



Workshop Manual

Audi A4 2015 ➤

Audi A4 China 2016 ➤

Audi A5 2016 ➤

Running gear, axles, steering

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List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

40 - Front suspension

42 - Rear suspension

43 - Self-levelling suspension

44 - Wheels, tyres, vehicle geometry

48 - Steering

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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 General notes

(ARL005871; Edition 07.2018)

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⇒ ["1.2 Steering", page 1](#)

⇒ ["1.3 Types of tyre", page 1](#)

⇒ ["1.4 General notes on drive shaft", page 1](#)

1.1 Running gear

Front axle	MacPherson struts with lower transverse links, subframe and anti-roll bar, or shock absorbers with variable damper characteristics (option)
Rear axle	Multi-link suspension with separate spring/shock absorber layout and anti-roll bar, or shock absorbers with variable damper characteristics (option)

1.2 Steering

Steering rack	Electro-mechanically assisted, maintenance-free rack-and-pinion steering
---------------	--

1.3 Types of tyre

For general information on wheel/tyre combinations, winter tyres, snow chains and recommended tyre makes, refer to ⇒ [Wheel/Tyre Guide](#) .

1.4 General notes on drive shaft

Before fitting the outer joint in the wheel hub, apply a thin coat of assembly paste to the splines on the outer joint ⇒ [Electronic parts catalogue](#) .

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

Wheel bearings must not be subjected to load after loosening bolt securing drive shaft at wheel hub.

If the wheel bearings are subjected to the full weight of the vehicle they will be overloaded, resulting in reduced service life. For this reason please note the following points:

- ◆ Procedure for slackening bolt securing drive shaft to wheel hub ⇒ [page 85](#)

Do not attempt to move the vehicle without the drive shafts fitted; this would result in wheel bearing damage. If moving the vehicle is unavoidable, note the following points:

- Fit an outer joint in place of the drive shaft.
- Tighten outer joint to 200 Nm.



2 Safety precautions

⇒ "2.1 Safety precautions when working on vehicles with start/stop system", page 2

⇒ "2.2 Safety precautions when working on subframe", page 2

⇒ "2.3 Safety precautions when using testers and measuring instruments during a road test", page 2

2.1 Safety precautions when working on vehicles with start/stop system

Risk of injury - engine may start unexpectedly

The engine can start unexpectedly if the vehicle's start/stop system is activated. A message in the instrument cluster indicates whether the start/stop system is activated.

- To deactivate the start/stop system, switch off the ignition.



2.2 Safety precautions when working on subframe

Risk of damage to components

Lowering the vehicle onto its wheels can damage components if the assembly mountings, steering rack or subframe cross brace are not properly fitted.

- Never lower vehicle onto its wheels with suspension components unfastened or detached.
- Never support weight of vehicle on subframe or subframe cross brace with suspension components unfastened or detached.

2.3 Safety precautions when using testers and measuring instruments during a road test

Risk of injury if test equipment is not secured

If an accident occurs and the front passenger's airbag is triggered, test equipment which is not secured adequately may be catapulted through the vehicle with potentially serious consequences.

- Secure test equipment to the rear seat.

Or

- Have another person operate the test equipment from the rear seat.



3 Repair notes

⇒ [“3.1 Leaks at shock absorbers”, page 3](#)

⇒ [“3.2 Checking shock absorbers when removed”, page 4](#)

⇒ [“3.3 Checking shock absorbers on shock tester”, page 4](#)

⇒ [“3.4 Maximum values "a" in mm”, page 6](#)

⇒ [“3.5 Rules for cleanliness”, page 7](#)

⇒ [“3.6 General notes”, page 7](#)

⇒ [“3.7 Contact corrosion”, page 9](#)

⇒ [“3.8 Gaskets and seals”, page 9](#)

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⇒ [“3.10 Electrical components”, page 10](#)

⇒ [“3.11 Repairing damaged threads in longitudinal member \(sub-frame to body\)”, page 10](#)

⇒ [“3.12 Lifting suspension to unladen position - vehicles with coil springs”, page 10](#)

3.1 Leaks at shock absorbers

Vehicles with coil springs

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.

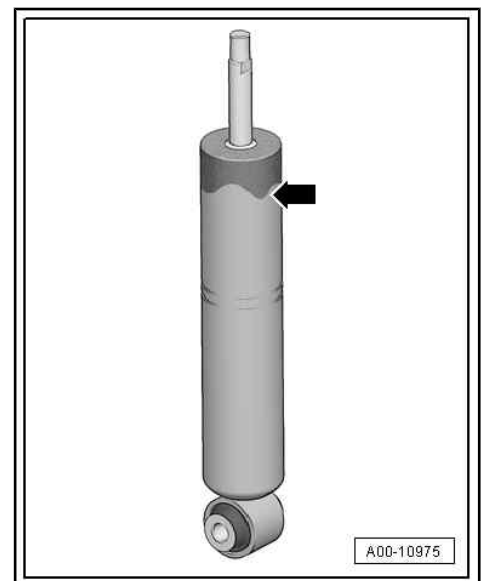
Slight loss of fluid (“sweating”) at the piston rod seal is not a reason for renewing a shock absorber. A shock absorber with slight fluid leakage can be accepted as OK under the following conditions:



Note

Slight fluid leakage is actually beneficial, as it lubricates the piston rod seal and thus extends the life of the shock absorber. This applies to shock absorbers on both the front and rear axles.

- ◆ Fluid seepage (as shown in the shaded part of the illustration -arrow-) is visible, but the fluid is dull and possibly dried by dust.
- ◆ A thin film of fluid or dirt has formed on one side; no drips.



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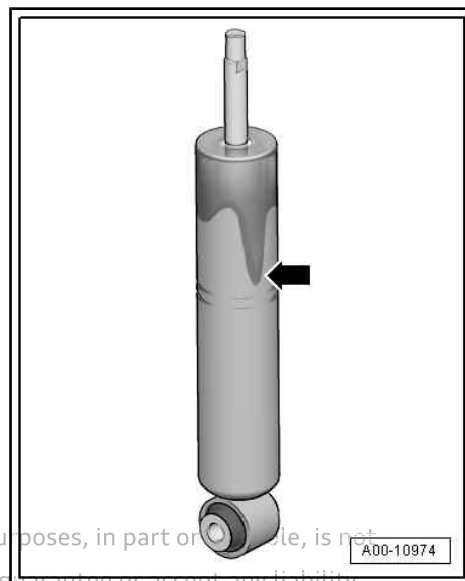


A shock absorber cannot be accepted as "OK" if the following occurs:

- ♦ Drips running down the side -arrow-; large area wet with fluid.
- ♦ If the shock absorber has a wet film of fluid running down the side of the tube, it is leaking and must be renewed.



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3.2 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.*

3.3 Checking shock absorbers on shock tester

The shock tester allows shock absorbers to be tested without removing them from the vehicle. The damping effect can be assessed on the basis of the pointer deflection or the print-out.

Special tools and workshop equipment required



- ◆ Maha shock absorber tester - VAS 1990S-
- ◆ Suspension strut test stand - VAS 6636-
- ◆ Suspension strut test stand - VAS 6640-

Test requirements

- Temperature: +10...+40 °C.
- Driver in vehicle
- Tyre pressures OK.
- Wheels of vehicle in a central and straight position on the tyre contact plates
- Front wheels in straight-ahead position
- Mechanical parking brake not applied, brake pedal not depressed.

Test results

The condition of the shock absorbers can only be evaluated as follows:

- ◆ Satisfactory damping effect
- Or
- ◆ Unsatisfactory damping effect



Note

- ◆ *It is not possible to obtain intermediate readings specifying the exact degree of impairment of damping effect.*
- ◆ *A forecast of the remaining service life is not permissible.*
- ◆ *Test results will be falsified if the suspension contacts the bump stops when the readings are taken.*

The following values apply only to tests conducted on the test equipment listed above. If the maximum values listed below are exceeded, the effectiveness of the shock absorber has deteriorated significantly and replacement is recommended.

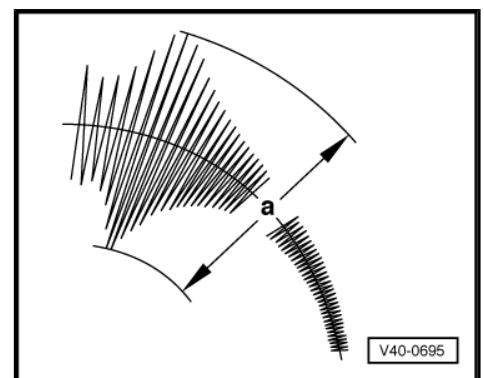
Example:

Maximum value = 70

- ◆ a = higher than 70: unsatisfactory damping effect
- ◆ a = lower than 70: satisfactory damping effect

The damper combinations fitted in the vehicle are indicated by the corresponding PR number on the vehicle data sticker.

Explanatory notes on production control numbers (PR numbers)
⇒ [page 215](#)





3.4 Maximum values "a" in mm

3.4.1 Maximum values "a" in mm, Saloon/ Avant



Note

- ◆ If the reading is higher than the maximum value "a" listed in the table, the damping effect is unsatisfactory ⇒ renew the shock absorber.
- ◆ If the reading is lower than the maximum value "a" listed in the table, the damping effect is satisfactory ⇒ the shock absorber does not have to be renewed.

Running gear	Front axle	Rear axle	Remarks
1BA	43	46	Unladen Tank full
1BE	48	49	Unladen Tank full
1BR	43	43	Unladen Tank full
1BB	47	52	Unladen Tank full
1BD	43	49	Unladen Tank full
1BL	50	63	Unladen Tank full
1BM	47	48	Unladen Tank full
1BP	44	45	Unladen Tank full
1BQ / 2MV	54	62	Unladen Tank full
2MN	--	--	Unladen Tank full
2MC/2MS	--	--	Unladen Tank full

3.4.2 Maximum values "a" in mm, Coupé/ Sportback



Note

- ◆ If the reading is higher than the maximum value "a" listed in the table, the damping effect is unsatisfactory ⇒ renew the shock absorber.
- ◆ If the reading is lower than the maximum value "a" listed in the table, the damping effect is satisfactory ⇒ the shock absorber does not have to be renewed.

Running gear	Front axle	Rear axle	Remarks
1BA	43	46	Unladen Tank full



Running gear	Front axle	Rear axle	Remarks
1BE	48	49	Unladen Tank full
1BD	46	49	Unladen Tank full
1BM	45	47	Unladen Tank full
1BL / 2MV	54	62	Unladen Tank full
2MN	54	62	Unladen Tank full
2MC/2MS	--	--	Unladen Tank full

3.4.3 Maximum values "a" in mm, Cabriolet



Note

- ◆ If the reading is higher than the maximum value "a" listed in the table, the damping effect is unsatisfactory → renew the shock absorber.
- ◆ If the reading is lower than the maximum value "a" listed in the table, the damping effect is satisfactory → the shock absorber does not have to be renewed.

Running gear	Front axle	Rear axle	Remarks
1BA	48	49	Unladen Tank full
1BD	46	49	Unladen Tank full
1BE	48	49	Unladen Tank full
1BL / 2MV	--	--	Unladen Tank full

3.5 Rules for cleanliness

- ◆ Thoroughly clean all unions and the adjacent areas before disconnecting.
- ◆ Place removed parts on a clean surface and cover them up to keep them clean. Use plastic sheeting or paper for this purpose. Only use lint-free cloths.
- ◆ Only install clean components; replacement parts should only be unpacked immediately prior to installation.
- ◆ Use only the grease and sealants with the part number stated.
- ◆ Carefully cover or seal open components if repairs cannot be carried out immediately.

3.6 General notes

To avoid repetition, a number of notes that are generally applicable to the individual procedures described in this manual are summarised here. They apply for this individual Workshop Manual.

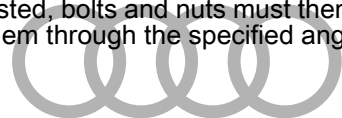


Caution

Risk of damage to threads in body.

- ◆ ***DO NOT use an impact wrench when loosening or tightening bolts and nuts on any chassis components.***
- ◆ ***Always start the first few threads of bolts and nuts by hand.***

- ◆ All contact surfaces must be cleaned when installing wax-coated components. The contact surfaces must be free of wax and grease.
- ◆ Load-bearing components and other suspension parts must not be welded or straightened.
- ◆ Do not subject coil springs to hammer blows or weld splashes and do not make any new colour markings.
- ◆ Do not perform welding or cutting operations (using power grinders) near the coil springs or suspension struts. Cover up coil springs or suspension struts if necessary.
- ◆ Make sketches or take photographs when unfastening or removing and installing hydraulic and pneumatic lines or electrical wires. This ensures re-installation at the original location.
- ◆ Any cable ties, brackets or fasteners removed during repair work must be re-attached at their original standard locations.
- ◆ Before fitting the outer joint in the wheel hub, apply a thin coat of assembly paste to the splines on the outer joint → Electronic parts catalogue .
- ◆ When working on the vehicle, do not allow the drive shafts to hang down under their own weight and never let the joints bend to such an extent that they contact the end stop.
- ◆ Do not attempt to move the vehicle without the drive shafts fitted; this would result in wheel bearing damage. If moving the vehicle is unavoidable, note the following points:
- ◆ Fit an outer joint in place of the drive shaft.
- ◆ Tighten outer joint to 200 Nm.
- ◆ Bonded rubber mountings can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.
- ◆ If a component has a defective bonded rubber bush, the bonded rubber bush must be renewed individually if it is available as a replacement part.
- ◆ Full renewal of a component with bonded rubber bush is only permissible if, for example, its basic structure or joint is damaged.
- ◆ Lifting suspension to unladen position ⇒ [page 10](#)
- ◆ If the wheel alignment has to be checked and adjusted at a later stage, all bolts and nuts which need to be slackened to make adjustments should initially only be tightened to the specified torque figure. After wheel alignment has been checked and adjusted, bolts and nuts must then be fully tightened by turning them through the specified angle.





WARNING

Risk of accident!

- ◆ **All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.**

3.7 Contact corrosion

Contact corrosion can occur if unsuitable fasteners are used (e.g. bolts, nuts, washers, etc.).

For this reason, only fasteners with a special surface coating are fitted.

In addition, rubber parts, plastic parts and adhesives are made of non-conductive material.

Always install new parts as listed in the Electronic parts catalogue if you are not sure whether used parts can be refitted.

Please note:

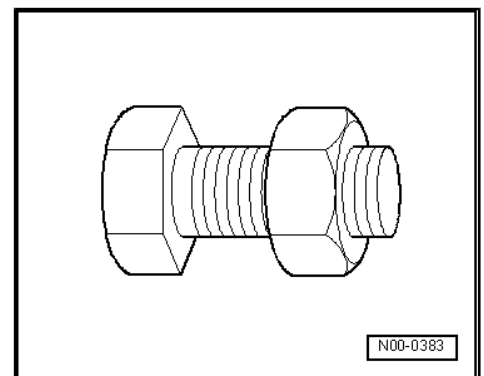
- ◆ We recommend using only genuine replacement parts: these have been fully tested and are compatible with aluminium.
- ◆ We recommend the use of Audi accessories.
- ◆ Damage caused by contact corrosion is not covered by the warranty.

3.8 Gaskets and seals

- ◆ Always renew gaskets and seals.
- ◆ Check contact surface on housing or shafts for burrs and damage after removing the seals, and repair as required.
- ◆ Remove residues of liquid gaskets completely from sealing surfaces.

3.9 Bolts and nuts

- ◆ Loosen and tighten bolts and nuts securing covers and housings in diagonal sequence.
- ◆ Take care not to tilt particularly sensitive components such as the servo motor with control unit; slacken off and tighten progressively in diagonal sequence.
- ◆ Tightening torques refer to uncoiled bolts and nuts.
- ◆ Always renew self-locking bolts/nuts.
- ◆ Always renew bolts and nuts which are tightened by turning through a specified angle.



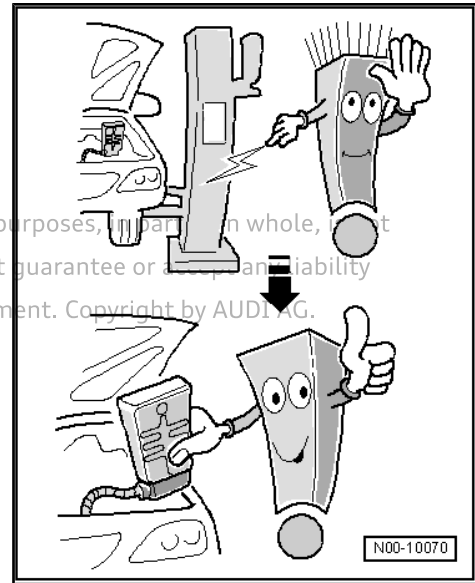


3.10 Electrical components

You have certainly experienced light electric shocks when touching metal objects. This is due to the electrostatic charge accumulated by the human body. This charge can cause malfunctions if you touch the electric steering rack components.

- Before working on electrical components, touch an earthed object (e.g. water pipe or lifting platform). Do not touch the contact pins of the electrical connectors.

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3.11 Repairing damaged threads in longitudinal member (subframe to body)

Instructions for repairing damaged threads ⇒ Body Repairs; Rep. gr. 50 .

3.12 Lifting suspension to unladen position - vehicles with coil springs



Note

All bolts on running gear components with bonded rubber bushes must always be tightened with the suspension in the unladen position ⇒ [page 216](#) .

- ◆ Bonded rubber bushes can only be turned to a limited extent. Therefore, before tightening the bolts, suspension components with bonded rubber bushes must be brought into a position corresponding to the normal position while driving (unladen position).
- ◆ Otherwise, the bush would be subject to torsion loading and its service life would be shortened.
- ◆ This position can be simulated on the lifting platform by raising the appropriate part of the suspension with the engine and gearbox jack - VAS 6931- and support - T10149- .

Special tools and workshop equipment required



◆ Engine and gearbox jack - VAS 6931-

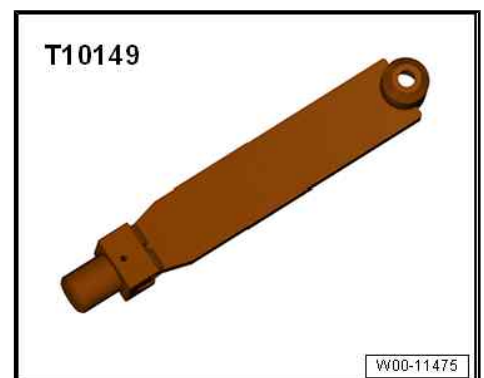


◆ Tensioning strap - T10038-

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◆ Support - T10149-



Procedure

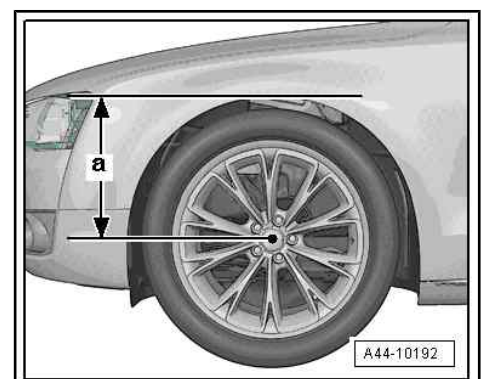
- Before commencing work, use measuring tape or similar to measure dimension -a- from wheel centre to lower edge of wing/wheel housing.



Note

This measurement must be taken with the suspension in the unladen position. ⇒ [page 216](#)

- Make a note of the measured value. This will be needed when tightening the bolts and/or nuts on the suspension.





- Remove wheel ⇒ [page 205](#) .
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.

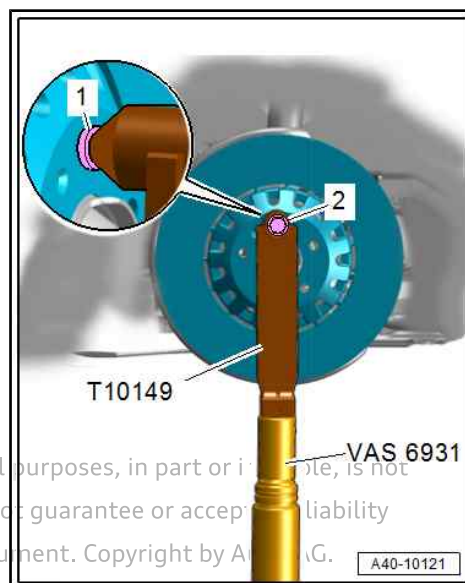


Note

Disregard -item 1-.



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Note

The bolts/nuts on the relevant suspension mountings must not be tightened until the distance between the wheel centre and the lower edge of the wing/wheel arch is the same as the distance measured before commencing work.



WARNING

Risk of accident!

- ◆ *The vehicle can slip off the lifting platform if it is not properly secured.*

- Fit support - T10149- in engine and gearbox jack - VAS 6931- and raise wheel bearing housing slightly.
- Before raising wheel unit to unladen position, secure vehicle to engine and gearbox jack - T10038- using tensioning strap - VAS 6931- .
- Raise wheel bearing housing until distance -a- is obtained.



WARNING

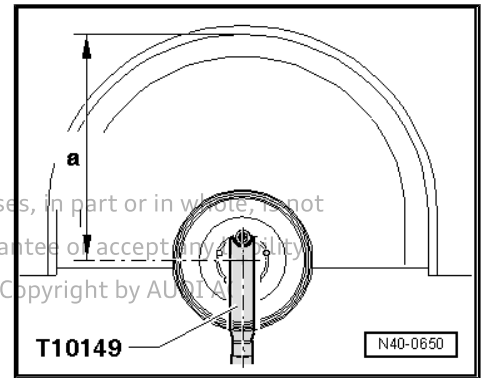
Risk of accident!

- ◆ *Do not raise or lower vehicle when engine and gearbox jack is under vehicle.*
- ◆ *Do not leave engine and gearbox jack under vehicle for longer than necessary.*

- Tighten relevant nuts and bolts.
- Lower wheel bearing housing.
- Move engine and gearbox jack - VAS 6931- aside.
- Detach support - T10149- .

Tightening torques

- ◆ ⇒ ["1 Wheels, tyres", page 205](#)





4 Disposal

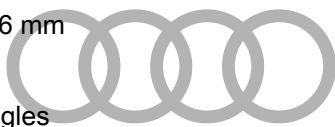
⇒ "4.1 Releasing gas and draining front gas-filled shock absorbers", page 14

⇒ "4.2 Releasing gas and draining rear gas-filled shock absorbers", page 14

4.1 Releasing gas and draining front gas-filled shock absorbers

Special tools and workshop equipment required

- ◆ Hand-held drill
- ◆ Drill bit, $\varnothing$ 3 mm
- ◆ Drill bit, $\varnothing$ 6 mm
- ◆ Drip tray
- ◆ Safety goggles



Procedure

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



WARNING

Danger of eye injuries!

- ◆ ***Put on safety goggles.***

- Drill a 3 mm $\varnothing$ hole -item A- through outer tube of shock absorber.



Note

Gas will escape during drilling.

- Continue drilling until inner tube is fully penetrated (approx. 25 mm deep).
- Drill a second hole (6 mm $\varnothing$) -item B- through outer and inner tubes of shock absorber.
- Hold shock absorber over a drip tray and move piston rod up and down several times through entire stroke until no more fluid comes out.



4.2 Releasing gas and draining rear gas-filled shock absorbers

Special tools and workshop equipment required

- ◆ Hand-held drill
- ◆ Drill bit, $\varnothing$ 3 mm
- ◆ Drill bit, $\varnothing$ 6 mm
- ◆ Drip tray
- ◆ Safety goggles



Procedure

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



WARNING

Danger of eye injuries!

◆ *Put on safety goggles.*

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

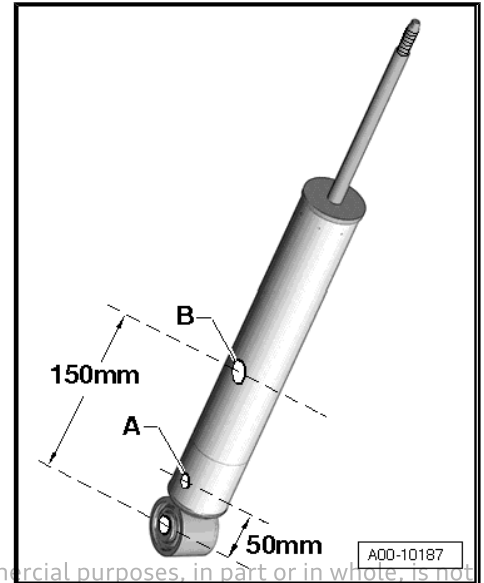


Note



Gas will escape during drilling.

- Continue drilling until inner tube is fully penetrated (approx. 25 mm deep).
- Drill a second hole (6 mm Ø) -item B- through outer and inner tubes of shock absorber.
- Hold shock absorber over a drip tray and move piston rod up and down several times through entire stroke until no more fluid comes out.



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40 – Front suspension

1 Front axle

⇒ ["1.1 Overview - front axle", page 16](#)

1.1 Overview - front axle

I - ⇒ ["2 Subframe", page 17](#)

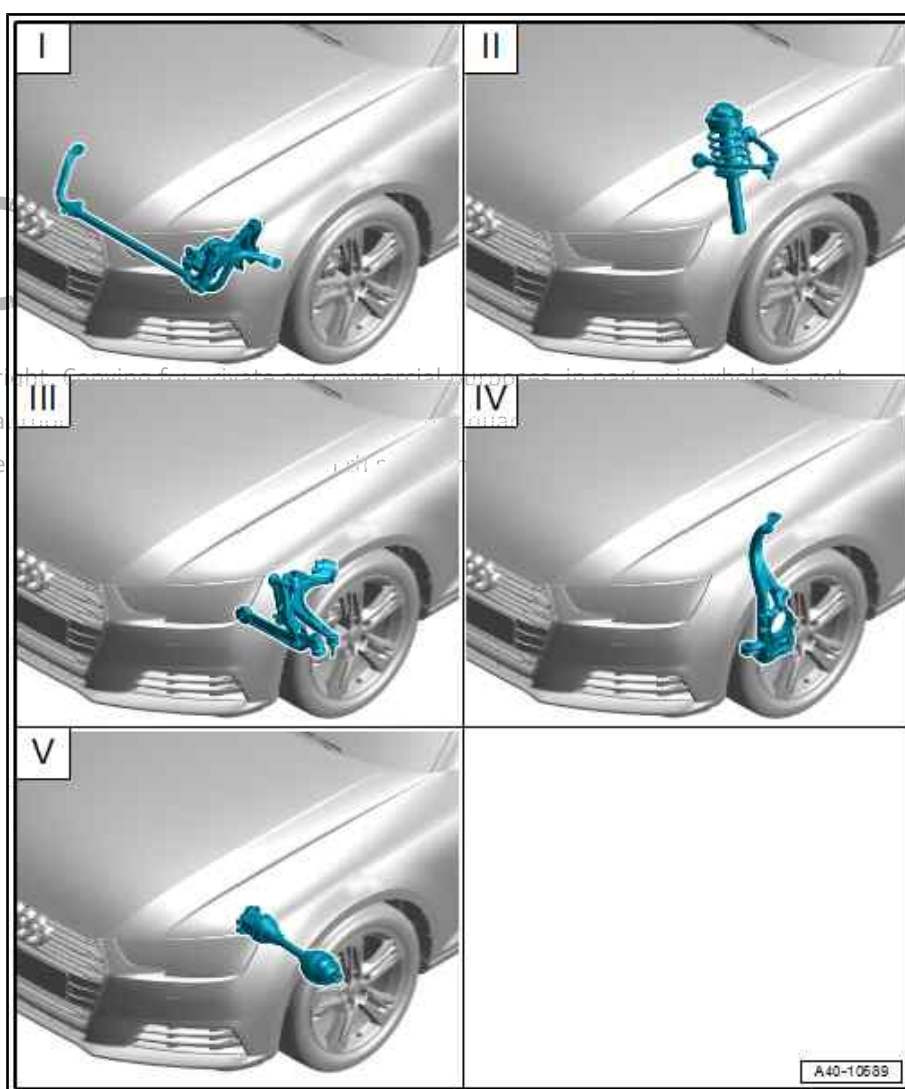
II -
⇒ ["3 Suspension strut, upper links", page 41](#)

III -
⇒ ["4 Lower suspension links, swivel joint", page 55](#)

IV -
⇒ ["5 Wheel bearing", page 71](#)

V -
⇒ ["6 Drive shaft", page 81](#)

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2 Subframe

⇒ [“2.1 Exploded view - subframe”, page 17](#)

⇒ [“2.2 Fixing position of subframe”, page 20](#)

⇒ [“2.3 Lowering subframe”, page 24](#)

⇒ [“2.4 Removing and installing subframe with steering rack”, page 27](#)

⇒ [“2.5 Removing and installing subframe cross brace”, page 34](#)

⇒ [“2.6 Removing and installing subframe shield”, page 37](#)

⇒ [“2.7 Removing and installing anti-roll bar”, page 38](#)

⇒ [“2.8 Removing and installing coupling rod”, page 39](#)

2.1 Exploded view - subframe



Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ *DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.*
- ◆ *Always fit all bolts by hand; make the first few turns by hand.*

Risk of damage to running gear components.

- ◆ *Never place the vehicle on its wheels if the subframe mounting, steering rack or subframe cross brace is not correctly installed.*
- ◆ *Under no circumstances must the vehicle be supported on the subframe or the subframe cross brace (e.g. using a trolley jack or similar).*

Subframe ⇒ [page 17](#)

Anti-roll bar ⇒ [page 19](#)

Subframe



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1 - Bolt

- ☐ Renew after removing
- ☐ 90 Nm +90°

2 - Fitted bolt

- ☐ Renew after removing
- ☐ 90 Nm +90°

3 - Bolt

- ☐ 30 Nm

4 - Subframe cross brace

- ☐ Removing and installing
⇒ [page 34](#)

5 - Bolt

- ☐ Renew after removing
- ☐ Loosen and tighten together with
⇒ [Item 11 \(page 18\)](#)
and
⇒ [Item 12 \(page 18\)](#) in
several stages in diagonal
sequence
- ☐ 115 Nm +180°

6 - Subframe

- ☐ Fixing position
⇒ [page 20](#)
- ☐ Lowering ⇒ [page 24](#)
- ☐ Removing and installing
⇒ [page 27](#)

7 - Bolts

- ☐ 9 Nm

8 - Shield

- ☐ Removing and installing
⇒ [page 37](#)

9 - Nut

- ☐ 9 Nm

10 - Steering rack

- ☐ Exploded view ⇒ [page 262](#)

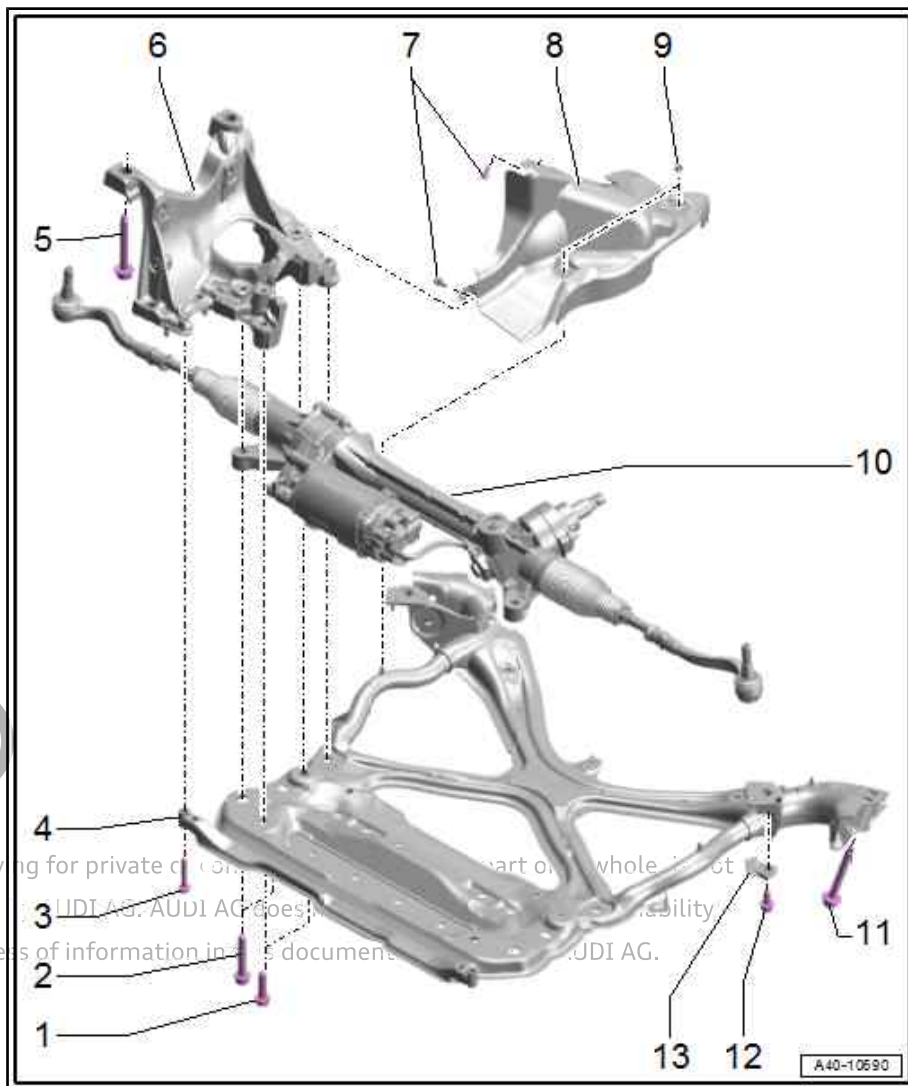
11 - Bolt

- ☐ Renew after removing
- ☐ Loosen and tighten together with ⇒ [Item 5 \(page 18\)](#) and ⇒ [Item 12 \(page 18\)](#) in several stages in diagonal sequence
- ☐ 115 Nm +180°

12 - Bolt

- ☐ Renew after removing
- ☐ Loosen and tighten together with ⇒ [Item 5 \(page 18\)](#) and ⇒ [Item 11 \(page 18\)](#) in several stages in diagonal sequence
- ☐ 50 Nm +90°

13 - Clip

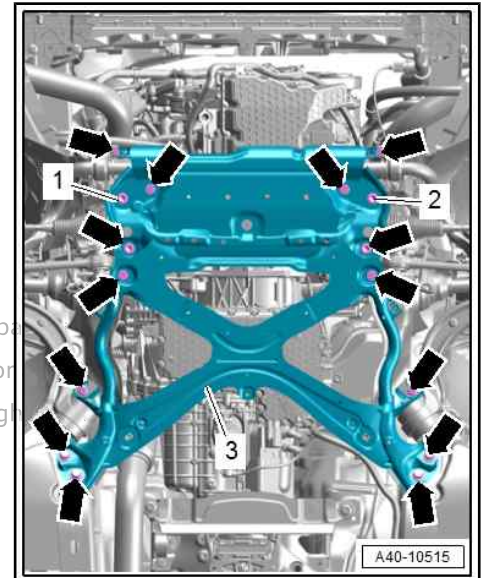




Subframe cross brace (all vehicles except for A5 Cabriolet) - tightening sequence

- Tighten bolts in stages in the sequence shown:

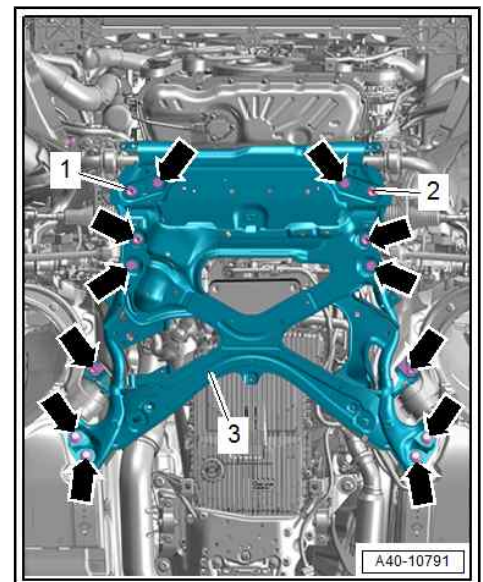
Stage	Bolts	Tightening sequence
1.	-arrows-	Screw in by hand as far as stop
2.	-arrows-	Tighten in several stages in diagonal sequence
3.	Remove locating pins - T40334-	
4.	-1, 2-	Tighten



Subframe cross brace (A5 Cabriolet) - tightening sequence

- Tighten bolts in stages in the sequence shown:

Stage	Bolts	Tightening sequence
1.	-arrows-	Screw in by hand as far as stop
2.	-arrows-	Tighten in several stages in diagonal sequence
3.	Remove locating pins - T40334-	
4.	-1, 2-	Tighten



Anti-roll bar



1 - Nut

- ☐ Renew after removing
- ☐ Unscrew and tighten evenly in stages
- ☐ 30 Nm

2 - Clamp

3 - Anti-roll bar

- ☐ With rubber bush
- ☐ Rubber bush cannot be renewed separately
- ☐ Removing and installing
⇒ [page 38](#)

4 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 40 Nm +90°

5 - Subframe

6 - Bolt

- ☐ Renew after removing

7 - Coupling rod

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

8 - Shock absorber fork

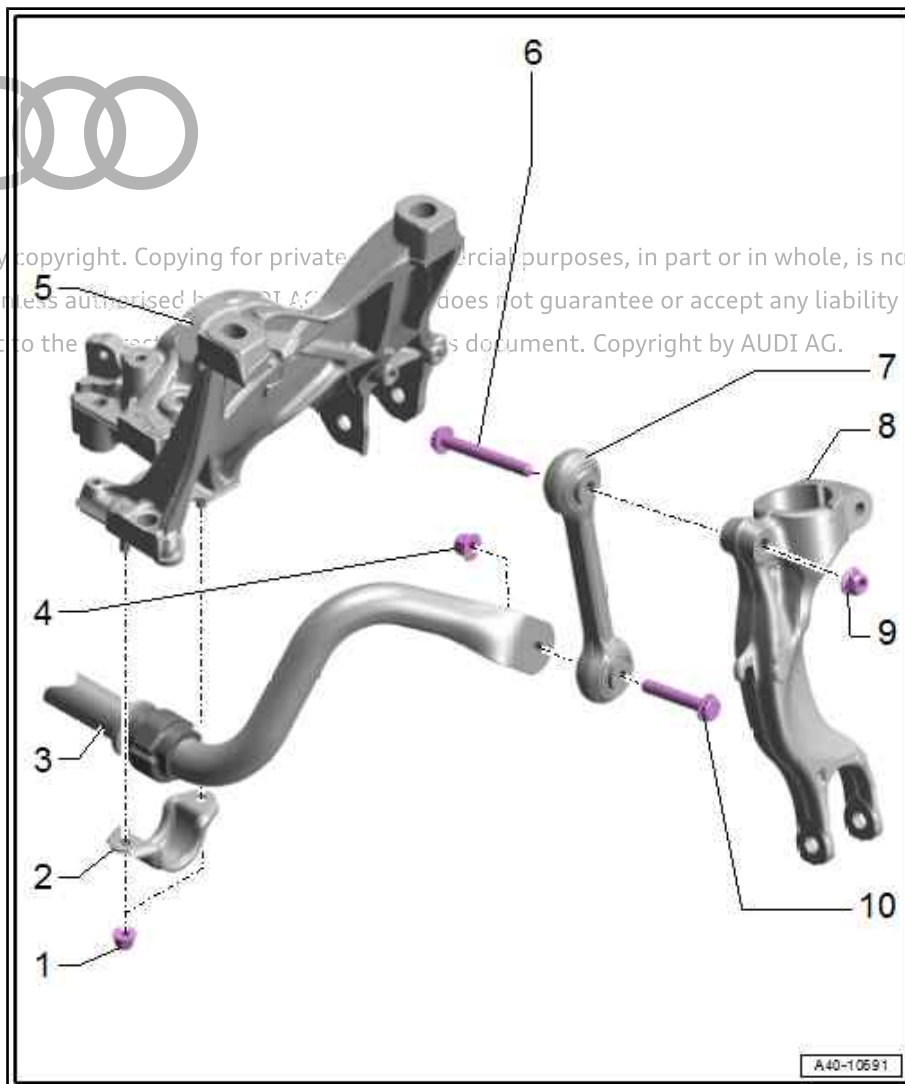
- ☐ Removing and installing
⇒ [page 52](#)

9 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 40 Nm +90°

10 - Bolt

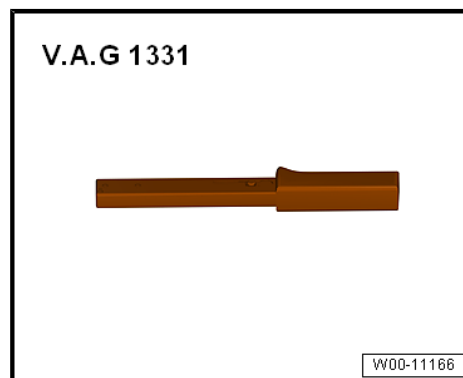
- ☐ Renew after removing



2.2 Fixing position of subframe

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-





- ◆ Torque wrench - V.A.G 1332-



- ◆ Engine and gearbox jack - VAS 6931-

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- ◆ Rear axle support - T10552-



- ◆ Fastening device - T40327- (not illustrated)
- ◆ Support - T40386- (not illustrated)



Preparing tool

- Loosen bolts -arrows-.
- Set to dimension -a-.
- Dimension -a- = 250 mm
- Re-tighten bolts.

Procedure

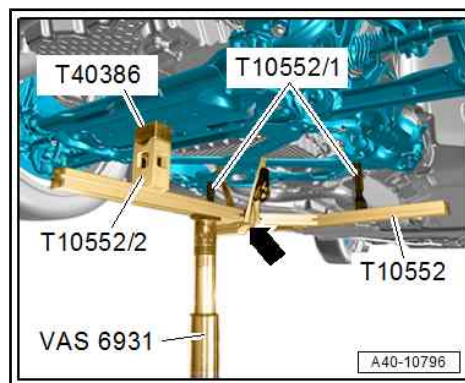
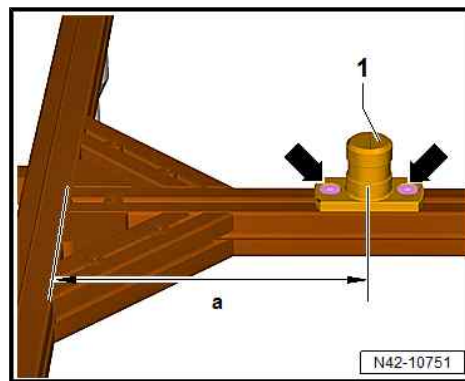


WARNING

Risk of accident if engine/gearbox assembly is not secured properly.

- ◆ **The entire weight of the engine must be supported in installation position for the following steps.**

- Support engine in installation position ⇒ Rep. gr. 10 ; Assembly mountings; Supporting engine in installation position .
- Remove front wheels ⇒ [page 205](#) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove wheel spoilers (both sides) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- A5 Cabriolet: Remove diagonal struts ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing diagonal struts .
- Detach clip nuts from subframe cross brace.
- Position rear axle support - T10552- with engine and gearbox jack - VAS 6931- underneath subframe and raise.
- Position support - T10552/2- with mounting - T40386- so that it makes contact with cross brace at front.
- Screw mounting pins - T10552/1- into rear holes on cross brace so that they make contact; to do so, turn threaded sleeve on left and right.
- Secure cross brace with a tensioning strap -arrow-.





Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ **DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.**
- ◆ **Always fit all bolts by hand; make the first few turns by hand.**



Note

- ◆ *To fix position of subframe, a locating pin -T40327- must be screwed in at position -1- on left and right sides.*
- ◆ *The locating pins must not be tightened to more than 20 Nm; otherwise the threads of the pins will be damaged.*
- ◆ *The holes in the subframe are peened slightly from the ribbed washers of the securing bolts; it may be necessary to de-burr them.*
- Fit locating pins -T40327- in place of securing bolts -1- on both sides of the vehicle and tighten to 20 Nm.
- The position of the subframe is now fixed.
- Remove bolts -arrows- on both sides.

Removing locating pins -T40327-

Removal is performed in reverse sequence; note the following:

- Unscrew only one locating pin at a time and screw in a new bolt in its place.



Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ **DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.**
- ◆ **Always fit all bolts by hand; make the first few turns by hand.**



WARNING

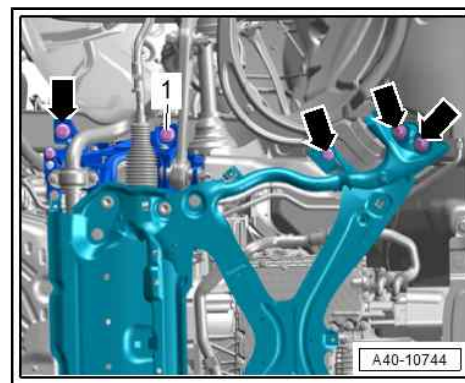
Risk of accident!

- ◆ **All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.**

- Remove support bracket - 10-222A- ⇒ Rep. gr. 10 ; Assembly mountings; Supporting engine in installation position .
- Perform test drive after completing repair work. Wheel alignment must be checked and adjusted if the steering wheel is not straight ⇒ [page 210](#) .

Tightening torques

- ◆ ⇒ ["2.1 Exploded view - subframe", page 17](#)





- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ⇒ ["1 Wheels, tyres", page 205](#)

2.3 Lowering subframe

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

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V.A.G 1331



W00-11166

- ◆ Torque wrench - V.A.G 1332-

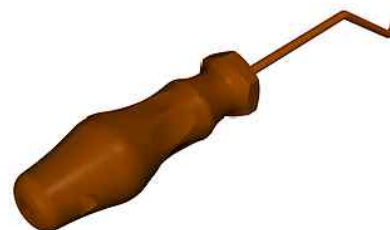
V.A.G 1332



W00-11165

- ◆ Assembly tool - T10118-

T10118



W00-11303

Procedure

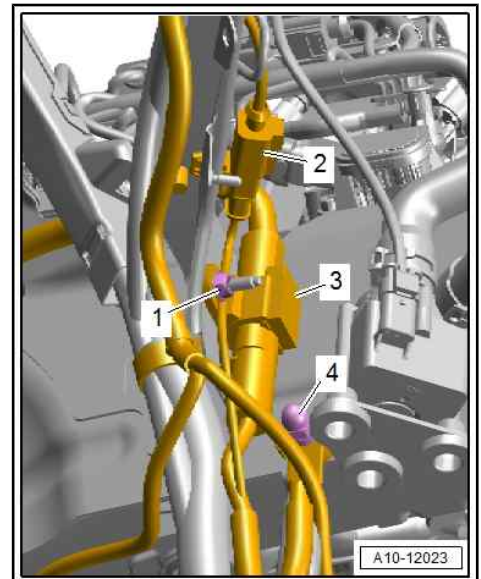


Note

Re-install all cable ties in original positions.



- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Fix position of subframe ⇒ [page 20](#) .
- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- by a few turns, move electrical connector -3-
clear and unplug it.
- Remove nut -4- and move earth wire clear.
- Move electrical wiring leading to steering rack clear.

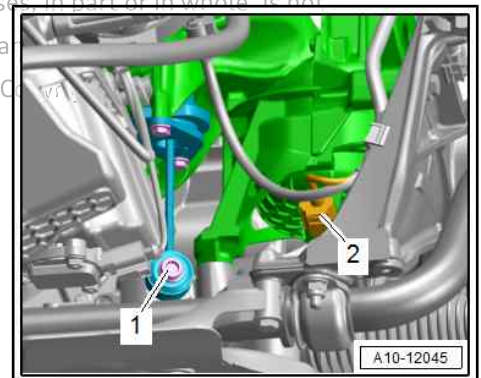


- Equipment version with electrohydraulic engine mountings:
Unplug electrical connectors -2- (left and right) for electrohy-
draulic engine mounting solenoid valves.
- Equipment version with support mountings: Unscrew bolts
-1- (left and right) for support mountings.

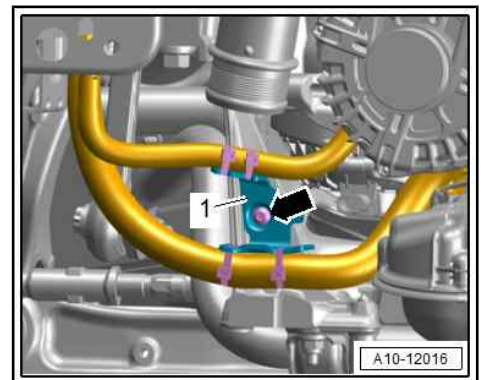


Note

*Illustration shows installation position on a vehicle with 2.0 ltr.
TFSI engine as an example.*

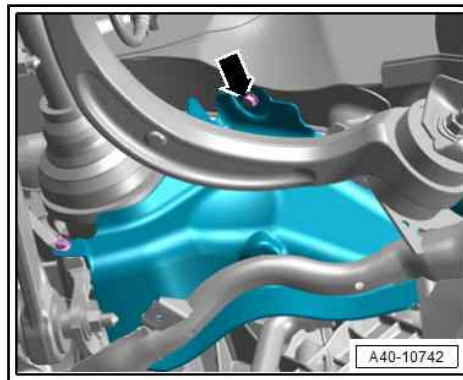


- Remove bolt -arrow- and move bracket -1- with electrical wir-
ing harness clear.

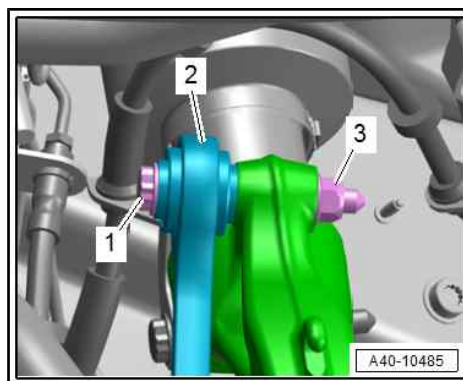




- Remove bolt -arrow- for subframe shield on both sides.



- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Detach intermediate steering shaft from steering rack and slide shaft together ⇒ [page 257](#) .
- Detach drive shafts (left and right) from gearbox ⇒ [page 83](#) .

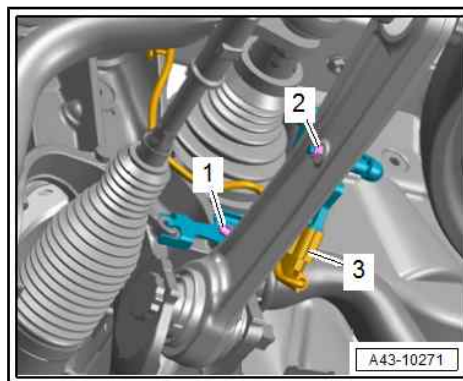


- Equipment version with electronic damping control: Unplug electrical connectors -3- (left and right) for vehicle level senders and move electrical wiring clear.



Note

Disregard items -1 and 2-.



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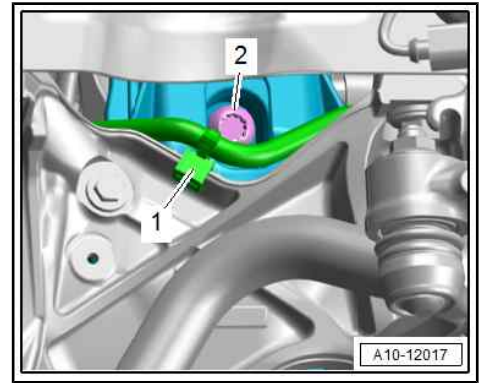


- Equipment version with SCR system: Move SCR supply line -1- clear at subframe.
- Remove bolts -2- (left and right) and lower subframe with engine and gearbox jack - VAS 6931- .



Note

- ◆ *When lowering subframe, make sure there is enough clearance for electrical wiring.*
- ◆ *If necessary for additional work, tie up subframe to body using tensioning straps -T10038- and remove engine and gearbox jack - VAS 6931- .*



Installing

Installation is carried out in reverse order; note the following:

- Remove locating pins -T40327- ⇒ [page 20](#) .
- Install intermediate steering shaft ⇒ [page 257](#) .



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)



WARNING

Risk of accident!

- ◆ ***All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.***

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Tightening torques

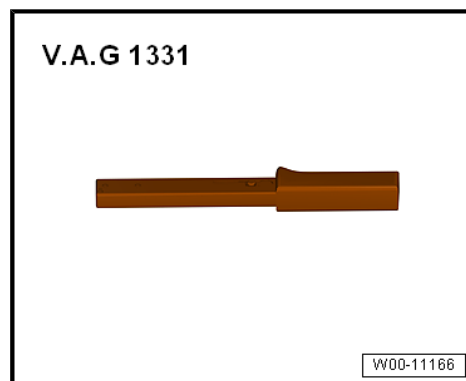
- ◆ ⇒ [“2.1 Exploded view - subframe”, page 17](#)
- ◆ ⇒ [“6.1 Exploded view - drive shaft”, page 81](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - impact bar
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)

2.4 Removing and installing subframe with steering rack

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



◆ Engine and gearbox jack - VAS 6931-



◆ Ball joint ejector - VAS 251 805-



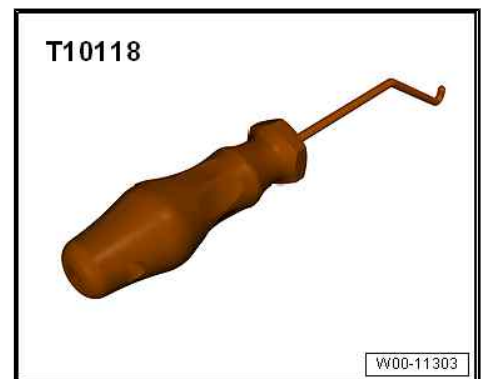
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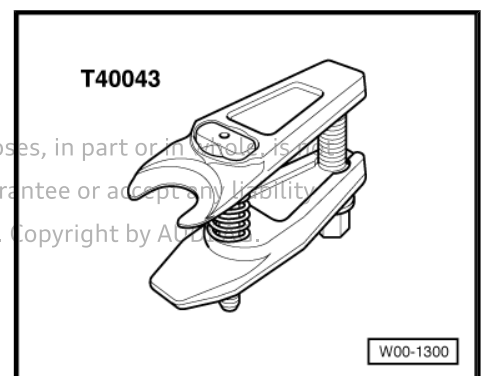
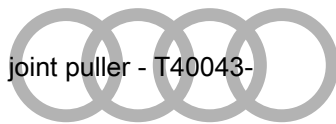
◆ Tensioning strap - T10038-



◆ Assembly tool - T10118-



◆ Ball joint puller - T40043-



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Removing



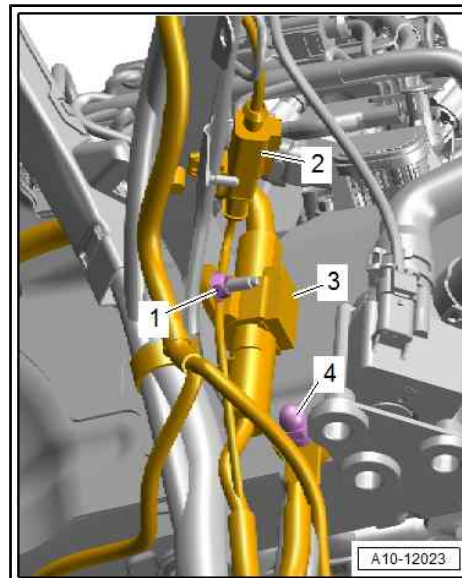
Note

Re-install all cable ties in original positions.

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Fix position of subframe ⇒ [page 20](#) .



- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- by a few turns, move electrical connector -3- clear and unplug it.
- Remove nut -4- and move earth wire clear.
- Move electrical wiring leading to steering rack clear.

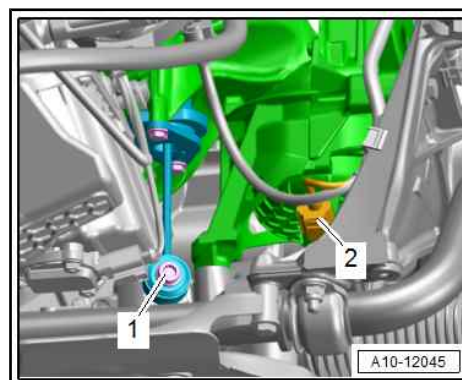


- Equipment version with electrohydraulic engine mountings: Unplug electrical connectors -2- (left and right) for electrohydraulic engine mounting solenoid valves.
- Equipment version with support mountings: Unscrew bolts -1- (left and right) for support mountings.

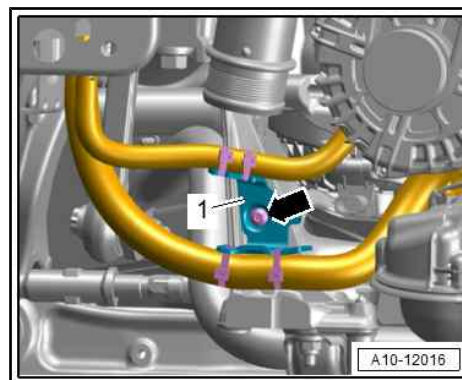


Note

Illustration shows installation position on a vehicle with 2.0 ltr. TFSI engine as an example.



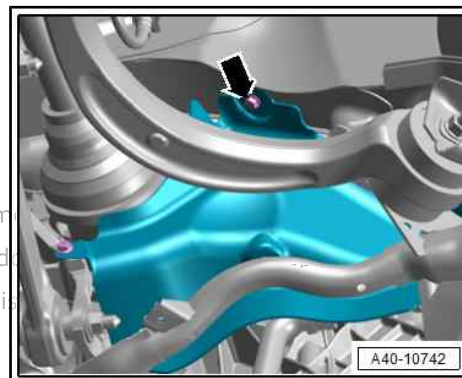
- Remove bolt -arrow- and move bracket -1- with electrical wiring harness clear.

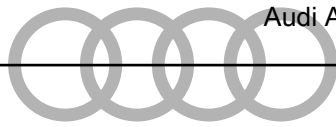


- Remove bolt -arrow- for subframe shield on both sides.



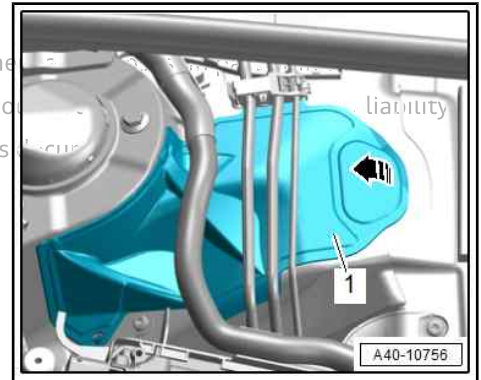
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- On both sides, remove cover -1- -arrow- on suspension turret.

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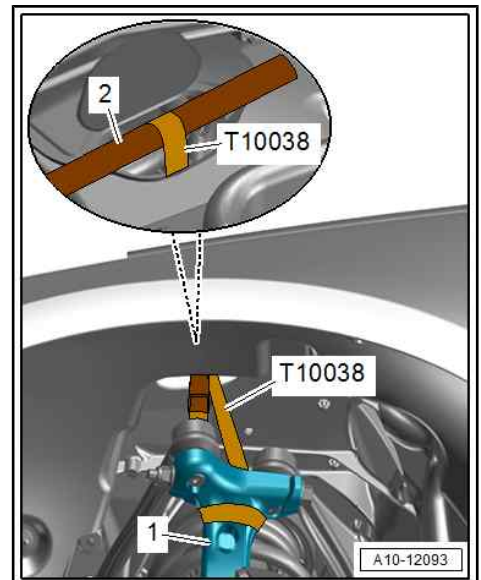


Caution

Risk of damage to joints of upper links.

- ◆ *The wheel bearing housings must be supported.*

- On both sides, tie up wheel bearing housing -1- with tensioning strap - T10038- as shown (use the handle of a hammer -2- to do so).



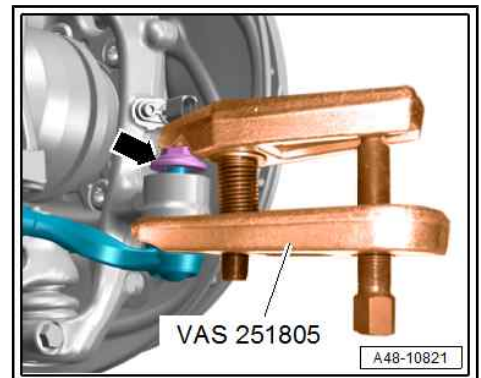
- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint (on both sides) until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out

- ◆ *The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



Caution

Risk of damage to ball joint puller.

- ◆ *Make sure the two lever arms of the puller are parallel when maximum force is exerted.*

- Use ball joint ejector - VAS 251 805- to press track rod ball joint off wheel bearing housing on both sides.
- Then unscrew nut; if necessary, counterhold at joint pin with a 6 mm hexagon socket.



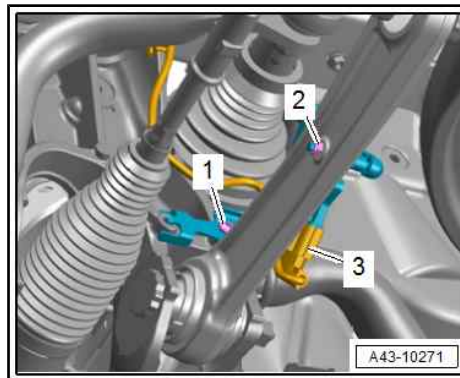
Equipment version with electronic damping control:

- Unplug electrical connector -3- for vehicle level sender on both sides and move wiring clear.
- Remove nut -2- and move coupling rod clear.



Note

Disregard -item 1-.



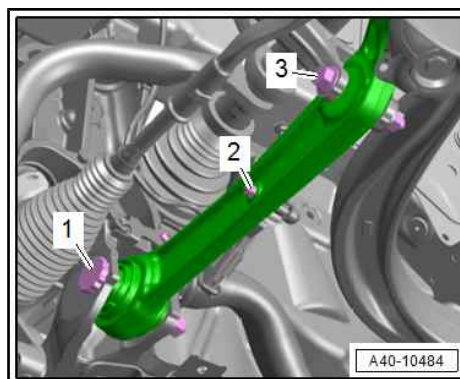
All vehicles (continued):

- On both sides, separate bolted connections -1, 3- for track control links.
- Swivel track control link to the front.



Note

- ♦ To remove bolt -1-, turn steering to full left/right lock.
- ♦ Disregard -item 2-.



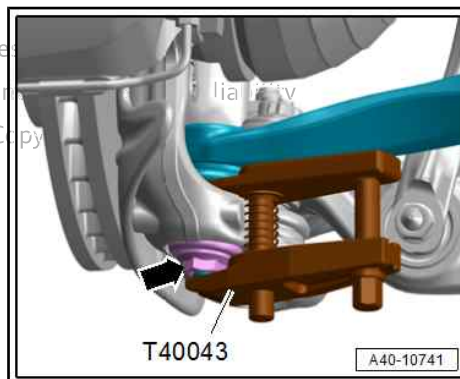
- To protect thread, unscrew nut -arrow- on joint pin of guide link (on both sides) until nut is flush with thread of joint pin.



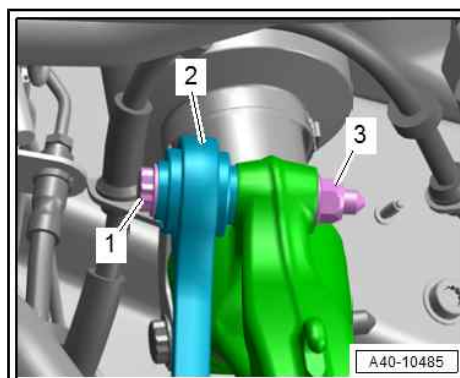
WARNING

Risk of injury if parts are allowed to drop out

- ♦ The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.



- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.
- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Detach intermediate steering shaft from steering rack and slide shaft together ➔ [page 257](#) .
- Detach drive shafts (left and right) from gearbox ➔ [page 83](#) .





- Equipment version with SCR system: Move SCR supply line -1- clear at subframe.
- Remove bolts -2- (left and right) and lower subframe with engine and gearbox jack - VAS 6931- .



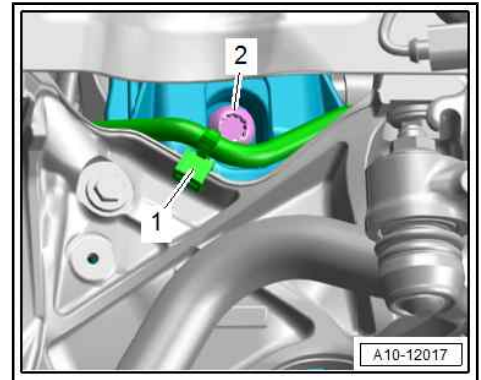
Note

When lowering subframe, make sure there is enough clearance for electrical wiring.

Installing

Installation is carried out in reverse order; note the following:

- Remove locating pins -T40327- ⇒ [page 20](#) .
- Install intermediate steering shaft ⇒ [page 257](#) .



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)



WARNING

Risk of accident!

- ◆ *All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.*

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)



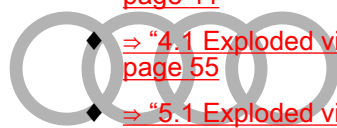
Note

Perform wheel alignment if the steering wheel is not straight following work involving removal of the subframe and steering rack.

- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Calibrate front camera for driver assist systems ⇒ [page 239](#) .

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - subframe”, page 17](#)
- ◆ ⇒ [“3.1 Exploded view - suspension strut, upper links”, page 41](#)
- ◆ ⇒ [“4.1 Exploded view - lower suspension links, swivel joint”, page 55](#)
- ◆ ⇒ [“5.1 Exploded view - wheel bearing”, page 71](#)
- ◆ ⇒ [“6.1 Exploded view - drive shaft”, page 81](#)





2.5 Removing and installing subframe cross brace

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Engine and gearbox jack - VAS 6931-



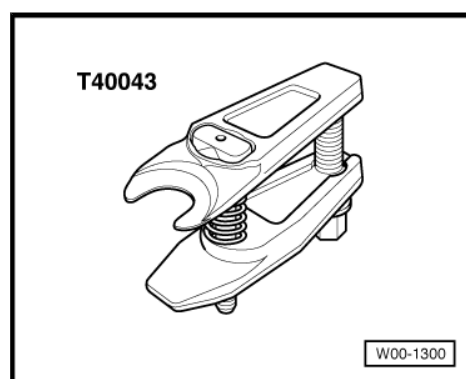
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- ◆ Rear axle support - T10552-



- ◆ Ball joint puller - T40043-

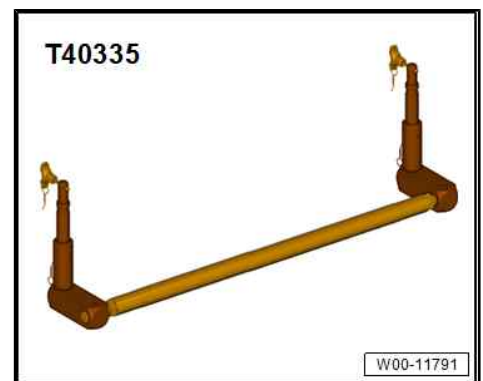




◆ Locking pin - T40334-



◆ Brace -T40335-



◆ Support - T40386- (not illustrated)

Preparing tool

- Loosen bolts -arrows-.
- Set to dimension -a-.
- Dimension -a- = 250 mm
- Re-tighten bolts.

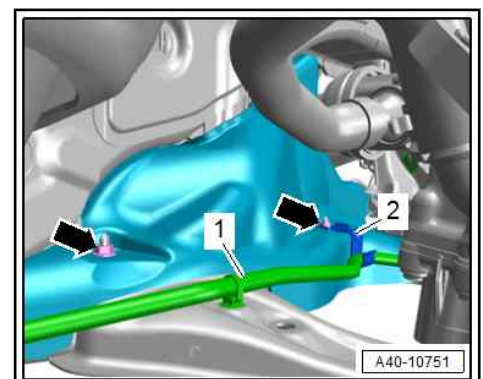
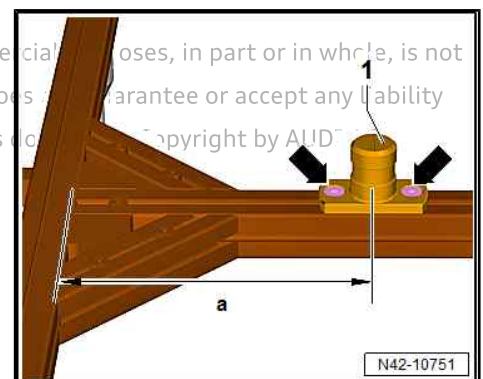
Removing



Note

Re-install all cable ties in original positions.

- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove nuts -arrows- (left and right) for subframe shield.
- Equipment version with SCR system: Move SCR supply line -1- with bracket -2- clear at cross brace.
- Move electrical wiring clear at cross brace.





- To protect thread, unscrew nut -arrow- on joint pin of guide link (on both sides) until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out

- ◆ *The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*

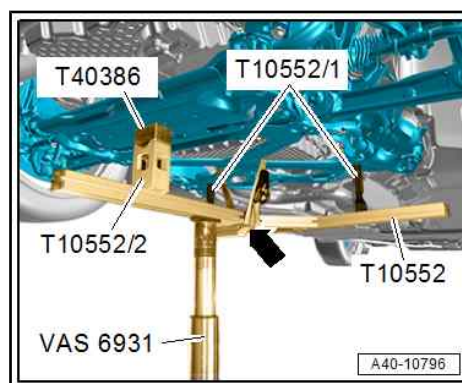
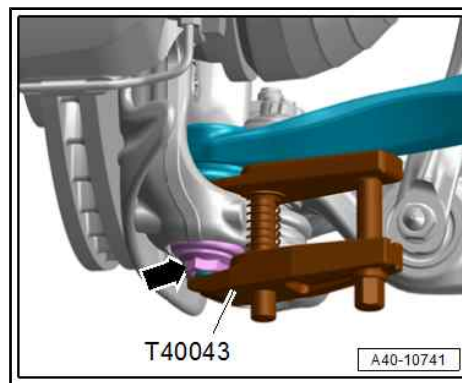
- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.
- If necessary, move wiring harness and SCR supply line clear.
- A5 Cabriolet: Remove diagonal struts ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing diagonal struts .
- Detach clip nuts from subframe cross brace.
- Position rear axle support - T10552- with engine and gearbox jack - VAS 6931- underneath subframe and raise.
- Position support - T10552/2- with mounting - T40386- so that it makes contact with cross brace at front.
- Screw mounting pins - T10552/1- into rear holes on cross brace so that they make contact; to do so, turn threaded sleeve on left and right.
- Secure cross brace with a tensioning strap -arrow-.



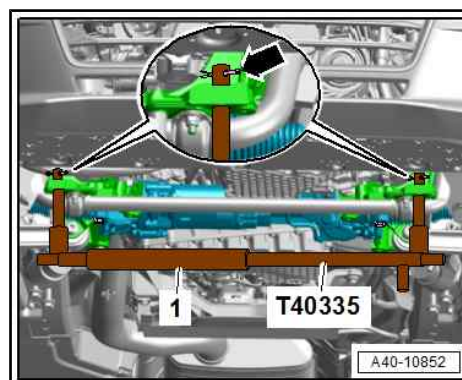
Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ *DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.*
- ◆ *Always fit all bolts by hand; make the first few turns by hand.*



- Attach brace -T40335- to subframe on left and right. If necessary, adjust brace using knurled handle -1-.
- Secure brace on both sides with a split pin -arrow-.





Note

To fix position of subframe, locating pins - T40334- must be screwed in at -position 1- and -position 2-.

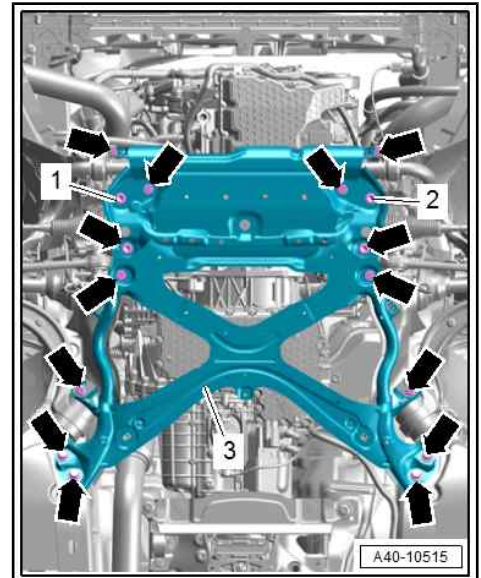
- Fit locating pins - T40334- in place of bolts -1- and -2- and tighten to 60 Nm.
- The position of the steering rack is now fixed.
- Remove bolts -arrows-, lower subframe cross brace -3- with engine and gearbox jack - VAS 6931- and remove.



Caution

Risk of damage to running gear components.

- ◆ **Never place the vehicle on its wheels if the subframe mounting, steering rack or subframe cross brace is not correctly installed.**
- ◆ **Under no circumstances must the vehicle be supported on the subframe or the subframe cross brace (e.g. using a trolley jack or similar).**



Installing

Installation is carried out in reverse order; note the following:

- Move cross brace into installation position and secure
⇒ Fig. “Subframe cross brace (all vehicles except for A5 Cabriolet) - tightening sequence”, page 19 /
⇒ Fig. “Subframe cross brace (A5 Cabriolet) - tightening sequence”, page 19 .

Tightening torques

- ◆ ⇒ “2.1 Exploded view - subframe”, page 17

⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts

⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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2.6 Removing and installing subframe shield

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-

V.A.G 1410



W00-11174



Removing subframe shield (left-side)

- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unscrew bolts -arrows-.
- If fitted, move bracket -2- clear.
- Detach shield -1-.

Removing subframe shield (right-side)

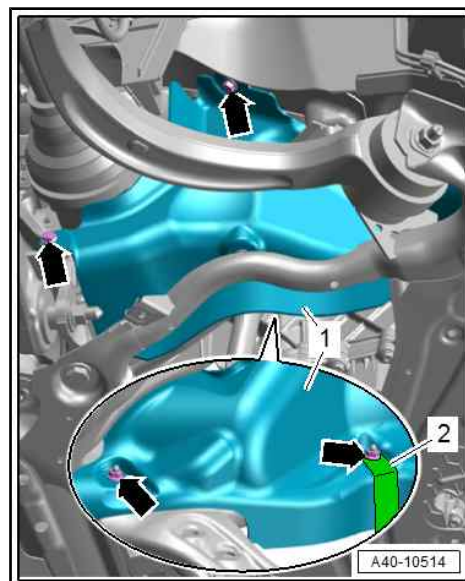
- Version with petrol engine: Remove front silencer ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Removing and installing front silencer .
- Version with TDI engine: Unbolt drive shaft (right-side) from gearbox ⇒ [page 83](#) .
- Detach subframe shield.

Installing

Installation is carried out in reverse sequence.

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - subframe”, page 17](#)
- ♦ ⇒ [“6.1 Exploded view - drive shaft”, page 81](#)
- ♦ ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



2.7 Removing and installing anti-roll bar

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-

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V.A.G 1331



W00-11166

- ♦ Brace -T40335-

T40335



W00-11791



Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Lower subframe cross brace, taking care not to press off joint pin of guide link when doing so ⇒ [page 34](#) .
- Remove nuts -arrows- and -3- on both sides.
- Remove clamp -1- and bolt -4- on both sides.
- Detach anti-roll bar -2-.

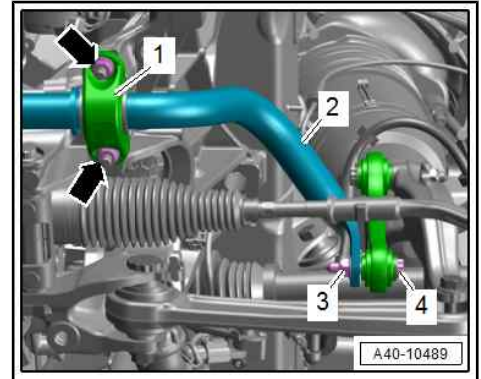
Installing

Installation is carried out in reverse order; note the following:



Note

- ◆ *Anti-roll bar and rubber bushes must be free of grease.*
- ◆ *Tighten any loose studs for clamps as far as stop.*
- Screw in bolts for anti-roll bar initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - subframe”, page 17](#)

2.8 Removing and installing coupling rod

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332



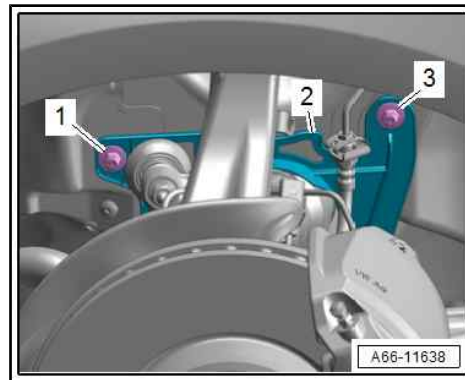
W00-11165

Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Remove front wheel spoiler ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .



- Unscrew nuts -1, 3- and remove drive shaft cover -2-.



- Remove nuts -arrows-.
- Remove bolts -1, 3- and detach coupling rod -2-.



Note

Turn front wheels to left or right as necessary to unscrew bottom bolt.

Installing

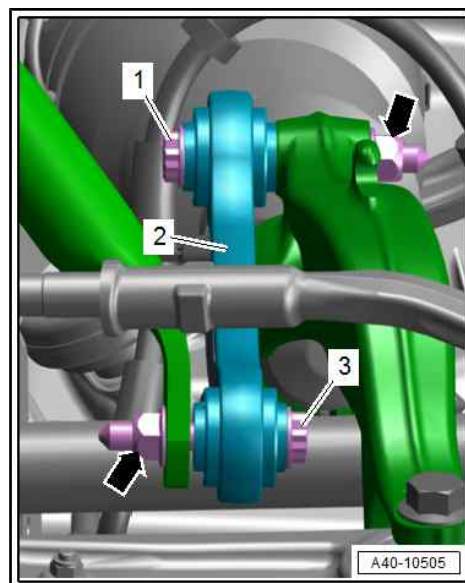
Installation is carried out in reverse order; note the following:

- Screw in bolts for components with bonded rubber bushes initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.



- Lifting suspension to unladen position ⇒ [page 10](#)

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - subframe”, page 17](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



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3 Suspension strut, upper links

⇒ [“3.1 Exploded view - suspension strut, upper links”, page 41](#)

⇒ [“3.2 Removing and installing suspension strut”, page 44](#)

⇒ [“3.3 Servicing suspension strut”, page 46](#)

⇒ [“3.4 Removing and installing upper suspension link”,
page 48](#)

⇒ [“3.5 Renewing bush for upper link”, page 50](#)

⇒ [“3.6 Removing and installing shock absorber fork”, page 52](#)

⇒ [“3.7 Removing and installing body brace”, page 54](#)

3.1 Exploded view - suspension strut, upper links

⇒ [“3.1.1 Exploded view - suspension strut, upper links”,
page 41](#)

⇒ [“3.1.2 Exploded view - suspension strut \(coil springs\)”,
page 43](#)

⇒ [“3.1.3 Exploded view - body brace”, page 44](#)

3.1.1 Exploded view - suspension strut, upper links

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1 - Bolt

- ☐ Renew after removing

2 - Track control link

3 - Shock absorber fork

- ☐ Removing and installing
⇒ [page 52](#)

4 - Nut

- ☐ Renew after removing
- ☐ 40 Nm

5 - Bolt

- ☐ Renew after removing

6 - Suspension strut

- ☐ Exploded view
⇒ [page 43](#)

7 - Suspension turret

8 - Bolt

- ☐ Renew after removing
- ☐ 20 Nm +90°

9 - Upper link (front)

- ☐ Removing and installing
⇒ [page 48](#)

10 - Bolts

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 50 Nm +90°

11 - Upper link (rear)

- ☐ Removing and installing
⇒ [page 48](#)

12 - Bonded rubber bush

- ☐ Renewing ⇒ [page 50](#)

13 - Bolt

- ☐ Renew after removing

14 - Nut

- ☐ Renew after removing
- ☐ 40 Nm

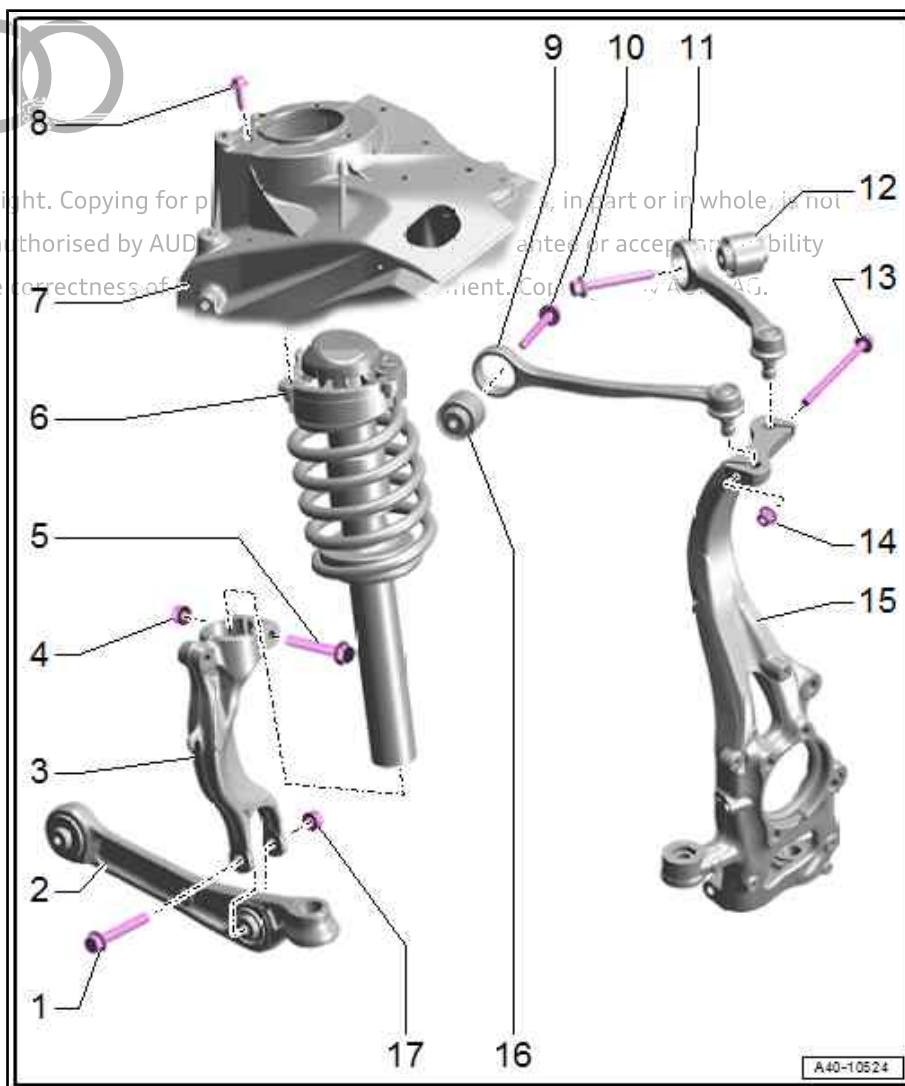
15 - Wheel bearing housing

16 - Bonded rubber bush

- ☐ Renewing ⇒ [page 50](#)

17 - Nut

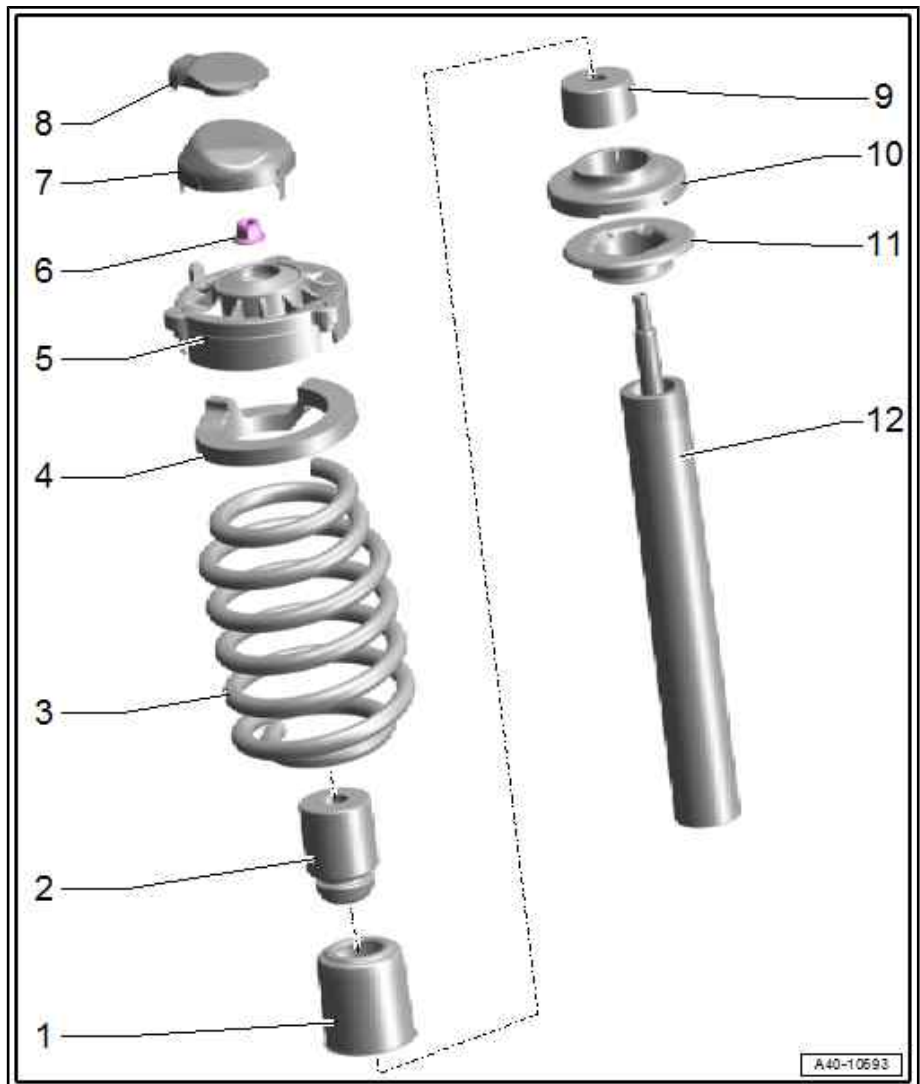
- ☐ Tightening torque ⇒ [Item 16 \(page 56\)](#)





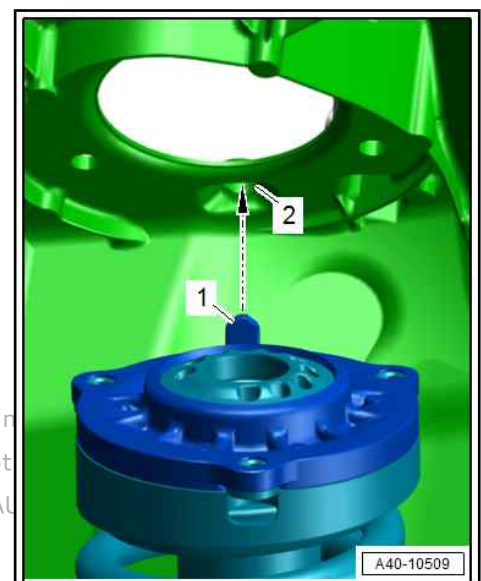
3.1.2 Exploded view - suspension strut (coil springs)

- 1 - Protective sleeve
- 2 - Bump stop
- 3 - Coil spring
- 4 - Spring seat
- 5 - Suspension strut mounting
 - ☐ Installation position
⇒ [page 43](#)
- 6 - Nut
 - ☐ Renew after removing
 - ☐ 50 Nm
- 7 - Trim cap
 - ☐ Can only be fitted in one position
- 8 - Trim cap
 - ☐ Not on all versions
- 9 - Protective cap
- 10 - Spring seat
- 11 - Bottom spring plate
- 12 - Shock absorber
 - ☐ Because of the different shock absorber valve systems, shock absorbers on both sides of an axle should always be from the same manufacturer whenever possible
 - ☐ Removing and installing
⇒ [page 46](#)
 - ☐ For equipment version with electronic damping control: Re-adapt reference position after renewing ⇒ Vehicle diagnostic tester



Installation position of suspension strut (coil springs)

- The locating pin -1- on the suspension strut mounting must engage in the hole -2- in the suspension turret -arrow-.



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3.1.3 Exploded view - body brace

1 - Suspension turret (right-side)

2 - Bolt

□ 20 Nm

3 - Body brace (right-side)

□ A5 Cabriolet: joined in one part with body brace (left-side)

□ Removing and installing
⇒ [page 54](#)

4 - Sealing element

5 - Nut

□ 20 Nm

6 - Bulkhead

7 - Body brace (left-side)

□ A5 Cabriolet: joined in one part with body brace (right-side)

□ Removing and installing
⇒ [page 54](#)

8 - Sealing element

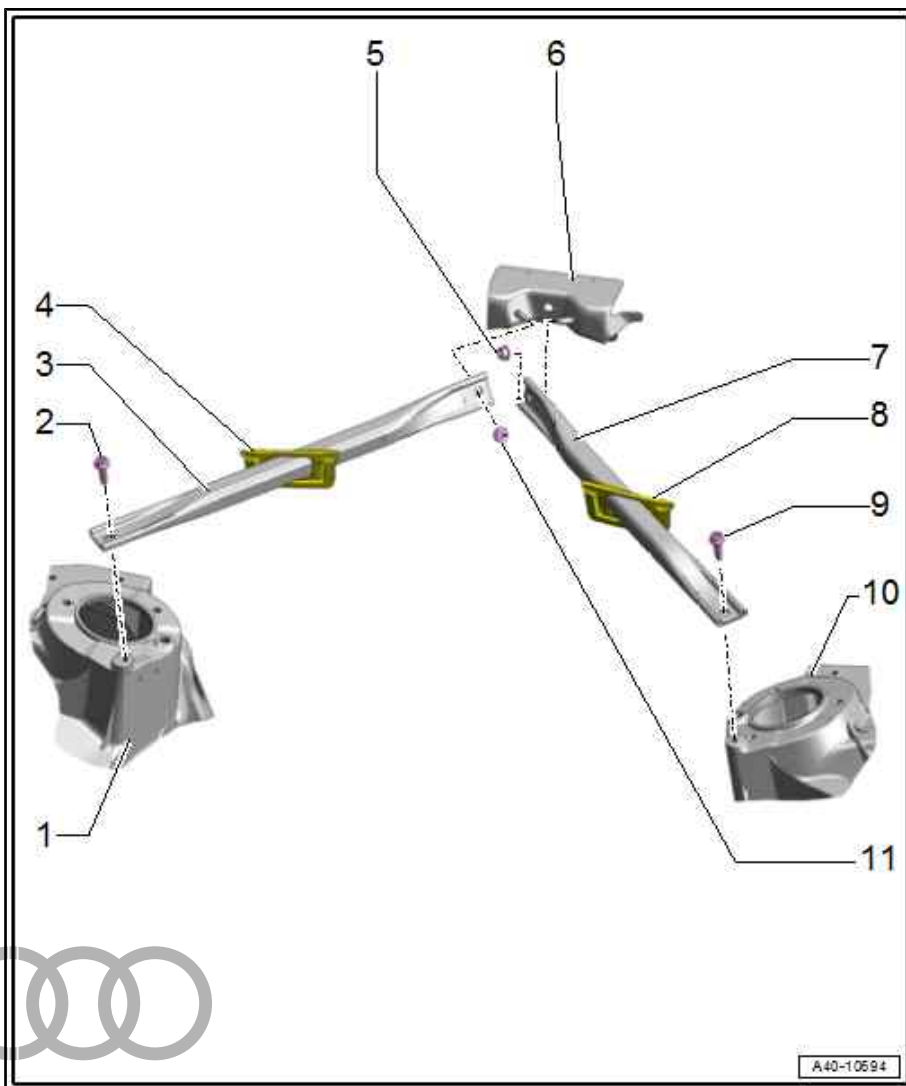
9 - Bolt

□ 20 Nm

10 - Suspension turret (left-side)

11 - Nut

□ 20 Nm

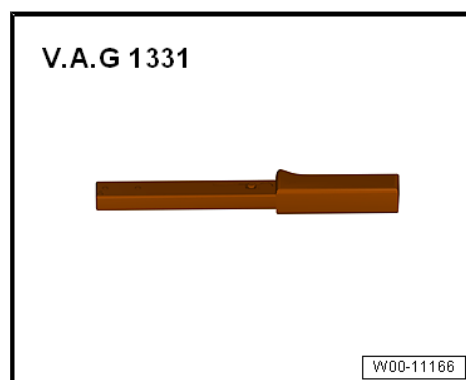


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3.2 Removing and installing suspension strut

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◆ Torque wrench - V.A.G 1331-



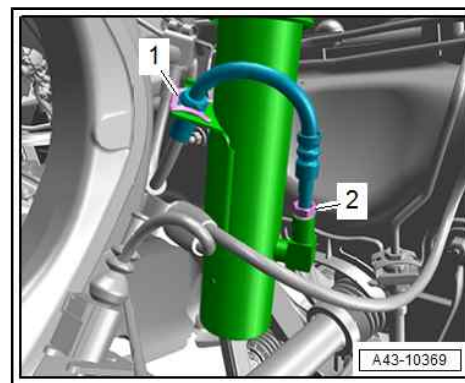
Removing

– Remove shock absorber fork ⇒ [page 52](#) .



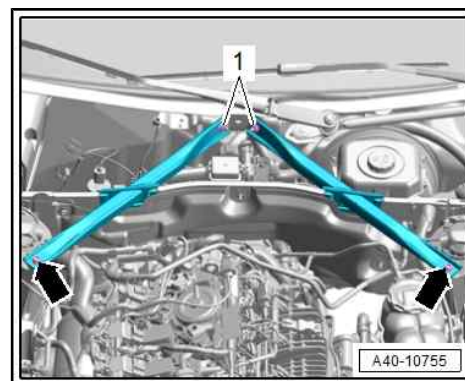
Equipment version with Dynamic Ride Control (DRC):

- Discharge DRC system ⇒ [page 196](#) .
- Remove union screw -2-, detach retaining spring -1- and move hose clear.
- Protect open connections from dirt.



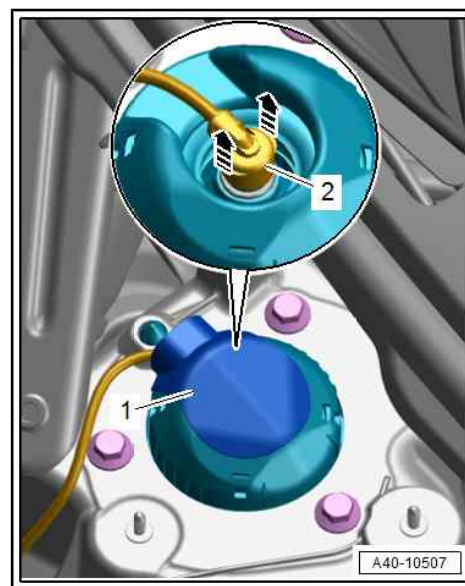
All vehicles (continued):

- Remove bolt for body brace -arrow-.



Equipment version with electronic damping control:

- Detach cover -1-.
- Release catch -2- upwards -arrows- and unplug electrical connector.



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All vehicles (continued):

- Remove bolts -arrows- and detach suspension strut, taking care not to damage protective boots on steering and drive shaft or boot on suspension strut.

Installing

Installation is carried out in reverse order; note the following:

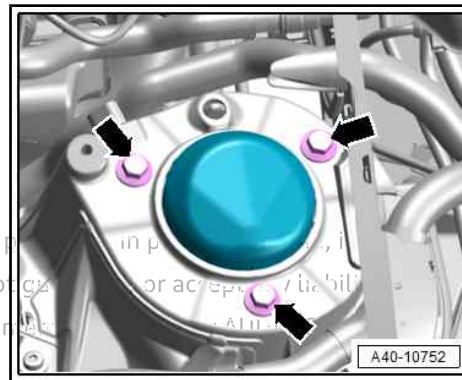
- Installation position
⇒ [Fig. “Installation position of suspension strut \(coil springs\)”](#), [page 43](#).

After renewing springs:

- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Calibrate front camera for driver assist systems ⇒ [page 239](#) .

Tightening torques

- ♦ ⇒ [“3.1 Exploded view - suspension strut, upper links”](#), [page 41](#)
- ♦ ⇒ [“4.1 Exploded view - lower suspension links, swivel joint”](#), [page 55](#)



3.3 Servicing suspension strut

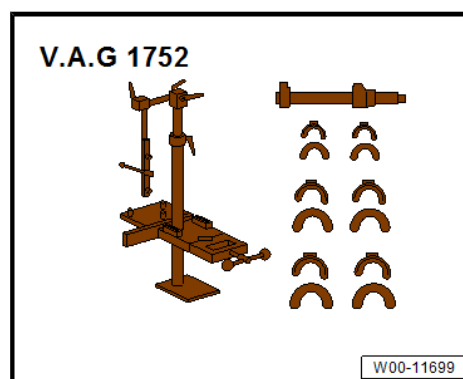


Note

Because of the different shock absorber valve systems, shock absorbers on both sides of an axle should always be from the same manufacturer whenever possible.

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-
- ♦ Suspension strut spring compressor - V.A.G 1752-

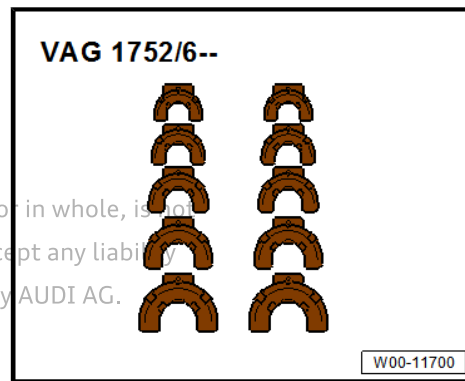




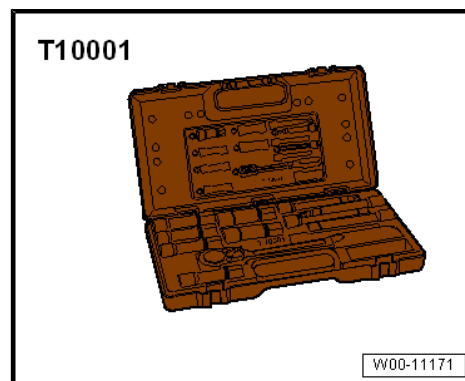
◆ Spring retainer - V.A.G 1752/6-



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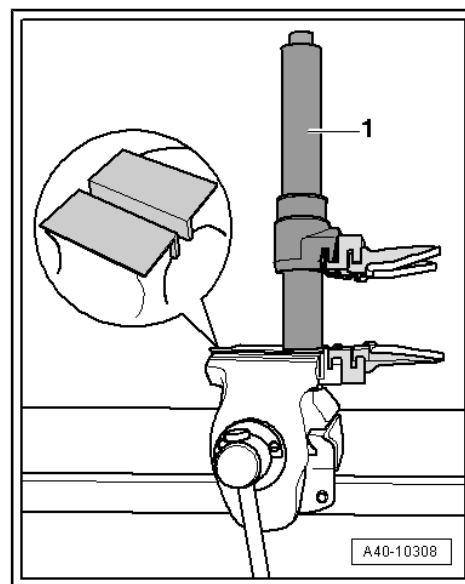


◆ Shock absorber tool set - T10001-



Removing coil spring

- Suspension strut removed ➔ [page 44](#) .
- Clamp spring compressor - V.A.G 1752/1- -item 1- in a vice using protective jaw covers.

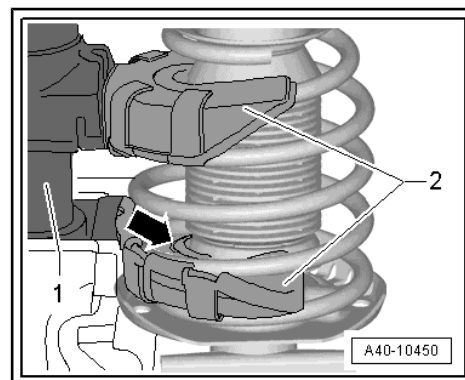


WARNING

Risk of accident!

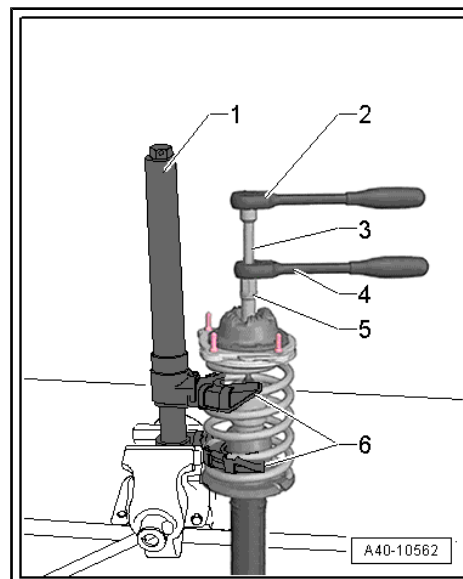
- ◆ ***Ensure that coil spring is correctly seated -arrow- in spring retainer - V.A.G 1752/6- .***

- 1 - Spring compressor - V.A.G 1752/1-
- 2 - Spring retainer - V.A.G 1752/6-





- Set up special tools as shown:
- 1 - Spring compressor - V.A.G 1752/1-
- 2 - Commercially available ratchet
- 3 - -T10001/7-
- 4 - -T10001/11-
- 5 - -T10001/3-
- 6 - Spring retainer - V.A.G 1752/6-
- Compress coil spring using spring compressor until top spring plate with spring seat is free.
- Take off cover.
- Unscrew nut from piston rod.
- Take off suspension strut components and coil spring together with spring compressor.

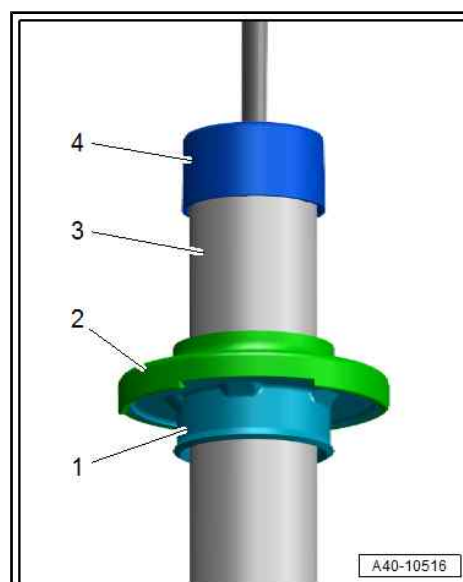


Renewing shock absorber

- Take off protective cap -4- and bottom spring seat -2-.
- Knock spring plate -1- loose using plastic-headed hammer and lift it off shock absorber -3-.

Installing coil spring

- Using plastic-headed hammer, knock spring plate -1- onto new shock absorber -3-.
- Install bottom spring seat -2- and protective cap -4-.
- Position compressed coil spring on bottom spring seat.
- Fit component parts of suspension strut.

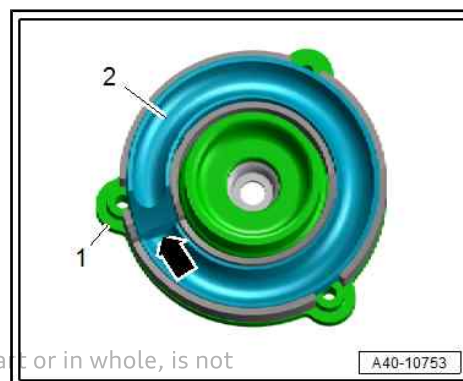


- Install suspension strut mounting -1- with spring seat -2- on compressed coil spring so that spring seat makes contact with end of spring coil -arrow-.
- Maximum permissible clearance: 2 mm
- Release spring compressor - V.A.G 1752/1- .



Note

When releasing, make sure top end of spring contacts stop on spring seat.



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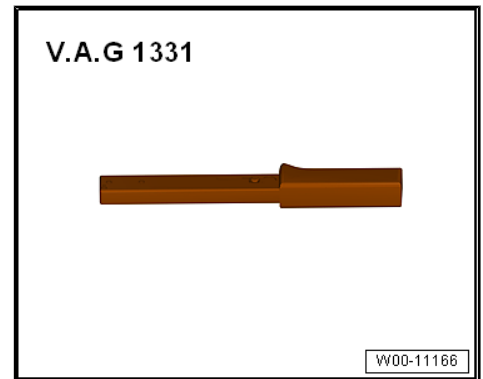
→ "3.1.2 Exploded view - suspension strut (coil springs)", page 43

3.4 Removing and installing upper suspension link

Special tools and workshop equipment required



- ◆ Vehicle diagnostic tester
- ◆ Torque wrench - V.A.G 1331-



- ◆ Ring spanner insert, 16 mm - V.A.G 1331/12- (not illustrated)
- ◆ Torque wrench - V.A.G 1332-



- ◆ Engine and gearbox jack - VAS 6931-



- ◆ Support - T10149-



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- Before commencing work, determine unladen position
⇒ [page 10](#) .



- Remove front wheel ➔ [page 205](#) .
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.



Note

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Disregard -item 1-.

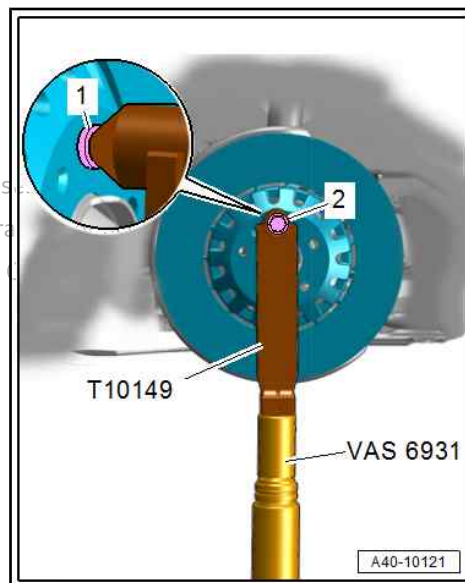
- Support wheel bearing housing using support - T10149- with engine and gearbox jack - VAS 6931- .



WARNING

Risk of accident!

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



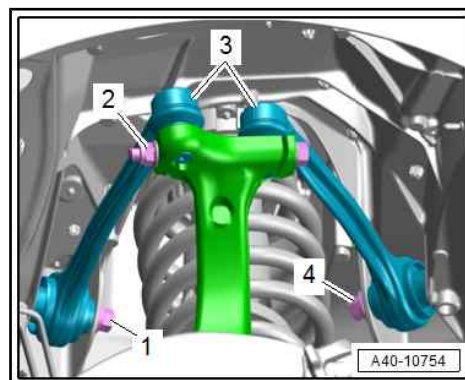
- Unscrew bolt -2-.



Caution

Risk of damage to wheel bearing housing.

- ◆ *Do not attempt to enlarge slots in wheel bearing housing using a chisel or similar.*



- Pull appropriate joint pins of upper links -3- out of wheel bearing housing.
- Unscrew bolt -1- or -4- and detach appropriate upper link.

Installing

Installation is carried out in reverse order; note the following:

- Screw in bolts for components with bonded rubber bushes initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ➔ [page 10](#)

Tightening torques

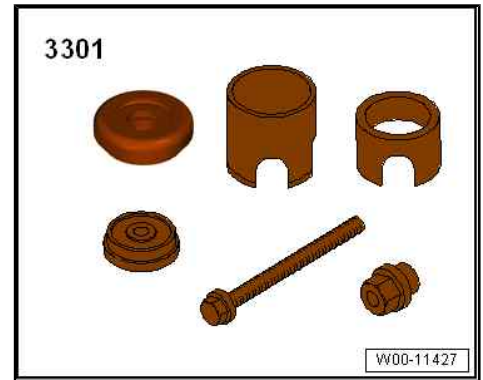
- ◆ ➔ [“3.1 Exploded view - suspension strut, upper links”, page 41](#)
- ◆ ➔ [“1 Wheels, tyres”, page 205](#)

3.5 Renewing bush for upper link

Special tools and workshop equipment required



◆ Assembly tool - 3301-



◆ Assembly tool - 3348-

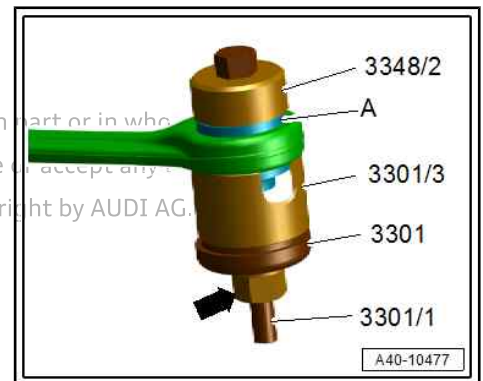


Procedure

- Upper suspension link removed ➤ [page 48](#) .
- Mark installation depth of bonded rubber bush using a water-proof felt-tip pen or similar.

Extracting bonded rubber bush

- Clamp suspension link in jaws of vice. Use protective jaw covers.
- Set up special tools as shown in illustration.
- Extract bonded rubber bush -A- by turning nut -arrow-.



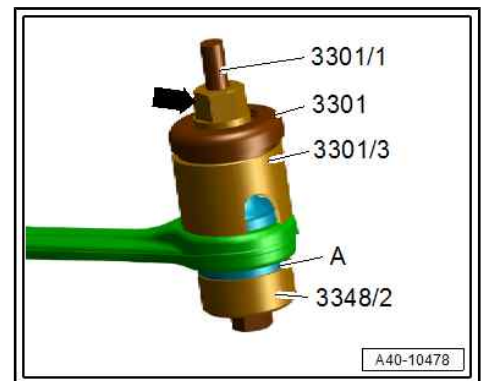
Installing bonded rubber bush



Note

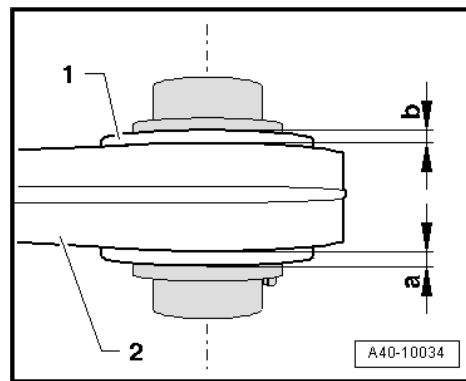
Do not use lubricant.

- Transfer marking for installation depth from old bonded rubber bush to new bush.
- Set up special tools as shown in illustration.
- Install bonded rubber bush -A- by turning nut -arrow-, using the installation depth marking made earlier as a guide.





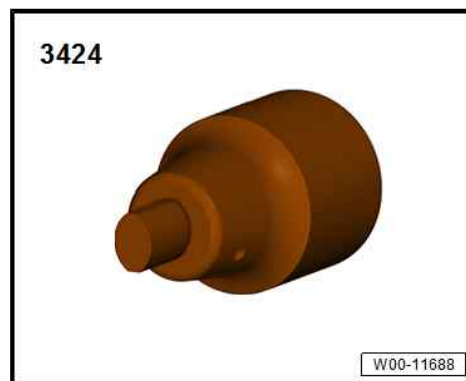
- Check installation depth of bonded rubber bush -1- in suspension link -2-.
- Specification: Dimension -a- = dimension -b-
- Increase depth of bonded rubber bush if dimensions are not equal.



3.6 Removing and installing shock absorber fork

Special tools and workshop equipment required

- ◆ Spreader - 3424-



- ◆ Torque wrench - V.A.G 1331-

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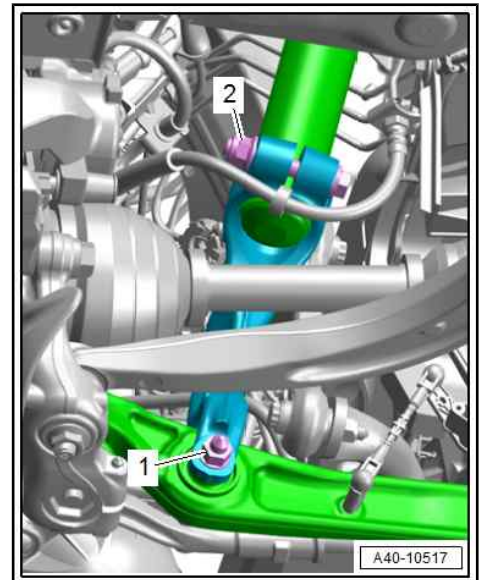
- ◆ Torque wrench - V.A.G 1332-





Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Remove front wheel ⇒ [page 205](#) .
- Remove coupling rod ⇒ [page 39](#) .
- Detach bolt connections -1, 2- for shock absorber fork.



- Insert spreader - 3424- in slot in shock absorber fork -arrow-.

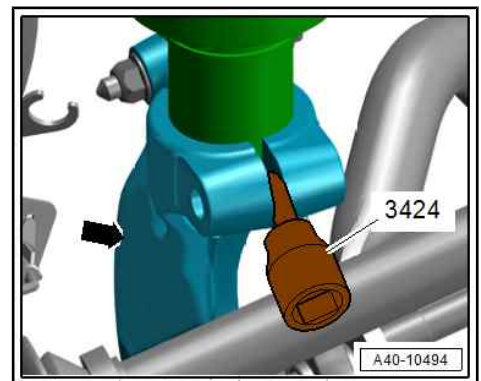


Caution

Risk of damage to swivel joints

- ◆ *Do not force the joints of the upper links beyond their maximum articulation point.*

- Pull shock absorber fork downwards off shock absorber tube and remove; at the same time, carefully push wheel bearing housing downwards.



Installing

Installation is carried out in reverse order; note the following:

- Attach shock absorber fork.



- RS models: T-bolt -1- of suspension strut must engage in groove -arrow- on shock absorber fork.
- Screw in bolts for components with bonded rubber bushes initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

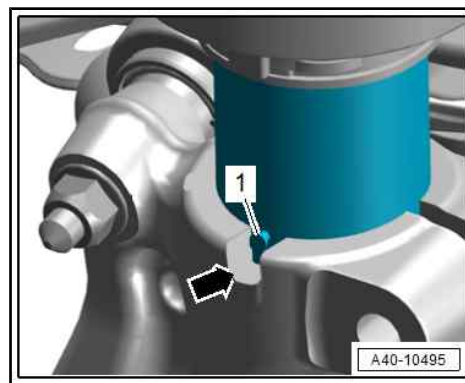
Tightening torques

- ◆ ⇒ [“2.1 Exploded view - subframe”, page 17](#)
- ◆ ⇒ [“3.1 Exploded view - suspension strut, upper links”, page 41](#)
- ◆ ⇒ [“4.1 Exploded view - lower suspension links, swivel joint”, page 55](#)
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)

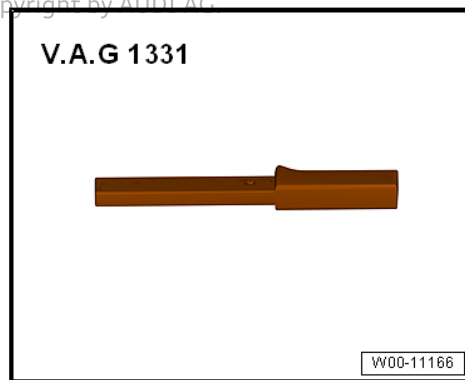
3.7 Removing and installing body brace

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



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Removing

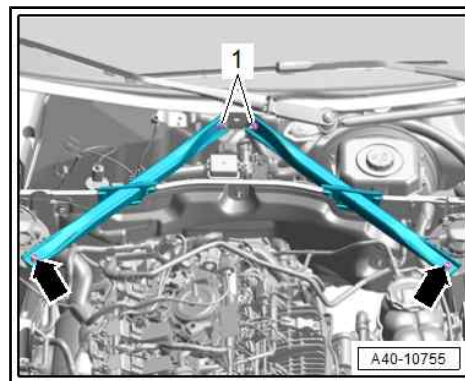
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Remove nuts -1- and bolts -arrows- and detach body braces.

Installing

Installation is carried out in reverse sequence.

Tightening torques

- ◆ ⇒ [“3.1.3 Exploded view - body brace”, page 44](#)





4 Lower suspension links, swivel joint

⇒ [“4.1 Exploded view - lower suspension links, swivel joint”, page 55](#)

⇒ [“4.2 Removing and installing track control link”, page 56](#)

⇒ [“4.3 Removing and installing guide link”, page 60](#)

⇒ [“4.4 Renewing bush for track control link”, page 62](#)

⇒ [“4.5 Removing and installing swivel joint”, page 67](#)

⇒ [“4.6 Removing and installing bonded rubber bush for guide link”, page 68](#)

4.1 Exploded view - lower suspension links, swivel joint

1 - Bonded rubber bush (wheel bearing housing end)

- ❑ Renewing ⇒ [page 62](#)

2 - Bolt

- ❑ Renew after removing

3 - Bonded rubber bush (sub-frame end)

- ❑ Renewing ⇒ [page 64](#)

4 - Track control link

- ❑ Removing and installing
⇒ [page 56](#)

5 - Shock absorber fork

- ❑ Removing and installing
⇒ [page 52](#)

6 - Nut

- ❑ Renew after removing
- ❑ Tighten in unladen position ⇒ [page 10](#)
- ❑ 70 Nm +180°

7 - Bolt

- ❑ Renew after removing

8 - Subframe

9 - Bolt

- ❑ Renew after removing

10 - Nut

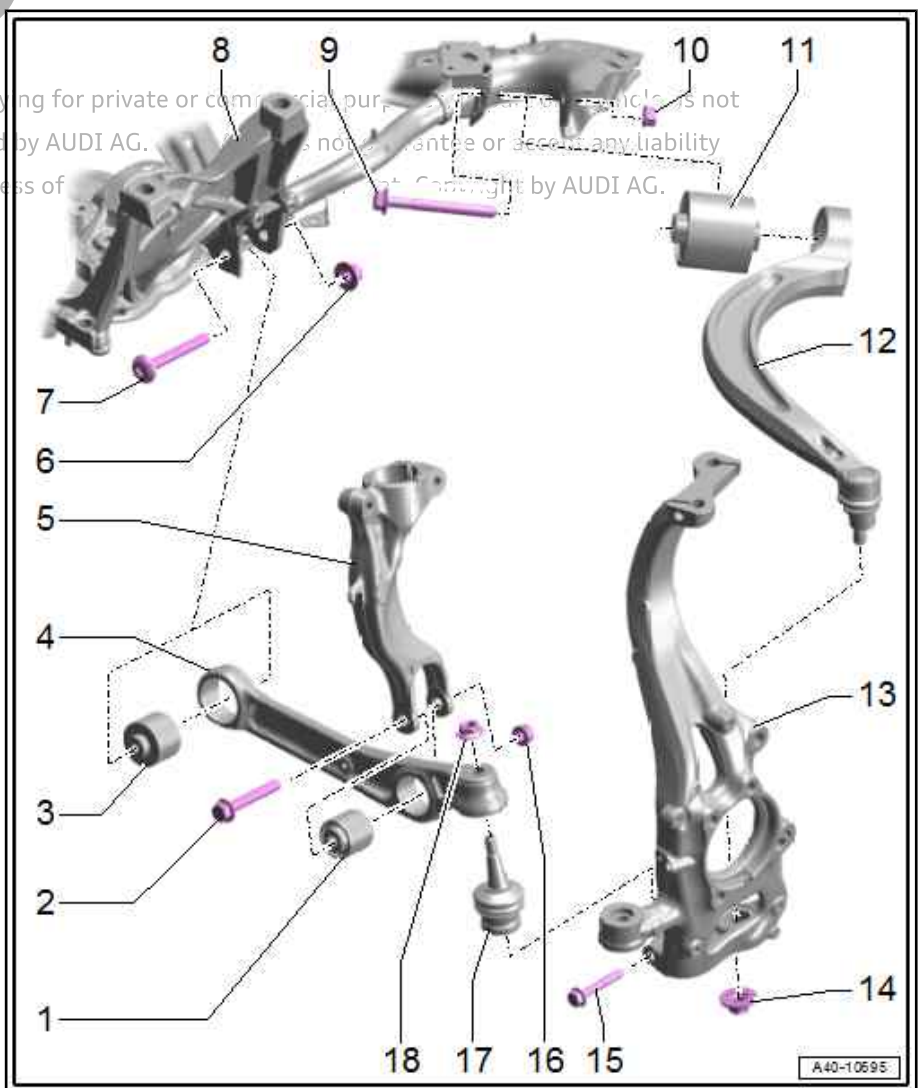
- ❑ Renew after removing
- ❑ Tighten in unladen position ⇒ [page 10](#)
- ❑ 70 Nm +180°

11 - Bonded rubber bush

- ❑ Renewing ⇒ [page 68](#)

12 - Guide link

- ❑ Removing and installing ⇒ [page 60](#)





13 - Wheel bearing housing

14 - Nut

- ☐ Renew after removing
- ☐ If re-installing guide link, clean any remaining locking fluid off thread of joint pin
- ☐ 140 Nm

15 - Bolt

- ☐ Renew after removing
- ☐ 40 Nm

16 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 90 Nm +90°

17 - Swivel joint

- ☐ Removing and installing ⇒ [page 67](#)
- ☐ Insert onto contact surface in wheel bearing housing ⇒ [page 59](#)

18 - Nut

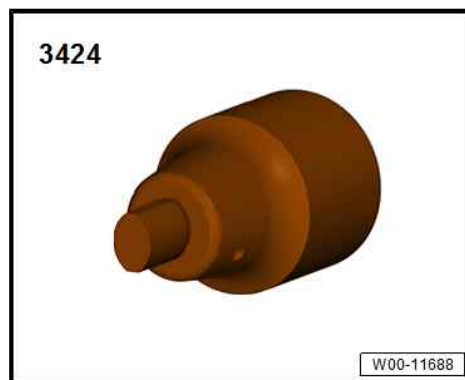
- ☐ Renew after removing
- ☐ If re-installing swivel joint, clean any remaining locking fluid off thread of joint pin
- ☐ 140 Nm

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4.2 Removing and installing track control link

Special tools and workshop equipment required

- ◆ Spreader - 3424-



- ◆ Torque wrench - V.A.G 1332-





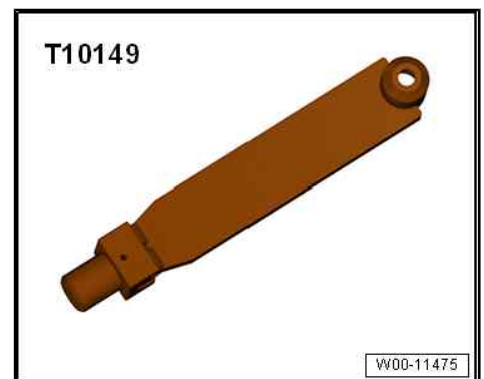
◆ Engine and gearbox jack - VAS 6931-



◆ Ball joint ejector - VAS 251 805-



◆ Support - T10149-



Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Remove front wheel ⇒ [page 205](#) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

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- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out

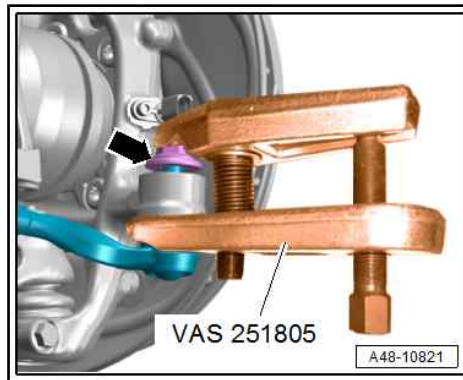
- ◆ *The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



Caution

Risk of damage to ball joint puller.

- ◆ *Make sure the two lever arms of the puller are parallel when maximum force is exerted.*



- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- .
- Then unscrew nut; if necessary, counterhold at joint pin with a 6 mm hexagon socket.
- Lift track rod clear and tie up.



Note

To avoid damage to joints of upper links, support wheel bearing housing to prevent the suspension from extending too far.

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.

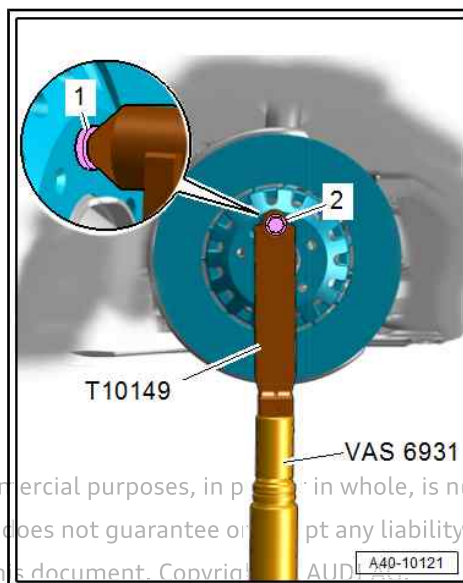


Note

Disregard -item 1-.



- Support wheel bearing housing using support - T10149- with engine and gearbox jack - VAS 6931- .



WARNING

Risk of accident!

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

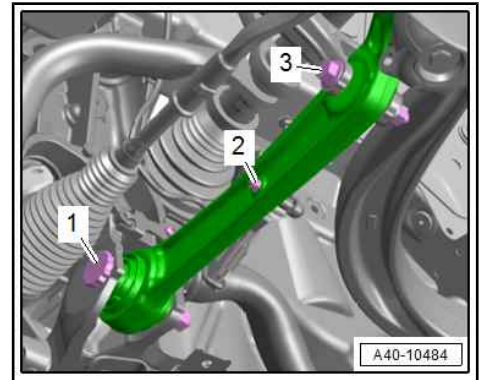


- On appropriate versions: Remove nut -2- and move coupling rod for vehicle level sender clear.
- Detach bolt connections -1, 3- for track control link.
- Swivel track control link to the front.

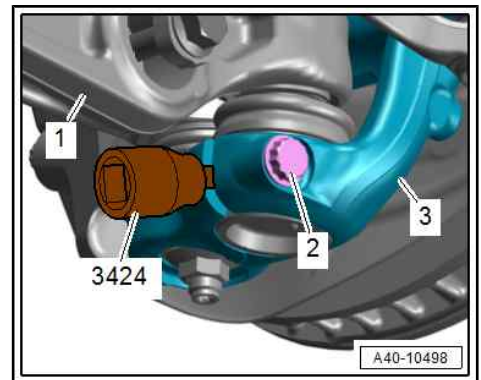


Note

To remove bolt -1-, turn steering to full left/right lock.



- Remove bolt -2-.
- Insert spreader - 3424- in slot in wheel bearing housing -3- and turn it 90°.
- Take out track control link -1- with swivel joint.



Installing

Installation is carried out in reverse order; note the following:

- If re-installing swivel joint, clean any remaining locking fluid off thread of joint pin.
- Move track control link with swivel joint into installation position.

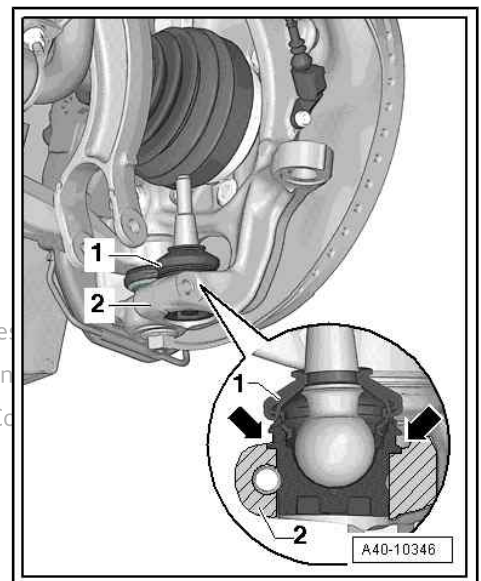


Caution

Risk of damage to wheel bearing housing in area of bolted connection if installation position is incorrect.

- ◆ **Insert swivel joint -1- all the way onto contact surface -arrows- on wheel bearing housing -2-.**

- Screw in bolts for components with bonded rubber bushes initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

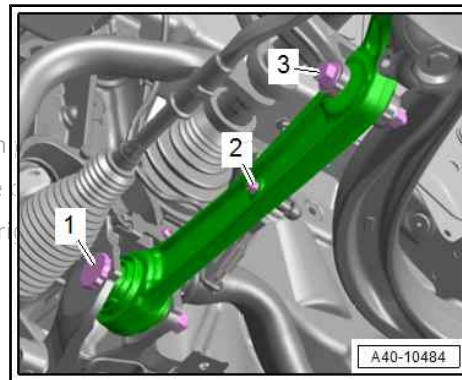
- Lifting suspension to unladen position ➔ [page 10](#)



- When tightening bolt connection -1-, track control link must be pressed towards inside of vehicle.
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)
- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights
- Calibrate front camera for driver assist systems ⇒ [page 239](#)

Tightening torques

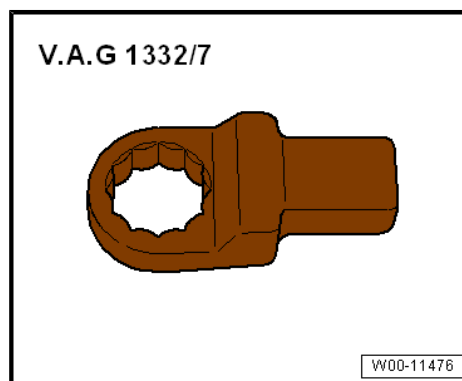
- ◆ ⇒ [“4.1 Exploded view - lower suspension links, swivel joint”, page 55](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)



4.3 Removing and installing guide link

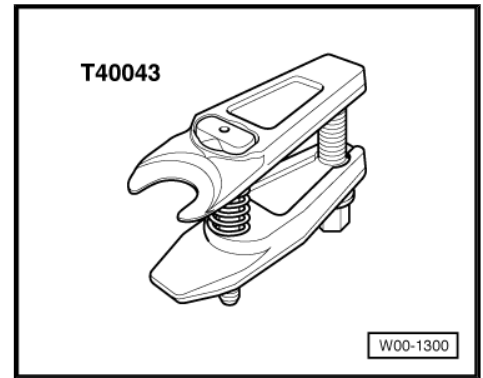
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-
- ◆ Ring spanner insert - V.A.G 1332/7-
- ◆ Engine and gearbox jack - VAS 6931-





◆ Ball joint puller - T40043-



Removing

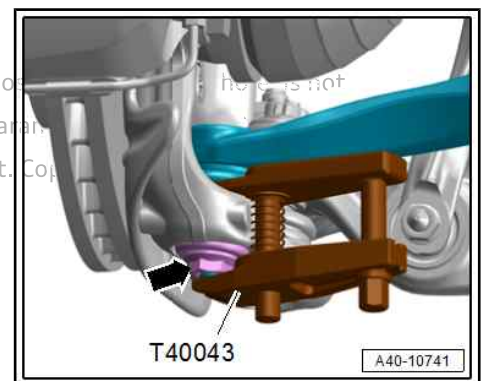
- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Remove front wheel ⇒ [page 205](#) .
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unbolt subframe shield and place it to one side ⇒ [page 37](#) .
- A5 Cabriolet: Remove relevant diagonal strut ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing diagonal struts .
- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin.
- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.



WARNING

Risk of injury if parts are allowed to drop out

- ◆ *The guide link will release suddenly from the wheel bearing housing when it is pressed out. Use engine and gear-box jack - VAS 6931- or similar to provide support.*



- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.



- Unscrew nut -3- and remove bolt -2-.
- Detach guide link -1-.

Installing

Installation is carried out in reverse order; note the following:

- If re-installing guide link, clean any remaining locking fluid off thread of joint pin.
- Screw in bolts for components with bonded rubber bushes initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - lower suspension links, swivel joint”, page 55](#)
- ◆ ⇒ [“2.1 Exploded view - subframe”, page 17](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)

4.4 Renewing bush for track control link

⇒ [“4.4.1 Renewing bush for track control link \(wheel bearing housing end\)”, page 62](#)

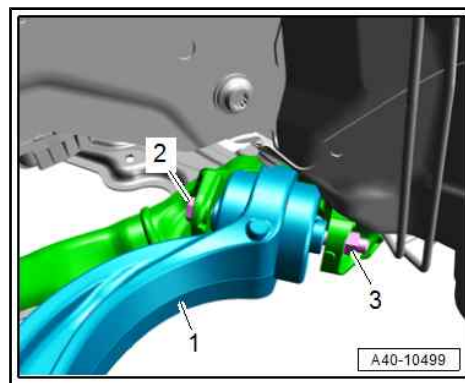
⇒ [“4.4.2 Renewing bush for track control link \(subframe end\)”, page 64](#)

4.4.1 Renewing bush for track control link (wheel bearing housing end)

Special tools and workshop equipment required

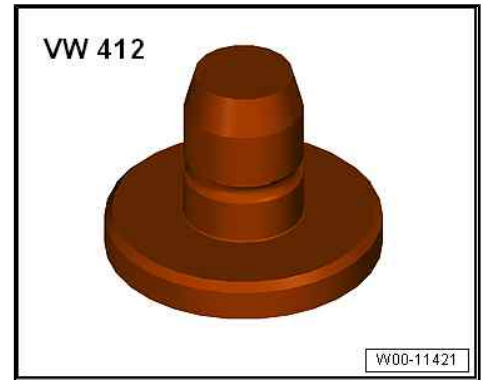
- ◆ Thrust plate - VW 402-

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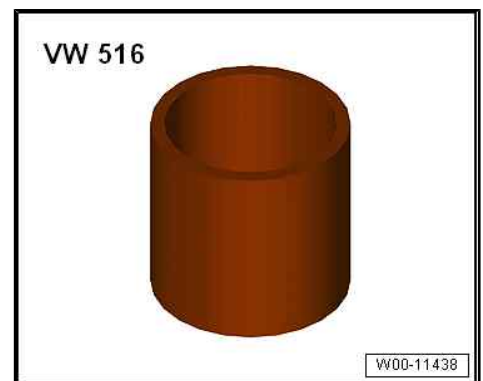




◆ Press tool - VW 412-



◆ Tube - VW 516-



◆ Tube - 3296-



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◆ Assembly paste - G 052 109 A2-

Procedure

- Track control link removed ⇒ [page 56](#)



Pressing out bonded rubber bush

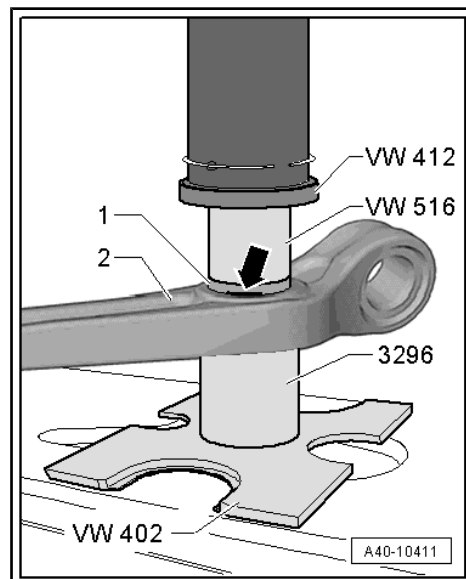
- Mark installation depth -arrow- on bonded rubber bush -1- using a waterproof felt-tip pen or similar.
- Set up special tools as shown in illustration.



Note

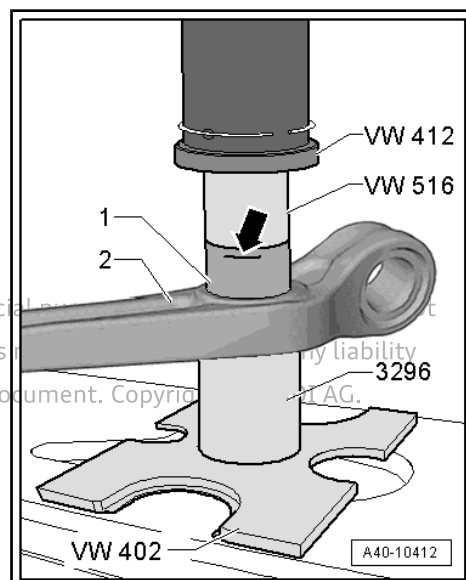
Hold the track control link when pressing the bonded rubber bush in or out.

- Press bonded rubber bush out of track control link -2-.

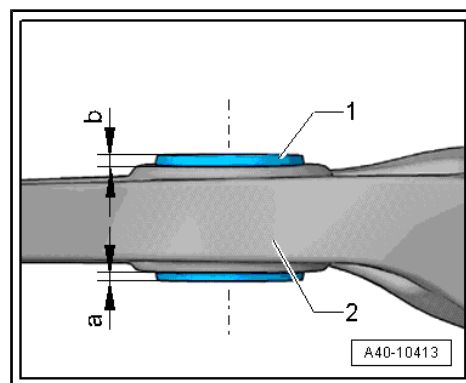


Pressing in bonded rubber bush

- Transfer marking for installation depth from old bonded rubber bush to new bush.
- Apply a thin coat of assembly paste - G 052 109 A2- to bonded rubber bush.
- Insert bonded rubber bush -1- into track control link -2-.
- Set up special tools as shown in illustration.
- Press bonded rubber bush into track control link, taking care to keep it straight.
- Use marking made before removal -arrow- as a guide.



- Check installation depth of bonded rubber bush -1- in track control link -2-.
- Specification: Dimension -a- = dimension -b-
- Press bonded rubber bush in further if dimensions are not equal.

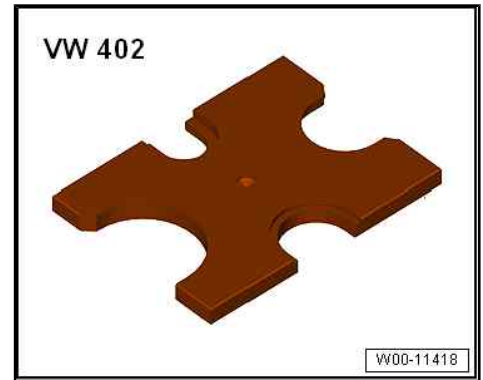


4.4.2 Renewing bush for track control link (subframe end)

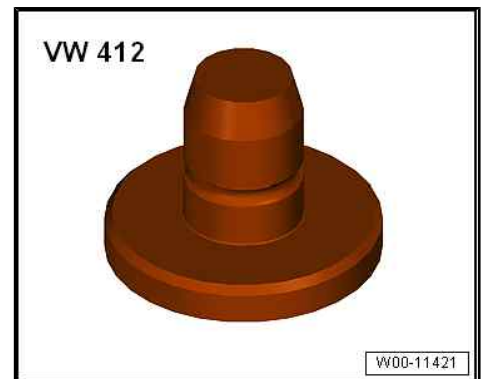
Special tools and workshop equipment required



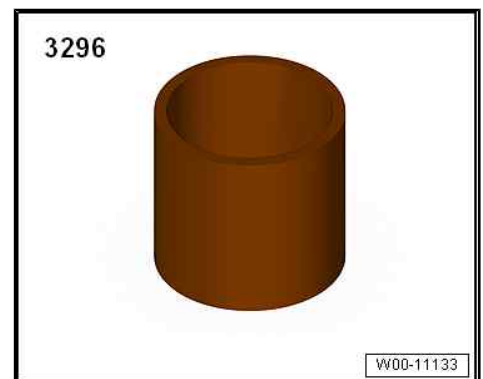
◆ Thrust plate - VW 402-



◆ Press tool - VW 412-

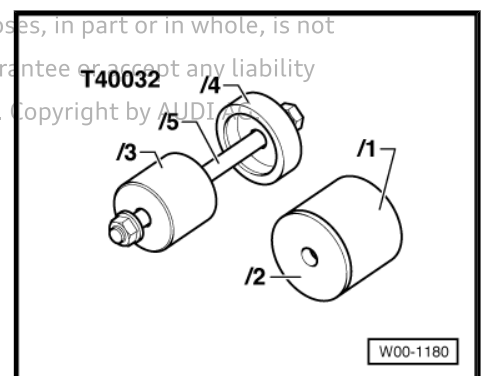


◆ Tube - 3296-



◆ Assembly tool - T40032-

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◆ Assembly paste - G 052 109 A2-

Procedure

- Track control link removed ➔ [page 56](#)

Pressing out bonded rubber bush

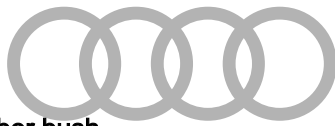
- Mark installation depth -arrow- and position -3, 4- on bonded rubber bush -1- using a waterproof felt-tip pen or similar, as shown in illustration.
- Set up special tools as shown in illustration.



Note

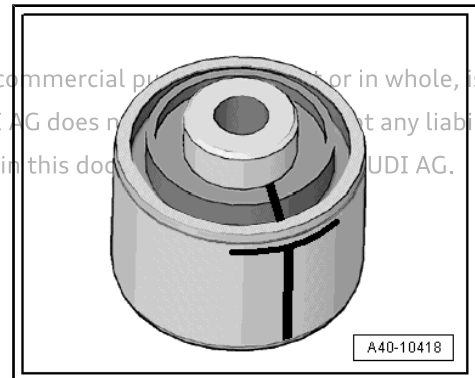
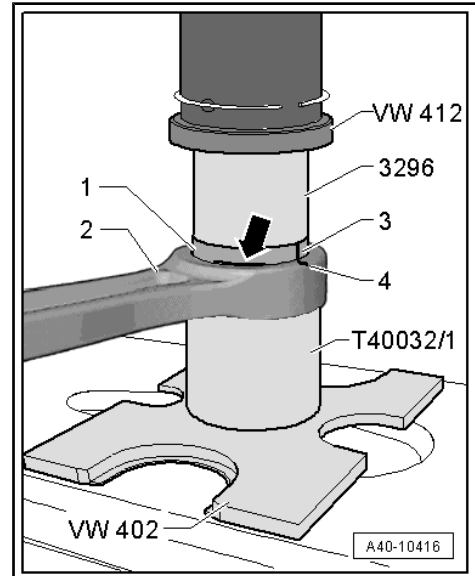
Hold the track control link when pressing the bonded rubber bush in or out.

- Press bonded rubber bush out of track control link -2-.

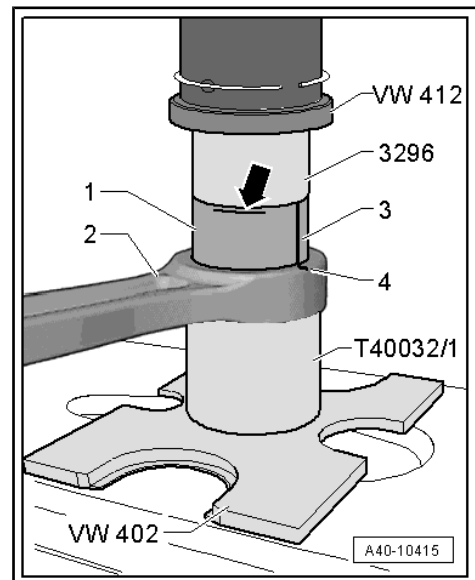


Pressing in bonded rubber bush

- Transfer marking for installation depth from old bonded rubber bush to new bush.

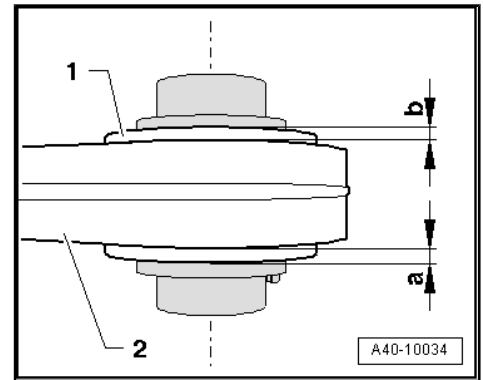


- Apply a thin coat of assembly paste - G 052 109 A2- to bonded rubber bush.
- Fit bonded rubber bush -1- into track control link -2- and align marking -3- with marking -4-.
- Set up special tools as shown in illustration.
- Press bonded rubber bush into track control link, taking care to keep it straight.
- Use marking -arrow- made before removal as a guide.





- Check installation depth of bonded rubber bush -1- in track control link -2-.
- Specification: Dimension -a- = dimension -b-
- Press bonded rubber bush in further if dimensions are not equal.



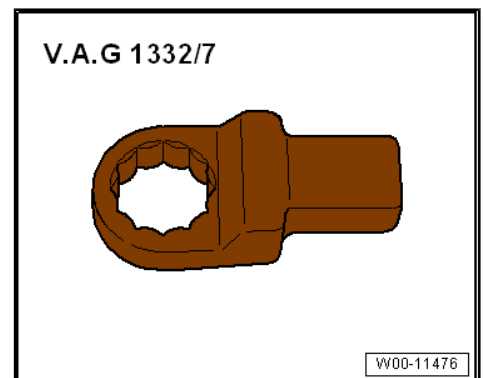
4.5 Removing and installing swivel joint

Special tools and workshop equipment required

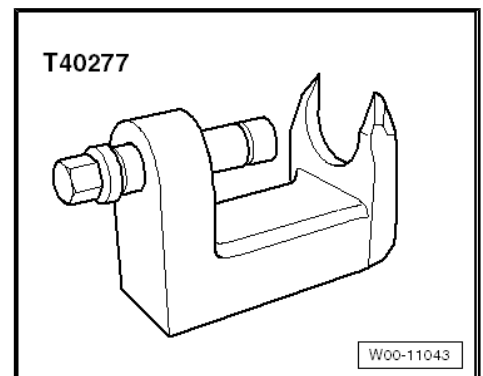
- ◆ Torque wrench - V.A.G 1332-



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



- ◆ Ball joint puller - T40277-



Removing

- Track control link removed ➔ [page 56](#)

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WARNING

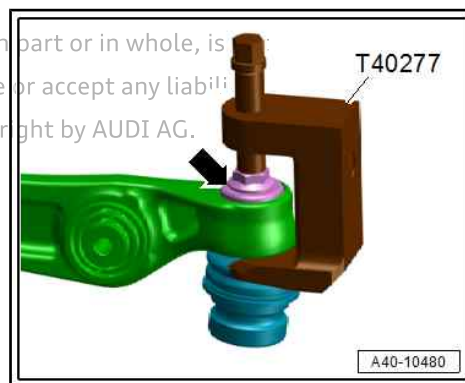
Risk of injury if parts are allowed to drop out

- ◆ *The swivel joint will release suddenly from the track control link when it is pressed out. Secure ball joint puller - T40277-.*

- Clamp track control link in jaws of vice. Use protective jaw covers.
- To protect thread, unscrew nut -arrow- on joint pin of swivel joint until nut is flush with thread of joint pin.
- Press swivel joint off track control link using ball joint puller - T40277- , taking care not to damage boot.
- Then unscrew nut and detach swivel joint; if necessary, counterhold at joint pin with a TX 40 socket wrench.

Installing

Installation is carried out in reverse sequence.



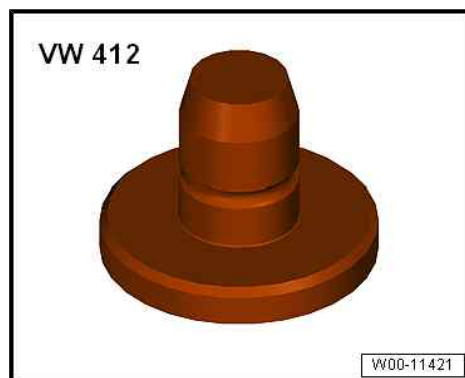
4.6 Removing and installing bonded rubber bush for guide link

Special tools and workshop equipment required

- ◆ Thrust plate - VW 402-

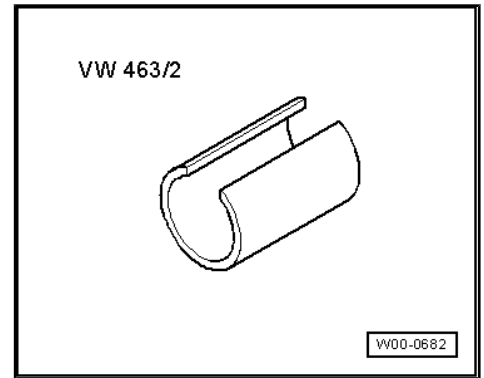


- ◆ Press tool - VW 412-

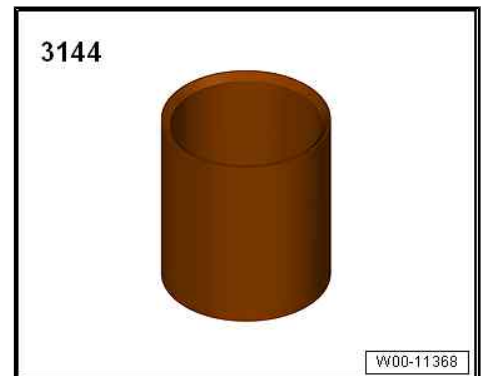




◆ Tube - VW 463/2-



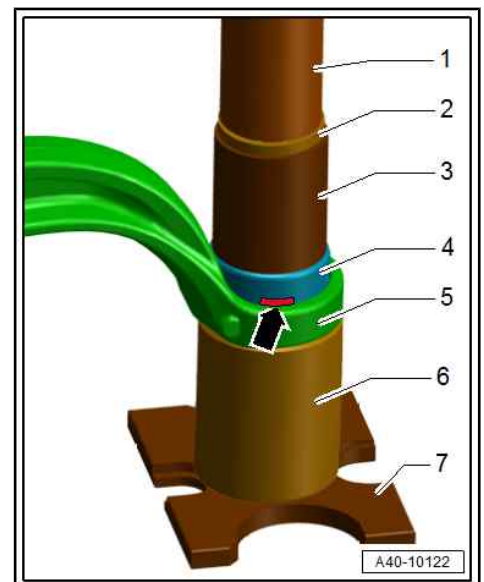
◆ Sleeve - 3144-



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- ◆ Workshop press - VAS 6654- not illustrated
 - ◆ Assembly lubricant - G 294 421 A1- ➤ Electronic parts catalogue

Pressing out bonded rubber bush

- Guide link removed ➤ [page 60](#)
 - Mark installation depth -arrow- on bonded rubber bush -4- using a waterproof felt-tip pen or similar.
 - Set up special tools as shown in illustration.
- 1 - Press tool of workshop press - VAS 6654-
 - 2 - Press tool - VW 412-
 - 3 - Tube - VW 463/2-
 - 4 - Bonded rubber bush
 - 5 - Guide link
 - 6 - Sleeve - 3144-
 - 7 - Thrust plate - VW 402-



Note

Hold the guide link when pressing the bonded rubber bush in or out.

- Press bonded rubber bush out of guide link.

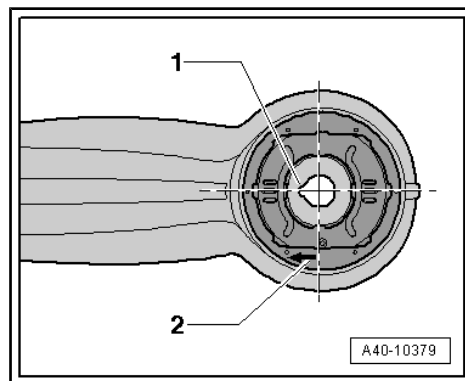


Pressing in bonded rubber bush

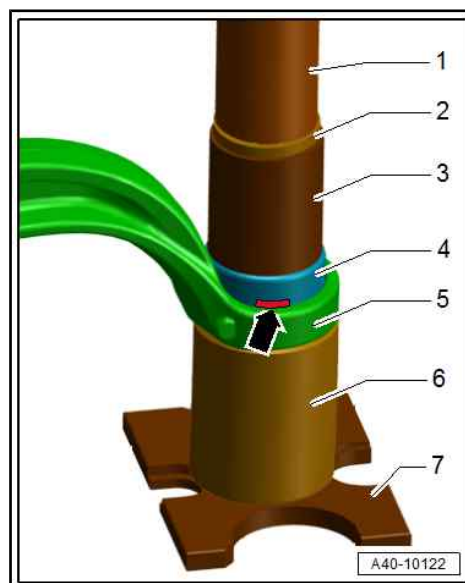
- Transfer marking for installation depth from old bonded rubber bush to new bush.
- Lightly lubricate new bush with assembly lubricant - G 294 421 A1-.

Installation position of bonded rubber bush:

- Notch -1- should be parallel with guide link and should point inwards towards guide link.
- Arrow -2- points inwards towards guide link.



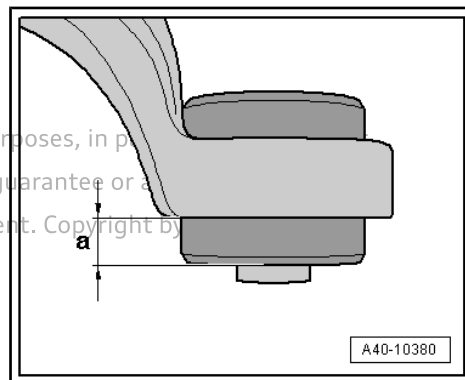
- Fit bonded rubber bush into guide link (note correct installation position).
- Set up special tools as shown in illustration.
- 1 - Press tool of workshop press - VAS 6654-
- 2 - Press tool - VW 412-
- 3 - Removal tool -VW 459/2-
- 4 - Bonded rubber bush
- 5 - Guide link
- 6 - Sleeve - 3144-
- 7 - Thrust plate - VW 402-
- Press bonded rubber bush into guide link, taking care to keep it straight.
- Use marking made before removal -arrow- as a guide.



- Check installation depth -a- of bonded rubber bush in guide link.

- Dimension -a- = 23 mm

- Press bonded rubber bush in further if specification is not met
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5 Wheel bearing

⇒ ["5.1 Exploded view - wheel bearing", page 71](#)

⇒ ["5.2 Removing and installing wheel bearing housing", page 72](#)

⇒ ["5.3 Removing and installing wheel bearing unit", page 76](#)

⇒ ["5.4 Servicing wheel bearing unit", page 77](#)

5.1 Exploded view - wheel bearing

1 - Wheel bearing housing

- ❑ Removing and installing
⇒ [page 72](#)

2 - Bolt

- ❑ Renew after removing
- ❑ 80 Nm +90°

3 - Drive shaft

4 - Wheel bearing

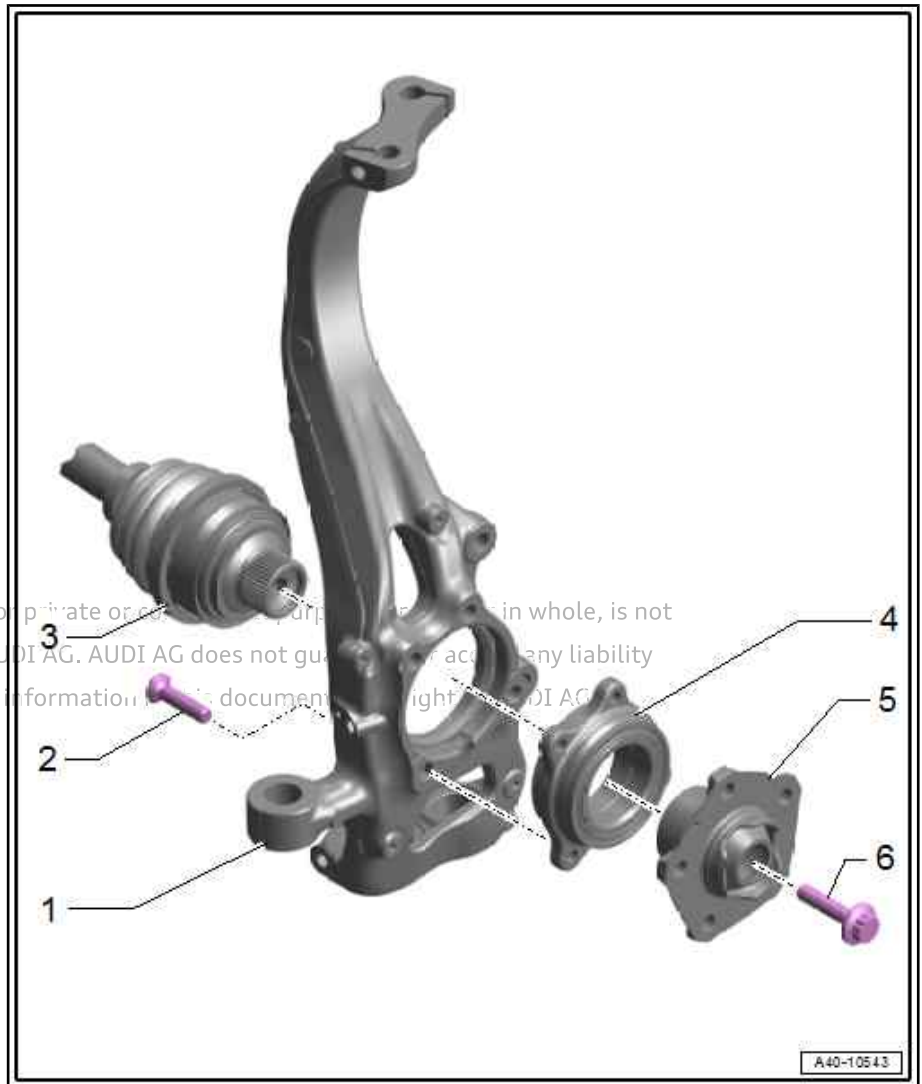
- ❑ Removing and installing wheel bearing unit
⇒ [page 76](#)
- ❑ Removing and installing
⇒ [page 77](#)
- ❑ Instructions for handling
⇒ [page 72](#)

5 - Wheel hub

- ❑ Permissible lateral run-out of wheel hub (at outer diameter) when installed: max. 0.02 mm
- ❑ Measure lateral run-out with dial gauge - VAS 6079- and dial gauge bracket for brake discs - VAS 6079/1-
- ❑ Removing and installing
⇒ [page 77](#)

6 - Bolt

- ❑ Renew after removing
- ❑ Before securing, clean threads in CV joint using a thread tap
- ❑ Loosening and tightening bolt securing drive shaft ⇒ [page 85](#)





Instructions for handling wheel bearing



Caution

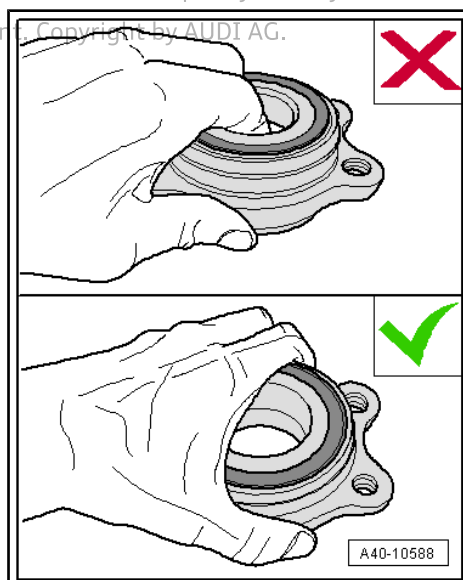
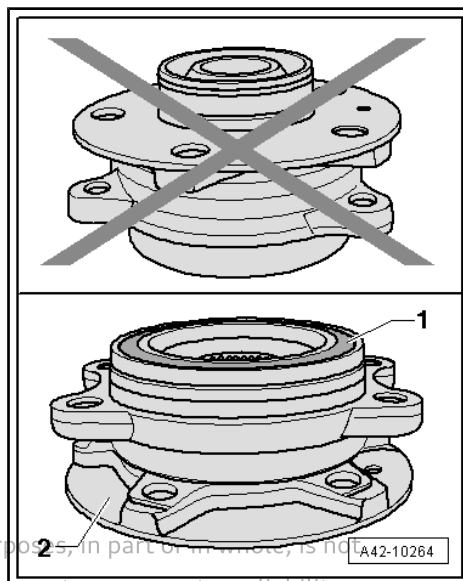
Risk of damage to seal caused by dirt

- ◆ *The wheel bearing -1- must always face upwards when laying down the wheel bearing unit.*
- ◆ *Always put down the wheel bearing unit with the wheel hub -2- facing downwards.*



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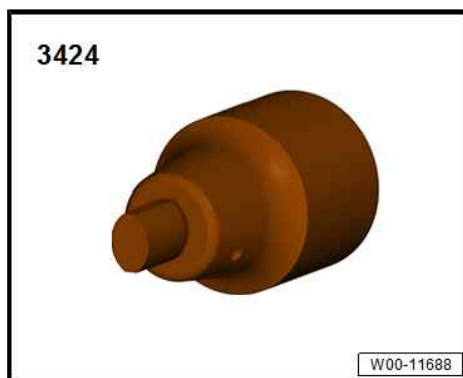
- Do not touch the inside of the wheel bearing when you pick it up.
- Always take hold of the outside of the wheel bearing.

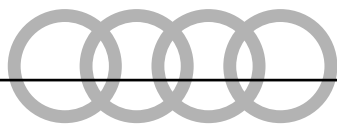


5.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

- ◆ Spreader - 3424-





◆ Torque wrench - V.A.G 1332-

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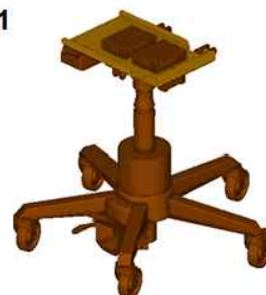
V.A.G 1332



W00-11165

◆ Engine and gearbox jack - VAS 6931-

VAS 6931



W00-11607

◆ Ball joint ejector - VAS 251 805-

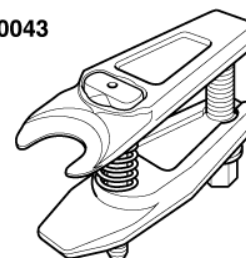
VAS 251 805



W00-11810

◆ Ball joint puller - T40043-

T40043



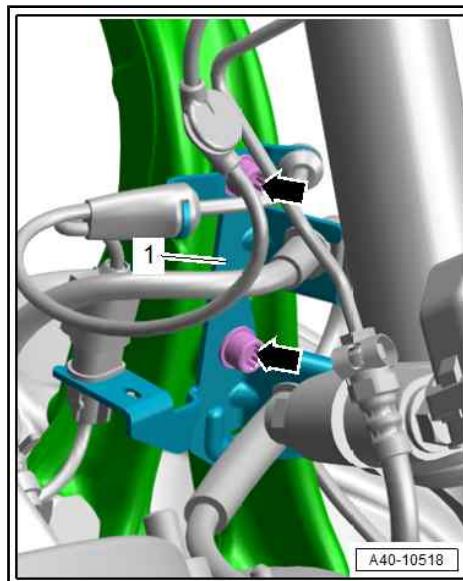
W00-1300

Removing

- Slacken bolt securing drive shaft to wheel hub ⇒ [page 85](#) .
- Remove front speed sensor and move electrical wiring clear
⇒ Brake system; Rep. gr. 45 ; Sensors; Removing and installing front speed sensor -G45- / -G47- .



- Remove brake caliper ⇒ Brake system; Rep. gr. 46 ; Front brakes; Removing and installing brake caliper .
- Remove bolts -arrows- and place bracket -1- to one side.



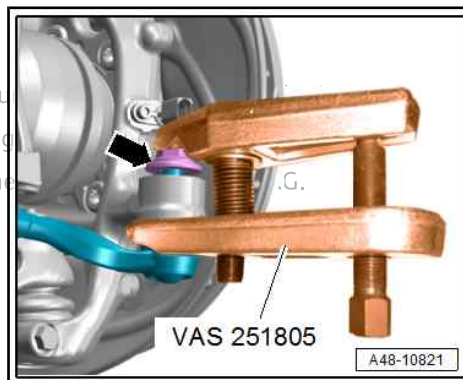
- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out.

- ◆ ***The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.***



Caution

Risk of damage to ball joint puller.

- ◆ ***Make sure the two lever arms of the puller are parallel when maximum force is exerted.***

- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- .
- Then unscrew nut; if necessary, counterhold at joint pin with a 6 mm hexagon socket.

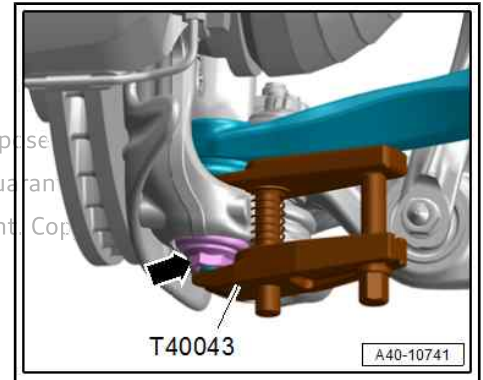


- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin. Counterhold joint pin if necessary.



WARNING
Risk of injury if parts are allowed to drop out
♦ *The swivel joint will release suddenly from the wheel bearing housing when it is pressed out. Use engine and gear-box jack - VAS 6931- or similar to provide support.*

- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.



WARNING
Risk of accident caused by weight of wheel bearing housing.
♦ *A 2nd mechanic is required in order to remove wheel bearing housing.*



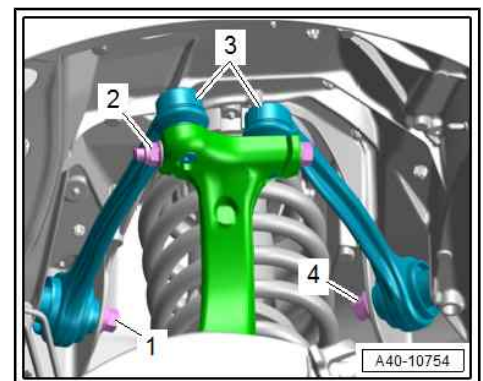
Caution
Risk of damage to wheel bearing housing.
♦ *Do not attempt to enlarge slots in wheel bearing housing using a chisel or similar.*

- Detach bolt connection -2-.
- Take joint pins of upper links -3- out of wheel bearing housing.



Note

Disregard items -1 and 4-.



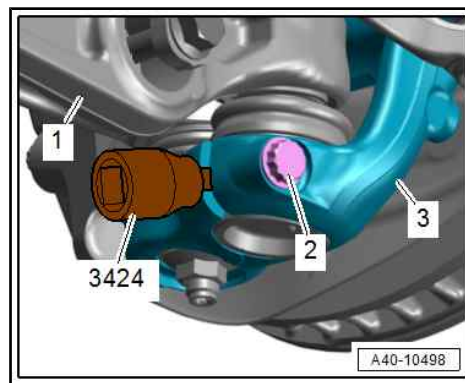


- Remove bolt -2-.
- Insert spreader - 3424- in slot in wheel bearing housing -3- and turn it 90°.
- Pull wheel bearing housing downwards off swivel joint and remove.
- Tie up drive shaft.



Note

- ♦ *Do not let the drive shaft hang down under its own weight, as otherwise excessive bending could damage the inner CV joint.*
- ♦ *Disregard -item 1-.*



Installing

Installation is carried out in reverse order; note the following:

- Push wheel bearing housing onto drive shaft splines.
- Install track control link ➔ [page 56](#) .
- Install upper link ➔ [page 48](#) .
- Tighten bolt securing drive shaft to wheel hub ➔ [page 85](#) .
- Overview table: when does wheel alignment have to be checked? ➔ [page 213](#)

Tightening torques

- ♦ ➔ [“5.1 Exploded view - wheel bearing”, page 71](#)
- ♦ ➔ [“4.1 Exploded view - lower suspension links, swivel joint”, page 55](#)
- ♦ ➔ Brake system; Rep. gr. 45 ; Sensors; Exploded view - front wheel speed sensor

5.3 Removing and installing wheel bearing unit

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-





Removing



Caution

Take precautions not to damage or dirty the wheel bearing.

◆ *Instructions for handling wheel bearing ➔ [page 72](#)*

- Slacken bolt securing drive shaft to wheel hub ➔ [page 85](#) .
- Remove brake disc ➔ Brake system; Rep. gr. 46 ; Front brakes; Removing and installing brake disc .
- Remove bolts -arrows-.
- Detach wheel hub -2- with wheel bearing unit from drive shaft -3- and from wheel bearing housing -1-.

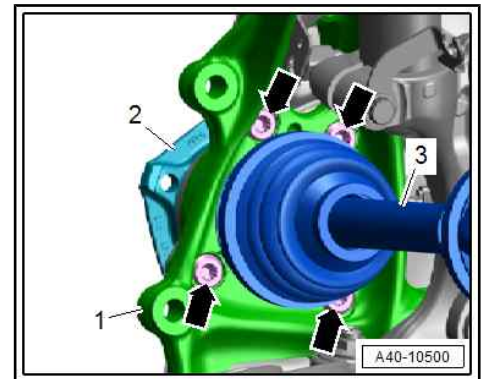
Installing

Installation is carried out in reverse order; note the following:

- Tighten bolt securing drive shaft to wheel hub ➔ [page 85](#) .

Tightening torques

- ◆ ➔ ["5.1 Exploded view - wheel bearing", page 71](#)
- ◆ ➔ ["1 Wheels, tyres", page 205](#)



5.4 Servicing wheel bearing unit

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-



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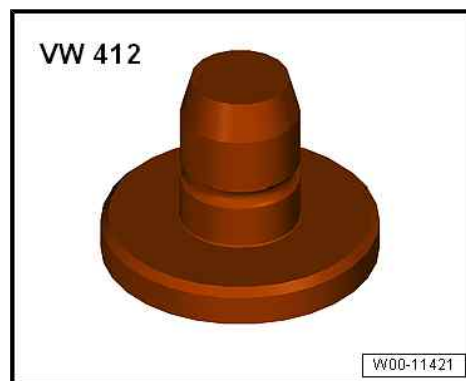


- ◆ Thrust plate - VW 402-





◆ Press tool - VW 412-



◆ Assembly tool - T10230-



- ◆ Workshop press - VAS 6654- , not illustrated
- ◆ Puller set for inner bearing races - VAS 701 003- (not illustrated)

Procedure

- Wheel bearing unit removed ⇒ [page 76](#)

Pressing wheel hub out of wheel bearing

- Set up special tools as shown in illustration.

1 - Press tool - VW 412-

2 - Sleeve -T10230/3-

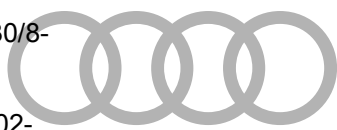
3 - Thrust piece -T10230/8-

4 - Wheel bearing unit

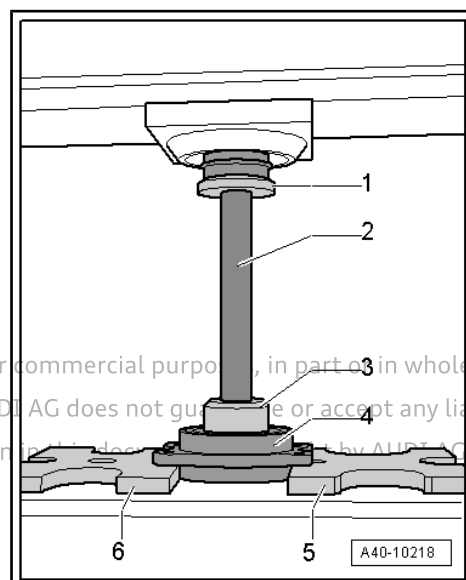
5 - Thrust plate - VW 402-

6 - Thrust plate - VW 401-

- Press wheel hub out of wheel bearing.



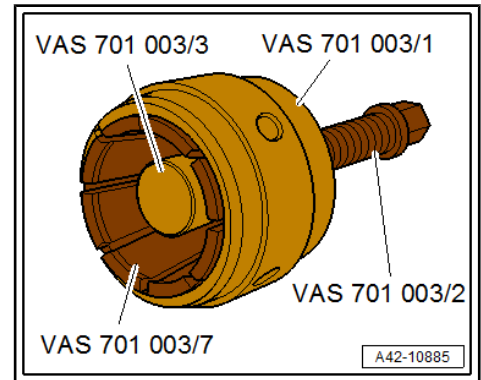
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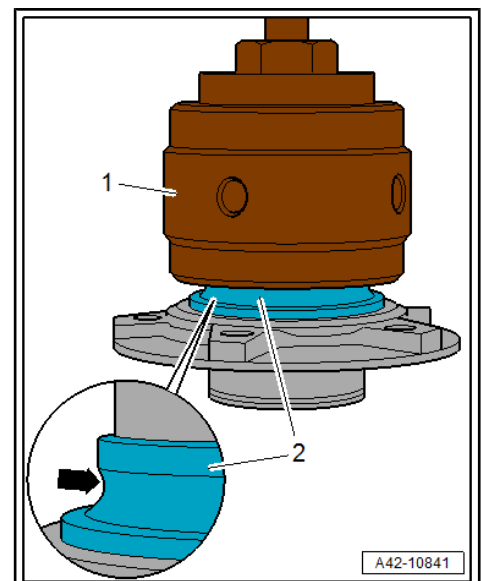
Pressing inner bearing race off wheel hub

- Prepare puller from puller set for inner bearing races - VAS 701 003- as follows:
- Screw clamping sleeve - VAS 701 003/1- onto clamp tensioner - VAS 701 003/7- .
- Screw threaded spindle - VAS 701 003/2- into clamping sleeve and fit thrust piece - VAS 701 003/3- .



Inner bearing race version 1:

- Remove ball cage from inner bearing race -2-.
- Apply puller -1- to ball raceways -arrow- of inner race, as shown.

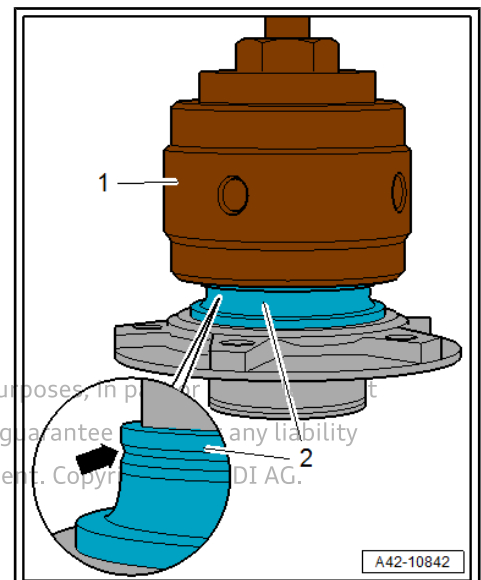


Inner bearing race version 2:

- Apply puller -1- to groove -arrow- of inner race -2-.



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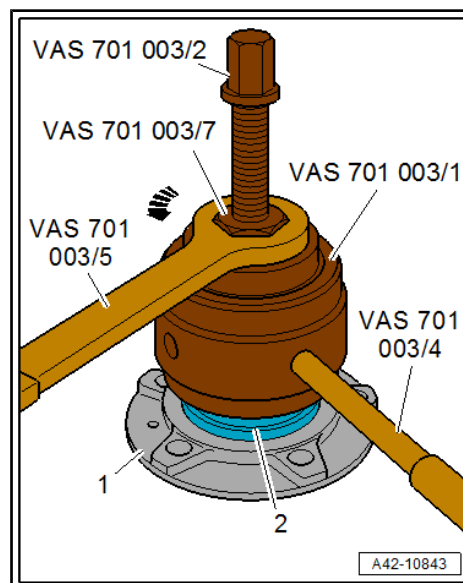




All versions (continued):

- Clamp puller in place on inner race -2-; to do so, use spanner - VAS 701 003/7- to turn clamp tensioner - VAS 701 003/5- in direction of -arrow- and counterhold clamping sleeve - VAS 701 003/1- with tensioner handle - VAS 701 003/4- .
- Use threaded spindle - VAS 701 003/2- to detach inner bearing race from wheel hub -1-.

Pressing wheel hub into wheel bearing



Instructions for handling wheel bearing ➤ [page 156](#)

- Set up special tools as shown in illustration.

1 - Press tool - VW 412-

2 - Thrust plate - VW 402-

3 - Wheel hub

4 - Wheel bearing

5 - Thrust plate - VW 401-

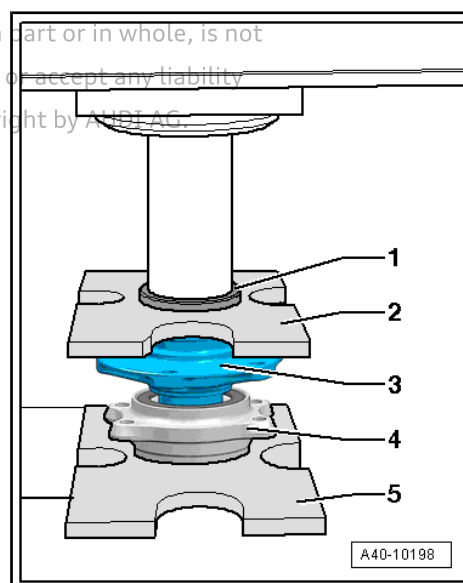
- The machined surface of the wheel bearing outer race faces downwards.



Caution

Take precautions not to damage or dirty the wheel bearing.

- ◆ *Make sure no dirt gets between thrust plate - VW 401- and wheel bearing when pressing in the hub or when the parts are placed on a workbench, etc.*



- Press wheel hub into wheel bearing.
- Install wheel bearing unit ➤ [page 76](#) .



6 Drive shaft

⇒ [“6.1 Exploded view - drive shaft”, page 81](#)

⇒ [“6.2 Removing and installing drive shaft”, page 83](#)

⇒ [“6.3 Removing and installing heat shield for drive shaft”, page 84](#)

⇒ [“6.4 Loosening and tightening nut/bolt securing drive shaft”, page 85](#)

⇒ [“6.5 Dismantling and assembling drive shaft”, page 86](#)

⇒ [“6.6 Servicing constant velocity joint”, page 99](#)

⇒ [“6.7 Checking outer constant velocity joint”, page 100](#)

⇒ [“6.8 Tightening hose clip on triple roller joint and outer joint”, page 101](#)

6.1 Exploded view - drive shaft

1 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 101](#)

2 - Boot

- ☐ A triple roller joint adapter is installed on drive shafts with peened triple roller joint
- ☐ Boot must rest in groove and on contour of joint body

3 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 101](#)

4 - Circlip

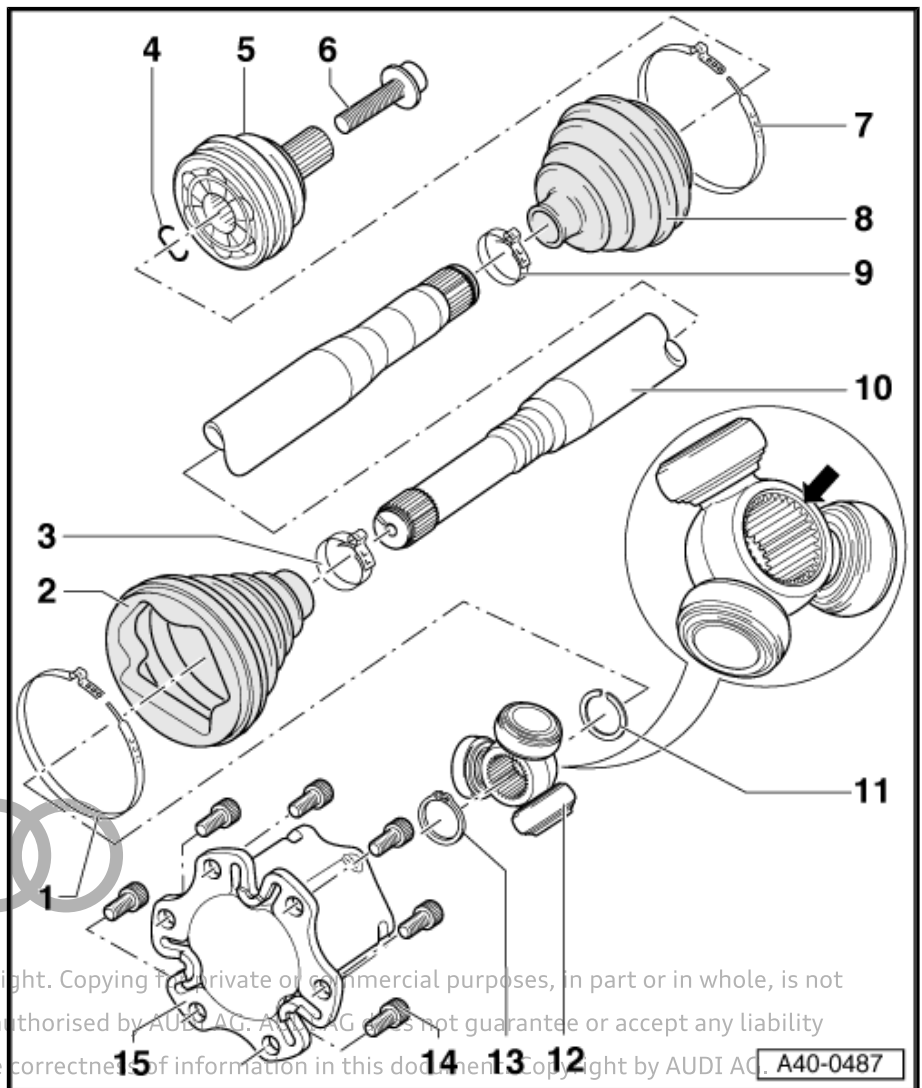
- ☐ Renew after removing
- ☐ Fit into annular groove on shaft before installing (no longer visible once joint is installed)
- ☐ Before fitting constant velocity joint, align circlip centrally with opening facing upwards

5 - Outer constant velocity joint

- ☐ Renew as a complete unit
- ☐ Removing ⇒ [page 99](#)
- ☐ Checking ⇒ [page 100](#)
- ☐ Installing ⇒ [page 99](#)
- ☐ Greasing ⇒ [page 83](#)
- ☐ Grease splines on drive shaft lightly with grease used in joint before fitting constant velocity joint onto drive shaft

6 - Bolt

- ☐ Renew after removing



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- ☐ Clean threads in constant velocity joint using a thread tap or similar
- ☐ Loosening and tightening bolt securing drive shaft ⇒ [page 85](#)

7 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 101](#)

8 - Boot

- ☐ Check for splits and chafing

9 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 101](#)

10 - Drive shaft

- ☐ Different versions available:
- ◆ Triple roller joint AAR 2600 i with outer constant velocity joint (85.2 mm diameter)
- ◆ Triple roller joint AAR 3300 i with outer constant velocity joint (94 mm or 98.9 mm diameter)
- ◆ Triple roller joint AAR 3700 i with outer constant velocity joint (102.7 mm diameter)
 - ☐ For correct version refer to ⇒ Electronic parts catalogue
 - ☐ Removing and installing ⇒ [page 83](#)
 - ☐ Allocation of triple roller joint ⇒ [page 83](#)
 - ☐ Dismantling and assembling drive shaft ⇒ [page 86](#)

11 - Circlip

- ☐ Renew after removing
- ☐ Insert in groove on shaft

12 - Triple roller spider

- ☐ Mark installation position for re-installation
- ☐ Dismantling and assembling ⇒ [page 86](#)
- ☐ Grease splines on drive shaft lightly with grease used in joint before fitting triple roller spider onto drive shaft

13 - Circlip

- ☐ Renew after removing
- ☐ Insert in groove on shaft

14 - Bolt

- ☐ Renew after removing
- ☐ M10: 50 Nm +90°
- ☐ M12: 90 Nm +90°

15 - Joint body

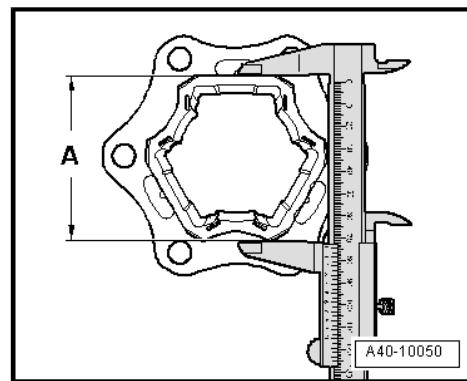
- ☐ Dismantling and assembling ⇒ [page 86](#)

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Allocation of triple roller joint

- Measure dimension -A- with hose clips released and boot pushed back.
- ◆ Dimension -A- = approx. 74 mm: drive shaft with triple roller joint AAR 2600 i
- Dismantling and assembling drive shaft with triple roller joint AAR 2600 i ➔ [page 86](#)
- ◆ Dimension -A- = approx. 77 mm: drive shaft with triple roller joint AAR 3300 i
- Dismantling and assembling drive shaft with triple roller joint AAR 3300 i ➔ [page 86](#)
- ◆ Dimension -A- = approx. 82 mm: drive shaft with triple roller joint AAR 3700 i
- Dismantling and assembling drive shaft with triple roller joint AAR 3700 i ➔ [page 93](#)



Grease quantity and type

- ◆ Regrease joint when renewing boot.
- ◆ Please note the correct type of grease for the inner and outer joints ➔ Electronic parts catalogue .

Designation	Outer joint Ø mm	Grease Total quantity g	of which in:	
			Joint g	Boot g
SX1.29	85.2	approx. 128	approx. 50 ¹⁾	approx. 78
SX1.41	94	approx. 194	approx. 70 ¹⁾	approx. 124
SX1.46	98.9	approx. 214	approx. 80 ¹⁾	approx. 134
SX1.51	102.7	approx. 252	approx. 90 ¹⁾	approx. 162
	Inner joint			
AAR 2600 i		approx. 130	approx. 80	approx. 50
AAR 3300 i		approx. 160	approx. 90	approx. 70
AAR 3700 i		approx. 192	approx. 100	approx. 92

1) Pack this amount of grease into joint through splines of ball hub. Distribute remainder on face of joint underneath boot.

6.2 Removing and installing drive shaft

Special tools and workshop equipment required

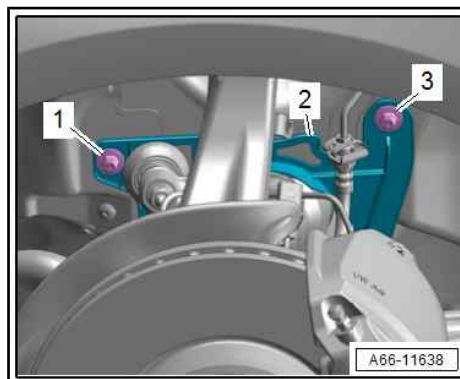
- ◆ Torque wrench - V.A.G 1332-





Removing

- Slacken bolt securing drive shaft to wheel hub ➔ [page 85](#) .
- Remove front wheel ➔ [page 205](#) .
- Drive shaft (left-side): Remove subframe shield ➔ [page 37](#) .
- Drive shaft (right-side): Unbolt subframe shield and push it to one side ➔ [page 37](#) .
- Unscrew nuts -1, 3- and remove drive shaft cover -2-.



- Unscrew bolts -arrows- securing drive shaft to flange shaft.
- Detach drive shaft, taking care not to damage boot and coating on drive shaft.

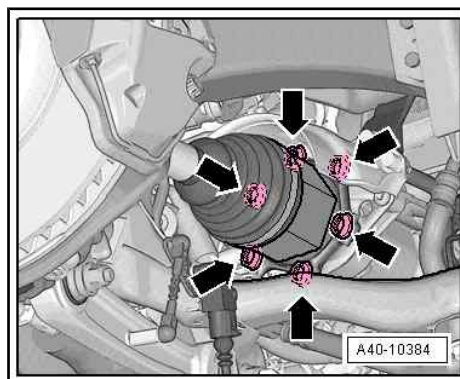
Installing

Installation is carried out in reverse order; note the following:

- Tighten bolt securing drive shaft to wheel hub ➔ [page 85](#) .

Tightening torques

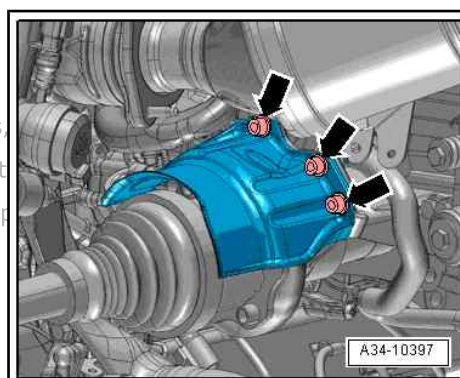
- ◆ ➔ [“6.1 Exploded view - drive shaft”, page 81](#)
- ◆ ➔ [“2.1 Exploded view - subframe”, page 17](#)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ➔ [“1 Wheels, tyres”, page 205](#)



6.3 Removing and installing heat shield for drive shaft

Heat shield for drive shaft (left-side)

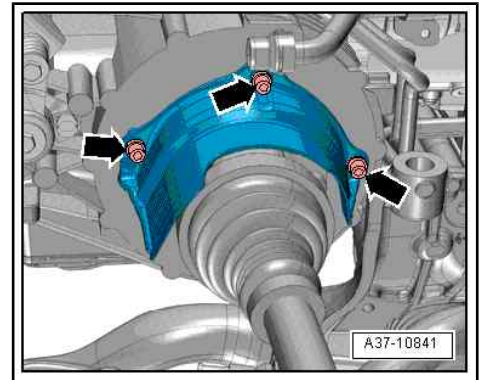
Component	Tightening torque
Bolts -arrows-	23 Nm





Heat shield for drive shaft (right-side)

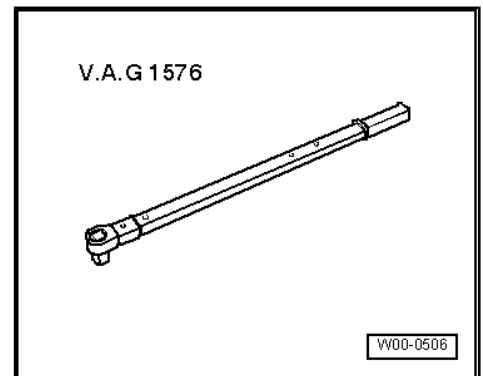
Component	Tightening torque
Bolts -arrows-	23 Nm



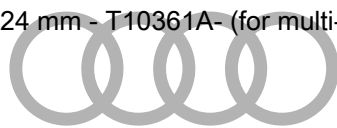
6.4 Loosening and tightening nut/bolt securing drive shaft

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1576-



- ◆ Socket, 24 mm - T10361A- (for multi-point head bolt)



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- ◆ Or: hexagon socket, 19 mm (commercially available)



Loosening bolt securing drive shaft to wheel hub

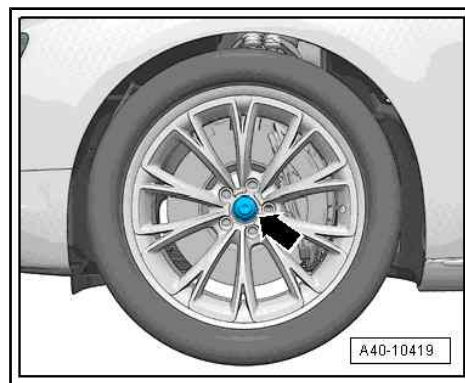
- To avoid damage to wheel bearing, slacken off bolt -arrow- no further than 90° with vehicle standing on its wheels.
- Raise vehicle so that wheels are off the ground.
- Have a second mechanic press the brake pedal.
- Remove bolt.

Tightening bolt securing drive shaft to wheel hub



Note

- ♦ *Always renew bolt after removal.*
 - ♦ *Before securing, clean threads in constant velocity joint/stub axle using a thread tap.*
 - ♦ *The wheels must not be in contact with the ground when initially tightening the bolt for the drive shaft/stub axle; otherwise the wheel bearing can be damaged.*
- Have a second mechanic press the brake pedal.
 - Tighten bolt to 200 Nm.
 - Lower vehicle onto its wheels.
 - Turn bolt 180° further.



6.5 Dismantling and assembling drive shaft

⇒ [“6.5.1 Dismantling and assembling drive shaft \(triple roller joint AAR 2600 i, AAR 3300 i\)”, page 86](#)

⇒ [“6.5.2 Dismantling and assembling drive shaft - triple roller joint AAR 3700 i”, page 93](#)

6.5.1 Dismantling and assembling drive shaft (triple roller joint AAR 2600 i, AAR 3300 i)



Note

- ♦ *The procedure is the same for drive shafts with triple roller joints AAR 2600 i and AAR 3300 i except for the following difference:*
- ♦ *Assembly tool - T40084- is used for triple roller joint AAR 2600 i.*
- ♦ *Removal and assembly tool - T40018- is used for triple roller joint AAR 3300 i.*

Special tools and workshop equipment required



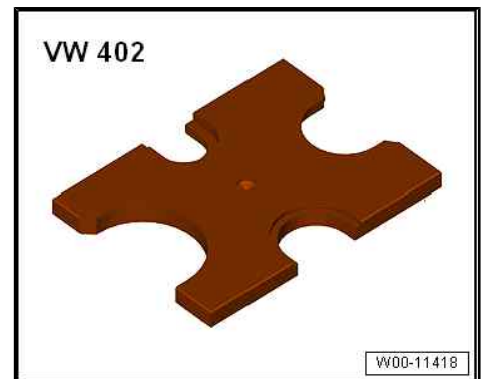
◆ Thrust plate - VW 401-



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◆ Thrust plate - VW 402-



◆ Press tool - VW 408A-

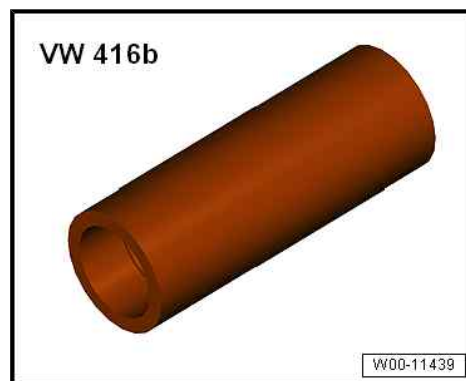


◆ Press tool - VW 411-





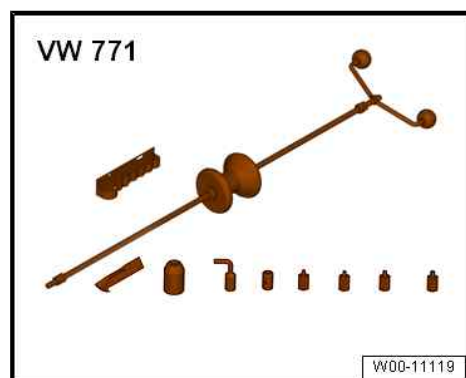
◆ Tube - VW 416B-



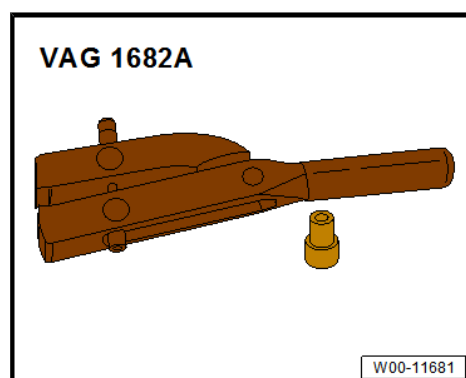
◆ Thrust pad - VW 447H-



◆ Multi-purpose tool - VW 771-



◆ Clamp tensioner - V.A.G 1682 A- with adapter -V.A.G 1682 A/1-



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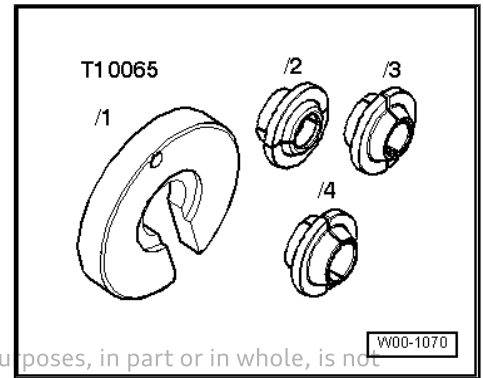


- ◆ Assembly tool - T10065-

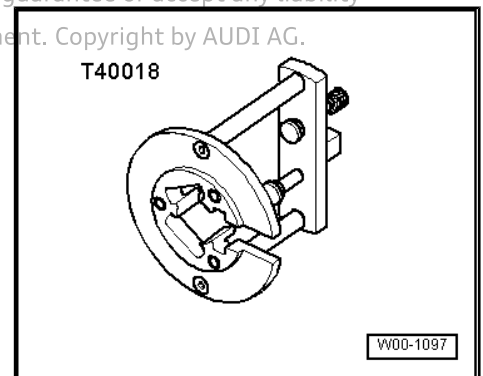


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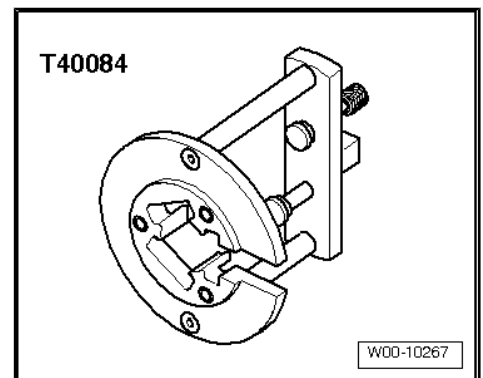
- ◆ Removal and assembly tool - T40018- for drive shaft with triple roller joint AAR 3300 i



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- ◆ Assembly tool - T40084- for drive shaft with triple roller joint AAR 2600 i



- ◆ Workshop press - VAS 6654- , not illustrated
- ◆ Circlip pliers, commercially available



Dismantling

- Clamp drive shaft horizontally in vice using protective jaw covers.



Note

Take care not to damage drive shaft.

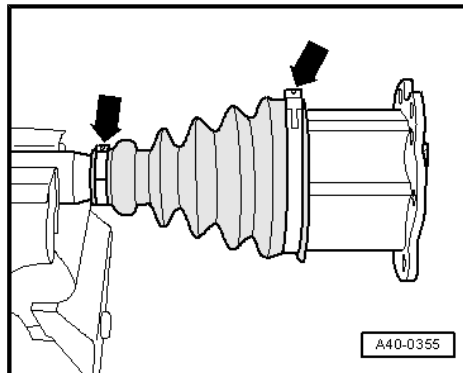
- Open hose clips -arrows-.
- Push back boot.



Caution

Changing the installation position can cause noise when the vehicle is driven.

- ◆ *To facilitate installation, mark the position of the joint body in relation to the drive shaft using a waterproof felt-tip pen or similar.*

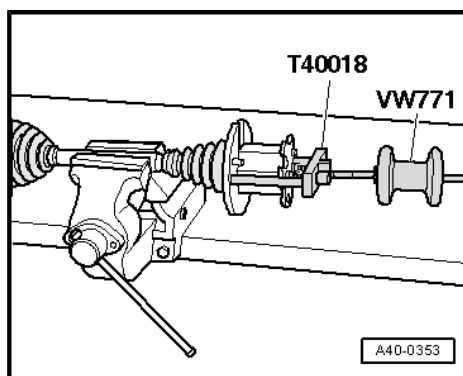
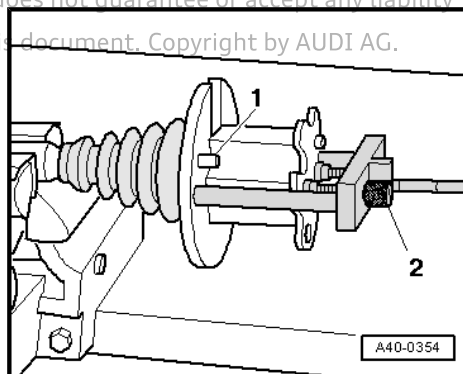


- Apply removal and assembly tool - T40018- or assembly tool - T40084- behind joint body.
- Locating pin -1- must lie against outside of joint body.
- Bring removal and assembly tool - T40018- or assembly tool - T40084- into contact with joint body by turning knurled screws -2-.



Note

- ◆ *Joint body must be fixed in removal and assembly tool - T40018- or assembly tool - T40084- without play.*
- ◆ *Tighten knurled screws just hand-tight.*
- Screw multi-purpose tool - VW 771- into removal and assembly tool - T40018- or assembly tool - T40084- .
- Use -VW 771- to detach joint body horizontally.
- Leave joint body clamped in removal and assembly tool - T40018- or assembly tool - T40084- .





Caution

Changing the installation position can cause noise when the vehicle is driven.

- ◆ *To facilitate installation, mark the position of drive shaft -1- in relation to the triple roller spider -2- using a water-proof felt-tip pen or similar.*

– Remove grease with a lint-free cloth.

– Remove circlip using circlip pliers -1-.

– Set up special tools as shown in illustration.

1 - Assembly tool - T10065/1-

2 - Assembly tool - T10065/5-

3 - Thrust plate - VW 401-

4 - Press tool - VW 408A-

5 - Thrust plate - VW 402-

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- Assembly tool - T10065/5- must make contact with base of triple roller spider.
- Assembly tool - T10065/5- must not rest on rollers (swivel the rollers aside if necessary).

– Press triple roller spider off drive shaft.

– Pull off boot.

– Remove grease from shaft splines.

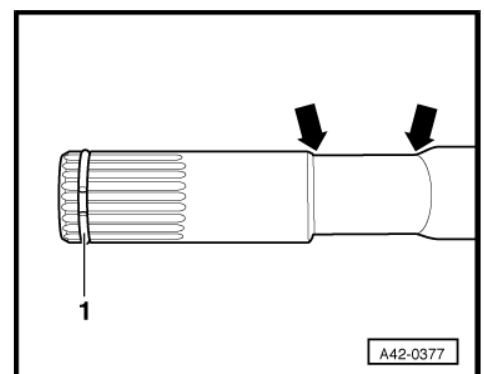
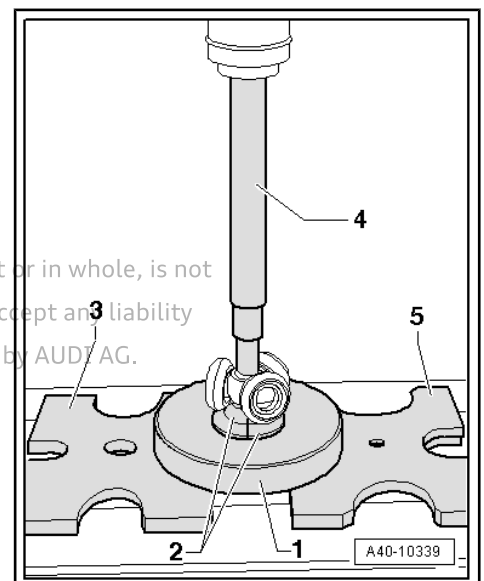
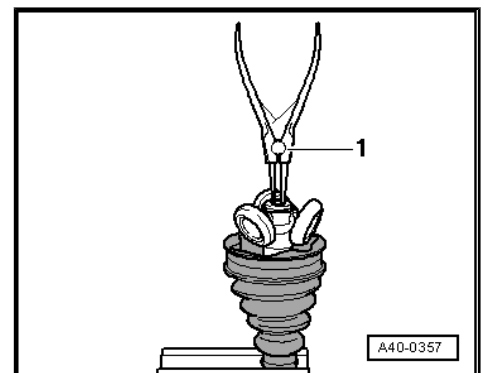
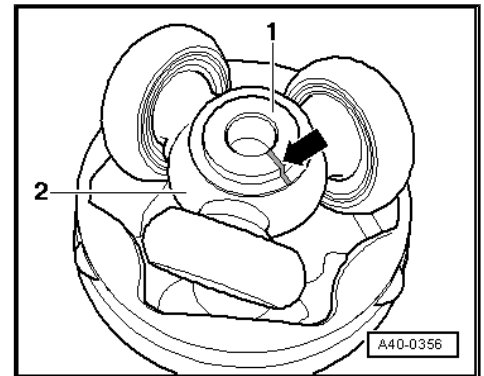
– Check rollers and roller races for wear.

– Clean drive shaft and housing.

Assembling

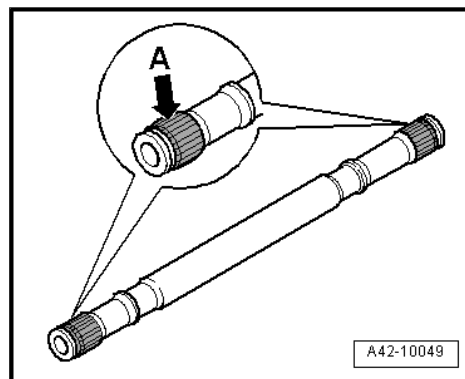
– Slide smaller hose clip on with boot.

– Position boot between -arrows- on drive shaft.





- Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint or triple roller spider onto drive shaft.
- Fit triple roller spider onto shaft so that markings are aligned and drive home onto stop.



- Set up special tools as shown in illustration.

1 - Assembly tool - T10065/1-

2 - Assembly tool - T10065/6-

3 - Thrust plate - VW 401-

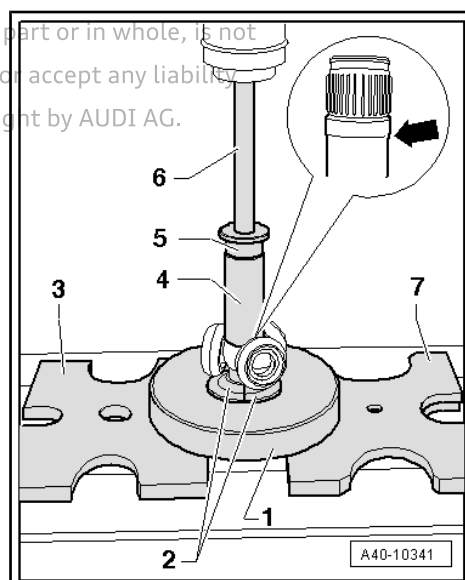
4 - Tube - VW 416B-

5 - Thrust plate - VW 447H-

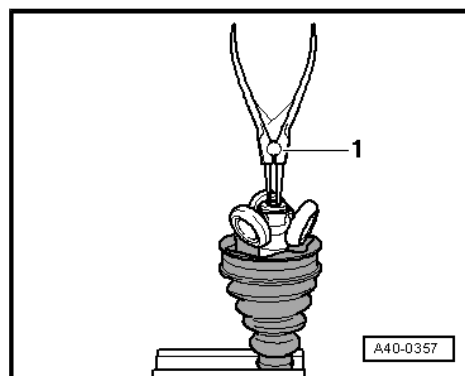
6 - Press tool - VW 411-

7 - Thrust plate - VW 402-

- Assembly tool - T10065/6- must grip drive shaft at bottom seam -arrow-.
- Assembly tool - T10065/6- must not rest on rollers (swivel the rollers aside if necessary).



- Install circlip using circlip pliers -1-.
- Circlip must engage audibly. Triple roller spider must lie directly against circlip (zero gap).
- Pack grease from repair kit into rear of triple roller joint ➔ [page 83](#) .
- Lightly grease the rollers.



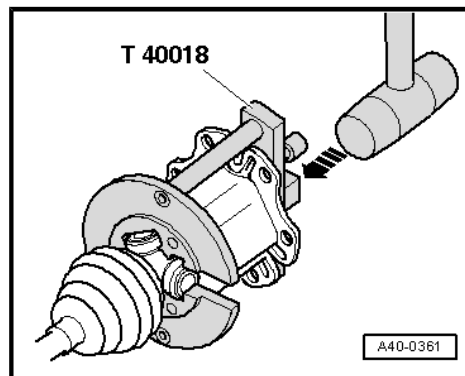
- Use plastic-headed hammer to drive joint body over triple roller spider -arrow-; ensure that rollers are not tilted.



Note

Removal and assembly tool - T40018- is shown as an example.

- Pack remaining quantity of grease into boot.
- Make sure boot is properly positioned on joint body.
- Boot must rest in groove and on contour of joint body.
- Fit and tighten hose clips on triple roller joint ➔ [page 101](#) .





6.5.2 Dismantling and assembling drive shaft - triple roller joint AAR 3700 i

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-



- ◆ Thrust plate - VW 402-



- ◆ Press tool - VW 409-

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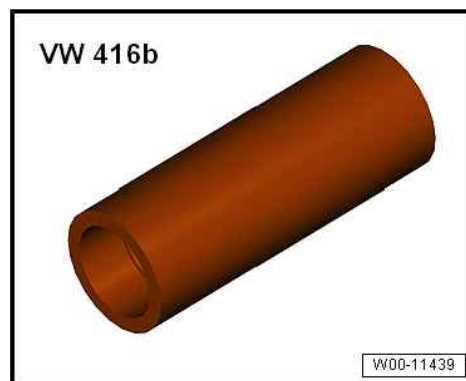


- ◆ Press tool - VW 412-

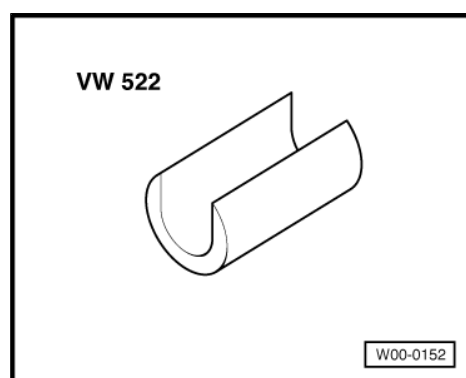




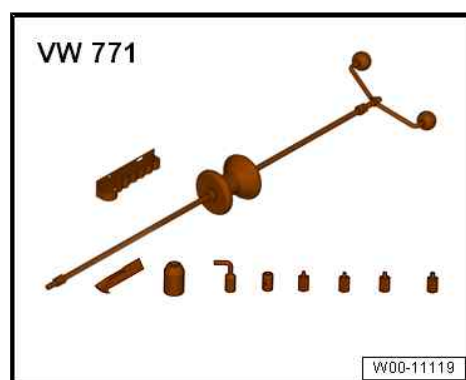
◆ Tube - VW 416B-



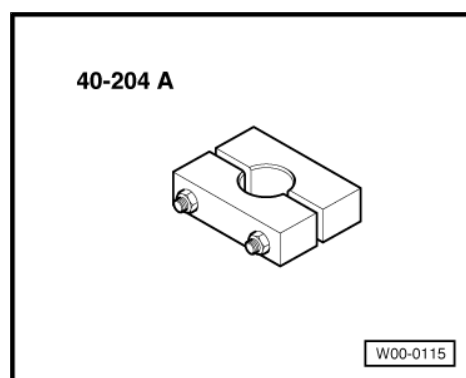
◆ Support sleeve - VW 522-



◆ Multi-purpose tool - VW 771-



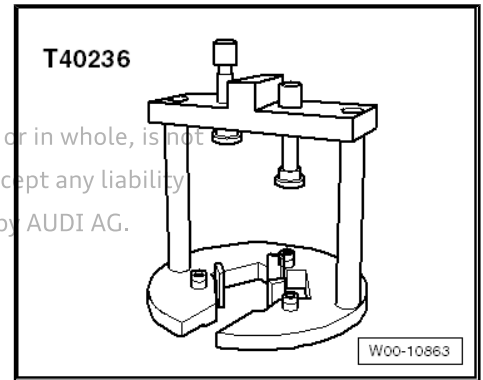
◆ Clamp - 40-204A-





◆ Assembly tool - T40236-

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- ◆ Workshop press - VAS 6654- , not illustrated
- ◆ Circlip pliers, commercially available

Dismantling

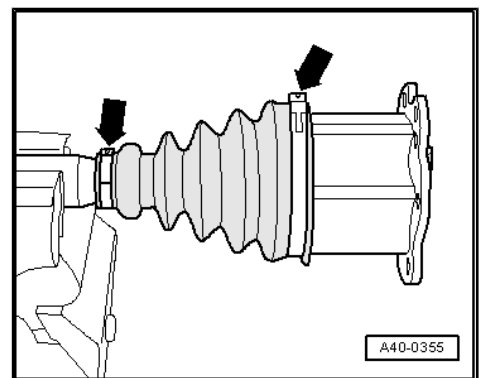
- Clamp drive shaft horizontally in vice using protective jaw covers.



Note

Take care not to damage drive shaft.

- Open hose clips -arrows-.
- Push back boot.



Caution

Changing the installation position can cause noise when the vehicle is driven.

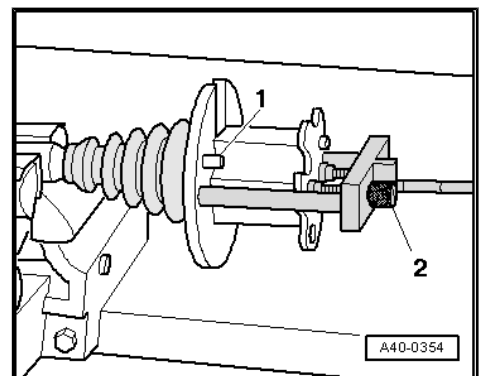
- ◆ ***To facilitate installation, mark the position of the joint body in relation to the drive shaft using a waterproof felt-tip pen or similar.***

- Apply assembly tool - T40236- behind joint body.
- Locating pin -1- must lie against outside of joint body.
- Bring assembly tool into contact with joint body by turning knurled screws -2-.



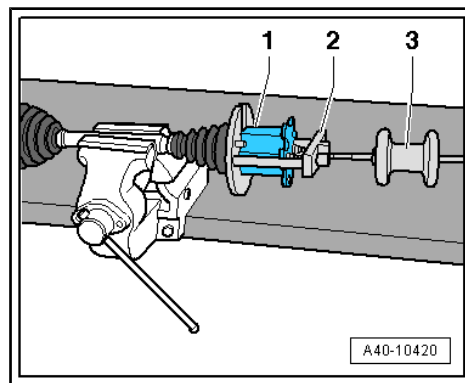
Note

- ◆ ***Joint body must be fixed in assembly tool - T40236- without play.***
- ◆ ***Tighten knurled screws just hand-tight.***





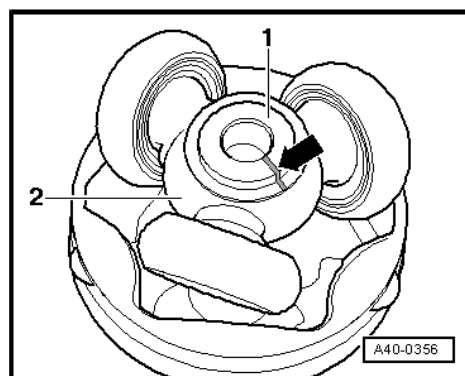
- Screw multi-purpose tool - VW 771- -item 3- into assembly tool - T40236- -item 2-.
- Use -VW 771- to detach joint body -1- horizontally.
- Joint body stays in assembly tool - T40236- .



Caution

Changing the installation position can cause noise when the vehicle is driven.

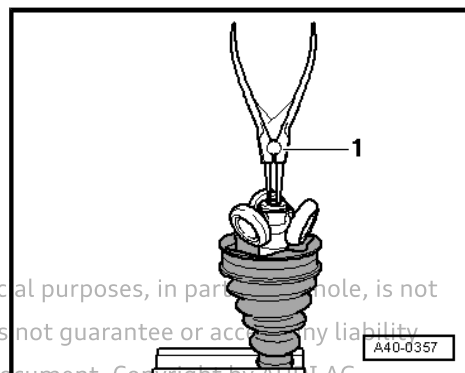
- ◆ *To facilitate installation, mark the position -arrow- of drive shaft -1- in relation to the triple roller spider -2- using a waterproof felt-tip pen or similar.*



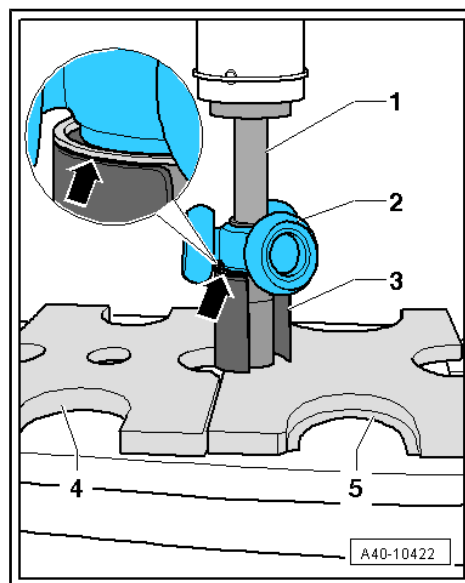
- Remove grease with a lint-free cloth.
- Remove circlip using circlip pliers -1-.



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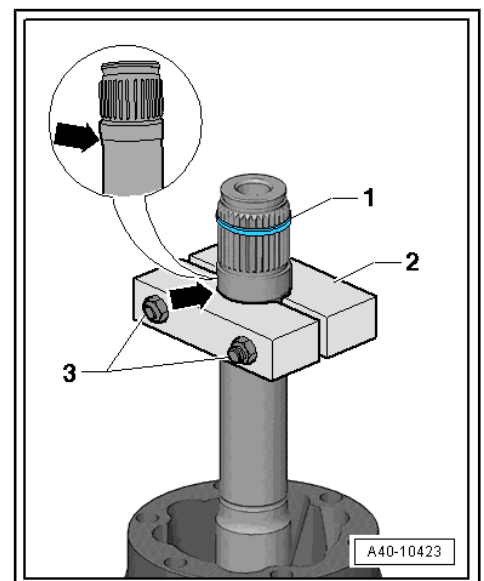
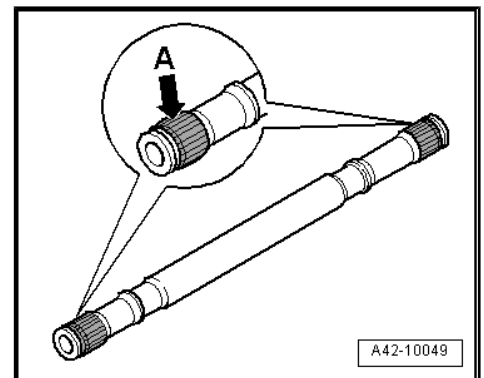
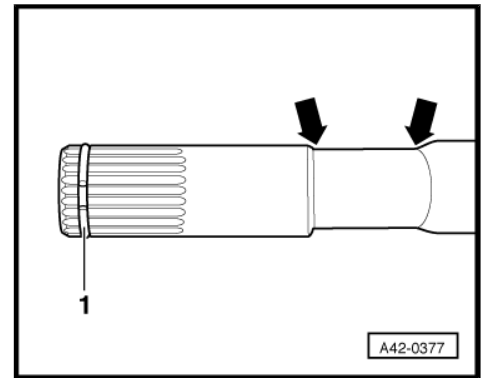
- Set up special tools as shown in illustration.
- 1 - Press tool - VW 409-
- 2 - Triple roller spider
- 3 - Support sleeve - VW 522-
- 4 - Thrust plate - VW 401-
- 5 - Thrust plate - VW 402-
- Support sleeve - VW 522- must lie against circlip -arrow-. Circlip is removed from drive shaft together with triple roller spider.
- Support sleeve - VW 522- must not rest on rollers (swivel the rollers aside if necessary).
- Press triple roller spider off drive shaft.
- Pull off boot.
- Remove grease from shaft splines.
- Check rollers and roller races for wear.
- Clean drive shaft and housing.





Assembling

- Slide smaller hose clip on with boot.
 - Position boot between -arrows- on drive shaft.
-
- Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint or triple roller spider onto drive shaft.
-
- Attach clamp - 40-204A- -item 2-, as shown in illustration.
 - Clamp - 40-204A- must grip drive shaft at bottom seam -arrow-.
 - Hand-tighten nuts -3-.
 - Fit new circlip -1- as far as centre of splines.
 - Fit triple roller spider onto shaft so that markings are aligned and drive home onto stop.



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– Set up special tools as shown in illustration.

1 - Press tool - VW 412-

2 - Tube - VW 416B-

3 - Triple roller spider

4 - Clamp - 40-204A-

5 - Thrust plate - VW 402-

6 - Thrust plate - VW 401-

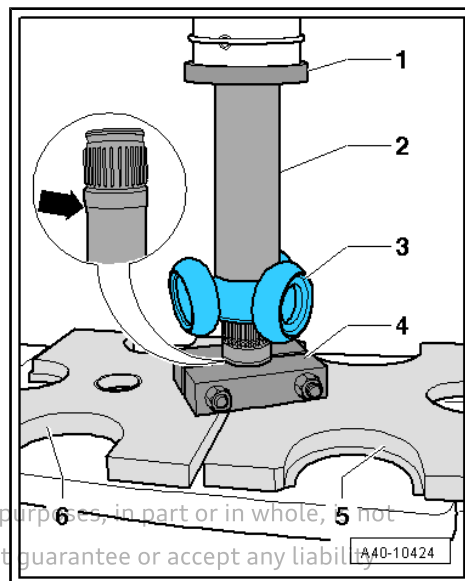
• Side of tube - VW 416B- with larger internal diameter faces triple roller spider.

• Clamp - 40-204A- must grip drive shaft at bottom seam -arrow-.

• Clamp - 40-204A- must not rest on rollers (swivel the rollers aside if necessary).

– Press on triple roller spider.

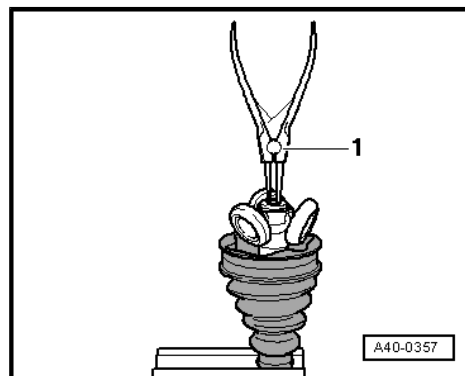
• Circlip must engage audibly. Triple roller spider must lie directly against circlip (zero gap).



– Install circlip using circlip pliers -1-.

– Pack grease from repair kit into rear of triple roller joint
⇒ [page 83](#) .

– Lightly grease the rollers.



– Use plastic-headed hammer to drive joint body -2- over triple roller spider -arrow-; ensure that rollers are not tilted.

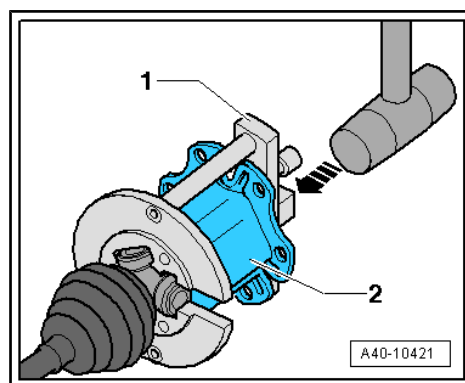
1 - Assembly tool - T40236-

– Pack remaining quantity of grease into boot.

– Make sure boot is properly positioned on joint body.

• Boot must rest in groove and on contour of joint body.

– Fit and tighten hose clip on triple roller joint ⇒ [page 101](#) .

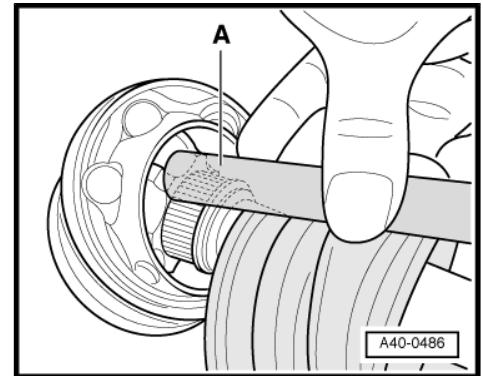




6.6 Servicing constant velocity joint

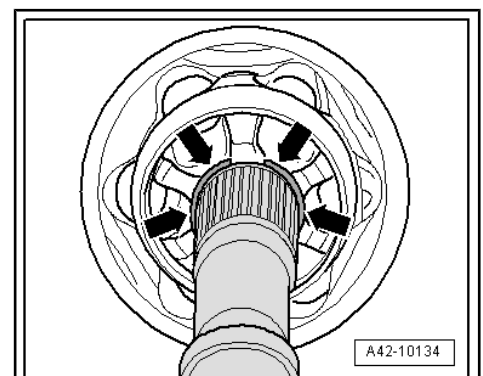
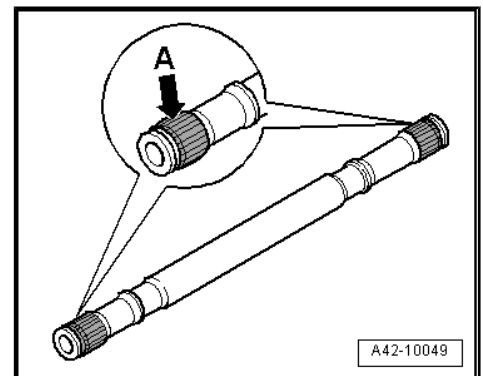
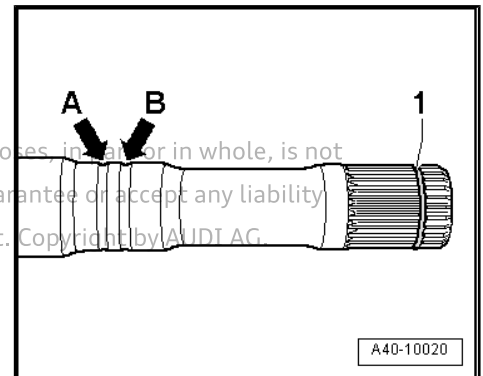
Removing outer constant velocity joint

- Clamp drive shaft in a vice using protective jaw covers.
- Unfasten both clips and detach boot from outer joint.
- Drive constant velocity joint off drive shaft by applying a copper or brass drift -A- to inner race.
- Detach joint and boot.



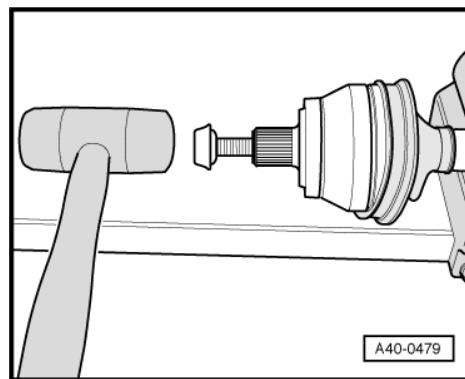
Installing outer constant velocity joint

- Boot and drive shaft must be free from grease.
- Renew circlip -1- after removing.
- Slide smaller hose clip on with boot.
- Position boot in outer groove -arrow B-.
- Inner groove -arrow A- remains visible ("identification groove" for correct boot assembly).
- Refer to ➤ [page 83](#) and pack specified quantity of grease inside joint body.
- Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.
- Fit circlip in groove on shaft.
- Slide on constant velocity joint as far as circlip.
- Align circlip so that opening faces upwards -arrows-.





- Screw old drive shaft bolt into joint body.
- Use plastic-headed hammer to drive joint onto drive shaft until circlip engages.
- Refer to ➤ [page 83](#) and pack specified quantity of grease into boot side of joint body.
- Push boot onto joint body.
- Vent air from boot.
- Make sure boot is properly positioned on joint body.
- Boot must rest in groove and on contour of joint body.
- Tighten hose clips on outer joint ➤ [page 101](#) .

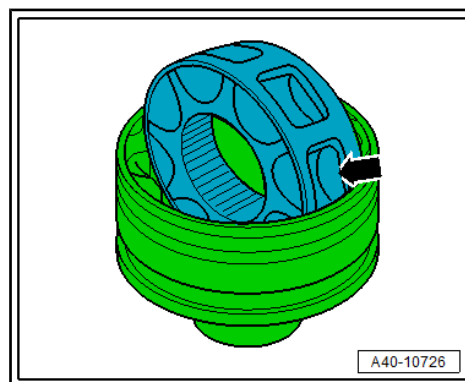
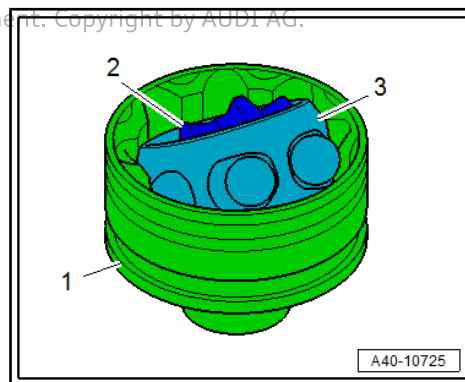


6.7 Checking outer constant velocity joint

The joint should be dismantled to renew dirty grease or for checking the balls and ball races for wear and damage.

Dismantling

- Before dismantling, mark position of ball hub -2- in relation to ball cage -3- and joint body -1- with an electric scribe or oil stone.
 - Swivel ball hub and ball cage.
 - Take out balls one after the other.
-
- Turn the cage until the two rectangular openings -arrow- are level with the joint body.
 - Lift out cage together with hub.





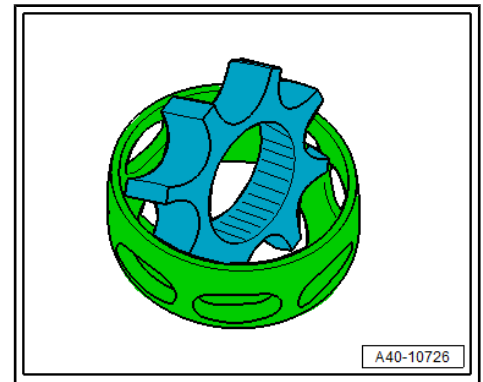
- Swivel segment of hub with short lobe into square cage opening.
- Pivot hub out of cage.

Checking

The balls in each joint belong to one tolerance group. Check stub axle, hub, cage and balls for pitting and signs of seizure. Excessive backlash in the joint will cause knocking or jolts under load change; in such cases the joint must be renewed. Polished areas and visible tracks in the ball races do not justify renewal of the joint.

Assembling

- 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 balls one after the other from opposite sides, taking care to re-establish original position of hub relative to cage and joint body.
- Pack required amount of grease into joint body ⇒ [page 83](#) .

6.8 Tightening hose clip on triple roller joint and outer joint

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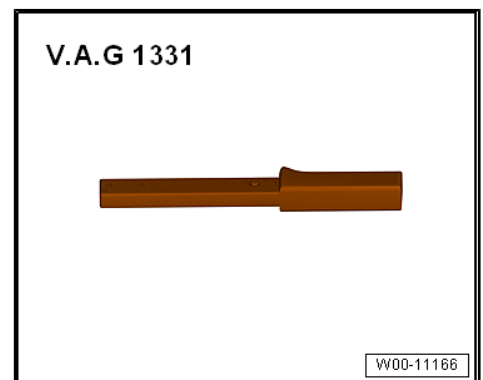


Note

Use the following tools depending on type of hose clip:

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



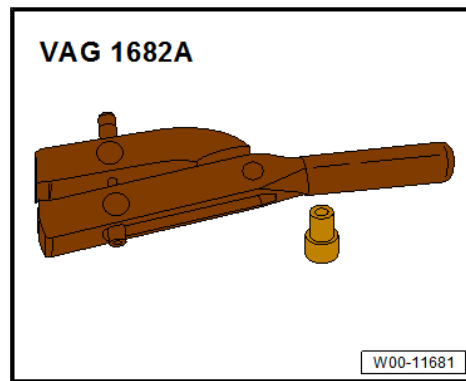


◆ Clamp tensioner - V.A.G 1682 A-



◆ Locking pliers for Phaeton steering rack - VAS 6199-

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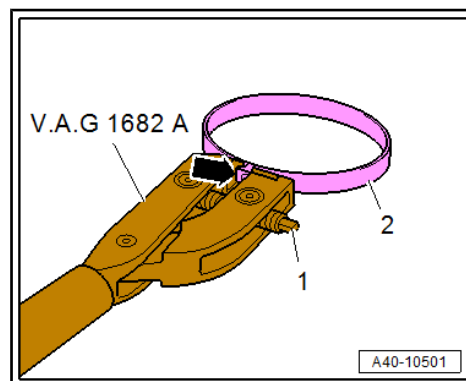
Tightening stainless steel hose clip using hose clip pliers - V.A.G 1682 A-

- Apply clamp tensioner - V.A.G 1682 A- as shown.
- Tips of tool must be applied centrally -arrow- to clip -2-.



Note

- ◆ *The thread of the spindle should move freely; if necessary, lubricate with MoS₂ grease.*
- ◆ *If the thread is stiff (e.g. due to dirt), the required clamping force will not be attained at the hose clip when the specified tightening torque is applied.*
- Tighten hose clip by turning spindle -1- with torque wrench (take care to keep clamp tensioner straight).
- Tightening torque: 20 Nm.



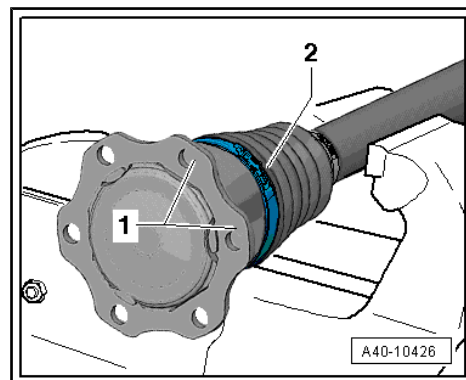
Tightening hose clip with retaining lugs using locking pliers for Phaeton steering rack - VAS 6199-



Note

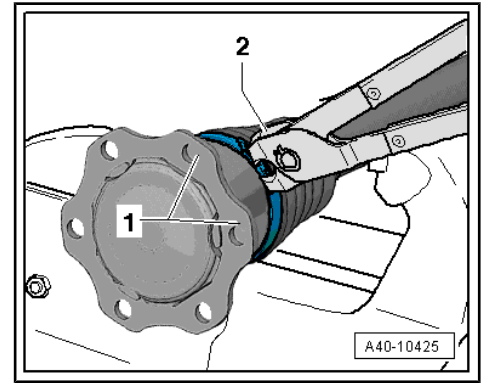
To facilitate fitting of multi-point socket head bolts when installing drive shaft, fastener lug -2- on hose clip must be positioned between mounting flanges -1- on joint body.

- Engage hose clip by hand at first lug.





- Close hose clip using locking pliers for Phaeton steering rack
- VAS 6199- -item 2-.



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42 – Rear suspension

1 Rear axle

⇒ [“1.1 Overview - rear axle”, page 104](#)

1.1 Overview - rear axle

I - ⇒ [“2 Subframe”, page 105](#)

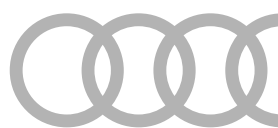
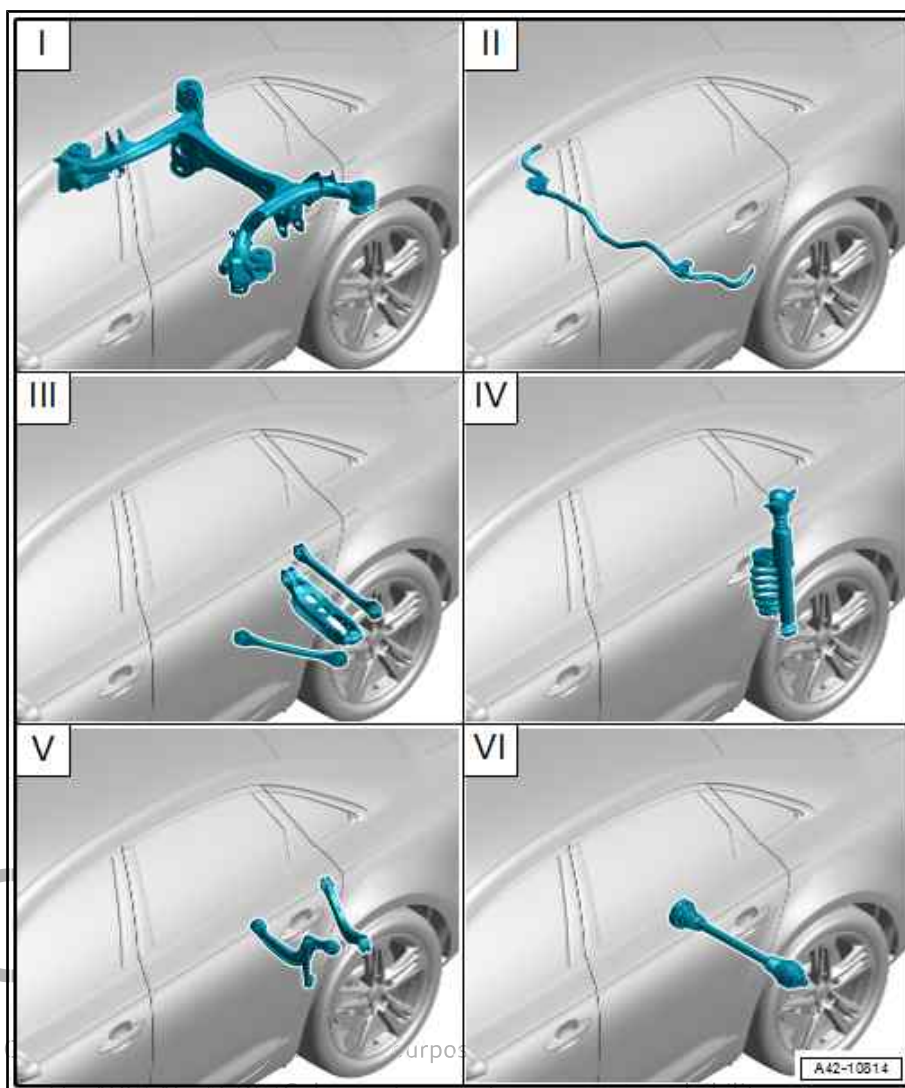
II -
⇒ [“3 Anti-roll bar”, page 126](#)

III -
⇒ [“4 Suspension links, track rod”, page 129](#)

IV -
⇒ [“5 Suspension strut/shock absorber, spring”, page 140](#)

V -
⇒ [“6 Wheel bearing, trailing arm”, page 155](#)

VI -
⇒ [“7 Drive shaft”, page 168](#)



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2 Subframe

⇒ [“2.1 Exploded view - subframe”, page 105](#)

⇒ [“2.2 Fixing position of subframe”, page 109](#)

⇒ [“2.3 Removing and installing subframe”, page 113](#)

⇒ [“2.4 Servicing subframe”, page 117](#)

2.1 Exploded view - subframe

⇒ [“2.1.1 Exploded view - subframe, vehicles with front-wheel drive”, page 105](#)

⇒ [“2.1.2 Exploded view - subframe, vehicles with four-wheel drive”, page 107](#)

2.1.1 Exploded view - subframe, vehicles with front-wheel drive



Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ *DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.*
- ◆ *Always fit all bolts by hand; make the first few turns by hand.*



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1 - Bolt

- ☐ Renew after removing
- ☐ 130 Nm +180°

2 - Bonded rubber bush (front)

- ☐ For subframe
- ☐ Removing and installing
⇒ [page 117](#)

3 - Subframe

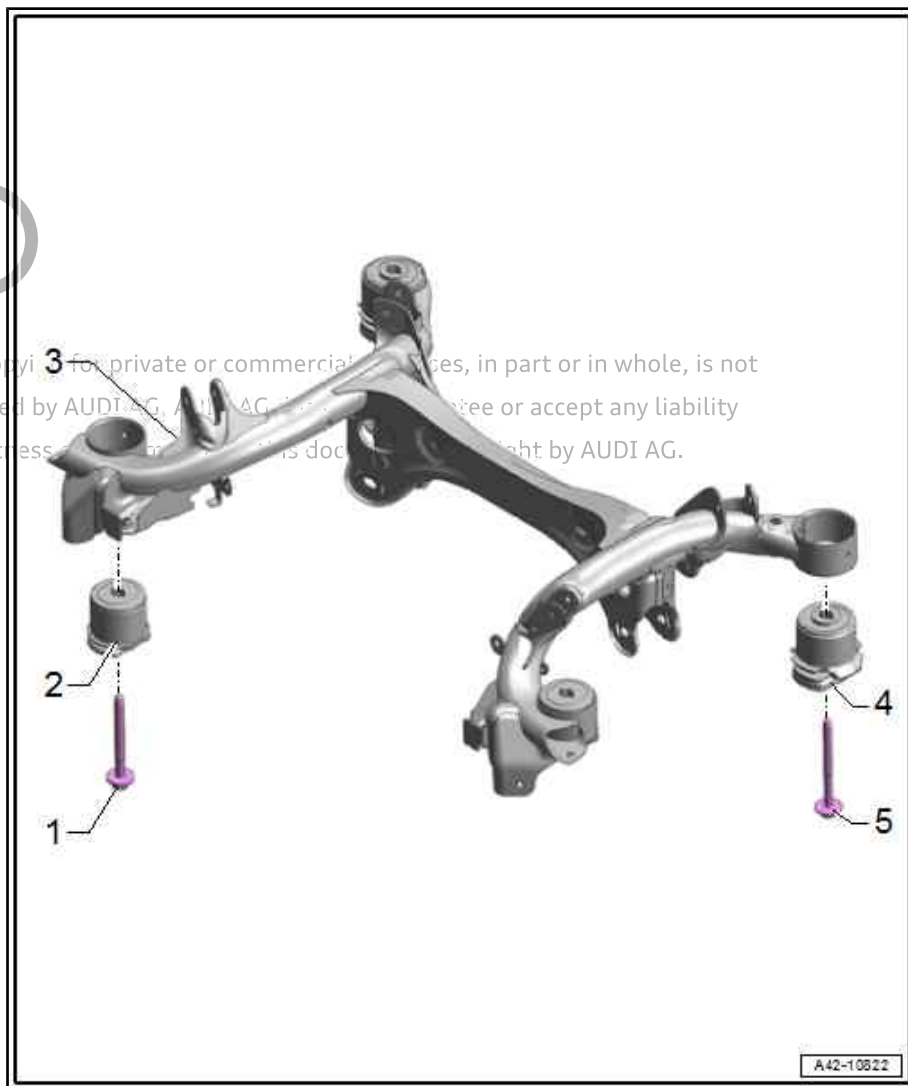
- ☐ Equipment version with vibration damper
⇒ [page 106](#)
- ☐ Removing and installing
⇒ [page 113](#)

4 - Bonded rubber bush (rear)

- ☐ For subframe
- ☐ Removing and installing
⇒ [page 117](#)

5 - Bolt

- ☐ Renew after removing
- ☐ 90 Nm +180°



Equipment version with vibration damper

1 - Bolt

- ◆ Renew after removing
- ◆ 50 Nm +180°

2 - Vibration damper

3 - Washer

4 - Bracket

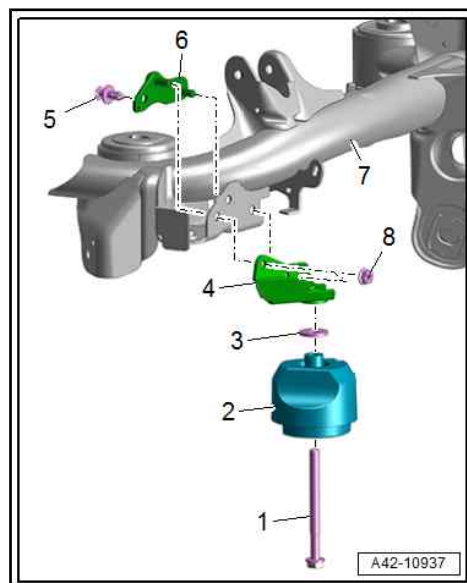
5 - Spreader rivet

6 - Bracket

7 - Subframe

8 - Nut

- ◆ Renew after removing
- ◆ 20 Nm +90°



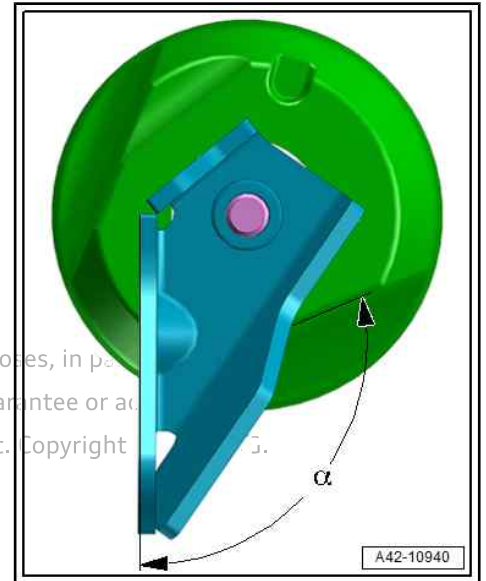


Vibration damper - installation position

- Align bracket with vibration damper.
- Angle $-\alpha-$ = $113 \pm 2^\circ$



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2.1.2 Exploded view - subframe, vehicles with four-wheel drive



Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ **DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.**
- ◆ **Always fit all bolts by hand; make the first few turns by hand.**



1 - Bolt

- ☐ Renew after removing

2 - Rear final drive

3 - Bump stop

- ☐ Equipment version

4 - Bolt

- ☐ Renew after removing
- ☐ 130 Nm +180°

5 - Bolt

6 - Bonded rubber bush (front)

- ☐ For subframe
- ☐ Removing and installing
⇒ [page 117](#)

7 - Subframe

- ☐ Equipment version with vibration damper
⇒ [page 109](#)
- ☐ Fixing position
⇒ [page 109](#)
- ☐ Removing and installing
⇒ [page 113](#)

8 - Spacer

- ☐ Not installed on all models

9 - Nut

- ☐ 20 Nm

10 - Bonded rubber bush (rear)

- ☐ For rear final drive
- ☐ Removing and installing
⇒ [page 124](#)
- ☐ Installation position ⇒ [page 109](#)

11 - Bolt

- ☐ Tightening torque ⇒ Final drive; Rep. gr. 39 ; Final drive; Exploded view - final drive

12 - Spacer

- ☐ Not installed on all models

13 - Bonded rubber bush (rear)

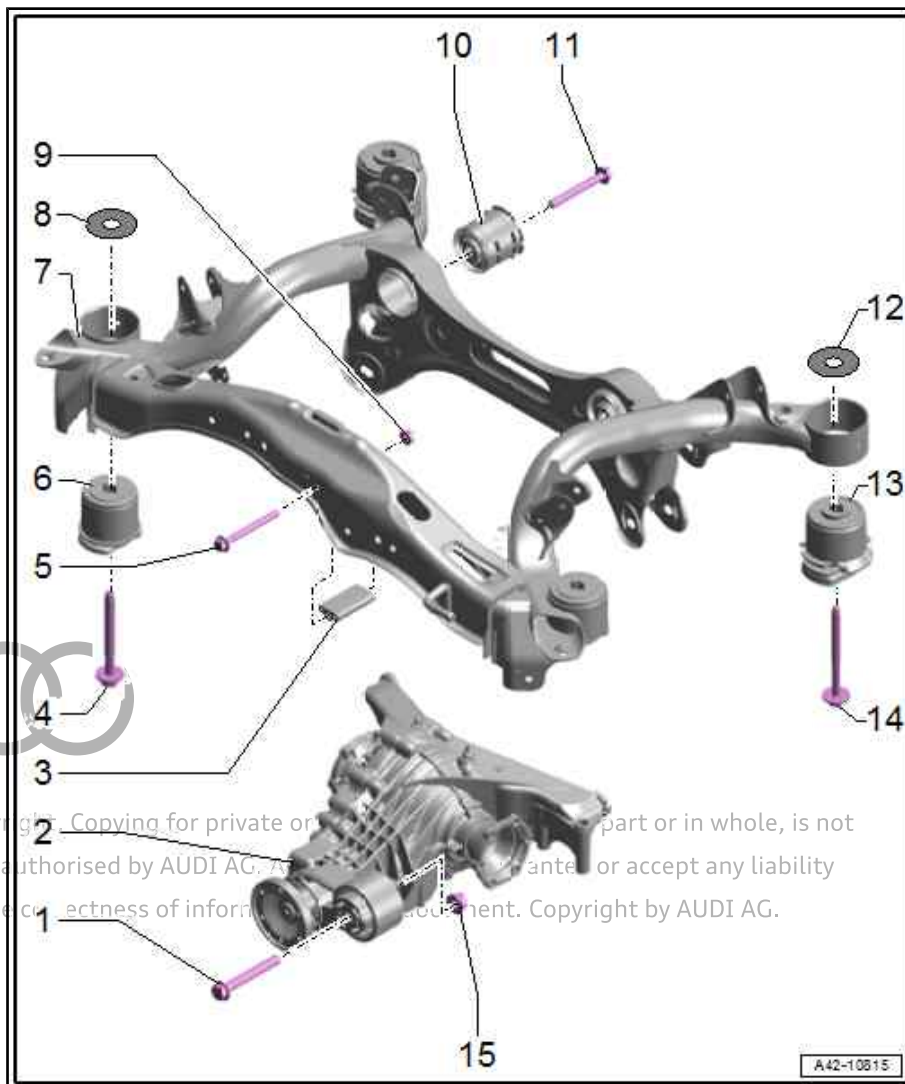
- ☐ For subframe
- ☐ Removing and installing ⇒ [page 121](#)

14 - Bolt

- ☐ Renew after removing
- ☐ 90 Nm +180°

15 - Nut

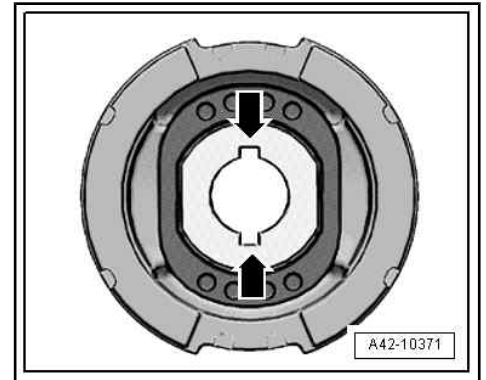
- ☐ Tightening torque ⇒ Final drive; Rep. gr. 39 ; Final drive; Exploded view - final drive





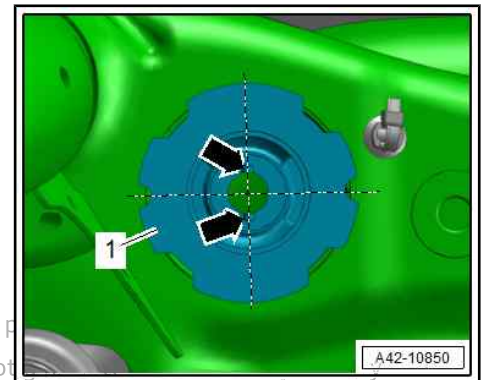
Installation position of front hydraulic bonded rubber bush for subframe

- Grooves -arrows- are perpendicular to direction of travel.



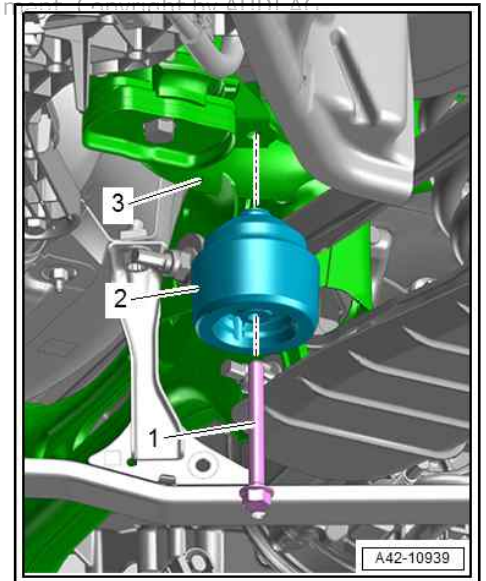
Installation position of rear bonded rubber bushes for rear final drive

- Grooves -arrows- on bonded rubber bush -1- should be vertical.



Equipment version with vibration damper

- 1 - Bolt
- ◆ Renew after removing
- ◆ 50 Nm +180°
- 2 - Vibration damper
- 3 - Subframe

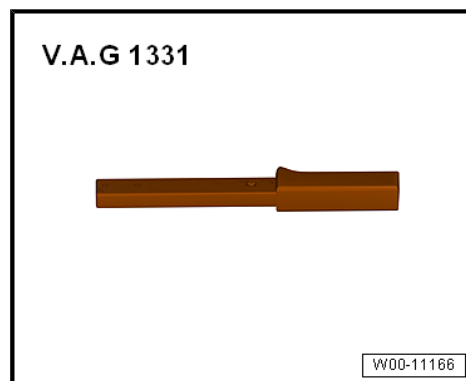


2.2 Fixing position of subframe

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



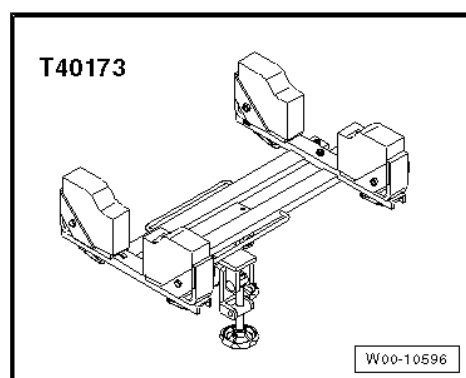
◆ Torque wrench - V.A.G 1332-



◆ Engine and gearbox jack - VAS 6931-



◆ Gearbox support - T40173-



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◆ Rear axle support - T10552-



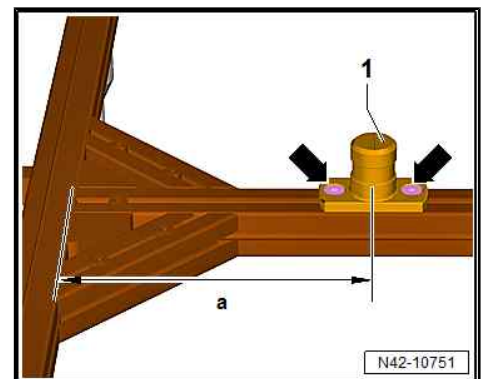
◆ Fastening device - T40327- (not illustrated)

Preparing tool

- Loosen bolts -arrows-.
- Set to dimension -a-.
- Dimension -a- = 250 mm
- Re-tighten bolts.

Procedure

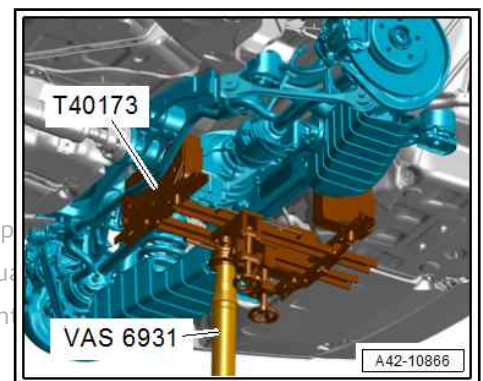
- Depending on equipment version: Remove diagonal strut on left and right ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing diagonal struts .
- Remove silencers ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Removing and installing silencers .
- Remove springs (left and right) ⇒ [page 145](#) .



Version with four-wheel drive with rear final drive installed:

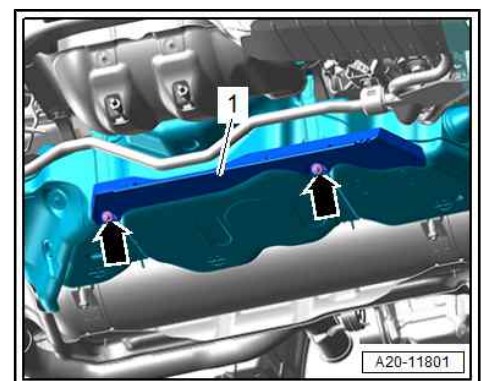
- Support weight of subframe by positioning engine and gearbox jack - VAS 6931- and gearbox support - T40173- as shown against rear final drive and subframe.

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Version with front-wheel drive, or four-wheel drive with rear final drive removed:

- Equipment version with natural gas system: Remove nuts -arrows- and detach wind deflector -1-.





- Where applicable, move anti-roll bar into installation position and secure with bolts.
- Position rear axle support - T10552- with engine and gearbox jack - VAS 6931- underneath subframe and raise.
- Position support - T10552/2- so that it makes contact with anti-roll bar.
- Screw mounting pins - T10552/1- into rear holes in subframe so that they make contact; to do so, turn threaded sleeve on left and right.

Continued:

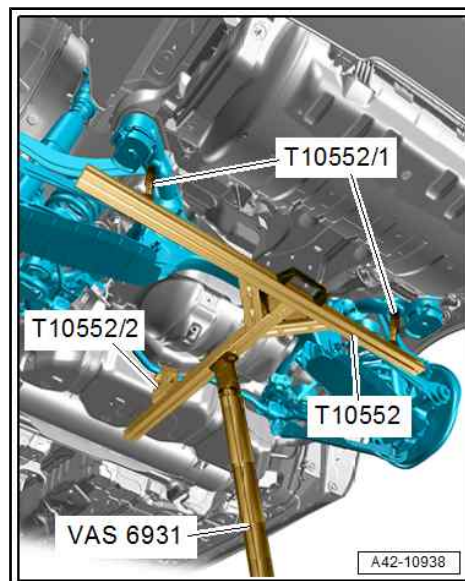
- Secure subframe to engine and gearbox jack using tensioning strap.



Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ ***DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.***
- ◆ ***Always fit all bolts by hand; make the first few turns by hand.***



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- One after the other, remove bolt -2- on each side at rear of subframe and screw in a locating pin for locating device - T40327- .



Note

If it is not possible to fit the locating pin, use a file to re-work the stop plate in the subframe in the area of the retaining lugs.

- Tighten locating pins to 20 Nm.
- The position of the subframe is now fixed.
- Unscrew bolts -1- (left and right) on subframe.

Removing locating pins -T40327-

Removal is performed in reverse sequence; note the following:



Caution

Risk of damage to threads of bolts securing subframe to body.

- ◆ **DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.**
- ◆ **Always fit all bolts by hand; make the first few turns by hand.**

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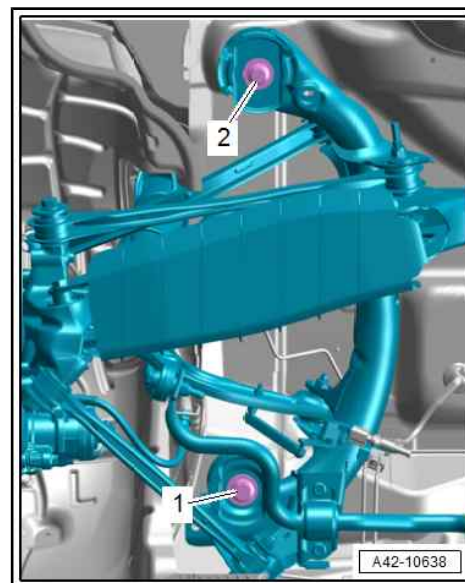


WARNING

Risk of accident!

- ◆ **All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.**

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- Install springs ⇒ [page 145](#) .
- Perform test drive after completing repair work. Wheel alignment must be checked and adjusted if the steering wheel is not straight ⇒ [page 210](#) .

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - subframe”, page 105](#)
- ◆ ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)

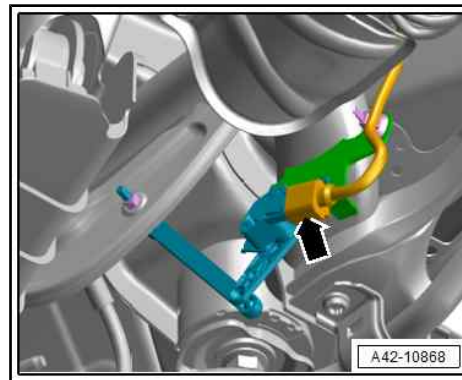
2.3 Removing and installing subframe

Removing

- Fix position of subframe ⇒ [page 109](#) .
- Remove brake calipers (rear) on both sides ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake caliper .

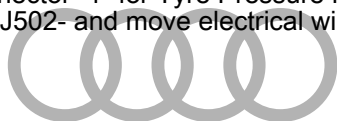


- Unplug electrical connector -arrow- from rear vehicle level sender on both sides and move wiring clear.

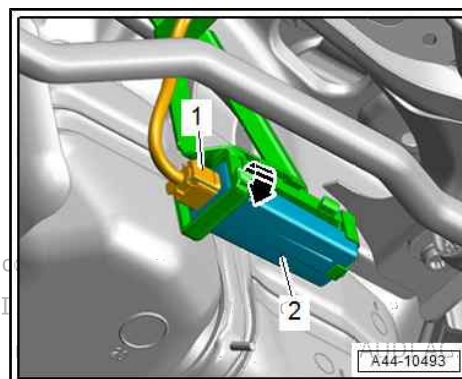


Equipment version with Tyre Pressure Monitoring System:

- Unplug electrical connector -1- for Tyre Pressure Monitoring System control unit - J502- and move electrical wiring clear.

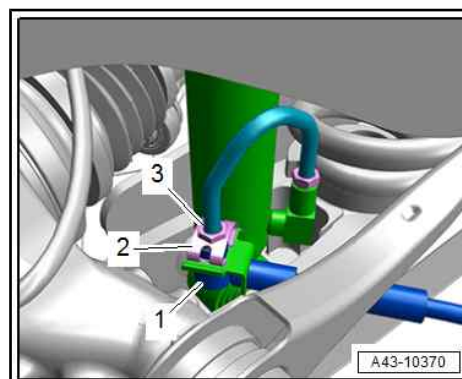


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Equipment version with Dynamic Ride Control (DRC):

- Discharge DRC system ➔ [page 196](#) .
- Remove union screw -2- and move hose -1- clear.
- Protect open connections from dirt.



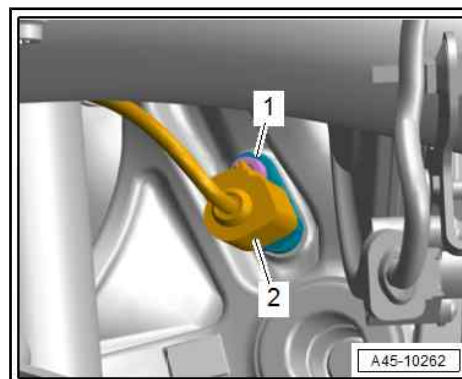
Version with front-wheel drive:

- Unplug electrical connector -2- (left and right) for speed sensor.



Note

Disregard -item 1-.





Version with four-wheel drive:

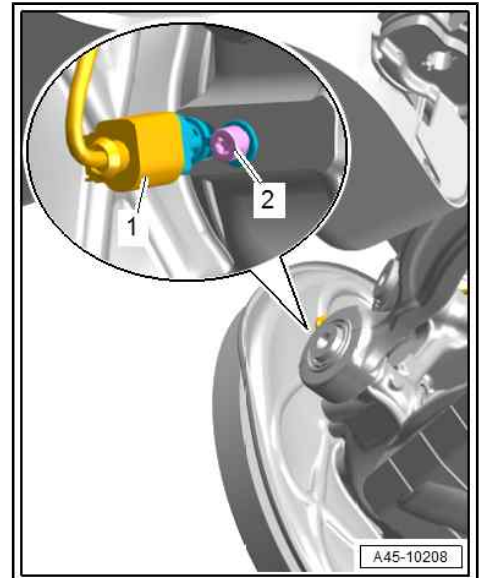
- Unplug electrical connector -1- (left and right) for speed sensor.



Note

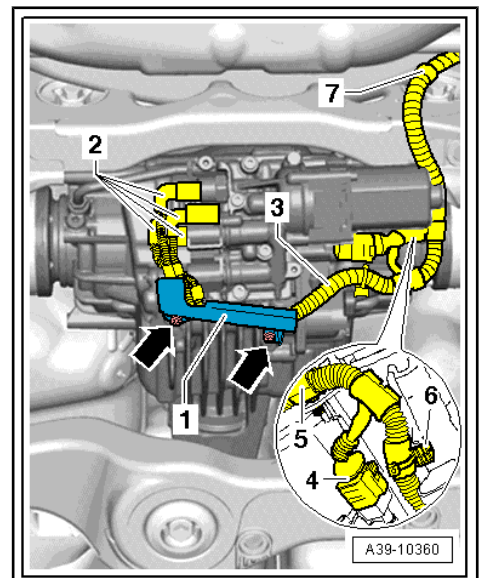
Disregard -item 2-.

- Disconnect propshaft from rear final drive and tie it up ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .



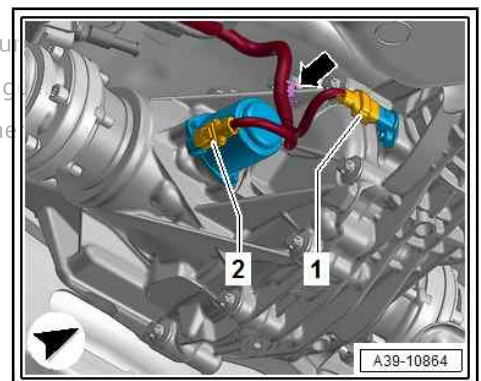
Final drive 0D3 “quattro sport”:

- Remove bolts -arrows- and detach bracket -1- from rear final drive.
- Unplug electrical connectors -2- for oil pressure and oil temperature sender and at clutch valves (mark allocation before unplugging).
- Unplug electrical connector -4- at all-wheel drive pump - V415- .
- Unclip electrical wiring harness -3- from final drive -items 5, 6, 7- and tie up.



Final drive 0B0 “quattro ultra”:

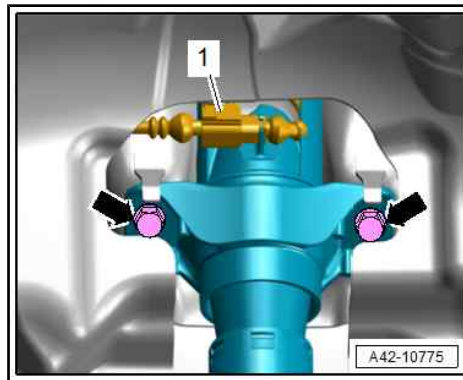
- Unplug electrical connectors -1, 2-.
- Detach wiring guide from final drive and move electrical wiring clear.





All versions (continued):

- On appropriate version: Unplug electrical connector -1-.
- Remove bolts -arrows- securing shock absorber at top.

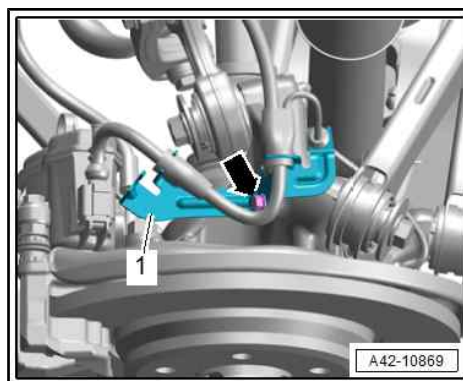


- Remove bolt -arrow- on both sides and move bracket -1- with electrical wiring clear.
- Lower subframe with engine and gearbox jack - VAS 6931- .



Note

When lowering the subframe, make sure there is enough clearance to the surrounding components.



Installing

Installation is carried out in reverse order; note the following:

- Tighten subframe bolts in diagonal sequence (do not tighten through specified angle yet).



WARNING

Risk of accident!

- ♦ *All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.*

- Perform test drive after completing repair work. Wheel alignment must be checked and adjusted if the steering wheel is not straight ⇒ [page 210](#) .

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - subframe”, page 105](#)
- ♦ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)
- ♦ ⇒ [“6.1 Exploded view - wheel bearing”, page 155](#)
- ♦ ⇒ [“1 Wheels, tyres”, page 205](#)

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2.4 Servicing subframe

⇒ [“2.4.1 Renewing front hydraulic bonded rubber bush for subframe”, page 117](#)

⇒ [“2.4.2 Renewing rear bonded rubber bush for subframe”, page 121](#)

⇒ [“2.4.3 Removing and installing rear bonded rubber bushes for rear final drive”, page 124](#)

2.4.1 Renewing front hydraulic bonded rubber bush for subframe



Note

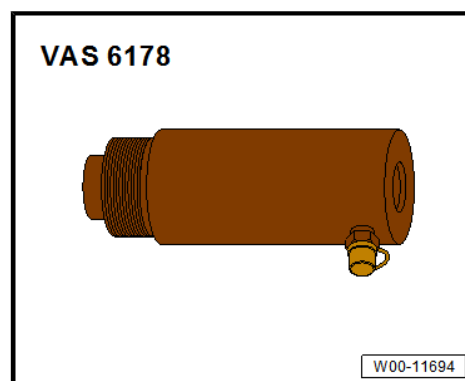
- ◆ *If a bonded rubber bush on one side is defective, the bush on the other side must be renewed at the same time. For correct version refer to ⇒ [Electronic parts catalogue](#) .*
- ◆ *Also check the other bushes before renewing a defective bonded rubber bush.*
- ◆ *If cracks, oil stains or other damage is visible, these bonded rubber bushes must also be renewed.*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



- ◆ Hydraulic cylinder - VAS 6178-



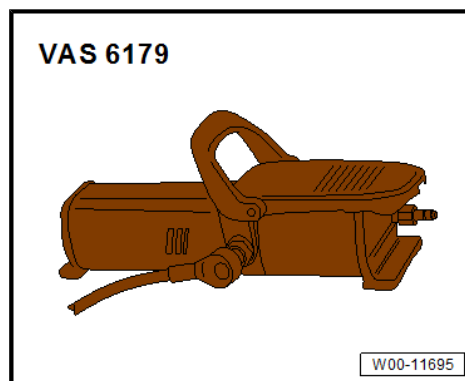


◆ Foot pump - VAS 6179-



◆ Assembly tool - T10205A-

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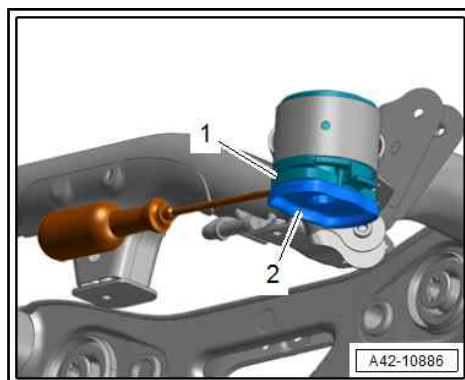


◆ Assembly tool - T40328- (not illustrated)

◆ Assembly tool - T40373- (not illustrated)

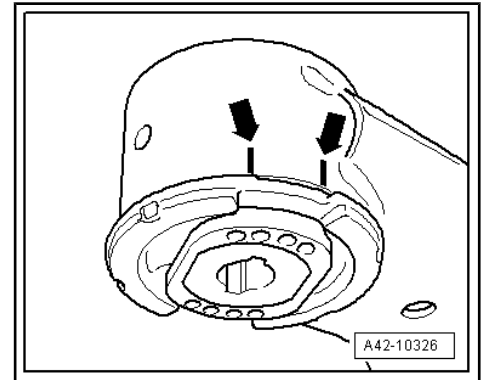
Removing

- Remove wheels ⇒ [page 205](#) .
- Depending on equipment version: Remove diagonal struts ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing diagonal struts .
- Exhaust system without cutting point, or equipment version with natural gas system: Remove silencers ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Removing and installing silencers .
- Exhaust system with cutting point: Remove exhaust pipe ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers .
- Remove springs (left and right) ⇒ [page 145](#) .
- Remove anti-roll bar ⇒ [page 126](#) .
- Remove lower transverse link (front) ⇒ [page 136](#) .
- Prise locating element -2- off bonded rubber bush on alternate sides in area of retaining lugs using a screwdriver.
- Version with plastic insert: Prise plastic insert -1- off bonded rubber bush.

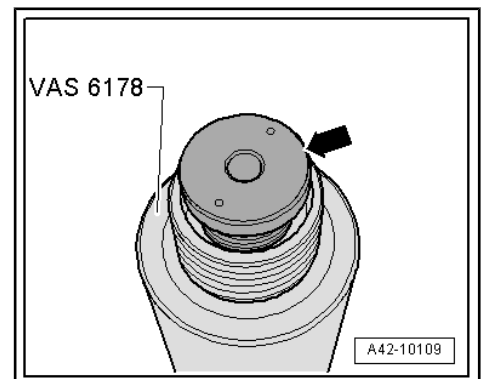




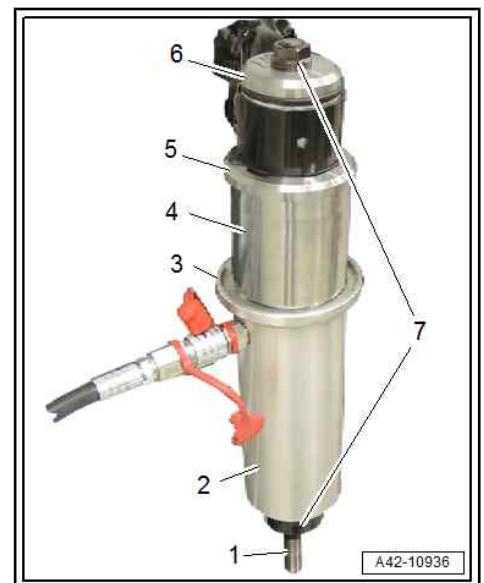
- Mark installation position of hydraulic bonded rubber bush in relation to subframe -arrows- using a felt-tip pen or similar.



- If necessary, unscrew small-diameter support -arrow- from hydraulic press -VAS 6178- and screw in support T10205/13 in its place.



- Set up special tools as shown.
- 1 - Spindle -T10205/8-1-
- 2 - Hydraulic cylinder - VAS 6178-
- 3 - Support ring -T40328/3-
- 4 - Tube -T40373/3-
- 5 - Support ring -T40373/2- . Tapered end faces upwards and projections engage in recesses in bonded rubber bush.
- 6 - Thrust piece -T40373/6- . May be reversible (depending on bonded rubber bush).
- 7 - Nuts -T10205/8-2-



WARNING

Risk of injury if parts are allowed to drop out

- ◆ *Hold hydraulic cylinder - VAS 6178- securely during pressing operation.*



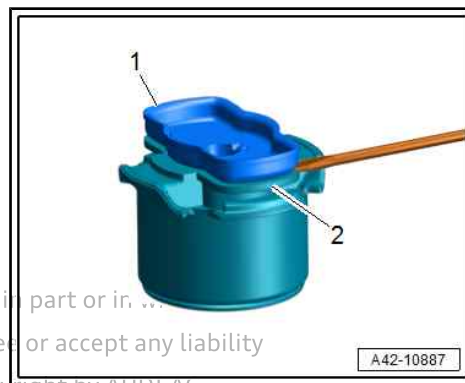
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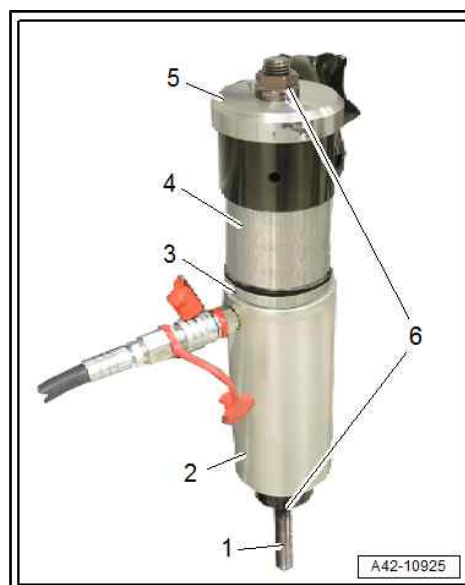
Installing

- Prise locating element -1- off new bonded rubber bush using a screwdriver on alternate sides.
- Version with plastic insert: Prise plastic insert -2- off bonded rubber bush.

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- Set up special tools as shown.
- 1 - Spindle -T10205/8-1-
- 2 - Hydraulic cylinder - VAS 6178-
- 3 - Thrust piece -T40328/10-
- 4 - Bonded rubber bush. Installation position ⇒ [page 109](#) .
- 5 - Thrust piece -T40373/5-
- 6 - Nuts -T10205/8-2-
- Align bonded rubber bush according to markings made earlier and press in at the correct position until collar is flush with subframe bushing.



Note

- ♦ *If necessary, slacken using foot pump - VAS 6179- and then press home again.*
- ♦ *Ensure that the bonded rubber bush remains straight when you begin pressing it in, otherwise the outer ring may be damaged.*
- Ends of rubber beads on bonded rubber bush must align with markings -arrows- made earlier on subframe.

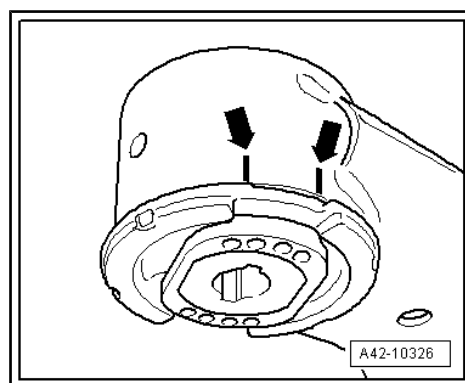


Note

Repair any paint damage created on subframe with anti-corrosion coating, primer and black topcoat.

- Fit plastic insert and locating element on hydraulic bonded rubber bush.

The remaining installation steps are carried out in the reverse sequence.



Tightening torques

- ♦ ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts



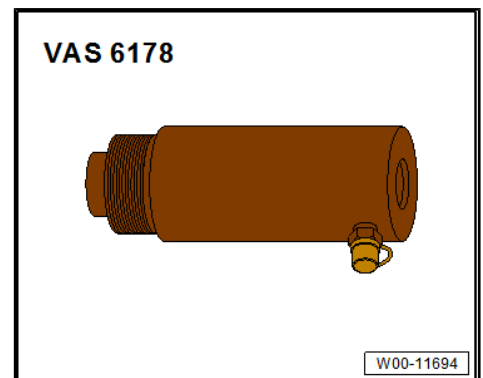
2.4.2 Renewing rear bonded rubber bush for subframe

Special tools and workshop equipment required

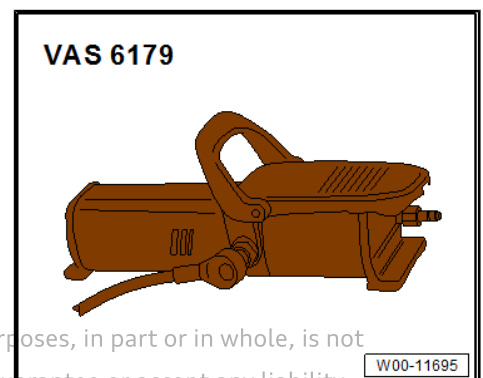
- ◆ Torque wrench - V.A.G 1332-



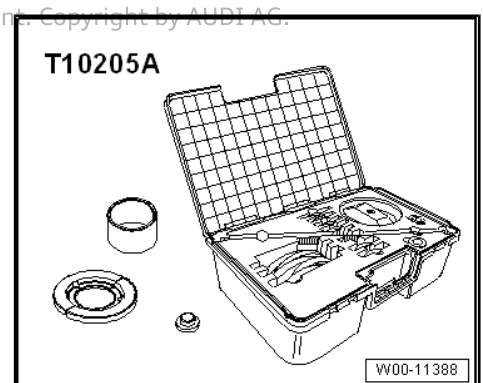
- ◆ Hydraulic cylinder - VAS 6178-



- ◆ Foot pump - VAS 6179-



- ◆ Assembly tool - T10205A-



- ◆ Assembly tool - T40328- (not illustrated)

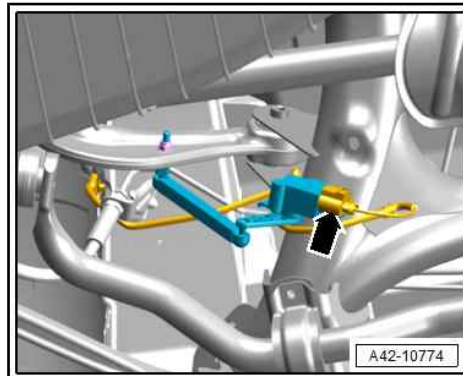
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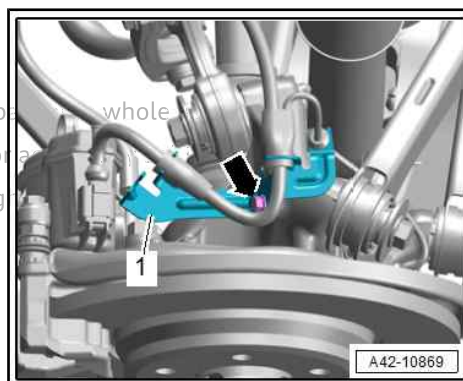
- ◆ Assembly tool - T40328- (not illustrated)

Removing

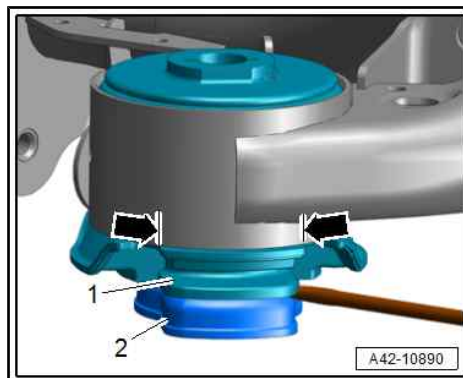
- Disconnect propshaft from rear final drive and tie it up ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- Unplug electrical connector -arrow- from rear vehicle level sender on both sides and move wiring clear.
- On relevant versions: Move electrical wiring for rear wheel steering control unit - J1019- and roll stabiliser control unit 2 - J1096- clear at body.



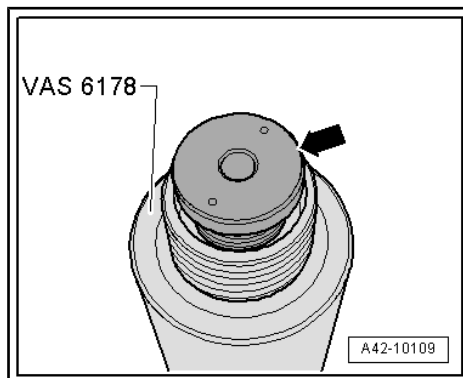
- Remove bolt -arrow- on both sides and move bracket -2- with electrical wiring clear.
- Fix position of subframe ⇒ [page 109](#).
- Lower subframe by a maximum of 100 mm (in total).



- Prise locating element -2- off bonded rubber bush on alternate sides in area of retaining lugs using a screwdriver.
- Prise plastic insert -1- off bonded rubber bush.
- Mark installation position of bonded rubber bush in relation to subframe -arrows- using a felt-tip pen or similar.



- If necessary, unscrew small-diameter support -arrow- from hydraulic press - VAS 6178- and screw in support T10205/13 in its place.





– Set up special tools as shown.

- 1 - Spindle -T10205/8-1-
- 2 - Hydraulic cylinder - VAS 6178-
- 3 - Support ring -T40328/3-
- 4 - Tube -T40328/1-
- 5 - Support ring -T40373/1- . Tapered end faces upwards and projections engage in recesses in bonded rubber bush.
- 6 - Thrust piece -T40328/10-
- 7 - Nuts -T10205/8-2-

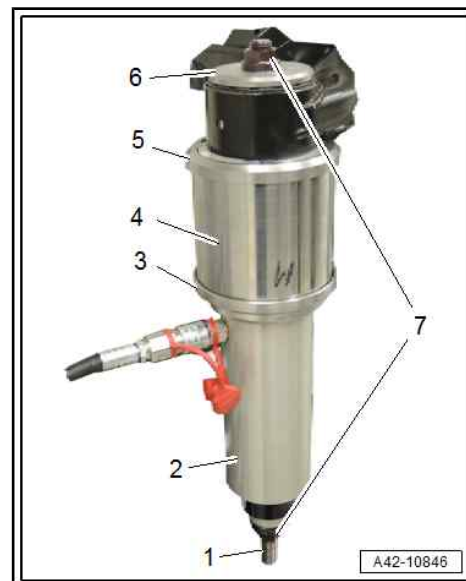


WARNING

Risk of injury if parts are allowed to drop out

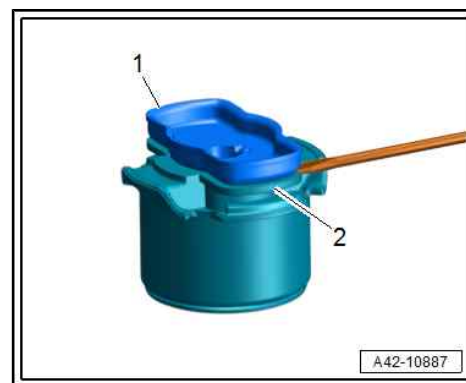
◆ *Hold hydraulic cylinder - VAS 6178- securely during pressing operation.*

◆ *The bonded rubber bush will release suddenly from the subframe when it is pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



Installing

- Prise locating element -1- off new bonded rubber bush on alternate sides in area of retaining lugs -arrows- using a screwdriver.
- Prise plastic insert off bonded rubber bush.





- Set up special tools as shown.
- 1 - Spindle -T10205/8-1-
- 2 - Hydraulic cylinder - VAS 6178-
- 3 - Support ring -T40328/3-
- 4 - Thrust piece -T40373/4- . Projections must engage in recesses in bonded rubber bush
- 5 - Bonded rubber bush
- 6 - Thrust piece -T40328/9-
- 7 - Nuts -T10205/8-2-
- Align bonded rubber bush according to markings made earlier and press in at the correct position until collar is flush with subframe bushing.



Note

- ♦ *If necessary, slacken cylinder and then press home again.*
- ♦ *Ensure that the bonded rubber bush remains straight when you begin pressing it in, otherwise the outer ring may be damaged.*
- Ends of rubber beads on bonded rubber bush must align with markings -arrows- made earlier on subframe.

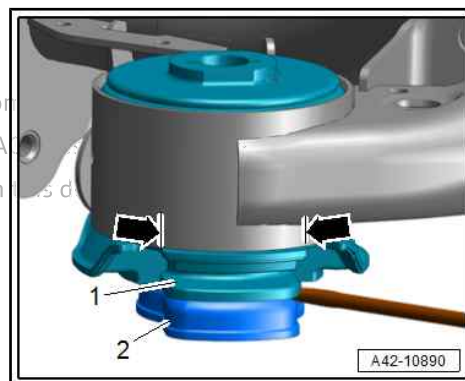
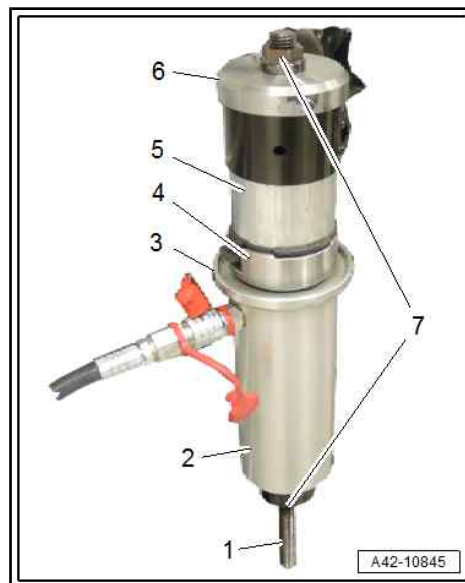


Note

Repair any paint damage created on subframe with anti-corrosion coating, primer and black topcoat.

- Fit plastic insert and locating element on hydraulic bonded rubber bush.

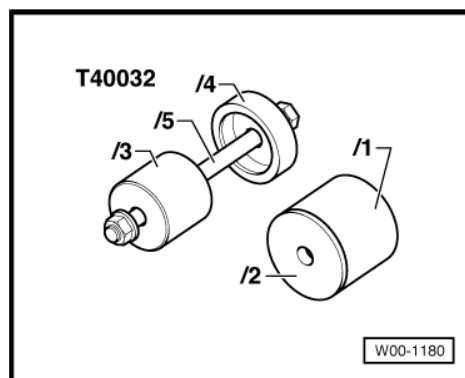
The remaining installation steps are carried out in the reverse sequence.



2.4.3 Removing and installing rear bonded rubber bushes for rear final drive

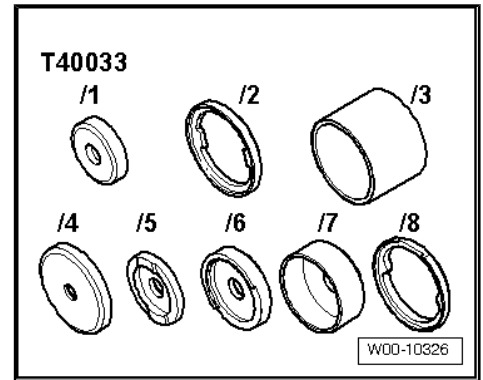
Special tools and workshop equipment required

- ♦ Assembly tool - T40032-



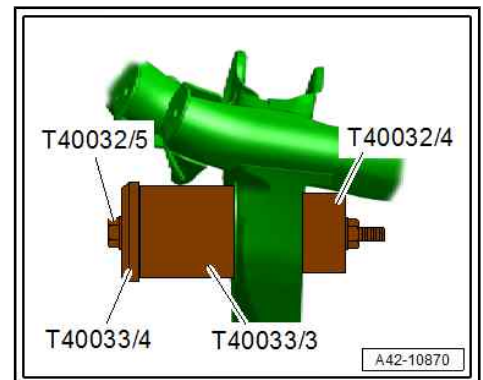


◆ Assembly tool - T40033-



Removing

- Version with four-wheel drive: Remove rear final drive ⇒ Final drive; Rep. gr. 39 ; Final drive; Removing and installing final drive .
- Remove subframe ⇒ [page 113](#) .
- Set up assembly tool - T40032- and assembly tool - T40033- at bonded rubber bush and subframe, as shown.
- Pull bonded rubber bush out of subframe.

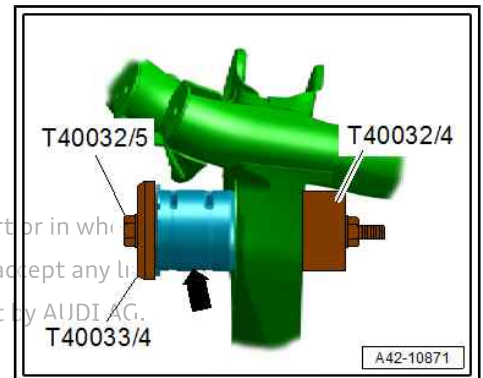


Installing

- Set up assembly tool - T40032- and assembly tool - T40033- at bonded rubber bush and subframe, as shown in illustration.
- Pull bonded rubber bush into subframe as far as stop.

The remaining installation steps are carried out in the reverse sequence.

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3 Anti-roll bar

⇒ "3.1 Exploded view - anti-roll bar", page 126

⇒ "3.2 Removing and installing anti-roll bar", page 126

⇒ "3.3 Removing and installing coupling rod", page 127

3.1 Exploded view - anti-roll bar

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1 - Bolt
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- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ Tighten alternately in stages
- ☐ Tightening torques

◆ All vehicles except for all-road: 25 Nm +90°

◆ allroad: 15 Nm +180°

2 - Clamp

3 - Anti-roll bar

- ☐ Removing and installing ⇒ [page 126](#)
- ☐ Do not remove rubber bush from anti-roll bar

4 - Subframe

5 - Nut

- ☐ Renew after removing

6 - Upper transverse link (front)

7 - Bolt

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 40 Nm +180°

8 - Coupling rod

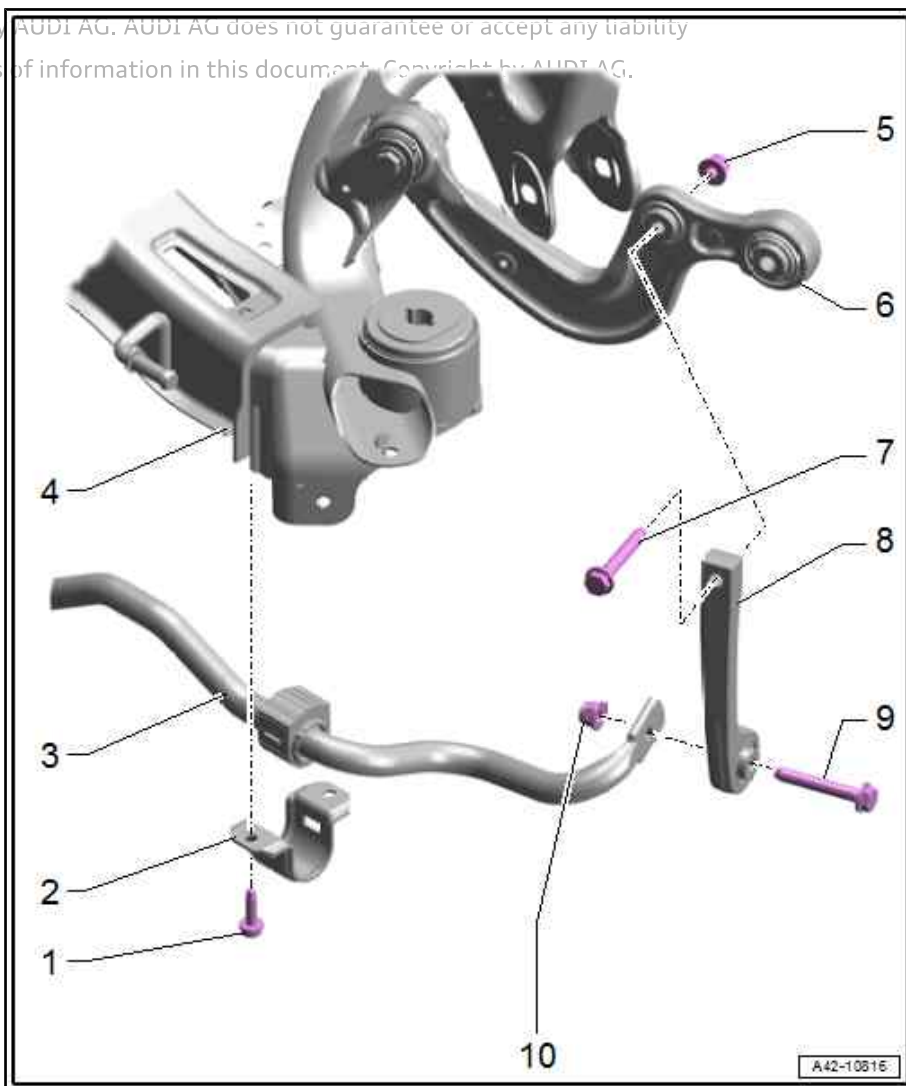
- ☐ Removing and installing ⇒ [page 127](#)

9 - Bolt

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 40 Nm +180°

10 - Nut

- ☐ Renew after removing

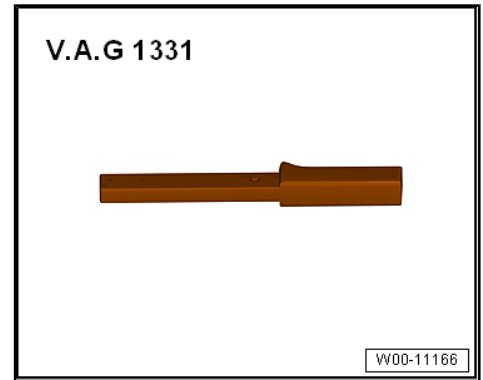


3.2 Removing and installing anti-roll bar

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-



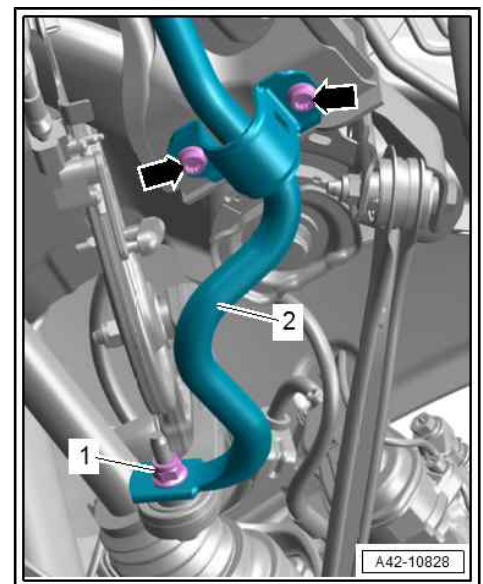
Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Depending on equipment version: Remove diagonal strut
(right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ;
Underbody trim; Removing and installing diagonal struts .
- Remove bolts -arrows- on both sides.
- Separate bolted connection -1- on both sides and detach anti-
roll bar -2-.



Note

Illustration shows installation position on a vehicle with four-wheel drive as an example.



Installing

Installation is carried out in reverse sequence.

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - anti-roll bar”, page 126](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts

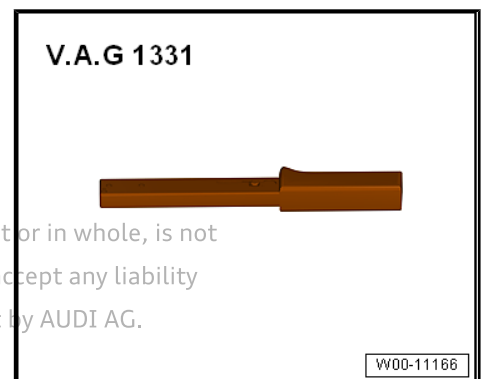
3.3 Removing and installing coupling rod

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



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Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Remove bolts -1, 3- and detach coupling rod -2-.



Note

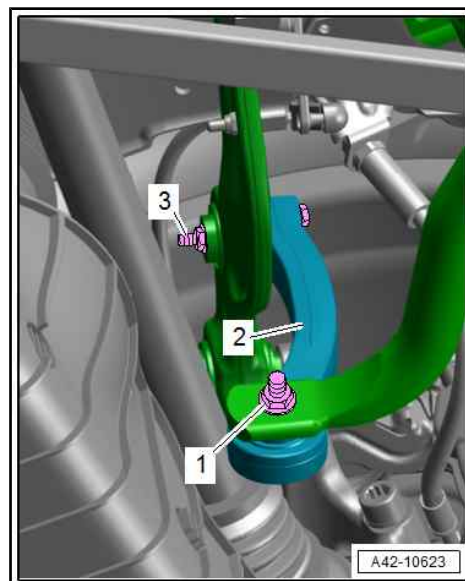
Illustration shows installation position on a vehicle with four-wheel drive as an example.

Installing

Installation is carried out in reverse sequence.

Tightening torques

- ♦ ⇒ [“3.1 Exploded view - anti-roll bar”, page 126](#)



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4 Suspension links, track rod

⇒ ["4.1 Exploded view - transverse links", page 129](#)

⇒ ["4.2 Removing and installing upper transverse links", page 132](#)

⇒ ["4.3 Removing and installing lower transverse links", page 134](#)

⇒ ["4.4 Removing and installing track rod", page 138](#)

4.1 Exploded view - transverse links

Upper transverse links ⇒ [page 129](#)

Lower transverse links ⇒ [page 130](#)

Upper transverse links

1 - Wheel bearing housing

2 - Bolt

- ☐ Renew after removing
- ☐ 70 Nm +180°

3 - Upper transverse link (front)

- ☐ Removing and installing
⇒ [page 132](#)
- ☐ Installation position
⇒ [page 130](#)

4 - Eccentric bolt

5 - Subframe

6 - Bolt

- ☐ Renew after removing
- ☐ Tighten in unladen position
⇒ [page 10](#)
- ☐ 40 Nm +180°

7 - Nut

- ☐ Renew after removing

8 - Nut

- ☐ Renew after removing

9 - Bolt

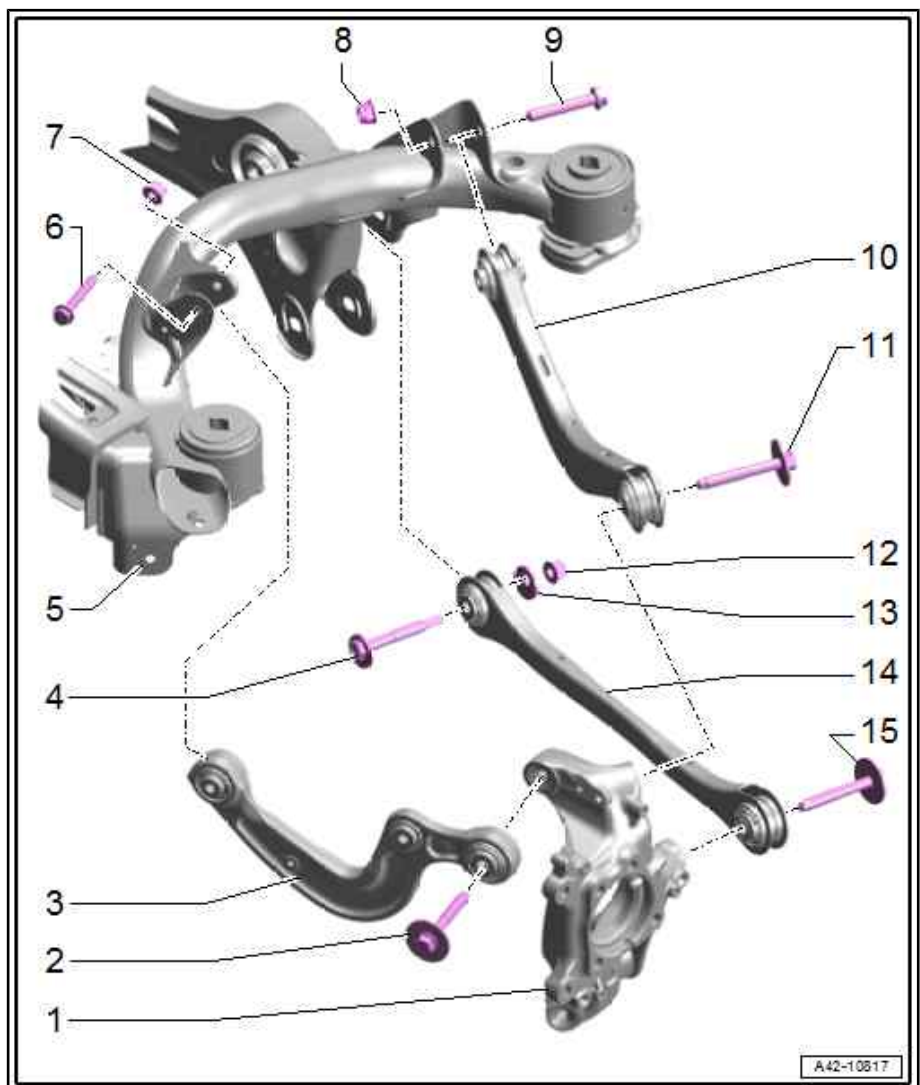
- ☐ Renew after removing
- ☐ Tighten in unladen position
⇒ [page 10](#)
- ☐ 70 Nm +180°

10 - Upper transverse link (rear)

- ☐ Removing and installing
⇒ [page 133](#)
- ☐ Installation position ⇒ [page 130](#)

11 - Bolt

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 70 Nm +180°





12 - Nut

- ☐ Renew after removing
- ☐ Loosen and tighten with a multi-point socket (21 mm)
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 90 Nm

13 - Eccentric washer

14 - Track rod

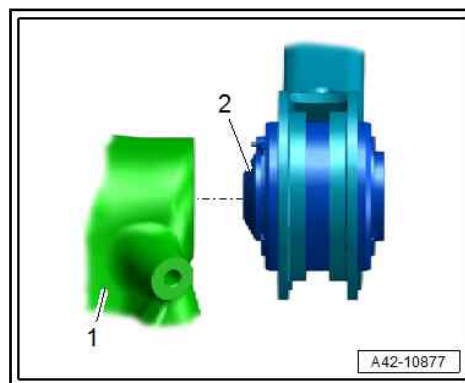
- ☐ Removing and installing ⇒ [page 138](#)
- ☐ Installation position ⇒ [page 130](#)

15 - Bolt

- ☐ Renew after removing
 - ☐ Tighten in unladen position ⇒ [page 10](#)
 - ☐ 70 Nm +180°
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Installation position of transverse link and track rod

- The tapered side -2- of the transverse link and the track rod must engage in the wheel bearing housing -1-.



Lower transverse links



1 - Wind deflector

- ☐ Not on all versions

2 - Bolt

- ☐ Renew after removing

3 - Lower transverse link (front)

- ☐ Removing and installing
⇒ [page 136](#)
- ☐ Installation position
⇒ [page 130](#)

4 - Wind deflector

5 - Eccentric bolt

6 - Subframe

7 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 40 Nm +180°

8 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ Loosen and tighten with a multi-point socket (21 mm)
- ☐ 140 Nm

9 - Eccentric washer

10 - Lower transverse link (rear)

- ☐ Removing and installing
⇒ [page 134](#)

11 - Spreader rivet

12 - Bolt

- ☐ Renew after removing

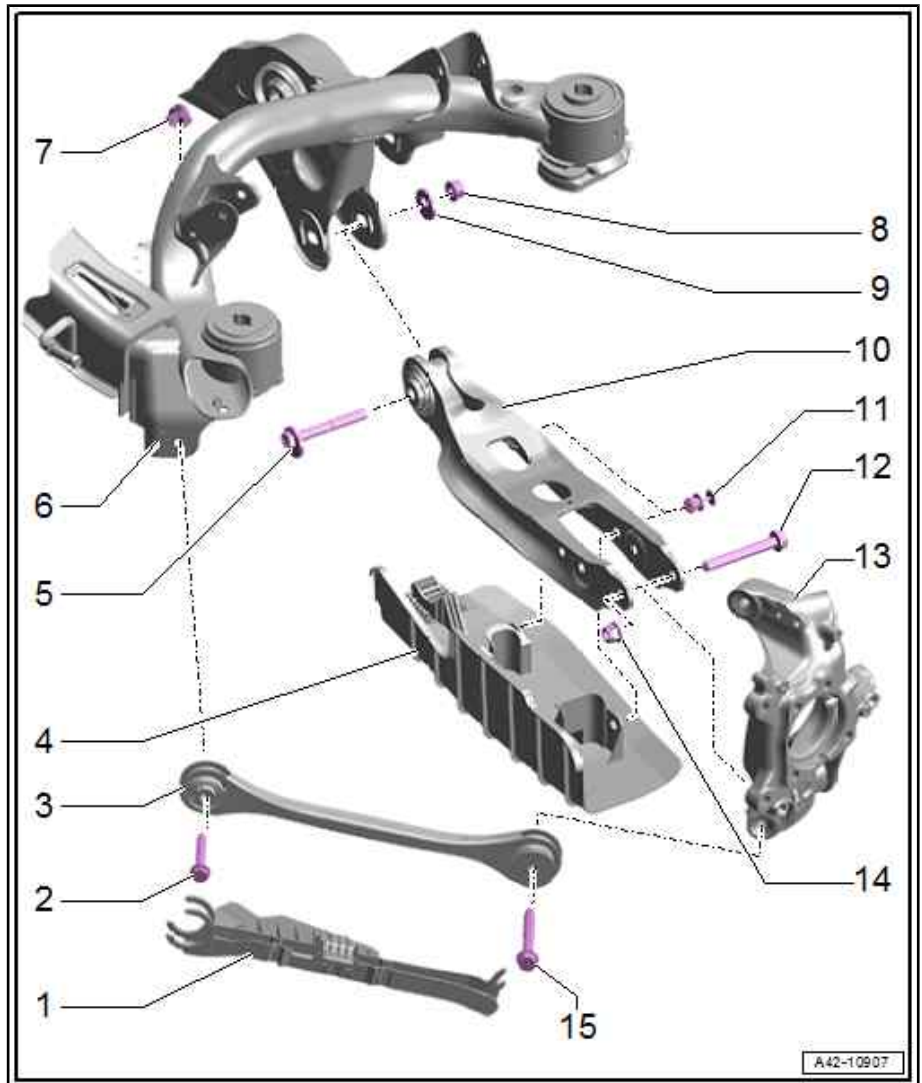
13 - Wheel bearing housing

14 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 70 Nm +180°

15 - Bolt

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 70 Nm +180°





4.2 Removing and installing upper transverse links

⇒ [“4.2.1 Removing and installing upper transverse link \(front\)”, page 132](#)

⇒ [“4.2.2 Removing and installing upper transverse link \(rear\)”, page 133](#)

4.2.1 Removing and installing upper transverse link (front)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



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Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Version with front-wheel drive: Lower subframe without removing brake caliper and shock absorber ⇒ [page 113](#) .
- Version with four-wheel drive: Remove subframe
⇒ [page 113](#) .

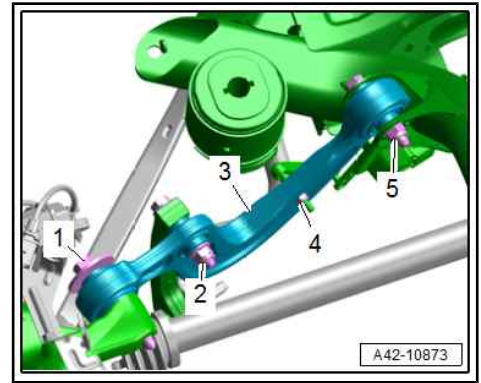


- Detach bolted connections -2, 4, 5-.
- Remove bolt -1- and detach upper transverse link -3-.

Installing

Installation is carried out in reverse order; note the following:

- Installation position ➔ [page 130](#) .
- Screw in bolts initially until they make contact, but do not tighten to final torque yet.
- Install subframe ➔ [page 113](#) .



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ➔ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ➔ [page 213](#)
- Adjust headlights ➔ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Calibrate front camera for driver assist systems ➔ [page 239](#) .

Tightening torques

- ◆ ➔ [“4.1 Exploded view - transverse links”, page 129](#)
- ◆ ➔ [“3.1 Exploded view - anti-roll bar”, page 126](#)
- ◆ ➔ [“2.2 Exploded view - rear vehicle level senders”, page 187](#)

4.2.2 Removing and installing upper transverse link (rear)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

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Removing

- Before commencing work, determine unladen position ➔ [page 10](#) .
- Version with front-wheel drive: Lower subframe without removing brake caliper and shock absorber ➔ [page 113](#) .
- Version with four-wheel drive: Remove subframe ➔ [page 113](#) .



- Detach bolt connection -3-.
- Remove bolt -1- and detach upper transverse link -2-.

Installing

Installation is carried out in reverse order; note the following:

- Installation position ⇒ [page 130](#) .
- Screw in bolts initially until they make contact, but do not tighten to final torque yet.
- Install subframe ⇒ [page 113](#) .



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ♦ ⇒ ["4.1 Exploded view - transverse links", page 129](#)

4.3 Removing and installing lower transverse links

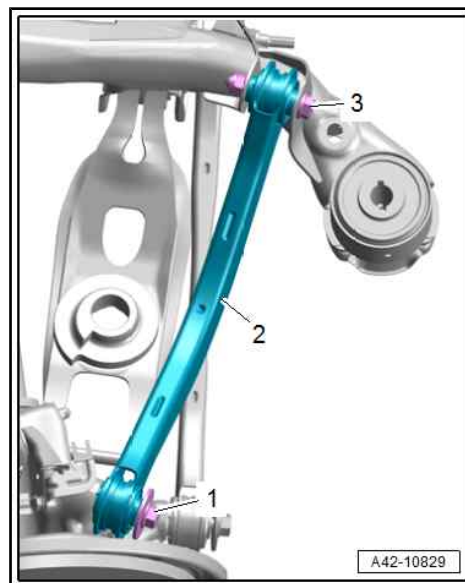
⇒ ["4.3.1 Removing and installing lower transverse link \(rear\)", page 134](#)

⇒ ["4.3.2 Removing and installing lower transverse link \(front\)", page 136](#)

4.3.1 Removing and installing lower transverse link (rear)

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-





◆ Engine and gearbox jack - VAS 6931-



◆ Support - T10149-



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Removing

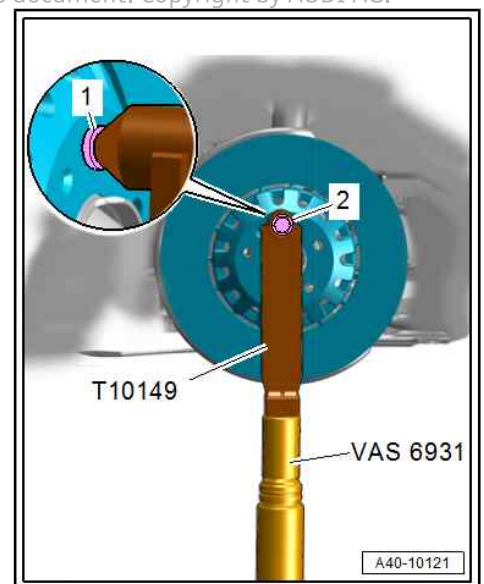
- Before commencing work, determine unladen position ⇒ [page 10](#) .
- Remove spring ⇒ [page 145](#) .
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.



Note

Disregard -item 1-.

- Use engine and gearbox jack - T10149- attached to support - VAS 6931- to raise wheel bearing housing slightly so that bolts can be removed more easily.



WARNING

Risk of accident!

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



- Detach bolt connection -3-.
- Remove bolts -1, 4- and detach lower transverse link -2-.

Installing

Installation is carried out in reverse order; note the following:

- Screw in bolts initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

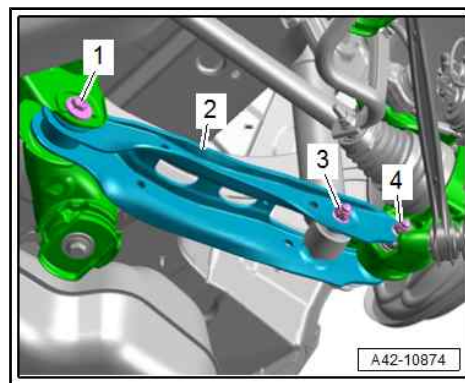
Tightening torques

- ◆ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)

4.3.2 Removing and installing lower transverse link (front)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



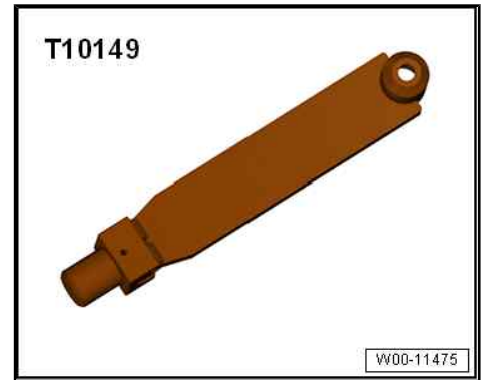
- ◆ Engine and gearbox jack - VAS 6931-



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◆ Support - T10149-



Removing Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not

- Before commencing work, determine unladen position ⇒ [page 10](#) .
- Remove rear wheel ⇒ [page 205](#) .
- Unfasten rear section of underbody trim (rear) and press down slightly ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.



Note

Disregard -item 1-.

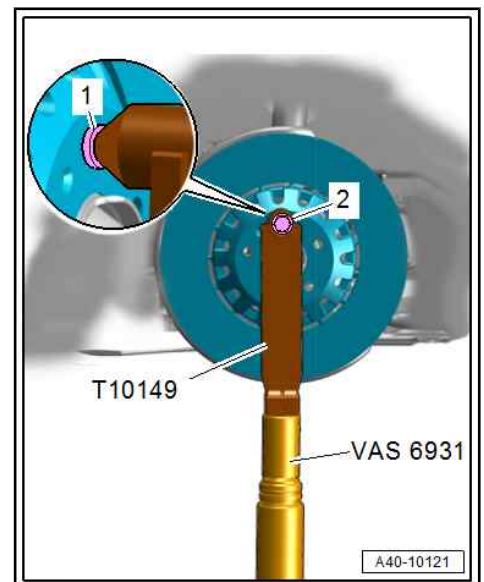
- Use engine and gearbox jack - T10149- attached to support - VAS 6931- to raise wheel bearing housing slightly so that bolts can be removed more easily.



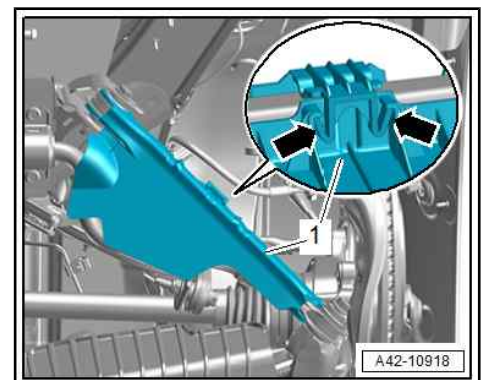
WARNING

Risk of accident!

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



- Depending on version: Release fasteners -arrows- and unclip wind deflector -1-.



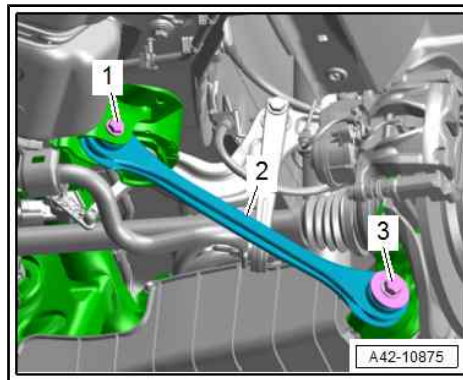


- Detach bolt connection -1- on left side of vehicle.
- Detach bolt connection -1- on right side of vehicle, fix position of subframe ⇒ [page 109](#) and lower.
- Remove bolt -3- and detach lower transverse link -2-.

Installing

Installation is carried out in reverse order; note the following:

- Installation position ⇒ [page 130](#) .
- Fix position of subframe on right side of vehicle/remove fastening device -T40327- ⇒ [page 109](#) .
- Screw in bolts initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)

4.4 Removing and installing track rod

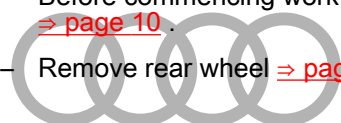
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



Removing

- Before commencing work, determine unladen position ⇒ [page 10](#) .
- Remove rear wheel ⇒ [page 205](#) .



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- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.



Note

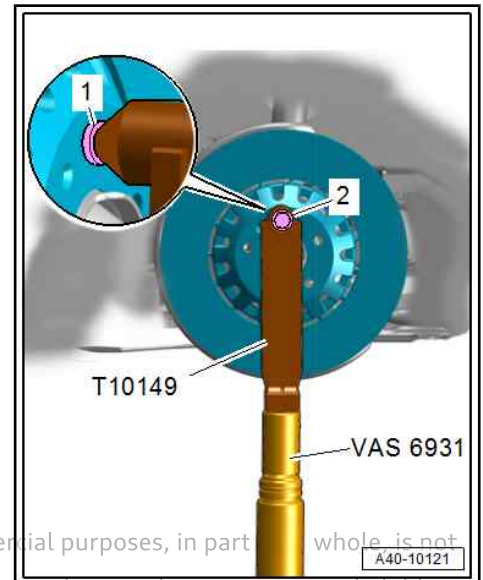
Disregard -item 1-.

- Use engine and gearbox jack - T10149- attached to support - VAS 6931- to raise wheel bearing housing slightly so that bolts can be removed more easily.

WARNING

Risk of accident!

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



- Remove bolt -1-, detach bolted connection -3- and detach track control link -2-.

Installing

Installation is carried out in reverse order; note the following:

- Installation position ⇒ [page 130](#) .
- Screw in bolts initially until they make contact, but do not tighten to final torque yet.



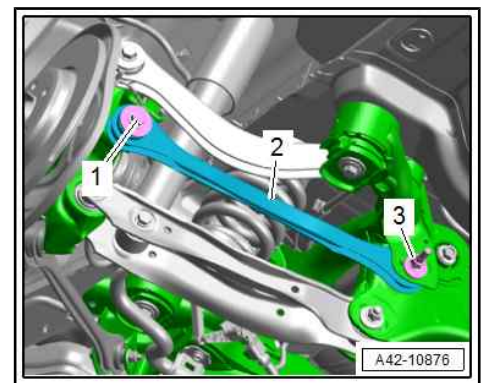
Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)





5 Suspension strut/shock absorber, spring

⇒ ["5.1 Exploded view - suspension strut/shock absorber, spring", page 140](#)

⇒ ["5.2 Removing and installing shock absorber", page 142](#)

⇒ ["5.3 Removing and installing spring", page 145](#)

5.1 Exploded view - suspension strut/shock absorber, spring

⇒ ["5.1.1 Exploded view - spring", page 140](#)

⇒ ["5.1.2 Exploded view - shock absorber", page 141](#)

5.1.1 Exploded view - spring

1 - Lower transverse link (rear)

- ❑ Removing and installing
⇒ [page 134](#)



WARNING

The transverse link must be renewed if its surface has been damaged as the result of a broken coil spring.

2 - Coil spring

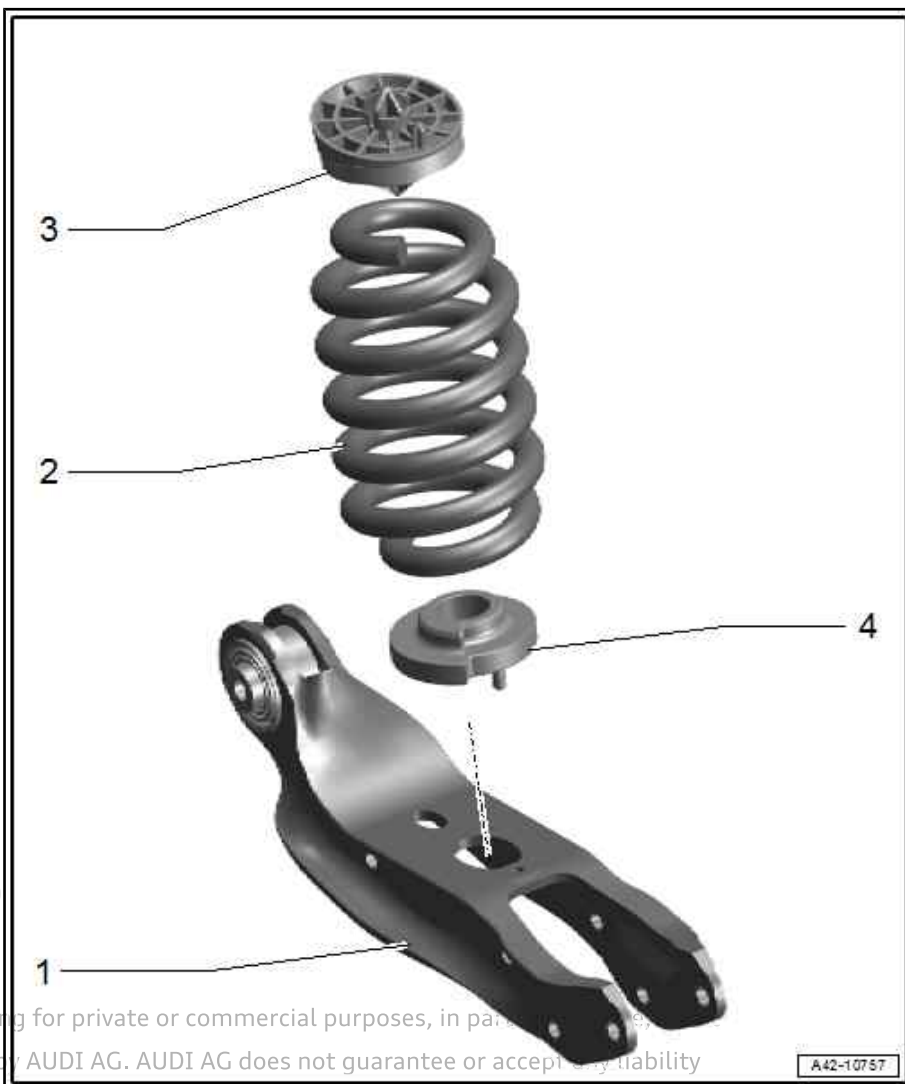
- ❑ Removing and installing
⇒ [page 145](#)
- ❑ Installation position
⇒ [page 141](#)

3 - Top spring seat

- ❑ Installation position
⇒ [page 141](#)

4 - Bottom spring seat

- ❑ Installation position
⇒ [page 141](#)

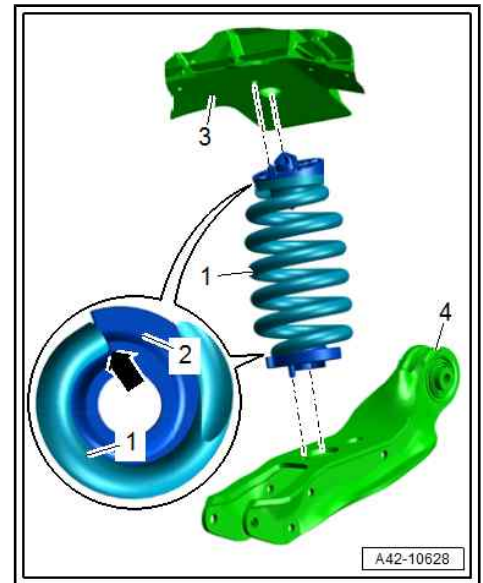


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Installation position of coil spring and spring plate

- The end of the spring -1- must be positioned against the stop on the spring plate -2- -arrow-.
- The positioning tabs on the spring plate must engage in the holes in the body -3- at the top, and in the holes in the transverse link (rear) -4- at the bottom, as shown in the illustration.



5.1.2 Exploded view - shock absorber

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1 - Nut

- ☐ Renew after removing
- ☐ Tighten in unladen position ⇒ [page 10](#)
- ☐ 70 Nm +180°

2 - Lower transverse link (rear)

3 - Shock absorber

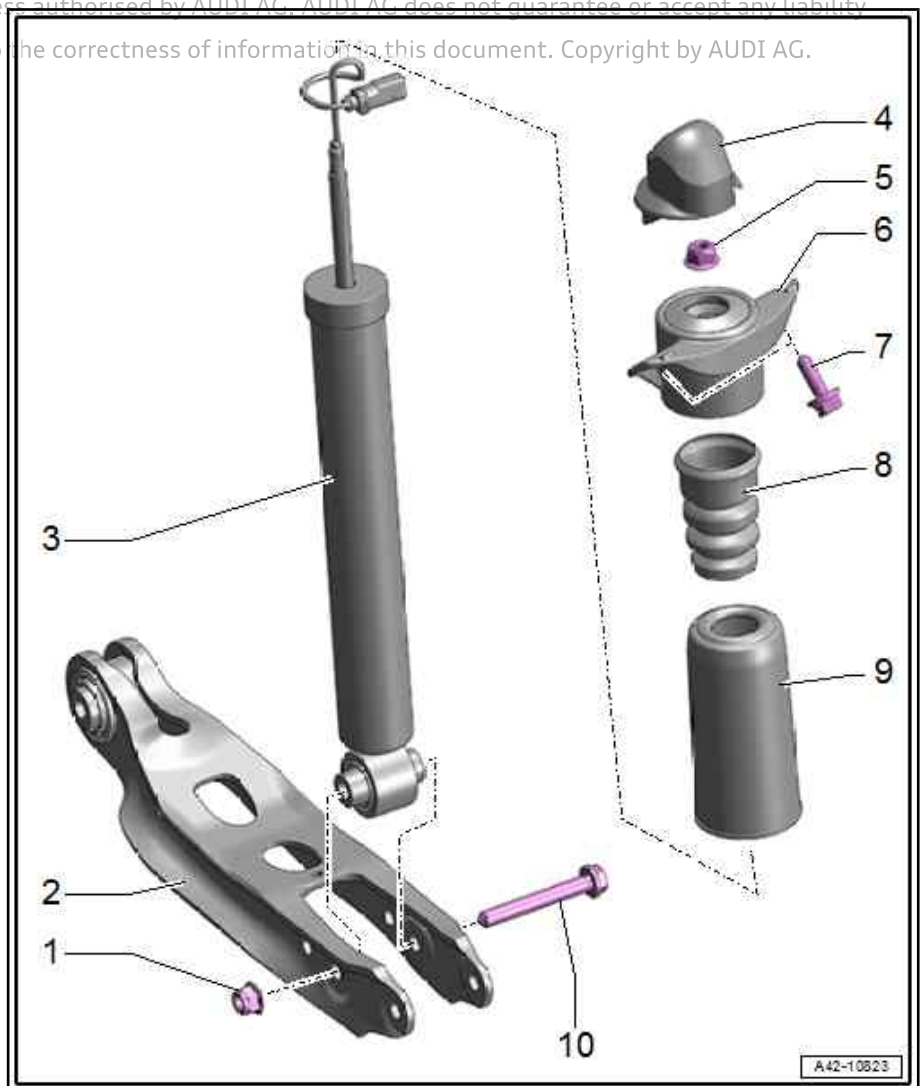
- ☐ Different versions; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 142](#)
- ☐ Degas and drain defective shock absorbers before disposal ⇒ [page 14](#)
- ☐ Checking shock absorber following removal ⇒ [page 4](#)
- ☐ For equipment version with electronic damping control: Re-adapt reference position after renewing ⇒ Vehicle diagnostic tester

4 - Cover

- ☐ For equipment version with electronic damping control: With fastener for electrical wire

5 - Nut

- ☐ Renew after removing
- ☐ 35 Nm





6 - Shock absorber mounting

- ❑ Removing and installing ⇒ [page 142](#)

7 - Bolt

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

8 - Auxiliary spring

9 - Protective sleeve

- ❑ Clipped into groove on auxiliary spring

10 - Bolt

- ❑ Renew after removing

Removing and installing shock absorber mounting

- Shock absorber removed

Equipment version with electronic damping control:

- Move electrical wire clear at cover.
- Release contacts and detach connector housing from electrical wire ⇒ Electrical system; General information; Rep. gr. 97 ; Releasing and dismantling connector housings .
- Disconnect wiring duct from nut.

All versions (continued):

- Set up special tools as shown.
- 1 - Insert tool - T10001/1- or -T10001/3-
- 2 - Ring spanner insert - V.A.G 1332/7-
- 3 - Counterhold tool -T40255- or -T10001/10-
- 4 - Electrical wire
- 5 - Ring spanner
- 6 - Torque wrench - V.A.G 1331-
- 7 - Shock absorber mounting

Tightening torques

- ◆ ⇒ [“5.1.2 Exploded view - shock absorber”, page 141](#)

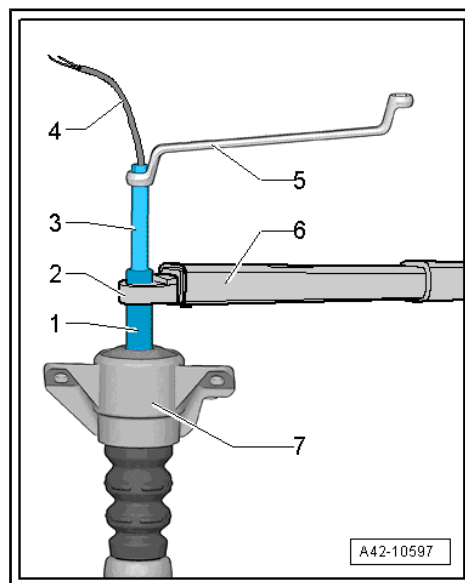
5.2 Removing and installing shock absorber



Note

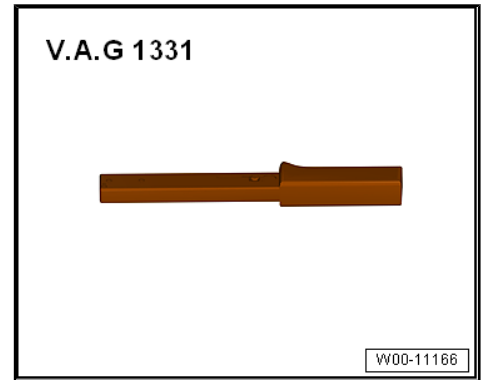
Because of the different shock absorber valve systems, shock absorbers on both sides of an axle should always be from the same manufacturer whenever possible.

Special tools and workshop equipment required





◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-

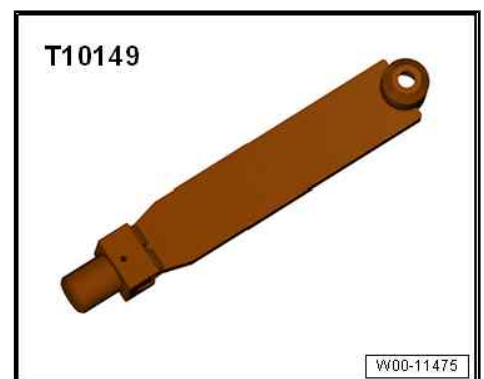
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◆ Engine and gearbox jack - VAS 6931-



◆ Support - T10149-

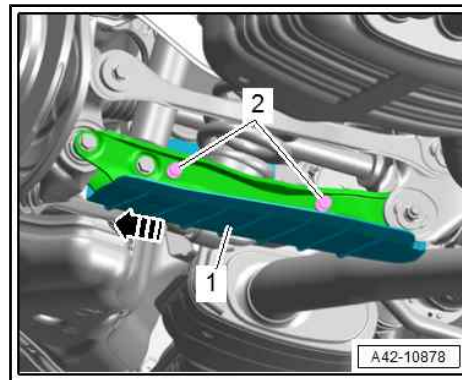


Removing

- Before commencing work, determine unladen position
⇒ [page 10](#) .
- Remove rear wheel ⇒ [page 205](#) .



- Detach spreader rivet -2-.
- Pull wind deflector -1- outwards slightly -arrow- and detach.



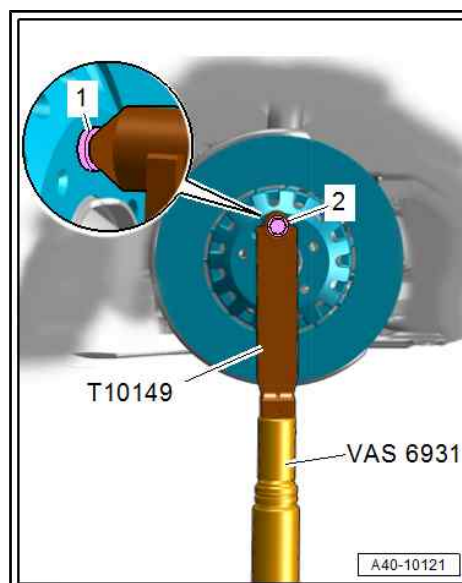
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.



Note

Disregard -item 1-.

- Fit support - T10149- in engine and gearbox jack - VAS 6931- and raise wheel bearing housing slightly.

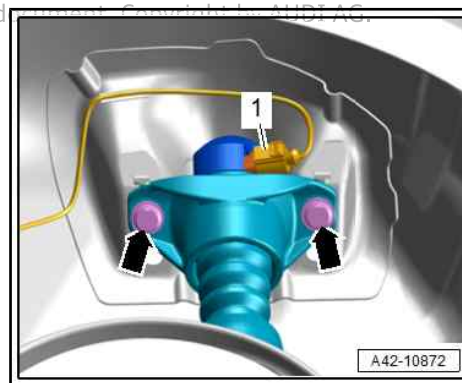


WARNING

Risk of accident!

- ◆ *Do not lower the wheel bearing housing with the engine and gearbox jack if the top or bottom bolted connection for the shock absorber has been unscrewed.*
- ◆ *Do not leave the engine and gearbox jack under the vehicle for longer than necessary.*

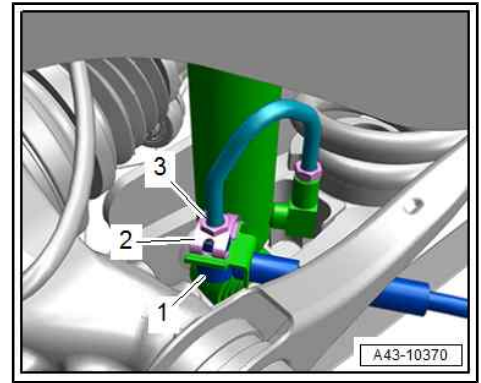
- On appropriate version: Unplug electrical connector -1-.
- Remove bolts -arrows- securing shock absorber at top.





Equipment version with Dynamic Ride Control (DRC):

- Discharge DRC system ➔ [page 196](#) .
- Remove union screw -2- and move hose -1- clear.
- Protect open connections from dirt.



All vehicles (continued):

- Remove bolt -1- and detach shock absorber -2-.

Installing

Installation is carried out in reverse order; note the following:

- Screw in bolts initially until they make contact, but do not tighten to final torque yet.



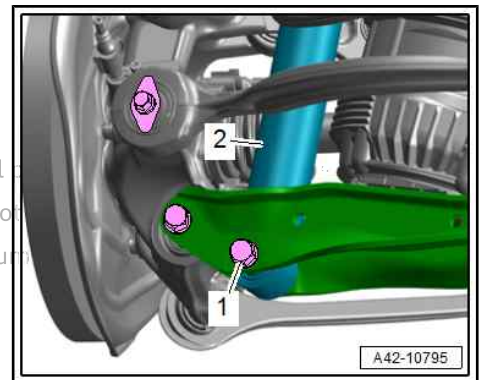
Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ➔ [page 10](#)
- Overview table: when does wheel alignment have to be checked? ➔ [page 213](#)

Tightening torques

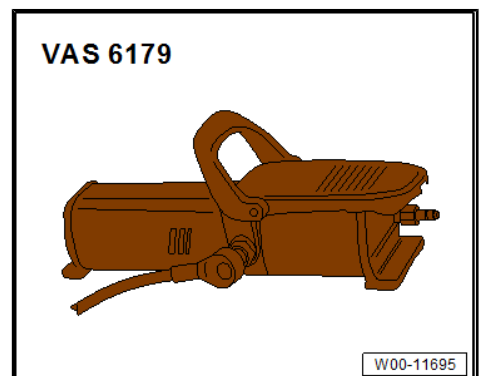
- ◆ ➔ [“6.1 Exploded view - wheel bearing”, page 155](#)
- ◆ ➔ [“1 Wheels, tyres”, page 205](#)



5.3 Removing and installing spring

Special tools and workshop equipment required

- ◆ Foot pump - VAS 6179-

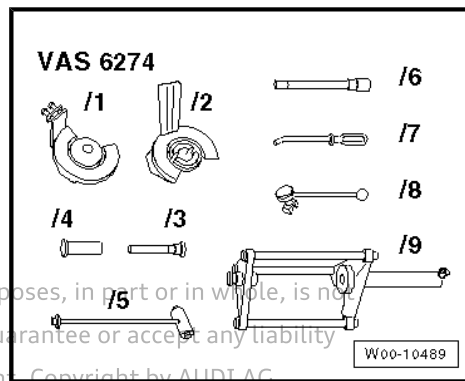




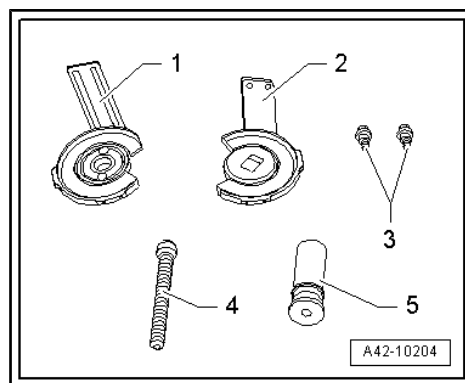
◆ Spring compressing system - VAS 6274-



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◆ Centring sleeve, 130 mm long -item 5- from supplementary set
- VAS 6274/10-

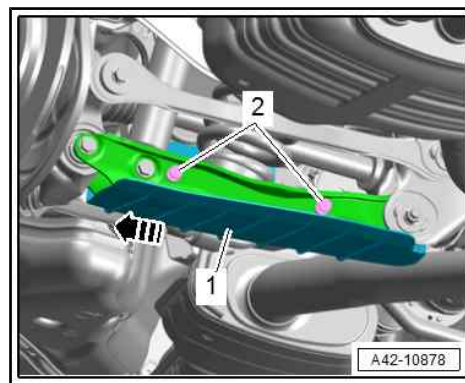


◆ Supplementary set - VAS 6274/12- (not illustrated)

Removing

Vehicles with front-wheel drive:

- Remove rear wheel ➔ [page 205](#) .
- Detach spreader rivet -2-.
- Pull wind deflector -1- outwards slightly -arrow- and detach.

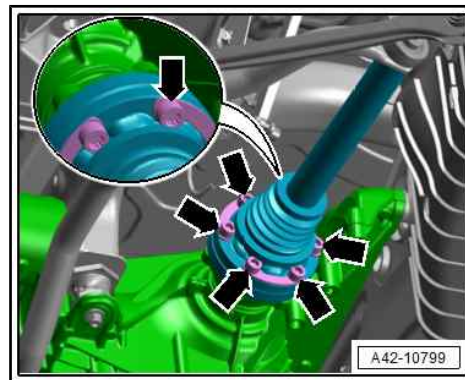


Four-wheel drive vehicles (right side of vehicle):

- Remove bolts -arrows- from inner constant velocity joint and press drive shaft upwards from the inside.

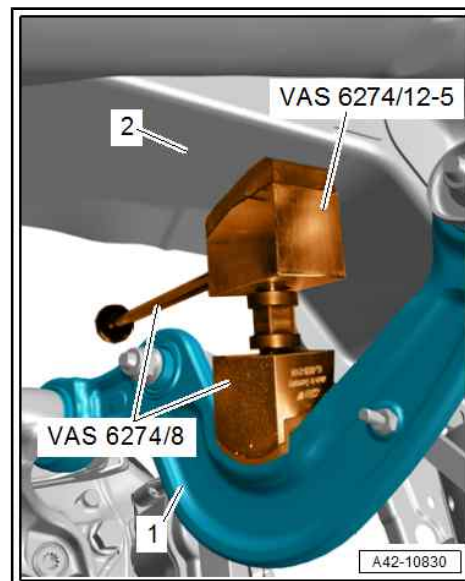
Four-wheel drive vehicles (left side of vehicle):

- Detach heat shield.
- Remove bolts from inner constant velocity joint and press drive shaft upwards from the inside.

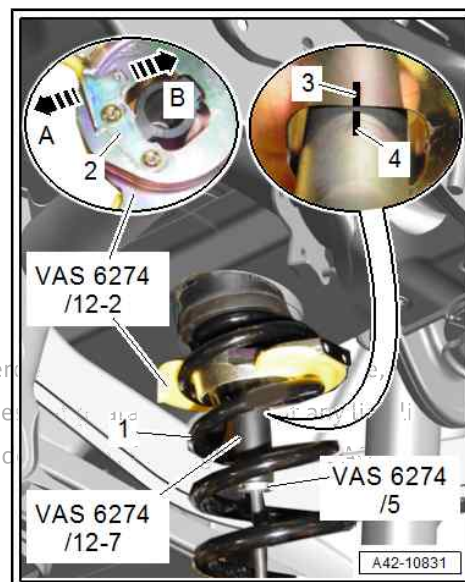




- Position spreader device (comprised of -VAS 6274/8- and -VAS 6274/12-5-) as shown between upper transverse link (front) -1- and longitudinal member -2- and apply light pressure.



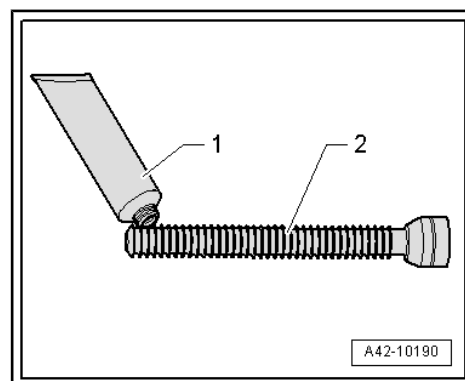
- Press locking plate -2- outwards -arrow A- to open.
- Insert thrust plate with securing plate - VAS 6274/12-2- from outside into coil spring -1-, as shown.
- Insert plunger, 89 mm - VAS 6274/12-7- with T-bar - VAS 6274/5- into thrust plate and turn 90° until line marking -3- on thrust plate is aligned with line marking -4- on plunger.
- Pull plunger downwards into thrust plate and secure with locking plate -arrow B- to close.
- Detach T-bar - VAS 6274/5- .



Caution

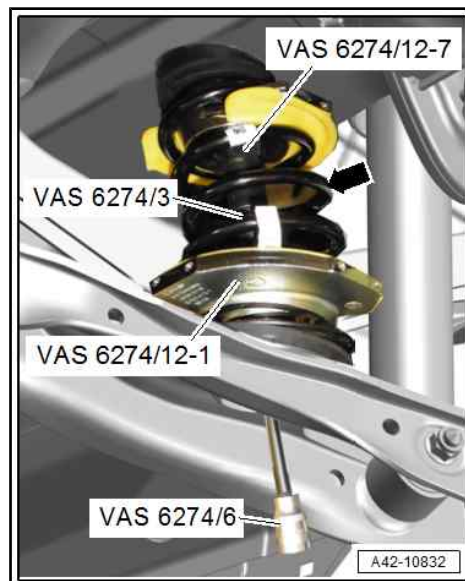
Risk of damage to spindle if it is not lubricated or if the incorrect lubricant is used.

- ◆ **Before removing and installing any of the springs, always lubricate the front of the spindle - VAS 6274/3- -item 2- lightly with the grease supplied -1-.**





- Insert thrust plate with swivel mounting - VAS 6274/12-1- from outside into coil spring -arrow-, as shown.
- Lightly lubricate front of spindle - VAS 6274/3- and use socket - VAS 6274/6- to screw it loosely into plunger - VAS 6274/12-7- .



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WARNING

Risk of accident!

- *The coil spring must be compressed or released only when the locating brackets -2- and -5- are joined together by the two bolts -3-.*

- Screw thrust plate with securing plate - VAS 6274/12-2- all the way up, and screw thrust plate with swivel mounting - VAS 6274/12-1- all the way down.
- Bolt locating brackets -2- and -5- to the two thrust plates -arrows-.
- The locating brackets face forwards.



Note

The attachment point of the locating brackets to the thrust plates differs depending on the type of running gear.

- Screw in bolts -3- for locating brackets of the two thrust plates hand-tight with lock plate -4-.
- First pre-tension thrust plates slightly using spindle - VAS 6274/3- .
- Check that coil spring -1- is correctly seated in thrust plates.



Caution

Risk of damage to threads.

- ◆ *DO NOT use an impact wrench to loosen or tighten the spindle - VAS 6274/3- .*
- ◆ *Always use a standard commercially available ratchet to turn the spindle.*

Risk of damage to transverse links.

- ◆ *The thrust plates of the tensioning device must not make contact with the transverse links when compressing the coil springs. Rotate the thrust plates if necessary.*

- Compress coil spring with socket - VAS 6274/6- (use counterhold tool - VAS 6274/7-).

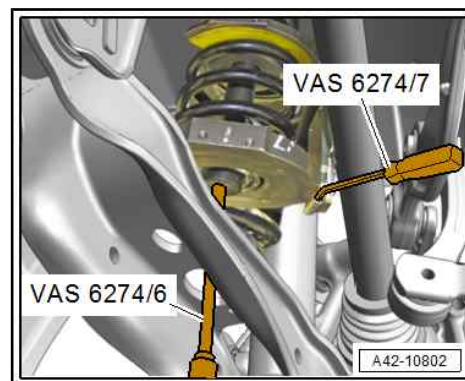


WARNING

Risk of injury if the coil spring is not released in the proper manner.

- ◆ *The coil spring must only be released using hydraulic tensioning device -VAS 6274/9- .*

- Compress coil spring until it can be removed.
- If necessary for subsequent work, detach spreader device - VAS 6274/8- with -VAS 6274/12-5- .





Release coil spring in hydraulic tensioning device -VAS 6274/9- :



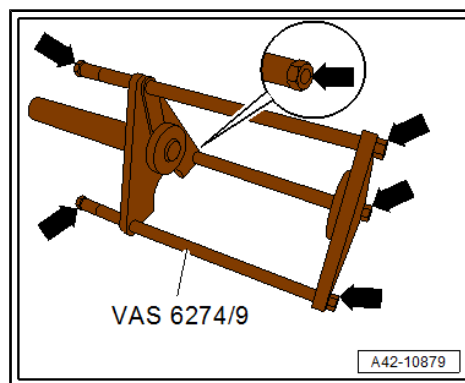
WARNING

Risk of injury if bolted connections are not tightened.

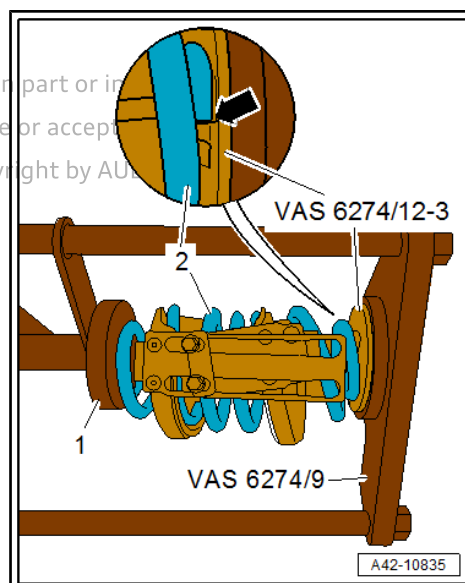
- ◆ *Before using hydraulic tensioning device -VAS 6274/9- , check that nuts -arrows- are secured; tighten if necessary.*



- Fit spring plate - VAS 6274/12-3- onto hydraulic tensioning device - VAS 6274/9- .
- Position bottom end of compressed coil spring -2- onto spring plate.
- End of spring coil must make contact with stop arrow- of spring plate.
- Extend plunger -1- of hydraulic tensioning device all the way towards coil spring, but do not apply tension.



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- Mark position of plunger -1- on hydraulic tensioning device - VAS 6274/9- -arrow A- using a waterproof felt-tip pen or similar.
- Mark position of locating brackets -2- on coil spring -3- -arrow B- using a waterproof felt-tip pen or similar.



Note

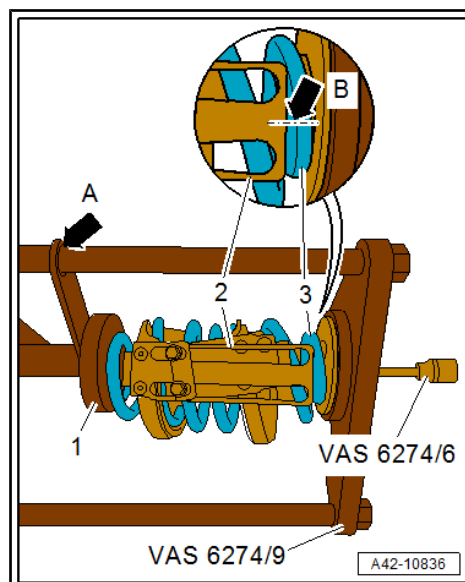
The markings will be needed when compressing the spring during installation.



Caution

Risk of damage to threads.

- ◆ *DO NOT use an impact wrench to loosen or tighten the spindle - VAS 6274/3- .*
- ◆ *Always use a standard commercially available ratchet to turn the spindle.*

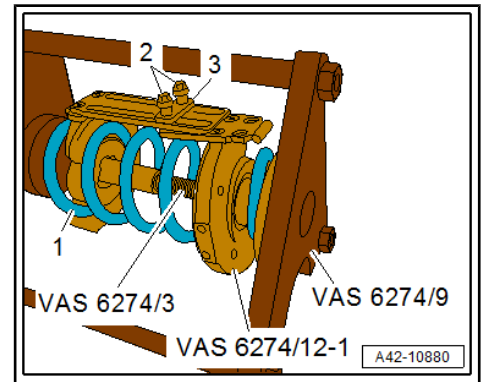


A42-10836

- Use socket - VAS 6274/6- to slacken coil spring completely with hydraulic tensioning device.



- Detach spindle - VAS 6274/3- after slackening coil spring -1-.
- Remove bolts -2- from locating bracket and detach lock plate -3-.
- Take out thrust plate with swivel mounting - VAS 6274/12-1- .

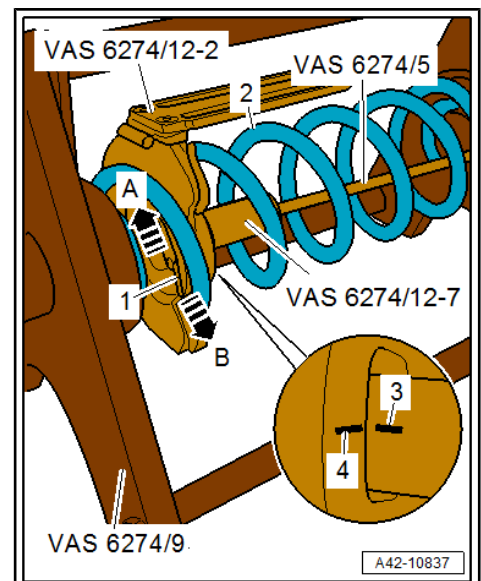


- Press locking plate -1- outwards -arrow B- to open.
- Remove plunger - VAS 6274/12-7- with T-bar - VAS 6274/5- from thrust plate with securing plate - VAS 6274/12-2- .
- Remove thrust plate from coil spring -2-.



Note

- ◆ -Items 3, 4 and arrow A- can be disregarded.
- ◆ If you intend to subsequently remove the coil spring on the opposite side of the vehicle, the installation position and fastening point of the locating brackets to the thrust plates must be marked for later installation.
- ◆ If renewing the coil spring, transfer the marking to the new coil spring.



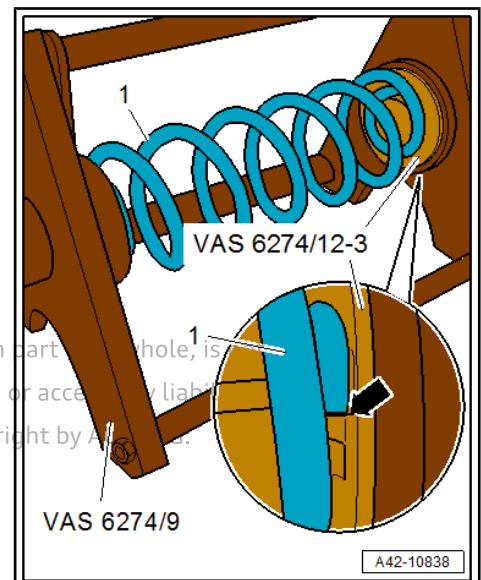
Installing

Installation is carried out in reverse order; note the following:

- Fit coil spring -1- into hydraulic tensioning device - VAS 6274/9- .
- Bottom end of coil spring must make contact with stop -arrow- of spring plate -VAS 6274/12-3- .

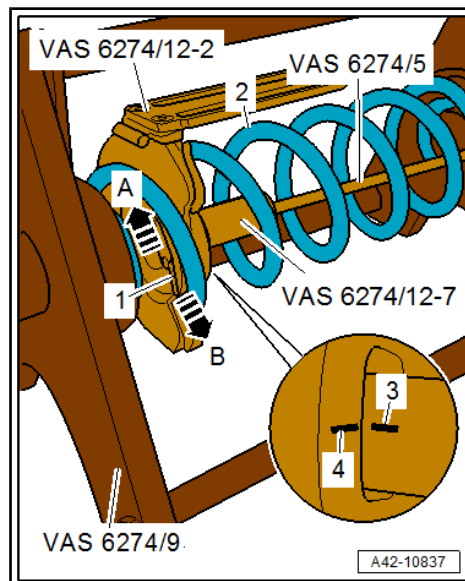


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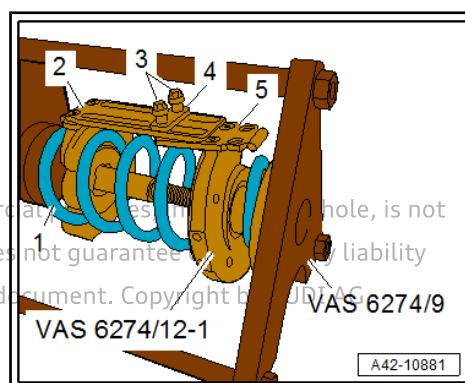




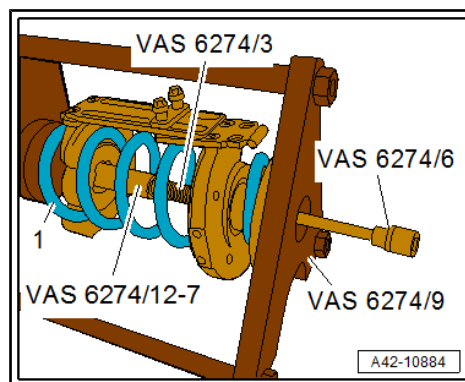
- Insert thrust plate with securing plate - VAS 6274/12-2- into coil spring -2-, as shown.
- Press locking plate -1- outwards -arrow B- to open.
- Insert plunger, 89 mm - VAS 6274/12-7- with T-bar - VAS 6274/5- into thrust plate and turn 90° until line marking -4- on thrust plate is aligned with line marking -3- on plunger.
- Pull plunger into thrust plate and secure with locking plate -arrow A- to close.
- Remove T-bar - VAS 6274/5- .



- Insert thrust plate with swivel mounting - VAS 6274/12-1- into coil spring -1-.
- Pay attention to markings made during removal indicating installation position and position of locating brackets -2- and -5- in relation to thrust plates for each side of vehicle.
- Screw in bolts -3- for locating bracket with locking plate -4- hand-tight.



- Screw spindle - VAS 6274/3- loosely into plunger - VAS 6274/12-7- using socket - VAS 6274/6- , compressing spring coil -1- slightly with hydraulic tensioning device - VAS 6274/9- as you do so.





- Insert centring sleeve, 130 mm long -item 4- as far as it will go.
- Align locating bracket -2- according to marking -arrow B- on coil spring -3- made during removal.
- Using socket -VAS 6274/6- and hydraulic tensioning device -VAS 6274/9- simultaneously, compress coil spring as far as markings -arrow A- made previously.
- When compressing coil spring, make sure that centring sleeve does not slip off spindle; press it on if necessary.



Note

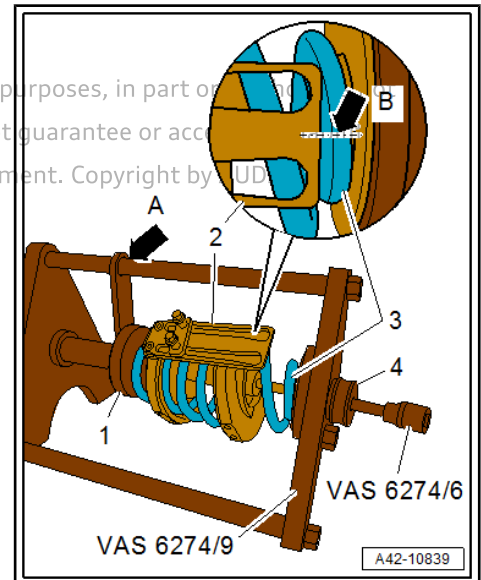
It may be necessary to use counterhold tool - VAS 6274/7- to hold thrust plates in position aligned with marking -arrow B-.



Caution

Risk of damage to threads.

- ◆ ***DO NOT use an impact wrench to loosen or tighten the spindle - VAS 6274/3- .***
- ◆ ***Always use a standard commercially available ratchet to turn the spindle.***



- Use socket - VAS 6274/6- to compress coil spring further until it makes light contact with hydraulic tensioning device.
- Slacken off hydraulic tensioning device and remove centring sleeve and compressed coil spring.
- Apply spreader device - VAS 6274/8- from -VAS 6274/12-5- .
- Bring coil spring and spring plate into installation position
⇒ [page 141](#) .



Caution

Risk of damage to threads.

- ◆ ***DO NOT use an impact wrench to loosen or tighten the spindle - VAS 6274/3- .***
- ◆ ***Always use a standard commercially available ratchet to turn the spindle.***

- Relieve tension on coil spring using socket - VAS 6274/6- (counterhold with counterhold tool - VAS 6274/7-).



Caution

Risk of damage to transverse links.

- ◆ ***The thrust plates of the tensioning device must not make contact with the transverse links when relieving the tension on the coil springs. Rotate the thrust plates if necessary.***

- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)



Tightening torques

- ◆ ⇒ [“7.1 Exploded view - drive shaft”, page 168](#)
- ◆ ⇒ [Fig. ““Heat shield - tightening torque””, page 169](#)



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6 Wheel bearing, trailing arm

⇒ [“6.1 Exploded view - wheel bearing”, page 155](#)

⇒ [“6.2 Removing and installing wheel bearing housing”, page 157](#)

⇒ [“6.3 Removing and installing wheel bearing unit”, page 160](#)

⇒ [“6.4 Servicing wheel bearing unit”, page 164](#)

6.1 Exploded view - wheel bearing

⇒ [“6.1.1 Exploded view - wheel bearing, vehicles with front-wheel drive”, page 155](#)

⇒ [“6.1.2 Exploded view - wheel bearing, vehicles with four-wheel drive”, page 156](#)

6.1.1 Exploded view - wheel bearing, vehicles with front-wheel drive

1 - Wheel bearing unit

- ❑ Removing and installing
⇒ [page 160](#)

- ❑ Instructions for handling wheel bearing
⇒ [page 156](#)

2 - Additional seal

3 - Wheel bearing housing

- ❑ Removing and installing
⇒ [page 157](#)

4 - Bracket

- ❑ For electrical wiring

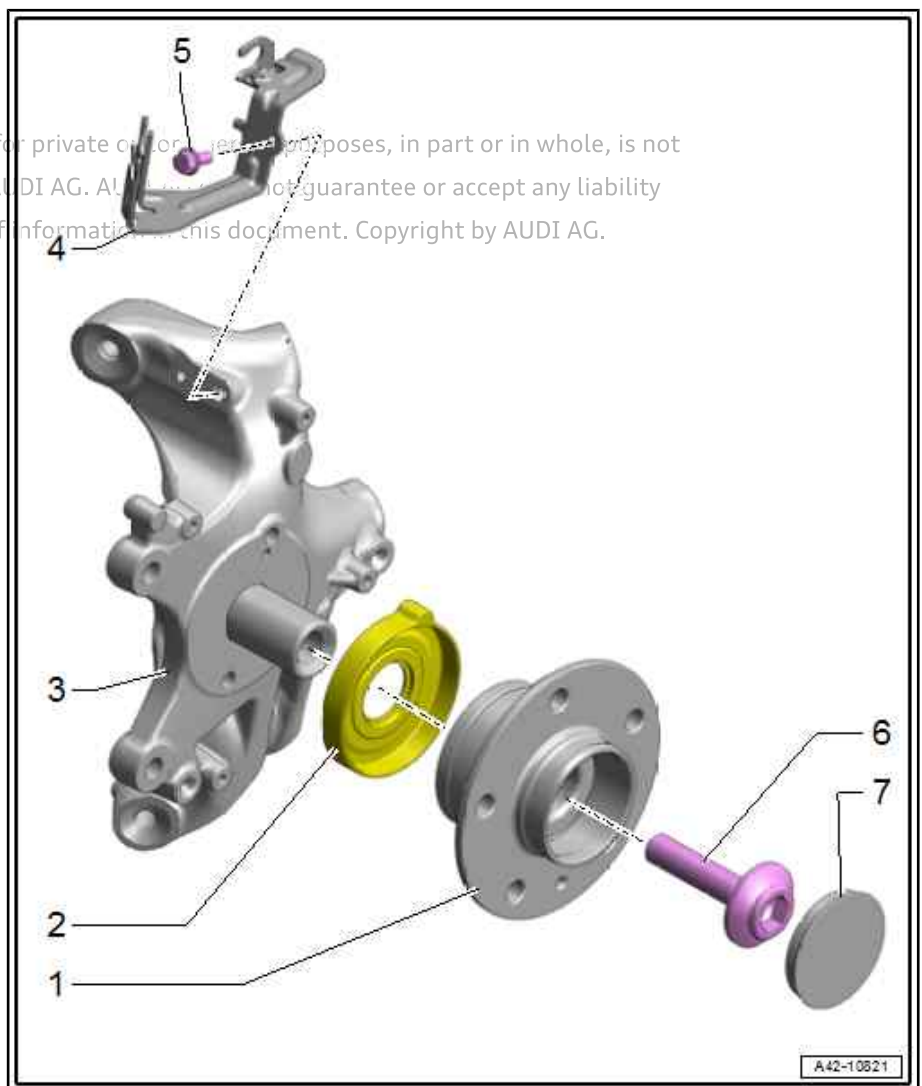
5 - Bolt

- ❑ Thread-forming
- ❑ Fit and screw in by hand so that bolt locates in old threads; then tighten to specified torque
- ❑ 13 Nm

6 - Bolt

- ❑ 200 Nm +180°

7 - Grease cap





Instructions for handling wheel bearing

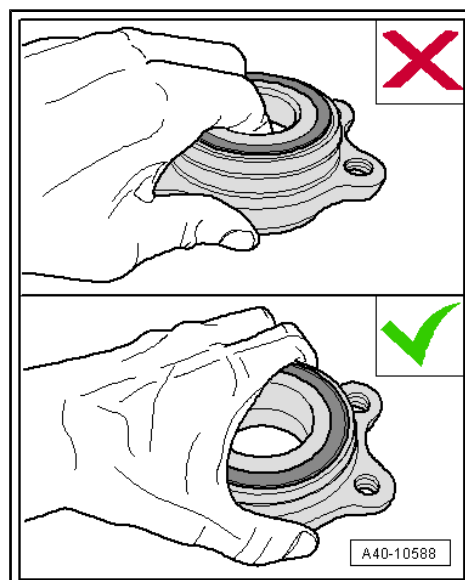
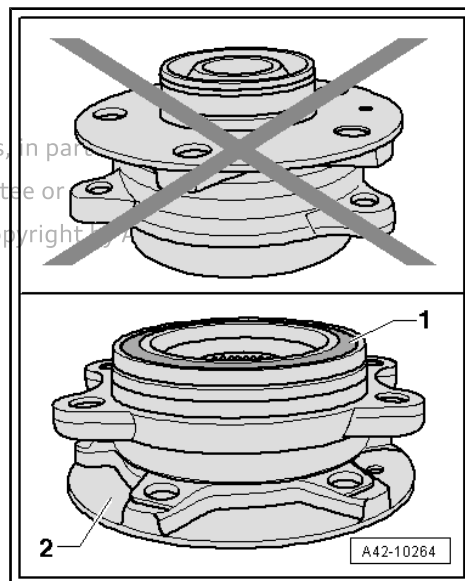


Caution

Risk of damage to seal caused by dirt

- ◆ ***The wheel bearing -1- must always face upwards when laying down the wheel bearing unit.***
- ◆ ***Always put down the wheel bearing unit with the wheel hub -2- facing downwards.***

- Do not touch the inside of the wheel bearing when you pick it up.
- Always take hold of the outside of the wheel bearing.



6.1.2 Exploded view - wheel bearing, vehicles with four-wheel drive



1 - Wheel bearing housing

- ☐ Removing and installing
⇒ [page 157](#)

2 - Bolt

- ☐ Renew after removing
- ☐ 80 Nm +90°

3 - Drive shaft

4 - Bracket

- ☐ For electrical wiring

5 - Bolt

- ☐ Thread-forming
- ☐ Fit and screw in by hand so that bolt locates in old threads; then tighten to specified torque
- ☐ 13 Nm

6 - Wheel bearing

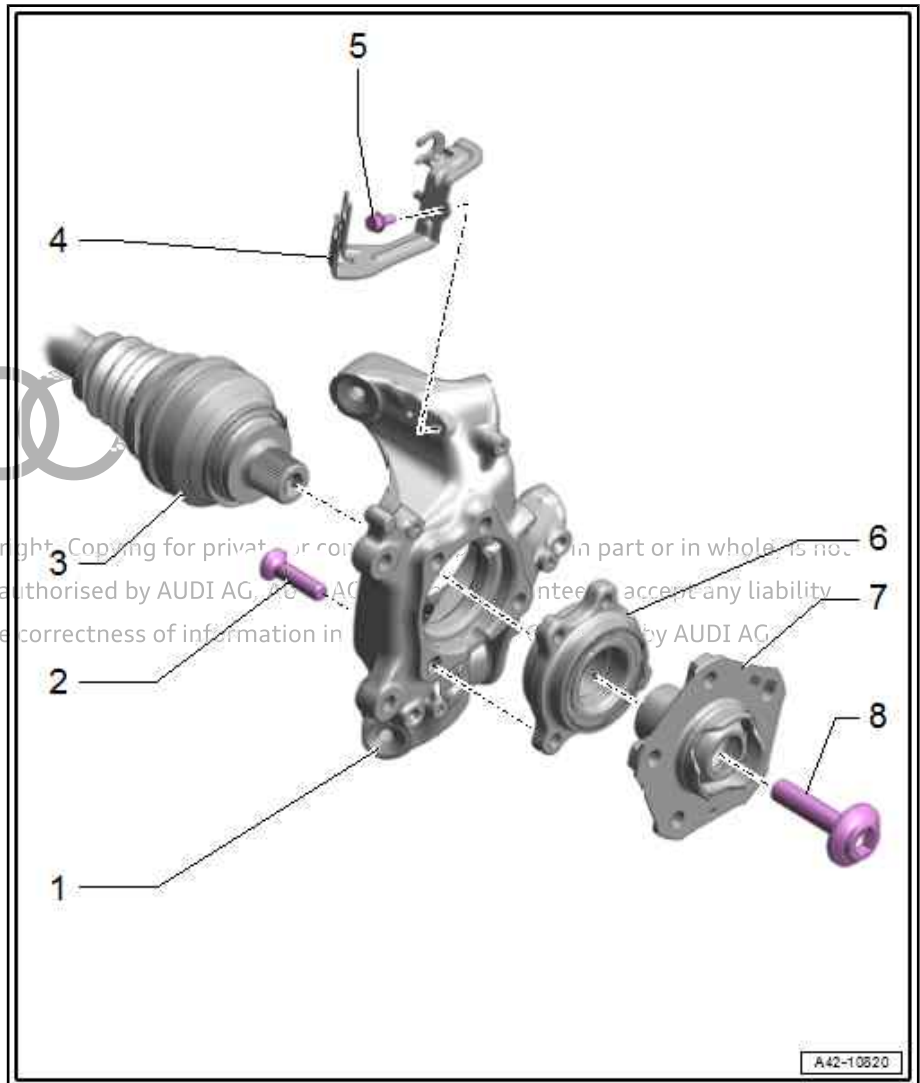
- ☐ Removing and installing wheel bearing unit
⇒ [page 160](#)
- ☐ Currently only supplied together with -item 7-
- ☐ Servicing wheel bearing unit ⇒ [page 164](#)
- ☐ Instructions for handling wheel bearing
⇒ [page 156](#)

7 - Wheel hub

- ☐ Currently only supplied together with -item 6-

8 - Bolt

- ☐ Loosening and tightening bolt securing drive shaft ⇒ [page 172](#)



6.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-





◆ Engine and gearbox jack - VAS 6931-



◆ Support - T10149-



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Removing

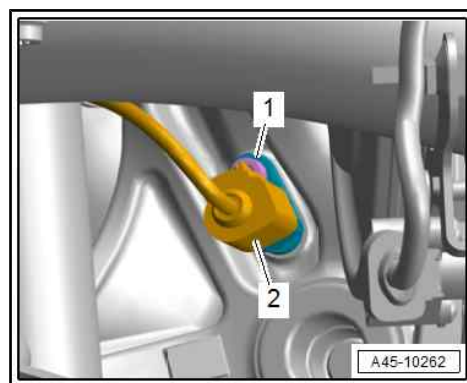
Version with front-wheel drive:

- Unplug electrical connector -1- for rear speed sensor.



Note

Disregard -item 2-.



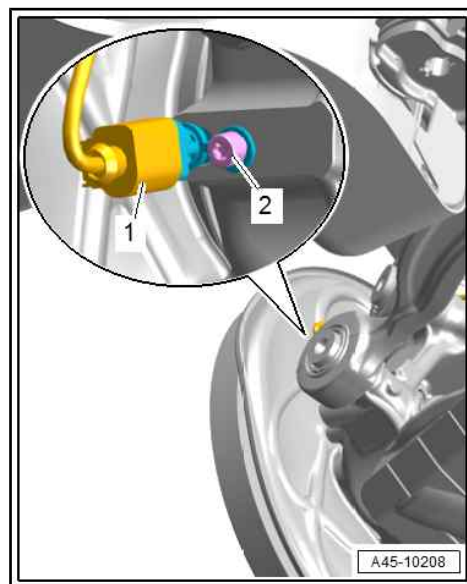
Version with four-wheel drive:

- Slacken bolt securing drive shaft to wheel hub ⇒ [page 172](#) .
- Unplug electrical connector -1- for rear speed sensor.



Note

Disregard -item 2-.

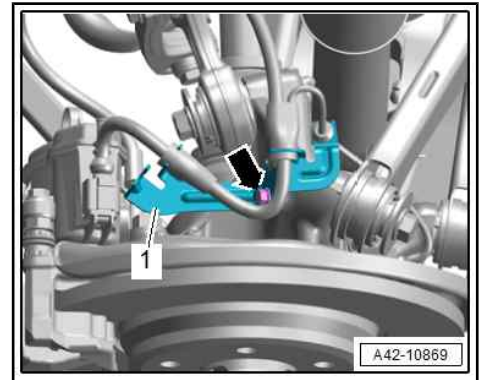


All versions (continued):

- Remove splash plate ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing splash plate .



- Remove bolt -arrow- and move bracket -1- with electrical wiring clear to one side.



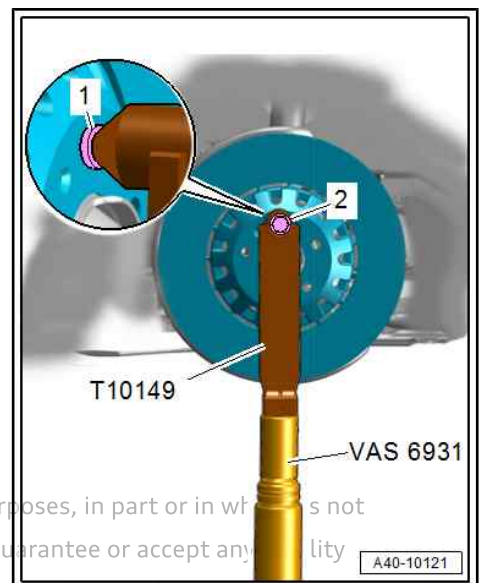
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support - T10149- to wheel hub using wheel bolt -2-.



Note

Disregard -item 1-.

- Use engine and gearbox jack - T10149- attached to support - VAS 6931- to raise wheel bearing housing slightly so that bolts can be removed more easily.

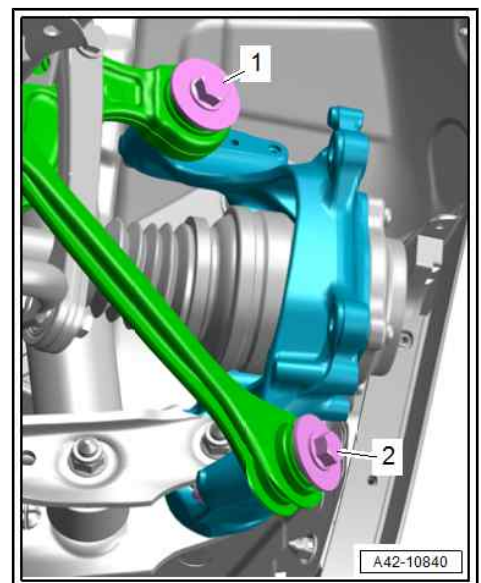


WARNING

Risk of accident!

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

- Remove bolts -1, 2-.





- Remove bolts -3, 4- and detach bolted connection -1-.
- Pull wheel bearing housing -2- off drive shaft and remove.

Installing

Installation is carried out in reverse order; note the following:

- Screw in bolts initially until they make contact, but do not tighten to final torque yet.



Note

Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.

- Lifting suspension to unladen position ⇒ [page 10](#)
- Tightening bolt securing drive shaft to wheel hub
⇒ [page 172](#) .
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)
- ◆ ⇒ [“6.1 Exploded view - wheel bearing”, page 155](#)

6.3 Removing and installing wheel bearing unit

⇒ [“6.3.1 Removing and installing wheel bearing unit - vehicles with front-wheel drive”, page 160](#)

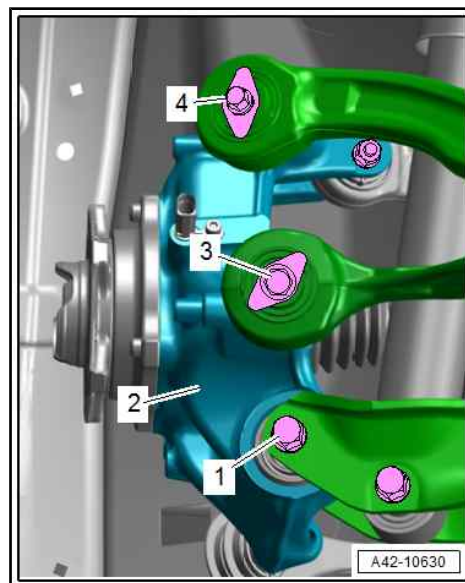
⇒ [“6.3.2 Removing and installing wheel bearing unit - vehicles with four-wheel drive”, page 163](#)

6.3.1 Removing and installing wheel bearing unit - vehicles with front-wheel drive

Special tools and workshop equipment required

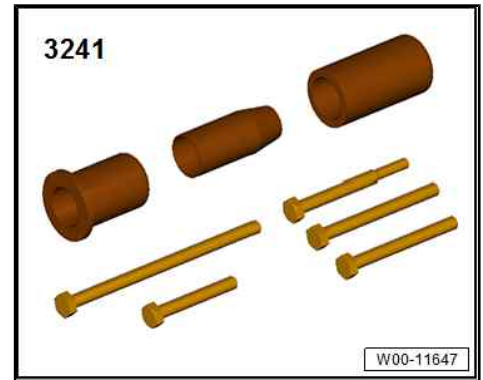
- ◆ Hub grease cap puller - VW 637/2-

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- ◆ Fitting sleeve - 3241/4- from fitting sleeves - 3241-



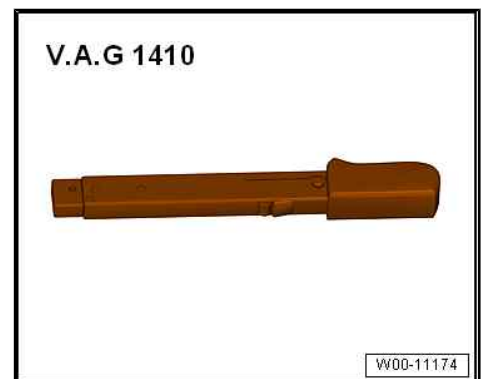
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- ◆ Torque wrench - V.A.G 1332-

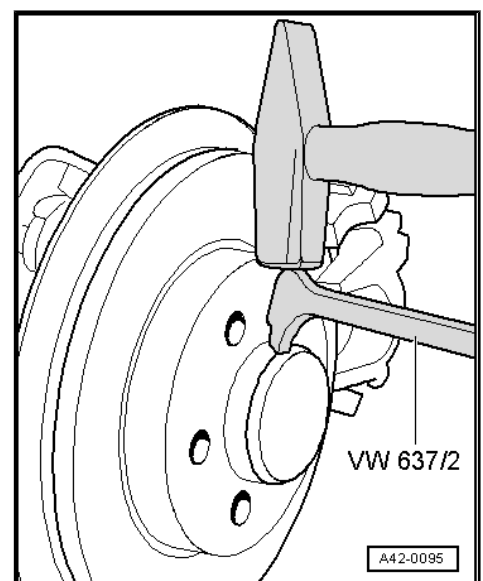


- ◆ Torque wrench - V.A.G 1410-



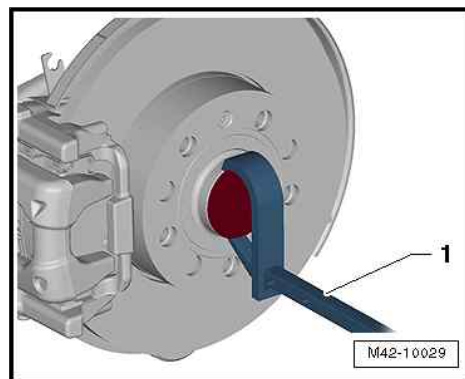
Removing

- Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc .
- Loosen grease cap -3- from seat by tapping lightly on claw of hub grease cap puller - VW 637/2- -2- with hammer -1-.





- Lever off grease cap using hub grease cap puller - VW 637/2-
-item 1-.

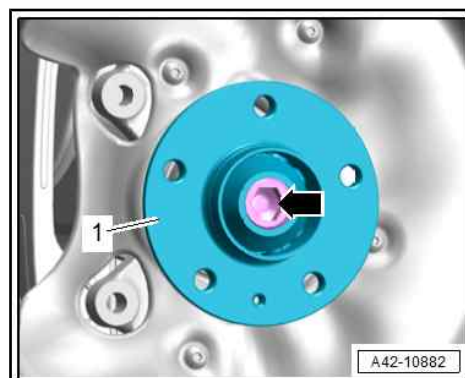


Caution

Risk of damage to threads

- ◆ **DO NOT use an impact wrench to loosen or tighten the bolt.**

- Remove bolt -arrow- and pull wheel bearing unit -1- off stub axle.
- Instructions for handling wheel bearing ⇒ [page 156](#)
- Pull metal washer -2- and additional seal -1- from stub axle -arrow-.



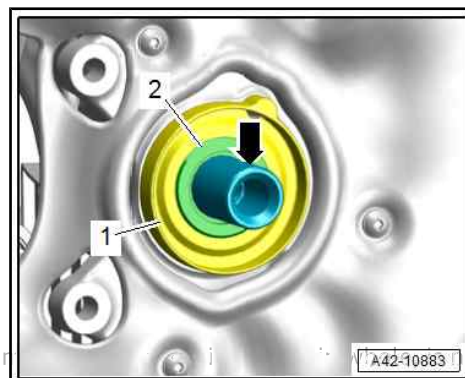
Installing



Note

Always renew bolt and grease cap after removal.

- Fit additional seal -1-.
- Lightly lubricate metal washer -2- and stub axle -arrow- with lubricating paste ⇒ [Electronic parts catalogue](#).
- Carefully push wheel bearing unit onto stub axle, taking care to keep it straight.



Remaining installation steps are the reverse of removal; note the following:



Caution

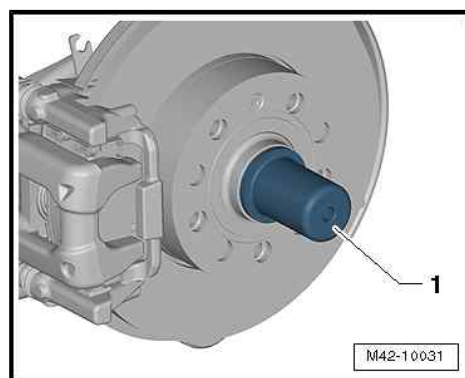
Take precautions to prevent premature wear of wheel bearing.

- ◆ **Moisture can enter if the grease cap is damaged; use the tools shown to avoid damaging the grease cap.**

- Drive new grease cap in as far as stop using fitting sleeve - 3241/4- -item 1-.

Tightening torques

- ◆ ⇒ [“6.1.1 Exploded view - wheel bearing, vehicles with front-wheel drive”, page 155](#)





6.3.2 Removing and installing wheel bearing unit - vehicles with four-wheel drive

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

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V.A.G 1332



W00-11165

- ◆ Torque wrench - V.A.G 1410-

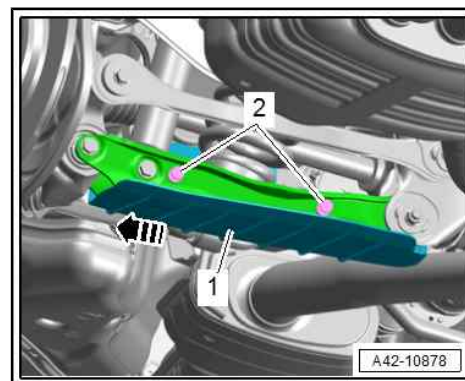
V.A.G 1410



W00-11174

Removing

- Slacken bolt securing drive shaft to wheel hub ⇒ [page 172](#) .
- Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc .
- Detach spreader rivet -2-.
- Pull wind deflector -1- outwards slightly -arrow- and detach.





- Remove bolts -arrows- in stages and detach wheel bearing unit from drive shaft and wheel bearing housing.
- Instructions for handling wheel bearing ➔ [page 156](#)

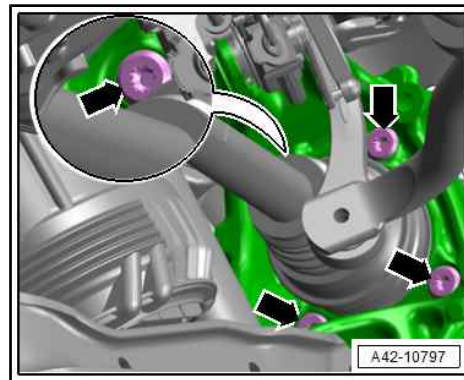
Installing

Installation is carried out in reverse order; note the following:

- Tighten bolt securing drive shaft to wheel hub ➔ [page 172](#) .

Tightening torques

- ♦ ➔ [“6.1.2 Exploded view - wheel bearing, vehicles with four-wheel drive”, page 156](#)



6.4 Servicing wheel bearing unit



Note

The wheel bearing and wheel hub are currently only supplied together. The following instructions apply as soon as these components are available separately.

Special tools and workshop equipment required

- ♦ Thrust plate - VW 401-

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- ♦ Thrust plate - VW 402-





◆ Press tool - VW 412-



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◆ Assembly tool - T10230-



◆ Workshop press - VAS 6654- , not illustrated

◆ Puller set for inner bearing races - VAS 701 003- (not illustrated)

Procedure

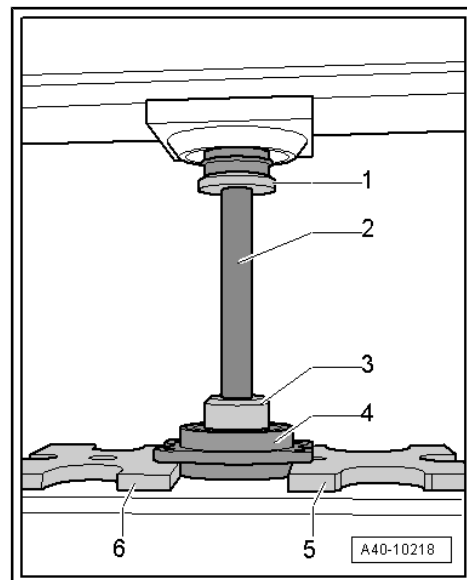
- Wheel bearing unit removed ➔ [page 160](#)

Pressing wheel hub out of wheel bearing

- Set up special tools as shown in illustration.

- 1 - Press tool - VW 412-
- 2 - Sleeve - T10230/3-
- 3 - Thrust piece - T10230/8-
- 4 - Wheel bearing unit
- 5 - Thrust plate - VW 402-
- 6 - Thrust plate - VW 401-

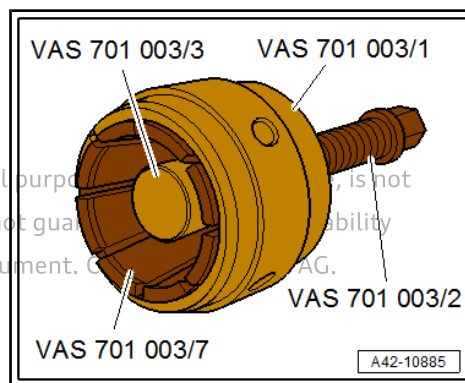
- Press wheel hub out of wheel bearing.





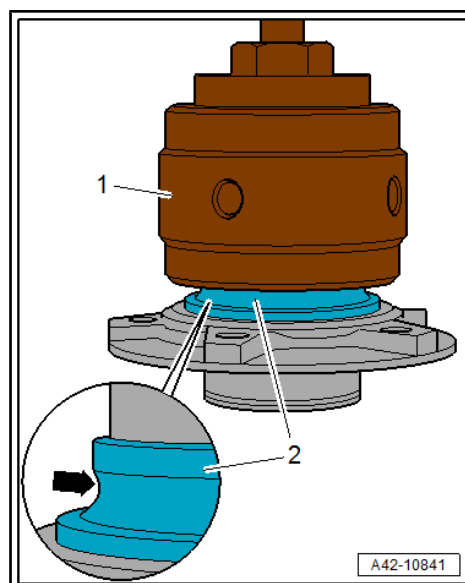
Pressing inner bearing race off wheel hub

- Prepare puller from puller set for inner bearing races - VAS 701 003- as follows:
- Screw clamping sleeve - VAS 701 003/1- onto clamp tensioner - VAS 701 003/7-
- Screw threaded spindle - VAS 701 003/2- into clamping sleeve and fit thrust piece - VAS 701 003/3- .



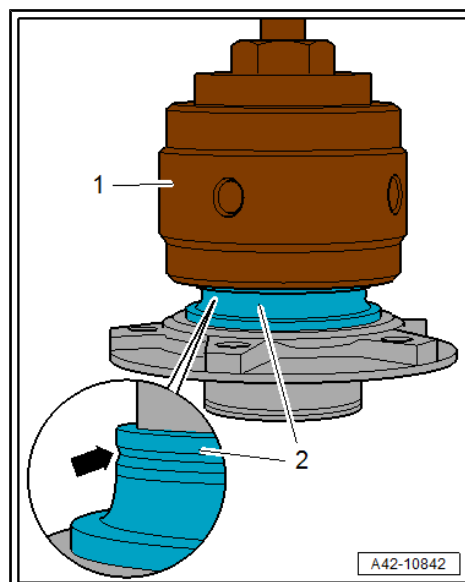
Inner bearing race version 1:

- Remove ball cage from inner bearing race -2-.
- Apply puller -1- to ball raceways -arrow- of inner race, as shown.



Inner bearing race version 2:

- Apply puller -1- to groove -arrow- of inner race -2-.



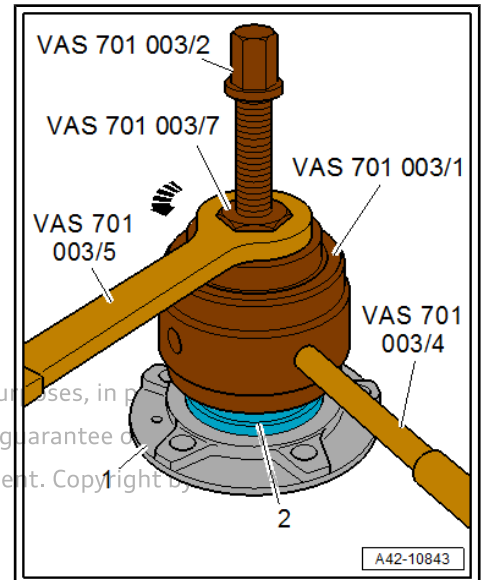


All versions (continued):

- Clamp puller in place on inner race -2-; to do so, use spanner - VAS 701 003/7- to turn clamp tensioner - VAS 701 003/5- in direction of -arrow- and counterhold clamping sleeve - VAS 701 003/1- with tensioner handle - VAS 701 003/4- .
- Use threaded spindle - VAS 701 003/2- to detach inner bearing race from wheel hub -1-.



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Pressing wheel hub into wheel bearing

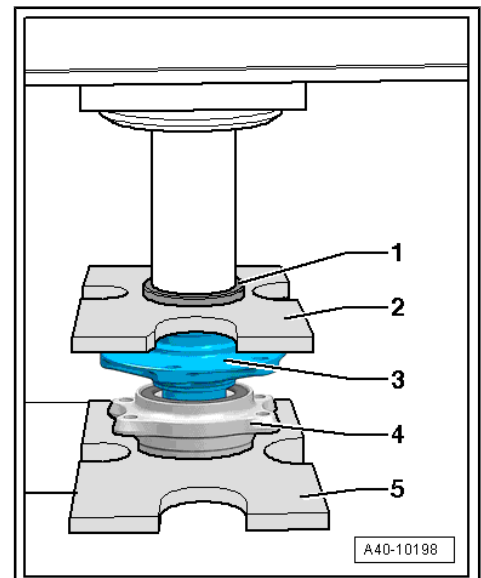
- Instructions for handling wheel bearing ➔ [page 156](#)
 - Set up special tools as shown in illustration.
- 1 - Press tool - VW 412-
 - 2 - Thrust plate - VW 402-
 - 3 - Wheel hub
 - 4 - Wheel bearing
 - 5 - Thrust plate - VW 401-
- The machined surface of the wheel bearing outer race faces downwards.



Caution

Take precautions not to damage or dirty the wheel bearing.

- ◆ *Make sure no dirt gets between thrust plate - VW 401- and wheel bearing when pressing in the hub or when the parts are placed on a workbench, etc.*



- Press wheel hub into wheel bearing.



7 Drive shaft

⇒ ["7.1 Exploded view - drive shaft", page 168](#)

⇒ ["7.2 Removing and installing drive shaft", page 170](#)

⇒ ["7.3 Loosening and tightening nut/bolt securing drive shaft", page 172](#)

⇒ ["7.4 Dismantling and assembling drive shaft", page 173](#)

⇒ ["7.5 Checking outer constant velocity joint", page 179](#)

⇒ ["7.6 Checking inner constant velocity joint", page 179](#)

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7.1 Exploded view - drive shaft

1 - Cover

- ☐ Drive off carefully with drift
- ☐ Renew if damaged
- ☐ Adhesive surface must be free of oil and grease
- ☐ Before attaching to constant velocity joint, apply sealant - D 454 300 A2- to sealing surface
⇒ [page 177](#)

2 - Circlip

- ☐ Renew after removing
- ☐ Insert in groove on shaft

3 - Inner constant velocity joint

- ☐ Renew only as complete unit
- ☐ Checking ⇒ [page 179](#)
- ☐ Grease quantity and type ⇒ [page 170](#)
- ☐ Adhesive surfaces must be free of oil and grease
- ☐ Grease splines on drive shaft lightly with grease used in joint when fitting constant velocity joint onto drive shaft

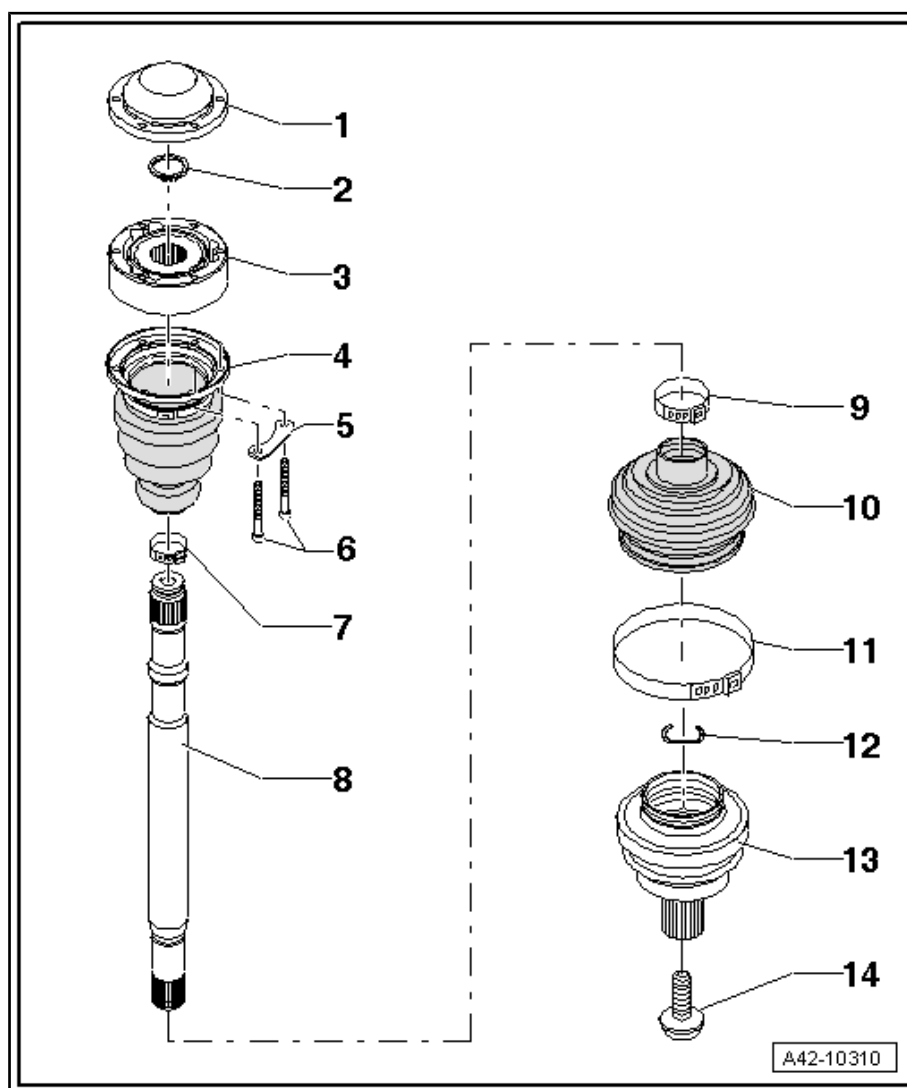
4 - Boot

- ☐ Without vent hole
- ☐ Drive cap off carefully with drift
- ☐ Check for splits and chafing
- ☐ Check inner constant velocity joint if boot is damaged ⇒ [page 179](#)
- ☐ Sealing surfaces between metal cap and constant velocity joint must be free from grease on assembly

5 - Lock plate

6 - Bolts

- ☐ Renew after removing
- ☐ M8: 30 Nm +90°
- ☐ M10: 50 Nm +90°





7 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 170](#)

8 - Drive shaft

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

9 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 170](#)

10 - Boot

- ☐ Without vent hole
- ☐ Check for splits and chafing
- ☐ Check outer constant velocity joint if boot is damaged ⇒ [page 179](#)
- ☐ Sealing surfaces between boot and outer metal cap must be free from grease on assembly
- ☐ Sealing surfaces between boot and drive shaft must be free from grease on assembly

11 - Hose clip

- ☐ Renew after removing
- ☐ Tightening ⇒ [page 170](#)

12 - Circlip

- ☐ Renew after removing
- ☐ Fit into annular groove on shaft before installing (no longer visible once joint is installed)
- ☐ Before fitting the constant velocity joint, align the circlip centrally with the opening facing upwards

13 - Outer constant velocity joint

- ☐ Renew only as complete unit
- ☐ Checking ⇒ [page 179](#)
- ☐ Driving off ⇒ [page 173](#)
- ☐ Installing: drive onto shaft with plastic hammer until compressed circlip seats
- ☐ Circlip must fit in chamfer on joint when installing; guide with pliers if necessary
- ☐ Grease quantity and type ⇒ [page 170](#)
- ☐ Sealing surfaces between boot and outer CV joint must be free from grease on assembly
- ☐ Grease splines on drive shaft lightly with grease used in joint when fitting constant velocity joint onto drive shaft

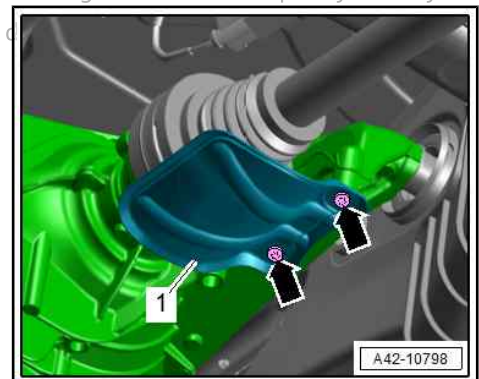
14 - Bolt

- ☐ Renew after removing
- ☐ Clean threads in constant velocity joint using a thread tap or similar
- ☐ Loosening and tightening bolt securing drive shaft ⇒ [page 172](#)

Heat shield - tightening torque

Version 1

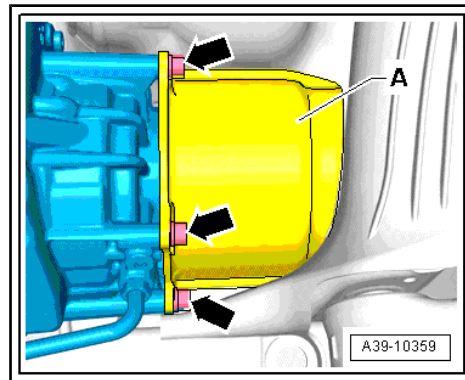
- Tighten bolts -arrows- for heat shield -1- to 23 Nm.





Version 2

- Tighten bolts -arrows- for heat shield -A- to 23 Nm.



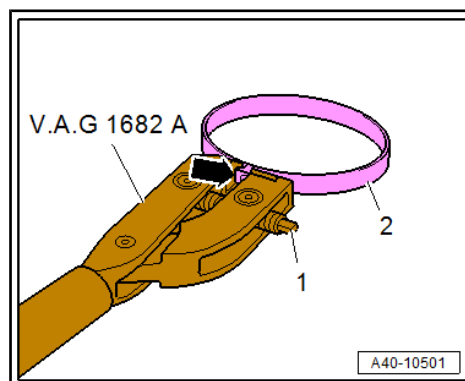
Tightening hose clip with hose clip pliers - V.A.G 1682 A-

- Apply clamp tensioner - V.A.G 1682 A- as shown.
- Tips of tool must be applied centrally -arrow- to clip -2-.



Note

- ♦ The thread of the spindle should move freely; if necessary, lubricate with MoS₂ grease.
- ♦ If the thread is stiff (e.g. due to dirt), the required clamping force will not be attained at the hose clip when the specified tightening torque is applied.



- Tighten hose clip by turning spindle -1- with torque wrench (take care to keep clamp tensioner straight).
 - Tightening torque: 20 Nm.
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Grease quantity and type



Note

- ♦ Regrease joint when renewing boot.
- ♦ Please note the correct type of grease for the inner and outer joints ⇒ Electronic parts catalogue .

Drive shaft	Joint, mm	Grease quantity		
		Total quantity	In joint	In rubber boot
	Outer joint	g	g	g
CGXIX 2500	89.4	70	35 ¹⁾	35
CGFIX 4300	94.5	80	40 ¹⁾	40
	Inner joint			
VL 100	99.8	110	55 ¹⁾	55
VL 107	108	120	60 ¹⁾	60

¹⁾ Put in grease through ball bearing races.

7.2 Removing and installing drive shaft

Removing

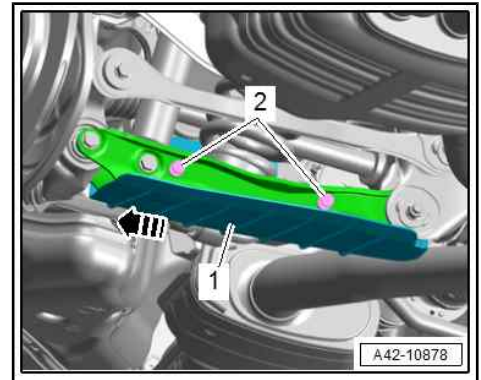
- Slacken bolt securing drive shaft to wheel hub ⇒ [page 172](#) .



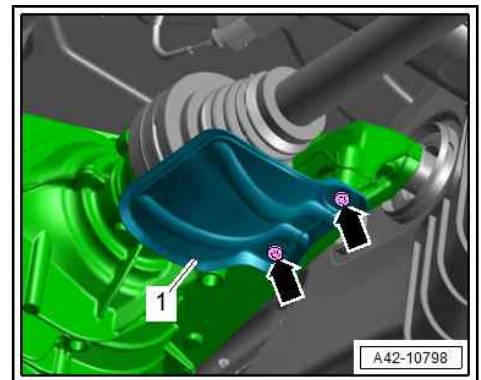
- Detach spreader rivet -2-.
- Pull wind deflector -1- outwards slightly -arrow- and detach.

Left side of vehicle:

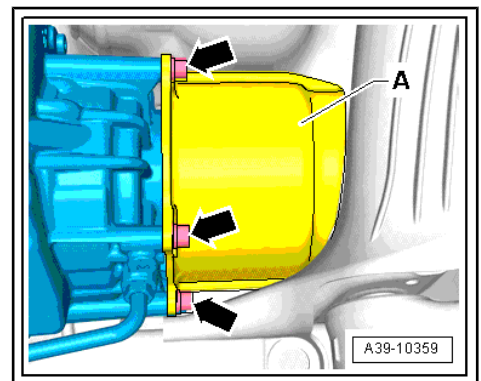
- Remove rear silencer ⇒ Rep. gr. 26 ; Exhaust pipes/silencers;
Exploded view - silencers .



- Version 1 of heat shield: Remove bolts -arrows- and detach heat shield -1-.



- Version 2 of heat shield: Remove bolts -arrows- and detach heat shield -A-.



All vehicles (continued):

- Unscrew bolts -arrows- and carefully detach drive shaft.



Note

Take care not to damage protective coating on drive shaft.

Installing

Installation is carried out in reverse order; note the following:

- Tighten bolt securing drive shaft to wheel hub ⇒ [page 172](#) .

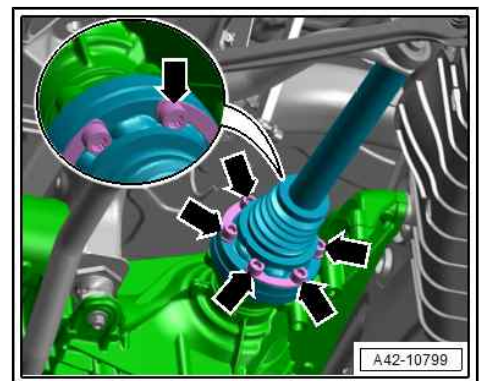
Tightening torques

- ◆ ⇒ [“7.1 Exploded view - drive shaft”, page 168](#)

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- ◆ ⇒ [Fig. “Heat shield - tightening torque”, page 169](#)

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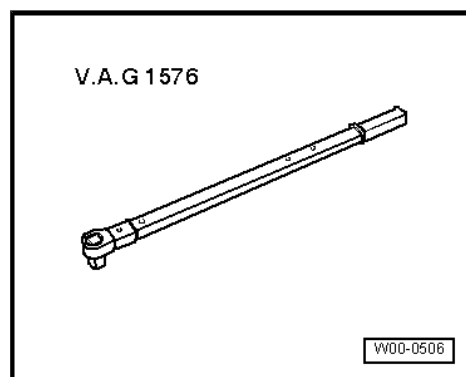




7.3 Loosening and tightening nut/bolt securing drive shaft

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1576-



- ◆ Socket, 24 mm - T10361A- (for multi-point head bolt)



- ◆ Or: hexagon socket, 19 mm (commercially available)

Slackening bolt securing drive shaft/stub axle to wheel hub

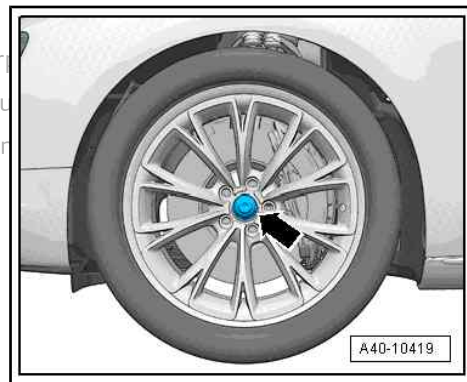
- To avoid damage to wheel bearing, slacken off bolt -arrow- no further than 90° with vehicle standing on its wheels.
- Raise vehicle so that wheels are off the ground.
- Have a second mechanic press the brake pedal.
- Remove bolt.

Tightening bolt securing drive shaft/stub axle to wheel hub



Note

- ◆ *Always renew bolt after removal.*
- ◆ *Before securing, clean threads in constant velocity joint/stub axle using a thread tap.*
- ◆ *The wheels must not be in contact with the ground when initially tightening the bolt for the drive shaft/stub axle; otherwise the wheel bearing can be damaged.*
- Have a second mechanic press the brake pedal.
- Tighten bolt to 200 Nm.
- Lower vehicle onto its wheels.
- Turn bolt 180° further.





7.4 Dismantling and assembling drive shaft

⇒ [“7.4.1 Dismantling and assembling drive shaft - outer constant velocity joint”, page 173](#)

⇒ [“7.4.2 Dismantling and assembling drive shaft - inner constant velocity joint”, page 174](#)

7.4.1 Dismantling and assembling drive shaft - outer constant velocity joint

Special tools and workshop equipment required

- ◆ Circlip pliers, commercially available
- ◆ Sealing compound - D454 300 A2- ⇒ Electronic parts catalogue

Removing outer constant velocity joint

- Clamp drive shaft in a vice using protective jaw covers.
- Open hose clip.
- Push back boot.
- Drive constant velocity joint off drive shaft using a drift -A-.
- The drift must be applied exactly on the ball hub of the constant velocity joint.
- Detach joint and boot.



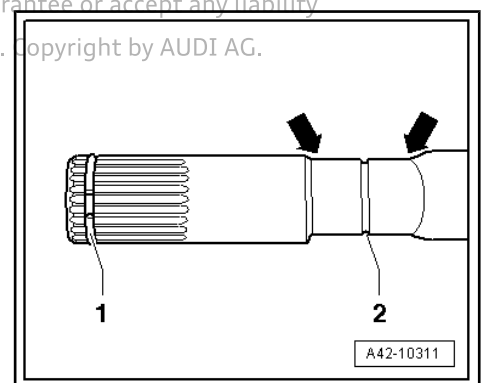
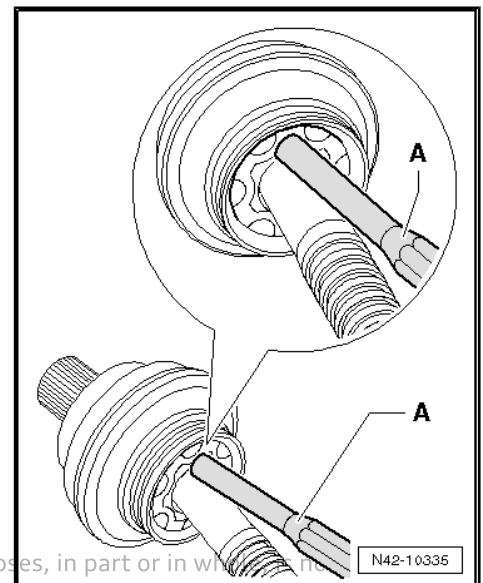
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- Remove circlip -1- using circlip pliers.



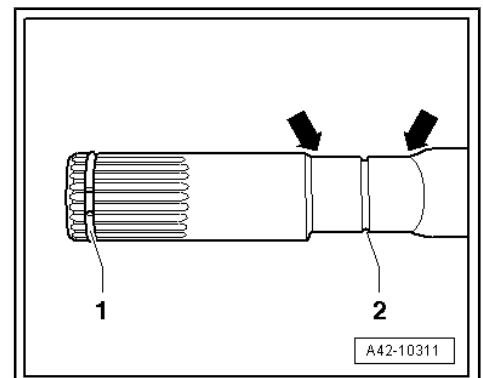
Note

Disregard -item 2, arrows-.



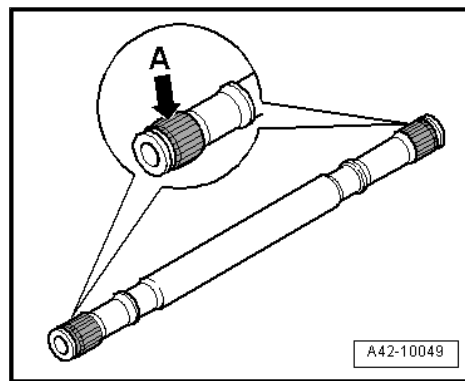
Installing outer constant velocity joint

- Push boot with new hose clip onto drive shaft.
- Boot and drive shaft must be free from grease.
- Slide boot on until it engages between -arrows- in groove -2-.
- Pack drive shaft grease evenly into inside of joint body
⇒ [page 170](#).

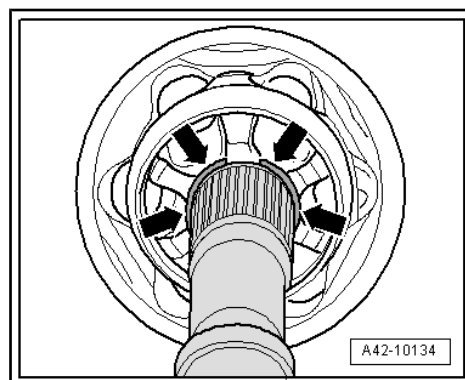




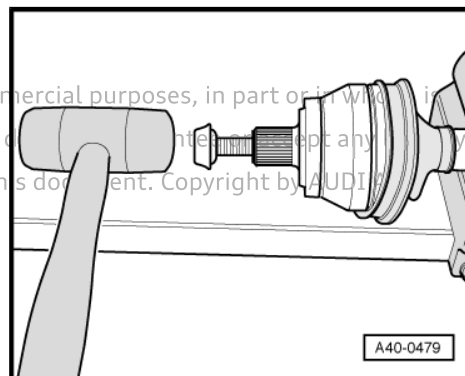
- Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.
- Fit circlip in groove on shaft.



- Slide on constant velocity joint as far as circlip.
- Align circlip so that opening faces upwards -arrows-.



- Screw old bolt into joint body, as shown in illustration.
- Use a plastic-headed hammer to drive joint onto drive shaft until circlip engages.
- Fit boot on metal cap.
- Vent air from boot.
- Make sure boot is properly positioned on joint body.
- Boot must rest in groove and on contour of joint body.
- Tighten hose clips on outer joint ⇒ [page 170](#) .



7.4.2 Dismantling and assembling drive shaft - inner constant velocity joint

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-





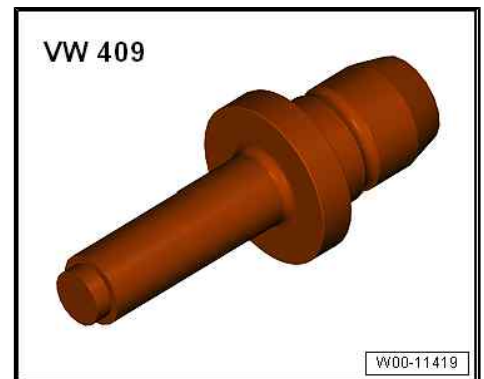
◆ Thrust plate - VW 402-



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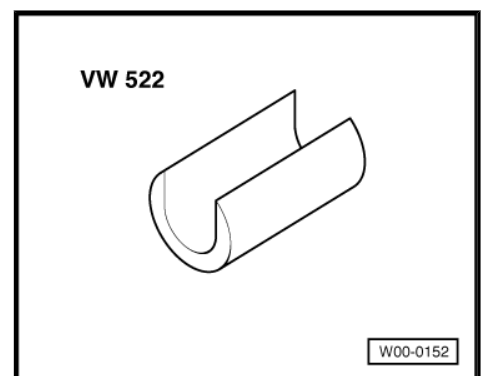
◆ Press tool - VW 409-



◆ Press tool - VW 412-



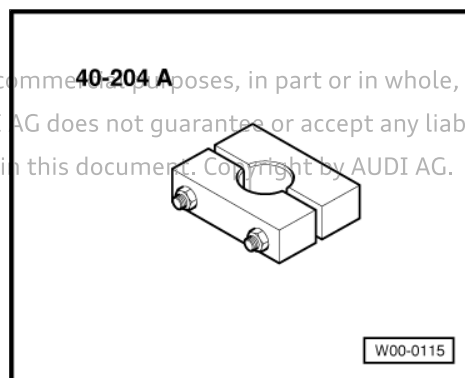
◆ Support sleeve - VW 522-



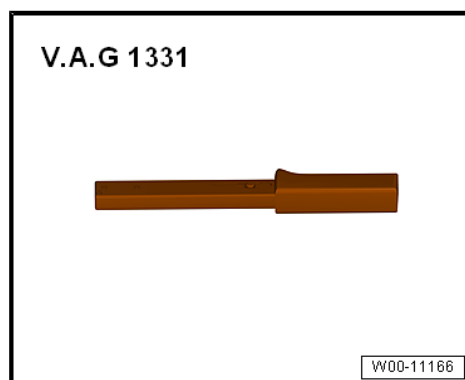


◆ Clamp - 40-204A-

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◆ Torque wrench - V.A.G 1331-

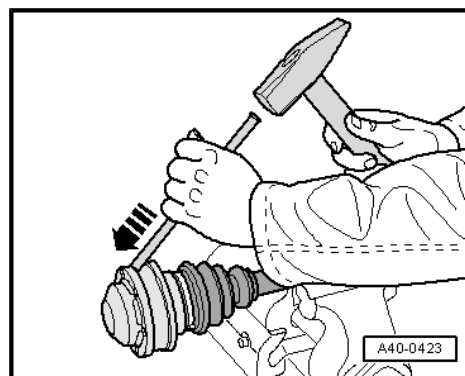


◆ Circlip pliers, commercially available

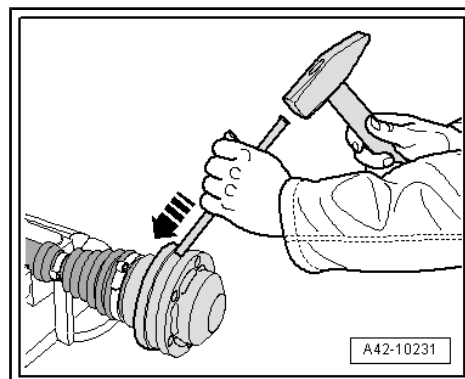
◆ Sealing compound - D 454 300 A2-

Removing inner constant velocity joint

- Clamp drive shaft horizontally in vice using protective jaw covers.
- Drive off cover with a copper or brass drift -arrow-.

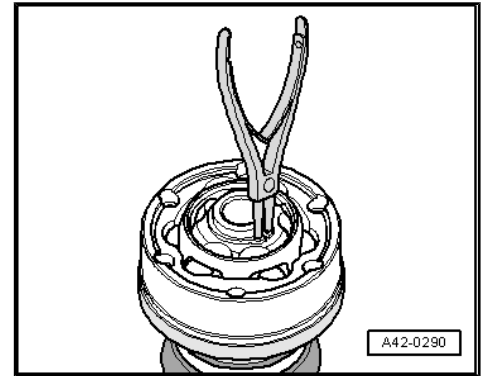


- Drive off cap with a copper or brass drift -arrow-.
- Unfasten and detach only the “small” hose clip.



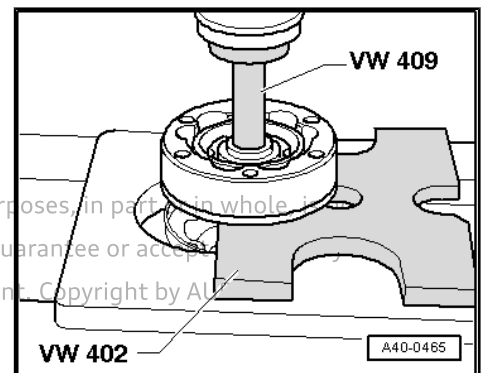


- Remove circlip using circlip pliers.



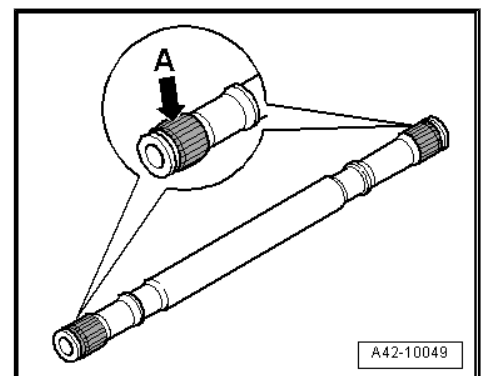
- Set up special tools as shown in illustration.
- Press inner constant velocity joint off drive shaft.
- Pull boot off drive shaft.

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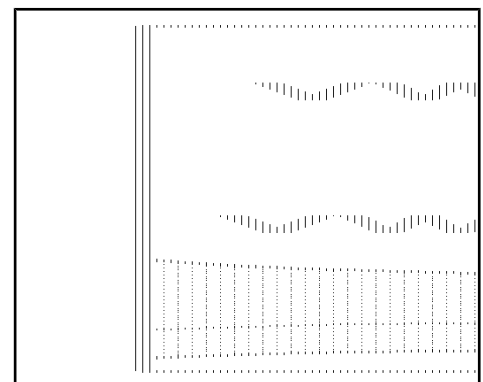


Installing inner constant velocity joint

- Push boot with “small” hose clip onto drive shaft.
- Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.

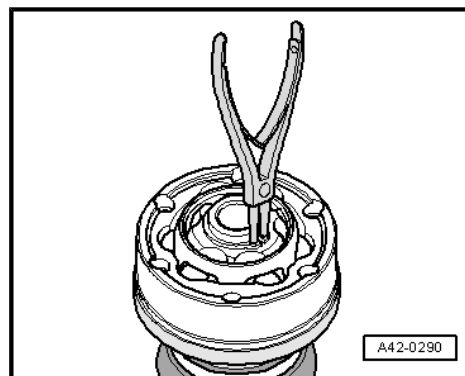


- Set up special tools as shown in illustration.
- Tensioner - 40-204A- and clamping surface on drive shaft must be free of grease.
- Chamfer on internal diameter of ball hub (splines) must face contact collar of drive shaft.
- Press on joint as far as stop.

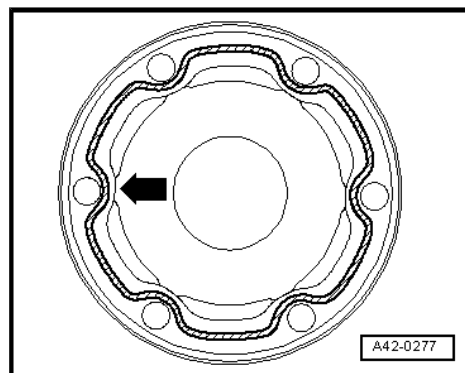




- Install new circlip using circlip pliers.
- Check that circlip is seated correctly.
- Before fitting boot, pack half the drive shaft grease provided into joint from boot side of joint.



- Degrease contact surfaces for boot and cap.
- Apply sealant - D 454 300 A2- -hatched area- on clean inner surface of cap on boot.
- ◆ Width of sealant bead: 2 ... 3 mm.
- Route sealant bead around inside of holes -arrow-.



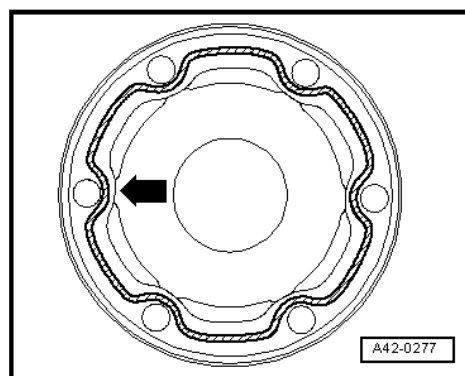
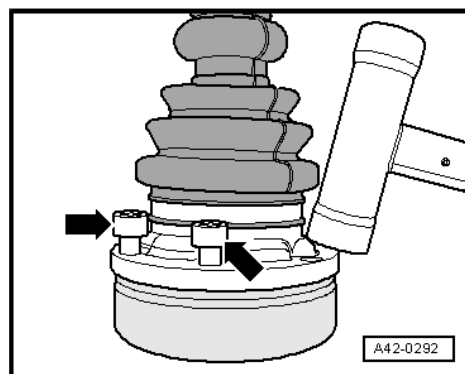
- Align cap and bolts -arrows- with bolt holes.



Note

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

- Drive on cover using a plastic hammer.
- Remove surplus sealing compound immediately as it is pressed out.
- Pack remaining drive shaft grease into constant velocity joint through ball races.
- Degrease contact surface for cover and for constant velocity joint.
- Apply sealant - D 454 300 A2- -hatched area- to clean inner surface of cover.
- ◆ Width of sealant bead: 2 ... 3 mm.
- Route sealant bead around inside of holes -arrow-.





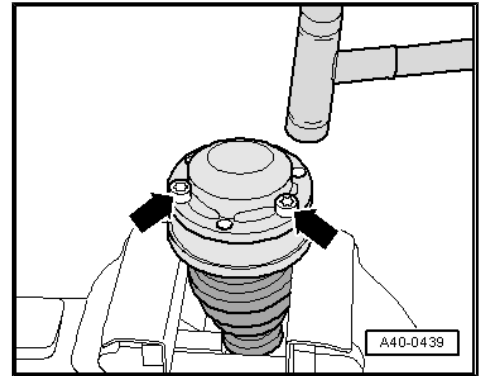
- Using bolts -arrows-, align new cover in relation to bolt holes.



Note

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

- Drive on cover using a plastic hammer.
- Remove surplus sealant immediately as it is pressed out.



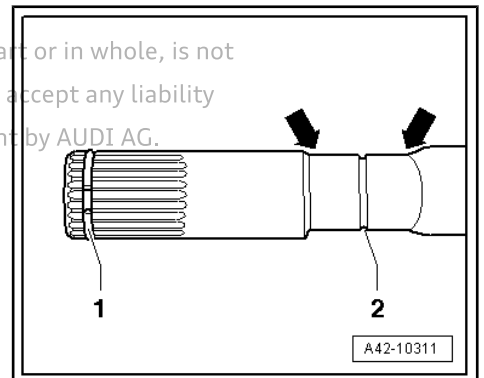
- Slide boot onto drive shaft and position it in groove -2- between arrows-



Note

Disregard -item 1-.

- Tighten hose clips on inner joint ➔ [page 170](#) .



7.5 Checking outer constant velocity joint

- ◆ Outer constant velocity joint with cap cannot be dismantled.
- ◆ Only a visual inspection can be performed on outer constant velocity joint with cap.
- ◆ Grease remaining in joint must be free from water and dirt.
- ◆ If the visual inspection reveals wear or damage on the balls or ball races, the complete outer constant velocity joint with cap must be renewed.

Quantities and type of grease for drive shaft with outer constant velocity joint ➔ [page 170](#) .

7.6 Checking inner constant velocity joint

The joint should be dismantled to renew dirty grease or for checking the balls and ball races for wear and damage.

Dismantling

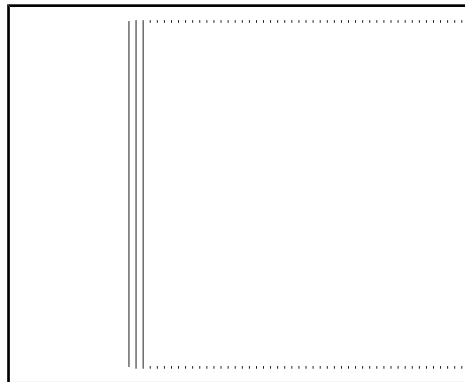


Note

Ball hub and joint body are paired and must be marked before dismantling. Ensure that the balls run in the same races after assembly.



- Swivel ball hub and ball cage.
- Press out joint body in direction of -arrow-.
- Push balls out of cage.

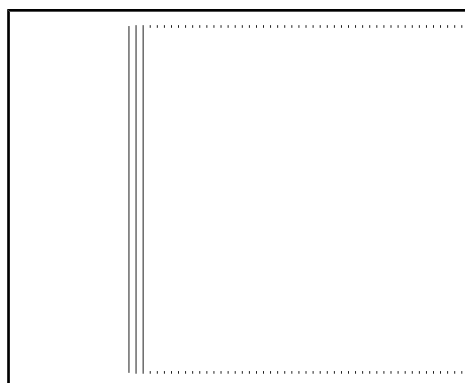


- Align ball hub with cage as shown -arrows- and pivot hub out of cage.
- Check joint, ball hub, ball cage and balls for pitting and signs of seizure.



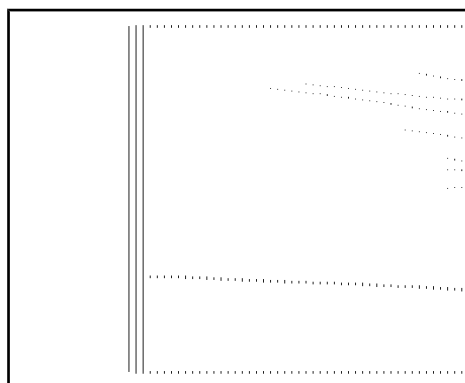
Note

Excessive backlash in the joint will cause knocking or jolts under load change. In such cases the joint must be renewed. Polished areas and visible tracks in the ball races are not a reason for renewing the joint.

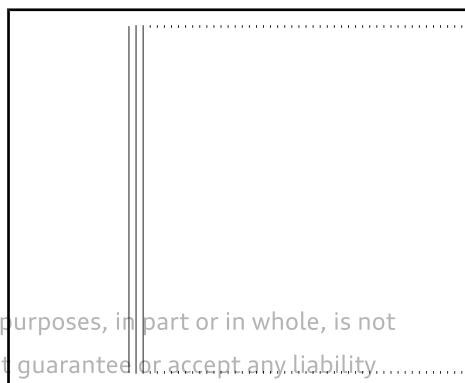


Assembling

- Insert hub into cage via the two chamfers. No specific installation position is required. Push balls into cage.
- Insert hub with cage and balls at a right angle to the 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 swivelling in.
- ◆ Chamfer on internal diameter of ball hub (splines) must face drive shaft.



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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 races.



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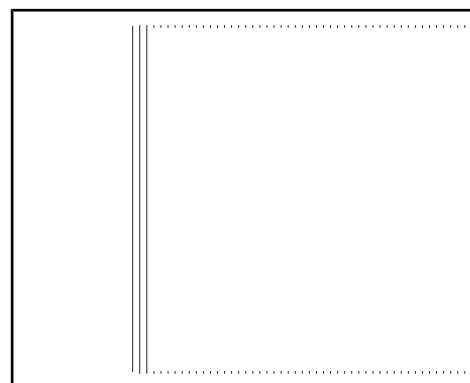
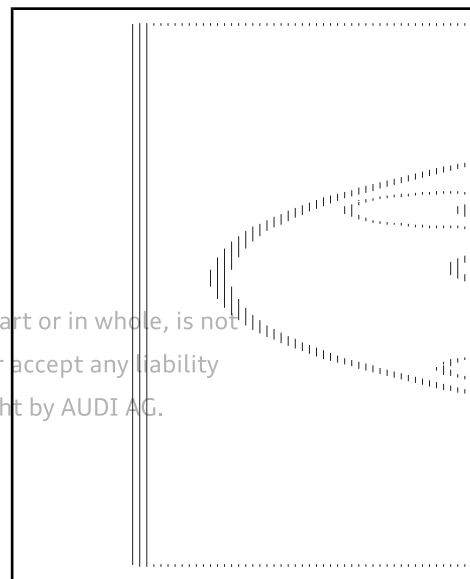
- Swivel in the hub with balls by applying firm pressure on the cage -arrow-.

Checking function of constant velocity joint

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

- Pack required amount of grease into joint body.

Quantities and type of grease for drive shaft with inner constant velocity joint ➔ [page 170](#) .





43 – Self-levelling suspension

1 Electronic damping control

⇒ [“1.1 Overview of fitting locations - electronic damping control”, page 182](#)

⇒ [“1.2 Basic setting of electronic damper control”, page 183](#)

⇒ [“1.3 Removing and installing running gear control unit J775 ”, page 184](#)

1.1 Overview of fitting locations - electronic damping control

1 - Vehicle level sender (front)

◆ Front left vehicle level sender - G78-

◆ Front right vehicle level sender - G289-

□ Exploded view
⇒ [page 186](#)

2 - Shock absorber with front right shock absorber damper adjustment valve - N337-

□ Exploded view
⇒ [page 43](#)

3 - Driving mode selection button

□ With driving mode selection button - E735- / driving mode selection button 2 - E797-

□ In centre switch module in dash panel - EX22-

□ Components cannot be renewed separately if defective

4 - Running gear control unit - J775-

□ Installation position: On centre tunnel

□ Removing and installing
⇒ [page 184](#)

5 - Shock absorber with rear right shock absorber damper adjustment valve - N339-

□ Exploded view
⇒ [page 141](#)

6 - Shock absorber with rear left shock absorber damper adjustment valve - N338-

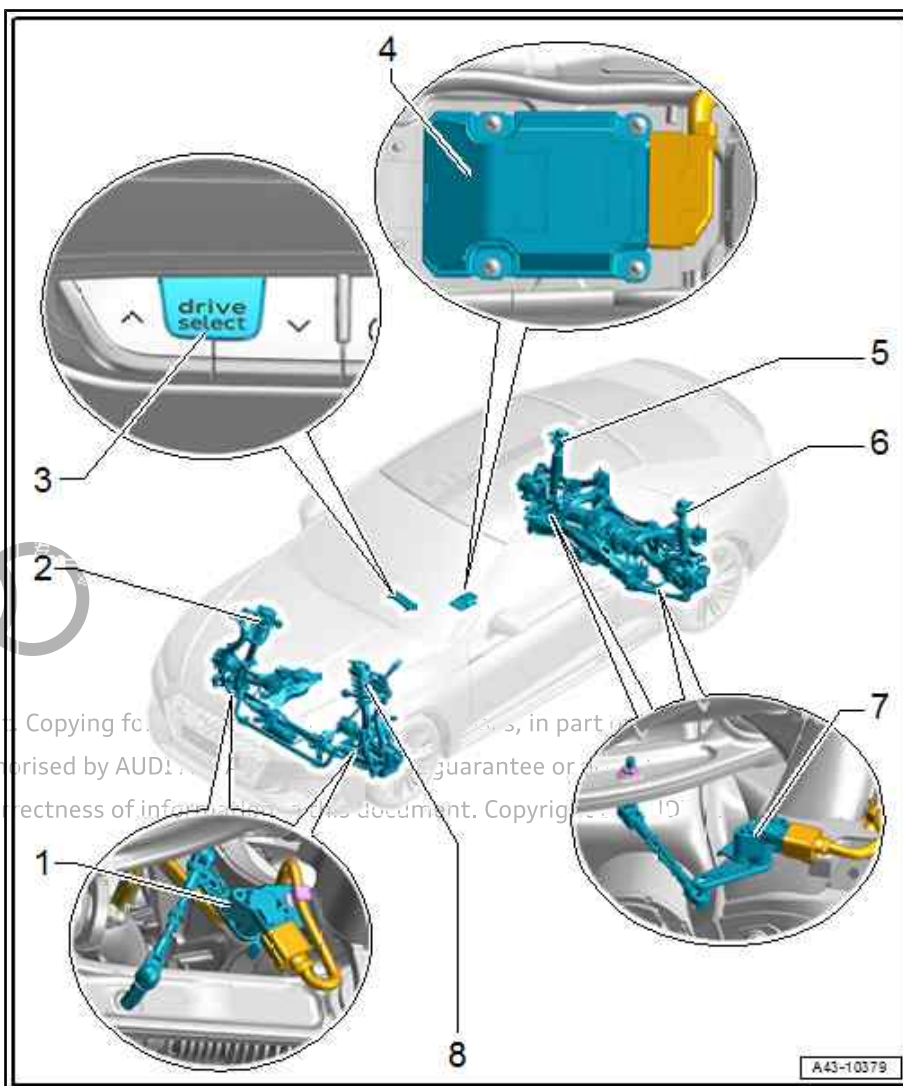
□ Exploded view ⇒ [page 141](#)

7 - Vehicle level sender (rear)

◆ Rear left vehicle level sender - G76-

◆ Rear right vehicle level sender - G77-

□ Exploded view ⇒ [page 187](#)





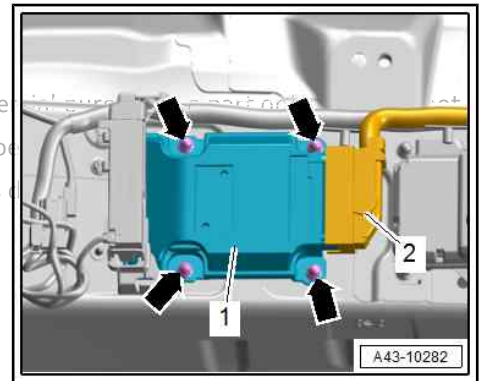
8 - Shock absorber with front left shock absorber damper adjustment valve - N336-

- ❑ Exploded view ➔ [page 43](#)

Electronically controlled damping control unit - J250- - tightening torque

- Tighten nuts -arrows- to 8 Nm.

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1.2 Basic setting of electronic damper control

Adapting stops for level sensor system

Perform this basic setting if:

- ◆ The bolts for one of the vehicle level senders were unscrewed.
- ◆ One of the vehicle level senders was removed and installed.
- ◆ One of the shock absorbers (front or rear) was renewed.

Requirement:

- The vehicle must be raised on a lifting platform until the wheels are off the ground; this will move the shock absorbers to their stops.

Adapting zero position for level sensor system

Perform this basic setting if:

- ◆ The bolts for one of the vehicle level senders were unscrewed.
- ◆ One of the vehicle level senders was removed and installed.
- ◆ The running gear control unit - J775- has been removed and installed.

Requirements:

- The vehicle must be standing on a level surface.
- The vehicle must be unladen.

Calibrating the inertia sensor system (sensors in control unit)

Perform this basic setting if:

- ◆ The running gear control unit - J775- has been renewed.

Requirements:

- The vehicle must be standing on a level surface.
- The vehicle must be unladen.



Note

The basic settings can be performed individually or several at a time.



Procedure

- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Running gear
 - ◆ Chassis control
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 0074 - Chassis control unit J775
 - ◆ 0074 - Chassis control unit, functions
 - ◆ 0074 - Basic setting
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.

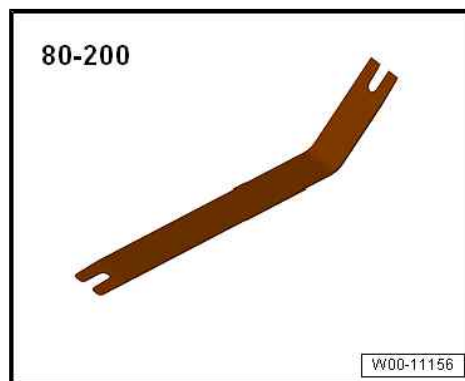
The following steps must be carried out after performing a basic setting:

- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Calibrate front camera for driver assist systems ⇒ [page 239](#) .

1.3 Removing and installing running gear control unit - J775-

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Removal lever - 80-200-



- ◆ Scissors

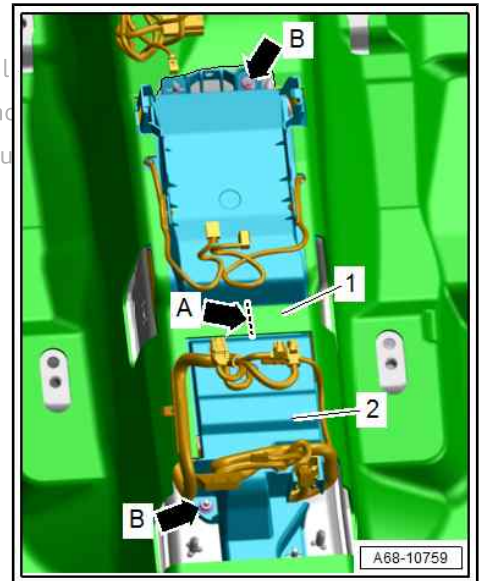
Removing

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console
- Remove interior aerial 1 for entry and start authorisation R138- ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Overview of fitting locations - keyless entry system .
- Depending on equipment version: Remove air duct (rear) ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Ex-



ploded view - routing of air flow and air distribution in passenger compartment .

- Cut through connecting piece -1- of floor covering using a pair of scissors at point indicated in illustration -arrow A-.
- Unscrew nuts -arrows B-.
- Unclip cover -2- for control unit from studs.
- Unclip electrical wiring harness from cover using removal lever - 80-200- and move wiring harness clear.
- Pull cover for control unit out from under floor covering and remove.



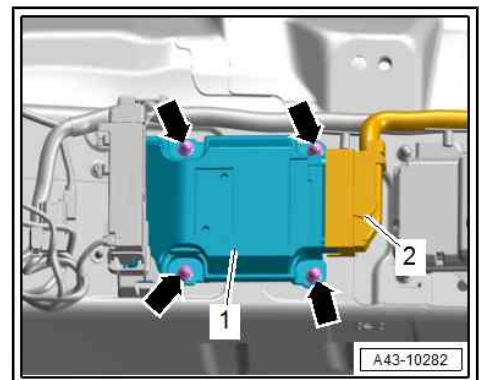
- Unscrew nuts -arrows- and detach electronically controlled damping control unit - J250- -item 1- -arrows-.
- Unplug electrical connector -2-.

Installing

Installation is carried out in reverse order; note the following:

Activate new electronically controlled damping control unit -J250- after installing:

- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Drive train
 - ◆ Chassis control
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 0074 - Chassis control unit J775
 - ◆ 0074 - Chassis control unit, functions
 - ◆ 0074 - Replace control unit
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.



Tightening torques

- ◆ ⇒ Fig. "" Electronically controlled damping control unit -J250- - tightening torque"" , page 183



2 Vehicle level senders

⇒ "2.1 Exploded view - front vehicle level senders", page 186

⇒ "2.2 Exploded view - rear vehicle level senders", page 187

⇒ "2.3 Removing and installing front vehicle level senders G78 / G289", page 187

⇒ "2.4 Removing and installing rear vehicle level senders G76 / G77", page 188

2.1 Exploded view - front vehicle level senders

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1 - Bolt

- ☐ 9 Nm

2 - Vehicle level sender (front)

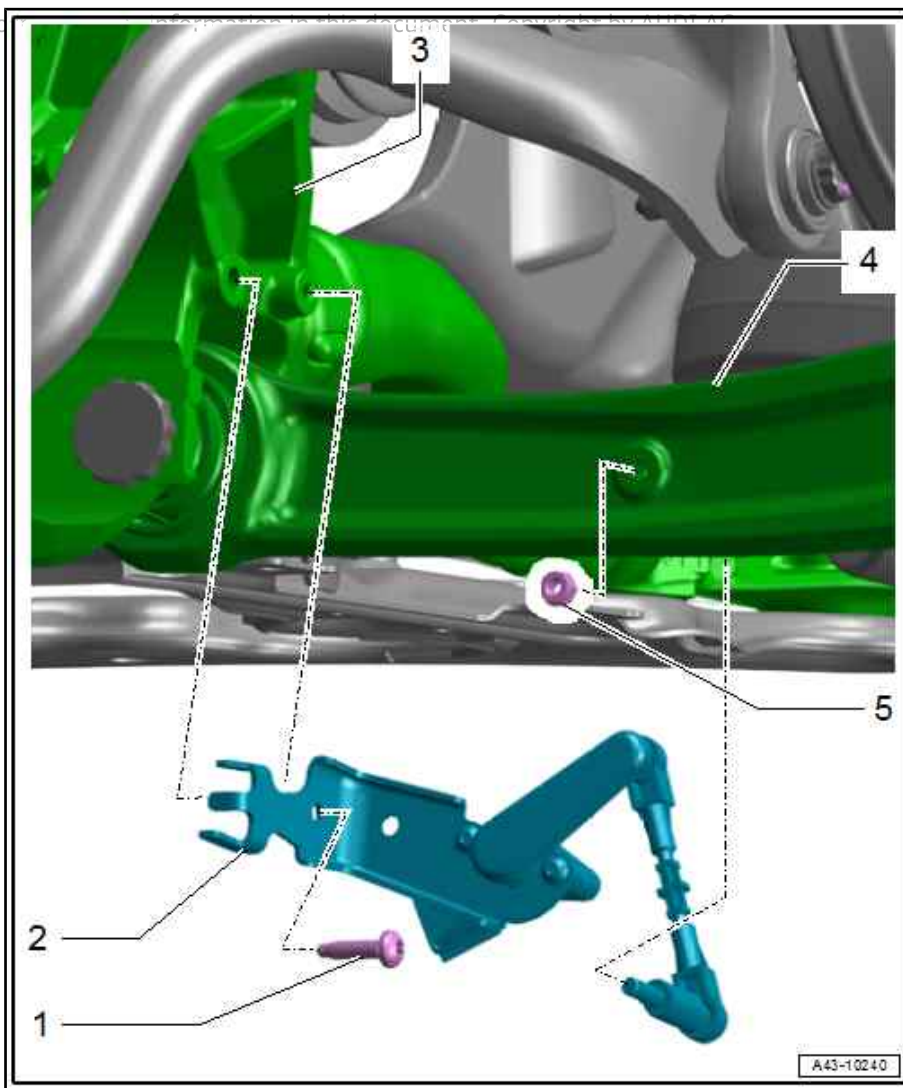
- ◆ Front left vehicle level sender - G78-
- ◆ Front right vehicle level sender - G289-
- ☐ With coupling rod and retaining plate
- ☐ Removing and installing ⇒ [page 187](#)
- ☐ Installation position: coupling rod of sender faces outwards

3 - Subframe

4 - Track control link

5 - Nut

- ☐ Self-locking
- ☐ Renew after removing
- ☐ 9 Nm





2.2 Exploded view - rear vehicle level senders

1 - Vehicle level sender (rear)

- ◆ Rear left vehicle level sender - G76-
- ◆ Rear right vehicle level sender - G77-
 - ❑ With coupling rod and retaining plate
 - ❑ Removing and installing ⇒ [page 188](#)
 - ❑ Installation position: coupling rod of sender faces towards rear

2 - Bolt

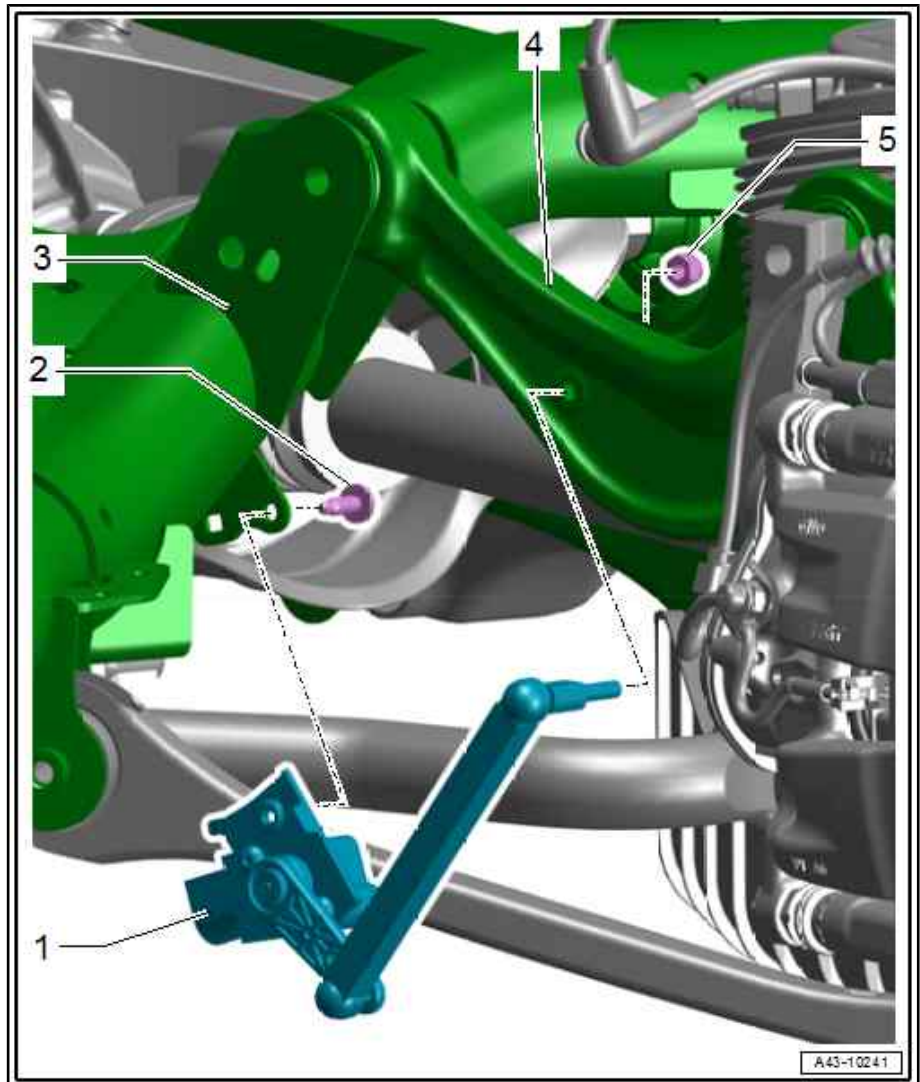
- ❑ 9 Nm

3 - Subframe

4 - Upper transverse link (front)

5 - Nut

- ❑ Self-locking
- ❑ Renew after removing
- ❑ 9 Nm



A43-10241

2.3 Removing and installing front vehicle level senders -G78- / -G289-

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



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V.A.G 1410



W00-11174



Removing

- Unplug electrical connector -3- and move wiring clear.
- Unscrew nut -2- for coupling rod.
- Remove bolt -1- and detach vehicle level sender.

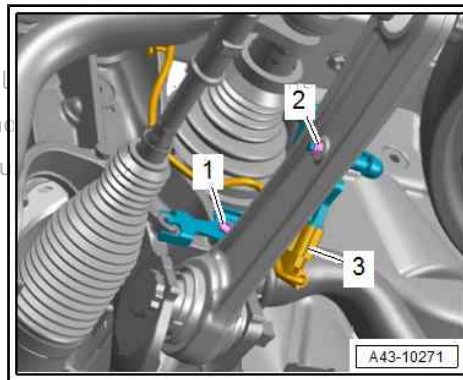
Installing

Installation is carried out in reverse order; note the following:

- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Calibrate front camera for driver assist systems ⇒ [page 239](#) .

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - front vehicle level senders”, page 186](#)



2.4 Removing and installing rear vehicle level senders -G76- / -G77-

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1410-



Removing

- Unplug electrical connector -3-.
- Unscrew nut -1- for coupling rod.
- Remove bolt -2- and detach vehicle level sender.

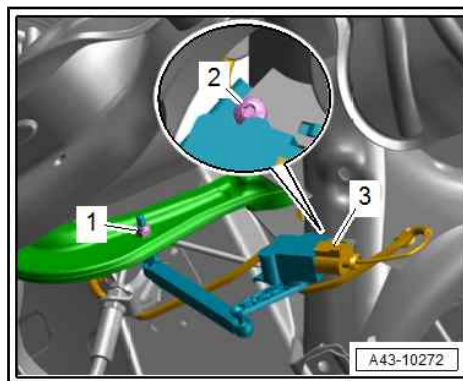
Installing

Installation is carried out in reverse order; note the following:

- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

- ♦ ⇒ [“2.2 Exploded view - rear vehicle level senders”, page 187](#)





3 Dynamic Ride Control (DRC)

⇒ [“3.1 System description - DRC”, page 189](#)

⇒ [“3.2 Overview of fitting locations - DRC”, page 189](#)

⇒ [“3.3 Exploded view - central valve”, page 191](#)

⇒ [“3.4 Exploded view - suspension strut \(front\)”, page 192](#)

⇒ [“3.5 Exploded view - suspension strut \(rear\)”, page 193](#)

⇒ [“3.6 Removing and installing central valve”, page 193](#)

⇒ [“3.7 Checking DRC system”, page 194](#)

⇒ [“3.8 Checking DRC system pressure”, page 195](#)

⇒ [“3.9 Discharging and charging DRC system”, page 196](#)

3.1 System description - DRC

Equipment version for RS models only

The DRC wheel damping system counteracts the pitch and roll of the body about the longitudinal and transverse axes to permit optimum handling. A purely hydraulic DRC with variable damping is fitted.

3.2 Overview of fitting locations - DRC

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1 - Suspension strut (front)

- ❑ Exploded view
⇒ [page 192](#)

2 - Central valves

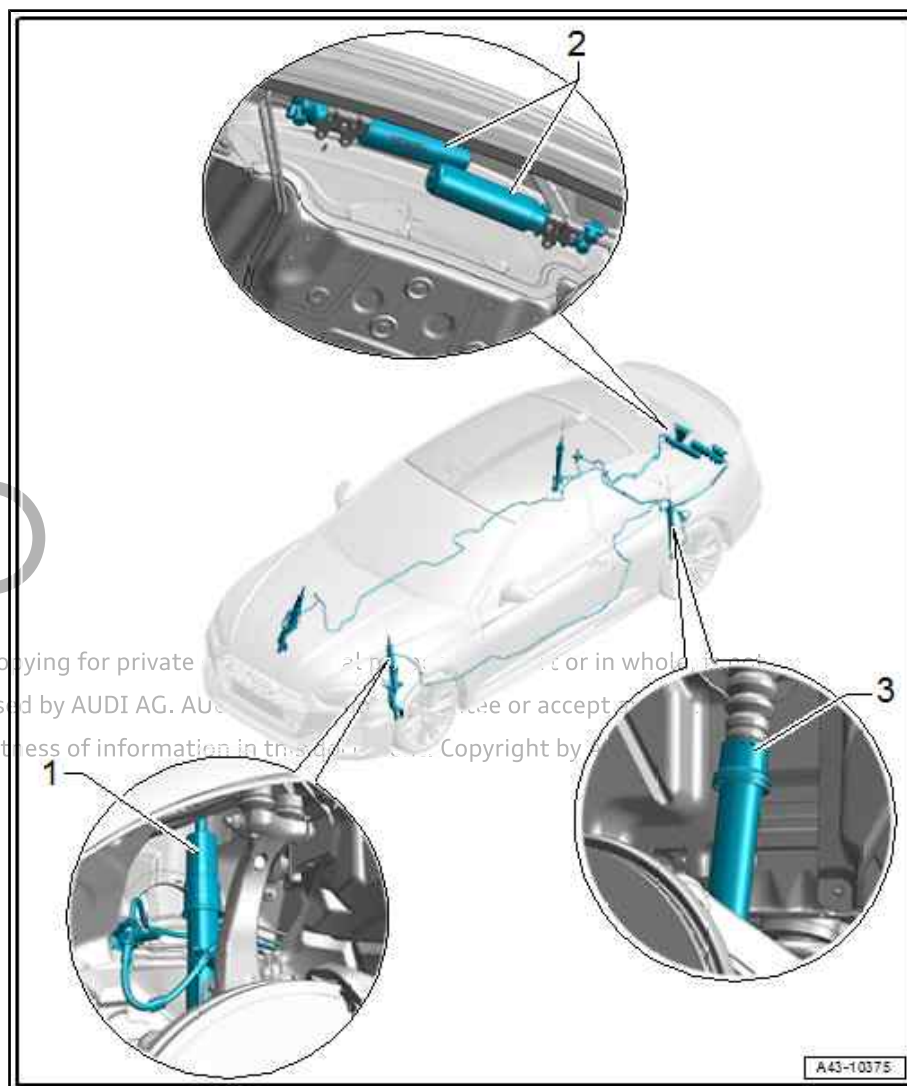
- ❑ Exploded view
⇒ [page 191](#)

3 - Shock absorber (rear)

- ❑ Exploded view
⇒ [page 193](#)



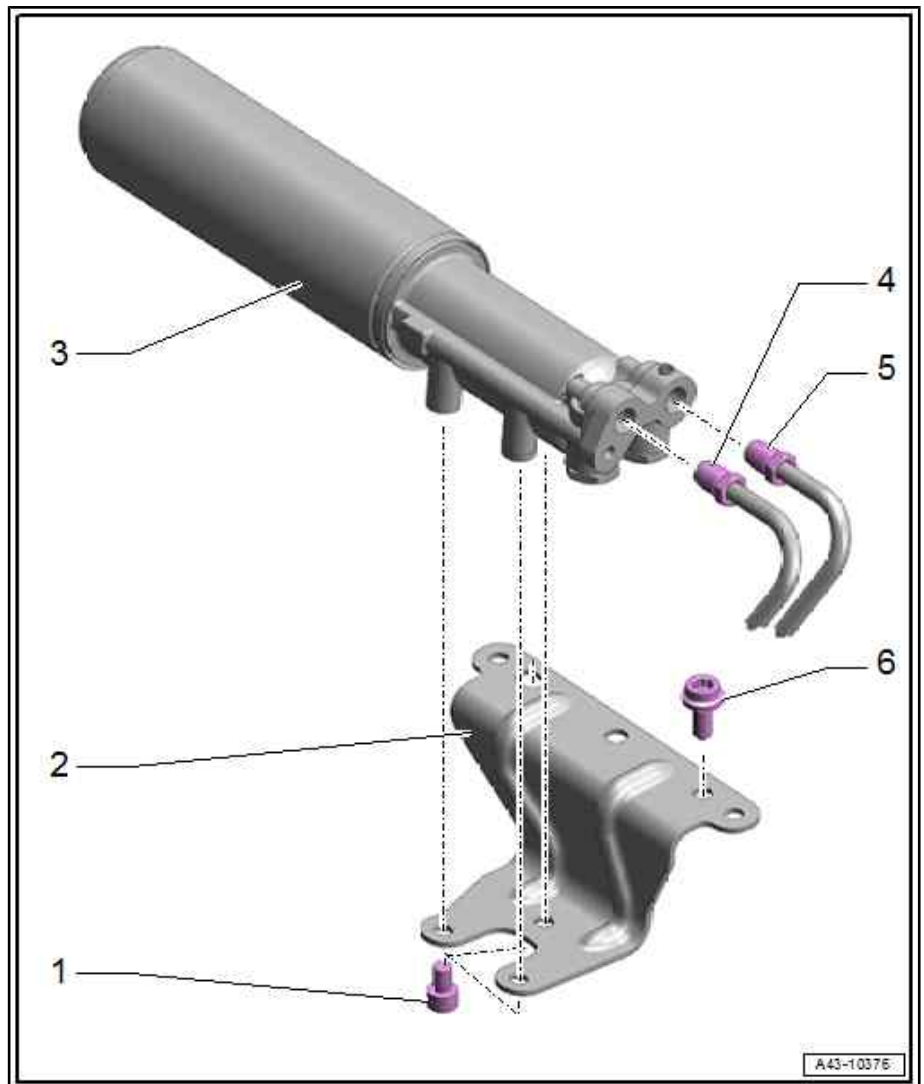
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3.3 Exploded view - central valve

- 1 - Bolt**
 - 20 Nm
- 2 - Bracket**
- 3 - Central valve**
 - Removing and installing
⇒ [page 193](#)
- 4 - DRC pipe to shock absorber (rear)**
 - Coloured marking
 - ◆ Green on left side
 - ◆ Blue on right side
 - 14 Nm
- 5 - DRC pipe to shock absorber (front)**
 - Coloured marking
 - ◆ Yellow on left side
 - ◆ White on right side
 - 14 Nm
- 6 - Bolt**
 - 20 Nm

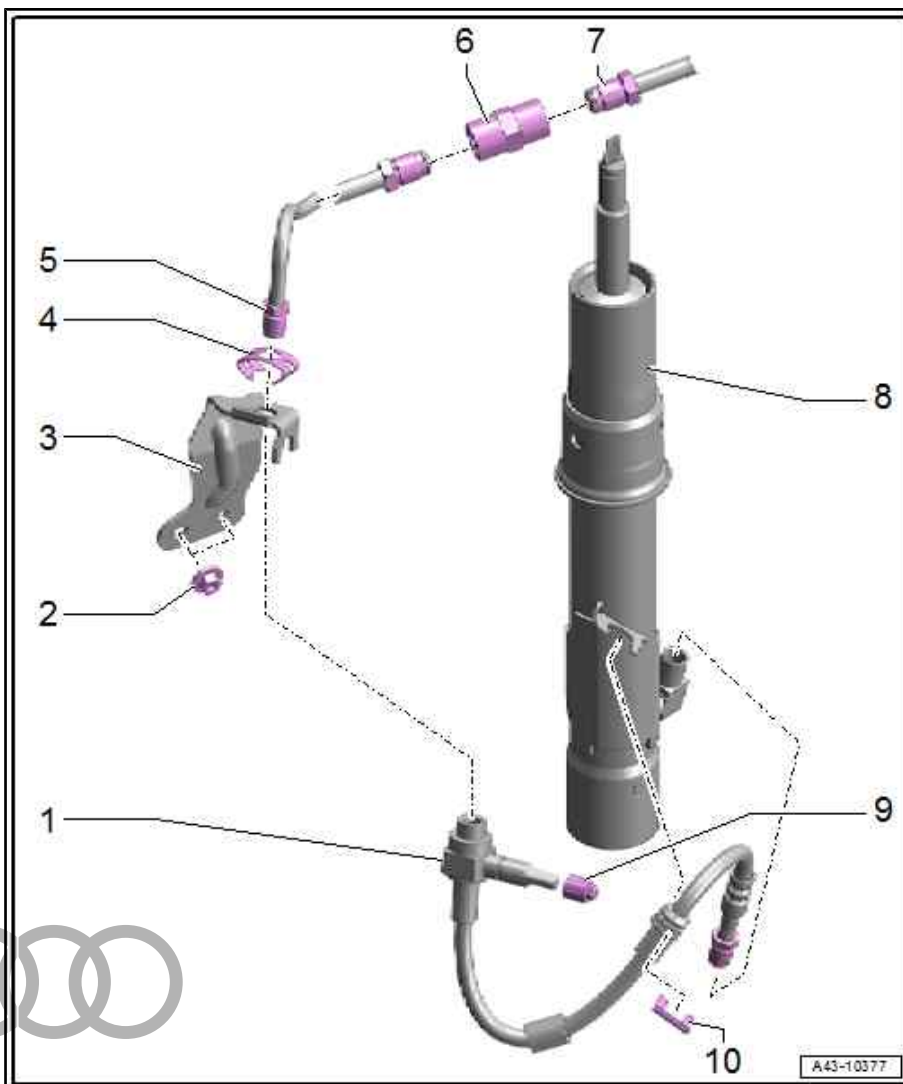


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3.4 Exploded view - suspension strut (front)

- 1 - Pipe/hose assembly
 - ☐ With drain/charge valve
 - ☐ Union screw: 14 Nm
- 2 - Nut
 - ☐ 9 Nm
- 3 - Bracket
- 4 - Retaining spring
 - ☐ Renew if damaged
- 5 - Hydraulic line
 - ☐ Union screw: 14 Nm
- 6 - Connecting piece
- 7 - Hydraulic line
 - ☐ Union screw: 14 Nm
- 8 - DRC shock absorber
 - ☐ Removing and installing
⇒ [page 44](#)
- 9 - Dust cap
 - ☐ 1.5 Nm
- 10 - Retaining spring
 - ☐ Renew if damaged

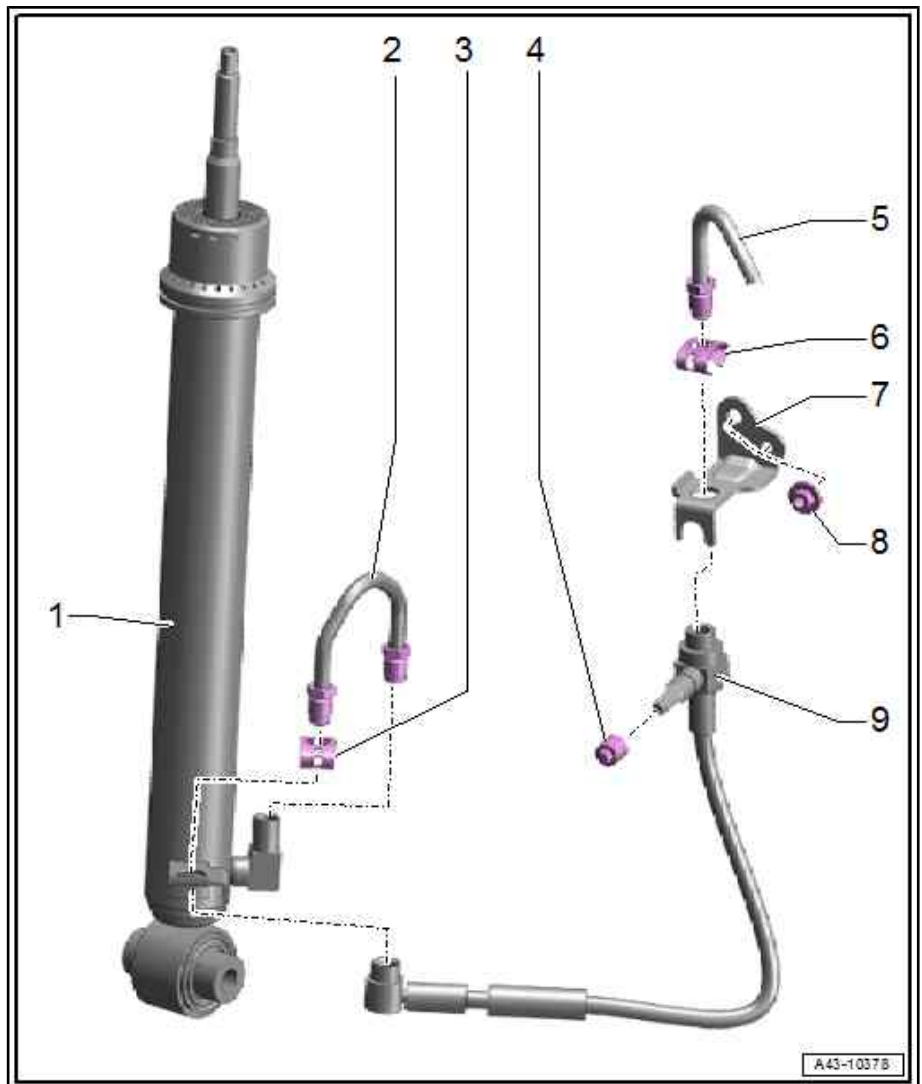


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3.5 Exploded view - suspension strut (rear)

- 1 - DRC shock absorber
 - ❑ Removing and installing
⇒ [page 142](#)
- 2 - Hydraulic line
 - ❑ Union screw: 14 Nm
- 3 - Retaining spring
 - ❑ Renew if damaged
- 4 - Dust cap
 - ❑ 1.5 Nm
- 5 - Hydraulic line
 - ❑ Union screw: 14 Nm
- 6 - Retaining spring
 - ❑ Renew if damaged
- 7 - Bracket
 - ❑ 9 Nm
- 8 - Nut
 - ❑ 9 Nm
- 9 - Pipe/hose assembly
 - ❑ With drain/charge valve



3.6 Removing and installing central valve

Removing

The central valves are bolted on the impact bar under the rear bumper cover.

- Unfasten bumper cover at bottom right ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear); Removing and installing bumper cover .



WARNING

Danger of eye injuries!

◆ ***Put on safety goggles.***

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- ◆ *Before disconnecting the DRC pipes from the central valve, the relevant section of the system must be discharged*
⇒ [page 196](#)
- ◆ *This step must be repeated for both sets of pipes connected to the relevant central valve.*

- Unscrew union screws -1-.
- Remove bolts -2- and detach central valve -3-.

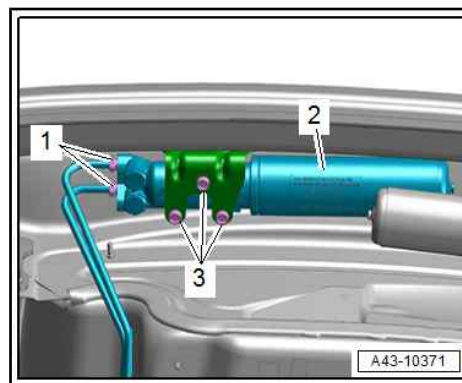
Installing

Installation is carried out in reverse order; note the following:

- Connect DRC pipes to relevant central valve.
- Fill DRC system ⇒ [page 196](#) .

Tightening torques

- ◆ ⇒ [“3.3 Exploded view - central valve”, page 191](#)



3.7 Checking DRC system

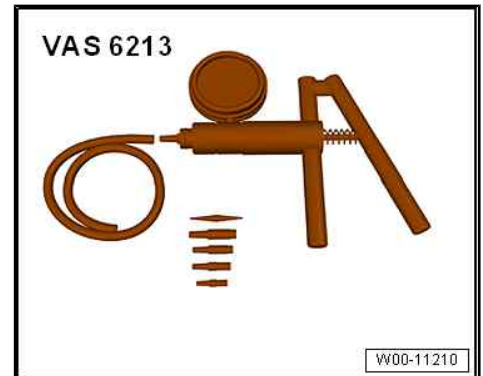
Start			
Rattling noise coming from suspension or rear of vehicle when driving over rough surfaces			Excessive body roll when entering a bend
→	Visible fluid leakage?		←
	↓	↓	
◆ Check components ◆ Check unions at central valves, shock absorbers and pipe connections ◆ Renew leaking shock absorbers	← Yes	No →	Check all unions at central valves, shock absorbers and pipe connections
↓		↓	
↓		Problem eliminated?	
↓		↓	↓
↓		No ↓	Yes ↓
↓		Check system pressure in both sections of system. (Central valves must be closed when connecting and disconnecting pressure tester.)	↓
↓		↓	↓
↓		↓	↓
↓		Yes ↓	↓
Discharge, evacuate and charge entire DRC system using filling device for DRC system - VAS 6544- ; check for leakage ⇒ page 196 .		↓	↓
↓		↓	↓
↓		↓	↓
↓			
End			



3.8 Checking DRC system pressure

Special tools and workshop equipment required

- ◆ Pressure tester -VAS 6209/2- (not illustrated)
- ◆ Hand vacuum pump - VAS 6213-



Bleeding pressure tester -VAS 6209/2-

Use only the approved type of fluid for this bleeding procedure.
Please refer to ⇒ Electronic parts catalogue .



Note

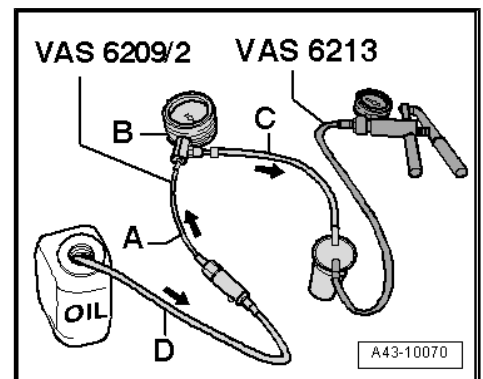
- ◆ *The pressure tester -VAS 6209/2- must always be bled before it is used for the first time.*
- ◆ *Bleeding is not required if the pressure tester -VAS 6209/2- still indicates a residual pressure in excess of 0.5 bar (e.g. from a previous measurement).*
- Set up special tools as illustrated in order to bleed pressure gauge -B- and connecting line -A-.



Note

The illustration shows the bleeding method involving drawing in hydraulic fluid with hand vacuum pump - VAS 6213- .

- Continue bleeding until no more air bubbles are visible in hose -C-.
- Disconnect hoses -C- and -D-.



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System pressure test



Note

The system pressure test is carried out at the front shock absorber of the section of the DRC system that is to be tested.

- Unscrew dust cap -arrow- from drain/charge valve and connect pressure tester -VAS 6209/2- .
- Read off system pressure at pressure tester -VAS 6209/2- .



Note

The pressure at pressure tester -VAS 6209/2- only builds up gradually; the process takes approx. 2 minutes. Do not read off the DRC system pressure until the gauge needle of -VAS 6209/2- has finally come to rest.

- Disconnect pressure tester -VAS 6209/2- and screw on dust cap.



Note

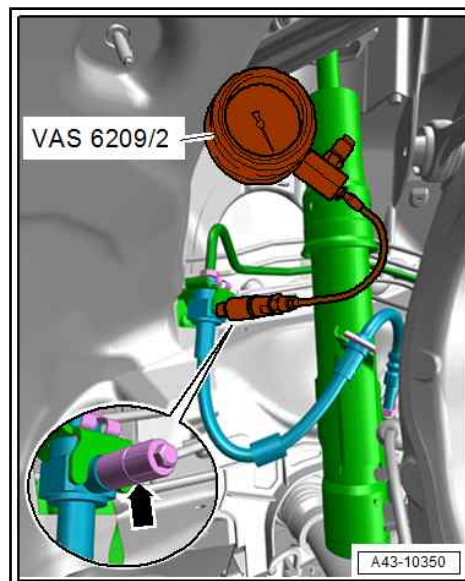
When connecting and disconnecting pressure gauge -VAS 6209/2- , a small amount of fluid will always escape at the connection, but this is not critical. Repeated measurements should be avoided because the system loses a small amount of fluid every time the pressure tester -VAS 6209/2- is connected. The pressure reading will be about 0.3 bar lower than the previous value when the gauge is reconnected. Several repeated measurements will thus cause the pressure in the system to drop below the minimum limit, or can cause failure of the system.

- If the pressure is not OK, trace the cause of the fault and repair the system.

DRC system pressure figures

These pressure figures are based on a reference temperature of 20 °C.

- ◆ 16 bar = Operating pressure
- ◆ 15 bar – 16 bar = Central valve new or in as-new condition
- ◆ 14 bar – 15 bar = Normal working range; system OK
- ◆ < 14 bar = System leaking or not fully charged; air trapped in system; central valve depressurised/empty.



3.9 Discharging and charging DRC system



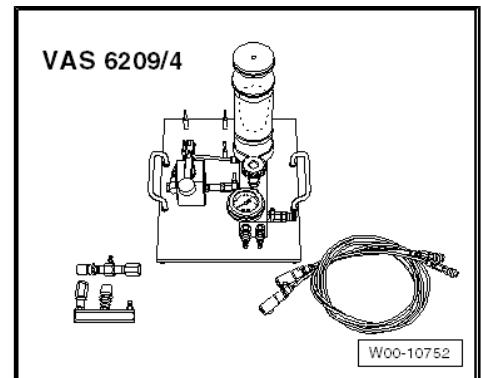
Note

Discharging, evacuating and charging the complete DRC system (pipes/shock absorbers and central valve) is performed using the filling device for DRC system - VAS 6544- . Depending on the equipment available in your workshop for the DRC system, it may be necessary to modify/convert the existing equipment with the appropriate supplementary, upgrade or retrofit kits to meet the standard of the filling device for DRC system - VAS 6544- . The following equipment is available:



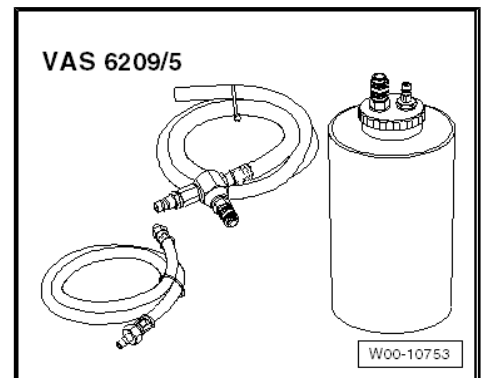
Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Upgrade kit, filling device DRC system - VAS 6209/4-



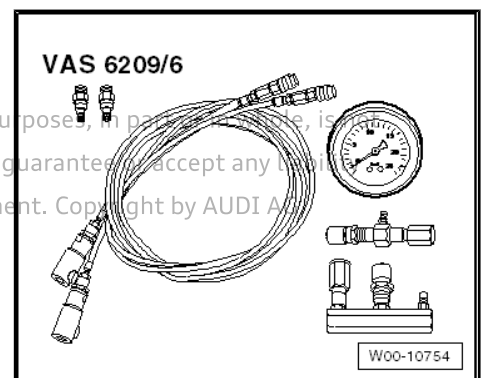
The upgrade kit, filling device DRC system - VAS 6209/4- is used as an upgrade kit for the charging device for Audi RS 6 DRC system - VAS 6209- already available in the workshop.

- ◆ Retrofit kit, filling device DRC system - VAS 6209/5-



The retrofit kit, DRC system - VAS 6209/5- is required by workshops equipped with the pressure pump - VAS 6209/3- wishing to upgrade this to the technical standard of the filling device for DRC system - VAS 6544- . The supplementary kit, DRC system - VAS 6209/6- must also be obtained.

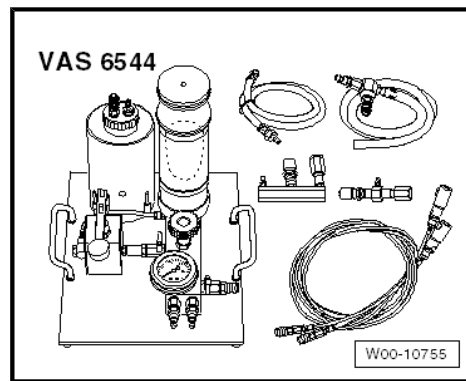
- ◆ Supplementary kit, DRC system - VAS 6209/6-



The supplementary kit, DRC system - VAS 6209/6- is required to upgrade the existing pressure pump - VAS 6209/3- to the technical standard of the filling device for DRC system - VAS 6544- . As a basic requirement, the workshop must already be equipped with the charging device for Audi RS 6 DRC system - VAS 6209- . If the workshop is not equipped with the charging device for Audi RS 6 DRC system - VAS 6209- the retrofit kit, filling device DRC system - VAS 6209/5- must be obtained additionally.



◆ Filling device for DRC system - VAS 6544-



Required components of filling device for DRC system - VAS 6544-

1 - Not required

2 - Not required

3 - Charging lines with quick-release couplings

4 - Venturi nozzle with air outlet hose

- ☐ From charging device for Audi RS 6 DRC system - VAS 6209-

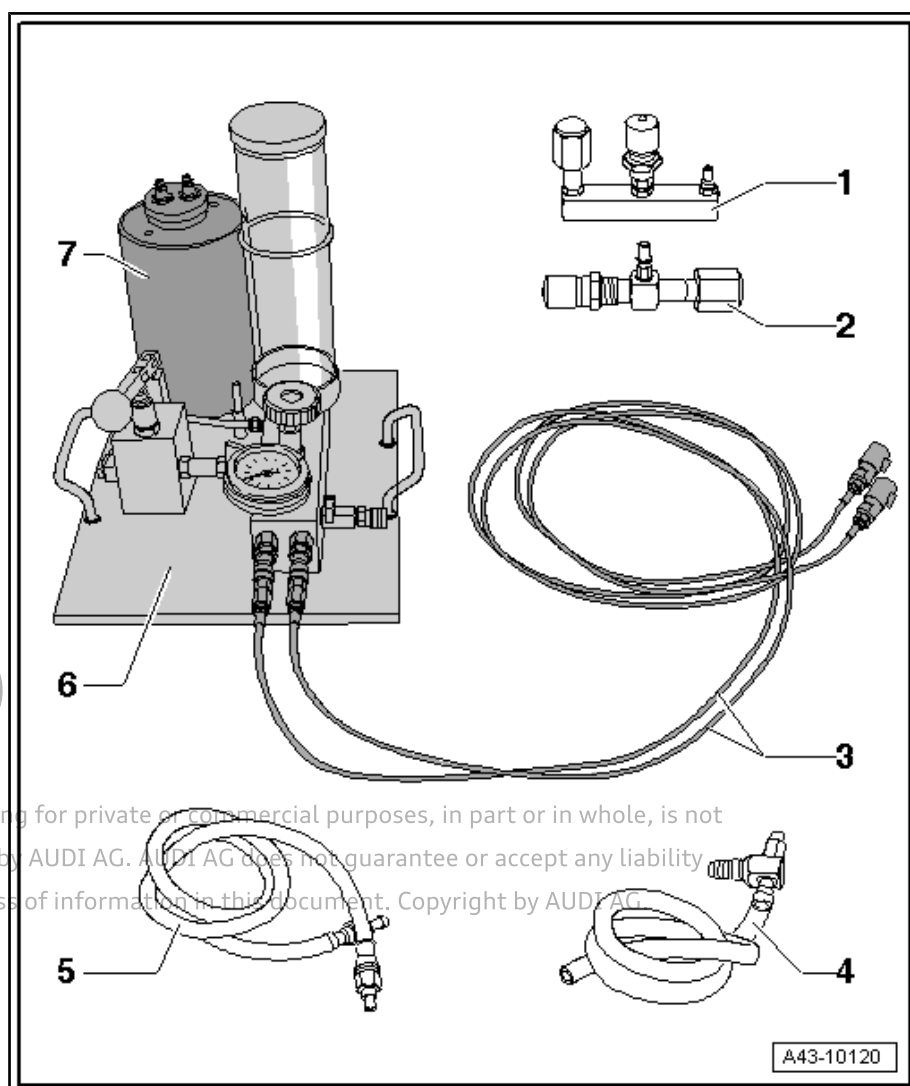
5 - Connecting hose

- ☐ From charging device for Audi RS 6 DRC system - VAS 6209-

6 - Filling device for DRC system - VAS 6544-

7 - Used fluid container

- ☐ Empty before starting work
- ☐ Identified by red dot



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Note

The equipment for the DRC system only needs to be modified once in your workshop. It is not necessary to convert the equipment back to its original condition. The further procedure for discharging and charging the entire DRC system is described for the filling device for DRC system - VAS 6544- .

- Use only the approved type of fluid when charging and topping up the system ⇒ Electronic parts catalogue .
- Replacement shock absorbers and pipes are supplied empty.
- Charging may only be performed at room temperature (approx. 20 °C).
- Pipes/shock absorbers and central valves may only be discharged, evacuated and charged when they are installed in the vehicle and connected.
- When charging the DRC system, the gas accumulator leading to the pressure chambers at the piston in the central valve is automatically checked for leaks.
- The valves on the workshop equipment are open when the cut-off lever is in line with the direction of flow.
- The valves must be kept closed for transport and storage of the filling device for DRC system - VAS 6544- .
- Pipes must not be bent.



WARNING

Danger of eye injuries!

◆ ***Put on safety goggles.***



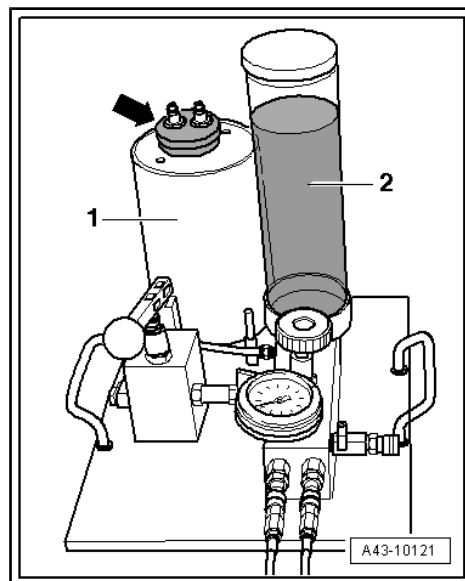
Note

- ◆ ***Before starting to charge the DRC system, it is important to ensure that the fluid container of the filling device for DRC system - VAS 6544- and the connecting line between the pressure pump and the fluid container are filled with fluid.***
- ◆ ***The used fluid container of the filling device for DRC system - VAS 6544- must be empty and must be drained after each extraction.***



Draining used fluid container

- Unscrew the cap -arrow- on the used fluid container -1- and dispose of the used fluid.
- Refit cap.



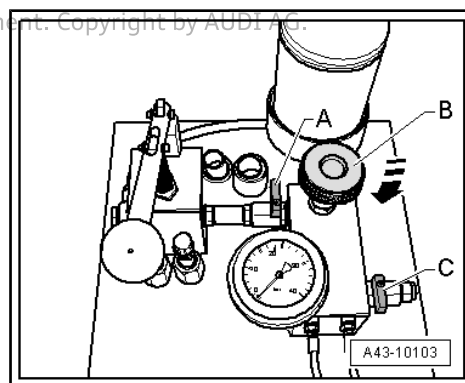
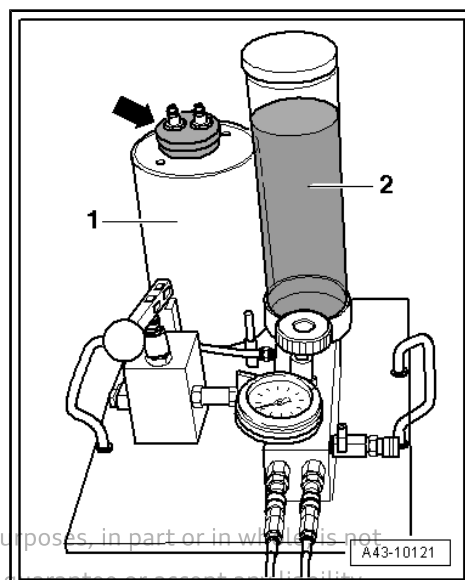
Filling and bleeding filling device for DRC system - VAS 6544-

- Fill up fluid container -2- with fresh fluid as far as the mark and position O-ring in line with fluid level ⇒ Electronic parts catalogue .



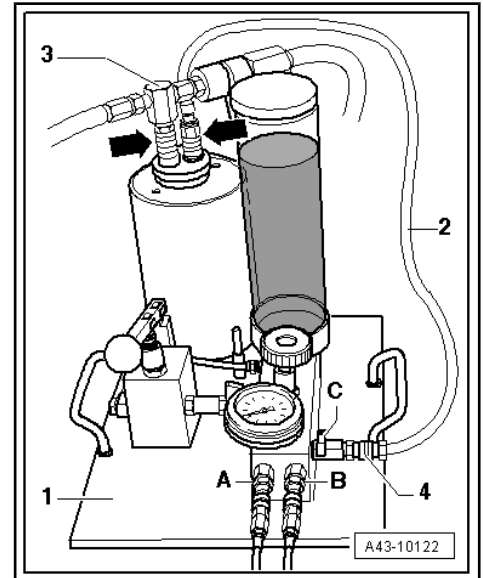
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- Close shut-off valves -A- and -C- of filling device for DRC system - VAS 6544- .
- Close needle valve -B-.





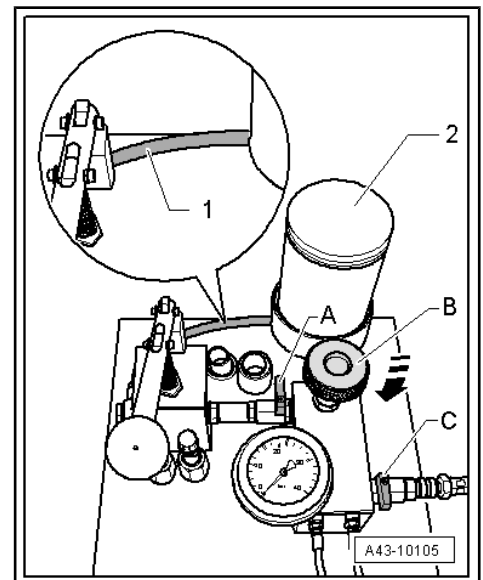
- Connect hose -2- to used fluid container -right arrow- and quick-release coupling -4- of filling device for DRC system - VAS 6544- .
- Connect venturi nozzle -3- with air outlet hose to used fluid container -left arrow-, as shown in illustration.
- Connect compressed air line to venturi nozzle -3-.



- Open shut-off valve -C-.
- Open shut-off valve -A- for approx. 1-2 seconds until line -1- between fluid container -2- and pressure pump is filled with bubble-free fluid.
- Close shut-off valve -C-. Disconnect compressed air line from venturi nozzle.

Discharging/evacuating

- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Running gear
 - ◆ Chassis control
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 0074 - Chassis control unit J775
 - ◆ 0074 - Chassis control unit, functions
 - ◆ 0074 - Charge DRC (RS models only)
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.



WARNING

Danger of eye injuries!

- ◆ ***Put on safety goggles.***

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- Turn the front wheel outwards on the side to be discharged.



Note

The DRC system comprises two separate hydraulic systems. The central valves are connected diagonally in relation to the corresponding shock absorbers.

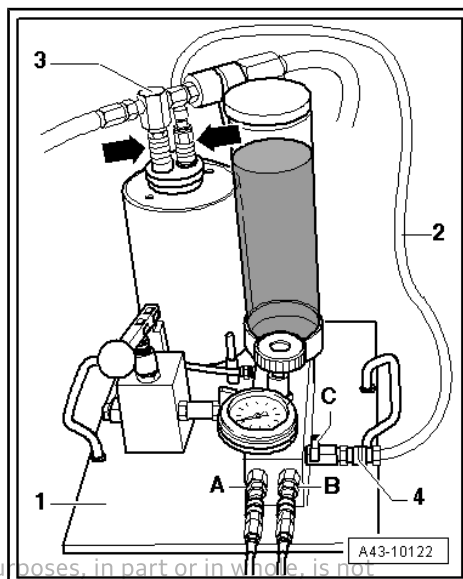
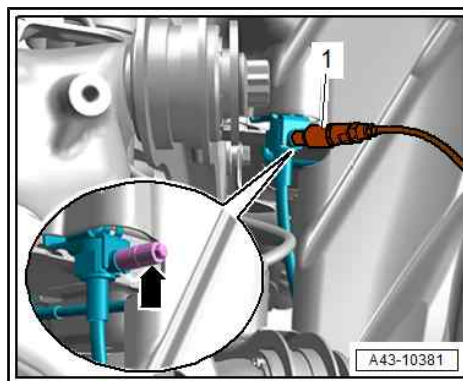
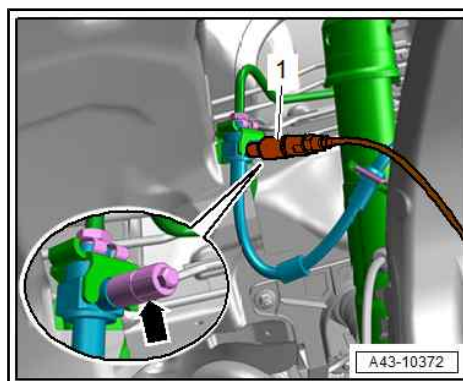
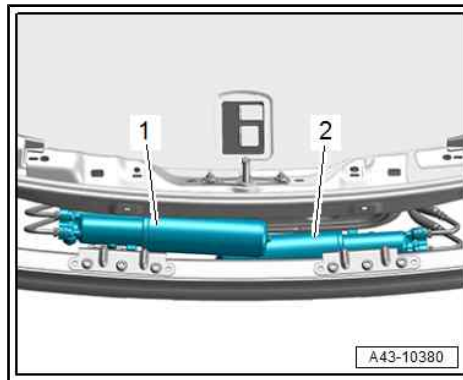
- Discharge DRC system as follows:

Central valve	Shock absorber
1 - left-side	Front left/rear right
2 - right-side	Front right/rear left

- Unscrew dust cap -arrow- from drain/charge valve (front).
- Connect charging line with quick-release coupling -1- of filling device for DRC system - VAS 6544- ⇒ [Item 3 \(page 198\)](#) to drain/charge valve (front) on the pipe connection to be discharged.
- Remove the rear wheel on the side of the pipe connection to be discharged ⇒ [page 205](#) .
- Move clear wheel housing liner at drain/charge valve (rear).

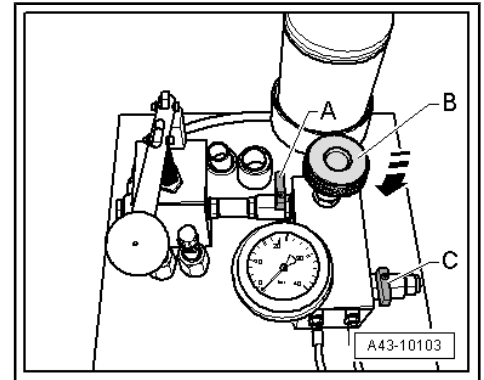
- Unscrew dust cap -arrow- from drain/charge valve (rear).
- Connect charging line with quick-release coupling -1- of filling device for DRC system - VAS 6544- ⇒ [Item 3 \(page 198\)](#) to drain/charge valve (rear) on the pipe connection to be discharged.

- Connect charging lines ⇒ [Item 3 \(page 198\)](#) to connections -A- and -B- of the filling device for DRC system - VAS 6544- .

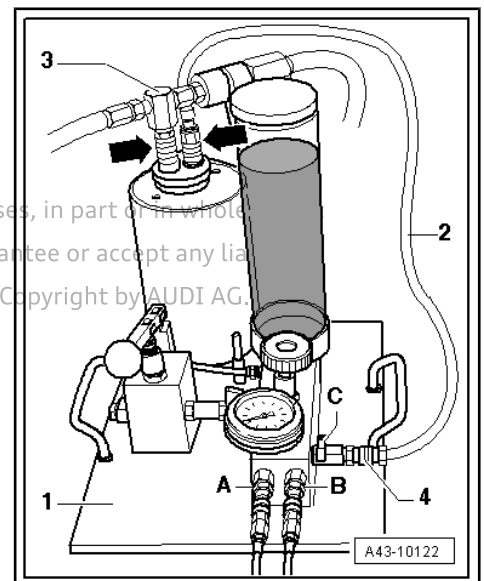




- Shut-off valves -A- and -C- of filling device for DRC system - VAS 6544- closed.
- Needle valve -B- closed.



- Hose -2- connected to used fluid container -right arrow- and to filling device for DRC system - VAS 6544- -4-.
- Venturi nozzle -3- with air outlet hose connected to used fluid container -left arrow- of filling device for DRC system - VAS 6544- .
- Compressed air line connected to venturi nozzle -3-.
- Open valve -C- until fluid is discharged from DRC system down to the smallest possible remainder. (This is visible at return hose -2- going to used fluid container).
- At a pressure gauge reading of approx. minus 0.9 bar, close valve -C- and disconnect compressed air line from venturi nozzle.
- Check for leakage.
- Vacuum must be maintained stable at minus 0.9 bar for at least 2 minutes.
- Check fluid level in fluid container, fill up fluid container with fresh fluid as far as the mark (if necessary) and position O-ring in line with fluid level ⇒ Electronic parts catalogue .



Charging

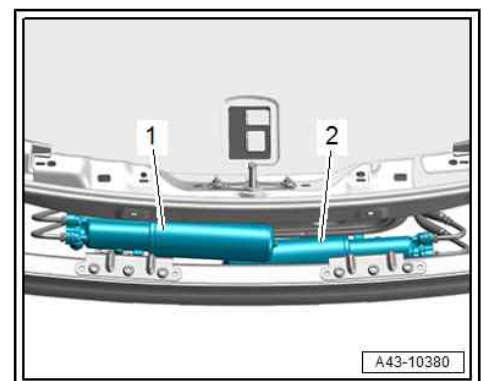


Note

The DRC system comprises two separate hydraulic systems. The central valves are connected diagonally in relation to the corresponding shock absorbers.

- Charge DRC system as follows:

Central valve	Shock absorber
1 - left-side	Front left/rear right
2 - right-side	Front right/rear left





- Open needle valve -B- approx. two turns, allowing fluid to flow out of fluid container of filling device for DRC system - VAS 6544- and into evacuated DRC system.

The fluid will flow out of the fluid container and into the connected DRC system. This can be seen from the dropping fluid level in the fluid container. This process may take several minutes depending on the quantity of fluid remaining in the system after discharging. The rate at which the fluid level drops decreases as system charging progresses. When the fluid level stops moving, the first step in the charging process is complete.

- Close needle valve -B-.

- Open valve -A- and charge DRC system to 22 bar by repeatedly pumping lever of hand-operated pump -1-.



Note

Make sure the fluid container of the filling device for DRC system - VAS 6544- does not run empty when charging. Top up the fluid container with fresh fluid if necessary.

- When a pressure of 22 bar has been reached, close valve -A- and stop pumping lever of hand-operated pump.



Note

- ♦ *The quality of the filling process is not improved if the maximum pressure of 22 bar is exceeded. Caution: this can damage the DRC system components and filling device for DRC system - VAS 6544- !*

- ♦ *If the pressure of 22 bar cannot be reached, or if the pressure drops continuously, check all the separating couplings and connections for leaks and damage. If no irregularities are visible on the outside, the piston of the gas accumulator inside the central valve leading to the pressure chambers is leaking, so the central valve must be renewed.*

- Open needle valve -B- slightly and allow pressure to drop to 16 bar.

- When needle on pressure gauge reaches 16 bar mark, close valve -B-.



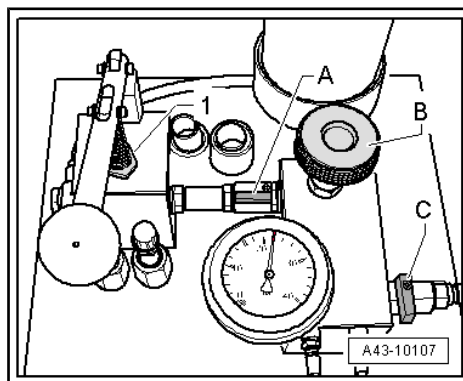
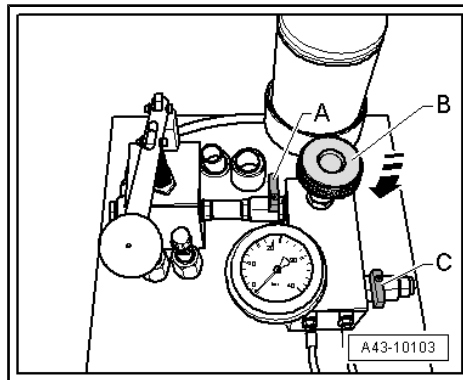
Note

On some versions of the pressure gauge, the 16 bar graduation has a green marking. This marking is irrelevant to the application described here and must be ignored.

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DRC system is charged. authorised by AUDI AG. AUDI AG does not guarantee or accept any liability

- Disconnect charging line with quick-release coupling of filling device for DRC system - VAS 6544- ➔ [Item 3 \(page 198\)](#) from drain/charge valves (front and rear).
- Fit rear wheel ➔ [page 205](#) .
- Screw on dust cap for drain/charge valves (front and rear).





44 – Wheels, tyres, vehicle geometry

1 Wheels, tyres

This information is contained in the Workshop Manual on Wheels and tyres ⇒ Wheels and tyres; Rep. gr. 44 ; Fitting wheels / tyres / Tyre Pressure Monitoring System / Tyre Pressure Loss Indicator .



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2 Tyre Pressure Monitoring System

⇒ "2.1 Exploded view - tyre pressure sensor", page 206

⇒ "2.2 Exploded view - Tyre Pressure Monitoring System control unit J502", page 207

⇒ "2.3 Removing and installing Tyre Pressure Monitoring System control unit J502", page 207

⇒ "2.4 Changing tyres on vehicles with Tyre Pressure Monitoring System", page 208

⇒ "2.5 Removing and installing metal valve body", page 208

2.1 Exploded view - tyre pressure sensor

1 - Metal valve

- ☐ For correct version refer to ⇒ Electronic parts catalogue

- ☐ Removing and installing ⇒ page 208

2 - Valve core

- ☐ Renew after removing tyre

3 - Rim

- ☐ Removing and fitting tyre ⇒ page 208

4 - Tyre pressure sensor

- ☐ Removing and installing ⇒ page 208

5 - Bolt

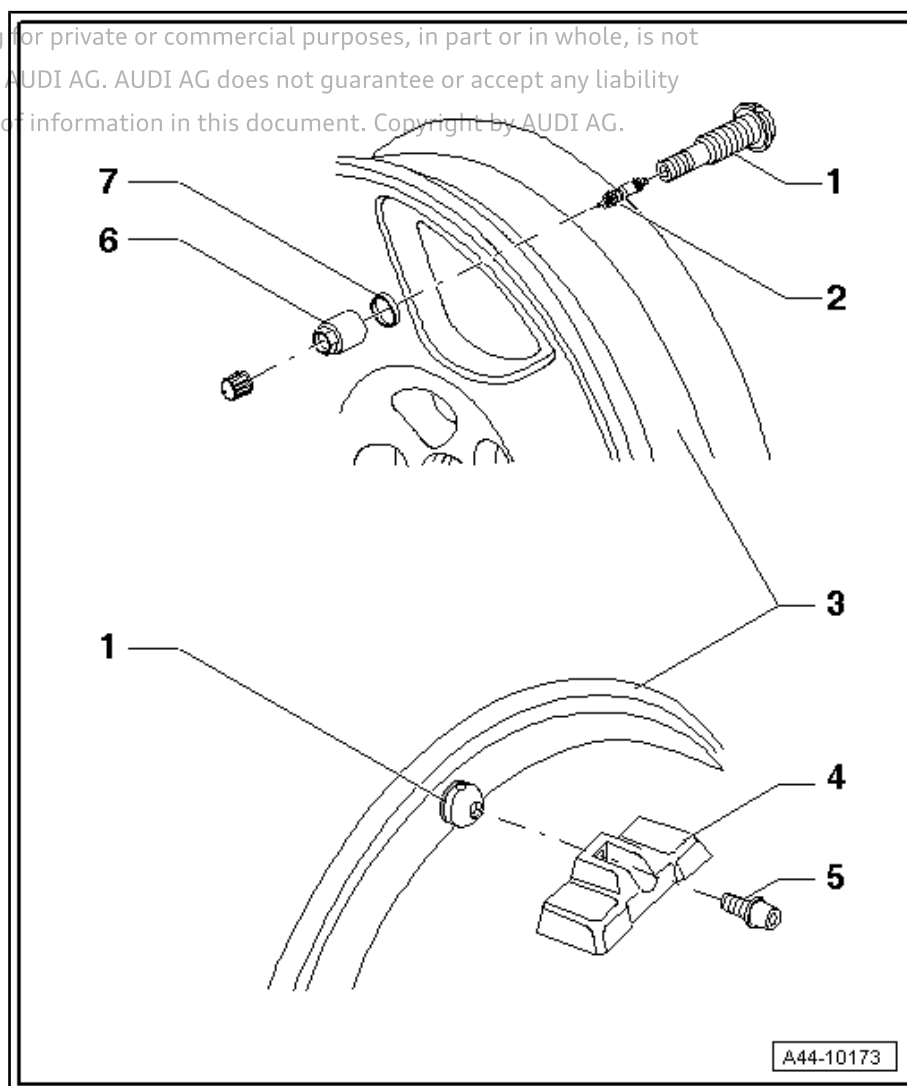
- ☐ Self-locking
- ☐ Renew after removing
- ☐ 4 Nm

6 - Union nut

- ☐ Not available separately
- ☐ 6 Nm

7 - Washer

- ☐ Not available separately





2.2 Exploded view - Tyre Pressure Monitoring System control unit - J502-

1 - Tyre Pressure Monitoring System control unit - J502-

- ❑ Removing and installing
⇒ [page 207](#)

2 - Nut

- ❑ 9 Nm

3 - Mounting

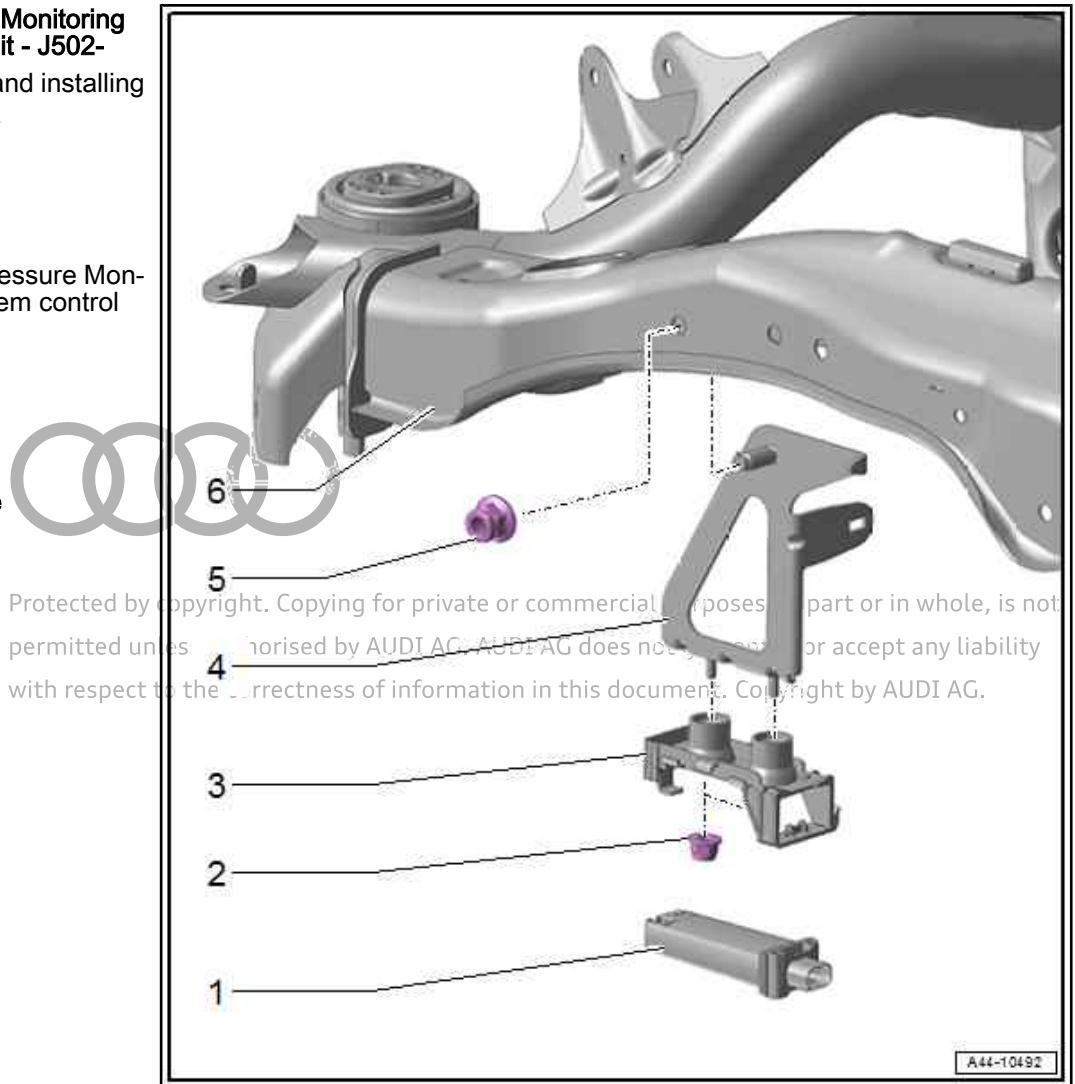
- ❑ For Tyre Pressure Monitoring System control unit - J502-

4 - Bracket

5 - Nut

- ❑ 20 Nm

6 - Rear subframe



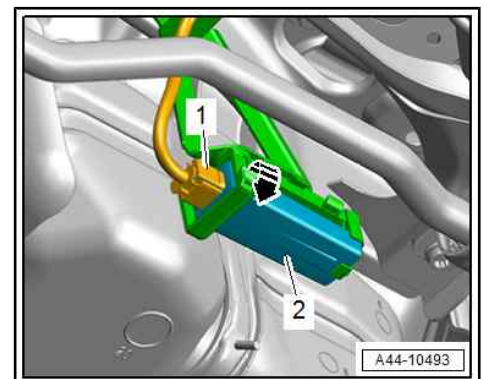
2.3 Removing and installing Tyre Pressure Monitoring System control unit - J502-

Removing

- Unplug electrical connector -1-.
- Release fastener -arrow- and detach Tyre Pressure Monitoring System control unit - J502- -item 2- towards rear.

Installing

Installation is carried out in reverse sequence.





2.4 Changing tyres on vehicles with Tyre Pressure Monitoring System

Removing

The metal valve and the tyre pressure sensor can be re-installed.

- Release air from tyre by unscrewing nickel-plated valve core.
- Roll off or unseat tyre.
- When using an unseating tool, first press off the tyre on the side opposite the valve.



Note

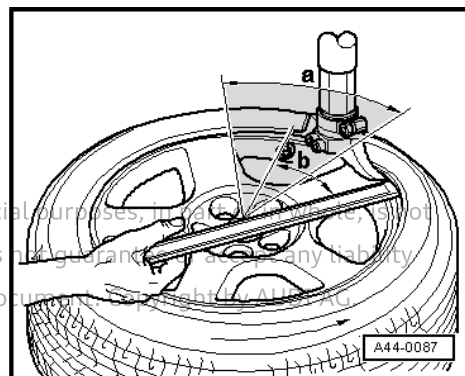
Unseating tools must not be used in hatched area -a-.

- Position head of installing tool close to valve so that tyre iron can be applied approx. 30° -b- away from valve.
- Then pull off the tyre in the valve area first.
- Check for loose or damaged components (visual check).



Note

- ♦ *Renew complete valve unit if attachment points are loosened/detached.*
- ♦ *Always renew damaged tyre pressure sensors.*



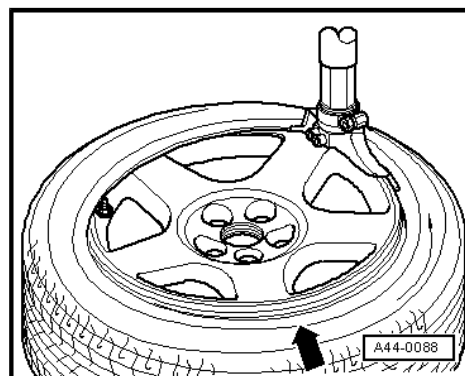
Assembling



Note

Unseating tools must not be used in area of valve.

- Position tyre pressure sensor approx. 180° opposite head of installing tool.
- Press tyre into well base approx. 90° in front of installing tool -arrow-.
- Fit tyre.
- Screw in new valve core.
- Inflate tyre and screw on plastic cap.
- Balance tyre.

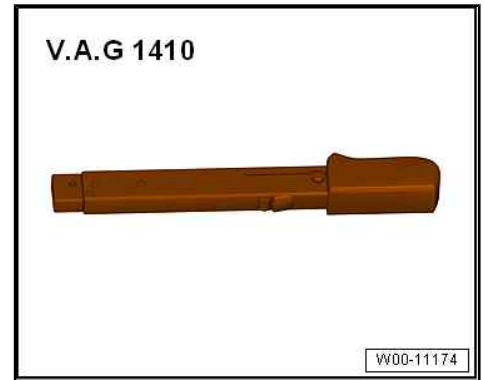


2.5 Removing and installing metal valve body

Special tools and workshop equipment required



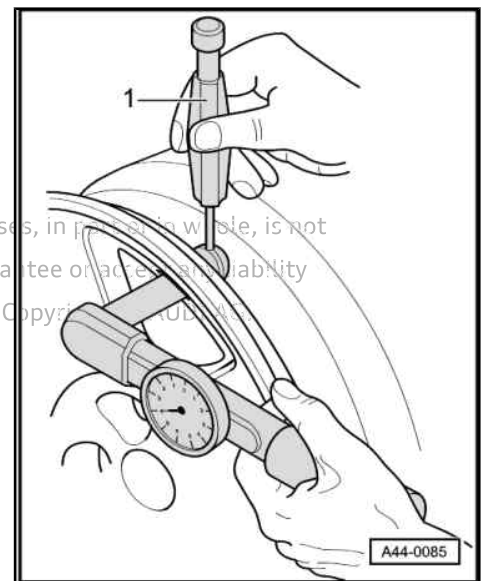
◆ Torque wrench - V.A.G 1410-



- Push metal valve with rubber seal through the rim from the inside.
- Fit chamfered washer and union nut from outside and tighten.
- Use a suitable tool -1- (e.g. Ø 2 mm drill bit) to prevent turning.



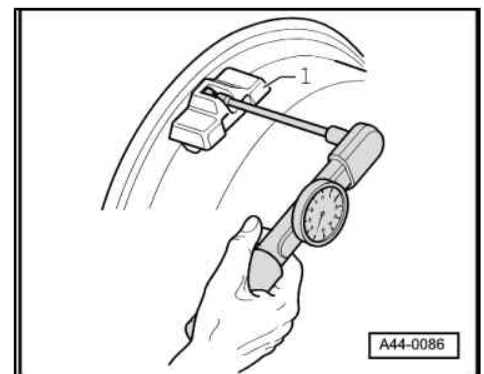
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- Press tyre pressure sensor -1- against base of rim and secure it.

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - tyre pressure sensor”, page 206](#)





3 Wheel alignment

- ⇒ [“3.1 Notes on wheel alignment”, page 210](#)
- ⇒ [“3.2 Test requirements for wheel alignment”, page 210](#)
- ⇒ [“3.3 Preparations for measurement”, page 211](#)
- ⇒ [“3.4 When does wheel alignment have to be checked?”, page 213](#)
- ⇒ [“3.5 Wheel alignment procedure”, page 214](#)
- ⇒ [“3.6 Explanatory notes on production control numbers \(PR numbers\)”, page 215](#)
- ⇒ [“3.7 Wheel runout compensation”, page 215](#)
- ⇒ [“3.8 Checking full steering lock”, page 216](#)
- ⇒ [“3.9 Checking unladen position for wheel alignment - vehicles with coil springs”, page 216](#)
- ⇒ [“3.10 Wheel alignment specifications”, page 218](#)
- ⇒ [“3.11 Adjusting camber at rear wheels”, page 224](#)
- ⇒ [“3.12 Adjusting toe setting at rear wheels”, page 225](#)
- ⇒ [“3.13 Centralising camber at front wheels”, page 226](#)
- ⇒ [“3.14 Adjusting toe setting at front wheels”, page 227](#)
- ⇒ [“3.15 Basic setting for steering angle sender G85 ”, page 228](#)

3.1 Notes on wheel alignment

- Wheel alignment must always be performed using a wheel alignment unit approved by VW/Audi.
- The alignment check must always include both the front and the rear axles. This is important to achieve proper handling and road behaviour.
- To allow running gear to fully settle, wheel alignment should not be checked before the vehicle has completed 1000 to 2000 km.
- When making adjustments, try to obtain the specified settings as accurately as possible.



WARNING

Risk of accident!

- ◆ *All bolts and nuts must be fully tightened according to specifications before the vehicle is driven on public roads.*

3.2 Test requirements for wheel alignment

- Please refer to general information on wheel alignment
⇒ [page 210](#) .
- Before driving the vehicle onto the wheel alignment unit, make sure there is sufficient space between the vehicle and the setting device. The distance between the setting device and the vehicle must be 120 cm ± 2.5 cm.
- If the available space is not adequate, drive the vehicle backwards onto the wheel alignment unit as required.
- Allow the vehicle to cool down.



- Check suspension, steering and steering linkage for excessive play or damage and service if necessary.
- Tread depth difference of no more than 2 mm on one axle.
- Tyres inflated to correct pressures.
- Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.
- Sensors must be properly attached and adjusted; refer to operating instructions of equipment manufacturer.
- Wheel alignment units and computer measuring equipment can lose their original levelling setting and calibration over a period of time, and they should therefore be serviced and calibrated at least once a year.
- Precision equipment should be treated with appropriate care.
- If necessary, contact the manufacturer for familiarisation with the proper use of the wheel alignment equipment.

3.3 Preparations for measurement

⇒ **"3.3.1 Preparations for calibration/adjustment of driver assist systems - quick-start mode", page 211**

⇒ **"3.3.2 Preparations for wheel alignment - full wheel alignment mode", page 211**

3.3.1 Preparations for calibration/adjustment of driver assist systems - quick-start mode

Select "Quick-start" mode on the wheel alignment computer if the driver assist systems need to be calibrated/adjusted, or if a basic setting needs to be performed for the dynamic steering.

- Connect battery charger for backup power supply ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
- Bring front wheels into straight-ahead position.
- Interrogate event memory before starting calibration/adjustment. Work through all entries that are displayed.
- Vehicle accurately aligned, suspension bounced and rocked several times.
- Exterior lighting switched off.
- All vehicle doors closed.

3.3.2 Preparations for wheel alignment - full wheel alignment mode

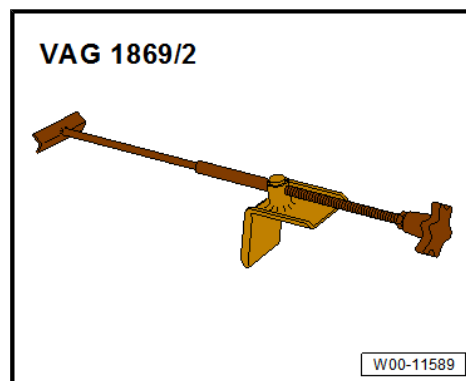
Select "Full wheel alignment" mode on the wheel alignment computer if wheel alignment needs to be performed together with an adjustment/calibration of the driver assist systems.

Special tools and workshop equipment required

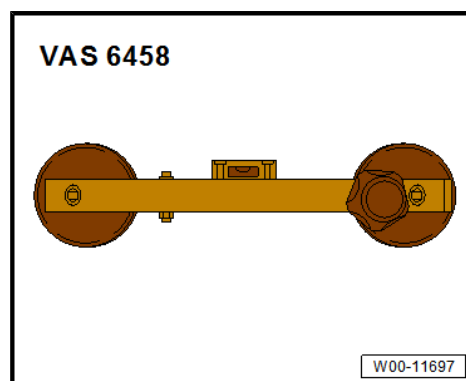
- ◆ Wheel alignment computer approved by VW/Audi
 - ◆ Vehicle diagnostic tester
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◆ Brake pedal actuator - V.A.G 1869/2-



◆ Steering wheel balance - VAS 6458-



Preparations for measurement

- Drive vehicle onto wheel alignment unit and ensure that suspension is not under stress, if necessary by moving vehicle backwards and forwards several times.
 - Do not switch ignition off until vehicle is stationary.
 - Vehicle accurately aligned, suspension bounced and rocked several times.
 - Before starting the initial measurement and before making any adjustments, make sure that the steering is returned correctly to the centre position by turning the steering wheel uniformly in both directions using the steering wheel balance - VAS 6458- .
 - Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.
 - Sensors must be properly attached and adjusted; refer to operating instructions of equipment manufacturer.
 - Perform compensation of wheel rim runout: A certain amount of axial runout at the wheel rims is permissible, but this may already exceed the specified toe-in tolerance. In such cases it is not possible to set the toe-in correctly without first compensating for the wheel runout.
 - Wheel alignment units and computer measuring equipment can lose their original levelling setting and calibration over a period of time, and they should therefore be serviced and calibrated at least once a year.
 - Precision equipment should be treated with appropriate care.
 - If necessary, contact the manufacturer for familiarisation with the proper use of the wheel alignment equipment.
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3.4 When does wheel alignment have to be checked?

Wheel alignment must be checked:

- ◆ In the event of handling problems
- ◆ Following accident damage
- ◆ If suspension components have been reinstalled or renewed.
- ◆ If tyres are worn unevenly.

After REMOVING AND REINSTALLING components

Front axle	Wheel alignment check required		Rear axle	Wheel alignment check required	
	Yes	No		Yes	No
Subframe cross brace		X			
Upper link (front)		X	Upper transverse link (front)		X
Upper link (rear)		X	Upper transverse link (rear)		X
Guide link (bottom)		X	Lower transverse link (front)		X
Track control link (bottom)		X	Lower transverse link (rear)		X
Swivel joint		X			
Suspension strut		X	Shock absorber		X
Coil spring		X	Coil spring		X
Shock absorber fork		X			
Wheel bearing housing		X	Wheel bearing housing	X	
Track rod	X		Track rod	X	
Track rod ball joint	X				
Steering rack	X				
Subframe	X ¹⁾		Subframe	X ²⁾	
Anti-roll bar	X		Anti-roll bar	X	
Coupling rod	X		Coupling rod	X	

• 1) A wheel alignment check may still be required, even if the position of the subframe has been fixed using locating pins: perform a road test ⇒ [page 23](#) .
 • 2) A wheel alignment check may still be required, even if the position of the subframe has been fixed using locating pins: perform a road test ⇒ [page 116](#) .

After RENEWING components

Front axle	Wheel alignment check required		Rear axle	Wheel alignment check required	
	Yes	No		Yes	No
Subframe cross brace	X				
Upper link (front)		X	Upper transverse link (front)	X	
Upper link (rear)		X	Upper transverse link (rear)	X	
Guide link (bottom)		X	Lower transverse link (front)	X	
Track control link (bottom)	X		Lower transverse link (rear)	X	
Bonded rubber bush for subframe			Bonded rubber bush for subframe		X



Front axle	Wheel alignment check required		Rear axle	Wheel alignment check required	
	Yes	No		Yes	No
Swivel joint		X			
Suspension strut		X	Shock absorber		X
Coil spring		X	Coil spring		X
Shock absorber fork		X			
Wheel bearing housing	X		Wheel bearing housing	X	
Track rod	X		Track rod	X	
Track rod ball joint	X				
Steering rack	X				
Subframe	X		Subframe	X	
Anti-roll bar		X	Anti-roll bar		X
Coupling rod		X	Coupling rod		X

3.5 Wheel alignment procedure

Select "Full wheel alignment" mode on the wheel alignment computer if wheel alignment needs to be performed as well as an adjustment/calibration of the driver assist systems.

Always keep to the sequence of operations.

- 1 - Drive vehicle onto wheel alignment unit (vehicle must be positioned straight). Do not switch ignition off until vehicle is stationary.
- 2 - Carry out wheel rim runout compensation
⇒ ["3.7 Wheel runout compensation", page 215](#) .
- 3 - Check full steering lock
⇒ ["3.8 Checking full steering lock", page 216](#) .
- 4 - Check camber at rear wheels and adjust if necessary
⇒ ["3.11 Adjusting camber at rear wheels", page 224](#) .
- 5 - Check toe setting at rear wheels and adjust if necessary
⇒ ["3.12 Adjusting toe setting at rear wheels", page 225](#) .
- 6 - Check camber at front wheels and centralise if necessary
⇒ ["3.13 Centralising camber at front wheels", page 226](#) .
- 7 - Check toe setting at front wheels and adjust if necessary
⇒ ["3.14 Adjusting toe setting at front wheels", page 227](#) .
- 8 - If suspension settings have been changed, calibrate steering angle sender - G85-
⇒ ["3.15 Basic setting for steering angle sender G85", page 228](#) .
- 9 - If suspension settings have been changed, perform basic setting of dynamic steering
⇒ ["4.3 Basic setting for dynamic steering", page 232](#) .
- 10 - The driver assist systems must be adjusted/calibrated if rear axle settings have been changed. Due to the distance between the vehicle and the setting device - VAS 6430- , keep to the following order of operations:
 - Adjust adaptive cruise control
⇒ ["5.1 Adjusting adaptive cruise control", page 234](#) .

3.6 Explanatory notes on production control numbers (PR numbers)

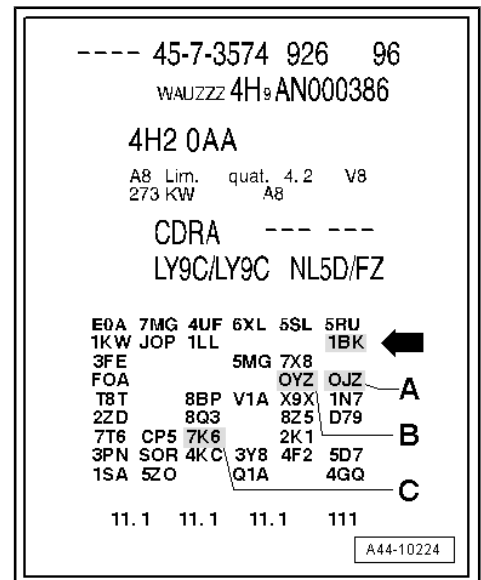
Vehicle data sticker

The corresponding PR number on the vehicle data sticker indicates which running gear version is installed in the vehicle.

Example of a vehicle data sticker:

- ◆ 1BK -arrow- = PR number

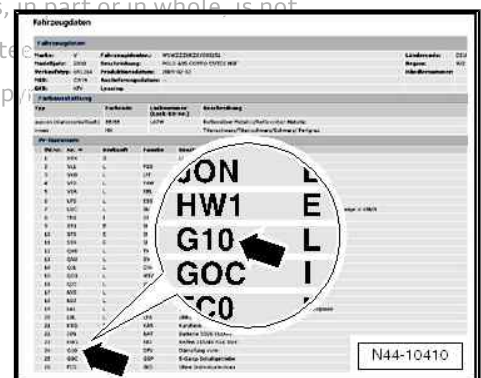
Fitting location of vehicle data sticker $\Rightarrow$ Maintenance ; Booklet
830



ELSA/Vehicle-specific notes

The required information on the type of running gear, the spring/shock absorber combination and driver assist systems can be found in ELSA in the ⇒ Vehicle-specific notes in the document "Vehicle data".

Pfeil - Example of a PR number for a given spring/shock absorber combination



3.7 Wheel runout compensation

- ◆ The toe-in cannot be set correctly without performing wheel runout compensation.
- ◆ The existing lateral runout of the wheel rims must be compensated accordingly; otherwise the measurement will be incorrect.
- ◆ A certain amount of axial runout at the wheel rims is permissible, but this may already exceed the specified toe-in tolerance. In such cases it is not possible to set the toe-in correctly without first compensating for the wheel runout.
- ◆ Please observe the operating instructions provided by the manufacturer of the wheel alignment unit.
- ◆ The vehicle is equipped with an electronically controlled automatic gearbox. Please therefore note the following when performing wheel runout compensation: If the engine is switched off with the selector lever in position **N**, the gearbox will remain in **N** for about 30 minutes before automatically se-

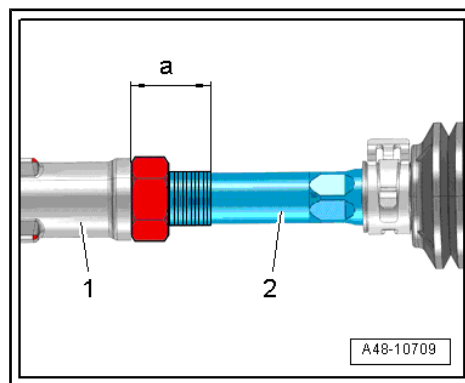


lecting **P**. **P** is engaged immediately if the driver's door is opened. Please observe the instructions in the ⇒ Owner's Manual .

3.8 Checking full steering lock

The wheel alignment computer is used to determine the full steering lock.

- If the value was outside the tolerance when determining the full steering lock on the wheel alignment unit, inspect the steering and suspension for any damage or distortion and check the symmetry of the track rods. If necessary, shorten the “longer” track rod ball joint (by screwing it further onto the track rod) and renew any damaged components.
- If the steering wheel was found to be out of alignment when checking the centre position of the steering on the wheel alignment unit, inspect the steering and suspension for damage or distortion and renew any damaged parts. Also check the symmetry of the track rods.
- Measure dimension -a- on “shorter” track rod ball joint. Shorten the “longer” track rod ball joint to the same dimension. To do so, screw track rod ball joint -1- further onto track rod -2-.
- Specification: Dimension -a- on right track rod ball joint = dimension -a- on left track rod ball joint.
- Maximum permissible difference between right and left < 2.5 mm.
- When returning steering to centre position, allow steering wheel to “settle” by rocking it evenly back and forth past centre position a few times.



3.9 Checking unladen position for wheel alignment - vehicles with coil springs

⇒ [“3.9.1 Unladen position for wheel alignment - A4 Saloon/Avant”, page 216](#)

⇒ [“3.9.2 Unladen position for wheel alignment - A5 Coupé/Sportback/Cabriolet”, page 217](#)

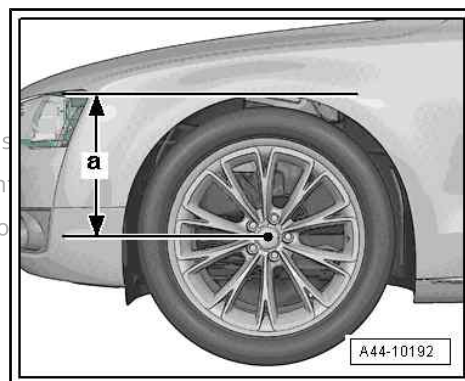
3.9.1 Unladen position for wheel alignment - A4 Saloon/Avant

Before checking the wheel alignment on vehicles with coil springs, the unladen position must be checked. “Unladen” means: the weight of the vehicle ready for the road (full tank, full windscreen washer/headlight washer fluid reservoir, spare wheel, vehicle tools and vehicle jack), without driver.

Determining dimension -a-

- Determine dimension -a- between centre of wheel and bottom edge of wing/wheel housing, as shown in illustration.

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Overview of dimension -a-

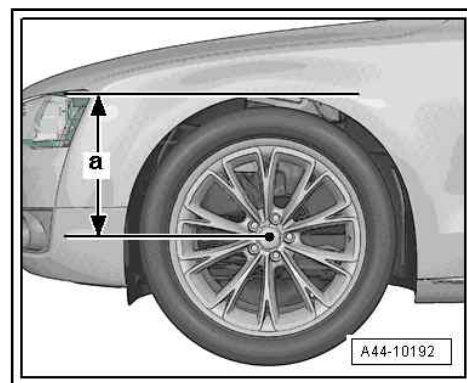
Running gear	Distance between centre of wheel and bottom edge of wing/wheel housing				
	Front axle		Rear axle		Tolerance between left and right
	Nominal dimension	Tolerance	Nominal dimension	Tolerance	
1BA/1BU	394 mm	± 10 mm	392 mm	± 10 mm	≤ 10 mm
1BE	371 mm	± 10 mm	369 mm	± 10 mm	≤ 10 mm
1BR	407 mm	± 10 mm	405 mm	± 10 mm	≤ 10 mm
1BB	394 mm	± 10 mm	392 mm	± 10 mm	≤ 10 mm
1BD	371 mm	± 10 mm	369 mm	± 10 mm	≤ 10 mm
1BM	394 mm	± 10 mm	405 mm	± 10 mm	≤ 10 mm
1BL	384 mm	± 10 mm	382 mm	± 10 mm	≤ 10 mm
1BQ / 2MV	371 mm	± 10 mm	369 mm	± 10 mm	≤ 10 mm
2MN / 1BP	410 mm	± 10 mm	408 mm	± 10 mm	≤ 10 mm
2MT	389 mm	± 10 mm	387 mm	± 10 mm	≤ 10 mm
2MC/2MS	367 mm	± 10 mm	371 mm	± 10 mm	≤ 10 mm

3.9.2 Unladen position for wheel alignment - A5 Coupé/Sportback/Cabriolet

Before checking the wheel alignment on vehicles with coil springs, the unladen position must be checked. "Unladen" means: the weight of the vehicle ready for the road (full tank, full windscreen washer/headlight washer fluid reservoir, spare wheel, vehicle tools and vehicle jack), without driver.

Determining dimension -a-

- Determine dimension -a- between centre of wheel and bottom edge of wing/wheel housing, as shown in illustration.



Overview of dimension -a-

Running gear	Distance between centre of wheel and bottom edge of wing/wheel housing				
	Front axle		Rear axle		Tolerance between left and right
	Nominal di- mension	Tolerance	Nominal dimen- sion	Tolerance	
1BA	368 mm	± 10 mm	366 mm	± 10 mm	<= 10 mm
1BE	368 mm	± 10 mm	366 mm	± 10 mm	<= 10 mm
1BD	368 mm	± 10 mm	366 mm	± 10 mm	<= 10 mm
1BM	368 mm	± 10 mm	376 mm	± 10 mm	<= 10 mm
1BL	368 mm	± 10 mm	366 mm	± 10 mm	<= 10 mm
1BU/1BH	391 mm	± 10 mm	398 mm	± 10 mm	<= 10 mm
2MV	368 mm	± 10 mm	366 mm	± 10 mm	<= 10 mm



Running gear	Distance between centre of wheel and bottom edge of wing/wheel housing				
2MC/2MS	367 mm	± 10 mm	371 mm	± 10 mm	≤ 10 mm
2MT/1BC	386 mm	± 10 mm	384 mm	± 10 mm	≤ 10 mm

3.10 Wheel alignment specifications

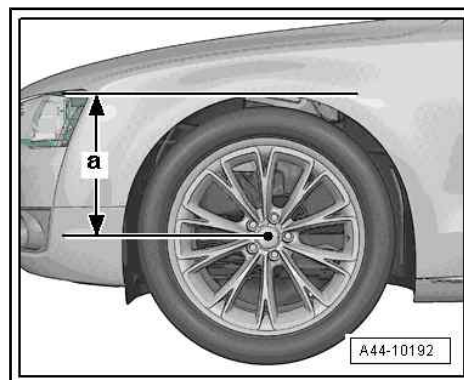
⇒ ["3.10.1 Wheel alignment specifications - Saloon/Avant", page 218](#)

⇒ ["3.10.2 Specifications for wheel alignment - Coupé/Sportback/Cabriolet", page 221](#)

3.10.1 Wheel alignment specifications - Saloon/Avant

Important

- The alignment values given here apply to the unladen position of the vehicle ⇒ [page 217](#). The unladen position is calculated using dimension -a- between the wheel centre and the lower edge of the wing/wheel housing.



Front axle	1BA	1BE	1BR
Camber			
Adjustment value - Saloon	-43' ± 23'	-1° 3' ± 23'	-34' ± 23'
Reference value - Saloon	-43' ± 25'	-1° 3' ± 25'	-34' ± 25'
Adjustment value - Avant	-43' ± 23'	-1° 3' ± 23'	-34' ± 23'
Reference value - Avant	-43' ± 25'	-1° 3' ± 25'	-34' ± 25'
Maximum permissible difference between left and right	30'	30'	30'
Toe-in for each wheel			
Specification when making adjustment	+ 10 ± 5'	+ 10 ± 5'	+ 10 ± 5'
Specification when checking adjustment	+ 10 ± 7'	+ 10 ± 7'	+ 10 ± 7'
Total toe-in	+ 20 ± 10'	+ 20 ± 10'	+ 20 ± 10'
Toe-out on turns at 20° ²⁾	-1° 31' ± 30'	1° 31' ± 30'	-1° 31' ± 30'
Outer wheel steering angle at full lock	33° 15' + 1° 30' - 2°	33° 11' + 1° 30' - 2°	33° 18' + 1° 30' - 2°
Inner wheel steering angle at full lock	39° 33' + 1° 30' - 2°	39° 30' + 1° 30' - 2°	39° 35' + 1° 30' - 2°



2) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Front axle	1BB	1BD	1BL
Camber			
Adjustment value - Saloon	$-43' \pm 23'$	$-1^\circ 3' \pm 23'$	$-50' \pm 23'$
Reference value - Saloon	$-43' \pm 25'$	$-1^\circ 3' \pm 25'$	$-50' \pm 25'$
Adjustment value - Avant	$-43' \pm 23'$	$-1^\circ 3' \pm 23'$	$-50' \pm 23'$
Reference value - Avant	$-43' \pm 25'$	$-1^\circ 3' \pm 25'$	$-50' \pm 25'$
Maximum permissible difference between left and right	30'	30'	30'
Toe-in for each wheel			
Specification when making adjustment	$+ 10 \pm 5'$	$+ 10 \pm 5'$	$+ 10 \pm 5'$
Specification when checking adjustment	$+ 10 \pm 7'$	$+ 10 \pm 7'$	$+ 10 \pm 7'$
Total toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$
Toe-out on turns at 20° ³⁾	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$
Outer wheel steering angle at full lock	$33^\circ 15' + 1^\circ 30'$ $- 2^\circ$	$33^\circ 11' + 1^\circ 30'$ $- 2^\circ$	$33^\circ 14' + 1^\circ 30'$ $- 2^\circ$
Inner wheel steering angle at full lock	$39^\circ 33' + 1^\circ 30'$ $- 2^\circ$	$39^\circ 30' + 1^\circ 30'$ $- 2^\circ$	$39^\circ 32' + 1^\circ 30'$ $- 2^\circ$

3) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Front axle	1BQ / 2MV	1BP / 2MN	1BM
Camber			
Adjustment value - Saloon	$-1^\circ 2' \pm 23'$	$-28' \pm 23'$	$-43' \pm 23'$
Reference value - Saloon	$-1^\circ 2' \pm 25'$	$-28' \pm 25'$	$-43' \pm 25'$
Adjustment value - Avant	$-1^\circ 2' \pm 23'$	$-28' \pm 23'$	$-43' \pm 23'$
Reference value - Avant	$-1^\circ 2' \pm 25'$	$-28' \pm 25'$	$-43' \pm 25'$
Maximum permissible difference between left and right	30'	30'	30'
Toe-in for each wheel			
Specification when making adjustment	$+ 10 \pm 5'$	$+ 10 \pm 5'$	$+ 10 \pm 5'$
Specification when checking adjustment	$+ 10 \pm 7'$	$+ 10 \pm 7'$	$+ 10 \pm 7'$
Total toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$
Toe-out on turns at 20° ⁴⁾	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$
Outer wheel steering angle at full lock	$33^\circ 11' + 1^\circ 30'$ $- 2^\circ$	$33^\circ 20' + 1^\circ 30'$ $- 2^\circ$	$33^\circ 15' + 1^\circ 30'$ $- 2^\circ$
Inner wheel steering angle at full lock	$39^\circ 30' + 1^\circ 30'$ $- 2^\circ$	$39^\circ 33' + 1^\circ 30'$ $- 2^\circ$	$39^\circ 33' + 1^\circ 30'$ $- 2^\circ$

4) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.



Front axle	2MC/2MS	1BU	2MT
Camber			
Adjustment value - Sa- loon		$-43' \pm 23'$	$-47' \pm 23'$
Reference value - Sa- loon		$-43' \pm 25'$	$-47' \pm 25'$
Adjustment value - Avant	$-1^\circ 10' \pm 23'$	$-44' \pm 23'$	$-48' \pm 23'$
Reference value - Avant	$-1^\circ 10' \pm 25'$	$-44' \pm 25'$	$-48' \pm 25'$
Maximum permissible difference between left and right	30'	30'	30'
Toe-in for each wheel			
Specification when mak- ing adjustment	$+ 10 \pm 5'$	$+ 10 \pm 5'$	$+ 10 \pm 5'$
Specification when checking adjustment	$+ 10 \pm 7'$	$+ 10 \pm 7'$	$+ 10 \pm 7'$
Total toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$
Toe-out on turns at 20° ⁵⁾	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$
Outer wheel steering angle at full lock	$33^\circ 8' + 1^\circ 30'$ $- 2^\circ$	$33^\circ 15' + 1^\circ 30'$ $- 2^\circ$	$33^\circ 15' + 1^\circ 30'$ $- 2^\circ$
Inner wheel steering angle at full lock	$39^\circ 29' + 1^\circ 30'$ $- 2^\circ$	$39^\circ 33' + 1^\circ 30'$ $- 2^\circ$	$39^\circ 33' + 1^\circ 30'$ $- 2^\circ$

5) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Rear axle	1BA	1BE	1BR
Camber	$- 50' \pm 25'$	$- 50' \pm 25'$	$- 50' \pm 25'$
Maximum permissible difference between left and right	30'	30'	30'
Toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$
Maximum permissible deviation in direction of travel relative to longi- tudinal axis of vehicle	10'	10'	10'

Rear axle	1BB	1BD	1BL
Camber	$- 50' \pm 25'$	$- 50' \pm 25'$	$- 50' \pm 25'$
Maximum permissible difference between left and right	30'	30'	30'
Toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$
Maximum permissible deviation in direction of travel relative to longi- tudinal axis of vehicle	10'	10'	10'

Rear axle	1BQ / 2MV	1BP / 2MN	1BM
Camber	$- 50' \pm 25'$	$- 50' \pm 25'$	$- 50' \pm 25'$
Maximum permissible difference between left and right	30'	30'	30'
Toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$



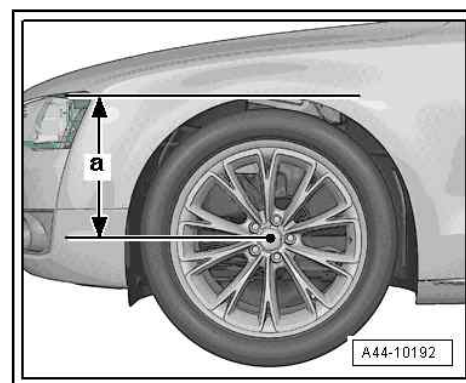
Rear axle	1BQ / 2MV	1BP / 2MN	1BM
Maximum permissible deviation in direction of travel relative to longitudinal axis of vehicle	10'	10'	10'

Rear axle	2MC/2MS	1BU	2MT
Camber	- 50' ± 25'	- 50' ± 25'	- 50' ± 25'
Maximum permissible difference between left and right	30'	30'	30'
Toe-in	+ 20 ± 10'	+ 20 ± 10'	+ 20 ± 10'
Maximum permissible deviation in direction of travel relative to longitudinal axis of vehicle	10'	10'	10'

3.10.2 Specifications for wheel alignment - Coupé/Sportback/Cabriolet

Important

- The alignment values given here apply to the unladen position of the vehicle ➔ [page 217](#) . The unladen position is calculated using dimension -a- between the wheel centre and the lower edge of the wing/wheel housing.



Front axle	1BA	1BD	1BE
Camber			
Adjustment value - Coupé	-1° 3' ± 23'	-1° 3' ± 23'	-1° 3' ± 23'
Reference value - Coupé	-1° 3' ± 25'	-1° 3' ± 25'	-1° 3' ± 25'
Adjustment value - Sportback	-1° 3' ± 23'	-1° 3' ± 23'	-1° 3' ± 23'
Reference value - Sportback	-1° 3' ± 25'	-1° 3' ± 25'	-1° 3' ± 25'
Adjustment value - Cabriolet	-1° 3' ± 23'	-1° 3' ± 23'	-1° 3' ± 23'
Reference value - Cabriolet	-1° 3' ± 25'	-1° 3' ± 25'	-1° 3' ± 25'
Maximum permissible difference between left and right	30'	30'	30'
Toe-in for each wheel			
Specification when making adjustment	+ 10 ± 5'	+ 10 ± 5'	+ 10 ± 5'
Specification when checking adjustment	+ 10 ± 7'	+ 10 ± 7'	+ 10 ± 7'
Total toe-in	+ 20 ± 10'	+ 20 ± 10'	+ 20 ± 10'



Front axle	1BA	1BD	1BE
Toe-out on turns at 20° ⁶⁾	-1° 31' ± 30'	1° 31' ± 30'	-1° 31' ± 30'
Outer wheel steering angle at full lock	33° 15' + 1° 30' - 2°	33° 11' + 1° 30' - 2°	33° 18' + 1° 30' - 2°
Inner wheel steering angle at full lock	39° 33' + 1° 30' - 2°	39° 30' + 1° 30' - 2°	39° 35' + 1° 30' - 2°

6) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Front axle	1BL / 2MV	2MC/2MS	1BM
Camber			
Adjustment value - Coupé	-1° 2' ± 23'	-1° 10' ± 23'	-1° 2' ± 23'
Reference value - Coupé	-1° 2' ± 25'	-1° 10' ± 25'	-1° 2' ± 25'
Adjustment value - Sportback	-1° 2' ± 23'	-1° 10' ± 23'	-1° 2' ± 25'
Reference value - Sportback	-1° 2' ± 25'	-1° 10' ± 25'	-1° 2' ± 25'
Adjustment value - Cabriolet	-1° 2' ± 23'	-1° 10' ± 23'	-1° 2' ± 25'
Reference value - Cabriolet	-1° 2' ± 25'	-1° 10' ± 25'	-1° 2' ± 25'
Maximum permissible difference between left and right	30'	30'	30'
Toe-in for each wheel			
Specification when making adjustment	+ 10 ± 5'	+ 10 ± 5'	+ 10 ± 5'
Specification when checking adjustment	+ 10 ± 7'	+ 10 ± 7'	+ 10 ± 7'
Total toe-in	+ 20 ± 10'	+ 20 ± 10'	+ 20 ± 10'
Toe-out on turns at 20° ⁷⁾	-1° 31' ± 30'	1° 31' ± 30'	-1° 31' ± 30'
Outer wheel steering angle at full lock	33° 11' + 1° 30' - 2°	33° 8' + 1° 30' - 2°	33° 11' + 1° 30' - 2°
Inner wheel steering angle at full lock	39° 30' + 1° 30' - 2°	39° 29' + 1° 30' - 2°	39° 30' + 1° 30' - 2°

7) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Front axle	1BU	1BH	1BC
Camber			
Adjustment value - Coupé	-44' ± 23'	-43' ± 23'	-47' ± 23'
Reference value - Coupé	-44' ± 25'	-43' ± 25'	-47' ± 25'
Adjustment value - Sportback	-44' ± 23'	-43' ± 23'	-47' ± 23'
Reference value - Sportback	-44' ± 25'	-43' ± 25'	-47' ± 25'
Adjustment value - Cabriolet	-44' ± 23'	-43' ± 23'	



Front axle	1BU	1BH	1BC
Reference value - Cabriolet	$-44' \pm 25'$	$-43' \pm 25'$	
Maximum permissible difference between left and right	30'		
Toe-in for each wheel			
Specification when making adjustment	$+ 10 \pm 5'$	$+ 10 \pm 5'$	$+ 10 \pm 5'$
Specification when checking adjustment	$+ 10 \pm 7'$	$+ 10 \pm 7'$	$+ 10 \pm 7'$
Total toe-in	$+ 20 \pm 10'$	$+ 20 \pm 10'$	$+ 20 \pm 10'$
Toe-out on turns at 20° ⁸⁾	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$	$-1^\circ 31' \pm 30'$
Outer wheel steering angle at full lock	$33^\circ 15' + 1^\circ 30' - 2^\circ$	$33^\circ 15' + 1^\circ 30' - 2^\circ$	$33^\circ 15' + 1^\circ 30' - 2^\circ$
Inner wheel steering angle at full lock	$39^\circ 33' + 1^\circ 30' - 2^\circ$	$39^\circ 33' + 1^\circ 30' - 2^\circ$	$39^\circ 33' + 1^\circ 30' - 2^\circ$

8) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It may be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Front axle	2MT		
Camber			
Adjustment value - Coupé	$-48' \pm 23'$		
Reference value - Coupé	$-48' \pm 25'$		
Adjustment value - Sportback	$-48' \pm 23'$		
Reference value - Sportback	$-48' \pm 25'$		
Adjustment value - Cabriolet			
Reference value - Cabriolet			
Maximum permissible difference between left and right	30'		
Toe-in for each wheel			
Specification when making adjustment	$+ 10 \pm 5'$		
Specification when checking adjustment	$+ 10 \pm 7'$		
Total toe-in	$+ 20 \pm 10'$		
Toe-out on turns at 20° ⁹⁾	$-1^\circ 31' \pm 30'$		
Outer wheel steering angle at full lock	$33^\circ 15' + 1^\circ 30' - 2^\circ$		
Inner wheel steering angle at full lock	$39^\circ 33' + 1^\circ 30' - 2^\circ$		

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Rear axle	1BA	1BD	1BE
Camber	$- 50' \pm 25'$	$- 50' \pm 25'$	$- 50' \pm 25'$



Rear axle	1BA	1BD	1BE
Maximum permissible difference between left and right	30'	30'	30'
Toe-in	+ 20 ± 10'	+ 20 ± 10'	+ 20 ± 10'
Maximum permissible deviation in direction of travel relative to longitudinal axis of vehicle	10'	10'	10'

Rear axle	1BL / 2MV	2MC/2MS	1BM
Camber	- 50' ± 25'	- 50' ± 25'	- 50' ± 25'
Maximum permissible difference between left and right	30'	30'	30'
Toe-in	+ 20 ± 10'	+ 20 ± 10'	+ 20 ± 10'
Maximum permissible deviation in direction of travel relative to longitudinal axis of vehicle	10'	10'	10'

Rear axle	1BU	1BH
Camber	- 50' ± 25'	- 50' ± 25'
Maximum permissible difference between left and right	30'	30'
Toe-in	+ 20 ± 10'	+ 20 ± 10'
Maximum permissible deviation in direction of travel relative to longitudinal axis of vehicle	10'	10'

Rear axle	1BC	2MT
Camber	- 50' ± 25'	- 50' ± 25'
Maximum permissible difference between left and right	30'	30'
Toe-in	+ 20 ± 10'	+ 20 ± 10'
Maximum permissible deviation in direction of travel relative to longitudinal axis of vehicle	10'	10'

3.11 Adjusting camber at rear wheels

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Special tools and workshop equipment required

- ◆ Fine-tooth ratchet (commercially available)
- ◆ Multi-point socket, 21 mm (commercially available)



Procedure

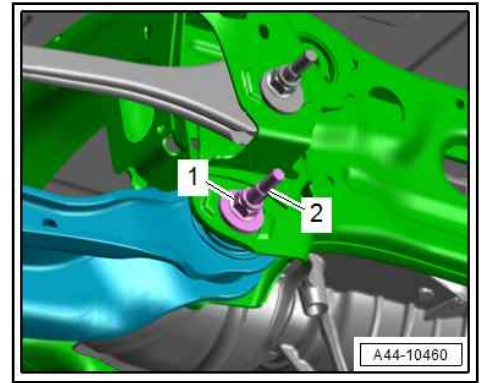
- Unscrew nut -1- joining subframe and lower transverse link, and screw on new nut as far as stop.
- Adjust camber by turning adjuster screw -2-.



Note

Adjuster screw can also be turned via hexagon flats at tip of screw.

- Wheel alignment specifications ⇒ [page 218](#)



Note

- ◆ *The maximum adjustment range is 135° to the left or right of the centre position.*
- ◆ *When the end position of the adjuster screw -2- is reached, do not turn further; otherwise components will be damaged.*
- ◆ *For greater clarity, the rear wheel is not shown in the illustration.*

- Tighten nut and check camber settings again ⇒ [page 218](#) .

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)

3.12 Adjusting toe setting at rear wheels

Special tools and workshop equipment required

- ◆ Fine-tooth ratchet (commercially available)
- ◆ Multi-point socket, 21 mm (commercially available)

Procedure

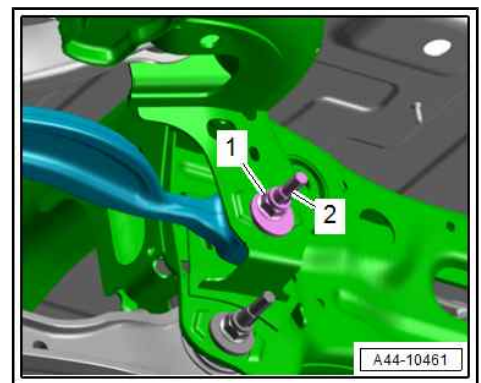
- Unscrew nut -1- at track rod/subframe, and screw on new nut as far as stop.
- Adjust toe setting by turning eccentric bolt -2-.



Note

Eccentric bolt can also be turned via hexagon flats at tip of screw.

- Wheel alignment specifications ⇒ [page 218](#)



Note

- ◆ *The maximum adjustment range is 90° to the left or right of the centre position.*
- ◆ *Adjusting the individual toe settings automatically alters the geometric running direction of the axle.*

- Tighten nut and check toe settings again ⇒ [page 218](#) .

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - transverse links”, page 129](#)



3.13 Centralising camber at front wheels



Note

- ♦ *The camber cannot be adjusted.*
- ♦ *By moving the subframe, it is possible to centralise the camber setting symmetrically within the specified tolerance range.*

Procedure

- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove wheel spoilers (both sides) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .

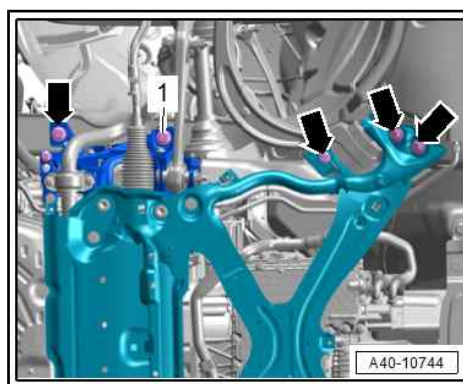


Caution

Risk of damage to threads of bolts securing subframe to body.

- ♦ **DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.**
- ♦ **Always fit all bolts by hand; make the first few turns by hand.**

- Remove and renew subframe bolts -1- and -arrow- one after the other on both sides.
- Screw in new bolts by hand until they make contact.



Note

When moving the subframe (in order to centralise the camber setting), the vehicle must be raised at the front by positioning the axle lift under the jacking points for the lifting platform.

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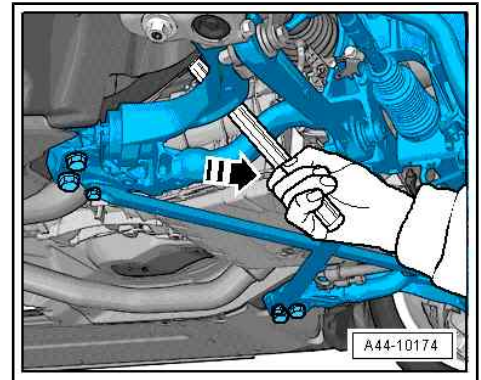
- Use plastic-coated lever or similar to move subframe to required position -arrow-.
- To do so, apply lever in centre of subframe close to track control link between subframe and longitudinal member of body.



Note

If a plastic-coated lever is not available, wrap a normal assembly lever with adhesive tape.

- Before checking the camber values, the vehicle must be bounced several times at the front axle.
- Wheel alignment specifications ➔ [page 218](#)



WARNING

Risk of accident!

- ◆ ***Renew subframe bolts one at a time.***

- Tighten subframe bolts (left and right) in several stages in a diagonal sequence, then check camber settings again ➔ [page 218](#).



Caution

Risk of incorrect alignment.

- ◆ ***All wheel alignment settings must be checked if camber setting has been altered.***

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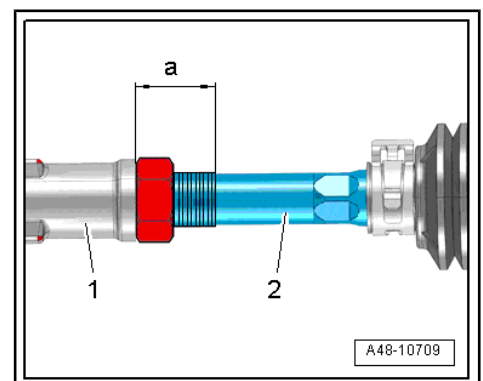
Tightening torques

- ◆ ➔ ["2.1 Exploded view - subframe", page 17](#)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.14 Adjusting toe setting at front wheels

Procedure

- Measure and note down dimension -a- between track rod ball joint -1- and track rod -2- on both sides. Dimension -a- should be the same on the left and right prior to and after adjustment.





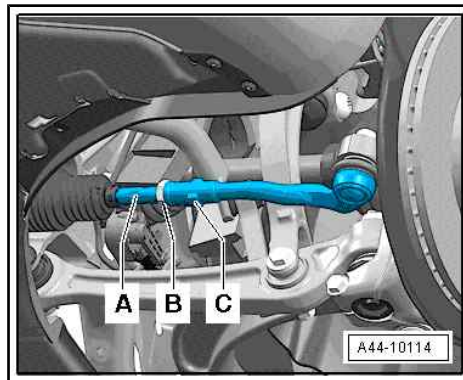
- Loosen union nut -B- (counterhold track rod ball joint -C-).
- Adjust toe setting at left and right wheels via hexagon flats -A-.



Caution

Risk of premature wear if boot is twisted.

- ◆ *Make sure that rubber boot is not twisted after turning track rod.*



- Tighten lock nut -B- ➔ [Item 5 \(page 263\)](#) and check toe setting again.



Note

- ◆ *The setting may change slightly after tightening lock nut -B-.*
- ◆ *However, the adjustment is correct if the measured toe value is still inside the tolerance.*

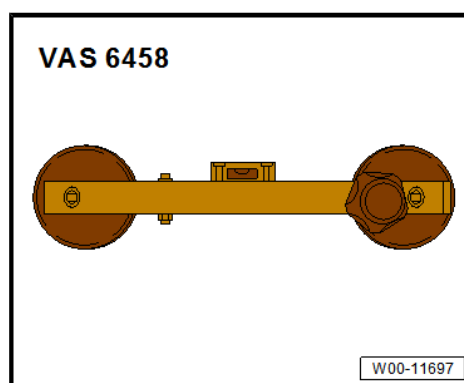
3.15 Basic setting for steering angle sender - G85-

Select this basic setting after the following types of work have been performed:

- ◆ Changes have been made to the suspension settings.
- ◆ The control unit for steering column electronics - J527- has been renewed.
- ◆ The active steering control unit - J792- has been renewed.
- ◆ The steering column has been renewed.

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Steering wheel balance - VAS 6458-



Procedure

- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:



- ◆ Body
- ◆ Electrical system
- ◆ 0001 - Self-diagnosis compatible systems
- ◆ 0016 - Steering column electronics control unit J527
- ◆ 0016 - Steering column electronics control unit, functions
- ◆ 0016 - Calibration of steering angle sender G85
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.



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4 Dynamic steering

⇒ **"4.1 Exploded view - dynamic steering", page 230**

⇒ **"4.2 Removing and installing active steering control unit J792", page 230**

⇒ **"4.3 Basic setting for dynamic steering", page 232**

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4.1 Exploded view - dynamic steering

1 - Steering rack

- ❑ With electromechanical power steering motor - V187- and power steering control unit - J500-

2 - Active steering motor - V477-

- ❑ If defective, remove steering column
⇒ [page 253](#)

3 - Steering column

- ❑ Exploded view
⇒ [page 250](#)
- ❑ Perform basic setting following renewal
⇒ [page 232](#)

4 - Active steering safety lock actuator - F437-

- ❑ Removing and installing
⇒ [page 256](#)

5 - Active steering control unit - J792-

- ❑ Installation position: In front of driver's seat
- ❑ Removing and installing
⇒ [page 230](#)
- ❑ Perform basic setting following renewal
⇒ [page 232](#)

6 - Bolt

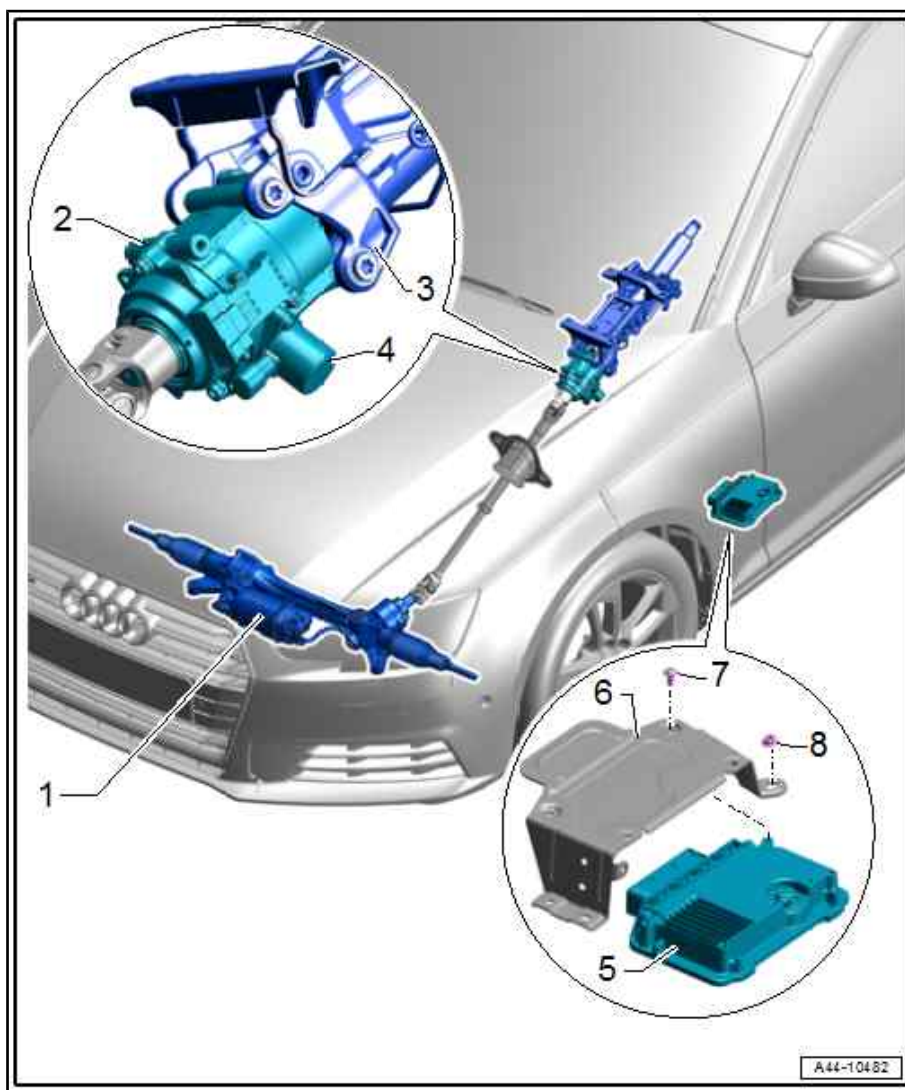
- ❑ 8 Nm

7 - Nut

- ❑ 6 Nm

8 - Bracket

- ❑ For active steering control unit - J792-

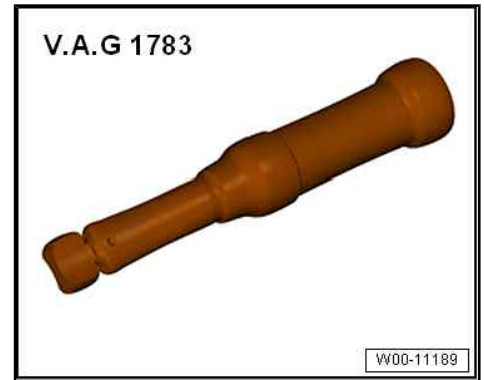


4.2 Removing and installing active steering control unit - J792-

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



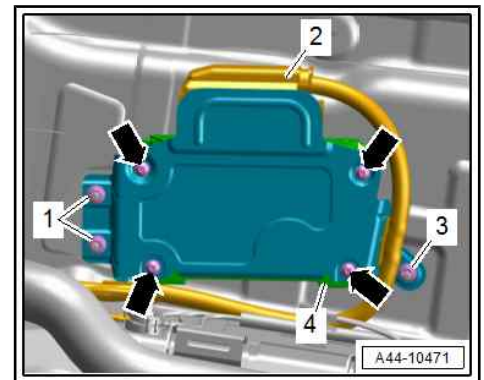
Removing

- Remove foot rest ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing foot rest .
- Remove sill panel trim (front) ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing sill panel trim .
- Remove A-pillar trim (bottom) ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing sill panel trim .
- Move floor covering (front left) clear and lift it slightly.
- Remove bolts -arrows- and unplug electrical connector -1-.
- Detach active steering control unit - J792- -item 2-.

Installing

Installation is carried out in reverse order; note the following:

- Activate new active steering control unit -J792- after installing.
- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:



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- ◆ **Chassis control** less authorised by AUDI AG. AUDI AG does not guarantee or accept any liability
- ◆ **0001 - Self-diagnosis compatible systems** with regard to the content of information in this document. Copyright by AUDI AG.
- ◆ **001B - Active steering control unit J792**
- ◆ **001B - Functions - Active steering J792**
- ◆ **001B - Replace control unit**
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.
- Basic setting must be performed if active steering control unit - J792- has been renewed ⇒ [page 232](#) .

Tightening torques

- ◆ ⇒ ["4.1 Exploded view - dynamic steering", page 230](#)



4.3 Basic setting for dynamic steering

There are two options for performing the basic setting:

Full wheel alignment

This procedure (wheel alignment and basic setting) should be selected if:

- ◆ The front axle toe setting has been changed.
- ◆ The rear axle toe setting has been changed.
- ◆ The running gear of the vehicle has been modified in any way – e.g. conversion from standard running gear to sports running gear.

Quick-start

This procedure (basic setting only) should be selected if:

- ◆ The steering angle sender - G85- has been calibrated.
- ◆ The active steering control unit - J792- has been renewed.
- ◆ The steering wheel is not straight when driving in a straight line.



Note

- ◆ *The two procedures are programmed on the wheel alignment computer. Each procedure runs automatically. All you have to do is select the relevant program.*
- ◆ *To perform only the basic setting, select "Quick-start" mode on the wheel alignment computer.*
- ◆ *The procedure in "Quick-start" mode is described below.*

Special tools and workshop equipment required

- ◆ Wheel alignment computer approved by VW/Audi
- ◆ Vehicle diagnostic tester

Procedure

- Observe test requirements
⇒ ["3.2 Test requirements for wheel alignment", page 210](#) .
- Please note preparations required before calibration/adjustment of driver assist systems
⇒ ["3.3.1 Preparations for calibration/adjustment of driver assist systems - quick-start mode", page 211](#) .
- Drive vehicle onto wheel alignment unit (vehicle must be positioned straight). Do not switch ignition off until vehicle is stationary.
- Carry out wheel rim runout compensation.
- Calibrate steering angle sender - G85- ⇒ [page 228](#) .

The remaining steps are now performed via the vehicle diagnostic tester .

- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.



- Choose Select own test and select following options one after the other:
 - ◆ Running gear
 - ◆ Active steering
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 001B - Active steering control unit J792
 - ◆ 001B - Functions - Active steering J792
 - ◆ 001B - Basic setting
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.



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5 Adaptive cruise control

⇒ **"5.1 Adjusting adaptive cruise control", page 234**

5.1 Adjusting adaptive cruise control

There are two options for performing the calibration/adjustment:

Full wheel alignment

This procedure (wheel alignment and calibration/adjustment) should be selected if:

- ◆ The rear axle toe setting has been changed.
- ◆ The running gear of the vehicle has been modified in any way – e.g. conversion from standard running gear to sports running gear.

Quick-start

This procedure (calibration/adjustment only) should be selected if:

- ◆ If the adaptive cruise control unit - J428- has been removed and re-installed or renewed.
- ◆ If the front bumper has been removed and re-installed or renewed.
- ◆ If the front bumper has been detached or moved.
- ◆ If the front bumper is damaged.

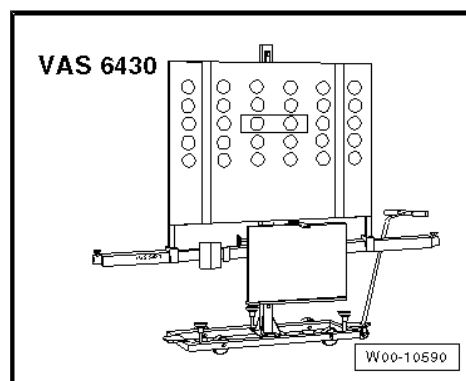


Note

- ◆ *The two procedures are programmed on the wheel alignment computer. Each procedure runs automatically. All you have to do is select the relevant program.*
- ◆ *To perform only the calibration/adjustment of the radar sensor, select "Quick-start" mode on the wheel alignment computer.*
- ◆ *The procedure in "Quick-start" mode is described below.*

Special tools and workshop equipment required

- ◆ Wheel alignment computer approved by VW/Audi
- ◆ Vehicle diagnostic tester
- ◆ Camera -VAS 6331/1- (not illustrated)
- ◆ Setting device - VAS 6430- or setting device, basic set - VAS 6430/1-



- ◆ ACC reflective mirror, Audi - VAS 6430/3-
- ◆ Adjusting tool - VAS 272 001- , not illustrated



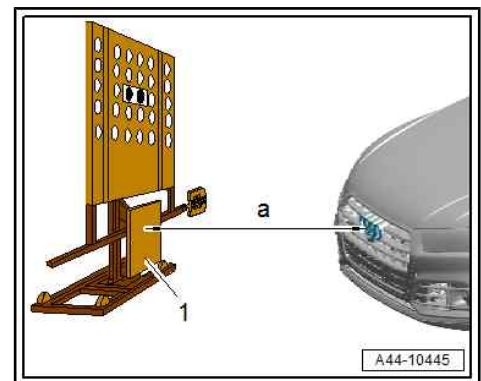
Procedure



Note

The procedure is described for a John Bean wheel alignment computer -VAS 6331- as an example.

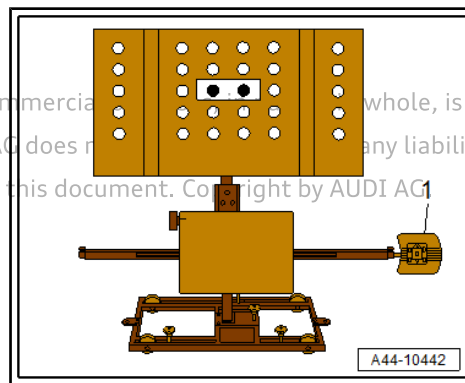
- Observe test requirements
⇒ ["3.2 Test requirements for wheel alignment", page 210](#) .
- Please note preparations required before calibration/adjustment of driver assist systems
⇒ ["3.3.1 Preparations for calibration/adjustment of driver assist systems - quick-start mode", page 211](#) .
- Check that sensors and fasteners are properly secured and inspect them for signs of impacts and/or extraneous damage. Service any damaged components as necessary.
- Check front bumper cover for damage and cracks, and ensure that it is securely fitted. Service any damaged components as necessary.
- Drive vehicle onto wheel alignment unit (vehicle must be positioned straight). Do not switch ignition off until vehicle is stationary.
- Interrogate event memory of adaptive cruise control system. Work through all entries that are displayed.
- Bring front wheels into straight-ahead position.
- Attach quick-release clamps to wheels.
- Fit reflectors onto quick-release clamps.
- Carry out wheel rim runout compensation.
- Detach air intake grille on both sides ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove any dirt from sensor lens.
- Press button to select ACC adjustment procedure in wheel alignment computer.
- ACC setting device must not be moved on alignment beam.
- Position setting device - VAS 6430- so that distance -a- is attained between ACC reflective mirror, Audi - VAS 6430/3- -item 1- (in centre position) and Audi rings.
- Dimension -a- = 120 ± 2.5 cm



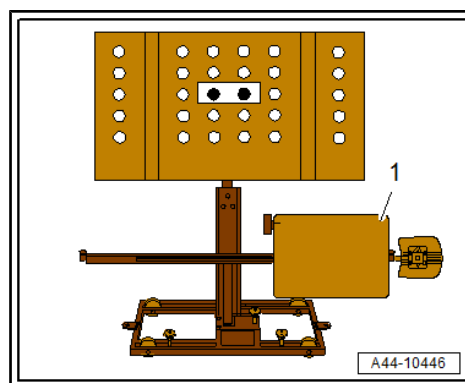


- Fit camera for ACC adjustment -VAS 6331/1- -item 1- on setting device - VAS 6430- (right-side) and secure camera.

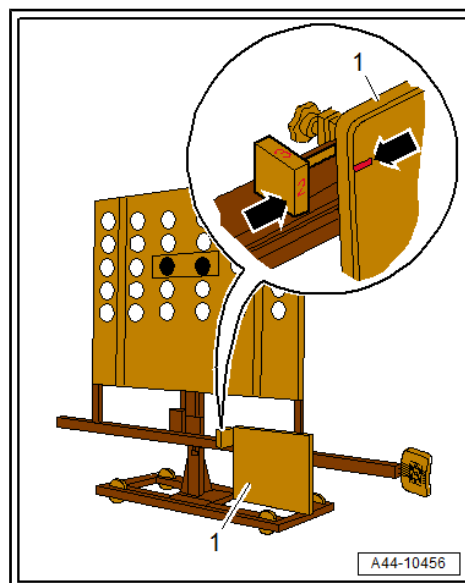
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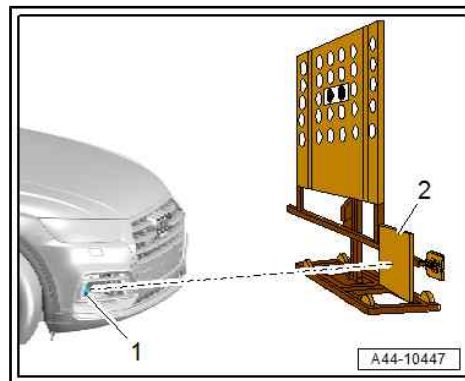
- Move ACC reflective mirror, Audi - VAS 6430/3- -item 1- to right side next to vertical slide.



- Adjust knob on ACC reflective mirror, Audi - VAS 6430/3- -item 1- so that the number "2" is aligned with line marking -arrows-.



- By moving reflective mirror -2- to left/right, adjust setting device - VAS 6430- so that laser beam hits sensor lens -1-.



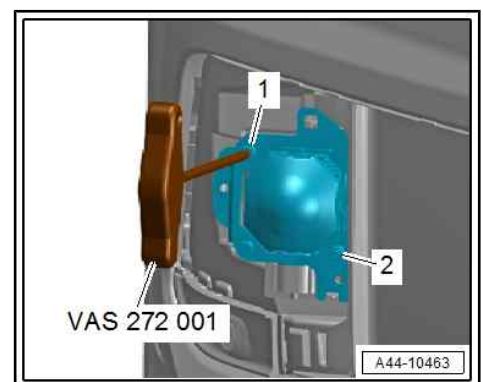
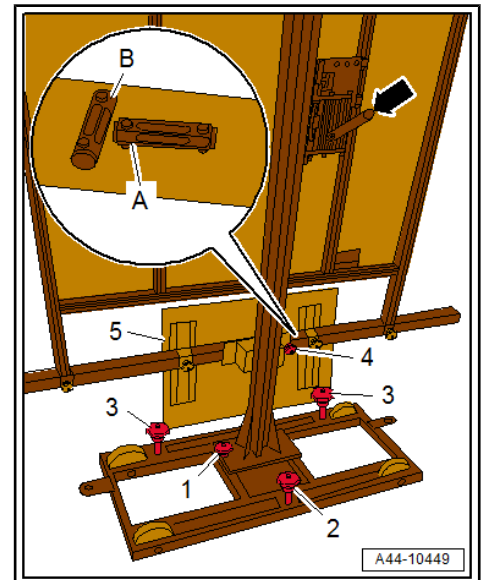


- Set spirit level -A- on ACC reflective mirror, Audi - VAS 6430/3- item 5- to horizontal position with adjuster screw -1-.
- Set spirit level -B- to horizontal position with adjuster screws -2, 3-.
- Adjust height of reflective mirror using crank -arrow- so that laser beam hits centre of sensor lens in the vertical plane.
- If necessary, re-position reflective mirror laterally on cross bar so that laser beam hits centre of sensor lens in the horizontal plane.
- Turn fine adjustment screw -4- until display on wheel alignment computer is within tolerance.
- Check once more that laser beam on reflective mirror coincides with centre of sensor lens. If necessary, re-align reflective mirror.
- Switch on vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 0013 - Adaptive cruise control I J428
 - ◆ 0013 / 8B - ACC control unit, functions
 - ◆ 0013 / 8B - Adjustment, (Rep. Gr. 44)
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.
- For fine adjustment of adaptive cruise control unit -J428- , turn screws -1- and -2- using adjusting tool - VAS 272 001- .
- After adaptive cruise control unit - J428- has been adjusted successfully, repeat the procedure for control unit 2 for adaptive cruise control - J850- .

The procedures for adjusting control unit 2 for adaptive cruise control - J850- and adaptive cruise control unit - J428- are basically the same. ACC reflective mirror, Audi - VAS 6430/3- and camera -VAS 6331/1- have to be refitted on opposite side of cross bar.

- To adjust, select the following menu items:

- ◆ Body
- ◆ Electrical system
- ◆ 01 - Self-diagnosis compatible systems
- ◆ 8B - Adaptive cruise control II J850
- ◆ 8B - ACC control unit, functions
- ◆ 13 / 8B - Adjustment, (Rep. Gr. 44)





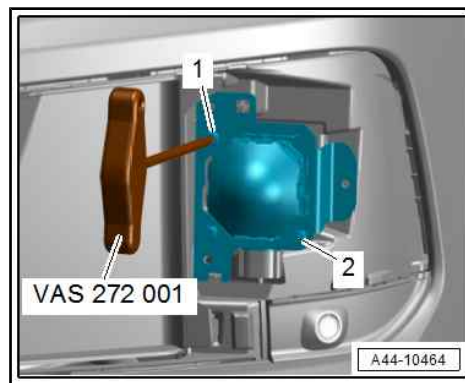
- For fine adjustment of adaptive cruise control unit -J850- , turn screws -1- and -2- using adjusting tool - VAS 272 001- .



Note

ACC adjustment is not completed until diagnostic tester displays "Final control element diagnosis ended".

- Switch off ignition.
- Disconnect vehicle diagnostic tester from diagnostic connection.
- Disconnect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
- Install air intake grille ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



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6 Front camera for driver assist systems

⇒ ["6.1 Calibrating front camera for driver assist systems", page 239](#)

6.1 Calibrating front camera for driver assist systems

There are two options for performing the calibration:

Full wheel alignment

This procedure (wheel alignment and calibration/adjustment) should be selected if:

- ◆ The rear axle toe setting has been adjusted.
- ◆ The running gear of the vehicle has been modified in any way – e.g. conversion from standard running gear to sports running gear.

Quick-start

This procedure (calibration/adjustment only) should be selected if:

- ◆ Re-adjustment is called for in the test plan on the vehicle diagnostic tester .
- ◆ The front camera for driver assist systems - R242- has been removed and re-installed or renewed.
- ◆ The bracket for the front camera for driver assist systems - R242- has been removed and re-installed or renewed.
- ◆ The backlight masking screen has been renewed (windscreen heater faulty).
- ◆ The inside of the black printed section has been cleaned.
- ◆ The electrical wire for the front camera for driver assist systems - R242- has been renewed.
- ◆ Contact has been made with the electrical connector for the front camera for driver assist systems - R242- .
- ◆ The windscreen has been removed and installed/renewed.



Note

- ◆ *The two procedures are programmed on the wheel alignment computer. Each procedure runs automatically. All you have to do is select the relevant program.*
- ◆ *To perform only the calibration/adjustment of the front camera, select "Quick-start" mode on the wheel alignment computer.*
- ◆ *The procedure in "Quick-start" mode is described below.*

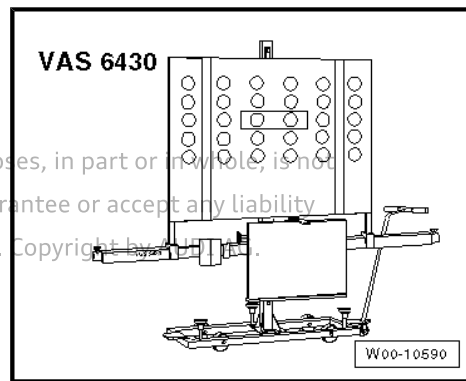
Special tools and workshop equipment required

- ◆ Wheel alignment computer approved by VW/Audi
- ◆ Vehicle diagnostic tester
- ◆ Camera -VAS 6331/1- (not illustrated)



◆ Setting device - VAS 6430-

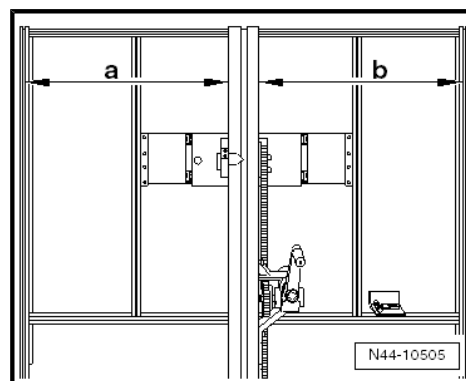
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Procedure

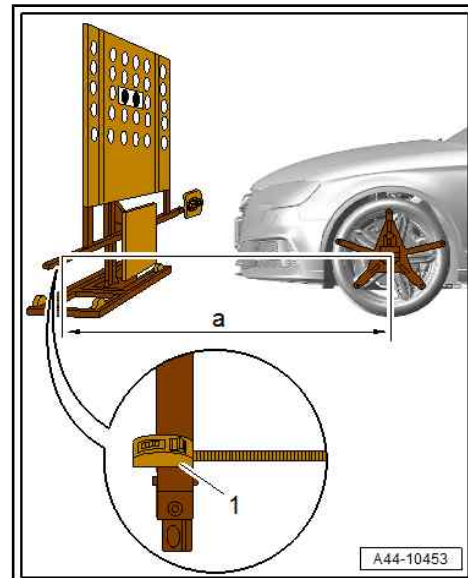
The procedure is described for a John Bean wheel alignment computer -VAS 6331- as an example.

- Observe test requirements
⇒ [“3.2 Test requirements for wheel alignment”, page 210](#) .
- Please note preparations required before calibration/adjustment of driver assist systems
⇒ [“3.3.1 Preparations for calibration/adjustment of driver assist systems - quick-start mode”, page 211](#) .
- Check that setting device - VAS 6430- is locked in centre position.
- Check that front camera for driver assist systems - R242- is correctly seated in bracket and that camera vision is unobstructed.
- Drive vehicle onto wheel alignment unit (vehicle must be positioned straight). Do not switch ignition off until vehicle is stationary.
- Interrogate event memory of front camera for driver assist systems - R242- . Work through all entries that are displayed.
- Bring front wheels into straight-ahead position.
- Attach quick-release clamps to wheels.
- Fit reflectors onto quick-release clamps.
- Carry out wheel rim runout compensation.
- Select calibration procedure for front camera for driver assist systems on wheel alignment computer.
- ACC setting device must not be moved on alignment beam.
- Check that calibration screen is positioned centrally and engaged properly.
- Dimension -a- = dimension -b-

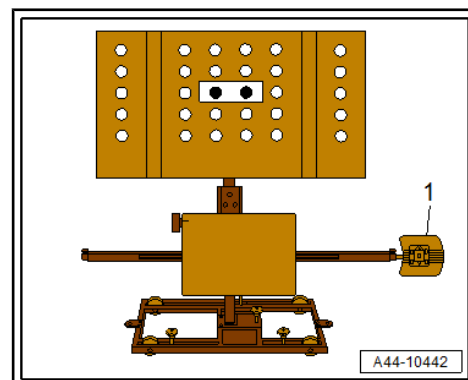




- Set up -VAS 6430- as shown in illustration so that distance -a- measured from hub centres of front wheels to cross bar of -VAS 6430- is 150 cm $\pm$ 2.5 cm.
- 1 - Tape measure
- Do not pull on the cross bar when moving -VAS 6430- .



- Fit camera for ACC adjustment -VAS 6331/1- -item 1- on setting device - VAS 6430- (right-side) and secure camera.
- For the next step the wheel alignment platform must be set at the lowest available position.

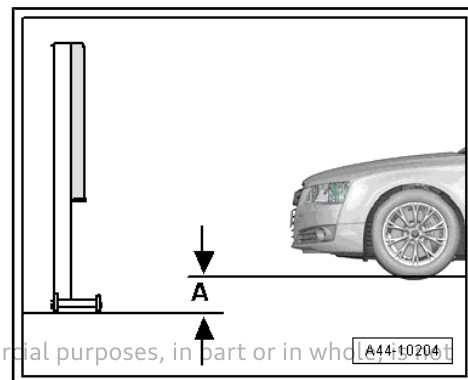


- Determine height difference -A- between floor level where -VAS 6430- is set up and tyre contact surface as shown in illustration and enter this value in the wheel alignment computer.

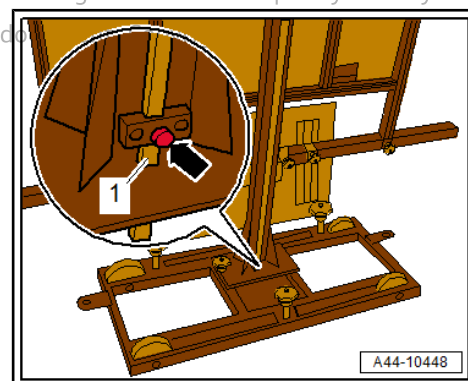


Note

- ◆ Height of calibration screen for all Audi SUV models: 1400 mm + height -A-
- ◆ Height of calibration screen for all Audi models except SUVs: 1200 mm + height -A-



- Loosen bolt -arrow- and set measuring bar -1- on floor.

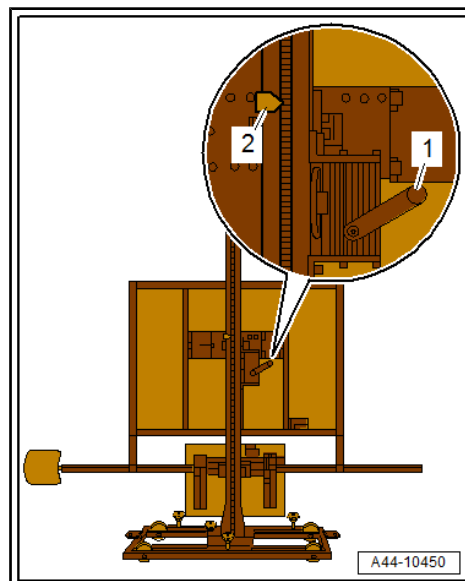




- Using crank -1-, adjust calibration screen to specified height
-2- as indicated by wheel alignment computer.

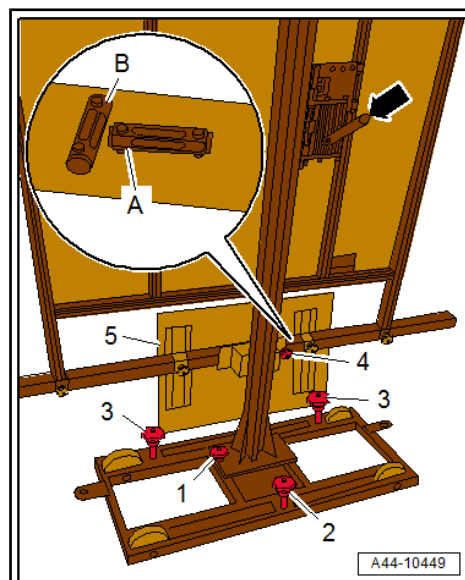
When specified height -2- has been set, move measuring bar up slightly and tighten securing bolt.

- If the height of the calibration screen has to be corrected at a later stage of the procedure, the measuring bar must be set on the floor when making the adjustment.



- Set spirit level -A- to horizontal position with adjuster screw -1-.

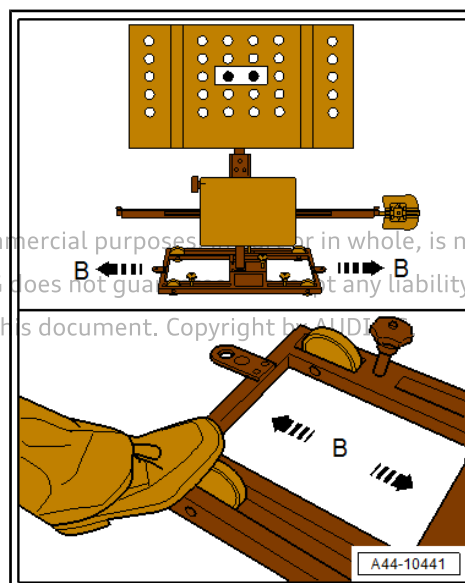
The spirit level -A- has to be adjusted at this point to compensate for any floor irregularities.



- Move -VAS 6430- sideways -arrow B- until display on wheel alignment computer is within tolerance.

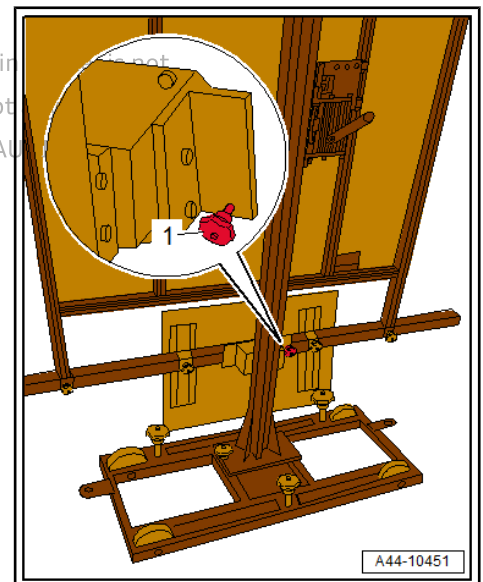
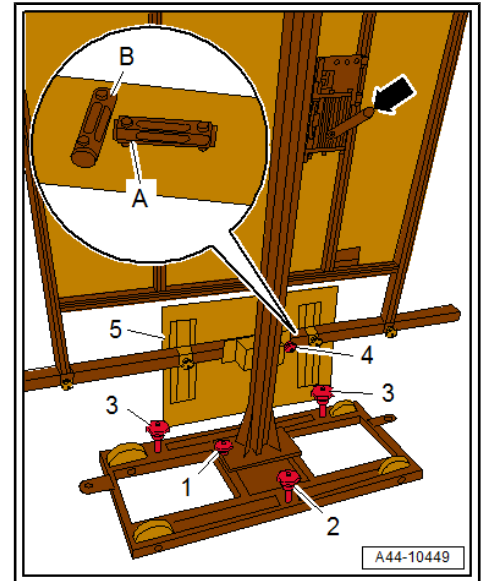


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- Secure by tightening bolts -2- and -3- -VAS 6430- lightly. (This will prevent the -VAS 6430- from rolling away).



- Turn fine adjustment screw -1- until display on wheel alignment computer is within tolerance.

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- Set spirit level -A- to horizontal position with adjuster screw -1-.
- Set spirit level -B- to horizontal position with adjuster screws -2, 3-.



Note

Check the height of the calibration screen again (adjusting the spirit level may have changed the height slightly) ⇒ [page 242](#) .

The remaining steps are now performed via the vehicle diagnostic tester .

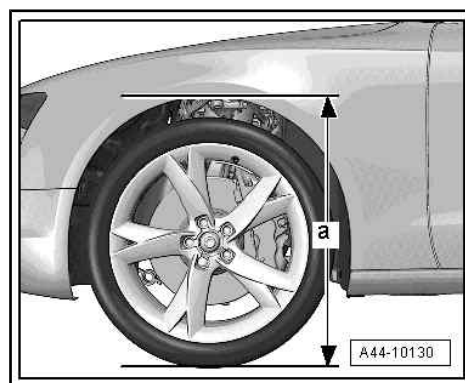
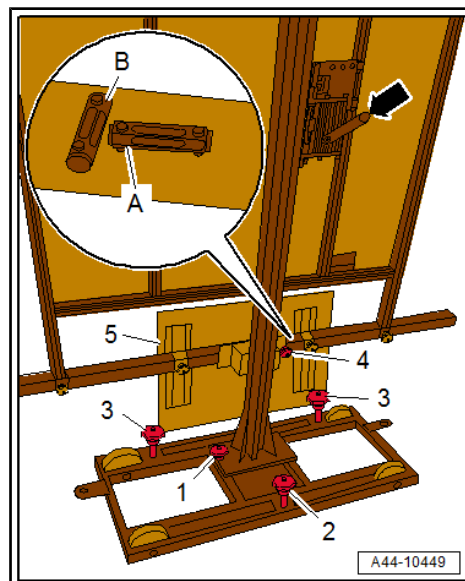
- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 00A5 - Front camera for driver assist systems - R242
 - ◆ 00A5 - Front camera for driver assist systems, functions
 - ◆ 00A5 - Calibrate control unit
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.

The next step required is to measure the height of the body.

- Measure height of body -a- at all four wheels between tyre contact surface and bottom edge of wing panel/wheel housing at centre of wheel.

Additional steps if front camera for driver assist systems - R242- was renewed:

- Adjust headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .





48 – Steering

1 Steering wheel

⇒ [“1.1 Exploded view - steering wheel”, page 245](#)

⇒ [“1.2 Removing and installing steering wheel”, page 248](#)

1.1 Exploded view - steering wheel

⇒ [“1.1.1 Exploded view - three-spoke steering wheel”, page 245](#)

⇒ [“1.1.2 Exploded view - four-spoke steering wheel”, page 247](#)

1.1.1 Exploded view - three-spoke steering wheel

1 - Bolt

- Tightening torque ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

2 - Tiptronic switch (shift down) - E480-

- Exploded view ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

3 - Bolt

- 1.2 Nm

4 - Trim (rear)

- For steering wheel

5 - Three-spoke steering wheel

- Removing and installing ⇒ [page 248](#)

6 - Tiptronic switch (shift up) - E479-

- Exploded view ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

7 - Bolt

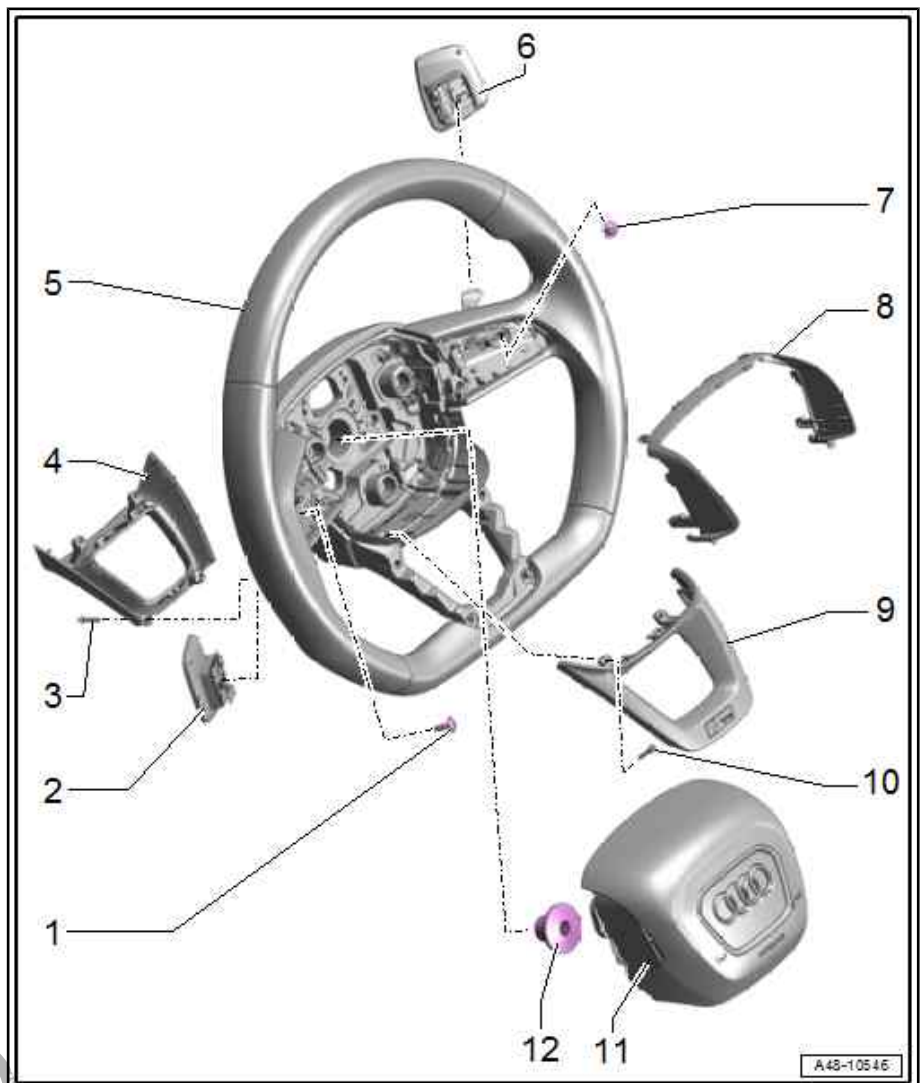
- Tightening torque ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

8 - Trim (top)

- For steering wheel

9 - Trim (bottom)

- For steering wheel



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10 - Bolt

- ☐ 1.2 Nm

11 - Driver's airbag unit



WARNING

***Risk of injury from pyrotechnic components.
Observe safety precautions for working on airbags ⇒ General body repairs, interior; Rep. gr. 00 ; Safety precautions; Safety precautions when working with pyrotechnic components .***

- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag (driver side); Removing and installing airbag unit with igniters

12 - Bolt

- ☐ Renew after removing
- ☐ 30 Nm +90°



1.1.2 Exploded view - four-spoke steering wheel

1 - Bolt

- ☐ Tightening torque ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

2 - Tiptronic switch (shift down) - E480-

- ☐ Exploded view ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

3 - Four-spoke steering wheel

- ☐ Removing and installing ⇒ [page 248](#)

4 - Multifunction buttons on left in steering wheel - E440-

- ☐ Exploded view ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

5 - Multifunction buttons on right in steering wheel - E441-

- ☐ Exploded view ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

6 - Tiptronic switch (shift up) - E479-

- ☐ Exploded view ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

7 - Bolt

- ☐ Tightening torque ⇒ Communication; Rep. gr. 91 ; Multi-function steering wheel; Exploded view - multi-function steering wheel

8 - Trim (top)

- ☐ For steering wheel

9 - Trim

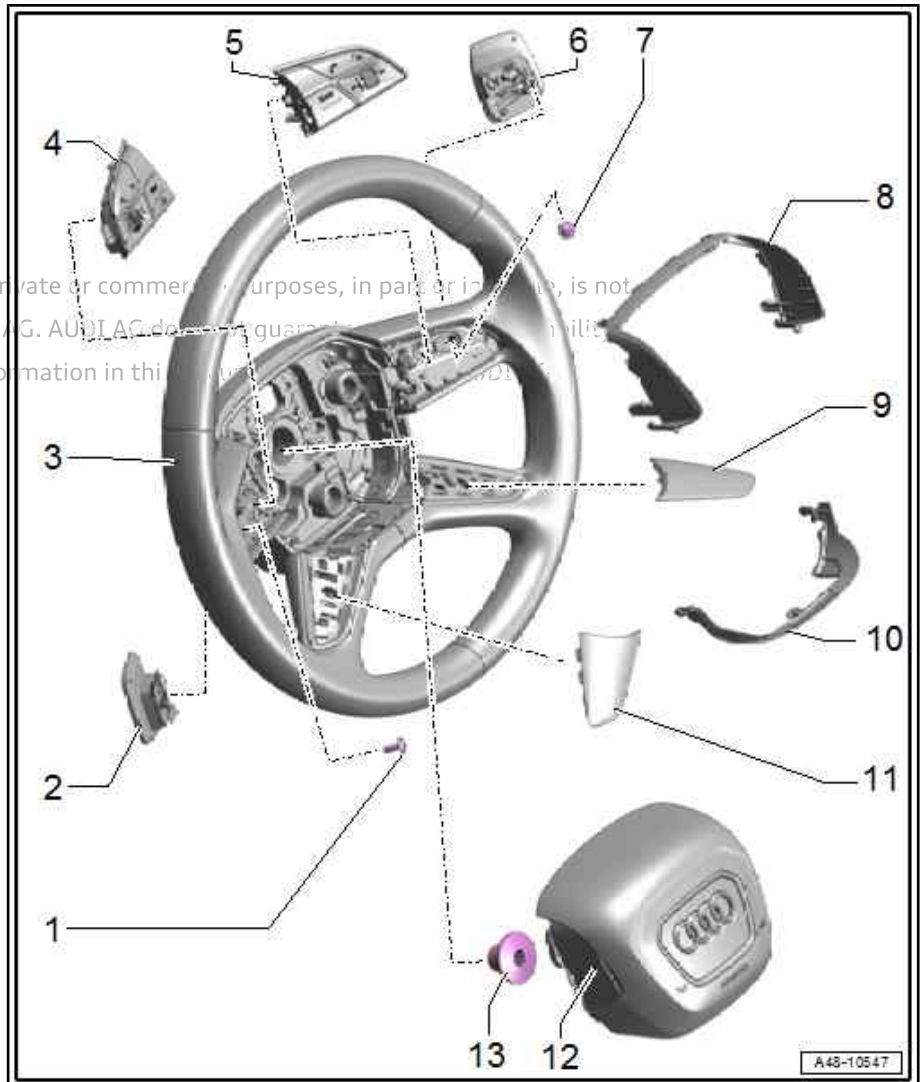
- ☐ For steering wheel spoke

10 - Trim (bottom)

- ☐ For steering wheel

11 - Trim

- ☐ For steering wheel spoke



A48-10547



12 - Driver's airbag unit



- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag (driver side); Removing and installing airbag unit with igniters

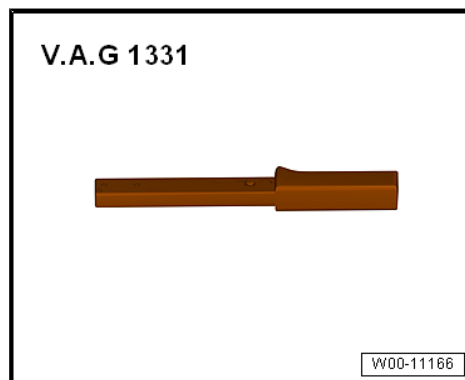
13 - Bolt

- ☐ Renew after removing
- ☐ 30 Nm +90°

1.2 Removing and installing steering wheel

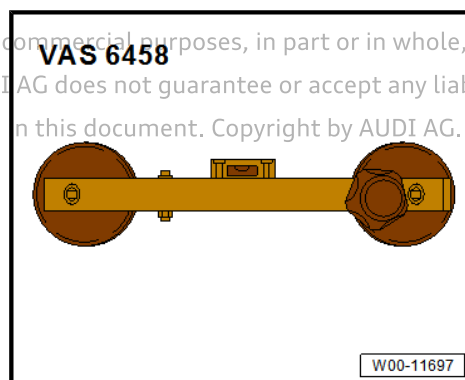
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Steering wheel balance - VAS 6458-

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Removing

- Turn wheels to straight ahead position.
- Move steering wheel rearwards and down as far as possible, using full range of steering column adjuster.
- Switch off ignition.



- Remove airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag (driver side); Removing and installing airbag unit with igniters .
- Remove bolt -2-.
- Mark position of steering wheel -1- relative to steering column -3- -arrow- for re-installation.
- Pull steering wheel off steering column.

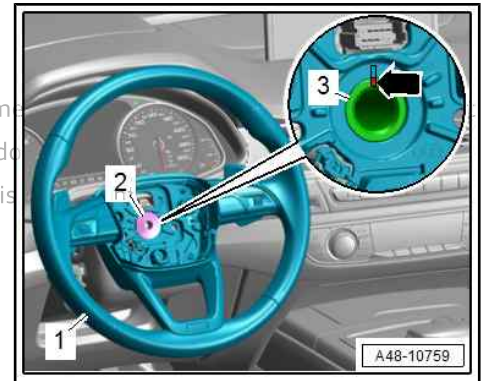
Installing

Installation is carried out in reverse order; note the following:

- Front wheels in straight-ahead position
- If re-installing old steering wheel, observe marks showing position of steering wheel/steering column.
- Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag (driver side); Removing and installing airbag unit with igniters .
- Road-test vehicle.
- If the steering wheel is not correctly centred, it must be re-moved again and re-fitted onto the splines of the steering column.

Tightening torques

- ◆ ⇒ ["1.1 Exploded view - steering wheel", page 245](#)





2 Steering column

⇒ [“2.1 Exploded view - steering column”, page 250](#)

⇒ [“2.2 Checking steering column for damage”, page 252](#)

⇒ [“2.3 Handling and transporting steering column”, page 252](#)

⇒ [“2.4 Removing and installing steering column”, page 253](#)

⇒ [“2.5 Removing and installing safety lock for active steering \(locking solenoid\)”, page 256](#)

⇒ [“2.6 Removing and installing intermediate steering shaft”, page 257](#)

⇒ [“2.7 Removing and installing control unit for electronic steering column lock J764”, page 260](#)

⇒ [“2.8 Disconnecting steering column from active steering motor V477”, page 260](#)

2.1 Exploded view - steering column

1 - Bolt

- ☐ Renew after removing
- ☐ Clean threaded hole (e.g. with a thread tap) before fitting new bolt
- ☐ Start by screwing in bolt a few turns by hand. Try to pull off intermediate steering shaft to check that it is correctly seated. Then tighten bolt.
- ☐ 20 Nm +90°

2 - Intermediate steering shaft

- ☐ Removing and installing
⇒ [page 257](#)

3 - Central tube for dash panel

4 - Bolt

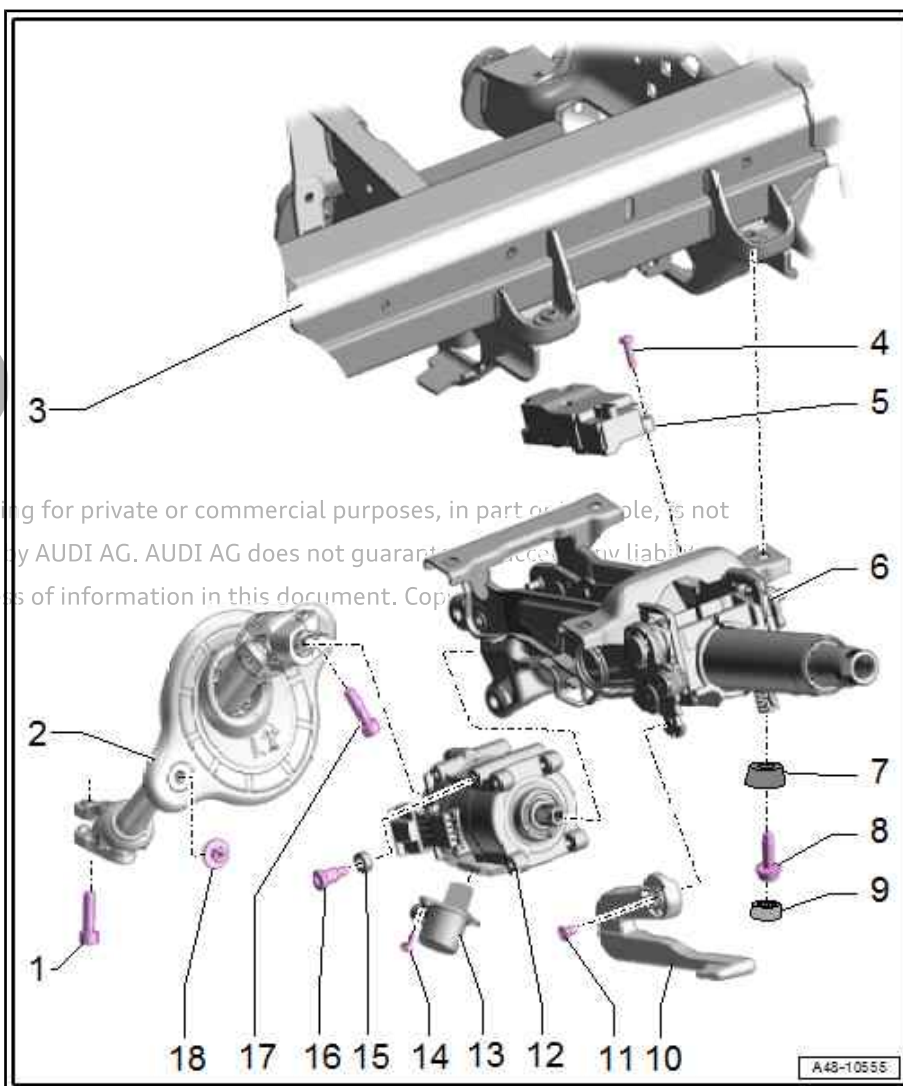
- ☐ 4.5 Nm

5 - Control unit for electronic steering column lock - J764-

- ☐ Removing and installing
⇒ [page 260](#)

6 - Steering column

- ☐ Different versions; for correct version refer to
⇒ Electronic parts catalogue
- ☐ Removing and installing
⇒ [page 253](#)
- ☐ Checking for damage
⇒ [page 252](#)
- ☐ Disconnecting from actuator for active steering
⇒ [page 260](#)



7 - Mechanical anti-theft device (bottom section)

- ☐ For version with manual gearbox



8 - Bolt

- ☐ 4x
- ☐ Tightening torque and tightening sequence ⇒ [page 251](#)

9 - Mechanical anti-theft device (top section)

- ☐ For version with manual gearbox

10 - Handle

- ☐ For steering column adjustment

11 - Bolt

- ☐ 5 Nm

12 - Active steering motor - V477-

- ☐ Disconnecting steering column from active steering motor - V477- ⇒ [page 260](#)

13 - Active steering safety lock actuator - F437-

- ☐ Removing and installing ⇒ [page 256](#)

14 - Bolt

- ☐ Tightening torque and tightening sequence ⇒ [page 252](#)

15 - Damping element

- ☐ Renew after removing

16 - Pin

- ☐ Renew after removing
- ☐ Tightening torque and tightening sequence ⇒ [page 252](#)

17 - Bolt

- ☐ Renew after removing
- ☐ Clean threaded hole (e.g. with a thread tap) before fitting new bolt
- ☐ Start by screwing in bolt a few turns by hand. Try to pull off intermediate steering shaft to check that it is correctly seated. Then tighten bolt.
- ☐ 20 Nm +90°

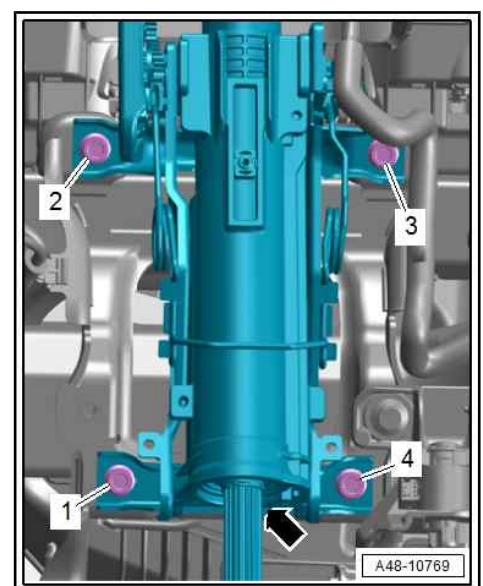
18 - Nut

- ☐ 4.5 Nm

Steering column - tightening torque and tightening sequence

– Tighten bolts in stages in the sequence shown:

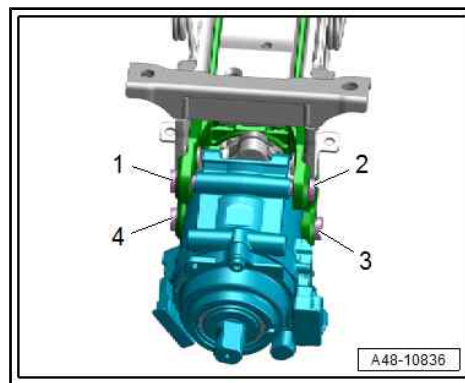
Stage	Bolt	Tightening torque
1.	-1 ... 4-	Screw in by hand as far as stop
2.	-1 ... 4-	20 Nm





Steering column and actuator for active steering - tightening torque and tightening sequence

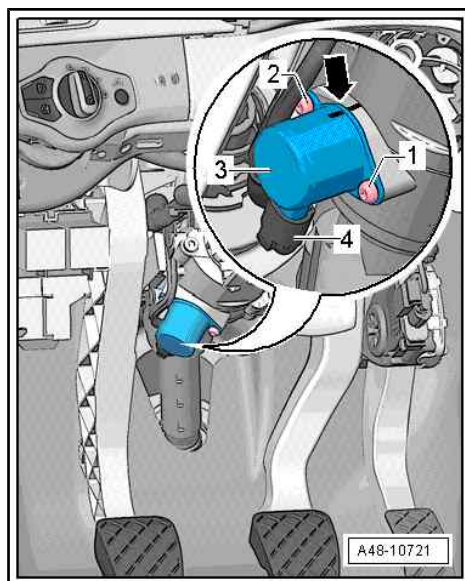
- Tighten pins to 9 Nm in the sequence -1 ... 4-.



Safety lock for active steering (locking solenoid) - tightening torque and sequence

- Tighten bolts in stages:

Stage	Bolt	Tightening torque
1.	-1-	2 + 2 Nm
2.	-2-	4 + 2 Nm
3.	-1-	8 + 2 Nm
4.	-2-	8 + 2 Nm



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2.2 Checking steering column for damage

Visual inspection

- The components of the steering column must not be damaged.

Checking function

- The steering column must turn smoothly and easily.
- It must be possible to easily adjust the steering column for height and reach (this check can only be performed when the steering column is installed).

2.3 Handling and transporting steering column



WARNING

Damage to steering column can cause a safety risk.

- ◆ *These instructions for handling the steering column MUST be observed at all times.*

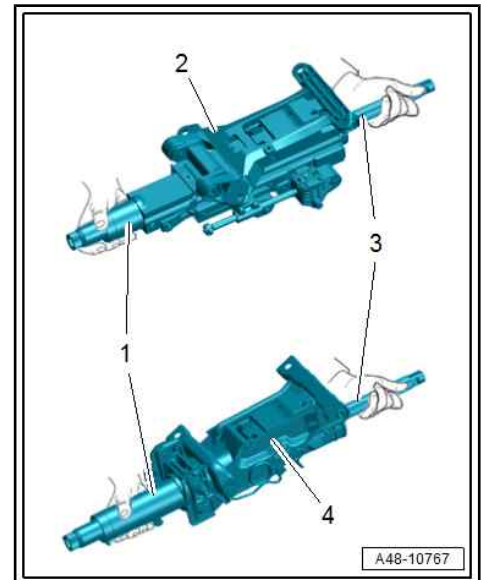


Correct handling and transportation of steering column

2 - Steering column with electrical adjustment

4 - Steering column with manual adjustment

- Use both hands to carry the steering column.
- Take hold of the steering column by the upper column tube -1- and the upper universal joint close to the end of the shaft -3-.



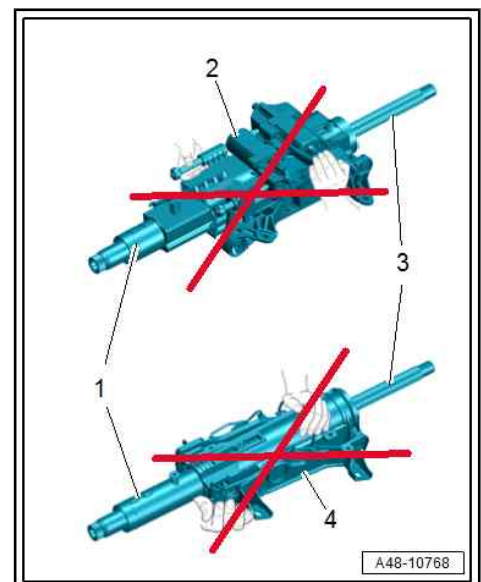
Incorrect handling of steering column

Carrying the steering column by the following parts will cause damage and can lead to injuries:

- Steering column with electric adjustment -2-: motors, spindles, connectors and wiring harness
- Steering column with manual adjustment -4-: release lever and weight balancing springs

The steering column must not be put under mechanical load:

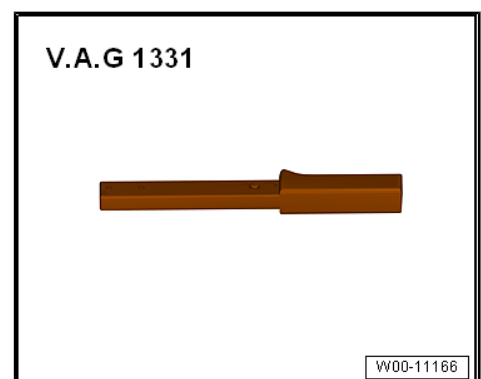
- ◆ A steering column that has been dropped onto a hard surface or shows signs of damage must not be installed in the vehicle.
- ◆ The steering column must not be put down on the shafts at either end -1, 3-.
- ◆ The ends of the shafts must not be subjected to any impact.



2.4 Removing and installing steering column

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Additionally for equipment version with mechanical anti-theft device:

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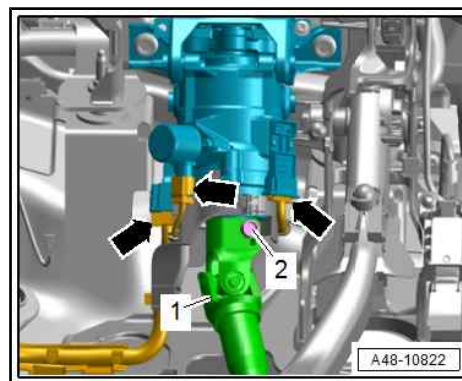


- ◆ Steering column repair set ⇒ Electronic parts catalogue
- ◆ Bolt extractor set - VAS 5514- (not illustrated)
- ◆ Protector set - VAS 871 009- (not illustrated)
- ◆ Hand-held drill
- ◆ Drill bit, Ø 4.5 mm

◆ **Safety goggles** Copyright. Copying for private or commercial purposes, in part or in whole, is not

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- Remove front section of footwell trim (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/ covers/trim panels; Removing and installing dash panel cover (driver side) .
- Depending on version: Remove knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Removing and installing knee airbag with igniter .
- Remove footwell vent (driver side) ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side) .
- Remove steering column switch module ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column switch module .
- Remove bolt -2- and detach universal joint -1- of intermediate steering shaft from steering column.
- Equipment version with active steering: Unplug electrical connectors -arrows- and move electrical wiring clear; detach wiring retainers to do so.



Equipment version with mechanical anti-theft device:

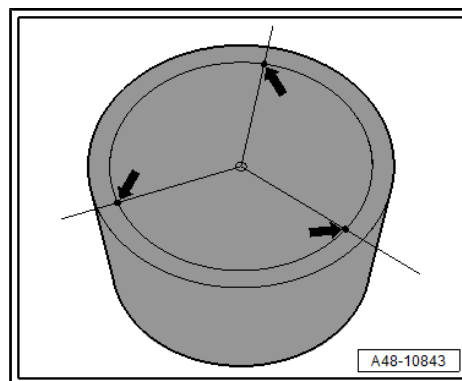
- Fit protector set - VAS 871 009- .



Caution

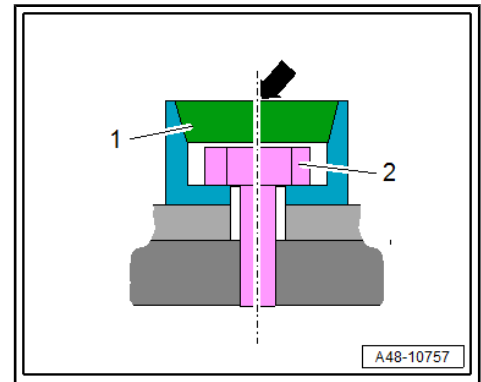
Wear safety goggles when carrying out all of the following steps.

- Punch anti-theft device three times at intervals of 120° in groove of top and bottom sections so that top section of mechanical anti-theft device -1- cannot turn while you are drilling.





- Centre-punch mechanical anti-theft device (top section) -1- and drill through punch marking using carbide drill from repair kit (4.5 mm Ø).
- Working through drilled hole -arrow- in mechanical anti-theft device (top section) -1-, drill approx. 8 mm into bolt -2- using a Ø 4.5 mm bit (commercially available).
- Drill through mechanical anti-theft device (top section) -1- using carbide drill from repair kit (7.0 mm Ø).
- Unscrew bolt (with anti-theft device) using bolt extractor no. 4 from bolt extractor set - VAS 5514- .
- Vacuum up all swarf.

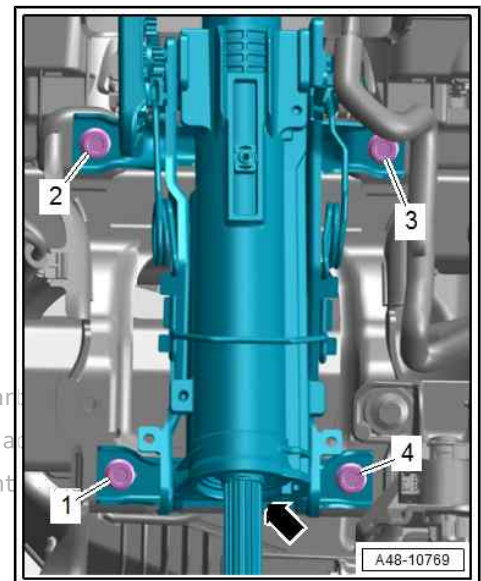


All vehicles (continued):

- Unscrew bolts in the sequence -4 ... 1-, supporting steering column -arrow- by hand from below.
- Detach steering column towards rear and lower it slightly.



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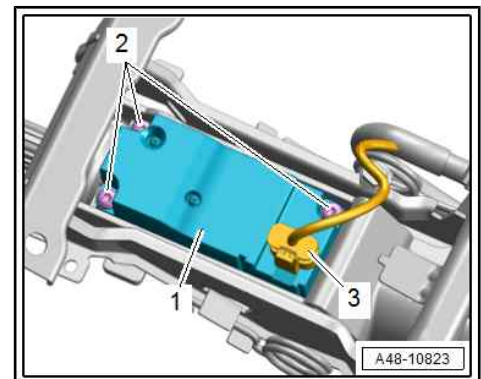
- Unplug electrical connector -3- for control unit for electronic steering column lock - J764- -item 1- and move it clear.



Note

Disregard -item 2-.

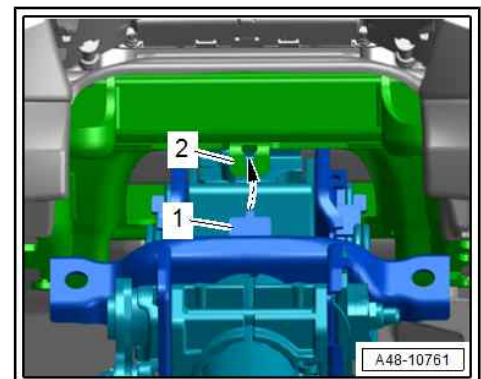
- Remove steering column.
- Disconnect steering column from active steering motor
⇒ [page 260](#) .



Installing

Installation is carried out in reverse order; note the following:

- Bring steering column into installation position; to do so, engage retaining hook -1- in centre tunnel -2- -arrow-.



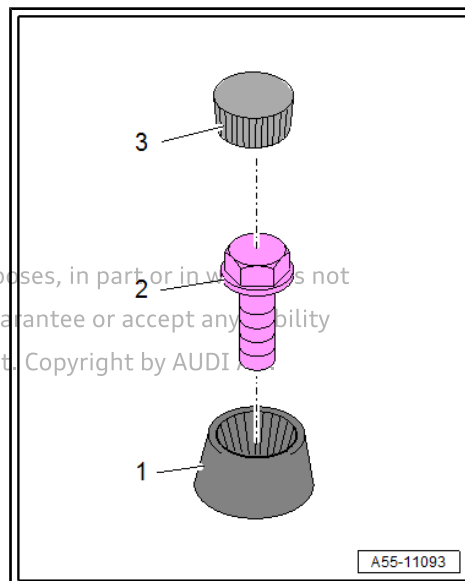


Equipment version with mechanical anti-theft device:

- Locate bolt -2- with anti-theft device (bottom section) -1- in installation position.
- Tighten bolts ⇒ [page 251](#) .
- Using a plastic hammer, drive mechanical anti-theft device (top section) -3- into bottom section, making sure it is flush.
- Install intermediate steering shaft ⇒ [page 257](#) .
- Install knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Removing and installing knee airbag with igniter.
- Calibrate steering angle sender - G85- ⇒ [page 228](#) .

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - steering column”, page 250](#)



2.5 Removing and installing safety lock for active steering (locking solenoid)

Special tools and workshop equipment required

- ♦ Vehicle diagnostic tester
- ♦ Torque wrench - V.A.G 1783-



Removing



Note

- ♦ *To prevent the steering wheel from being skewed, it must not be turned, and the straight-ahead position or the steering angle of the front wheels must not be altered when the actuator has been removed.*
- ♦ *Observe rules for cleanliness ⇒ [page 7](#) .*
- Turn steering wheel to straight ahead position.
- Switch off ignition.
- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

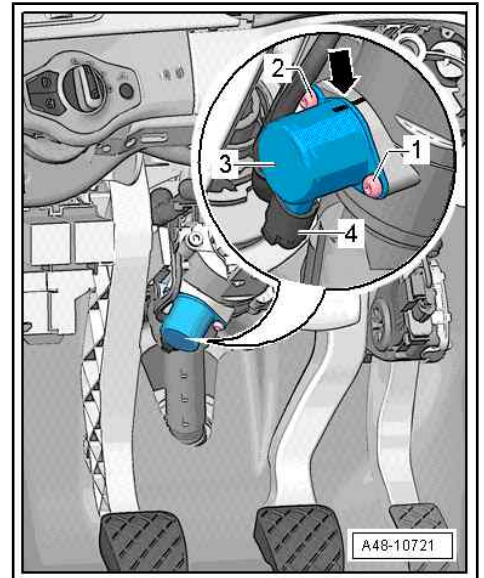


- Mark installation position of active steering safety lock actuator -F437- -arrow- for subsequent installation.
- Unplug electrical connector -4-.
- Clean any paint residue from bolt heads.
- Remove bolts -1, 2- (use bit included in repair set) and detach safety lock -3- from steering column.

Installing

Installation is carried out in reverse order; note the following:

- Position actuator according to marking made during removal and secure with bolts (use bit provided in repair set)
⇒ [page 252](#) .
- Connect vehicle diagnostic tester .
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Running gear
 - ◆ Steering
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 001B - Active steering J792
 - ◆ 001B - Active steering, functions
 - ◆ 001B - Basic setting (Rep. Gr. 48)
 - ◆ 001B - Basic setting complete
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.



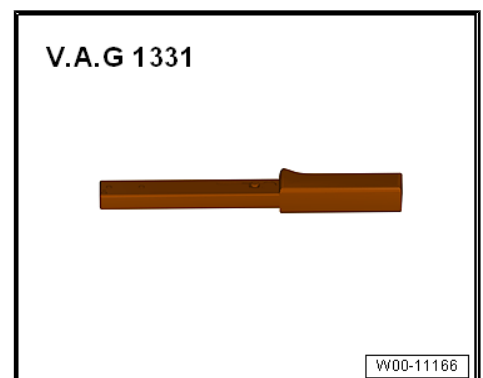
Tightening torques

- ◆ ⇒ [Fig. ““Safety lock for active steering \(locking solenoid\) - tightening torque and sequence””](#) , [page 252](#)

2.6 Removing and installing intermediate steering shaft

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

- Turn wheels to straight ahead position.



- Move driver's seat back as far as possible.
- Move steering wheel rearwards and down as far as possible, using full range of steering column adjuster.
- Switch off ignition.
- To prevent unintentional turning, secure steering wheel in straight-ahead position with adhesive tape -arrows-.

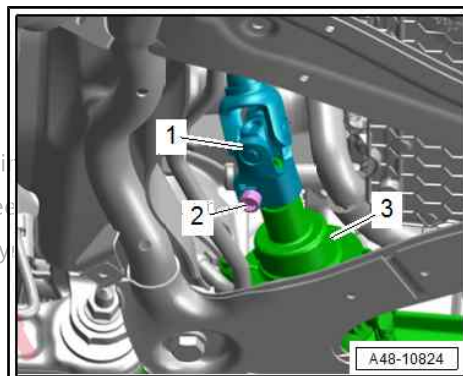


Note

- ♦ Use adhesive tape that can be completely removed afterwards without leaving marks.
- ♦ Do not turn steering wheel while performing repair work, as otherwise airbag coil connector and return ring with slip ring - F138- could be damaged.
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



- Remove bolt -2-.
- Detach universal joint -1- of intermediate steering shaft from steering rack -3-.
- Remove front section of footwell trim (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/ covers/trim panels; Removing and installing dash panel cover (driver side) .
- Remove foot rest ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing foot rest .

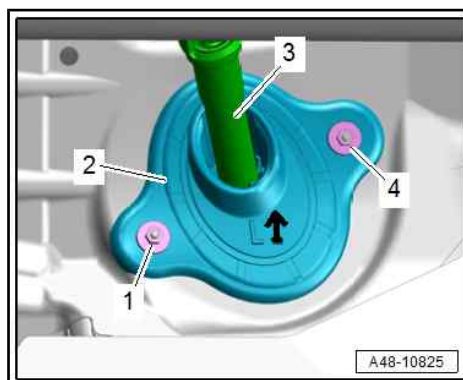


- Push floor covering slightly towards rear.
- Remove nuts -1, 4- and detach intermediate steering shaft -3- with sealing lip -2-.



Note

-Arrow- can be disregarded.





- Remove bolt -arrow- and detach universal joint -1- of intermediate steering shaft from steering column -2-.
- Detach intermediate steering shaft.

i Note

Illustration shows installation position on a vehicle without active steering as an example.

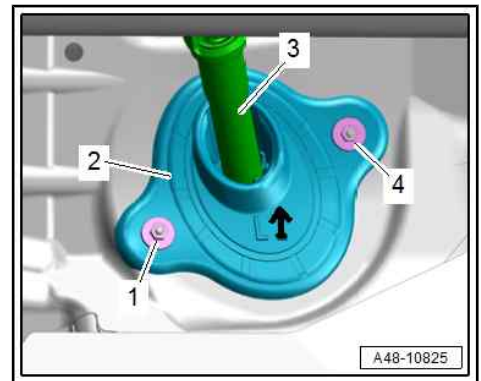
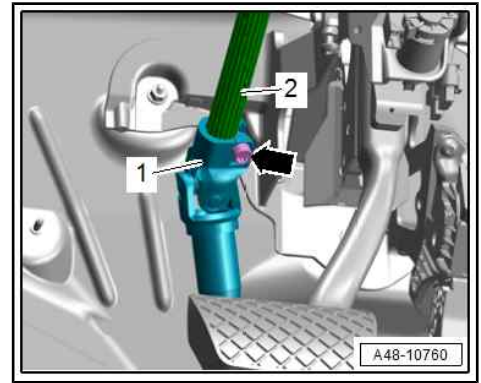
Installing

Installation is carried out in reverse order; note the following:

i Note

- ◆ *Always renew bolts after removal.*
- ◆ *Clean threaded holes for bolts on universal joints using a thread tap or similar.*

- Move intermediate steering shaft -3- into installation position as shown; ensure that sealing lip -2- is positioned on insulation.
- The -arrow- should point upwards.
- Tighten nuts -1, 4-.

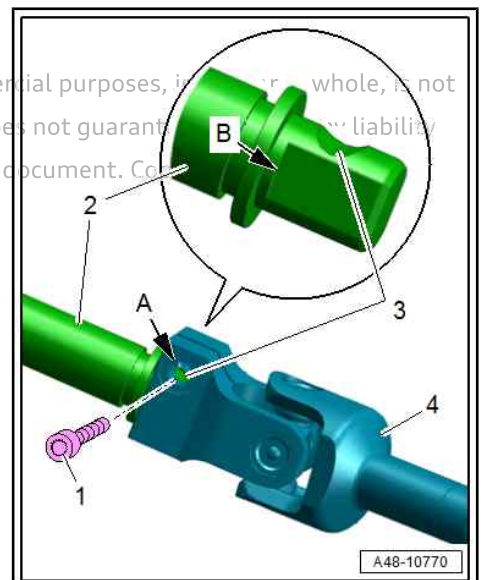


WARNING

Incorrect installation of intermediate steering shaft can cause an interruption in power flow - risk of accident!

- ◆ ***Note installation position and instructions.***

- Push universal joint -4- of intermediate steering shaft onto steering column -2-/steering rack as far as stop -arrow B-.
- The recess -3- on the steering column/steering rack must align exactly with the hole -arrow A- for the bolt -1- on the universal joint, as shown.
- Screw in new bolt by hand until it makes contact.
- Try to pull off intermediate steering shaft to check that it is correctly seated. Then tighten bolt.
- Repeat procedure for lower universal joint connecting to steering rack.



Tightening torques

- ◆ ➔ [“2.1 Exploded view - steering column”, page 250](#)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



2.7 Removing and installing control unit for electronic steering column lock - J764-

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



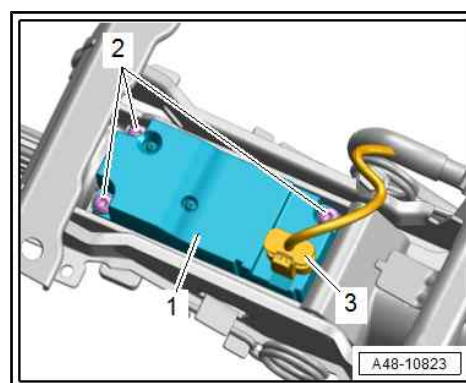
Removing

- Detach steering column from central tube for dash panel and place it in driver's footwell with intermediate steering shaft attached ⇒ [page 253](#) .
- Remove bolts -2- and detach control unit for electronic steering column lock - J764- .



Note

Disregard -item 3-.



Installing

Installation is carried out in reverse order; note the following:

- Install steering column ⇒ [page 253](#) .
- Calibrate steering angle sender - G85- ⇒ [page 228](#) .

Tightening torques

- ◆ ⇒ ["2.1 Exploded view - steering column", page 250](#)

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2.8 Disconnecting steering column from active steering motor - V477-

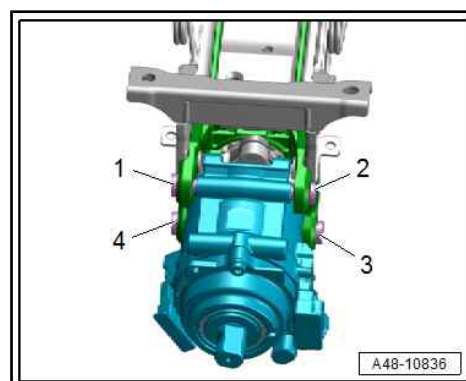
Procedure

- Steering column removed ⇒ [page 253](#) .
- Unscrew pins -1 ... 4- and carefully detach steering column from active steering motor - V477- .



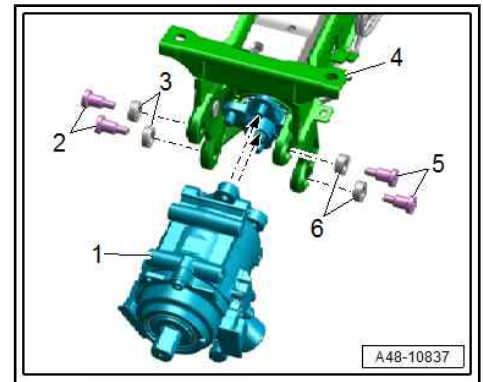
Note

Renew pins and damping elements after removal.





- Carefully fit steering column -3- and actuator for active steering -1- together -arrows-, taking care to keep them straight.
- Fit damping elements -4, 6- in steering column and screw in bolts -2, 5- until they make contact.
- Tighten pins ➔ [page 252](#) .



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3 Steering rack

⇒ [“3.1 Exploded view - steering rack”, page 262](#)

⇒ [“3.2 Handling and transporting steering rack”, page 265](#)

⇒ [“3.3 Removing and installing steering rack”, page 266](#)

⇒ [“3.4 Removing and installing boot”, page 269](#)

⇒ [“3.5 Removing and installing track rod”, page 272](#)

⇒ [“3.6 Removing and installing track rod ball joint”, page 273](#)

3.1 Exploded view - steering rack

⇒ [“3.1.1 Exploded view - steering rack”, page 262](#)

⇒ [“3.1.2 Exploded view - steering rack, track rods”, page 263](#)

3.1.1 Exploded view - steering rack

1 - Bolt

- ☐ Renew after removing
- ☐ Tightening torque
⇒ [Item 2 \(page 18\)](#)

2 - Subframe cross brace

- ☐ Exploded view
⇒ [page 17](#)

3 - Steering rack with track rods

- ☐ With the following integrated components:
- ◆ Electromechanical power steering motor - V187-
- ◆ Power steering control unit - J500-
- ☐ Components cannot be renewed separately
- ☐ If defective, renew steering rack
- ☐ Removing and installing
⇒ [page 266](#)
- ☐ Servicing ⇒ [page 263](#)

4 - Subframe

- ☐ Exploded view
⇒ [page 17](#)

5 - Intermediate steering shaft

- ☐ Removing and installing
⇒ [page 257](#)

6 - Wheel bearing housing

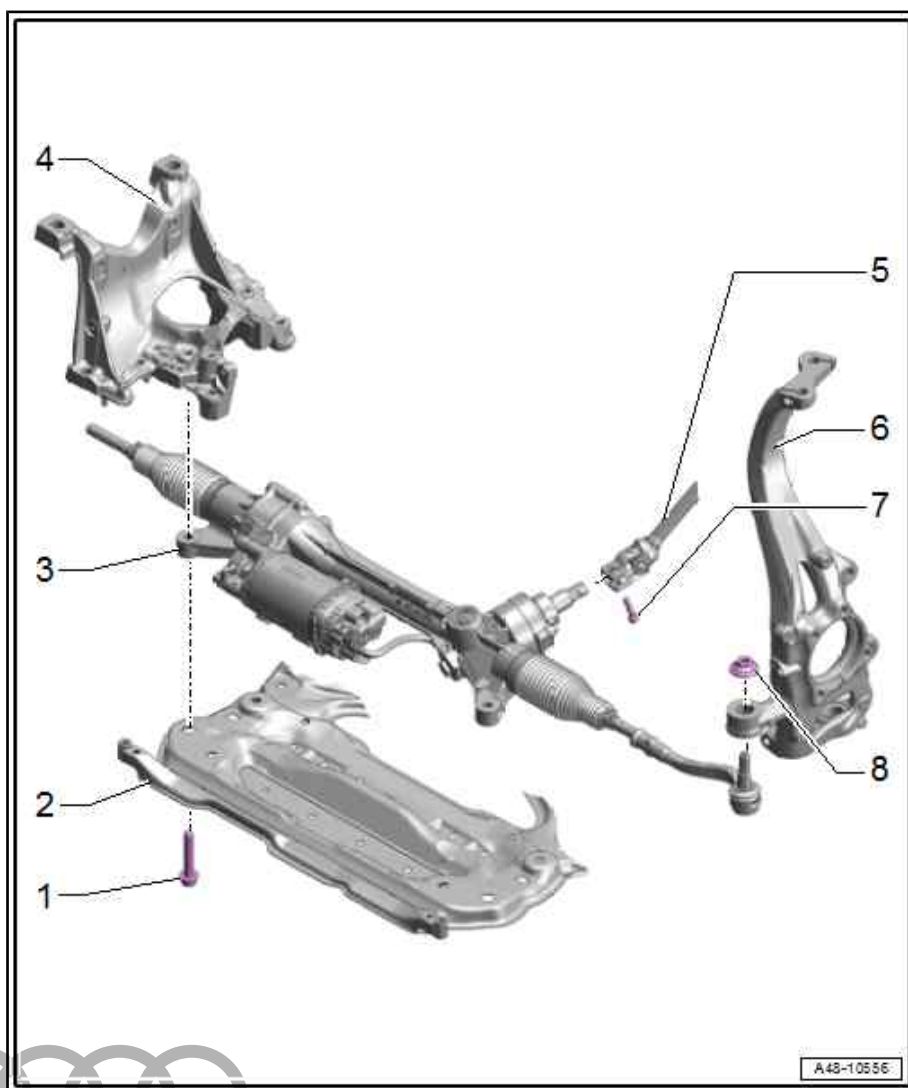
- ☐ Exploded view
⇒ [page 155](#)

7 - Bolt

- ☐ Tightening torque ⇒ [Item 1 \(page 250\)](#)

8 - Nut

- ☐ Renew after removing





- ☐ After loosening, remove any remaining adhesive from thread
- ☐ 140 Nm

3.1.2 Exploded view - steering rack, track rods

1 - Hose clip

- ☐ Renew after removing
- ☐ Do not open new hose clip
- ☐ Tightening ⇒ [page 265](#)

2 - Track rod

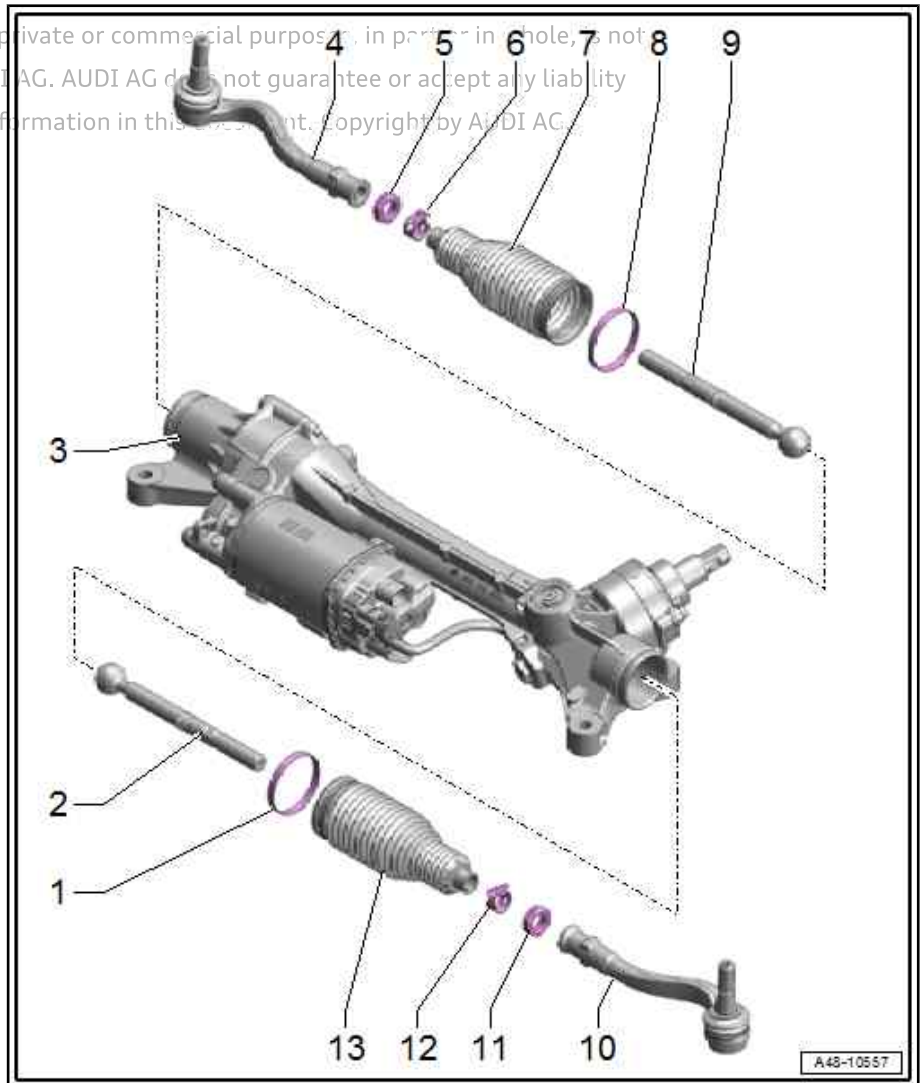
- ☐ Grease joint with steering rack grease - G 052 168 A1-
- ☐ Removing and installing ⇒ [page 272](#)
- ☐ If track rod is bent and needs to be renewed, track control link on this side of vehicle is also damaged and must be renewed
- ☐ 140 Nm

3 - Steering rack

- ☐ Grease rack with steering rack grease - G 052 168 A1-
- ☐ Removing and installing ⇒ [page 266](#)

4 - Track rod ball joint

- ☐ Check that dust cap is seated correctly and not damaged
- ☐ Specified dimension ⇒ [page 264](#)
- ☐ Removing and installing ⇒ [page 273](#)
- ☐ If track rod ball joint is bent and needs to be renewed, track control link on this side of vehicle is also damaged and must be renewed



5 - Nut

- ☐ Counterhold at track rod ball joint when loosening and tightening
- ☐ 80 Nm

6 - Spring-type clip

- ☐ Renew after removing
- ☐ Installing spring-type clip ⇒ [page 265](#)

7 - Boot

- ☐ Check for damage
- ☐ Renew after removing
- ☐ Must not be twisted when adjusting toe setting
- ☐ Do not crush folds
- ☐ Do not allow to come into contact with hard or sharp objects
- ☐ Grease seal seat with steering rack grease - G 052 168 A1-



- ☐ Renewing ⇒ [page 269](#)

8 - Hose clip

- ☐ Renew after removing
- ☐ Do not open new hose clip
- ☐ Tightening ⇒ [page 265](#)

9 - Track rod

- ☐ Grease joint with steering rack grease - G 052 168 A1-
- ☐ Removing and installing ⇒ [page 272](#)
- ☐ If track rod is bent and needs to be renewed, track control link on this side of vehicle is also damaged and must be renewed
- ☐ 140 Nm

10 - Track rod ball joint

- ☐ Check that dust cap is seated correctly and not damaged
- ☐ Specified dimension ⇒ [page 264](#)
- ☐ Removing and installing ⇒ [page 273](#)
- ☐ If track rod ball joint is bent and needs to be renewed, track control link on this side of vehicle is also damaged and must be renewed

11 - Nut

- ☐ Counterhold at track rod ball joint when loosening and tightening
- ☐ 80 Nm

12 - Spring-type clip

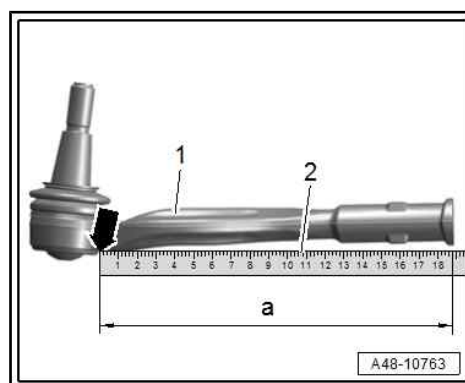
- ☐ Renew after removing
- ☐ Installing spring-type clip ⇒ [page 265](#)

13 - Boot

- ☐ Check for damage
- ☐ Renew after removing
- ☐ Must not be twisted when adjusting toe setting
- ☐ Do not crush folds
- ☐ Do not allow to come into contact with hard or sharp objects
- ☐ Grease seal seat with steering rack grease - G 052 168 A1-
- ☐ Installation position ⇒ [page 265](#)
- ☐ Renewing ⇒ [page 269](#)

Specified dimension for track rod ball joint

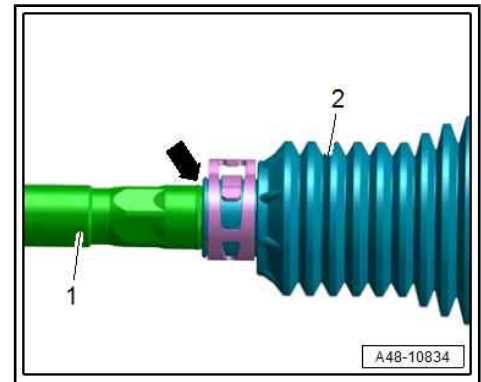
- Apply steel ruler -2- to track rod ball joint -1- and slide as far as rolled edge -arrow- on end of track rod ball joint.
- The entire steering rack with track rod, track rod ball joint and track rod control link (on the corresponding side) must be renewed if dimension -a- is less than 190 mm.
- Renew entire steering rack if it is damaged or if it makes unusual noises.





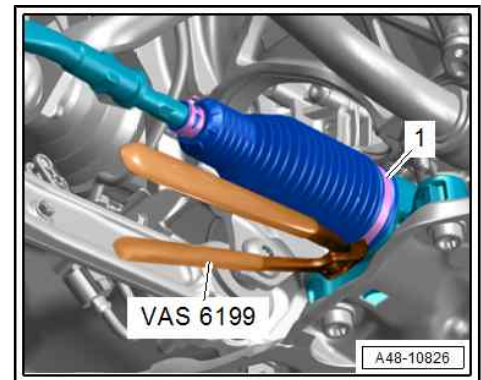
Installation position of outer boot

- Push boot -2- on and position it as shown at groove -arrow- on track rod -1-.



Tightening inner hose clip using locking pliers for Phaeton steering rack - VAS 6199-

- Tighten new O-type hose clip -1- using locking pliers for Phaeton steering rack - VAS 6199- as far as shown in illustration.



3.2 Handling and transporting steering rack

Special tools and workshop equipment required

- ◆ Protective gloves



WARNING

Damage to the steering rack can cause a safety risk.

- ◆ *These instructions for handling the steering rack MUST be observed at all times.*

Incorrect handling and transport of the steering rack

Carrying the steering rack by the parts shown in red will cause damage:

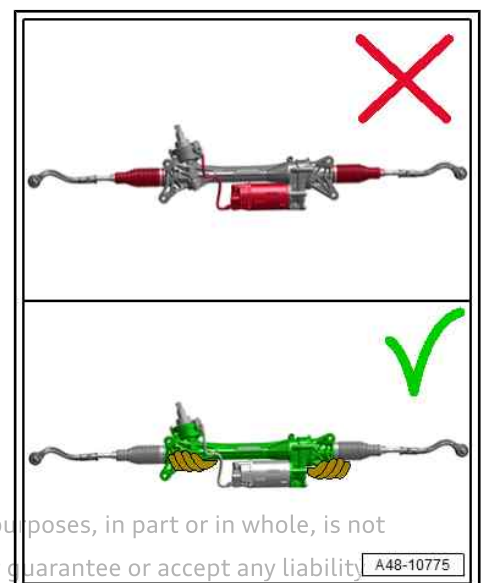
- Boots: Can be damaged if compressed, grasped or placed on a hard surface.
- Motor: Electrical connectors and wiring can be damaged if grasped or placed on a hard surface.

The steering rack must not be put under mechanical load:

- ◆ Do not install a steering rack that has been dropped onto a hard surface or shows signs of damage.

Correct handling and transport of the steering rack

- When carrying the steering rack, use both hands and wear protective gloves.
- Hold the steering rack only at the areas shown in green.



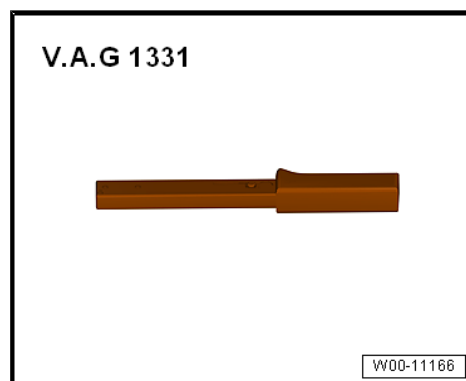
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3.3 Removing and installing steering rack

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - V.A.G 1332-



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- ◆ Engine and gearbox jack - VAS 6931-



- ◆ Ball joint ejector - VAS 251 805-





◆ Brace -T40335-



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Removing

- Turn wheels to straight ahead position.
- Switch off ignition.
- To prevent unintentional turning, secure steering wheel in straight-ahead position with adhesive tape -arrows-.



Note

- ◆ *Use adhesive tape that can be completely removed afterwards without leaving marks.*
- ◆ *Do not turn steering wheel while performing repair work, as otherwise airbag coil connector and return ring with slip ring - F138- could be damaged.*
- Remove front wheels ⇒ [page 205](#) .





- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out

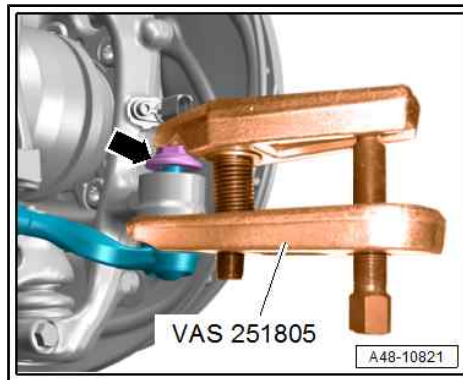
- ◆ *The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



Caution

Risk of damage to ball joint puller.

- ◆ *Make sure the two lever arms of the puller are parallel when maximum force is exerted.*



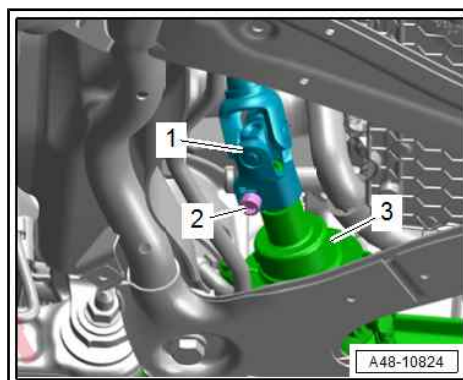
- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805-
- Then unscrew nut; if necessary, counterhold at joint pin with a 6 mm hexagon socket.
- Repeat procedure on opposite side.
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove bolt -2-.
- Detach universal joint -1- of intermediate steering shaft from steering rack -3-.
- Lower subframe cross brace, taking care not to press joint pin of guide link out of tapered seat when doing so ⇒ [page 34](#) .



Caution

Risk of damage to running gear components.

- ◆ *Never place the vehicle on its wheels if the subframe mounting, steering rack or subframe cross brace is not correctly installed!*
- ◆ *The vehicle must not be supported on the subframe or the subframe cross brace (e.g. using a trolley jack or similar)!*



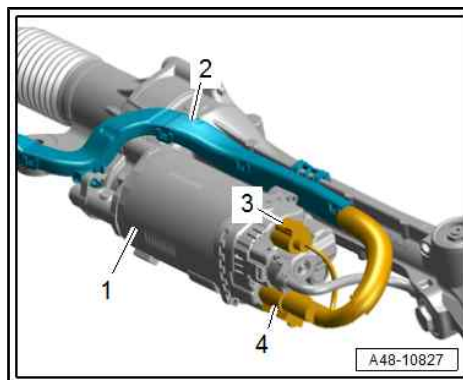
- Unplug electrical connectors -3, 4- from power steering control unit - J500- ; to do so, release retainer and push catch downwards.
- Move duct -2- for electrical wiring clear at steering rack -1-.



WARNING

Risk of accident caused by weight of steering rack.

- ◆ *A 2nd mechanic is required in order to remove the steering rack.*





Caution

Risk of damage to boots.

- ◆ *Do not hold onto boots when removing the steering rack.*

- Unscrew locking pins - T40334- and remove steering rack.

Installing

Installation is carried out in reverse order; note the following:

- Install subframe cross brace ➔ [page 34](#) .
- Install intermediate steering shaft ➔ [page 257](#) .

If a new steering rack has been installed with a power steering control unit - J500- , activate control unit:

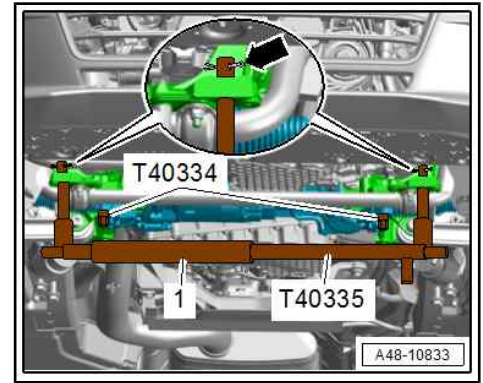
- Connect vehicle diagnostic tester.
- Switch on ignition.
- Select **Diagnosis** and start the diagnosis.
- Select **Test plan** tab.
- Choose **Select own test** and select following options one after the other:
 - ◆ Running gear
 - ◆ Steering
 - ◆ 0001 - Self-diagnosis compatible systems
 - ◆ 0044 - Power steering control unit J500
 - ◆ 0044 - Power steering control unit, functions
 - ◆ 0044 - Replace control unit
- Start selected program and follow instructions shown on display of vehicle diagnostic tester.
- Overview table: when does wheel alignment have to be checked? ➔ [page 213](#)

Tightening torques

- ◆ ➔ [“3.1 Exploded view - steering rack”, page 262](#)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

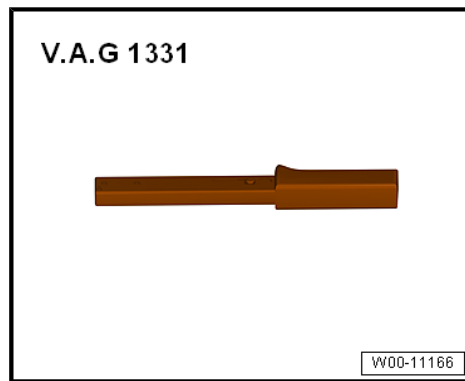
3.4 Removing and installing boot

Special tools and workshop equipment required





◆ Torque wrench - V.A.G 1331-



◆ Hose clip pliers - VAS 6362-



Removing



Caution

If boot is damaged, moisture and dirt can enter steering rack and cause irreparable damage.

- ◆ *A film of lubricant should be visible on and around the teeth of the steering rack. Renew steering rack if no film of lubricant is present.*
- ◆ *When cleaning the steering rack and surrounding components, removing steering rack components and lubricating the steering rack, ensure that no dirt enters the steering rack through the defective rubber boot.*



Note

Observe rules for cleanliness ⇒ [page 7](#) .

- Turn wheels to straight ahead position.
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove track rod ball joint ⇒ [page 273](#) .
- Clean steering rack and subframe in area of rubber boot.
- Unscrew nut from track rod.



- Release spring-type clip -3- using hose clip pliers - V.A.G 1921- and detach.
- Detach hose clip -1- and pull boot -2- outwards off steering rack.

Installing

Installation is carried out in reverse order; note the following:



Note

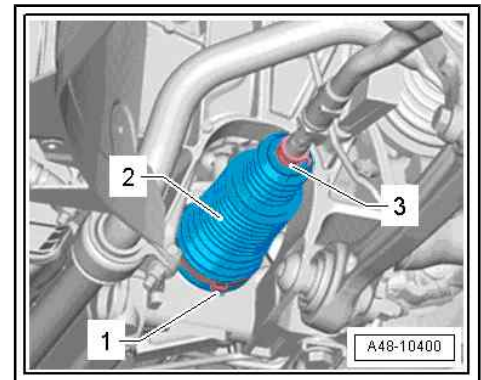
Always renew boot if removed



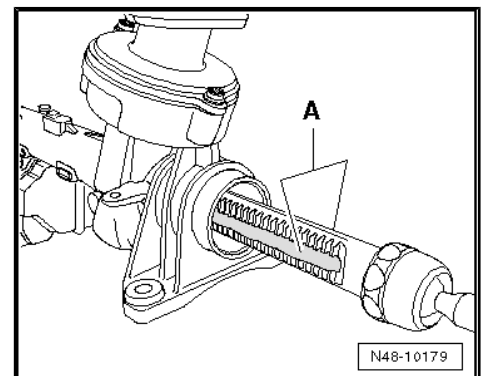
Caution

Risk of damage to boot if it is handled incorrectly.

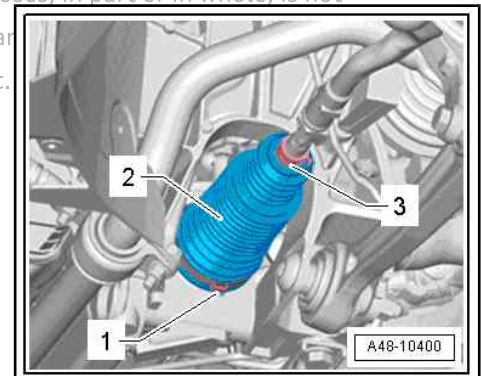
- ◆ **Do not crush folds of boot.**
- ◆ **Do not allow boot to come into contact with hard or sharp objects.**



- Check seat of boot on steering rack housing for damage. Renew steering rack if seal seat is damaged.
- Grease evenly all round inside of boot seating surfaces with steering rack grease - G 052 168 A1- .
- Grease rack on side with teeth -A- and on side that contacts thrust pieces using steering rack grease - G 052 168 A1- (turn steering to full lock in both directions to do so).



- Turn wheels to straight ahead position.
- Fit rubber boot with new hose clip onto steering rack housing.
- Ensure that boot is seated correctly.
- Boot must engage in groove and make contact with contour of steering rack.
- Tighten inner hose clip -1- ➔ [page 265](#) .
- Secure spring-type clip -3- on boot -2- with hose clip pliers - VAS 6362- , paying attention to installation position ➔ [page 265](#) .
- Overview table: when does wheel alignment have to be checked? ➔ [page 213](#)



Tightening torques

- ◆ ➔ ["3.1.1 Exploded view - steering rack", page 262](#)
- ◆ ➔ ["3.1.2 Exploded view - steering rack, track rods", page 263](#)
- ◆ ➔ ["1 Wheels, tyres", page 205](#)



3.5 Removing and installing track rod

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



- ◆ Open-end spanner attachment - V.A.G 1923-



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Removing



Note

Observe rules for cleanliness ⇒ [page 7](#) .

- Remove rubber boot ⇒ [page 269](#) .
- Turn the front wheels as follows:
 - ◆ Turn steering to full left lock for left track rod
 - ◆ Turn steering to full right lock for right track rod



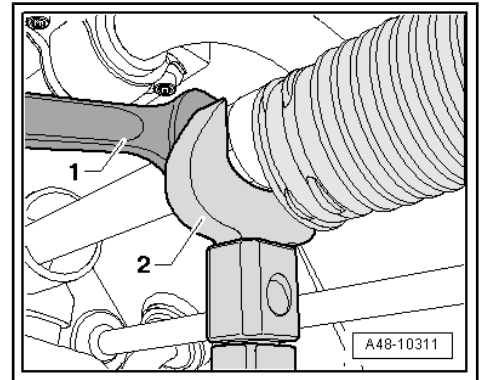
- Unscrew track rod using open-end spanner attachment - V.A.G 1923- -item 2-; to do so, counterhold with an open-end spanner -1- at teeth of steering rack.



Caution

Moisture and dirt can cause irreparable damage to steering rack.

- ◆ **A film of lubricant should be visible on and around the teeth of the steering rack. Renew steering rack if no film of lubricant is present.**



Installing

Installation is carried out in reverse order; note the following:

- Install rubber boot ⇒ [page 269](#) .
- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ◆ ⇒ [“3.1.1 Exploded view - steering rack”, page 262](#)
- ◆ ⇒ [“3.1.2 Exploded view - steering rack, track rods”, page 263](#)
- ◆ ⇒ [“1 Wheels, tyres”, page 205](#)

3.6 Removing and installing track rod ball joint

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332

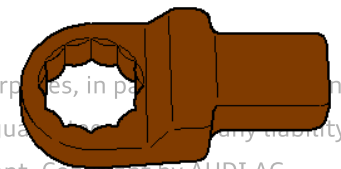


W00-11165

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



V.A.G 1332/7



W00-11476

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♦ Engine and gearbox jack - VAS 6931-

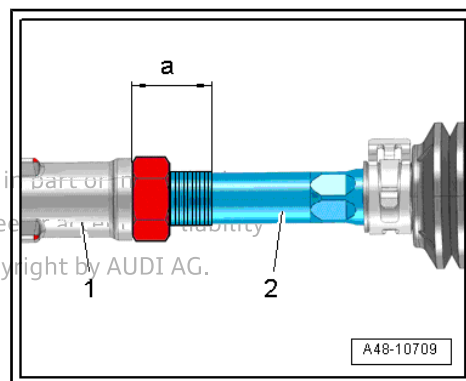


♦ Ball joint ejector - VAS 251 805-



Removing

- Remove front wheel ➔ [page 205](#) .
- Measure and note down dimension -a- between track rod ball joint -1- and track rod -2- on both sides.
- Dimension -a- should be the same on both sides after installation.





- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out

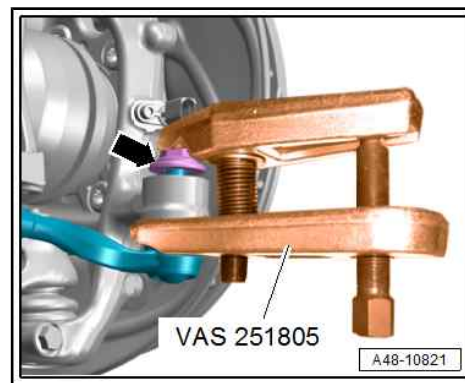
- ◆ *The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



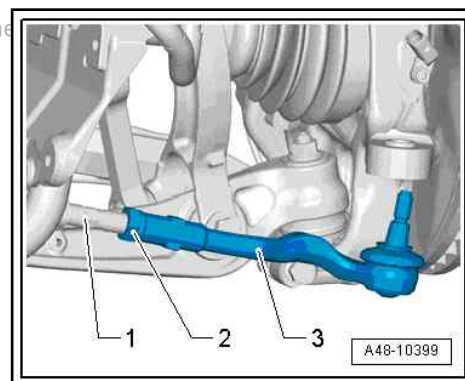
Caution

Risk of damage to ball joint puller.

- ◆ *Make sure the two lever arms of the puller are parallel when maximum force is exerted.*



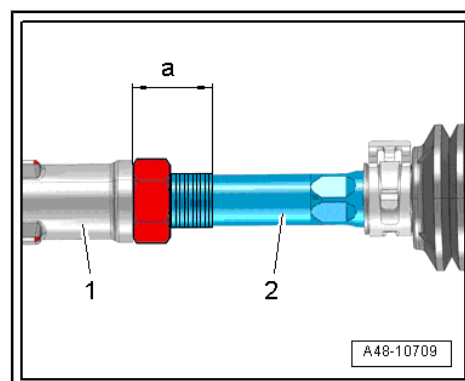
- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- .
- Unscrew nut; if necessary, counterhold at joint pin with a 6 mm hexagon socket.
- Loosen nut -2- but do not remove (counterhold track rod ball joint -3-).
- Unscrew track rod ball joint; if necessary, counterhold at hexagon flats of track rod -1-.



Installing

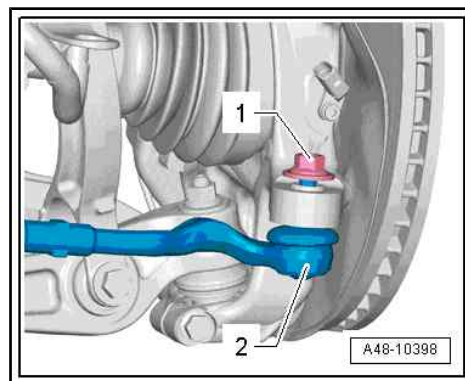
Installation is carried out in reverse order; note the following:

- Screw track rod ball joint -1- onto track rod -2- until dimension -a- measured on removal is obtained.
- Align track rod so that pin of track rod ball joint is in installation position.
- Insert track rod ball joint all the way into wheel bearing housing.





- To tighten nut -1- counterhold at joint pin with a 6 mm hexagon socket if necessary.



- Tighten nut 2.

- Overview table: when does wheel alignment have to be checked? ⇒ [page 213](#)

Tightening torques

- ♦ ⇒ [“3.1 Exploded view - steering rack”, page 262](#)
- ♦ ⇒ [“1 Wheels, tyres”, page 205](#)

