.

– Remove bracket for rear left vehicle level sender -2-.



Vehicles with stone guard

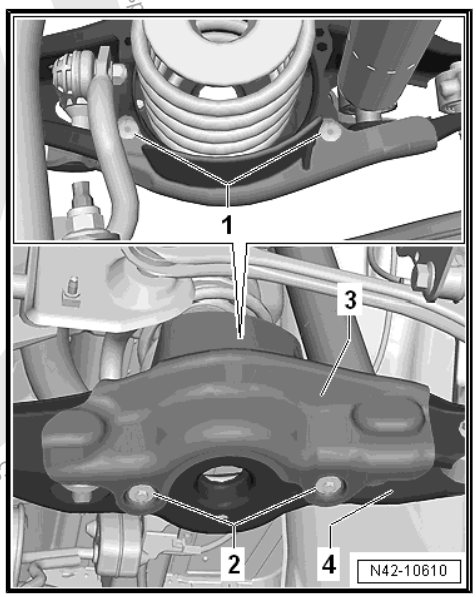
– Remove spreader rivet -1-.

– Remove bolts -2- for stone guard -3-.

Continued for all vehicles:

– Remove spring ⇒ page 186 .

– Disengage and lower exhaust system at rear ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencers .



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– Mark position of eccentric bolt -2- in relation to subframe, for example using a felt-tip pen.
– Undo nut -1- and pull out bolt -2-.
– Remove lower transverse link.

Installing

Install in the reverse order of removal, observing the following:

Torque settings

- ⇒ “4.1 Assembly overview - transverse link”, page 174
- ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Rear exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer

- Observe mark made for position of eccentric bolt -2- relative to subframe.
- The threaded connections of the transverse link may only be loosened and tightened in the unladen weight position ⇒ page 8 .
- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Perform wheel alignment ⇒ page 268 .

4.5 Removing and installing track rod

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



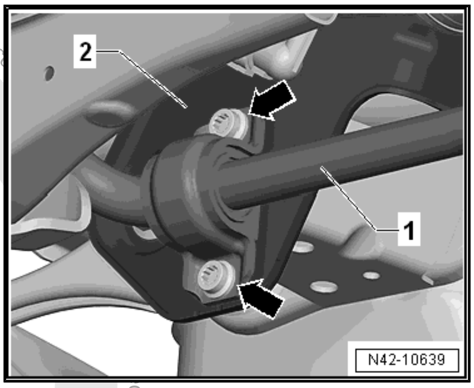
- Torque wrench - V.A.G 1332-



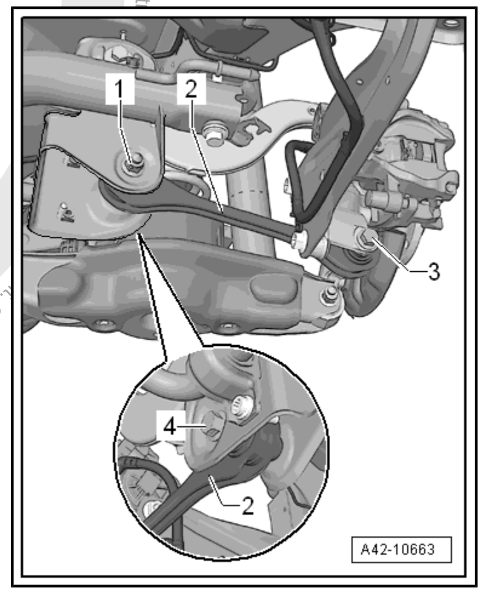
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Removing

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.
– Remove bolts -arrows- for anti-roll bar -1-.



– Unscrew nut -1- and bolt -3- by a few turns.
– Unscrew bolt -3- and remove.
– Unscrew nut -1-, and remove bolt -4- towards rear. Push anti-roll bar upwards while doing so.
– Remove track rod -2-.



Installing

Install in the reverse order of removal, observing the following:

Torque settings

- ⇒ “4.2 Assembly overview - track rod”, page 175
- ⇒ “3.1 Assembly overview - anti-roll bar”, page 170
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

• The threaded connection of the track rod may be tightened only when the dimension measured between the centre of wheel hub and lower edge of wheel housing before starting the work has been attained ⇒ page 8 .

– Perform wheel alignment ⇒ page 268 .

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5 Suspension strut, shock absorber, spring

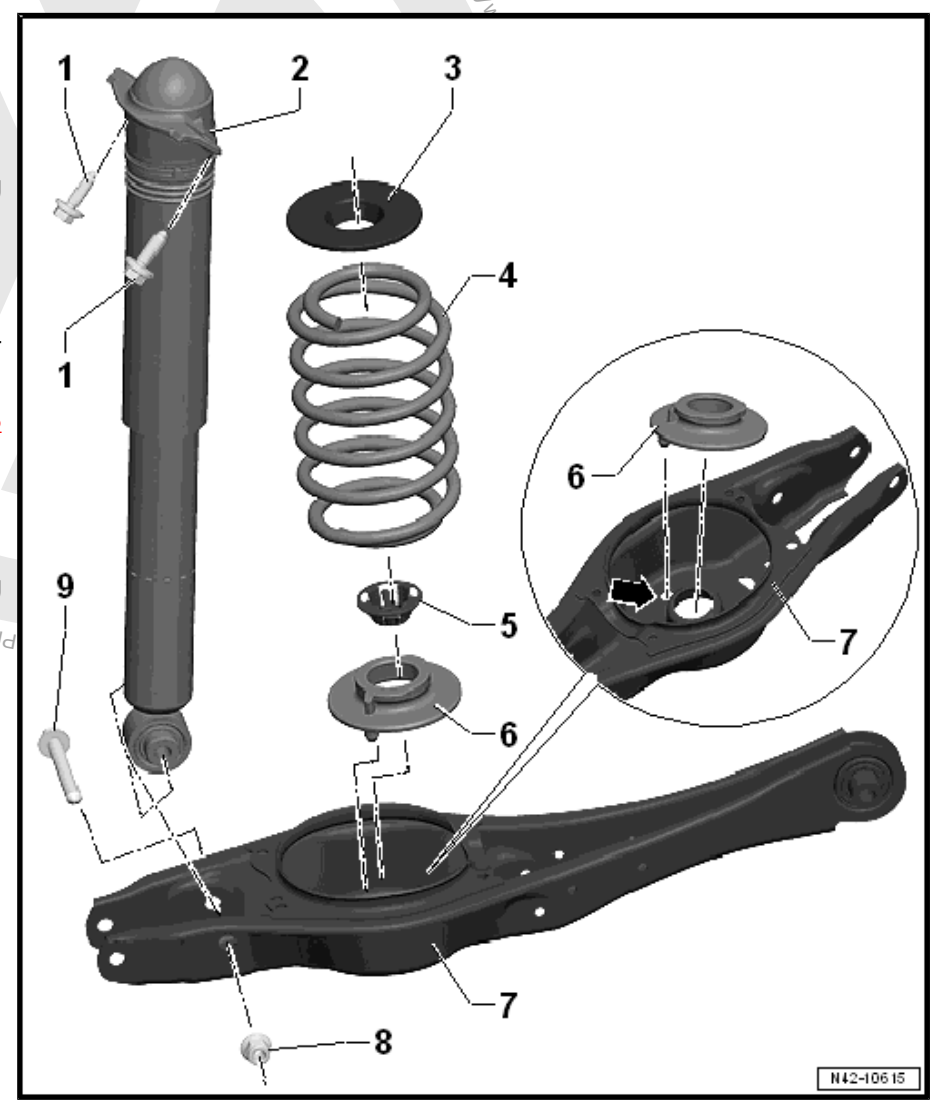
⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180

⇒ “5.2 Removing and installing shock absorbers”, page 181

⇒ “5.3 Repairing shock absorber”, page 183

⇒ “5.4 Removing and installing spring”, page 186

5.1 Assembly overview - suspension strut, shock absorber, spring



1 - Bolt

- ❑ Renew after removal
- ❑ 50 Nm +45°

2 - Shock absorbers

- ❑ Removing and installing ⇒ page 181
- ❑ Note correct installation position of cable tie fastener.
- ❑ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 13

3 - Upper spring seat

- ❑ Fit on “lug” on body.

4 - Spring

- ❑ Removing and installing ⇒ page 186

5 - Fastener

- ❑ Assists with installation

6 - Lower spring seat

- ❑ Turn end of spring against stop
- ❑ When installing, fit pin into aperture in spring mounting on lower transverse link -arrow-.

7 - Lower transverse link

8 - Nut

- ❑ Renew after removal
- ❑ Always tighten bolted connection with suspension in unladen position ⇒ page 8
- ❑ 70 Nm +180°

9 - Bolt

- ❑ Renew after removal

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5.2 Removing and installing shock absorbers

Special tools and workshop equipment required

- Tensioning strap - T10038-



- Torque wrench - V.A.G 1332-



- Torque wrench - V.A.G 1410-



- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-

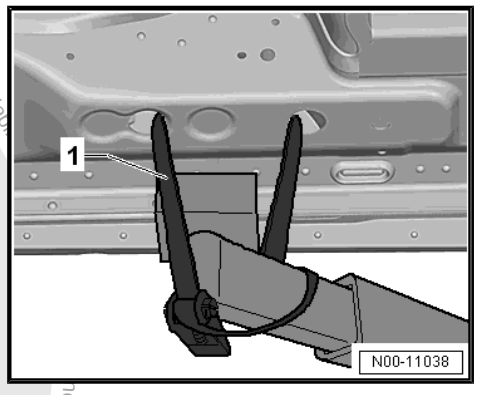


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Removing

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.
– Use tensioning straps - T10038- to strap vehicle at rear to support beams of lifting platform on both sides.

1 - Tensioning strap - T10038-

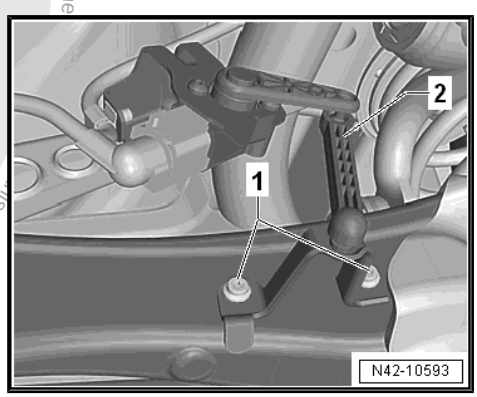


WARNING

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

Vehicles with vehicle level sender.

– Remove screws -1-.
– Remove bracket for rear left vehicle level sender -2-.

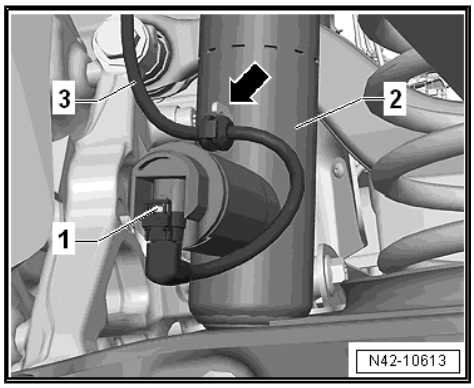


Vehicles with adaptive chassis control DCC

– Disconnect connector -1- on shock absorber -2-.
– Pull line -3- off shock absorber -2- -arrow-.

Note

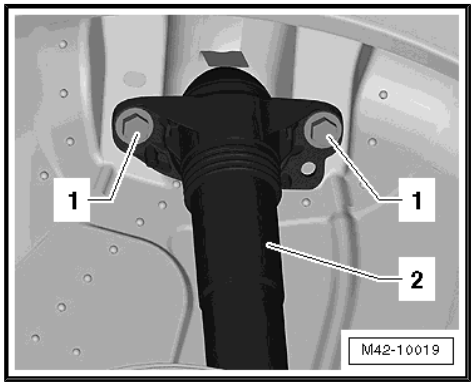
If there is moisture in the area of the connector, blow compressed air on the contacts on the shock absorber and the connector.



Continued for all vehicles:

– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under transverse link, and press upwards slightly.

– Remove bolts -1- for shock absorber -2-.



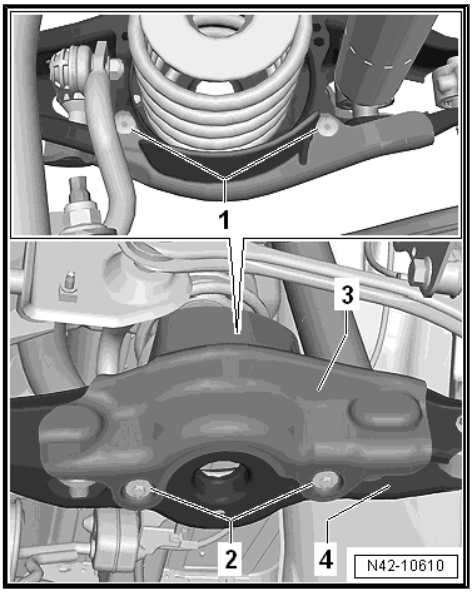
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Vehicles with stone guard

– Remove spreader rivet -1-.

– Remove bolts -2- for stone guard -3-.

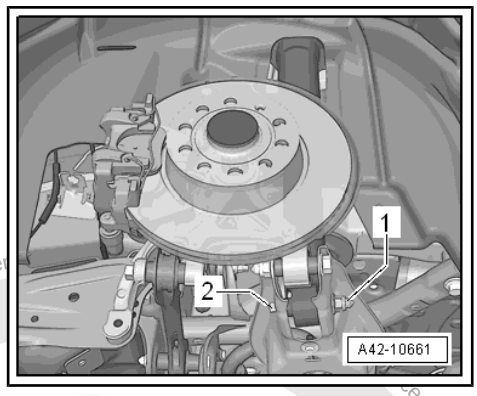
– Remove stone guard -3- from lower transverse link -4-.



Continued for all vehicles:

– Unscrew nut -1- and remove bolt -2-.

– Remove shock absorber.



Installing

Install in reverse order of removal. During this step, observe the following:

– On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester

Torque settings

- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “4.1 Assembly overview - transverse link”, page 174
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

• The threaded connections of the shock absorber to the lower transverse link may only be loosened and tightened in the unladen weight position ⇒ page 8 .

5.3 Repairing shock absorber

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1 - Shock absorbers

- ❑ Removing and installing ⇒ page 181
- ❑ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 11
- ❑ Checking shock absorber following removal ⇒ page 4

2 - Protective tube

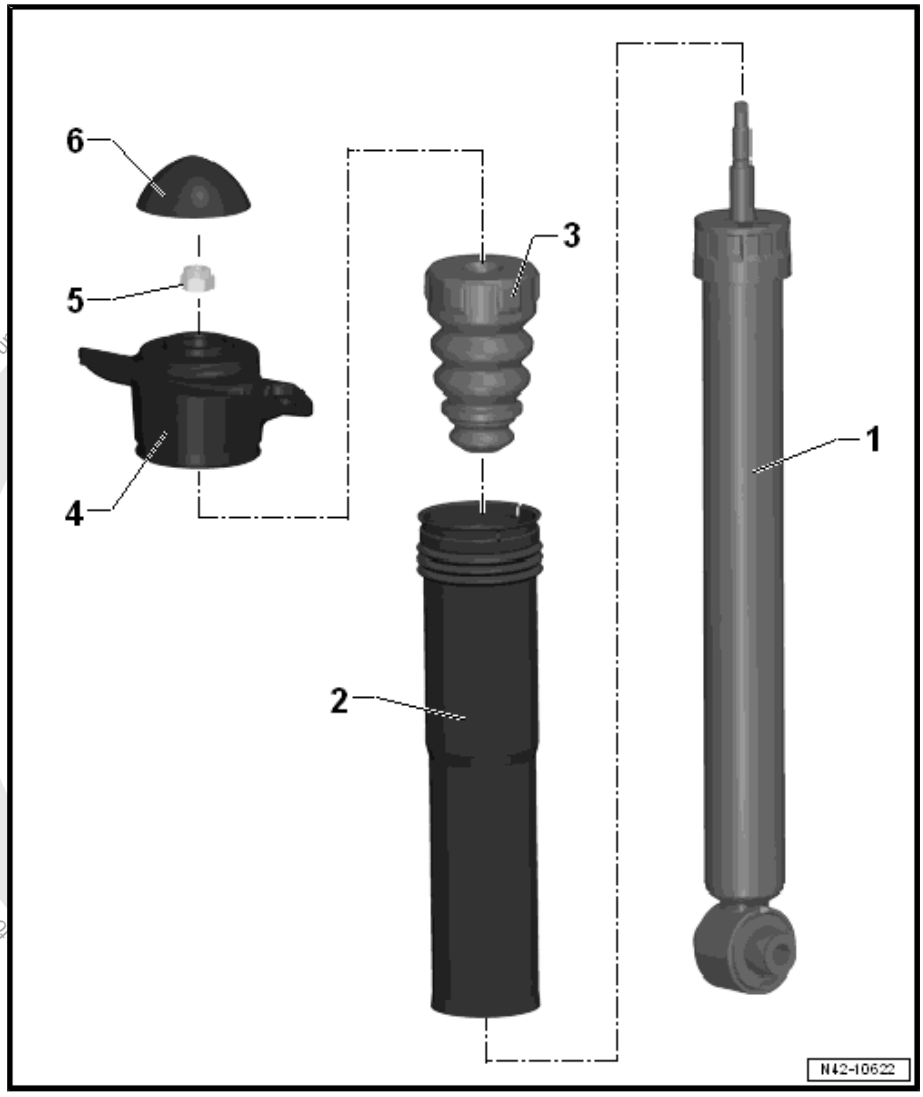
3 - Buffer stop

4 - Shock absorber mounting

5 - Nut

- ❑ Renew after removal
- ❑ Loosening and tightening ⇒ page 185
- ❑ 25 Nm

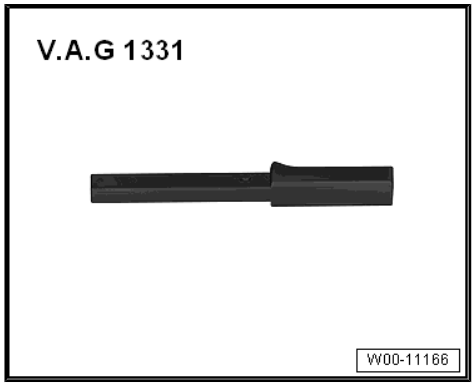
6 - Cover



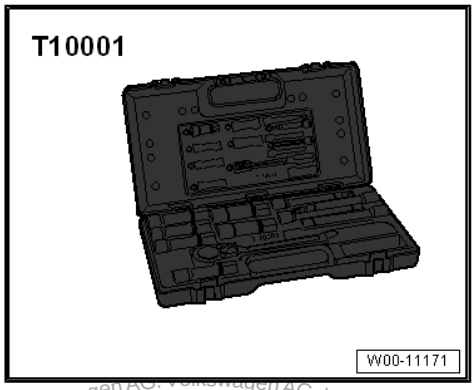
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Special tools and workshop equipment required

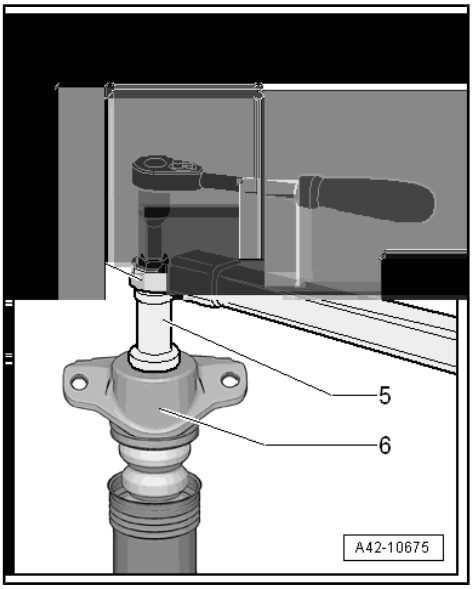
- Torque wrench - V.A.G 1331-



- Shock absorber set - T10001-



- Ring spanner insert (commercial type, e.g. »Hazet 6630c-21«)



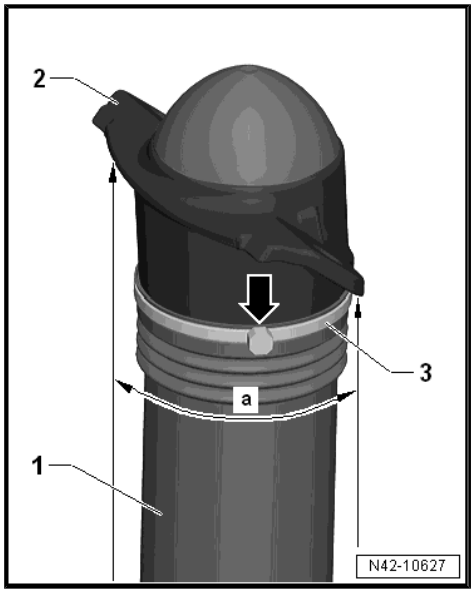
Loosening and tightening threaded connection for shock absorber mounting

1 - Ring spanner insert (commercial type, e.g. »Hazet 6630c-21«)
2 - Insert - T10001/9-
3 - Commercially available ratchet handle
4 - Torque wrench - V.A.G 1331-
5 - Insert - T10001/1-
6 - Shock absorber mounting

Install in reverse order of removal. During this step, observe the following:

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– Slide protective tube -1- onto shock absorber mounting -2-.
– Fit cable tie -3- and tighten.



Note

The fastener -arrow- of the cable tie -3- must be located within area -a-.

Torque settings

♦ ⇒ “5.3 Repairing shock absorber”, page 183

5.4 Removing and installing spring

Special tools and workshop equipment required

♦ Tensioning strap - T10038-



♦ Torque wrench - V.A.G 1332-

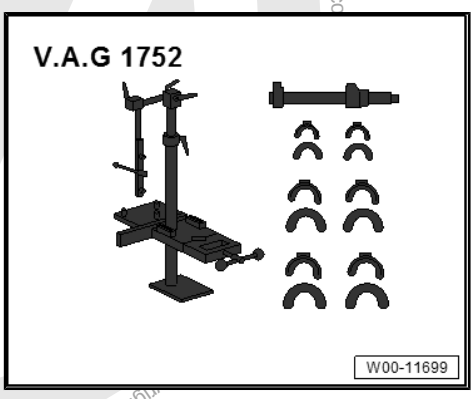


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- Torque wrench - V.A.G 1410-



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



- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



Removing

– Loosen wheel bolts.

– Raise vehicle on lift.

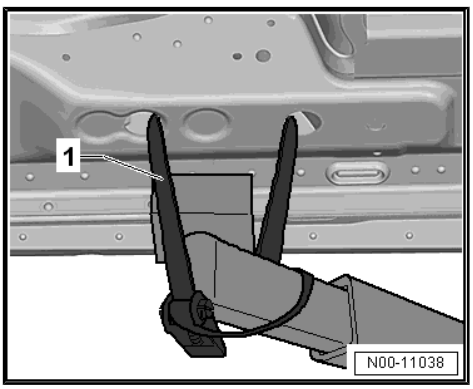
– Remove wheel.

– 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.

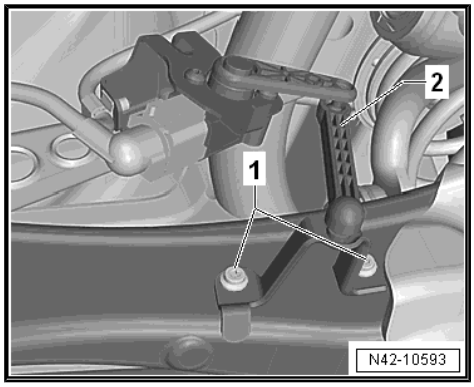


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Vehicles with vehicle level sender.

– Remove screws -1-.

– Remove bracket for rear left vehicle level sender -2-.

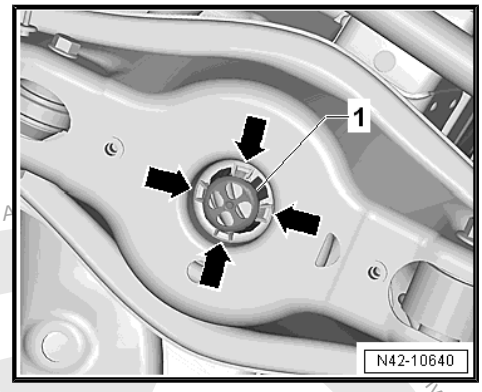


Continued for all vehicles:

– Press lugs -arrows- of assembly aid -1- inwards.

– Remove assembly aid -1- upwards.

– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- under transverse link, and press upwards slightly.



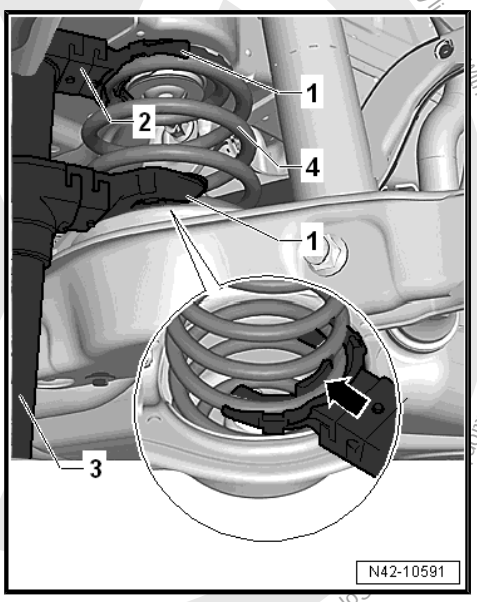
– Insert spring compressor -3-.

1 - Spring retainer - V.A.G 1752/3A-

2 - Adapter - V.A.G 1752/9-

3 - Spring compressor - V.A.G 1752/1-

4 - Spring



WARNING

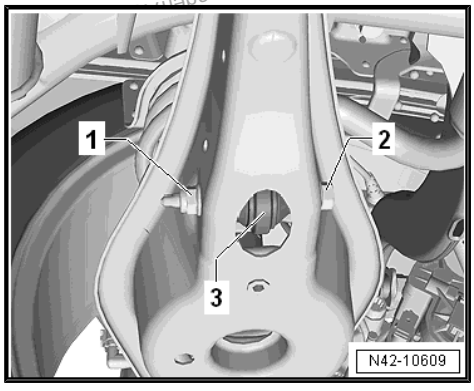
Ensure that coil spring is correctly seated in spring retainer - V.A.G 1752/3A- -arrow- (risk of accident).

Note

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

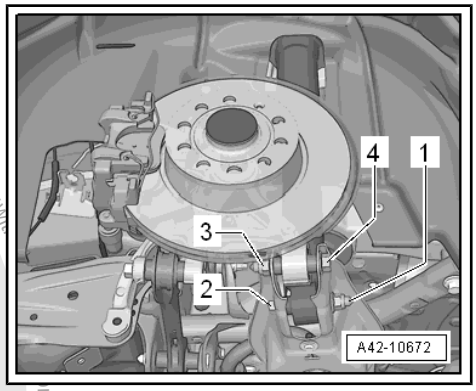
– Compress coil spring.

– Undo nut -1- and pull out bolt -2- for coupling rod -3-.



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– Unscrew nut -1- and pull out bolt -2- securing shock absorber.
– Unscrew nut -3- and pull out bolt -4- securing wheel bearing housing.



WARNING

Hold spring compressor - V.A.G 1752/1- with the compressed spring (risk of accident).

– Slowly lower engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- below transverse link far enough that spring compressor - V.A.G 1752/1- can be removed together with compressed spring.

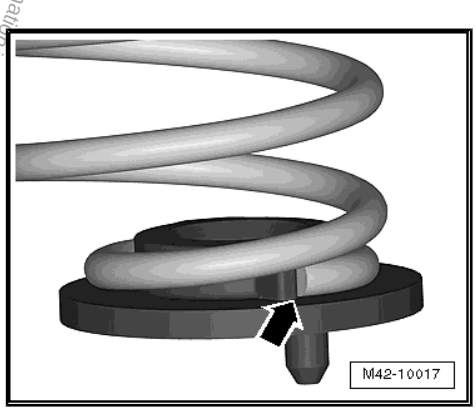
Installing

Install in reverse order of removal. During this step, observe the following:

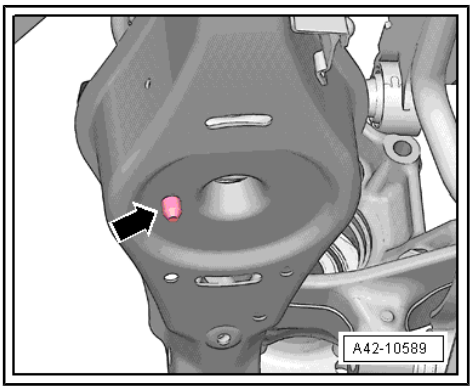
– Check that the lower spring plate is not damaged.
– If necessary, renew lower spring plate.
– Place lower plate onto bottom of coil spring.

End of spring -arrow- must contact stop in lower spring seat.

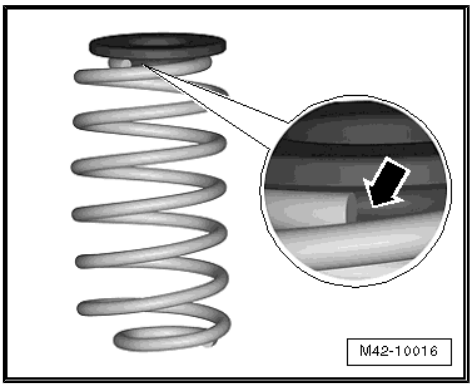
– Mount spring together with spring plate.
– The spring seat has a lug.



– Insert this pin in holes in lower transverse link -arrow-.



– Insert upper spring seat into upper end of spring.
– Bead of spring seat -arrow- must lie against coil spring correctly.



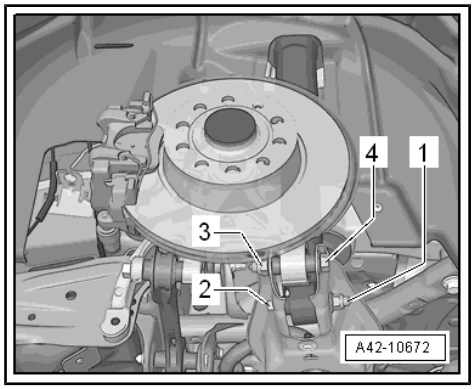
WARNING

Hold spring compressor - V.A.G 1752/1- with the compressed spring (risk of accident).

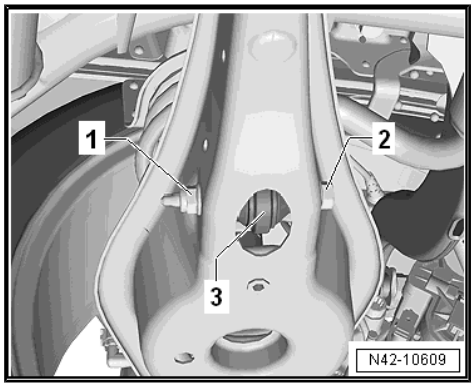
– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- beneath lower transverse link and press upwards.

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– Insert bolt -4- for wheel bearing housing, and screw on nut -3-.
– Insert bolt -2- for shock absorber, and screw on nut -1-.

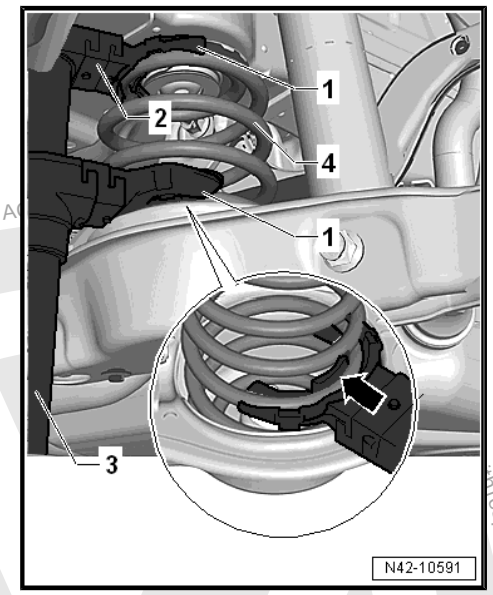


– Insert bolt -2- for coupling rod -3-, and screw on nut -1-.

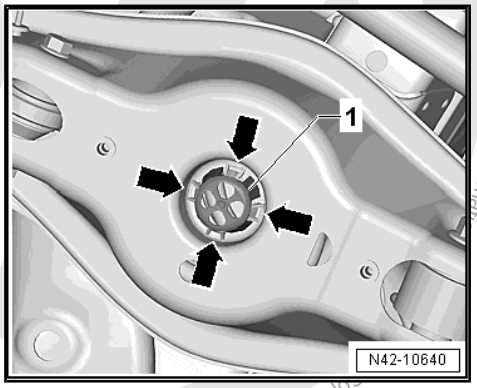


– Release tension on spring -4- while locating upper spring seat on lug on body.
– Remove spring compressor -3-.

1 - Spring retainer - V.A.G 1752/3A-
2 - Adapter - V.A.G 1752/9-
3 - Spring compressor - V.A.G 1752/1-
4 - Spring



– Insert assembly aid -1- and press downwards.
– Lugs -arrows- must engage.



Torque settings

- ⇒ “3.1 Assembly overview - anti-roll bar”, page 170
- ⇒ “4.1 Assembly overview - transverse link”, page 174
- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

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6 Wheel bearing assembly, trailing arm

⇒ “6.1 Assembly overview - wheel bearing”, page 191

⇒ “6.2 Assembly overview - trailing arm”, page 193

⇒ “6.3 Removing and installing wheel bearing housing”, page 193

⇒ “6.4 Removing and installing wheel bearing unit”, page 203

⇒ “6.5 Renewing bonded rubber bush for wheel bearing housing”, page 209

⇒ “6.6 Removing and installing trailing arm with mounting bracket”, page 212

⇒ “6.7 Repairing trailing arm”, page 215

6.1 Assembly overview - wheel bearing

⇒ “6.1.1 Assembly overview - suspension, multi-link suspension, front-wheel drive”, page 191

⇒ “6.1.2 Assembly overview - suspension, multi-link suspension, four-wheel drive”, page 192

6.1.1 Assembly overview - suspension, multi-link suspension, front-wheel drive

1 - Wheel bearing housing

- ❑ Removing and installing ⇒ page 193

2 - Bonded rubber bush

- ❑ Replacing ⇒ page 209

3 - Washer

- ❑ Chamfer of washer must face outwards.

4 - Bolt

- ❑ Specified torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

5 - Brake disc

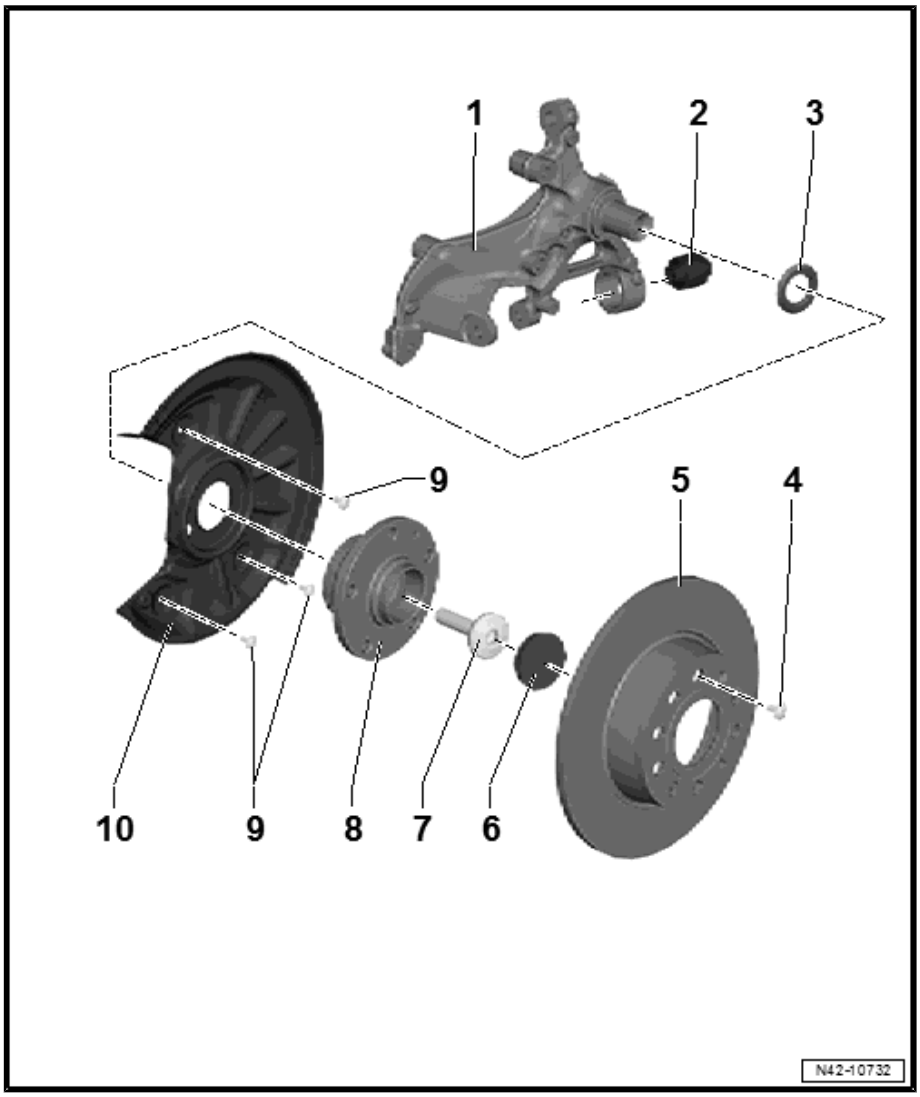
- ❑ Removing and installing: ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

6 - Dust cap

- ❑ Renew after removal
- ❑ Pressing off and driving in ⇒ page 203
- ❑ A proper seal can be achieved only by installing a new grease cap.

7 - Bolt

- ❑ Renew after removal
- ❑ Before fitting, clean threads in stub axle using a thread tap.



- ❑ 200 Nm +90°

8 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 203
- ❑ The wheel bearing and wheel hub are assembled in one housing.
- ❑ This wheel bearing unit is maintenance-free and does not require adjustment. Adjustments and repairs are not possible!
- ❑ Different versions are possible - encoder ring made of plastic or rubber; refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ Always install wheel bearing unit provided - mixing different types is permissible

9 - Bolt

- ❑ Specified torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

10 - Heat shield

- ❑ Removing and installing: ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

6.1.2 Assembly overview - suspension, multi-link suspension, four-wheel drive

1 - Drive shaft

2 - Bolt

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

3 - Wheel bearing housing

- ❑ Removing and installing ⇒ page 198

4 - Bonded rubber bush

- ❑ Replacing ⇒ page 209

5 - Brake disc

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

6 - Bolt

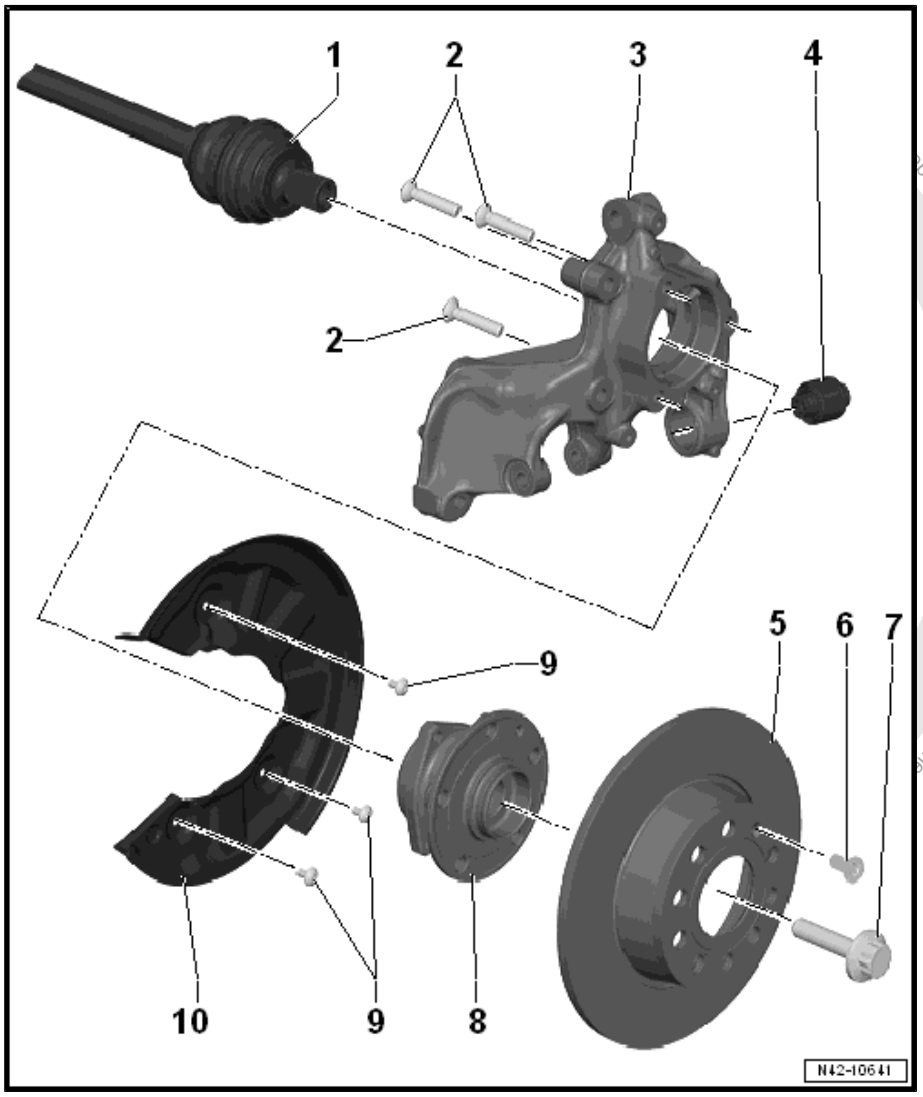
- ❑ Specified torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

7 - Bolt

- ❑ Loosening and tightening ⇒ page 222
- ❑ Renew after removal
- ❑ Before fitting, clean threads in stub axle using a thread tap.
- ❑ 200 Nm +180°

8 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 207
- ❑ The wheel bearing and wheel hub are assembled in one housing.
- ❑ This wheel bearing unit is maintenance-free and does not require adjustment. Adjustments and repairs are not possible!



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9 - Bolt

- ❑ Specified torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

10 - Heat shield

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

6.2 Assembly overview - trailing arm

1 - Cover

2 - Bolt

- ❑ Renew after removal
- ❑ 50 Nm +45°

3 - Mounting bracket

4 - Bolt

- ❑ Renew after removal
- ❑ 90 Nm +90°

5 - Wheel bearing housing

- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue "ETKA"

6 - Trailing arm

- ❑ Removing and installing ⇒ page 212

7 - Bonded rubber bush

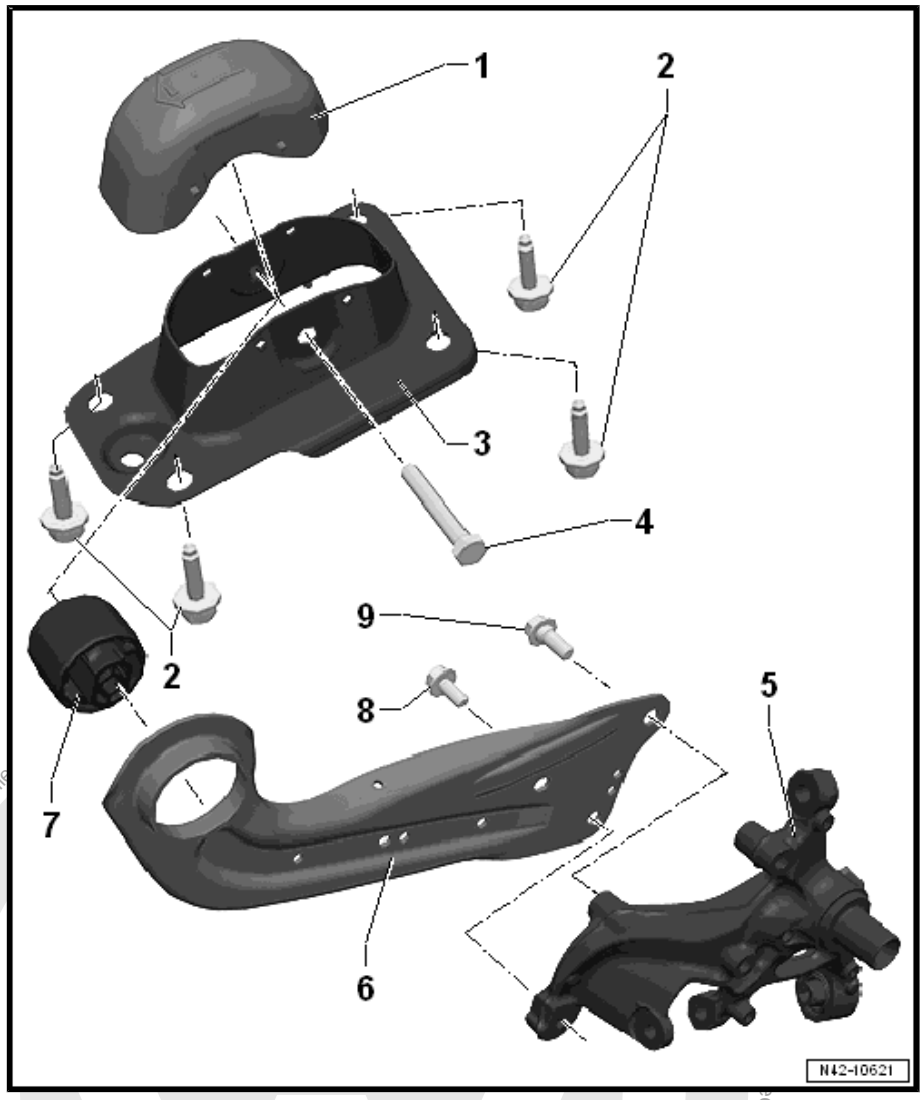
- ❑ Observe installation position
- ❑ Replacing ⇒ page 215

8 - Bolt

- ❑ M12 x 1.5
- ❑ Renew after removal
- ❑ 70 Nm +90°

9 - Bolt

- ❑ M14 x 1.5
- ❑ Renew after removal
- ❑ 70 Nm +90°



6.3 Removing and installing wheel bearing housing

⇒ "6.3.1 Removing and installing wheel bearing housing, multi-link suspension, front-wheel drive", page 193

⇒ "6.3.2 Removing and installing wheel bearing housing, multi-link suspension, four-wheel drive", page 198

6.3.1 Removing and installing wheel bearing housing, multi-link suspension, front-wheel drive

Special tools and workshop equipment required

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- Torque wrench - V.A.G 1332-



- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-

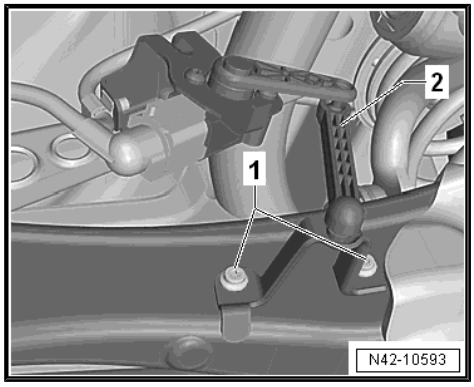


Removing

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.
– Remove wheel bearing unit ⇒ page 203 .
– Remove heat shield ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .
– Remove spring ⇒ page 186 .

Vehicles with vehicle level sender.

– Remove screws -1-.
– Remove bracket for rear left vehicle level sender -2-.



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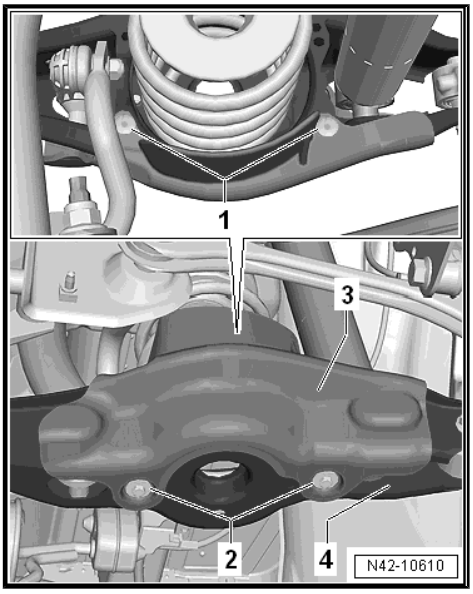
Vehicles with stone guard

– Remove spreader rivet -1-.

– Remove bolts -2- for stone guard -3-.

Continued for all vehicles:

– Disconnect electrical connector from ABS speed sensor and electromechanical parking brake motor.

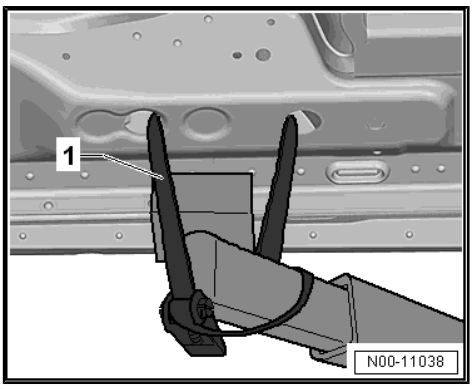


– Use tensioning straps - T10038- to strap vehicle at rear to support beams of lifting platform on both sides.

1 - Tensioning strap - T10038-

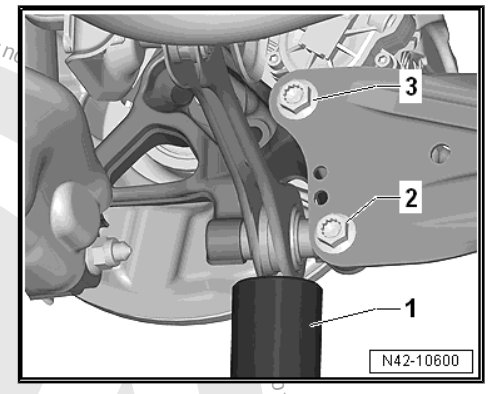
WARNING

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



– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under track rod, and press upwards slightly.

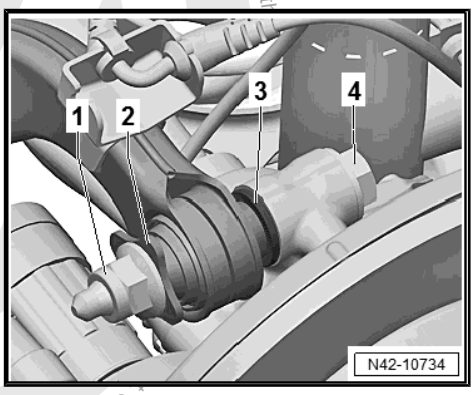
– Remove bolts -2- and -3- one after the other.



– Unscrew nut -1- and remove washer -2-.

– Unscrew bolt -4-.

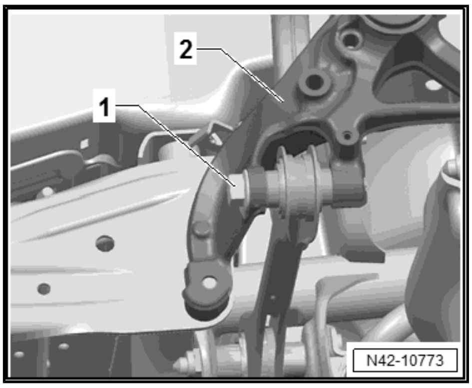
– Remove shim -3-.



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– Unscrew bolt -1-.

– Take out wheel bearing housing -2-.



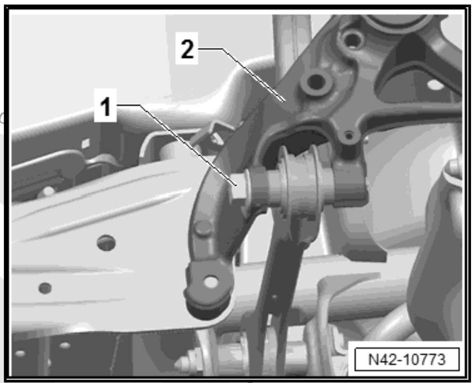
Installing

Install in the reverse order of removal, observing the following:

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

– Insert wheel bearing housing -2-.

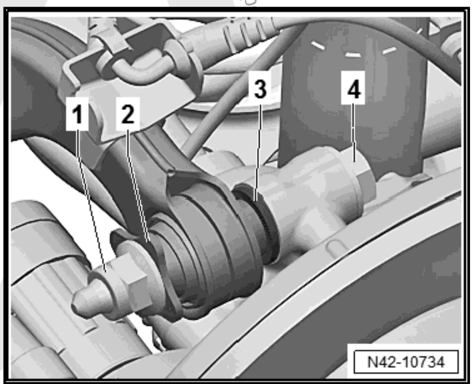
– Insert bolt -1- and tighten only hand-tight.



– Insert bolt -4- with washer -3-.

– Install washer -2-.

– Hand-tighten nut -1-.



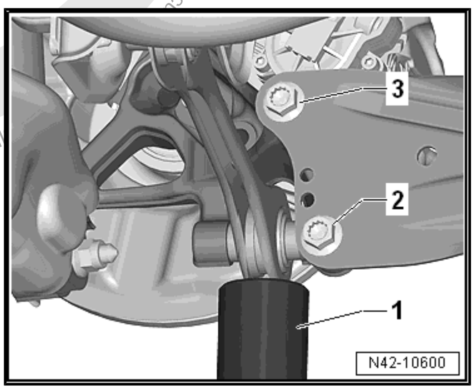
– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under track rod, and press upwards slightly.

– Screw in bolts -2- and -3- by hand.

– Remove engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- from under track rod.

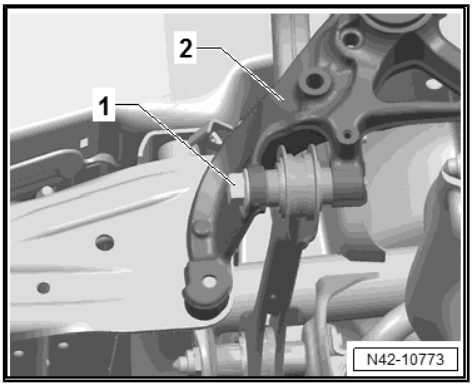
– Install heat shield ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .

– Install wheel bearing unit ⇒ page 203 .

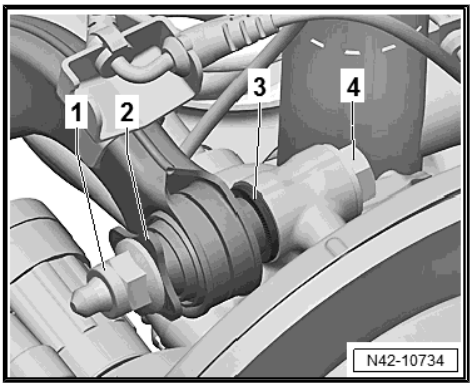


The threaded connections of the wheel bearing housing may only be loosened and tightened in the unladen weight position ⇒ page 8 .

– Tighten bolt -1-.



– Tighten nut -1-.

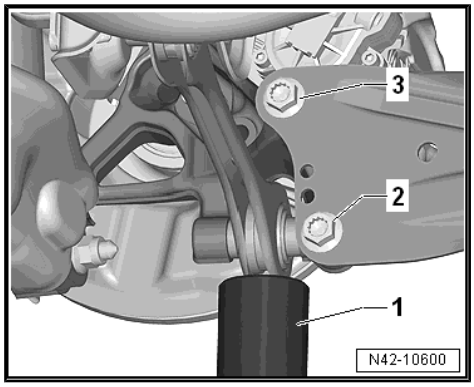


Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

– Installing spring ⇒ page 186 .

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– Tighten bolts -2- and -3-.



The remainder of the installation is carried out in the reverse sequence, when doing this note the following:

Torque settings

- ⇒ “6.1.1 Assembly overview - suspension, multi-link suspension, front-wheel drive”, page 191
- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “6.2 Assembly overview - trailing arm”, page 193
- ⇒ “4.2 Assembly overview - track rod”, page 175
- ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for heat shield, brake caliper and brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

6.3.2 Removing and installing wheel bearing housing, multi-link suspension, four-wheel drive

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



- Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



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Removing

– Loosen bolt securing drive shaft at wheel hub ⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222 .

Caution

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

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

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 on lift.

– Remove wheel.

– Remove wheel bearing unit ⇒ page 203 .

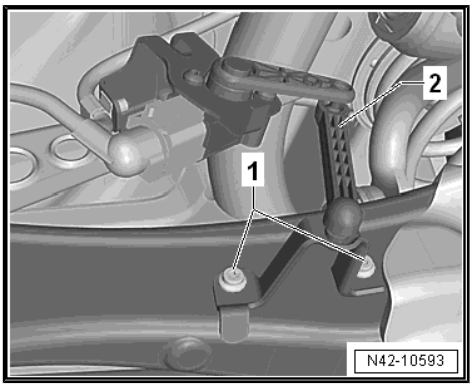
– Remove heat shield ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .

– Remove spring ⇒ page 186 .

Vehicles with vehicle level sender.

– Remove screws -1-.

– Remove bracket for rear left vehicle level sender -2-.



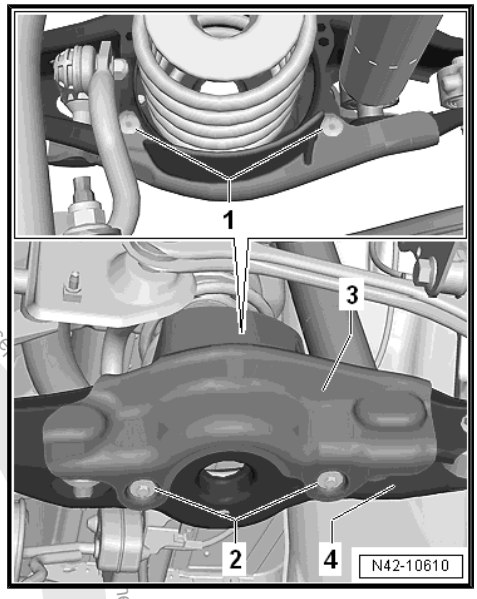
Vehicles with stone guard

– Remove spreader rivet -1-.

– Remove bolts -2- for stone guard -3-.

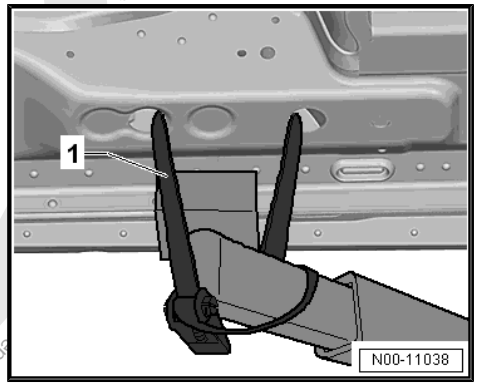
Continued for all vehicles:

– Disconnect electrical connector from ABS speed sensor and electromechanical parking brake motor.



– Use tensioning straps - T10038- to strap vehicle at rear to support beams of lifting platform on both sides.

1 - Tensioning strap - T10038-



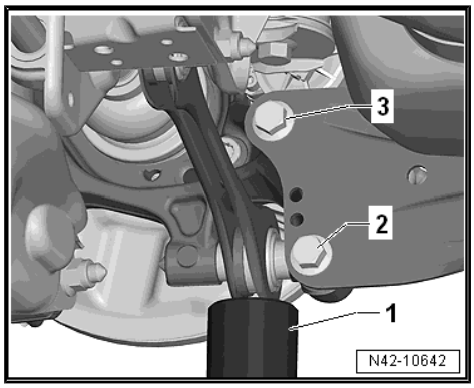
WARNING

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

– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under track rod, and press upwards slightly.

– Remove bolts -2- and -3- one after the other.

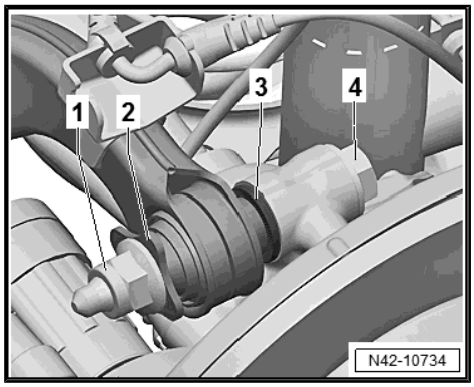
– Remove engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- from under track rod.



– Unscrew nut -1- and remove washer -2-.

– Unscrew bolt -4-.

– Remove shim -3-.

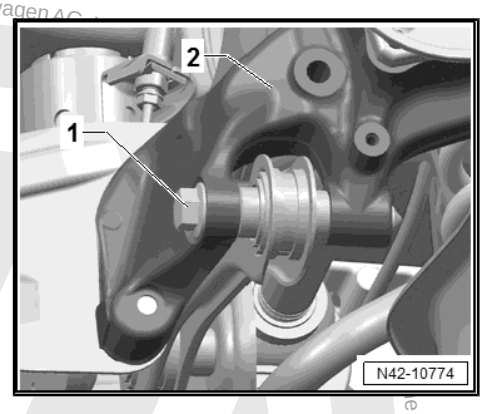


– Unscrew bolt -1-.
– Take out wheel bearing housing -2-.

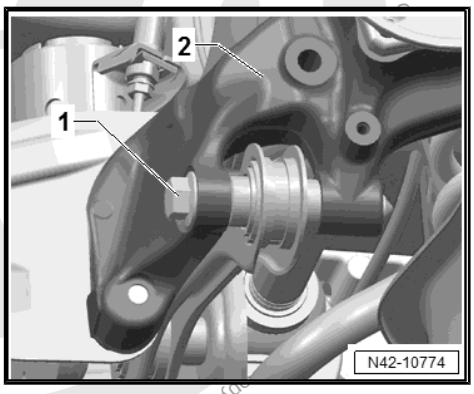
Installing

Install in the reverse order of removal, observing the following:

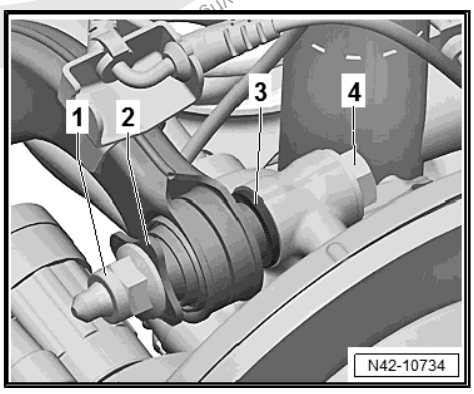
It is essential to follow specified sequence of work steps below!



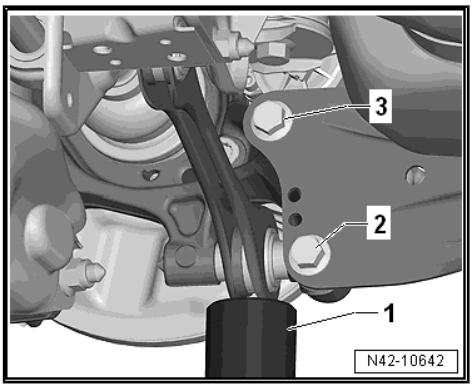
– Insert wheel bearing housing -2-.
– Insert bolt -1- and tighten only hand-tight.



– Insert bolt -4- with washer -3-.
– Install washer -2-.
– Hand-tighten nut -1-.



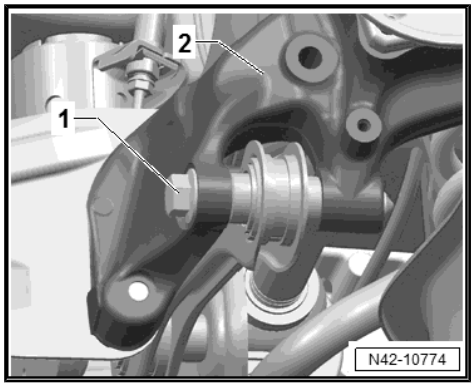
– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under track rod, and press upwards slightly.
– Screw in bolts -2- and -3- by hand.
– Remove engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- from under track rod.
– Install wheel bearing unit ⇒ page 203 .
– Install heat shield ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .



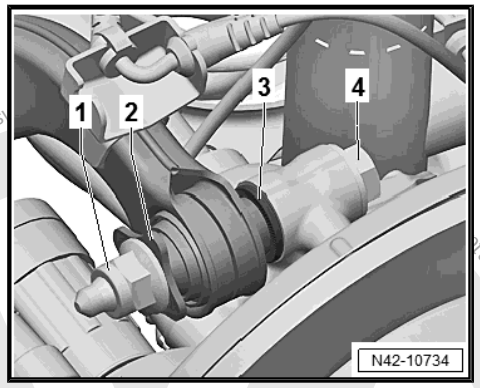
The threaded connections of the wheel bearing housing may only be loosened and tightened in the unladen weight position ⇒ page 8 .

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– Tighten bolt -1-.



– Tighten nut -1-.



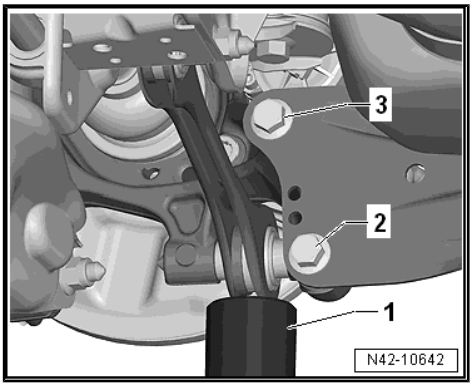
Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.



– Install coil spring ⇒ page 186 .

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– Tighten bolts -2- and -3-.



The remainder of the installation is carried out in the reverse sequence, when doing this note the following:

Torque settings

- ⇒ “6.1.2 Assembly overview - suspension, multi-link suspension, four-wheel drive”, page 192
- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “6.2 Assembly overview - trailing arm”, page 193
- ⇒ “4.2 Assembly overview - track rod”, page 175
- ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245
- ⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for heat shield, brake caliper and brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

6.4 Removing and installing wheel bearing unit

⇒ “6.4.1 Removing and installing wheel bearing unit, multi-link suspension, front-wheel drive”, page 203

⇒ “6.4.2 Removing and installing wheel bearing unit, multi-link suspension, four-wheel drive”, page 207

6.4.1 Removing and installing wheel bearing unit, multi-link suspension, front-wheel drive

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Special tools and workshop equipment required

- Fitting sleeve - 3241/4-
- Hub grease cap puller - VW 637/2-
- Torque wrench - V.A.G 1332-
- Hexagon bit, long reach - T10162 A-
- Torque wrench - V.A.G 1410-



Removing

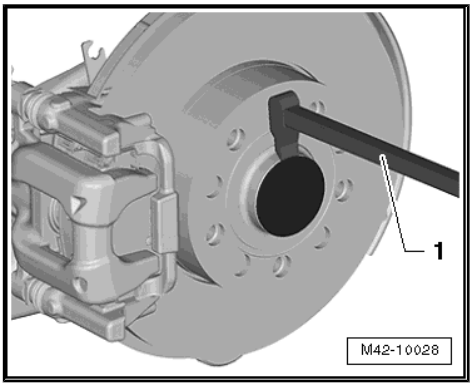
Note

- *There are different versions of the wheel bearing unit - encoder ring made of plastic or rubber; refer to ⇒ Electronic Parts Catalogue "ETKA".*
- *Always install the provided wheel bearing unit. It is permitted to install mixed types.*

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.

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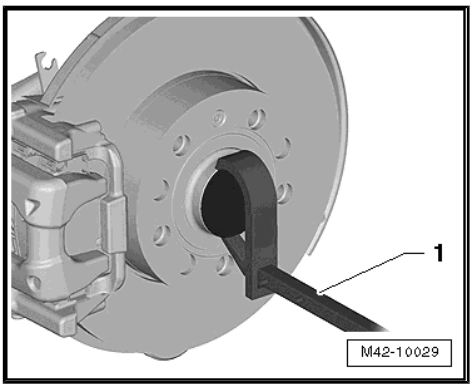
– Loosen grease cap from seat by tapping lightly on claw of hub grease cap puller - VW 637/2- -1-.



– Pry off grease cap.

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

– Detach brake carrier with brake caliper and tie to body with wire ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .



Note

Hang brake caliper from body.

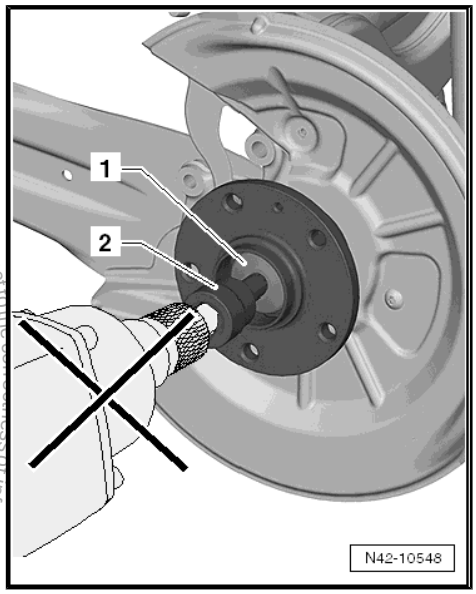
– Remove bolt for brake disc and remove brake disc.

– Unscrew bolt -1- using socket - T10162 A- -2-.

Caution

Do not use an impact driver when removing bolt -1- with socket - T10162 A- -2-!

– Pull wheel bearing unit off stub axle.



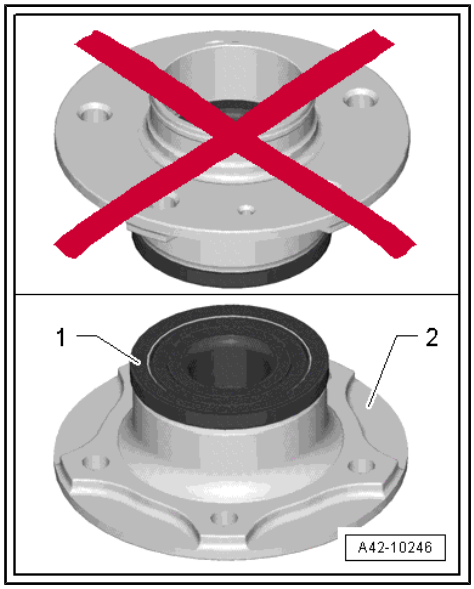
Caution

- ***Avoid soiling and damage to seal when placing on a surface or storing.***

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Wheel bearing -1- must always face upwards.

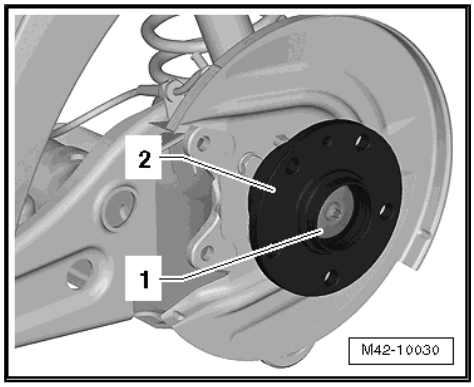
– Always set wheel bearing unit on hub -2- when placing on a surface.



Installing

Install in the reverse order of removal, observing the following:

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



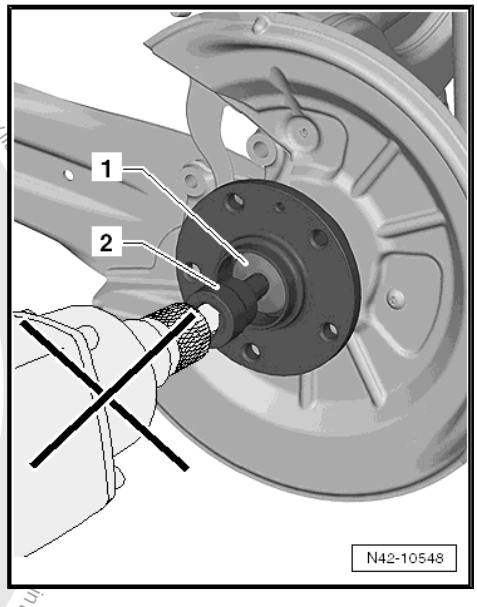
Caution

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

– Screw in new bolt -1- and tighten to specified torque.

Note

- *First tighten bolt to specified torque setting using torque wrench.*
- *Use a rigid spanner for turning further by angle.*



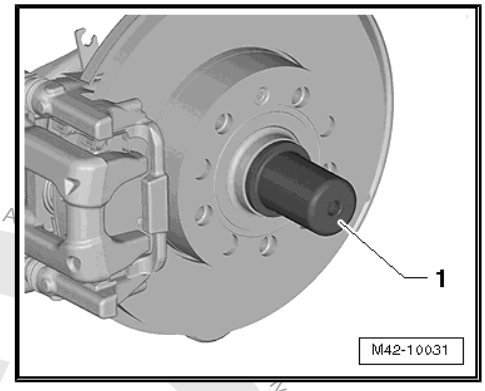
Caution

Do not use an impact driver when tightening bolt -1- with socket - T10162 A- -2-!

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– Drive in grease cap.

1 - Fitting sleeve - 3241/4-



Always renew removed grease caps.

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

Torque settings

- ⇒ “6.1.1 Assembly overview - suspension, multi-link suspension, front-wheel drive”, page 191
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for heat shield, brake caliper and brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

6.4.2 Removing and installing wheel bearing unit, multi-link suspension, four-wheel drive

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



- Torque wrench - V.A.G 1410-



Removing

– Loosen outer drive shaft threaded connection ⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222 .

– Remove coil springs ⇒ page 186 .

– Remove drive shaft ⇒ page 223 .

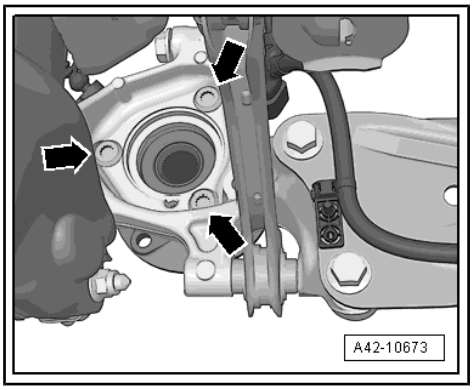
– Detach brake carrier with brake caliper and tie to body with wire ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes .

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Note

Do not suspend brake caliper by brake hose - risk of damage.

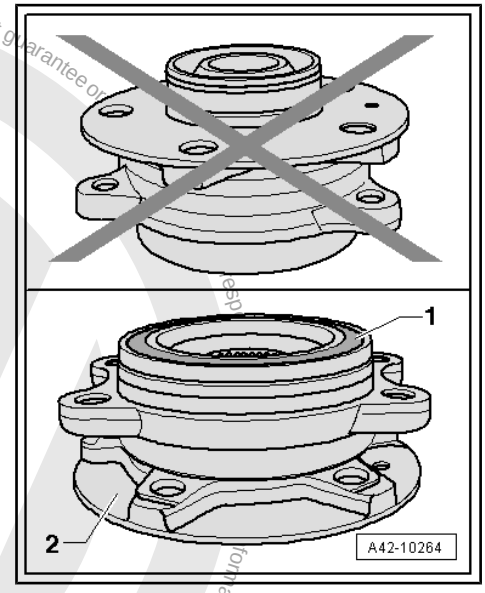
– Remove bolt for brake disc and remove brake disc.
– Unscrew bolts -arrows-.
– Pull wheel bearing unit from wheel bearing housing.



Caution

- ***Avoid soiling and damage to seal when placing on a surface/storing.***

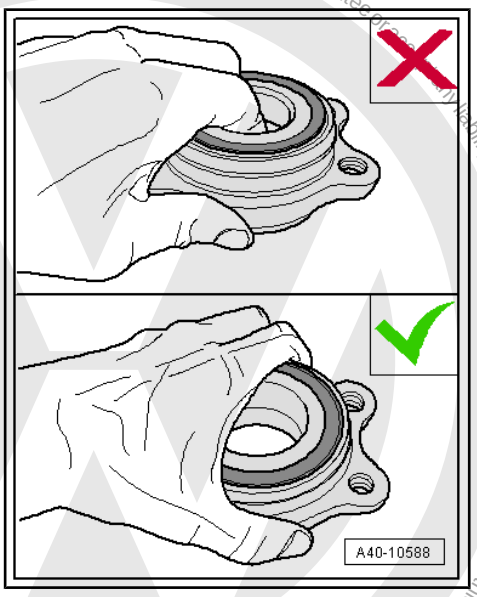
- Wheel bearing -1- must always face upwards.
- Always set wheel bearing unit on hub -2- when placing on a surface.



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- When picking wheel bearing up, never grasp inner side.
- Grasp only outer side of wheel bearing.

The same procedure applies to the wheel bearing without hub.



Installing

Install in the reverse order of removal, observing the following:

- The threaded connections of the wheel bearing housing may only be loosened and tightened in the unladen weight position ⇒ page 8 .

Torque settings

- ⇒ “6.1.2 Assembly overview - suspension, multi-link suspension, four-wheel drive”, page 192
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- ⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222
- Bolts for heat shield, brake caliper and brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Assembly overview - rear brakes

– When does wheel alignment have to be checked ⇒ page 268 ?

6.5 Renewing bonded rubber bush for wheel bearing housing

Special tools and workshop equipment required

- Assembly tool - 3301-
- Assembly tool - 3350-
- Torque wrench - V.A.G 1332-
- Viscous fan fitting tool - 3367-
- Follower - 3390-
- Assembly tool - 3346-

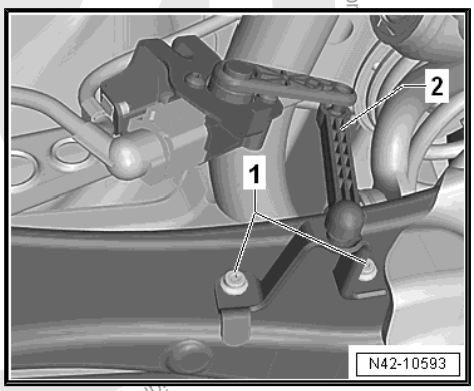


Removing

– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.

Vehicles with vehicle level sender.

– Remove screws -1-.
– Remove bracket for rear left vehicle level sender -2-.



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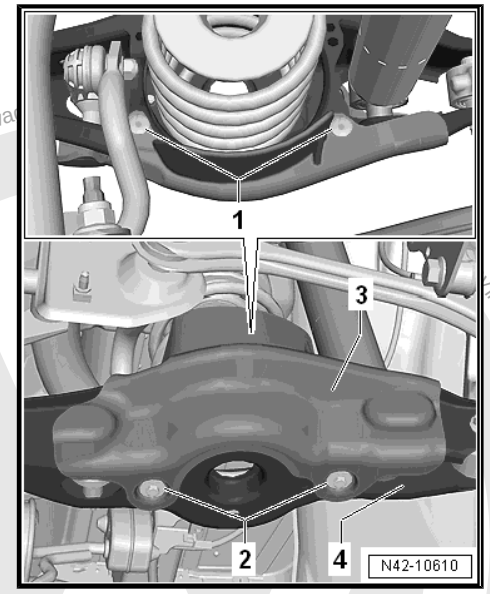
Vehicles with stone guard

– Remove spreader rivet -1-.

– Remove bolts -2- for stone guard -3-.

Continued for all vehicles:

– Remove spring ⇒ page 186 .



Pressing out bonded rubber bush

1 - Nut - 3346/3-

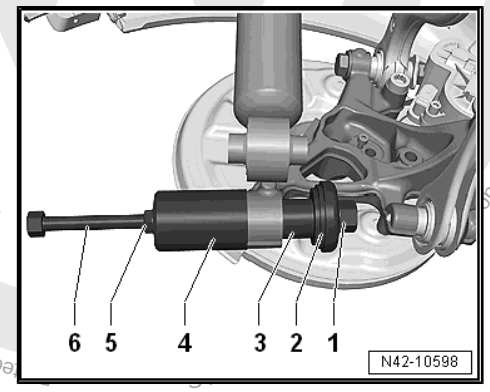
2 - Thrust disc from assembly tool - 3301-

3 - Follower - 3390-

4 - Sleeve from assembly tool - 3350-

5 - Nut

6 - Spindle - 3346/2-

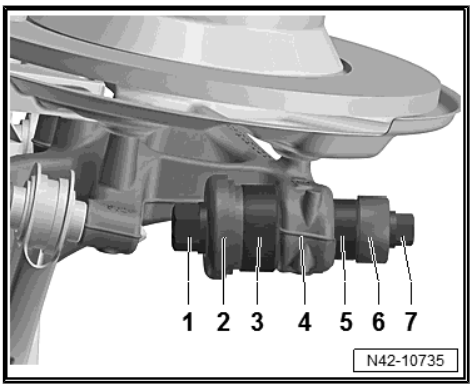


– Pull out bonded rubber bush by turning nut - 3346/3- -1-. When doing this, counterhold spindle - 3346/2- -6-.

Pulling in bonded rubber bush

Note

- *When pulling in, make sure that the tip of the spindle - 3301/1- does not rest against the wheel bearing housing.*
- *Do not use lubricant.*
- *Insert bearing carefully so it does not cant.*



1 - Nut from assembly tool - 3301-

2 - Thrust disc from assembly tool - 3301-

3 - Thrust piece from assembly tool - 3346- , with open side facing towards wheel bearing housing

4 - Wheel bearing housing

5 - Bonded rubber bush

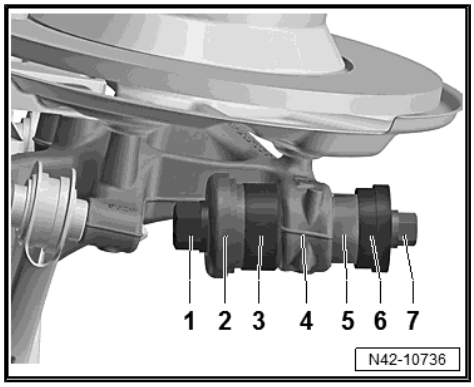
6 - Press tool - 3367/2-

7 - Spindle - 3301/1-

– Pull in bonded rubber bush by turning nut - 3301- -1- just far enough so that it is positioned right in front of wheel bearing housing. When doing this, counterhold spindle - 3301/1- -7-.

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– Remove tools, and fit them again as shown in illustration.



1 - Nut from assembly tool - 3301-

2 - Thrust disc from assembly tool - 3301-

3 - Thrust piece from assembly tool - 3346- , with open side facing towards wheel bearing housing

4 - Wheel bearing housing

5 - Press tool - 3367/2-

6 - Press tool - 3301/2-

7 - Spindle - 3301/1-

– Pull in bonded rubber bush to stop by turning nut - 3301- -1-. When doing this, counterhold spindle - 3301/1- -7-.

Installing

The remainder of the installation is carried out in the reverse sequence, when doing this note the following:

Torque settings

- ⇒ “6.1 Assembly overview - wheel bearing”, page 191
- ⇒ “5.1 Assembly overview - suspension strut, shock absorber, spring”, page 180
- ⇒ “3.1 Assembly overview - anti-roll bar”, page 170
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

- The threaded connections to the lower transverse link may only be loosened and tightened in the unladen weight position ⇒ page 8 .
- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

6.6 Removing and installing trailing arm with mounting bracket

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



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♦ Engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A-



Removing

– Loosen wheel bolts.

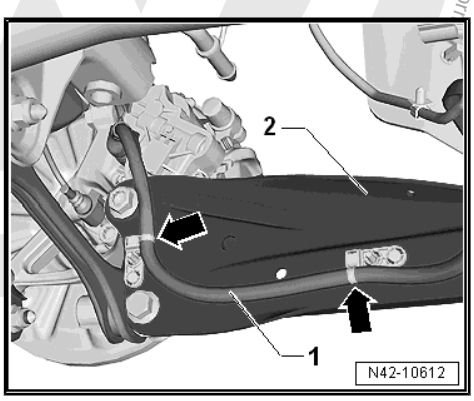
– Raise vehicle on lift.

– Remove wheel.

– Remove spring ⇒ page 186 .

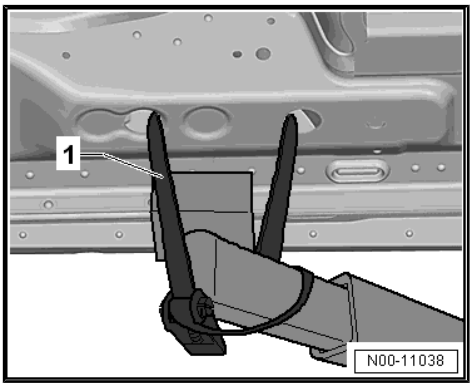
– If fitted, remove underbody cladding on mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding .

– Detach line -1- from trailing arm -2-. To do this push out inner pin of retainer -arrows-.



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

1 - Tensioning strap - T10038-

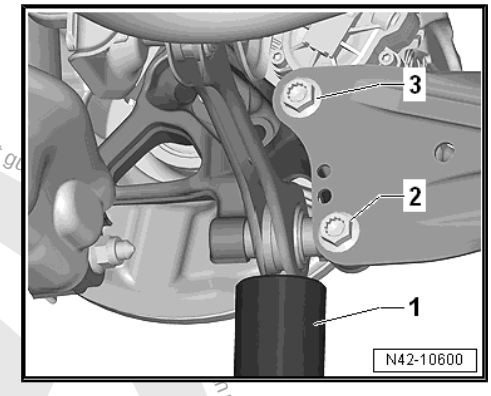


WARNING

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

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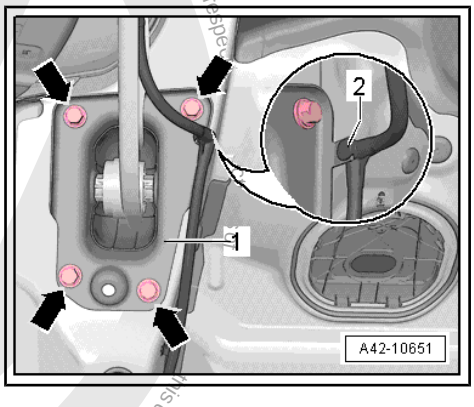
– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under track rod, and press upwards slightly.
– Remove bolts -2- and -3- one after the other.
– Remove engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- from under track rod.



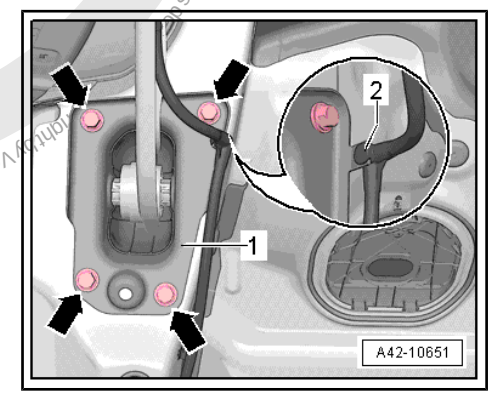
– Detach wire -2- from mounting bracket -1-.
– Mark installation position of mounting bracket -1- on body.
– Unscrew bolts -arrows-.
– Remove trailing arm with mounting bracket.

Installing

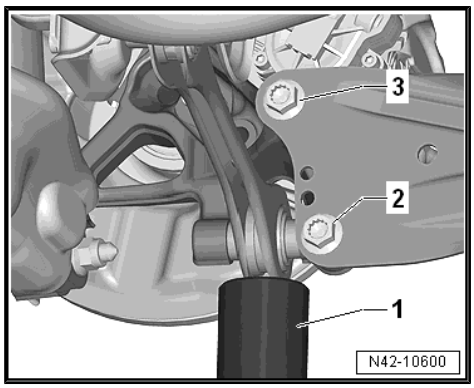
Install in the reverse order of removal, observing the following:



– Tighten bolts -arrows- onto old impression marks or previously applied marks.
– Secure line -2- on mounting bracket -1-.



– Position engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under track rod, and press upwards slightly.
– Screw in bolts -2- and -3- by hand.
– Remove engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- from under track rod.

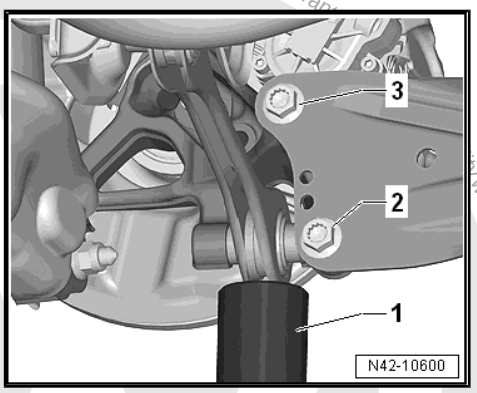


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Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

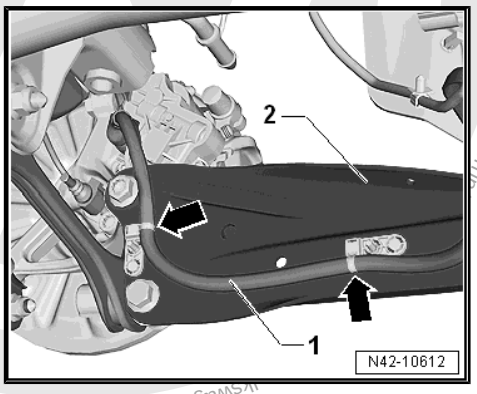
– Installing spring ⇒ page 180 .

– Tighten bolts -2- and -3-.



– Install retainers -arrows- on trailing arm -2- for line -1-. To do this push in inner pin of rivets.

– If present, install underbody cover to mounting bracket of trailing arm ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cover; Overview of fitting locations - trims .



Torque settings

- ⇒ “6.2 Assembly overview - trailing arm”, page 193
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

After installation, wheel alignment must be checked on wheel alignment unit ⇒ page 268 .

6.7 Repairing trailing arm

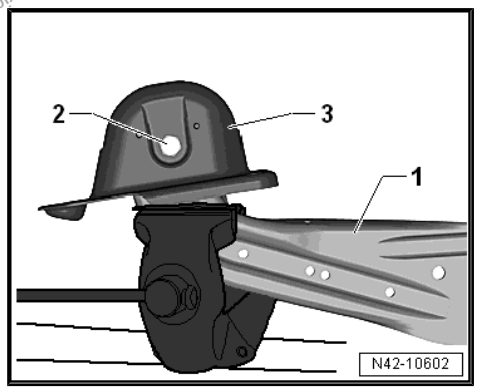
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Special tools and workshop equipment required

- Tube for wheel bearing - 3345-
- Assembly tool - 3346-
- Pressure plate - VW 402-
- Press piece - VW 412-
- Press tool - T10496-

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– Remove trailing arm with mounting bracket ⇒ page 212 .
– Clamp trailing arm -1- in vice using protective jaw covers.
– Undo bolt -2- and remove mounting bracket -3- from trailing arm.



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Pressing out bonded rubber bush

– Fit tools as shown in illustration.

1 - Press tool - VW 412-

2 - Tube -3346/1- from assembly tool - 3346- (the deep recess must face the bonded rubber bush)

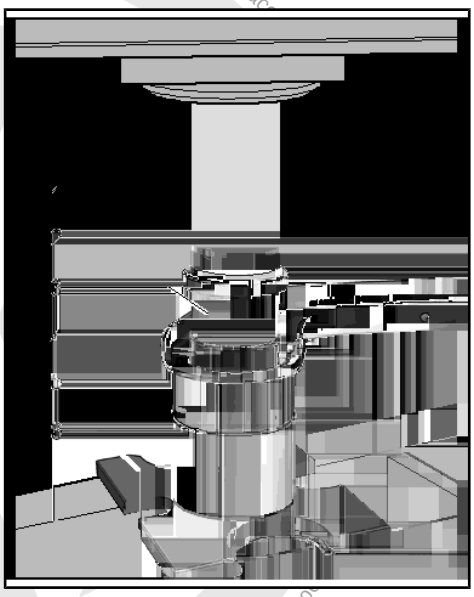
3 - Trailing arm

4 - Bonded rubber bush

5 - Tube for wheel bearing - 3345-

6 - Thrust plate - VW 402-

– Press out bonded rubber bush.



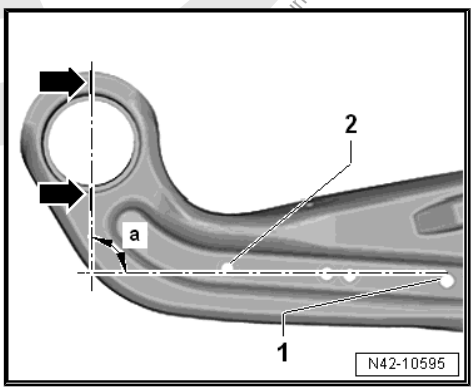
Pressing in bonded rubber bush

– Mark position of bonded rubber bush on trailing arm using a set square.

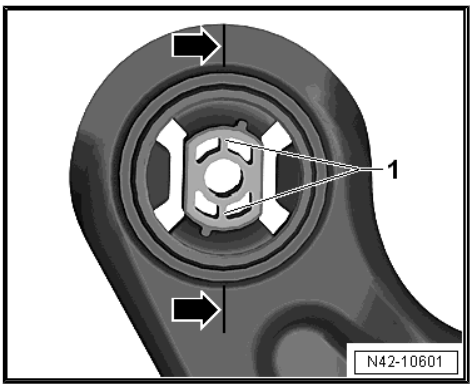
– Position outer edge of set square on upper radius of hole -1- and on lower radius of hole -2-.

– Make a mark above and below the trailing arm bush respectively -arrows-.

a - 90°



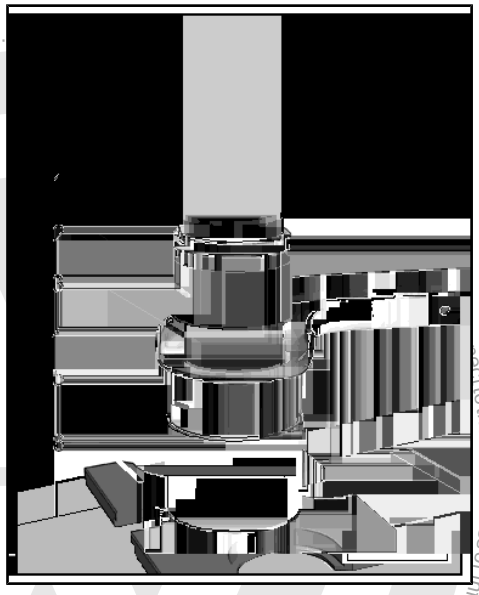
Position bonded rubber bush on trailing arm so that marked line -arrows- lies between the ribs -1-.



Note

Take great care to ensure that the installation position of the bonded rubber bush is correct relative to the bush in the trailing arm.

– Fit tools as shown in illustration.

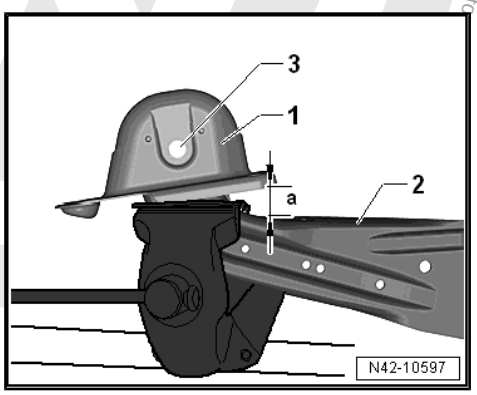


1 - Press tool - VW 412-
2 - Press tool - T10496-
3 - Bonded rubber bush
4 - Trailing arm
5 - Tube for wheel bearing - 3345-
6 - Thrust plate - VW 402-

– Pressing in bonded rubber bush.

Determining position of mounting bracket in relation to trailing arm

– Clamp trailing arm -2- in vice using protective jaw covers.
– Position mounting bracket -1- on trailing arm -2-.
– Screw in bolt -3-.
– Set dimension -a- to 37 mm and tighten bolt -3-.
– Install trailing arm with mounting bracket ⇒ page 212 .



Torque settings

- ⇒ “6.2 Assembly overview - trailing arm”, page 193
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

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7 Drive shaft

⇒ “7.1 Assembly overview - drive shaft”, page 219

⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222

⇒ “7.3 Removing and installing drive shaft”, page 223

⇒ “7.4 Dismantling and assembling drive shaft”, page 229

⇒ “7.5 Checking outer constant velocity joint”, page 234

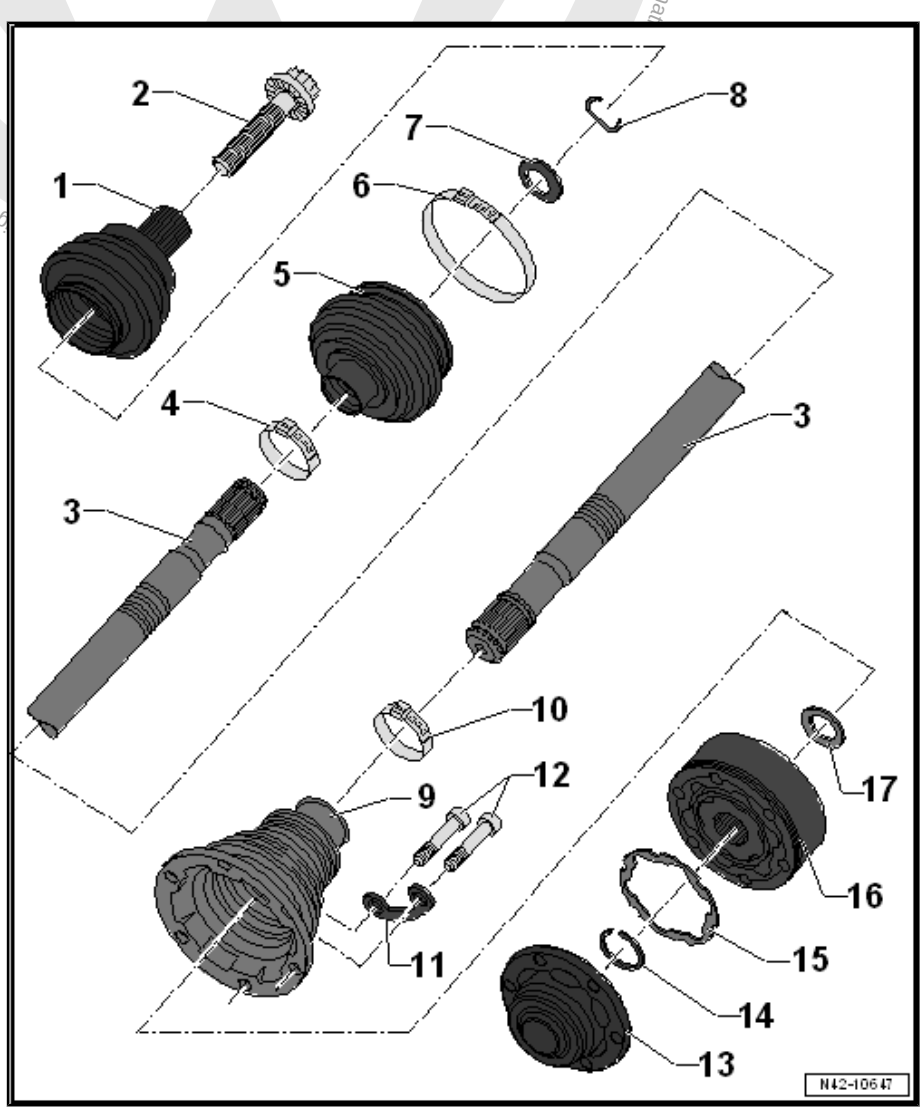
⇒ “7.6 Checking inner constant velocity joint”, page 235

7.1 Assembly overview - drive shaft

⇒ “7.1.1 Assembly overview - drive shaft, constant velocity joint VL90”, page 219

⇒ “7.1.2 Assembly overview - drive shaft, constant velocity joint VL100i”, page 221

7.1.1 Assembly overview - drive shaft, constant velocity joint VL90



1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 231
- ❑ Installing: drive onto shaft to stop using plastic hammer
- ❑ Distribute grease evenly in joint
- ❑ Checking ⇒ page 234

2 - Bolt

- ❑ Renew after removal
- ❑ Before securing, clean the threads in the CV joint using a thread tap.
- ❑ 200 Nm +180° ⇒ page 222 .

3 - Drive shaft

- ❑ Allocation ⇒ Electronic parts catalogue

4 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 234

5 - Boot

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

6 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 233

7 - Dished spring

- ❑ With inner splines

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- ❑ Fitting position ⇒ page 232

8 - Locking ring

- ❑ Renew after removal
- ❑ Insert in groove in shaft

9 - Boot for constant velocity joint

- ❑ Material: Hytrel (polyester elastomer)
- ❑ Without breather hole
- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.

10 - Clamping piece

- ❑ Renew after removal
- ❑ Tightening ⇒ page 234

11 - Locking plate

12 - Multi-point socket head bolt

- ❑ Renew after removal
- ❑ Pre-tighten diagonally to 10 Nm and then tighten diagonally to specified torque
- ❑ 40 Nm

13 - Cover

- ❑ Renew after removal
- ❑ Always renew
- ❑ Pressing off ⇒ page 232

14 - Locking ring

- ❑ Renew after removal
- ❑ Remove and install with circlip pliers - VW 161 A- .

15 - Seal

- ❑ Renew after removal
- ❑ Adhesive surface on constant velocity joint must be free of oil and grease!

16 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Distribute grease evenly in joint
- ❑ Pressing off ⇒ page 232
- ❑ Pressing on ⇒ page 233
- ❑ Checking ⇒ page 235

17 - Dished spring

- ❑ With inner splines
- ❑ Fitting position ⇒ page 232

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7.1.2 Assembly overview - drive shaft, constant velocity joint VL100i



1 - Outer constant velocity joint
- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 231
- ❑ Installing: drive onto shaft to stop using plastic hammer
- ❑ Distribute grease evenly in joint
- ❑ Checking ⇒ page 234

2 - Bolt
- ❑ Renew after removal
- ❑ Before securing, clean the threads in the CV joint using a thread tap.
- ❑ 200 Nm +180° ⇒ page 222 .

3 - Drive shaft
- ❑ Allocation ⇒ Electronic parts catalogue

4 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 234

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

6 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 233

7 - Dished spring
- ❑ With inner splines
- ❑ Fitting position ⇒ page 232

8 - Locking ring
- ❑ Renew after removal
- ❑ Insert in groove in shaft

9 - Boot for constant velocity joint
- ❑ Material: Hytrel (polyester elastomer)
- ❑ Without breather hole
- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.

10 - Clamping piece
- ❑ Renew after removal
- ❑ Tightening ⇒ page 234

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11 - Locking plate

12 - Multi-point socket head bolt

- ❑ Renew after removal
- ❑ Pre-tighten diagonally to 10 Nm and then tighten diagonally to specified torque
- ❑ 40 Nm

13 - Locking ring

- ❑ Renew after removal
- ❑ Remove and install with circlip pliers - VW 161 A- .

14 - Seal

- ❑ Renew after removal
- ❑ Adhesive surface on constant velocity joint must be free of oil and grease!

15 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Distribute grease evenly in joint
- ❑ Pressing off ⇒ page 232
- ❑ Pressing on ⇒ page 233
- ❑ Checking ⇒ page 235

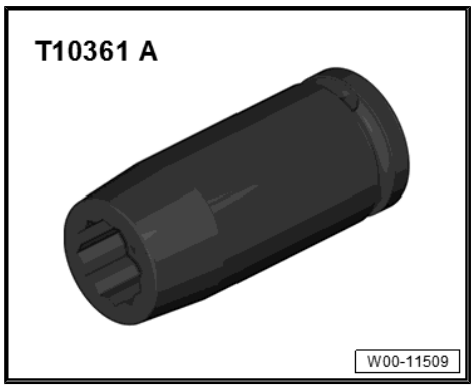
16 - Dished spring

- ❑ With inner splines
- ❑ Fitting position ⇒ page 232

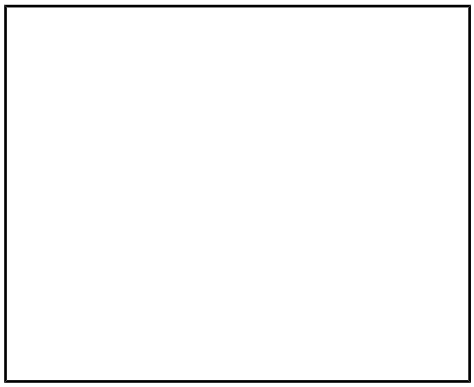
7.2 Loosening and tightening threaded connections of drive shaft

Special tools and workshop equipment required

- ♦ Socket AF 24 - T10361A-



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



Caution

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

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

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.*

Loosening twelve-point head bolt

– To avoid damage to wheel bearing, do not loosen twelve-point bolt using 24 mm socket - T10361A- further than 90° with vehicle still standing on its wheels.

– Raise vehicle so that wheels are off the ground.

– Have second mechanic apply brakes.

– Remove twelve-point head bolt -arrow-.



Fitting twelve-point head bolt

– Renew twelve-point bolt.

Note

It must be ensured that the wheels do not yet touch the floor when the drive shaft is being tightened. Otherwise the wheel bearing may be damaged.

– Have second mechanic apply brakes.

– Tighten twelve-point bolt to 200 Nm.

– Lower vehicle onto its wheels.

– Turn twelve-point head bolt 180° further.

7.3 Removing and installing drive shaft

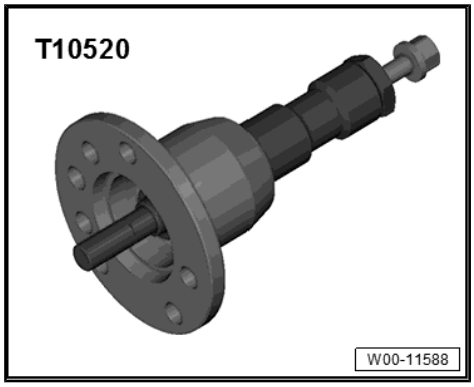
Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-

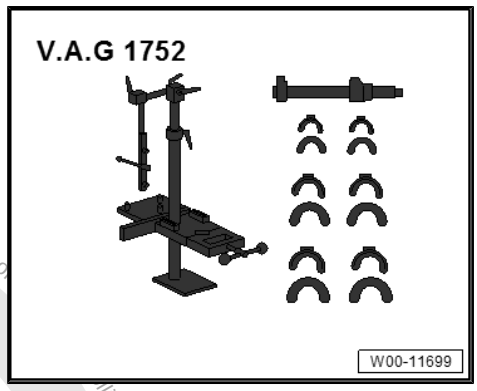


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- Press tool - T10520-



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



Caution

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

Removing

– Loosen bolt securing drive shaft at wheel hub
⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222 .

Caution

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

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

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.*

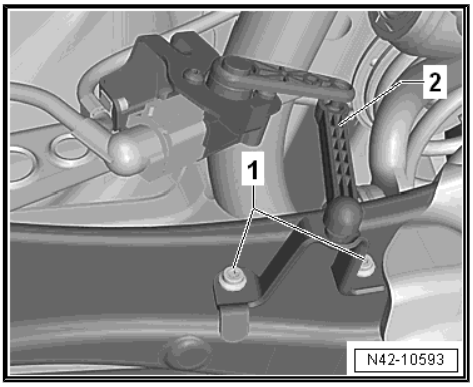
– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.

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Vehicles with vehicle level sender.

– Remove screws -1-.

– Remove bracket for rear left vehicle level sender -2-.



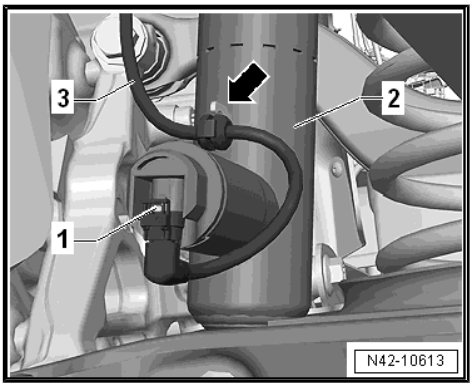
Vehicles with adaptive chassis control DCC

– Disconnect connector -1- on shock absorber -2-.

– Pull line -3- off shock absorber -2- -arrow-.

Note

If there is moisture in the area of the connector, blow compressed air on the contacts on the shock absorber and the connector.

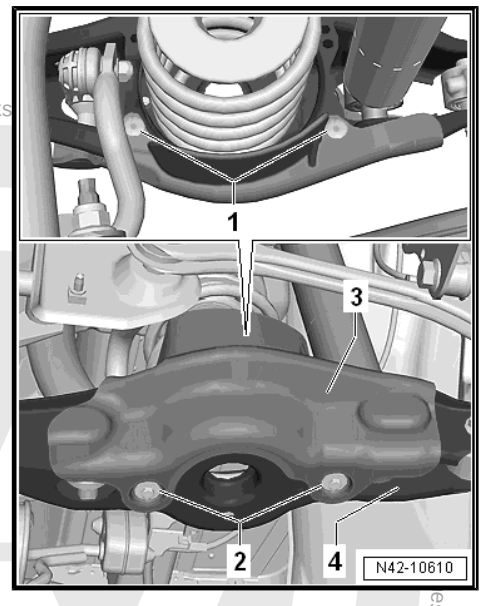


Vehicles with stone guard

– Remove spreader rivet -1-.

– Remove bolts -2- for stone guard -3-.

Continued for all vehicles:



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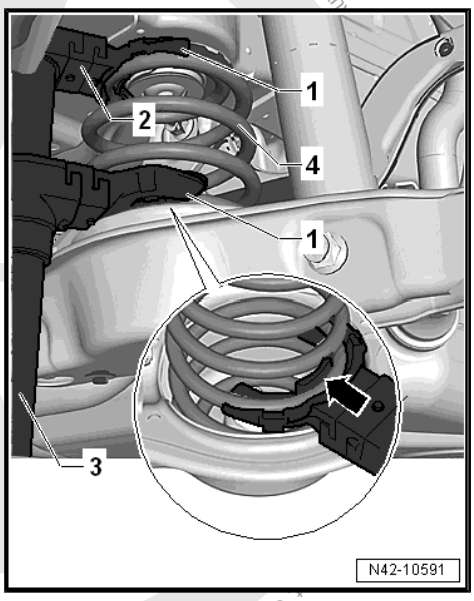
– Insert spring compressor -3-.

1 - Spring retainer - V.A.G 1752/3A-

2 - Adapter - V.A.G 1752/9-

3 - Spring compressor - V.A.G 1752/1-

4 - Spring



WARNING

Ensure that coil spring is correctly seated in spring retainer - V.A.G 1752/3A- -arrow- (risk of accident).

Note

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

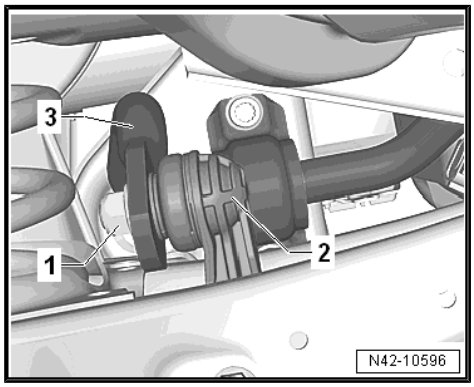
– Compress coil spring.

Note

The spring compressor remains in the vehicle together with the spring.

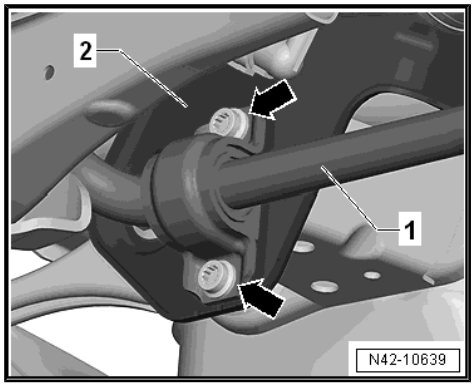
– Unscrew nut -1- from coupling rod -2-.

– Pull coupling rod -2- out of anti-roll bar -3-.



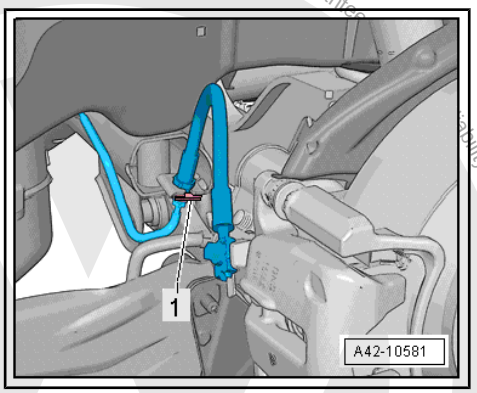
– Remove bolts -arrows- for anti-roll bar -1-.

– Pull anti-roll bar -1- off subframe -2- and swing it downwards.



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– Pull out retaining clip -1- on both sides of vehicle.
– Free brake lines from holder.



Note

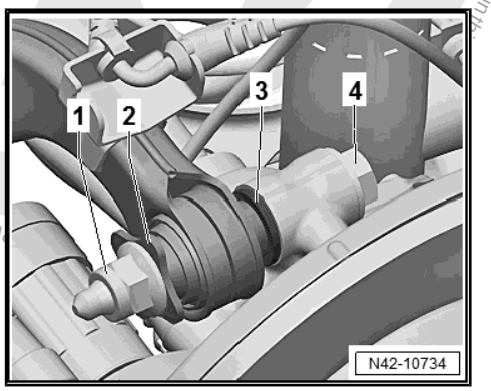
Do not open brake line.

Only right drive shaft

– Unbolt rear silencer on rear right.

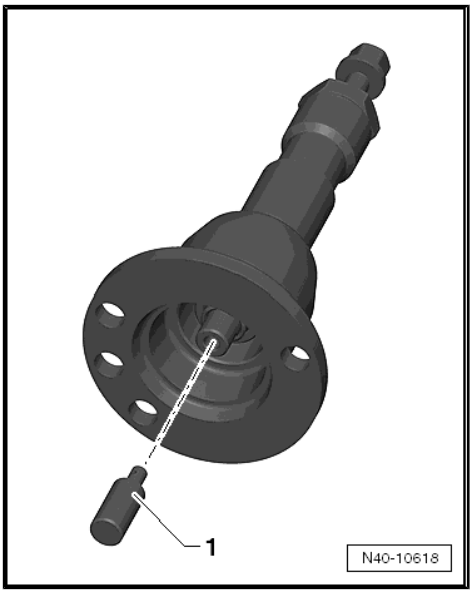
Continuation for both sides

– Unbolt drive shaft at gearbox flange.
– Disconnect electrical connector from ABS speed sensor and electromechanical parking brake motor.
– If fitted, detach line from retainer on transverse link.
– Unscrew nut -1- and remove washer -2-.
– Unscrew bolt -4-.
– Remove shim -3-.
– Swing wheel bearing housing outwards and pull drive shaft out of gearbox flange.
– Swing drive shaft downwards and remove from wheel bearing.



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

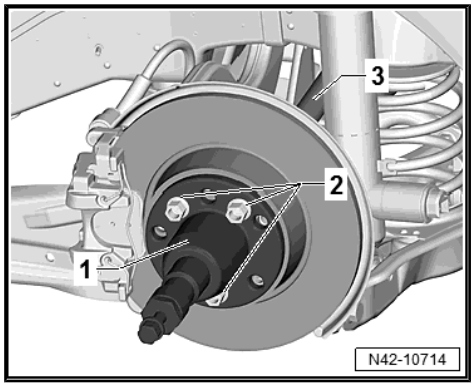
Before using press tool - T10520- ensure that thrust piece -1- is inserted.



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Using press tool - T10520- :

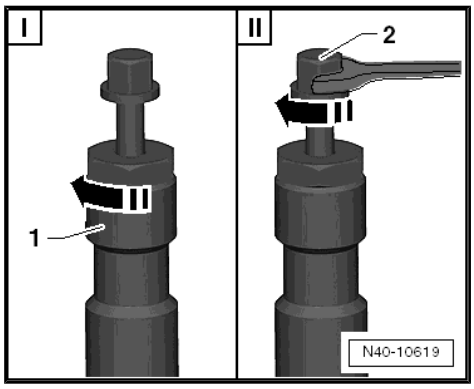
– To press out drive shaft -3-, secure press tool - T10520- -1- to wheel hub using 3 wheel bolts -2-.



– It is essential to follow specified sequence.

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

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



Note

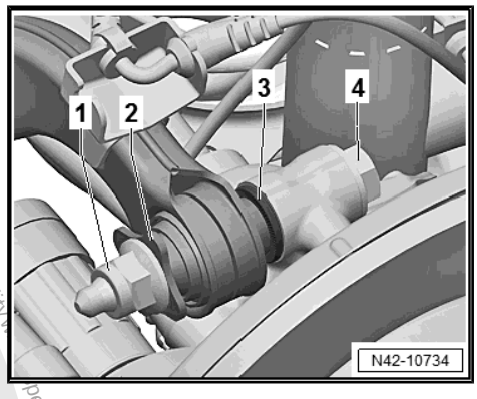
At the end of the procedure or for pressing out drive shaft further, the spindle must be moved to its original position in order to apply the hydraulic force.

– Remove drive shaft.

Installing

Install in the reverse order of removal, observing the following:

– Insert bolt -4- with washer -3-.
– Install washer -2-.
– Tighten nut -1-.



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– Release tension on spring -4- while making sure that upper spring seat is located on lug on body.

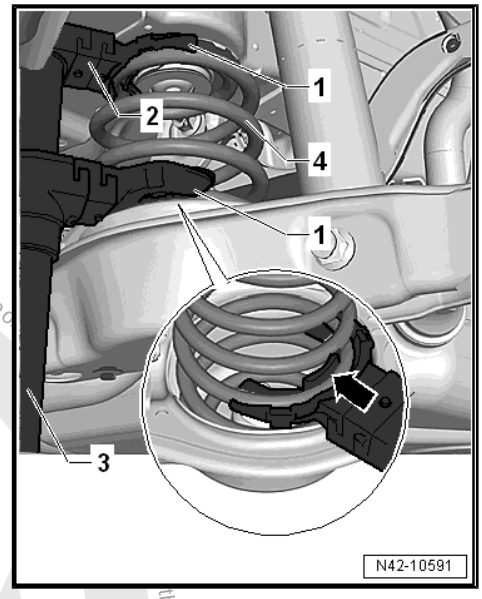
– Remove spring compressor -3-.

1 - Spring retainer - V.A.G 1752/3A-

2 - Adapter - V.A.G 1752/9-

3 - Spring compressor - V.A.G 1752/1-

4 - Spring



- The threaded connections of the wheel bearing housing may only be loosened and tightened in the unladen weight position ⇒ page 8 .
- On vehicles with vehicle level sender, carry out basic settings for wheel damper electronics ⇒ Vehicle diagnostic tester.

Torque settings

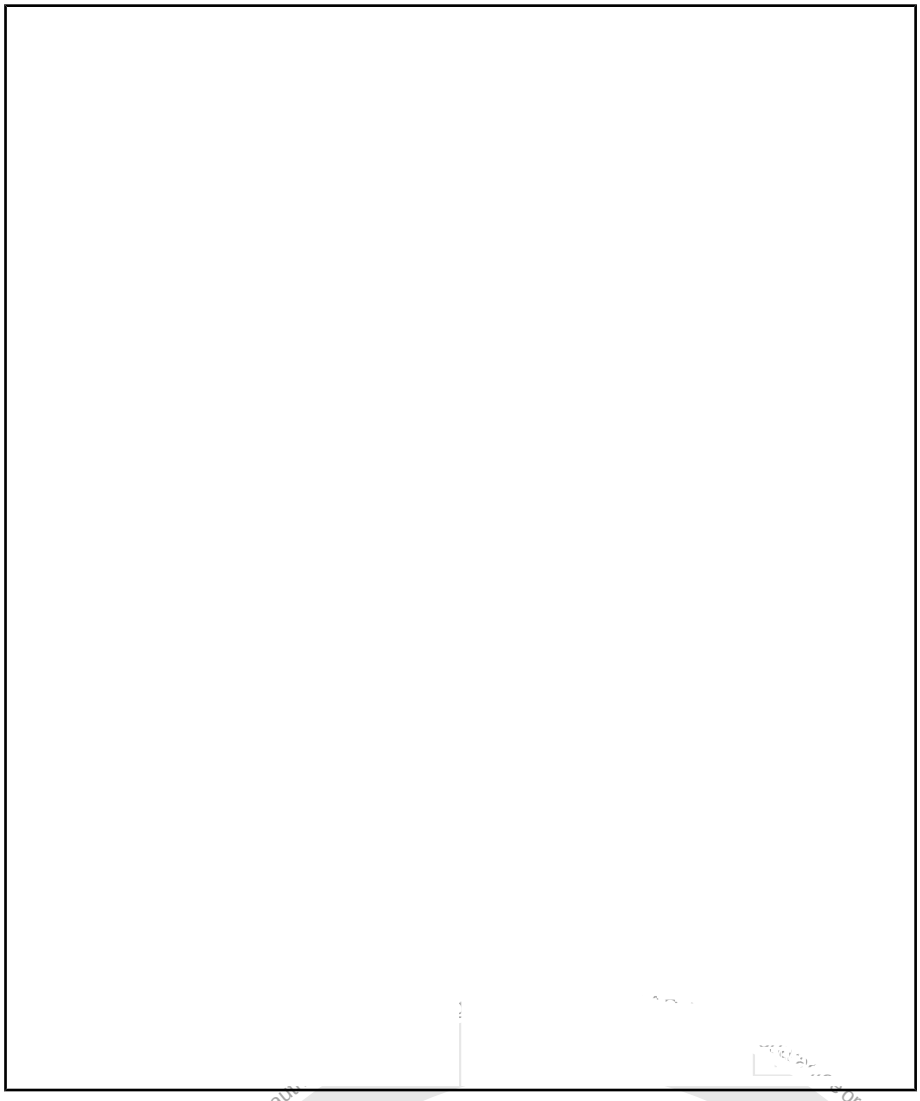
- ⇒ “7.1 Assembly overview - drive shaft”, page 219
- ⇒ “4.1 Assembly overview - transverse link”, page 174
- ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245
- ⇒ “7.2 Loosening and tightening threaded connections of drive shaft”, page 222
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Rear silencer to body ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

7.4 Dismantling and assembling drive shaft

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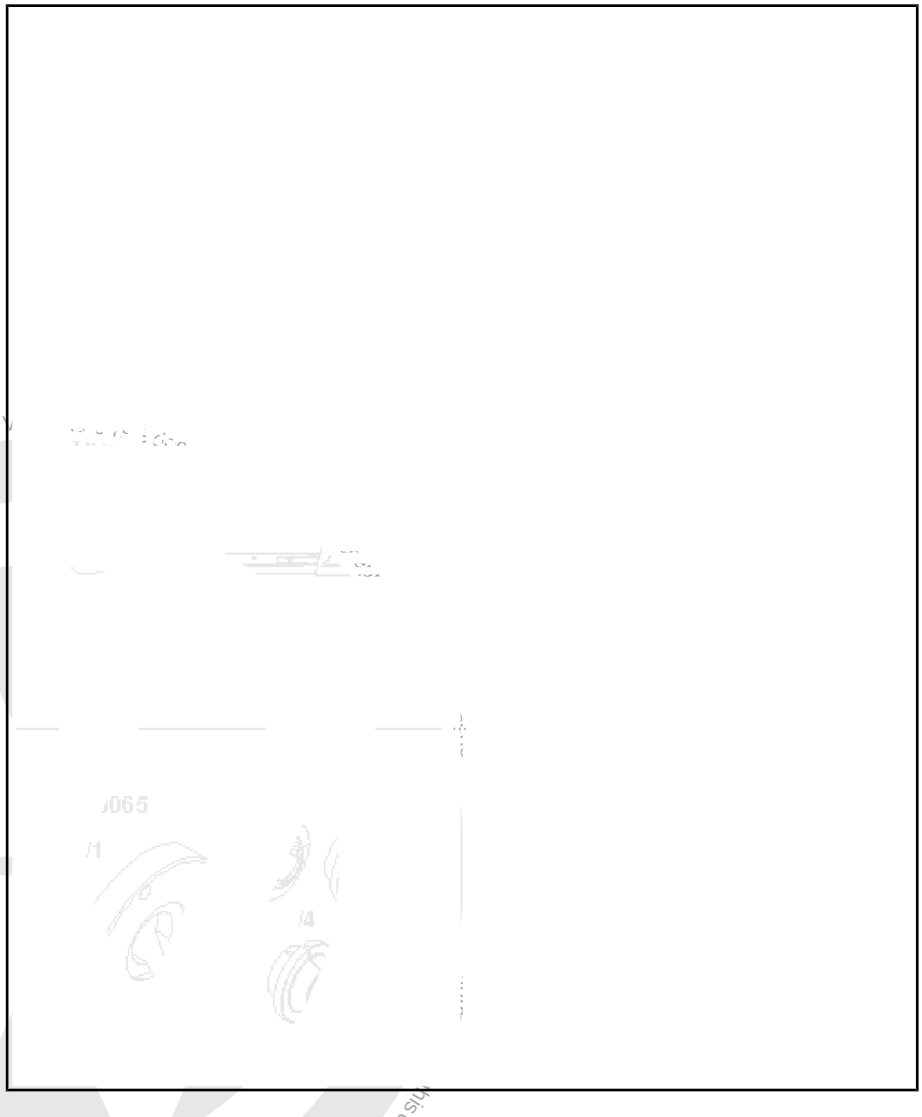
Special tools and workshop equipment required

- Pressure plate - VW 401-
- Pressure plate - VW 402-
- Press piece - VW 408 A-
- Press piece - VW 411-
- Tube - VW 416 B-
- Thrust washer - VW 447 H-



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- Circlip pliers - VW 161 A-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Hose clip pliers - V.A.G 1682-
- Assembly tool - T10065-



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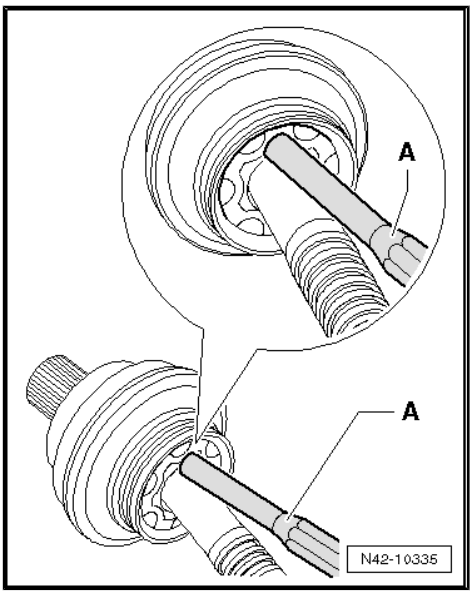
Dismantling

Driving off outer constant velocity joint

– Clamp drive shaft in vice using jaw protectors.
– Remove clamps.
– Fold back boot.
– Drive constant velocity joint off drive shaft using drift -A-.

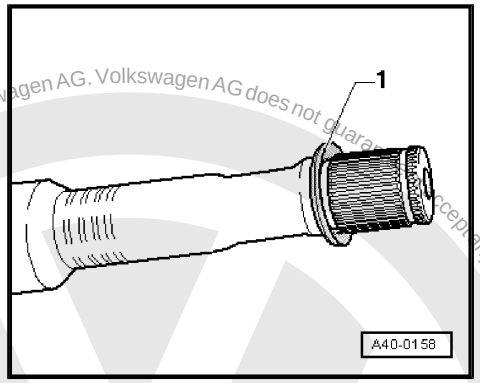
Drift must be positioned exactly on ball hub of constant velocity joint.

Driving joint on



Installation position of dished spring at outer joint

1 - Dished spring



– Fit new circlip.

– Use plastic-headed hammer to drive joint onto shaft until circlip engages.

Only for constant velocity joint VL90

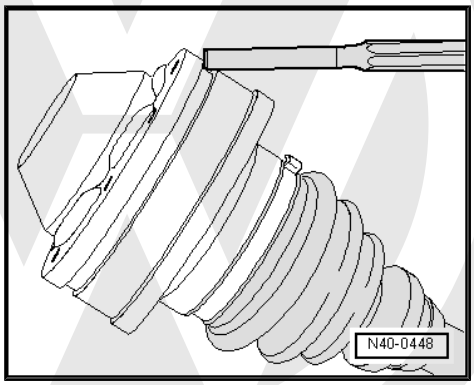
Driving off cover for inner joint

Continuation for all drive shafts

– Use a drift to drive boot off inner joint.

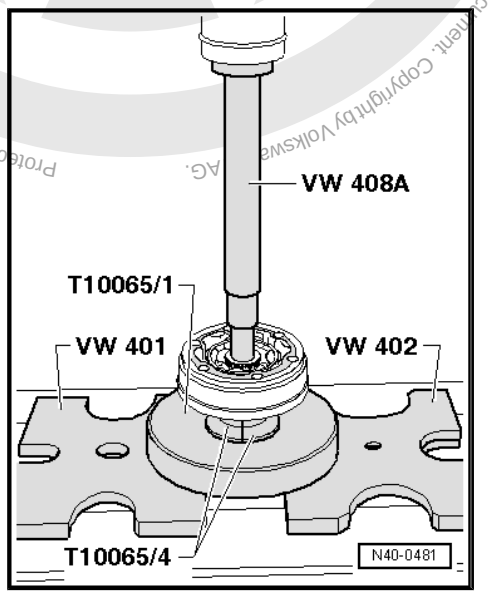
– Remove retaining ring.

– Remove both clamps and slide boot towards outer joint.



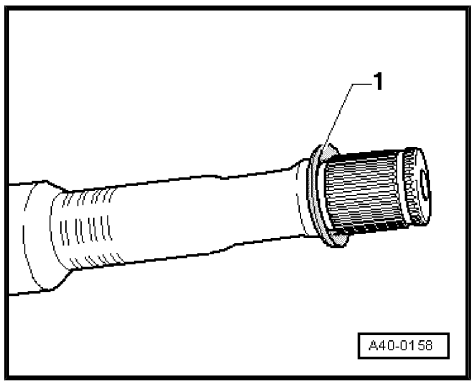
Pressing off inner constant velocity joint

Installing



Installation position of dished spring at inner joint

1 - Dished spring



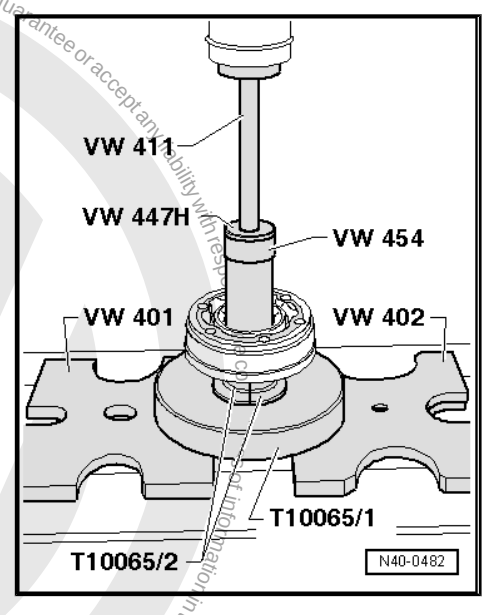
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Pressing on inner constant velocity joint

Note

Chamfer on internal circumference of ball hub (splines) must face contact shoulder on drive shaft.

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



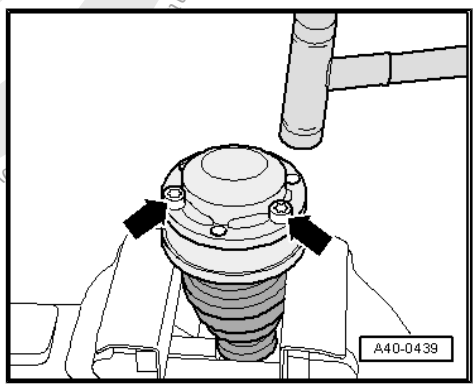
Only for constant velocity joint VL90

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

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

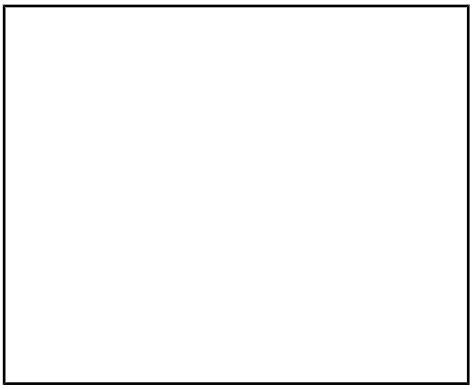
– Drive on cap with a plastic hammer.

Continuation for all drive shafts



Tighten clamp on outer joint

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



Note

- *Due to the hard material of the protective bellows (compared to rubber) and the necessity of using a stainless steel clamp, it is only possible to tension the clamp with clamp tensioner - V.A.G 1682- .*
- *Specified torque: 25 Nm.*
- *Use torque wrench with setting range of 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 clamp will not be attained in spite of correct specified torque specification.*

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Tightening 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 ear on O-type clip.

– Tighten clamp by turning spindle with a torque wrench (do not cant pliers).

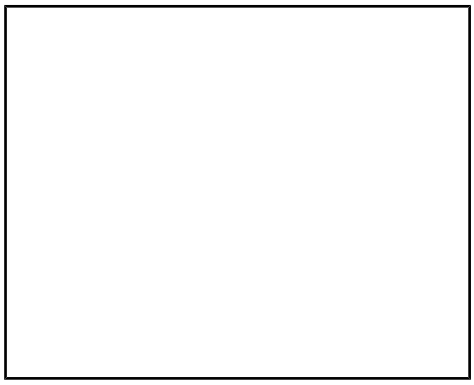
Note

- *Due to the hard material of the protective bellows (compared to rubber) and the necessity of using a stainless steel clamp, it is only possible to tension the clamp with clamp tensioner - V.A.G 1682- .*
- *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 clamp will not be attained in spite of correct specified torque specification.*

7.5 Checking outer constant velocity joint

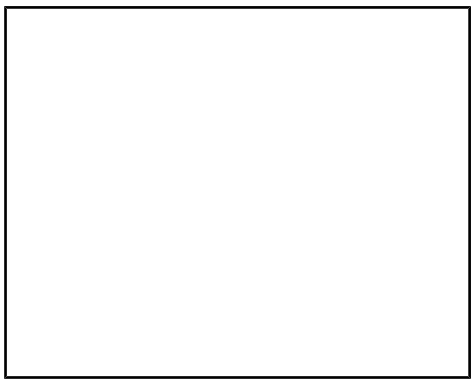
The joint is to be dismantled to renew the grease if it is heavily soiled, or to check the running surfaces of the balls for wear and damage.

Removing



– Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scriber or oil stone -arrow-.

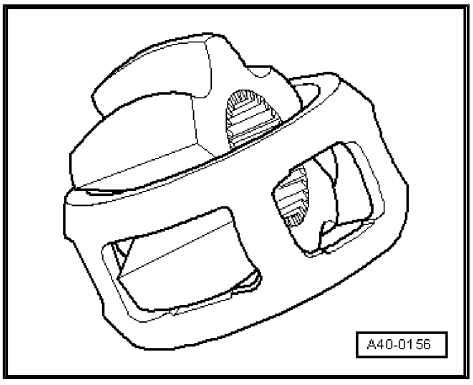
– Swivel ball hub and ball cage and take out balls one after the other.



– Turn cage until the two rectangular windows -arrow- lie on joint body.

– Take out cage with hub.

– Swivel one segment of the hub into one of the cage openings.
– Tip hub out of cage.



Note

- *The 6 balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and traces of seizing.*
- *Excessive backlash in the joint will be noticed as load change jolts. In such cases the joint must be renewed.*
- *Smoothing and traces of wear of the balls are no reason to change the joint.*

Installing

Install in the reverse order of removal, observing the following:

– Press half of the total amount of grease from repair kit into the joint body.
– Fit cage with hub into joint body.

Note

Make sure cage is inserted in correct position (i.e. sides facing in same direction as original position).

– 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 circlip in shaft.
– Distribute remaining grease in boot.

7.6 Checking inner 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.

Note

The ball hub and joint body are paired. Mark position in relation to each other with a waterproof felt-tip pen prior to removal.

Removing

– Swing ball hub and ball cage.
– Press out joint body in direction of arrow.
– Press balls out of cage.

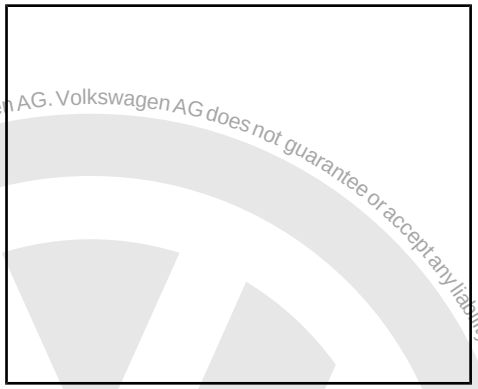
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– Tip ball hub out of ball cage via ball track -arrows-.

– Check joint body, ball hub, ball cage and balls for pitting and traces of seizing.

Note

Excessive circumferential backlash in the joint is noticeable during load change jolt. In this case the joint must be replaced. Smoothing and traces of wear of the balls are no reason to renew the joint.



Installing

Install in the reverse order of removal, observing the following:

– Insert hub into cage via the two chamfers. The hub can be installed in any position. Press balls into cage.

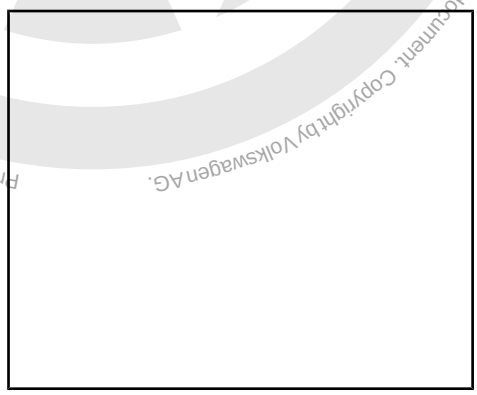
– Insert hub with cage and balls at a right angle to joint body.



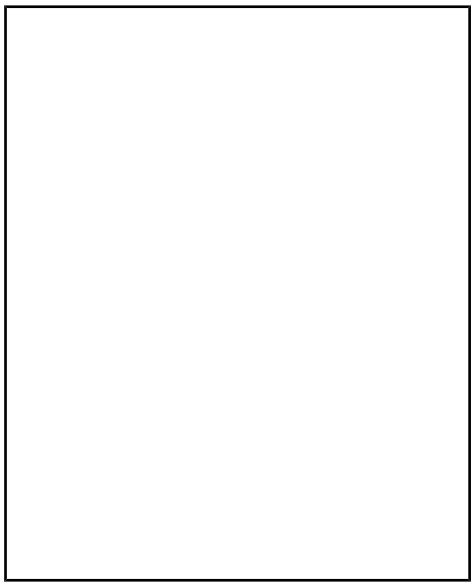
When inserting, ensure that the wide spacing -a- on the joint body is aligned with the narrow spacing -b- on the hub after it is swung in.

Chamfer on internal diameter of ball hub (splines) must face large diameter of joint body.

– Also take note of chamfer on interior diameter of ball hub. It must be visible after swivelling in.



– Swivel in ball hub, at the same time the hub must be swivelled out of the cage -arrows- far enough to allow the balls to fit into the ball tracks.



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– Swivel in hub with balls by applying firm pressure to cage -arrow-.

Checking function of constant velocity joint:

The constant velocity joint is correctly assembled if the ball hub can be moved by hand backwards and forwards over its entire range of axial movement.

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43 – Self-levelling suspension

1 Electronically controlled damping system

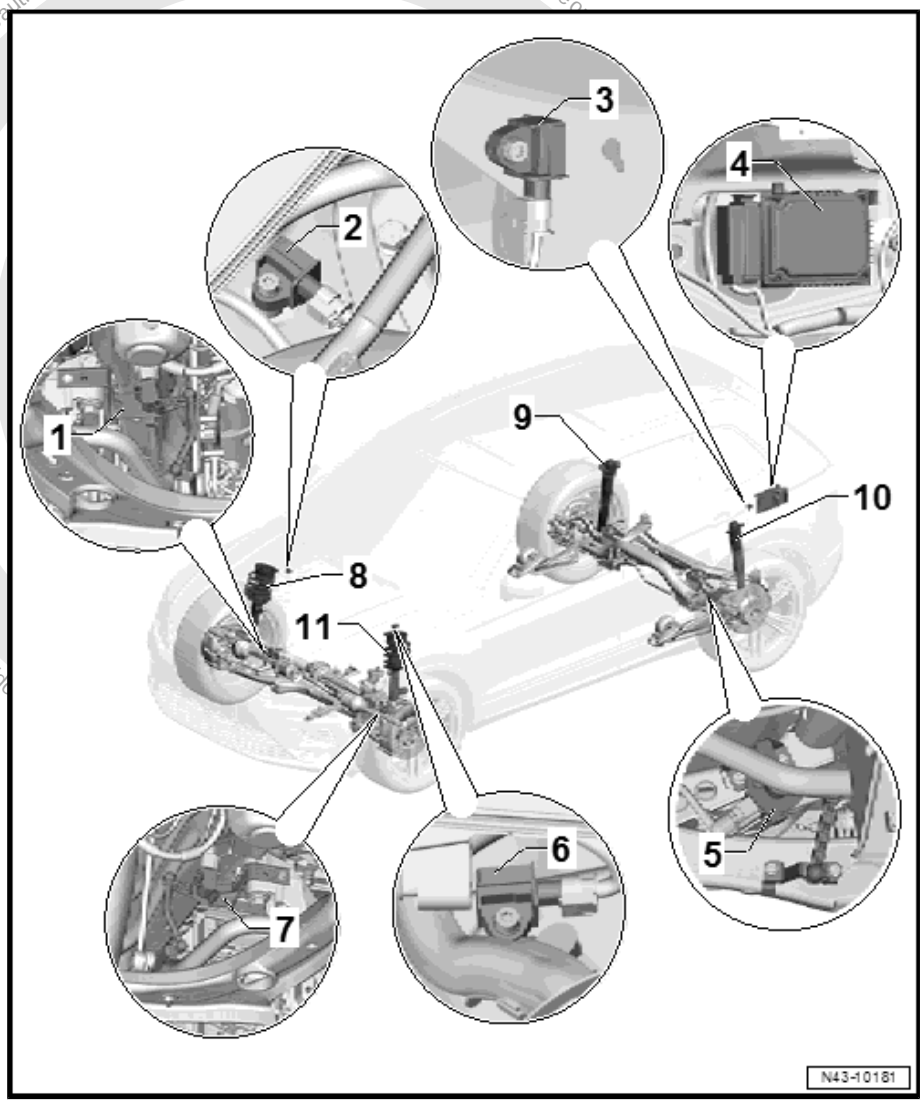
⇒ “1.1 Assembly overview - electronically controlled damping system”, page 238

⇒ “1.2 Removing and installing electronically controlled damping control unit J250 ”, page 239

⇒ “1.3 Removing and installing front body acceleration senders G341 / G342 ”, page 240

⇒ “1.4 Removing and installing rear left body acceleration sender G699 ”, page 242

1.1 Assembly overview - electronically controlled damping system



1 - Front right vehicle level sender - G289-

- ❑ Removing and installing ⇒ page 245

2 - Front right body acceleration sender - G342-

- ❑ Removing and installing ⇒ page 240
- ❑ Bolt: 8 Nm

3 - Rear left body acceleration sender - G699-

- ❑ Location: on left suspension strut dome behind left luggage compartment side trim.
- ❑ Removing and installing ⇒ page 242
- ❑ Bolt: 8 Nm

4 - Electronically controlled damping control unit - J250-

- ❑ Removing and installing ⇒ page 239
- ❑ Location: the electronically controlled damping control unit - J250- is installed under the front right seat.
- ❑ Function `Replace control unit` must be performed with ⇒ Vehicle diagnostic tester if electronically controlled damping control unit - J250- is renewed.
- ❑ If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ “6.1 Calibrating front camera for driver assist systems”, page 290 .

5 - Rear left vehicle level sender - G76-

- ❑ Removing and installing ⇒ page 247

6 - Front left body acceleration sender - G341-

- ❑ Removing and installing ⇒ page 240
- ❑ Bolt: 8 Nm

7 - Front left vehicle level sender - G78-

- ❑ Removing and installing ⇒ page 245

8 - Shock absorber with front right shock absorber damper adjustment valve - N337-

- ❑ Removing and installing suspension strut ⇒ page 49 .
- ❑ Repairing suspension strut ⇒ page 57 .

9 - Shock absorber with rear right shock absorber damper adjustment valve - N339- .

- ❑ Removing and installing shock absorber ⇒ page 181 .
- ❑ Repairing shock absorber ⇒ page 183 .

10 - Shock absorber with rear left shock absorber damper adjustment valve - N338- .

- ❑ Removing and installing shock absorber ⇒ page 181 .
- ❑ Repairing shock absorber ⇒ page 183 .

11 - Shock absorber with front left shock absorber damper adjustment valve - N336-

- ❑ Removing and installing suspension strut ⇒ page 49 .
- ❑ Repairing suspension strut ⇒ page 57 .

1.2 Removing and installing electronically controlled damping control unit - J250-

Special tools and workshop equipment required

- ♦ Vehicle diagnostic tester

Removing

Location: electronically controlled damping control unit - J250- is installed behind left side panel trim in luggage compartment.

– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Turn steering wheel to straight-ahead position.

Vehicles with mechanical ignition lock

– Pull off ignition key so that steering lock engages.

Vehicles with electronic ignition lock

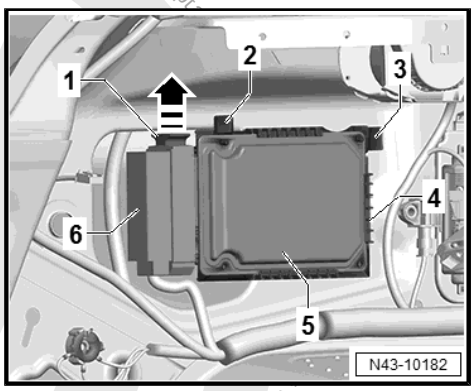
– Switch off ignition and open driver's door so that the steering lock engages.

Continued for all vehicles:

– Remove left luggage compartment side trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing luggage compartment side trim .

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– Pull control unit slightly into vehicle interior, and release release lever -1- in -direction of arrow-.
– Pull off electrical connector -6-.
– Push lugs -2- and -3- towards rear.
– Slide electronically controlled damping control unit - J250- -5- downwards out of retainer -4-.



Installing

Install in reverse order of removal, observing the following:

– Function `Replace control unit` must be performed with ⇒ Vehicle diagnostic tester if electronically controlled damping control unit - J250- has been renewed.
– If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function
⇒ “6.1 Calibrating front camera for driver assist systems”, page 290 .

1.3 Removing and installing front body acceleration senders -G341- / -G342-

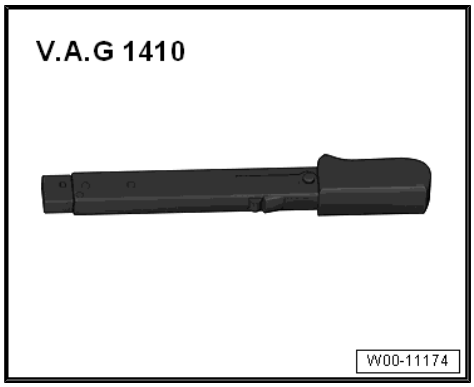
⇒ “1.3.1 Removing and installing front left body acceleration sender G341 ”, page 240

⇒ “1.3.2 Removing and installing front right body acceleration sender G342 ”, page 241

1.3.1 Removing and installing front left body acceleration sender - G341-

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1410-

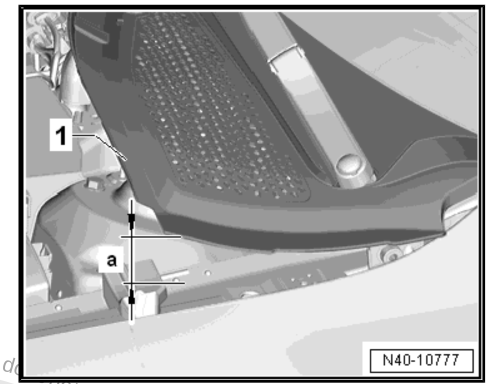


Removing

– Pull seal off entire length of plenum chamber cover.
– Detach clips.

– Lift plenum chamber cover -1- not more than 60 mm.

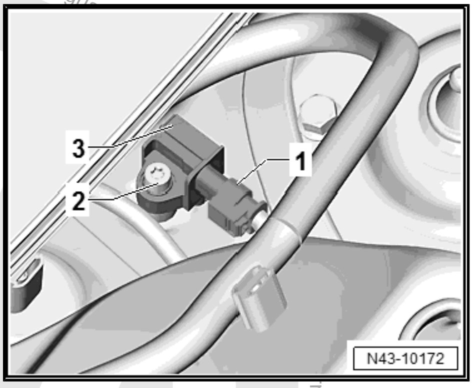
a - 60 mm



– Release and pull off electrical connector -1-.

– Unscrew bolt -2-.

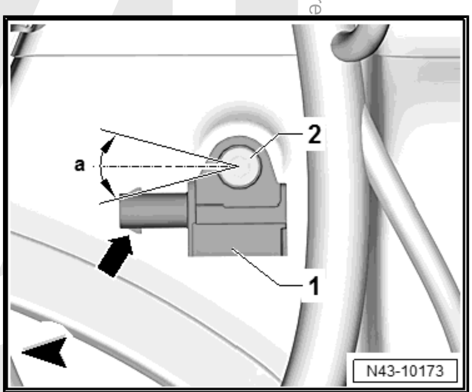
– Remove front left body acceleration sender - G341- -3-.



Installing

Install in reverse order of removal. During this step, observe the following:

– Insert front left body acceleration sender - G341- -1- so that electrical connector -arrow- points in direction of travel.



– Tighten bolt -2- for front left body acceleration sender - G341- -1-.

Installation position: angle tolerance -a- is ±12°. Installation position of front left body acceleration sender - G341- may deviate by this angle from the longitudinal axis of the vehicle.

– Reconnect connector, must engage audibly.

– Perform basic setting of wheel damper electronics ⇒ Vehicle diagnostic tester.

Torque settings

♦ ⇒ “1.1 Assembly overview - electronically controlled damping system”, page 238

1.3.2 Removing and installing front right body acceleration sender - G342-

Special tools and workshop equipment required

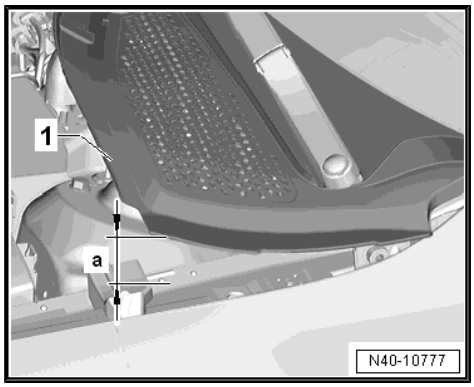
♦ Torque wrench - V.A.G 1410-



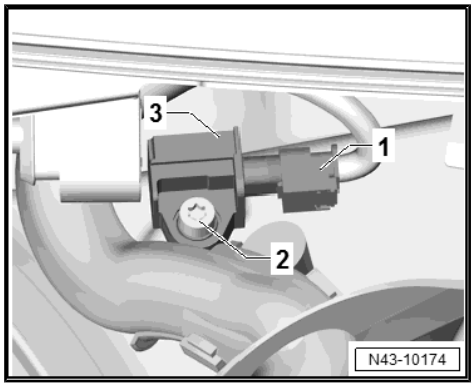
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– Pull seal off entire length of plenum chamber cover.
– Detach clips.
– Lift plenum chamber cover -1- not more than 60 mm.

a - 60 mm



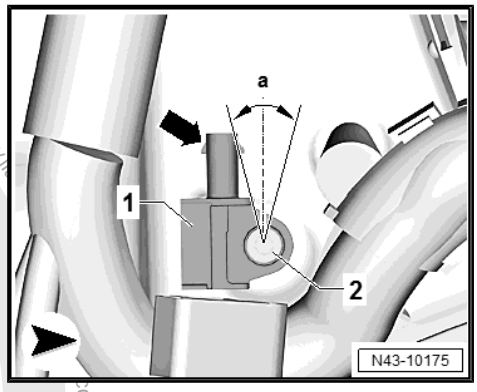
– Release and pull off electrical connector -1-.
– Unscrew bolt -2-.
– Remove front right body acceleration sender - G342- -3-.



Installing

Install in reverse order of removal. During this step, observe the following:

– Insert front right body acceleration sender - G342- -1- so that electrical connector -arrow- is perpendicular to direction of travel.
– Tighten bolt -2- for front right body acceleration sender - G342- -1-.



Installation position: angle tolerance -a- is ±12°. Installation position of front right body acceleration sender - G342- may deviate by this angle from the longitudinal axis of the vehicle.

– Reconnect connector, must engage audibly.
– Perform basic setting of wheel damper electronics ⇒ Vehicle diagnostic tester.

Torque settings

◆ ⇒ “1.1 Assembly overview - electronically controlled damping system”, page 238

1.4 Removing and installing rear left body acceleration sender - G699-

Special tools and workshop equipment required

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♦ Torque wrench - V.A.G 1410-

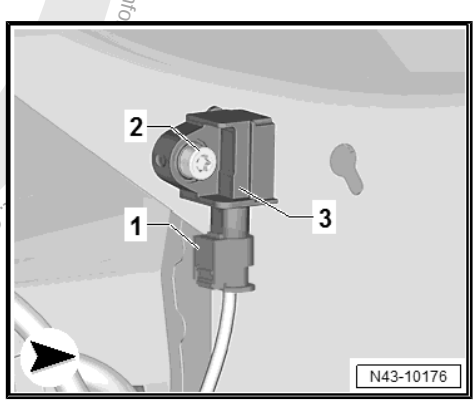


Removing

– Remove left luggage compartment side trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing luggage compartment side trim .

– Release and pull off electrical connector -1-.

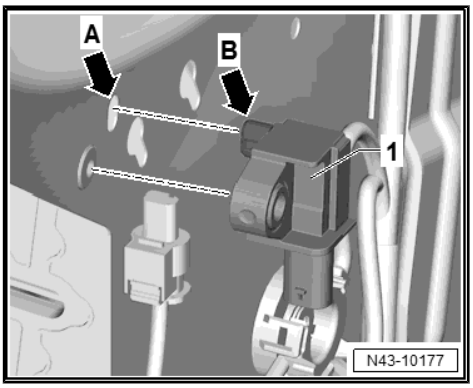
– Unscrew bolt -2- and remove rear body acceleration sender - G343- -3-.



Installing

Install in reverse order of removal. During this step, observe the following:

– Insert rear body acceleration sender - G343- -1- so that lug -arrow B- engages in hole -arrow A-.



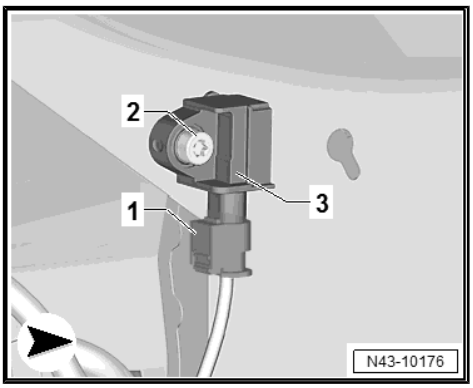
– Bolt on rear body acceleration sender - G343- -1- using bolt -3-.

– Push on connector -1- until it engages audibly.

– Perform basic setting of wheel damper electronics ⇒ Vehicle diagnostic tester.

Torque settings

♦ ⇒ “1.1 Assembly overview - electronically controlled damping system”, page 238



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2 Vehicle level sender

⇒ “2.1 Assembly overview - front vehicle level senders”, page 244

⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245

⇒ “2.3 Removing and installing front vehicle level senders G78 / G289 ”, page 245

⇒ “2.4 Removing and installing rear vehicle level senders G76 / G77 ”, page 247

2.1 Assembly overview - front vehicle level senders

Note

The front left/right vehicle level sender - G78/G289- is only available as a replacement part complete with coupling rod and upper and lower retaining plates.

1 - Suspension link

2 - Subframe

3 - Electrical connector

4 - Front left vehicle level sender - G78- and front right vehicle level sender - G289-

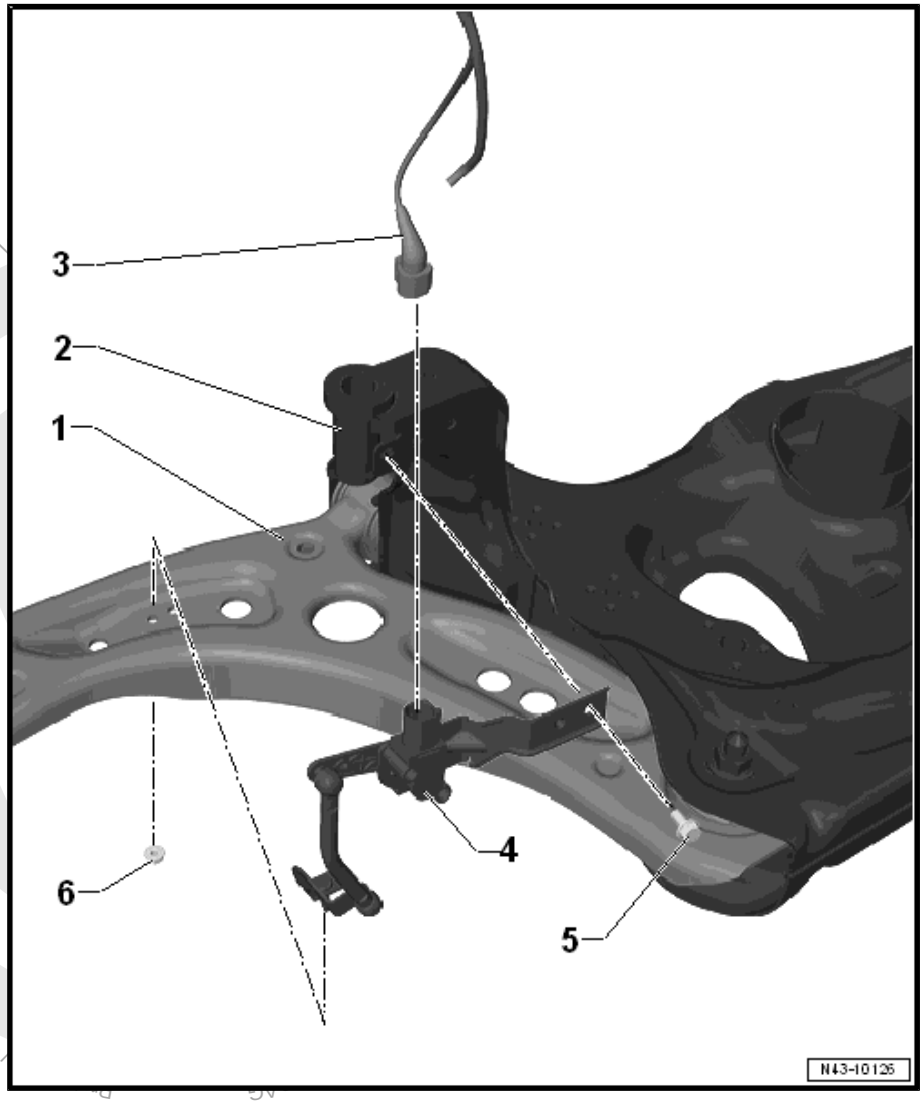
- ❑ Complete with attachments
- ❑ Lever must face outwards
- ❑ Removing and installing ⇒ page 245
- ❑ Carry out basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights

5 - Bolt

- ❑ 8 Nm

6 - Nut

- ❑ Renew after removal
- ❑ 8 Nm



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2.2 Assembly overview - rear vehicle level senders

Note

The vehicle level sender is available as a replacement part only complete with coupling rod and upper and lower retaining plates.

1 - Pop rivet nut

2 - Electrical connector

3 - Pop rivet nut

4 - Bolt

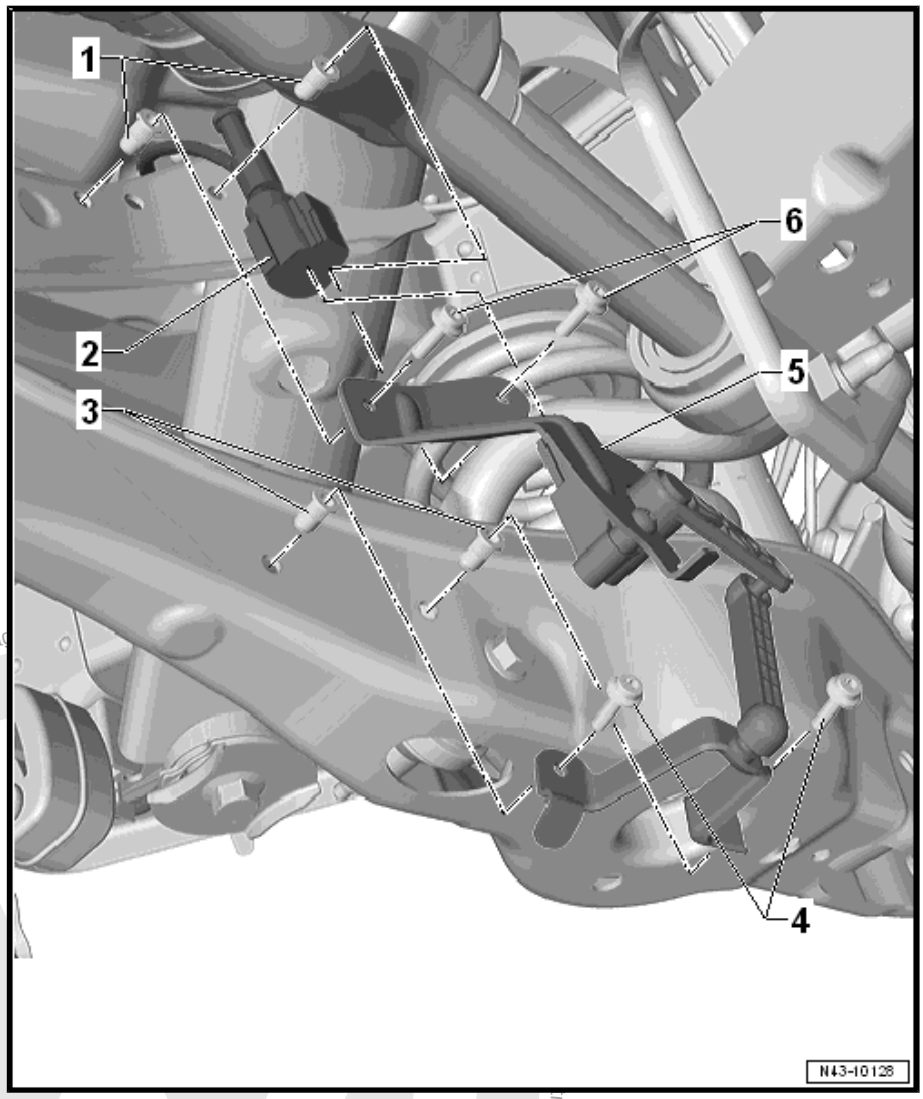
- ❑ 5 Nm

5 - Vehicle level sender at rear

- ❑ Complete with attachments
- ❑ Lever must face outwards
- ❑ Removing and installing ⇒ page 247
- ❑ Perform basic setting of wheel damper electronics ⇒ Vehicle diagnostic tester.
- ❑ Carry out basic setting of headlights ⇒ Electrical system; Rep. gr. 94; Headlights; Adjusting headlights

6 - Bolt

- ❑ 5 Nm



2.3 Removing and installing front vehicle level senders -G78- / -G289-

Special tools and workshop equipment required

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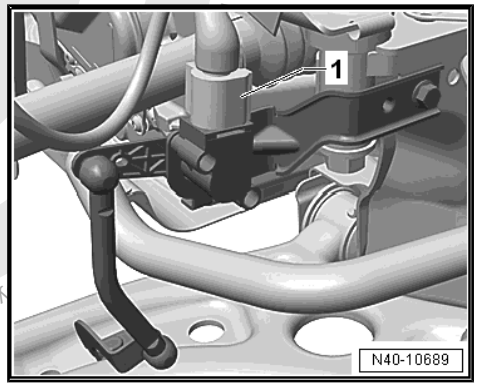
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♦ Torque wrench - V.A.G 1410-



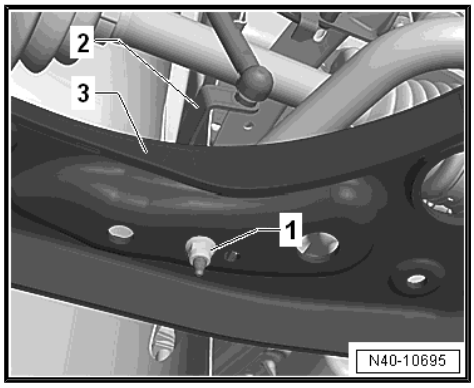
Removing

– Disconnect connector -1- on front left vehicle level sender - G78- and/or front right vehicle level sender - G289- , as applicable.



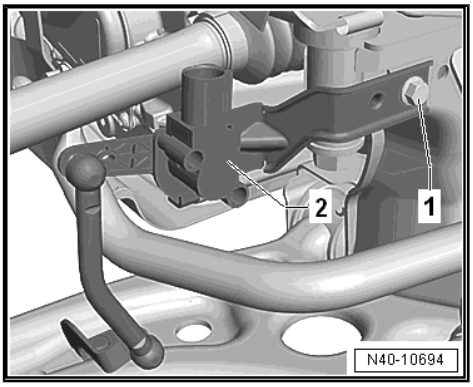
– Undo nuts -1-.

– Pull bracket -2- for front left vehicle level sender - G78- or front right vehicle level sender - G289- out of suspension link -3-.



– Unscrew bolt -1-.

– Remove front left vehicle level sender - G78- and/or front right vehicle level sender - G289- , as applicable.



Installing

Install in reverse order of removal. During this step, observe the following:

Note

- ♦ *The lever of the vehicle level sender must point towards the outside of the vehicle.*
- ♦ *Thread of vehicle level sender must be screwed into outer hole in suspension link. Retaining lug for vehicle level sender must engage in inner hole in order to guarantee correct installation position.*

- Perform basic setting of wheel damper electronics ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ “6.1 Calibrating front camera for driver assist systems”, page 290 .
- Carry out basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Torque settings

- ♦ ⇒ “2.1 Assembly overview - front vehicle level senders”, page 244

2.4 Removing and installing rear vehicle level senders -G76- / -G77-

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1410-



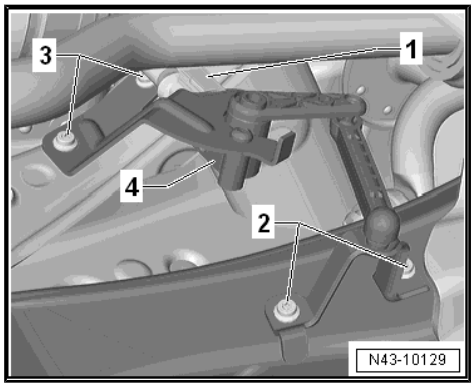
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Removing

– Disconnect connector -1-.

– Unscrew bolts -2- and -3-.

– Take out rear left vehicle level sender - G76- -4-.



Installing

Install in reverse order of removal. During this step, observe the following:

The lever of the vehicle level sender must point towards the outside of the vehicle.

- Perform basic setting of wheel damper electronics ⇒ Vehicle diagnostic tester.
- Carry out basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Torque settings

♦ ⇒ “2.2 Assembly overview - rear vehicle level senders”, page 245

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44 – Wheels, tyres, vehicle geometry

1 Wheels, tyres

⇒ “1.1 Specified torques for wheel bolts”, page 249
⇒ “1.2 Pressing tyre off wheel rim”, page 249
⇒ “1.3 Removing tyre from wheel”, page 250
⇒ “1.4 Mounting tyre”, page 250
⇒ “1.5 Wheel change”, page 251
⇒ “1.6 Tyre sealant disposal”, page 255
⇒ “1.7 Models with breakdown set”, page 255

1.1 Specified torques for wheel bolts

Wheel bolt to wheel hub for all vehicles:

Specified torque: 140 Nm

– Before fitting wheel, protect wheel centring seat against corrosion ⇒ page 251 .

♦ Position of anti-theft wheel bolts for steel wheels ⇒ page 254 .

♦ Install anti-theft wheel bolts using adapter set for wheel bolts .

1.2 Pressing tyre off wheel rim

The tyre fitting unit must be furnished with the tyre fitting head designed for these rims.

> **WARNING**
>
> *Otherwise there is a danger of the rim becoming damaged.*

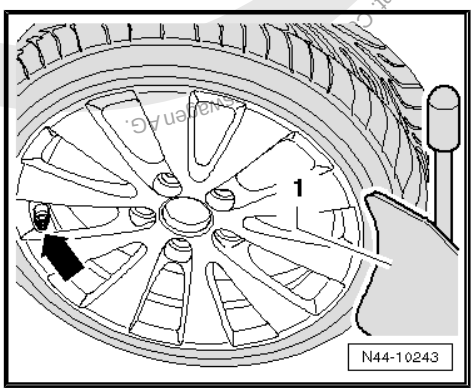
If your tyre fitting unit has not yet been modified, please contact the manufacturer of the unit.

Safety instructions and conditions for removing and installing tyres

- It is extremely important to adhere to the instructions and warnings in the following descriptions.

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

– Always ensure when pressing off a tyre using tyre fitting equipment with a press-off plate, that the tyre valve -arrow- is directly opposite the press-off plate -1-.

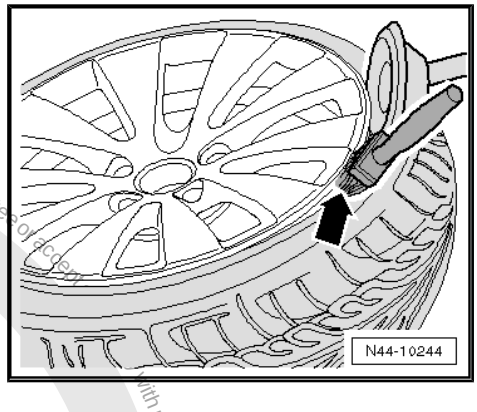


The bead breaker must be positioned no more than 2 cm away from the rim flange.

– Remove balancing weights and dirt from wheel rim.

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



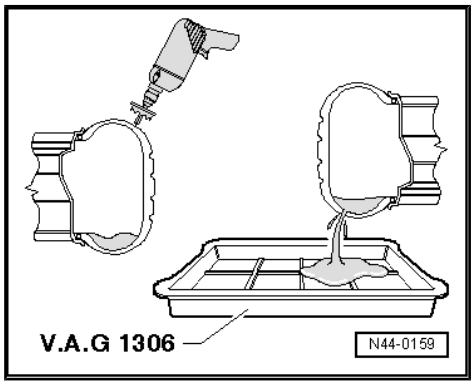
1.3 Removing tyre from wheel

Tyres which have been filled or sealed using tyre sealant must be drained before removal.

Caution

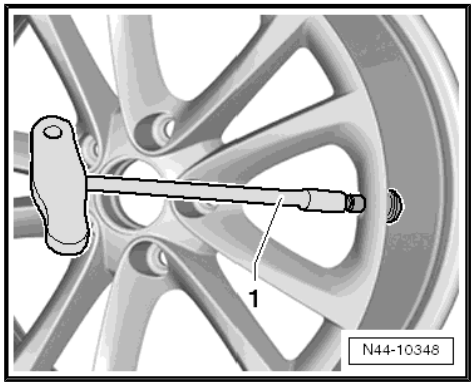
- *Avoid eye and skin contact with tyre sealant.*
- *It is damaging to health and can cause eye irritation and allergies.*
- *During this work, wear protective gloves and safety goggles.*

– Place the wheel on an even surface.
– Unscrew and remove the valve insert of tyre valve.
– Use a suitable drill or mill to carefully drill a hole in shoulder area of tyre.
– Hold wheel over a suitable container and drain sealant.
– Pull tyre from rim.
– Clean wheel rim with, for example, a moist cloth.



1.4 Mounting tyre

• Ensure that the wheel rim is clean.
– Insert new tyre valve with -VAS 6459- -1-.
– Unscrew and remove valve insert.
– Inflate tyre to approx. 3 … 4 bar. The bead of the tyre must slip audibly over the hump of the rim.
– Screw in valve insert.
– Check tyre pressure to make sure prescribed pressure has been reached.
– Balance wheel.



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1.5 Wheel change

⇒ “1.5.1 Wheel change, protecting wheel centring seat against corrosion”, page 251

⇒ “1.5.2 Wheel change, installation requirements”, page 251

⇒ “1.5.3 Wheel change, installation instructions for wheel change”, page 252

⇒ “1.5.4 Wheel change, wheel installation”, page 254

⇒ “1.5.5 Wheel change, position of anti-theft wheel bolts for steel wheels”, page 254

1.5.1 Wheel change, protecting wheel centring seat against corrosion

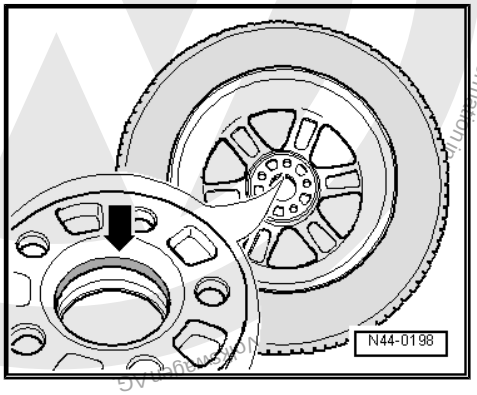
Applies to alloy and steel wheels

When changing a wheel, wheel centring seat should be waxed using wax spray to prevent corrosion between wheel centring seat and wheel rim ⇒ Electronic parts catalogue “ETKA” .

– Remove wheel.

– Thoroughly clean wheel centring seat on wheel hub and the centring ring of the wheel rim.

– Apply wax to centring area -arrow- with a brush.



Ensure that only centring ring -arrow- but not contact surface of wheel rim has been waxed. Otherwise, the brakes will be soiled, which would reduce the braking efficiency.

WARNING

Wheel bolts, contact surfaces of wheel hub and wheel rim and wheel hub threads must not be waxed. Never treat wheel securing bolts with lubricant or corrosion protection materials!

– Install wheel and tighten bolts or nuts ⇒ page 249 .

1.5.2 Wheel change, installation requirements

Warming cold tyres to minimum fitting temperature

Note

This instruction also applies to ultra-high performance tyres (aspect ratio less than or equal to 45 % and speed symbol V or higher).

WARNING

The minimum fitting temperature of a tyre should be between 15 °C and 30 °C in the core of the tyre.

- To install tyres without damage, it is especially important to warm the upper part of the sidewall and the inside of the upper bead to at least 15°C.

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- This internal temperature is referred to as the core temperature.
- Rubber is a poor conductor of heat. Therefore, a cold tyre must be left in an area with the correct temperature for a sufficiently long period so the inner rubber layers can warm up to at least 15°C.
- The surface temperature of the tyre during the warming up phase is no indication of the internal temperature of the tyre.
- To enable cold tyres to absorb heat from the ambient air as quickly as possible, they should not be stacked on top of one another. Instead, the tyres should be stored individually in order to allow the warm air to “circulate” around them effectively.
- Tyres must never be placed in front of a radiator or hot air blower for warming, since this can very quickly lead to critical surface temperatures.
- Heating the tyres without damage can only be achieved by heating with warm water or warm air (max. 50°C)!
- If cold tyres (below 0°C) are transferred to a warm environment (above 0°C), a layer of condensation immediately forms on the surface of the tyre. This layer of condensation indicates that the tyre is intensively absorbing heat from its environment through the process of water vapour in the air condensing out on the tyre surface.
- Once the layer of frost has thawed, condensate water forms. The condensation should be dried with a cloth so that the further warming process is not delayed due to a temperature drop caused by evaporation.

Warming times:

- ♦ Tyres with a temperature of above 0°C must be kept at least at 19°C for at least 2 hours.
- ♦ Tyres with a temperature of below 0°C must be kept at least at 19°C for at least 2.5 hours.

Warming recommendations:

- ♦ If possible, tyres should be stored in the workshop 1 day before they are fitted (order preparation).
- ♦ Store on an insulated base, pallet or on a similar surface raised from the floor.
- ♦ Position the tyres individually to allow the warm air to “circulate” around them effectively.
- ♦ Wipe off condensation
- ♦ Never heat with a radiator or hot air blower!

1.5.3 Wheel change, installation instructions for wheel change

WARNING

Perform the checks and follow the instructions listed below. This is important to ensure that the wheel bolts and the wheels are properly secured.

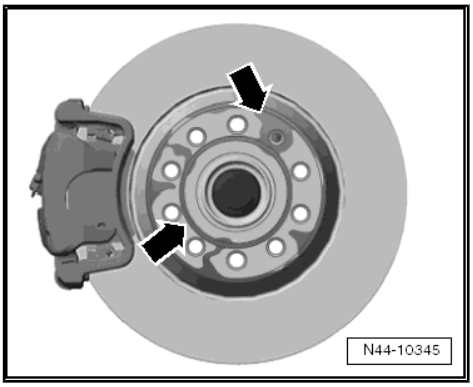
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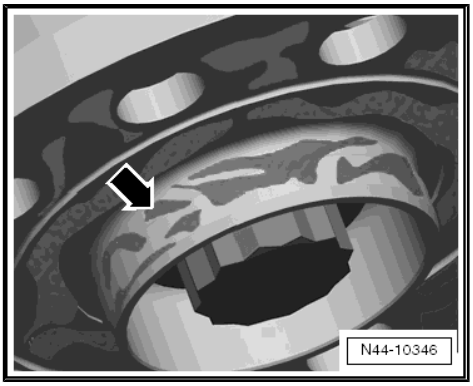
Note

On vehicles with Tyre Pressure Loss Indicator, the Tyre Pressure Loss Indicator has to be recalibrated any time one or more wheels are removed or fitted *⇒ page 258* *.*

– Check to ensure that contact surfaces -arrows- on brake disc are free of corrosion and dirt.

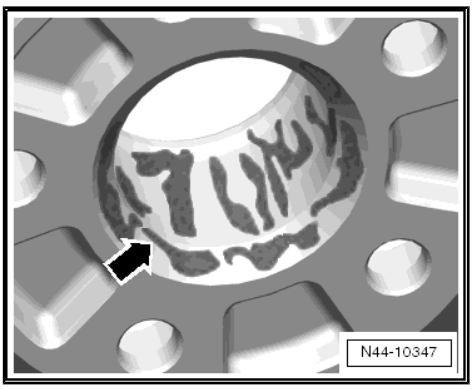


– Check to ensure that contact surface -arrow- on centring seat of brake disc are free of corrosion and dirt.



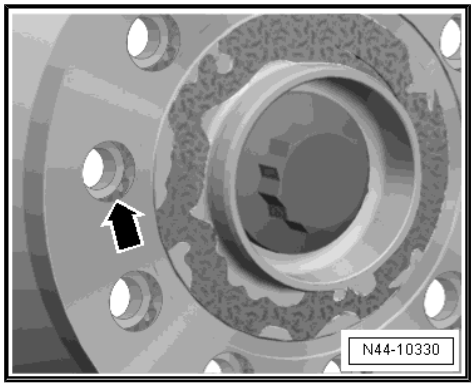
– Check to ensure that contact surface -arrow- on inner side of wheel (rim) and also centring seat of rim are free of corrosion and dirt.

– The lug seats* in the holes for the wheel bolts and the threads of the wheel bolts must also be free of corrosion and dirt, oil or grease.



* The lug seat is the curved surface of a section of a sphere cut by a plane.

– Check whether the wheel bolts can be easily screwed in by hand. The thread of the wheel bolts must not come into contact with the bore in the brake disc -arrow-.



If the thread of the wheel bolt touches the hole -arrow-, turn the brake disc relative to the wheel hub accordingly.

If necessary, remove dirt and corrosion:

- Oil or grease from contact surfaces
- Oil or grease from threads in wheel hub
- Oil or grease from threads in wheel bolts

WARNING

Damaged, badly corroded or difficult to remove wheel bolts must be renewed.

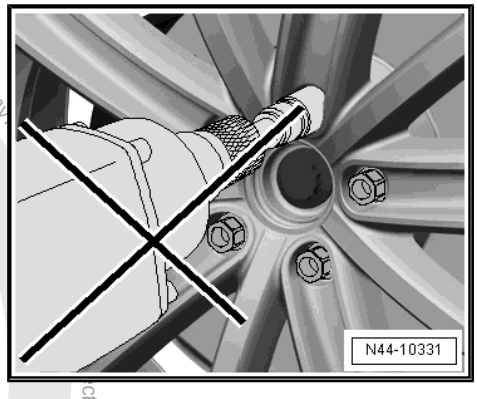
1.5.4 Wheel change, wheel installation

– Preserving wheel centring seat ⇒ page 251 .

1 - When fitting the wheel, pull in all wheel bolts uniformly by hand.

2 - Tighten diagonally to 30 Nm.

3 - Lower vehicle onto floor. Use torque wrench to firmly tighten wheel bolts diagonally to specified torque ⇒ page 249 .



WARNING

Do not use an impact screwdriver to screw in the bolts.

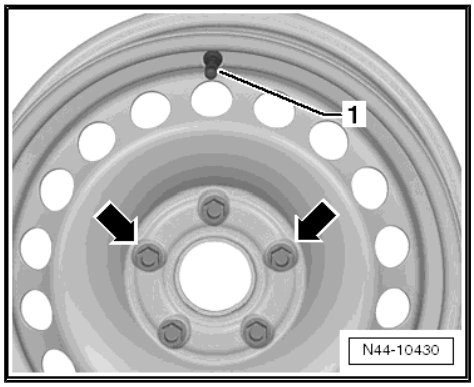
1.5.5 Wheel change, position of anti-theft wheel bolts for steel wheels

Caution

Adherence to position of anti-theft wheel bolts to tyre valve on steel wheels is vital.

Anti-theft wheel bolts may only be fitted on right or left -arrows- of valve -1- on steel wheels.

Secure installation of wheel trim on steel wheel is only possible if anti-theft wheel bolts are installed in this position.



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1.6 Tyre sealant disposal

- Tyre sealant or residue must not be mixed or disposed of with other fluids.
- Excess tyre sealant must be collected and stored in a plastic container. The plastic container can be disposed of through the disposal system along with the breakdown set (when the expiry date is exceeded).
- The items can be returned or disposed of through the existing workshop disposal system.
- Contact the service provider or the waste disposal officer of the sales centre or importer.

1.7 Models with breakdown set

Depending vehicle equipment, the vehicles are equipped with a tyre mobility set.

The breakdown set is located on the right side in the luggage compartment.

The breakdown set includes a bottle of tyre sealant -1- and a compressor -2-.

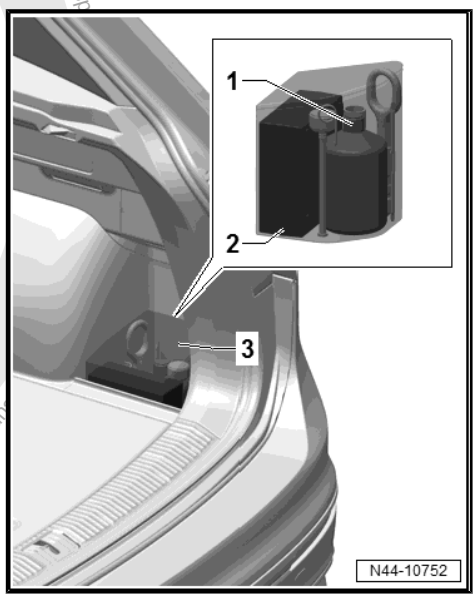
The tyre sealant in the bottle has a limited shelf life.

Expiry date -arrow- is therefore indicated on bottle -1-.

Renew tyre sealant if the expiry date is reached (the tyre sealant must not be older than 4 years).

If the bottle was opened e.g. at a "flat tyre", it must also be renewed.

Observe regulations for disposal ⇒ page 255 .



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2 Tyre pressure monitoring system

⇒ “2.1 Overview of fitting locations - tyre pressure monitor system”, page 256

⇒ “2.2 System description - tyre pressure monitoring system”, page 257

⇒ “2.3 Assembly overview - tyre pressure sensor”, page 258

⇒ “2.4 Removing and installing tyre pressure monitor control unit J502 ”, page 259

⇒ “2.5 Removing and installing tyre pressure sensor G222 / G223 / G224 / G225 ”, page 260

2.1 Overview of fitting locations - tyre pressure monitor system

1 - Rear left tyre pressure sensor - G224-

- ❑ Removing and installing ⇒ page 260

2 - Front left tyre pressure sensor - G222-

- ❑ Removing and installing ⇒ page 260

3 - Front right tyre pressure sensor - G223-

- ❑ Removing and installing ⇒ page 260

4 - Rear right tyre pressure sensor - G225-

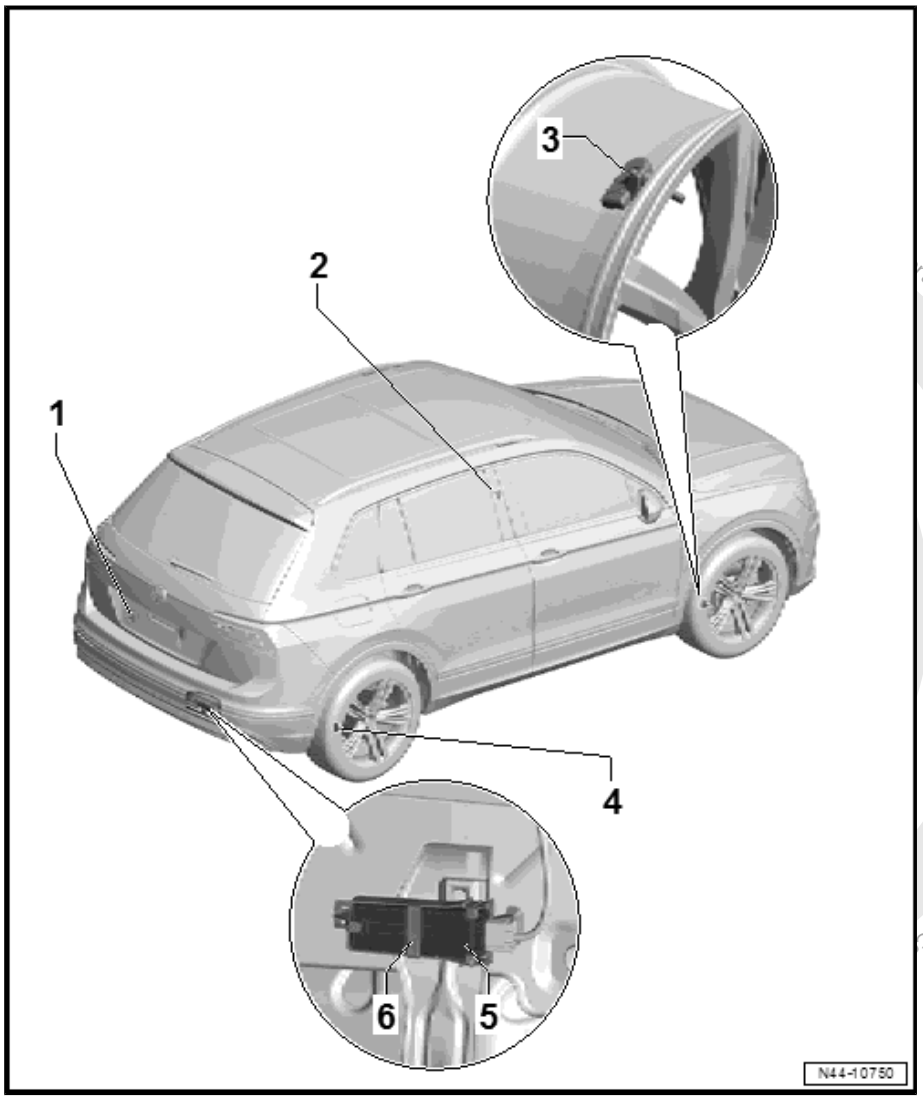
- ❑ Removing and installing ⇒ page 260

5 - Tyre pressure monitoring system control unit - J502-

- ❑ Removing and installing ⇒ page 259
- ❑ Location: on right rear mounting bracket

6 - Retainer tyre pressure monitor control unit - J502-

- ❑ Removing and installing ⇒ page 259



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2.2 System description - tyre pressure monitoring system

⇒ "2.2.1 System description - tyre pressure monitoring system, tyre pressure monitor display", page 257

⇒ "2.2.2 System description - tyre pressure monitoring system, tyre pressure monitoring system (TPMS) with autolocation", page 258

2.2.1 System description - tyre pressure monitoring system, tyre pressure monitor display

General information:

The tyre pressure monitoring system is part of the software in the ABS control unit - J104- . The system is used to detect slow tyre pressure loss from a wheel. Event memory entries for the Tyre Pressure Loss Indicator are stored in the ABS control unit - J104- . The Tyre Pressure Loss Indicator compares the speed and the rolling circumference of the individual wheels via the ABS sensors.

After the following work or modifications, the tyre pressure monitor display button - E492- must be pressed and held until a confirmation is sounded.

- Change in tyre pressures
- Changing one or more wheels
- Interchanging wheels, e.g. from front to rear
- Removing and fitting one or more wheels

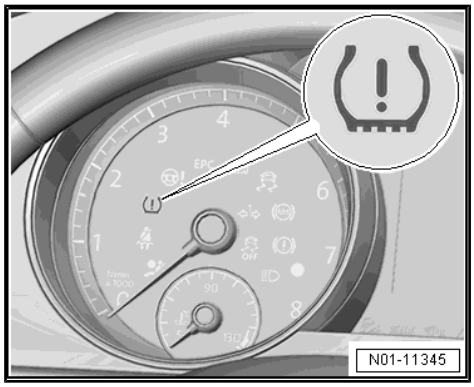
A change in a wheel's rolling circumference will be indicated by the tyre pressure monitor warning lamp - K220- lighting up in the dash panel insert. A tyre's rolling circumference may change as a result of:

- Insufficient tyre pressure
- Structural tyre damage
- Uneven load distribution in the vehicle
- Increased load on one axle, e.g. due to towing a trailer
- Use of snow chains.
- Temporary spare wheel installed
- Wheel renewal

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System fault in the ABS system

If a fault in the ABS is displayed by the ESP and TCS warning lamp - K155- then the Tyre Pressure Monitoring System warning lamp - K220- will also light up. However, no fault will be stored in the Tyre Pressure Loss Indicator system.



The warning lamp cannot be erased. In this case, please carry out the following steps:

– Connect ⇒ Vehicle diagnostic tester and select “Guided Fault Finding” ⇒ Vehicle diagnostic tester.

Follow instructions on screen to perform basic setting.

Carrying out basic setting of Infotainment system

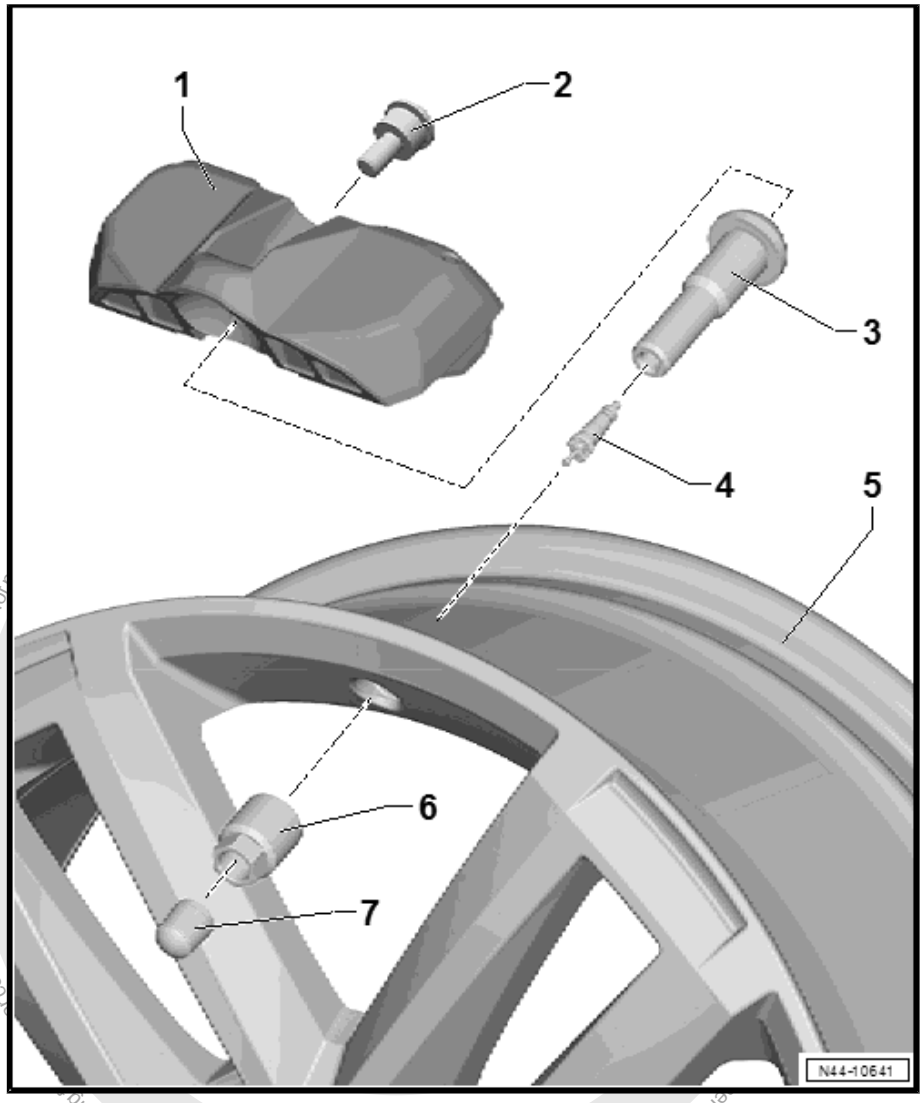
– Switch on ignition.
– Switch on Infotainment system.
– Press Infotainment button CAR.
– Press Setup function button.
– Press Tyres function button.
– Press Set function button.
– Press Confirm function button.

2.2.2 System description - tyre pressure monitoring system, tyre pressure monitoring system (TPMS) with autolocation

- As previously the system is based on sensors in the tyres, the sensors send the inflation pressure data to the tyre pressure monitor control unit - J502- .
- The function “autolocation” allows the system to react over a relatively short distance, sending inflation pressure and warnings correctly to the display in the dash panel.
- The “intelligent aerial” is a combined tyre pressure monitor control unit and a central receiver aerial.
- Manual calibration is not necessary after renewing wheel electronics or changing a set of tyres. The Tyre Pressure Monitoring System automatically identifies new tyre pressure sensors and programs these as soon as driving commences.

2.3 Assembly overview - tyre pressure sensor

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1 - Tyre pressure sensor

- ❑ Front left tyre pressure sensor - G222-
- ❑ Front right tyre pressure sensor - G223-
- ❑ Rear left tyre pressure sensor - G224-
- ❑ Rear right tyre pressure sensor - G225-
- ❑ Removing and installing ⇒ page 260

2 - Bolt

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

3 - Metal valve

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

4 - Valve insert

- ❑ Always renew when changing tyre

5 - Wheel rim

6 - Union nut

- ❑ 4 Nm

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

7 - Valve cap

2.4 Removing and installing tyre pressure monitor control unit - J502-

Fitting location:

The tyre pressure monitor control unit - J502- is fitted on the right of the rear cross panel.

Removing

– Switch off ignition.

Vehicles without towing bracket

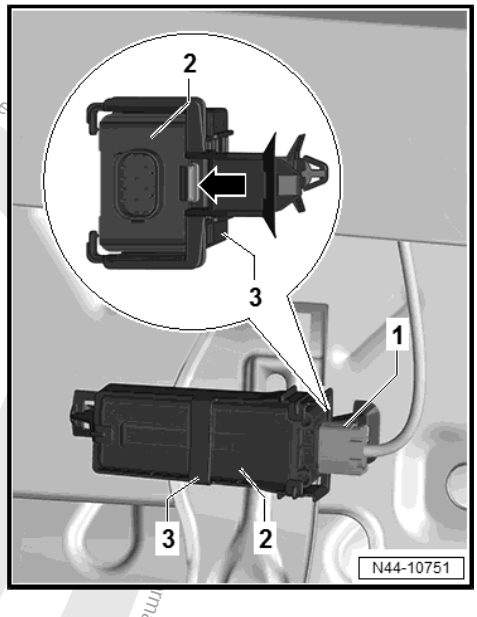
– Remove bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Removing and installing bumper cover .

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Continued for all vehicles:

– Disconnect connector -1- from tyre pressure monitor control unit - J502- -2-.

– Press lug -arrow- slightly outwards and pull tyre pressure monitoring control unit - J502- -2- out of bracket -3-.



Installing

Install in reverse order of removal.

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

Special tools and workshop equipment required

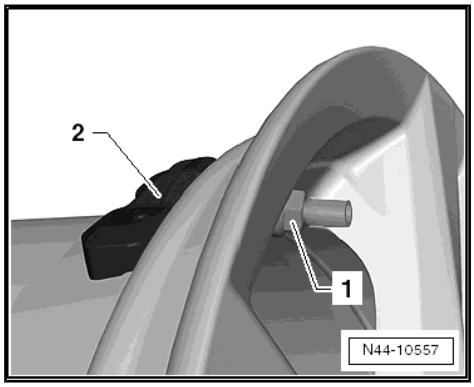
◆ Torque wrench - V.A.G 1410-



Removing

– Remove tyre from rim ⇒ page 249 .

– Turn nut -1- anti-clockwise until tyre pressure sensor -2- can be removed.



Note

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

Installing

Caution

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

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– Using square-head bolt -5-, secure tyre pressure sensor loosely to metal valve -3-.

Note

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

– Insert metal valve into valve hole in rim.

Caution

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

– Bolt new union nut onto metal valve. While doing so, the metal valve will turn and is bolted to tyre pressure sensor .

– Tighten union nut until rupture disc breaks.

– Install tyre on rim ⇒ page 249 .

Torque settings

- ⇒ “2.3 Assembly overview - tyre pressure sensor”, page 258

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3 Wheel alignment

⇒ “3.1 Notes for wheel alignment”, page 262
⇒ “3.2 Test conditions”, page 263
⇒ “3.3 Test preparations”, page 263
⇒ “3.4 Specifications for wheel alignment”, page 265
⇒ “3.5 Wheel alignment procedure”, page 266
⇒ “3.6 Necessity of wheel alignment”, page 268
⇒ “3.7 Vehicle data sticker”, page 268
⇒ “3.8 Adjusting camber at front wheels”, page 269
⇒ “3.9 Adjusting camber on rear axle”, page 270
⇒ “3.10 Adjusting toe at rear axle”, page 271
⇒ “3.11 Adjusting front axle toe”, page 272
⇒ “3.12 Wheel runout compensation”, page 273
⇒ “3.13 Checking maximum wheel lock”, page 273

3.1 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 1000 to 2000 km after the coil springs have settled.*
- *When making adjustments, adhere to the relevant specifications as closely as possible.*
- *Whenever adjustments are made to the running gear, always check whether any driver assist systems must be recalibrated following the adjustments.*

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.

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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 .

3.2 Test conditions

- Check wheel suspension, wheel bearing assembly and steering 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.
- Windscreen washer fluid reservoir 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 computers can lose their original calibration over a period of time.

Wheel alignment platforms 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.

3.3 Test preparations

⇒ “3.3.1 Test preparations, wheel alignment with no driver assist systems”, page 263

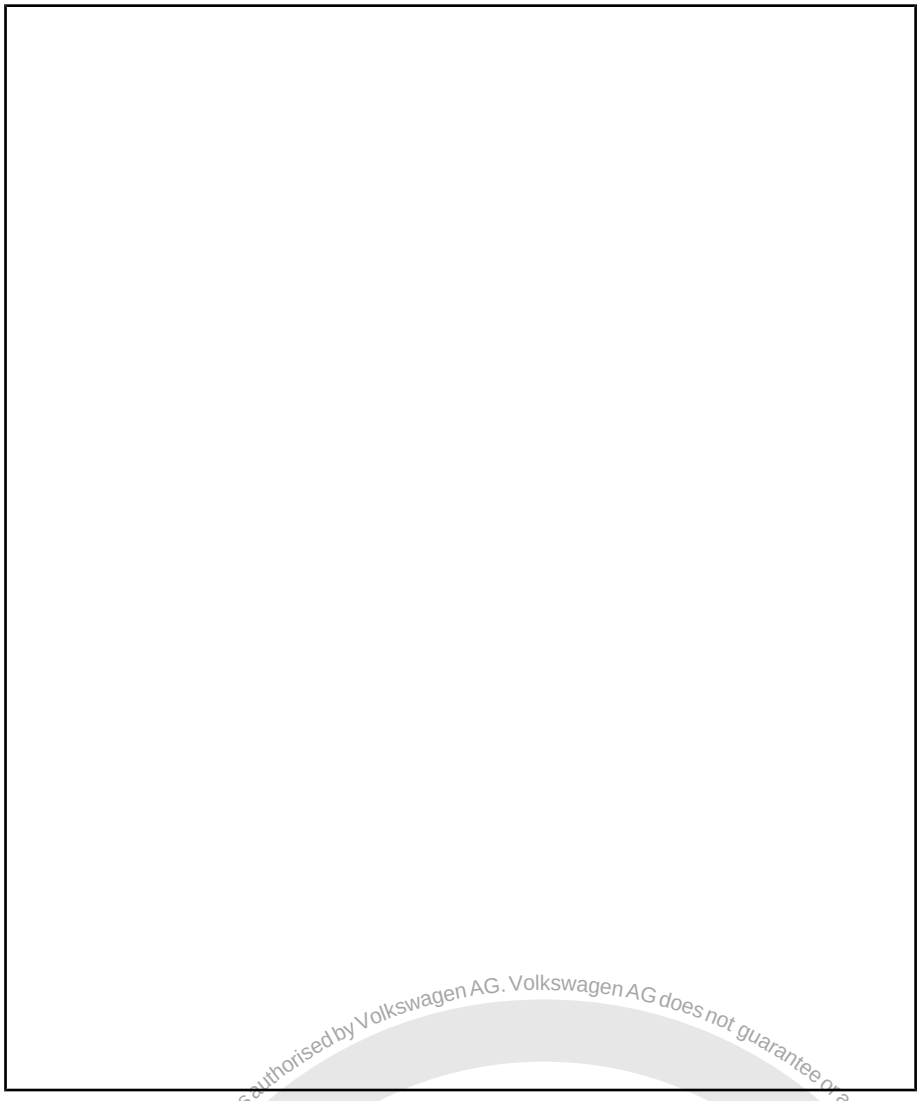
⇒ “3.3.2 Test preparations, wheel alignment with driver assist systems”, page 264

3.3.1 Test preparations, wheel alignment with no driver assist systems

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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-
- Insert tool, 18 mm - T10179-
- Shock absorber 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.

Preparations required before calibration of driver assist systems

3.3.2 Test preparations, wheel alignment with driver assist systems

The following steps are required if one or more driver assist systems on the vehicle are to be calibrated via the "Quick-start" procedure (i.e. without first checking and adjusting the wheel alignment):

- Before driving the vehicle onto the alignment platform, make sure there is sufficient space between the vehicle and the cal-

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ibration unit. The distance between the calibrating device and the vehicle must be 120 cm ± 2.5 cm.

- If the available space is not adequate, move the vehicle backwards on the alignment platform as required. This allows the use of the respective floor area.
- Before starting calibration, read out event memory and rectify any faults.
- Vehicle accurately aligned, suspension bounced and rocked several times.
- When checking wheel alignment, ensure that sliding plates and turn tables are not touching end stop.
- Connect battery charger ⇒ Electrical system; General information; Rep. gr. 27 ; Charging battery .
- Move front wheels to straight-ahead position.
- Connect ⇒ Vehicle diagnostic tester to vehicle, route diagnostic cable through open door window.
- Vehicle exterior lighting switched off.
- All doors of vehicle are closed.
- Press button to select required calibration on wheel alignment computer.

3.4 Specifications for wheel alignment

These specifications apply to all engines.

Explanations regarding PR numbers
⇒ “3.7 Vehicle data sticker”, page 268 .

Front axle	Standard/adaptive chassis control DCC, front-wheel drive	Standard/adaptive chassis control DCC, all-wheel drive		
PR numbers	**G02/G03/G05**	**G01/G04/G06/ G07/G08**		
Total toe (without load)	10′ ± 10′	10′ ± 10′		
Camber (in straight-ahead position) [1)] Maximum permissible difference between sides	-26′ ± 30′ max. 30'	-16′ ± 30′ max. 30'		
Toe-out on turns with 20° steering angle [2)]	1° 20′ ± 20′	1° 21′ ± 20′		
Caster Maximum permissible difference between sides	7° 19′ ± 30′ max. 30'	7° 07′ ± 30′ max. 30'		
Ride height	433 ± 10 mm	443 ± 10 mm		

1) Camber cannot be adjusted. Corrections are possible by moving the subframe slightly.

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

These specifications apply to all engines.

Explanations regarding PR numbers
⇒ "3.7 Vehicle data sticker", page 268 .

Rear axle	Standard/adaptive chassis control DCC, front-wheel drive	Standard/adaptive chassis control DCC, all-wheel drive		
PR numbers	**G01/G10**	**G01/G04/G06/ G07/G08**		
Camber Maximum permissible difference between sides	-1°20′ ± 30′ max. 30'	-1°20′ ± 30′ max. 30'		
Total toe Maximum permissible deviation from the axle running direction	+10′ ± 10′ max. 20'	+10′ ± 10′ max. 20'		
Ride height	445 ± 10 mm	455 ± 10 mm		

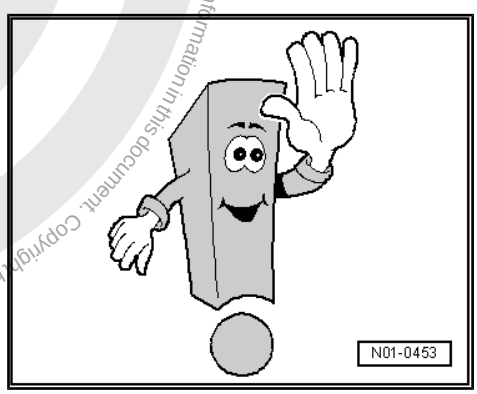
3.5 Wheel alignment procedure

Always adhere to the following procedure!

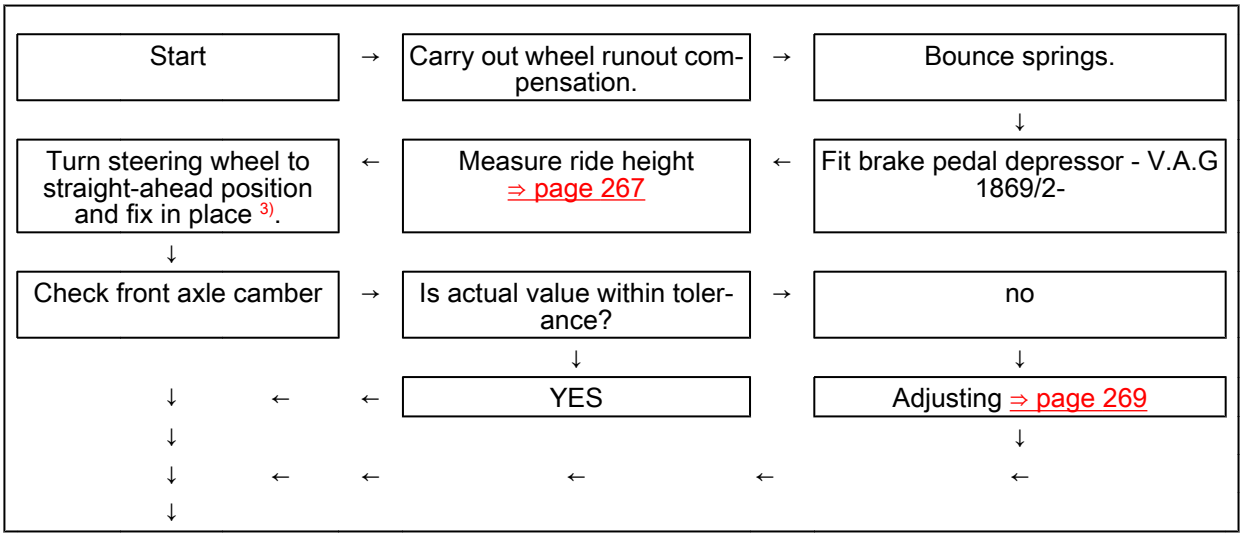
Note

The vehicle must always be in unladen condition when measuring wheel alignment ⇒ page 6 .

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



Alignment procedure



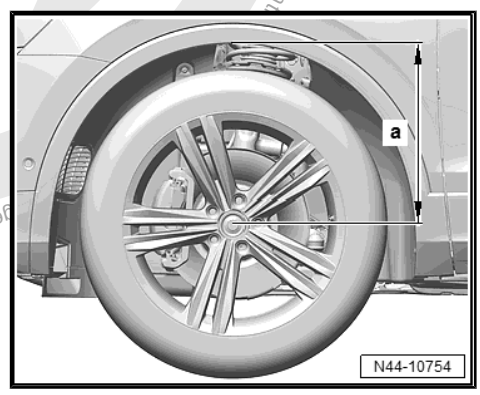
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Check rear axle camber	→	Is actual value within tolerance?	→	no
		↓		↓
		YES		Adjusting ⇒ page 270
Check rear axle toe	→	Is actual value within tolerance?	→	no
		↓		↓
		YES		Adjusting ⇒ page 270
Check front axle caster	→	Is actual value within tolerance?	→	no
		↓		↓
		YES		Inspect axle components and body
Check front axle toe	→	Is actual value within tolerance?	→	no
		↓		↓
End	←	YES		Adjusting ⇒ page 272

3) If steering wheel is not centred, it must be straightened after wheel alignment is finished. Then carry out basic setting for steering angle sender - G85- using ⇒ Vehicle diagnostic tester.

Measuring ride height

– The dimension -a- between the centre of the wheel hub and the lower edge of the wheel housing defines the ride height.



Note

- *If adjustments have been made to the suspension after a wheel alignment check on vehicles with ESP or ABS, the steering angle sender - G85- must be calibrated using the ⇒ Vehicle diagnostic tester.*
- *If any changes are made to the rear wheel alignment settings, the following driver assist systems must be recalibrated:*
- *Lane departure warning (Audi lane assist) ⇒ "6.1 Calibrating front camera for driver assist systems", page 290 ,*
- *ACC ⇒ page 285 .*

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3.6 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 re-newed	Alignment necessary	
	YES	no		YES	no
Lower suspension link		X	Lower transverse link	X	
Bonded rubber bush for suspension link		X	Upper transverse link	X	
Wheel bearing housing	X		Track rod	X	
Track rod/track rod ball joint	X		Wheel bearing housing	X	
Steering rack	X		Subframe	X	
Subframe	X		Coil spring		X
Suspension strut		X	Shock absorbers		X
Anti-roll bar		X 4)	Anti-roll bar		X
			Trailing arm	X	

4) Prerequisite: the position of the subframe was fixed before the subframe was removed ⇒ page 40

Components removed and installed

Front axle component re-moved and reinstalled	Alignment necessary		Rear axle component re-moved and reinstalled	Alignment necessary	
	YES	no		YES	no
Lower suspension link		X 5)	Lower transverse link	X	
Wheel bearing housing		X	Upper transverse link	X	
Track rod/track rod ball joint	X		Track rod	X	
Steering rack		X	Wheel bearing housing	X	
Subframe		X 5)	Subframe	X	
Suspension strut		X	Coil spring		X
Anti-roll bar		X 5)	Shock absorbers		X
			Anti-roll bar		X
			Trailing arm	X	

5) Prerequisite: the position of the subframe was fixed before the subframe was removed ⇒ page 40

3.7 Vehicle data sticker

Explanation regarding “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.

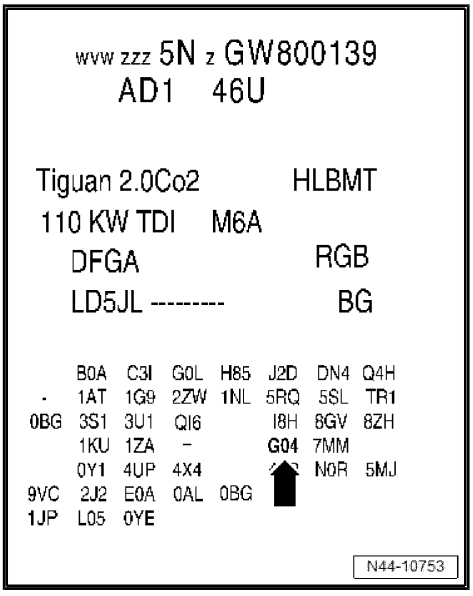
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The running gear version fitted in the vehicle is indicated on the vehicle data sticker by the PR number for the front axle.

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

Example of a vehicle data sticker

In this example the vehicle is equipped with a standard running gear for all-wheel drive vehicles G04 -arrow-.



3.8 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 ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

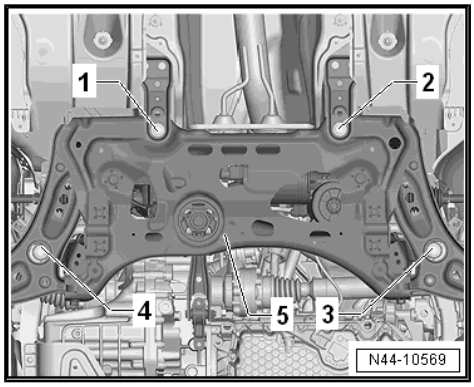
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– Undo bolt -1- and screw a new one in loosely.

– Undo bolt -2- and screw a new one in loosely.

– Undo bolt -3- and screw a new one in loosely.

– Undo bolt -4- and screw a new one in loosely.



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.

– Move subframe -5- sideways until camber is the same on both sides ⇒ page 265 .

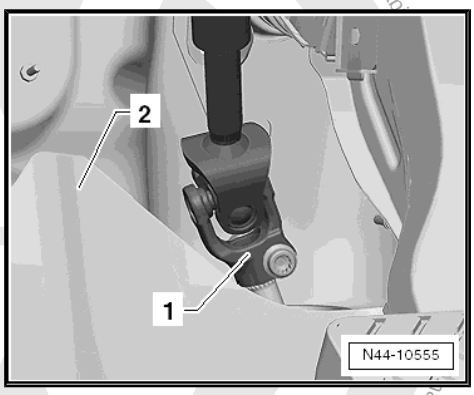
– Tighten subframe bolts -1-, -2-, -3- and -4-.

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

– Install dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side .

– Fold floor covering to the rear.

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



Torque settings

- ⇒ “2.1 Assembly overview - subframe”, page 16
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side

3.9 Adjusting camber on rear axle

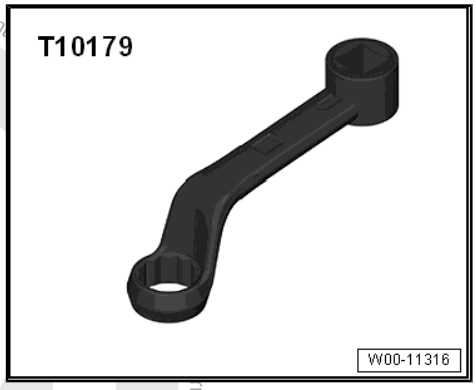
Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



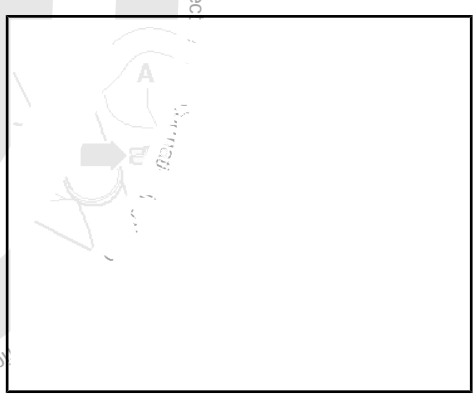
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♦ Insert tool, 18 mm - T10179-



– Loosen upper transverse link nut -A- on subframe.

– Adjust camber by turning hexagon head of eccentric bolt -arrow-.



Note

The maximum adjustment range is 90° to the left or right of centre.

– Tighten nut -A-.

– To do so, use insert tool 18 mm - T10179- .

On use of insert tool 18 mm - T10179- , tighten nuts to 80 Nm.

– Check camber value again after nut -A- has been tightened.

– Check camber value again after tightening nut -A-
⇒ “3.4 Specifications for wheel alignment”, page 265 .

Torque settings

♦ ⇒ “4.1 Assembly overview - transverse link”, page 174

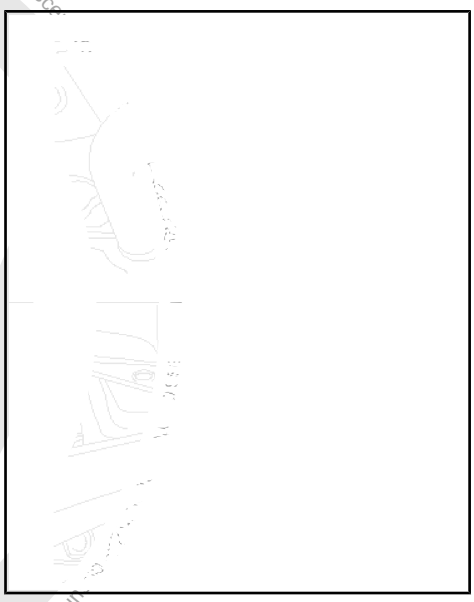
3.10 Adjusting toe at rear axle

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



– Loosen nut -1-.
– Turn eccentric bolt -2- until specification is attained.



Note

The maximum adjustment range is 90° to the left or right of centre.

– Tighten nut -1-.
– Check toe value again after tightening nut -A-
⇒ “3.4 Specifications for wheel alignment”, page 265 .

Torque settings

♦ ⇒ “4.1 Assembly overview - transverse link”, page 174

3.11 Adjusting front axle toe

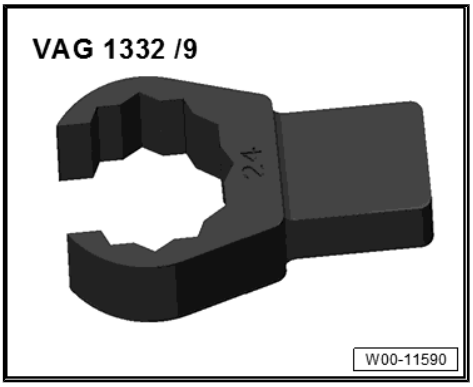
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



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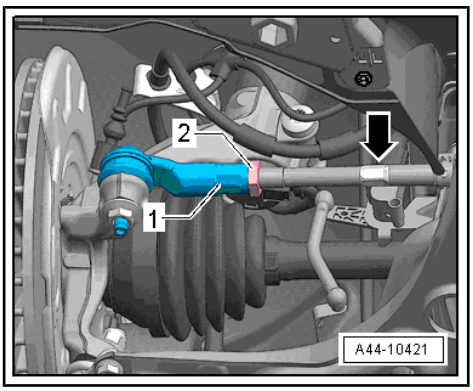
♦ Insert tool - V.A.G 1332/9-



– Counterhold track rod ball joint -1- with a suitable tool when loosening and tightening lock nut -2-.

– Loosen lock nut -2-.

– Adjust toe setting at both wheels by turning hexagon flats -arrow-.



Note

♦ *Ensure that bellows on steering rack are not damaged or twisted. Twisted boots wear out quickly.*

♦ *Tighten lock nuts on threaded portion only when vehicle is standing on its wheels - track rod ball head must be parallel with steering lever of suspension strut.*

– Tighten lock nut -2- and check toe setting again.

The setting may change slightly after lock nut -2- is tightened .

However, if the measured toe value lies within the tolerance, the adjustment is correct
⇒ “3.4 Specifications for wheel alignment”, page 265 .

Torque settings

♦ ⇒ “3.6 Repairing steering rack”, page 330

3.12 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.

3.13 Checking maximum wheel lock

The maximum wheel lock is determined with the aid of the wheel alignment computer.

– When the values for the maximum wheel lock lie outside the tolerances, then check following:

♦ Are steering or suspension components damaged or deformed?

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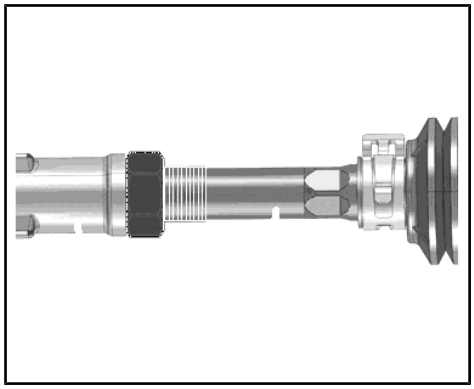
- Are track rods visually OK.?
- Is the symmetry of the track rods OK.?

Damaged components must be renewed.

– If the steering wheel is crooked, check the following:

- Check steering components for damage and deformation. If necessary, renew damaged components.
- Check suspension components for damage and deformation. If necessary, renew damaged components.
- Check symmetry of track rods also.

– Measure dimension -a- of “shorter” track rod. Shorten “longer” track rod to same dimension. Screw track rod ball joint -1- deeper onto track rod -2-.



Dimension -a- must be the same on left side and right side track rod ball joints.

Maximum permissible difference between left and right < 2.5 mm.

– When returning steering to central position, “swivel” steering wheel with even movements.

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4 Vibration due to wheels/tyres - causes and rectification

⇒ “4.1 Causes of rough running”, page 275

⇒ “4.2 Conducting a road test before balancing wheels”, page 275 .

⇒ “4.3 Balancing wheel”, page 276

⇒ “4.4 Vibration control system”, page 280

⇒ “4.5 Checking radial and lateral runout of wheels and tyres”, page 280

⇒ “4.6 Checking radial and lateral run-out on wheel rim”, page 281

⇒ “4.7 Matching wheels and tyres”, page 282

⇒ “4.8 Determining flat spots on tyres”, page 283

4.1 Causes of rough running

Rough running can have a number of different causes. It can also be caused by tyre wear. Tyre wear caused by driving is not always evenly spread across the entire running surface of the tyre. This causes slight imbalances which affect the smooth running of a wheel which was previously exactly balanced.

Minor imbalances will not be felt at the steering wheel, but that does not mean that they are not there. They increase wear on the tyre and thus reduce the tyre service life.

Recommendation

To ensure

- optimal safety,
- smoothest possible running and
- even wear

throughout a tyre's service life, we recommend having the wheels and tyres balanced at least twice during the tyre's service life.

4.2 Conducting a road test before balancing wheels

If a customer brings a vehicle to the workshop complaining about “vibration”, a road test is essential prior to balancing the wheels.

♦ This will give you information about the nature of the rough running.

♦ You will be able to determine the speed range in which rough running occurs.

– Raise the vehicle on a lifting platform immediately after the road test.

– Mark installation position on tyre.

Tyre position	Marked with …
Front left tyre	FL
Front right tyre	FR
Rear left tyre	RL
Rear right tyre	RR

– Remove wheels.

– Balance wheels.

4.3 Balancing wheel

⇒ “4.3.1 Balancing wheel, conditions”, page 276

⇒ “4.3.2 Balancing wheel, balancing wheel on stationary wheel balancer”, page 276

⇒ “4.3.3 Balancing wheel, balancing wheel with finish balancer ”, page 279

4.3.1 Balancing wheel, conditions

Before you start balancing the wheels, the following requirements must be met.

- Tyre pressure must be OK.
- Tread must not be worn on one side. Tread depth should be at least 4 mm.
- The tyre must not show any signs of damage, for example cuts, piercing, foreign bodies, etc.
- Wheel suspension and steering, including shock absorbers, must be in perfect condition.
- You must have conducted a road test.

4.3.2 Balancing wheel, balancing wheel on stationary wheel balancer

- Road test has been carried out ⇒ page 275 .

Clamp wheel into wheel balancing machine

Note

When balancing tyres, please remember that cleanliness is absolutely essential, as is the case in any other repair work you carry out. Only then can you attain a flawless result!

Dirt and rust in the area of the contact surfaces and centre of the wheel distort the result.

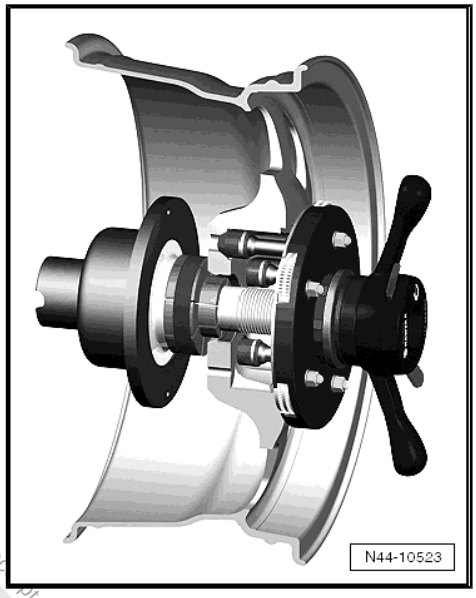
– Clean contact surface, centring element and inside of wheel using e.g. pneumatic brush grinding set - VAS 6446- ⇒ Volkswagen ServiceNet; Workshop Equipment, Catalogue before clamping wheel on wheel balancing machine!

Note

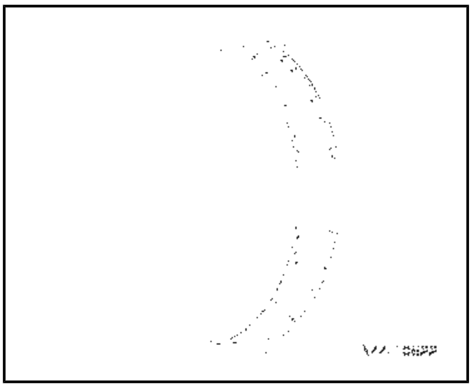
It is very important that the correct tools for centring and clamping the wheels are used on the wheel balancing system. Before commencing any work, find out about the respective centring system for wheel balancing machines ⇒ Volkswagen ServiceNet; Workshop Equipment, Catalogue .

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– Attach the wheel (together with tyre) to the wheel balancing machine.



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Note

- *To clamp the wheel in place, use centring system for wheel balancing machines - VAS 5271- , for example.*
- *This ensures that the wheel is 100% centred and that the wheel will be clamped without damage!*
- *The wheel cannot be centralised 100% with conical clamping elements on the wheel balancing machine.*
- *A deviation of 0.1 mm from the centre results in an imbalance of 10 g at the wheel/rim.*

Procedure for balancing wheels and tyres

– Allow the wheel (together with tyre) to rotate on the wheel balancing machine.

– Check that the indicator lines on the sidewalls of the tyre near the wheel rim flange run evenly.

– Check tyre profile with wheel/tyre rotating.

Note

If one-sided wear, flat spots from braking or severely washed out spots are apparent, balancing cannot achieve smooth running. In this case, the tyre must be renewed.

– Check true running of wheel/tyre. If the wheel and tyre do not run true although there are no flat spots, radial or lateral runout may be the cause.

– Check the wheel for radial or lateral run-out ⇒ page 281 .

– If radial and lateral runout are within the specified tolerance, balance the wheel and tyre.

Note

- *More than 60 g of weight per tyre should not be used.*
- *If more weight is required, you may be able to achieve smoother running by "matching" the tyre and rim. Matching tyres ⇒ page 282 .*
- *The wheel balancer display should indicate 0 g.*
- *As an alternative to match mounting, you could use the vibration control system - VAS 6230 A- ⇒ page 280 .*

– Bolt wheel onto vehicle.

– First, hand-tighten the lowest wheel bolt to about 30 Nm.

– Then, tighten the remaining wheel bolts diagonally to about 30 Nm. This process centres the wheel on the hub.

– Lower vehicle onto its wheels.

– Now use the torque wrench to firmly tighten the wheel bolts diagonally to the prescribed torque.

Carry out a road test

– After balancing the wheel/tyre, carry out a road test.

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If you detect vibration during the road test, it may be due to wheel centring tolerances.

In unfavourable circumstances, the component tolerances of wheels and hubs could cumulate. This too can lead to vibration. This can be alleviated using a finish balancer. ⇒ page 279

4.3.3 Balancing wheel, balancing wheel with finish balancer

Note

- *Before working with a finish balancer , the mechanic needs to have been instructed by the manufacturer of the balancer.*
- *To balance the wheels, set the wheels of the driven axle on the sensor platforms. On front-wheel drive models, front wheels must be set. On four-wheel drive models, all 4 wheels must be set.*

If a residual imbalance greater than 20 g is determined when balancing the wheels, rotate the mounting position of the wheel on the hub.

– Mark the point at which the imbalance is indicated.

– Then, unbolt the wheel and rotate its position on the hub so that the marking points downwards.

Note

The hub must not rotate during this procedure.

– First, hand-tighten the lowest wheel bolt to about 30 Nm.

– Then, tighten the remaining wheel bolts diagonally to about 30 Nm. This process ensures that the wheel is centred properly on the hub.

– Check whether the imbalance is less than 20 g using the finish balancer.

Note

The imbalance must be less than 20 g before the balance weight is changed.

– Loosen the wheel bolts again if necessary.

– Rotate wheel again by 1 or 2 wheel bolt holes in relation to wheel hub.

– Tighten wheels using the method described above.

Note

Do not try to reduce the imbalance using balancing weights unless the imbalance is less than 20 grams.

– Balance wheels if imbalance is less than 5 grams.

– Tighten wheel bolts to specified torque if you have not already done so.

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WARNING

Always tighten wheel bolts to specified tightening torque using a torque wrench!

4.4 Vibration control system

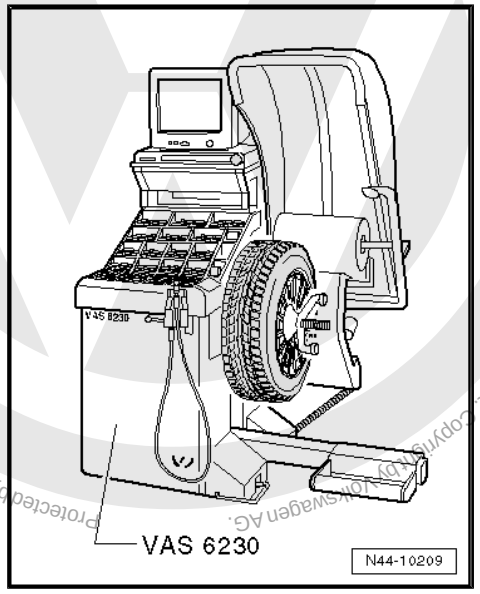
Using the vibration control system - VAS 6230 A- you can perform more functions than just stationary balancing.

A special feature of this system is the testing of the radial force of the wheel and tyre while rolling.

A roller presses against the wheel with a force of about 635 kg. This simulates the vertical tyre force against the road surface during travel.

Radial and lateral runout in the wheel and tyre and differences in the stiffness of the tyre cause the vertical force of the wheel to vary.

The -VAS 6230 A- detects and stores the position of the maximum measured radial force in the tyre. Then the position of the smallest distance between the wheel rim flange and the centre of the rim is measured.



4.5 Checking radial and lateral runout of wheels and tyres

⇒ “4.5.1 Checking radial and lateral runout of wheels and tyres, tolerances”, page 280

⇒ “4.5.2 Checking radial and lateral runout on wheels and tyres with tyre gauge”, page 281

4.5.1 Checking radial and lateral runout of wheels and tyres, tolerances

Radial and lateral runout occur when the wheel and tyre do not run absolutely true.

For technical reasons, 100% true running is not possible.

Therefore, the manufacturers of these components allow a precisely determined tolerance.

Aligning the tyre in an unfavourable position on the wheel can cause the maximum allowed tolerance for wheel with tyre to be exceeded.

The table shows the maximum permissible tolerances for a wheel with mounted tyre.

Tolerances for radial and lateral runout of rim with tyre

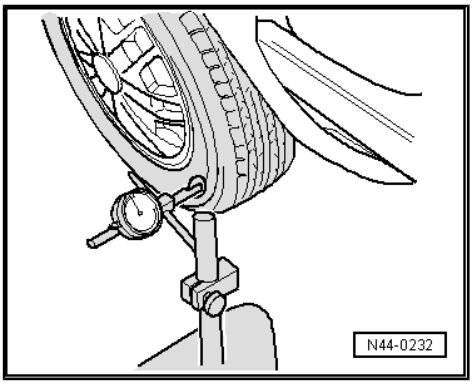
Wheel with tyre	Radial runout (mm)	Lateral runout (mm)
Passenger cars	0.9	1.1 (1.3 in vicinity of lettering)

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4.5.2 Checking radial and lateral runout on wheels and tyres with tyre gauge

Checking lateral run-out

– Preload tyre gauge approx. 2 mm.
– Fit tyre gauge to sidewall of tyre.
– Turn wheel slowly.
– Make a note of the smallest and largest deflection of the indicator needle.



Note

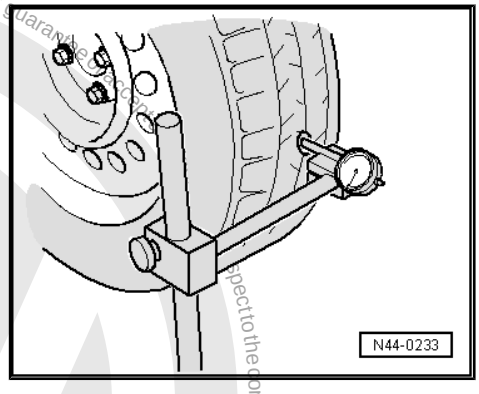
If the difference is greater than 1.3 mm, the lateral runout is too great.

In this case, you can reduce lateral runout by match mounting the tyre ⇒ page 282 .

Extreme values on the tyre gauge due to small irregularities in the rubber may be disregarded.

Checking radial runout

– Preload tyre gauge approx. 2 mm.
– Fit tyre gauge to running surface of tyre.
– Turn wheel slowly.
– Make a note of the smallest and largest deflection of the indicator needle.



Note

If the difference is greater than 1 mm, the radial runout is too great.

In this case, you can reduce radial runout by match mounting the tyre ⇒ page 282 .

4.6 Checking radial and lateral run-out on wheel rim

– Attach rim to wheel balancing machine .
– Use the centring system for wheel balancing machines - VAS 5271- .
– Preload tyre gauge approx. 2 mm.
– Turn rim slowly.

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– Make a note of the smallest and largest deflection of the indicator needle.

S - Lateral runout

H - Radial runout

– Compare the measured values with the specifications in the table ⇒ page 282 .

Note

Extreme values on the tyre gauge due to small irregularities may be disregarded.

Specifications for radial and lateral runout on wheel

Wheel rim	Radial runout (mm)	Lateral runout (mm)
Steel wheel	0.5	0.5
Alloy wheel	0.5	0.8

Note

If the measured value exceeds the specification, acceptably smooth running cannot be attained.

4.7 Matching wheels and tyres

General information

When radial or lateral runout of the wheel and tyre coincide, the imbalance of the wheel is amplified by the tyre.

For technical reasons, 100% true running is not possible ⇒ page 280 .

Before match mounting the used wheels which are fitted on the vehicle, run the tyres warm. This will eliminate any flat spots caused by storage or handling, ⇒ page 283 .

Procedure for match mounting

– Let air out of tyre.

– Press tyre beads off wheel rim flanges.

– Apply tyre assembly paste all around the tyre beads.

– Rotate tyre by 180° relative to wheel rim.

– Inflate tyre to approx. 4 bar.

– Attach the wheel (together with tyre) to the wheel balancing machine.

– Check wheel for true running and for radial and lateral runout .

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Note

- *If the specified values for radial and lateral runout are not exceeded, the wheel can be balanced to 0 g. Specified values appear on ⇒ page 280 .*
- *If the radial and lateral runout is not within the specifications, the tyre must be rotated again.*

– Let air out and press tyre beads off the wheel rim flanges.

– Rotate tyre by 90° relative to wheel (quarter of a turn).

– Inflate tyre again to 4 bar and check true running.

Note

- *If the specified values for radial and lateral runout are not exceeded, the wheel can be balanced to 0 g.*
- *If the radial and lateral runout are not within the specified values, the tyre must be rotated again.*

– Press tyre off wheel rim flange again as described above.

– Rotate tyre by 180° relative to wheel rim (half a rotation).

If the radial and/or lateral runout are still not within the specified values, check the wheel for radial and/or lateral runout ⇒ page 281 .

If the measured values for radial and lateral runout of the wheel are within the specified values, the tyre has unacceptably high radial or lateral runout. In this case, the tyre must be renewed.

Note

- *After fitting the tyres there will be fitting lubricant between the tyres and the rim flanges.*
- *You should therefore avoid severe braking and acceleration manoeuvres for the first 100 or 200 km driven. Otherwise, the tyres can turn on the wheel rim. In this case, your work will have been in vain!*

4.8 Determining flat spots on tyres

What is a flat spot?

The terms flat area and flats are also used for the term flat spot.

Flat spots caused by storage or handling also cause vibration in the same way as incorrectly balanced wheels do. It is important that flat spots on the tread are identified as such.

Flat spots caused by storage or handling cannot be balanced and they can reoccur at any time due to various circumstances. Flat spots caused by storage or handling can be eliminated without complicated special tools. Assuming it is not a flat spot caused by full braking ⇒ Wheels and Tyres Guide - General Information; Rep. gr. 44 ; Rolling noises due to tyres, locked-brake flat spots .

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Note

Flat spots caused by hard braking cannot be repaired. Such tyres must be renewed.

Reasons for flat spots caused by storage or handling:

- The vehicle has been left standing in one place without being moved for several weeks.
- The tyre pressure is too low.
- The vehicle was placed in a paint shop drying booth after being painted.
- The vehicle was parked with warm tyres in a cool garage or similar for a long period of time. In this case, a standing flat spot may even occur overnight.

Eliminating flat spots caused by storage or handling

- Flat spots caused by storage or handling cannot be eliminated from the tyre using workshop equipment.
- Flat spots caused by storage or handling can be removed only by running the tyres warm.
- The method described below is not recommended in cold and wintry weather.

Requirements and conditions:

– If necessary, check tyre pressure and correct.

– If possible, drive the vehicle onto a motorway.

– Traffic and road conditions permitting, drive a 20 to 30 km stretch at a speed of 120 to 150 km/h (where legally permissible).

WARNING

- *Do not endanger yourself or other road users during this road test.*
- *Observe the highway code and speed limitations in force when performing the road test.*

– Jack up the vehicle immediately after the trip.

– Unbolt wheels from vehicle.

– Balancing wheels on stationary wheel balancer ⇒ page 276 .

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5 Adaptive cruise control

⇒ “5.1 Calibrating adaptive cruise control”, page 285

5.1 Calibrating adaptive cruise control

⇒ “5.1.1 Calibrating adaptive cruise control - static calibration”, page 285

⇒ “5.1.2 Calibrating adaptive cruise control - dynamic calibration”, page 288

5.1.1 Calibrating adaptive cruise control - static calibration

Before adjusting the adaptive cruise control (ACC) system, check the sensor, its bracket and its securing elements for damage, external influence and secure seating. Repair any damaged parts if necessary.

Before adjusting the adaptive cruise control (ACC) system, read out the event memory and rectify any faults found.

The “measured misalignment-angle value” of the ACC control unit indicates whether or not the sensor is out of adjustment.

Use only a wheel alignment machine and adjusting devices approved by VW/AUDI to adjust the adaptive cruise control (ACC) system.

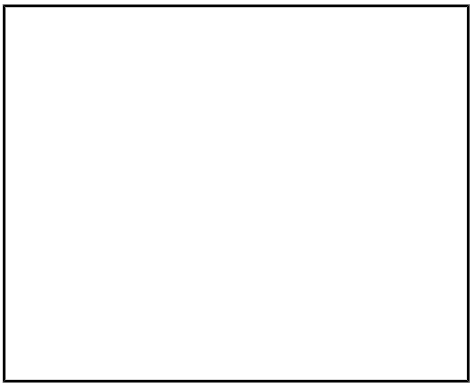
Correct adjustment is an essential prerequisite for the perfect functioning of the adaptive cruise control (ACC) system.

– The adaptive cruise control unit - J428- needs to be calibrated if the following conditions apply:

- Adaptive cruise control unit - J428- has been renewed
- Lock carrier has been moved to service position
- Lock carrier has been removed and installed
- Lock carrier has been renewed
- Toe on rear axle has been adjusted
- Conversions/adjustments have been carried out on the running gear that affect the suspension height.

Special tools and workshop equipment required

- Setting device - VAS 6430- or setting device, basic kit - VAS 6430/1-



- ACC reflector mirror - VAS 6430/10-
- Wheel alignment computer

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Note

- *Before driving vehicle onto wheel alignment platform, make sure there is sufficient space between vehicle and setting device - VAS 6430- . The distance between ACC reflecting mirror - VAS 6430- and the sensor must be 120 cm ± 2.5 cm.*
- *If available space is not adequate, move vehicle backwards onto alignment platform as required to achieve space required.*
- *If the position of the ACC reflecting mirror - VAS 6430/10- on alignment beam is changed during the adjustment work, the setting of adjustment device - VAS 6430- must always be checked (e.g. spirit levels, individual toe values on adjusting beam, etc.).*

- Before starting adjustment, read out event memory and rectify any faults.

Adjustment procedure described here is based on adjustment device - VAS 6430- .

The following setting sequence is to be adhered to:

1 - Establish a distance of 120 cm ± 2.5 cm between the ACC reflecting mirror - VAS 6430/10- fitted in the middle and the sensor in the radiator grille.

2 - Install ACC reflector mirror - VAS 6430/10- centred on alignment beam.

3 - Adjust adaptive cruise control unit - J428- .

If wheel alignment has just been carried out, the steps described under “Setting without preceding wheel alignment” do not have to be carried out.

Setting without preceding wheel alignment

– Press button to select ACC calibration in wheel alignment computer.

– Note testing preconditions for wheel alignment ⇒ page 263 .

– Drive car onto wheel alignment platform.

– Connect battery charger ⇒ Electrical system; General information; Rep. gr. 27 ; Charging battery .

– Connect ⇒ Vehicle diagnostic tester. (Route diagnostic cable through open window.)

Note

During the setting procedure, make sure that all the car doors remain closed and that the car's exterior lighting is switched off.

– Move front wheels to straight-ahead position.

– Mount quick-release clamps on rear wheels.

– Mount measurement transducers on rear wheels.

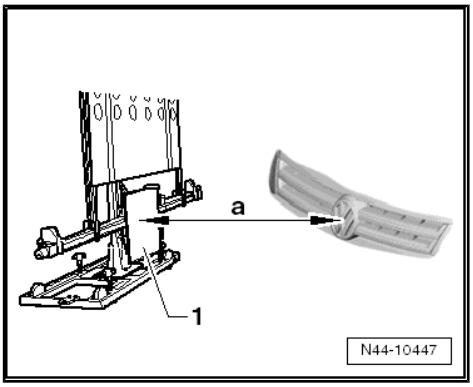
– Carry out wheel run-out compensation at rear wheels.

Setting with or without preceding wheel alignment

– Position ACC setting device - VAS 6430- in the middle and parallel at a distance -a- from the ACC reflector mirror - VAS 6430/10- fitted in the middle to the VW emblem in the radiator grille.

a - 120 cm ± 2.5 cm

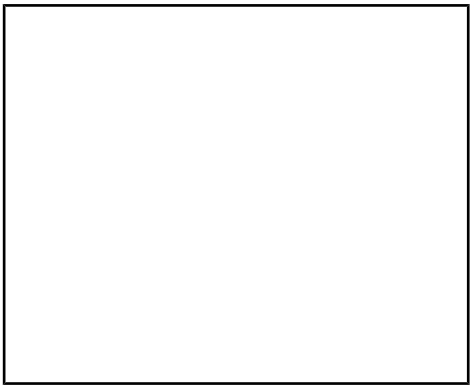
– Remove any dirt from Volkswagen badge as necessary.



Note

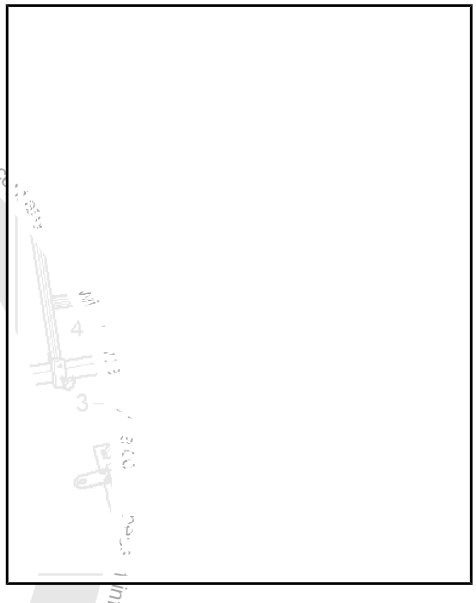
ACC setting device - VAS 6430- is not allowed to be moved on alignment beam.

– Mount measurement transducers -1- of front wheels on alignment beam.



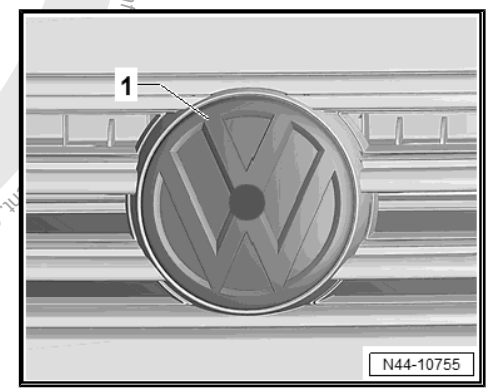
– Use adjusting screws -1-, -2- and -3- to bring spirit levels -A- and -B- to - VAS 6430/10- horizontal.

– Adjust mirror -4- by means of crank handle -arrow- in such a way that the laser beam contacts the centre of the sensor lens.



– Position mirror on side of alignment beam so that the laser beam contacts the centre of the Volkswagen badge -1-.

– Level spirit levels of measurement transducer.

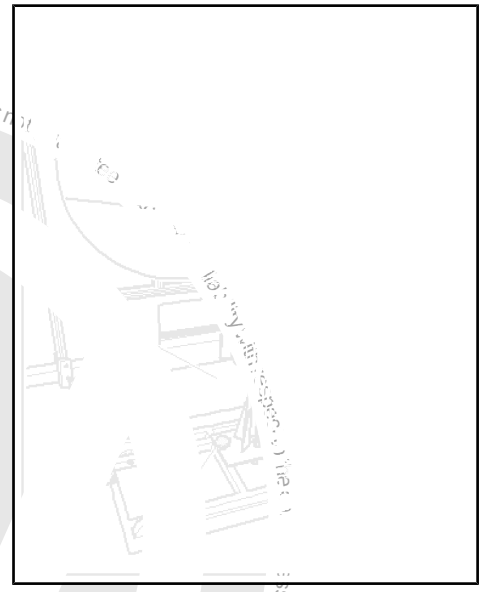


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– Turn fine adjuster screw -5- until display on wheel alignment computer is within tolerance.

– Level spirit levels of measurement transducer.

– Now, use laser beam of -VAS 6430/10- to check again whether spirit levels are horizontal and laser beam hits centre of sensor lens.



Note

The alignment of - VAS 6430/10- must be repeated if the laser beam does not coincide with the sensor lens.

– Select “Own test schedule” on ⇒ Vehicle diagnostic tester.

– On the screen, click the following buttons one after the other:

♦ Diagnosis-capable systems

♦ 0013 – Adaptive cruise control

♦ 0013 - Adaptive cruise control, functions

♦ 0013 - Calibration

Follow instructions on screen to set the control unit.

5.1.2 Calibrating adaptive cruise control - dynamic calibration

Before adjusting the adaptive cruise control (ACC) system, check the sensor, its bracket and its securing elements for damage, external influence and secure seating. Repair any damaged parts if necessary.

Before adjusting the adaptive cruise control (ACC) system, read out the event memory and rectify any faults found.

The “measured misalignment-angle value” of the ACC control unit indicates whether or not the sensor is out of adjustment.

Use only a wheel alignment machine and adjusting devices approved by VW/AUDI to adjust the adaptive cruise control (ACC) system.

Correct adjustment is an essential prerequisite for the perfect functioning of the adaptive cruise control (ACC) system.

– The adaptive cruise control unit - J428- needs to be calibrated if the following conditions apply:

♦ Adaptive cruise control unit - J428- has been renewed

♦ Lock carrier has been moved to service position

♦ Lock carrier has been removed and installed

♦ Lock carrier has been renewed

♦ Toe on rear axle has been adjusted

– Connect ⇒ Vehicle diagnostic tester.

– Select “Own test schedule” on ⇒ Vehicle diagnostic tester.

– On the screen, click the following buttons one after the other:

♦ Diagnosis-capable systems

♦ 0013 – Adaptive cruise control

♦ 0013 - Adaptive cruise control, functions

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♦ 0013 - Calibration

Follow instructions on screen to set the control unit.

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6 Front camera for assist systems

⇒ “6.1 Calibrating front camera for driver assist systems”, page 290

6.1 Calibrating front camera for driver assist systems

Note

The following situations can cause the camera function to be impaired by sustained poor visibility of the lane marker lines:

- The field of view of the camera is soiled or iced over. In this case, clean the affected area.
- The field of view of the camera is fogged over.

The camera’s viewing window must be cleaned manually if there is heavy soiling on the inside of the windscreen in the field of view of the camera. To do this, the control unit and lens hood must be removed and the windscreen cleaned using cleaning solution. Remove control unit and lens hood ⇒ Electrical system; Rep. gr. 96 ; Front camera for driver assist systems .

Correct calibration is a basic precondition for the front camera for driver assist systems - R242- to function without faults.

The front camera for driver assist systems - R242- must be recalibrated if:

- The entry “no or incorrect basic setting / adaptation” is stored in the event memory.
- The front camera for driver assist systems - R242- was renewed.
- Windscreen has been renewed or removed.
- Rear axle toe has been adjusted.
- Modifications having an effect on the body height have been made to the car's running gear.
- The vehicle level senders have been reprogrammed on vehicles with damper control.

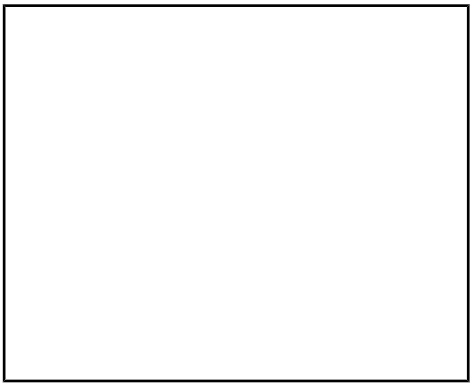
Note

- *Before calibrating the front camera for driver assist systems, read out event memory and rectify faults as necessary.*
- *Calibration of the front camera for driver assist systems must be performed using only VW/AUDI approved wheel alignment equipment!*
- *Calibration of the driver assistant system's front camera is permitted only with the setting device - VAS 6430- !*

Special tools and workshop equipment required

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- Setting device - VAS 6430-



- Wheel alignment computer
- ⇒ Vehicle diagnostic tester

Note

- *The front camera for driver assist systems - R242- must be correctly located in the holder.*
- *The field of view of the camera must be clean and clear.*
- *Before driving the vehicle onto the wheel alignment platform, make sure there is sufficient space between the midpoint of the hub of the front wheels and the setting device - VAS 6430- .*
- *The distance between the setting device - VAS 6430- and the centre point of the hub of the front wheels must be 1500 mm ± 25 mm.*
- *If available space is not adequate, move vehicle backwards onto alignment platform as required to achieve space required.*
- *The calibration board must be positioned centrally on the setting device.*
- *The event memory must be read before starting calibration. Any memory entries must be deleted.*

– Note testing preconditions for wheel alignment ⇒ page 263 .

– Drive car onto wheel alignment platform.

– Connect battery charger ⇒ Electrical system; General information; Rep. gr. 27 ; Charging battery .

– Connect ⇒ Vehicle diagnostic tester. (Route diagnostic cable through open window.)

Note

During the calibration procedure, make sure that all the car doors remain closed and that the car's exterior lighting is switched off.

– Move front wheels to straight-ahead position.

– Select calibration run for front camera for driver assist systems -R242- on wheel alignment computer.

– Mount quick-release clamps on all four wheels.

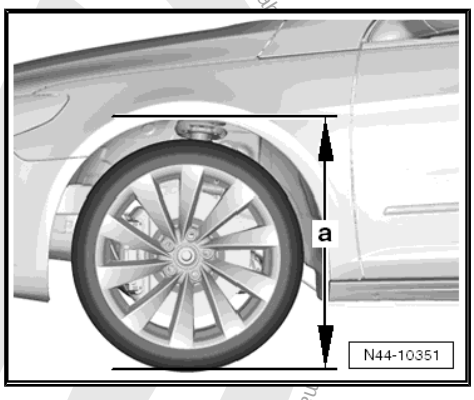
– Mount wheel alignment sensors on wheels.

– Carry out wheel run-out compensation at rear wheels.

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– Bounce springs.

– Measure standing height at all four wheels and note it.



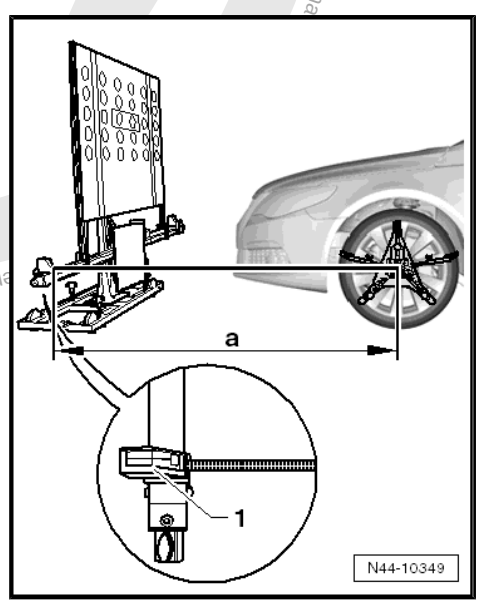
Note

- *Setting device - VAS 6430- is not allowed to be moved on alignment beam.*
- *Wheel alignment platform must be in the lowermost levelled position for next work step.*

– Turn setting device - VAS 6430- upwards so that alignment beam is parallel to middle of measurement transducers on front wheels, in order to perform a correct measurement with distance measuring unit -1-.

1 - Distance measuring unit with tape measure and socket pin

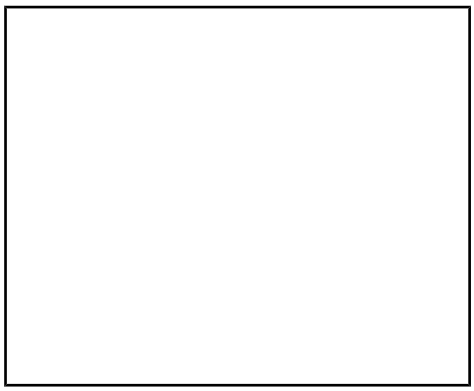
– Position setting device - VAS 6430- at distance -a- of 1500 mm ± 25 mm from centre point of hub of front wheels to beam of setting device - VAS 6430- .



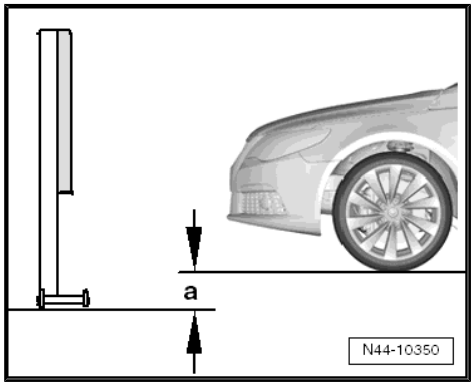
Caution

- ***Distance -a- of 1500 mm ± 25 mm must be measured on both sides of vehicle and adjustment device - VAS 6430- must then be aligned.***
- ***Distance -a- must be same on both sides of car.***

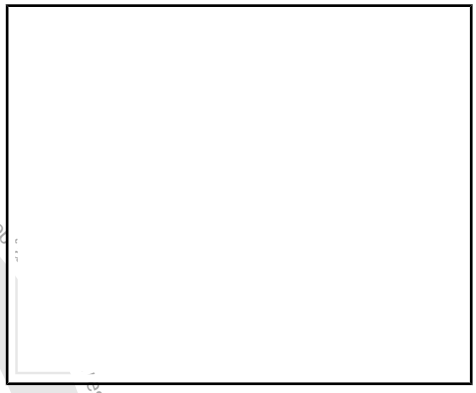
– Mount measurement transducer -1- of front wheels onto setting device - VAS 6430- .



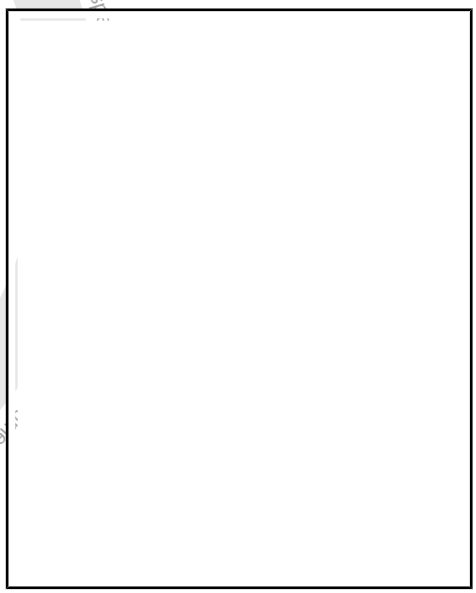
– Measure height value -a- between standing surface of setting device - VAS 6430- and wheel support surface on wheel alignment platform. Enter value in wheel alignment computer.



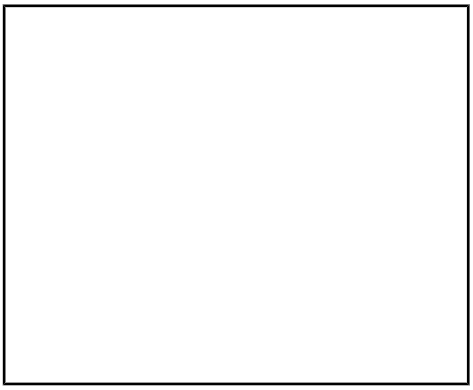
– Unscrew clamping bolt -arrow-, place measuring bar -1- on floor.



– Use crank -1- to set calibration panel - VAS 6430/4- to nominal height -2- indicated by wheel alignment computer and make a note.

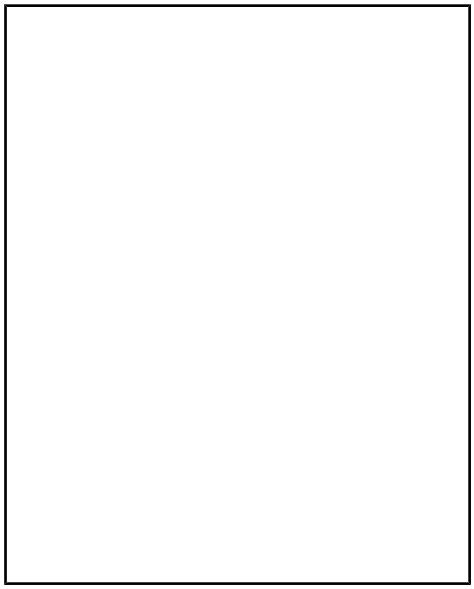


When nominal height has been reached, measuring bar -1- must be moved upwards slightly and secured with clamping screw -arrow-.

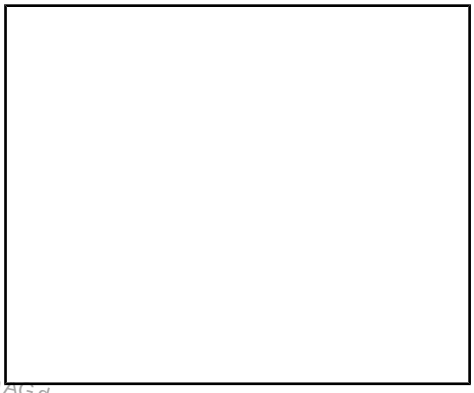


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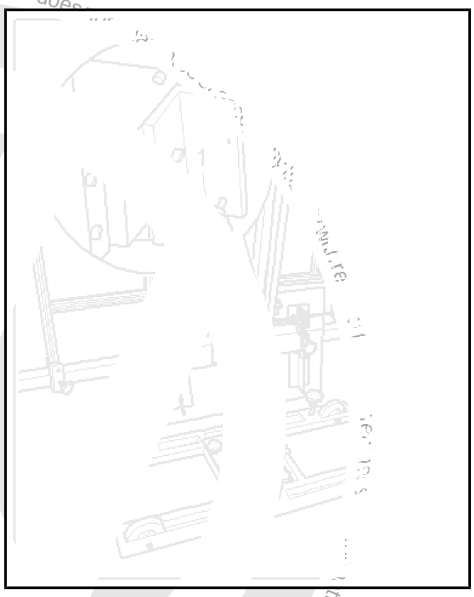
– Move setting device - VAS 6430- sideways -arrows B- until display on wheel alignment computer is within tolerance.



– Screw down adjuster screws -2- and -3- slightly to secure setting device - VAS 6430- against rolling away.

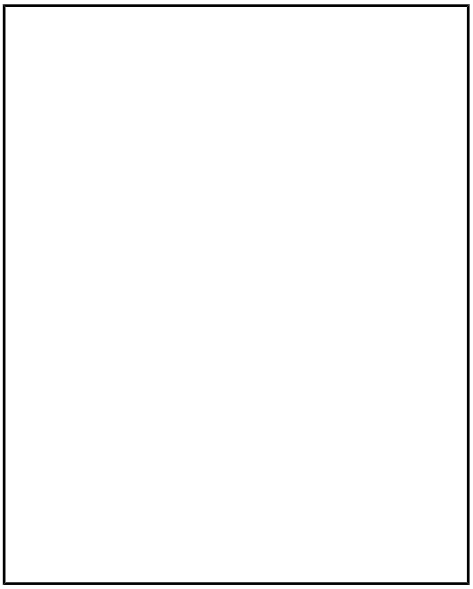


– Turn fine adjuster screw -1- until display on wheel alignment computer is within tolerance.

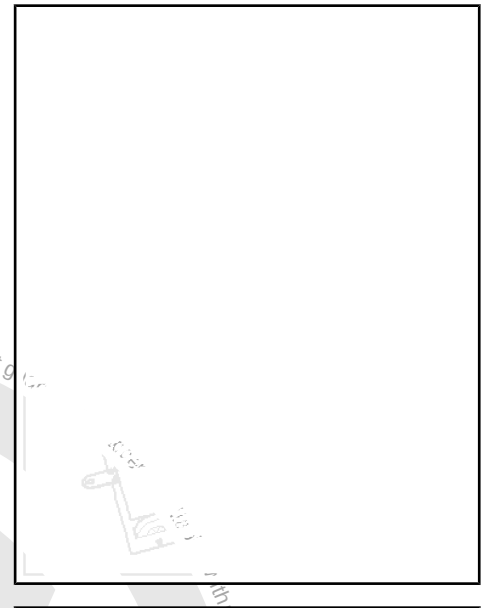


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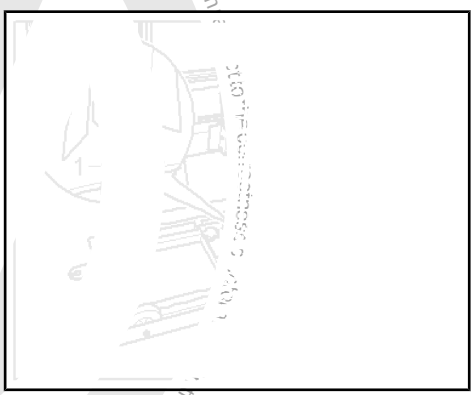
– Use adjuster screw -1- to level spirit level -A-.



– Use adjuster screws -2- and -3- to level spirit level -B-.



– Unscrew clamping bolt -arrow-, place measuring bar -1- on floor.



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– Check nominal height -2- again and correct if necessary.

When nominal height has been reached, measuring bar -1- must be moved upwards slightly and secured with clamping screw -arrow-.

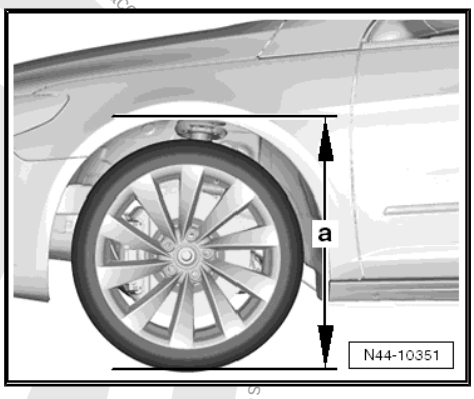
Concluding work is carried out via ⇒ Vehicle diagnostic tester.

Follow instructions on screen to perform calibration.

Note

The next step in Guided fault finding is to measure the body height.

– Enter the noted standing height.



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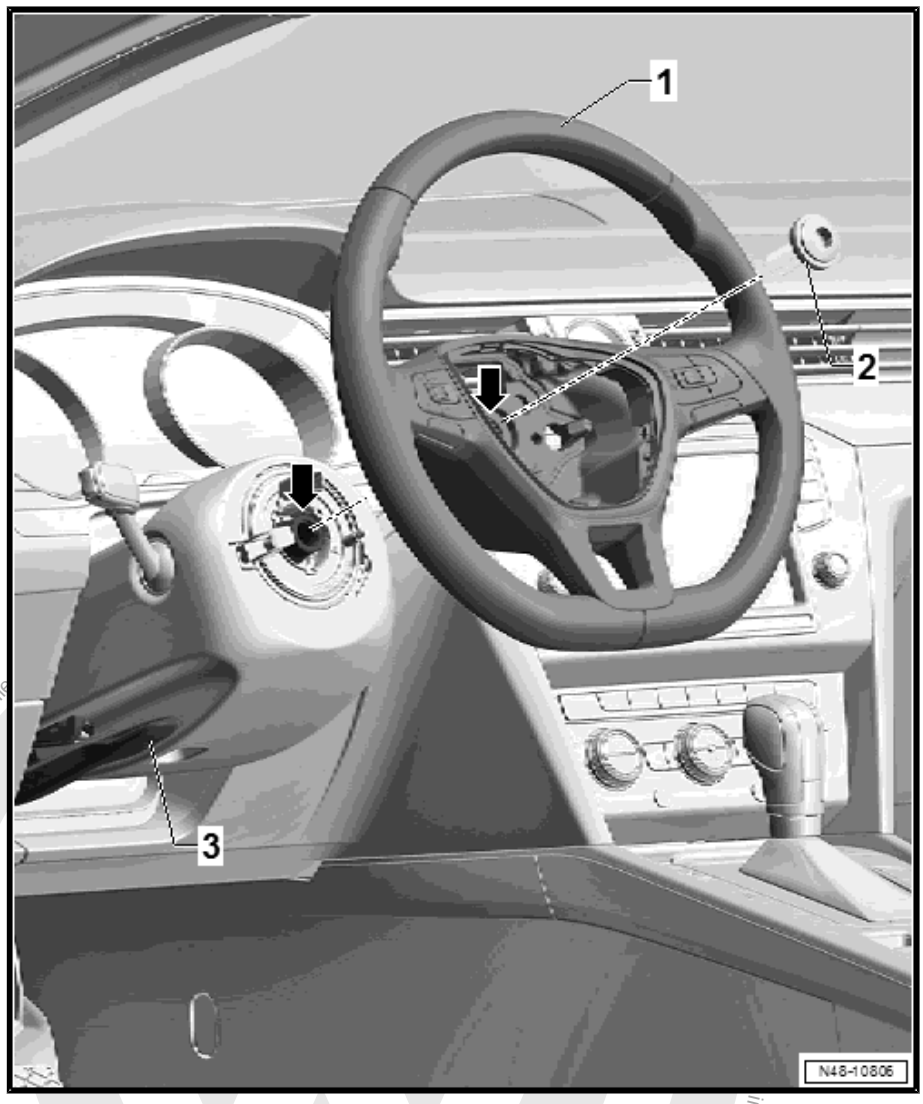
48 – Steering

1 Steering wheel

⇒ “1.1 Assembly overview - steering wheel”, page 297

⇒ “1.2 Removing and installing steering wheel”, page 297

1.1 Assembly overview - steering wheel



1 - Steering wheel

- ❑ Removing and installing ⇒ page 297
- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue
- ❑ The centre punch marks -arrows- on the steering wheel and the steering column must align when reinstalling. Some steering columns leave the factory with no centre punch mark. On these steering columns a respective centre punch mark must be made before removing the steering wheel ⇒ page 297 .

2 - Bolt

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

3 - Steering column

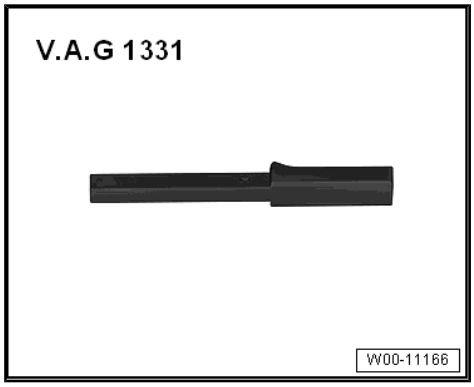
- ❑ Removing and installing ⇒ page 302
- ❑ The centre punch marks -arrows- on the steering wheel and the steering column must align when reinstalling. Some steering columns leave the factory with no centre punch mark. On these steering columns a respective centre punch mark must be made before removing the steering wheel ⇒ page 297 .

1.2 Removing and installing steering wheel

Special tools and workshop equipment required

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- Torque wrench - V.A.G 1331-



Removing

WARNING

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

- ***Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .***
- ***The wheels must be in straight-ahead position.***

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

– Move steering column to middle height position.

– Remove airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Assembly overview - driver side airbag .

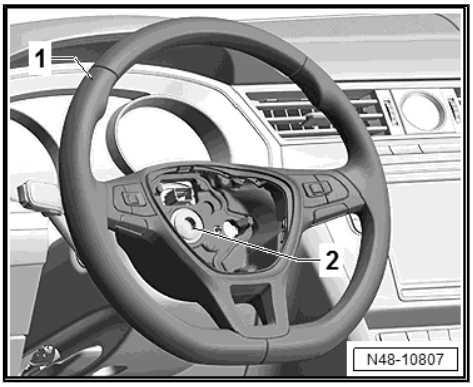
– Turn wheels to straight-ahead position.

Note

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

– If fitted, disconnect connector for steering wheel heating.

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– Remove bolt -2-.
– Check that steering column has a centre punch mark that aligns with mark on steering wheel.
– If this is not the case, the position of the steering wheel to steering column must be marked on the steering column with a centre punch mark.
– Pull steering wheel -1- off steering column.

Installing

Install in reverse order of removal. During this step, 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.
– If previously disconnected, connect connector for steering wheel heating.
– Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Assembly overview - driver side airbag .
– Carry out road test.
– If the steering wheel is skewed, the steering wheel must be removed again and fitted onto the splines of the steering column.

Torque settings

◆ ⇒ “1.1 Assembly overview - steering wheel”, page 297

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2 Steering column

⇒ “2.1 Assembly overview - steering column”, page 300

⇒ “2.2 Checking steering column for damage”, page 301

⇒ “2.3 Handling and transporting steering column”, page 301

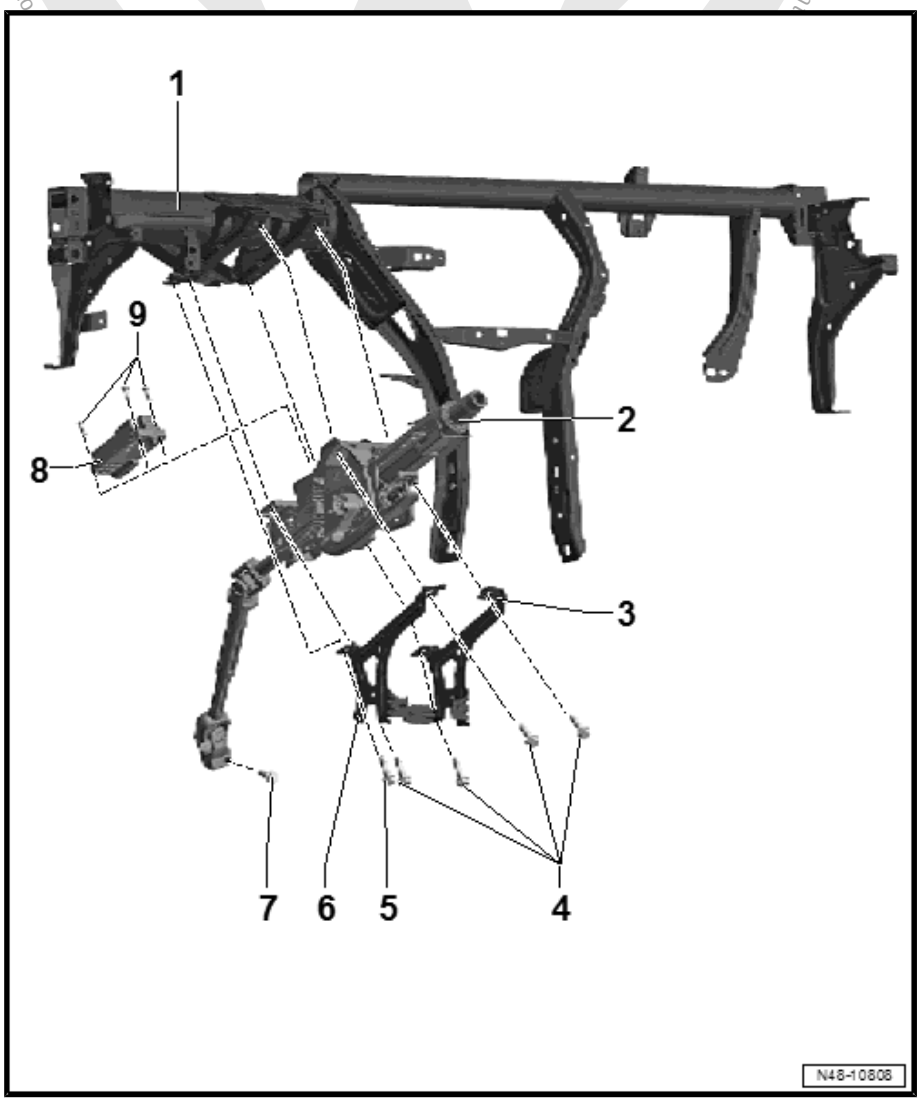
⇒ “2.4 Removing and installing steering column”, page 302

⇒ “2.5 Removing and installing control unit for electronic steering column lock J764 ”, page 310

2.1 Assembly overview - steering column

Note

- *Always renew self-locking nuts.*
- *Always renew corroded nuts and bolts.*
- *Always renew nuts and bolts that have been tightened further by a set angle.*



1 - Dash panel central tube

2 - Steering column

- ❑ Removing and installing ⇒ page 302
- ❑ When installing, steering column must be engaged at mounting bracket for central tube for dash panel (assists with installation).
- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue “ETKA”

3 - Right bracket

- ❑ For knee airbag

4 - Bolt

- ❑ Note tightening sequence
- ❑ Renew after removal
- ❑ 20 Nm

5 - Bolt

- ❑ Renew after removal
- ❑ 20 Nm

6 - Left bracket

- ❑ For knee airbag

7 - Bolt

- ❑ Renew after removal
- ❑ 20 Nm +90°

8 - Electronic steering column lock control unit - J764-

- ❑ For vehicles with keyless entry system
- ❑ Removing and installing ⇒ page 310

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9 - Bolt

- ❑ Qty. 3
- ❑ 6 Nm

2.2 Checking steering column for damage

Visual check

– Check all steering column parts for damage.

Checking function

– Check that steering column turns smoothly and easily.

– Check whether steering column can be moved in the longitudinal direction and vertically.

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 upper jacket tube and in area of upper universal joint.

Improper handling of steering column

Transportation using the clamping lever leads to primary steering column damage.

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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°.



2.4 Removing and installing steering column

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Torque wrench - V.A.G 1332-



Removing

Only the complete steering column is supplied as a replacement part. A repair is not possible.

Vehicles with mechanical ignition lock

Steering lock housing can be transferred ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column switch module .

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Vehicles with electronic ignition lock

Electronic steering column lock control unit - J764- can be transferred ⇒ page 310 .

Continued for all vehicles:

WARNING

The following are prerequisites before starting work on the electrical system and removing the steering wheel:

- ***Mechanic must electrostatically discharge himself/herself. This can be done by touching earthed metal such as a water pipe, a heating pipe, metal girders or a lifting platform ⇒ page 6 .***

Failure to comply with this precaution may lead to subsequent failure of the electronic steering column lock control unit - J764- !

- ***Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting 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 airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Assembly overview - driver side airbag .

– Remove steering wheel ⇒ page 297 .

– Remove upper steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .

– Remove lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .

– Remove steering column switch module ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column switch module .

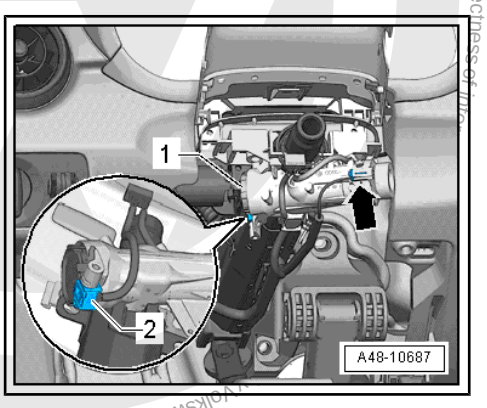
– Remove knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Assembly overview - knee airbag .

Vehicles with mechanical ignition lock

– Unplug connector -1- from immobiliser reader coil - D2- .

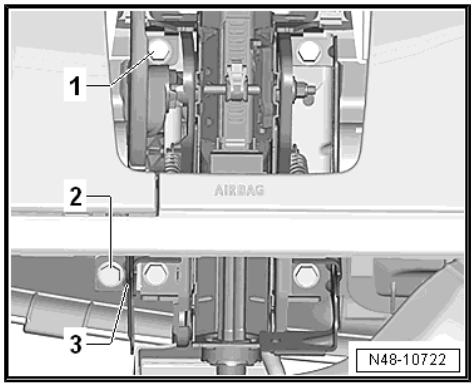
– Pull off connector -2- off ignition/starter switch -1-.

Continued for all vehicles:

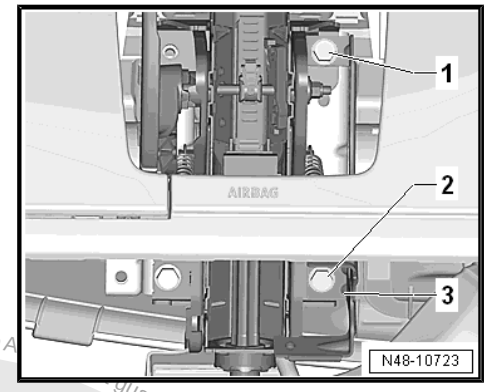


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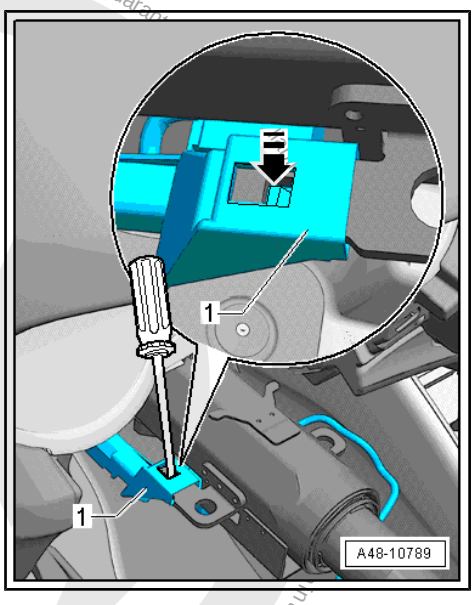
– Unscrew bolts -1- and -2-.
– Remove left bracket -3- for knee airbag.



– Unscrew bolts -1- and -2-.
– Remove right bracket -3- for knee airbag.

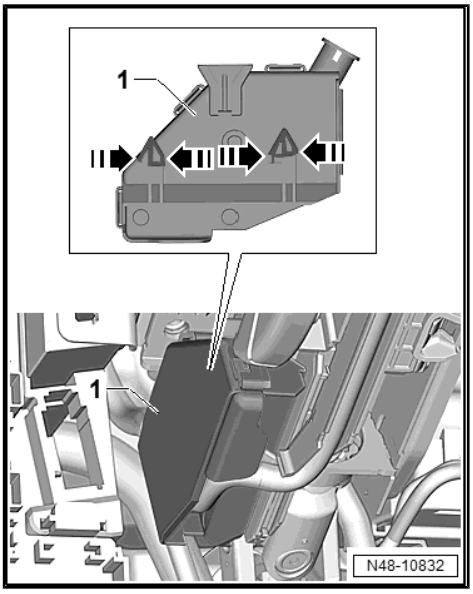


– Release tab -arrow- using a small screwdriver.
– Pull cable guide -1- forwards off metal tab.



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– Release bottom cable retainer -1- from lugs in direction of -arrow-.



Note

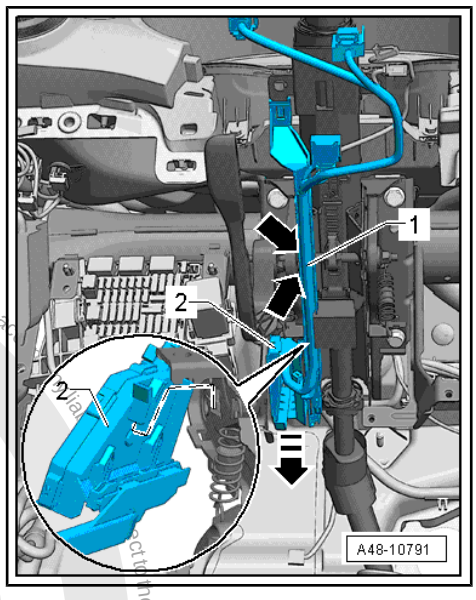
The lugs are anchored directly in the steering column and are located between the retainer -1- and the steering column.

– Pull off bottom cable retainer -1- downwards.

– Release tabs -arrows- of cable guide -1- using a small screwdriver.

– Pull cable duct -1- with lower wire retainer -1- downwards off steering column.

– Move electrical wire for steering column to side.



Vehicles with electronic ignition lock

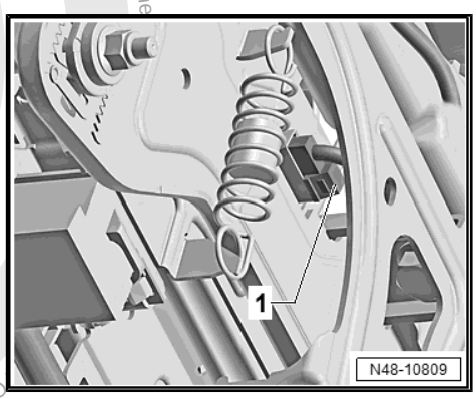
– Disconnect connector -1- on electronic steering column lock control unit - J764- .

Continued for all vehicles:

– Pull cable off steering column.

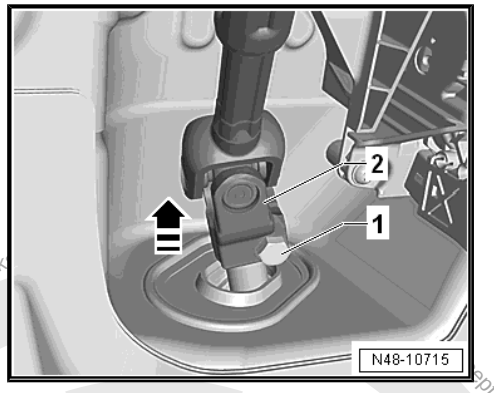
– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .

– Fold floor covering to the rear.



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– Unscrew bolt -1- from universal joint -2- and pull off universal joint in -direction of arrow-.



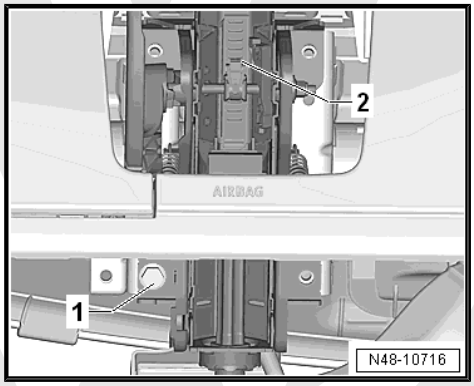
Caution

The following work must not be performed while the universal joint is separated from the steering rack:

- ***Connect battery***
- ***Switch on ignition***
- ***Turn steering mechanism***
- ***Turn steering column***

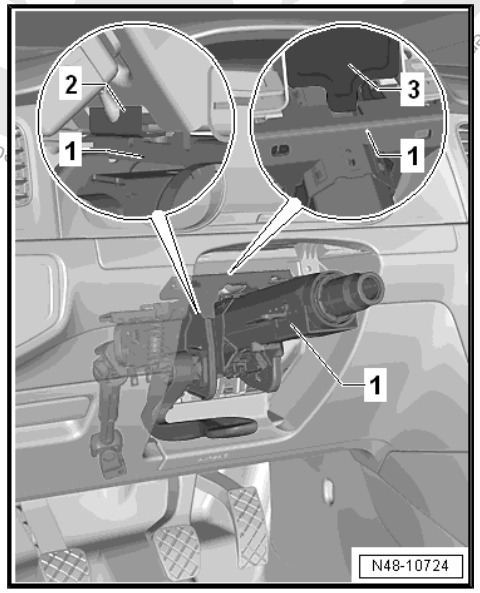
These points must absolutely be heeded because otherwise, irreparable damage may be caused.

– Remove bolt -1- while holding steering column -2- securely.



LHD only

– Unhook steering column -1- upwards out of lugs -2- and -3- on mounting bracket and remove.



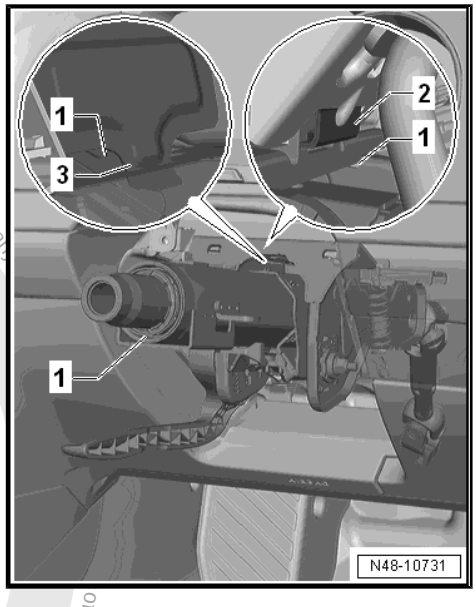
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RHD only

– Unhook steering column -1- upwards out of lugs -2- and -3- on mounting bracket and remove.

Continuation for both sides

> **Caution**
>
> ***Ensure the steering column is handled and transported correctly*** ***⇒ page 301*** ***.***

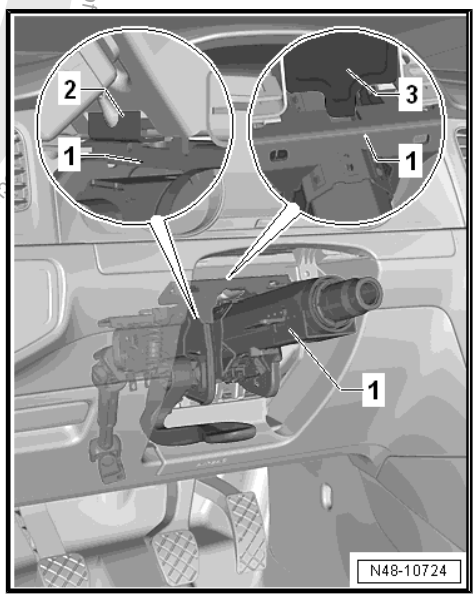


Installing

Install in the reverse order of removal, observing the following:

LHD only

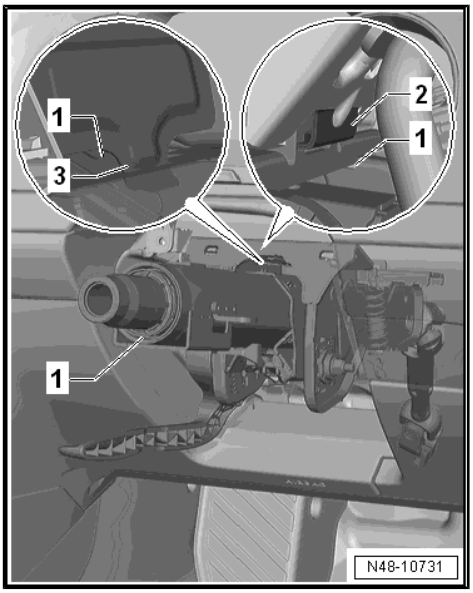
– Hook steering column -1- into lugs on mounting bracket at bottom -2- and top -3-.



RHD only

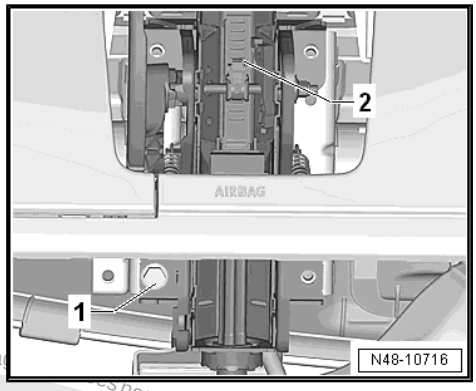
– Hook steering column -1- into lugs on mounting bracket at bottom -2- and top -3-.

Continuation for both sides

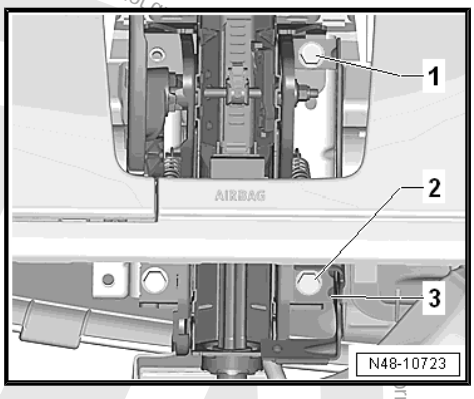


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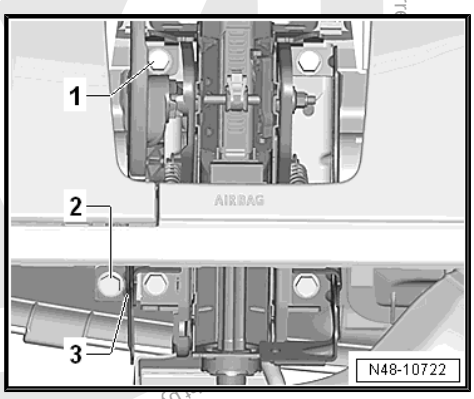
– Align steering column -2- with mounting bracket. Screw in bolt -1- hand-tight.



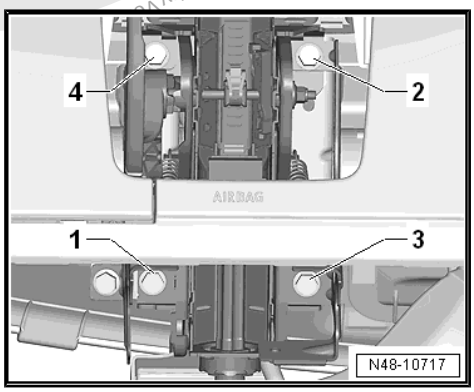
– Install right bracket -3- for knee airbag.
– Screw in bolts -1- and -2- hand-tight.



– Install left bracket -3- for knee airbag.
– Screw in bolts -1- and -2- hand-tight.

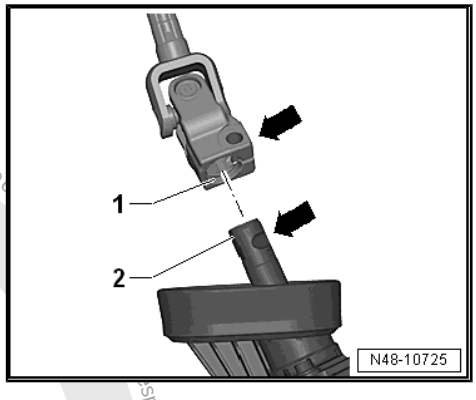


– Tighten bolts -1-, -2-, -3- and -4- one after the other to the specified torque.

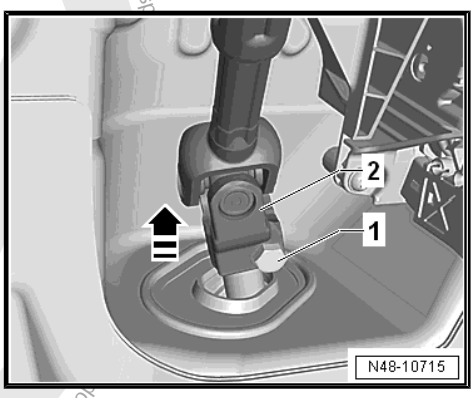


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– The flat surface of the steering column -1- must lie against the flat surface of the steering rack -2-. The cut-out in the steering rack must align exactly with the hole for the securing bolt -arrows-.

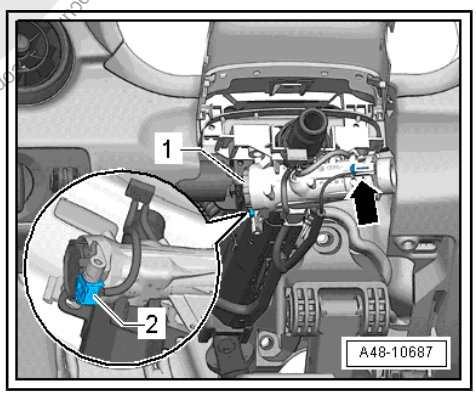


– Fit universal joint -2- onto steering pinion in opposite -direction of arrow-.
– Insert new hexagon bolt -1- and tighten.
– Install dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side .



Vehicles with mechanical ignition lock

– Connect connector -arrow- to immobilizer reader coil - D2- .
– Connect connector -2-.

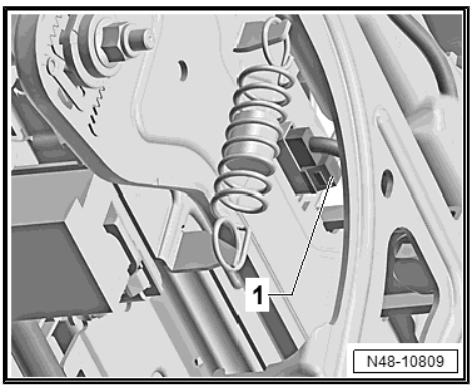


Vehicles with electronic ignition lock

– Connect connector -1- to electronic steering column lock control unit - J764- .

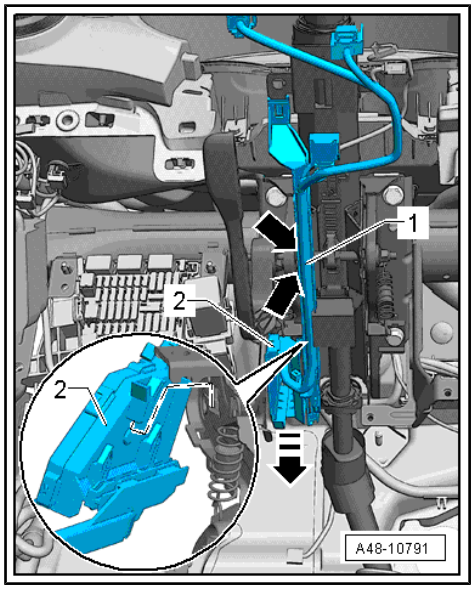
Continued for all vehicles:

– Install steering column switch module ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column switch module .



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– Fit cable retainer under steering column -2- so that lugs in guide engage in steering column.
– Fit cable guide -1-. Lugs -arrows- must engage in steering column.
– Install knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Assembly overview - knee airbag .
– Install lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .
– Install upper steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .
– Install steering wheel ⇒ page 297 .
– Install driver side airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Assembly overview - driver side airbag .
– Carry out basic setting for steering angle sender - G85- using ⇒ Vehicle diagnostic tester.



Torque settings

- ⇒ “2.1 Assembly overview - steering column”, page 300
- Steering column switch module ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column switch module .
- Knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Assembly overview - knee airbag .
- Driver side airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Assembly overview - driver side airbag .
- Lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing lower steering column trim .
- Upper steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing upper steering column trim .
- Dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side

2.5 Removing and installing control unit for electronic steering column lock - J764-

Note

When renewing the control unit, select “Renew” function for the respective control unit in “Guided fault finding” or `Guided functions` *mode ⇒ Vehicle diagnostic tester.*

Special tools and workshop equipment required

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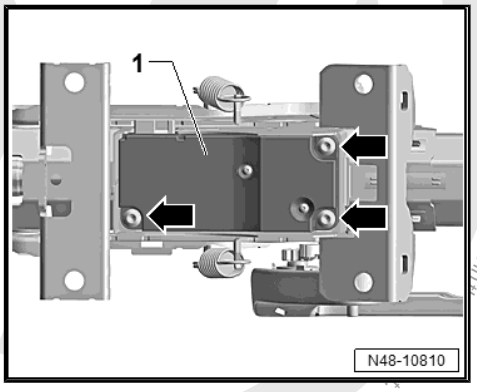
♦ Torque wrench - V.A.G 1783-



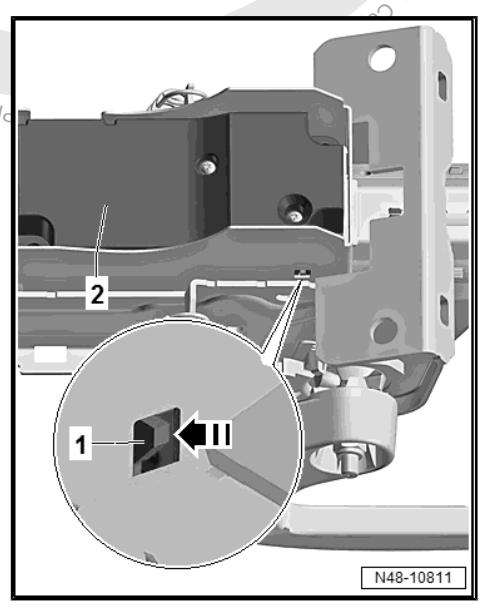
Removing

– Remove steering column ⇒ page 302 .

– Unscrew bolts -arrows- from control unit for electronic steering column lock - J764- .



– Push tab -1- in -direction of arrow-, and remove control unit for electronic steering column lock - J764- -2-.

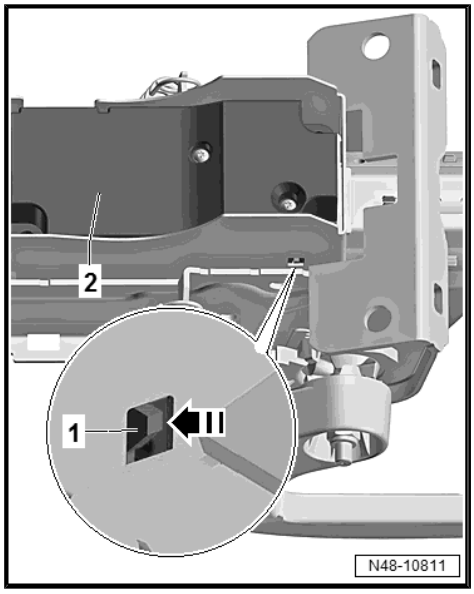


Installing

Install in reverse order of removal, observing the following:

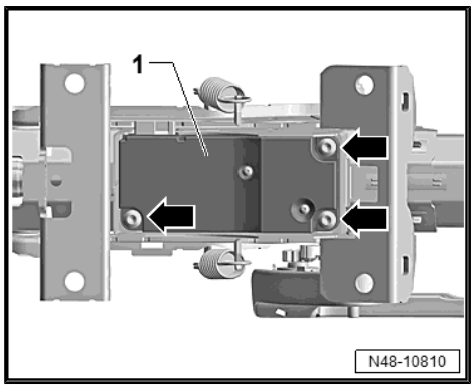
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– Insert control unit for electronic steering column lock - J764- -2-, and make sure that tab -1- engages properly.



– Secure control unit for electronic steering column lock - J764- -1- using bolts -arrows-.

– Install steering column ⇒ page 302 .



Torque settings

♦ ⇒ “2.1 Assembly overview - steering column”, page 300

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3 Steering rack

⇒ “3.1 Assembly overview - steering rack”, page 313

⇒ “3.2 Removing and installing steering rack”, page 316

⇒ “3.3 Removing and installing bellows”, page 323

⇒ “3.4 Removing and installing track rod”, page 326

⇒ “3.5 Removing and installing track rod ball joint”, page 329

⇒ “3.6 Repairing steering rack”, page 330

3.1 Assembly overview - steering rack

⇒ “3.1.1 Assembly overview - steering rack, left-hand drive”, page 313

⇒ “3.1.2 Assembly overview - steering rack, right-hand drive”, page 315

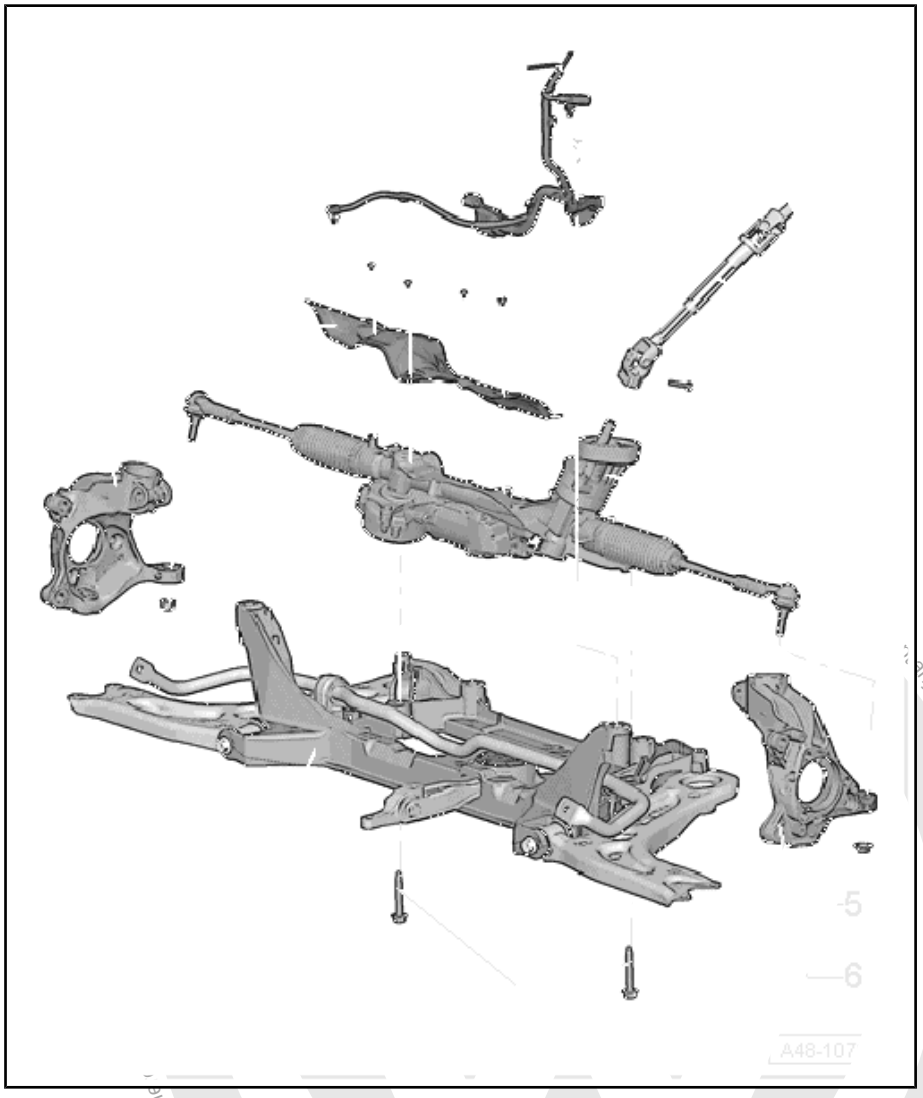
3.1.1 Assembly overview - steering rack, left-hand drive

Caution

The following work must not be performed while the universal joint is separated from the steering rack:

These points must absolutely be heeded because otherwise, irreparable damage may be caused.

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1 - Spreader clip

2 - Steering column

3 - Bolt

- ❑ Specified torque ⇒ “2.1 Assembly overview - steering column”, page 300

4 - Steering rack

- ❑ Removing and installing ⇒ page 316
- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ With power steering control unit - J500-
- ❑ Can be tested in “Guided Fault Finding” using ⇒ Vehicle diagnostic tester

5 - Nut

- ❑ Renew after removal
- ❑ 20 Nm +90°

6 - Left wheel bearing housing

7 - Bolt

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

8 - Subframe

9 - Right wheel bearing housing

10 - Heat shield

- ❑ Different versions possible depending on engine version. Refer to ⇒ Electronic parts catalogue “ETKA”

11 - Bolt

- ❑ Either qty. 3 or qty. 4 are fitted depending on engine version. Refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ 8 Nm

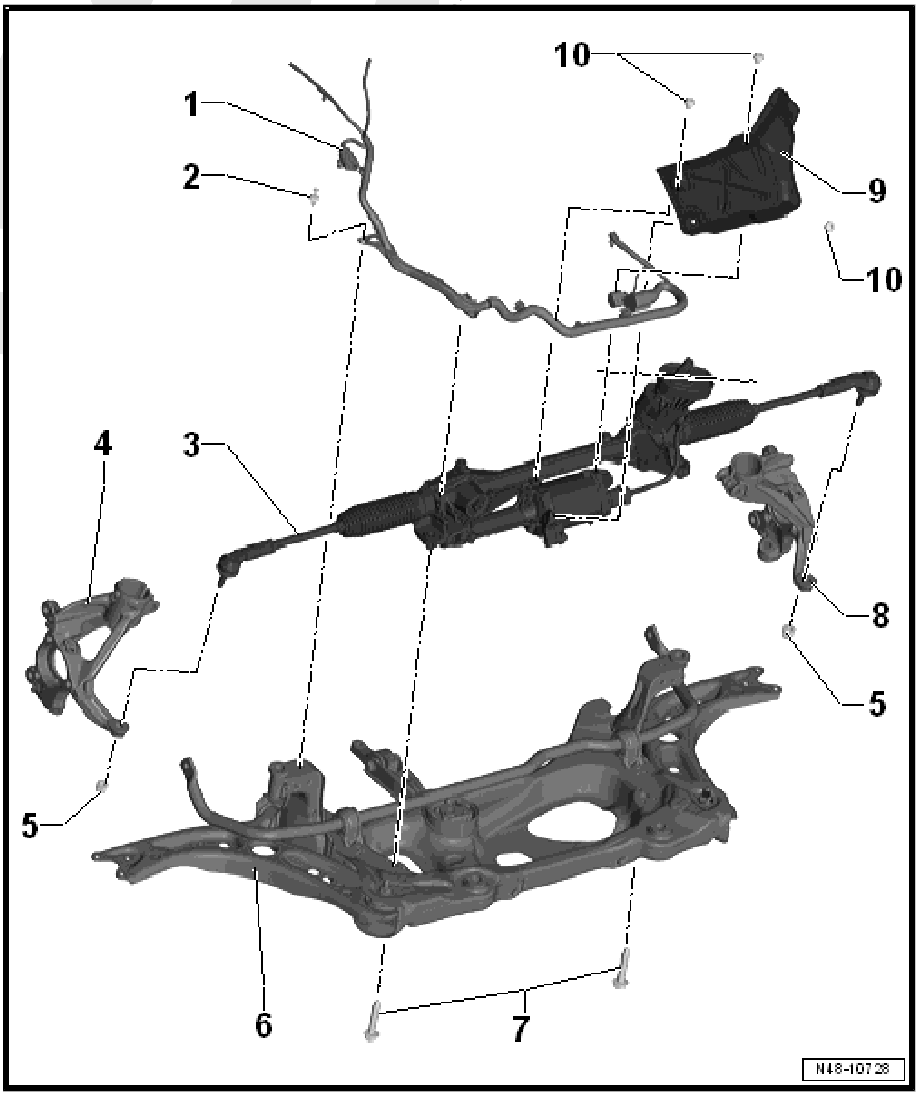
12 - Wire

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3.1.2 Assembly overview - steering rack, right-hand drive

> ⚠ Caution
>
> *The following work must not be performed while the universal joint is separated from the steering rack:*
>
> *These points must absolutely be heeded because otherwise, irreparable damage may be caused.*



1 - Wire

2 - Spreader clip

3 - Steering rack

- ❑ Removing and installing ⇒ page 316
- ❑ Different versions possible. Refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ With power steering control unit - J500-
- ❑ Can be tested in “Guided Fault Finding” using ⇒ Vehicle diagnostic tester

4 - Left wheel bearing housing

5 - Nut

- ❑ Renew after removal
- ❑ 20 Nm +90°

6 - Subframe

7 - Bolt

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

8 - Right wheel bearing housing

9 - Heat shield

- ❑ Different versions possible depending on engine version. Refer to ⇒ Electronic parts catalogue “ETKA”

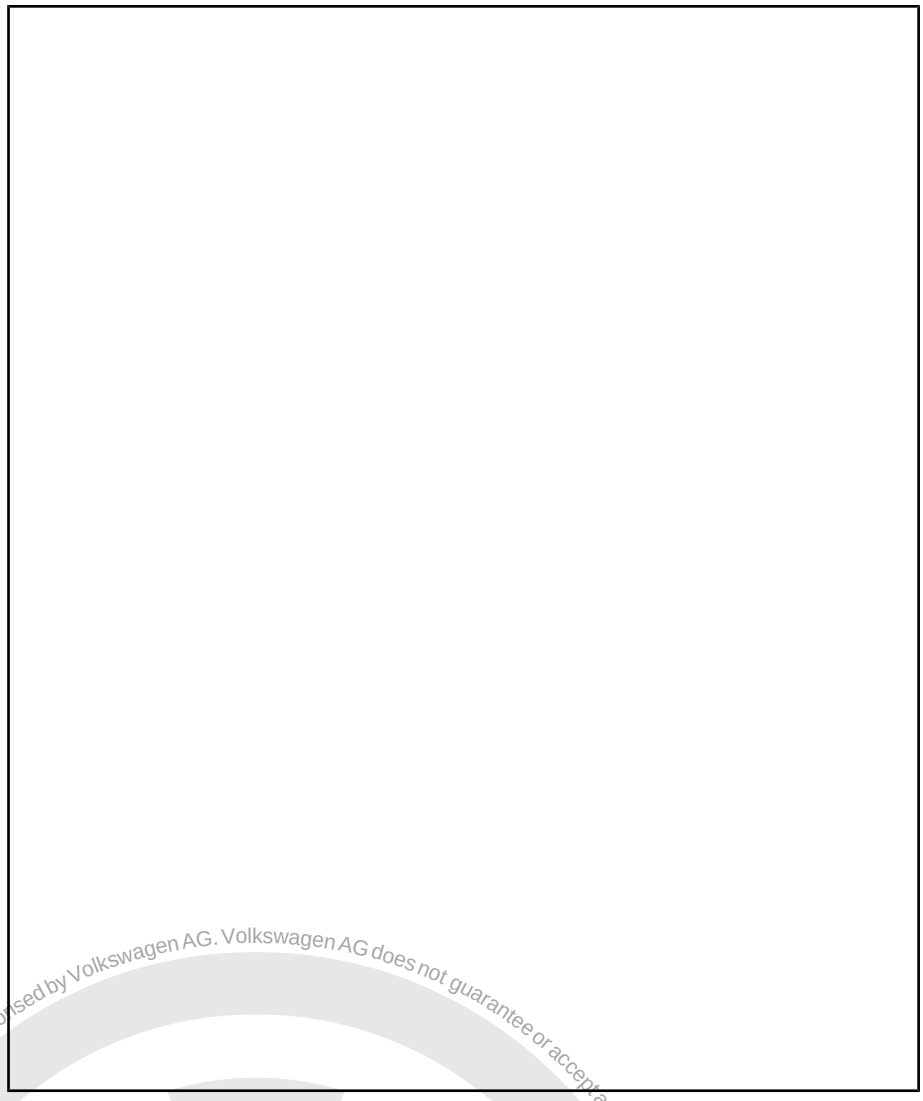
10 - Bolt

- ❑ Either qty. 3 or qty. 4 are fitted depending on engine version. Refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ 8 Nm

3.2 Removing and installing steering rack

Special tools and workshop equipment required

- Ball joint puller - T10187-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Engine and gearbox jack - VAS 6931- or 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.

– Switch off ignition and open driver's door so that the steering lock engages.

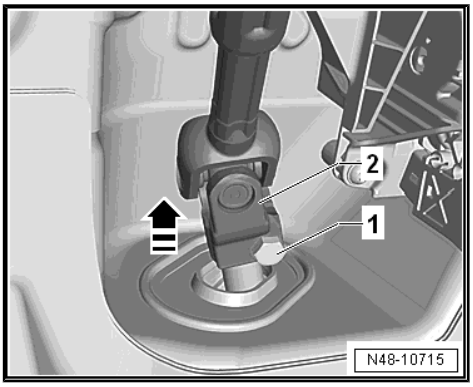
– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .

– Fold floor covering to the rear.

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– Unscrew bolt -arrow- from universal joint -1- and pull off universal joint in -direction of arrow-.



Caution

The following work must not be performed while the universal joint is separated from the steering rack:

- ***Connect battery***
- ***Switch on ignition***
- ***Turn steering mechanism***
- ***Turn steering column***

These points must absolutely be heeded because otherwise, irreparable damage may be caused.

– Loosen wheel bolts.

– Raise vehicle on lift.

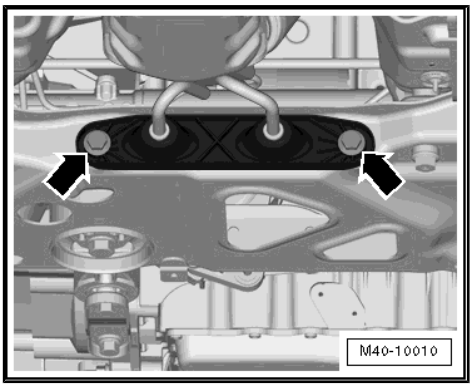
– Remove wheels.

– Remove lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

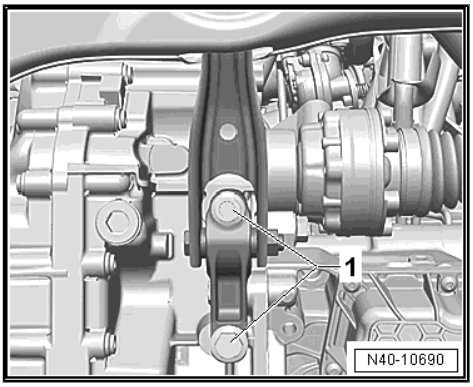
– Remove noise insulation at rear from subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– If fitted, remove centre underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

– Detach exhaust system bracket from subframe -arrows-.

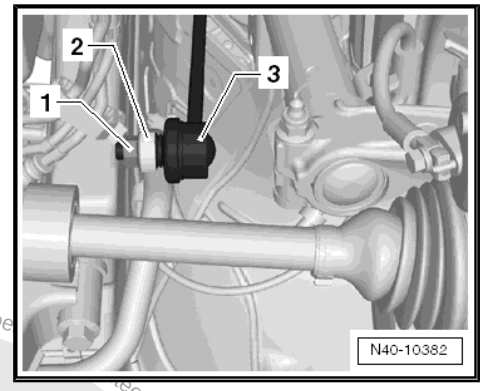


– Remove bolts -1- for pendulum support.

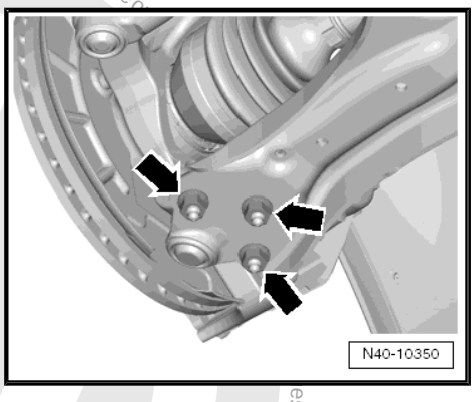


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– Remove hexagon nut -1- from coupling rod -3- (left and right sides).
– Pull coupling rod -3- out of anti-roll bar -2- on left and right side.



– Remove nuts -arrows- on left and right sides of vehicle.
– Pull swivel joint out of suspension link.



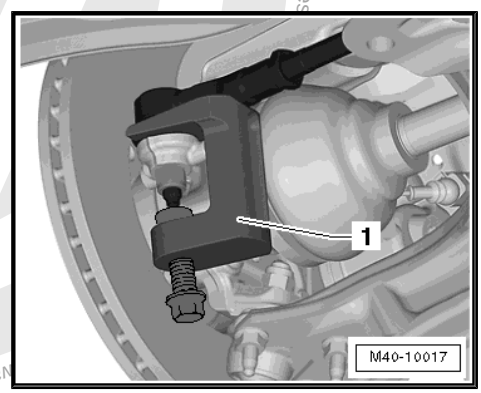
– Loosen nut on track rod ball joint but do not remove completely.

Caution

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

– Push track rod ball joint off wheel bearing housing and remove nut.

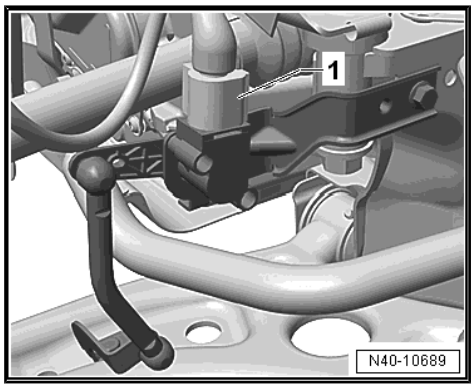
1 - Ball joint puller - T10187-



Vehicles with vehicle level sender.

– Disconnect connector -1- on front left vehicle level sender - G78- and/or front right vehicle level sender - G289- , as applicable.

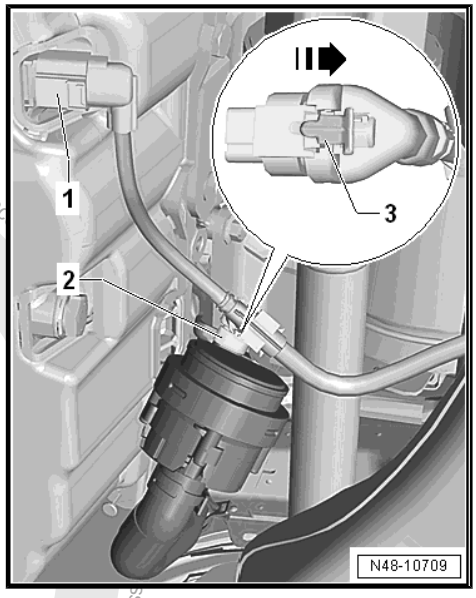
Continued for all vehicles:



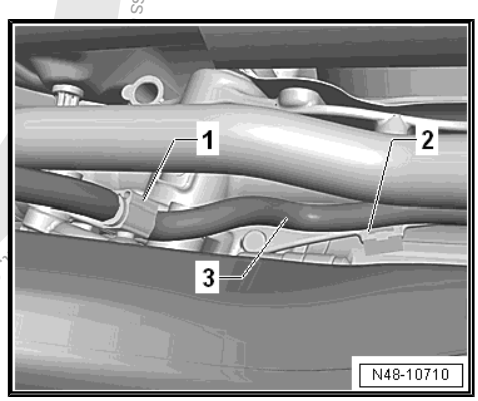
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– Disconnect connector -1- for oil level and oil temperature sender - G266- .

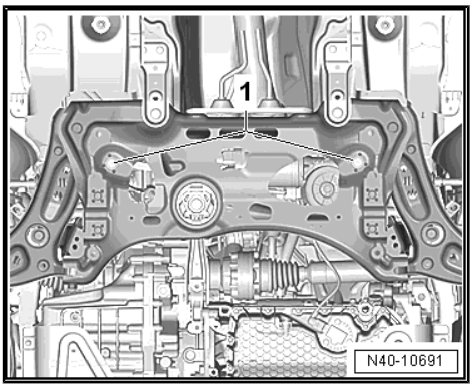
– If installed, disconnect connector -2- on continued coolant circulation pump - V51- . To do this, open locking device -3- by pressing in direction of -arrow- and release connector.



– Pull wiring harness -3- clips -1- and -2- off subframe and steering rack.

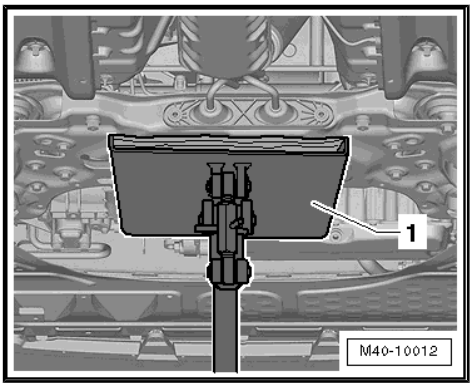


– Remove bolts -1- for steering rack.



– Place engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- -1- under subframe.

– Fix position of subframe ⇒ page 40 and lower approx. 10 cm.

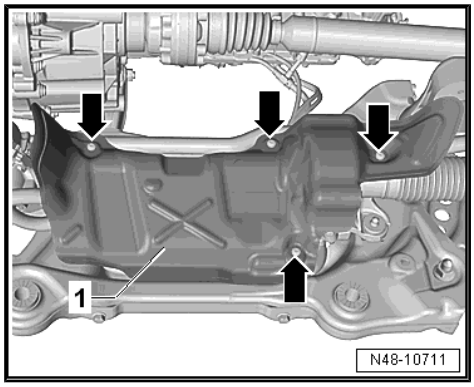


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LHD only

Vehicles with longer head shield

– Unscrew bolts -arrows- and remove heat shield -1- from steering rack.

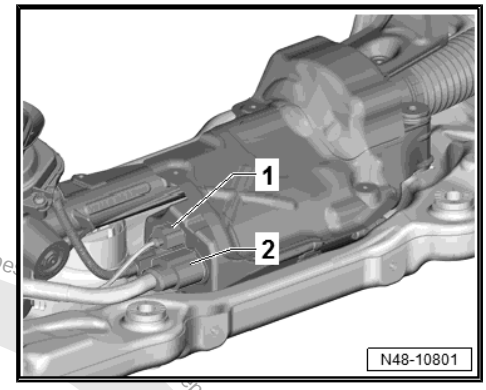


Note

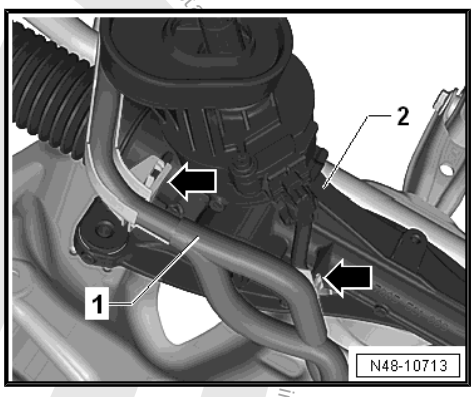
Different heat shields -1- are installed depending on the engine. On some engines it is possible to access the connectors for the steering rack without removing the heat shield.

Continuation for all scenarios

– Disconnect connectors -1- and -2- from steering rack.

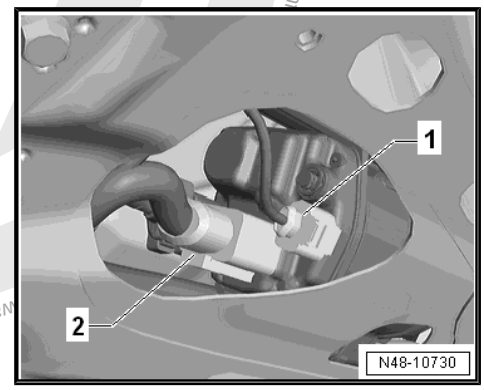


– Unclip wiring harness -1- from steering rack -2- -arrows-.



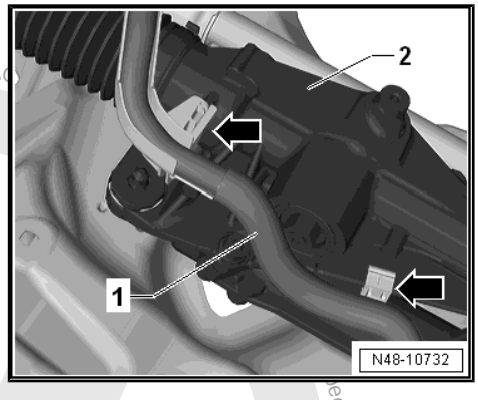
RHD only

– Disconnect connectors -1- and -2- from steering rack.



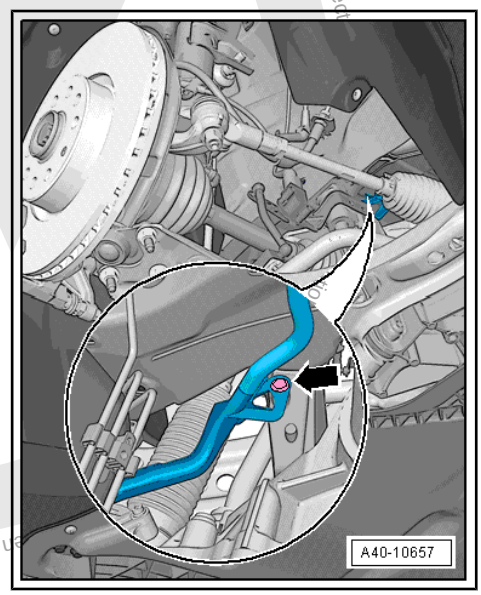
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– Unclip wiring harness -1- from steering rack -2- -arrows-.



Continuation for both sides

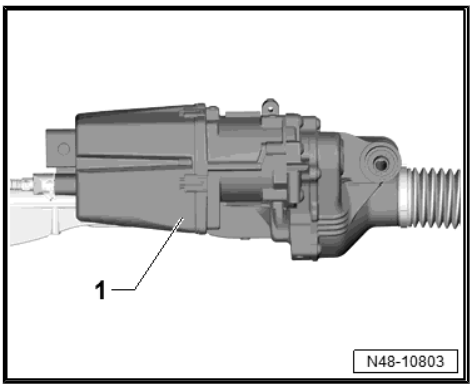
– Pull out spreader clip -arrow-.
– Lower subframe using engine and gearbox jack - VAS 6931- or engine and gearbox jack - V.A.G 1383 A- .
– Lever off steering rack from subframe with a large screwdriver, for example, and remove backwards.



LHD only

– Place steering rack on a surface as shown.

This prevents damage to the control unit -1-.



RHD only

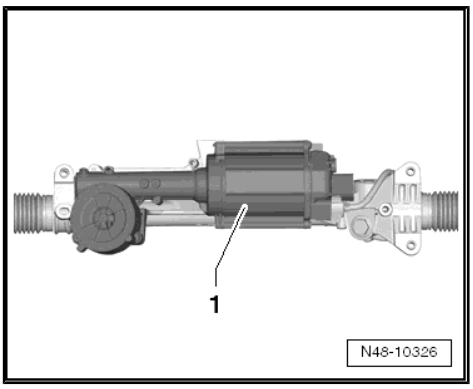
– Place steering rack on a surface as shown.

This prevents damage to the control unit -1-.

Installing

Install in reverse order of removal. During this step, observe the following:

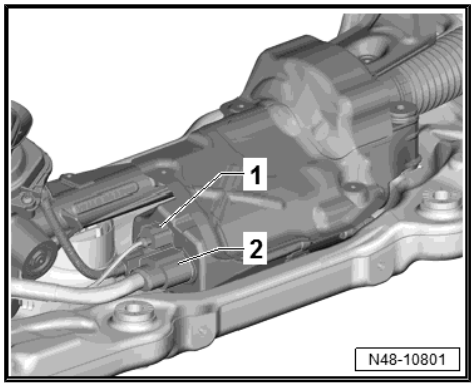
Threaded sleeves of steering rack must seat in holes in subframe.



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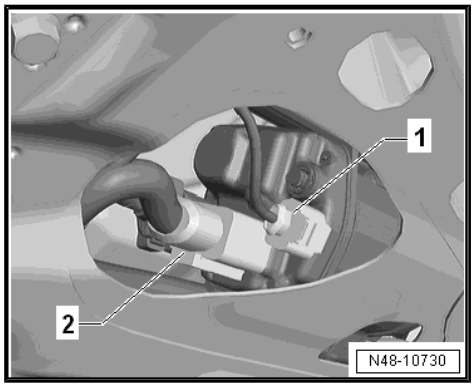
LHD only

– Plug in connectors -1- and -2- so that they audibly engage.



RHD only

– Plug in connectors -1- and -2- so that they audibly engage.



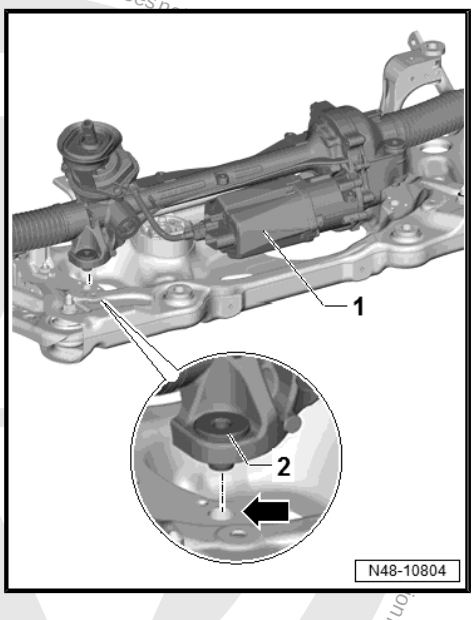
Continuation for both sides

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *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 surfaces are clean.*

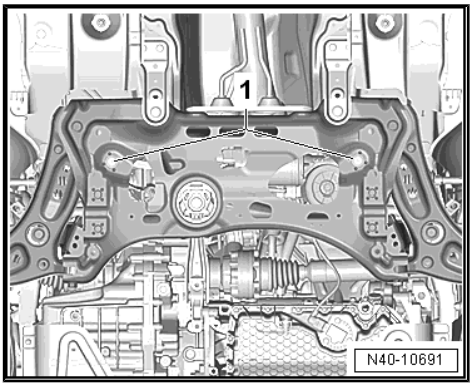
– Position steering rack -1- on subframe.

– Threaded sleeves -2- of steering rack must be inserted in holes in subframe -arrow-.



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– Screw in bolts -1- for steering rack, and tighten them.

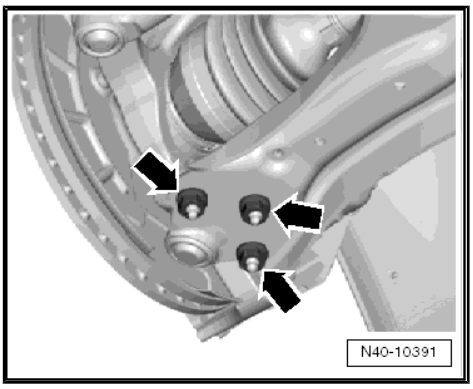


Note

Ensure that boot is not damaged or twisted.

– Install lower noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Tighten nuts -arrows-.



Note

- *Tighten nuts -arrows- in unladen state ⇒ page 6 .*
- *Ensure that boot is not damaged or twisted.*

– Bolt universal joint to steering rack.

– Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Carry out basic setting for steering angle sender - G85- using ⇒ Vehicle diagnostic tester.

If new steering rack has been installed, adapt electromechanical power steering using ⇒ Vehicle diagnostic tester.

Torque settings

- ⇒ “4.1 Assembly overview - lower suspension link, swivel joint”, page 59
- ⇒ “2.1 Assembly overview - subframe”, page 16
- ⇒ “3.1 Assembly overview - steering rack”, page 313
- ⇒ “3.6 Repairing steering rack”, page 330
- ⇒ “1.1 Specified torques for wheel bolts”, page 249
- Bolts for pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Exhaust system to subframe ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .
- Bolts for noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Bolts for underbody cladding in centre ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Overview of fitting locations - cladding
- Dash panel cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing dash panel cover on driver side

If a crooked steering wheel is determined during the road test even though locating pins - T10486/1- were used, check wheel alignment. In this case the wheel alignment test results must be archived in the vehicle files.

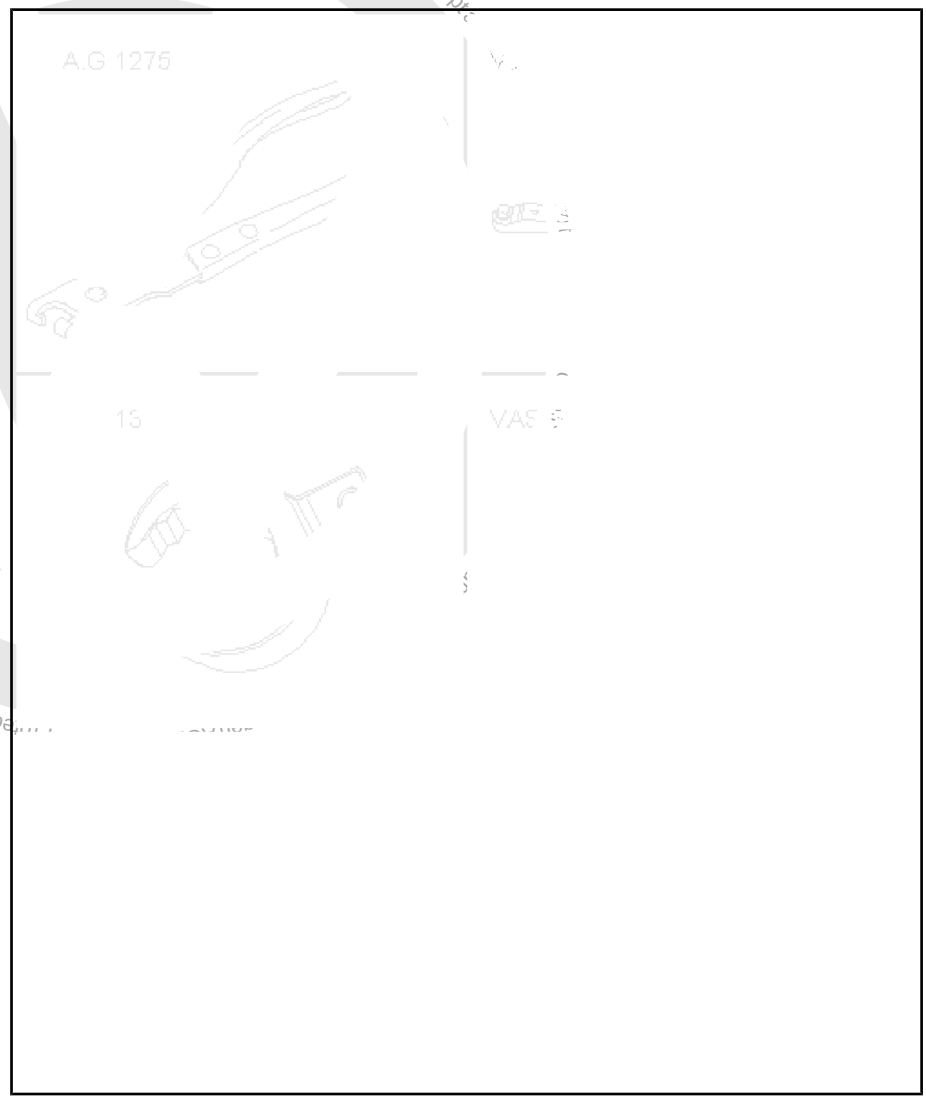
3.3 Removing and installing bellows

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Special tools and workshop equipment required

- Hose clip pliers - V.A.G 1275-
- Torque wrench - V.A.G 1332-
- Insert tool, 24 mm - V.A.G 1332/11-
- Locking pliers for Phaeton steering rack - VAS 6199-



Removing

Note

- *If boot is defective, moisture and dirt will enter steering rack. There must be a palpable film of grease in the area of the teeth on the steering rack. If there is no film of grease, the steering rack must be renewed.*
- *The steering rack must be renewed:*
- *In the event of corrosion.*
- *In the event of damage.*
- *In the event of excessive wear*
- *In the event of soiling on the steering rack.*

– Turn steering wheel to straight-ahead position.
– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.
– Mark position of nut on track rod.

– Remove track rod ball joint ⇒ page 329 .

– Clean outside of steering rack in vicinity of boot.

No dirt must be allowed to enter the steering rack through a defective rubber boot during this operation.

– Open hose clips.

– Pull boot off steering rack housing and track rod.

Note

- *If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering rack.*
- *Likewise, if there is no film of grease on the steering rack, the steering rack must be renewed.*

Installing

Caution

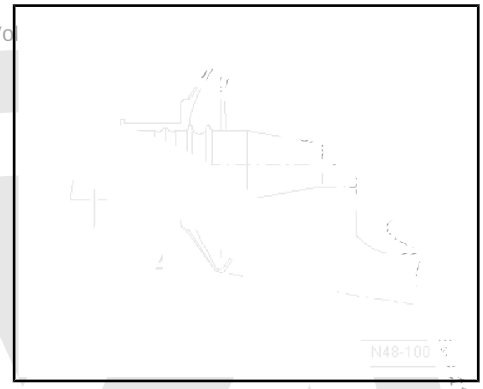
Do not grease steering rack.

– Turn steering wheel to straight-ahead position.

– Thread new clamps and rubber boot onto track rod.

– Lightly grease sealing surface between boot and track rod with grease from repair kit.

– Push rubber boot -2- onto track rod -1- as shown in figure.

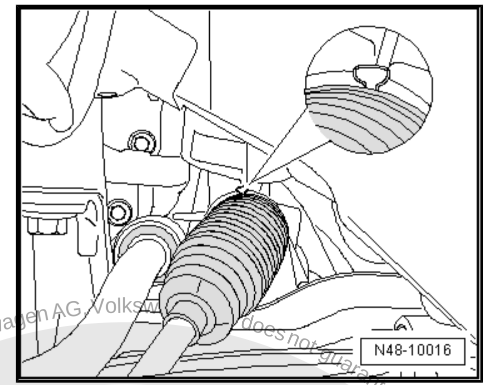


– Secure spring-type clip on rubber boot using hose clip pliers - V.A.G 1275- .

– Lightly grease sealing surface between boot and steering rack housing with grease from repair kit.

– Push rubber boot onto steering rack housing to stop.

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– Install new clamp, as shown in figure, with locking pliers for Phaeton steering rack - VAS 6199- .
– Screw in track rod ball joint up to mark made during removal and install ⇒ page 329 .
– Install front wheel and tighten.
– Check wheel alignment ⇒ page 266 .
– If both track rods have been exchanged, basic setting must be carried out for steering angle sender - G85- ⇒ Vehicle diagnostic tester.
– Then carry out basic setting of steering ⇒ Vehicle diagnostic tester.

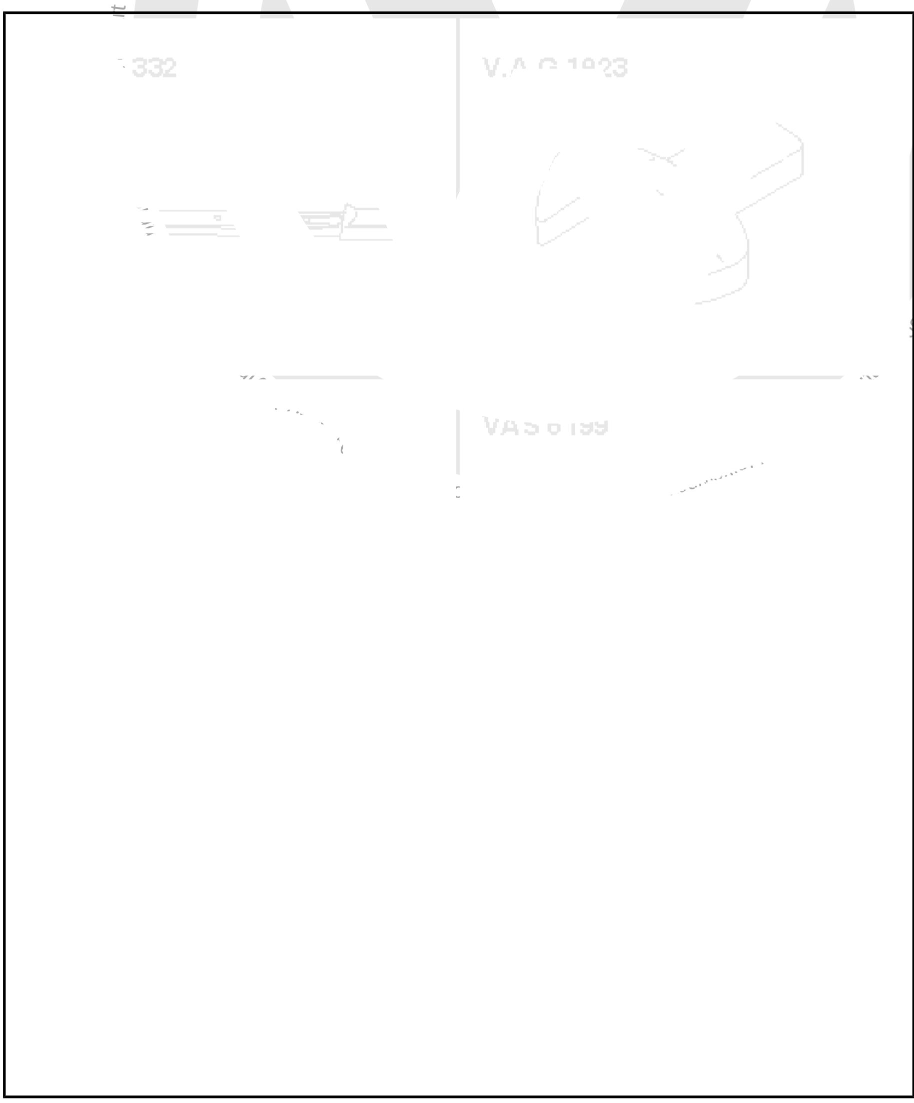
Torque settings

♦ ⇒ “3.1 Assembly overview - steering rack”, page 313
♦ ⇒ “3.6 Repairing steering rack”, page 330
♦ ⇒ “1.1 Specified torques for wheel bolts”, page 249

3.4 Removing and installing track rod

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-
♦ Open end spanner insert, AF 38 mm - V.A.G 1923-
♦ Ball joint puller - T10187-
♦ Locking pliers for Phaeton steering rack - VAS 6199-



Removing

– Turn steering wheel to straight-ahead position.

– Loosen wheel bolts.

– Raise vehicle on lift.

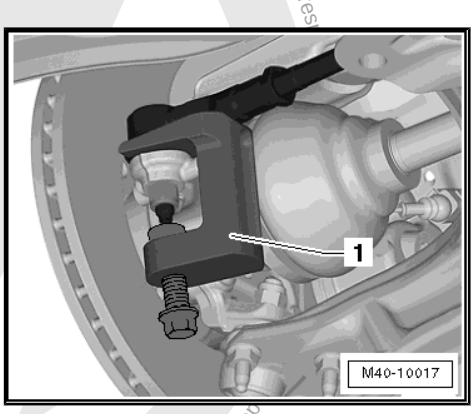
– Remove wheel.

– Clean outside of steering rack in vicinity of boot.

– Loosen nut 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 ball joint off wheel bearing housing and remove nut.

1 - Ball joint puller - T10187-

– Open clamps and push boot back.

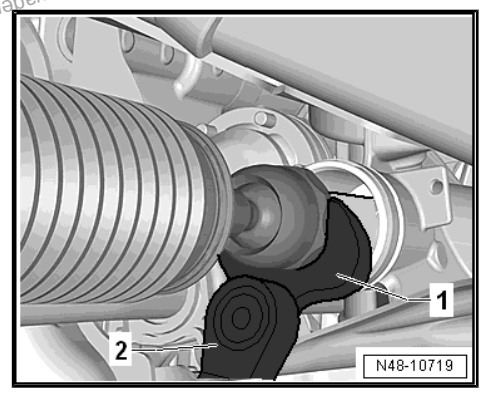
– Turn steering as follows:

- For left track rod, turn steering to full right lock
- For right track rod, turn steering to full left lock.

– Unscrew track rod.

1 - Open-end spanner attachment - V.A.G 1923-

2 - Torque wrench - V.A.G 1332-



Note

- *If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering rack.*
- *Likewise, if there is no film of grease on the steering rack, the steering rack must be renewed.*

Installing track rod

Install in reverse order of removal. During this step, observe the following:

Caution

Do not grease steering rack.

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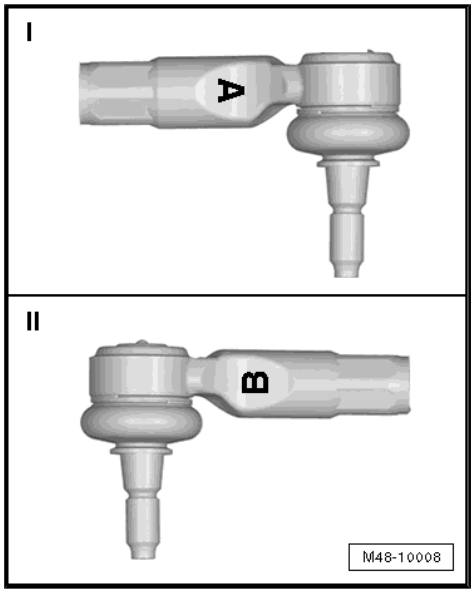
– Make sure that correct track rod ball joint is installed on each side.

I - Track rod ball joint on right marked with an “A”

II - Track rod ball joint on left marked with a “B”

– Turn steering wheel to straight-ahead position.

– Thread new clamps and rubber boot onto track rod.



– Screw track rod into track rod ball joint until dimension -a- is attained.

Dimension -a- = 373 ± 1 mm

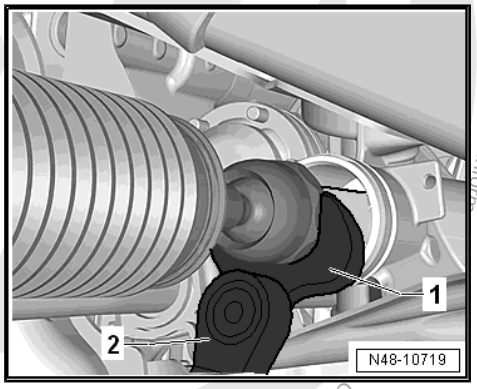


– Tighten track rod.

1 - Open-end spanner attachment - V.A.G 1923-

2 - Torque wrench - V.A.G 1332-

– Lightly grease sealing surface between boot and track rod with grease from repair kit.

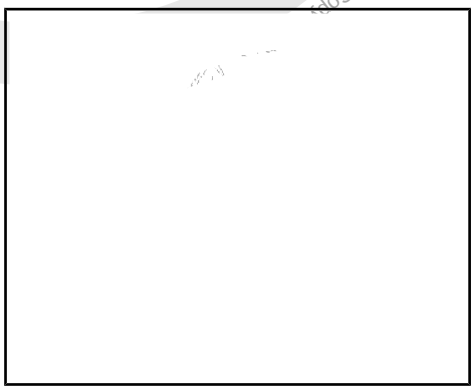


– Push rubber boot -2- onto track rod -1-, making sure that boot is correctly positioned.

– Secure spring-type clip on rubber boot using hose clip pliers - V.A.G 1275- .

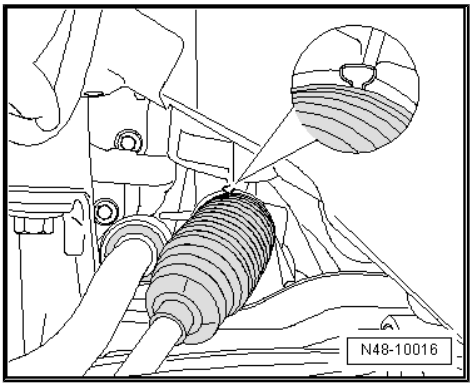
– Lightly grease sealing surface between boot and steering rack housing with grease from repair kit.

– Push rubber boot onto steering rack housing as far as it will go.



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– Install new clamp, as shown in figure, with locking pliers for Phaeton steering rack - VAS 6199- .



– Install wheel and tighten.
– Check wheel alignment ⇒ page 266 .
– If both track rods have been exchanged, basic setting must be carried out for steering angle sender - G85- ⇒ Vehicle diagnostic tester.
– Then carry out basic setting of steering ⇒ Vehicle diagnostic tester.

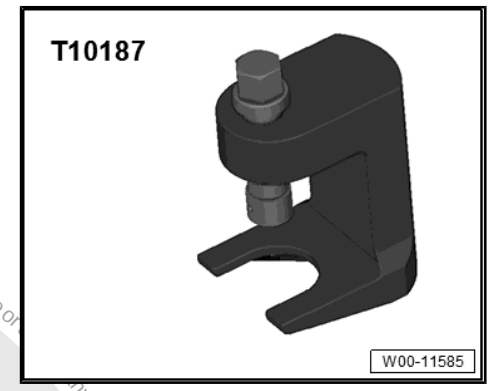
Torque settings

- ⇒ “3.1 Assembly overview - steering rack”, page 313
- ⇒ “3.6 Repairing steering rack”, page 330
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

3.5 Removing and installing track rod ball joint

Special tools and workshop equipment required

- Ball joint puller - T10187-



- Torque wrench - V.A.G 1332-



Removing

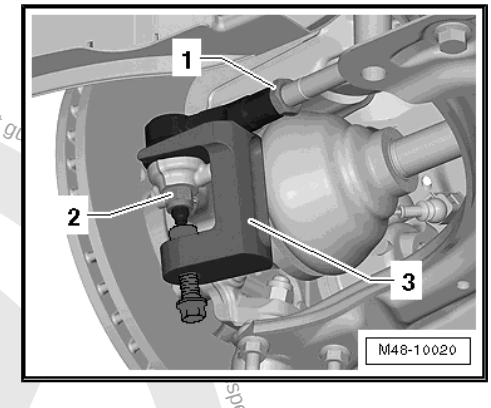
– Loosen wheel bolts.
– Raise vehicle on lift.
– Remove wheel.

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– 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.

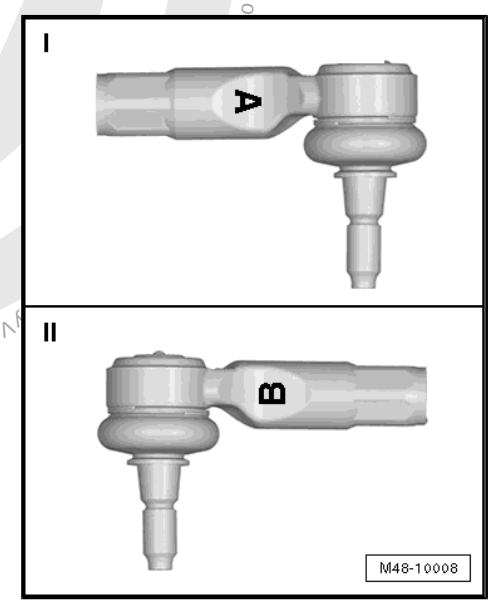
1 - Ball joint puller - T10187-

– Unscrew track rod ball joint from track rod.

Installing

Install in reverse order of removal. During this step, 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 wheel and tighten.

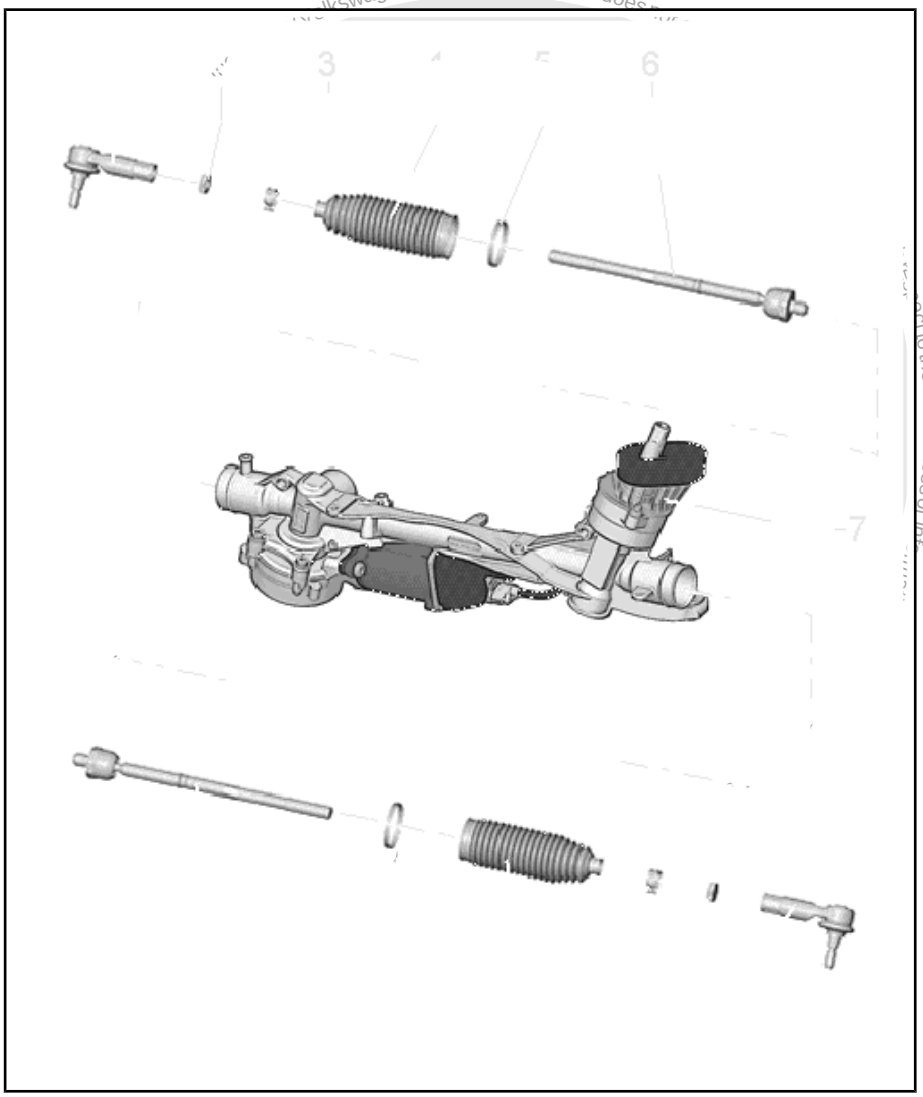
– Check wheel alignment ⇒ page 266 .

Torque settings

- ⇒ “3.1 Assembly overview - steering rack”, page 313
- ⇒ “3.6 Repairing steering rack”, page 330
- ⇒ “1.1 Specified torques for wheel bolts”, page 249

3.6 Repairing steering rack

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1 - Right track rod ball joint

- ❑ Marked with “A” ⇒ page 328
- ❑ Removing and installing ⇒ page 329
- ❑ Fitting position ⇒ page 328
- ❑ Allocation ⇒ Electronic parts catalogue “ETKA”

2 - Nut

- ❑ Counterhold on track rod ball joint with a spanner when loosening or tightening nut.
- ❑ 70 Nm

3 - Clip

4 - Boot

- ❑ Must not be twisted after toe setting has been adjusted.
- ❑ Removing and installing ⇒ page 323

5 - Clamping piece

- ❑ Renewing
- ❑ Tightening ⇒ page 326

6 - Track rod

- ❑ Removing and installing ⇒ page 326
- ❑ 100 Nm

7 - Steering rack

- ❑ Allocation ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 316

8 - Left track rod ball joint

- ❑ Marked with “B” ⇒ page 328
- ❑ Removing and installing ⇒ page 329
- ❑ Fitting position ⇒ page 328
- ❑ Allocation ⇒ Electronic parts catalogue “ETKA”

9 - Nut

- ❑ Counterhold on track rod ball joint with a spanner when loosening or tightening nut.
- ❑ 70 Nm

10 - Spring-type clip

11 - Boot

- ❑ Removing and installing ⇒ page 323
- ❑ Check for damage
- ❑ Must not be twisted after toe setting has been adjusted.

12 - Clamping piece

- ❑ Renew after removal
- ❑ Secure new hose clip using locking pliers for Phaeton steering rack - VAS 6199- .

13 - Track rod

- ❑ If defective, renew together with track rod ball joint

- ❑ Removing and installing ⇒ page 326
- ❑ 100 Nm

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4 Sensors

⇒ “4.1 Removing and installing steering angle sender G85 ”, page 333

4.1 Removing and installing steering angle sender - G85-

Note

- *The steering angle sender - G85- is a component of the steering rack.*
- *It cannot be renewed as an individual part.*
- *If the steering angle sender - G85- is defective, the steering rack must be renewed ⇒ page 316 .*

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