Workshop Manual

Audi A3 2013 ➤ ,
Audi A3 Cabriolet 2015 ➤ ,
Audi A3 Limousine 2014 ➤ ,
Audi A3 Limousine China 2014 ➤ ,
Audi A3 Sportback 2013 ➤ ,
Audi A3 Sportback China 2014 ➤

Running gear, axles, steering

Edition 02.2019

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List of Workshop Manual Repair Groups

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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

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⇒ "1.2 Steering", page 1
⇒ "1.3 Types of tyre", page 1

1.1 Running gear

	Front-wheel drive and four-wheel drive
Front axle	MacPherson struts with lower transverse links, subframe and anti-roll bar or shock absorbers with variable damper characteristics (option)
Rear axle (vehicles with entry-level engine)	Torsion beam axle with separate spring/shock absorber layout
Rear axle (vehicles with more powerful engine)	Multi-link suspension with separate spring/shock absorber layout and anti-roll bar or shock absorbers with variable damper characteristics (option)

1.2 Steering

	Front-wheel drive and four-wheel drive
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; Rep. gr. 44 and ⇒ Wheel/Tyre Guide - General information; Rep. gr. 44 .

2 Safety precautions

⇒ “2.1 Safety precautions when working on vehicles with high-voltage system”, page 2

⇒ “2.2 Safety precautions when working in the vicinity of high-voltage components”, page 2

⇒ “2.3 Safety precautions when working on vehicles with start/stop system”, page 3

⇒ “2.4 Safety precautions when using testers and measuring instruments during a road test”, page 3

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2.1 Safety precautions when working on vehicles with high-voltage system

High voltage! Danger to life!

The voltage levels in the high-voltage system constitute a safety hazard. Danger of severe or fatal injuries from electric shock.

- Persons with life-sustaining or other electronic medical devices in or on their body must not perform any work on the high-voltage system. Such medical devices include internal analgesic pumps, implanted defibrillators, pacemakers, insulin pumps and hearing aids.
- The high-voltage system must be de-energised by a suitably qualified person.

Risk of injury - engine may start unexpectedly

It is difficult to determine whether the drive system of an electric vehicle or hybrid vehicle is active. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).

- Switch off ignition.
- Place ignition key outside vehicle interior.

Risk of damage to high-voltage wiring

Incorrect handling may result in damage to the insulation of high-voltage wires or high-voltage connectors.

- Never use high-voltage wiring or high-voltage connectors as a support.
- Never prop tools against high-voltage wiring or high-voltage connectors.
- Never bend or kink high-voltage wiring.
- Pay attention to coding when connecting high-voltage connections.

2.2 Safety precautions when working in the vicinity of high-voltage components

High voltage! Danger to life!

The voltage levels in the high-voltage system constitute a safety hazard. Danger of severe or fatal injuries from electric shock if high-voltage components or high-voltage wiring are damaged.

– Carry out visual check of high-voltage components and high-voltage wiring.
– Never use cutting/forming tools or other sharp-edged implements.
– Never perform work using welding, brazing, thermal bonding or hot air.

2.3 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.

2.4 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.

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3 Repair notes

⇒ “3.1 Leaks at shock absorbers”, page 4

⇒ “3.2 Noises from shock absorbers”, page 5

⇒ “3.3 Checking shock absorbers when removed”, page 5

⇒ “3.4 Checking shock absorbers on shock tester”, page 6

⇒ “3.5 Maximum values "a" in mm”, page 7

⇒ “3.6 Rules for cleanliness”, page 7

⇒ “3.7 General notes”, page 7

⇒ “3.8 General repair instructions”, page 8

⇒ “3.9 Contact corrosion”, page 8

⇒ “3.10 Steering rack”, page 9

⇒ “3.11 Gaskets and seals”, page 9

⇒ “3.12 Bolts and nuts”, page 9

⇒ “3.13 Electrical components”, page 10

⇒ “3.14 Repair notes for drive shaft”, page 10

⇒ “3.15 Repairing damaged threads in longitudinal member (sub-frame to body)”, page 10

⇒ “3.16 Lifting suspension to unladen position - vehicles with coil springs”, page 10

3.1 Leaks at shock absorbers

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

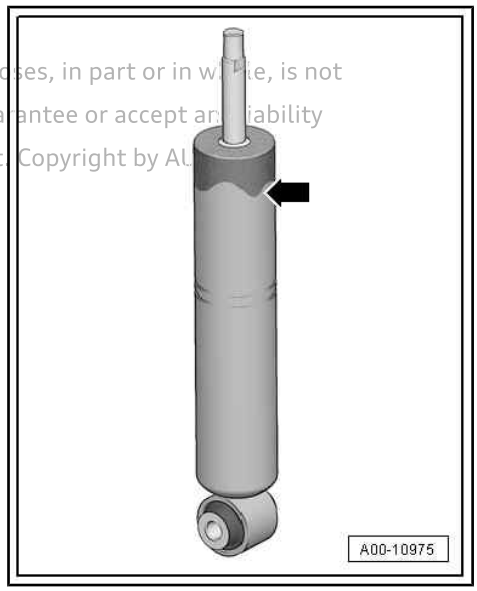
Slight loss of fluid (“sweating”) at the piston rod seal is not a reason for renewing a shock absorber. A shock absorber with slight fluid leakage can be accepted as OK under the following conditions:

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Note

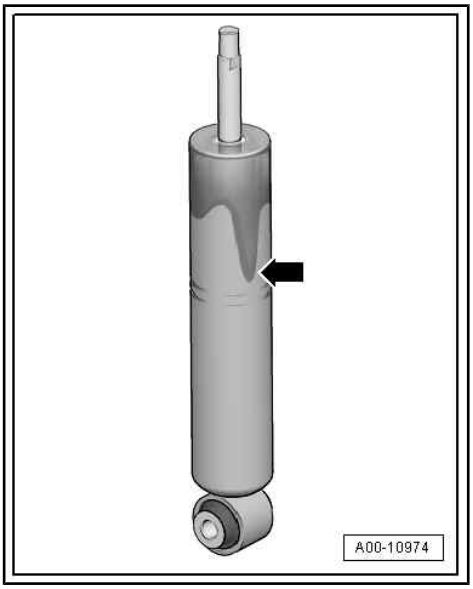
Slight fluid leakage is actually beneficial, as it lubricates the piston rod seal and thus extends the life of the shock absorber. This applies to shock absorbers on both the front and rear axles.

- 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.



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.



3.2 Noises from shock absorbers

Shock absorbers are often replaced because of noises (rumbling, etc.) experienced by the customer. Inspections on the test rig and in the vehicle have shown that in approx. 70 % of these cases the complaints and subsequent renewal are not justified.

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

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

Note

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

3.3 Checking shock absorbers when removed

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

Note

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

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

– Compress shock absorber by hand.

- The piston rod should move smoothly over the entire stroke with uniform resistance and without jolts.

– Release piston rod.

- If the shock absorber has sufficient gas pressure the piston rod will return by itself to its original position.

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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.*

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3.4 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 pressure OK
- Wheels of vehicle in a central and straight position on the tyre contact plates
- Front wheels in straight-ahead position
- Handbrake 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 renewal is recommended.

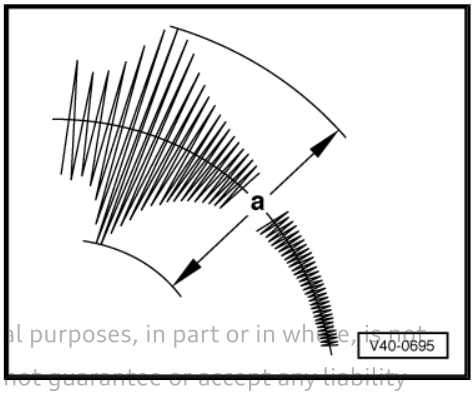
Example:

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 313



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3.5 Maximum values "a" in mm

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.*

Vehicle type	Front axle	Rear axle	Remarks
Standard running gear 2UA	43 mm	52 mm	Unladen Tank full
Heavy-duty running gear 2UF	43 mm	52 mm	Unladen Tank full
Sports running gear 2UC	42 mm	50 mm	Unladen Tank full
S line sports running gear 2UG	42 mm	50 mm	Unladen Tank full

Test must be carried out with tyre inflation pressures for "part load".

3.6 Rules for cleanliness

- Thoroughly clean all joints and connections and the surrounding 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.

3.7 General notes

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

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.

3.8 General repair instructions

All contact surfaces must be cleaned when installing wax-coated components. The contact surfaces must be free of wax and grease.

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Tightening torques refer to unoiled bolts and nuts.

Always renew self-locking bolts/nuts.

Always renew bolts and nuts which are tightened by turning through a specified angle.

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 “ETKA” .

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 bushes can only be turned to a limited extent. The suspension must therefore always be in the unladen position ⇒ page 10 when the suspension link attachments are tightened.

3.9 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 using Audi Genuine Accessories.

- Damage caused by contact corrosion is not covered by the warranty.

3.10 Steering rack

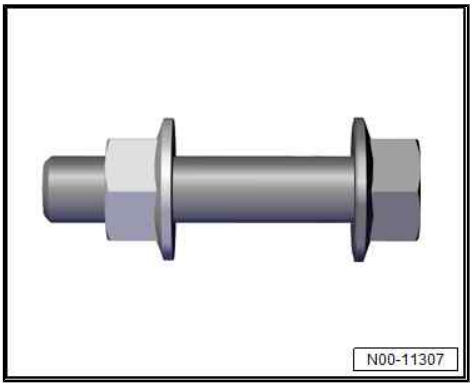
- Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- Ensure proper seating of dowel sleeves for centralising suspension bracket and steering rack when installing.
- Place removed parts on a clean surface and cover them up to keep them clean. Use plastic sheeting 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.

3.11 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.
- Clean off all residues of liquid gasket thoroughly; make sure that no remaining material enters the steering rack housing.

3.12 Bolts and nuts

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

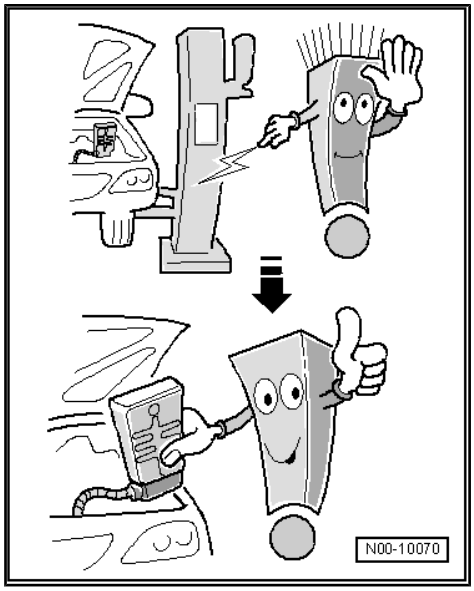


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3.13 Electrical components

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.



3.14 Repair notes for 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 “ETKA” .

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.

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 loosening bolt securing drive shaft at wheel hub
⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111

Procedure for tightening bolts securing drive shaft to flange shaft:

First pre-tighten all 6 bolts in diagonal sequence to 10 Nm, then tighten in diagonal sequence to final specified torque.

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.

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

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Under certain circumstances it is possible to repair the threads in the captive nuts in the longitudinal member.

Instructions for repairing damaged threads ⇒ Body Repairs; Rep. gr. 50 ; Repairing threads for attachment of subframe .

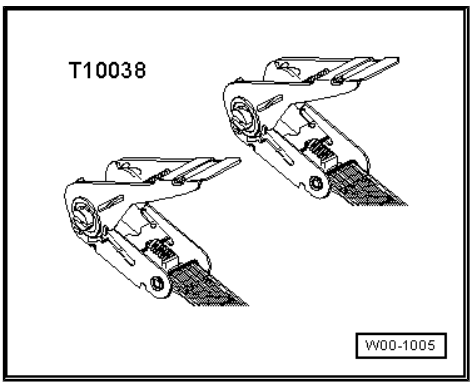
3.16 Lifting suspension to unladen position - vehicles with coil springs

Special tools and workshop equipment required

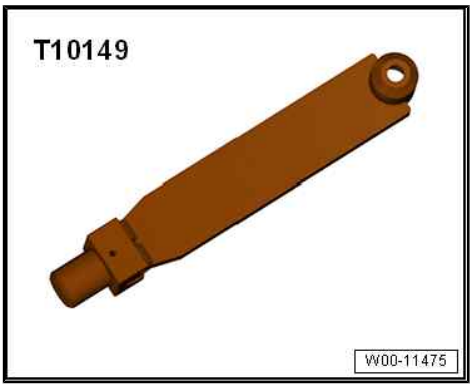
- Engine and gearbox jack - VAS 6931-



- Tensioning strap - T10038-



- Support - T10149-



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Note

All bolts on running gear components with bonded rubber bushes must always be tightened with the suspension in the unladen position (vehicle unladen).

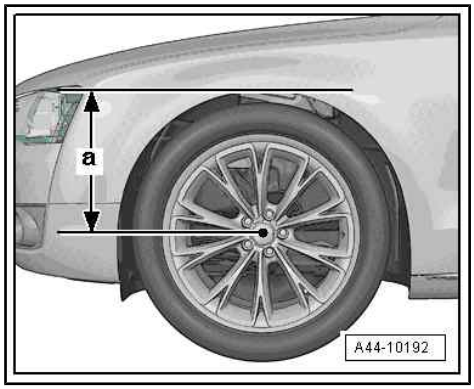
Bonded rubber bushes can only be turned to a limited extent.

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- .

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



Note

This measurement must be taken with the suspension in the unladen position (vehicle unladen).

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

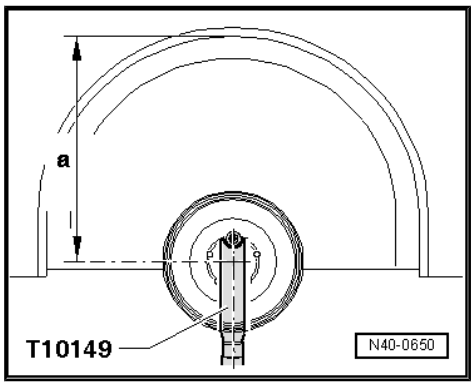
Before raising wheel unit, secure vehicle to arms of lifting platform using tensioning straps - T10038- .

Note

If vehicle is not secured, there is a risk of it slipping off the lifting platform.

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

– Raise wheel bearing housing with engine and gearbox jack - VAS 6931- until distance -a- is obtained.



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

WARNING

- *Do not raise or lower vehicle when engine and gearbox jack - VAS 6931- is under vehicle.*
- *Do not leave engine and gearbox jack - VAS 6931- under vehicle for longer than necessary.*

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

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4 Technical data

⇒ “4.1 Running gear”, page 13

⇒ “4.2 Steering”, page 13

4.1 Running gear

		Front-wheel drive and four-wheel drive
Wheelbase (2-door/4-door)	mm	2595 / 2630
Track width (front/rear) [1)]	mm	1555/1526

1) Front/rear track width only applicable to standard running gear with standard tyre size 205/55/R16 on 7.0Jx16 ET40 rims (ET= rim offset)

4.2 Steering

	Front-wheel drive and four-wheel drive
Maximum wheel lock angle	Approx. 40°

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5 Disposal

⇒ “5.1 Releasing gas and draining front gas-filled shock absorbers”, page 14

⇒ “5.2 Releasing gas and draining rear gas-filled shock absorbers”, page 15

5.1 Releasing gas and draining front gas-filled shock absorbers

⇒ “5.1.1 Releasing gas and draining front gas-filled shock absorbers - conventional shock absorbers”, page 14

⇒ “5.1.2 Releasing gas from front gas-filled shock absorbers - version with variable damping”, page 15

5.1.1 Releasing gas and draining front gas-filled shock absorbers - conventional shock absorbers

Special tools and workshop equipment required

- Hand-held drill
- Drill bit, ∅ 3 mm
- Drill bit, ∅ 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 ∅ hole -arrow A- through outer tube of shock absorber.

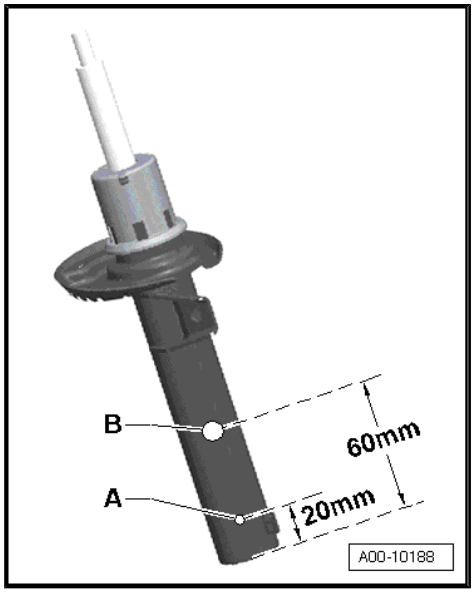
Note

Gas will escape during drilling.

– Continue drilling until inner tube is fully penetrated (approx. 25 mm deep).

– Drill a second 6 mm ∅ hole -arrow 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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5.1.2 Releasing gas from front gas-filled shock absorbers - version with variable damping

Special tools and workshop equipment required

- Hand-held drill
- Thread tap ∅ 3 mm
- Thread tap ∅ 6 mm
- Drip tray
- Safety goggles

Procedure

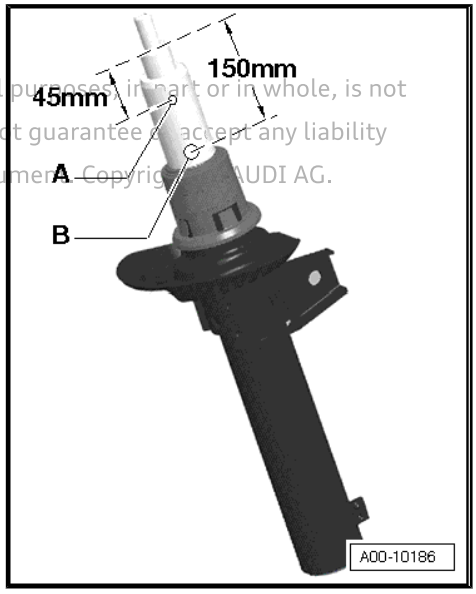
– Clamp gas-filled shock absorber vertically in vice.

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WARNING

Danger of eye injuries!

- *Put on safety goggles.*



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

Note

Gas will escape during drilling.

– Drill a second 6 mm ∅ hole -arrow B- through outer tube 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.

5.2 Releasing gas and draining rear gas-filled shock absorbers

Note

The procedure is the same for conventional shock absorbers and shock absorbers with variable damping.

Special tools and workshop equipment required

- Hand-held drill
- Thread tap ∅ 3 mm
- Thread tap ∅ 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 ∅ hole -arrow A- through outer tube of shock absorber.

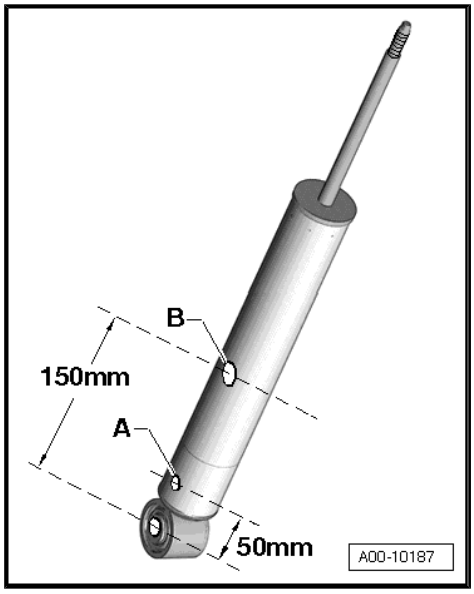
Note

Gas will escape during drilling.

– Continue drilling until inner tube is fully penetrated (approx. 25 mm deep).

– Drill a second 6 mm ∅ hole -arrow 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 of fitting locations - front axle”, page 17

1.1 Overview of fitting locations - front axle

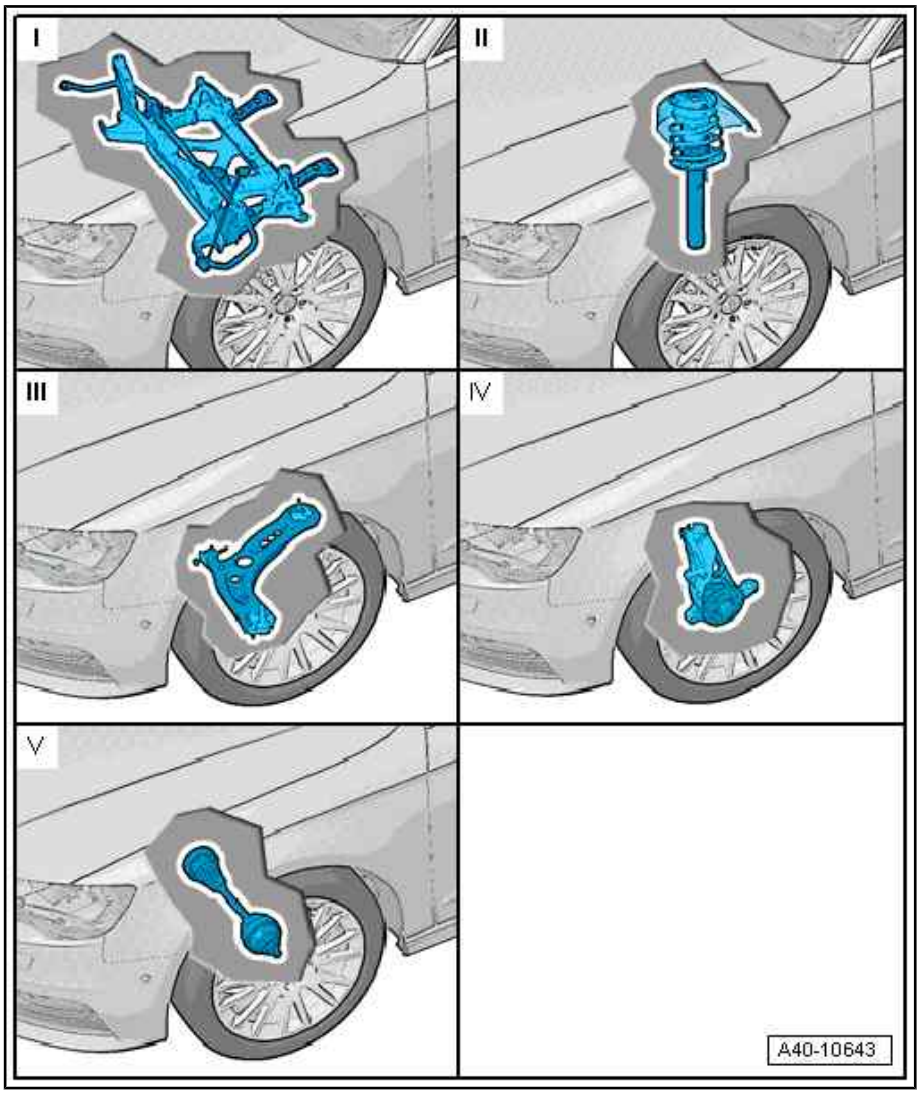
I - ⇒ “2 Subframe”, page 18

II - ⇒ “3 Suspension strut, upper wishbone”, page 67

III - ⇒ “4 Lower wishbone, swivel joint”, page 77

IV - ⇒ “5 Wheel bearing”, page 90

V - ⇒ “6 Drive shaft”, page 99



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2 Subframe

⇒ “2.1 Exploded view - subframe”, page 18

⇒ “2.2 Fixing position of subframe”, page 20

⇒ “2.3 Lowering subframe”, page 23

⇒ “2.4 Removing and installing subframe without steering rack”, page 33

⇒ “2.5 Removing and installing subframe with steering rack”, page 43

⇒ “2.6 Servicing subframe”, page 54

⇒ “2.7 Removing and installing anti-roll bar”, page 64

⇒ “2.8 Removing and installing coupling rod”, page 65

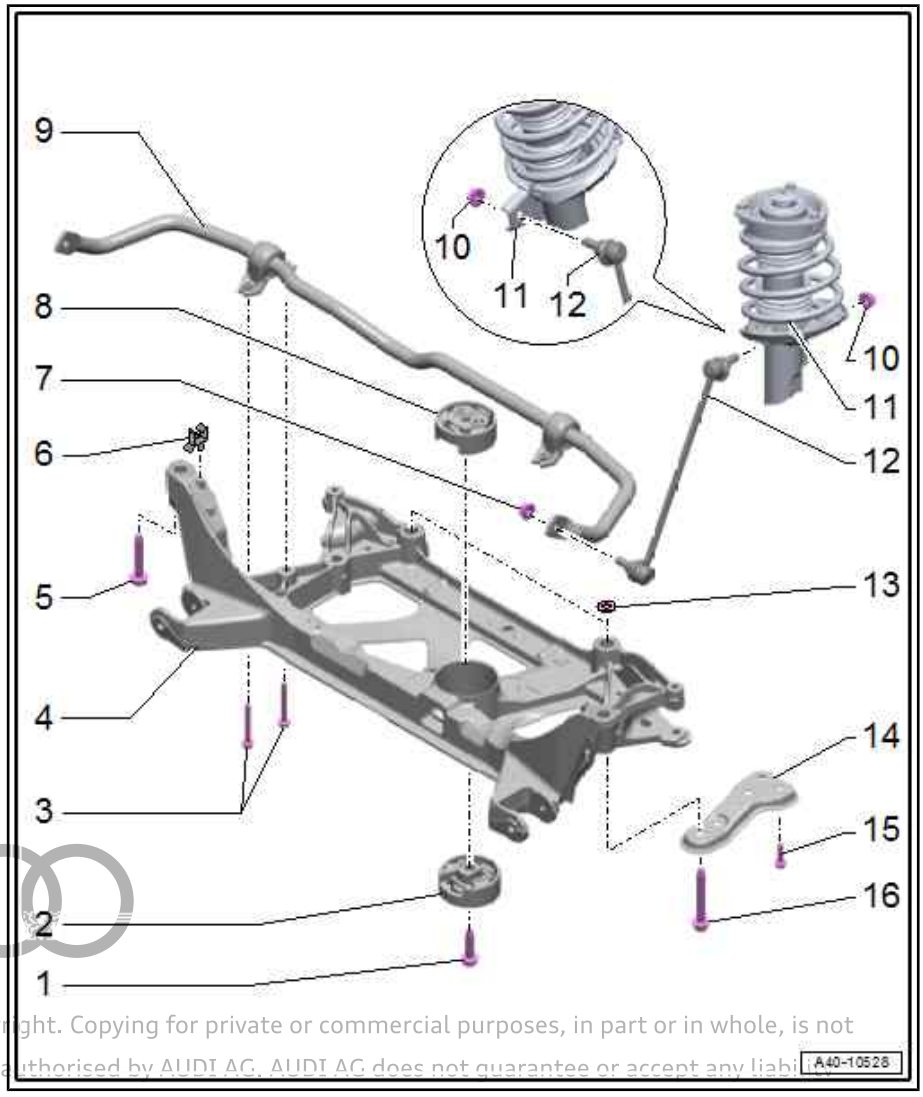
2.1 Exploded view - subframe

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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

- ❑ Tightening torque: Exploded view - assembly mountings ⇒ Removing and installing engine; Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

2 - Bonded rubber bush (bottom) for pendulum support

- ❑ Renewing ⇒ page 54

3 - Bolt

- ❑ Always renew if removed
- ❑ 20 Nm +180°

4 - Subframe

- ❑ Different versions; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Fixing position ⇒ page 20
- ❑ Lowering ⇒ page 23
- ❑ Removing and installing without steering rack ⇒ page 33
- ❑ Removing and installing with steering rack ⇒ page 43

5 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +180°

6 - Clip

- ❑ For A3 g-tron only

7 - Nut

- ❑ When tightening, counterhold multi-point socket of joint pin
- ❑ Always renew if removed
- ❑ 65 Nm

8 - Bonded rubber bush (top) for pendulum support

- ❑ Renewing ⇒ page 54

9 - Anti-roll bar with rubber bush

- ❑ Removing and installing ⇒ page 64

10 - Nut

- ❑ When tightening, counterhold multi-point socket of joint pin
- ❑ Always renew if removed
- ❑ 65 Nm

11 - Suspension strut

- ❑ Removing and installing ⇒ page 68

12 - Coupling rod

- ❑ Removing and installing ⇒ page 65

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13 - Intermediate plate

- ❑ For correct version refer to ⇒ Electronic parts catalogue “ETKA”

14 - Support

- ❑ Different versions; for correct version refer to ⇒ Electronic parts catalogue “ETKA”

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15 - Bolt

- ❑ Always renew if removed
- ❑ 20 Nm +90°

16 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +180°

2.2 Fixing position of subframe

Certain repairs on vehicles require the removal of the subframe or the entire front axle. The original position of the subframe relative to the body can be retained with the aid of the locating pins - T10486/1- or -T10486 A- . The locating pins - T10486/1- or - T10486 A- should always be screwed in just before lowering the subframe or the complete front axle. Perform test drive after completing repair work. Wheel alignment must be checked and adjusted if the steering wheel is not straight ⇒ page 310 .

Note

- ♦ *2x locating pins - T10486/1- are supplied with the assembly tool - T10486- . If the assembly tool - T10486- is already available in the workshop, only the supplementary set consisting of 2x locating pins - T10486/1- will then be required.*
- ♦ *If the assembly tool - T10486- is not available in the workshop, then the assembly tool - T10486 A- can be used. This contains 4x locating pins - T10486/1- and 2x locating pins - T10486/2- . The locating pins - T10486/2- are not required for the following procedure.*

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-

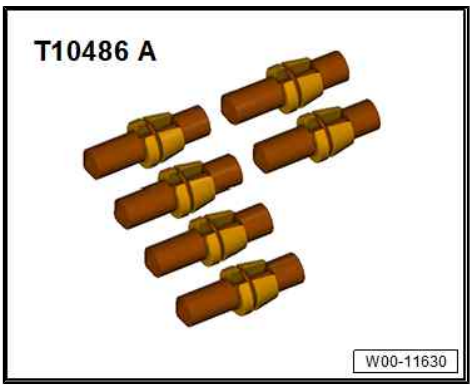


♦ Engine and gearbox jack - VAS 6931-



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♦ Locating pins - T10486/1- or -T10486 A-



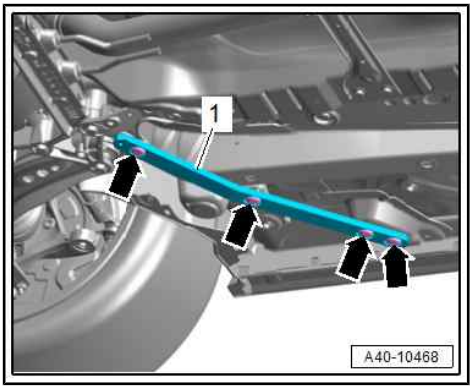
Procedure

– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

Audi A3 Cabriolet:

– Remove underbody trim (left and right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .

– Remove bolts -arrows- on both sides and detach diagonal strut -1-.



Vehicles with high-voltage system:

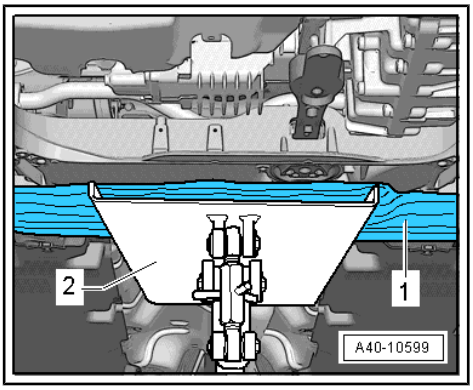
– Unfasten and lower underbody trim (left and right) towards centre of vehicle ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .

All vehicles (continued):

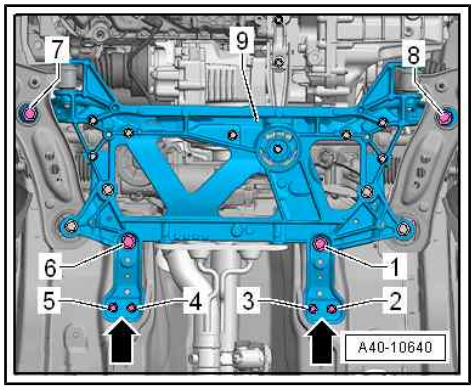
– Position engine and gearbox jack - VAS 6931- -2- under subframe

– Place a wooden block -1- or similar between engine and gearbox jack - VAS 6931- and subframe.

– If necessary, clean threads of locating pins - T10486/1- or -T10486 A- .



– Slacken bolts -2 to 5- for support -arrows- on both sides.



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.***

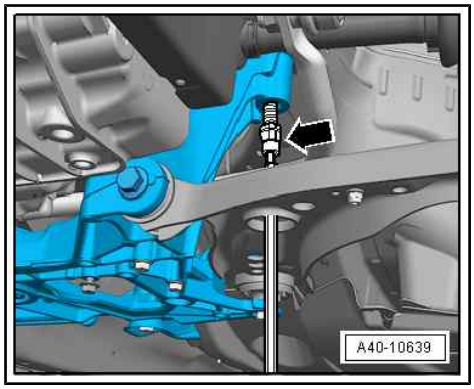
- To fix position of subframe, locating pins - T10486/1- or -T10486 A- must be screwed in one after the other at positions -1, 6, 7 and 8-.

Note

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

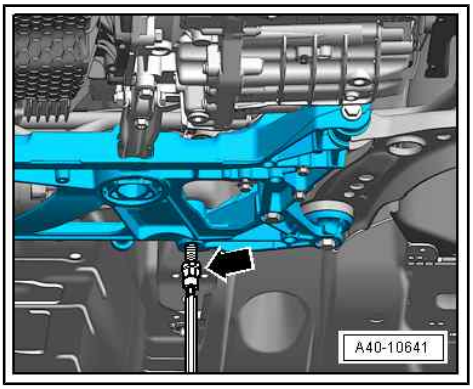
Fixing position of subframe at front

– Fit locating pins - T10486/1- or -T10486 A- -arrow- one after the other in place of securing bolts on both sides of vehicle and tighten to 20 Nm.



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Fixing position of subframe at rear



– Remove bolts for support and securing bolt for subframe. Then detach support and insert locating pins - T10486/1- or -T10486 A- -arrow- and tighten to 20 Nm.

– Repeat this procedure on the opposite side.

• The process of fixing the position of the subframe is complete when all the bolts referred to above have been replaced in turn with a locating pin from the locating pin set - T10486/1- or -T10486 A- .

• The position of the front axle is now fixed.

Removing locating pins - T10486/1- or -T10486 A-

Removal is performed in reverse sequence; note the following:

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

• After installation, check position of steering wheel by test-driving vehicle. Wheel alignment must be checked and adjusted if the steering wheel is not straight ⇒ page 310 .

Tightening torques

♦ ⇒ “2.1 Exploded view - subframe”, page 18

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

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

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2.3 Lowering subframe

⇒ “2.3.1 Lowering subframe - vehicles without high-voltage system”, page 23

⇒ “2.3.2 Lowering subframe - vehicles with high-voltage system”, page 28

2.3.1 Lowering subframe - vehicles without high-voltage system

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



Procedure

– Turn steering wheel to straight-ahead position and remove ignition key so that the steering lock engages.

Vehicles with keyless entry system

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

All vehicles (continued)

– To prevent unintentional turning, secure steering wheel in straight-ahead position with adhesive tape -arrow-.



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.*

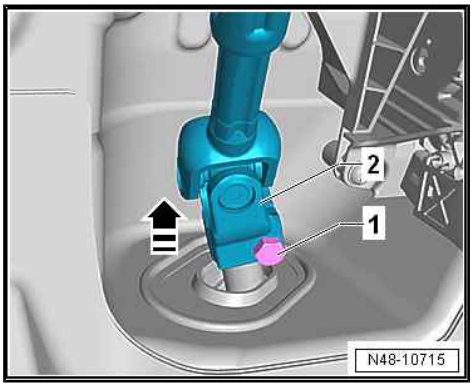
– Unscrew nuts -arrows- and remove footwell trim.



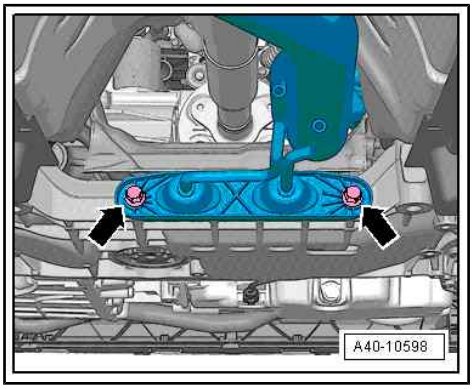
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– Unscrew bolt -1- for universal joint -2- and pull universal joint off steering rack -arrow-.

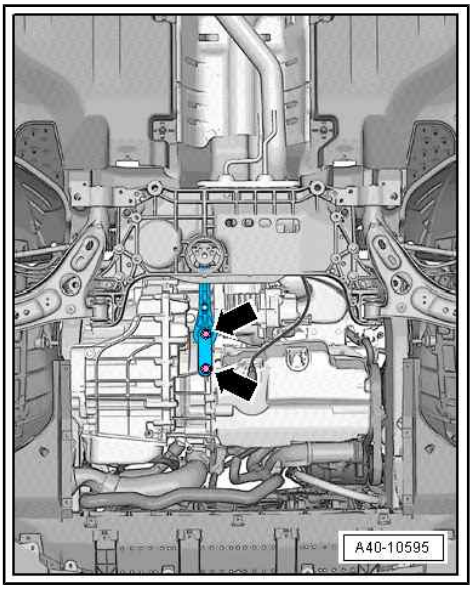
– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



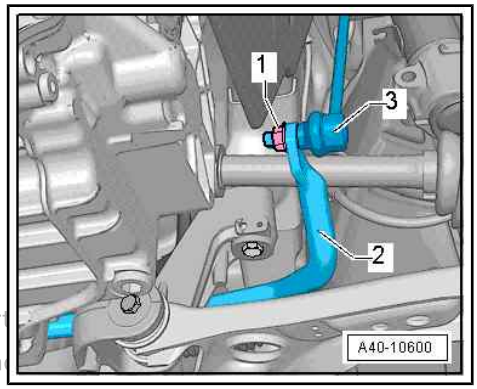
– Remove bolts -arrows- on bracket for front exhaust pipe.



– Remove bolts -arrows- securing pendulum support.



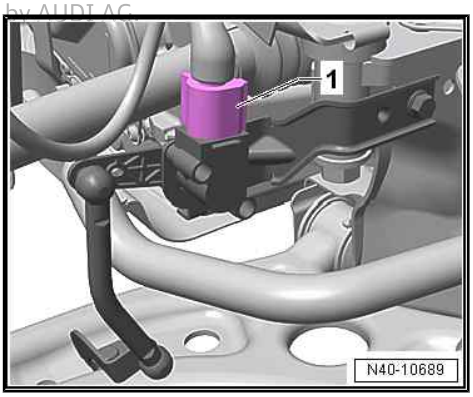
– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .
– Pull coupling rod -3- out of anti-roll bar -2- (left and right sides).



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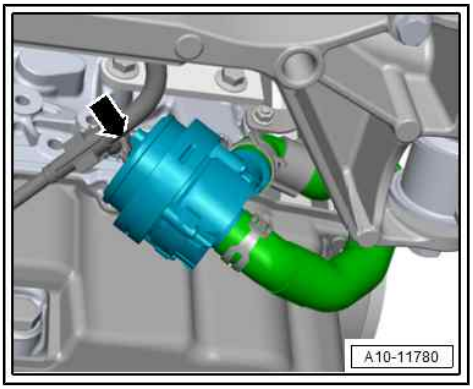
Vehicles with vehicle level senders:

– Unplug electrical connector -1- at front left vehicle level sender - G78- and front right vehicle level sender - G289- .



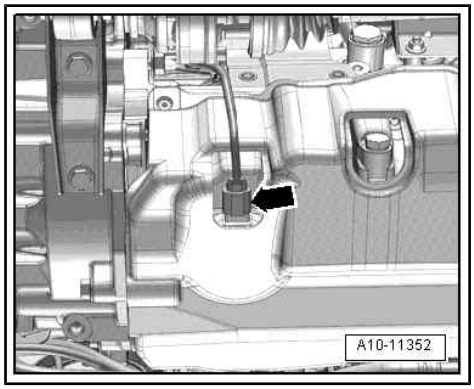
Vehicles with TDI engine:

– Unplug electrical connector -arrow- on auxiliary pump for heating - V488- .



Vehicles with 4-cylinder engine:

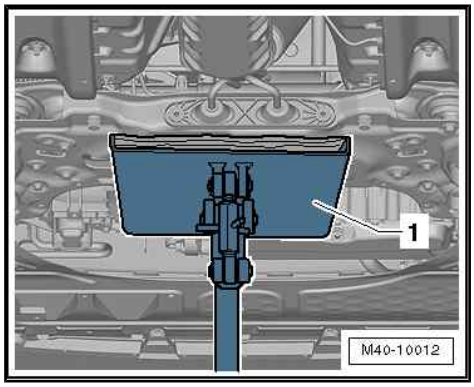
– Unplug electrical connector for oil level and oil temperature sender - G266- -arrow- and move wiring clear at subframe.



All vehicles (continued):

– Fix position of subframe ⇒ page 20 .

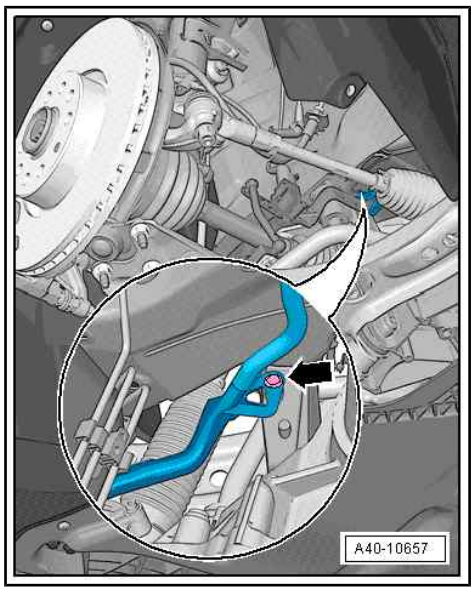
– Lower subframe slightly with engine and gearbox jack - VAS 6931- -item 1-.



Note

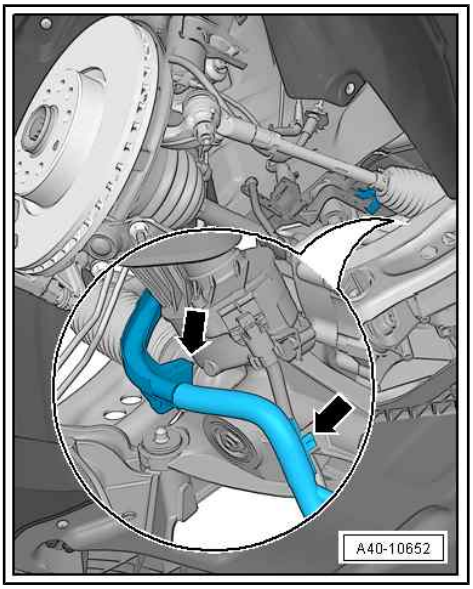
Important: Take care to avoid overstretching the electrical wiring for the steering and the oil level and oil temperature sender - G266- .

– Pull out expanding clip -arrow- and move cable guide clear at subframe.

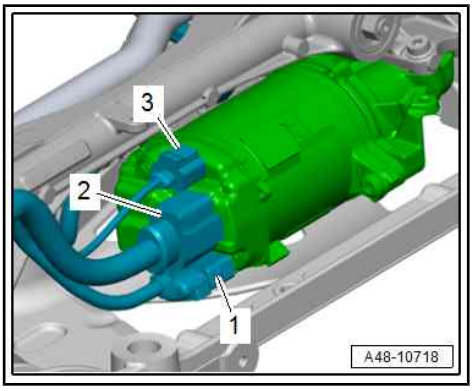


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– Unclip cable retainers -arrows- on steering rack.
– Unclip all other cable securing clips at steering rack.



– Unplug electrical connectors -2 and 3- at steering rack.



Note

Disregard -item 1-.

– Lower subframe by a maximum of 100 mm.

Installing

Install in reverse sequence, paying attention to the following:

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After positioning steering rack in relation to universal joint, ensure seal ⇒ Item 13 (page 362) on steering rack makes snug contact with base plate, without kinks, and properly seals off opening to footwell. Otherwise, this can result in water leaks and/or noise.*
- *Make sure sealing surfaces are clean.*

– Remove locating pins - T10486/1- or -T10486 A- ⇒ page 23 .
– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “2.1 Exploded view - steering column”, page 352
- ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers

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2.3.2 Lowering subframe - vehicles with high-voltage system

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



Procedure

DANGER!

High voltage! Danger to life!

Danger of severe or fatal injuries from electric shock.

- *The high-voltage system must be de-energised by a "high-voltage technician".*
- *Work on the de-energised high-voltage system may only be performed by an "electrically instructed person".*

– De-energise high-voltage system ⇒ Engine; Rep. gr. 93 ; De-energising high-voltage system .

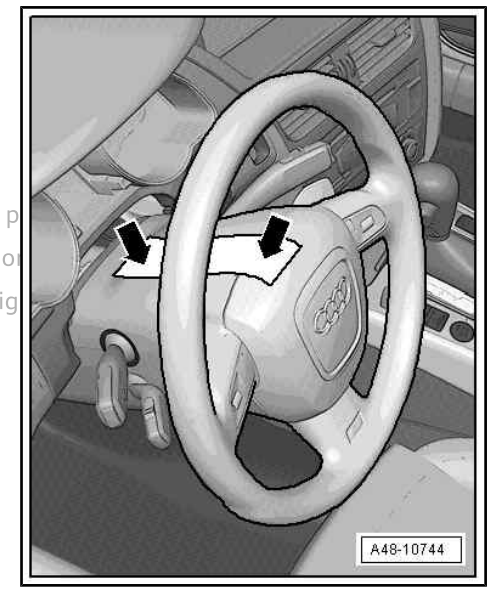
– Turn steering wheel to straight-ahead position and remove ignition key so that the steering lock engages.

Vehicles with keyless entry system

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

All vehicles (continued)

– To prevent unintentional turning, secure steering wheel in straight-ahead position with adhesive tape -arrow-.



Note

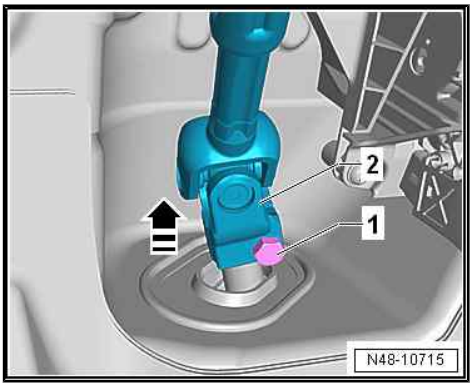
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- *Use adhesive tape that can be completely removed afterwards without leaving marks.*
- *Do not turn steering wheel while performing repair work, as otherwise airbag coil connector and return ring with slip ring - F138- could be damaged.*

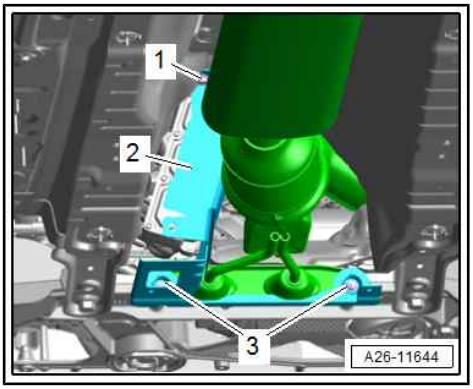
– Unscrew nuts -arrows- and remove footwell trim.



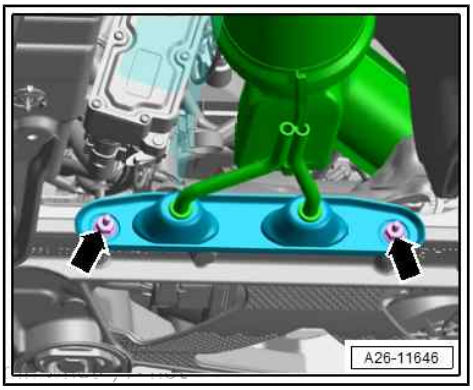
– Unscrew bolt -1- for universal joint -2- and pull universal joint off steering rack -arrow-.
– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



– Remove bolts -1- and nuts -3-.
– Tie up bracket -2- with high-voltage heater (PTC) - Z115- to one side.

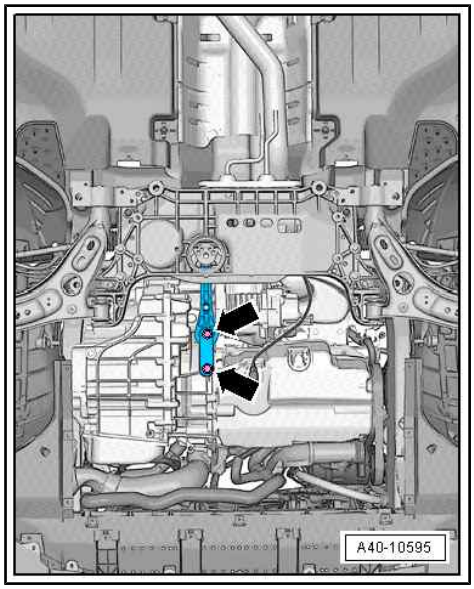


– Remove centre hex studs -arrows- on bracket for front exhaust pipe.



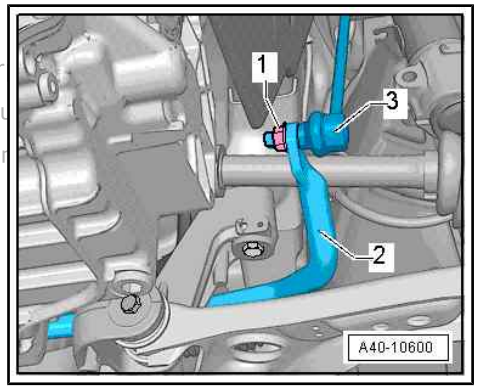
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– Remove bolts -arrows- securing pendulum support.



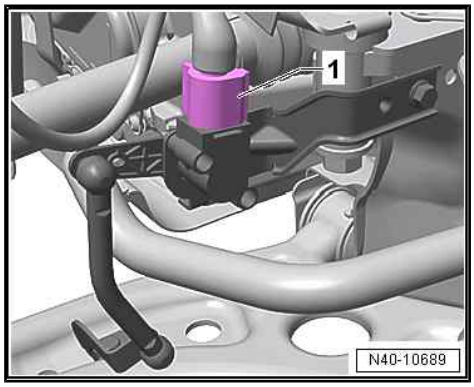
– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .
– Pull coupling rod -3- out of anti-roll bar -2- (left and right sides).

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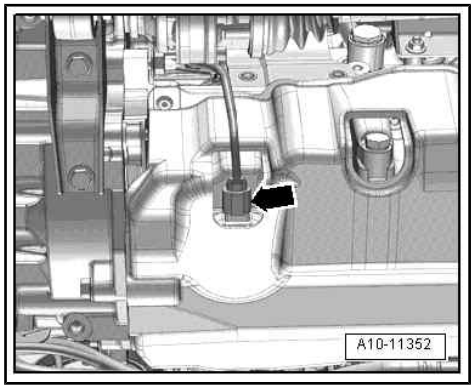
Vehicles with vehicle level senders:

– Unplug electrical connector -1- at front left vehicle level sender - G78- and front right vehicle level sender - G289- .

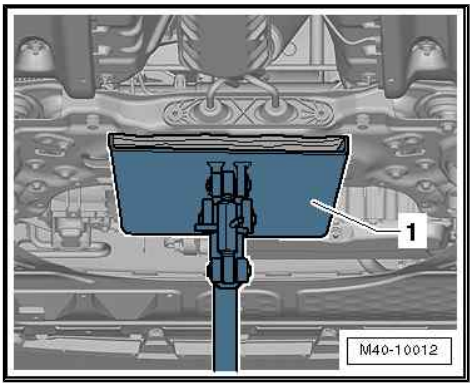


All vehicles (continued):

– Unplug electrical connector for oil level and oil temperature sender - G266- -arrow- and move wiring clear at subframe.
– Fix position of subframe ⇒ page 20 .



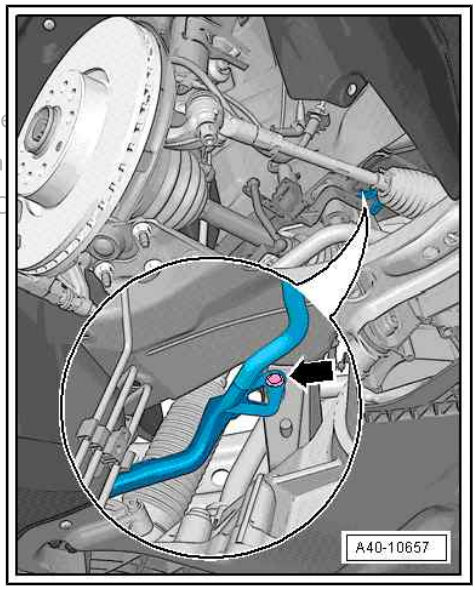
– Lower subframe slightly with engine and gearbox jack - VAS 6931- -item 1-.



Note

Important: Take care to avoid overstretching the electrical wiring for the steering and the oil level and oil temperature sender - G266- .

– Pull out expanding clip -arrow- and move cable guide clear at subframe.

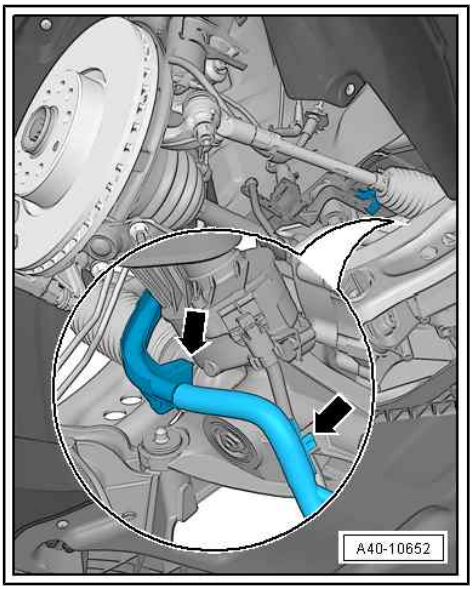


Note

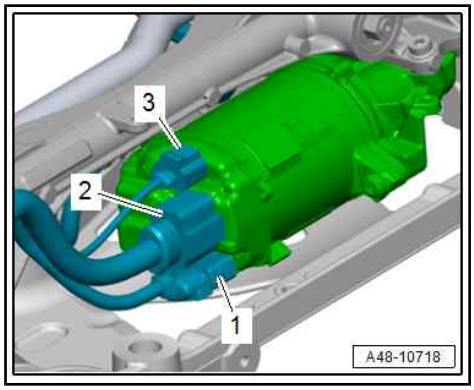
Illustration shows installation position on a vehicle without high-voltage system.

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– Unclip cable retainers -arrows- on steering rack.
– Unclip all other cable securing clips at steering rack.



– Unplug electrical connectors -2 and 3- at steering rack.



Note

Disregard -item 1-.

– Lower subframe by a maximum of 100 mm.

Installing

Install in reverse sequence, paying attention to the following:

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After positioning steering rack in relation to universal joint, ensure seal ⇒ Item 13 (page 362) on steering rack makes snug contact with base plate, without kinks, and properly seals off opening to footwell. Otherwise, this can result in water leaks and/or noise.*
- *Make sure sealing surfaces are clean.*

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– Remove locating pins - T10486/1- or -T10486 A- ⇒ page 23 .

– Secure bracket with high-voltage heater (PTC) - Z115- ⇒ Heating, air conditioning; Rep. gr. 87 ; Coolant circuit; Removing and installing high-voltage heater (PTC) - Z115- / high-voltage heater (PTC) control unit - J848- .

DANGER!

High voltage! Danger to life!

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system must be re-energised by a "high-voltage technician".***

– Re-energise high-voltage system ⇒ Engine; Rep. gr. 93 ; Re-energising high-voltage system .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ "2.1 Exploded view - subframe", page 18
- ⇒ "2.1 Exploded view - steering column", page 352
- ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers

2.4 Removing and installing subframe without steering rack

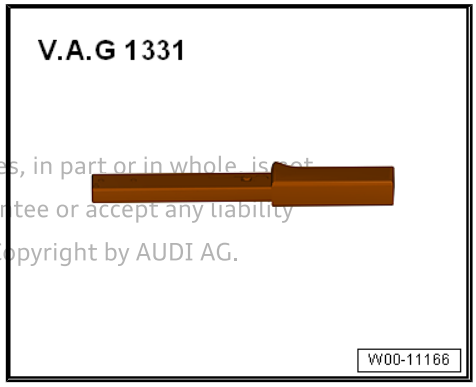
⇒ "2.4.1 Removing and installing subframe without steering rack - vehicles without high-voltage system", page 33

⇒ "2.4.2 Removing and installing subframe without steering rack (vehicles with high-voltage system)", page 37

2.4.1 Removing and installing subframe without steering rack - vehicles without high-voltage system

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



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- Torque wrench - V.A.G 1332-



Removing

Note

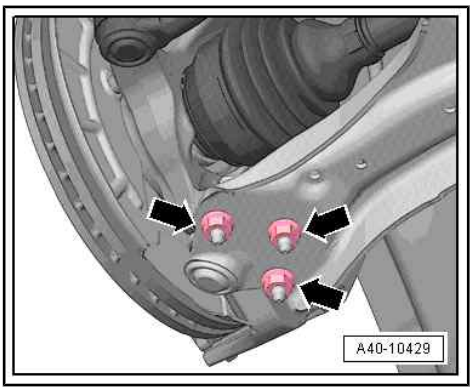
The subframe is removed together with the wishbones.

– Remove front wheels ⇒ page 309 .

– Remove nuts -arrows- on both sides of vehicle.

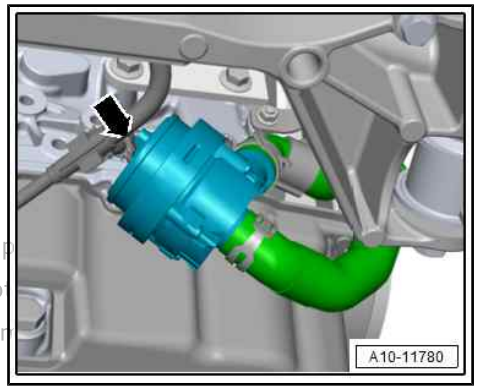
– Pull wishbone out of swivel joint.

– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



Vehicles with TDI engine:

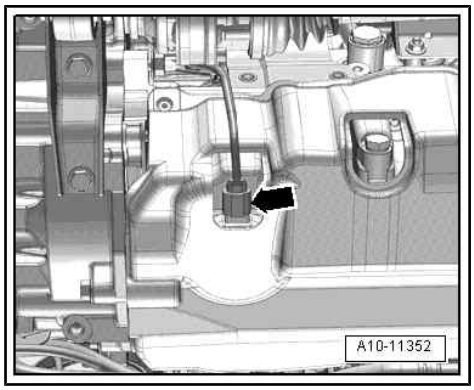
– Unplug electrical connector -arrow- on auxiliary pump for heating - V488- .



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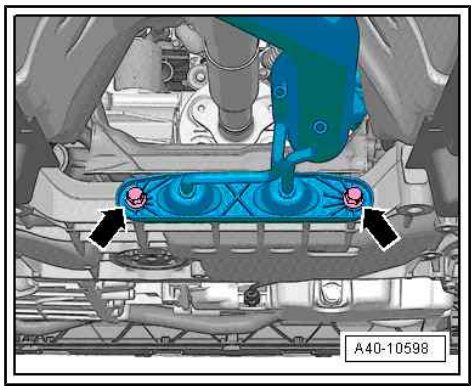
Vehicles with 4-cylinder engine:

– Unplug electrical connector for oil level and oil temperature sender - G266- -arrow- and move wiring clear at subframe.



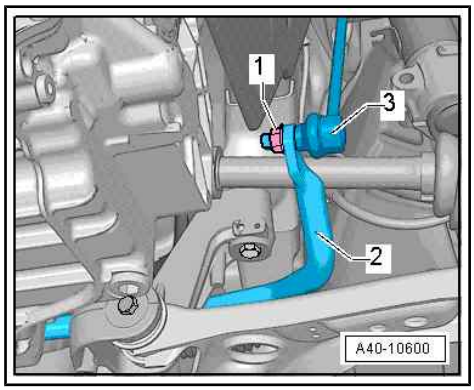
All vehicles (continued):

– Remove bolts -arrows- on bracket for front exhaust pipe.



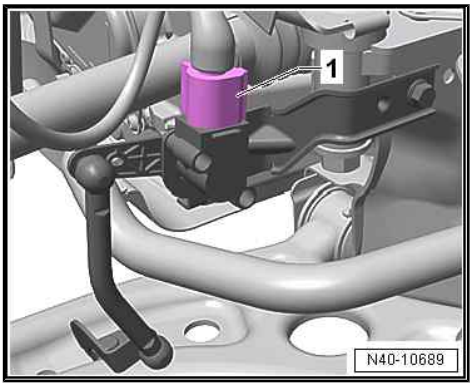
– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .

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



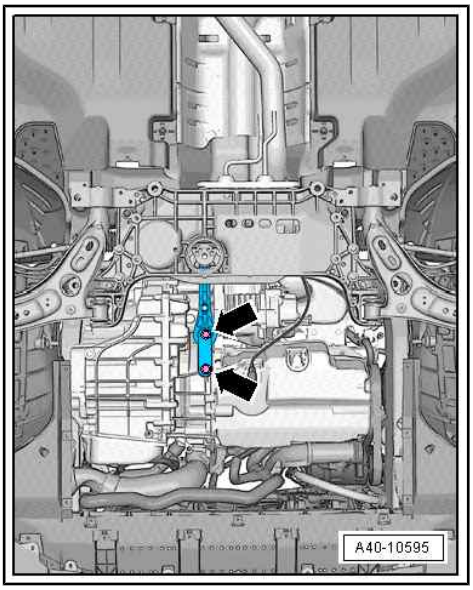
Vehicles with vehicle level senders:

– Unplug electrical connector -1- at front left vehicle level sender - G78- and front right vehicle level sender - G289- .



All vehicles (continued):

– Remove bolts -arrows- securing pendulum support.

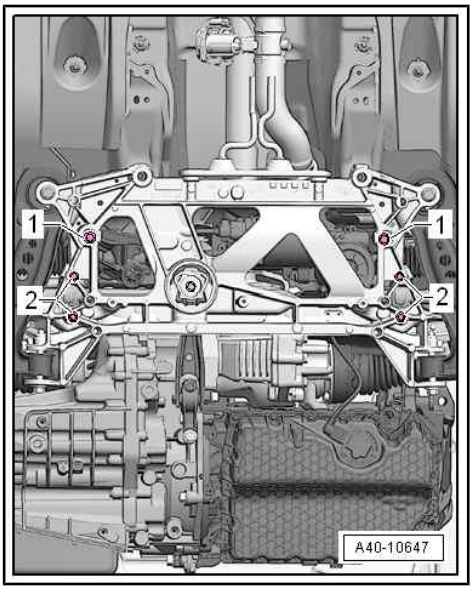


– Remove bolts -1- for steering rack.

Note

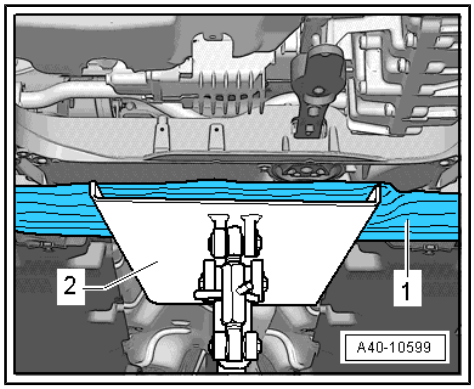
Disregard -item 2-.

– Fix position of subframe ⇒ page 20 .



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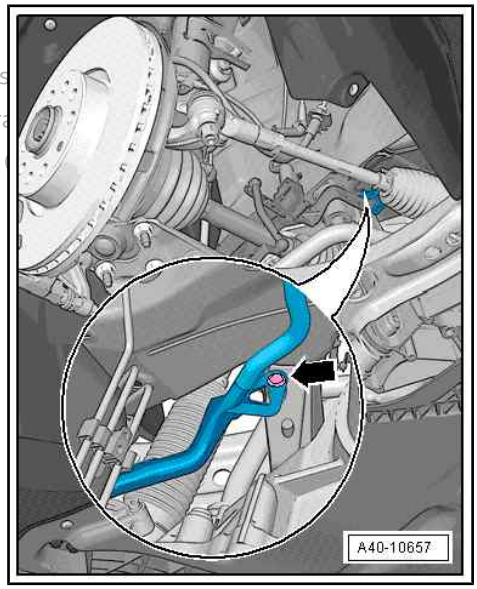
– Lower subframe slightly with engine and gearbox jack - VAS 6931- -item 2-.



Note

Important: Take care to avoid overstretching the electrical wiring for the steering and the oil level and oil temperature sender - G266- .

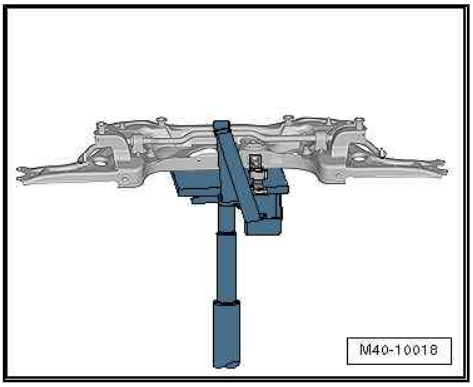
– Pull out expanding clip -arrow- and move cable guide clear at subframe.



– Secure steering rack to body.

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– Secure subframe to engine and gearbox jack - VAS 6931- with the appropriate strap.



Installing

Install in reverse sequence, paying attention to 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.***

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

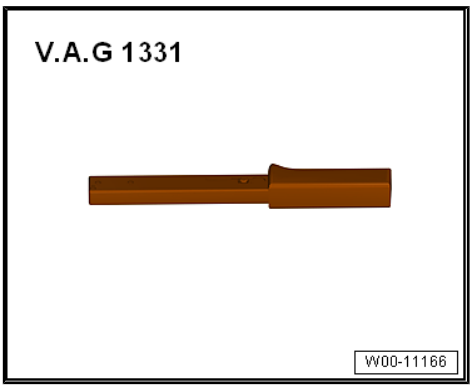
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “3.1 Exploded view - steering rack”, page 361
- ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ⇒ “1 Wheels, tyres”, page 309

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2.4.2 Removing and installing subframe without steering rack (vehicles with high-voltage system)

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Torque wrench - V.A.G 1332-



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Removing

Note

The subframe is removed together with the wishbones.

DANGER!

High voltage! Danger to life!

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system must be de-energised by a "high-voltage technician".***
- ***Work on the de-energised high-voltage system may only be performed by an "electrically instructed person".***

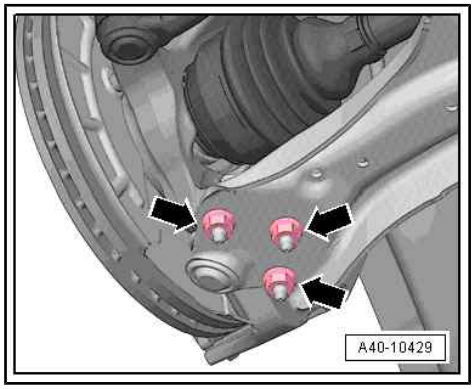
– De-energise high-voltage system ⇒ Engine; Rep. gr. 93 ; De-energising high-voltage system .

– Remove front wheels ⇒ page 309 .

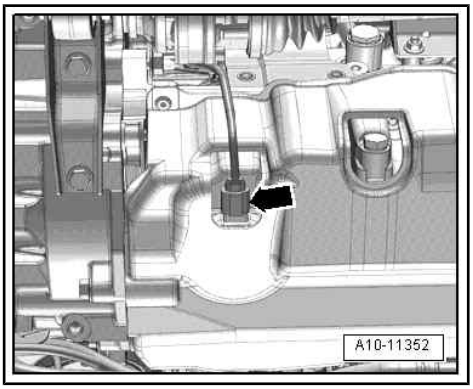
– Remove nuts -arrows- on both sides of vehicle.

– Pull wishbone out of swivel joint.

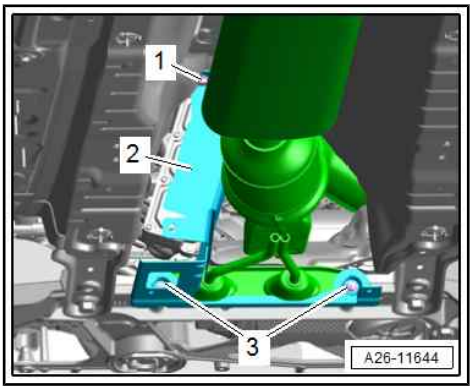
– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



– Unplug electrical connector for oil level and oil temperature sender - G266- -arrow- and move wiring clear at subframe.

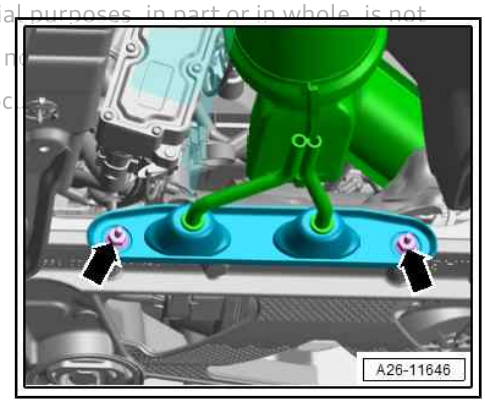


– Remove bolts -1- and nuts -3-.
– Tie up bracket -2- with high-voltage heater (PTC) - Z115- to one side.

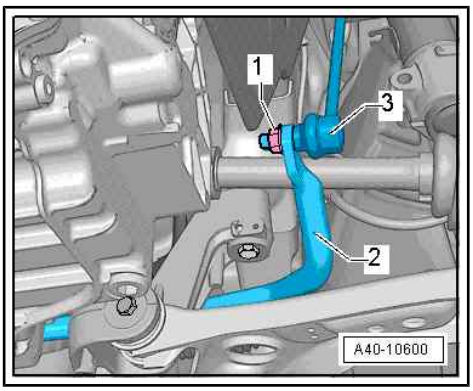


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– Remove centre hex studs -arrows- on bracket for front exhaust pipe.

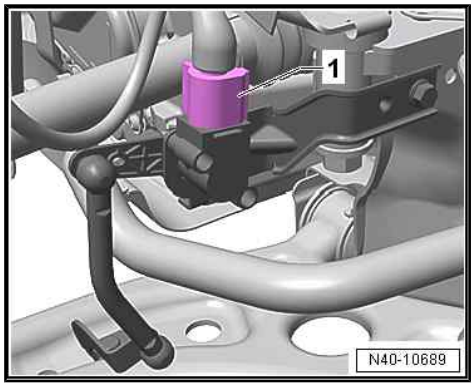


– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .
– Pull coupling rod -3- out of anti-roll bar -2- on both sides.



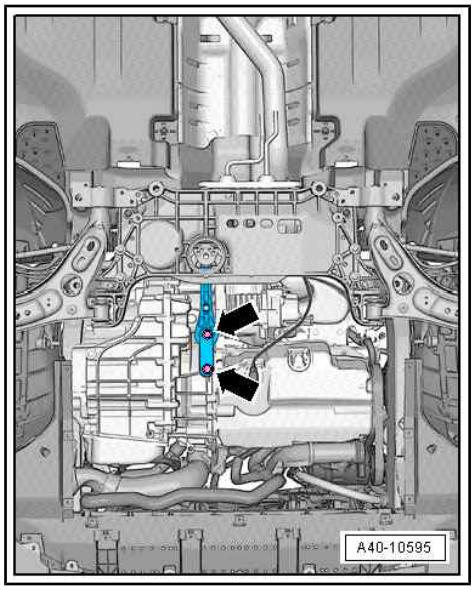
Vehicles with vehicle level senders:

– Unplug electrical connector -1- at front left vehicle level sender - G78- and front right vehicle level sender - G289- .

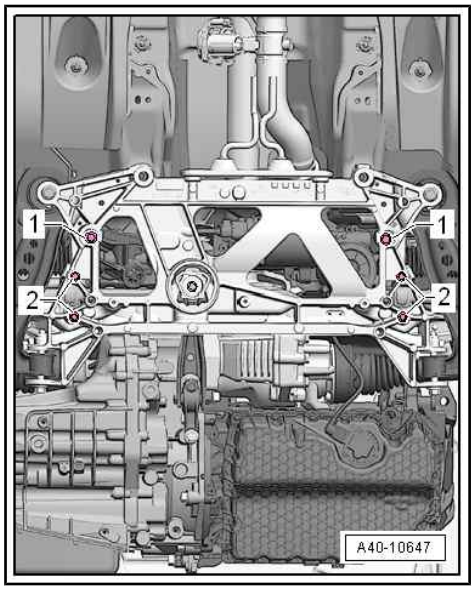


All vehicles (continued):

– Remove bolts -arrows- securing pendulum support.



– Remove bolts -1- for steering rack.



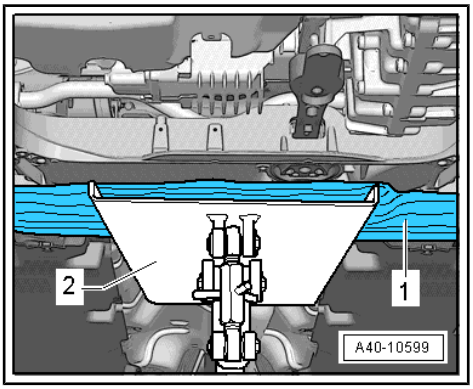
Note

Disregard -item 2-.

– Fix position of subframe ⇒ page 20 .

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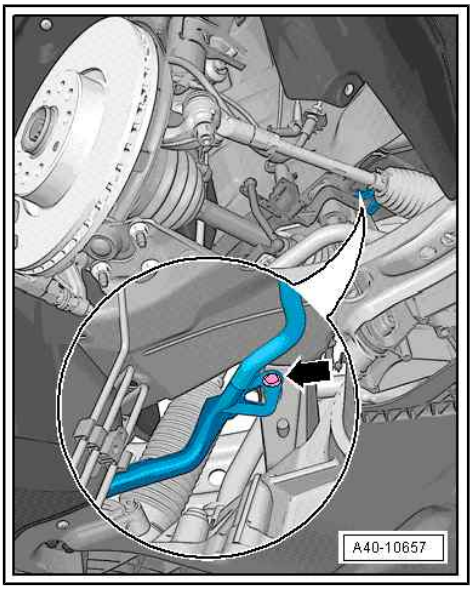
– Lower subframe slightly with engine and gearbox jack - VAS 6931- -item 2-.



Note

Important: Take care to avoid overstretching the electrical wiring for the steering and the oil level and oil temperature sender - G266- .

– Pull out expanding clip -arrow- and move cable guide clear at subframe.



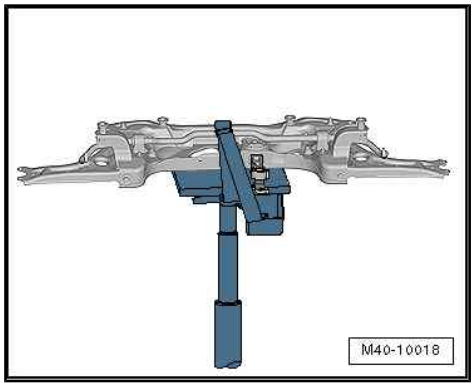
Note

Illustration shows installation position on a vehicle without high-voltage system.

– Secure steering rack to body.

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– Secure subframe to engine and gearbox jack - VAS 6931- with the appropriate strap.



Installing

Install in reverse sequence, paying attention to 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.***

– Install swivel joints ⇒ page 87 .

– Secure bracket with high-voltage heater (PTC) - Z115- ⇒ Heating, air conditioning; Rep. gr. 87 ; Coolant circuit; Removing and installing high-voltage heater (PTC) - Z115- / high-voltage heater (PTC) control unit - J848- .

DANGER!

High voltage! Danger to life!

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system must be re-energised by a "high-voltage technician".***

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– Re-energise high-voltage system ⇒ Engine; Rep. gr. 93 ; Re-energising high-voltage system .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ "2.1 Exploded view - subframe", page 18
- ⇒ "3.1 Exploded view - steering rack", page 361
- ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ⇒ "1 Wheels, tyres", page 309

2.5 Removing and installing subframe with steering rack

⇒ “2.5.1 Removing and installing subframe with steering rack - vehicles without high-voltage system”, page 43

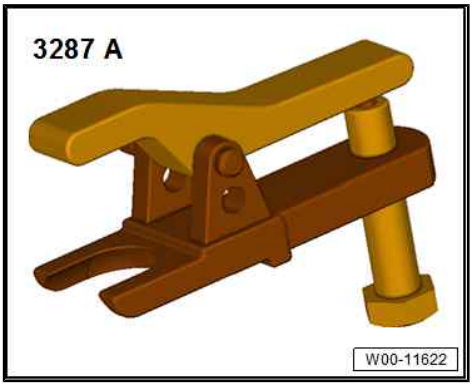
⇒ “2.5.2 Removing and installing subframe with steering rack - vehicles with high-voltage system”, page 48

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2.5.1 Removing and installing subframe with steering rack - vehicles without high-voltage system

Special tools and workshop equipment required

- Ball joint puller - 3287 A-



- Torque wrench - V.A.G 1332-



Removing

– Turn steering wheel to straight-ahead position and remove ignition key so that the steering lock engages.

Vehicles with keyless entry system

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

All vehicles (continued):

– To prevent unintentional turning, secure steering wheel in straight-ahead position with adhesive tape -arrow-.



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.*

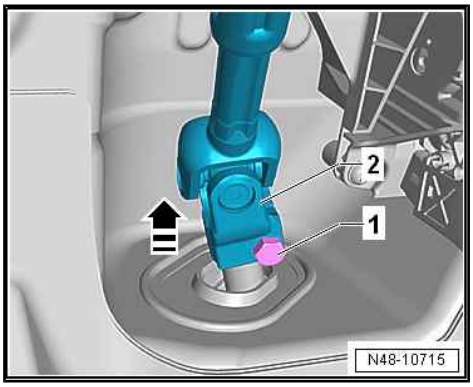
– Unscrew nuts -arrows- and remove footwell trim.



– Unscrew bolt -1- for universal joint -2- and pull universal joint off steering rack -arrow-.

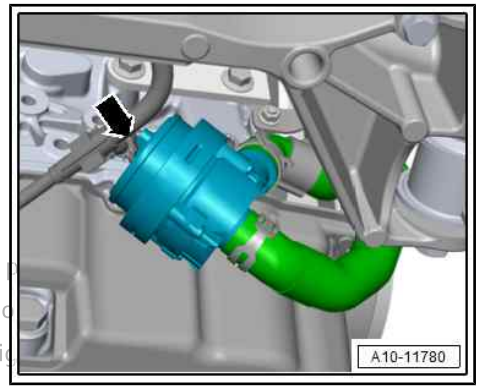
– Remove front wheels ⇒ page 309 .

– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



Vehicles with TDI engine:

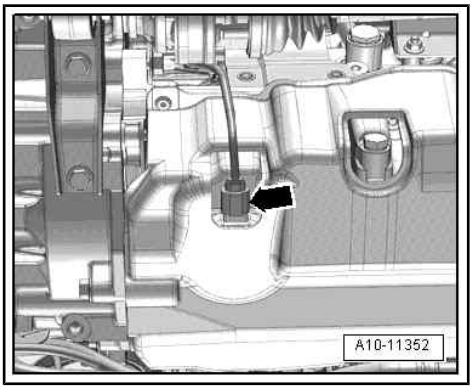
– Unplug electrical connector -arrow- on auxiliary pump for heating - V488- .



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Vehicles with 4-cylinder engine:

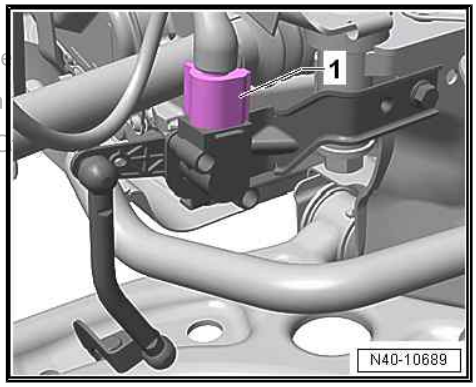
– Unplug electrical connector for oil level and oil temperature sender - G266- -arrow- and move wiring clear at subframe.



Vehicles with vehicle level senders:

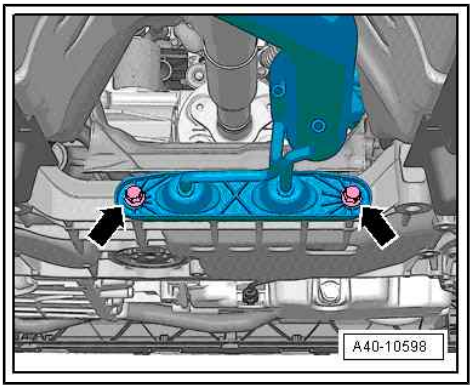
– Unplug electrical connector -1- at front left vehicle level sender - G78- and front right vehicle level sender - G289-.

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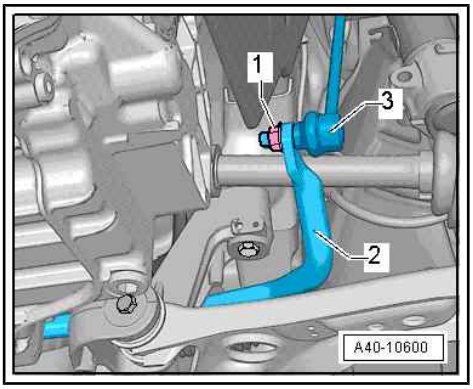
All vehicles (continued):

– Remove bolts -arrows- on bracket for front exhaust pipe.

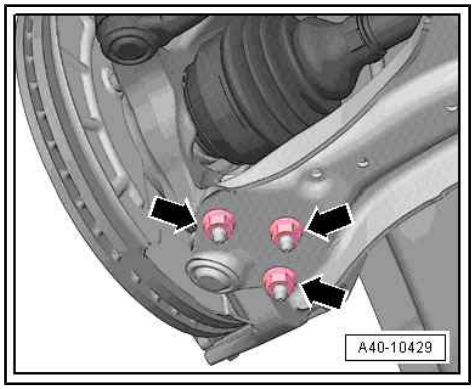


– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .

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

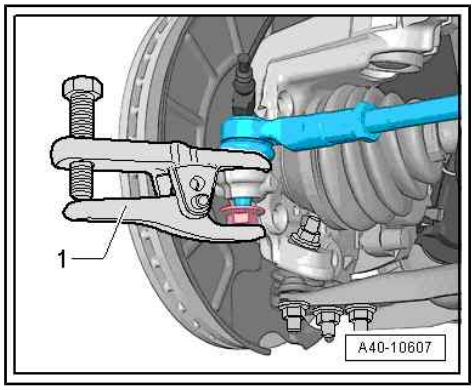


– Remove nuts -arrows-.

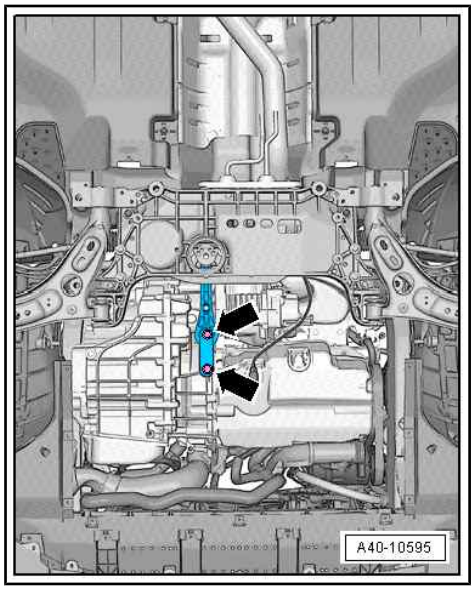


Leave nut screwed on a few turns to protect threads on joint pin.

– Slacken off nuts on track rod ball joints (but do not remove yet).
– Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- -1- and then unscrew nut.



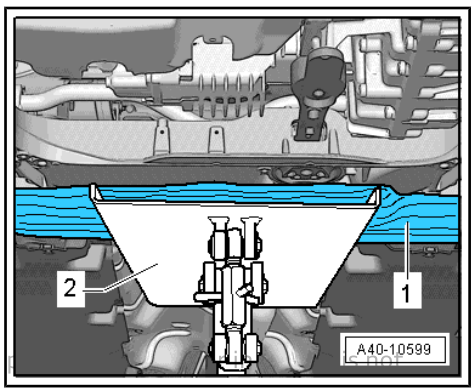
– Remove bolts -arrows- securing pendulum support.
– Fix position of subframe ⇒ page 20 .



– Lower subframe slightly with engine and gearbox jack - VAS 6931- -item 2-.

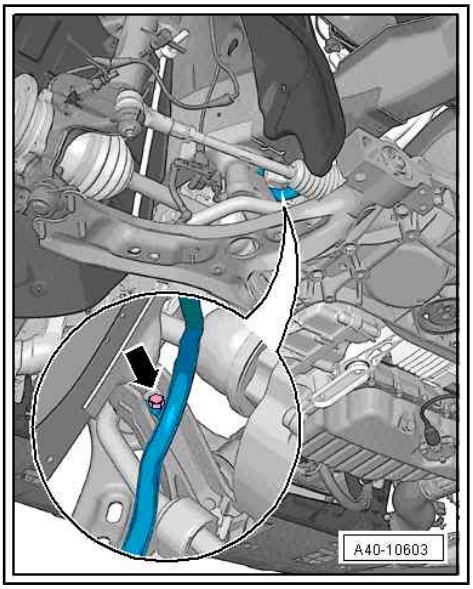
Note

Important: Take care to avoid overstretching the electrical wiring for the steering and the oil level and oil temperature sender - G266- .



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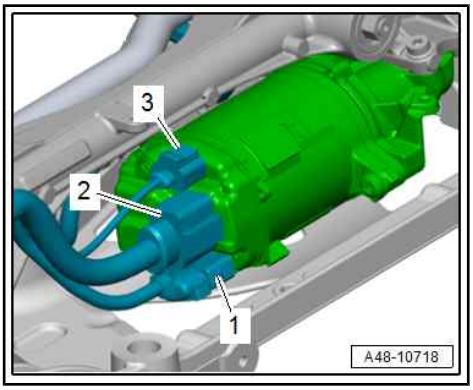
– Pull out expanding clip -arrow- and move cable guide clear at subframe.



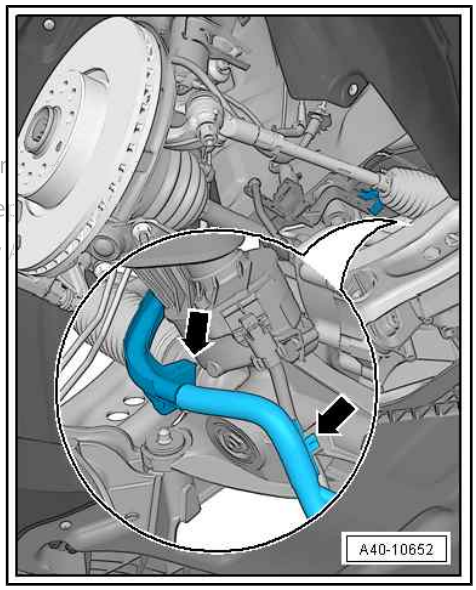
– Unplug electrical connectors -2 and 3- at steering rack.

Note

Disregard -item 1-.

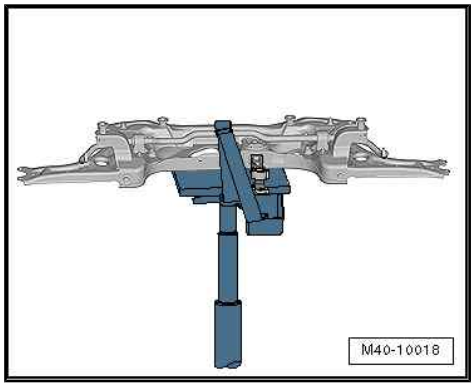


– Unclip cable retainers -arrows- on steering rack.
– Unclip all other cable securing clips at steering rack.
– Lower subframe slightly, noting the position of the electrical wiring.
– Lower engine and gearbox jack - VAS 6931- slowly while guiding wiring harness for steering rack.



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– Secure subframe to engine and gearbox jack - VAS 6931- with the appropriate strap.



Installing

Install in reverse sequence, paying attention to the following:

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After positioning steering rack in relation to universal joint, ensure seal ⇒ Item 13 (page 362) on steering rack makes snug contact with base plate, without kinks, and properly seals off opening to footwell. Otherwise, this can result in water leaks and/or noise.*
- *Make sure sealing surfaces are clean.*

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

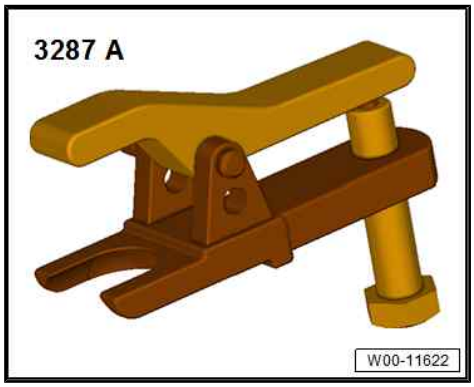
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “2.1 Exploded view - steering column”, page 352
- ⇒ “3.1 Exploded view - steering rack”, page 361
- ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ⇒ “1 Wheels, tyres”, page 309

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2.5.2 Removing and installing subframe with steering rack - vehicles with high-voltage system

Special tools and workshop equipment required

- Ball joint puller - 3287 A-



- Torque wrench - V.A.G 1332-



Removing

DANGER!

High voltage! Danger to life!

Danger of severe or fatal injuries from electric shock.

- *The high-voltage system must be de-energised by a "high-voltage technician".*
- *Work on the de-energised high-voltage system may only be performed by an "electrically instructed person".*

– De-energise high-voltage system ⇒ Engine; Rep. gr. 93 ; De-energising high-voltage system .

– Turn steering wheel to straight-ahead position and remove ignition key so that the steering lock engages.

Vehicles with keyless entry system

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

All vehicles (continued):

– To prevent unintentional turning, secure steering wheel in straight-ahead position with adhesive tape -arrow-.



Note

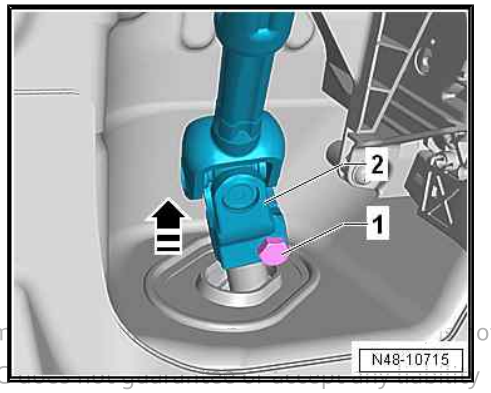
- *Use adhesive tape that can be completely removed afterwards without leaving marks.*
- *Do not turn steering wheel while performing repair work, as otherwise airbag coil connector and return ring with slip ring - F138- could be damaged.*

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– Unscrew nuts -arrows- and remove footwell trim.

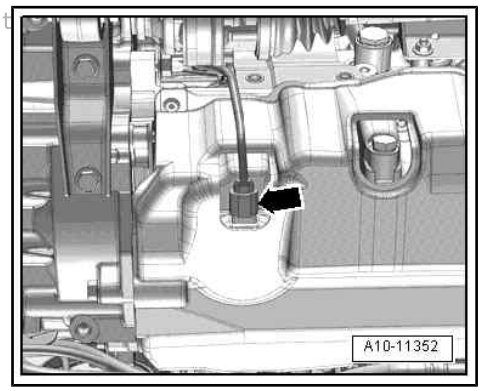


– Unscrew bolt -1- for universal joint -2- and pull universal joint off steering rack -arrow-.
– Remove front wheels ⇒ page 309 .
– Remove noise insulation (front and rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



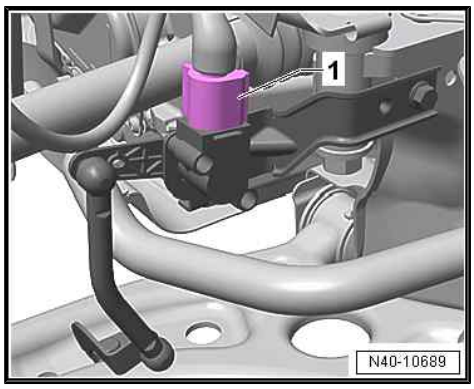
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– Unplug electrical connector for oil level and oil temperature sender - G266- -arrow- and move wiring clear at subframe.



Vehicles with vehicle level senders:

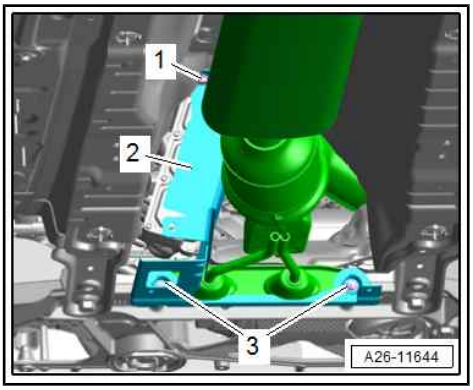
– Unplug electrical connector -1- at front left vehicle level sender - G78- and front right vehicle level sender - G289- .



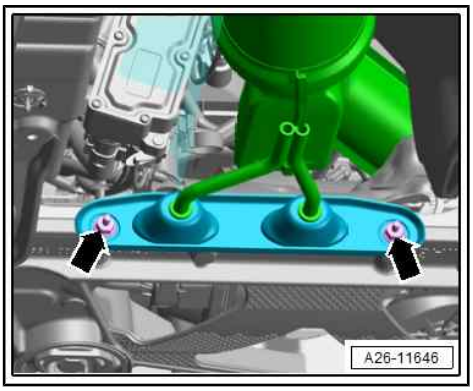
All vehicles (continued):

– Remove bolts -1- and nuts -3-.

– Tie up bracket -2- with high-voltage heater (PTC) - Z115- to one side.

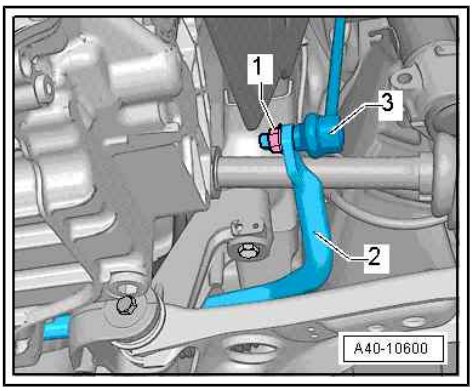


– Remove centre hex studs -arrows- on bracket for front exhaust pipe.

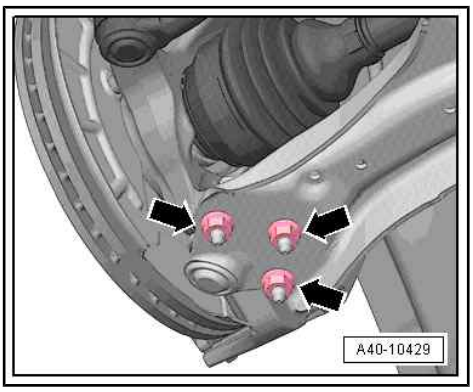


– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .

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



– Remove nuts -arrows-.

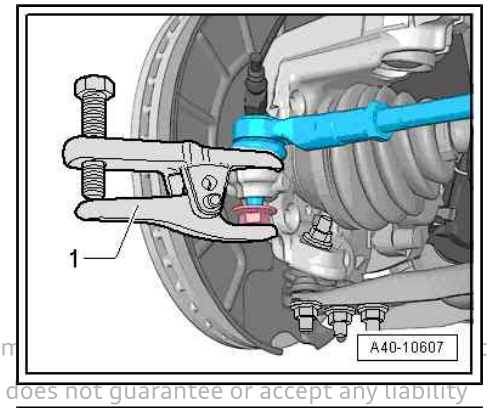


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Leave nut screwed on a few turns to protect threads on joint pin.

– Slacken off nuts on track rod ball joints (but do not remove yet).

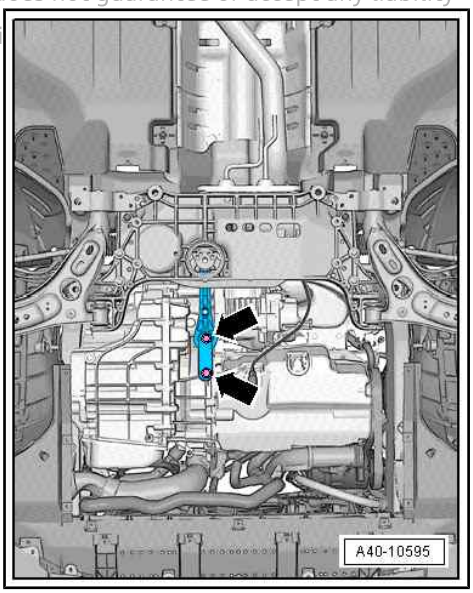
– Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- -1- and then unscrew nut.



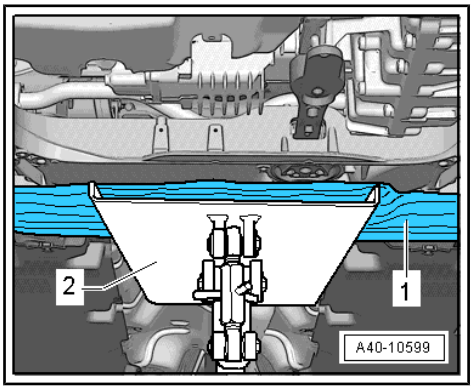
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– Remove bolts -arrows- securing pendulum support.

– Fix position of subframe ⇒ page 20 .



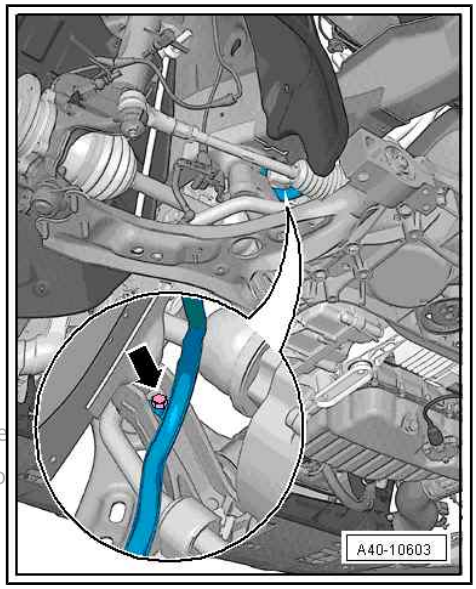
– Lower subframe slightly with engine and gearbox jack - VAS 6931- -item 2-.



Note

Important: Take care to avoid overstretching the electrical wiring for the steering and the oil level and oil temperature sender - G266- .

– Pull out expanding clip -arrow- and move cable guide clear at subframe.

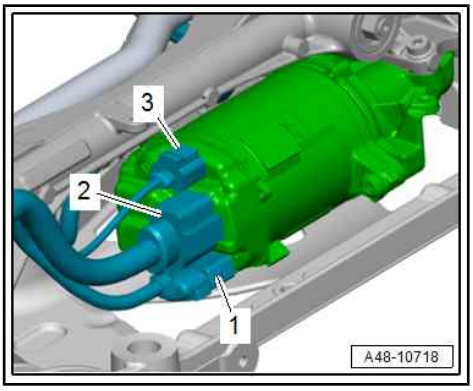


Note

Illustration shows installation position on a vehicle without high-voltage system.

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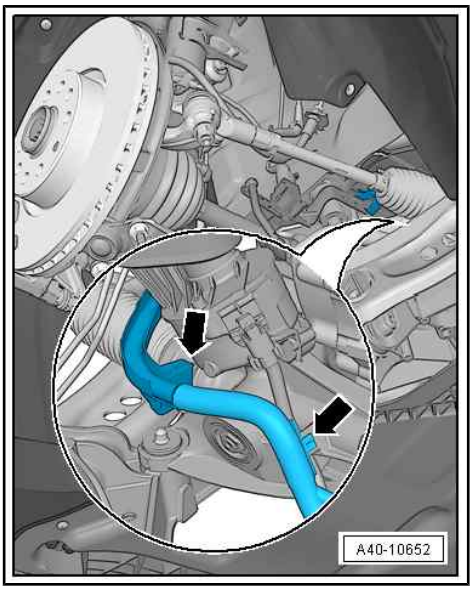
– Unplug electrical connectors -2 and 3- at steering rack.



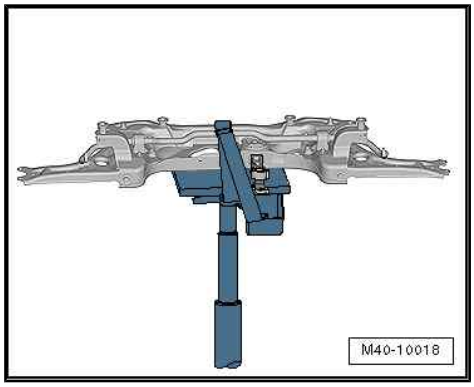
Note

Disregard -item 1-.

– Unclip cable retainers -arrows- on steering rack.
– Unclip all other cable securing clips at steering rack.
– Lower subframe slightly, noting the position of the electrical wiring.
– Lower engine and gearbox jack - VAS 6931- slowly while guiding wiring harness for steering rack.



– Secure subframe to engine and gearbox jack - VAS 6931- with the appropriate strap.



Installing

Install in reverse sequence, paying attention to the following:

Note

- *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*
- *After positioning steering rack in relation to universal joint, ensure seal ⇒ Item 13 (page 362) on steering rack makes snug contact with base plate, without kinks, and properly seals off opening to footwell. Otherwise, this can result in water leaks and/or noise.*
- *Make sure sealing surfaces are clean.*

– Re-energise high-voltage system ⇒ Engine; Rep. gr. 93 ; Re-energising high-voltage system .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “2.1 Exploded view - steering column”, page 352
- ⇒ “3.1 Exploded view - steering rack”, page 361
- ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ⇒ “1 Wheels, tyres”, page 309

2.6 Servicing subframe

⇒ “2.6.1 Servicing subframe - vehicles with aluminium subframe”, page 54

⇒ “2.6.2 Servicing subframe - vehicles with pressed-steel subframe”, page 59

2.6.1 Servicing subframe - vehicles with aluminium subframe

Special tools and workshop equipment required

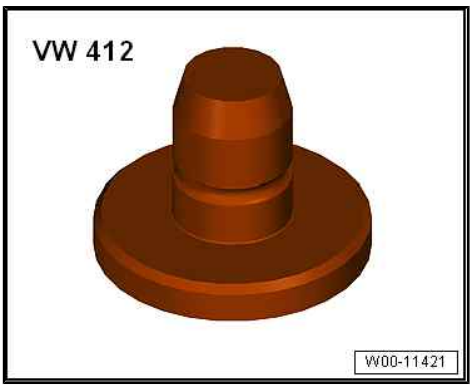
- Workshop press - VAS 6654-

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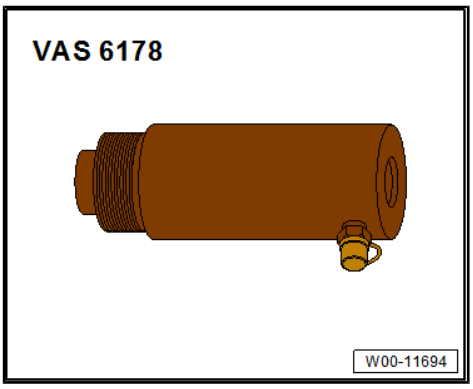
- Thrust plate - VW 401-



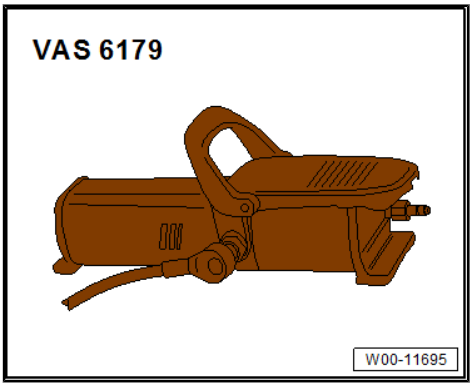
- Press tool - VW 412-



- Hydraulic cylinder - VAS 6178-

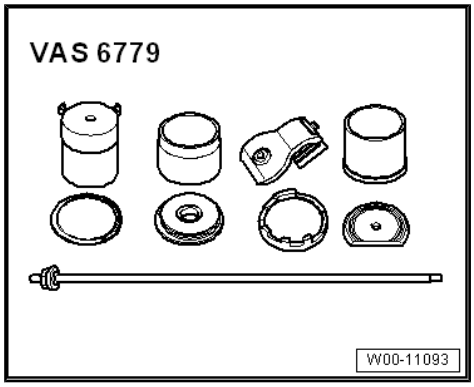


- Foot pump - VAS 6179-

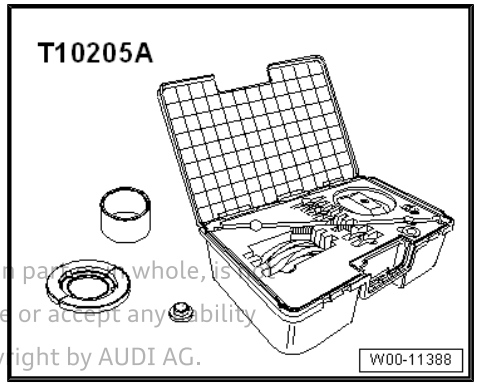


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♦ Assembly tool - VAS 6779-



♦ Assembly tool - T10205 A-



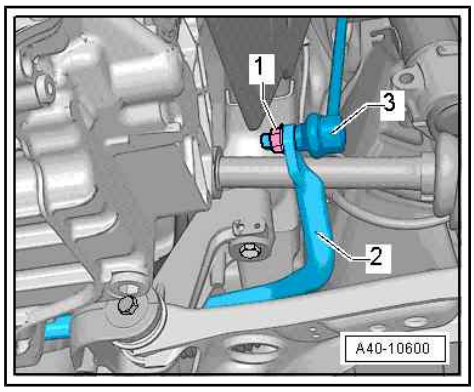
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Renewing bonded rubber bushes for pendulum support

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

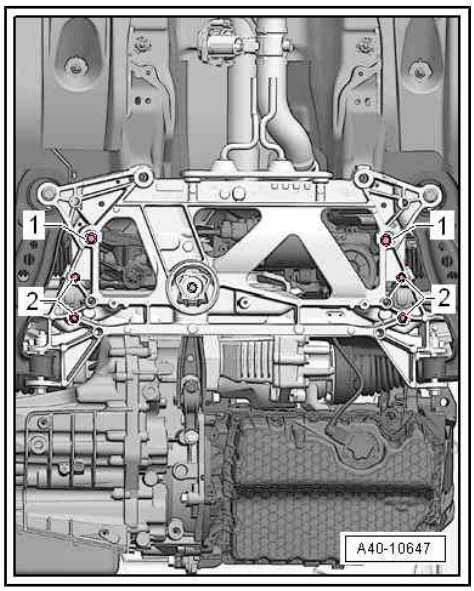
– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .

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



– Remove bolts -2- and detach anti-roll bar from subframe.

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



Pressing out bonded rubber bush

– Place thrust piece (for removal) - VAS 6779/1- -item 1- on bonded rubber bush with flat side -arrow- facing in direction of travel.

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

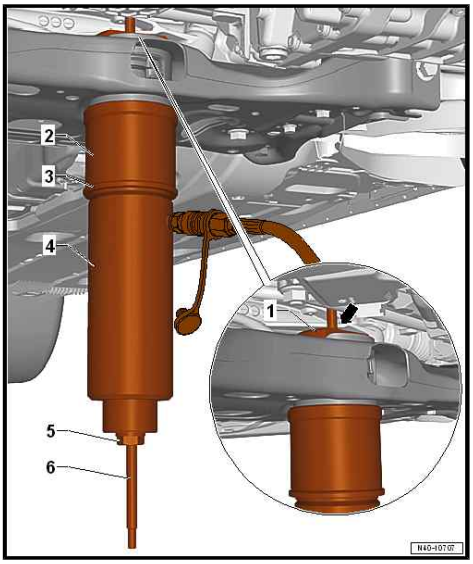
2 - Tube - VAS 6779/4-

3 - Thrust piece - VAS 6779/5-

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

5 - Hexagon nut - VAS 6779/3-

6 - Threaded spindle - VAS 6779/2-

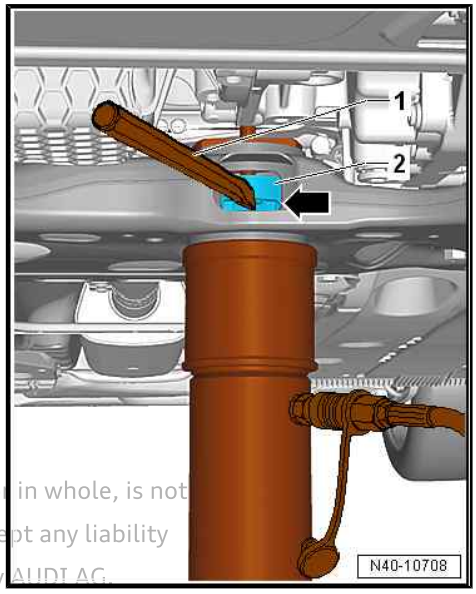


– Press out both bonded rubber bushes simultaneously until upper bush -2- is visible in aperture for pendulum support -arrow- in subframe.

– Visually inspect outer ring of upper bonded rubber bush -2-.

• If the outer ring of the upper bonded rubber bush -2- is deformed, it must be chiselled open through the aperture for the pendulum support -arrow- in the subframe.

– Using a chisel or similar tool -1-, break out an opening in outer ring of upper bonded rubber bush -2-.



Note

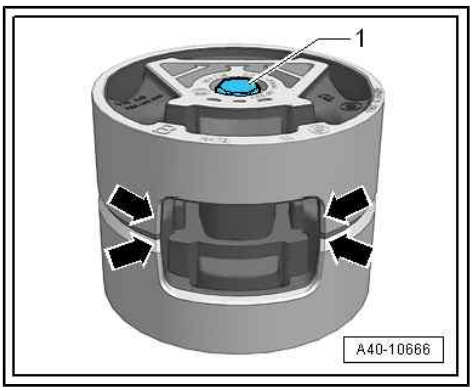
This step is necessary to prevent the outer ring of the upper bonded rubber bush from tilting sideways and catching in the aperture for the pendulum support in the subframe.

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– Press out bonded rubber bushes completely (both bushes are pressed out together).

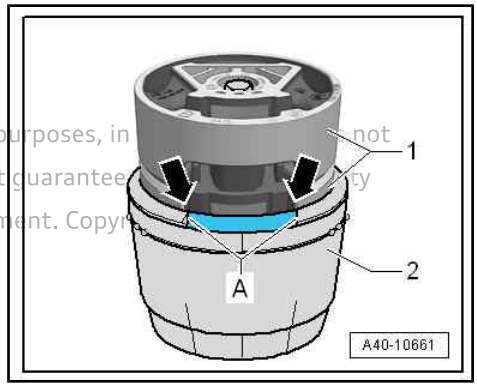
Preparing bonded rubber bushes for installation

– Bolt together both bonded rubber bushes hand-tight with original bolt (the two cut-outs -arrows- must be exactly above each other).



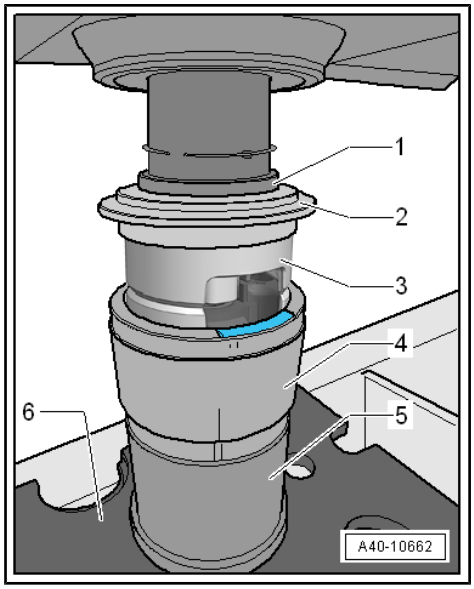
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– Insert bonded rubber bushes -1- into larger diameter of funnel -VAS 6779/6- -item 2- (with bolt head facing upwards).
– Align bonded rubber bushes -1- in funnel - VAS 6779/6- -item 2- so that cut-out -arrows- is exactly in line with recess -A- in funnel - VAS 6779/6- -2-.



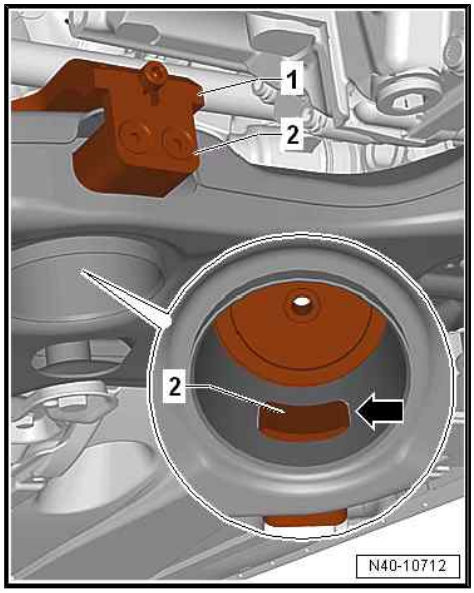
– Using workshop press - VAS 6654- , press bonded rubber bushes into funnel - VAS 6779/6- as shown in illustration until thrust piece - VAS 6779/5- reaches stop.

1 - Press tool - VW 412-
2 - Thrust piece - VAS 6779/5- (side marked »A« faces upwards)
3 - Bonded rubber bush
4 - Funnel - VAS 6779/6-
5 - Tube - VAS 6779/4-
6 - Thrust plate - VW 401-



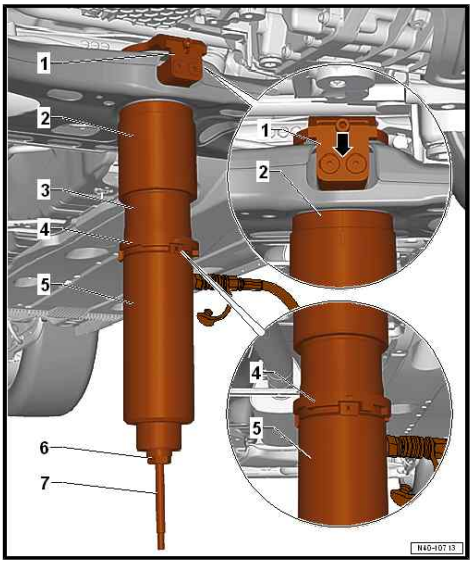
Pressing in bonded rubber bush

– Insert counterhold tool - VAS 6779/7- -item 1- in subframe.
– Fit insert - VAS 6779/7-1A- -item 2- in opening for pendulum support in subframe.
– Bolt insert - VAS 6779/7-1A- onto counterhold tool - VAS 6779/7- .
– Make sure that insert - VAS 6779/7-1A- is correctly located in opening in subframe.



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

– Attach assembly tool - VAS 6779A- to subframe as shown.



1 - Counterhold tool - VAS 6779/7-

2 - Funnel - VAS 6779/6- (-arrow marking- on funnel must be aligned centrally between the two bolts -arrow-)

3 - Thrust piece - VAS 6779/9-

4 - Stepped ring - VAS 6779/8- (marking -I- on stepped ring must be aligned with marking -X- on thrust piece - VAS 6779/9-)

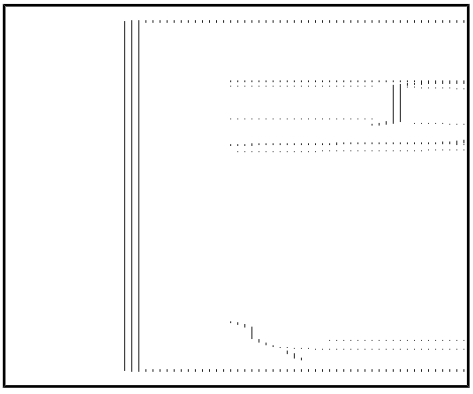
5 - Hydraulic cylinder - VAS 6178- with thrust piece - T10205/13-

6 - Hexagon nut - VAS 6779/3-

7 - Threaded spindle - VAS 6779/2-

– Press in both bonded rubber bushes together.

– Detach assembly tool - VAS 6779- from subframe and check that pressed-in bonded rubber bushes are seated correctly.



- The cut-outs in the bonded rubber bushes must be positioned in the centre of the aperture in the subframe.
- A gap -arrow- between the bonded rubber bushes is permissible.

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

Tightening torques:

- ⇒ Engine; Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

2.6.2 Servicing subframe - vehicles with pressed-steel subframe

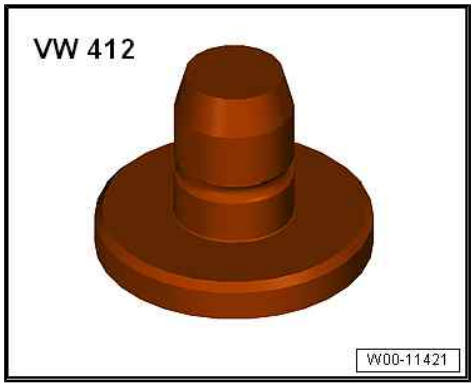
Special tools and workshop equipment required

- Workshop press - VAS 6654-
- Thrust plate - VW 401-

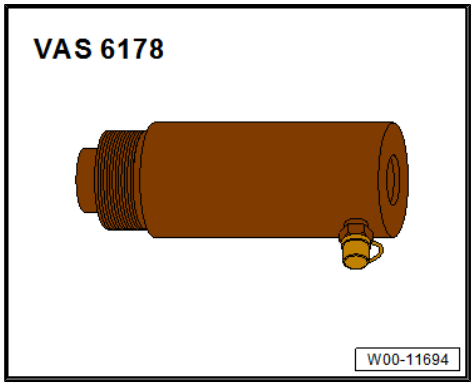


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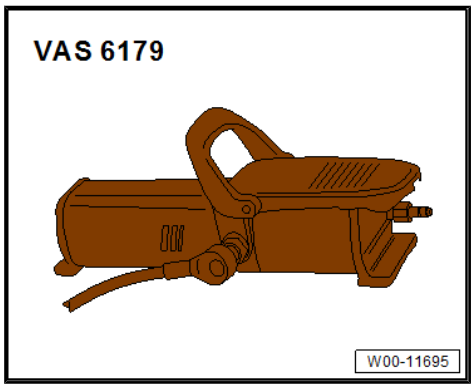
- Press tool - VW 412-



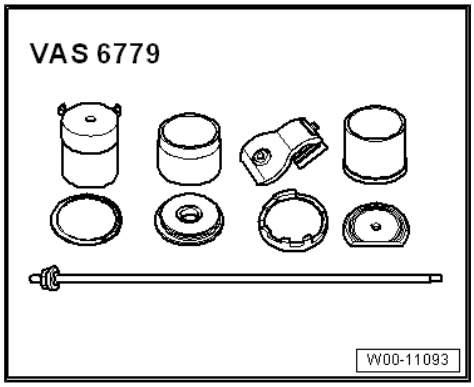
- Hydraulic cylinder - VAS 6178-



- Foot pump - VAS 6179-

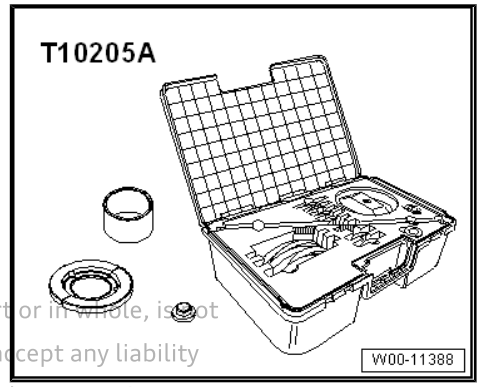


- Assembly tool - VAS 6779-



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♦ Support ring - T10205/4- from assembly tool - T10205 A-



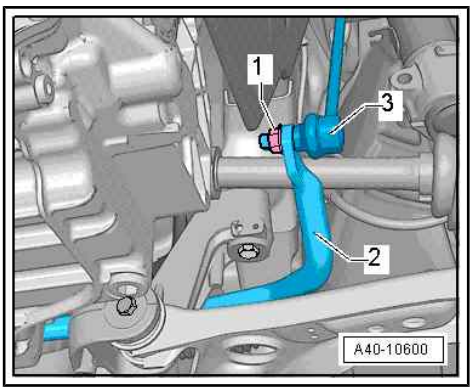
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Renewing bonded rubber bushes for pendulum support

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

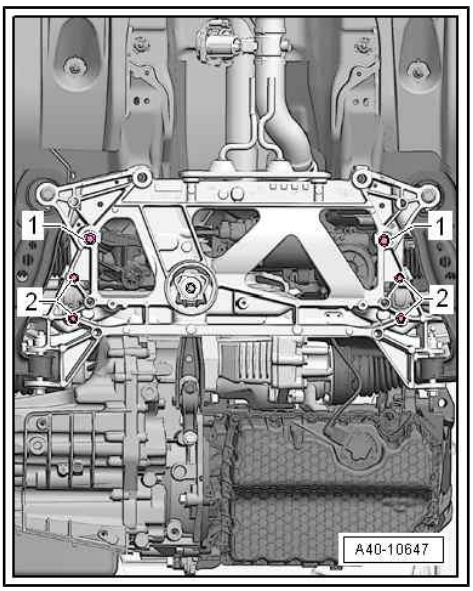
– Remove nut -1- from coupling rod -3- on both sides ⇒ page 65 .

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



– Remove bolts -2- and detach anti-roll bar from subframe.

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



Pressing out bonded rubber bush

– Place thrust piece (for removal) - VAS 6779/1- -item 1- on bonded rubber bush with flat side -arrow- facing in direction of travel.

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

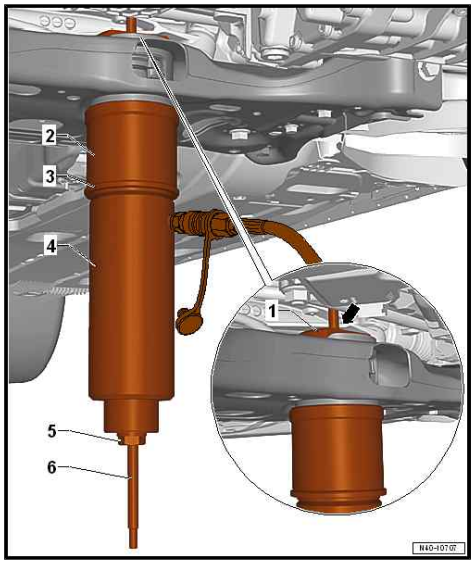
2 - Tube - VAS 6779/4-

3 - Thrust piece - VAS 6779/5-

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

5 - Hexagon nut - VAS 6779/3-

6 - Threaded spindle - VAS 6779/2-

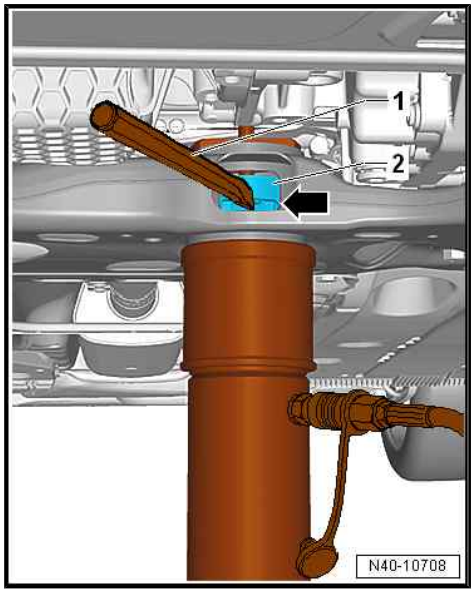


– Press out both bonded rubber bushes simultaneously until upper bush -2- is visible in aperture for pendulum support -arrow- in subframe.

– Visually inspect outer ring of upper bonded rubber bush -2-.

• If the outer ring of the upper bonded rubber bush -2- is deformed, it must be chiselled open through the aperture for the pendulum support -arrow- in the subframe.

– Using a chisel or similar tool -1-, break out an opening in outer ring of upper bonded rubber bush -2-.



Note

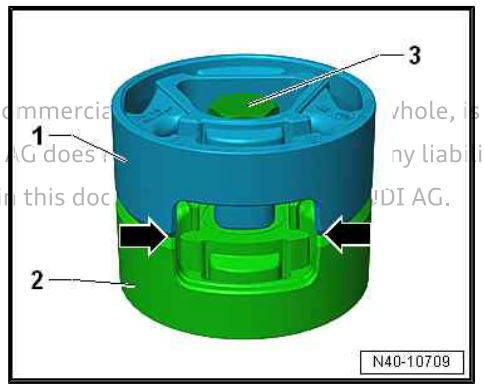
This step is necessary to prevent the outer ring of the upper bonded rubber bush from tilting sideways and catching in the aperture for the pendulum support in the subframe.

– Press out bonded rubber bushes completely (both bushes are pressed out together).

Preparing bonded rubber bushes for installation

– Fit the two bonded rubber bushes -1 and 2- together so that the two cut-outs -arrows- are exactly above each other.

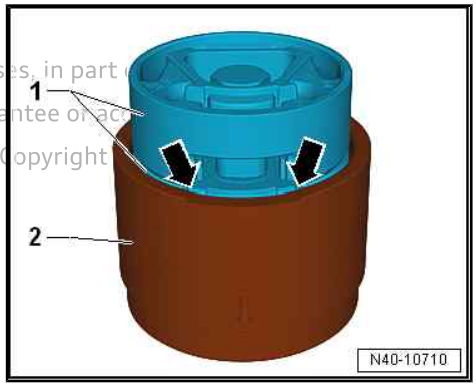
– Bolt together both bonded rubber bushes hand-tight with original bolt -3-.



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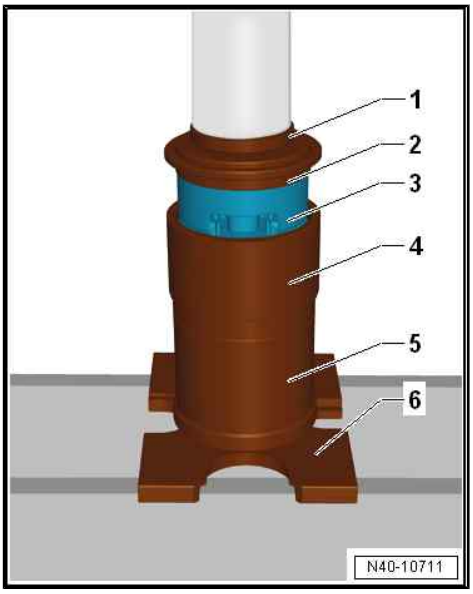
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– Insert bonded rubber bushes -1- into larger diameter of funnel -VAS 6779/6- -item 2- (with bolt head facing upwards).
– Align bonded rubber bushes in funnel - VAS 6779/6- .
• The cut-out in the bonded rubber bushes must be exactly in line with the recess -arrows- in funnel - VAS 6779/6- .

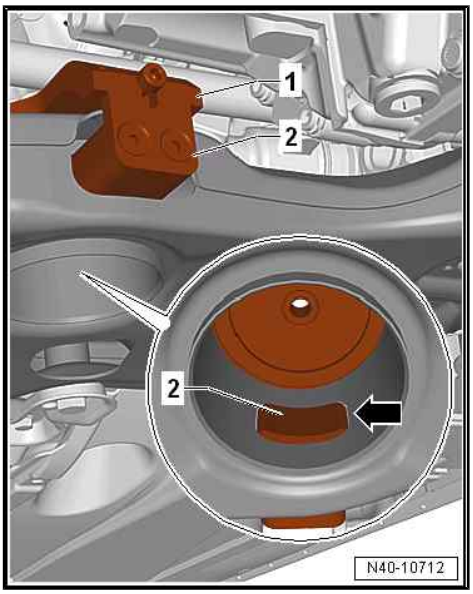


– Press bonded rubber bushes -3- into funnel - VAS 6779/6- as far as stop, as shown in illustration.

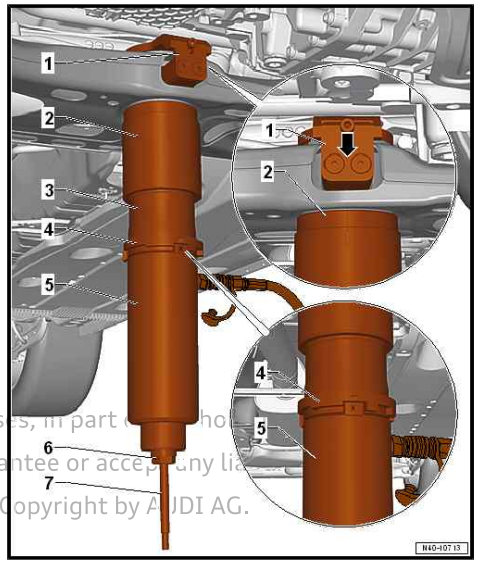
1 - Press tool - VW 412-
2 - Thrust piece - VAS 6779/5- (side marked “A” faces upwards)
3 - Bonded rubber bush
4 - Funnel - VAS 6779/6-
5 - Tube - VAS 6779/4-
6 - Thrust plate - VW 401-



– Insert counterhold tool - VAS 6779/7- -item 1- in subframe.
– Fit insert - VAS 6779/7-1A- -item 2- in opening for pendulum support in subframe.
– Bolt insert - VAS 6779/7-1A- onto counterhold tool - VAS 6779/7- .
– Make sure that insert - VAS 6779/7-1A- -item 2- is correctly located in opening in subframe.



Pressing in bonded rubber bush



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

– Set up assembly tool - VAS 6779- on subframe as shown in illustration.

1 - Counterhold tool - VAS 6779/7-

2 - Funnel - VAS 6779/6- (-arrow marking- on funnel must be aligned centrally between the two bolts -arrow-)

3 - Thrust piece - VAS 6779/9-

4 - Stepped ring - VAS 6779/8- (marking -I- on stepped ring must be aligned with marking -X- on thrust piece - VAS 6779/9-)

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

6 - Hexagon nut - VAS 6779/3-

7 - Threaded spindle - VAS 6779/2-

– Press in both bonded rubber bushes together.

– Detach assembly tool - VAS 6779- from subframe and check that pressed-in bonded rubber bushes are seated correctly.

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

Tightening torques:

- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ Engine; Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings
- ⇒ 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 1332-

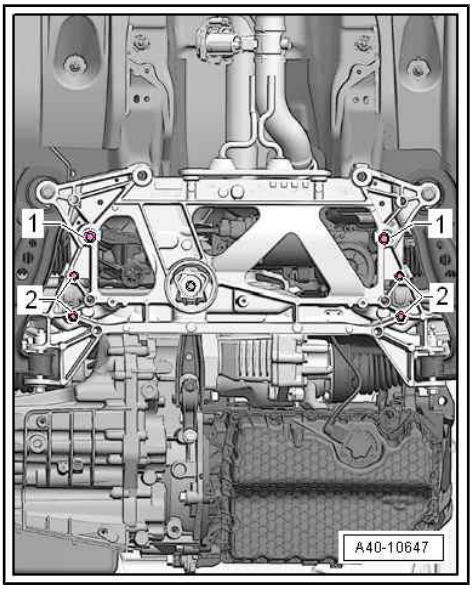


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Removing

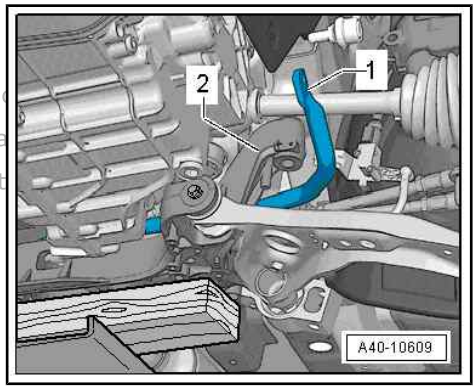
– Lower subframe ⇒ page 23 .

– Remove bolts -2- and detach anti-roll bar from subframe.



– Lift anti-roll bar off subframe.

– Then remove anti-roll bar -1- from subframe and over suspension bracket -2- towards front of vehicle.



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Installing

Install in reverse sequence, paying attention to the following:

– Install subframe ⇒ page 23 .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

♦ ⇒ “2.1 Exploded view - subframe”, page 18

2.8 Removing and installing coupling rod

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



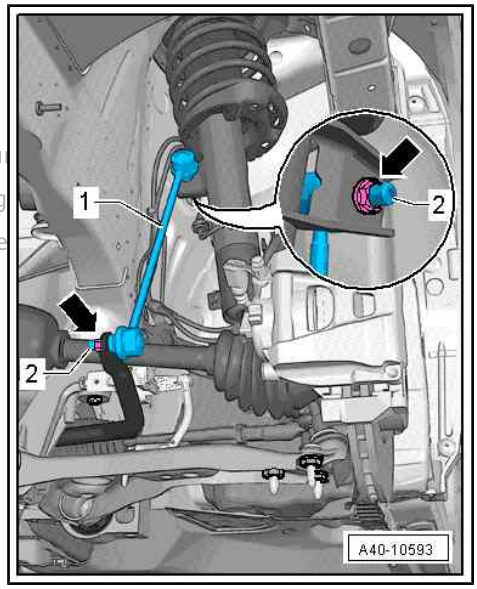
Removing

– Remove wheel ⇒ page 309 .

– Unscrew nuts -arrows- from coupling rod -1- (if necessary, counterhold stud -2- with multi-point socket).

– Pull coupling rod -1- out of anti-roll bar and suspension strut and detach coupling rod.

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Installing

Install in reverse sequence, paying attention to the following:

– Tighten nuts -arrows- securing coupling rod to suspension strut and anti-roll bar (counterhold stud -2- with multi-point socket).

Note

The tool used for counterholding must be applied straight.

Tightening torques

- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “1 Wheels, tyres”, page 309

3 Suspension strut, upper wishbone

⇒ “3.1 Exploded view - suspension strut, upper wishbone”, page 67

⇒ “3.2 Removing and installing suspension strut”, page 68

⇒ “3.3 Servicing suspension strut”, page 72

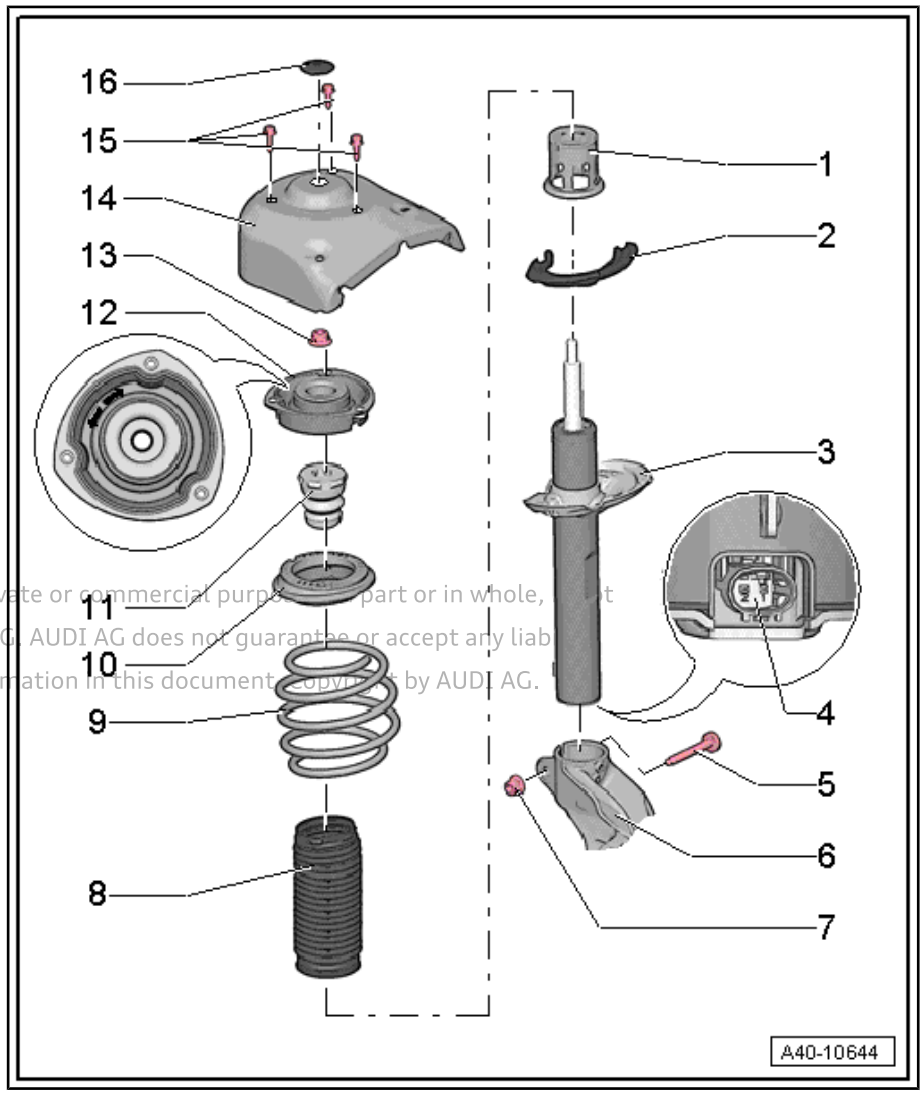
⇒ “3.4 Lowering suspension strut”, page 74

3.1 Exploded view - suspension strut, upper wishbone

If front axle components (axle parts and/or rim) are renewed due to deformations, the tightening torques at the following bolted connections must be checked if they were not renewed as part of the repair work:

- 100 Nm test torque for clamping bolt ⇒ Item 5 (page 67) and nut ⇒ Item 7 (page 68) for suspension strut

The connection must not turn until the test torque in the tightening direction is reached.



1 - Trim cap

- ❑ Part of shock absorber

2 - Spring seat

- ❑ Note correct installation position

3 - Shock absorber with bottom spring plate

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 72
- ❑ If shock absorber is renewed due to a bent piston rod, track rod ball joint must also be renewed on same side of vehicle
- ❑ 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

4 - Electrical connection

- ❑ Fitted on shock absorbers with electronic damping control (Audi magnetic ride)

5 - Bolt

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

6 - Wheel bearing housing

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

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7 - Nut

- ❑ Renew after removing

8 - Protective sleeve

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

9 - Coil spring

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 72
- ❑ Surface of spring coil must not be damaged

10 - Deep groove ball thrust bearing

11 - Bump stop

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

12 - Suspension strut mounting

- ❑ Note installation position; one of the two markings -arrows- on the spring plate must point in the direction of travel ⇒ page 72 .

13 - Nut

- ❑ Always renew if removed
- ❑ 60 Nm

14 - Suspension turret

15 - Bolt

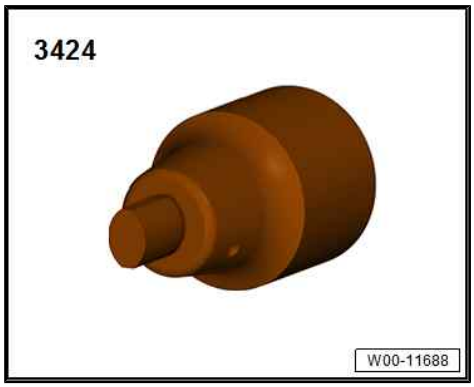
- ❑ Always renew if removed
- ❑ 15 Nm +90°

16 - Cover

3.2 Removing and installing suspension strut

Special tools and workshop equipment required

- ◆ Spreader - 3424-



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- Torque wrench - V.A.G 1332-



- Engine and gearbox jack - VAS 6931-



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- Support - T10149-

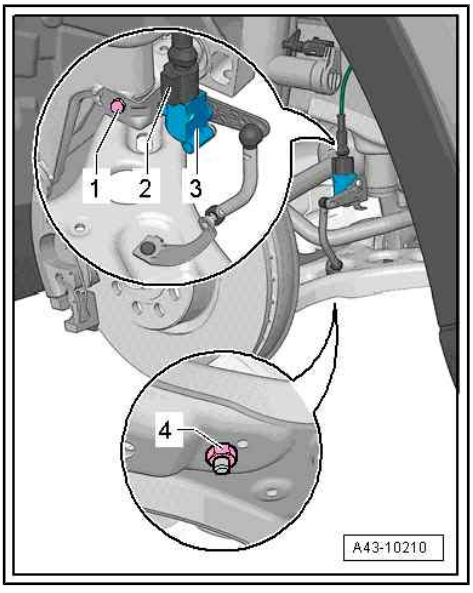


Removing

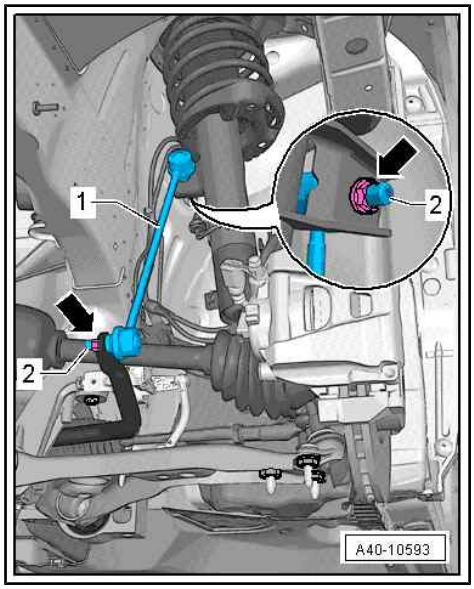
– Loosen drive shaft bolt at wheel hub ⇒ page 111 .

– Remove wheel ⇒ page 309 .

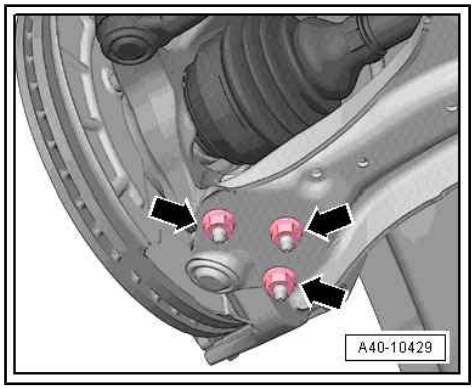
– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



– Unscrew nut -arrow- for coupling rod -1- at suspension strut ⇒ page 65 .



– Unscrew nuts -arrows-.
– Separate swivel joint from wishbone.
– Pull wheel bearing housing with swivel joint out of wishbone.



Applies to right side of vehicle

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .
– Remove cover for plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– Remove drive shaft (right-side) ⇒ page 113 .

Applies to left side of vehicle

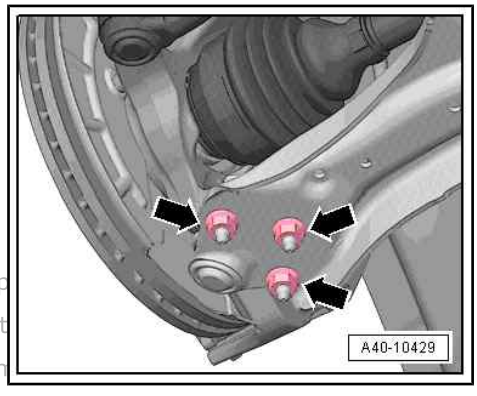
– On vehicles with sports running gear: Lower suspension strut. It is not necessary to lower the suspension strut on vehicles not equipped with sports running gear ⇒ page 74 .
– Pull wheel hub off outer joint on drive shaft.
– Tie up drive shaft to body with wire.

Note

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

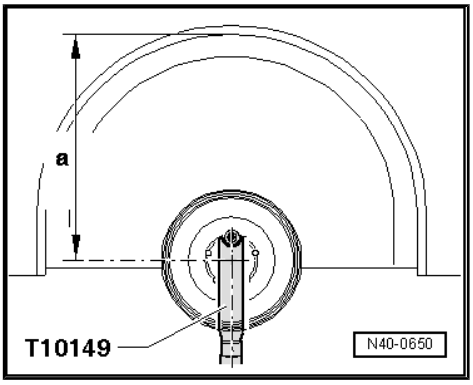
Both sides (continued)

– Bolt swivel joint to wishbone by screwing nuts -arrows- in hand-tight.

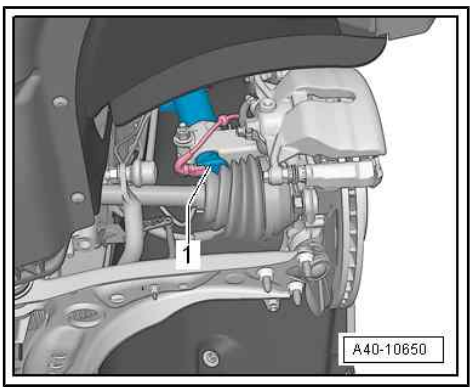


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– Use wheel bolt to attach engine and gearbox jack - VAS 6931- with support - T10149- to wheel hub.



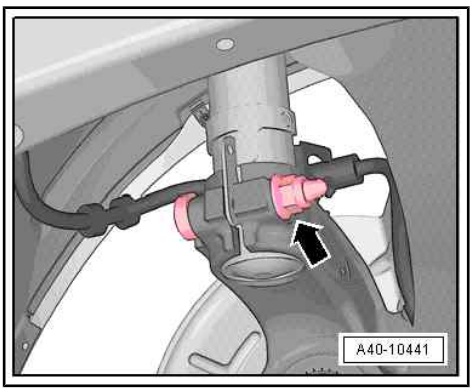
– On vehicles with electronic damping control (Audi magnetic ride), unplug connector -1- and move wiring clear at suspension strut.



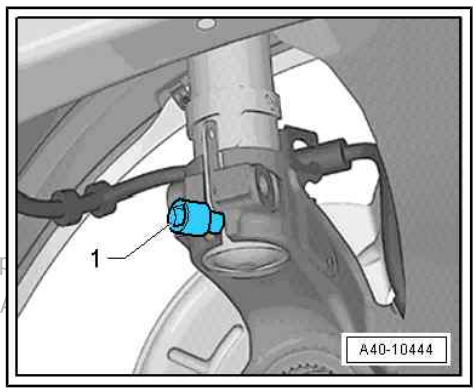
Note

Use both hands to remove the connector: open the catch with one hand whilst pressing off the connector with the other; do not use any tools.

– Remove bolt and nut securing wheel bearing housing/suspension strut -arrow-.



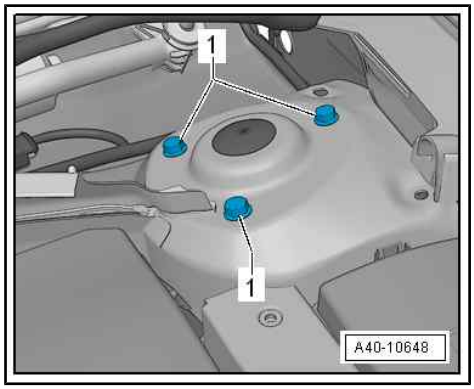
– Insert spreader - 3424- -1- into slot in wheel bearing housing.
– Turn ratchet handle through 90° and pull ratchet handle off spreader - 3424- .
– Press the brake disc by hand towards the suspension strut, as the shock absorber tube may otherwise become skewed in the bore of the wheel bearing housing.
– Pull wheel bearing housing downwards off shock absorber tube and lower with engine and gearbox jack - VAS 6931- until shock absorber tube is free.



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– Secure wheel bearing housing to bracket/subframe with binding wire.
– Remove engine/gearbox jack - VAS 6931- from under wheel bearing housing.

– If the suspension strut was not lowered, unscrew bolts -1- for spring plate and take out suspension strut.



Installing

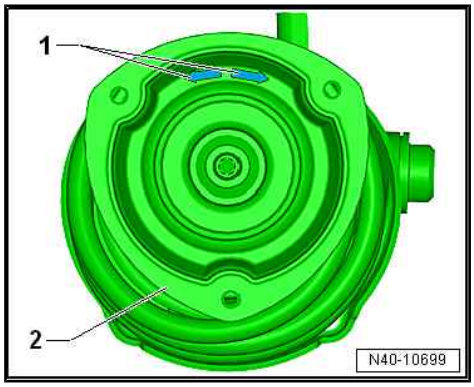
Install in reverse sequence, paying attention to the following:

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

– Fit wheel hub onto outer joint of drive shaft.

– Insert wheel bearing housing with swivel joint into wishbone.

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” ⇒ Vehicle diagnostic tester.



- If the reference position has been re-adapted, the front camera for driver assist systems must be calibrated on vehicles with lane departure warning function ⇒ page 343 .
- Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

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Tightening torques

- ⇒ “3.1 Exploded view - suspension strut, upper wishbone”, page 67
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ “6.2 Exploded view - drive shaft”, page 100
- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ “1 Wheels, tyres”, page 309

3.3 Servicing suspension strut

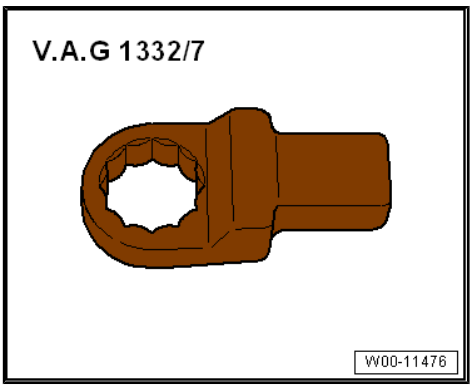
Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-

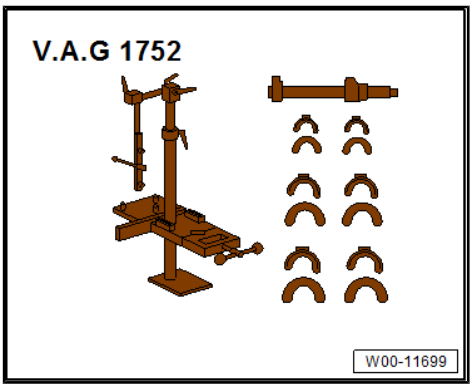


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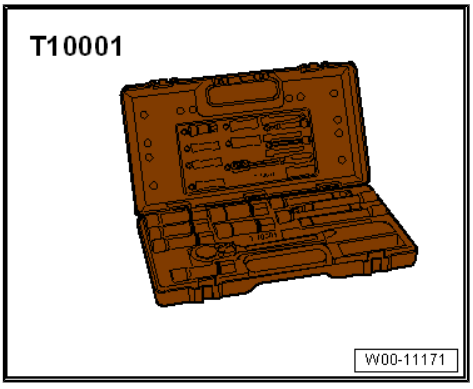
- Ring spanner insert - V.A.G 1332/7-



- Suspension strut spring compressor - V.A.G 1752-



- Shock absorber tool set - T10001-



Procedure

- Suspension strut removed ⇒ page 68 .

– Compress coil spring with spring compressor - V.A.G 1752/1- until thrust bearing is free at top.

– Unscrew hexagon nut from piston rod.

– Take off suspension strut components and coil spring together with spring compressor - V.A.G 1752/1- .

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

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

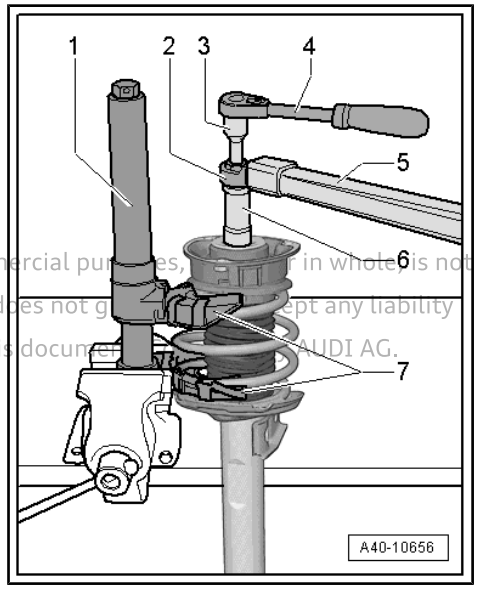
3 - Socket - T10001/8-

4 - Commercially available ratchet

5 - Torque wrench - V.A.G 1332-

6 - Socket - T10001/5-

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

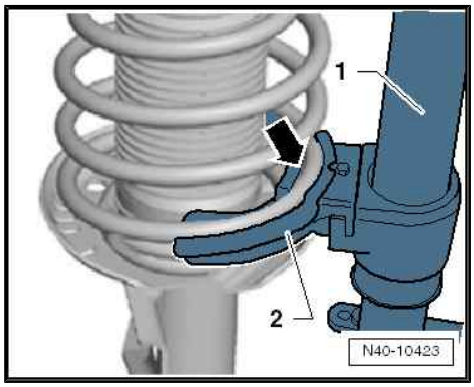


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WARNING

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

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



Installing coil spring

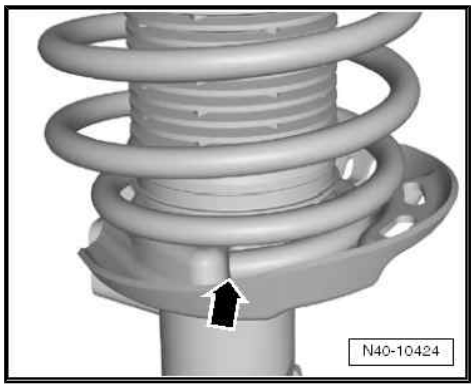
– Position coil spring with spring compressor - V.A.G 1752/1- on bottom spring seat.

• End of spring coil must make contact with stop -arrow-.

– Tighten new nut on piston rod ⇒ page 67 .

– Slacken off spring compressor - V.A.G 1752/1- and detach from coil spring.

– Install suspension strut ⇒ page 68 .



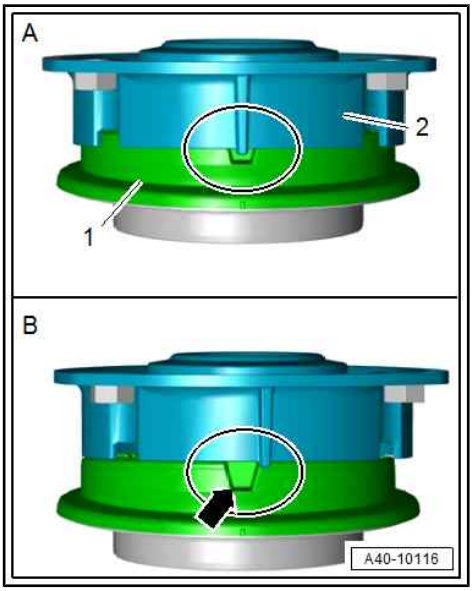
3.4 Lowering suspension strut

On vehicles with the following types of sports running gear the suspension strut must first be lowered in order to detach the wheel bearing unit / wheel bearing housing from the drive shaft:

- S3 sports running gear and S3 sports running gear with Audi magnetic ride 2UC and G06/G07/G26/G27/G46/G47/G97
- S line sports running gear 2UG and G34/G35/G36/G48/G49/G50
- RS 3 sports running gear and RS 3 sports running gear with Audi magnetic ride = 2UC and G08/G09

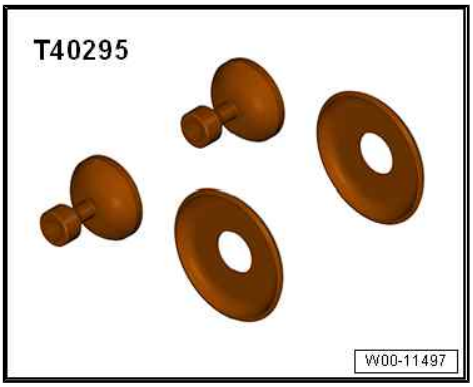
Note

- *Risk of damage to deep groove ball thrust bearing -1-*
- *If the suspension strut is not first lowered when detaching the wheel bearing unit / wheel bearing housing from the drive shaft on vehicles with the types of sports running gear listed above, and the suspension strut is pulled outwards, the thrust bearing will slip out of the retainer -arrow- on the suspension strut mounting -2-.*
- *When the parts are installed, the thrust bearing will not re-seat in the retainer on the suspension strut mounting; this will cause noise and damage to the bearing due to the ingress of dirt.*



Special tools and workshop equipment required

- Assembly tool - T40295-



Procedure

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

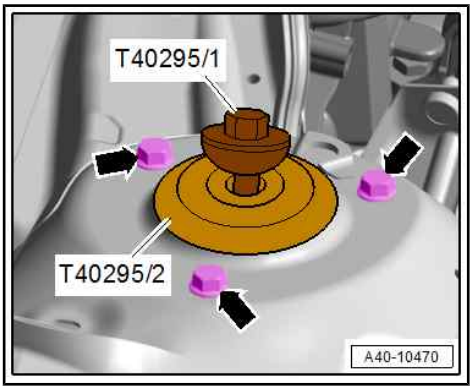
– Remove cover for plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .

– Detach cover from suspension turret.

– Place protective cover for suspension turret -T40295/2- on suspension turret.

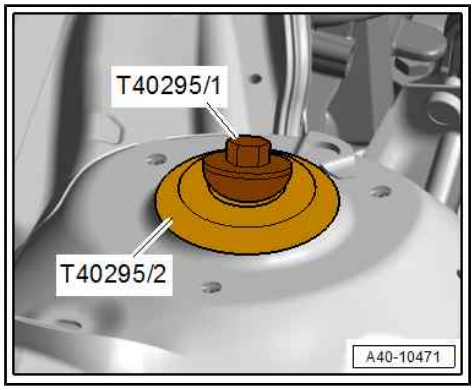
– Screw assembly aid -T40295/1- onto piston rod and tighten to 20 Nm.

– Loosen and remove bolts -arrows- securing suspension strut mounting (counterhold suspension strut).



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– Lower assembly aid -T40295/1- onto protective cover for suspension turret -T40295/2- .



Assembling

Assembly is performed in reverse sequence; note the following:

– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Tightening torques

◆ ⇒ “3.1 Exploded view - suspension strut, upper wishbone”, page 67

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4 Lower wishbone, swivel joint

⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77

⇒ “4.2 Removing and installing lower wishbone”, page 79

⇒ “4.3 Renewing bonded rubber bushes for lower wishbone”, page 82

⇒ “4.4 Removing and installing swivel joint”, page 87

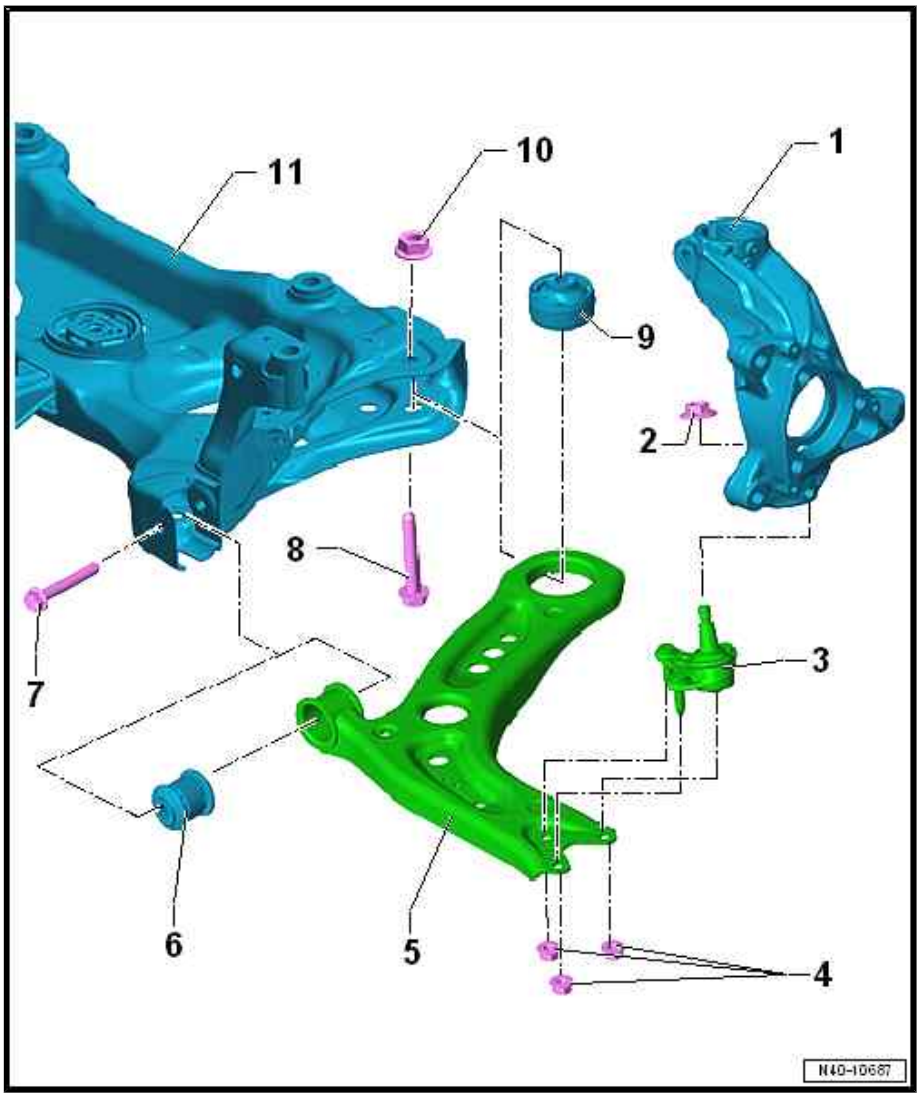
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4.1 Exploded view - lower wishbone, swivel joint

If front axle components (axle parts and/or rim) are renewed due to deformations, the tightening torques at the following bolted connections must be checked if they were not renewed as part of the repair work:

- 80 Nm test torque for nut ⇒ Item 2 (page 77) to swivel joint ⇒ Item 3 (page 77)

The connection must not turn until the test torque in the tightening direction is reached.



1 - Wheel bearing housing

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 91

2 - Nut

- ❑ Renew after removing
- ❑ 60 Nm

3 - Swivel joint

- ❑ Checking ⇒ Maintenance ; Booklet 821 ; Maintenance; Axles (front and rear): checking components for play, secure attachment and damage, and checking protective boots
- ❑ Removing and installing ⇒ page 87

4 - Nut

- ❑ Always renew if removed
- ❑ 40 Nm +45°

5 - Lower wishbone

- ❑ Different versions with single-point or three-point mounting
- ❑ Removing and installing ⇒ page 79
- ❑ If wishbone is bent and needs to be renewed, swivel joint on same side of vehicle must also be renewed
- ❑ Equipment version with air duct ⇒ page 79

6 - Bonded rubber bush (front)

- ❑ Renewing ⇒ page 82

7 - Bolt

- ❑ Always renew if removed
- ❑ Tighten in unladen position ⇒ page 10
- ❑ 70 Nm +180°

8 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +180°

9 - Bonded rubber bush (rear)

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”
- ❑ Renewing ⇒ page 84
- ❑ Version 1:

♦ Note installation position ⇒ page 78 .

♦ Apply grease after installing ⇒ page 87

- ❑ Version 2: no installation position specified

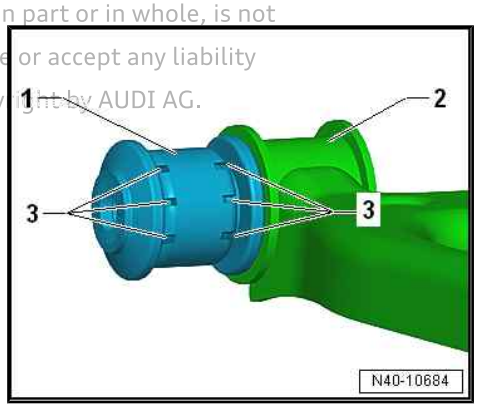
10 - Nut

11 - Subframe

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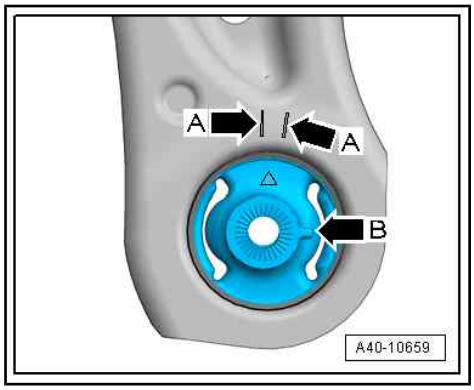
Installation position of front bonded rubber bush -1-

- Grooves -3- must face towards wishbone -2-.



Installation position of rear bonded rubber bush (version 1):

- The embossed arrow points between the two markings -arrows A- in the wishbone.
- Ridge -arrow B- must face centre of vehicle.

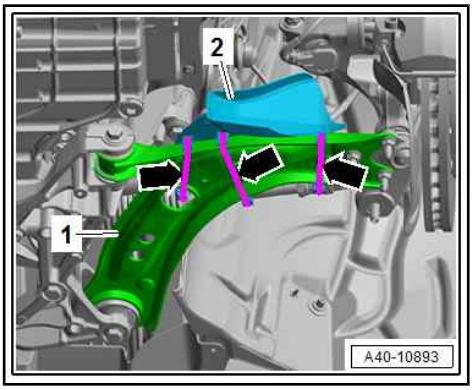


Note

Mixed installation of rear bonded rubber bushes (versions 1 and 2) is not permitted.

Air duct - installation position

– Move air duct -2- into installation position on wishbone -1- and secure with cable ties -arrows-, as shown.



4.2 Removing and installing lower wishbone

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

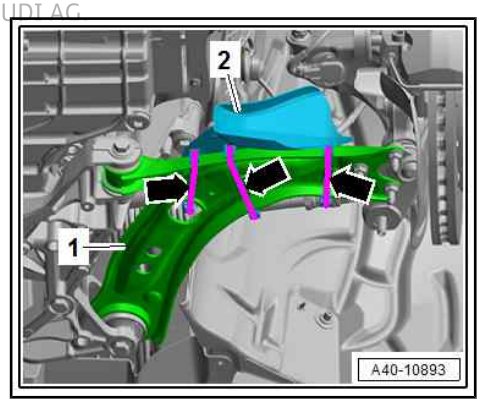
– Remove wheel ⇒ page 309 .

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

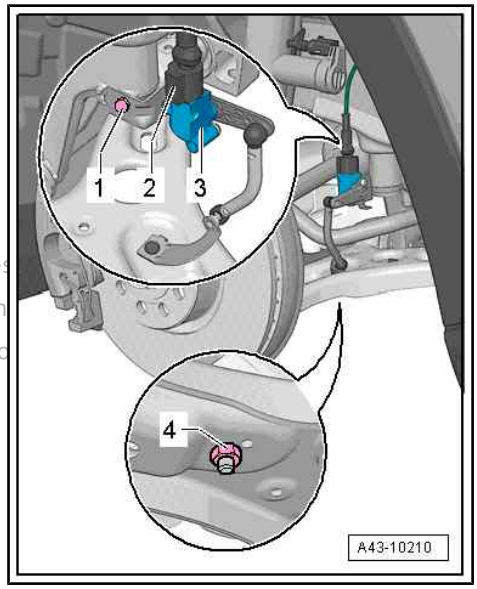
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– Detach wheel housing liner on underbody trim and swivel wheel housing liner slightly to side.

– Depending on equipment version: Cut through cable ties -arrows- and detach air duct -2- from wishbone -1-.

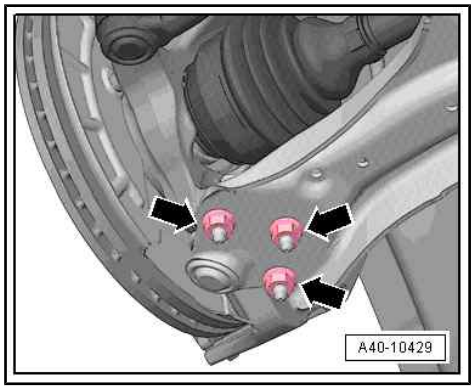


– If fitted, remove nut -4- and move coupling rod clear of vehicle level sender -3-.



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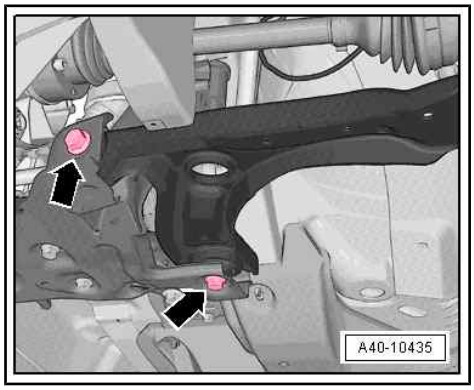
– Remove nuts -arrows-.
– Pull wishbone out of swivel joint and turn wheel bearing housing outwards to relieve wishbone.



Note

When removing and installing, take care not to damage the rubber boot of the swivel joint. The boot should be protected against damage if necessary.

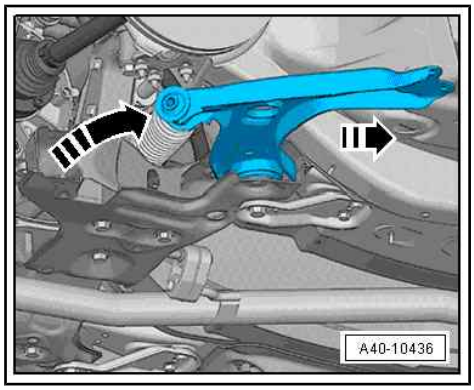
– Remove bolts -arrows-.



Note

- *If the front bolt cannot be removed (depends on gearbox version), the subframe must be lowered.*
- *Lower subframe by a maximum of 100 mm* ⇒ page 23 .

– Swivel wishbone backwards and pull out of subframe in direction of -arrow-.



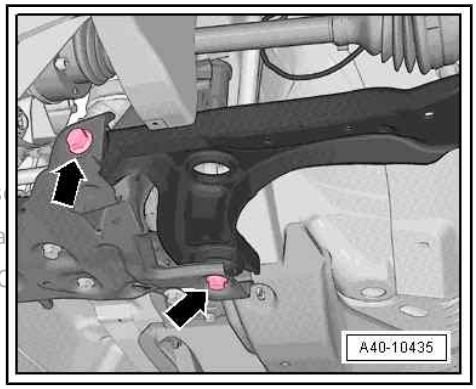
Installing

– Insert rear of wishbone into subframe and swivel forwards.

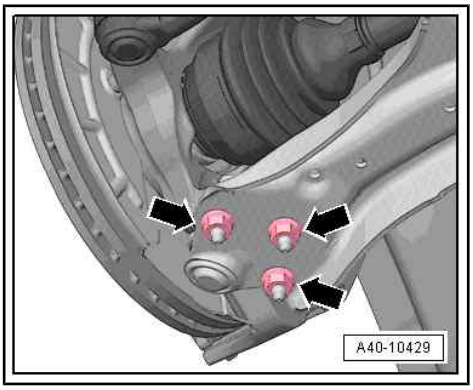
– Install bolts -arrows- and tighten hand-tight.

– Install subframe ⇒ page 33 .

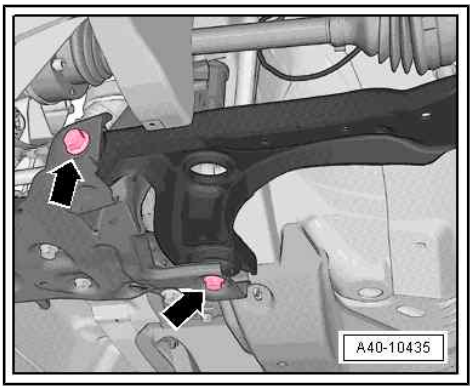
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– Bolt wishbone to swivel joint and tighten -arrows-.



– Lift suspension to unladen position and tighten bolts -arrows- ⇒ page 10 .



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

- Installation position of air duct ⇒ page 79 .
- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

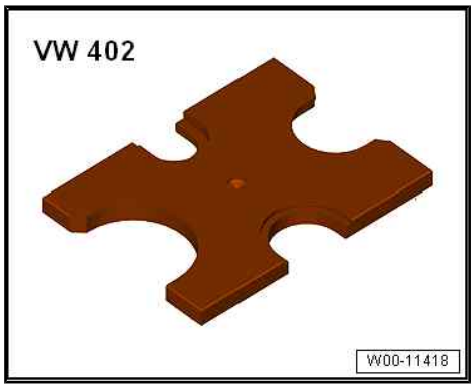
4.3 Renewing bonded rubber bushes for lower wishbone

⇒ “4.3.1 Renewing bonded rubber bush (front) for lower wishbone”, page 82

⇒ “4.3.2 Renewing bonded rubber bush (rear) for lower wishbone”, page 84

4.3.1 Renewing bonded rubber bush (front) for lower wishbone

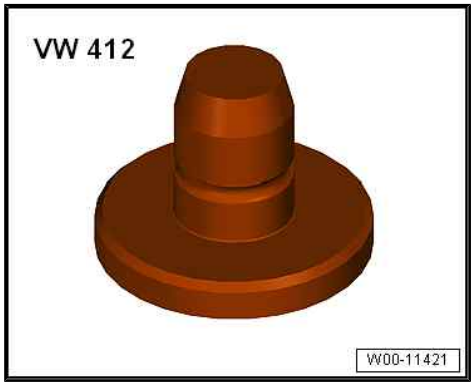
- Thrust plate - VW 402-



- Press tool - VW 411-

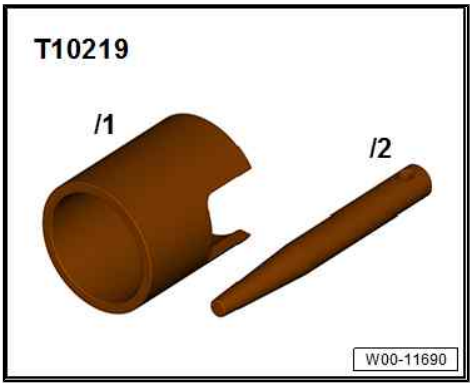


- Press tool - VW 412-



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♦ Drift - T10219/2-



♦ Assembly lubricant - G 294 421 A1- ⇒ Electronic parts catalogue “ETKA”

Pressing out bonded rubber bush

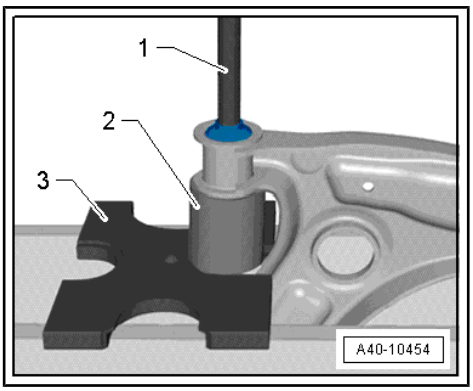
- Wishbone removed ⇒ page 79

– Press out bonded rubber bush as shown.

1 - Press tool - VW 411-

2 - Tube - T10219/1- (cutout in tube is at bottom and faces wishbone)

3 - Thrust plate - VW 402-



Pressing in bonded rubber bush

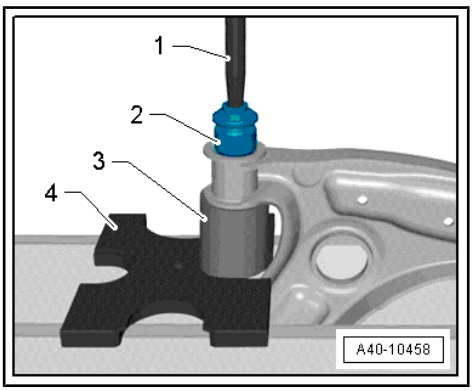
– Note installation position ⇒ page 78 .

Note

The bush will move temporarily out of line at the start of the pressing-in process, but will straighten up when it is pressed in further. Additional guiding is not necessary.

– Apply assembly lubricant - G 294 421 A1- to outside of bonded rubber bush.

– Position bonded rubber bush at an angle (towards wishbone) so that lip slides into hole.



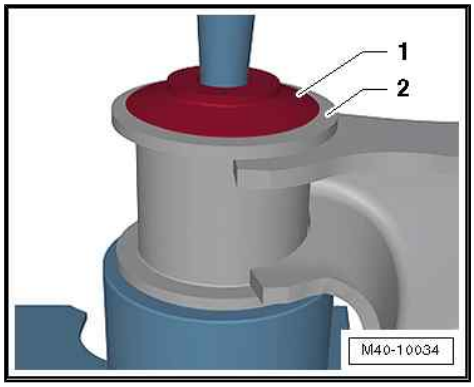
1 - Drift - T10219/2-

2 - Tube - T10219/1-

3 - Thrust plate - VW 402-

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– Press in bonded rubber bush until core of bush -1- and hole in wishbone -2- are on a level.

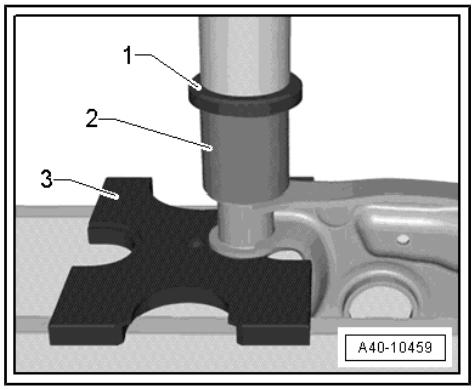


– Press bush back slightly in wishbone.

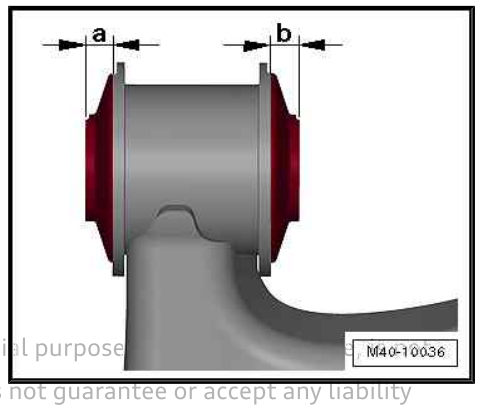
1 - Press tool - VW 412-

2 - Tube - T10219/1-

3 - Thrust plate - VW 402-



Dimensions -a- and -b- must be equal.



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4.3.2 Renewing bonded rubber bush (rear) for lower wishbone

Special tools and workshop equipment required

♦ Thrust plate - VW 401-

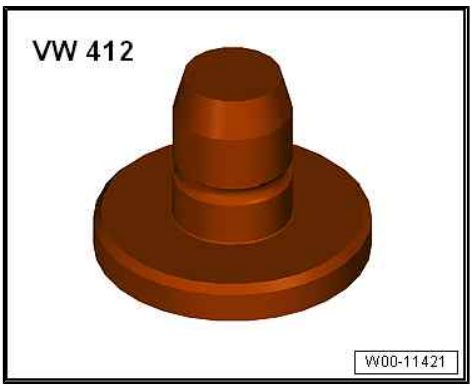


- Press tool - VW 411-

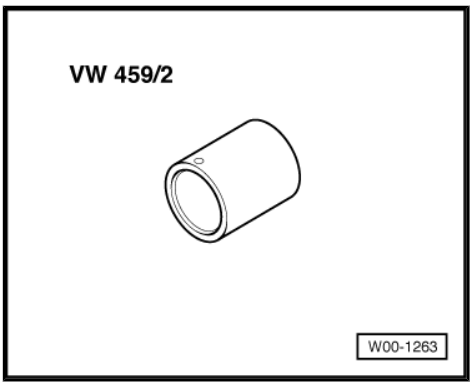


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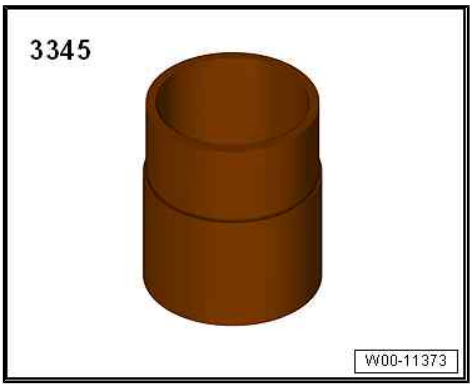
- Press tool - VW 412-



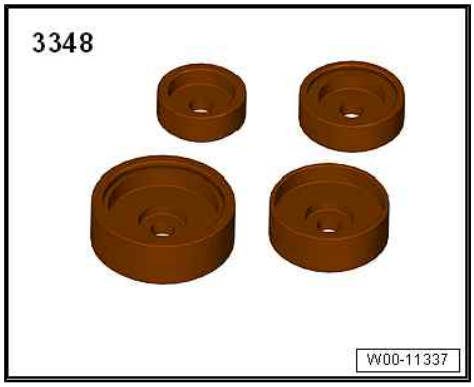
- Sleeve -VW 459/2- from removal and installing tool - VW 459-



- Wheel bearing tube - 3345-



♦ Assembly tool - 3348-

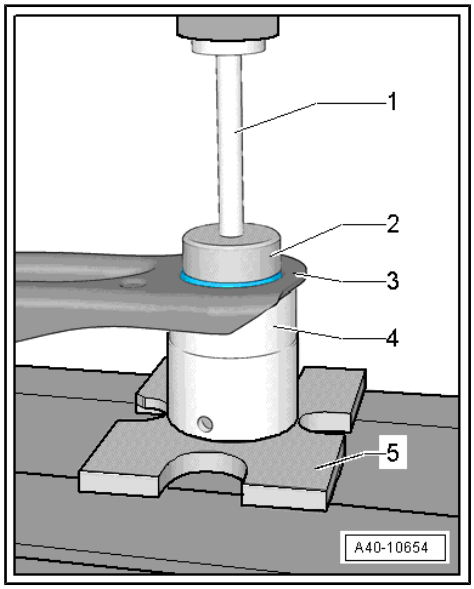


♦ Grease - G 052 150 A2- ⇒ Electronic parts catalogue

Pressing out bonded rubber bush

- Wishbone removed ⇒ page 79 .

– Press out bonded rubber bush as shown.

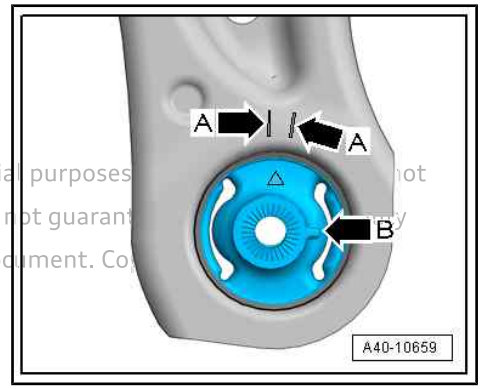


1 - Press tool - VW 411-
2 - Assembly tool - 3348-
3 - Wishbone
4 - Wheel bearing tube - 3345-
5 - Thrust plate - VW 401-

Pressing in bonded rubber bush

Note correct installation position of bonded rubber bush:

- The embossed arrow points between the two markings -arrows A- in the wishbone.
- Ridge -arrow B- must face centre of vehicle.



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– Press in bonded rubber bush as illustrated.

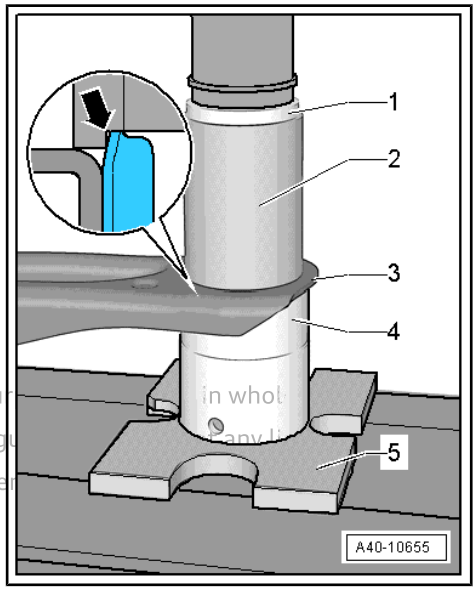
1 - Press tool - VW 412-

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

3 - Wishbone

4 - Wheel bearing tube - 3345-

5 - Thrust plate - VW 401-

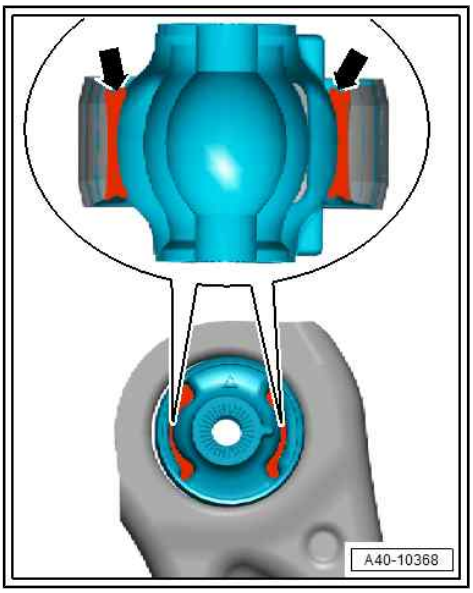


Note

Press in bonded rubber bush until wheel bearing tube - 3345- makes contact with wishbone.

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– Using a small brush, apply 0.1 g of grease - G 052 150 A2- evenly in each of the kidney-shaped cut-outs -arrows- in the bonded rubber bush from above.



Note

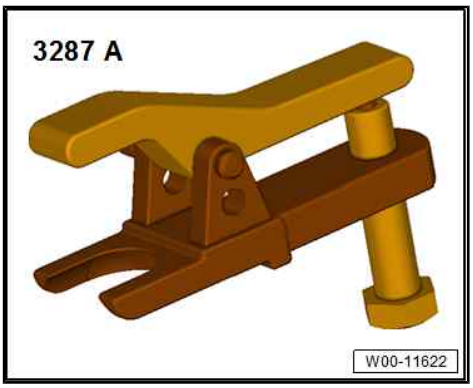
Greasing the bushes will prevent possible noise while they are bedding in.

– Install wishbone ⇒ page 79 .

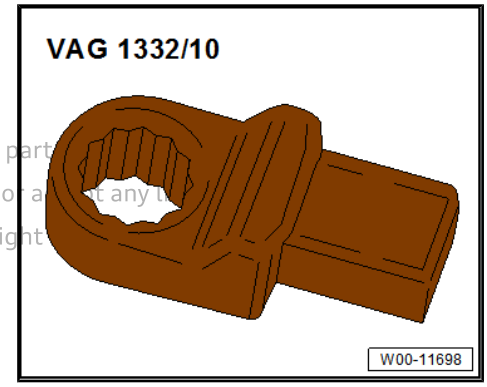
4.4 Removing and installing swivel joint

Special tools and workshop equipment required

♦ Ball joint puller - 3287A-

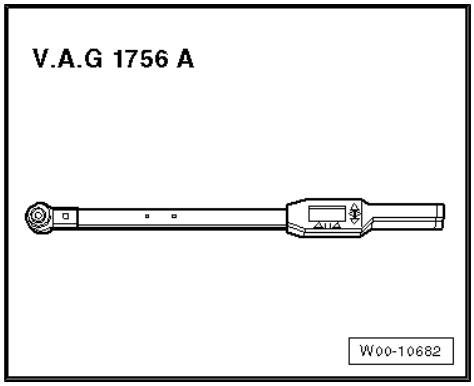


- Ring spanner insert - V.A.G 1332/10-



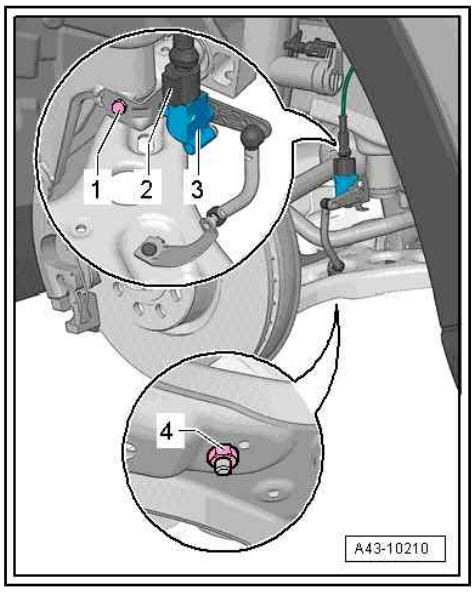
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- Angle wrench - V.A.G 1756 A-

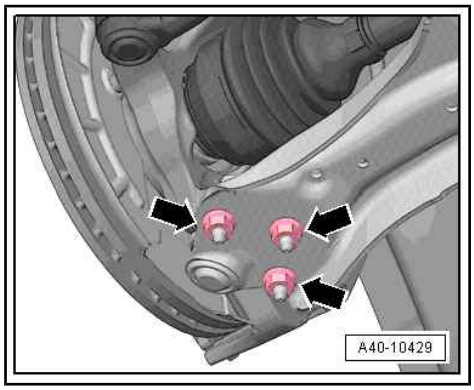


Removing

– Loosen drive shaft bolt at wheel hub ⇒ page 111 .
– Remove wheel ⇒ page 309 .
– If fitted, remove nut -4- and move coupling rod clear of vehicle level sender -3-.

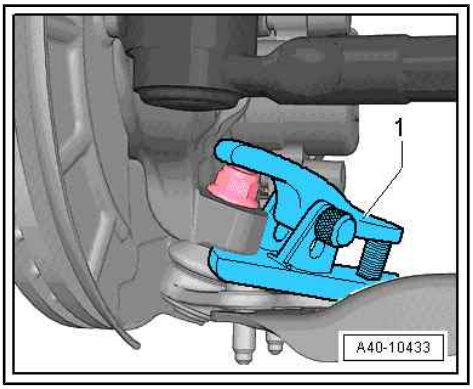


– Remove nuts -arrows- on swivel joint.
– Detach wishbone from swivel joint.
– Swivel out suspension strut and at the same time guide drive shaft out of wheel hub.



– Loosen nut on swivel joint but do not remove completely.

– Apply ball joint puller - 3287 A- -1- as shown in illustration and press out swivel joint.



Note

Place engine and gearbox jack - VAS 6931- underneath (risk of accident from parts dropping down when swivel joint is pressed out).

WARNING

When the swivel joint is pressed out, it will release suddenly from the wheel bearing housing and could cause injury.

– Unscrew nut on swivel joint and detach swivel joint.

Installing

Install in reverse sequence, paying attention to the following:

– Insert drive shaft into splines of wheel hub.

– Secure drive shaft: procedure for tightening 12-point bolt ⇒ page 111 .

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

◆ ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77

◆ ⇒ “2.1 Exploded view - front vehicle level senders”, page 302

◆ ⇒ “1 Wheels, tyres”, page 309

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5 Wheel bearing

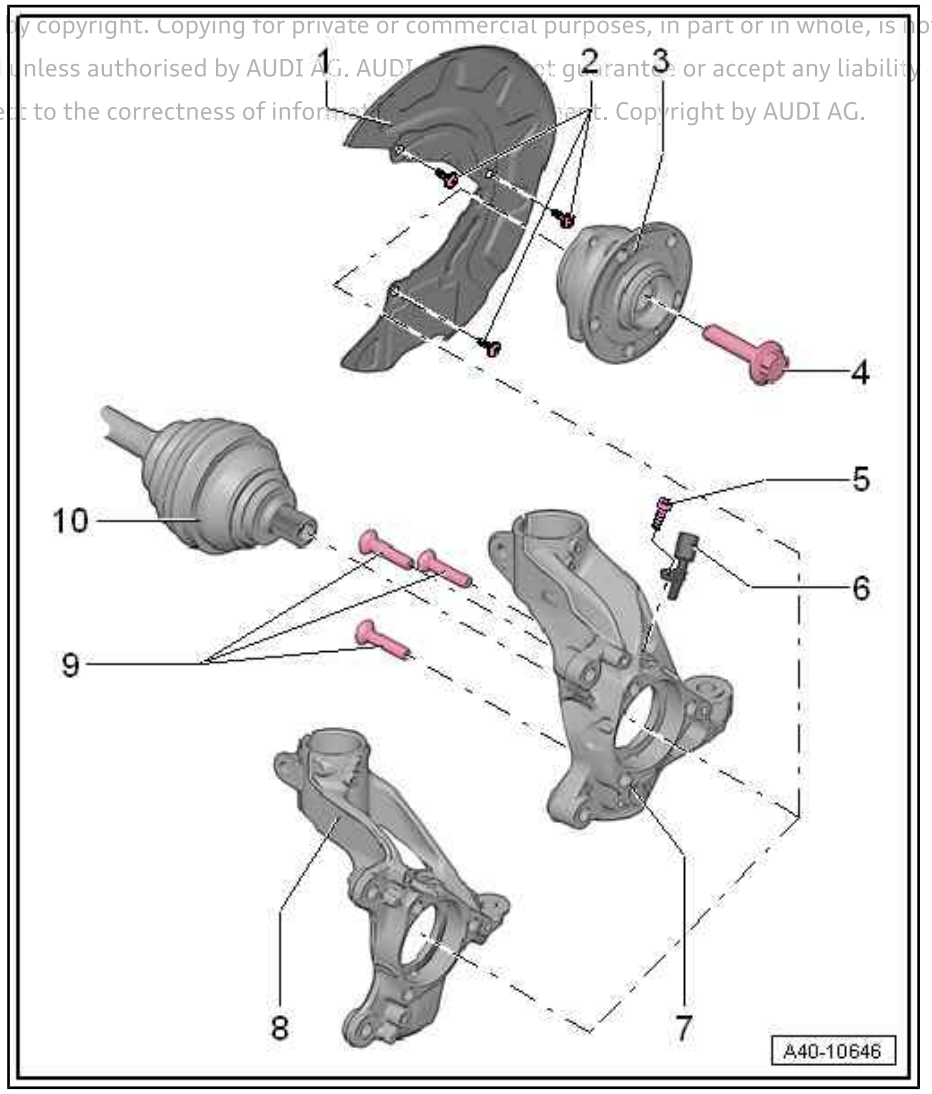
⇒ “5.1 Exploded view - wheel bearing”, page 90

⇒ “5.2 Removing and installing wheel bearing housing”, page 91

⇒ “5.3 Removing and installing wheel bearing unit”, page 96

5.1 Exploded view - wheel bearing

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1 - Splash plate for brakes

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Front brakes; Exploded view - front brake

2 - Bolts

- ❑ Tightening torque ⇒ Brake system; Rep. gr. 46 ; Front brakes; Exploded view - front brake

3 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 96
- ❑ Lateral run-out 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-
- ❑ Cannot be repaired

Caution

Avoid dirtying or damaging the seal when picking it up, laying it down or placing it in storage ⇒ page 98

4 - Bolt

- ❑ Always renew if removed
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ Loosening and tightening ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ❑ -WHT.002.795- / 200 Nm + turn 180° further
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

5 - Bolt

- ❑ Tightening torque ⇒ Brake system; Rep. gr. 45 ; Sensors; Exploded view - front wheel speed sensor

6 - Speed sensor

- ❑ Front right speed sensor - G45- , front left speed sensor - G47-
- ❑ Removing and installing ⇒ Brake system; Rep. gr. 45 ; Sensors; Removing and installing front speed sensors -G45- / -G47-

7 - Wheel bearing housing

- ❑ Different versions available depending on model ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 91

8 - Wheel bearing housing

- ❑ Different versions available depending on model ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 91

9 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +90°

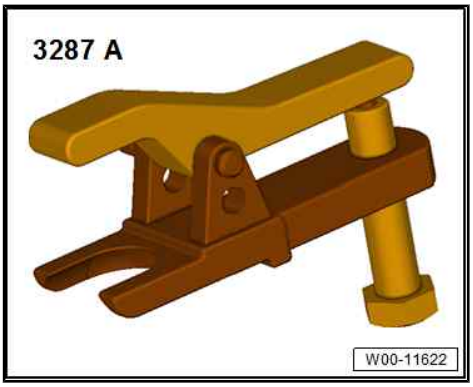
10 - Drive shaft

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

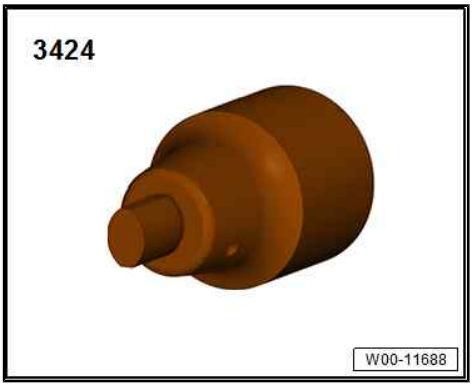
5.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

- ♦ Ball joint puller - 3287A-



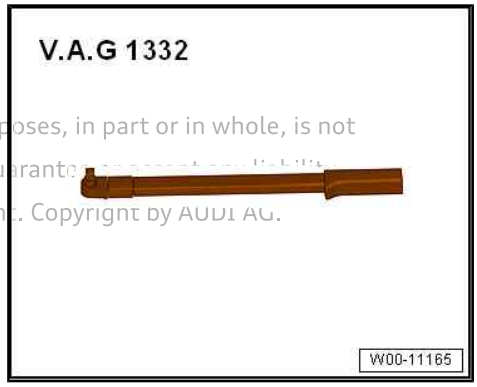
- ♦ Spreader - 3424-



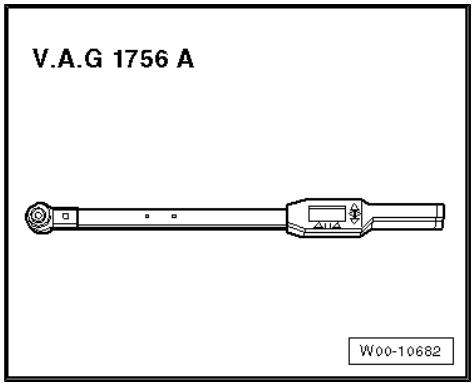
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- Torque wrench - V.A.G 1332-



- Angle wrench - V.A.G 1756 A-



- Engine and gearbox jack - VAS 6931-



Removing

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

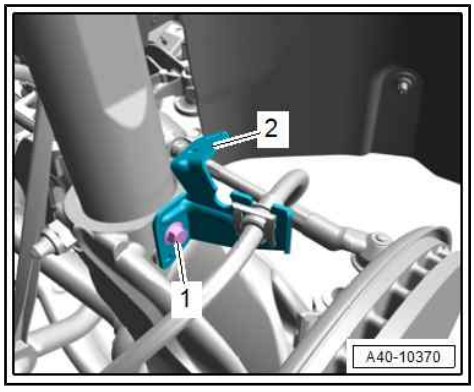
– Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Front brakes; Removing and installing brake disc .

– Remove ABS speed sensor ⇒ Brake system; Rep. gr. 45 ; Sensors; Exploded view - front wheel speed sensor .

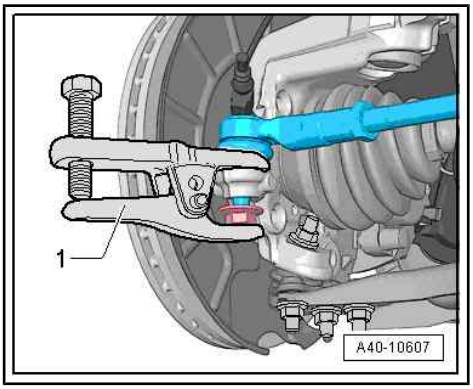
– Remove bolt -1-, detach bracket -2- with brake hose from wheel bearing housing and tie up one side.

– Detach bracket for brake line and electrical wiring from wheel bearing housing and move clear.

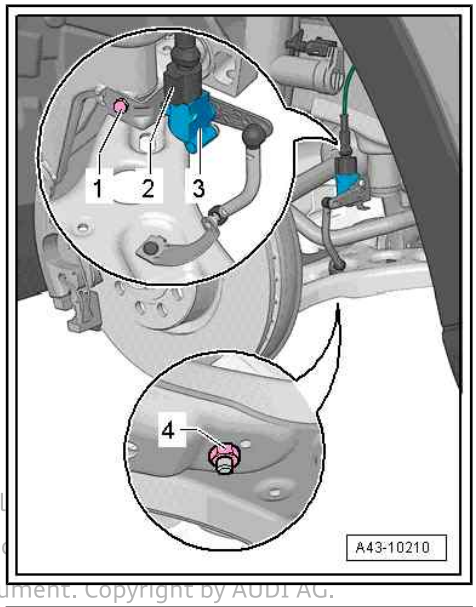
– Position engine and gearbox jack - VAS 6931- with support plate under wheel bearing housing.



– Slacken off nut on track rod ball joint (but do not remove yet).
– Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- -1- and then unscrew nut.

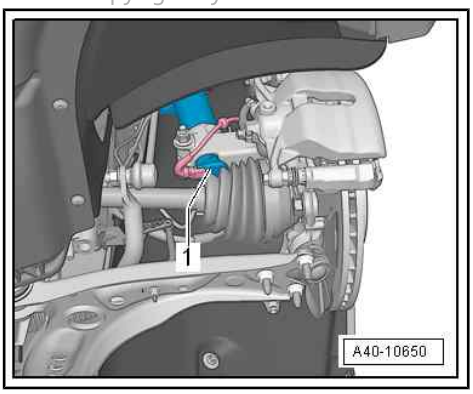


– If fitted, remove nut -4- and move coupling rod clear of vehicle level sender -3-.



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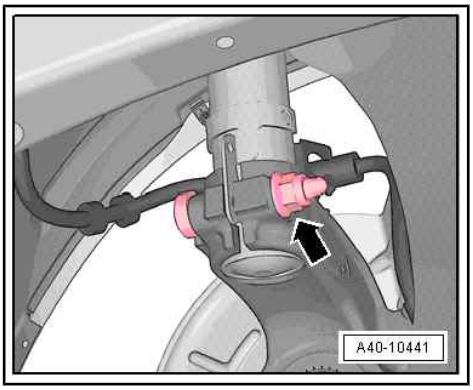
– On vehicles with electronic damping control (Audi magnetic ride), unplug connector -1- and move wiring clear at suspension strut.



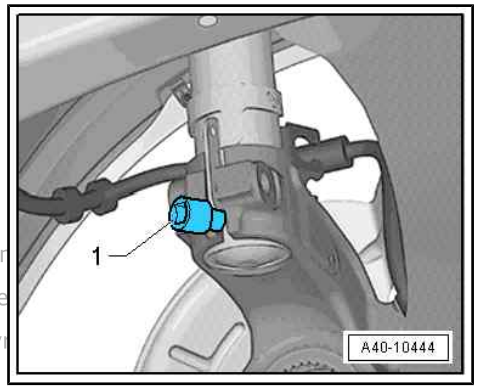
Note

Use both hands to remove the connector: open the catch with one hand whilst pressing off the connector with the other; do not use any tools.

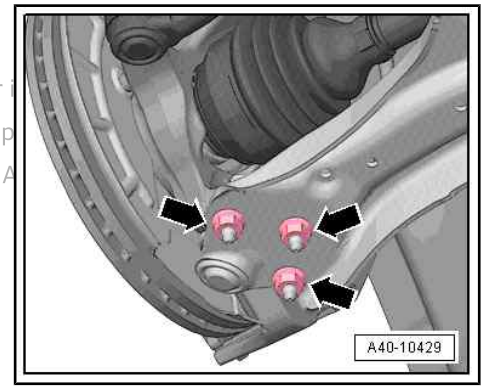
– Remove bolt and nut securing wheel bearing housing/suspension strut -arrow-.



– Insert spreader - 3424- -1- into slot in wheel bearing housing.
– Turn ratchet handle through 90° and pull ratchet handle off spreader - 3424- -1-.



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– Remove nuts -arrows-.

– Guide wishbone out of wheel bearing housing together with swivel joint.

– Pull wheel bearing housing downwards off shock absorber tube.

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Vehicles with sports running gear

– On vehicles with sports running gear: Lower suspension strut. It is not necessary to lower the suspension strut on vehicles not equipped with sports running gear ⇒ page 74 .

All vehicles

– Pull wheel hub off outer joint on 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.*
- *Tie up drive shaft to body with wire.*

– Remove wheel bearing housing with swivel joint.

Installing

Install in reverse sequence, paying attention to the following:

– Tightening bolt securing drive shaft to wheel hub ⇒ page 111 .

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

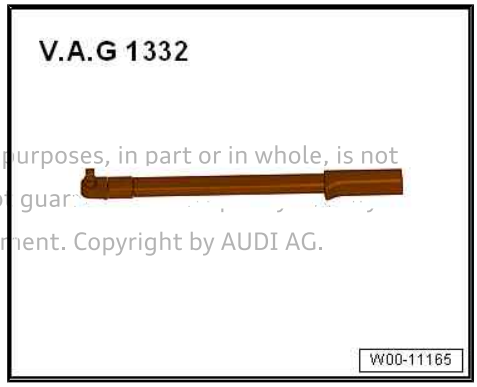
Tightening torques

- ⇒ “5.1 Exploded view - wheel bearing”, page 90
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “3.1 Exploded view - suspension strut, upper wishbone”, page 67
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ Brake system; Rep. gr. 45 ; Sensors; Exploded view - front wheel speed sensor
- ⇒ Brake system; Rep. gr. 46 ; Front brakes; Exploded view - front brake
- ⇒ “1 Wheels, tyres”, page 309

5.3 Removing and installing wheel bearing unit

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



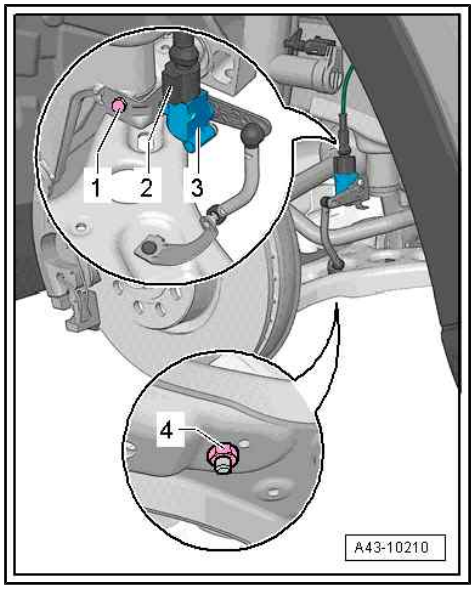
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Removing

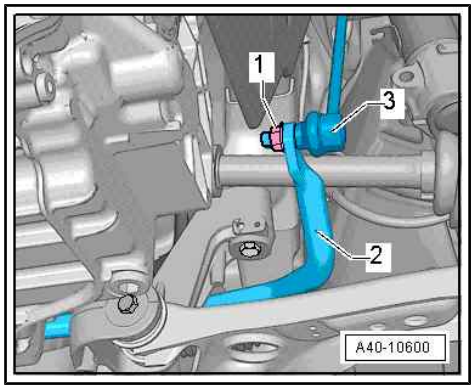
– Loosen bolt securing drive shaft at wheel hub ⇒ page 111 .

– If fitted, remove nut -4- and move coupling rod clear of vehicle level sender -3-.

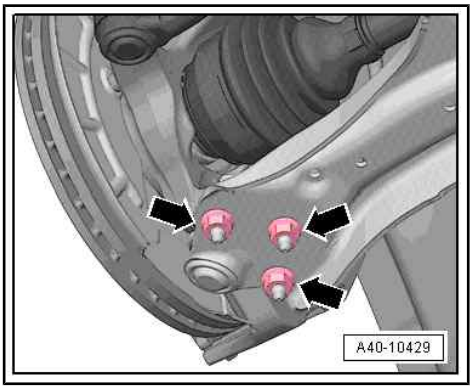
– Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Front brakes; Removing and installing brake disc .



– Remove nut -1-, pull coupling rod -3- out of anti-roll bar -2- and pivot to one side.



– Remove nuts -arrows-.
– Pull wishbone out of swivel joint.



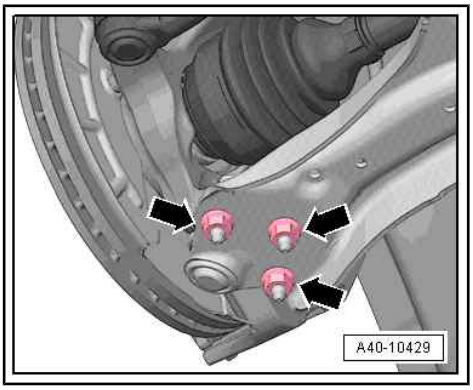
Vehicles with sports running gear

– On vehicles with sports running gear: Lower suspension strut. It is not necessary to lower the suspension strut on vehicles not equipped with sports running gear ⇒ page 74 .

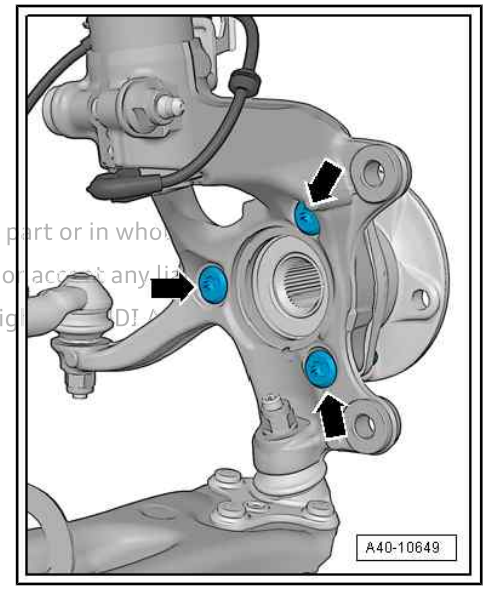
All vehicles

– Pull outer joint of drive shaft out of wheel hub.
– Tie up drive shaft to body with wire.

– Fit swivel joint in wishbone.
– Install nuts -arrows-.



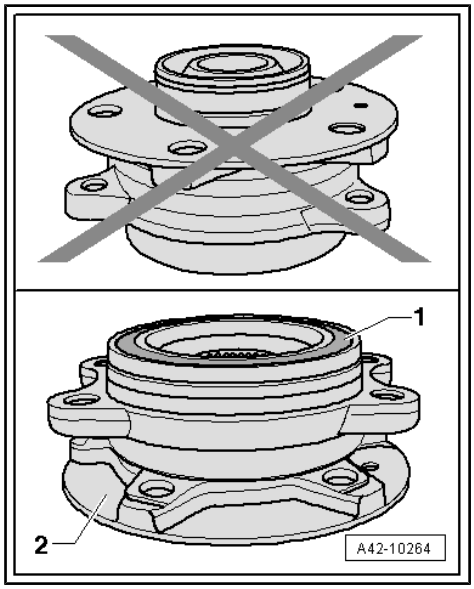
– Remove bolts -arrows-.
– Take wheel bearing unit out of wheel bearing housing.



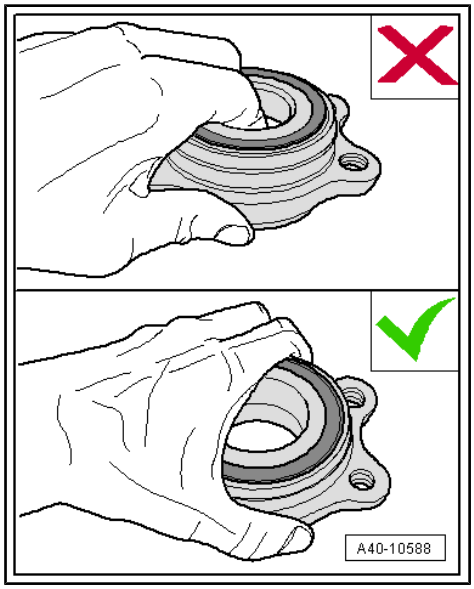
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Caution

- *Avoid dirtying or damaging the seal when laying it down or placing it in storage.*



- 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.



Installing

Installation is carried out in reverse sequence. Note the following:

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “5.1 Exploded view - wheel bearing”, page 90
- ⇒ “3.1 Exploded view - suspension strut, upper wishbone”, page 67
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ Brake system; Rep. gr. 46 ; Front brakes; Exploded view - front brake
- ⇒ “1 Wheels, tyres”, page 309

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6 Drive shaft

⇒ “6.1 Overview - drive shaft”, page 99

⇒ “6.2 Exploded view - drive shaft”, page 100

⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111

⇒ “6.4 Removing and installing heat shield for drive shaft”, page 112

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

⇒ “6.6 Dismantling and assembling drive shaft”, page 136

⇒ “6.7 Checking outer constant velocity joint”, page 166

⇒ “6.8 Checking inner constant velocity joint”, page 167

6.1 Overview - drive shaft

I -
⇒ “6.2.1 Exploded view - drive shaft with inner constant velocity joint (108 mm dia., version with bolted flange)”, page 100

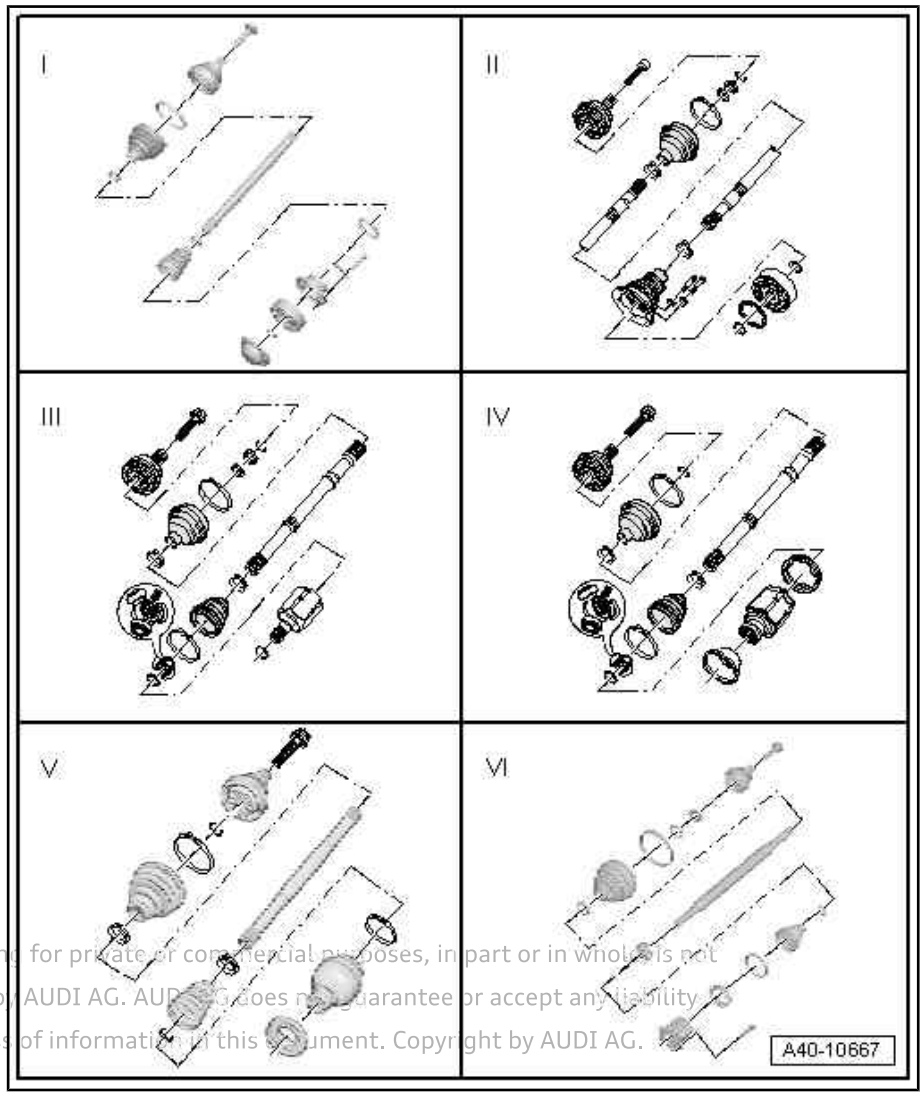
II -
⇒ “6.2.2 Exploded view - drive shaft with inner constant velocity joint (100 mm dia., version with bolted flange)”, page 102

III -
⇒ “6.2.3 Exploded view - drive shaft with triple roller joint AAR2600i/AAR3300i (with external splines for insertion in gearbox)”, page 105

IV -
⇒ “6.2.4 Exploded view - drive shaft with triple roller joint AAR2600i/AAR3300i (with internal splines for gearbox stub shaft)”, page 106

V -
⇒ “6.2.5 Exploded view - drive shaft with sliding constant velocity joint (with internal splines for gearbox stub shaft)”, page 108

VI -
⇒ “6.2.6 Exploded view - drive shaft with triple roller joint AAR 2600i (version with bolted flange)”, page 109



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6.2 Exploded view - drive shaft

⇒ “6.2.1 Exploded view - drive shaft with inner constant velocity joint (108 mm dia., version with bolted flange)”, page 100

⇒ “6.2.2 Exploded view - drive shaft with inner constant velocity joint (100 mm dia., version with bolted flange)”, page 102

⇒ “6.2.3 Exploded view - drive shaft with triple roller joint AAR2600i/AAR3300i (with external splines for insertion in gear-box)”, page 105

⇒ “6.2.4 Exploded view - drive shaft with triple roller joint AAR2600i/AAR3300i (with internal splines for gearbox stub shaft)”, page 106

⇒ “6.2.5 Exploded view - drive shaft with sliding constant velocity joint (with internal splines for gearbox stub shaft)”, page 108

⇒ “6.2.6 Exploded view - drive shaft with triple roller joint AAR 2600i (version with bolted flange)”, page 109

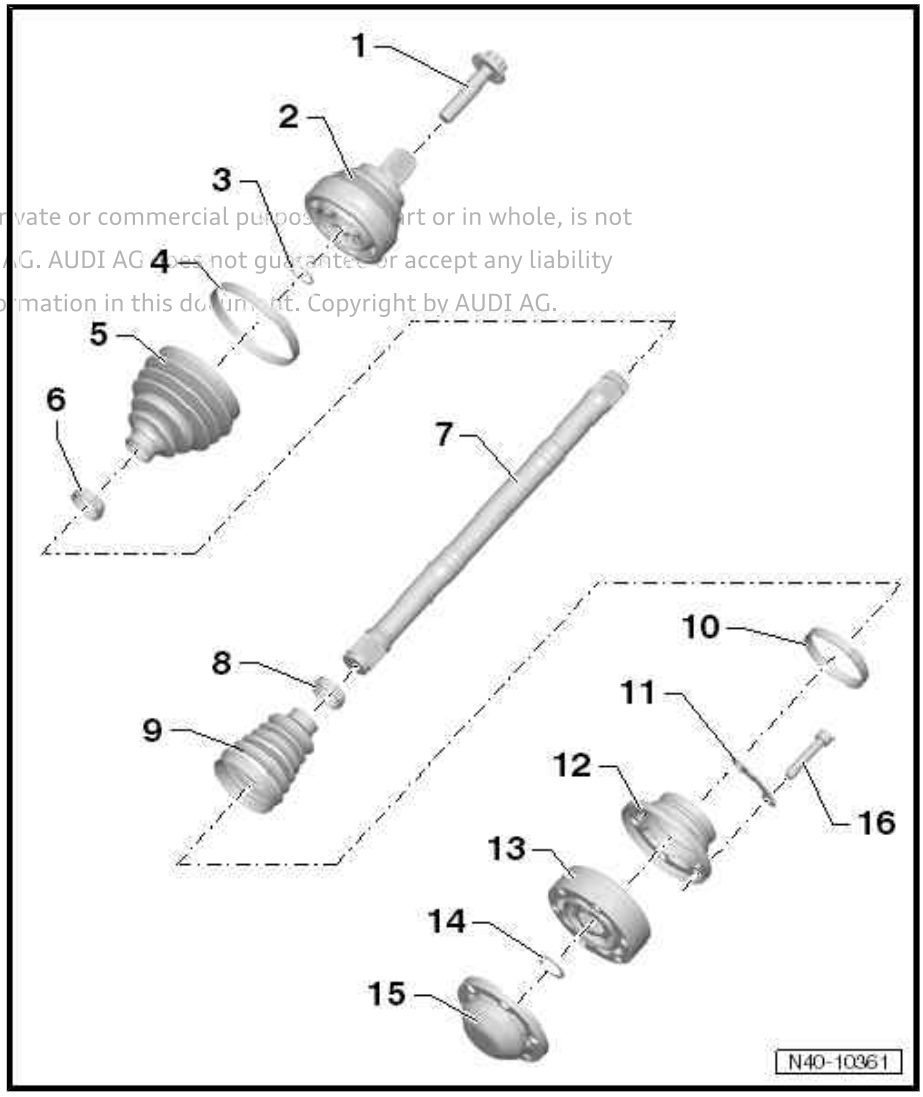
6.2.1 Exploded view - drive shaft with inner constant velocity joint (108 mm dia., version with bolted flange)

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Grease filling of joints

Grease	Outer joint ∅	Inner joint ∅
See ⇒ Electronic parts catalogue “ETKA”	**98 mm**	**108 mm**
Total quantity	120 g	140 g
In joint	80 g	60 g
In boot	40 g	80 g

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1 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.002.795- / 200 Nm + turn 180° further
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

2 - Outer constant velocity joint

- ❑ Checking ⇒ page 166
- ❑ Removing ⇒ page 138
- ❑ Installing ⇒ page 138
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

3 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

4 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 141

5 - Boot for outer constant velocity joint

- ❑ Check for splits and chafing

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 141

7 - Profile shaft

8 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 141

9 - Boot for inner constant velocity joint

- ❑ Check for splits and chafing

10 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 141

11 - Lock plate

12 - Cap

- ❑ Always renew if removed
- ❑ Drive off constant velocity joint with a drift
- ❑ Apply sealant between joint and cover ⇒ page 140

- ❑ Adhesive surface must be free of oil and grease

13 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Checking ⇒ page 167
- ❑ Pressing off ⇒ page 138
- ❑ Pressing on ⇒ page 139
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

14 - Circlip

- ❑ Always renew if removed
- ❑ Removing and installing with -VW 161 A- ⇒ page 139

15 - Cover

- ❑ Always renew if removed
- ❑ Drive off constant velocity joint with a drift
- ❑ Apply sealant between joint and cover ⇒ page 140

16 - Bolt

- ❑ Always renew if removed
- ❑ Initial tightening torque: 10 Nm in diagonal sequence
- ❑ Tightening torque, M8: 40 Nm in diagonal sequence
- ❑ Tightening torque, M10: 70 Nm in diagonal sequence

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6.2.2 Exploded view - drive shaft with inner constant velocity joint (100 mm dia., version with bolted flange)

Grease filling of joints

Grease	Outer joint ∅	Inner joint ∅
See ⇒ Electronic parts catalogue "ETKA"	**90 mm**	**100 mm**
Total quantity	120 g	110 g
In joint	80 g	50 g
In boot	40 g	60 g

1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Checking ⇒ page 166
- ❑ Removing ⇒ page 143
- ❑ Installing ⇒ page 144
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

2 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

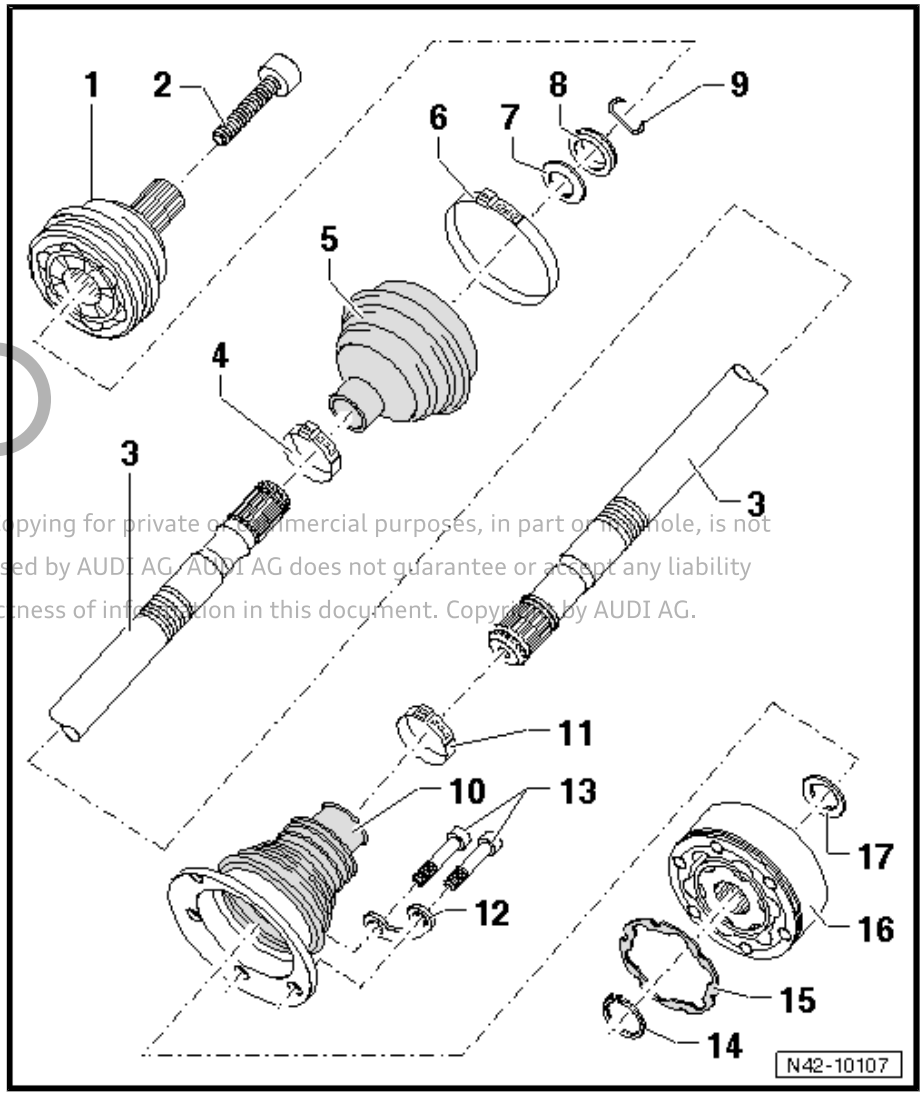
3 - Profile shaft

4 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 146

5 - Boot for outer constant velocity joint

- ❑ Check for splits and



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chafing

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 146

7 - Dished spring

- ❑ Installation position ⇒ page 144

8 - Spacer ring (plastic)

- ❑ Installation position ⇒ page 144

9 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

10 - Boot for inner constant velocity joint

- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Before fitting on constant velocity joint, coat sealing surface with sealant

11 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 146

12 - Lock plate

13 - Multi-point socket head bolt

- ❑ Always renew if removed
- ❑ Initial tightening torque: 10 Nm in diagonal sequence
- ❑ Tightening torque, M8: 40 Nm in diagonal sequence
- ❑ Tightening torque, M10: 70 Nm in diagonal sequence

14 - Circlip

- ❑ Always renew if removed
- ❑ Removing and installing with -VW 161 A- ⇒ page 143

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15 - Gasket

- ❑ Adhesive surface on constant velocity joint must be free of oil and grease

16 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Checking ⇒ page 167
- ❑ Pressing off ⇒ page 145
- ❑ Pressing on ⇒ page 145
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

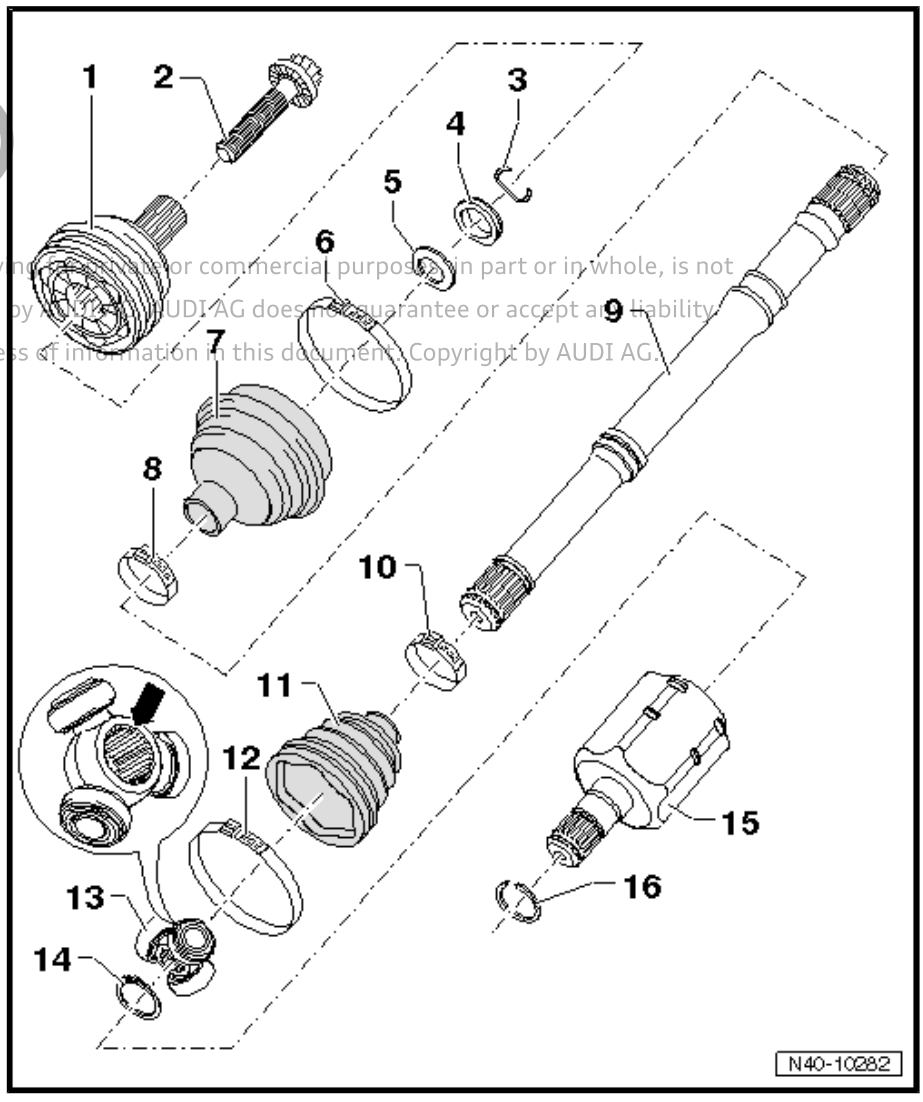
17 - Dished spring

- ❑ Installation position ⇒ page 144

6.2.3 Exploded view - drive shaft with triple roller joint AAR2600i/AAR3300i (with external splines for insertion in gearbox)

Grease filling of joints

Grease	Outer joint	Inner joint/triple roller
See ⇒ Electronic parts catalogue "ETKA"		
Total quantity	120 g	140 g
In joint	80 g	70 g
In boot	40 g	70 g



1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 149
- ❑ Installing: drive onto shaft with plastic hammer until compressed circlip seats
- ❑ Checking ⇒ page 166

2 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

3 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

4 - Thrust ring

- ❑ Not installed in all versions
- ❑ Installation position ⇒ page 149

5 - Dished spring

- ❑ Not installed in all versions
- ❑ Installation position ⇒ page 149

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 151

7 - Boot for constant velocity joint

- ❑ Check for splits and chafing

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8 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 151

9 - Drive shaft

10 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 151

11 - Boot for triple roller joint

- ❑ Check for splits and chafing

12 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 151

13 - Triple roller spider with rollers

Chamfer -arrow- faces towards drive shaft splines

14 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

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15 - Joint body

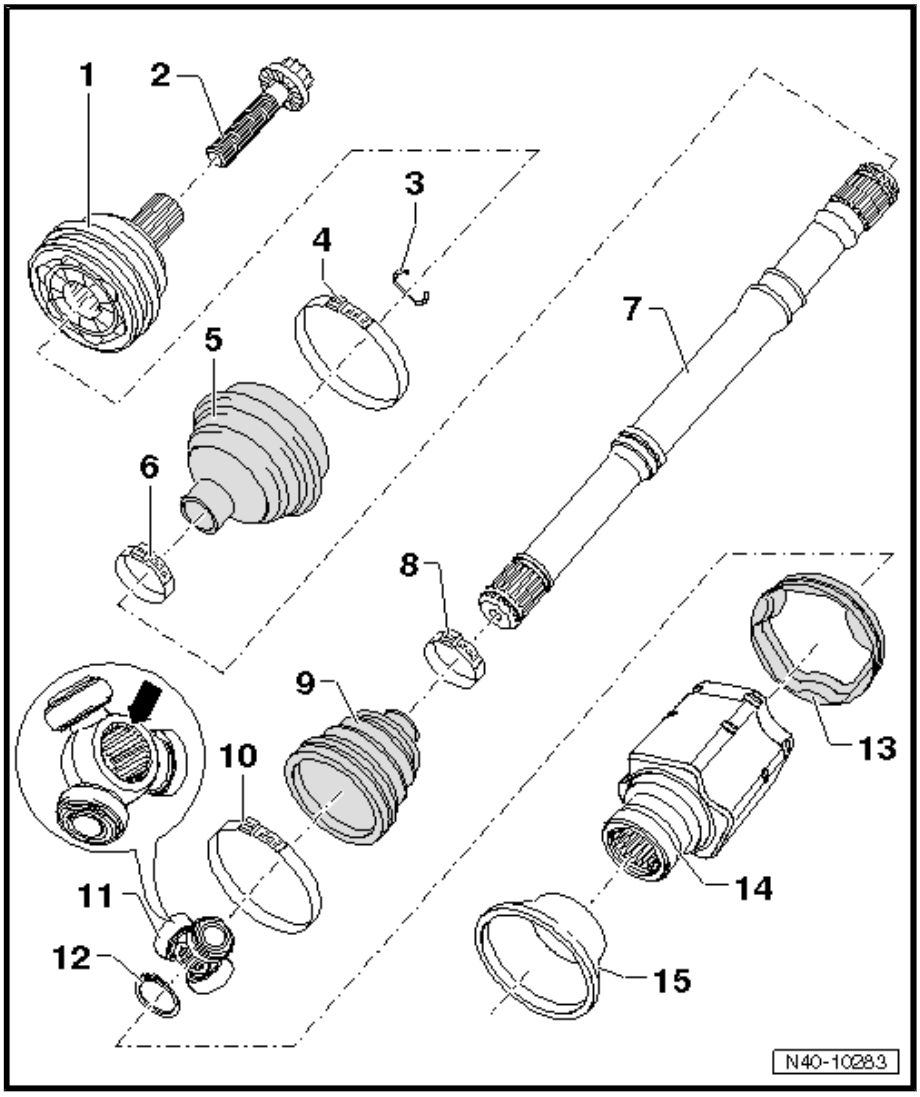
16 - Circlip

- ❑ Always renew if removed

6.2.4 Exploded view - drive shaft with triple roller joint AAR2600i/AAR3300i (with internal splines for gearbox stub shaft)

Grease filling of joints

Grease	Outer joint	Inner joint/triple roller
See ⇒ Electronic parts catalogue "ETKA"		
Total quantity	120 g	140 g
In joint	80 g	70 g
In boot	40 g	70 g



1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 154
- ❑ Installing: drive onto shaft with plastic hammer until compressed circlip seats
- ❑ Checking ⇒ page 166

2 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

3 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

4 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 156

5 - Boot for constant velocity joint

- ❑ Check for splits and chafing

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 156

7 - Drive shaft

8 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 156

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9 - Boot for triple roller joint

- ❑ Check for splits and chafing

10 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 156

11 - Triple roller spider with rollers

Chamfer -arrow- faces towards drive shaft splines

12 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

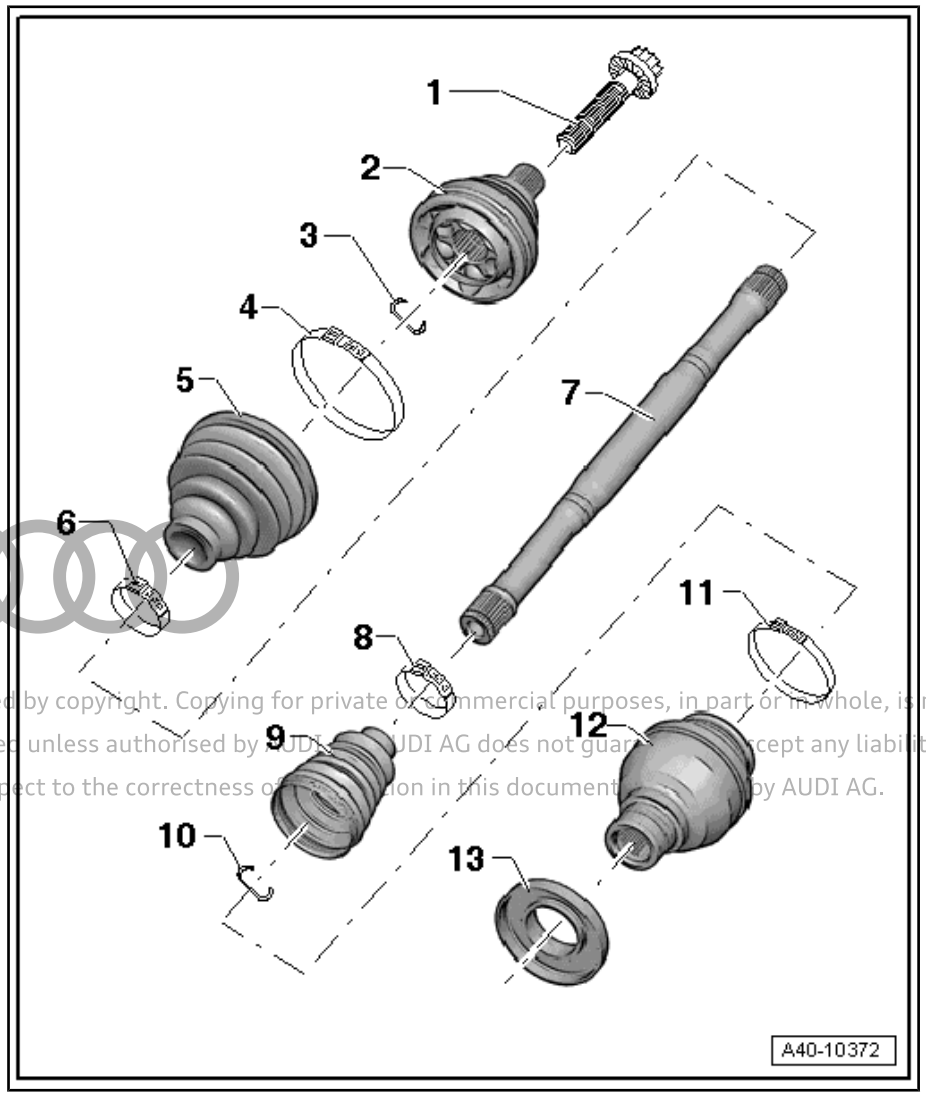
13 - Adapter

14 - Joint body

15 - Protective cap

- ❑ Detaching ⇒ page 157
- ❑ Driving on ⇒ page 157

6.2.5 Exploded view - drive shaft with sliding constant velocity joint (with internal splines for gearbox stub shaft)



1 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ 200 Nm +180°

2 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Distribute grease filling through ball races
- ❑ Removing ⇒ page 159
- ❑ Installing: drive onto shaft as far as stop using plastic hammer
- ❑ Checking ⇒ page 166

3 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

4 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 161

5 - Boot

- ❑ Check for splits and chafing

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 161

7 - Drive shaft

8 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 161

9 - Boot for sliding constant velocity joint

- ❑ Check for splits and chafing

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10 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

11 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 161

12 - Sliding constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 159
- ❑ Distribute grease filling through ball races
- ❑ Installing: drive onto shaft as far as stop using plastic hammer

13 - Protective cap

- ❑ Detaching ⇒ page 162
- ❑ Driving on ⇒ page 162

6.2.6 Exploded view - drive shaft with triple roller joint AAR 2600i (version with bolted flange)

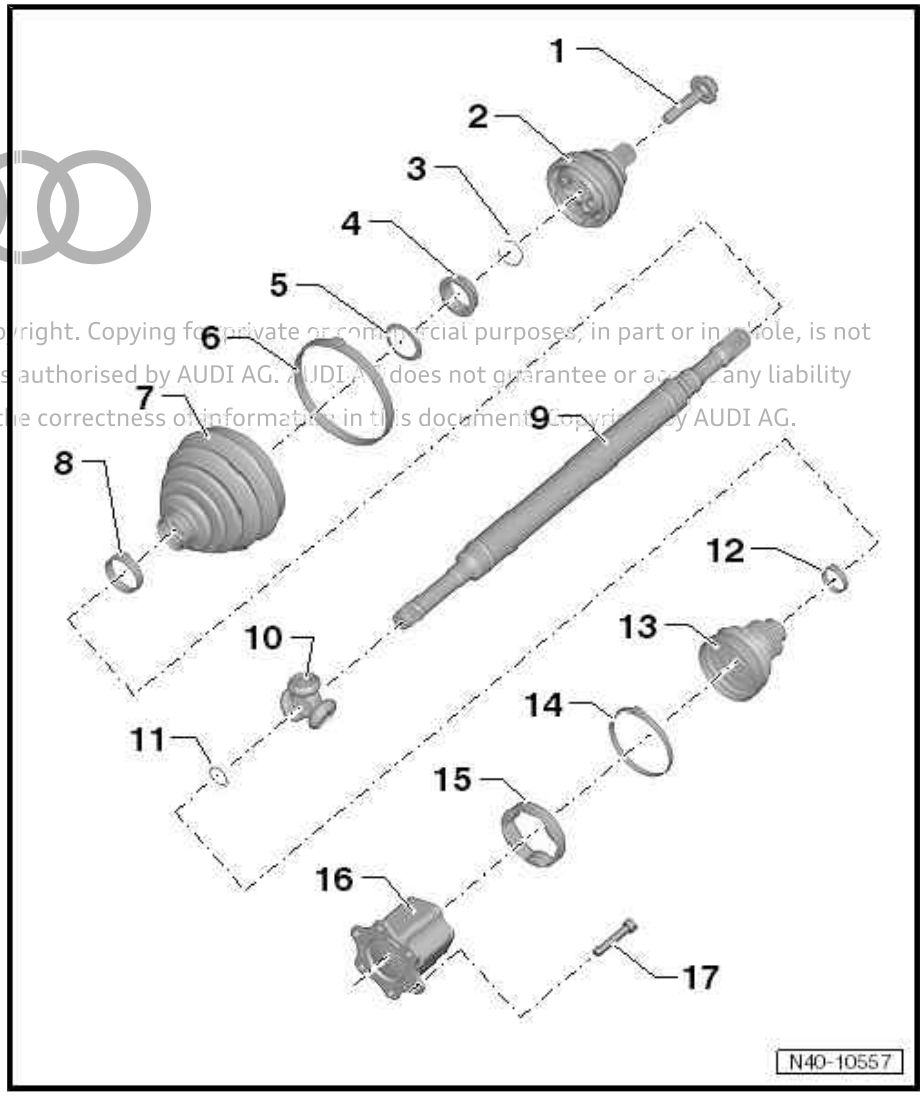
Grease filling of joints

For total quantity of grease, refer to ⇒ Electronic parts catalogue “ETKA”	Outer joint
	120 g
In joint	80 g
In boot	40 g
For total quantity of grease, refer to ⇒ Electronic parts catalogue “ETKA”	Triple roller joint
	140 g
In joint	70 g
In boot	70 g

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Note

Regrease joint when renewing boot.



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1 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 111
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

2 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 164
- ❑ Installing ⇒ page 164
- ❑ Checking ⇒ page 166
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

3 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

4 - Spacer ring (plastic)

- ❑ Installation position ⇒ page 164

5 - Spring plate

- ❑ Installation position ⇒ page 164

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 165

7 - Boot for constant velocity joint

- ❑ Check for splits and chafing

8 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 165

9 - Profile shaft

10 - Triple roller spider with rollers

- ❑ Chamfer -arrow- faces towards drive shaft splines
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting triple roller spider onto drive shaft

11 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

12 - Hose clip

- ❑ Always renew if removed

- ❑ Tightening ⇒ page 165

13 - Boot for triple roller joint

- ❑ Check for splits and chafing

14 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 165

15 - Adapter

16 - Joint body (version with bolted flange)

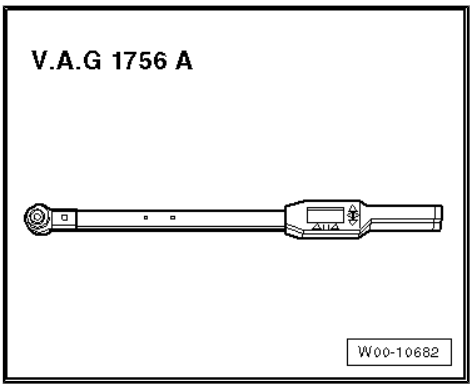
17 - Bolt

- ❑ Always renew if removed
- ❑ Initial tightening torque: 10 Nm in diagonal sequence
- ❑ Tightening torque, M8: 40 Nm in diagonal sequence
- ❑ Tightening torque, M10: 70 Nm in diagonal sequence

6.3 Loosening and tightening bolt securing drive shaft

Special tools and workshop equipment required

- ♦ Angle wrench - V.A.G 1756 A-



- ♦ Socket, 24 mm - T10361A-



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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 loosening 12-point bolt

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.

Loosening 12-point bolt



– To avoid damage to wheel bearing, slacken off 12-point bolt -arrow- no further than 90° with vehicle standing on its wheels, using socket (24 mm) - T10361A- .
– Raise vehicle so that wheels are off the ground.
– Have a second mechanic press the brake pedal.
– Remove 12-point bolt -arrow-.

Note

Before securing, clean the threads in the CV joint using a thread tap

Installing 12-point bolt

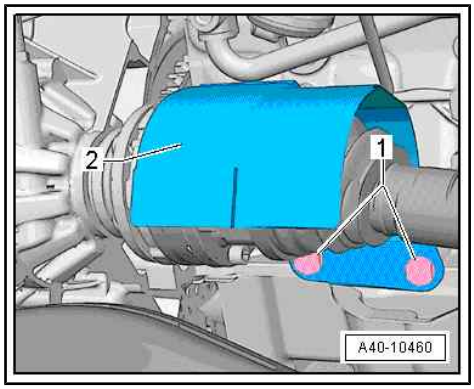
– Renew 12-point bolt.

Note

The wheels must not be in contact with the ground when initially tightening the drive shaft bolt; otherwise the wheel bearing can be damaged.

– Have a second mechanic press the brake pedal.
– Tighten 12-point bolt to 200 Nm.
– Lower vehicle onto its wheels.
– Turn 12-point bolt -WHT.005.437- / black 180° further.
– Turn 12-point bolt -WHT.005.437.A- / silver 90° further.

6.4 Removing and installing heat shield for drive shaft



Front-wheel drive:

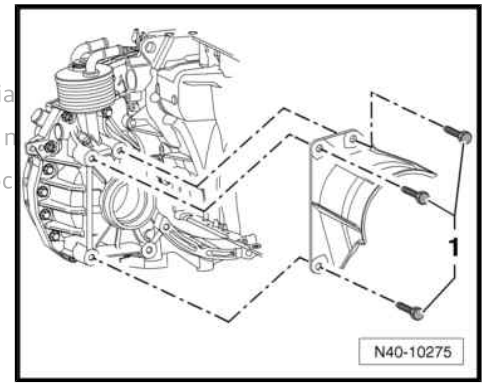
Component	Tightening torque
Bolts -1-	25 Nm

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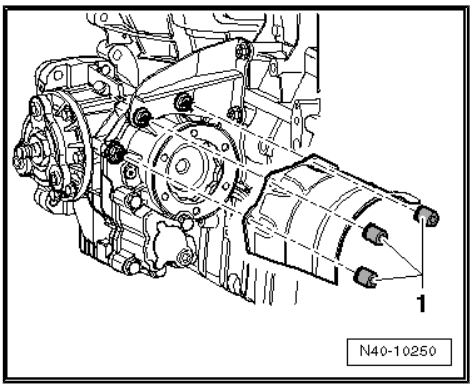
Automatic gearbox, front-wheel drive:

Component	Tightening torque
Bolts -1-	40 Nm



Four-wheel drive:

Component	Tightening torque
Nuts -1-	20 Nm ♦ Pre-tighten all nuts to 10 Nm



6.5 Removing and installing drive shaft

⇒ “6.5.1 Removing and installing left drive shaft (version with bolted flange on inner joint)”, page 113

⇒ “6.5.2 Removing and installing right drive shaft (version with bolted flange on inner joint)”, page 116

⇒ “6.5.3 Removing and installing drive shaft with triple roller joint AAR3300i (with external splines for insertion in gearbox)”, page 118

⇒ “6.5.4 Removing and installing drive shafts with triple roller joint AAR3300i (with internal splines for gearbox stub shaft)”, page 122

⇒ “6.5.5 Removing and installing drive shaft (left-side) with sliding CV joint (version with internal splines on inner joint)”, page 126

⇒ “6.5.6 Removing and installing drive shaft (right-side) with sliding CV joint (version with internal splines on inner joint)”, page 131

6.5.1 Removing and installing left drive shaft (version with bolted flange on inner joint)

Removing

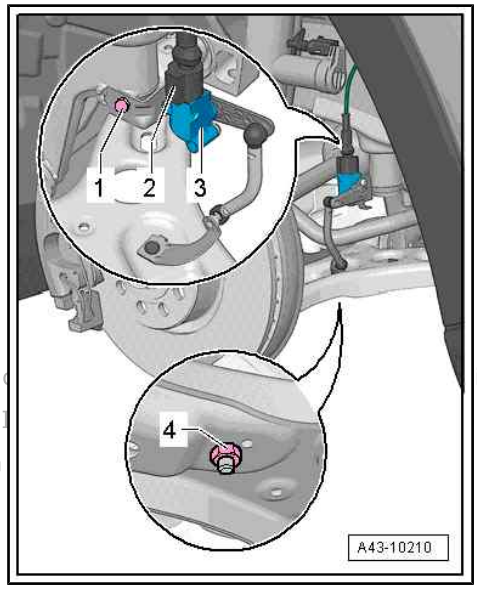


– Loosen bolt securing drive shaft at wheel hub -arrow- ⇒ page 111 .

– Remove wheel ⇒ page 309 .

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

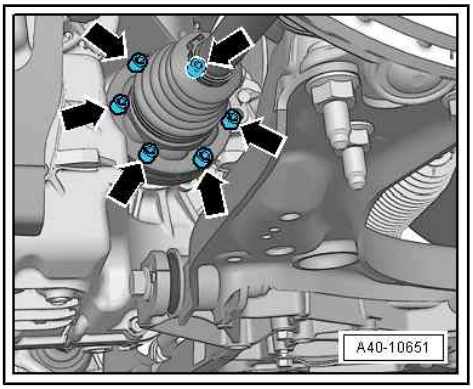
– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



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– Unbolt drive shaft from flange shaft on gearbox -arrows- and pivot upwards.

– Turn wheel bearing housing to left.



Vehicles with sports running gear

– On vehicles with sports running gear: Lower suspension strut. It is not necessary to lower the suspension strut on vehicles not equipped with sports running gear ⇒ page 74 .

All vehicles

– Pull drive shaft out of wheel hub.

– Take out drive shaft.

Installing

Install in reverse sequence, paying attention to the following:

- 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 “ETKA” .
- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

- ⇒ “6.2.2 Exploded view - drive shaft with inner constant velocity joint (100 mm dia., version with bolted flange)”, page 102
- ⇒ “6.2.1 Exploded view - drive shaft with inner constant velocity joint (108 mm dia., version with bolted flange)”, page 100
- ⇒ “6.2.6 Exploded view - drive shaft with triple roller joint AAR 2600i (version with bolted flange)”, page 109
- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

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6.5.2 Removing and installing right drive shaft (version with bolted flange on inner joint)

Removing

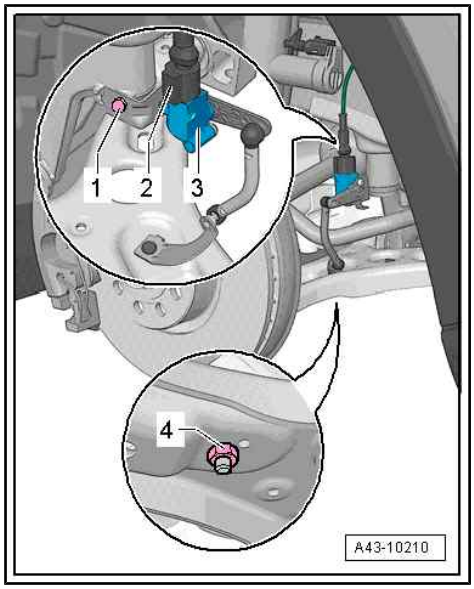
– Loosen bolt securing drive shaft at wheel hub -arrow- ⇒ page 111 .

– Remove wheel ⇒ page 309 .

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

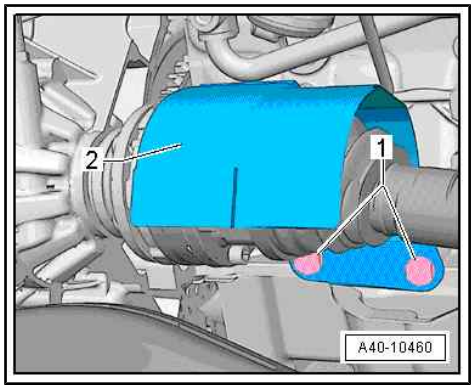


– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



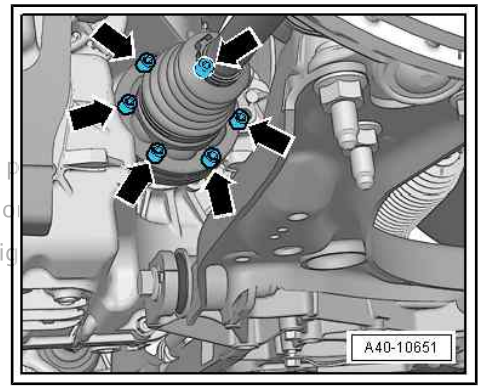
– If fitted, remove bolts -1- and detach heat shield -2-.

– Remove coupling rod ⇒ page 65 .



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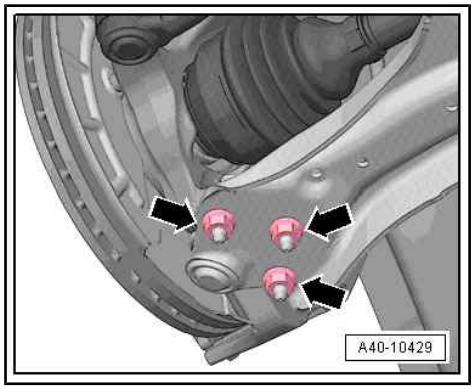
– Unbolt drive shaft from gearbox flange -arrows-.



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– Remove nuts -arrows- on swivel joint.

– Detach wishbone from swivel joint.



Vehicles with sports running gear

– On vehicles with sports running gear: Lower suspension strut. It is not necessary to lower the suspension strut on vehicles not equipped with sports running gear ⇒ page 74 .

– Swivel out suspension strut and at the same time guide drive shaft out of wheel bearing unit.

– Take out drive shaft.

Installing

Install in reverse sequence, paying attention to the following:

- 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 “ETKA” .
- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

- ⇒ “6.2.2 Exploded view - drive shaft with inner constant velocity joint (100 mm dia., version with bolted flange)”, page 102
- ⇒ “6.2.1 Exploded view - drive shaft with inner constant velocity joint (108 mm dia., version with bolted flange)”, page 100
- ⇒ “6.2.6 Exploded view - drive shaft with triple roller joint AAR 2600i (version with bolted flange)”, page 109
- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “3.1 Exploded view - suspension strut, upper wishbone”, page 67
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ “6.4 Removing and installing heat shield for drive shaft”, page 112
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

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6.5.3 Removing and installing drive shaft with triple roller joint AAR3300i (with external splines for insertion in gearbox)

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



♦ Assembly lever

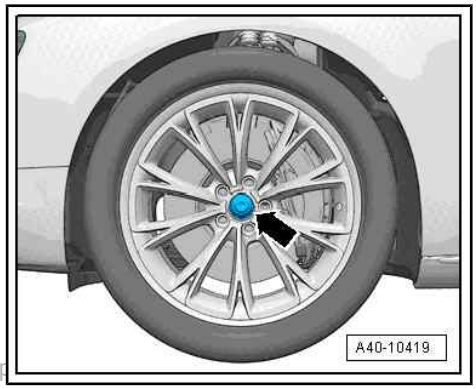
Removing

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

– Remove wheel ⇒ page 309 .

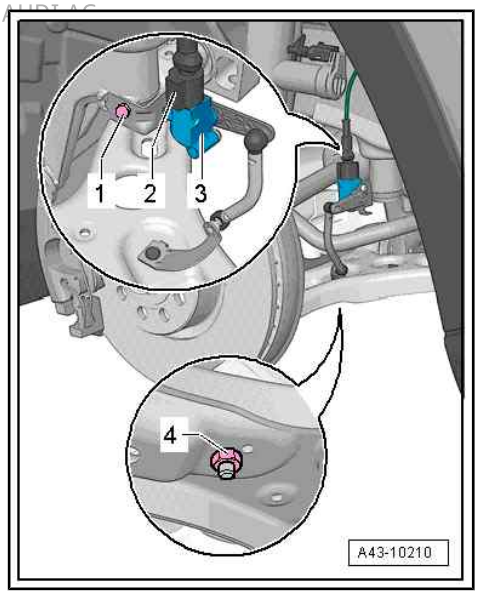
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

– Remove coupling rod ⇒ page 65 .

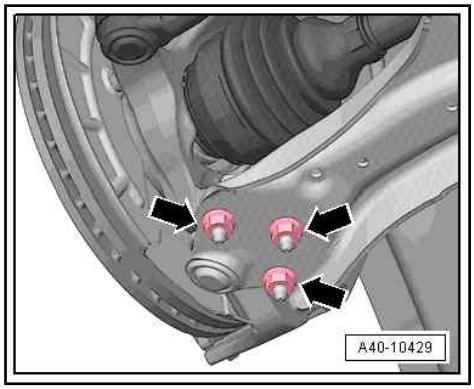


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– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



– Remove nuts -arrows- on swivel joint.
– Detach wishbone from swivel joint.
– Swivel out suspension strut and at the same time press drive shaft out of wheel hub.
– Tie up drive shaft to body.

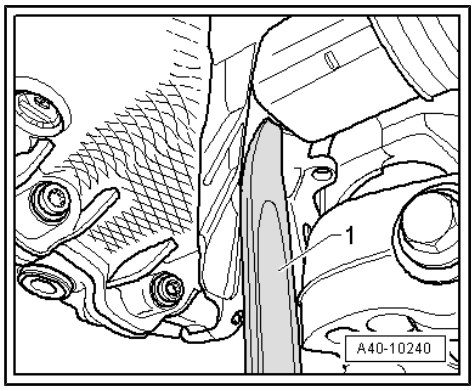


Note

Do not allow the drive shaft to hang down under its own weight; this would bend the inner joint too far and damage it.

• A second person is required for the next steps.

– Apply assembly lever -1- between gearbox housing and inner triple roller joint.
– Carefully pry drive shaft off joint pin (have a second mechanic hold the drive shaft to prevent it from dropping).
– Take out drive shaft.



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Installing

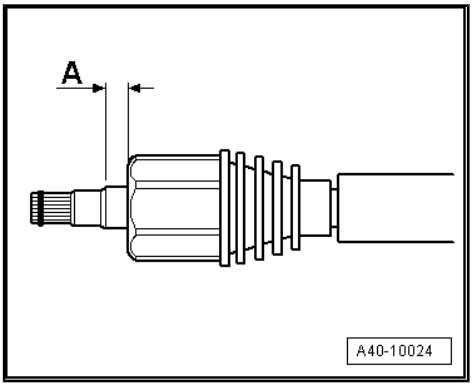
Install in reverse sequence, paying attention to the following:

– Circlip on drive shaft must always be renewed following removal.

– If fitted: Renew O-ring for drive shaft.

– On gearboxes not sealed with internally splined sleeve: Renew oil seal on gearbox ⇒ Gearbox; Rep. gr. 39 ; Oil seals; Overview of fitting locations - oil seals .

– Grease pin on end of joint in area -A- all round with approx. 0.5 g of grease ⇒ Electronic parts catalogue “ETKA” .



• Install drive shaft at gearbox end first.

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

– Take hold of drive shaft and slide it into joint body as far as it will go.

– Then push joint body firmly into gearbox with a sudden, hard push so that circlip engages.

Note

◆ *If the drive shaft cannot be pushed in easily, even though the splines are aligned correctly, you can make use of the sliding travel in the constant velocity joint. However, do not pull the drive shaft too far out of the joint body.*

◆ *DO NOT use a hammer or the like.*

– Check that the joint body is fitted securely by pulling the joint against the resistance of the circlip.

Caution

When making this check, only pull on the joint body. Do not pull the 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 “ETKA” .

• On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.

• If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .

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

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Tightening torques

◆ ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111

◆ ⇒ “2.1 Exploded view - front vehicle level senders”, page 302

◆ ⇒ “2.1 Exploded view - subframe”, page 18

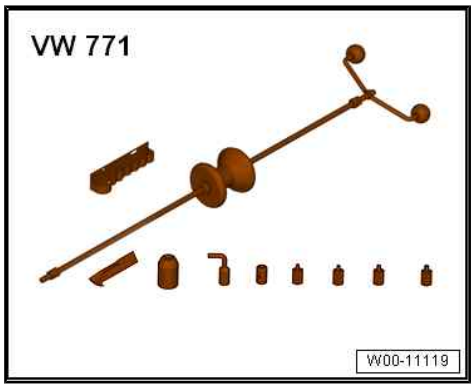
◆ ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77

- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

6.5.4 Removing and installing drive shafts with triple roller joint AAR3300i (with internal splines for gearbox stub shaft)

Special tools and workshop equipment required

- Multi-purpose tool - VW 771-

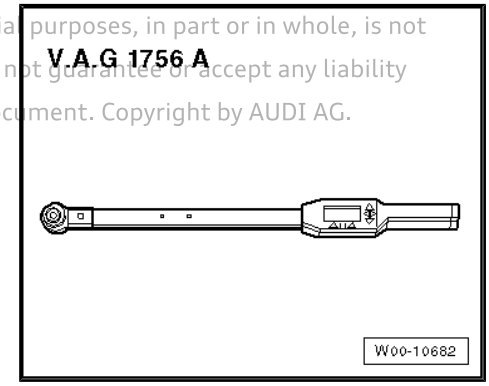


- Torque wrench - V.A.G 1332-

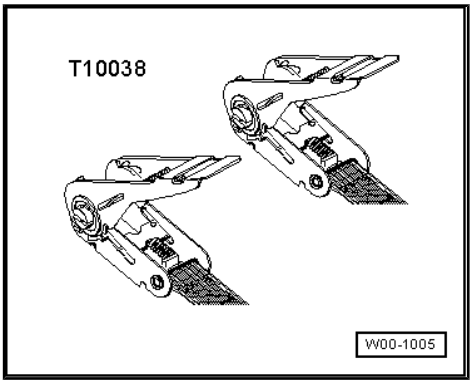


- Angle wrench - V.A.G 1756 A-

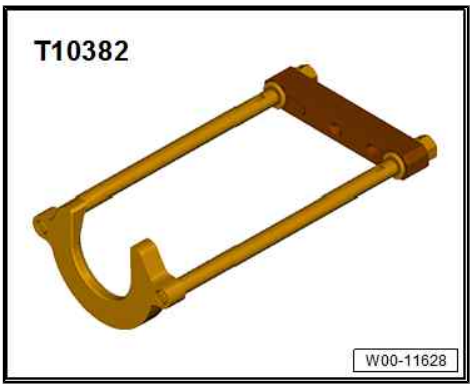
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♦ Tensioning strap - T10038-



♦ Puller - T10382-



Removing

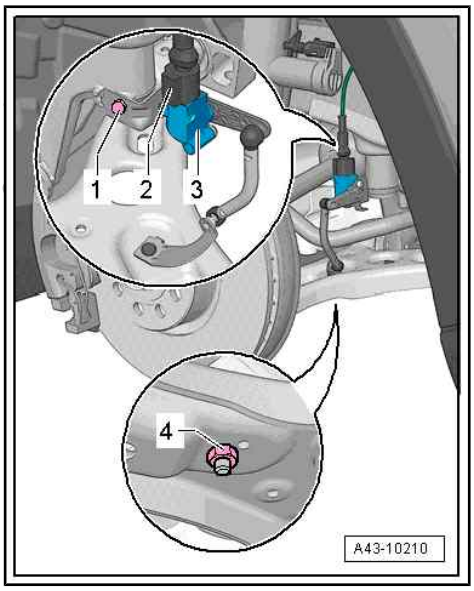
– Loosen bolt securing drive shaft at wheel hub -arrow- ⇒ page 111 .

– Remove wheel ⇒ page 309 .

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

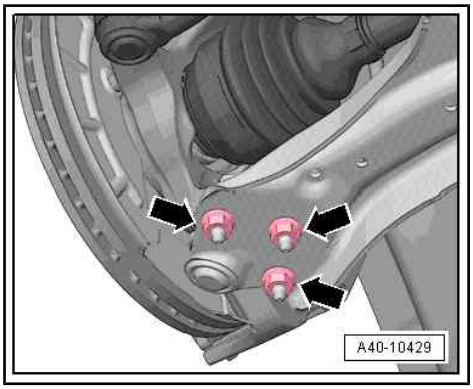


– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



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with respect to the correctness of information in this do

– Remove nuts -arrows-.
– Pull wheel bearing housing with swivel joint out of wishbone.
– Slide outer joint by hand out of wheel hub.
– Secure drive shaft to prevent it from dropping.



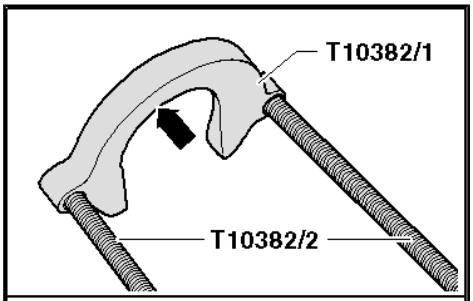
Note

Do not allow the drive shaft to hang down under its own weight; this would bend the inner joint too far and damage it.

– Set up puller - T10382- .

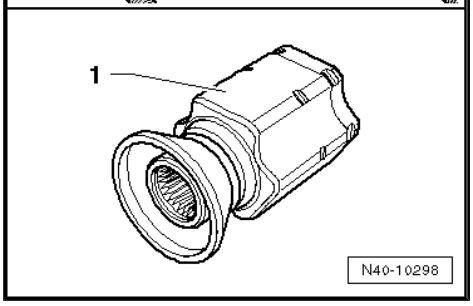
For the joint body -1- the surface -arrow- on the puller plate - T10382/1- must face the spindles - T10382/2- .

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

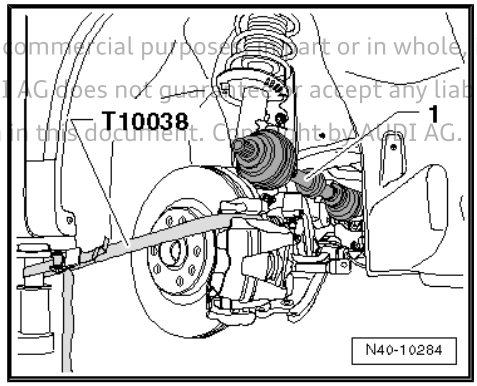


Note

The suspension strut with all the attached components must be pulled towards the rear in order to extract the drive shaft from the gearbox using puller - T10382- .



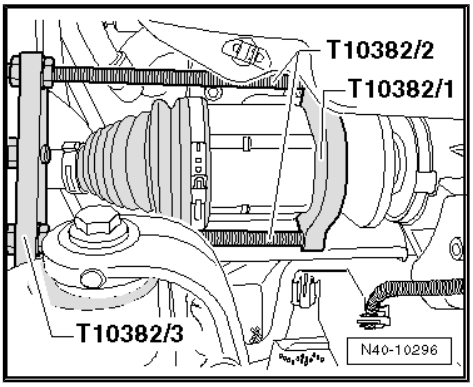
– Pull suspension strut with attached components towards the rear using tensioning strap - T10038- (e.g. secured to arm of lifting platform) until puller - T10382- can be inserted parallel with drive shaft.



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– Insert puller - T10382- and pull out drive shaft.

– Take drive shaft out of vehicle.



Installing

Install in reverse sequence, paying attention to the following:

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

Only for right side of vehicle and all-wheel drive

– Strike end of stub shaft using a plastic hammer.

Caution

- *This ensures that the circlip on the stub shaft engages correctly in the differential pinion.*
- *It will also help to prevent leakage.*

Both sides (continued)

– Fit new circlip in groove on stub shaft of gearbox.

– Renew oil seal on gearbox ⇒ Gearbox; Rep. gr. 39 ; Oil seals; Overview of fitting locations - oil seals .

– Apply approx. 2 g of grease all round splines on end of gearbox shaft ⇒ Electronic parts catalogue “ETKA” .

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

– Take hold of drive shaft and slide it into joint body as far as it will go.

– Now push joint body onto stub shaft of gearbox with a sudden, hard push.

– Push drive shaft joint onto end of gearbox shaft until circlip engages.

Note

DO NOT use a hammer or the like.

– Check that the joint body is fitted correctly by pulling the joint against the resistance of the circlip.

Caution

When making this check, only pull on the joint body. Do not pull the 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 “ETKA” .

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .

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

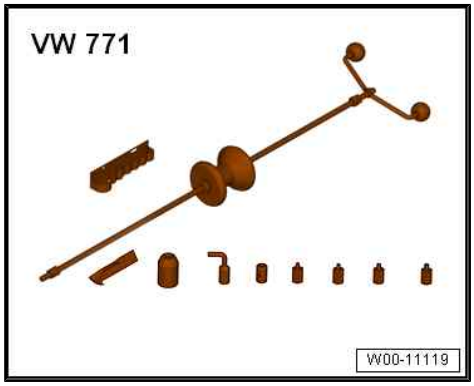
Tightening torques

- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

6.5.5 Removing and installing drive shaft (left-side) with sliding CV joint (version with internal splines on inner joint)

Special tools and workshop equipment required

- Multi-purpose tool - VW 771-

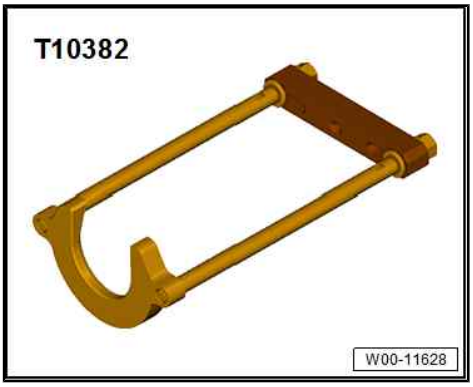


- Torque wrench - V.A.G 1332-



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♦ Puller - T10382-



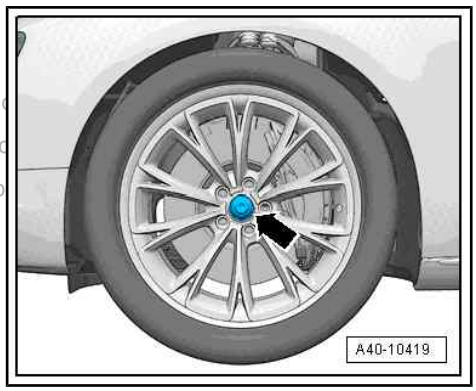
Removing

– Loosen bolt securing drive shaft at wheel hub -arrow- ⇒ page 111

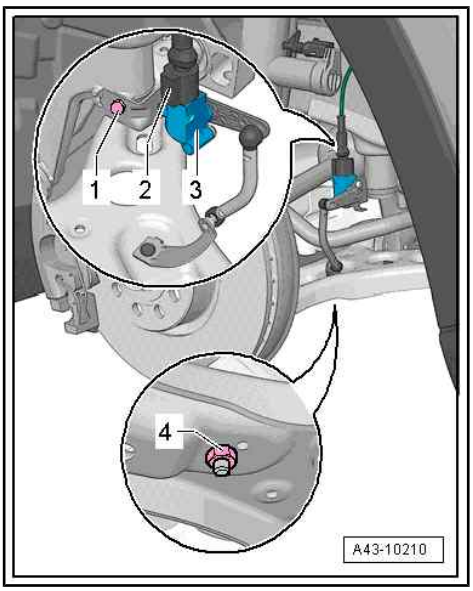
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– Remove wheel ⇒ page 309

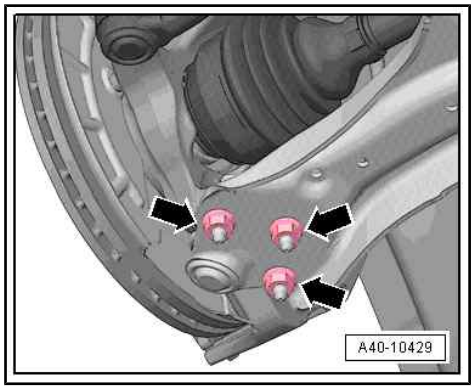
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



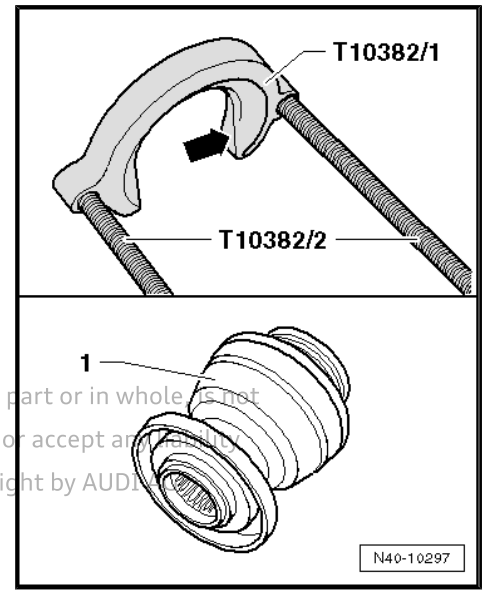
– Remove nuts -arrows-.
– Detach wishbone from swivel joint.
– Swivel out suspension strut and at the same time guide drive shaft out of wheel bearing unit.
– Slide outer joint by hand out of wheel hub.
– Secure drive shaft to prevent it from dropping.



Note

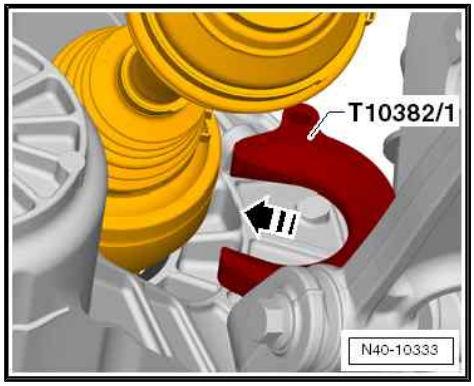
The suspension strut with all the attached components must be pulled towards the rear in order to extract the drive shaft from the gearbox using puller - T10382- . When doing this, take care not to damage any other parts (such as the brake hose or ABS wiring).

– Set up puller - T10382- .
• For the sliding constant velocity joint -1- the recess -arrow- on the puller plate - T10382/1- must face the spindles - T10382/2- .

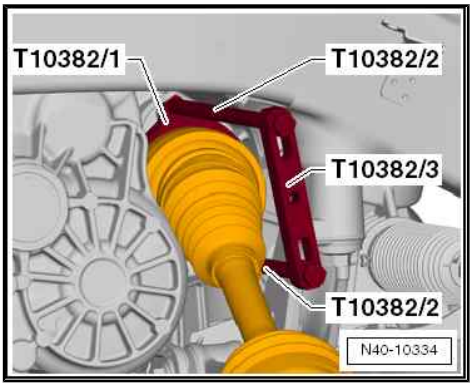


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– Apply puller plate - T10382/1- behind sliding constant velocity joint -1-.
• The recess -arrow- on puller plate - T10382/1- must face towards sliding constant velocity joint -1-.



– Attach spindles - T10382/2- and cross piece - T10382/3- to puller plate - T10382/1- .
– Attach multi-purpose tool - VW 771- to cross piece - T10382/3- .
– Pull out drive shaft by striking multi-purpose tool - VW 771- as required.
– Take drive shaft out of vehicle.



Installing

Install in reverse sequence, paying attention to the following:

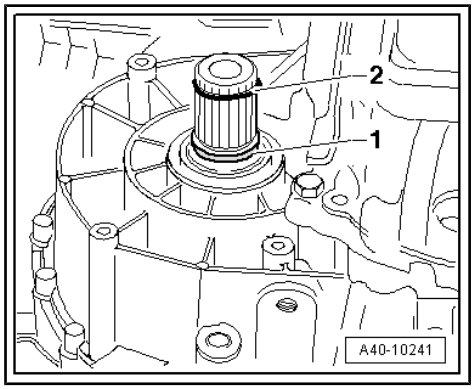
– Before fitting the outer joint in the wheel hub, apply a thin coat of assembly paste to the splines on the outer joint ⇒ Electronic parts catalogue “ETKA” .

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

– Renew oil seal on gearbox ⇒ Gearbox; Rep. gr. 39 ; Oil seals; Overview of fitting locations - oil seals .

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– Fit new seal -1- and circlip -2- in groove of stub shaft on gearbox.
– Apply approx. 2 g of grease all round splines on end of gearbox shaft ⇒ Electronic parts catalogue “ETKA” .
– Mesh outer and inner splines of gearbox shaft and sliding constant velocity joint.
– Take hold of drive shaft and slide it into constant velocity joint as far as it will go.
– Then push constant velocity joint onto stub shaft on gearbox with a sudden, hard push.



Note

- *If the drive shaft cannot be pushed in easily, even though the splines are aligned correctly, you can make use of the sliding travel in the constant velocity joint.*
- *DO NOT use a hammer or the like.*

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– Check that the sliding constant velocity joint is fitted securely by pulling the joint against the resistance of the circlip.

Caution

When making this check, only pull on the CV joint. Do not pull the drive shaft.

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

Note

Ensure sealing boot is not damaged or twisted.

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

6.5.6 Removing and installing drive shaft (right-side) with sliding CV joint (version with internal splines on inner joint)

Special tools and workshop equipment required

- Multi-purpose tool - VW 771-

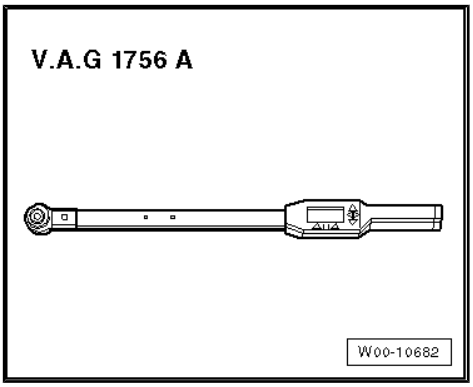


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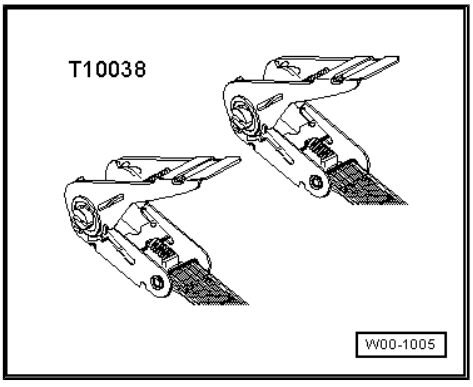
- Torque wrench - V.A.G 1332-



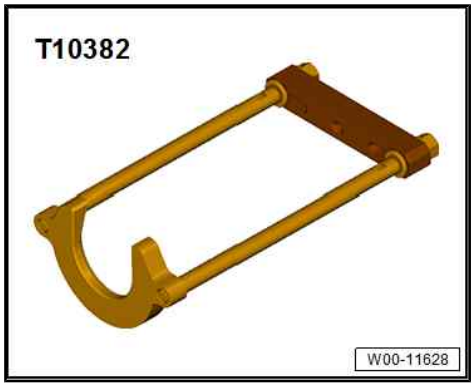
- Angle wrench - V.A.G 1756 A-



- Tensioning strap - T10038-



♦ Puller - T10382-

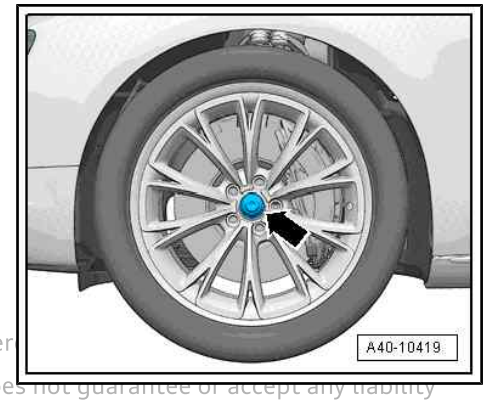


Removing

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

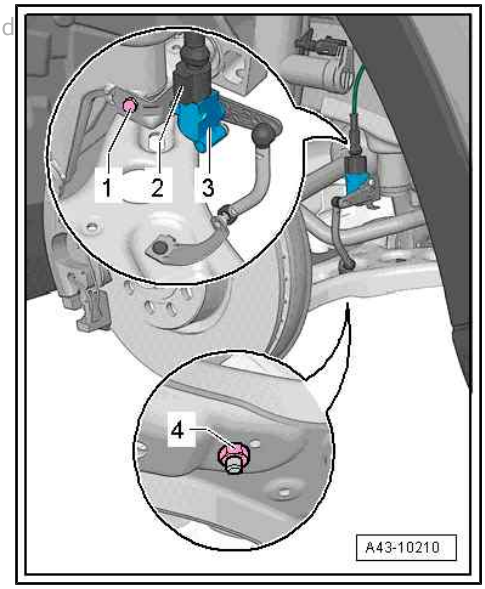
– Remove wheel ⇒ page 309 .

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

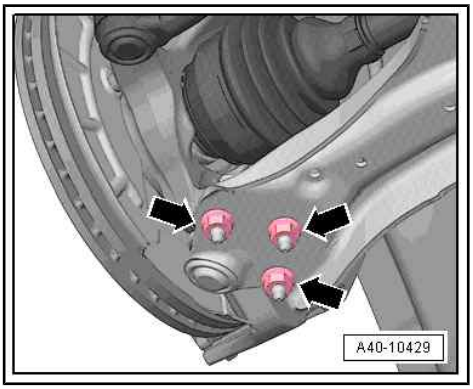


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– If fitted, unscrew nut -4- and detach coupling rod of vehicle level sender from wishbone.



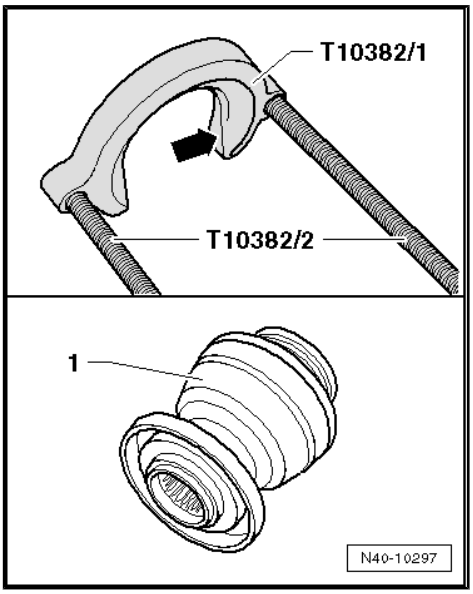
– Remove nuts -arrows- on swivel joint.
– Detach wishbone from swivel joint.
– Swivel out suspension strut and at the same time guide drive shaft out of wheel bearing unit.
– Slide outer joint by hand out of wheel hub.
– Secure drive shaft to prevent it from dropping.



Note

The suspension strut with all the attached components must be pulled towards the rear in order to extract the drive shaft from the gearbox using puller - T10382- . When doing this, take care not to damage any other parts (such as the brake hose or ABS wiring).

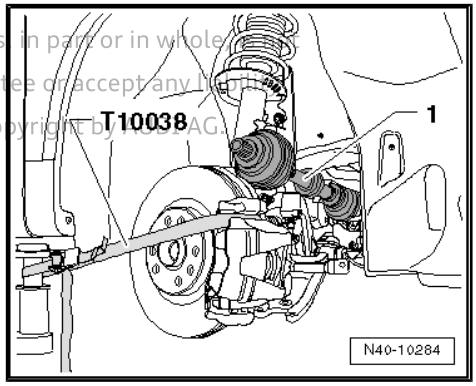
– Set up puller - T10382- .
• For the sliding constant velocity joint -1- the recess -arrow- on the puller plate - T10382/1- must face the spindles - T10382/2- .
– Assemble puller - T10382- together with multi-purpose tool - VW 771- .



Note

The suspension strut with all the attached components must be pulled towards the rear in order to extract the drive shaft from the gearbox using puller - T10382- .

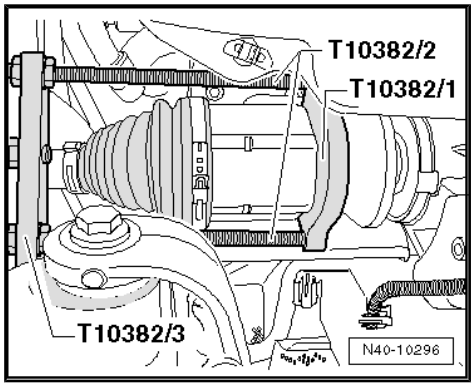
– Pull suspension strut with attached components towards the rear using tensioning strap - T10038- (e.g. secured to arm of lifting platform) until puller - T10382- can be inserted parallel with drive shaft.



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– Insert puller - T10382- and pull out drive shaft by striking multi-purpose tool - VW 771- as required.

– Take drive shaft out of vehicle.



Installing

Install in reverse sequence, paying attention to the following:

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

Vehicles with four-wheel drive

– Strike end of stub shaft using a plastic hammer.

Caution

- *This ensures that the circlip on the stub shaft engages correctly in the differential pinion.*
- *It will also help to prevent leakage.*

All vehicles (continued)

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– Renew oil seal on gearbox ⇒ Gearbox; Rep. gr. 39 ; Oil seals; Overview of fitting locations - oil seals .

– Fit new circlip in groove on stub shaft of gearbox.

– Lightly grease splines of stub shaft with universal grease ⇒ Electronic parts catalogue “ETKA” .

– Mesh outer and inner splines of gearbox shaft and sliding constant velocity joint.

– Take hold of drive shaft and slide it into constant velocity joint as far as it will go.

– Then push constant velocity joint onto stub shaft on gearbox with a sudden, hard push.

Note

DO NOT use a hammer or the like.

– Check that the sliding constant velocity joint is fitted securely by pulling the joint against the resistance of the circlip.

Caution

When making this check, only pull on the CV joint. Do not pull the drive shaft.

– Detach tensioning strap - T10038- .

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

– Bolt swivel joint to wishbone -arrows-.

Note

Ensure sealing boot is not damaged or twisted.

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

- ⇒ “6.3 Loosening and tightening bolt securing drive shaft”, page 111
- ⇒ “2.1 Exploded view - front vehicle level senders”, page 302
- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ “4.1 Exploded view - lower wishbone, swivel joint”, page 77
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ⇒ “1 Wheels, tyres”, page 309

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6.6 Dismantling and assembling drive shaft

⇒ “6.6.1 Servicing drive shaft with 108 mm dia. inner constant velocity joint”, page 136

⇒ “6.6.2 Servicing drive shaft with 100 mm dia. inner constant velocity joint”, page 141

⇒ “6.6.3 Servicing drive shaft with triple roller joint AAR3300i (with external splines for insertion in gearbox)”, page 146

⇒ “6.6.4 Servicing drive shaft with triple roller joint AAR2600i/ AAR3300i (with internal splines for gearbox stub shaft)”, page 151

⇒ “6.6.5 Servicing drive shaft with sliding constant velocity joint (version with internal splines on inner joint)”, page 158

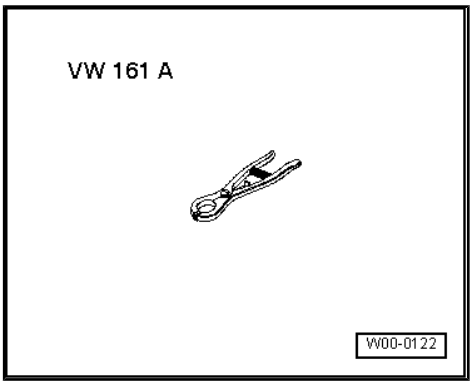
⇒ “6.6.6 Servicing drive shaft with triple roller joint AAR 2600i (version with bolted flange on inner joint)”, page 162

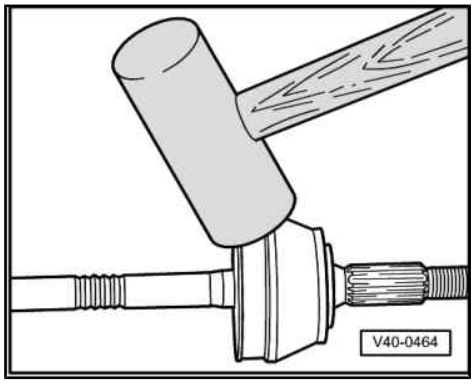
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6.6.1 Servicing drive shaft with 108 mm dia. inner constant velocity joint

Special tools and workshop equipment required

- Circlip pliers - VW 161 A-





- Thrust plate - VW 401-

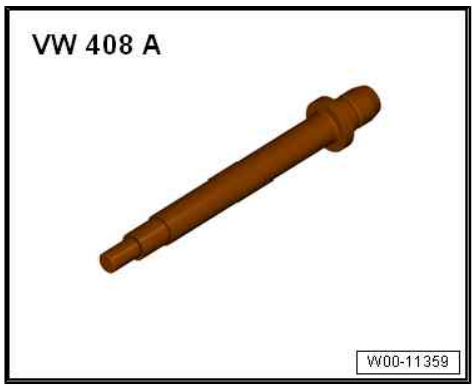


- Thrust plate - VW 402-

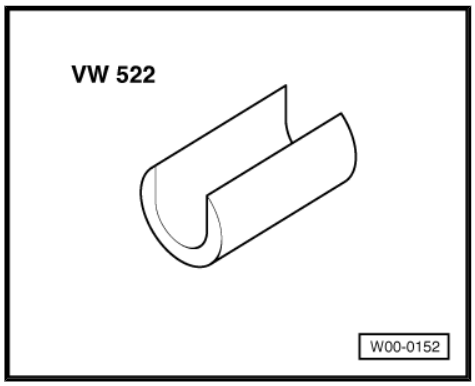


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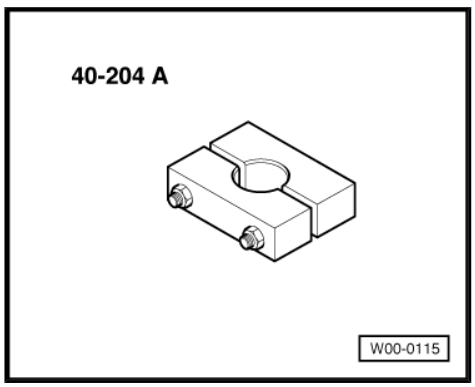
- Press tool - VW 408 A-



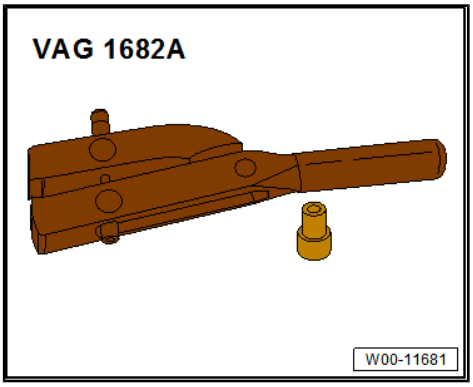
- Support sleeve - VW 522-



- Clamp - 40-204A-



- Clamp tensioner - V.A.G 1682 A-



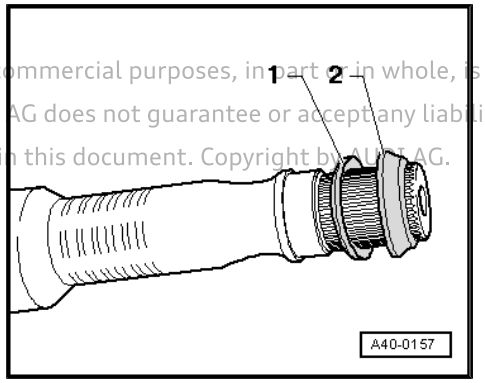
Removing outer constant velocity joint

– Drive joint off drive shaft with a firm blow from an aluminium hammer.

Installation position of spacer ring and dished spring on outer joint (if fitted)

1 - Dished spring

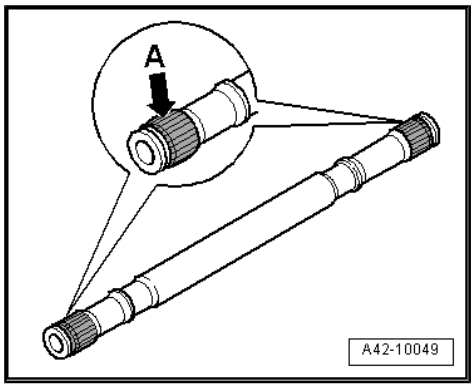
2 - Spacer ring (plastic)



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Installing outer constant velocity joint with bolt

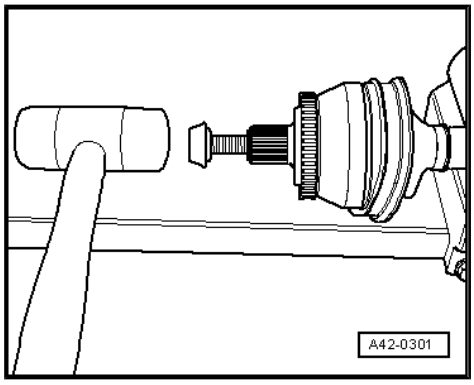
– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.



– Screw old bolt into CV joint as shown.

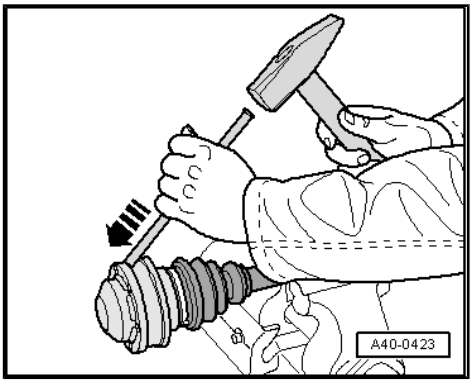
– Use plastic-headed hammer to drive joint onto shaft until circlip engages.

Pressing off inner constant velocity joint



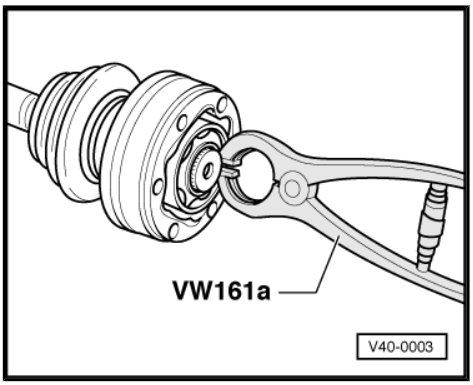
Detaching cover

– Drive off cover with a copper or brass drift.

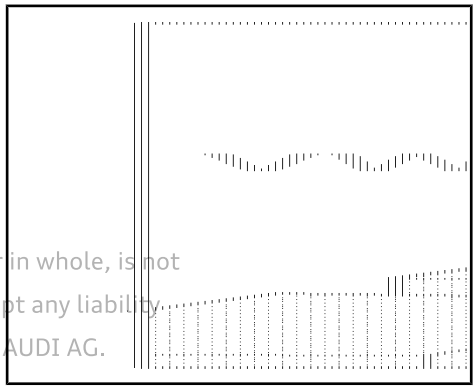


Removing and installing circlip

– Use drift to drive off boot.



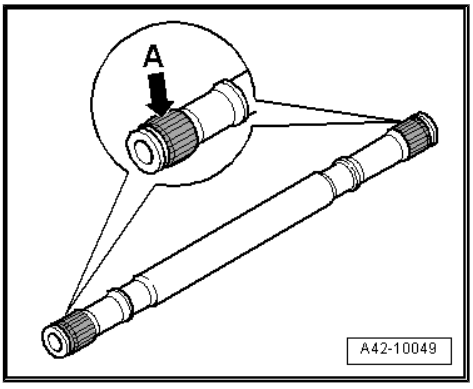
– Support ball hub while pressing off.



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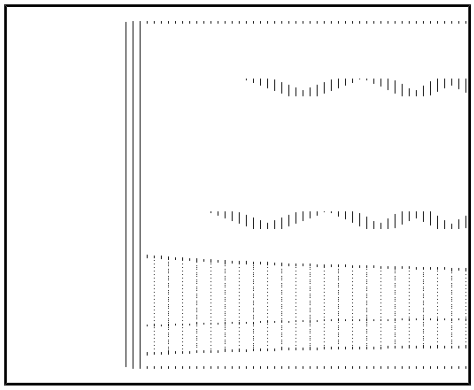
Pressing on inner constant velocity joint

– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.



– Press on joint as far as stop.

– Fit circlip.



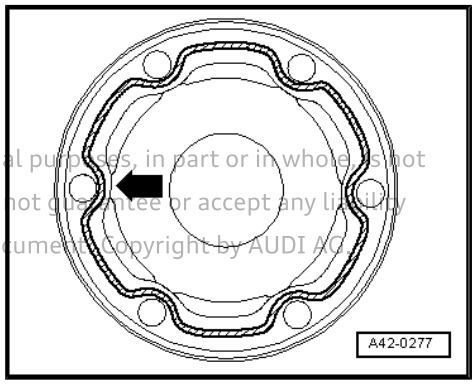
Note

Chamfer on internal diameter of ball hub (splines) must face contact collar of drive shaft.

Applying sealing compound to sealing surface on cover and installing cover

– Apply sealant -hatched area- to clean surface of cover.

♦ Route continuous bead of sealant (2 ... 3 mm ∅) around inside of holes -arrow-.



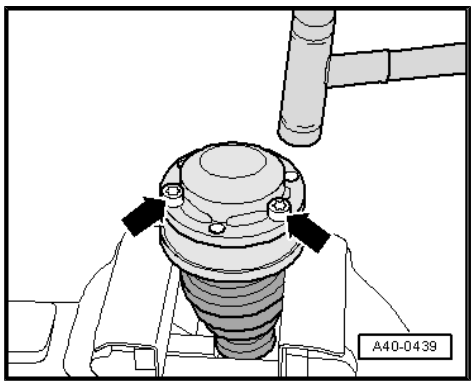
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– Using bolts -arrows-, align new cover in relation to bolt holes.

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

– Drive on cover using a plastic hammer.

– Wipe off surplus sealant.

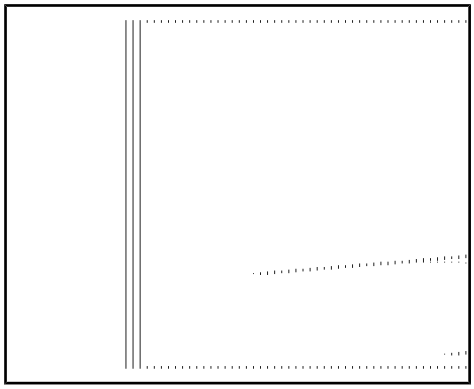


Venting joint boot

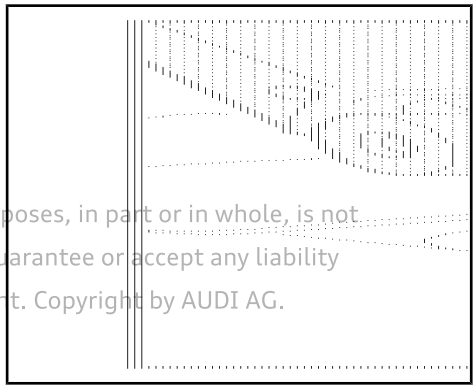
The joint boot is often squashed when it is installed on the joint body. This creates a partial vacuum inside the boot, which draws in a fold -arrow- whilst driving.

For this reason, please note the following:

– Before tightening the hose clips, vent the boot to equalise pressure by briefly lifting the lip.



Tightening stainless-steel hose clips for boots



– Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
– Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).

♦ Tightening torque: 20 Nm

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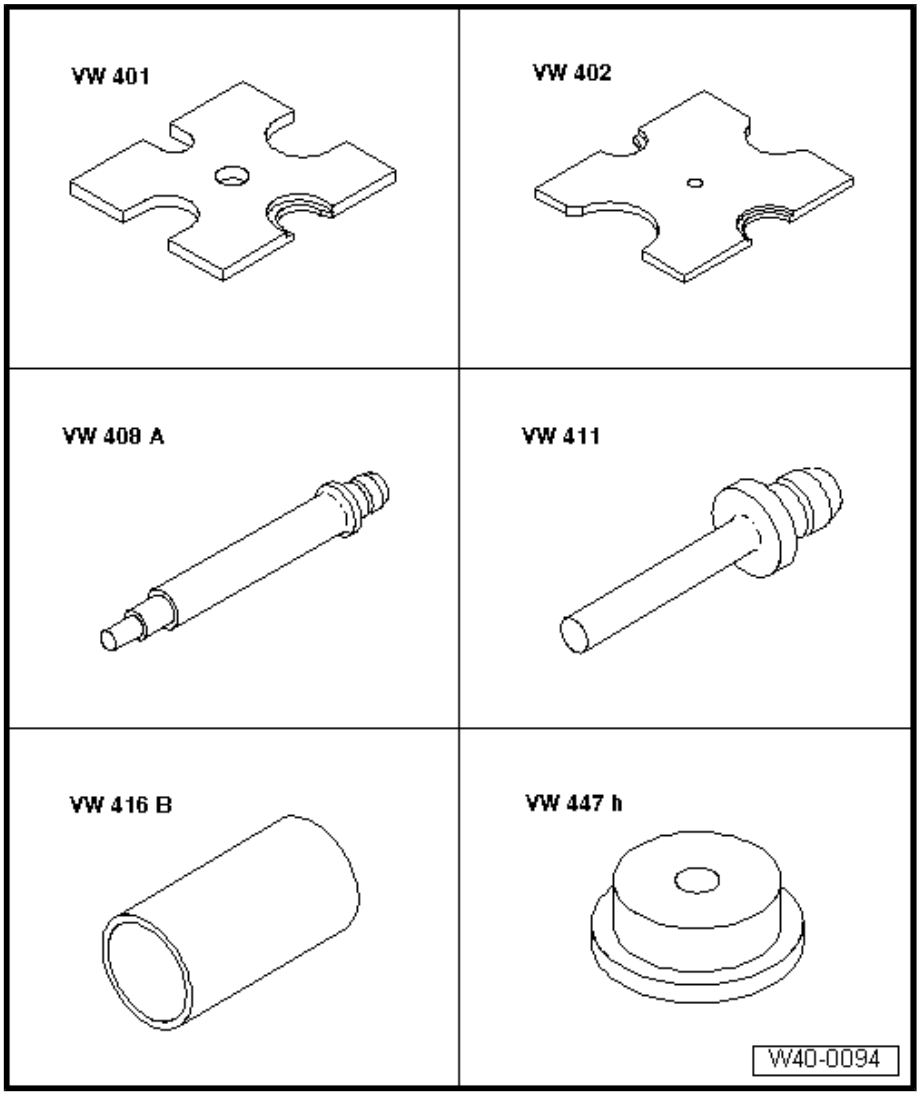
Note

♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*

♦ *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.*

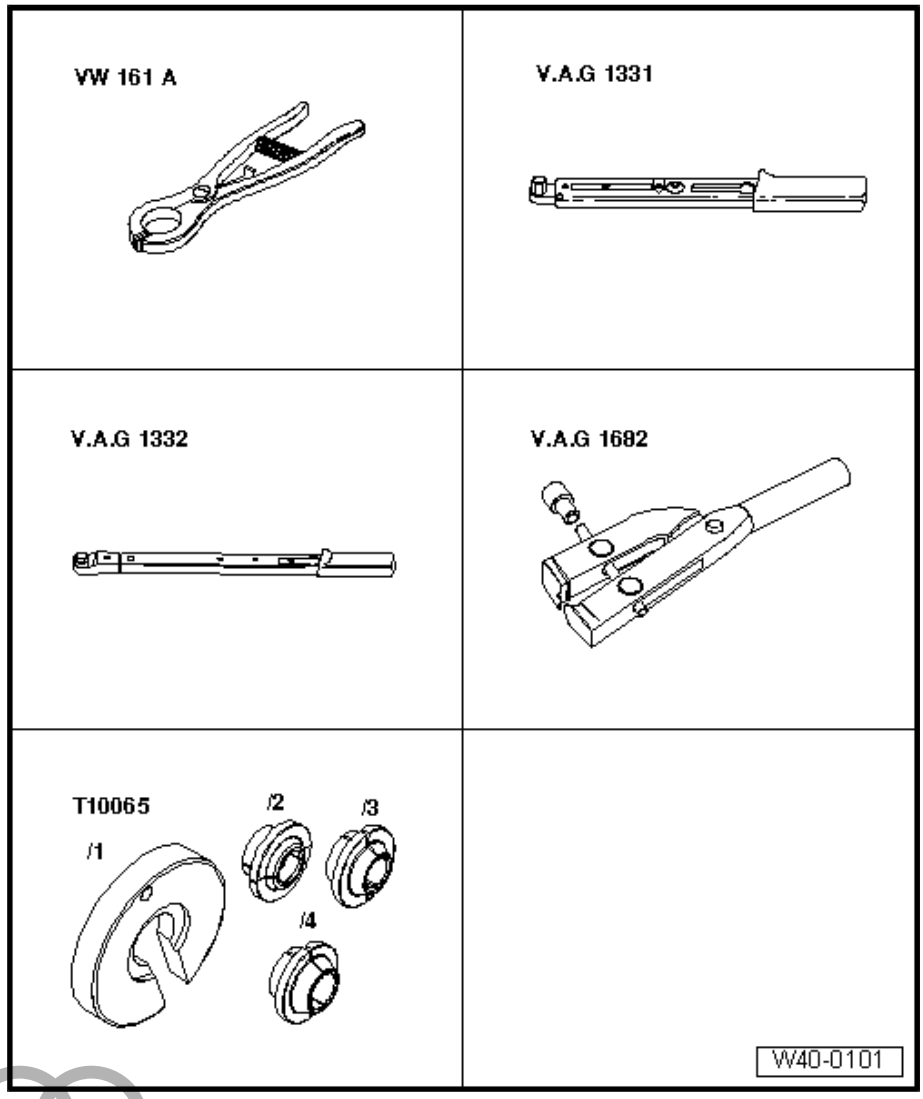
6.6.2 Servicing drive shaft with 100 mm dia. inner constant velocity joint

Special tools and workshop equipment required



♦ Thrust plate - VW 401-
♦ Thrust plate - VW 402-

- Press tool - VW 408 A-
- Press tool - VW 411-
- Tube - VW 416 B-
- Thrust plate - VW 447 H-

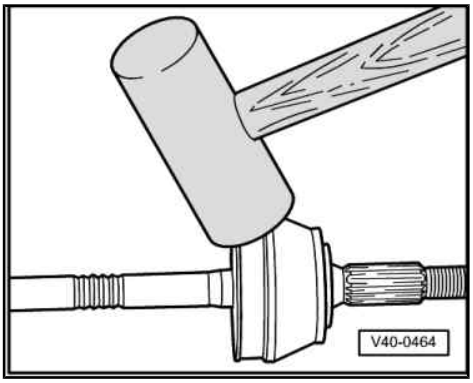


- Circlip pliers - VW 161 A-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Clamp tensioner - V.A.G 1682 A-
- Assembly tool - T10065-

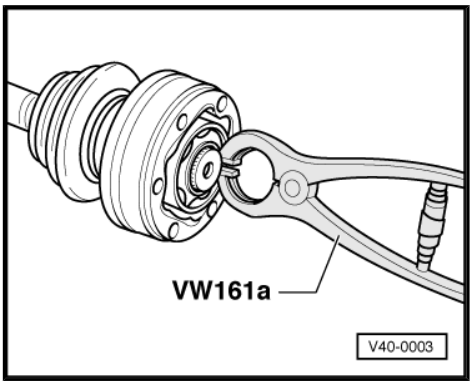
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Removing outer constant velocity joint

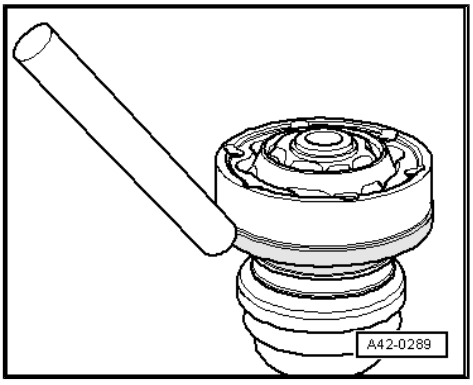
– Drive joint off drive shaft with a firm blow from an aluminium hammer.



Removing and installing circlip

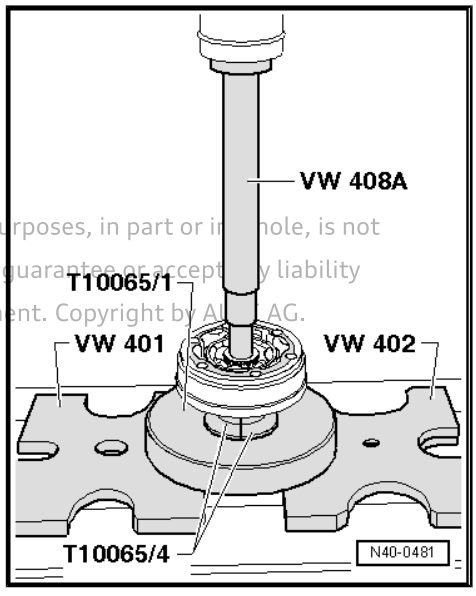


Knocking off cap (attached to boot) using a brass or copper drift



Pressing off inner constant velocity joint

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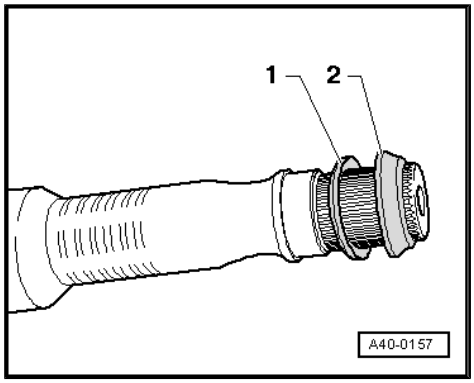


Assembling constant velocity joint

Installation position of dished spring and thrust washer at outer joint

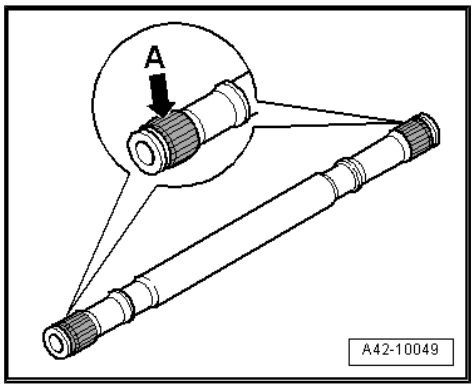
1 - Dished spring

2 - Spacer ring (plastic)



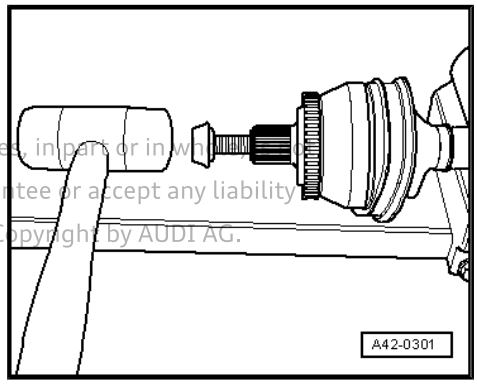
Installing outer constant velocity joint with bolt

– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.



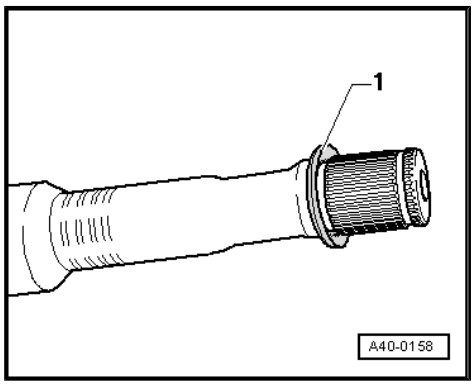
– Screw old bolt into CV joint as shown.

– Use plastic-headed hammer to drive joint onto shaft until circlip engages.



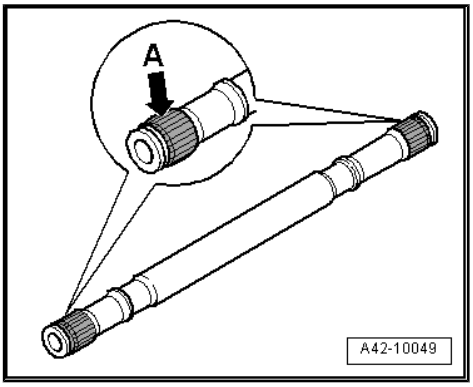
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Installation position of dished spring at inner joint

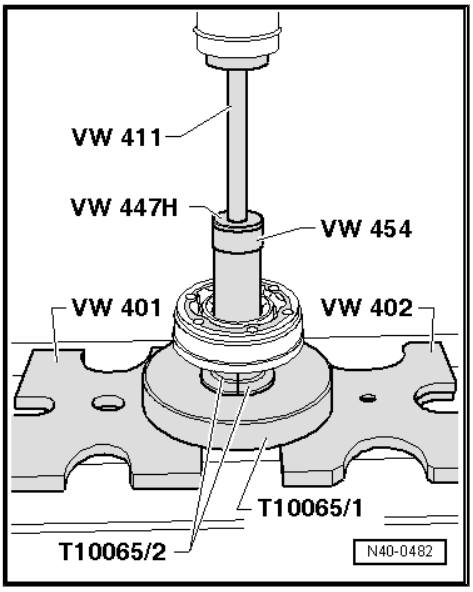


Pressing on inner constant velocity joint

– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.

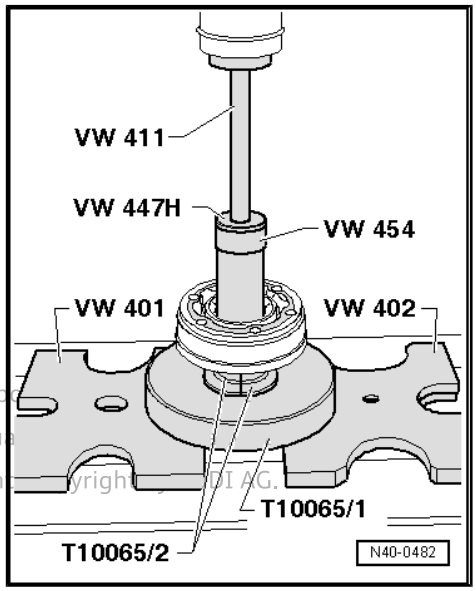


– Apply special tools as shown in illustration.



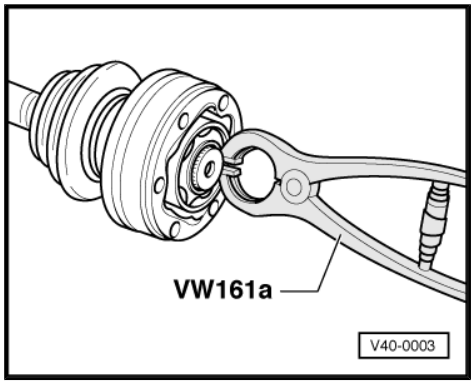
Note

Chamfer on internal diameter of ball hub (splines) must face contact collar of drive shaft.

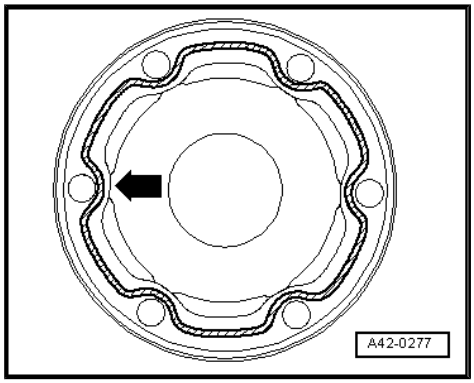


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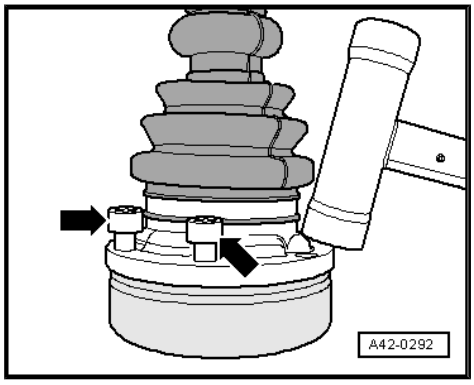
– Fit circlip.



– Apply sealant -hatched area- on clean inner surface of cap on CV joint boot. Sealant bead: continuous, 2...3 mm ∅. Route around inside of holes -arrow-.
– Use sealant as listed in ⇒ Electronic parts catalogue “ETKA” .
– Push joint boot onto drive shaft.
• Drive shaft, boot and contact surface of cap must be free from grease!
• Take care not to damage sealant bead.

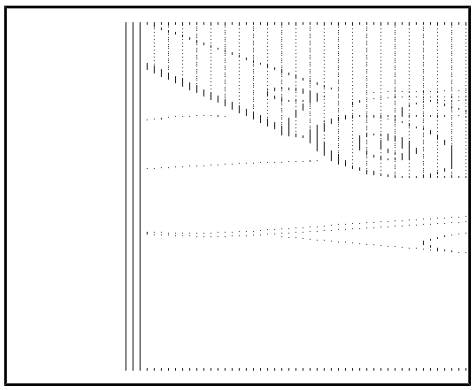


– Using bolts -arrows-, align CV joint boot with cap in relation to bolt holes.
• The alignment must be very accurate, because no further alignment is possible once the part has been hammered on.
– Drive on CV joint boot with cap using a plastic hammer.
– Remove surplus sealant immediately as it is pressed out.



Tightening stainless-steel hose clips for boots

– Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
– Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).
♦ Tightening torque: 20 Nm



Note

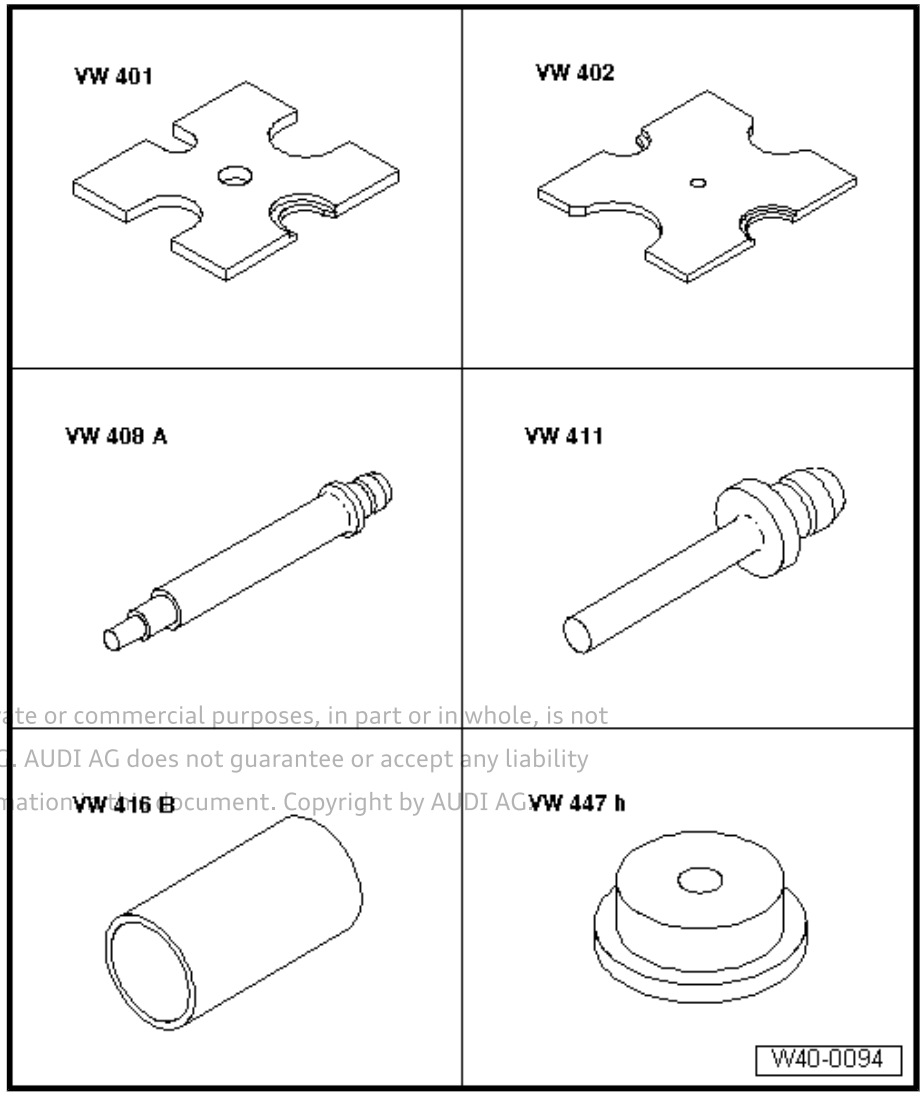
♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*

♦ *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.*

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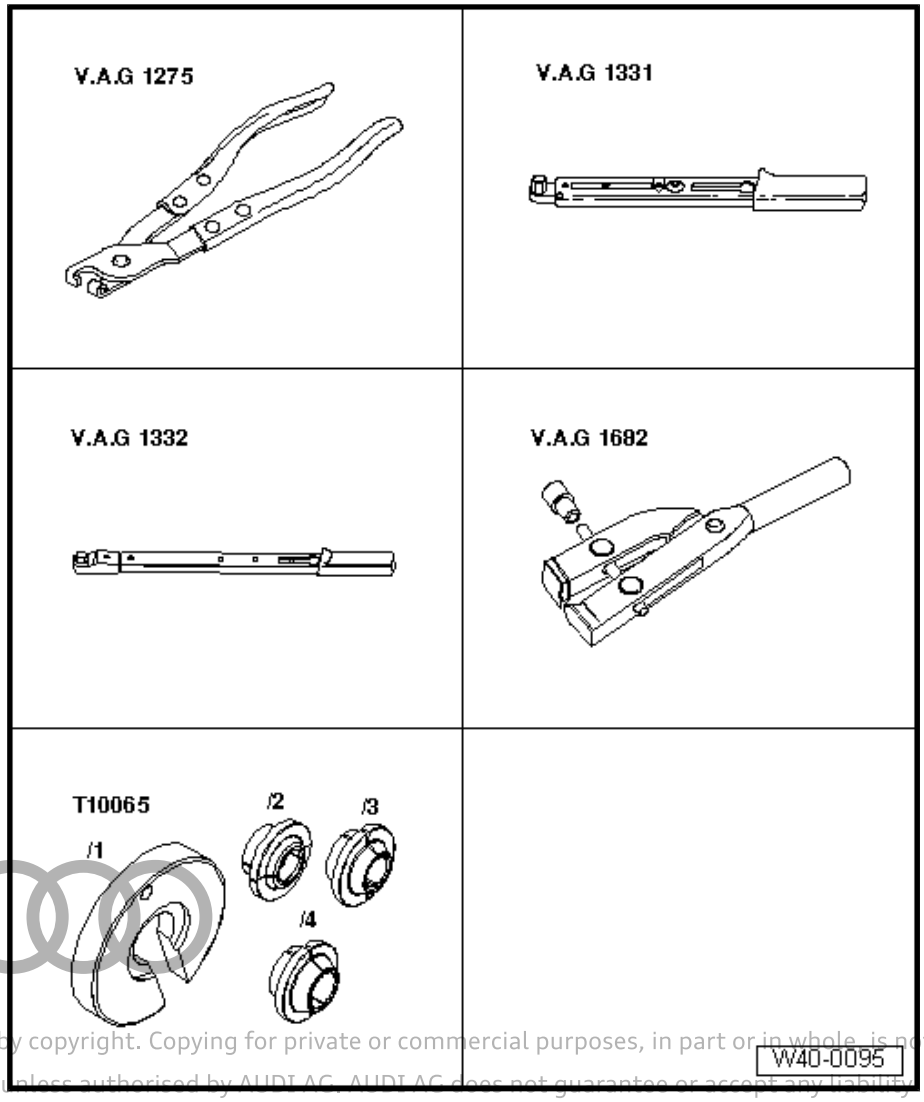
6.6.3 Servicing drive shaft with triple roller joint AAR3300i (with external splines for insertion in gearbox)

Special tools and workshop equipment required



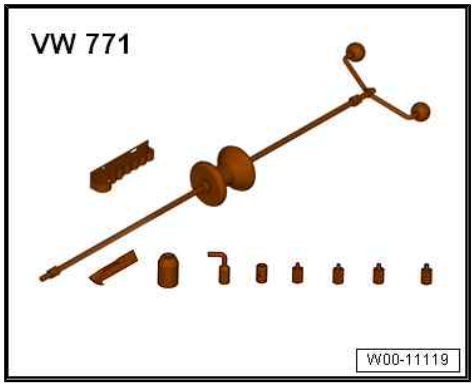
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- Thrust plate - VW 401-
- Thrust plate - VW 402-
- Press tool - VW 408 A-
- Press tool - VW 411-
- Tube - VW 416 B-
- Thrust plate - VW 447 H-



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- Hose clip pliers - V.A.G 1275-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Clamp tensioner - V.A.G 1682 A-
- Assembly tool - T10065-
- Multi-purpose tool - VW 771-



♦ Puller - T10382-

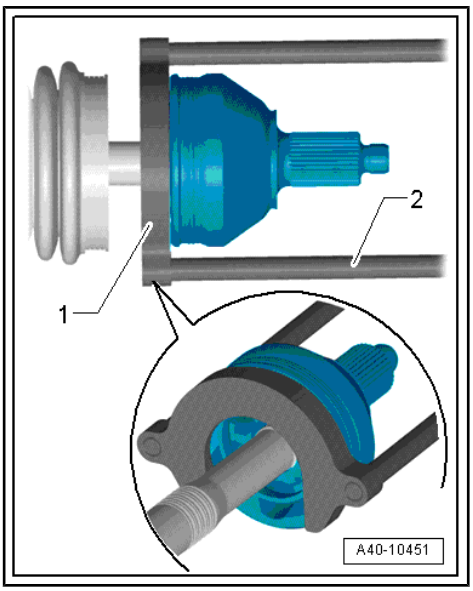
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Removing outer constant velocity joint

– Clamp drive shaft in vice using protective jaw covers.
– Fold back rubber boot.
– Set up puller - T10382- so that smooth side of puller plate - T10382/1- faces towards spindles - T10382/2- .
– Assemble puller - T10382- together with multi-purpose tool - VW 771- .
– Pull CV joint off drive shaft using puller - T10382- and multi-purpose tool - VW 771- .

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

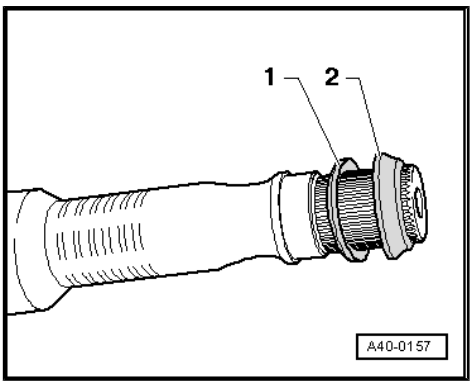


Driving on outer constant velocity joint

Installation position of dished spring and spacer ring on outer joint (if fitted)

1 - Dished spring
2 - Spacer ring (plastic)

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



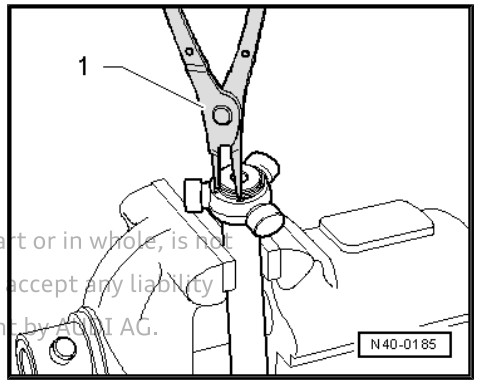
Dismantling

– Open both hose clips on inner joint and push back boot.
– Pull joint body off drive shaft.

– Remove circlip.

1 - Pliers (commercial type)

– Insert drive shaft in press.

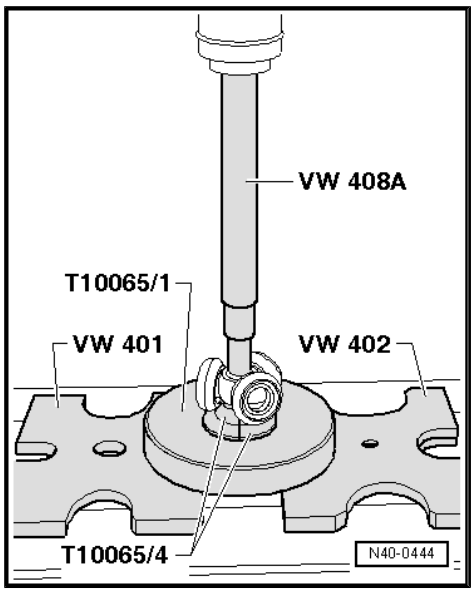


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– Press triple roller spider off drive shaft.
– Pull boot off drive shaft.
– Clean shaft, joint body and groove for seal.

Assembling

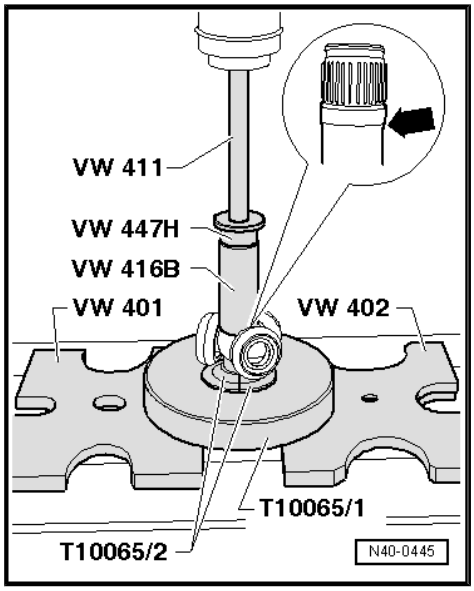
– Push small hose clip for boot onto shaft.
– Slide boot onto shaft.
– Push joint body onto shaft.



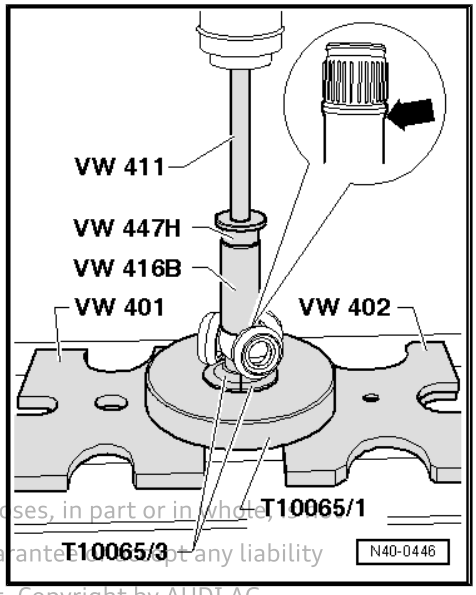
Fitting triple roller spider (tapered drive shaft version)

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

– Fit triple roller spider on shaft and press on as far as stop.
– Make sure pressure does not exceed 3.0 t.
– If necessary, grease splines of drive shaft and triple roller spider with lubricating paste - G 052 142 A2- .
– Install circlip (ensure proper seating).
– Press half the quantity of drive shaft grease from the repair kit into the triple roller joint.
– Slide joint body over rollers and hold in position.
– Press the other half of the drive shaft grease from the repair kit into the back of the triple roller joint.
– Install joint boot.



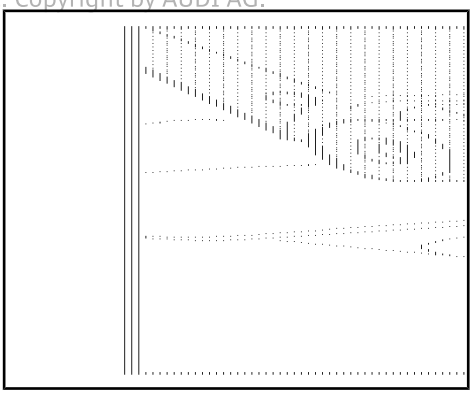
Fitting triple roller spider (cylindrical drive shaft version)



- Fit triple roller spider on shaft and press on as far as stop.
- Make sure pressure does not exceed 3.0 t.
- If necessary, grease splines of drive shaft and triple roller spider with lubricating paste - G 052 142 A2- .
- Install circlip (ensure proper seating).
- Press half the quantity of drive shaft grease from the repair kit into the triple roller joint.
- Slide joint body over rollers and hold in position.
- Press the other half of the drive shaft grease from the repair kit into the back of the triple roller joint.
- Install joint boot.
- Push boot onto joint body and fit hose clip.

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Tightening hose clip on outer joint



- Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
- Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).

♦ Tightening torque: 25 Nm.

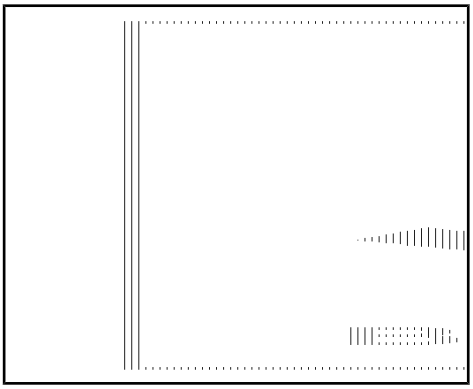
Note

♦ *Due to the hard material of the CV joint boot (as opposed to rubber), a stainless steel hose clip is required; this can only be tightened using clamp tensioner - V.A.G 1682 A- .*

♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*

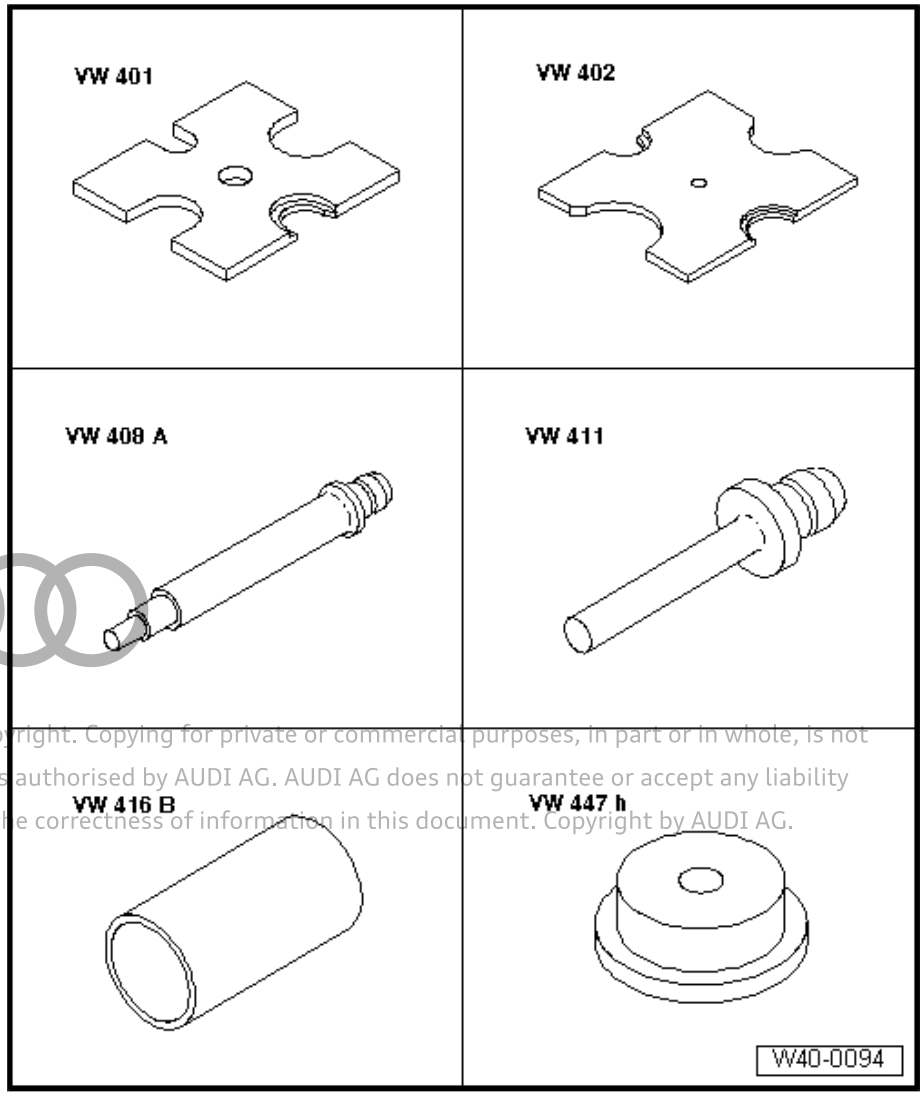
♦ *If the thread is stiff (e.g. due to dirt), the required clamping force will not be attained at the hose clip when the specified tightening torque is applied.*

Tightening hose clip at small diameter of boot



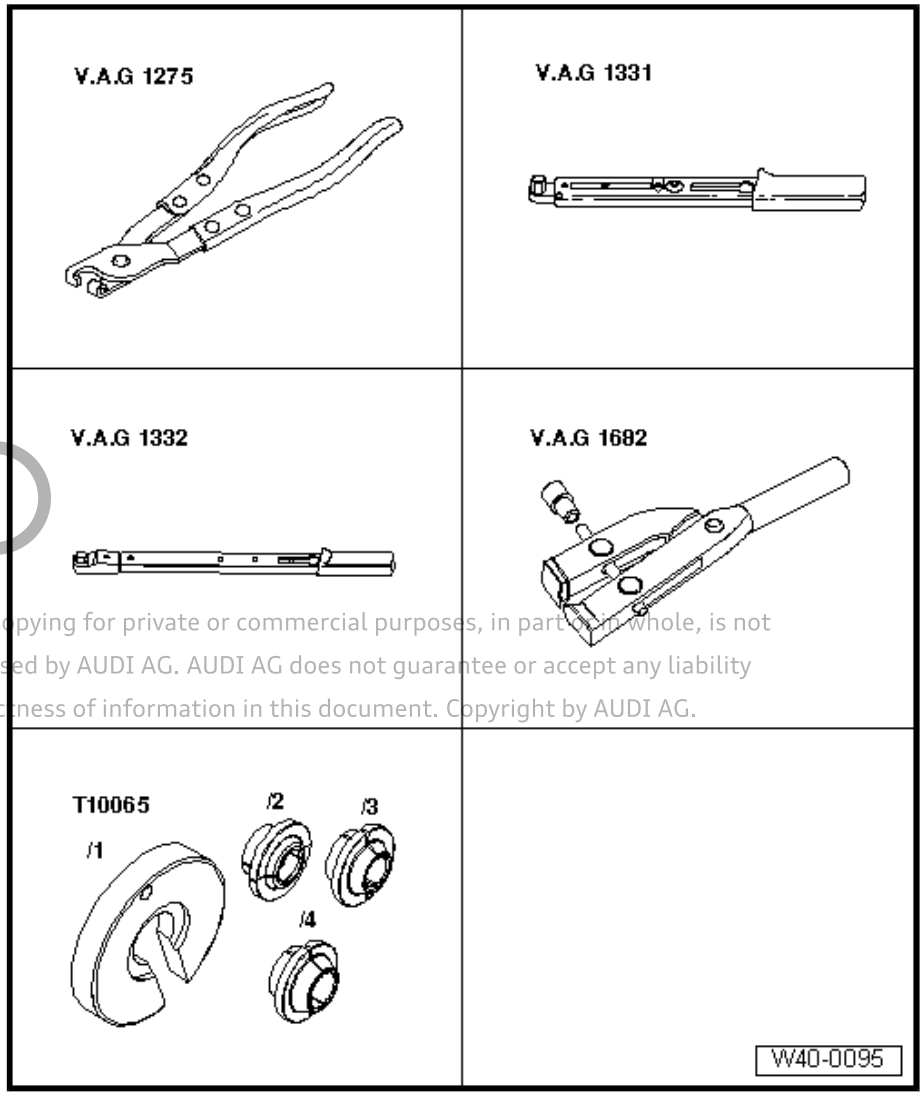
6.6.4 Servicing drive shaft with triple roller joint AAR2600i/AAR3300i (with internal splines for gearbox stub shaft)

Special tools and workshop equipment required



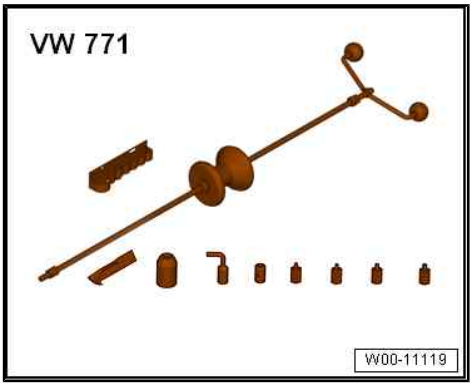
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- Thrust plate - VW 401-
- Thrust plate - VW 402-
- Press tool - VW 408 A-
- Press tool - VW 411-
- Tube - VW 416 B-
- Thrust plate - VW 447 H-

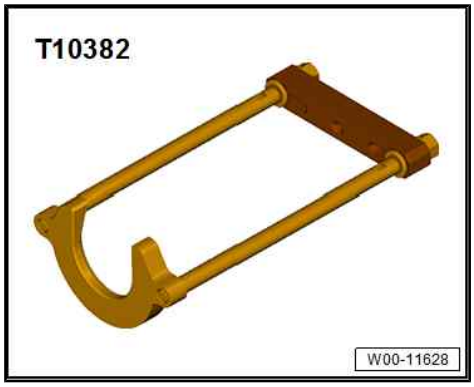


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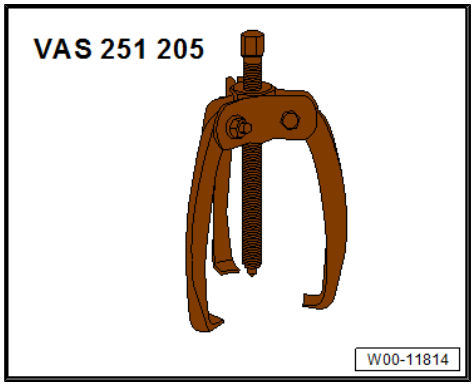
- Hose clip pliers - V.A.G 1275-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Clamp tensioner - V.A.G 1682 A-
- Assembly tool - T10065-
- Multi-purpose tool - VW 771-



- Puller - T10382-



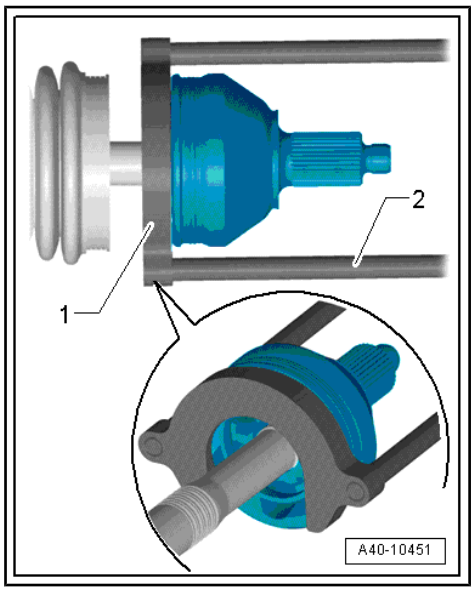
- Three-arm puller - VAS 251 205- (previously Kukko 45-2)



Removing outer constant velocity joint

– Clamp drive shaft in vice using protective jaw covers.
– Fold back rubber boot.
– Set up puller - T10382- so that smooth side of puller plate - T10382/1- faces towards spindles - T10382/2- .
– Assemble puller - T10382- together with multi-purpose tool - VW 771- .
– Pull CV joint off drive shaft using puller - T10382- and multi-purpose tool - VW 771- .

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



Driving on outer constant velocity joint

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

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Dismantling

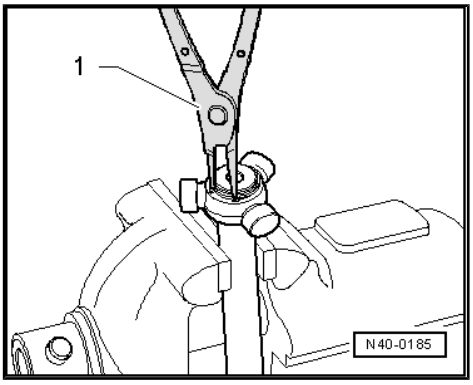
– Open hose clip at inner joint and push back boot from adapter.

– Pull joint body off drive shaft.

– Remove circlip.

1 - Pliers (commercial type)

– Insert drive shaft in press.



– Press triple roller spider off drive shaft.

– Pull boot off drive shaft.

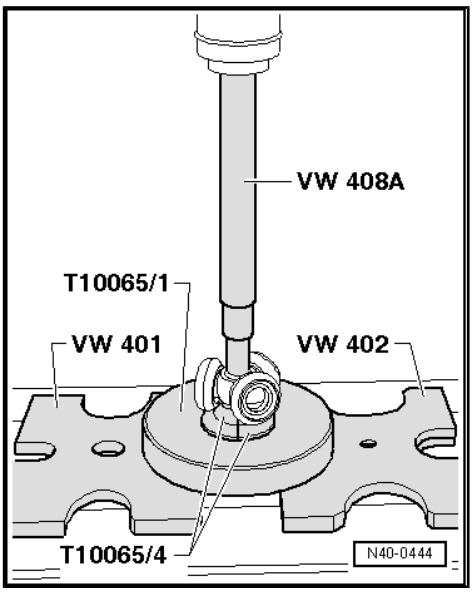
– Clean shaft, joint body and groove for seal.

Assembling

– Push small hose clip for boot onto shaft.

– Slide boot onto shaft.

– Push joint body onto shaft.



Fitting triple roller spider (tapered drive shaft version)

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

– Fit triple roller spider on shaft and press on as far as stop.

– Make sure pressure does not exceed 3.0 t.

– If necessary, grease splines of drive shaft and triple roller spider with lubricating paste - G 052 142 A2- .

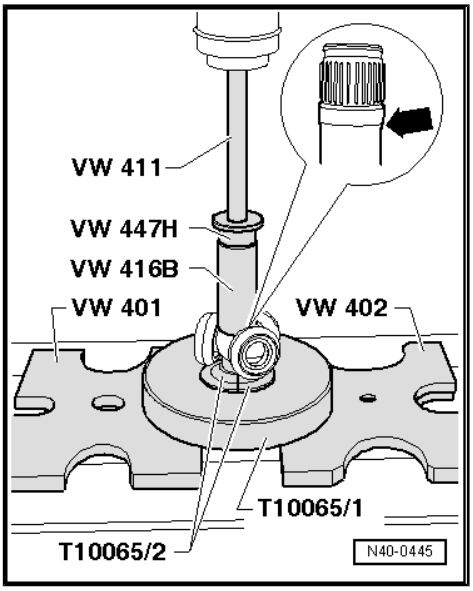
– Install circlip (ensure proper seating).

– Press half the quantity of drive shaft grease from the repair kit into the triple roller joint.

– Slide joint body over rollers and hold in position.

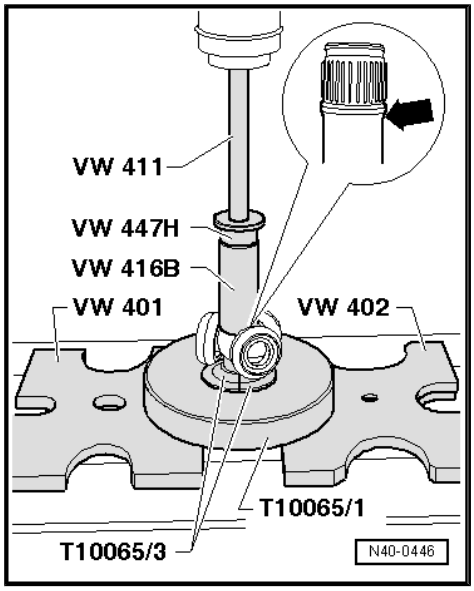
– Press the other half of the drive shaft grease from the repair kit into the back of the triple roller joint.

– Install joint boot.

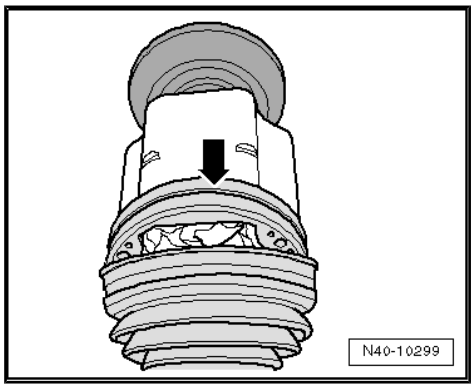


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Fitting triple roller spider (cylindrical drive shaft version)

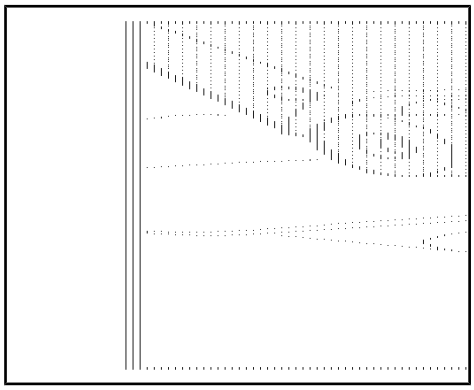


- Fit triple roller spider on shaft and press on as far as stop.
- Make sure pressure does not exceed 3.0 t.
- If necessary, grease splines of drive shaft and triple roller spider with lubricating paste - G 052 142 A2- .
- Install circlip (ensure proper seating).
- Press half the quantity of drive shaft grease from the repair kit into the triple roller joint.
- Slide joint body over rollers and hold in position.
- Press the other half of the drive shaft grease from the repair kit into the back of the triple roller joint.



- Push joint boot onto adapter, making sure that boot engages properly in groove on adapter -arrow-.
- Fit hose clip and tighten sufficiently to ensure reliable sealing.

Tightening hose clip on outer joint



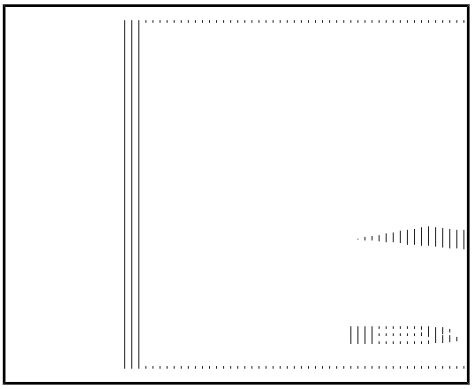
- Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
- Tighten hose clip by turning spindle with torque wrench (take care to keep tool straight).
- ♦ Tightening torque: 25 Nm.

Note

- ♦ *Due to the hard material of the CV joint boot (as opposed to rubber), a stainless steel hose clip is required; this can only be tightened using clamp tensioner - V.A.G 1682 A- .*
- ♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*
- ♦ *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.*

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Tightening hose clip at small diameter of boot

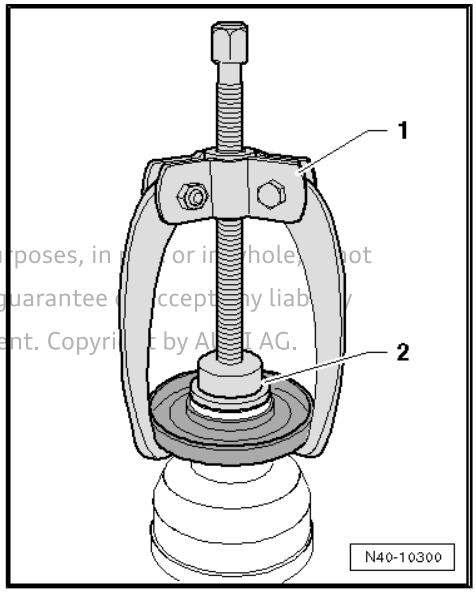


Pulling protective cap off triple roller joint

1 - Three-arm puller - VAS 251 205-

2 - Pressure washer - VW 447 H-

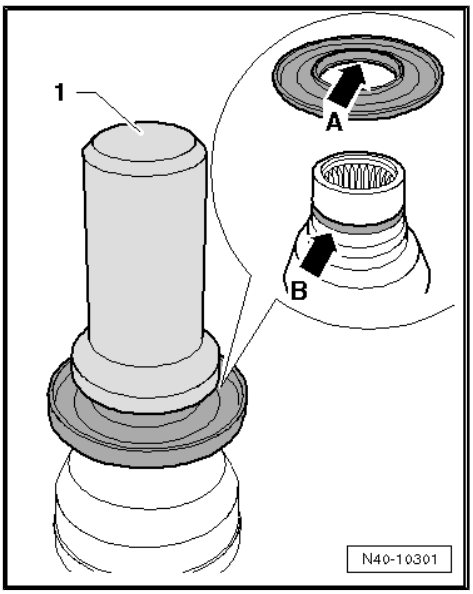
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Driving protective cap onto triple roller joint

1 - Thrust piece - T10243-

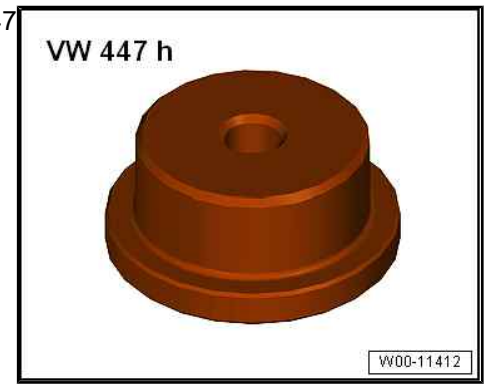
- Drive protective cap onto joint until shoulder -arrow A- engages in groove -arrow B-.

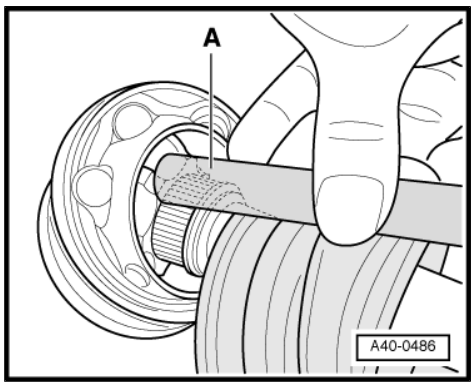


6.6.5 Servicing drive shaft with sliding constant velocity joint (version with internal splines on inner joint)

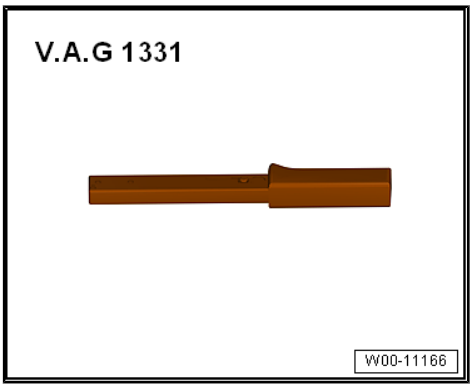
Special tools and workshop equipment required

- Thrust plate - VW 447 H-

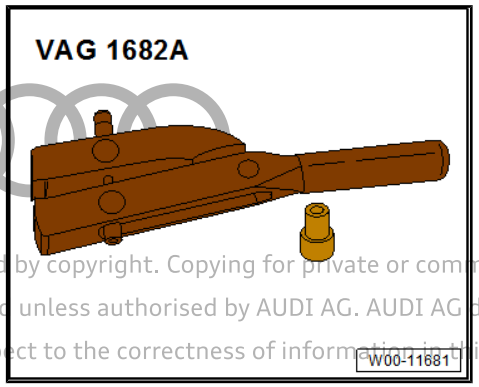




- Torque wrench - V.A.G 1331-

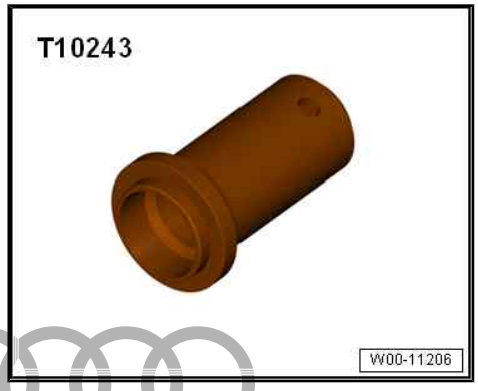


- Clamp tensioner - V.A.G 1682 A-

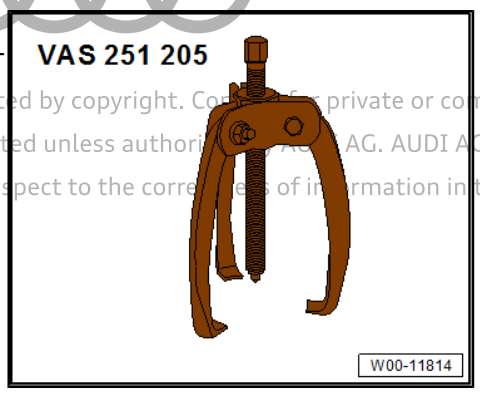


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- Thrust piece - T10243-



- Three-arm puller - VAS 251 205- (previously Kukko 45-2)



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- Copper or brass drift, commercially available

Removing outer constant velocity joint

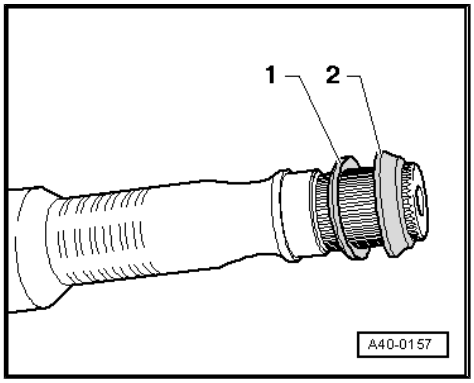
– Clamp drive shaft in vice using protective jaw covers.

– Unfasten both clips and detach boot from outer joint.

– Use hammer to tap copper or brass drift -A- against inner race of constant velocity joint.

– Detach joint and boot.

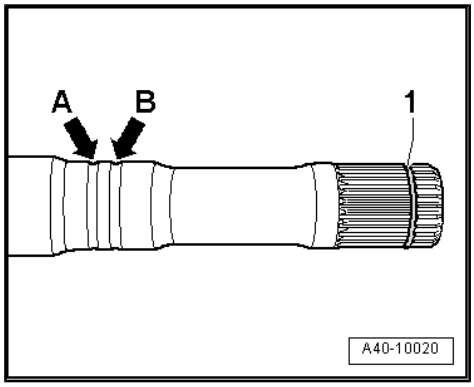
– If fitted, detach dished spring -1- and spacer ring -2-.



Installing outer joint

- Boot and drive shaft must be free from grease.

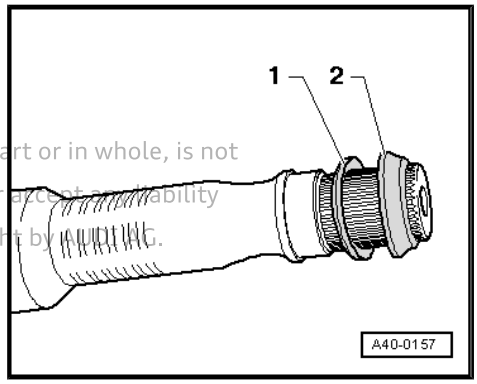
– Always renew circlip -1-.



– If originally fitted, install dished spring -1- and spacer ring -2- as shown in illustration.

– Push on small hose clip with joint boot and bring boot into position on drive shaft.

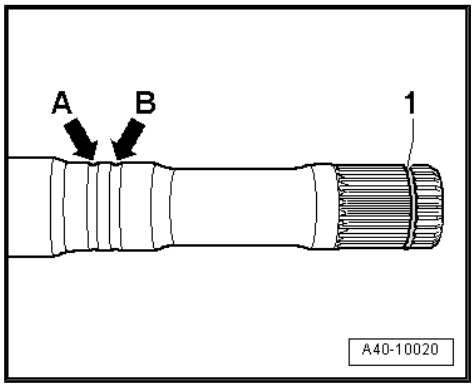
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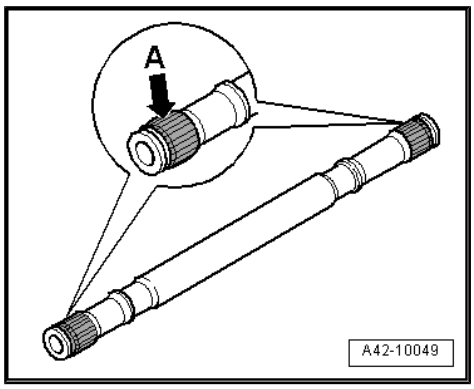
– Position boot in outer groove -arrow B-.

- The inner groove -arrow A- must remain visible (“identification groove” for correct boot assembly).

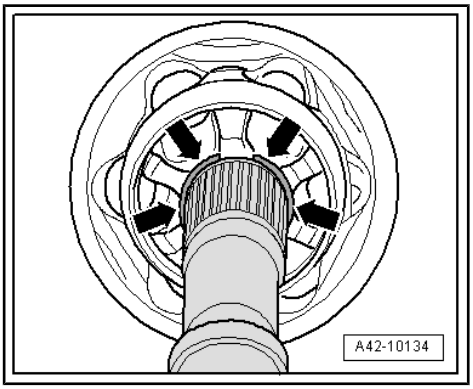
– Pack approx. 70 % of quantity of grease from tube inside joint body.



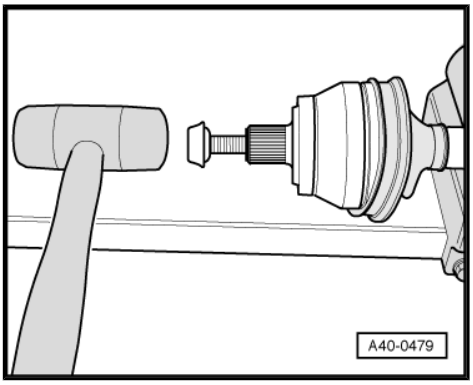
– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.



– Slide on constant velocity joint as far as circlip.
– Align circlip so that opening faces upwards -arrows-.



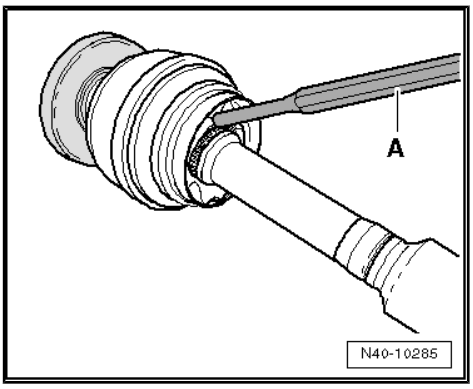
– Screw old drive shaft bolt into joint body as shown.
– Use plastic hammer to drive joint onto drive shaft until circlip engages.
– Pack remaining quantity of grease into boot side of joint body.
– Push boot onto joint body.
– Vent air from boot.
– Make sure boot is properly positioned on joint body.
– Boot must rest in groove and on contour of joint body.
– Tighten hose clips on outer joint ⇒ page 161 .



Removing inner sliding constant velocity joint

– Clamp drive shaft in vice using protective jaw covers.
– Fold back rubber boot.
– Use drift -A- to force sliding constant velocity joint off drive shaft.

• The drift must be applied exactly on the ball hub of the sliding constant velocity joint.



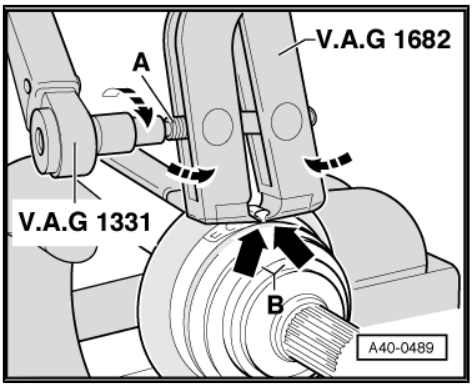
Installing inner sliding constant velocity joint

– Knock joint onto shaft with plastic hammer until circlip engages.

Tightening stainless-steel hose clips for boots

– Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
– Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).

♦ Tightening torque: 25 Nm.



Note

♦ *Due to the hard material of the CV joint boot (as opposed to rubber), a stainless steel hose clip is required; this can only be tightened using clamp tensioner - V.A.G 1682 A-.*

♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*

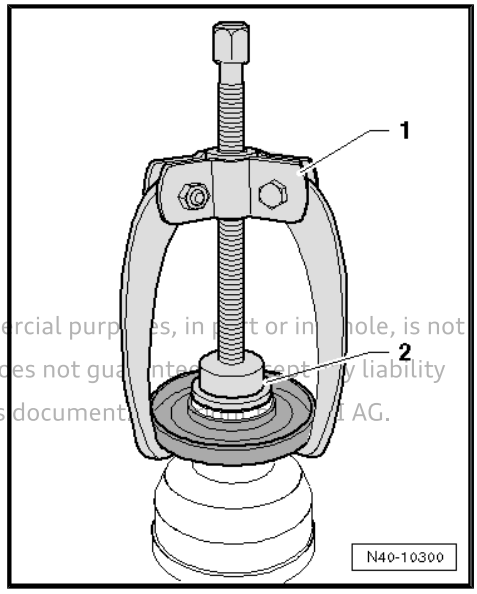
♦ *If the thread is stiff (e.g. due to dirt), the required clamping force will not be attained at the hose clip when the specified tightening torque is applied.*

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Removing protective cap from sliding constant velocity joint

1 - Three-arm puller - VAS 251 205-

2 - Pressure washer - VW 447 H-

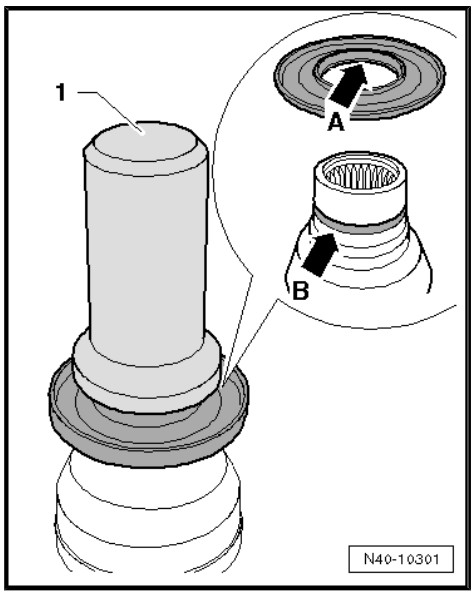


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Driving protective cap onto sliding constant velocity joint

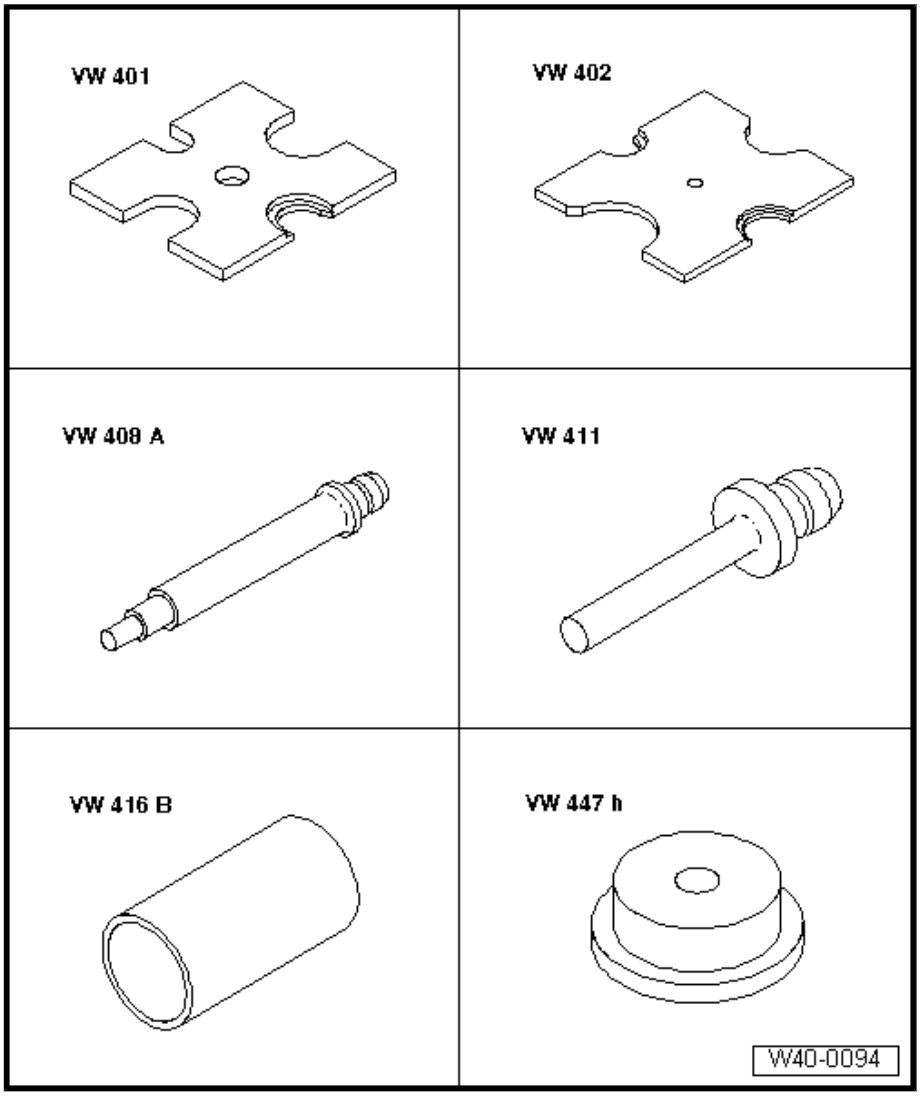
1 - Thrust piece - T10243-

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



6.6.6 Servicing drive shaft with triple roller joint AAR 2600i (version with bolted flange on inner joint)

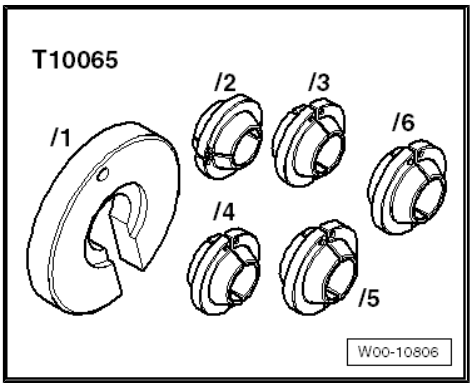
Special tools and workshop equipment required

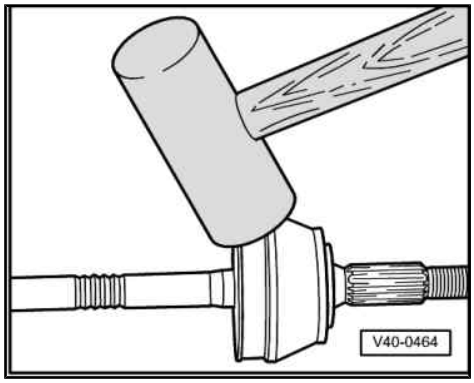


- Thrust plate - VW 401-
- Thrust plate - VW 402-
- Press tool - VW 408 A-
- Press tool - VW 411-
- Tube - VW 416 B-
- Thrust plate - VW 447 H-

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- Assembly tool - T10065-





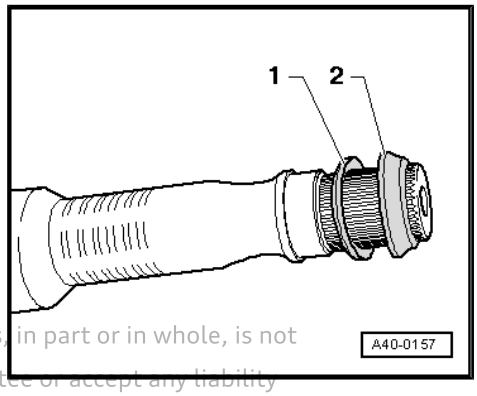
Removing outer constant velocity joint

– Drive joint off drive shaft with a firm blow from an aluminium hammer.

Installation position of spacer ring and dished spring

1 - Dished spring

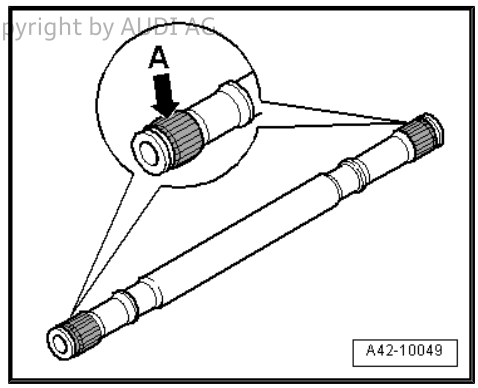
2 - Spacer ring (plastic)



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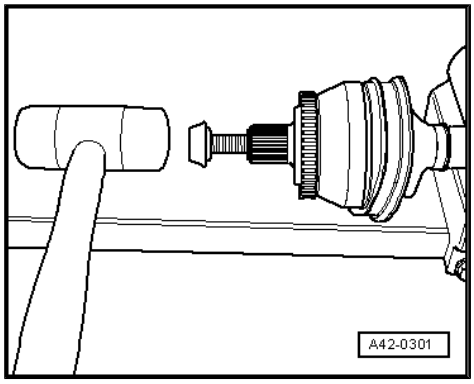
Installing outer constant velocity joint

– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting constant velocity joint or triple roller spider onto drive shaft.



– Screw old bolt into CV joint as shown.

– Use plastic-headed hammer to drive joint onto shaft until circlip engages.

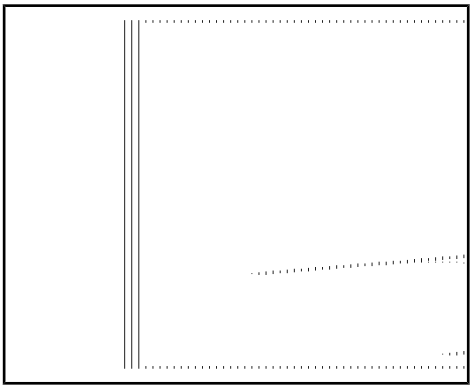


Venting rubber boot

The joint boot is often squashed when it is installed on the joint body. This creates a partial vacuum inside the boot, which draws in a fold -arrow- whilst driving.

For this reason, please note the following:

– Before tightening the hose clips, vent the boot to equalise pressure by briefly lifting the lip.

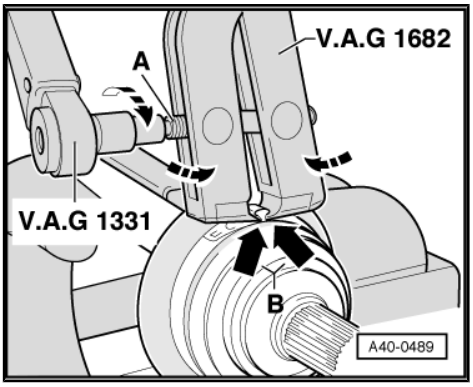


Tightening stainless-steel hose clips for boots

– Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.

– Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).

♦ Tightening torque: 20 Nm



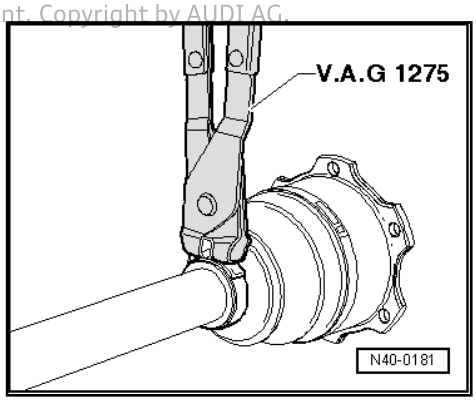
Note

♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*

♦ *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.*

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Tightening small hose clip for rubber boot



Dismantling triple roller joint

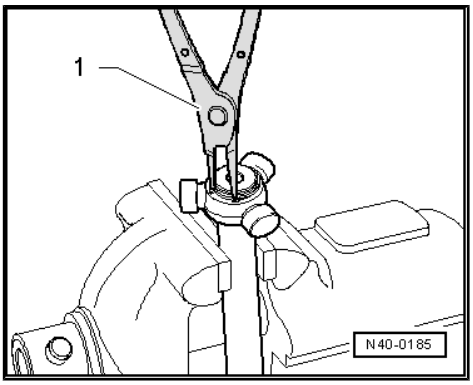
– Open hose clip on shaft and push back boot.

– Pull joint body off drive shaft.

– Remove circlip.

1 - Pliers (commercial type) or -VW 161 A-

– Insert drive shaft in press.



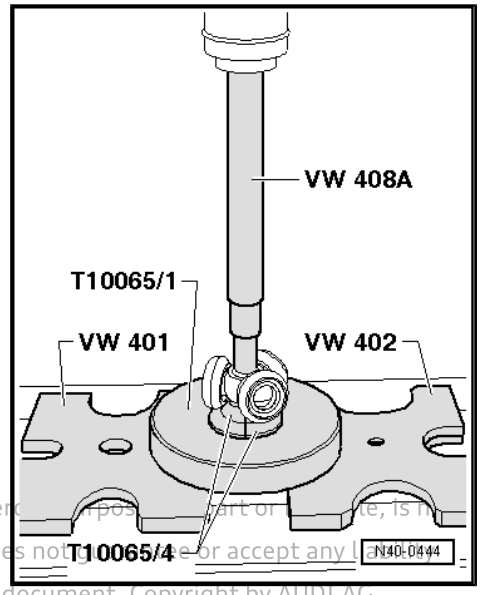
– Press triple roller spider off drive shaft.
– Pull boot off drive shaft.
– Clean shaft, joint body and groove for seal.

Assembling

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

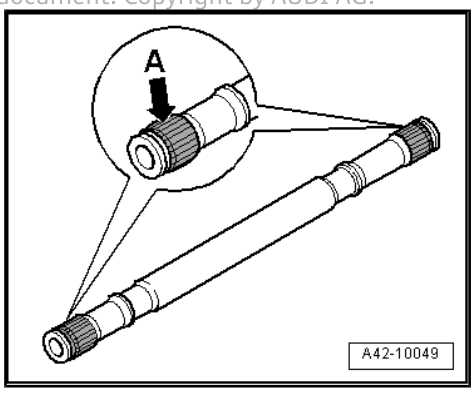
Fitting triple roller spider (tapered drive shaft version):

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

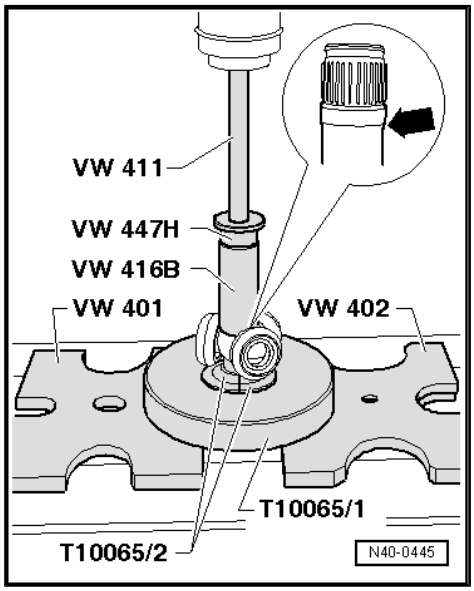


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– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting constant velocity joint or triple roller spider onto drive shaft.



– Fit triple roller spider on shaft and press on as far as stop.
– Make sure pressure does not exceed 3.0 t.
– If necessary, coat splines of drive shaft and triple roller spider with polycarbamide grease G 052 142 A2.
– Install circlip (ensure proper seating).
– Slide joint body over rollers and hold in position.
– Press 70 g of drive shaft grease from repair kit into triple roller joint.
– Press 70 g of drive shaft grease from repair kit into boot.
– Install joint boot.
– Install hose clip.



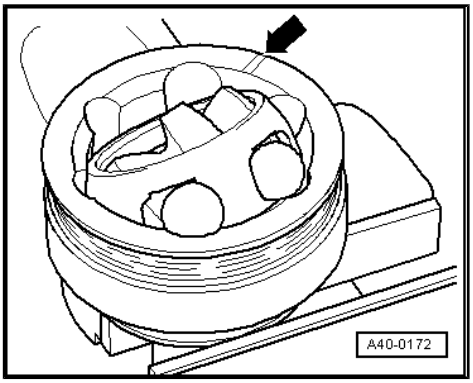
6.7 Checking outer constant velocity joint

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

Removing

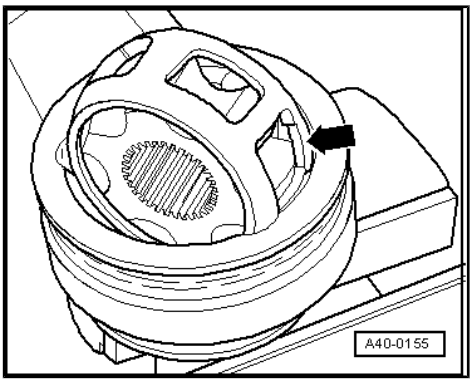
– Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scriber or oil stone -arrow-.

– Swivel ball hub and ball cage and take out balls one after the other.



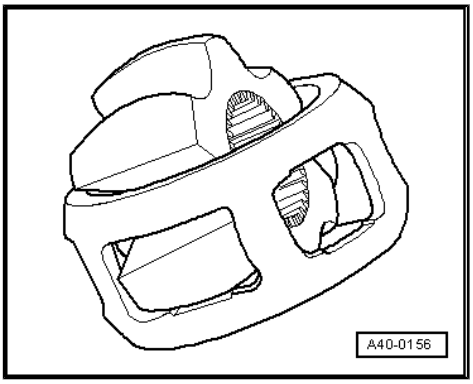
– Turn cage until two cage openings -arrow- are level with joint body.

– Lift out cage together with hub.



– Swivel one segment of the hub into one of the cage openings.

– Pivot hub out of cage.



Note

- *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.*

Installing

Install in reverse sequence, paying attention to the following:

– 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.

– Fit new circlip in shaft.

6.8 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.

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Note

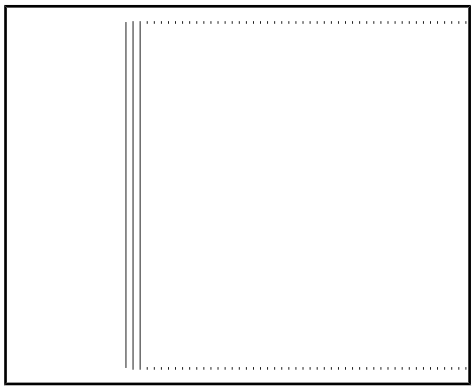
Ball hub and joint body are paired. Mark position in relation to each other with a waterproof felt-tip pen prior to removal.

Removing

– Swivel ball hub and ball cage.

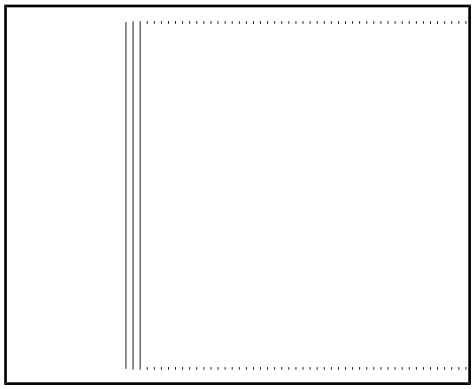
– Push out joint body in direction of -arrow-.

– 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

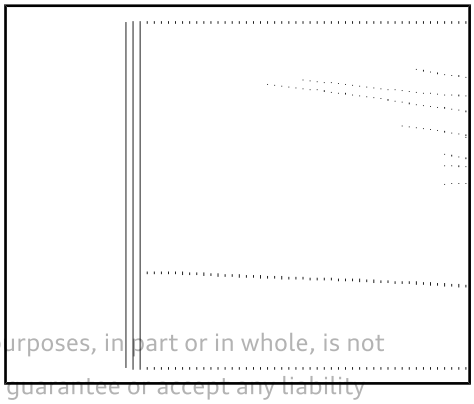
Excessive backlash in the joint will cause knocking or jolts under load change. In such cases the joint must be renewed. Polished areas and visible tracks in the ball races are not a reason for renewing the joint.

Installing

Install in reverse sequence, paying attention to the following:

– Insert hub into cage via the two chamfers. No specific installation position is required. Push balls into cage.

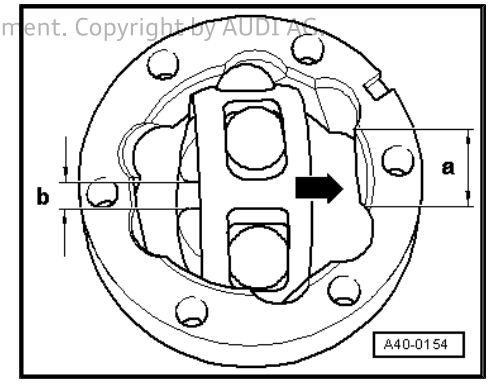
– Insert hub with cage and balls at a right angle to the joint body.



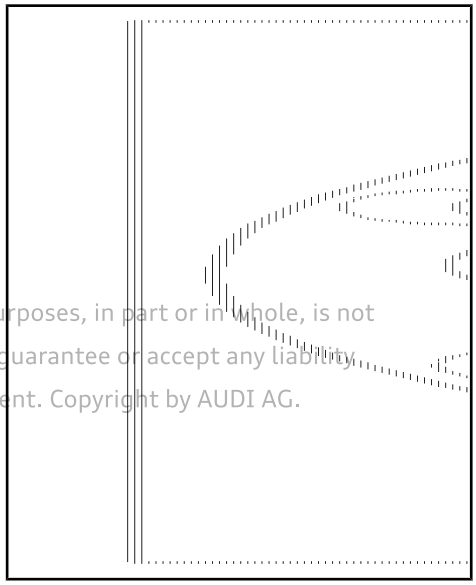
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Note

- *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 large diameter of joint body.*
- *When reinstalling, you should also use felt-tip pen mark made on removal as a guide.*

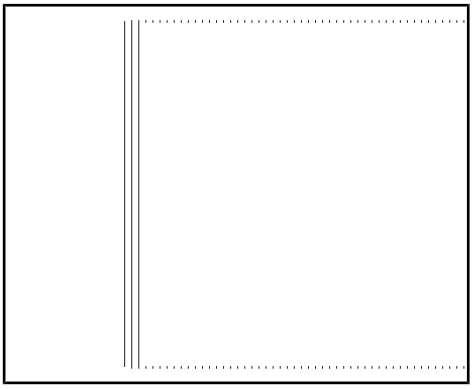


– Swivel the hub into the joint body; at the same time the hub must be swivelled out of the cage -arrows- far enough to allow the balls to fit into the ball races.



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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.

42 – Rear suspension

1 Rear axle

⇒ “1.1 Overview - rear axle”, page 170

⇒ “1.2 Removing and installing rear axle”, page 172

1.1 Overview - rear axle

⇒ “1.1.1 Overview - rear axle (torsion beam axle), front-wheel drive vehicles”, page 170

⇒ “1.1.2 Overview - rear axle (multi-link suspension), front-wheel drive vehicles”, page 171

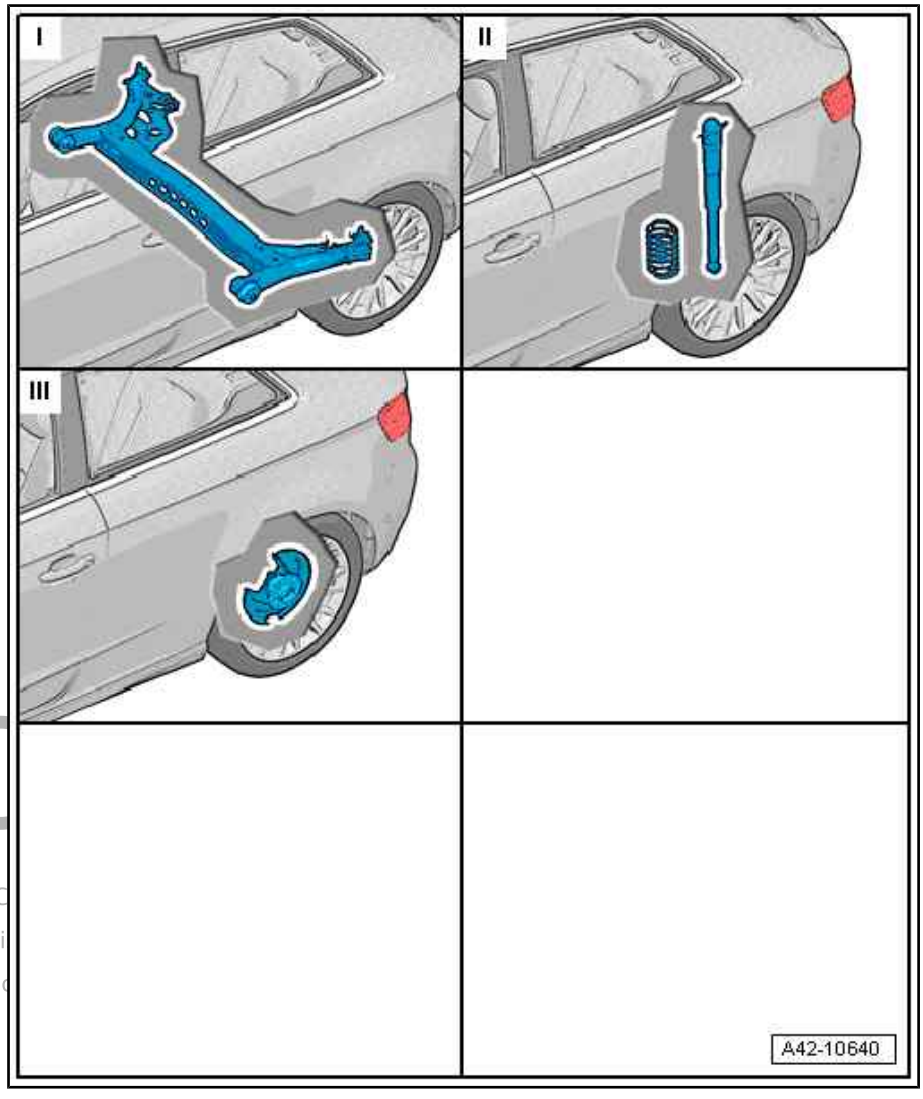
⇒ “1.1.3 Overview - rear axle (multi-link suspension), four-wheel drive vehicles”, page 172

1.1.1 Overview - rear axle (torsion beam axle), front-wheel drive vehicles

I - ⇒ “2 Axle beam”, page 188

II - ⇒ “6 Suspension strut/shock absorber, spring”, page 232

III - ⇒ “7 Wheel bearing, trailing arm”, page 246



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1.1.2 Overview - rear axle (multi-link suspension), front-wheel drive vehicles

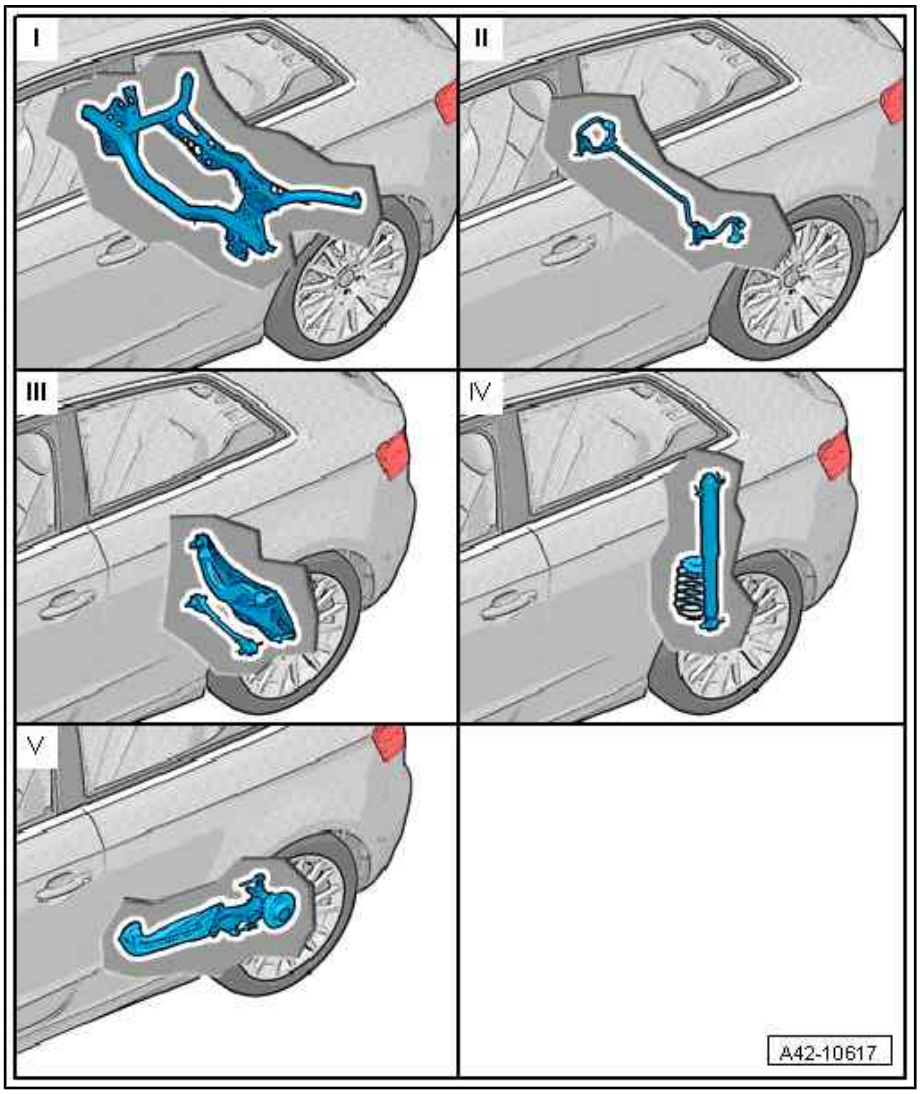
I - ⇒ “3 Subframe”, page 196

II - ⇒ “4 Anti-roll bar”, page 217

III - ⇒ “5 Suspension links, track rod”, page 224

IV - ⇒ “6 Suspension strut/shock absorber, spring”, page 232

V - ⇒ “7 Wheel bearing, trailing arm”, page 246



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1.1.3 Overview - rear axle (multi-link suspension), four-wheel drive vehicles

I - ⇒ “3 Subframe”, page 196

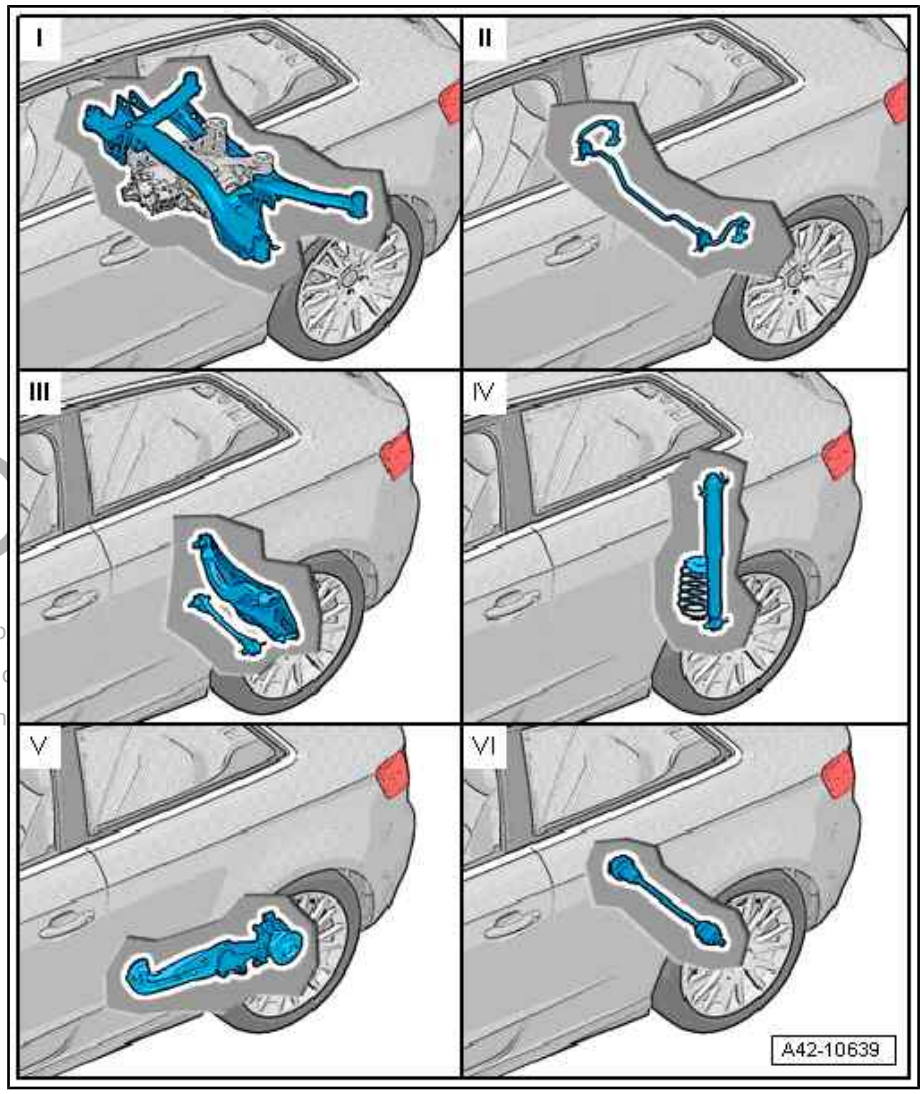
II - ⇒ “4 Anti-roll bar”, page 217

III - ⇒ “5 Suspension links, track rod”, page 224

IV - ⇒ “6 Suspension strut/shock absorber, spring”, page 232

V - ⇒ “7 Wheel bearing, trailing arm”, page 246

VI - ⇒ “8 Drive shaft”, page 279



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1.2 Removing and installing rear axle

⇒ “1.2.1 Removing and installing rear axle (torsion beam axle) - front-wheel drive vehicles”, page 172

⇒ “1.2.2 Removing and installing rear axle (multi-link suspension) - front-wheel drive vehicles”, page 176

⇒ “1.2.3 Removing and installing rear axle (multi-link suspension) - vehicles with high-voltage system”, page 179

⇒ “1.2.4 Removing and installing rear axle (multi-link suspension) - four-wheel drive vehicles”, page 183

1.2.1 Removing and installing rear axle (torsion beam axle) - front-wheel drive vehicles

Special tools and workshop equipment required

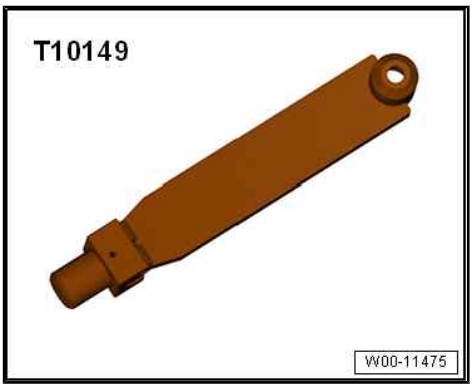
♦ Torque wrench - V.A.G 1332-



♦ Engine and gearbox jack - VAS 6931-



♦ Support - T10149-



Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Release handbrake.

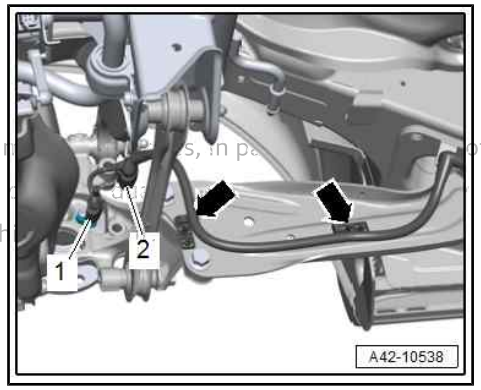
– Remove rear wheels ⇒ page 309 .

– If fitted, remove underbody trim in area of axle beam ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .

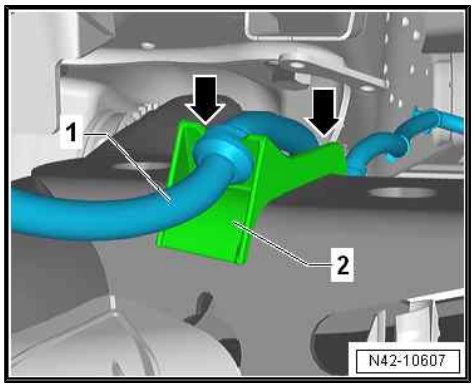
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– Unplug electrical connectors (left and right) -1- for ABS speed sensors and move electrical wiring clear.
– Unplug electrical connectors (left and right) -2- for electromechanical parking brake motor and move electrical wiring clear.
– Detach electrical wiring harness from retainers -arrows- and move clear.

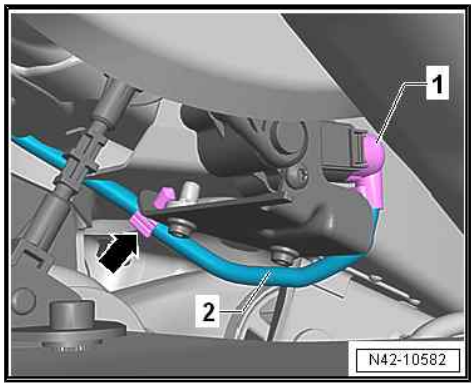


– Unclip electrical wire -1- from bracket -2- on axle beam (both sides) -arrows- and move clear.
– Detach brake calipers on both sides and tie to body with wire ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake .



Vehicles with vehicle level senders:

– Release and unplug connector -1- from rear left vehicle level sender - G76- .
– Detach wire -2- from clip -arrow-.



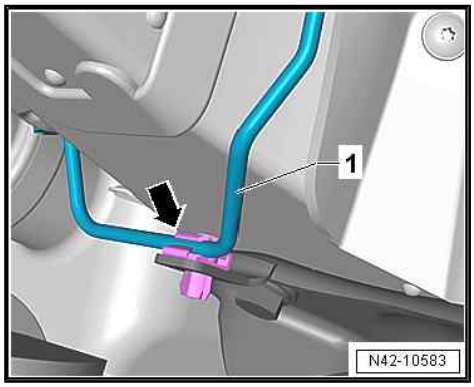
All vehicles (continued)

– Detach brake line -1- from clip -arrow- on mounting bracket (right-side).

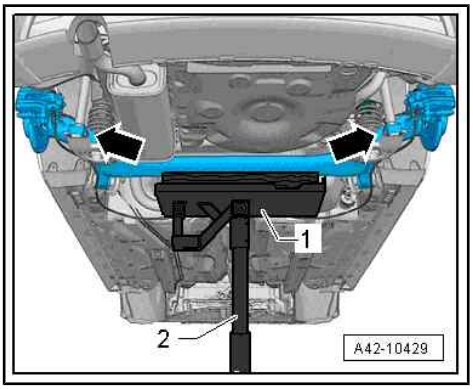
Note

The clip will be destroyed and must be renewed.

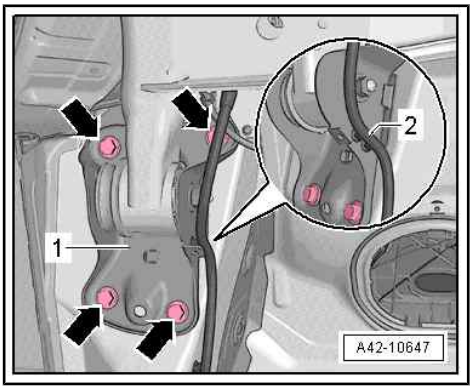
– Remove springs ⇒ page 240 .



– Position engine and gearbox jack - VAS 6931- -item 2- with support plate -1- under axle beam and secure with strap.



– Unclip electrical wiring harness -2- at mounting bracket -1- and axle beam and move clear.



Caution

Risk of damage to threads of bolts securing axle beam to body.

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

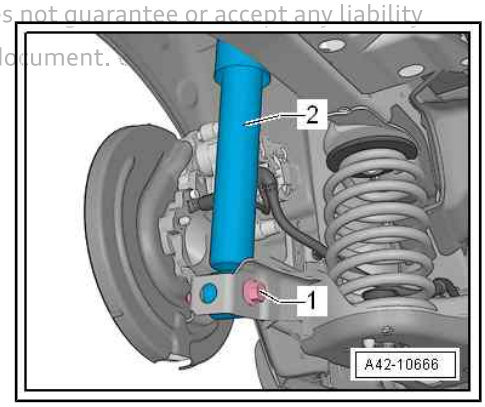
– Mark positions of bolts -arrows- on mounting bracket -1- on both sides of vehicle.

– Unscrew bolts -arrows- for axle beam on both sides.

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– Remove bolt -1- on shock absorber on both sides -2-.

– Lower rear axle with engine and gearbox jack - VAS 6931- .

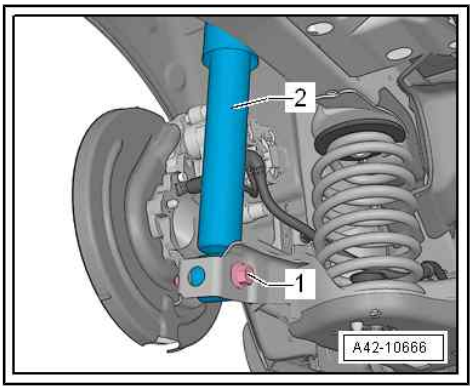


Installing

Installation is carried out in reverse sequence. Note the following:

- Tighten bolted connection -1- securing shock absorber to axle beam with suspension in unladen position ⇒ page 10 .

– Check and adjust wheel alignment ⇒ page 310 .



Tightening torques

- ⇒ “2.1 Exploded view - axle beam”, page 188
- ⇒ “6.1.1 Exploded view - shock absorber, spring (torsion beam axle)”, page 232
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ “1 Wheels, tyres”, page 309

1.2.2 Removing and installing rear axle (multi-link suspension) - front-wheel drive vehicles

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



Removing subframe with attachments

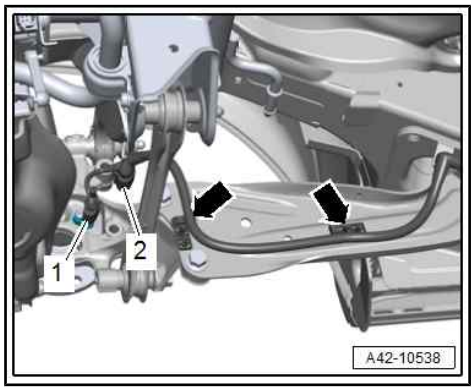
– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Fix position of subframe ⇒ page 200 .

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

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

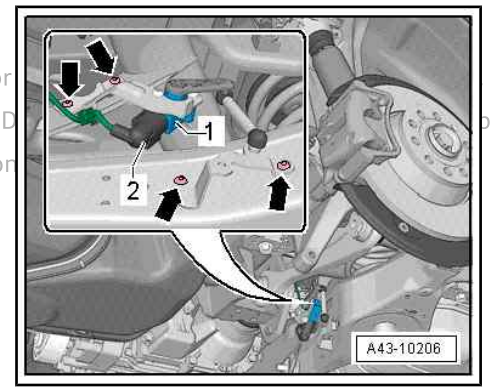
– Detach electrical wiring harness from retainers -arrows- and move clear.



– If fitted, unplug connector -2- for vehicle level sender -1- on both sides.

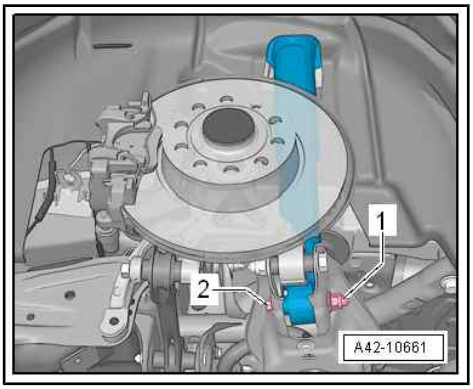
– To prevent damage to rear left and rear right vehicle level senders, remove bolts -bottom arrows- at linkage for rear left and rear right vehicle level senders -1-.

– Move electrical wiring from rear vehicle level sender clear at subframe on both sides.

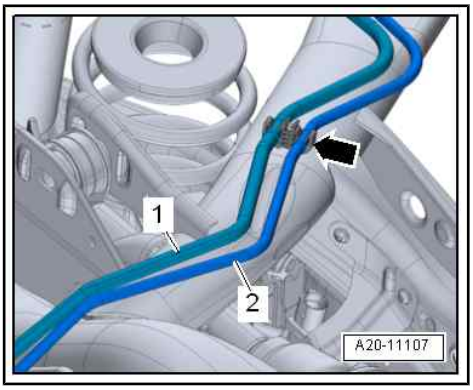


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– Unscrew nut -1- (both sides) and remove bolt -2-.



– Unclip breather lines -1 and 2-.

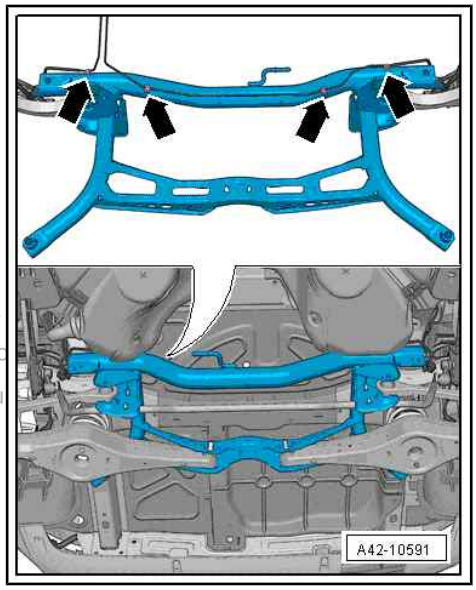


– Unclip brake line on both sides -arrows-.

Note

- *Clips will be destroyed and must be renewed.*
- *For greater clarity, the illustration shows the subframe from above after removal.*

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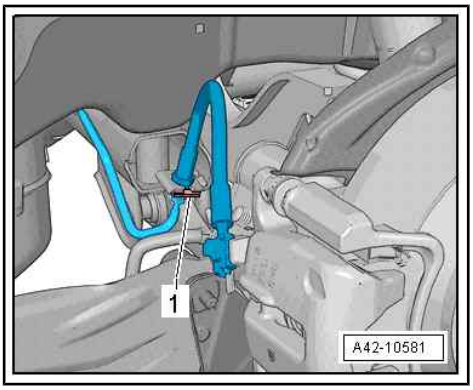


– Pull out retaining clip -1- on both sides of vehicle.
– Move brake line clear of retainer.

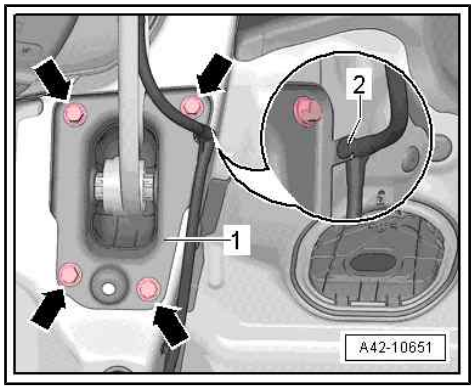
Note

Do not disconnect brake line.

– Remove brake calipers on both sides and tie to body with brake lines connected ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brakes .
– If fitted, remove underbody trim ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .



– Unclip electrical wire -2- on mounting bracket -1- and move clear.
– Mark installation position of mounting bracket -1- on body.
– Remove bolts -arrows-.



WARNING

BEFORE slackening subframe bolts, secure vehicle against tipping over (e.g. by placing a weight of approx. 50 kg in the luggage compartment).

– Lower subframe with attached components.

Note

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

Installing subframe with attachments

Installation is carried out in reverse sequence. Note the following:

– Remove locating pins - T10096- ⇒ page 200 .
- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Vehicles equipped with adaptive cruise control: Calibrate adaptive cruise control ⇒ page 327 .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

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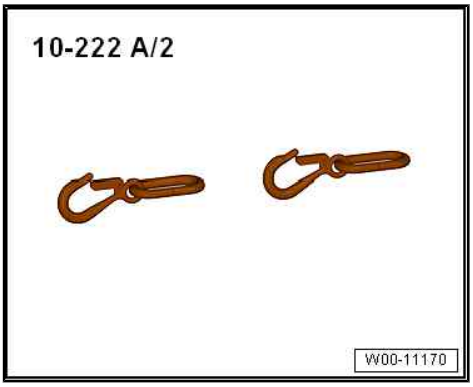
Tightening torques

- ⇒ “3.1.1 Exploded view - subframe (multi-link suspension without bonded rubber bushes), front-wheel drive vehicles and vehicles with high-voltage system”, page 196
- ⇒ “7.2 Exploded view - trailing arm”, page 250
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim
- ⇒ “1 Wheels, tyres”, page 309

1.2.3 Removing and installing rear axle (multi-link suspension) - vehicles with high-voltage system

Special tools and workshop equipment required

- Hook - 10-222A/2-



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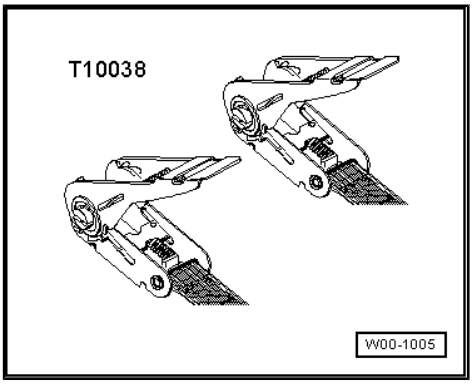
- Extension -2024 A/1-



- Torque wrench - V.A.G 1332-



- Tensioning strap - T10038-



Removing subframe with attachments

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

WARNING

Risk of accident caused by weight of fuel tank

- *The fuel tank must be empty when the subframe is removed.*

– Drain fuel tank ⇒ Fuel supply system; Rep. gr. 20 ; Fuel tank; Draining fuel tank .

– Remove underbody trim (rear) for high-voltage battery unit ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing underbody trim .

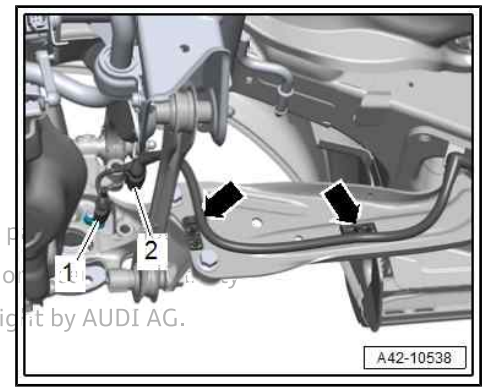
– Fix position of subframe ⇒ page 200 .

– Remove wheel housing liners (both sides) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (rear) .

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

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

– Detach electrical wiring harness from retainers -arrows- and move clear.

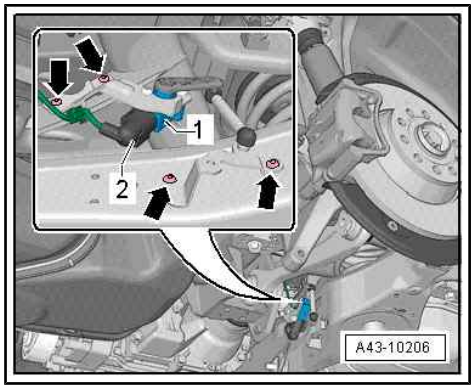


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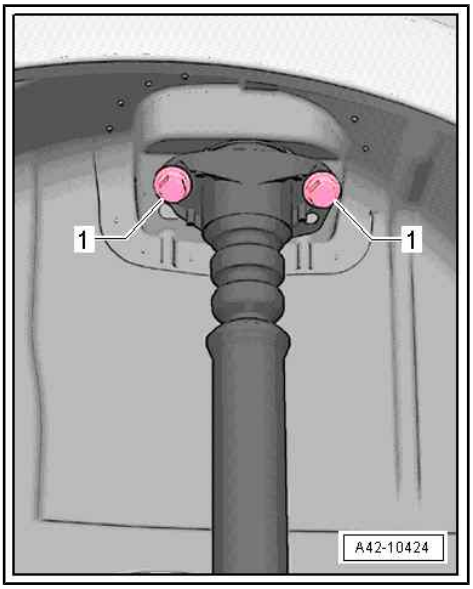
– If fitted, unplug connector -2- for vehicle level sender -1- on both sides.

– To prevent damage to rear left and rear right vehicle level senders, remove bolts -bottom arrows- at linkage for rear left and rear right vehicle level senders -1-.

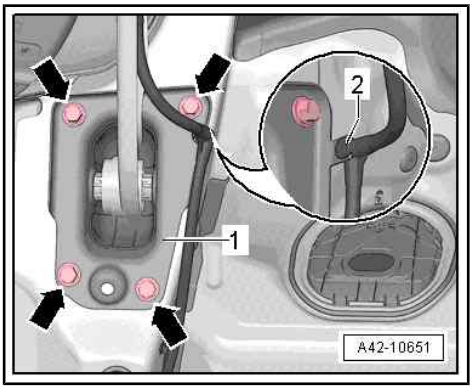
– Move electrical wiring from rear vehicle level sender clear at subframe on both sides.



– Remove bolts -1- for shock absorber on both sides.
– Remove brake calipers (both sides) ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake .
– Remove heat shield for rear silencer ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Removing and installing heat shield for floor .



– Unclip electrical wire -2- on mounting bracket -1- and move clear.
– Mark installation position of mounting bracket -1- on body.
– Remove bolts -arrows-.



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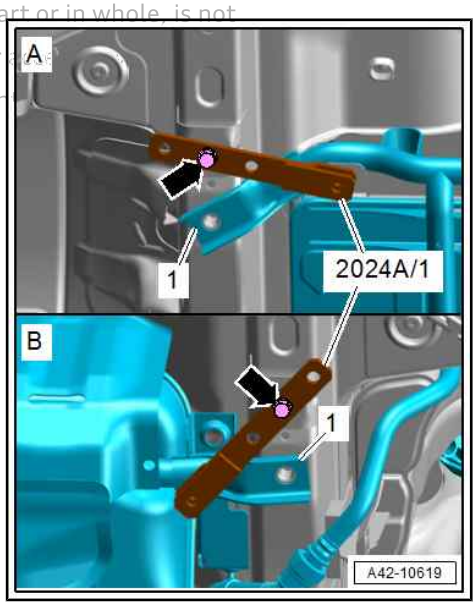
– Secure rear frame of fuel tank -1- using extension -2024 A /1- -arrows-, as shown in illustration (tightening torque 20 Nm).

A - Left side of vehicle

B - Right side of vehicle

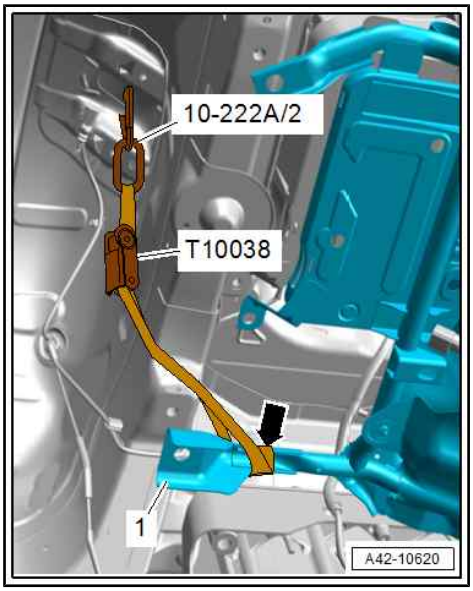
Note

For greater clarity, the illustration shows the installation position with the subframe removed.



– Secure front frame of fuel tank -1- using tensioning strap - T10038- : wrap tensioning strap several times round frame -arrow- and attach to body with hook - 10-222A/2- as shown in illustration.

– Apply light tension to tensioning strap - T10038- .

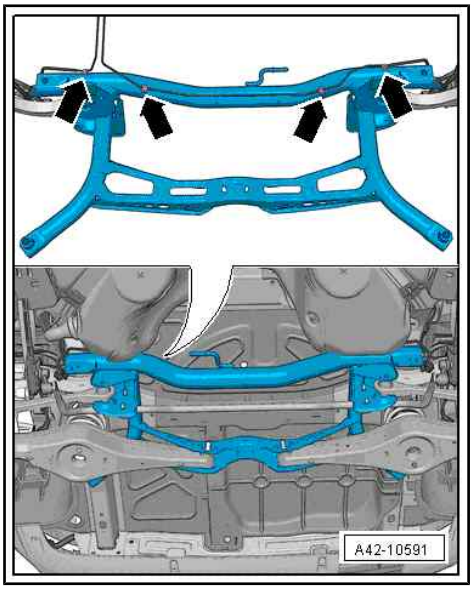


Note

For greater clarity, the illustration shows the installation position with the subframe removed.

– Lower subframe with attachments a maximum of 50 mm.

– Unclip brake line on both sides -arrows-.



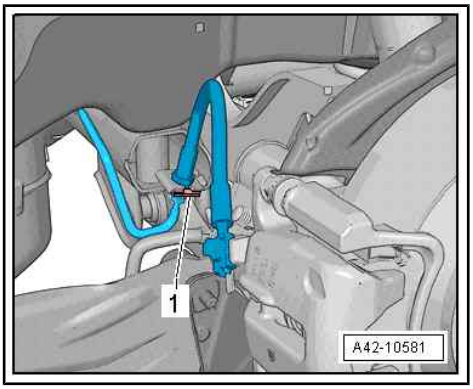
Note

- *Clips will be destroyed and must be renewed.*
- *For greater clarity, the illustration shows the subframe from above after removal.*

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

– Move brake line clear of retainer.



Note

Do not disconnect brake line.

– Lower subframe with attached components further.

Note

When lowering, ensure sufficient clearance to brake lines and fuel lines.

Installing subframe with attachments

Installation is carried out in reverse sequence. Note the following:

– Remove locating pins - T10096- ⇒ page 200 .

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Vehicles equipped with adaptive cruise control: Calibrate adaptive cruise control ⇒ page 327 .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “3.1.1 Exploded view - subframe (multi-link suspension without bonded rubber bushes), front-wheel drive vehicles and vehicles with high-voltage system”, page 196
- ⇒ “7.2 Exploded view - trailing arm”, page 250
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim
- ⇒ “1 Wheels, tyres”, page 309

1.2.4 Removing and installing rear axle (multi-link suspension) - four-wheel drive vehicles

Special tools and workshop equipment required

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♦ Torque wrench - V.A.G 1332-



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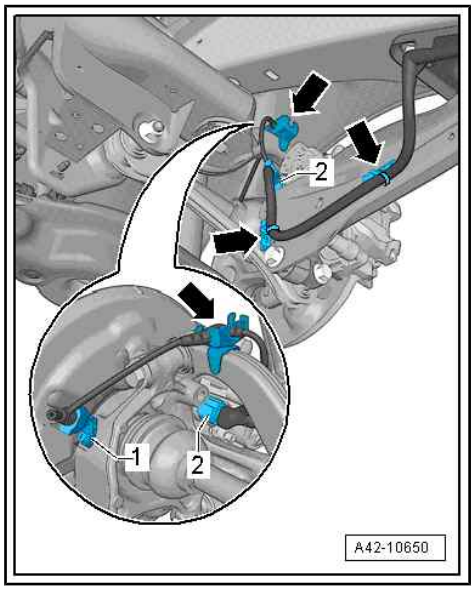
Removing subframe with attachments

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

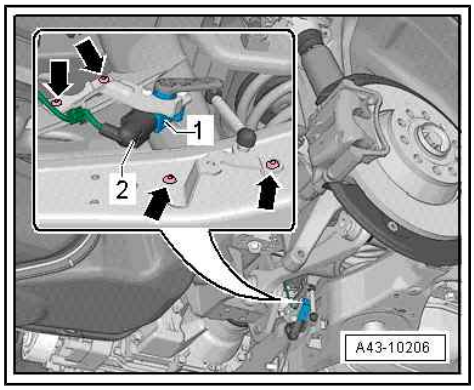
Note

If the bolt securing the drive shaft has to be loosened for later operations, remember that this must be done with the vehicle standing on its wheels. Slacken bolt securing drive shaft to wheel hub ⇒ page 283 .

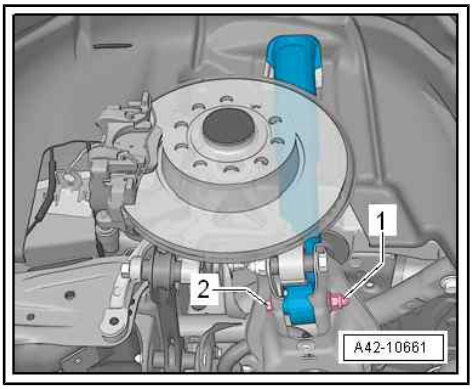
– Fix position of subframe ⇒ page 200 .
– Unplug electrical connector -1- from ABS speed sensor on both sides and move clear.
– Unplug electrical connector -2- from electromechanical parking brake motor on brake caliper on both sides.
– Detach electrical wiring harness from retainers -arrows- and move clear.



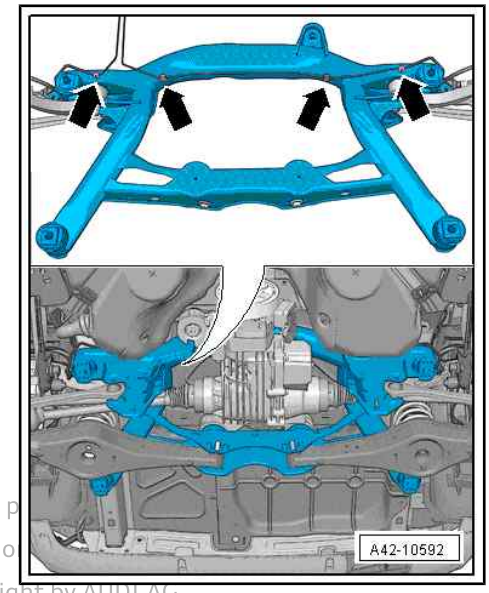
– If fitted, unplug connector -2- for vehicle level sender -1- on both sides.
– To prevent damage to rear left and rear right vehicle level senders , remove bolts -bottom arrows- at linkage for rear left and rear right vehicle level senders -1-.
– Move electrical wiring from rear vehicle level sender clear at subframe on both sides.



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



– Unclip brake line on both sides -arrows-.
– Detach breather line for activated charcoal filter from clips on right side.

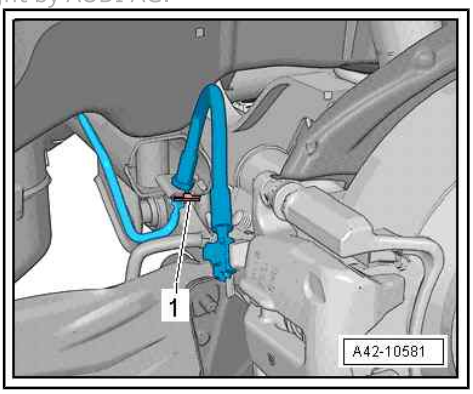


Note

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– Pull out retaining clip -1- on both sides of vehicle.
– Move brake line clear of retainer.

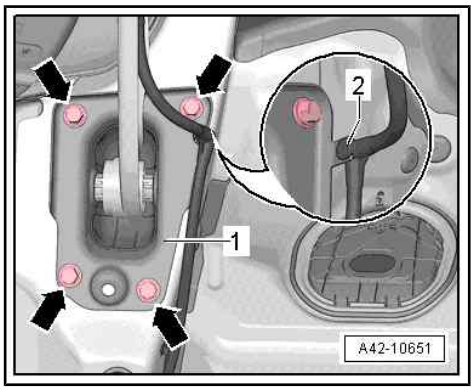


Note

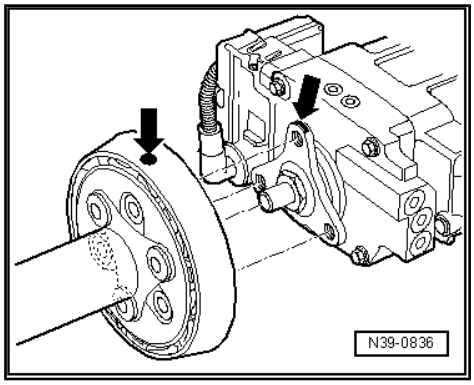
Do not disconnect brake line.

– Remove brake calipers on both sides and tie to body with brake lines connected ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brakes .
– If fitted, remove underbody trim ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .

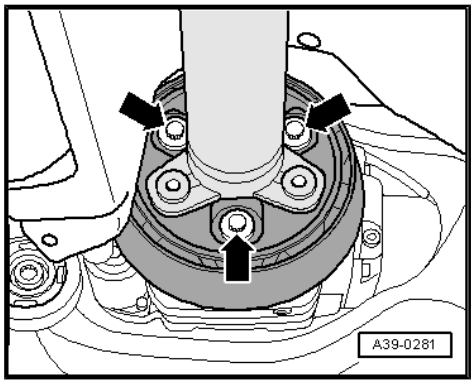
– Unclip electrical wire -2- on mounting bracket -1- and move clear.
– Mark installation position of mounting bracket -1- on body.
– Remove bolts -arrows-.



– Check for factory marks (coloured spot -arrows-) on flexible coupling and Haldex coupling flange. If necessary, mark position of flexible coupling and Haldex coupling flange in relation to each other -arrows-.

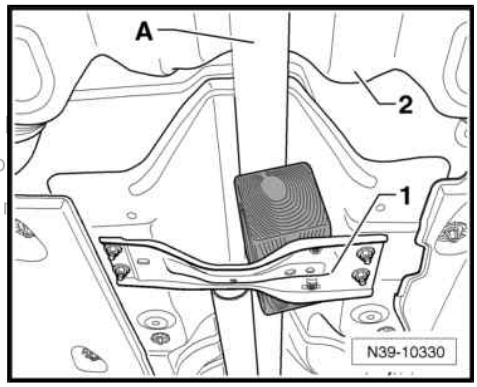


– Unbolt rear propshaft tube with flexible coupling and vibration damper from rear final drive -arrows- ⇒ Rep. gr. 39 ; Propshaft; Removing and installing propshaft .



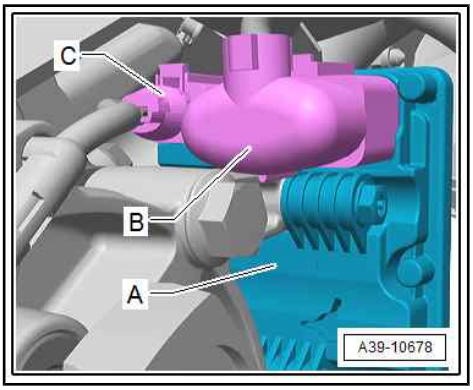
– Support propshaft -A- on tunnel cross-piece -1- using a wooden block. Re-install tunnel cross-piece if necessary.

– Push rear propshaft tube towards gearbox as far as possible.



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– Unplug electrical connector -B- on all-wheel drive control unit - J492- -item A-.



Note

Disregard -item C-.

– Carefully lower subframe with attachments.

Note

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

Installing subframe with attachments

Installation is carried out in reverse sequence. Note the following:

– Remove locating pins - T10096- ⇒ page 200 .

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .
- Vehicles equipped with adaptive cruise control: Calibrate adaptive cruise control ⇒ page 327 .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

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Tightening torques

- ⇒ “3.1.3 Exploded view - subframe (multi-link suspension), four-wheel drive vehicles”, page 200
- ⇒ “7.2 Exploded view - trailing arm”, page 250
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim
- ⇒ “1 Wheels, tyres”, page 309

2 Axle beam

⇒ “2.1 Exploded view - axle beam”, page 188

⇒ “2.2 Renewing bonded rubber bushes for axle beam”, page 189

2.1 Exploded view - axle beam

Caution

Risk of damage to threads of bolts securing axle beam to body.

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

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1 - Cover

2 - Bolt

- ❑ Always renew if removed
- ❑ 50 Nm +45°

3 - Bolt

- ❑ Always renew if removed
- ❑ Tighten in unladen position ⇒ page 10
- ❑ 70 Nm +360°

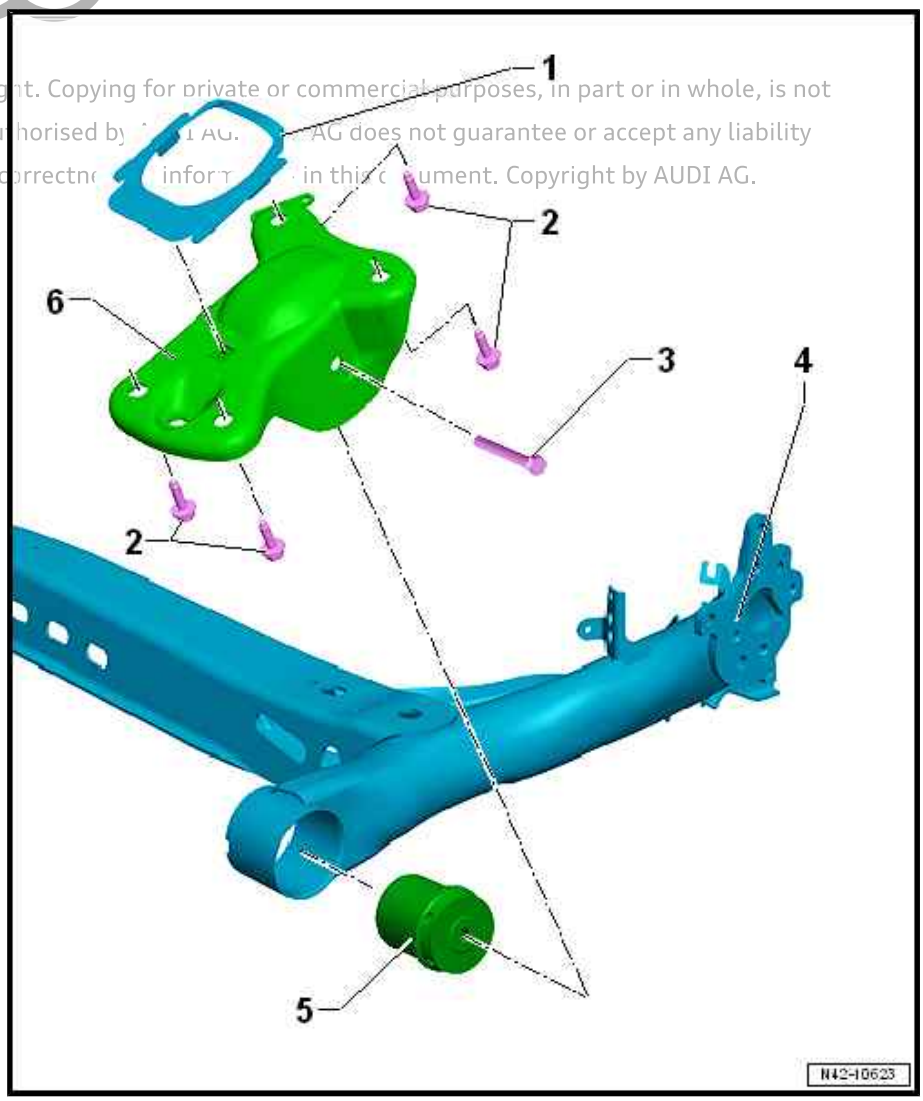
4 - Axle beam

- ❑ Removing and installing ⇒ page 172

5 - Bonded rubber bush

- ❑ Note correct installation position
- ❑ Renewing ⇒ page 189

6 - Mounting bracket



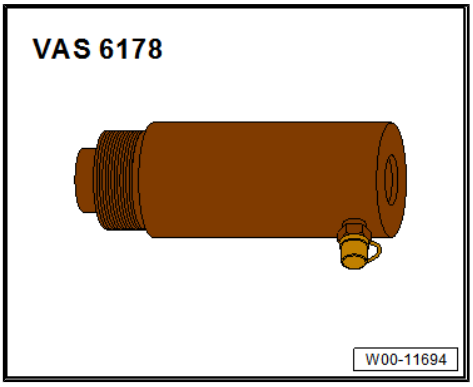
2.2 Renewing bonded rubber bushes for axle beam

Special tools and workshop equipment required

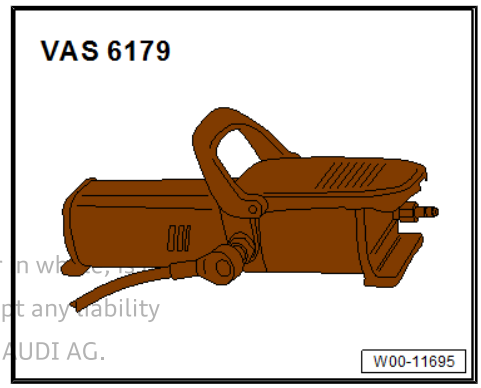
- Torque wrench - V.A.G 1332-



- Hydraulic cylinder - T10205/13- with thrust piece - VAS 6178-



- Foot pump - VAS 6179-



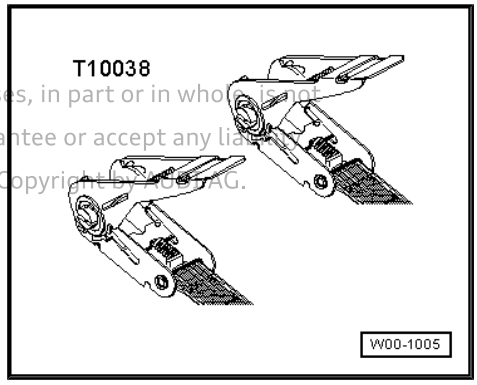
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- Engine and gearbox jack - VAS 6931-

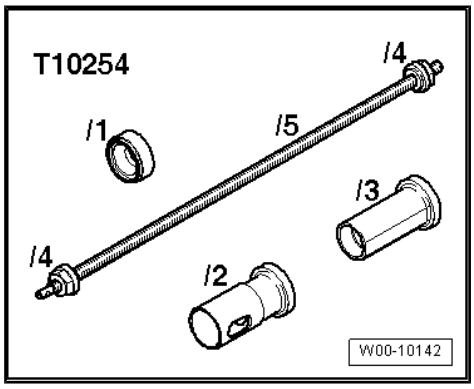


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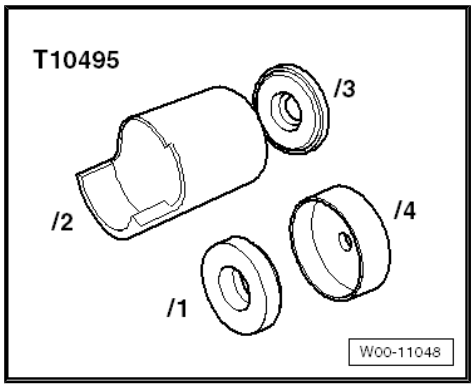
♦ Tensioning strap - T10038-



♦ Assembly tool - T10254-



♦ Assembly tool - T10495-



Removing

– Release handbrake.

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

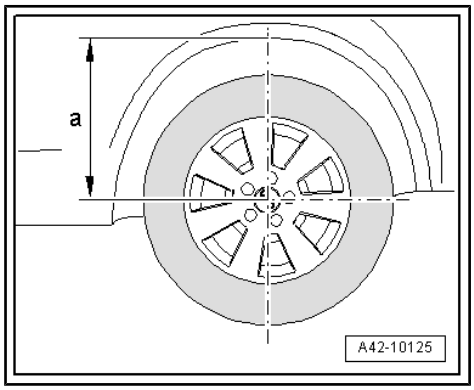
• This measurement must be taken with the suspension in the unladen position (vehicle unladen) ⇒ page 10 .

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

– Raise vehicle to working height.

– Remove rear wheels ⇒ page 309 .

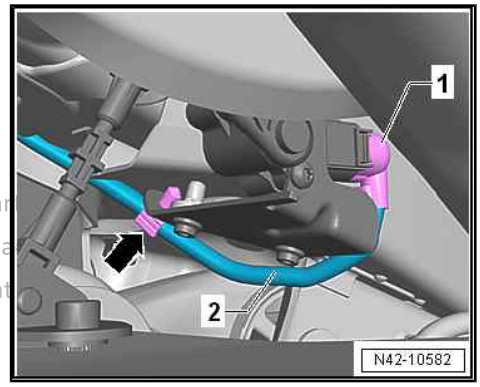
– If fitted, remove underbody trim in area of axle beam ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .



Vehicles with vehicle level senders:

– Release and unplug connector -1- from rear left vehicle level sender - G76- .

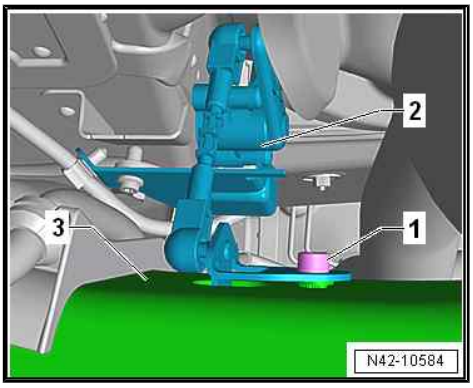
– Detach wire -2- from clip -arrow-.



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– Remove bolt -1-.

– Detach lever from rear left vehicle level sender - G76- -2- on axle beam -3-.

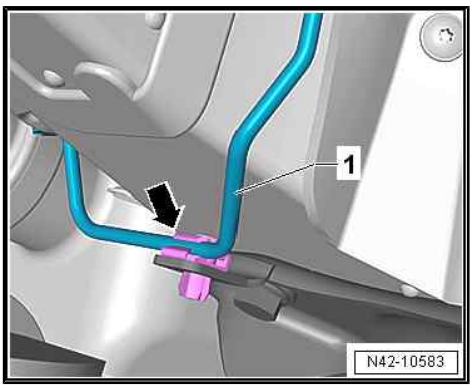


All vehicles (continued)

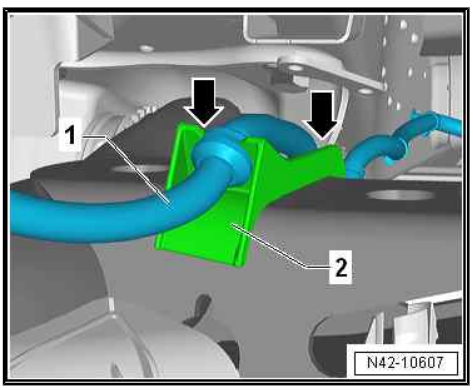
– Unclip brake line -1- from mounting bracket (right-side) -arrow-.

Note

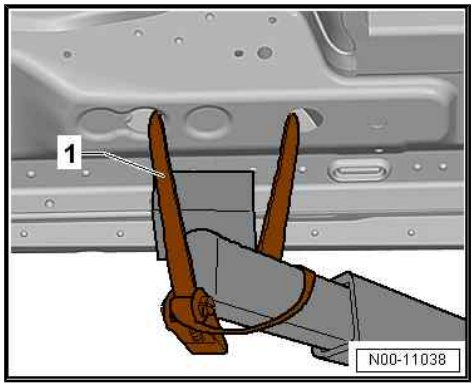
The clip will be destroyed and must be renewed.



– Unclip electrical wire -1- from bracket -2- on axle beam (both sides) -arrows-.



– Use tensioning straps -T10038- -item 1- to secure vehicle to support arms of lifting platform on both sides.

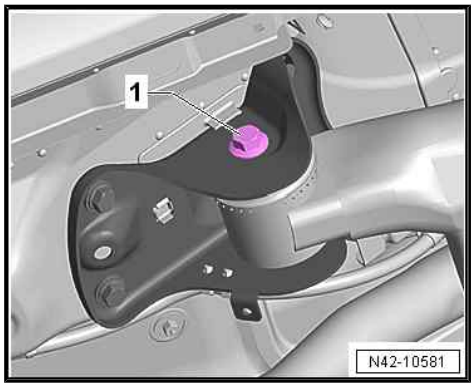


WARNING

If the vehicle is not strapped down, there is a danger that it can slip off the lifting platform.

– Loosen bolt -1- on both sides.

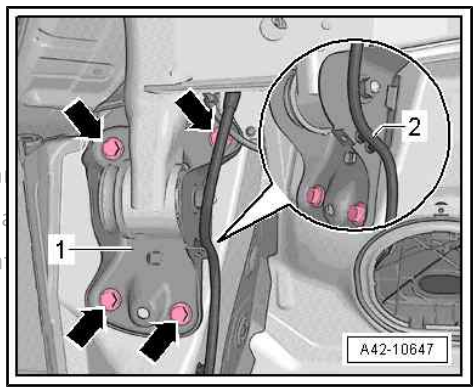
– Bring engine and gearbox jack - VAS 6931- into position with support plate and a suitable support block or similar.



– Unclip electrical wire -2- from mounting bracket -1-.

– Mark positions of bolts -arrows- on mounting bracket -1- on both sides of vehicle.

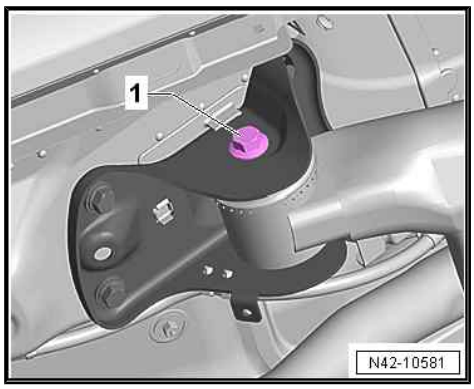
– Unscrew bolts -arrows- for axle beam on both sides.

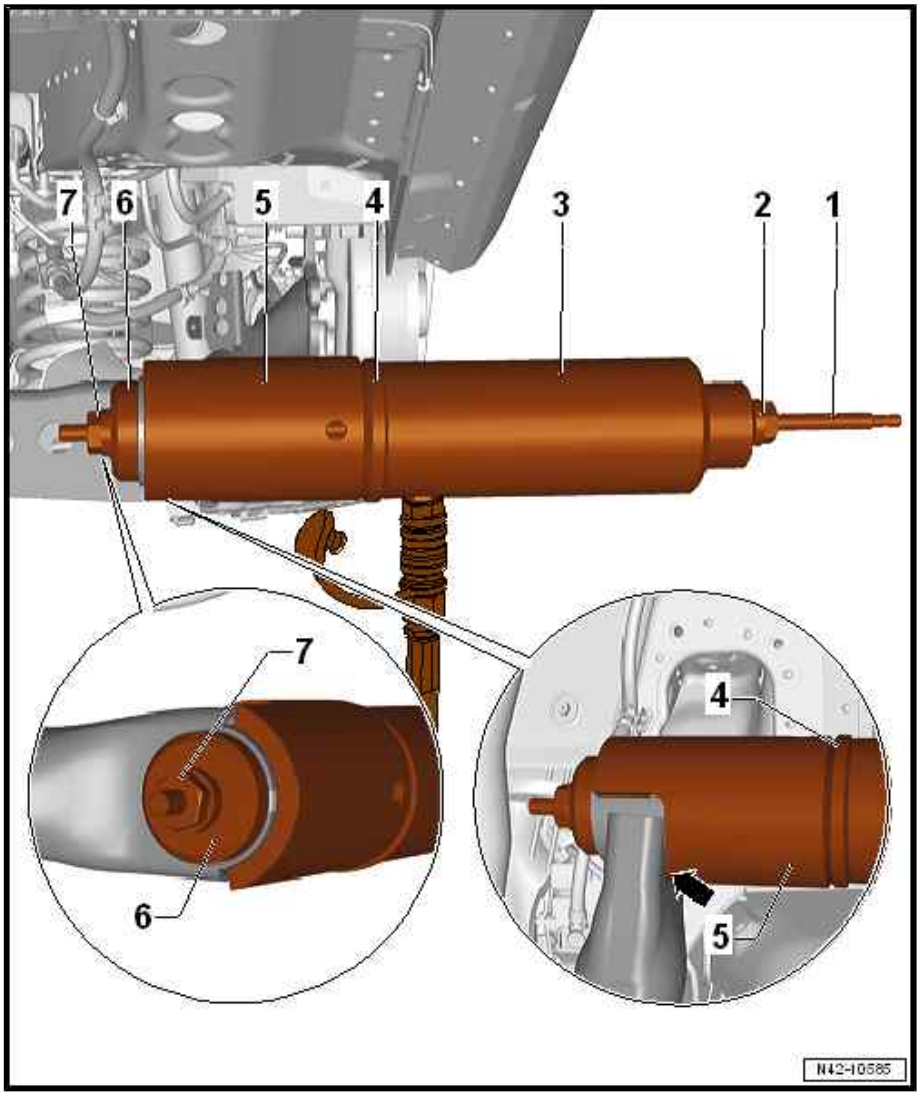


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– Carefully lower rear axle with engine and gearbox jack - VAS 6931- until bolt -1- can be taken out.

– Remove bolt -1-.





– Set up special tools as shown in illustration.

1 - Spindle - T10254/5-

2 - Nut - T10254/4-

3 - Hydraulic cylinder - VAS 6178- with thrust piece - T10205/13-

4 - Thrust plate - T10495/3-

5 - Tube - T10495/2-

♦ Make sure that tube makes contact with axle beam -arrow-.

6 - Thrust piece - T10495/1-

7 - Nut - T10254/4-

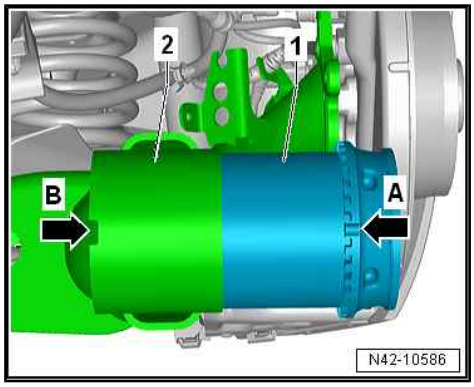
– Pull out bonded rubber bush by operating the pump.

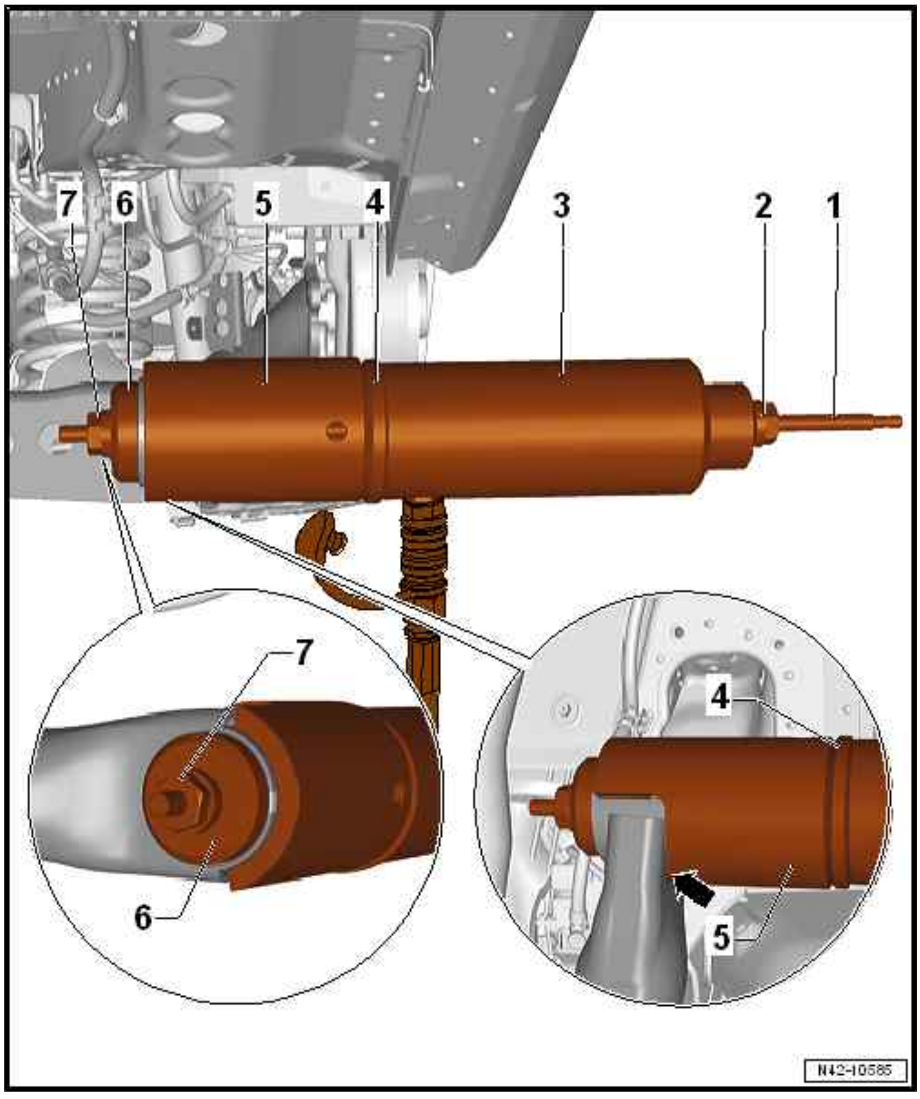
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Installing

– Note correct position of bonded rubber bush -1- relative to axle beam -2-.

Lug -arrow A- on bonded rubber bush -1- must point towards notch -arrow B- on axle beam -2-.





– Set up special tools as shown in illustration.

1 - Spindle - T10254/5-

2 - Nut - T10254/4-

3 - Hydraulic cylinder - VAS 6178- with thrust piece - T10205/13-

4 - Thrust piece - T10495/1-

5 - Bonded rubber bush

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6 - Thrust plate - T10495/3-

7 - Nut - T10254/4-

– Before pressing in bonded rubber bush, make sure that marking on bush is in line with marking on axle beam.

– Press in bonded rubber bush as far as stop.

– After installation, check that bonded rubber bush is in correct position.

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Remaining installation steps are the reverse of removal; note the following:

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be calibrated on vehicles with lane departure warning function ⇒ page 343 .
- Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Check and adjust wheel alignment ⇒ page 310 .

Tightening torques

- ⇒ “2.1 Exploded view - axle beam”, page 188
- ⇒ “2.2.2 Exploded view - rear left vehicle level sender G76 , vehicles with torsion beam axle”, page 305
- ⇒ “1 Wheels, tyres”, page 309

3 Subframe

⇒ “3.1 Exploded view - subframe”, page 196

⇒ “3.2 Fixing position of subframe”, page 200

⇒ “3.3 Servicing subframe”, page 207

3.1 Exploded view - subframe

⇒ “3.1.1 Exploded view - subframe (multi-link suspension without bonded rubber bushes), front-wheel drive vehicles and vehicles with high-voltage system”, page 196

⇒ “3.1.2 Exploded view - subframe (multi-link suspension with bonded rubber bushes), front-wheel drive vehicles”, page 198

⇒ “3.1.3 Exploded view - subframe (multi-link suspension), four-wheel drive vehicles”, page 200

3.1.1 Exploded view - subframe (multi-link suspension without bonded rubber bushes), front-wheel drive vehicles and vehicles with high-voltage system

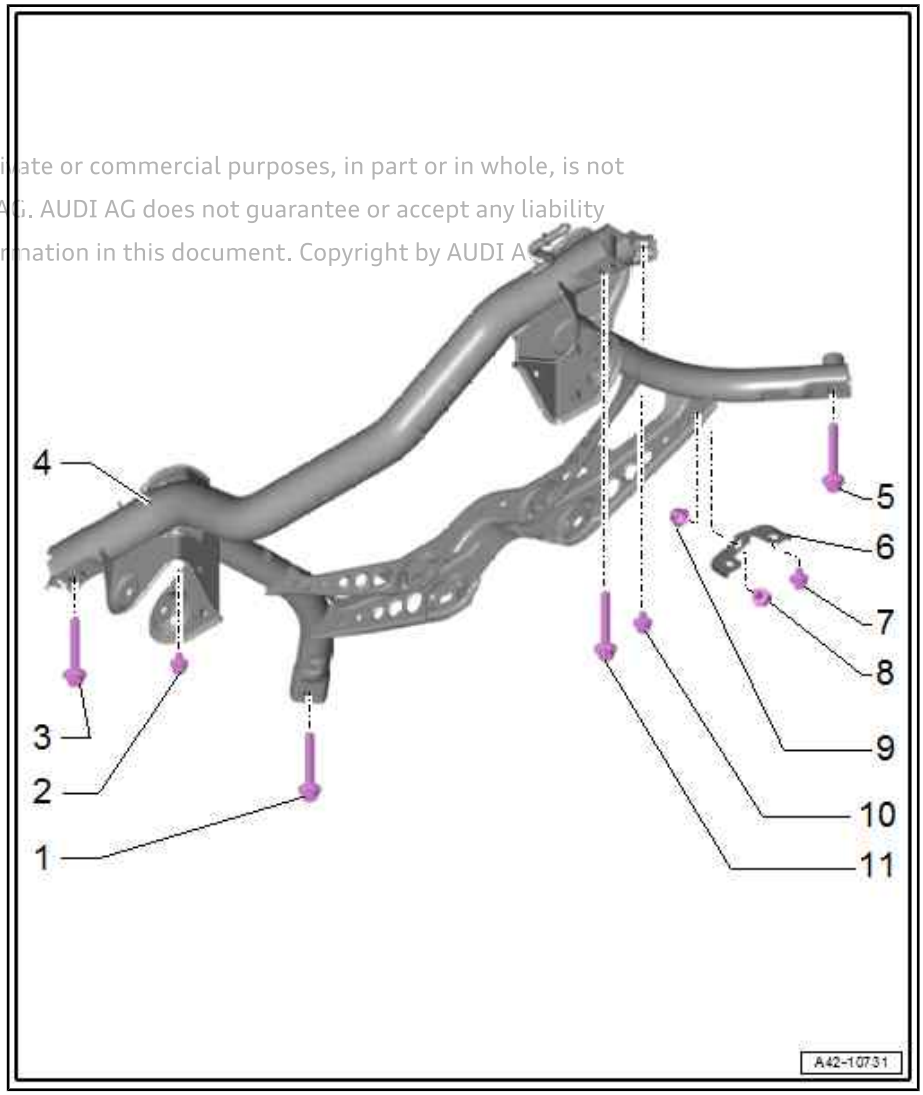
Caution

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

- ❑ Always renew if removed
- ❑ 70 Nm +180°

2 - Bolt

- ❑ Always renew if removed
- ❑ 50 Nm +45°

3 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +180°

4 - Subframe

- ❑ Different versions; for correct version refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing subframe with attachments

◆ ⇒ “1.2.2 Removing and installing rear axle (multi-link suspension) - front-wheel drive vehicles”, page 176

◆ ⇒ “1.2.3 Removing and installing rear axle (multi-link suspension) - vehicles with high-voltage system”, page 179

5 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +180°

6 - Bracket for subframe

- ❑ For Audi A3 Cabriolet only

7 - Bolt

- ❑ Tightening torque and tightening sequence ⇒ page 198

8 - Bolt

- ❑ Tightening torque and tightening sequence ⇒ page 198

9 - Nut

10 - Bolt

- ❑ Always renew if removed
- ❑ 50 Nm +45°

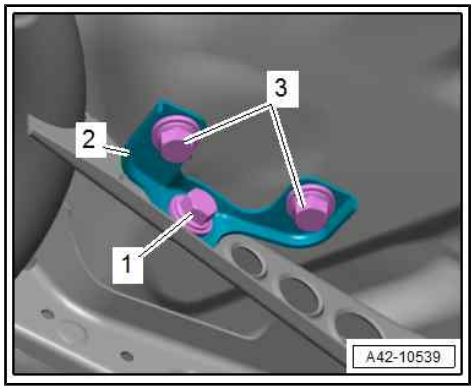
11 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +180°

Bracket for subframe on Audi A3 Cabriolet - tightening torque and tightening sequence

– Tighten bolts in stages as follows:

Stage	Bolts	Tightening torque/angle specification
1.	-1, 3-	Screw in by hand until bolt heads are seated
2.	-1, 3-	Tighten to 5 Nm and back off immediately by 90°
3.	-1, 3-	Tighten to 20 Nm



3.1.2 Exploded view - subframe (multi-link suspension with bonded rubber bushes), front-wheel drive vehicles

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 - Subframe

- ❑ Removing and installing subframe with attachments ⇒ page 176

2 - Bonded rubber bush (rear)

- ❑ Renewing ⇒ page 207

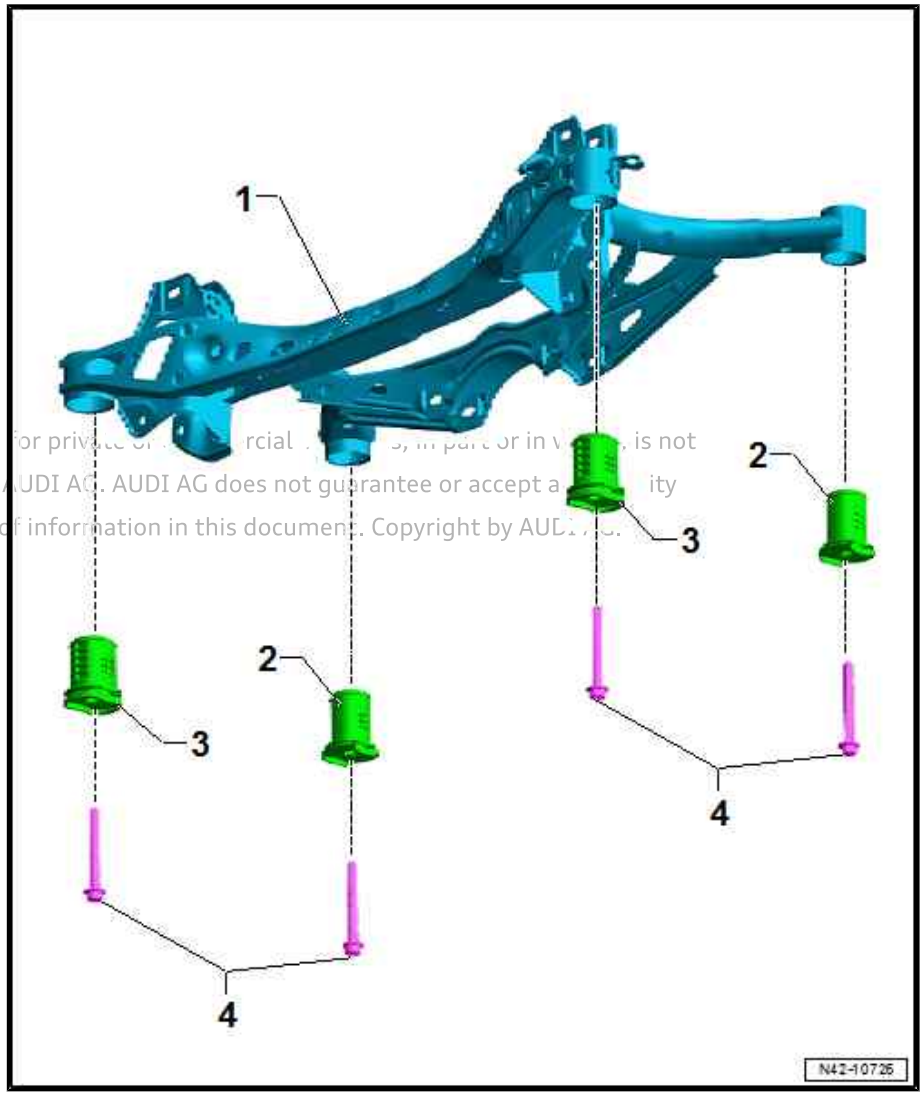
3 - Bonded rubber bush (front)

- ❑ Renewing ⇒ page 207

4 - Bolts

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

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3.1.3 Exploded view - subframe (multi-link suspension), four-wheel drive vehicles

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 - Cross piece
- ❑ For Audi Cabriolet (quattro) only

2 - Bolt
- ❑ 40 Nm

3 - Rivet nut

4 - Bolt
- ❑ 40 Nm

5 - Rivet nut

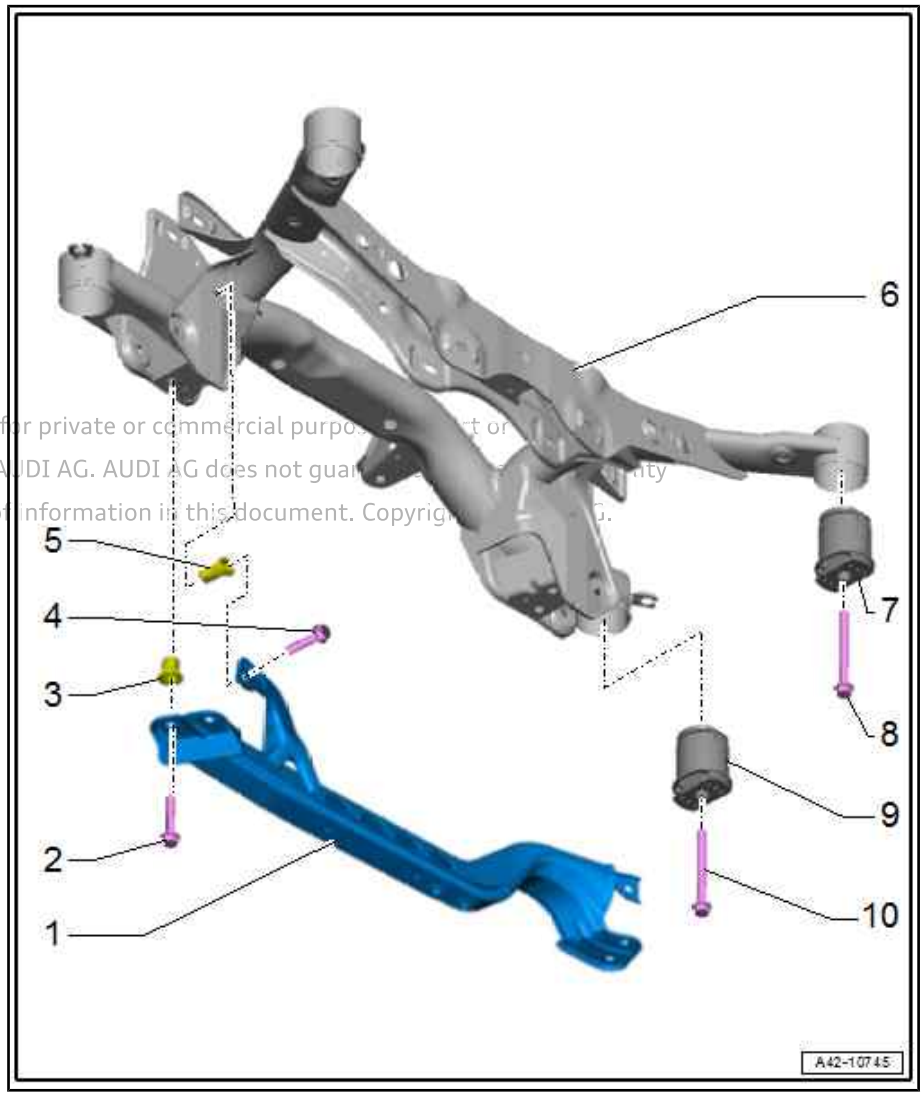
6 - Subframe
- ❑ Removing and installing subframe with attachments ⇒ page 183

7 - Bonded rubber bush (rear)
- ❑ Aluminium bushes on A3 Cabriolet (cannot be renewed)
- ❑ Renewing ⇒ page 207

8 - Bolt
- ❑ Always renew if removed
- ❑ 70 Nm +180°

9 - Bonded rubber bush (front)
- ❑ Aluminium bushes on A3 Cabriolet (cannot be renewed)
- ❑ Renewing ⇒ page 207

10 - Bolt
- ❑ Always renew if removed
- ❑ 70 Nm +180°



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3.2 Fixing position of subframe

Special tools and workshop equipment required

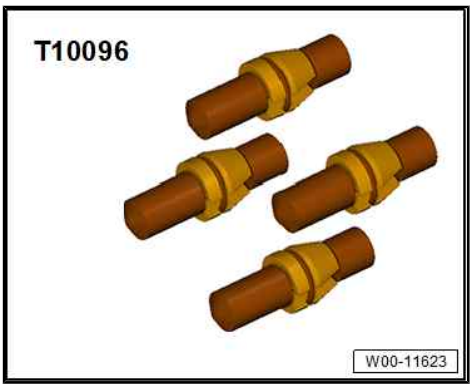
- Torque wrench - V.A.G 1332-



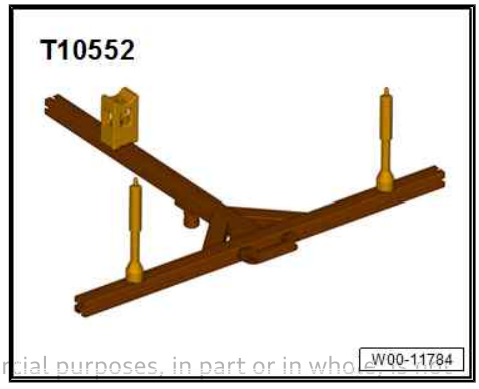
- Engine and gearbox jack - VAS 6931-



- Locating pins - T10096-



- Rear axle support - T10552-



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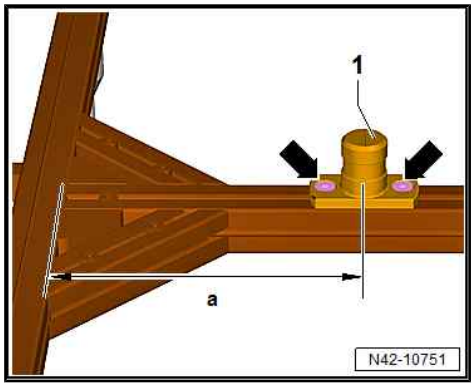
Preparing tool

– Loosen bolts -arrows-.

– Set to dimension -a-.

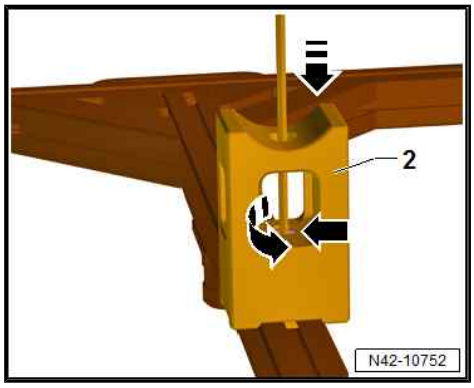
• Dimension -a- = 250 mm

– Tighten bolts to 10 Nm again.



– Loosen bolt -arrow-.

– Turn support -T10552/2- -item 2- so that recess is perpendicular to direction of travel.

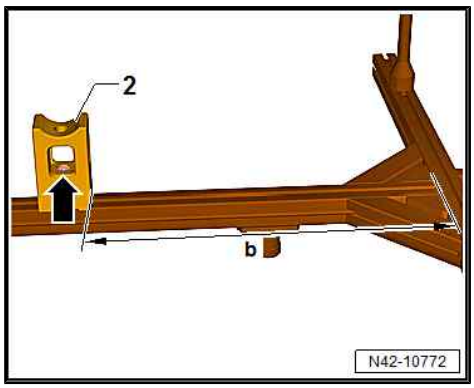


– Set to dimension -b-.

• Vehicles with front-wheel drive: -b- = 270 mm.

• Vehicles with four-wheel drive: -b- = 410 mm.

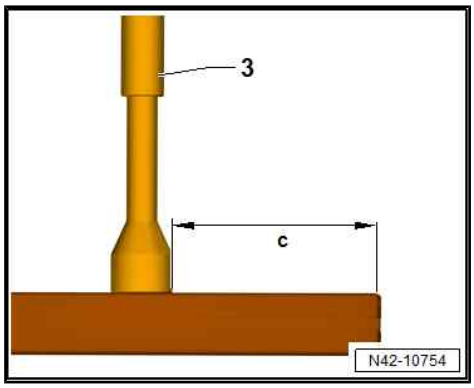
– Re-tighten bolt -arrow- to 10 Nm.



– Loosen mounting pins -T10552/1- -item 3- at bottom left and right.

– Set to dimension -c-.

• Dimension -c- = 47 mm.

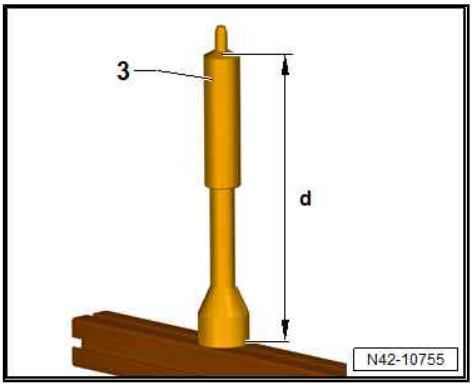


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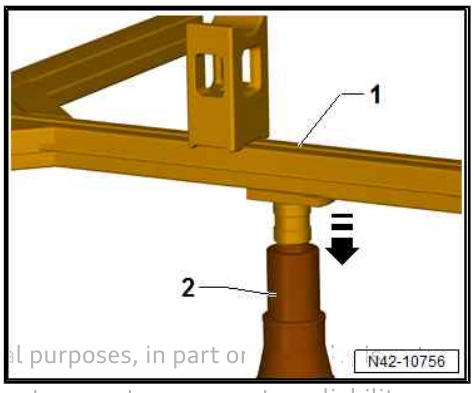
– Turn threaded sleeves (left and right) on mounting pins - T10552/1- -item 3- until dimension -d- is attained.

• Vehicles with front-wheel drive: -d- = 230 mm.

• Vehicles with four-wheel drive: -d- = 215 mm.



– Fit rear axle support - T10552- -item 1- onto engine and gearbox jack - VAS 6931- -item 2-.

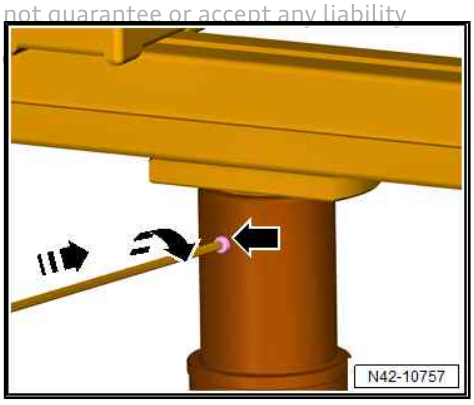


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– Tighten bolt -right arrow-.

♦ Tighten M6 bolt to 5 Nm.

♦ Tighten M8 bolt to 10 Nm.



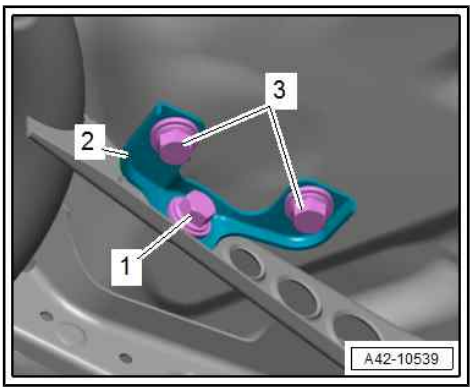
Procedure

– Remove silencer(s) ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers .

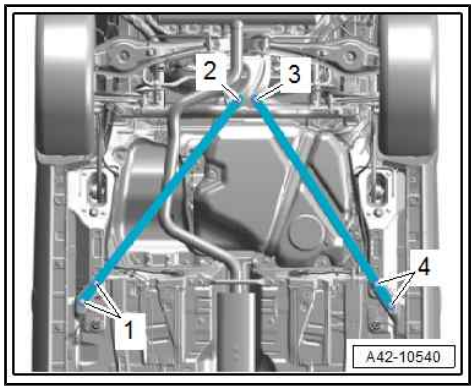
– Remove springs ⇒ page 240 .

Audi A3 Cabriolet:

– Slacken bolts -3- securing bracket -2- for subframe and remove bolt -1- (counterhold the nut).



– Remove bolts -1 … 4- and take out diagonal struts.



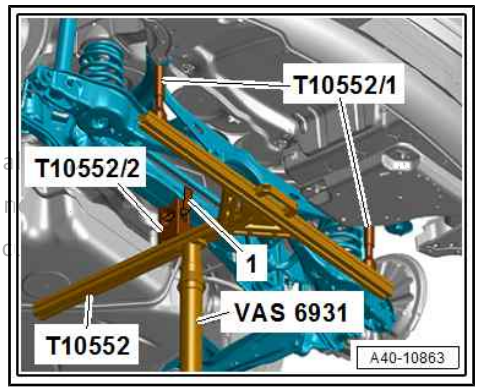
Vehicles with front-wheel drive:

– Move prepared rear axle support - T10552- with engine and gearbox jack - VAS 6931- so that it makes contact with cross brace.

• Mounting pins -T10552/1- engage in holes on rear of sub-frame.

– Secure subframe with tensioning strap of rear axle support.

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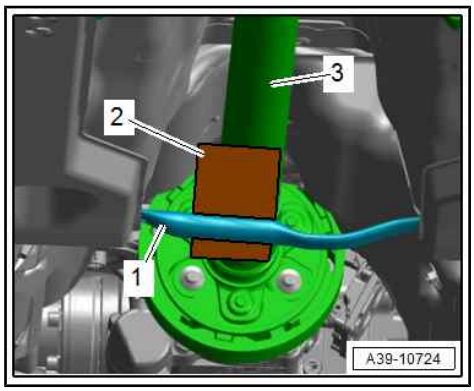


Four-wheel drive vehicles:

– Unbolt rear propshaft tube with flexible coupling and vibration damper from rear final drive ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .

– Support propshaft -3- on tunnel cross-piece -1- using a wooden block -2-.

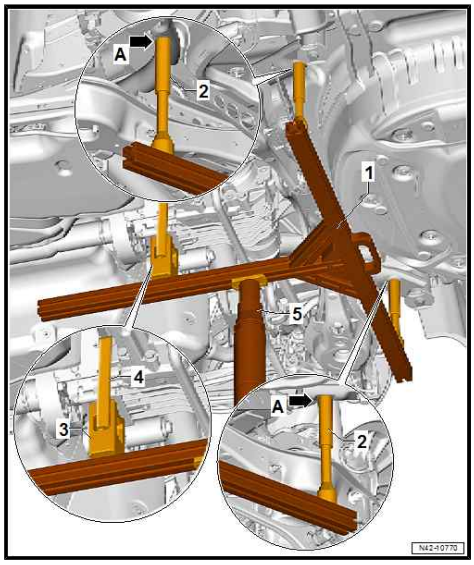
– Push rear propshaft tube towards gearbox as far as possible.



– Position rear axle support - T10552- -item 1- with engine and gearbox jack - VAS 6931- -item 5- underneath subframe and raise.

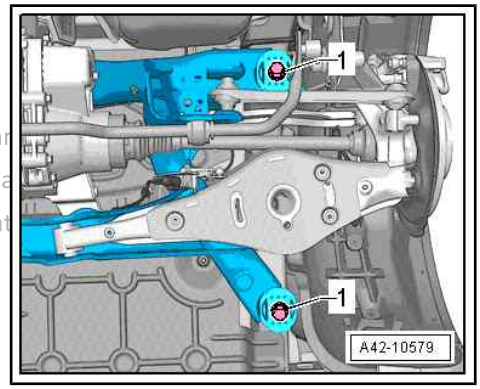
– Insert mounting pins -T10552/1- -item 2- into holes on subframe -arrows A-.

– Secure support -T10552/2- -item 3- to subframe using tensioning strap -4-.



Subframe version 1:

- To fix position of subframe, locating pins from locating pin set - T10096- must be screwed in one after the other on both sides at positions -1-.



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Caution

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

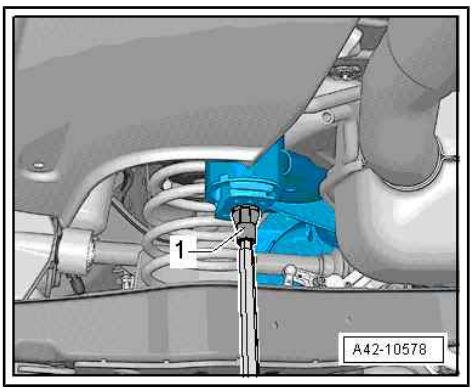
- ***DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.***
- ***Always fit all bolts by hand; make the first few turns by hand.***

– Remove one bolt (front) -1- for subframe.

– Screw in locating pin -1- from locating pin set - T10096- and tighten to max. 20 Nm.

– Repeat procedure for second bolt (front) and bolts (rear) for subframe.

♦ The position of the subframe is now fixed.

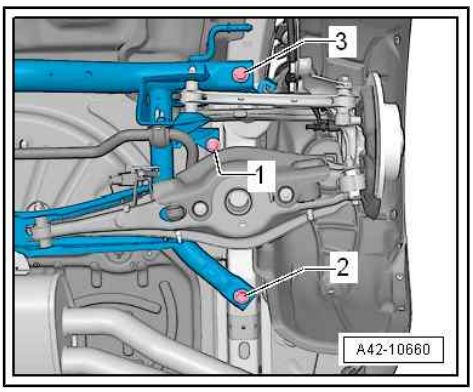


Subframe version 2:

Caution

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

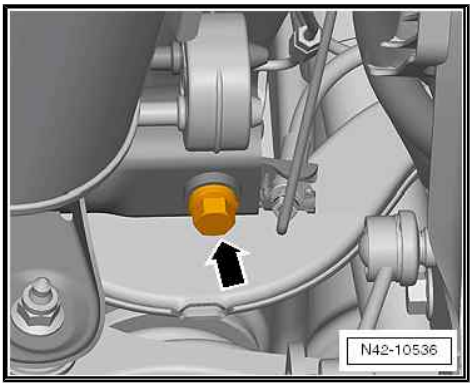
- ***DO NOT use an impact wrench when loosening or tightening the bolts that secure the subframe to the body.***
- ***Always fit all bolts by hand; make the first few turns by hand.***



– Remove bolt -1- on both sides.

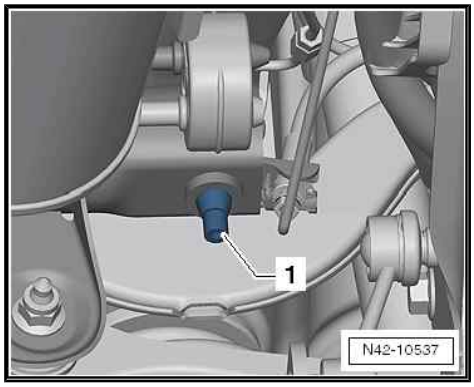
- To fix position of subframe, locating pins from locating pin set - T10096- must be screwed in one after the other on both sides at positions -2- and -3-.

– Remove one bolt (front) -arrow- for subframe.



– Screw in locating pin -1- from locating pin set - T10096- and tighten to max. 20 Nm.
– Repeat procedure for second bolt (front) and bolts (rear) for subframe.

♦ The position of the subframe is now fixed.



Removing locating pins -T10096-

Removal is performed in reverse sequence; note the following:

– Working in a diagonal sequence, 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.*

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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.*

– Install springs ⇒ page 240 .
– Install propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
– Perform test drive after completing repair work. Wheel alignment must be checked and adjusted if the steering wheel is not straight ⇒ page 310 .

Tightening torques

♦ ⇒ “3.1 Exploded view - subframe”, page 196
♦ Diagonal struts ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim
♦ ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers

3.3 Servicing subframe

⇒ “3.3.1 Renewing front bonded rubber bushes in subframe (multi-link suspension)”, page 207

⇒ “3.3.2 Renewing rear bonded rubber bushes in subframe (multi-link suspension)”, page 211

3.3.1 Renewing front bonded rubber bushes in subframe (multi-link suspension)

Note

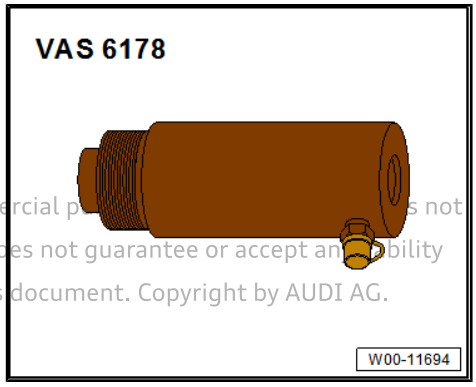
- *If a bonded rubber bush on one side is defective, the bush on the other side must be renewed at the same time. For correct version refer to ⇒ Electronic parts catalogue “ETKA”.*
- *Also check the other bushes before renewing a defective bonded rubber bush.*
- *If cracks or other damage are visible these bushes must also be renewed.*
- *The front or rear part of the subframe is lowered in order to renew the bonded rubber bushes. The subframe does not have to be removed.*
- *Lower the subframe at each end separately. This avoids the need for checking and adjusting wheel alignment.*
- *Mark the position of the bonded rubber bushes in relation to the subframe before removing them.*

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



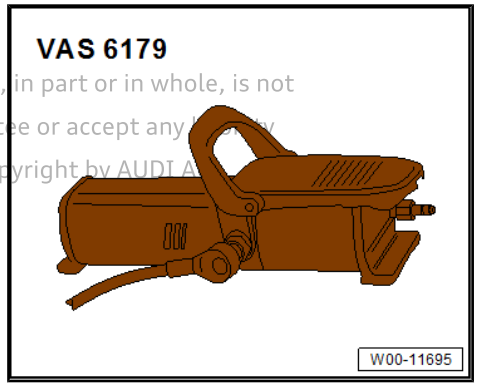
- Hydraulic cylinder - VAS 6178- with thrust piece - T10205/13-



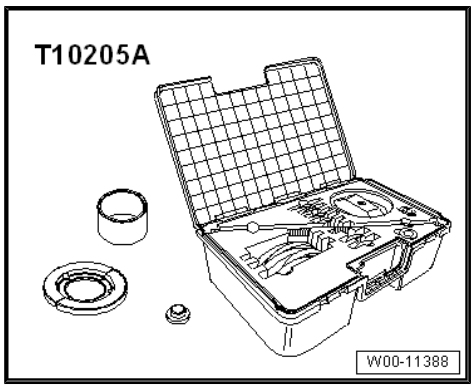
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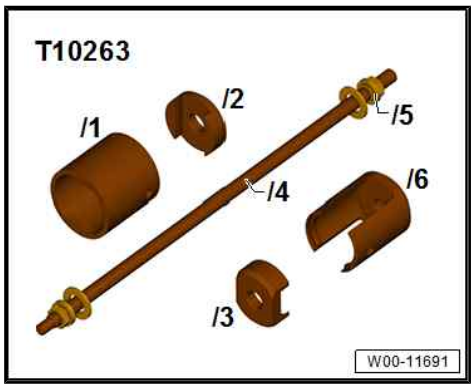
- Foot pump - VAS 6179-



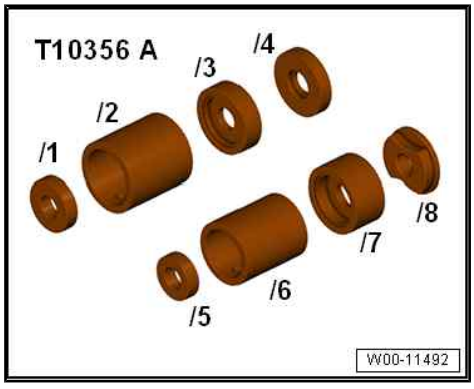
- Thrust plate - T10205/1- from assembly tool - T10205A-



- Assembly tool - T10263-



- Assembly tool - T10356 A-



- Assembly paste ⇒ Electronic parts catalogue

Removing

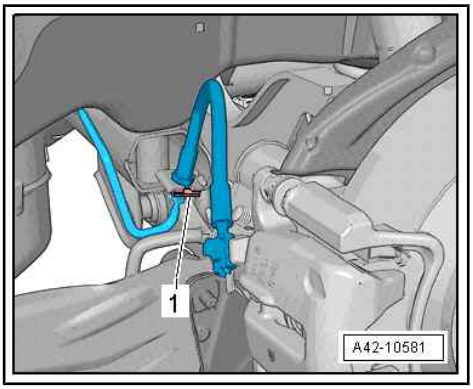
– Before commencing work, determine unladen position ⇒ page 10 .

– Remove wheels ⇒ page 309 .

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

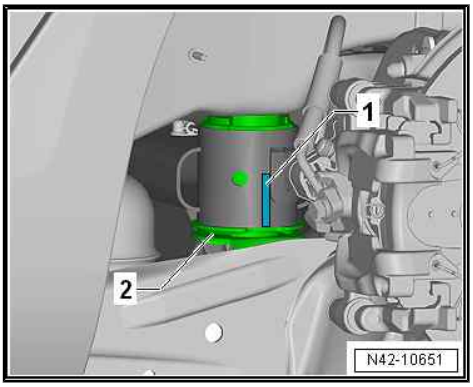
– Move brake line clear from retainer but do not disconnect brake line.

– Fix position of subframe ⇒ page 200 .

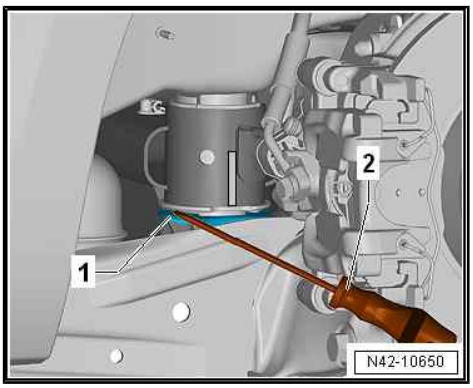


– Mark installation position of bonded rubber bush in relation to subframe -1- using a felt-tip pen or similar.

• Make marking -1- on subframe centrally in relation to cut-out in bonded rubber bush -2-.

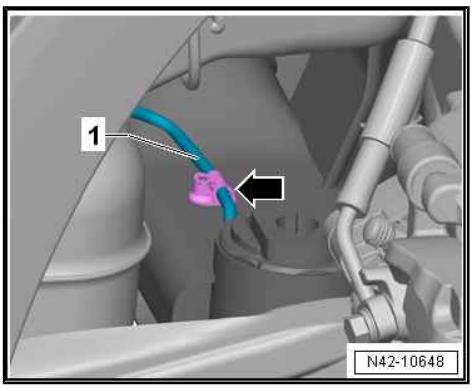


– Prise locating element -1- off bonded rubber bush in area of retaining lugs using e.g. a screwdriver -2-.



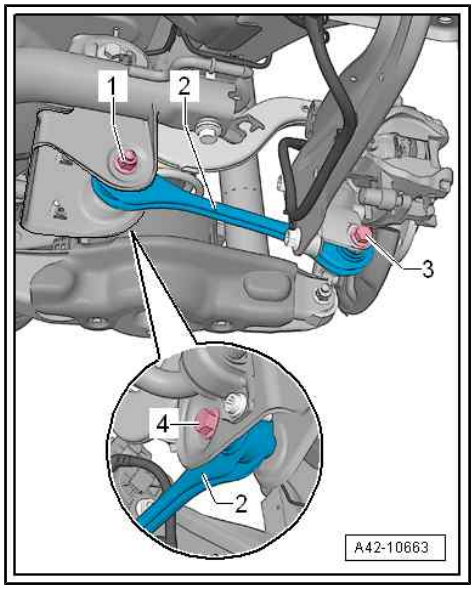
– Move brake line -1- clear on left side -arrow-. This will irreparably damage the clip.

– Lower subframe approx. 100 mm with engine and gearbox jack - VAS 6931- .



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– Remove bolt -3- and press track rod towards rear.



– Fit special tools as shown.

1 - Nut - T10263/5-

2 - Thrust piece - T10356/1-

3 - Subframe

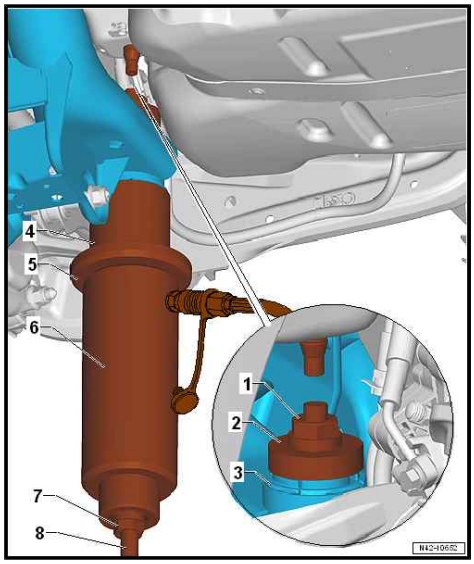
4 - Tube - T10356/2- (side with shoulder faces towards subframe)

5 - Thrust plate - T10205/1-

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

7 - Nut - T10263/5-

8 - Spindle - T10263/4-



– Take up play in special tools.

– Press out bonded rubber bush.

Note:

The collar on the outer ring of the bonded rubber bush will shear off with a loud bang when the bush is removed.

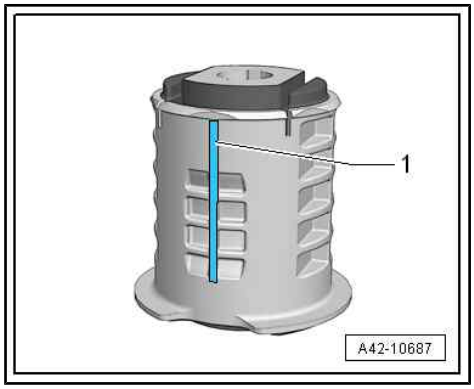
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- After it has been pulled out, the bonded rubber bush must be removed from the tube -T10356/2- with light blows from a hammer.

Installing

- To assist assembly, a mark -1- should be made on the new bonded rubber bush.

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



– Set up special tools with bonded rubber bush.

1 - Nut - T10263/5-

2 - Thrust piece - T10356/7- (marking »A« faces towards subframe)

3 - Subframe

4 - Bonded rubber bush (align according to markings made earlier -arrows-; markings must be in line).

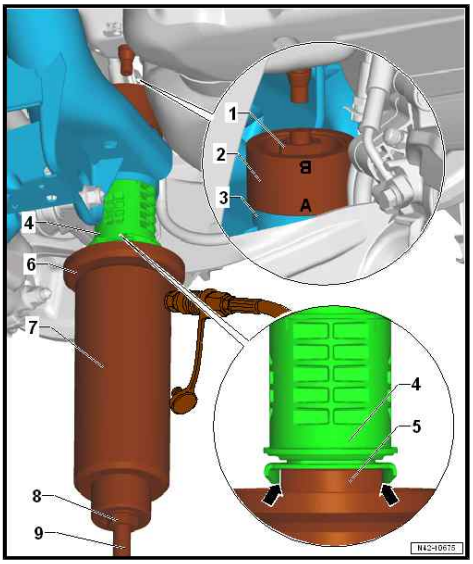
5 - Thrust piece - T10356/8- (flat sides must engage in cover of bonded rubber bush -arrows-)

6 - Thrust plate - T10205/1-

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

8 - Nut - T10263/5-

9 - Spindle - T10263/4-



– Check position of bonded rubber bush, align as required and take up play in special tools with bonded rubber bush.

• When pressing in, ensure that hose from hydraulic cylinder - VAS 6178- to foot pump - VAS 6179- is positioned between trailing arm and fuel tank.

• Ensure that the bonded rubber bush remains straight when you begin pressing it in, otherwise the outer ring may be damaged.

– Press in bonded rubber bush by actuating pump until collar is flush with subframe.

Remaining installation steps are the reverse of removal; note the following:

– Tighten bolted connections with suspension in unladen position ⇒ page 10 .

– When does wheel alignment have to be checked ⇒ page 311 ?

Tightening torques

♦ ⇒ “3.1.3 Exploded view - subframe (multi-link suspension), four-wheel drive vehicles”, page 200

♦ ⇒ “1 Wheels, tyres”, page 309

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3.3.2 Renewing rear bonded rubber bushes in subframe (multi-link suspension)

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 “ETKA” .*

♦ *Also check the other bushes before renewing a defective bonded rubber bush.*

♦ *If cracks or other damage are visible these bushes must also be renewed.*

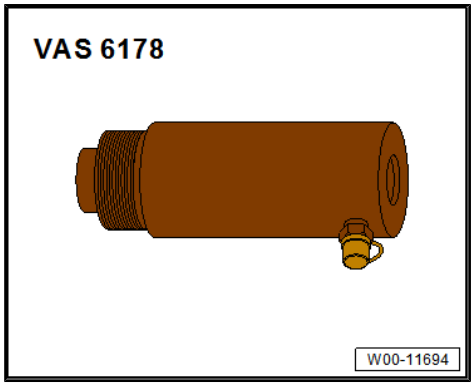
♦ *Mark the position of the bonded rubber bushes in relation to the subframe before removing them.*

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-

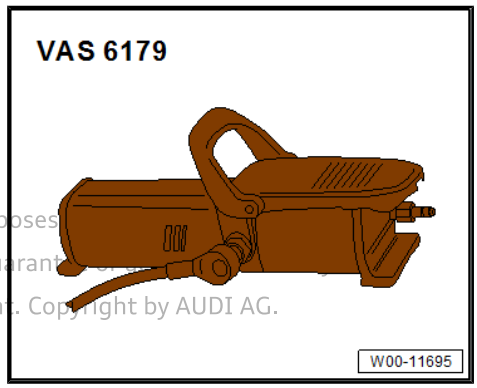


- Hydraulic cylinder - VAS 6178- with thrust piece - T10205/13-



- Foot pump - VAS 6179-

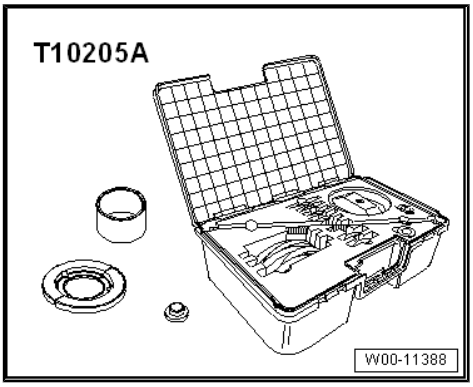
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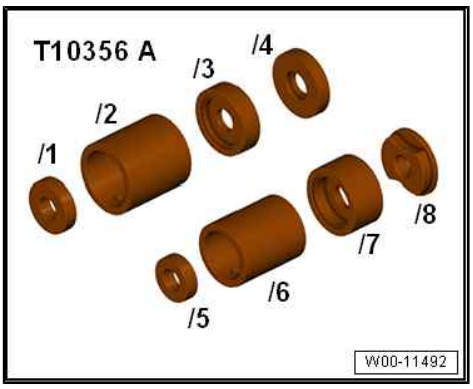
- Engine and gearbox jack - VAS 6931-



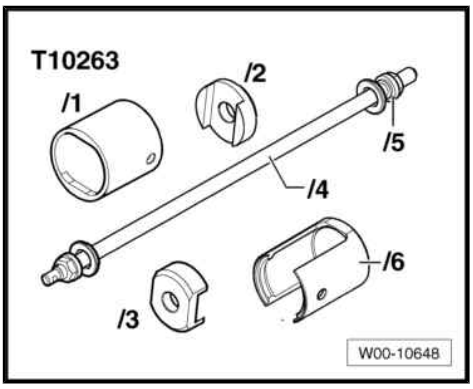
♦ Thrust plate - T10205/1- from assembly tool - T10205A-



♦ Assembly tool - T10356 A-



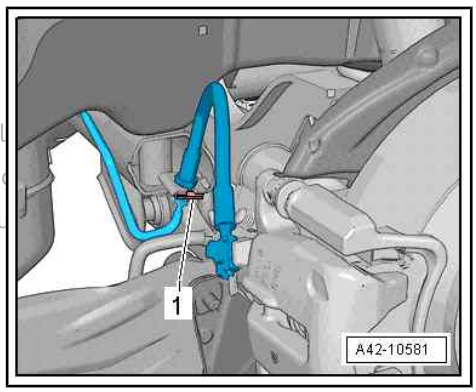
♦ Assembly tool - T10263-



♦ Assembly paste ⇒ Electronic parts catalogue “ETKA”

Removing

– Remove wheels ⇒ page 309 .
– Fix position of subframe ⇒ page 200 .
– Pull out retaining clip -1- on both sides of vehicle.
– Move brake line clear of retainer.

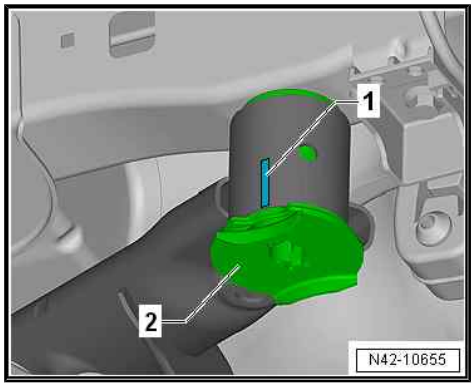


Note

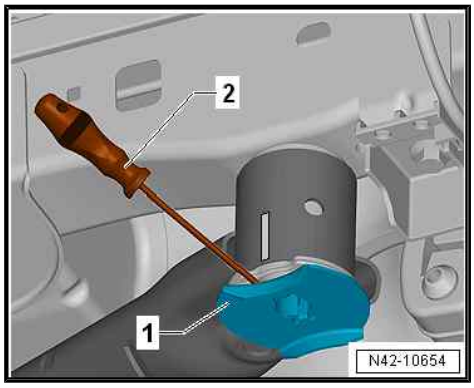
Do not disconnect brake line.

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– Mark installation position of bonded rubber bush -2- in relation to subframe -1- using a felt-tip pen or similar.

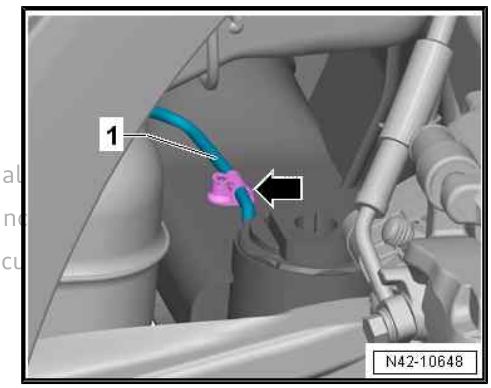


– Prise locating element -1- off bonded rubber bush in area of retaining lugs using e.g. a screwdriver -2-.



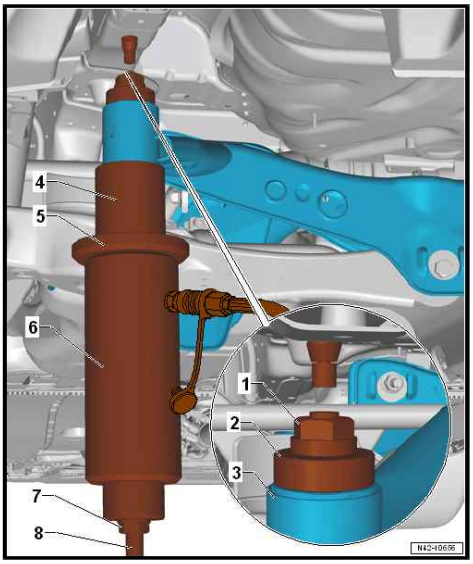
– Move brake line -1- clear on left side -arrow-. This will irreparably damage the clip.

– Lower subframe approx. 100 mm with engine and gearbox jack - VAS 6931- .



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– Fit special tools as shown.



1 - Nut - T10263/5-

2 - Thrust piece - T10356/5-

3 - Subframe

4 - Tube - T10356/6- (side with shoulder faces towards subframe)

5 - Thrust plate - T10205/1-

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

7 - Nut - T10263/5-

8 - Spindle - T10263/4-

– Take up play in special tools.

– Press out bonded rubber bush.

Note

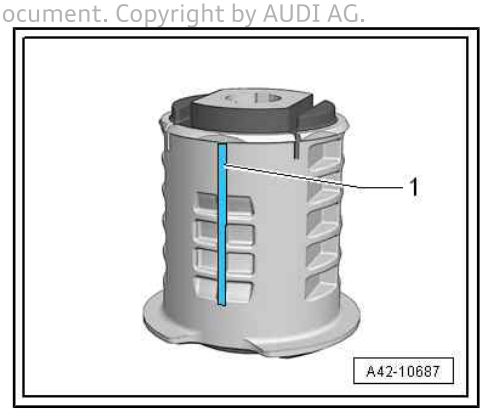
- *The collar on the outer ring of the bonded rubber bush will shear off with a loud bang when the bush is removed.*
- *After it has been pulled out, the bonded rubber bush must be removed from the tube - T10356/2- with light blows from a hammer.*

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Installing

– To assist assembly, a mark -1- should be made on the new bonded rubber bush.

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



– Set up special tools with bonded rubber bush.

1 - Nut - T10263/5-

2 - Thrust piece - T10356/7- (marking »B« faces towards subframe)

3 - Subframe

4 - Bonded rubber bush (align according to markings made earlier -arrows-; markings must be in line).

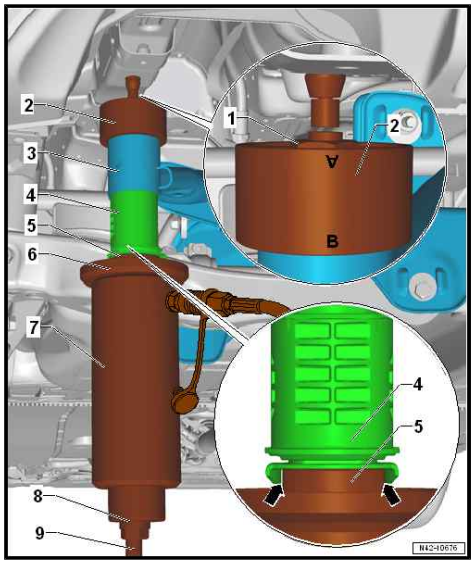
5 - Thrust piece - T10356/8- (flat sides must engage in cover of bonded rubber bush -arrows-)

6 - Thrust plate - T10205/1-

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

8 - Nut - T10263/5-

9 - Spindle - T10263/4-



– Check position of bonded rubber bush, align as required and take up play in special tools with bonded rubber bush.

– Press in bonded rubber bush by actuating pump until collar is flush with subframe. Ensure that the bonded rubber bush remains straight during the first stage of installation, otherwise the outer ring may be damaged.

Remaining installation steps are the reverse of removal; note the following:

– When does wheel alignment have to be checked ⇒ page 311 ?

Tightening torques

- ⇒ “3.1 Exploded view - subframe”, page 196
- ⇒ “1 Wheels, tyres”, page 309

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4 Anti-roll bar

⇒ “4.1 Exploded view - anti-roll bar”, page 217

⇒ “4.2 Removing and installing anti-roll bar”, page 217

⇒ “4.3 Removing and installing coupling rod”, page 221

4.1 Exploded view - anti-roll bar

1 - Anti-roll bar
- ❑ With rubber bushes
- ❑ Removing and installing ⇒ page 217

2 - Coupling rod
- ❑ Removing and installing ⇒ page 221

3 - Lower transverse link

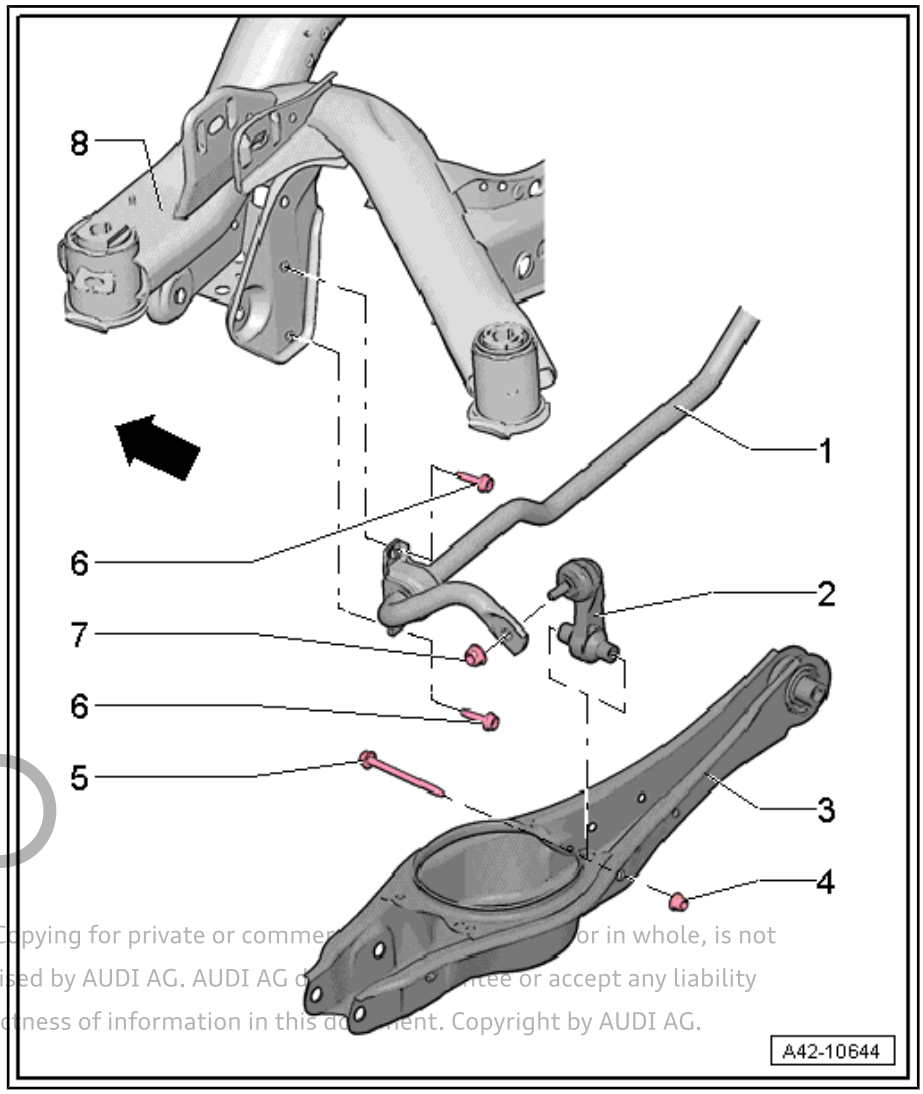
4 - Nut
- ❑ Always renew if removed
- ❑ 20 Nm +180°

5 - Bolt
- ❑ Always renew if removed

6 - Bolt
- ❑ Tighten evenly
- ❑ Always renew if removed
- ❑ 20 Nm +90°

7 - Nut
- ❑ When tightening, counterhold at multi-point socket of coupling rod
- ❑ 55 Nm

8 - Subframe



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4.2 Removing and installing anti-roll bar

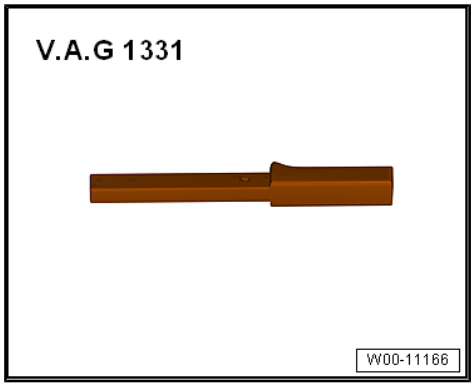
⇒ “4.2.1 Removing and installing anti-roll bar (multi-link suspension) - front-wheel drive vehicles”, page 217

⇒ “4.2.2 Removing and installing anti-roll bar (multi-link suspension) - four-wheel drive vehicles”, page 219

4.2.1 Removing and installing anti-roll bar (multi-link suspension) - front-wheel drive vehicles

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Ring spanner insert (16 mm) - V.A.G 1331/12-

Note

- *When loosening and tightening nut securing coupling rod to anti-roll bar, counterhold at socket on coupling rod.*
- *The tool used for counterholding must be applied straight.*
- *The following steps are described for the left side of the vehicle. The procedure for the right side of the vehicle is identical.*

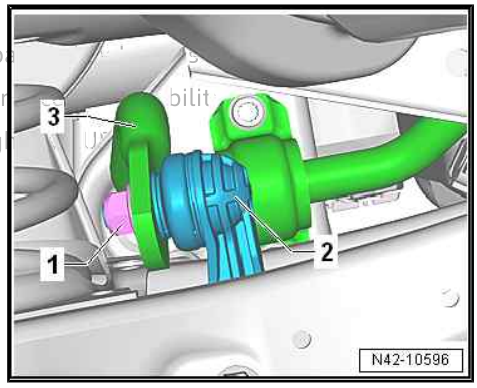
Removing

– All A3 models except Cabriolet: Remove rear silencer or centre silencer with rear silencer and move aside ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers .

– Remove nut -1- from coupling rod -2-.

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

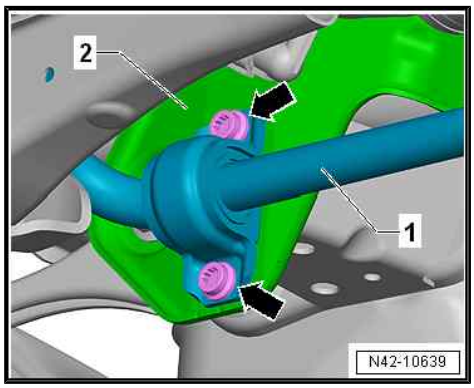
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– A3 Cabriolet: Remove spring (right-side) ⇒ page 243 .

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

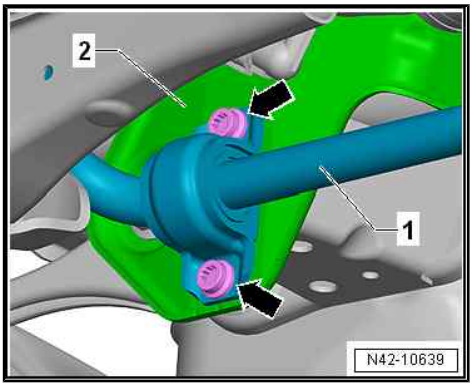
– Detach anti-roll bar from subframe -2- towards right side of vehicle.



Installing

Install in reverse sequence, paying attention to the following:

– Tighten bolts -arrows- securing anti-roll bar -1- to subframe -2- evenly.



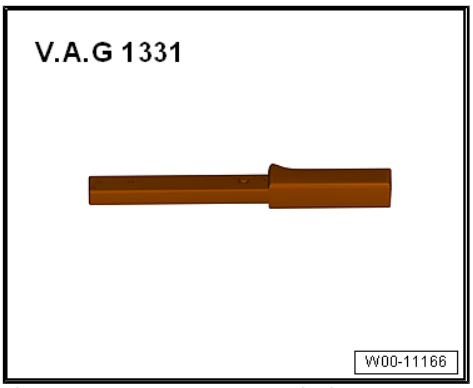
Tightening torques

- ⇒ “4.1 Exploded view - anti-roll bar”, page 217
- ⇒ “7.1 Exploded view - wheel bearing”, page 246
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers

4.2.2 Removing and installing anti-roll bar (multi-link suspension) - four-wheel drive vehicles

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-

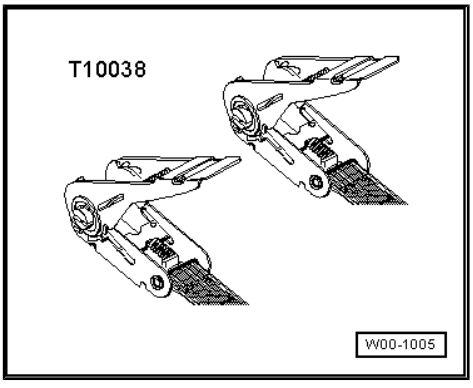


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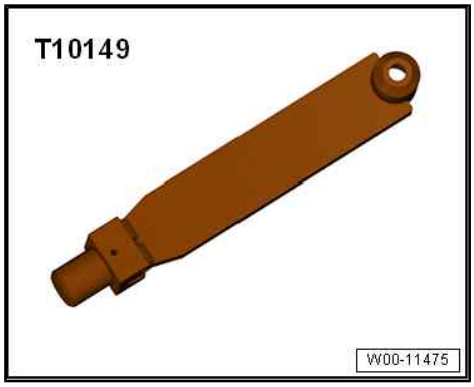
- Ring spanner insert, 16 mm - V.A.G 1331/12- (not illustrated)
- Engine and gearbox jack - VAS 6931-



- Tensioning strap - T10038-



- Support - T10149-



Note

- *When loosening and tightening nuts securing coupling rod to anti-roll bar, counterhold at socket on coupling rod.*
- *The tool used for counterholding must be applied straight.*

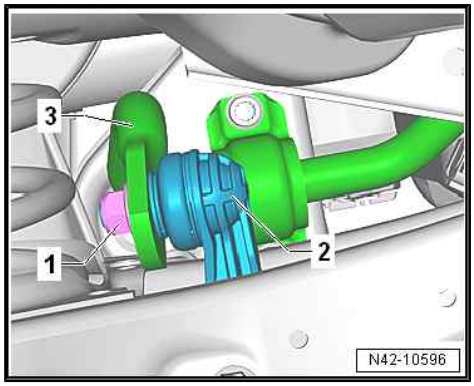
Note

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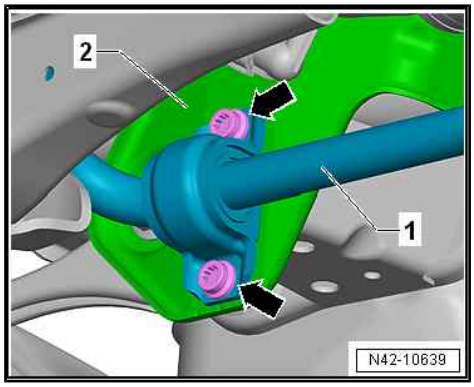
The following steps are described for the left side of the vehicle.
The procedure for the right side of the vehicle is identical.

Removing

– Remove rear silencer ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/ silencers; Exploded view - silencers .
– Remove nut -1- from coupling rod -2-.
– Pull coupling rod -2- out of anti-roll bar -3-.

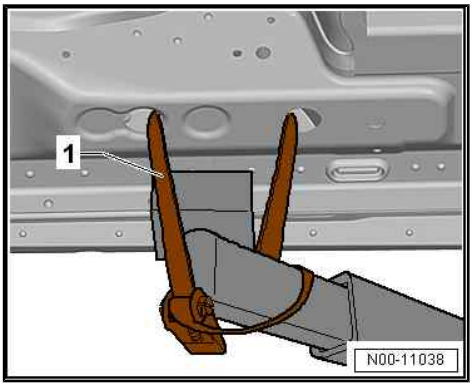


– Remove bolts -arrows- for anti-roll bar -1-.
– Detach anti-roll bar from subframe -2- towards right side of vehicle.



- If the upper bolt of the anti-roll bar clamp cannot be removed, then the following additional work must be performed:

– Use tensioning straps -T10038- -item 1- to secure vehicle to support arms of lifting platform on both sides.



WARNING

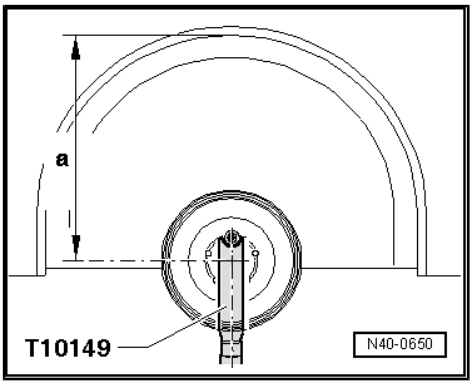
If the vehicle is not strapped down, there is a danger that it can slip off the lifting platform.

– Remove wheels ⇒ page 309 .

– Attach support - T10149- to wheel hub using wheel bolt.

– Raise wheel hub with support - T10149- and engine and gear-box jack - VAS 6931- until bolts of anti-roll bar clamp (right-side) are accessible.

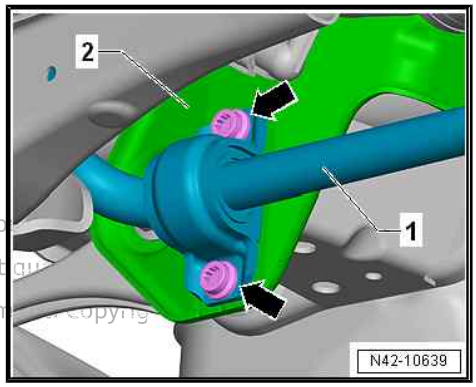
– Remove anti-roll bar.



Installing

Install in reverse sequence, paying attention to the following:

- Evenly tighten bolts -arrows- for anti-roll bar clamp.



Note

Disregard items -1 and 2-.

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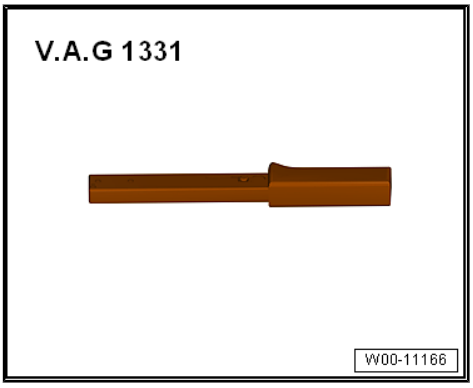
Tightening torques

- ⇒ “4.1 Exploded view - anti-roll bar”, page 217
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ⇒ “1 Wheels, tyres”, page 309

4.3 Removing and installing coupling rod

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



♦ Ring spanner insert, 16 mm - V.A.G 1331/12- (not illustrated)

Note

♦ *When loosening and tightening nuts securing coupling rod to anti-roll bar, counterhold at socket on coupling rod.*

♦ *The tool used for counterholding must be applied straight.*

Removing

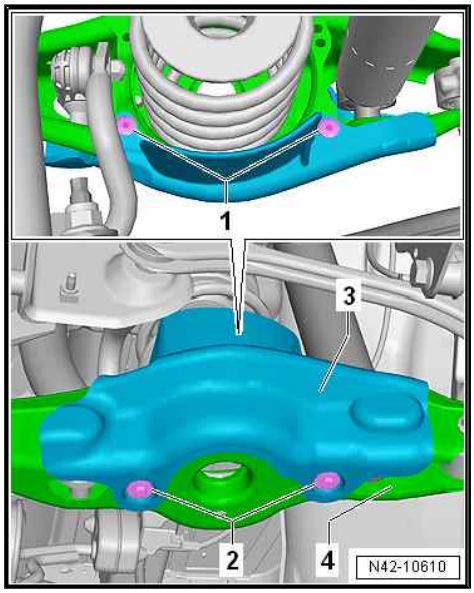
– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Remove wheel ⇒ page 309 .

Vehicles with stone deflector

– Remove spreader rivets -1-.

– Unscrew bolts -2- and detach stone deflector -3-.

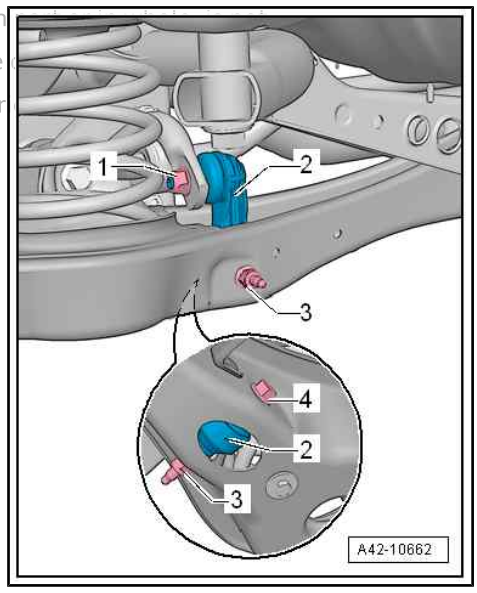


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All vehicles (continued):

– Unscrew nuts -1- and -3- and pull out bolt -4-.

– Pull coupling rod -2- out of anti-roll bar and suspension link.



Installing

Install in reverse sequence, paying attention to the following:

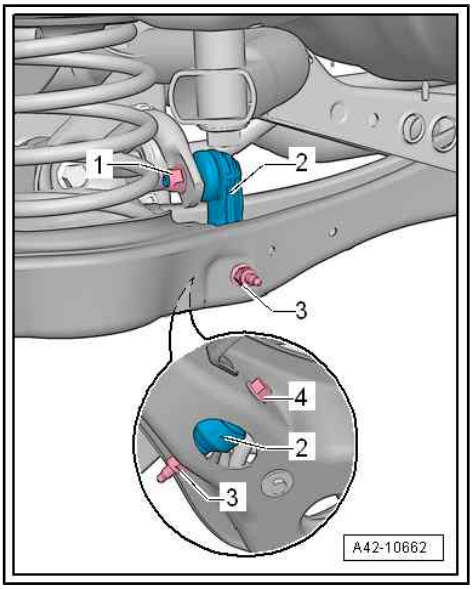
– Insert coupling rod -2-, fit nuts -1 and 3- and tighten with suspension in unladen position ⇒ page 10 .

• When tightening nut -1-, counterhold at multi-point socket of bolt.

Tightening torques

◆ ⇒ “4.1 Exploded view - anti-roll bar”, page 217

◆ ⇒ “1 Wheels, tyres”, page 309



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5 Suspension links, track rod

⇒ “5.1 Exploded view - transverse links”, page 224

⇒ “5.2 Exploded view - track rod”, page 226

⇒ “5.3 Removing and installing upper transverse link”, page 226

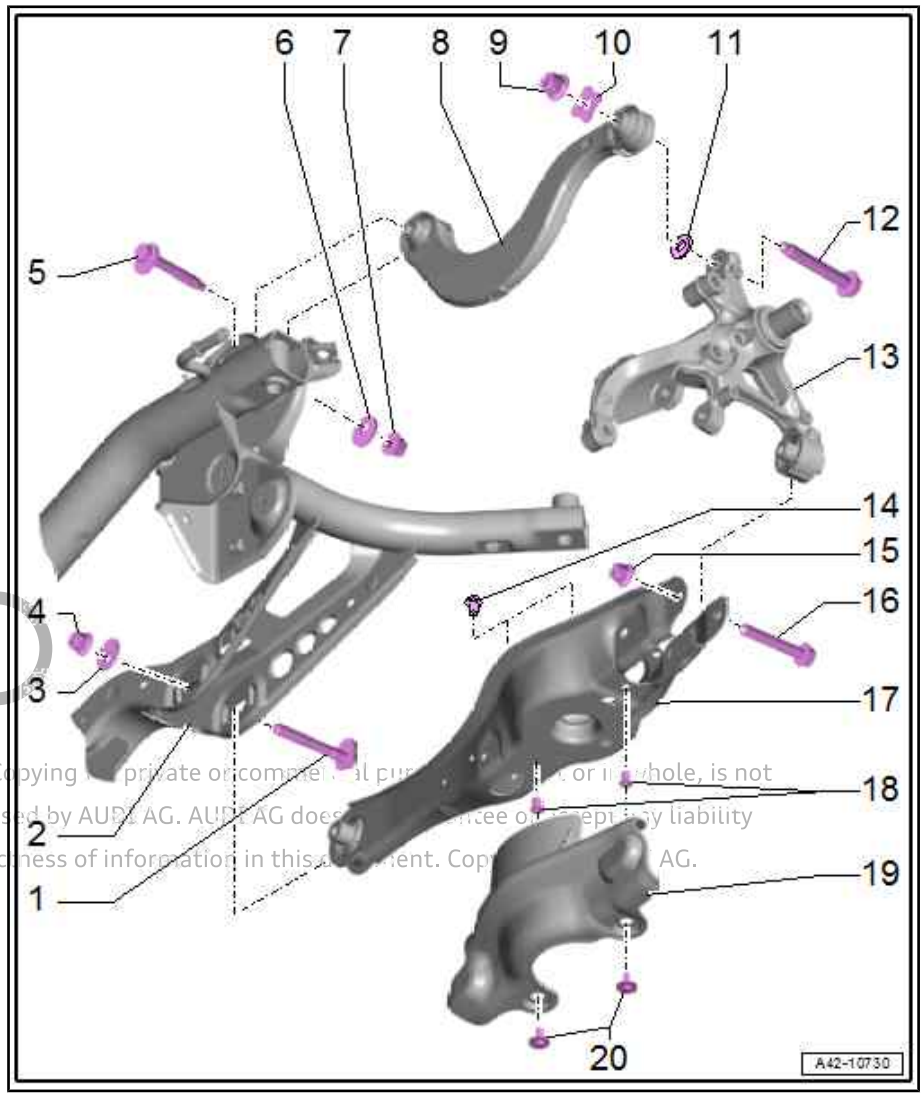
⇒ “5.4 Removing and installing lower transverse link”, page 228

⇒ “5.5 Removing and installing track rod”, page 230

5.1 Exploded view - transverse links

Note

The illustration shows the transverse links on a vehicle with front-wheel drive; four-wheel drive is similar.



1 - Eccentric bolt

- After slackening off, perform wheel alignment ⇒ page 310
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

2 - Subframe

3 - Eccentric washer

- With lug on inner bore

4 - Nut

- Always renew if removed
- Always tighten bolted joints with suspension in unladen position ⇒ page 10
- 95 Nm without insert tool 18 mm - T10179-
- 80 Nm with insert tool 18 mm - T10179-

5 - Eccentric bolt

- After slackening off, perform wheel alignment ⇒ page 310
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

6 - Eccentric washer

- With lug on inner bore

7 - Nut

- Always renew if removed
- Always tighten bolted joints with suspension in unladen position ⇒ page 10
- 95 Nm

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8 - Upper transverse link

- ❑ Removing and installing ⇒ page 226

9 - Nut

- ❑ Always renew if removed

10 - Washer

11 - Ribbed washer

- ❑ Only four-wheel drive vehicles

12 - Bolt

- ❑ Always renew if removed
- ❑ Always tighten bolted joints with suspension in unladen position ⇒ page 10
- ❑ 130 Nm +180°

13 - Wheel bearing housing

- ❑ Different versions; for correct version refer to ⇒ Electronic parts catalogue “ETKA”

14 - Spreader rivet

- ❑ 2x

15 - Nut

- ❑ Always renew if removed

16 - Bolt

- ❑ Always renew if removed
- ❑ Always tighten bolted joints with suspension in unladen position ⇒ page 10
- ❑ 70 Nm +180°

17 - Lower transverse link

- ❑ Removing and installing ⇒ page 228

18 - Pop rivet nuts

19 - Stone deflector

- ❑ Different versions; for correct version refer to ⇒ Electronic parts catalogue “ETKA”

20 - Bolts

- ❑ 8 Nm

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5.2 Exploded view - track rod

Note

The illustration shows the track rod on a vehicle with four-wheel drive; front-wheel drive is similar.

1 - Subframe

2 - Bolt

- ❑ Always renew if removed

3 - Wheel bearing housing

- ❑ Different versions for front-wheel drive and four-wheel drive. Illustration shows wheel bearing housing for four-wheel drive vehicle.

4 - Track rod

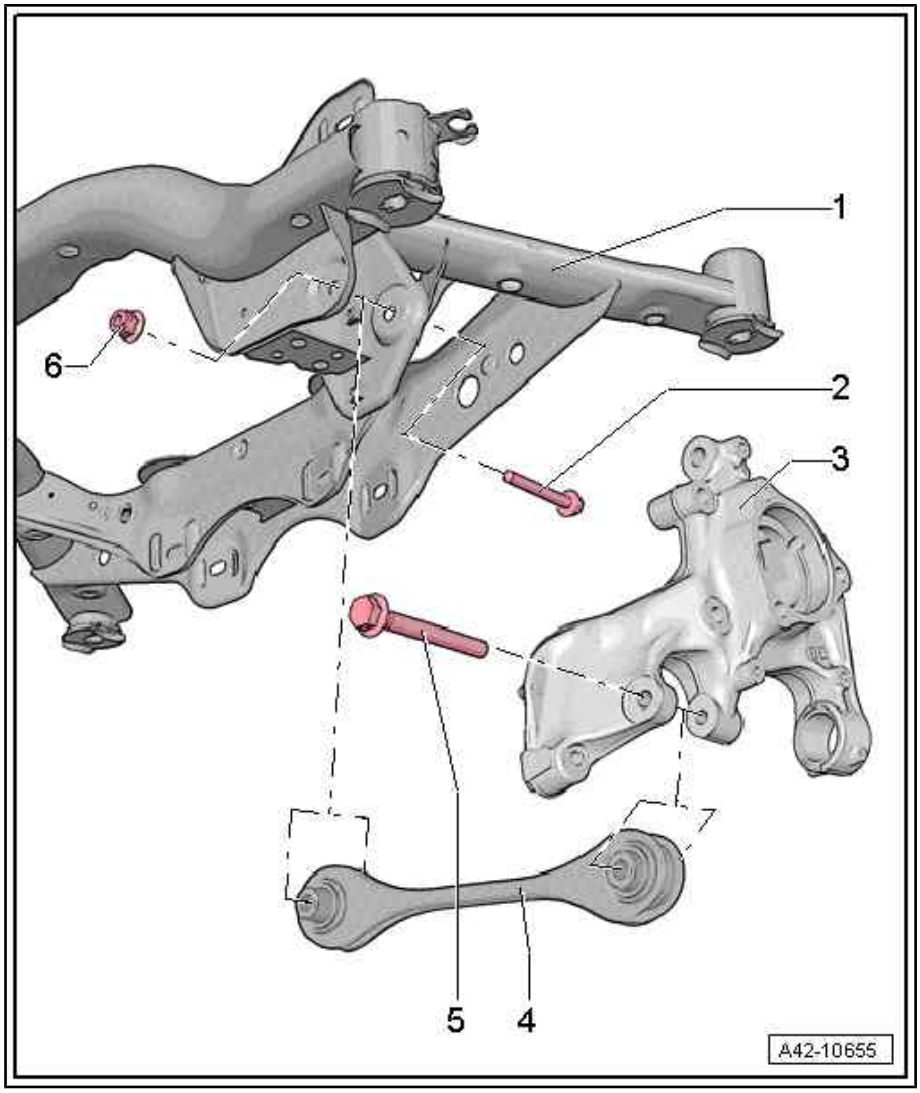
- ❑ Removing and installing ⇒ page 230

5 - Bolt

- ❑ Always renew if removed
- ❑ Always tighten bolted joints with suspension in unladen position ⇒ page 10
- ❑ 70 Nm +180°

6 - Nut

- ❑ Always renew if removed
- ❑ 70 Nm +180°



5.3 Removing and installing upper transverse link

Special tools and workshop equipment required

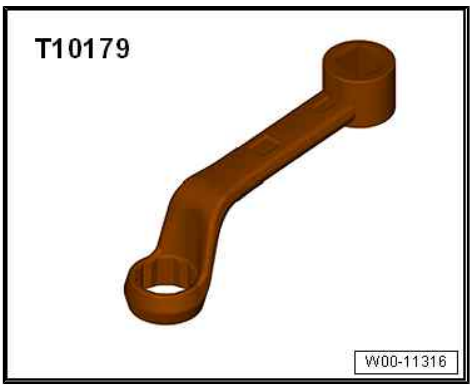
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♦ Torque wrench - V.A.G 1332-



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♦ Insert tool, 18 mm - T10179-



Removing

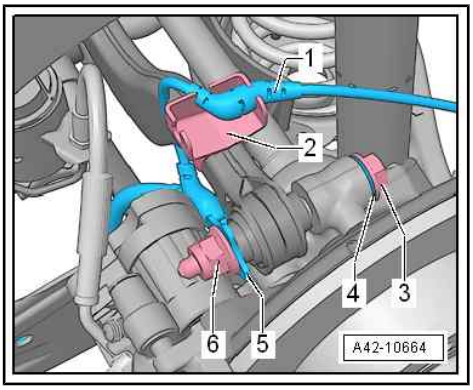
– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Remove wheel ⇒ page 309 .

– Four-wheel drive vehicles: disengage wire -1- from bracket -2- and move clear.

– Unscrew nut -6- and take off washer -5-.

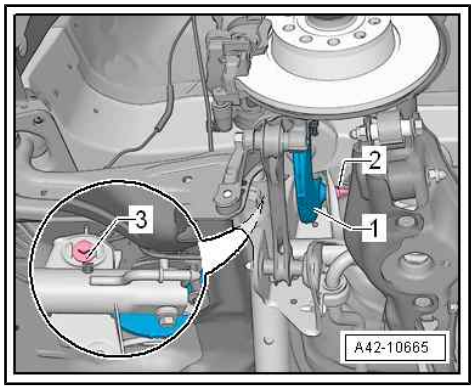
– Remove bolt -3- and, if fitted, washer -4-.



– Use felt-tip pen or similar to mark position of eccentric bolt -3- in relation to subframe.

– Unscrew nut -2- and pull out eccentric bolt -3-.

– Take out upper transverse link -1-.



Installing

Install in reverse sequence, paying attention to the following:

- Before tightening bolt securing transverse link, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 10 .
- Note mark for position of eccentric bolt -3- in relation to subframe.

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

◆ ⇒ “5.1 Exploded view - transverse links”, page 224

◆ ⇒ “1 Wheels, tyres”, page 309

5.4 Removing and installing lower transverse link

Special tools and workshop equipment required

◆ Torque wrench - V.A.G 1332-

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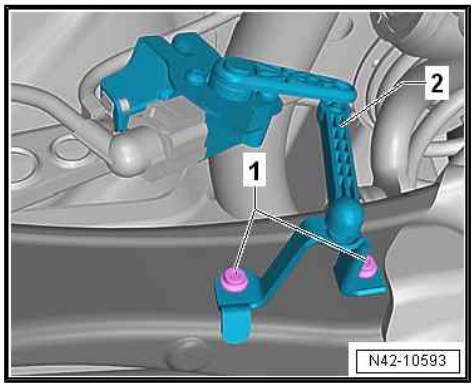
Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Remove wheel ⇒ page 309 .

Vehicles with vehicle level senders

– Remove bolts -1- on linkage -2- for rear vehicle level sender on both sides of vehicle.



Vehicles with stone deflector

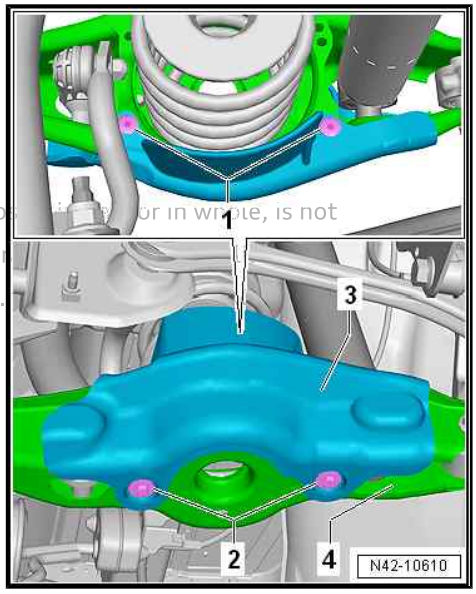
– Remove spreader rivets -1-.

– Unscrew bolts -2- and detach stone deflector -3-.

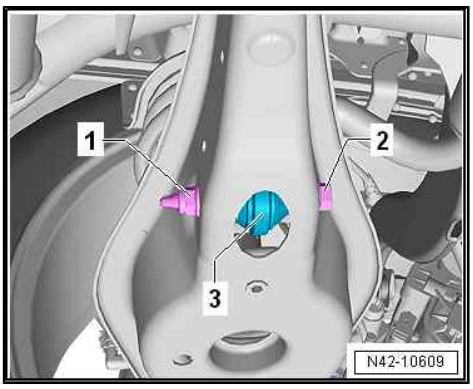
All vehicles (continued)

– Remove coil spring ⇒ page 240 .

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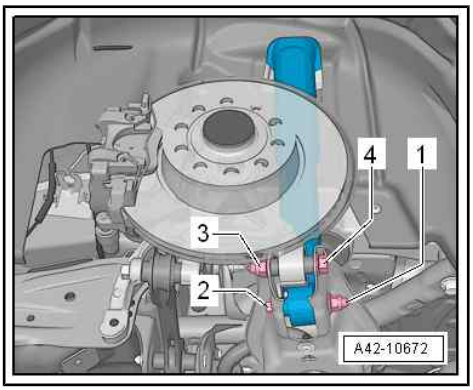


– Unscrew nut -1- and pull out bolt -2- for coupling rod -3-.

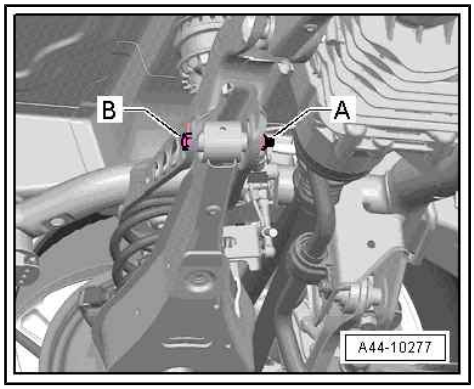


– Unscrew nut -1- and pull out bolt -2- securing shock absorber.

– Unscrew nut -3- and pull out bolt -4- securing wheel bearing housing.



– Disengage and lower exhaust system at rear ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers .
– Use felt-tip pen or similar to mark position of eccentric bolt -B- relative to subframe.
– Unscrew nut -A- and pull out eccentric bolt -B-.
– Take out lower transverse link.



Installing

Install in reverse sequence, paying attention to the following:

- Observe marking made previously for position of eccentric bolt -B- relative to subframe.
- Before tightening bolt securing transverse link, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 10 .
- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

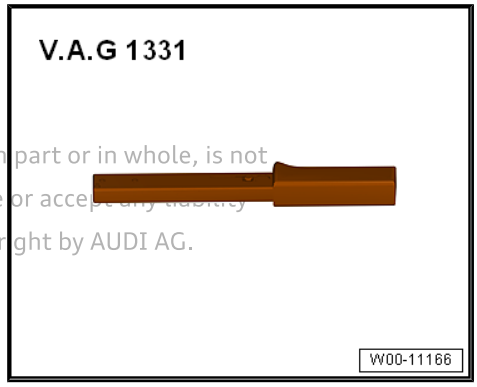
Tightening torques

- ⇒ “5.1 Exploded view - transverse links”, page 224
- ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304
- ⇒ Engine; Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers
- ⇒ “1 Wheels, tyres”, page 309

5.5 Removing and installing track rod

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



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♦ Torque wrench - V.A.G 1332-

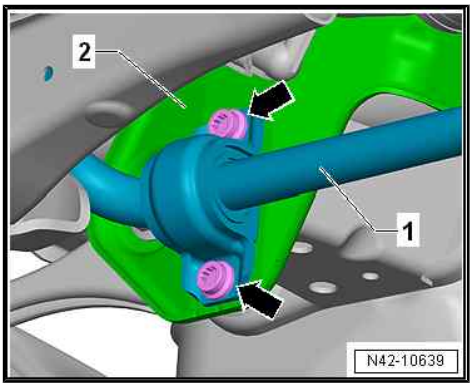


Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Remove wheel ⇒ page 309 .

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



Note

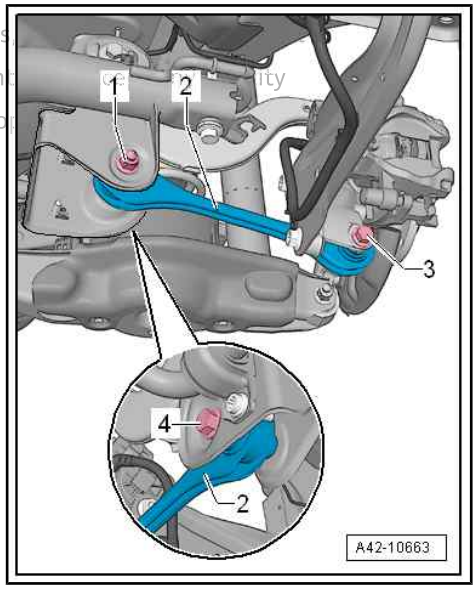
Disregard -item 2-.

– Unscrew nut -1- and bolt -3- by a few turns.

– Unscrew nut -1- and remove bolt -4- towards rear.

– Unscrew bolt -3- and remove.

– Take out track rod -2-.



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Installing

Install in reverse sequence, paying attention to the following:

• Before tightening bolt securing track rod, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 10 .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

♦ ⇒ “5.2 Exploded view - track rod”, page 226

♦ ⇒ “4.1 Exploded view - anti-roll bar”, page 217

♦ ⇒ “1 Wheels, tyres”, page 309

6 Suspension strut/shock absorber, spring

⇒ “6.1 Exploded view - suspension strut/shock absorber, spring”, page 232

⇒ “6.2 Removing and installing shock absorber”, page 233

⇒ “6.3 Servicing shock absorber”, page 236

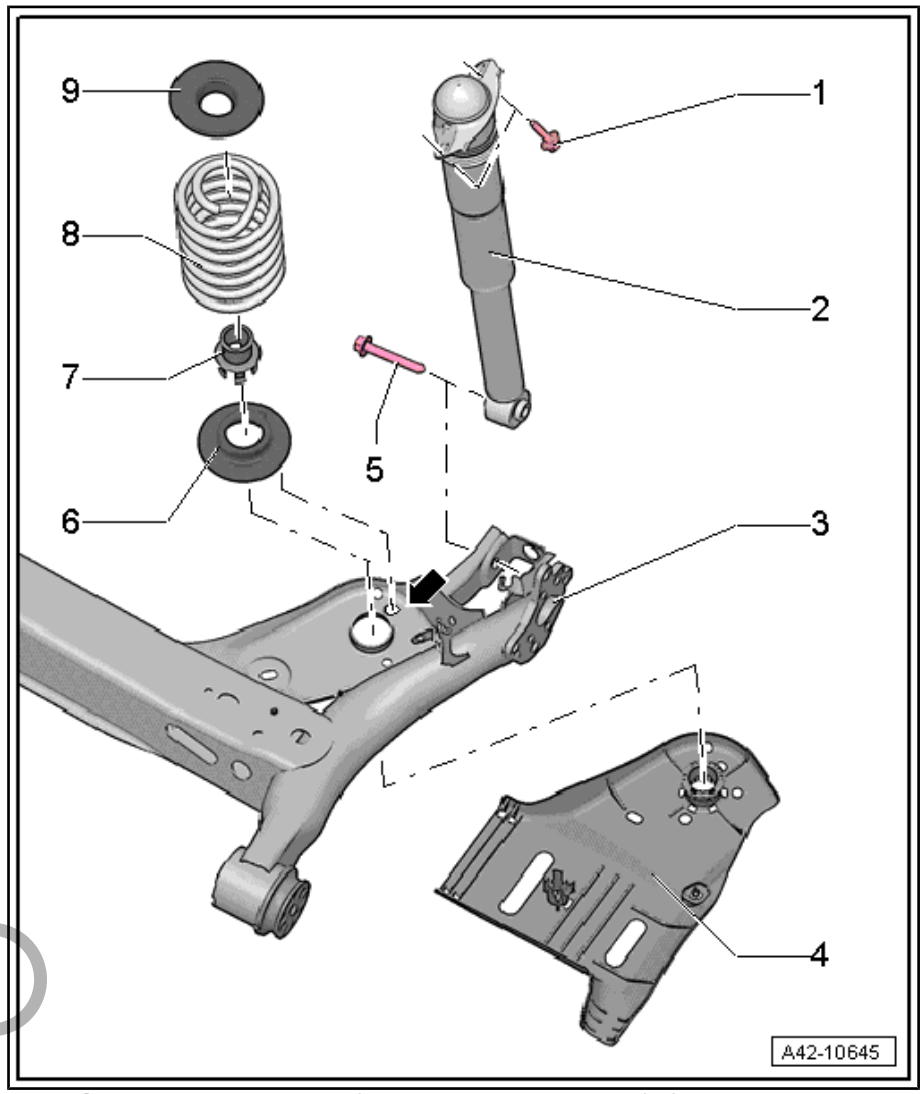
⇒ “6.4 Removing and installing spring”, page 240

6.1 Exploded view - suspension strut/shock absorber, spring

⇒ “6.1.1 Exploded view - shock absorber, spring (torsion beam axle)”, page 232

⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233

6.1.1 Exploded view - shock absorber, spring (torsion beam axle)



1 - Bolt

- ❑ Always renew if removed
- ❑ 50 Nm +45°

2 - Shock absorber

- ❑ Removing and installing ⇒ page 233
- ❑ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 15

3 - Axle beam

4 - Stone deflector

5 - Bolt

- ❑ Always renew if removed
- ❑ Always tighten bolted connection with suspension in unladen position ⇒ page 10
- ❑ 70 Nm +180°

6 - Bottom spring seat

- ❑ Turn end of spring against stop
- ❑ When installing, fit pin in aperture in spring mounting on axle beam.

7 - Clamp ring

- ❑ After installing stone deflector, press clamp ring on so it is flush

8 - Coil spring

- ❑ Removing and installing ⇒ page 240

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9 - Top spring seat

- ❑ Fit on lug on body.

6.1.2 Exploded view - shock absorber, spring (multi-link suspension)

1 - Bolt

- ❑ Always renew if removed
- ❑ 50 Nm +45°

2 - Shock absorber

- ❑ Removing and installing ⇒ page 233
- ❑ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 15

3 - Bolt

- ❑ Always renew if removed

4 - Lower transverse link

5 - Clip

- ❑ Assists with installation

6 - Coil spring

- ❑ Removing and installing ⇒ page 243

7 - Top spring seat

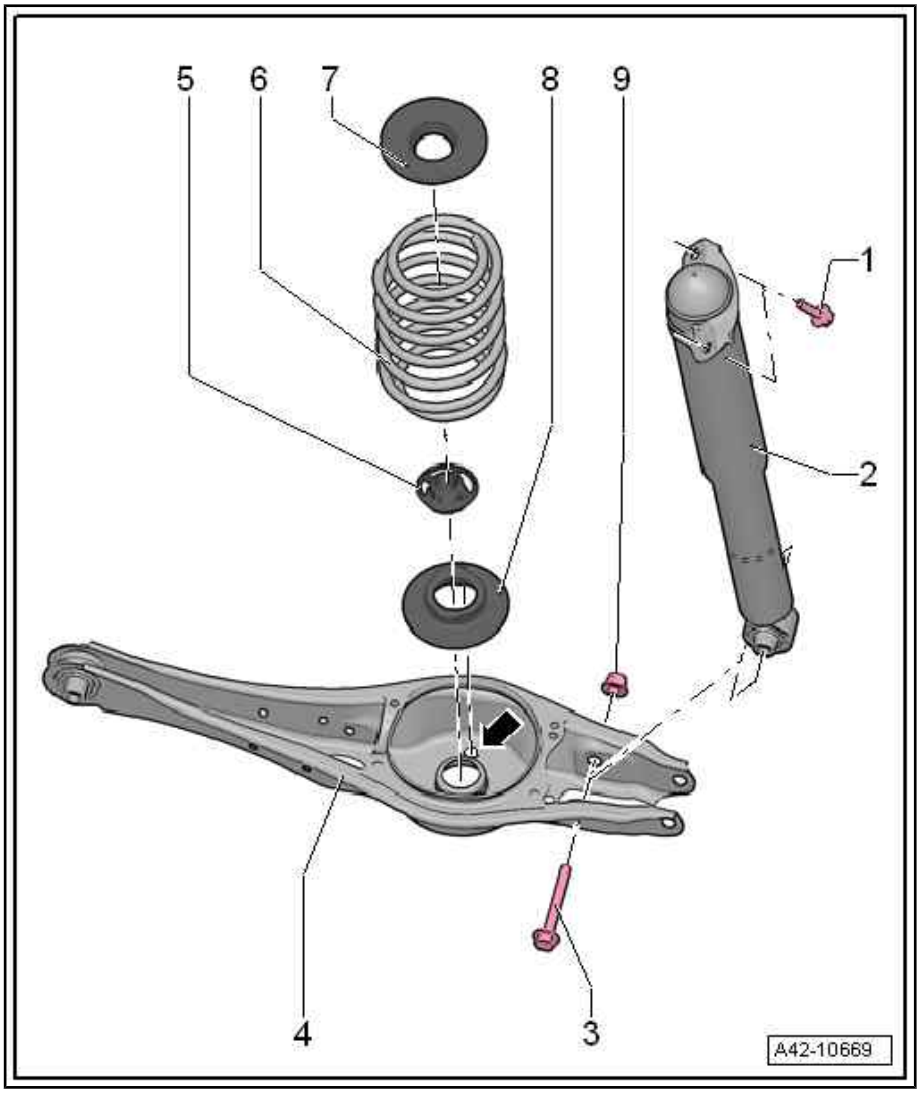
- ❑ Fit on lug on body.

8 - Bottom spring seat

- ❑ Turn end of spring against stop
- ❑ When installing, fit pin in aperture in spring mounting on lower transverse link -arrow-.

9 - Nut

- ❑ Always renew if removed
- ❑ Always tighten bolted connection with suspension in unladen position ⇒ page 10
- ❑ 70 Nm +180°



6.2 Removing and installing shock absorber

Special tools and workshop equipment required

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- Torque wrench - V.A.G 1332-

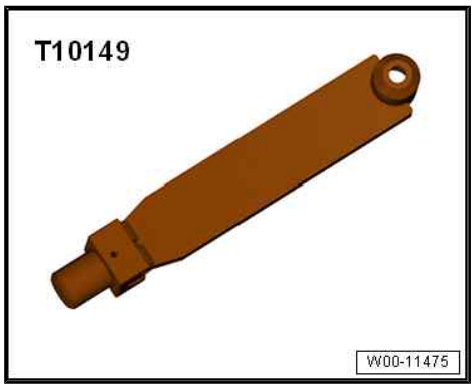


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- Engine and gearbox jack - VAS 6931-



- Support - T10149-

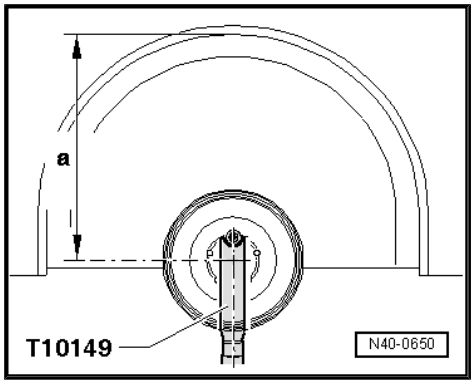


Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Remove wheel ⇒ page 309 .

– Use wheel bolt to attach engine and gearbox jack - VAS 6931- with support - T10149- to wheel hub.



WARNING

- *Do not raise or lower vehicle when engine and gearbox jack - VAS 6931- is under vehicle. The vehicle could slip off the lifting platform.*
- *Do not leave engine and gearbox jack - VAS 6931- under vehicle for longer than necessary.*

Applies to vehicles with electronic damping control (Audi magnetic ride):

– Remove wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners .

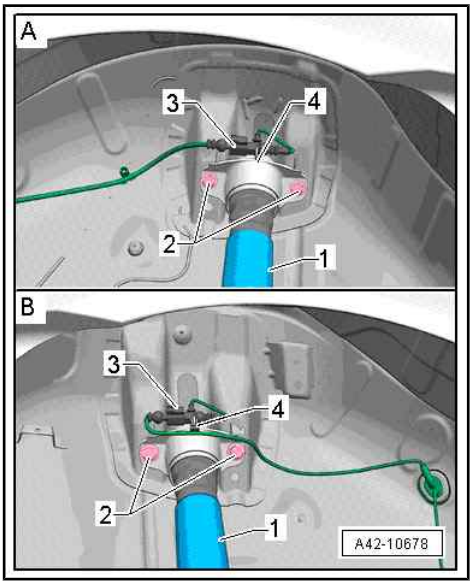
– Unplug electrical connector -3-.

♦ -A- Shock absorber (left-side)

♦ -B- Shock absorber (right-side)

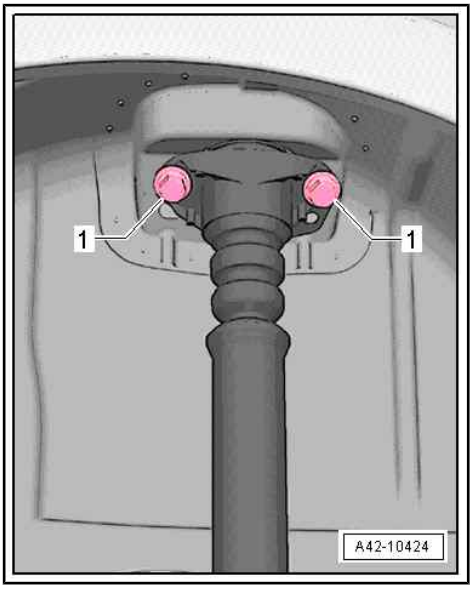
– Take connector housing out of retainer -4-.

– Remove bolts -2-.



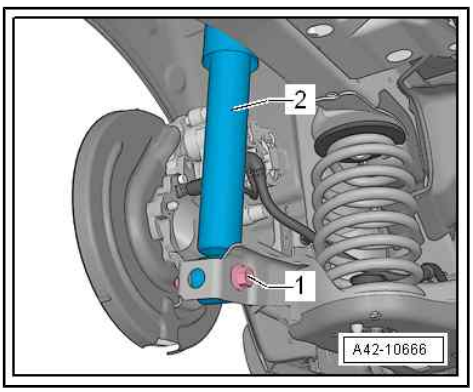
Applies to vehicles with conventional shock absorbers:

– Remove bolts -1-.



Vehicles with torsion beam axle

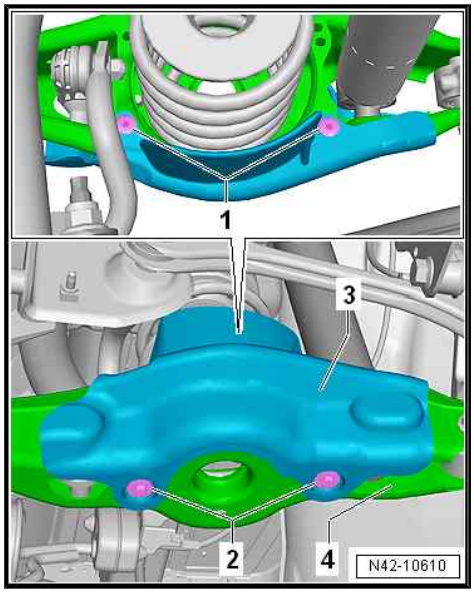
– Remove bolt -1- and detach shock absorber -2-.



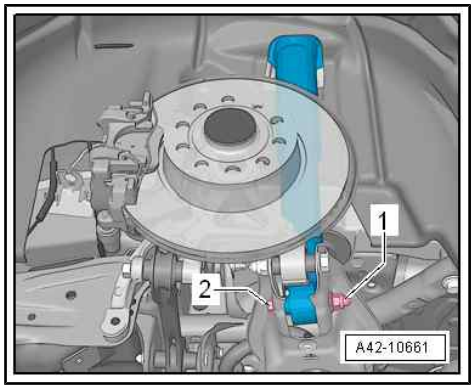
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Applies to vehicles with multi-link suspension and stone deflector

– If fitted, remove spreader rivets -1-.
– Unscrew bolts -2- and detach stone deflector -3-.



– Unscrew nut -1- and remove bolt -2-.
– Take out shock absorber.



Installing

Installation is carried out in reverse sequence. Note the following:

- Before tightening bolt securing shock absorber to lower transverse link, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 10 .

Tightening torques

- ⇒ “6.1.1 Exploded view - shock absorber, spring (torsion beam axle)”, page 232
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “1 Wheels, tyres”, page 309

6.3 Servicing shock absorber

⇒ “6.3.1 Servicing shock absorber (conventional version)”, page 236

⇒ “6.3.2 Servicing shock absorber (version with variable damping)”, page 238

6.3.1 Servicing shock absorber (conventional version)

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1 - Shock absorber

- ❑ Removing and installing ⇒ page 233
- ❑ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 14
- ❑ Checking shock absorber following removal ⇒ page 4

2 - Protective tube

- ❑ Combined with -item 3- as one unit

3 - Bump stop

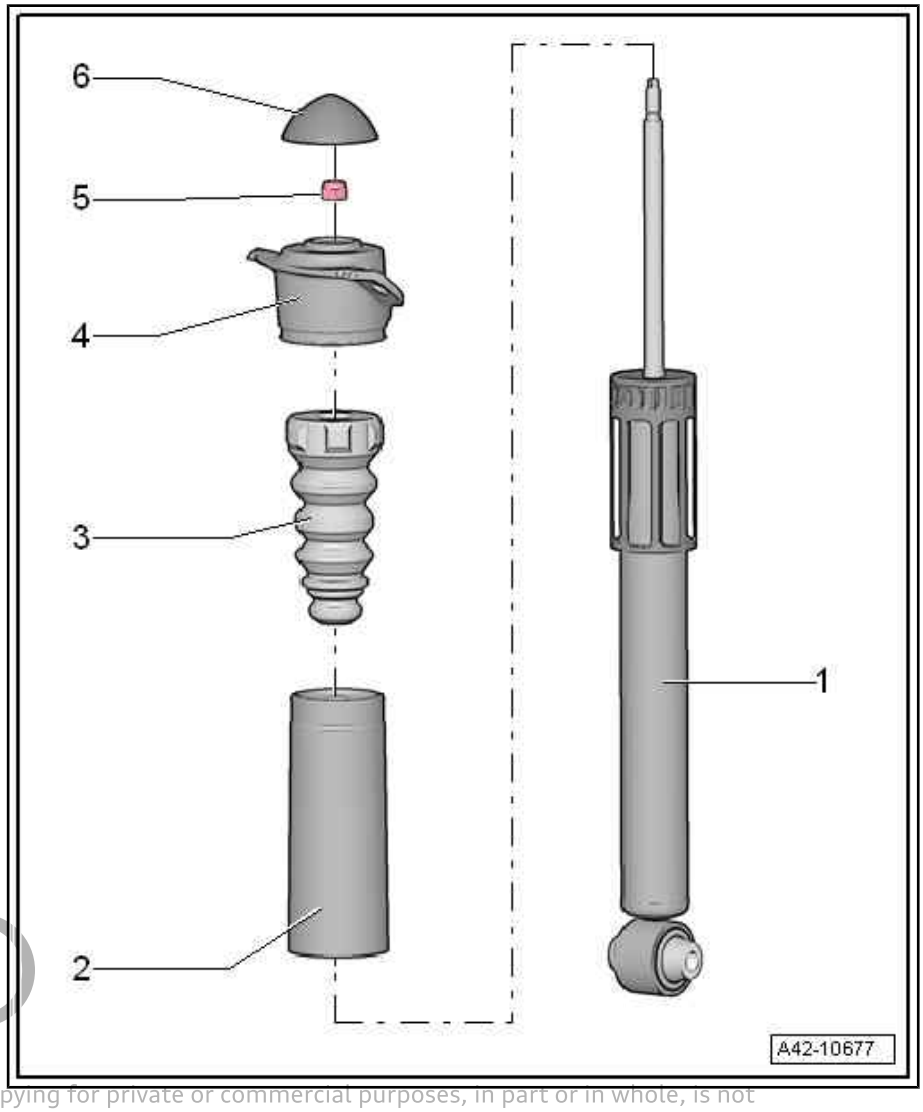
- ❑ Combined with -item 2- as one unit

4 - Shock absorber mounting

5 - Nut

- ❑ Always renew if removed
- ❑ 25 Nm

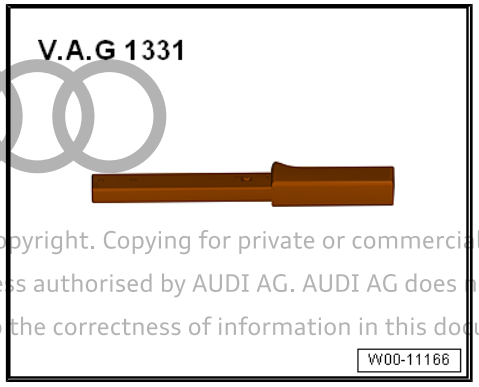
6 - Cover



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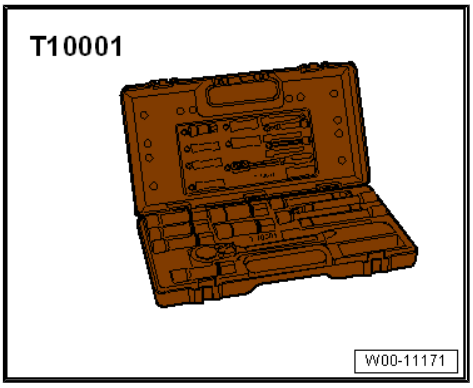
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-

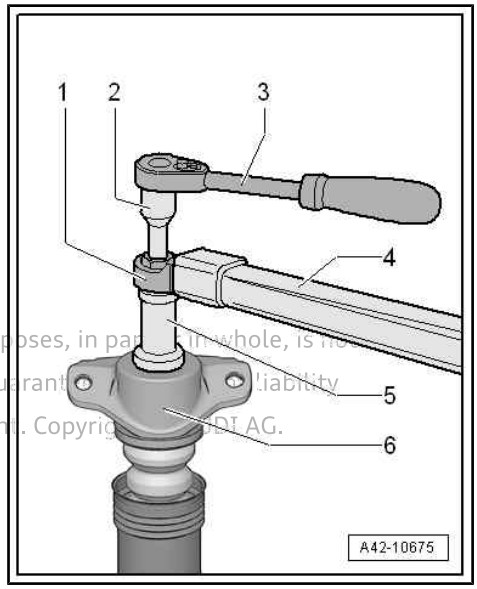


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- Shock absorber tool set - T10001-



- Ring spanner insert (commercial type, e.g. »Hazet 6630c-21«)



Loosening and tightening nut on shock absorber mounting

1 - Ring spanner insert (commercial type, e.g. »Hazet 6630c-21«)

2 - Tool insert - T10001/10-

3 - Commercially available ratchet

4 - Torque wrench - V.A.G 1331-

5 - Tool insert - T10001/1-

6 - Shock absorber mounting

Installation is carried out in reverse sequence. Note the following:

Tightening torque
⇒ Item 5 (page 237)

6.3.2 Servicing shock absorber (version with variable damping)

1 - Shock absorber

- ❑ For correct version refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ Removing and installing ⇒ page 233
- ❑ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 14
- ❑ Checking shock absorber following removal ⇒ page 4

2 - Protective tube

- ❑ Combined with -item 3- as one unit

3 - Bump stop

- ❑ Combined with -item 2- as one unit

4 - Shock absorber mounting

5 - Not fitted

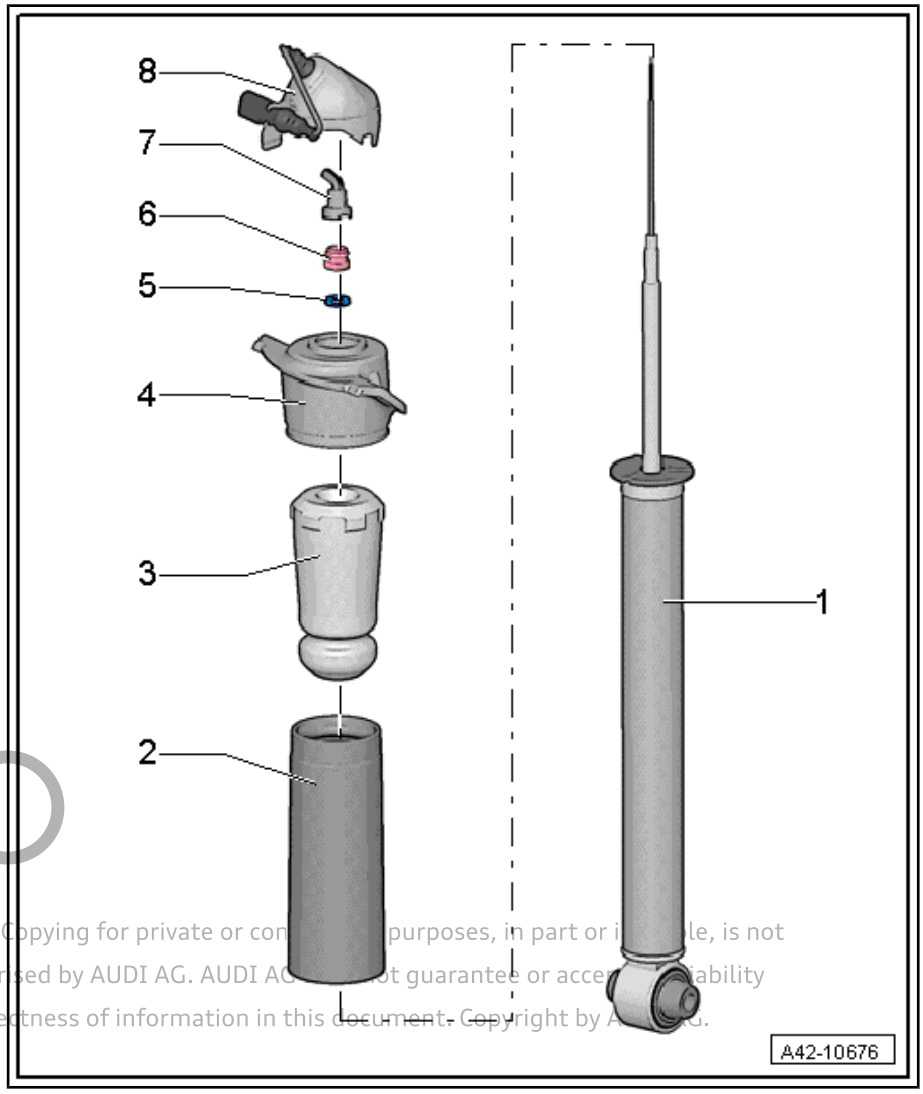
6 - Nut

- ❑ Always renew if removed
- ❑ 25 Nm

7 - Wiring guide

8 - Cover

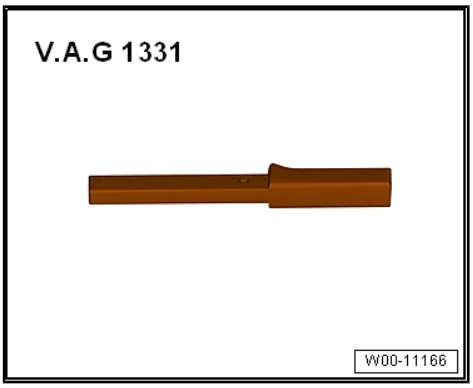
- ❑ With connector fastening



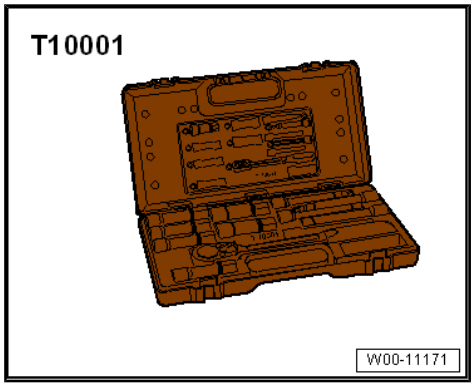
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Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



- Shock absorber tool set - T10001-



- Counterhold tool -T40279-
- Ring spanner insert (commercial type, e.g. »Hazet 6630c-21«)

Procedure

- Shock absorber removed

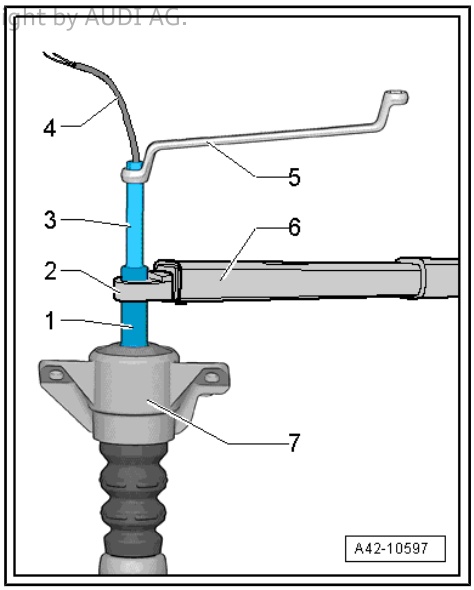
– Move electrical wire clear at cover ⇒ Item 8 (page 239) .

– Release contacts and detach connector housing from electrical wire ⇒ Electrical system; General information; Rep. gr. 97 ; Releasing and dismantling connector housings .

– Disconnect cable guide ⇒ Item 7 (page 239) from nut ⇒ Item 6 (page 239) .

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Loosening and tightening nut on shock absorber mounting



1 - Tool insert - T10001/1-

2 - Ring spanner insert (commercial type, e.g. »Hazet 6630c-21«)

3 - Counterhold tool -T40279-

4 - Wiring

5 - Ring spanner (commercially available type)

6 - Torque wrench - V.A.G 1331-

7 - Shock absorber mounting

Installation is carried out in reverse sequence. Note the following:

Tightening torque ⇒ Item 6 (page 239)

6.4 Removing and installing spring

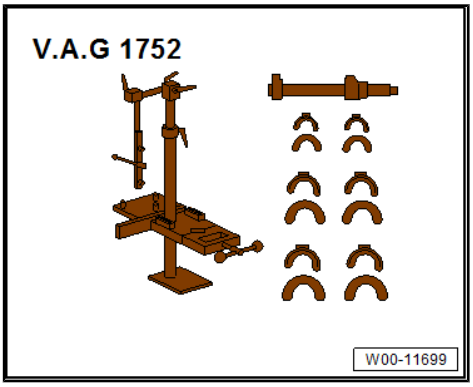
⇒ “6.4.1 Removing and installing spring (torsion beam axle)”, page 240

⇒ “6.4.2 Removing and installing spring (multi-link suspension)”, page 243

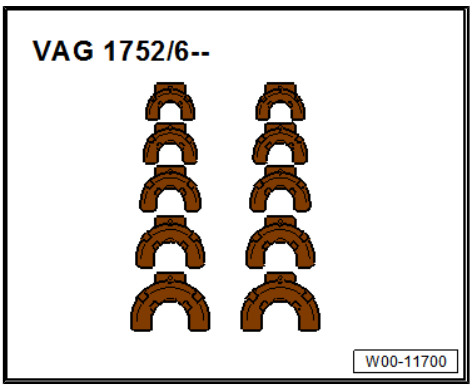
6.4.1 Removing and installing spring (torsion beam axle)

Special tools and workshop equipment required

♦ Suspension strut spring compressor - V.A.G 1752-



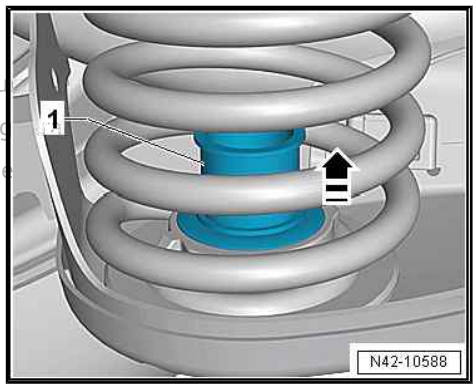
♦ Adapter - V.A.G 1752/9-



Removing

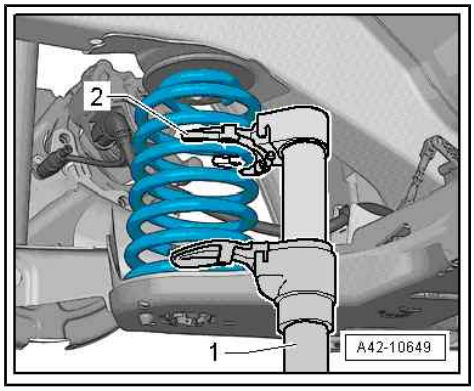
– Remove wheel ⇒ page 309 .

– Pull out clip -1- as far as it will go in direction of -arrow-.



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– Insert spring compressor -1-.



Note

Spring coils must be compressed further on vehicles with heavy-duty running gear ⇒ page 313 than on vehicles with standard running gear. This is only possible if upper spring retainer of spring compressor is removed. After doing this, fit both spring retainers on spring. You can then fit upper spring retainer back on spring compressor.

WARNING

Make sure coil spring is properly seated in spring retainer - V.A.G 1752/3A- -item 2- (risk of accident).

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– Compress coil spring until it can be removed.

Note

Use a suitable wrench or reversible ratchet to operate the spring compressor.

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

2 - Adapters - V.A.G 1752/9-

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

Installing

Install in reverse sequence, paying attention to the following:

– Check that spring seat is not damaged.

– Renew spring seat if necessary.

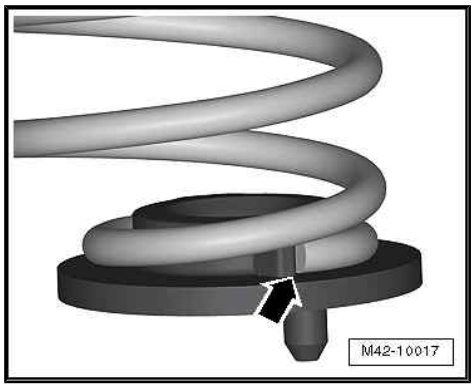
– Fit spring seat on bottom of coil spring.

• End of spring -arrow- must lie against stop on bottom spring seat.

– Install spring together with spring seat.

– The bottom spring seat has a pin.

– Insert this pin in hole in lower spring mounting on axle beam.

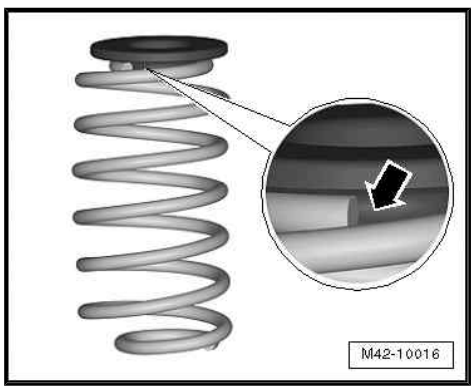


– Insert top spring seat into upper end of spring.

– Projection on spring seat -arrow- must fit correctly on coil spring.

– Slacken coil spring, and at the same time locate upper spring seat on lug on body.

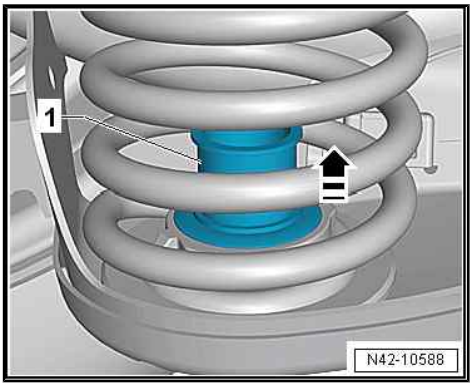
– Take out spring compressor .



– Push in clip -1- as far as it will go in opposite direction to -arrow-.
– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

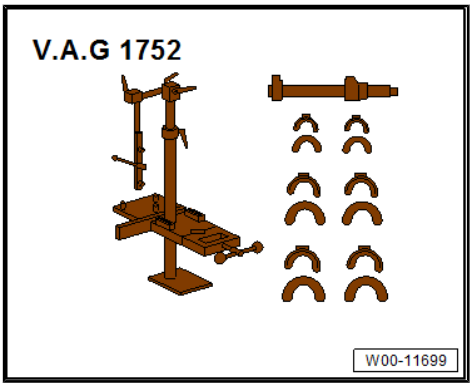
♦ ⇒ “1 Wheels, tyres”, page 309



6.4.2 Removing and installing spring (multi-link suspension)

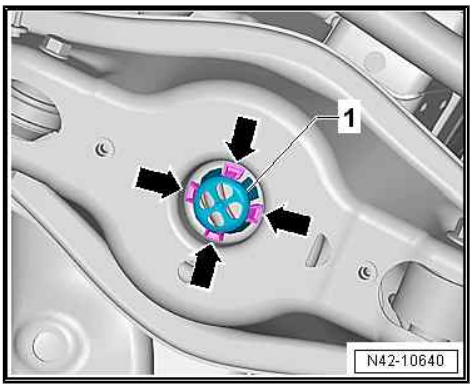
Special tools and workshop equipment required

♦ Suspension strut spring compressor - V.A.G 1752-



Removing

– Remove wheel ⇒ page 309 .
– Press in lugs -arrows- of assembly tool -1-.
– Lift out assembly tool -1-.



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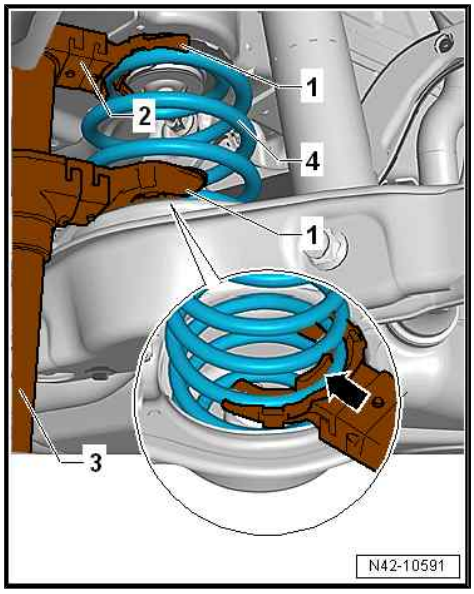
– Insert spring compressor -3-.

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

2 - Adapters - V.A.G 1752/9-

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

4 - Spring



WARNING

Make sure coil spring is properly seated in spring retainer - V.A.G 1752/3A- -item 1- (risk of accident).

– Compress coil spring until it can be removed.

Note

Use a suitable wrench or reversible ratchet to operate the spring compressor.

– Remove spring.

WARNING

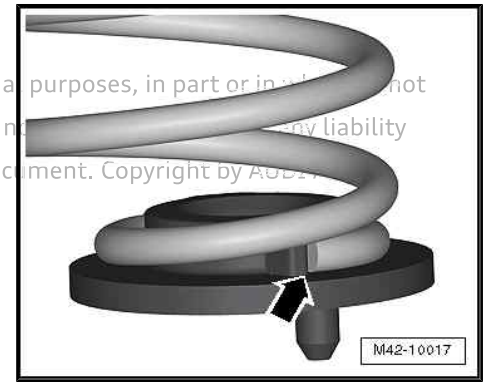
Ensure that coil spring is correctly seated in spring retainer - V.A.G 1752/3A- -arrow- (accident risk).

Installing

Install in reverse sequence, paying attention to the following:

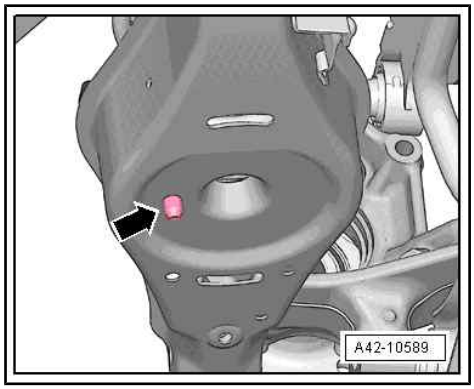
End of spring -arrow- must lie against stop on bottom spring seat.

– Install spring together with spring seat.



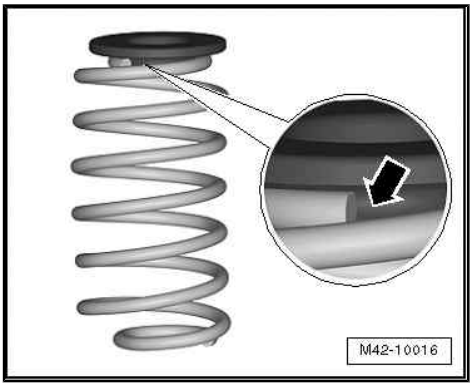
– The bottom spring seat has a pin.

– Insert this pin in hole in lower suspension link -arrow-.

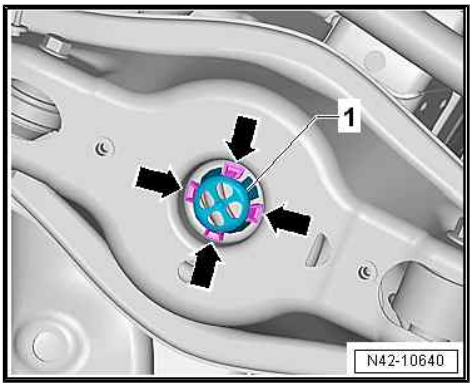


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– Insert top spring seat into upper end of spring.
– Projection on spring seat -arrow- must fit correctly on coil spring.
– Slacken coil spring, and at the same time locate upper spring seat on lug on body.
– Take out spring compressor.



– Insert assembly tool -1- and press down until lugs -arrows- engage.
– Overview table: when does wheel alignment have to be checked? ⇒ page 311



Tightening torques

◆ ⇒ “1 Wheels, tyres”, page 309

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7 Wheel bearing, trailing arm

⇒ “7.1 Exploded view - wheel bearing”, page 246

⇒ “7.2 Exploded view - trailing arm”, page 250

⇒ “7.3 Removing and installing wheel bearing housing”, page 251

⇒ “7.4 Removing and installing wheel bearing unit”, page 260

⇒ “7.5 Renewing bonded rubber bush for wheel bearing housing”, page 268

⇒ “7.6 Removing and installing trailing arm with mounting bracket”, page 273

⇒ “7.7 Servicing trailing arm”, page 276

7.1 Exploded view - wheel bearing

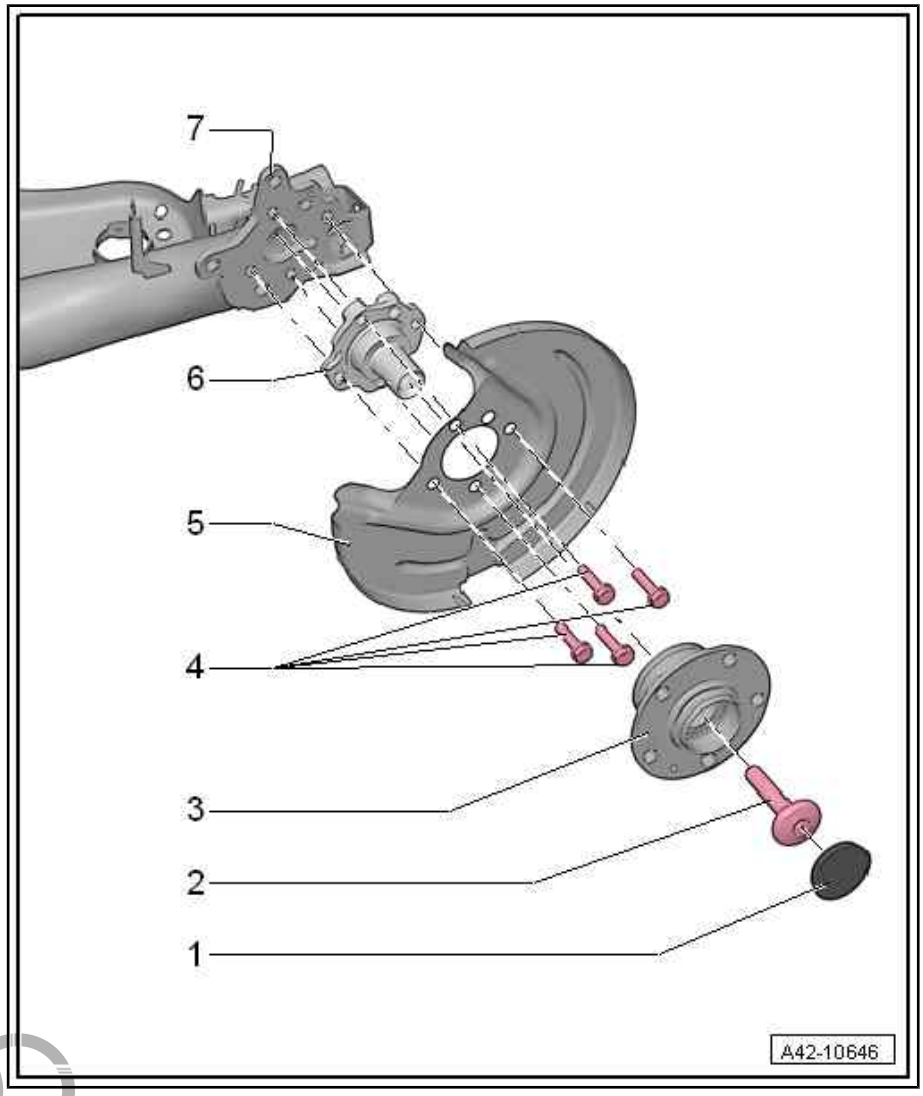
⇒ “7.1.1 Exploded view - wheel bearing unit (torsion beam axle), front-wheel drive vehicles”, page 246

⇒ “7.1.2 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), front-wheel drive vehicles”, page 248

⇒ “7.1.3 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), four-wheel drive vehicles”, page 249

7.1.1 Exploded view - wheel bearing unit (torsion beam axle), front-wheel drive vehicles

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1 - Grease cap

- ❑ Always renew if removed

2 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 283
- ❑ Before securing, clean threads in stub axle using a thread tap
- ❑ 200 Nm + turn +180° further

3 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 260
- ❑ Wheel bearing and wheel hub are combined in one housing.
- ❑ This wheel bearing unit is maintenance-free and has zero play. There is no provision for adjustment or repair.

4 - Bolt

- ❑ Always renew if removed
- ❑ 30 Nm +90°

5 - Splash plate for brakes

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

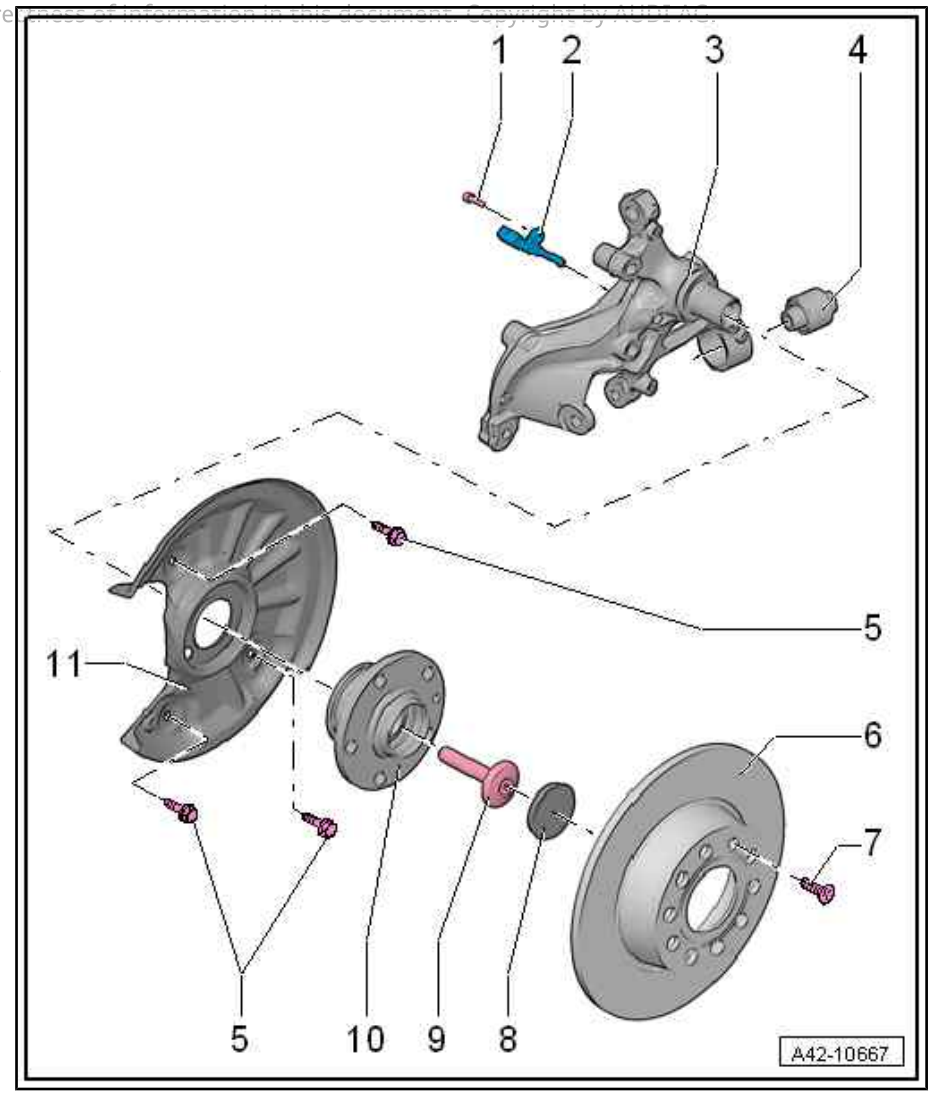
6 - Stub axle

7 - Axle beam

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7.1.2 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), front-wheel drive vehicles

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1 - Bolt

- ❑ Tightening torque: ⇒ Brake system; Rep. gr. 45 ; Overview of fitting locations; Overview of fitting locations - ABS/ESP

2 - Rear speed sensor

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 45 ; Overview of fitting locations; Overview of fitting locations - ABS/ESP

3 - Wheel bearing housing

- ❑ Removing and installing ⇒ page 251

4 - Bonded rubber bush

- ❑ Renewing ⇒ page 268

5 - Bolt

- ❑ Tightening torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

6 - Brake disc

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc

7 - Bolt

- ❑ Tightening torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

8 - Grease cap

- ❑ Always renew if removed
- ❑ Removing and installing ⇒ page 260
- ❑ Proper sealing can only be achieved by installing a new grease cap.

9 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 283
- ❑ Before securing, clean threads in wheel bearing housing using a thread tap.
- ❑ 200 Nm + turn +180° further

10 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 263
- ❑ Wheel bearing and wheel hub are combined in one housing.
- ❑ This wheel bearing unit is maintenance-free and has zero play. There is no provision for adjustment or repair.

Caution

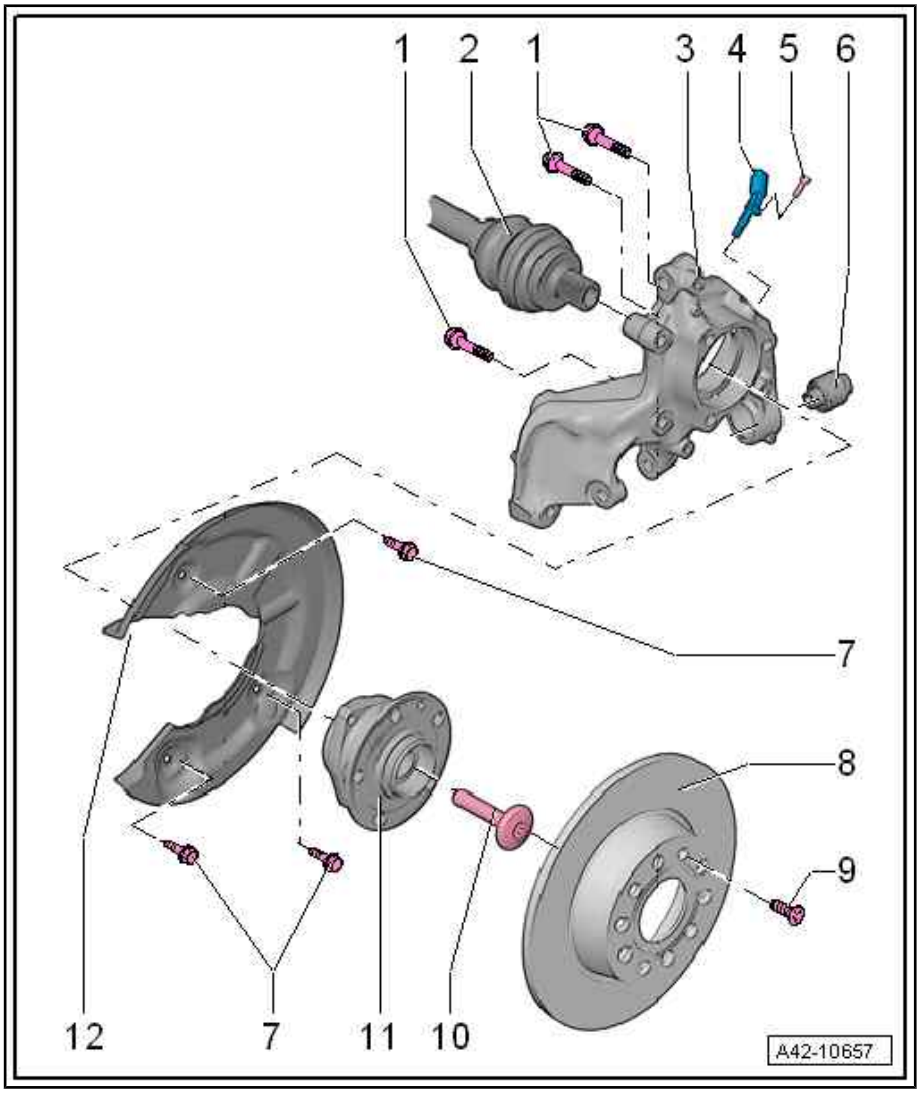
Avoid dirtying or damaging the seal when laying it down or placing it in storage ⇒ page 262 .

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11 - Splash plate for brakes

- ❑ Removing and installing: ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

7.1.3 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), four-wheel drive vehicles



1 - Bolt

- ❑ Always renew if removed
- ❑ 80 Nm +90°

2 - Drive shaft

3 - Wheel bearing housing

- ❑ Removing and installing ⇒ page 255

4 - Rear speed sensor

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 45 ; Overview of fitting locations; Overview of fitting locations - ABS/ESP

5 - Bolt

- ❑ Tightening torque: ⇒ Brake system; Rep. gr. 45 ; Overview of fitting locations; Overview of fitting locations - ABS/ESP

6 - Bonded rubber bush

- ❑ Renewing ⇒ page 268

7 - Bolt

- ❑ Tightening torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

8 - Brake disc

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc

9 - Bolt

- ❑ Tightening torque ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

10 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 283
- ❑ Before securing, clean the threads in the CV joint using a thread tap

- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

11 - Wheel bearing unit

- ❑ Removing and installing ⇒ page 266
- ❑ Wheel bearing and wheel hub are combined in one housing.
- ❑ This wheel bearing unit is maintenance-free and has zero play. There is no provision for adjustment or repair.

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Caution

Avoid dirtying or damaging the seal when laying it down or placing it in storage ⇒ page 268 .

12 - Splash plate for brakes

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

7.2 Exploded view - trailing arm

1 - Cover

2 - Mounting bracket

3 - Bolt

- ❑ Always renew if removed
- ❑ 50 Nm +45°

4 - Bolt

- ❑ Always renew if removed
- ❑ 90 Nm +90°

5 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +90°

6 - Bolt

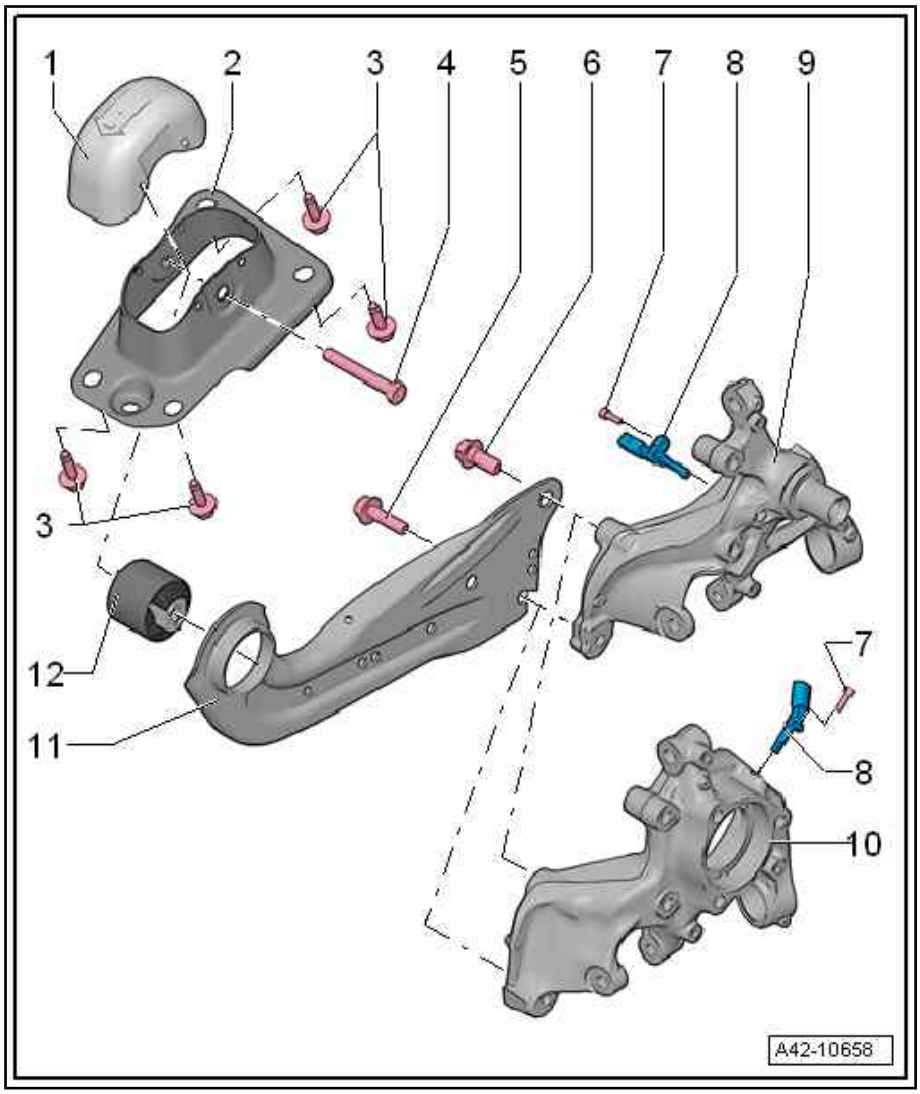
- ❑ Always renew if removed
- ❑ 70 Nm +90°

7 - Bolt

- ❑ Tightening torque: ⇒ Brake system; Rep. gr. 45 ; Overview of fitting locations; Overview of fitting locations - ABS/ ESP

8 - Rear speed sensor

- ❑ Removing and installing ⇒ Brake system; Rep. gr. 45 ; Overview of fitting locations; Overview of fitting locations - ABS/ ESP



9 - Wheel bearing housing

- ❑ For vehicles with front-wheel drive

10 - Wheel bearing housing

- ❑ For vehicles with four-wheel drive

11 - Trailing arm

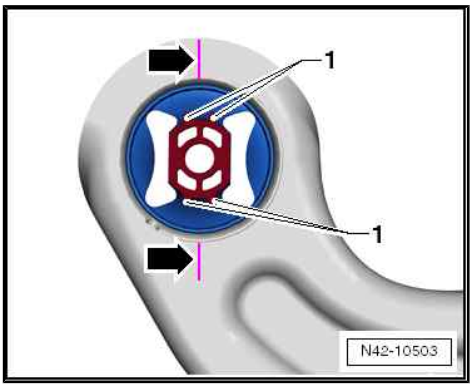
- ❑ Removing and installing ⇒ page 273

12 - Bonded rubber bush

- ❑ Note installation position ⇒ page 251 .
- ❑ Renewing ⇒ page 276

Installation position of bonded rubber bush:

Position bonded rubber bush on trailing arm so that marked vertical line -arrows- lies between raised portions -1-.



Note

It is very important that the bonded rubber bush is installed in the correct position relative to the bush of the trailing arm.

7.3 Removing and installing wheel bearing housing

⇒ "7.3.1 Removing and installing wheel bearing housing (multi-link suspension) - front-wheel drive vehicles", page 251

⇒ "7.3.2 Removing and installing wheel bearing housing (multi-link suspension) - four-wheel drive vehicles", page 255

7.3.1 Removing and installing wheel bearing housing (multi-link suspension) - front-wheel drive vehicles

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1332-



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♦ Engine and gearbox jack - VAS 6931-



♦ Support - T10149-



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Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Remove wheel ⇒ page 309 .

– Remove brake caliper ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake caliper .

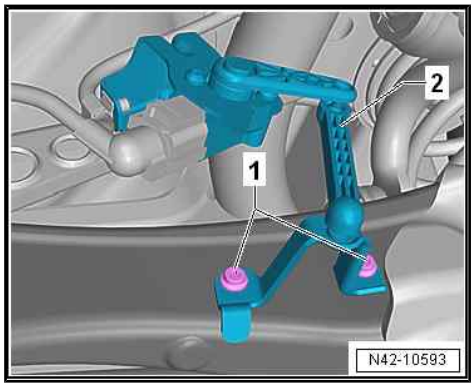
• If you are renewing the wheel bearing housing and intend to re-install the old wheel bearing unit, you must remove the wheel bearing unit.

– If necessary, remove wheel bearing unit ⇒ page 263 .

– If necessary, remove splash plate ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake .

Vehicles with vehicle level senders:

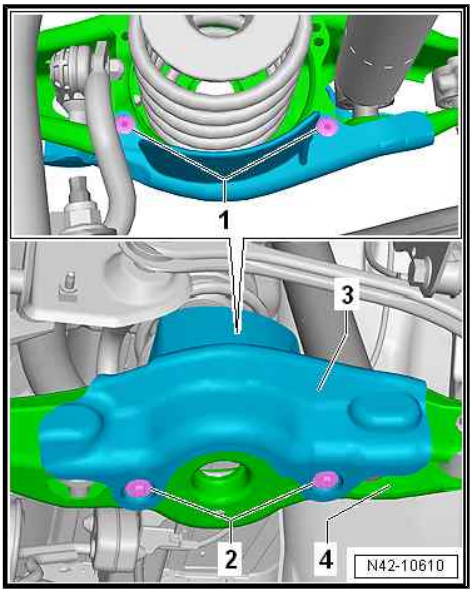
– Remove bolts -1- on linkage -2- for rear vehicle level sender on both sides of vehicle.



Vehicles with stone deflector

– Remove spreader rivets -1-.

– Unscrew bolts -2- and detach stone deflector -3-.



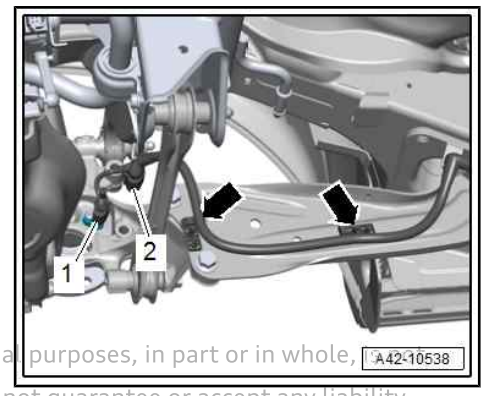
All vehicles (continued)

– Remove coil spring ⇒ page 240 .

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

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

– Detach electrical wiring harness from retainers -arrows- and move clear.

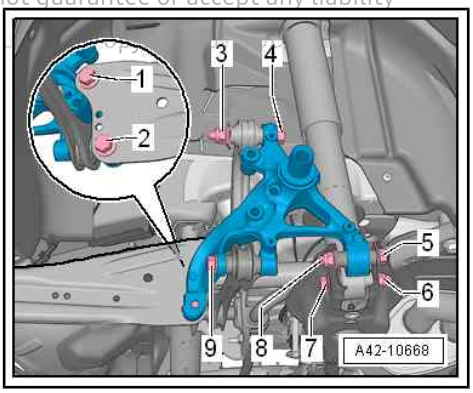


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– Remove bolts -1 and 2-.

– Unscrew nuts -3, 6 and 8- and pull out bolts -4, 5, 7 and 9-.

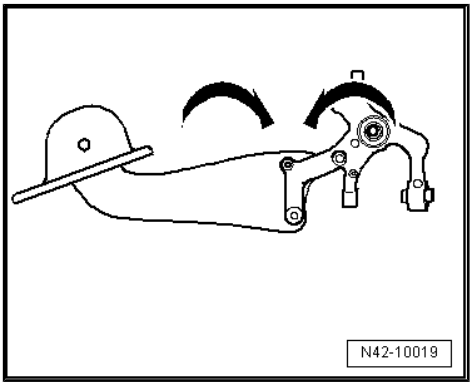
– Take out wheel bearing housing.



Installing

Install in reverse sequence, paying attention to the following:

Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. The suspension must be in extended position before securing. The trailing arm and the wheel bearing housing will only then move into the required position -arrows-.



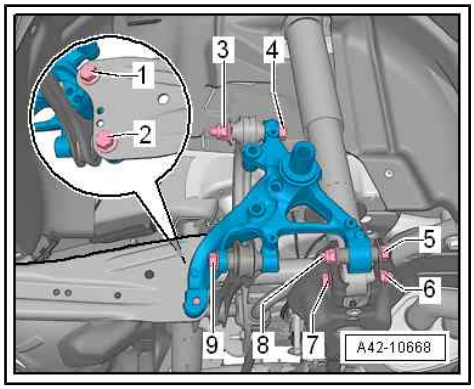
It is important to keep to the specified sequence for the following operations.

– Fit wheel bearing housing.

– Insert bolts -4, 5 and 7- and tighten nuts -3, 6 and 8- hand-tight.

– Tighten bolt -9- hand-tight.

– Tighten bolts -1 and 2- hand-tight.

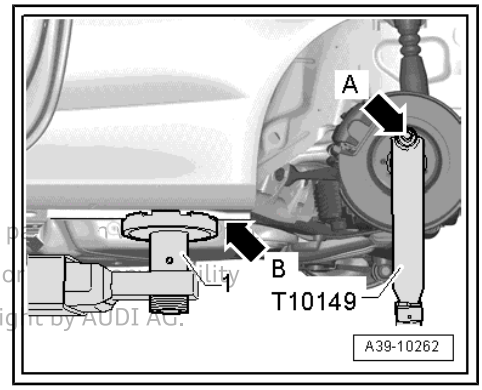


The bolted connections on the wheel bearing housing may only be tightened when dimension “a” has been obtained ⇒ page 10 .

– Attach support - T10149- to wheel hub -arrow- using wheel bolt.

– Raise wheel bearing housing with engine and gearbox jack - VAS 6931- until distance -a- is obtained ⇒ page 10 .

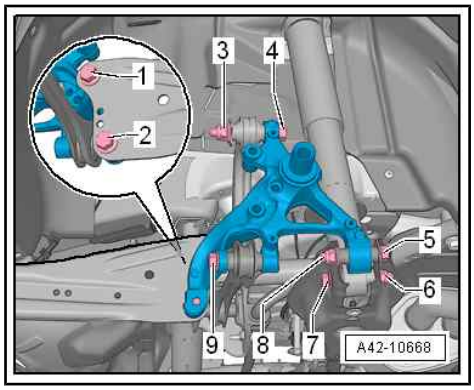
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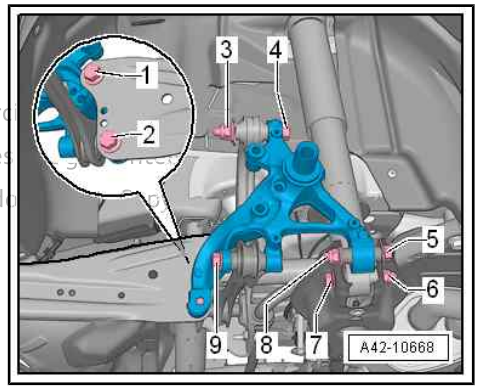
– Tighten nuts and bolts -3 to 9-.

– Detach engine and gearbox jack - VAS 6931- with support - T10149- from wheel hub.

– Install coil spring ⇒ page 240 .



– Tighten bolts -1 and 2-.



Perform further installation in reverse order; note the following:

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “7.1.2 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), front-wheel drive vehicles”, page 248
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “7.2 Exploded view - trailing arm”, page 250
- ⇒ “5.2 Exploded view - track rod”, page 226
- ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ “1 Wheels, tyres”, page 309

7.3.2 Removing and installing wheel bearing housing (multi-link suspension) - four-wheel drive vehicles

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

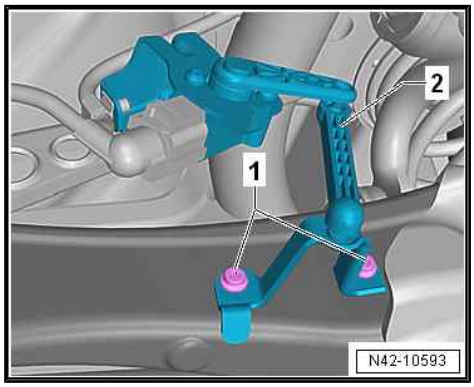
– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Loosen bolt securing drive shaft at wheel hub ⇒ page 283 .

– Remove wheel ⇒ page 309 .

Vehicles with vehicle level senders

– Remove bolts -1- on linkage -2- for rear vehicle level sender on both sides of vehicle.

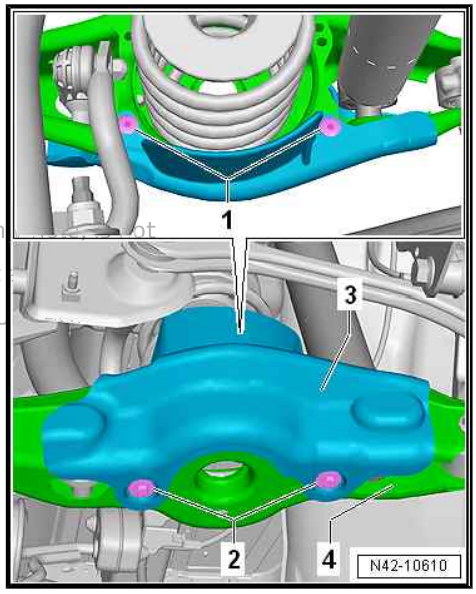


Note

Illustration shows installation position on a front-wheel drive vehicle; four-wheel drive is similar.

Vehicles with stone deflector

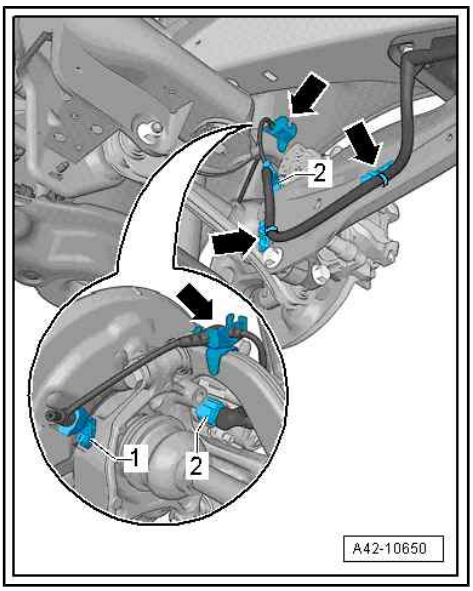
– Remove spreader rivets -1-.
– Unscrew bolts -2- and detach stone deflector -3-.



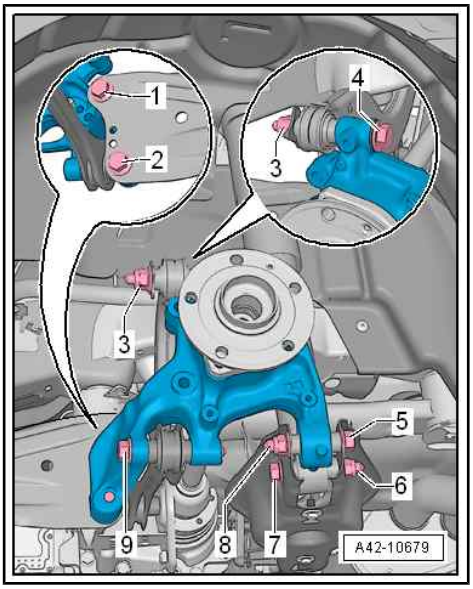
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All vehicles (continued)

– Remove coil spring ⇒ page 240 .
– Disconnect electrical connector -1- from ABS speed sensor and move clear.
– Unplug electrical connector -2- from electromechanical parking brake motor on brake caliper and move clear.
– Remove splash plate ⇒ Rep. gr. 46 .



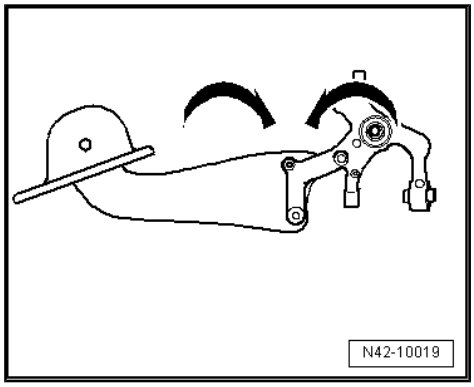
– Remove bolts -1 and 2-.
– Remove nuts -3, 6, 8- and bolts -4, 5, 7, 9-.
– Take out wheel bearing housing.



Installing

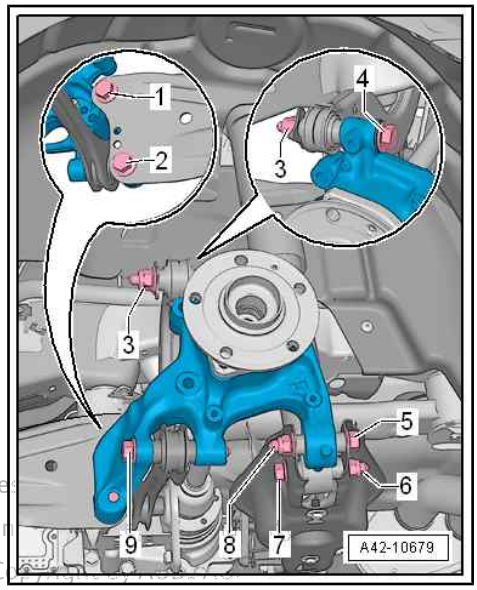
Install in reverse sequence, paying attention to the following:

Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. The suspension must be in extended position before securing. The trailing arm and the wheel bearing housing will only then move into the required position -arrows-.



It is important to keep to the specified sequence for the following operations.

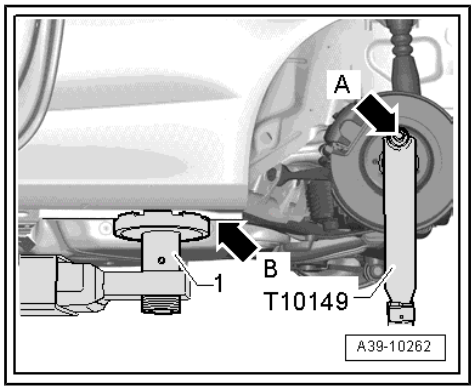
- Fit wheel bearing housing.
- Insert bolts -4, 5 and 7- and tighten nuts -3, 6 and 8- hand-tight.
- Tighten bolt -9- hand-tight.
- Tighten bolts -1 and 2- hand-tight.



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The bolted connections on the wheel bearing housing may only be tightened when dimension “a” has been obtained ⇒ page 10 **.**

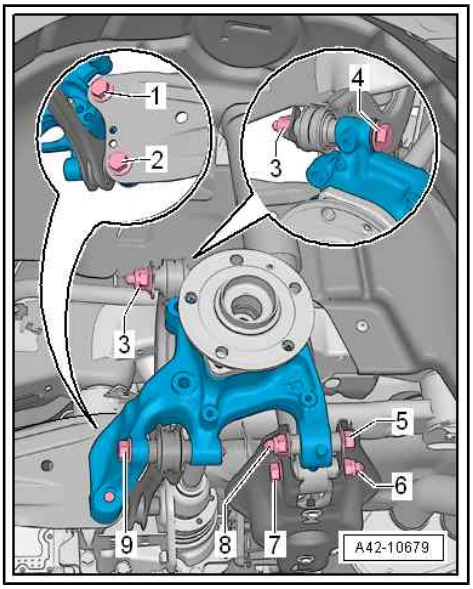
- Attach support - T10149- to wheel hub -arrow- using wheel bolt.
- Raise wheel bearing housing with engine and gearbox jack - VAS 6931- until distance -a- is obtained ⇒ page 10 .



– Tighten nuts and bolts -3 to 9-.

– Detach engine and gearbox jack - VAS 6931- with support - T10149- from wheel hub.

– Install coil spring ⇒ page 240 .

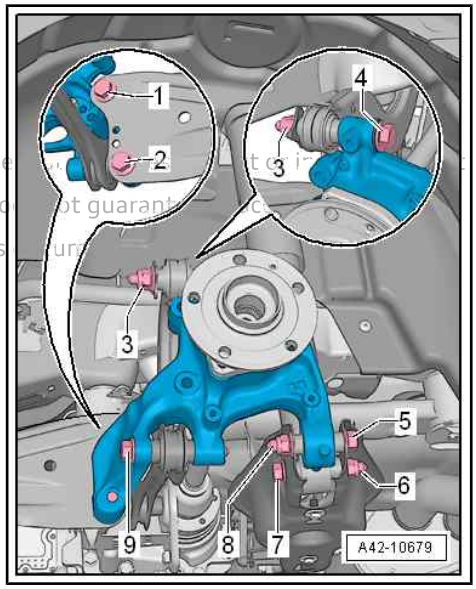


– Tighten bolts -1 and 2-.

Perform further installation in reverse order; note the following:

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311



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Tightening torques

- ⇒ “7.1.3 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), four-wheel drive vehicles”, page 249
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “7.2 Exploded view - trailing arm”, page 250
- ⇒ “5.2 Exploded view - track rod”, page 226
- ⇒ “8.3 Loosening and tightening bolt securing drive shaft”, page 283
- ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ “1 Wheels, tyres”, page 309

7.4 Removing and installing wheel bearing unit

⇒ “7.4.1 Removing and installing wheel bearing unit (torsion beam axle) - front-wheel drive vehicles”, page 260

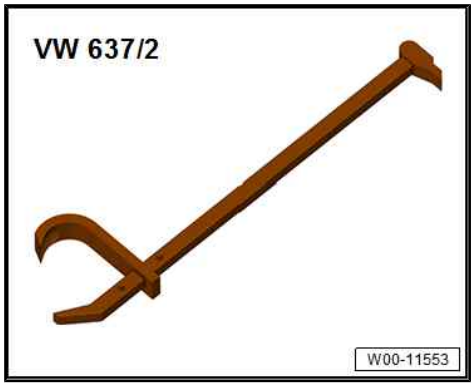
⇒ “7.4.2 Removing and installing wheel bearing unit (multi-link suspension) - front-wheel drive vehicles”, page 263

⇒ “7.4.3 Removing and installing wheel bearing unit (multi-link suspension) - four-wheel drive vehicles”, page 266

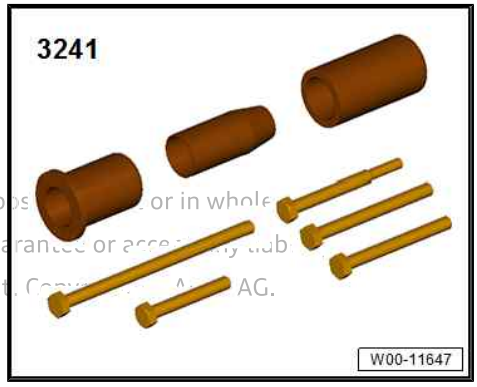
7.4.1 Removing and installing wheel bearing unit (torsion beam axle) - front-wheel drive vehicles

Special tools and workshop equipment required

- Hub grease cap puller - VW 637/2-



- Fitting sleeve - 3241/4- from fitting sleeves - 3241-

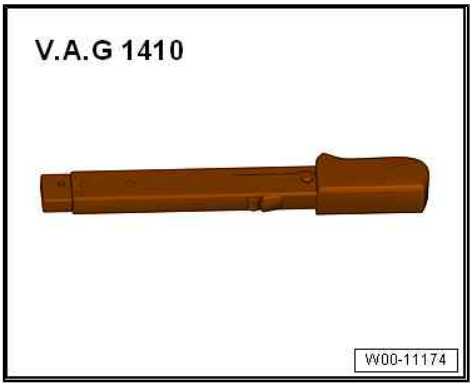


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- Torque wrench - V.A.G 1332-



- Torque wrench - V.A.G 1410-



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- Bit XZN 18 - T10162 A-



WARNING

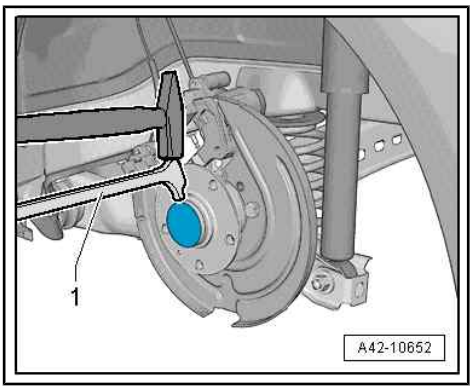
There is a risk that bit XZN 18 with tool number -T10162- without index "A" can break!

- ***Use ONLY bit XZN 18 - T10162 A- .***

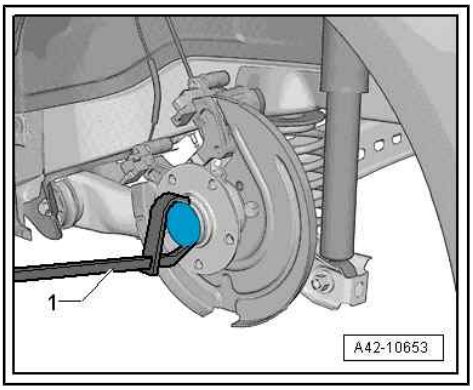
Removing

– Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc .

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



– Lever off grease cap using hub grease cap puller - VW 637/2- -item 1-.

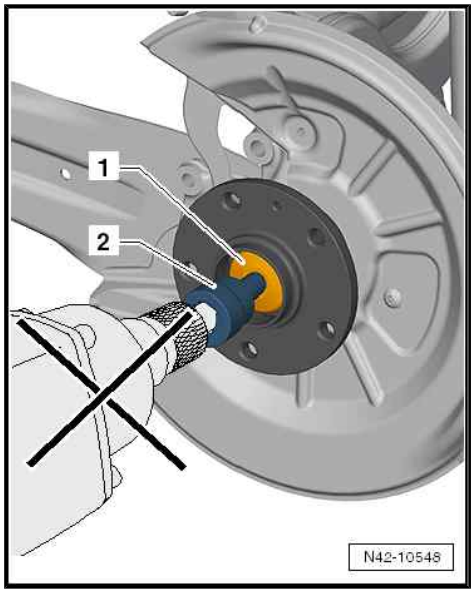


Caution

DO NOT use an impact wrench when slackening bolt -1- with bit XZN 18 - T10162 A- .

– Remove bolt using bit XZN 18 - T10162 A- -item 2-.

– Pull wheel bearing unit off stub axle.



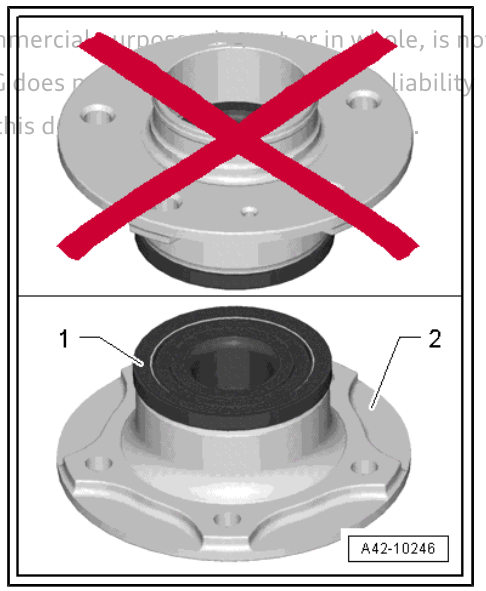
Caution

- ***Avoid dirtying or damaging the seal when laying it down or placing it in storage.***

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The wheel bearing -1- must always be pointing upwards.

– Always put down the wheel bearing unit with the wheel hub -2- facing downwards.



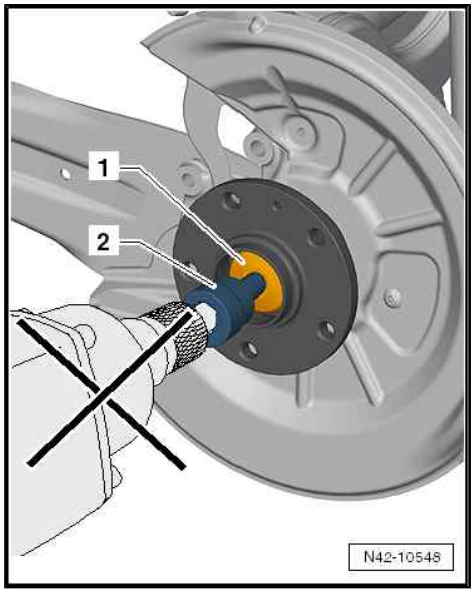
Installing

Install in reverse sequence, paying attention to the following:

– Carefully slide wheel hub/wheel bearing unit onto stub axle.

Take care to keep wheel hub/wheel bearing unit straight.

– Use a new multi-point socket head bolt -1- and tighten it.



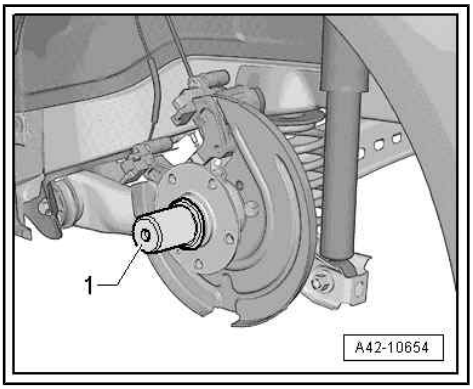
Caution

DO NOT use an impact wrench when tightening bolt -1- with bit XZN 18 - T10162 A- .

Note

- *First tighten bolt with torque wrench to specified tightening torque.*
- *Use fixed wrench to turn bolt further through specified angle.*

– Drive in new grease cap using fitting sleeve - 3241/4- -1-.



Note

- *Always renew grease caps.*
- *Damaged grease caps allow moisture to enter the bearing. For this reason it is important to use the tool shown in the illustration.*

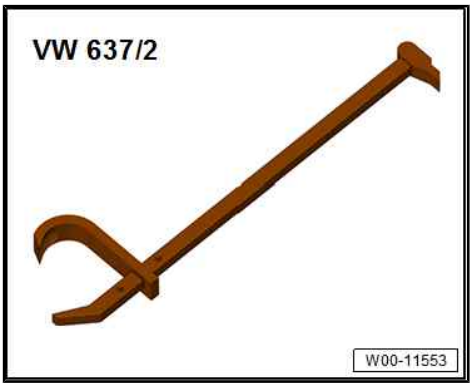
Tightening torques

- ⇒ “7.1.1 Exploded view - wheel bearing unit (torsion beam axle), front-wheel drive vehicles”, page 246
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ “1 Wheels, tyres”, page 309

7.4.2 Removing and installing wheel bearing unit (multi-link suspension) - front-wheel drive vehicles

Special tools and workshop equipment required

- Hub grease cap puller - VW 637/2-



- Fitting sleeve - 3241/4- from fitting sleeves - 3241-

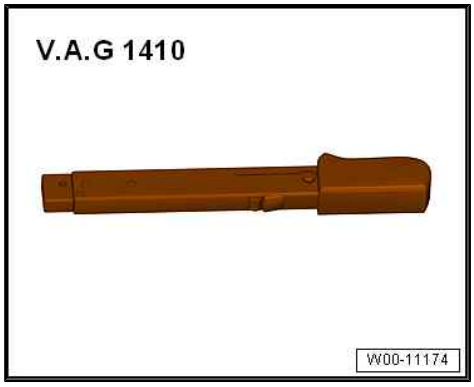


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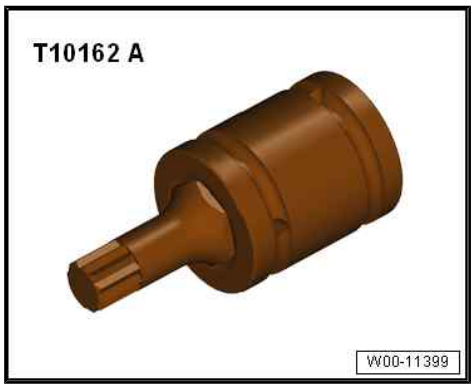
- Torque wrench - V.A.G 1332-



- Torque wrench - V.A.G 1410-



- Bit XZN 18 - T10162 A-



WARNING

There is a risk that bit XZN 18 with tool number -T10162- without index "A" can break!

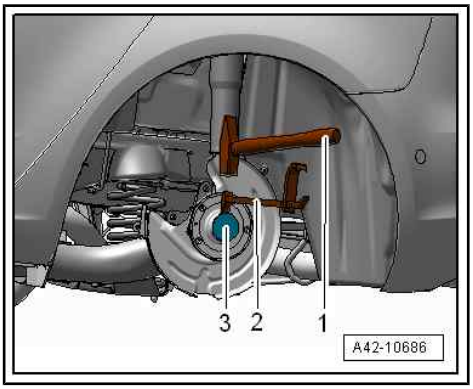
- ***Use ONLY bit XZN 18 - T10162 A- .***

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Removing

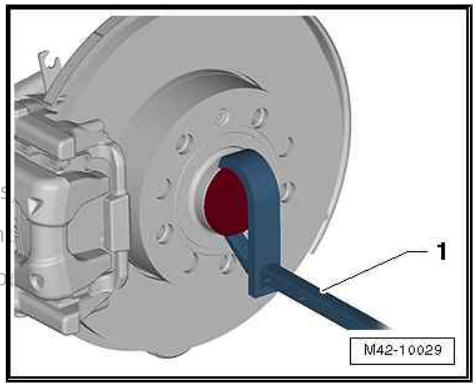
– Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc .

– 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-.

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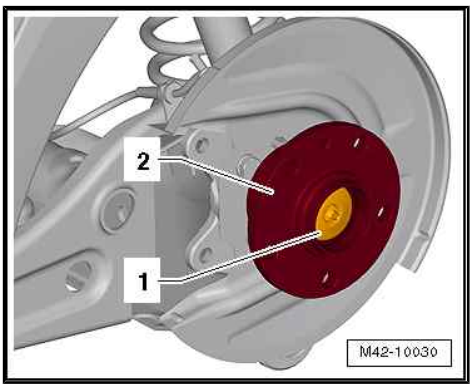


– Remove bolt -1- using bit XZN 18 - T10162 A- .

Caution

DO NOT use an impact wrench when slackening bolt -1- with bit XZN 18 - T10162 A- .

– Pull wheel bearing unit -2- off stub axle.

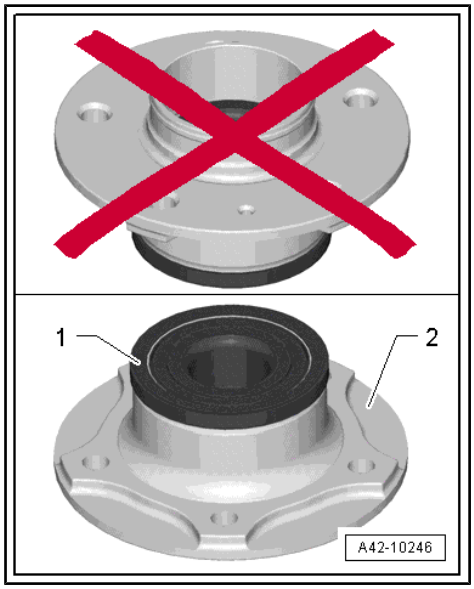


Caution

- ***Avoid dirtying or damaging the seal when laying it down or placing it in storage.***

The wheel bearing -1- must always be pointing upwards.

– Always put down the wheel bearing unit with the wheel hub -2- facing downwards.



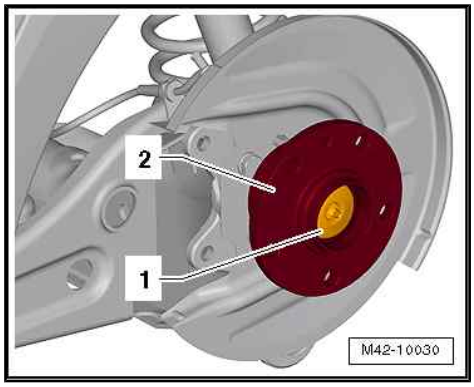
Installing

Install in reverse sequence, paying attention to the following:

– Carefully slide wheel hub/wheel bearing unit onto stub axle.

Take care to keep wheel hub/wheel bearing unit straight.

– Use a new multi-point socket head bolt -1- and tighten it.



Caution

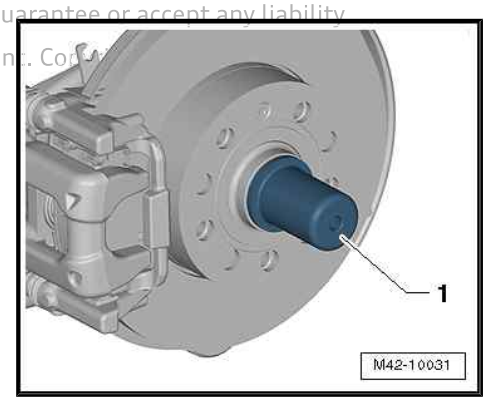
DO NOT use an impact wrench when tightening bolt -1- with bit XZN 18 - T10162 A- .

Note

- *First tighten bolt with torque wrench to specified tightening torque.*
- *Use fixed wrench to turn bolt further through specified angle.*

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– Drive in new grease cap using fitting sleeve - 3241/4- -1-.



Note

- *Always renew grease caps.*
- *Damaged grease caps allow moisture to enter the bearing. For this reason it is important to use the tool shown in the illustration.*

Tightening torques

- ⇒ “7.1.2 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), front-wheel drive vehicles”, page 248
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake

7.4.3 Removing and installing wheel bearing unit (multi-link suspension) - four-wheel drive vehicles

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



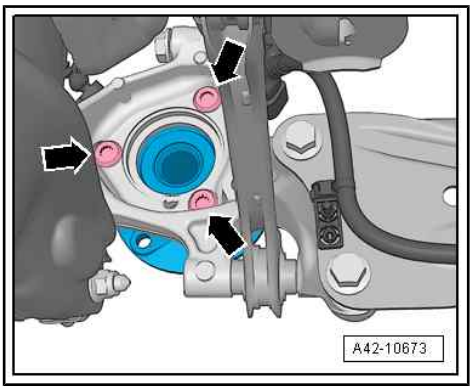
♦ Torque wrench - V.A.G 1410-



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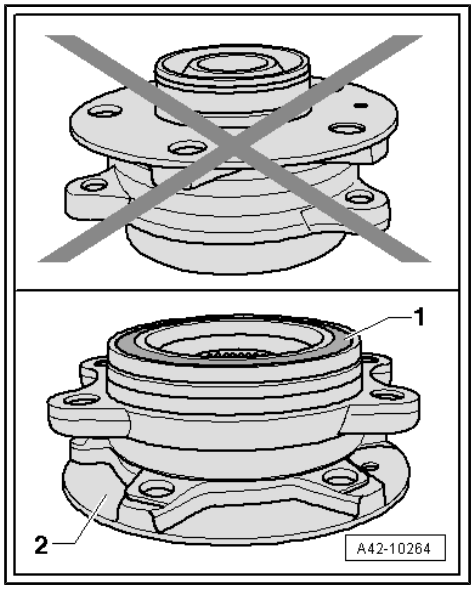
Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .
– Loosen bolt securing drive shaft at wheel hub ⇒ page 283 .
– Remove brake disc ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Removing and installing brake disc .
– Remove coil spring ⇒ page 240 .
– Remove drive shaft ⇒ page 284 .
– Remove bolts -arrows-.
– Pull wheel bearing unit out of wheel bearing housing.

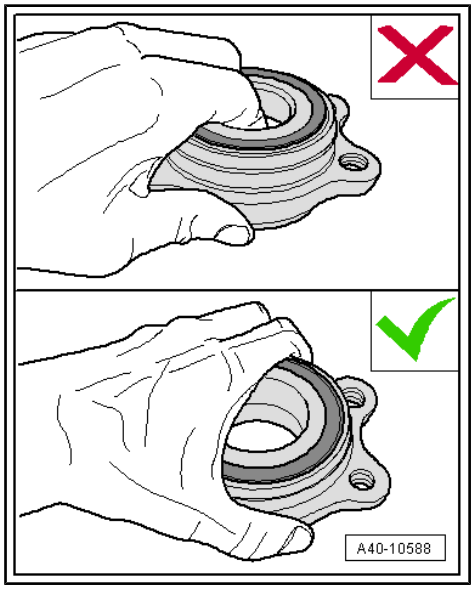


Caution

- *Avoid dirtying or damaging the seal when laying it down or placing it in storage.*



- The wheel bearing -1- must always be pointing upwards.
- 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.

The same procedure applies to the wheel bearing without wheel hub.

Installing

Install in reverse sequence, paying attention to the following:

- The bolted connections on the wheel bearing housing may only be tightened when the original distance between the wheel hub centre and the lower edge of the wheel housing (as measured before assembly) has been obtained ⇒ page 10 .

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

- ⇒ “7.1.3 Exploded view - wheel bearing housing, wheel bearing unit (multi-link suspension), four-wheel drive vehicles”, page 249
- ⇒ Brake system; Rep. gr. 46 ; Rear brakes; Exploded view - rear brake
- ⇒ “8.3 Loosening and tightening bolt securing drive shaft”, page 283

7.5 Renewing bonded rubber bush for wheel bearing housing

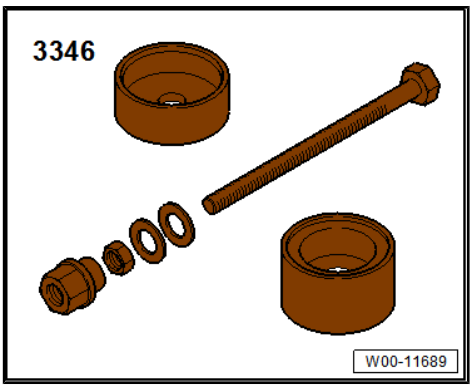
Special tools and workshop equipment required

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- Assembly tool - 3301-



- Assembly tool - 3346-

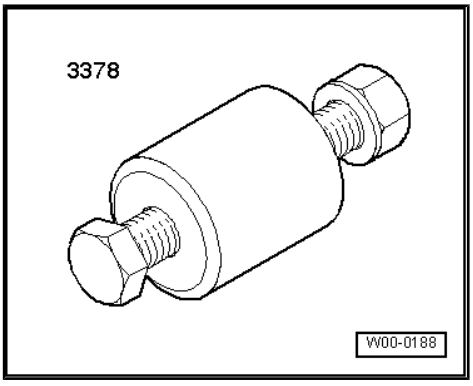


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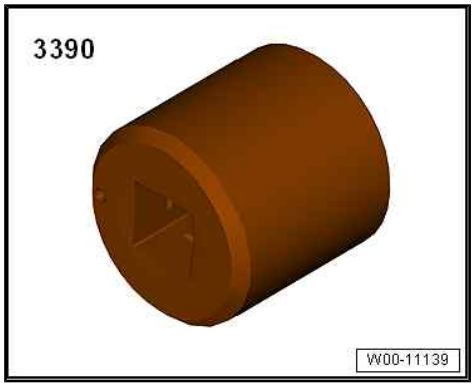
- Assembly tool - 3350-



- Fitting sleeve - 3378-



- Carrier - 3390-



- Torque wrench - V.A.G 1332-

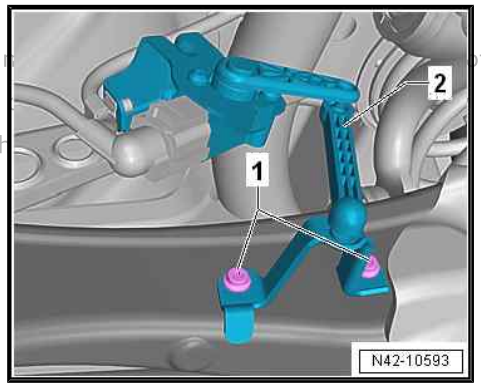


Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .
– Remove wheel ⇒ page 309 .
– Remove coil spring ⇒ page 240 .

Vehicles with vehicle level senders:

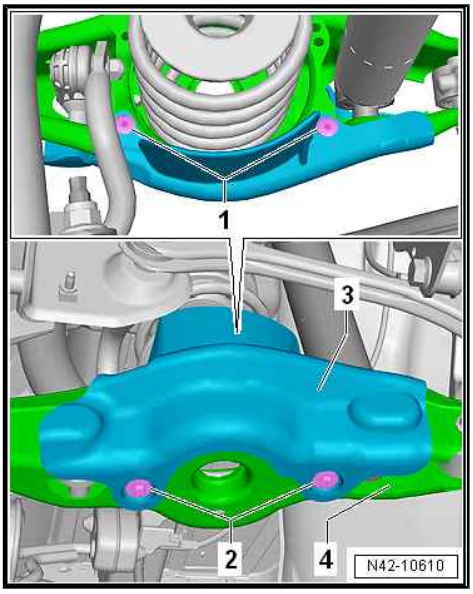
– Remove bolts -1- on linkage -2- for rear vehicle level sender on both sides of vehicle.



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Vehicles with stone deflector

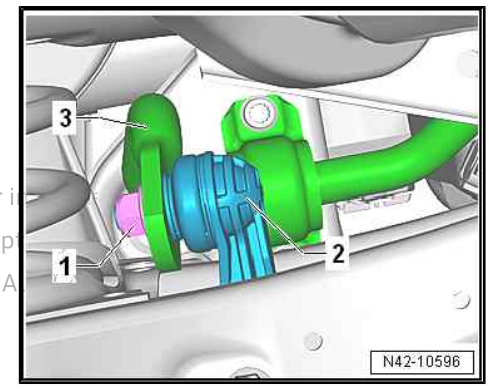
– Remove spreader rivets -1-.
– Unscrew bolts -2- and detach stone deflector -3-.



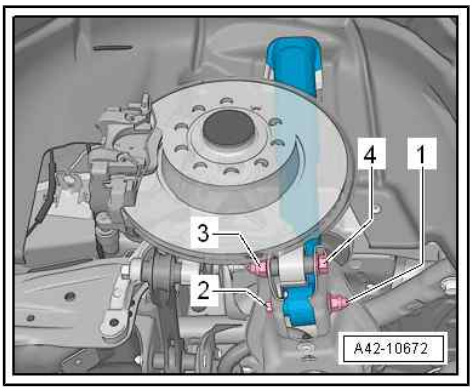
All vehicles (continued)

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

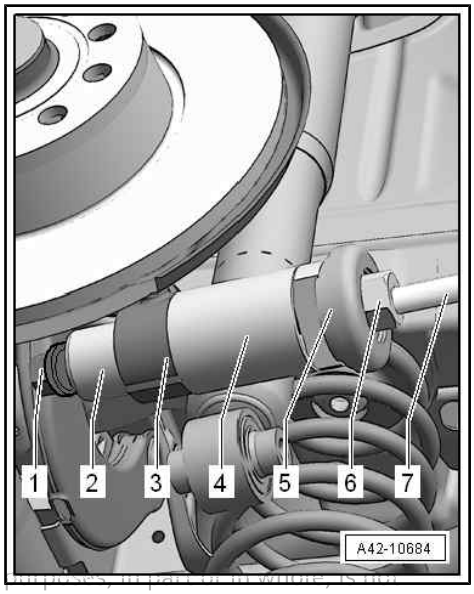
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– Unscrew nut -1- and pull out bolt -2- securing shock absorber.
– Unscrew nut -3- and pull out bolt -4- securing wheel bearing housing.



Pressing out bonded rubber bush



1 - Nut - 3346/3-

2 - Carrier - 3390-

3 - Wheel bearing housing

4 - Assembly tool - 3350-

5 - Thrust plate from assembly tool - 3301-

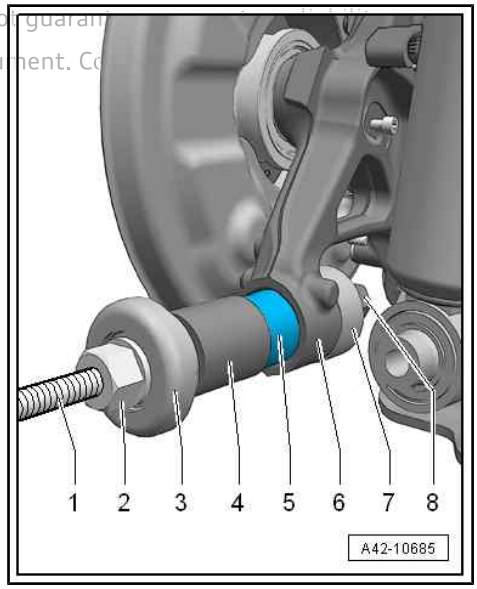
6 - Nut - 3346/3-

7 - Spindle - 3346/2-

– Pull out bonded rubber bush by turning nut - 3346/3- -item 6-. Counterhold spindle - 3346/2- -item 7- if necessary.

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Installing bonded rubber bush



1 - Spindle - 3346/2-

2 - Nut - 3346/3-

3 - Thrust plate from assembly tool - 3301-

4 - Fitting sleeve - 3378-

5 - Bonded rubber bush

6 - Wheel bearing housing

7 - Assembly tool - 3346-

8 - Nut - 3346/3-

– Pull in bonded rubber bush by turning nut - 3346/3- -2-. Counterhold spindle - 3346/2- -1- if necessary.

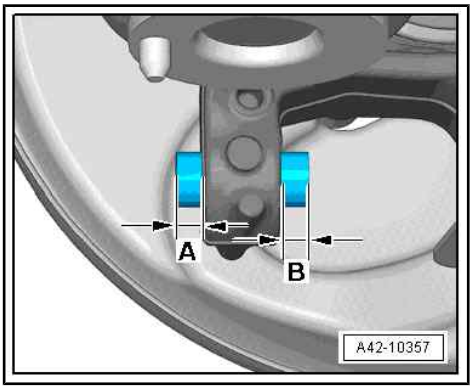
Note

- *Do not use lubricant.*
- *Insert bush carefully to keep it straight.*

– After installing, check that bonded rubber bush is in correct position.

• Dimensions -A- and -B- must be equal.

– Press bush in further if dimensions -A- and -B- are not equal.



Installing

Install in reverse sequence, paying attention to the following:

The bolted connections on the wheel bearing housing may only be tightened when the original distance between the wheel hub centre and the lower edge of the wheel housing (as measured before assembly) has been obtained ⇒ page 10 .

• On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.

• If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .

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

– Overview table: when does wheel alignment have to be checked? ⇒ page 311

Tightening torques

◆ ⇒ “7.1 Exploded view - wheel bearing”, page 246

◆ ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233

◆ ⇒ “4.1 Exploded view - anti-roll bar”, page 217

◆ ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304

◆ ⇒ “1 Wheels, tyres”, page 309

7.6 Removing and installing trailing arm with mounting bracket

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Special tools and workshop equipment required

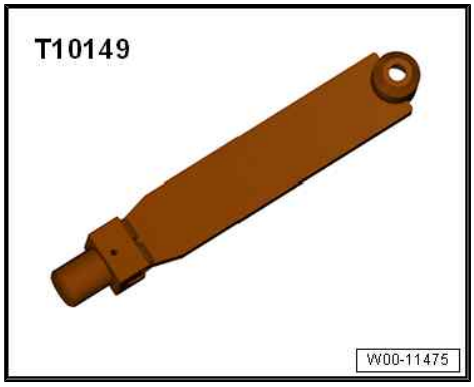
◆ Torque wrench - V.A.G 1332-



♦ Engine and gearbox jack - VAS 6931-

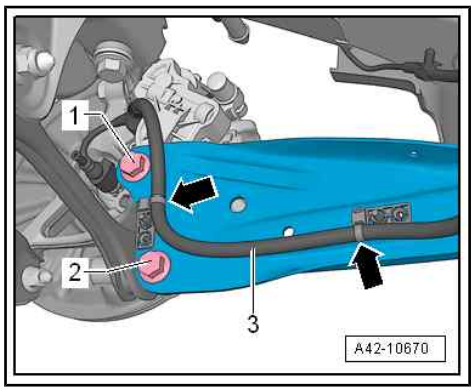


♦ Support - T10149-

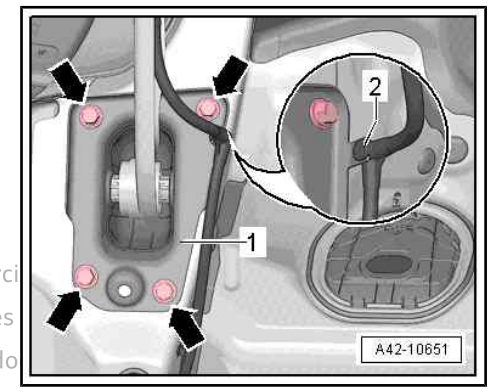


Removing

– Remove wheel ⇒ page 309 .
– Remove coil spring ⇒ page 240 .
– Remove retainers -arrows- by pushing out inner pins of rivets.
– Move electrical wiring harness -3- clear.
– Remove bolts -1 and 2- from trailing arm.
– Remove underbody trim on relevant side ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .



– Detach electrical wire -2- from mounting bracket -1-.
– Mark installation position of mounting bracket -1- on body.
– Remove bolts -arrows-.
– Take out trailing arm with mounting bracket.
• If the mounting bracket has to be separated from the trailing arm for subsequent repair work, the position of the mounting bracket relative to the trailing arm must be adjusted before installation.
– Clamp trailing arm in vice using protective jaw covers.



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Adjusting position of mounting bracket in relation to trailing arm

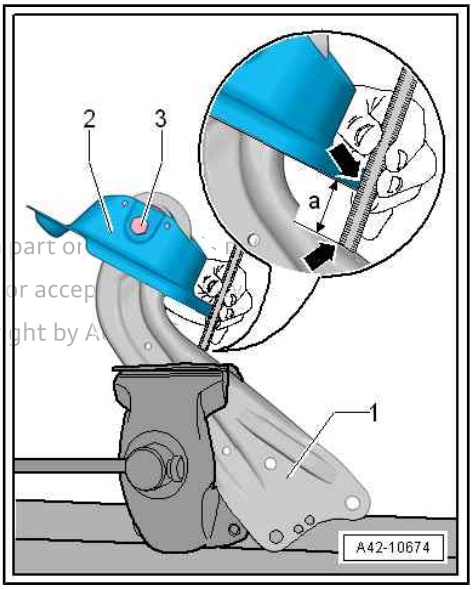
Dimension -a- is 37 mm.

1 - Trailing arm

2 - Mounting bracket

- Apply a steel ruler to the mounting bracket as shown in the illustration and set the dimension given above, ensuring that the complete surface of the steel ruler is touching the mounting bracket and that the ruler is applied to the inner edge of the trailing arm.

– Tighten bolt -3- when dimension -a- is set.



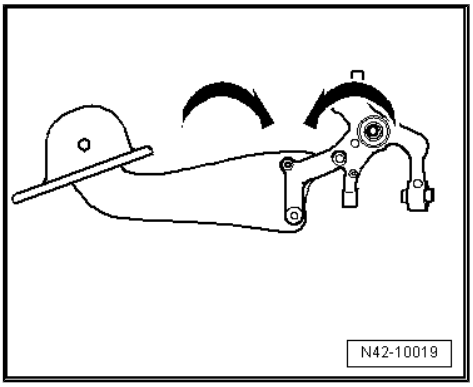
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Installing

Install in reverse sequence, paying attention to the following:

Installation position: Bolted connection between trailing arm and wheel bearing housing

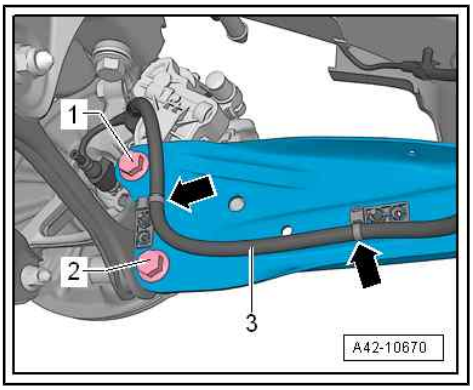
Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. The suspension must be in extended position before securing. The trailing arm and the wheel bearing housing will only then move into the required position -arrows-.



It is important to keep to the specified sequence for the following operations.

– Fit trailing arm and mounting bracket to wheel bearing housing with bolts -1 and 2- (do not tighten at this stage).

– Lift suspension with engine and gearbox jack - VAS 6931- and support - T10149- until mounting bracket makes contact with body.

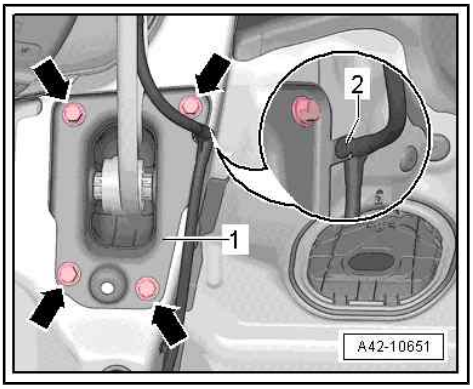


– Tighten bolts -arrows- onto old impression marks or previously applied marks.

– Secure line -2- on mounting bracket -1-.

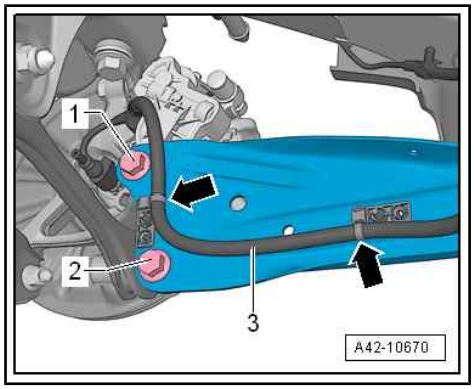
– Lower suspension with engine and gearbox jack - VAS 6931- and remove support - T10149- from wheel hub.

– Install coil spring ⇒ page 240 .



– Tighten trailing arm bolts -arrows- to torque (ensure that components are positioned as required) ⇒ page 275 .

– Install retainer by pushing in inner pins of rivets -arrows-.



After installation, wheel alignment must be checked on wheel alignment unit ⇒ page 311 .

Tightening torques

- ⇒ “7.2 Exploded view - trailing arm”, page 250
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim
- ⇒ “1 Wheels, tyres”, page 309

7.7 Servicing trailing arm

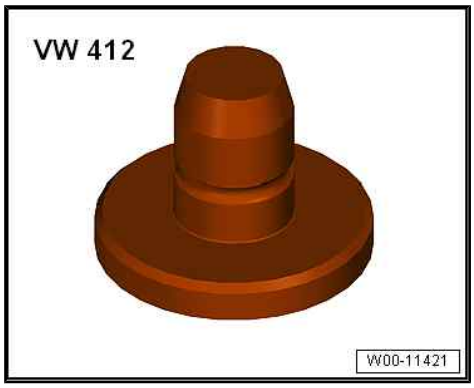
Special tools and workshop equipment required

- Thrust plate - VW 402-

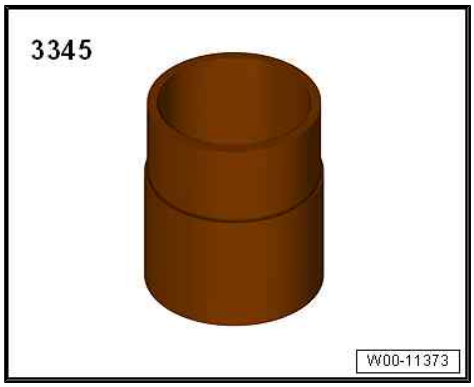


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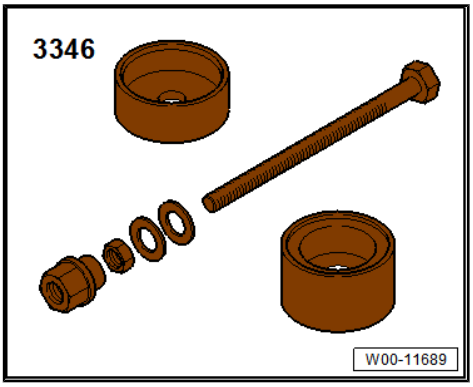
- Press tool - VW 412-



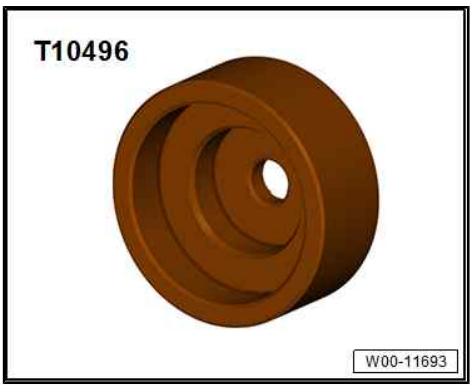
- Wheel bearing tube - 3345-



♦ Assembly tool - 3346-



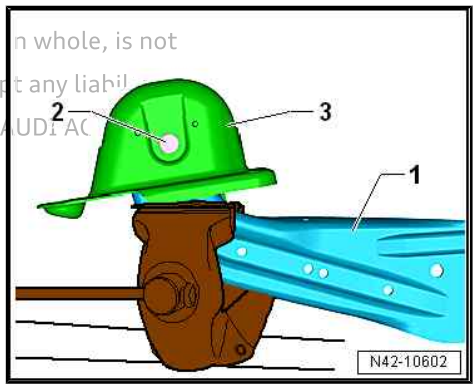
♦ Thrust piece - T10496-



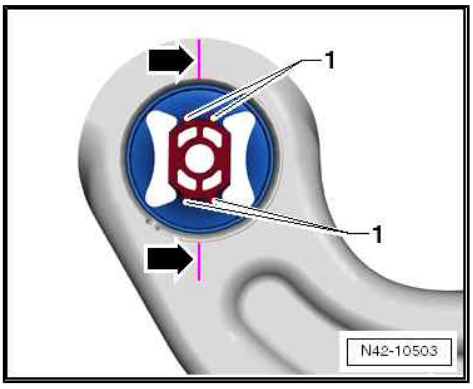
Procedure

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– Remove trailing arm with mounting bracket ⇒ page 273 .
– Clamp trailing arm -1- in vice using protective jaw covers.
– Unscrew bolt -2- and detach mounting bracket -3- from trailing arm.



– Mark installation position of bonded rubber bush on trailing arm.
– To do so, make marks above and below bush of trailing arm -arrows- between raised sections -1-.



Pressing out bonded rubber bush

– Apply tools as shown in illustration.

1 - Press tool - VW 412-

2 - Tube -3346/1- from assembly tool - 3346-

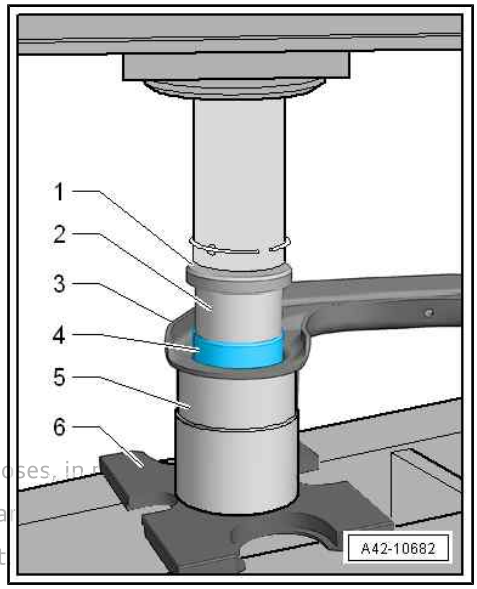
3 - Trailing arm

4 - Bonded rubber bush

5 - Wheel bearing tube - 3345-

6 - Thrust plate - VW 401-

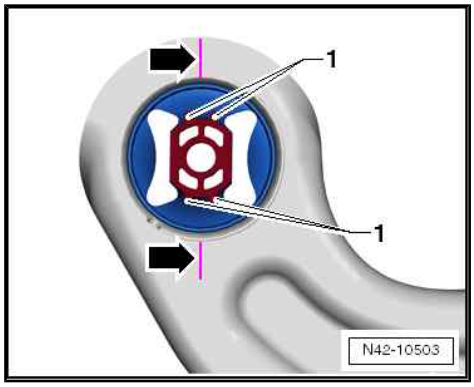
– Press out bonded rubber bush.



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Pressing in bonded rubber bush

• Position bonded rubber bush on trailing arm so that marked vertical line -arrows- lies between raised portions -1-.



Note

It is very important that the bonded rubber bush is installed in the correct position relative to the bush of the trailing arm.

– Apply tools as shown in illustration.

1 - Press tool - VW 412-

2 - Thrust piece - T10496-

3 - Bonded rubber bush

4 - Trailing arm

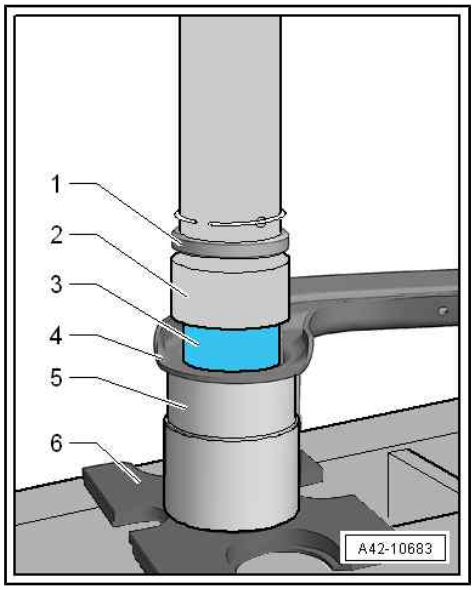
5 - Wheel bearing tube - 3345-

6 - Thrust plate - VW 402-

– Press in bonded rubber bush.

– Assemble trailing arm with mounting bracket ⇒ page 275 .

– Install trailing arm with mounting bracket ⇒ page 273 .



8 Drive shaft

⇒ “8.1 Overview - drive shaft”, page 279

⇒ “8.2 Exploded view - drive shaft”, page 280

⇒ “8.3 Loosening and tightening bolt securing drive shaft”, page 283

⇒ “8.4 Removing and installing drive shaft”, page 284

⇒ “8.5 Dismantling and assembling drive shaft”, page 286

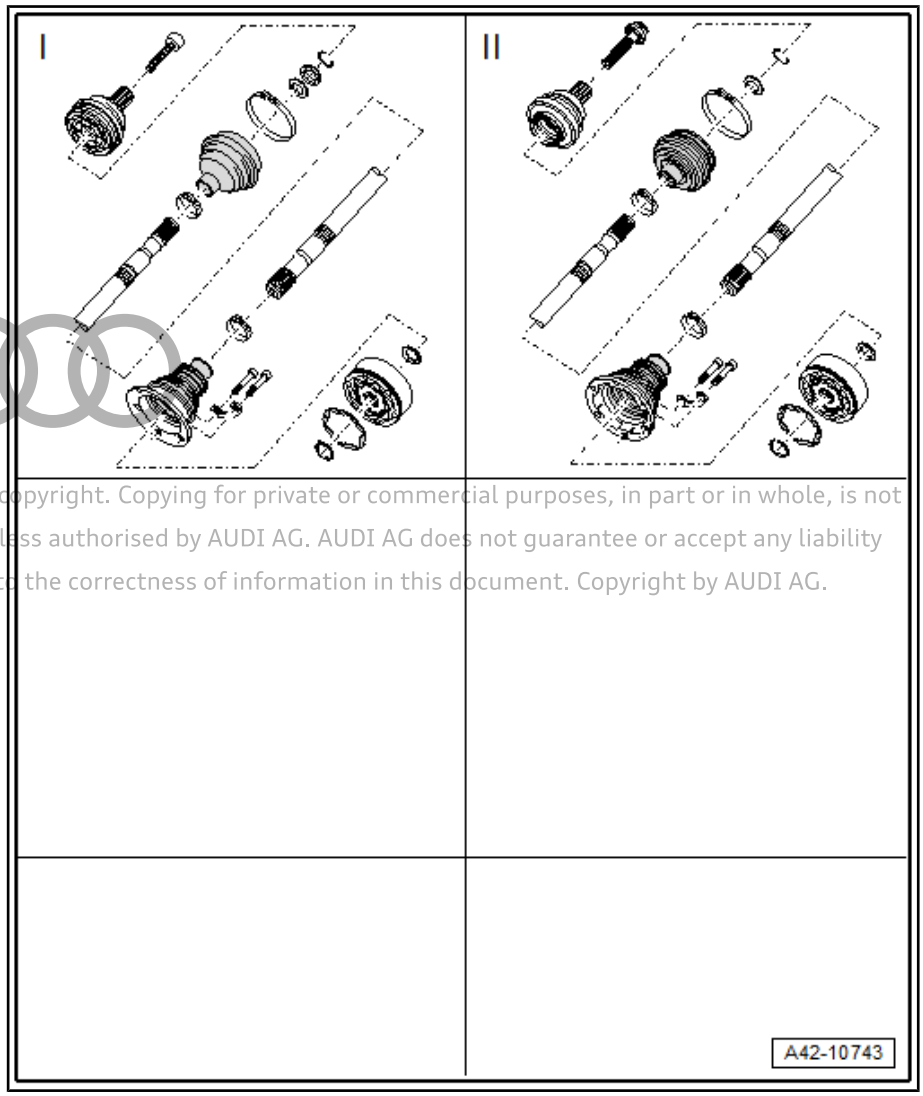
⇒ “8.6 Checking outer constant velocity joint”, page 296

⇒ “8.7 Checking inner constant velocity joint”, page 298

8.1 Overview - drive shaft

I -
⇒ “8.2.1 Exploded view - drive shaft with 90 mm diameter outer constant velocity joint”, page 280

II -
⇒ “8.2.2 Exploded view - drive shaft with 82 mm diameter outer constant velocity joint”, page 282



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8.2 Exploded view - drive shaft

⇒ “8.2.1 Exploded view - drive shaft with 90 mm diameter outer constant velocity joint”, page 280

⇒ “8.2.2 Exploded view - drive shaft with 82 mm diameter outer constant velocity joint”, page 282

8.2.1 Exploded view - drive shaft with 90 mm diameter outer constant velocity joint

Grease filling of joints

Grease	Outer joint ∅	Inner joint ∅
See ⇒ Electronic parts catalogue “ETKA”	**90 mm**	**100 mm**
Total quantity	45 g	110 g
In joint	25 g	50 g
In boot	20 g	60 g

Note

Regrease joint when renewing boot.

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1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Checking ⇒ page 296
- ❑ Removing ⇒ page 288
- ❑ Greasing ⇒ page 280
- ❑ Installing ⇒ page 290
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

2 - Bolt

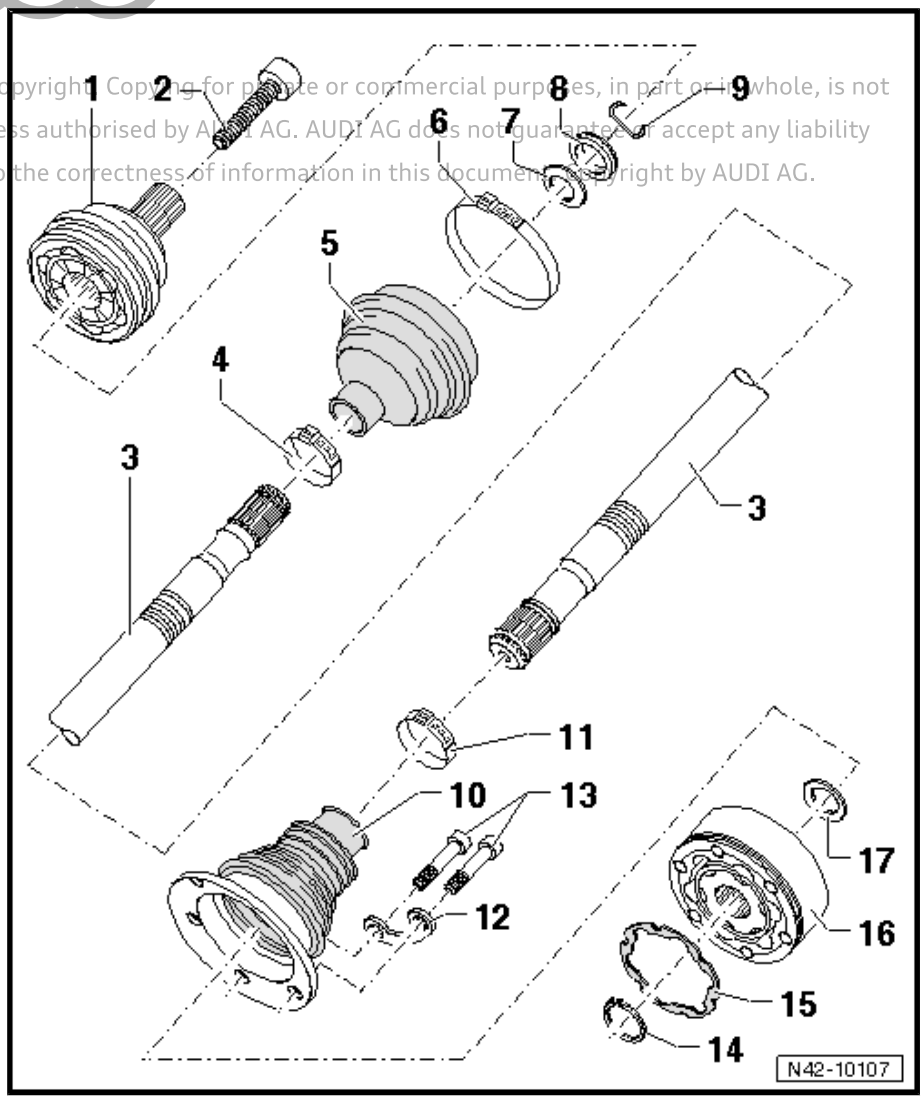
- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 283
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

3 - Drive shaft

- ❑ For correct version refer to ⇒ Electronic parts catalogue “ETKA”

4 - Hose clip

- ❑ Renew
- ❑ Tightening ⇒ page 292



or ⇒ page 292

5 - Boot for outer constant velocity joint

- ❑ Without vent hole
- ❑ Check for splits and chafing

6 - Hose clip

- ❑ Renew
- ❑ Tightening ⇒ page 292 or ⇒ page 292

7 - Dished spring

- ❑ Installation position ⇒ page 289

8 - Spacer ring (plastic)

- ❑ Installation position ⇒ page 289

9 - Circlip

- ❑ Renew
- ❑ Insert in groove on shaft

10 - Boot for inner constant velocity joint

- ❑ Without vent hole
- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Before fitting on constant velocity joint, coat sealing surface with D 454 300 A2

11 - Hose clip

- ❑ Renew
- ❑ Tightening ⇒ page 292 or ⇒ page 292

12 - Lock plate

13 - Multi-point socket head bolt

- ❑ Always renew if removed
- ❑ Initial tightening torque: 10 Nm in diagonal sequence
- ❑ Tightening torque, M8: 20 Nm in diagonal sequence
- ❑ Final setting, M8: turn 180° further in diagonal sequence

14 - Circlip

- ❑ Renew
- ❑ Removing and installing with -VW 161 A- ⇒ page 289

15 - Gasket

- ❑ Adhesive surface on constant velocity joint must be free of oil and grease

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16 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Checking ⇒ page 298
- ❑ Pressing off ⇒ page 289
- ❑ Greasing ⇒ page 280
- ❑ Pressing on ⇒ page 290
- ❑ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

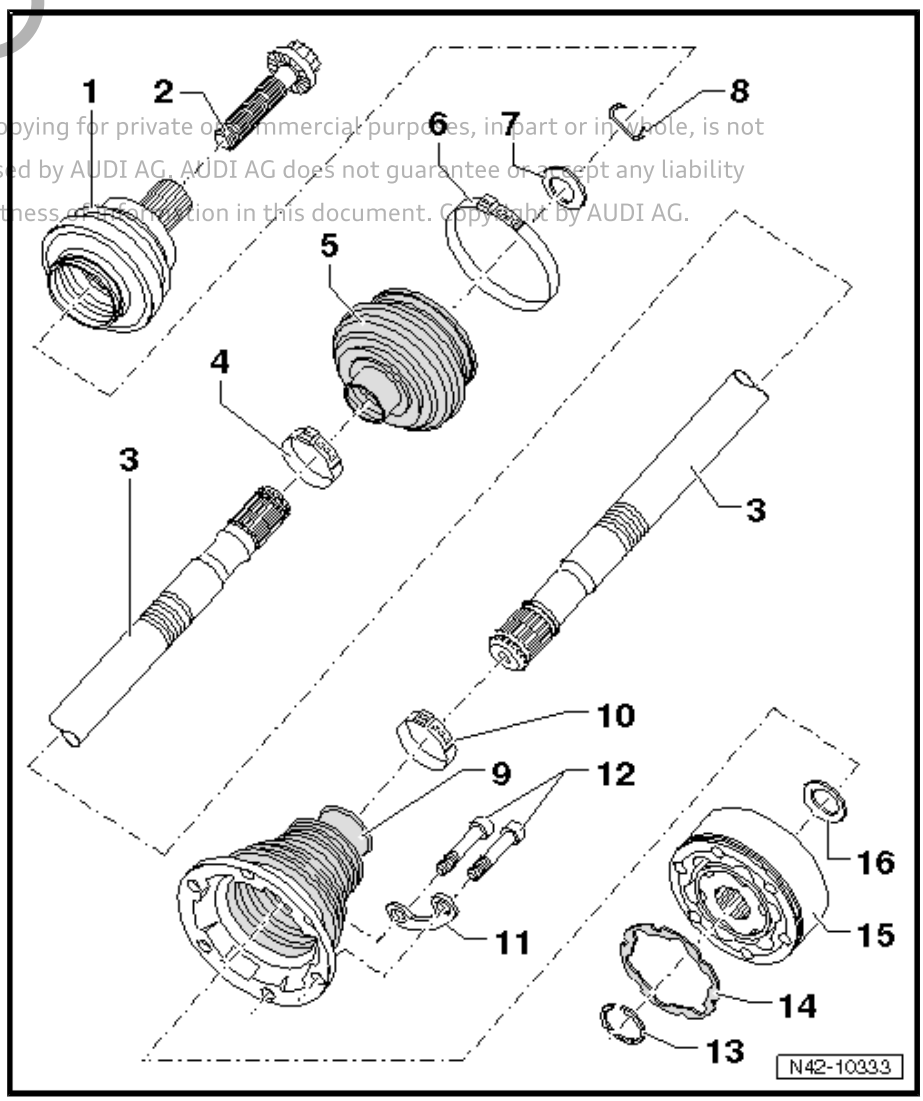
17 - Dished spring

- ❑ Installation position ⇒ page 290

8.2.2 Exploded view - drive shaft with 82 mm diameter outer constant velocity joint

Grease ⇒ Electronic parts catalogue “ETKA”	Outer joint ∅	Inner joint ∅
	82 mm	**100 mm**
Total quantity	45 g	110 g

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1 - Outer constant velocity joint

- ❑ Renew only as complete unit
- ❑ Removing ⇒ page 295
- ❑ Installing: drive onto shaft as far as stop using plastic hammer
- ❑ Distribute grease filling evenly in joint
- ❑ Checking ⇒ page 296

2 - Bolt

- ❑ Always renew if removed
- ❑ Loosening and tightening ⇒ page 283
- ❑ Before securing, clean the threads in the CV joint using a thread tap
- ❑ -WHT.005.437- / black = 200 Nm + turn 180° further
- ❑ -WHT.005.437.A- / silver = 200 Nm + turn 90° further

3 - Drive shaft

- ❑ For correct version refer to ⇒ Electronic parts catalogue “ETKA”

4 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 296

5 - Boot

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

6 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 296

7 - Dished spring

- ❑ With internal splines
- ❑ Installation position ⇒ page 295

8 - Circlip

- ❑ Always renew if removed
- ❑ Insert in groove on shaft

9 - Boot for constant velocity joint

- ❑ Material: Hytrel (polyelastomer)
- ❑ Without vent hole
- ❑ Check for splits and chafing
- ❑ Drive off constant velocity joint with a drift
- ❑ Before fitting on constant velocity joint, coat sealing surface with -D 454 300 A2-

10 - Hose clip

- ❑ Always renew if removed
- ❑ Tightening ⇒ page 296

11 - Lock plate

12 - Multi-point socket head bolt

- ❑ Always renew if removed
- ❑ Initial tightening torque: 10 Nm in diagonal sequence
- ❑ Tightening torque, M8: 20 Nm in diagonal sequence
- ❑ Final setting, M8: turn 180° further in diagonal sequence

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13 - Circlip

- ❑ Always renew if removed
- ❑ Remove and install using circlip pliers - VW 161 A-

14 - Gasket

- ❑ Always renew if removed
- ❑ Adhesive surface on constant velocity joint must be free of oil and grease

15 - Inner constant velocity joint

- ❑ Renew only as complete unit
- ❑ Distribute grease filling evenly in joint
- ❑ Pressing off ⇒ page 295
- ❑ Pressing on ⇒ page 296
- ❑ Checking ⇒ page 298

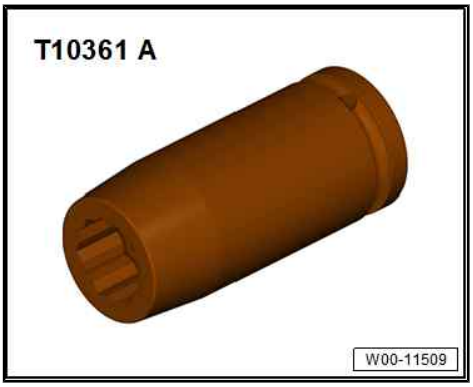
16 - Dished spring

- ❑ With internal splines
- ❑ Installation position ⇒ page 295

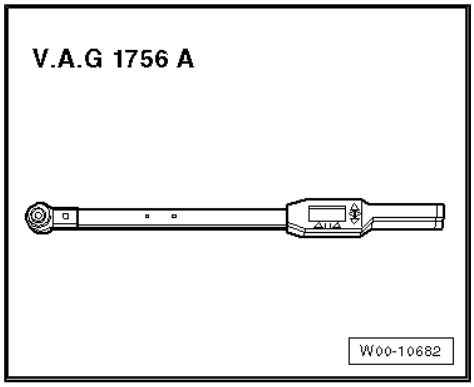
8.3 Loosening and tightening bolt securing drive shaft

Special tools and workshop equipment required

- ♦ Socket, 24 mm - T10361A-



♦ Angle wrench - V.A.G 1756 A-



- 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. Therefore please note the following:

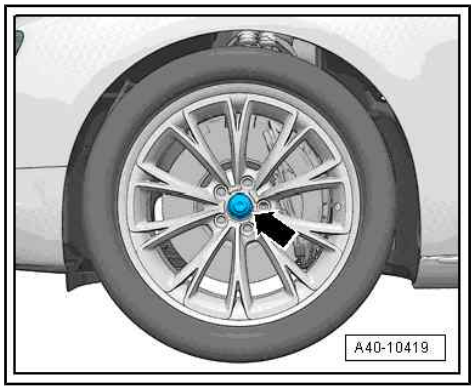
♦ Procedure for loosening 12-point bolt

- Do not attempt to move the vehicle without the drive shafts fitted; this would result in wheel bearing damage. If the vehicle does have to be moved, always note the following points:

– Fit an outer joint in place of the drive shaft.

– Tighten the outer joint to 200 Nm.

Loosening 12-point bolt



– To avoid damage to wheel bearing, slacken off 12-point bolt no further than 90° with vehicle still standing on its wheels, using socket AF 24 mm - T10361A- .

– Raise vehicle so that wheels are off the ground.

– Have a second mechanic press the brake pedal.

– Remove 12-point bolt -arrow-.

Installing 12-point bolt

– Clean the threads in the CV joint using a thread tap.

– Renew 12-point bolt.

Note

The wheels must not be in contact with the ground when initially tightening the drive shaft bolt; otherwise the wheel bearing can be damaged.

– Have a second mechanic press the brake pedal.

– Tighten 12-point bolt to 200 Nm.

– Lower vehicle onto its wheels.

– Turn 12-point bolt -WHT.005.437- / black 180° further.

– Turn 12-point bolt -WHT.005.437.A- / silver 90° further.

8.4 Removing and installing drive shaft

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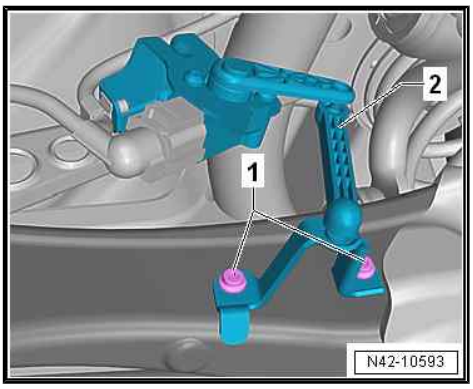
Removing

– Before starting work, measure distance from centre of wheel to lower edge of wheel housing ⇒ page 10 .

– Loosen bolt securing drive shaft ⇒ page 283 .
– Remove wheel ⇒ page 309 .
– Remove coil spring ⇒ page 240 .
– Remove anti-roll bar ⇒ page 219 .

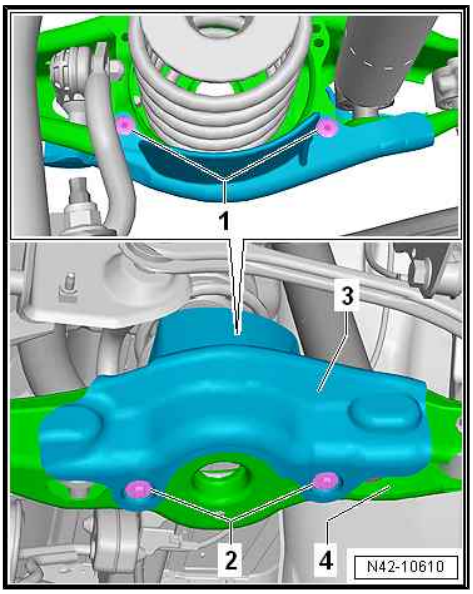
Vehicles with vehicle level senders

– Remove bolts -1- on linkage -2- for rear vehicle level sender on both sides of vehicle.



Vehicles with stone deflector

– Remove spreader rivets -1-.
– Unscrew bolts -2- and detach stone deflector -3-.

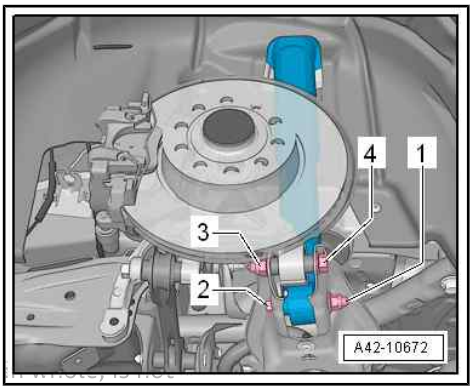


All vehicles (continued)

– Unscrew nut -3- and remove bolt -4-.

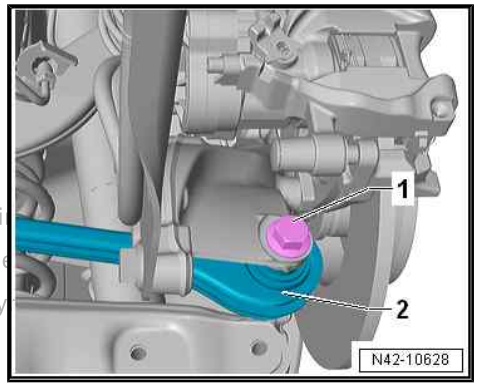
Note

Disregard items -1 and 2-.



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– Unscrew bolt -1- for track rod -2- and remove.
– Detach drive shaft at final drive.
– Pivot wheel bearing housing outwards and detach drive shaft from final drive flange.
– Pull wheel hub off outer joint on drive shaft.



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Installing

Install in reverse sequence, paying attention to the following:

- The bolted connections on the wheel bearing housing may only be tightened when the original distance between the wheel hub centre and the lower edge of the wheel housing (as measured before assembly) has been obtained ⇒ page 10 .
- 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 “ETKA” .
- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- On vehicles with vehicle level sender, carry out basic adjustment of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

- ⇒ “5.1 Exploded view - transverse links”, page 224
- ⇒ “5.2 Exploded view - track rod”, page 226
- ⇒ “6.1.2 Exploded view - shock absorber, spring (multi-link suspension)”, page 233
- ⇒ “2.4.2 Removing and installing rear vehicle level senders G76 / G77 - vehicles with multi-link suspension”, page 307
- ⇒ “8.3 Loosening and tightening bolt securing drive shaft”, page 283
- Drive shaft flange joint at rear final drive ⇒ “8.5.1 Servicing drive shaft with 90 mm dia. outer constant velocity joint”, page 286
- Drive shaft flange joint at rear final drive ⇒ “8.5.2 Servicing drive shaft with 82 mm dia. outer constant velocity joint”, page 292
- ⇒ “1 Wheels, tyres”, page 309

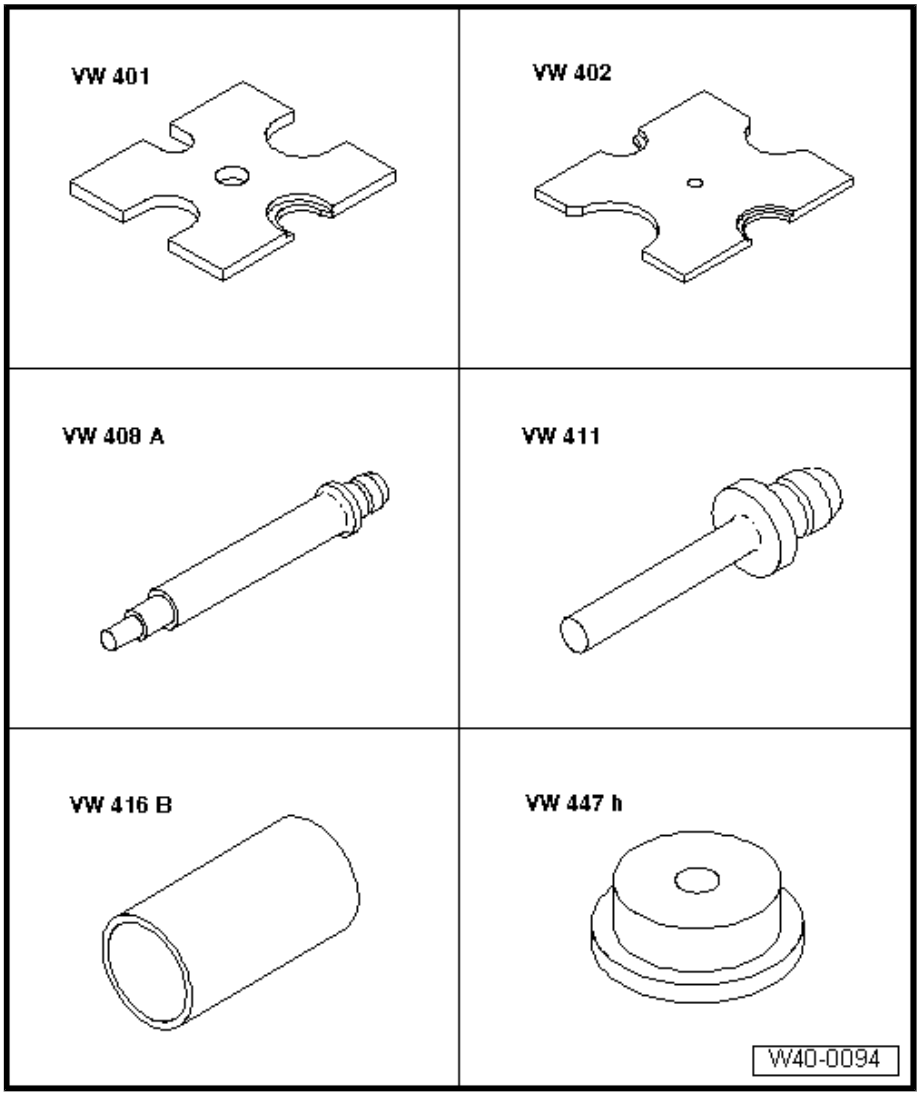
8.5 Dismantling and assembling drive shaft

⇒ “8.5.1 Servicing drive shaft with 90 mm dia. outer constant velocity joint”, page 286

⇒ “8.5.2 Servicing drive shaft with 82 mm dia. outer constant velocity joint”, page 292

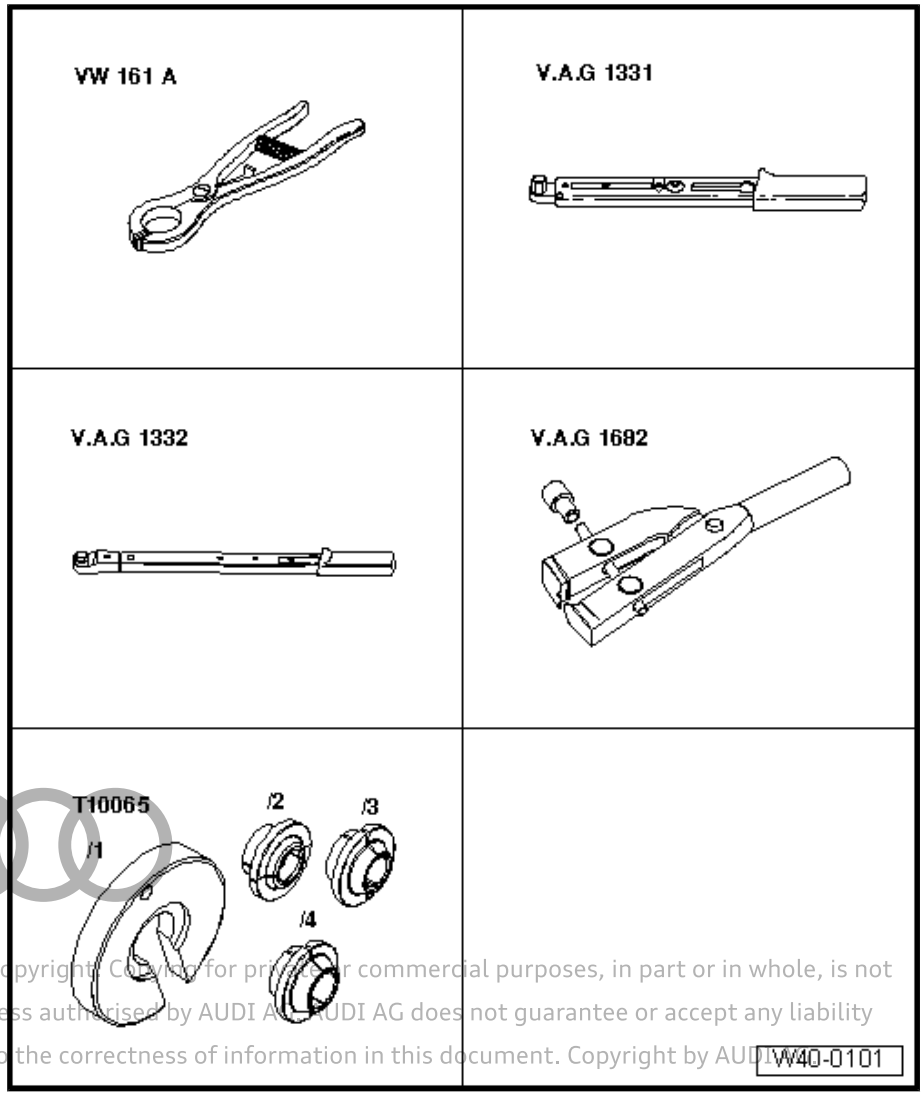
8.5.1 Servicing drive shaft with 90 mm dia. outer constant velocity joint

Special tools and workshop equipment required



- Thrust plate - VW 401-
- Thrust plate - VW 402-
- Press tool - VW 408 A-
- Press tool - VW 411-
- Tube - VW 416 B-
- Thrust plate - VW 447 H-

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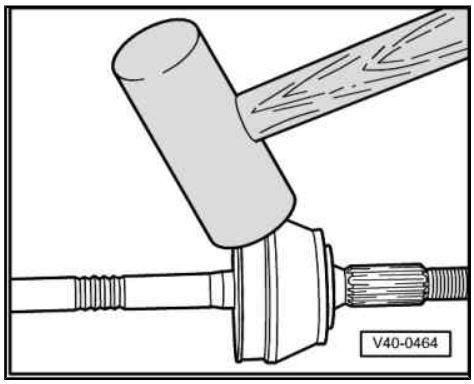
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- Circlip pliers - VW 161 A-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Clamp tensioner - V.A.G 1682 A-
- Assembly tool - T10065-

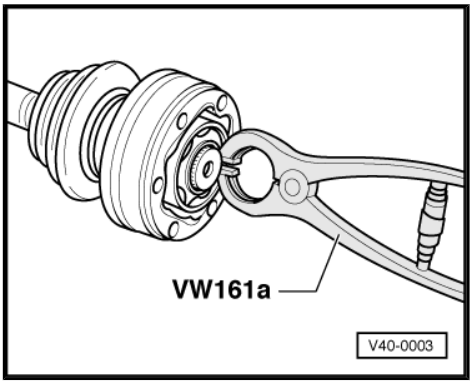
Dismantling constant velocity joint

Removing outer constant velocity joint

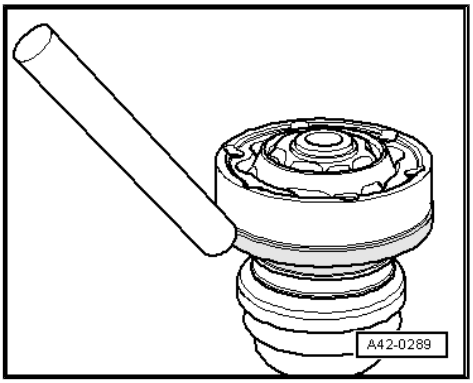
– Drive joint off drive shaft with a firm blow from an aluminium hammer.



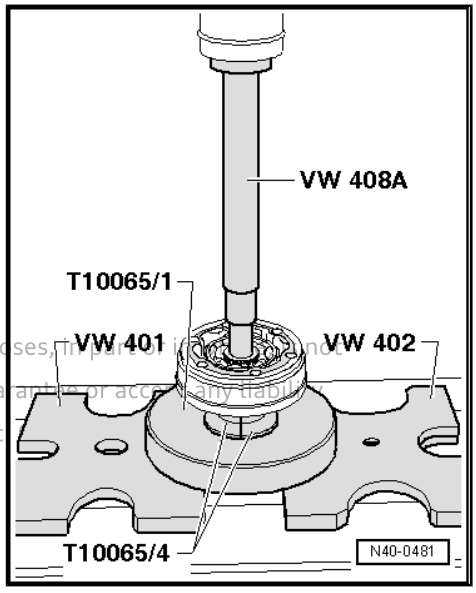
Removing and installing circlip



Knocking off cap (attached to boot) using a brass or copper drift



Pressing off inner constant velocity joint



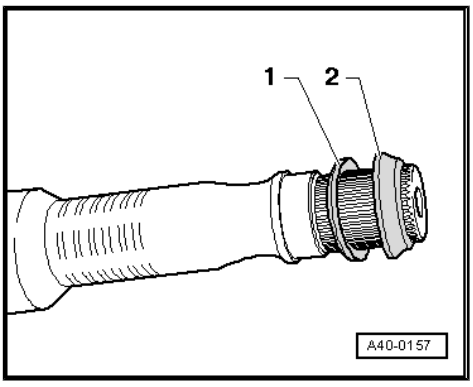
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Assembling constant velocity joint

Installation position of dished spring and thrust washer at outer joint

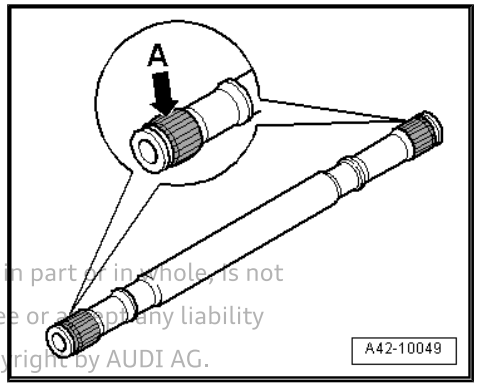
1 - Dished spring

2 - Spacer ring (plastic)



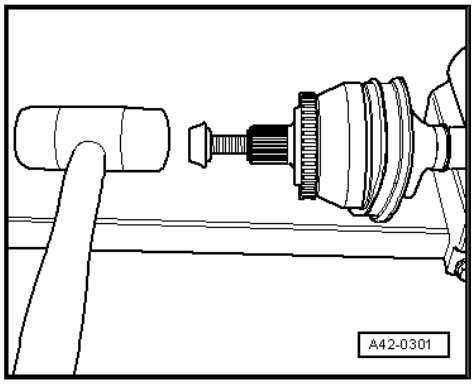
Installing outer constant velocity joint with bolt

– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.

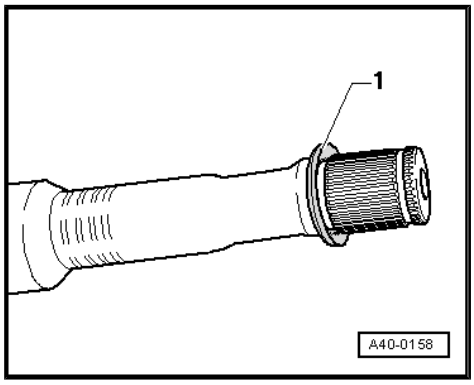


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– Screw old bolt into CV joint as shown.
– Use plastic-headed hammer to drive joint onto shaft until circlip engages.

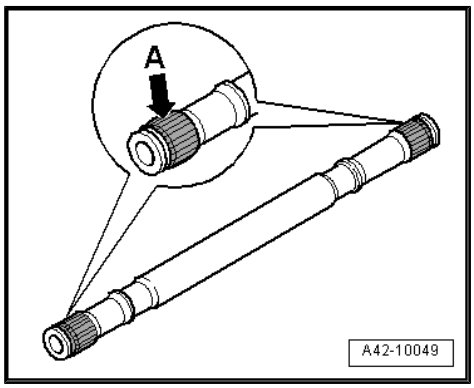


Installation position of dished spring at inner joint

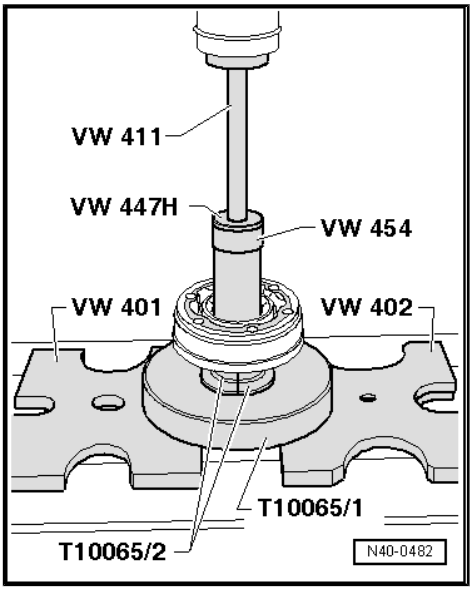


Pressing on inner constant velocity joint

– Grease splines -arrow A- on drive shaft lightly with grease used in joint before fitting joint body onto drive shaft.



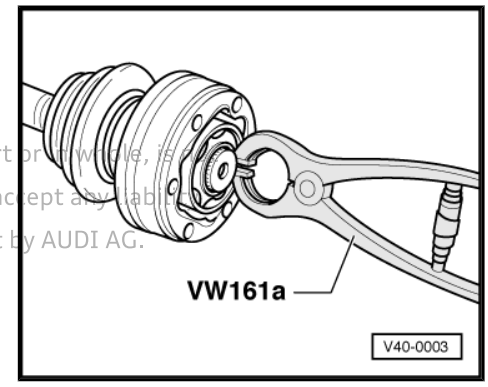
– Apply special tools as shown in illustration.



Note

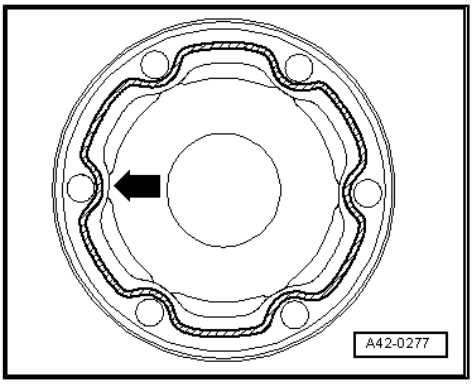
Chamfer on internal diameter of ball hub (splines) must face contact collar of drive shaft.

– Fit circlip.

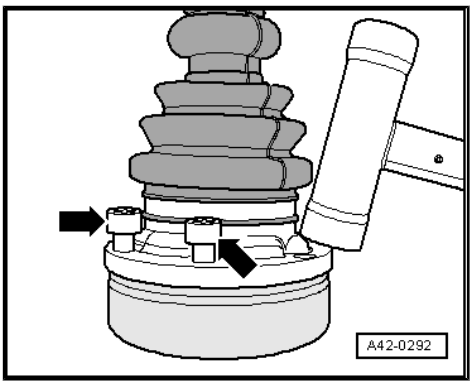


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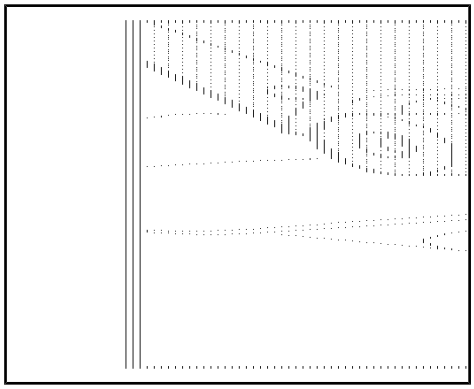
– Apply sealant -hatched area- on clean inner surface of cap on CV joint boot. Sealant bead: continuous, 2...3 mm ∅. Route around inside of holes -arrow-.
– Use sealant as listed in ⇒ Electronic parts catalogue “ETKA” .
– Push joint boot onto drive shaft.
• Drive shaft, boot and contact surface of cap must be free from grease!
• Take care not to damage sealant bead.



– Using bolts -arrows-, align CV joint boot with cap in relation to bolt holes.
• The alignment must be very accurate, because no further alignment is possible once the part has been hammered on.
– Drive on CV joint boot with cap using a plastic hammer.
– Remove surplus sealant immediately as it is pressed out.



Tightening stainless-steel hose clips for Hytrel boots



– Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
– Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).

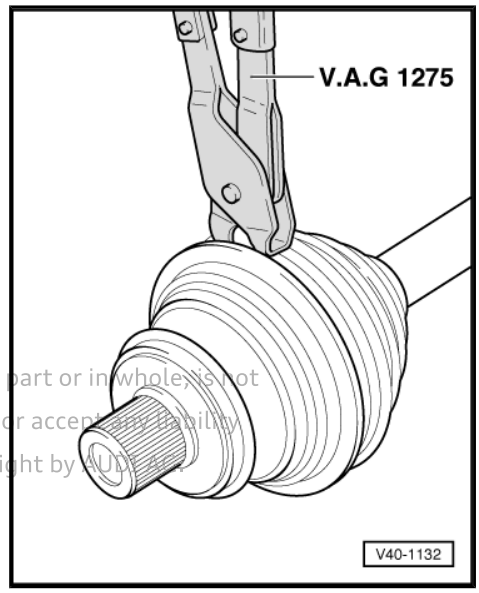
♦ Tightening torque: 20 Nm

Note

♦ *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*

♦ *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.*

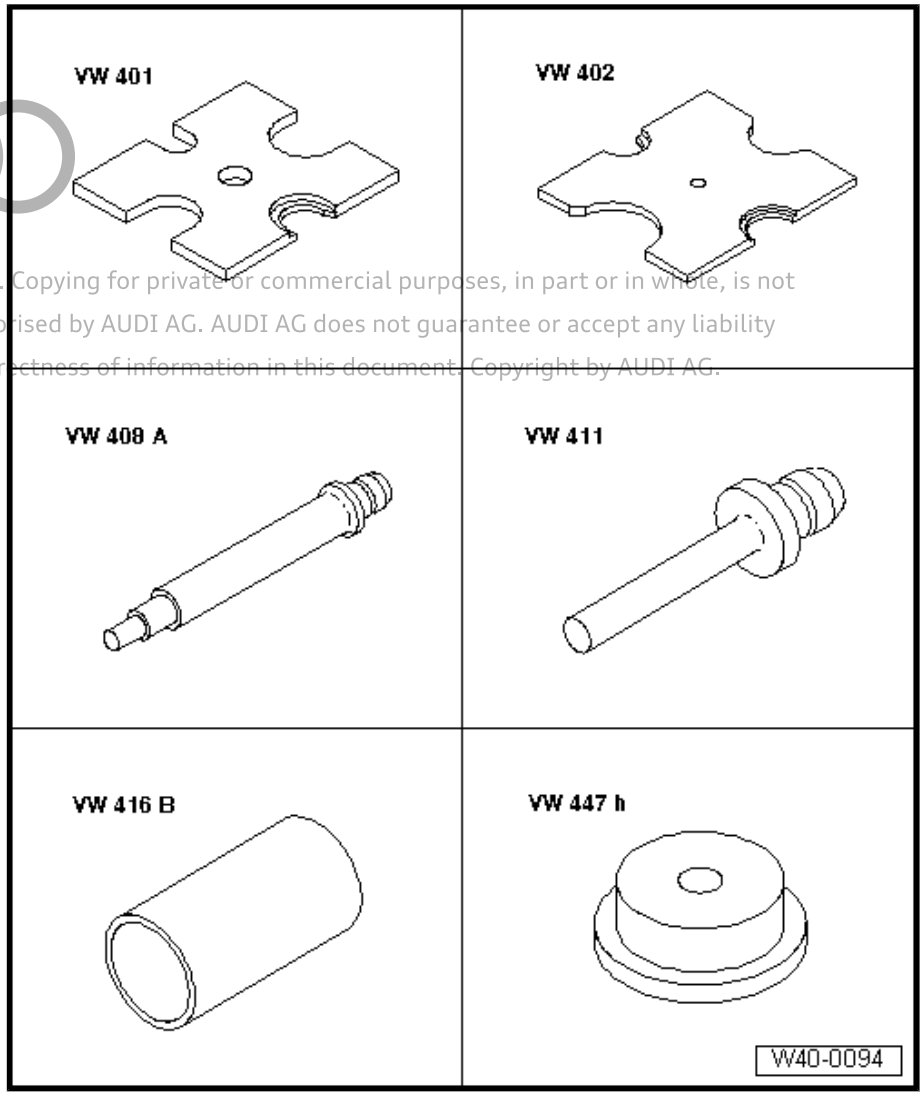
Tightening hose clip for rubber boot



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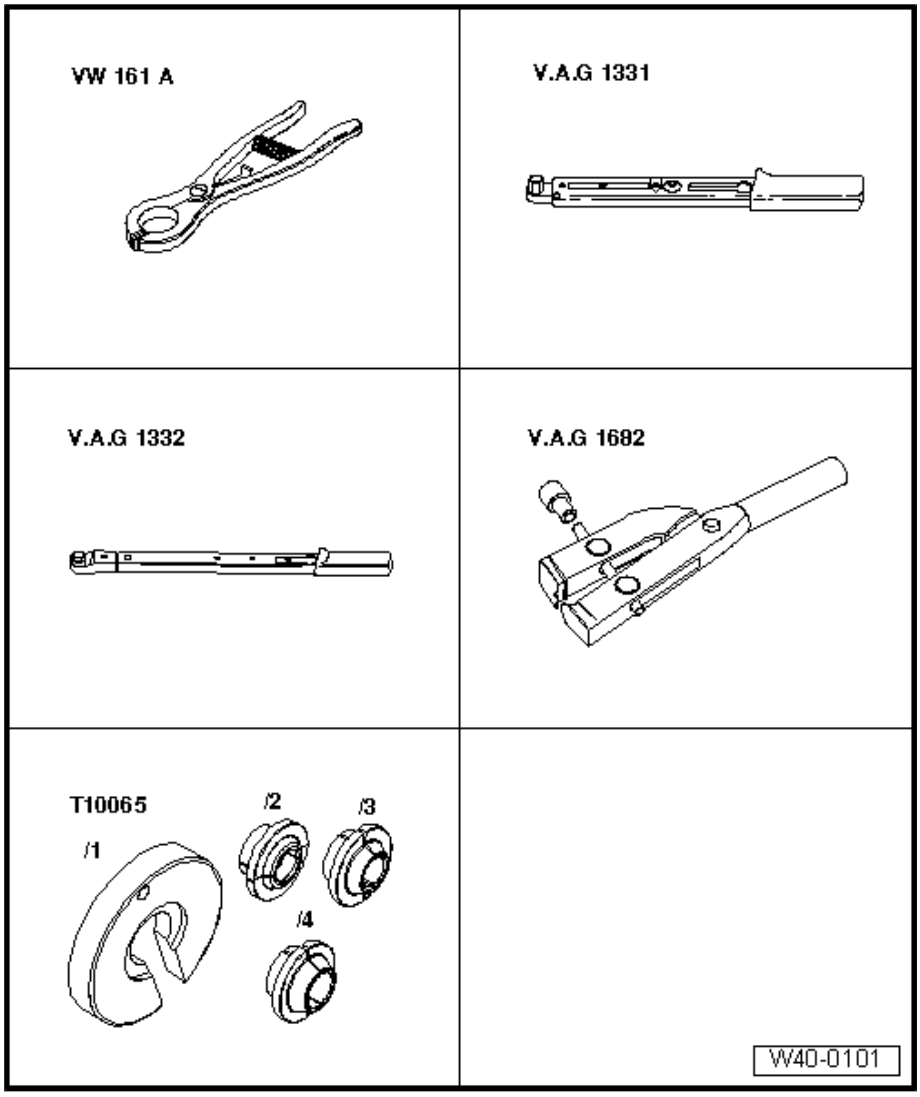
8.5.2 Servicing drive shaft with 82 mm dia. outer constant velocity joint

Special tools and workshop equipment required



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- Thrust plate - VW 401-
- Thrust plate - VW 402-
- Press tool - VW 408 A-
- Press tool - VW 411-
- Tube - VW 416 B-
- Thrust plate - VW 447 H-



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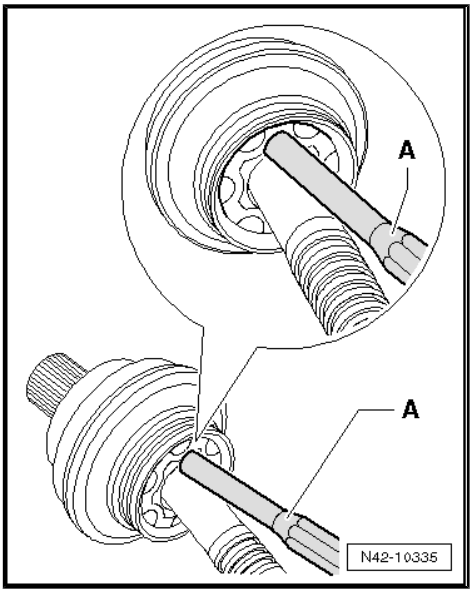
- Circlip pliers - VW 161 A-
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Clamp tensioner - V.A.G 1682 A-
- Assembly tool - T10065-

Dismantling constant velocity joint

Driving off outer constant velocity joint

– Clamp drive shaft in vice using protective jaw covers.
– Fold back rubber 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.

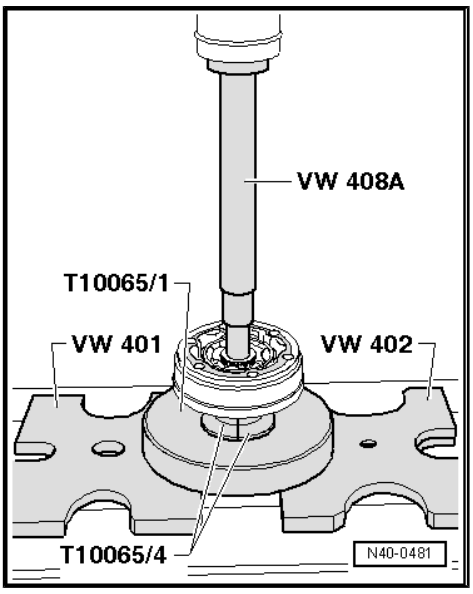


Installing joint

– Knock joint onto shaft with plastic hammer until circlip engages.

Pressing off inner constant velocity joint

– Use a drift to press boot off joint.
– Remove circlip.
– Detach both hose clips and slide boot towards outer joint.

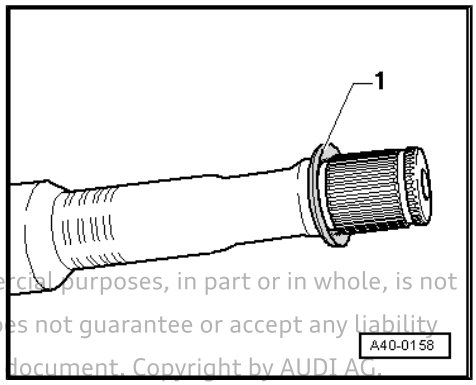


Assembling

Installation position of dished spring at inner and outer joint

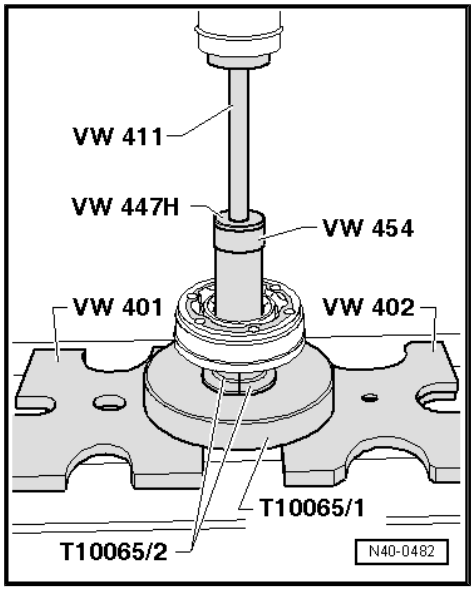
1 - Dished spring

– Press on joint as far as stop.
– Engage circlip.



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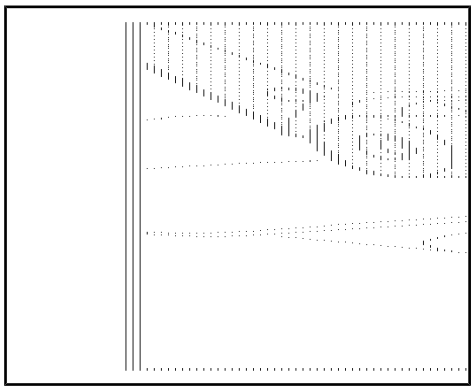
Pressing on inner constant velocity joint



Note

Chamfer on internal diameter of ball hub (splines) must face contact collar of drive shaft.

Tightening hose clip on outer joint



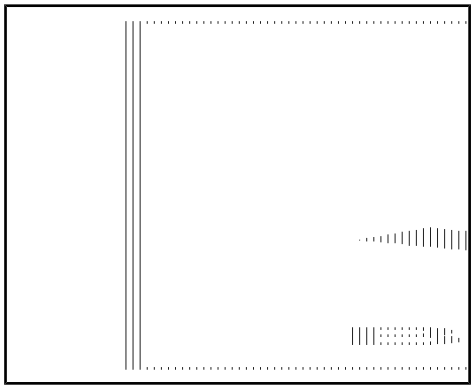
- Apply clamp tensioner - V.A.G 1682 A- as illustrated. Ensure jaws of tool make contact with lugs -arrows B- on hose clip.
- Tighten hose clip by turning spindle -A- with torque wrench (take care to keep clamp tensioner straight).
- Tightening torque: 25 Nm.

Note

- *Due to the hard material of the CV joint boot (as opposed to rubber), a stainless steel hose clip is required; this can only be tightened using clamp tensioner - V.A.G 1682 A- .*
- *Make sure thread of spindle -A- on clamp tensioner moves freely. Lubricate with MoS_2 grease if necessary.*
- *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.*

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Tightening hose clip at small diameter of boot



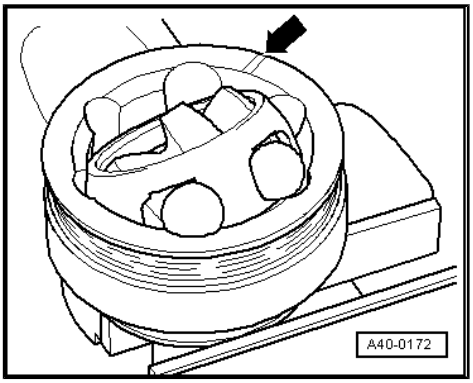
8.6 Checking outer constant velocity joint

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

Removing

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

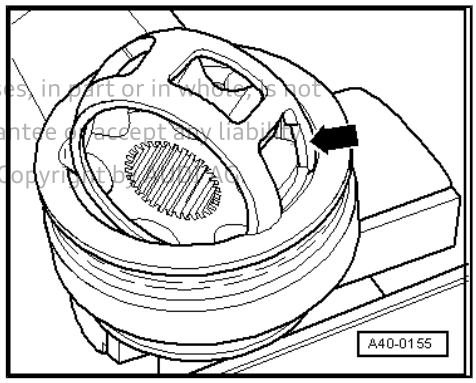
– Swivel ball hub and ball cage and take out balls one after the other.



– Turn cage until two cage openings -arrow- are level with joint body.

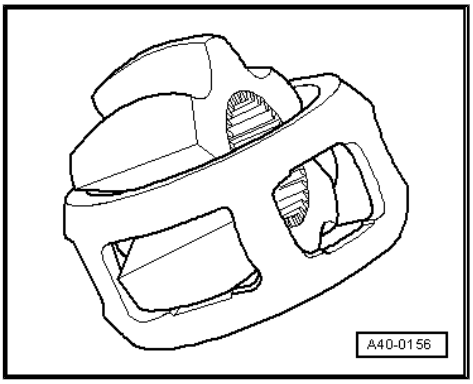
– Lift out cage together with hub.

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– Swivel one segment of the hub into one of the cage openings.

– Pivot hub out of cage.



Note

- *The 6 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.*

Installing

Install in reverse sequence, paying attention to the following:

– Pack required amount of grease into joint body (check table) ⇒ page 280 .

– 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.

– Fit new circlip in shaft.

– Distribute remaining grease in boot.

8.7 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.

Note

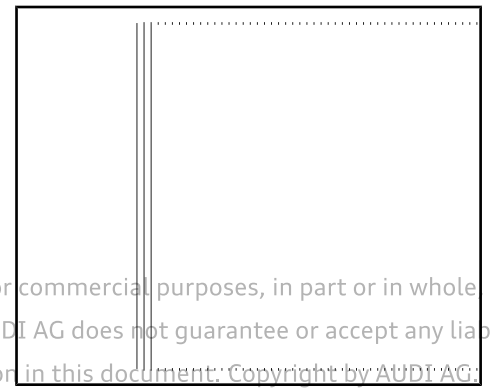
Ball hub and joint body are paired. Mark position in relation to each other with a waterproof felt-tip pen prior to removal.

Removing

– Swivel ball hub and ball cage.

– Push out joint body in direction of -arrow-.

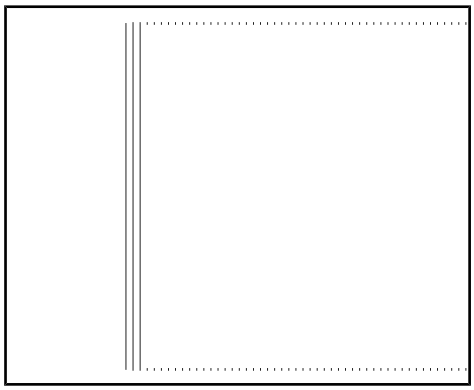
– Push balls out of cage.



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– 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

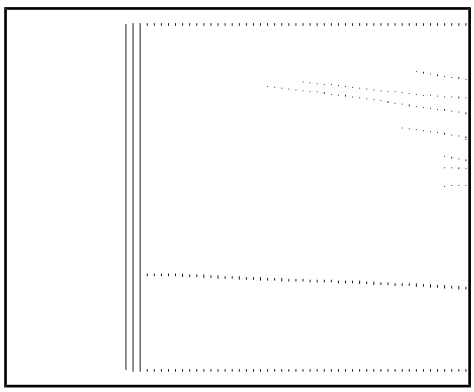
Excessive backlash in the joint will cause knocking or jolts under load change. In such cases the joint must be renewed. Polished areas and visible tracks in the ball races are not a reason for renewing the joint.

Installing

Install in reverse sequence, paying attention to the following:

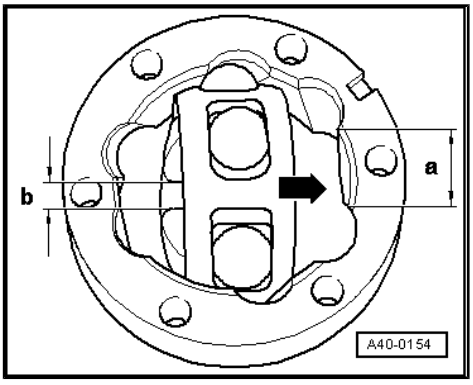
– Insert hub into cage via the two chamfers. No specific installation position is required. Push balls into cage.

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

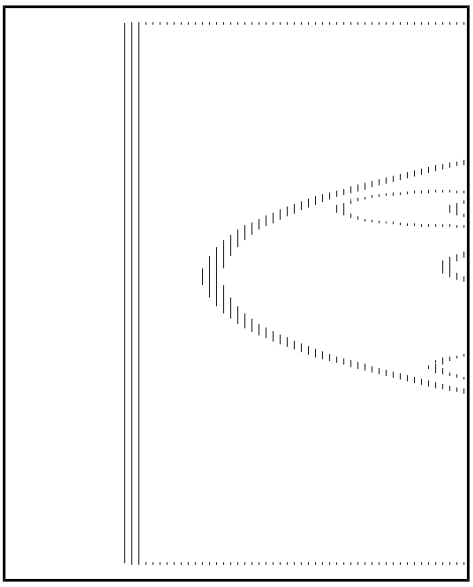


Note

- *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 large diameter of joint body.*
- *When reinstalling, you should also use felt-tip pen mark made on removal as a guide.*



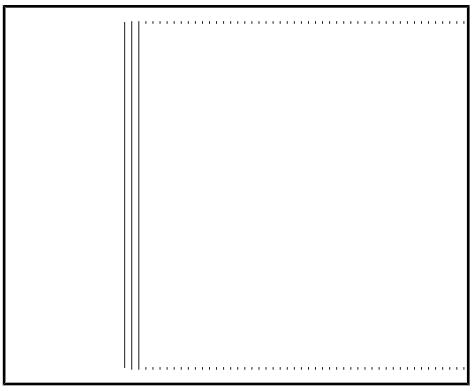
– Swivel the hub into the joint body; at the same time the hub must be swivelled out of the cage -arrows- far enough to allow the balls to fit into the ball races.



– 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.



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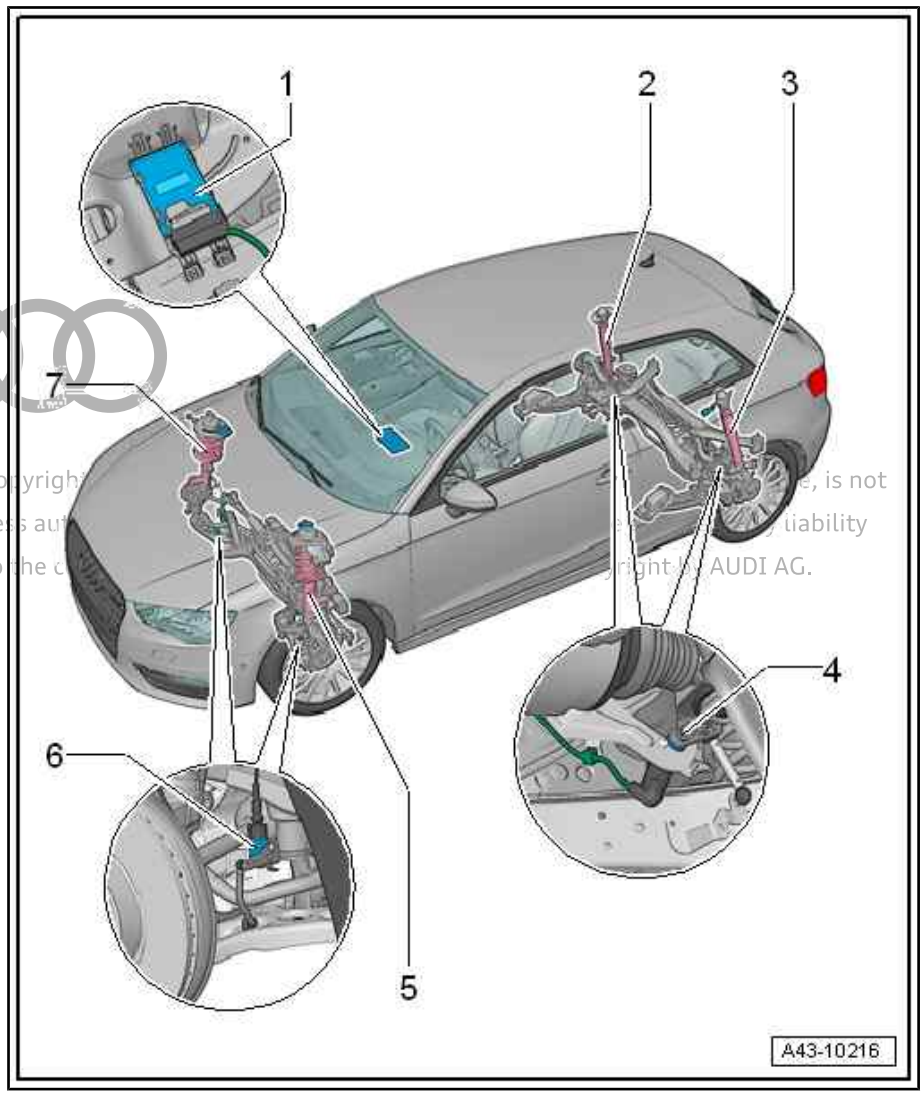
43 – Self-levelling suspension

1 Electronic damping control

⇒ “1.1 Exploded view - electronic damping control”, page 300

⇒ “1.2 Removing and installing electronically controlled damping control unit J250 ”, page 301

1.1 Exploded view - electronic damping control



1 - Electronically controlled damping control unit - J250-

- ❑ Removing and installing ⇒ page 301
- ❑ Fitting location: electronically controlled damping control unit - J250- is located under front right seat
- ❑ Function “Replace control unit” must be performed with ⇒ Vehicle diagnostic tester if electronically controlled damping control unit - J250- is renewed.
- ❑ If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .

2 - Shock absorber with rear right shock absorber damper adjustment valve - N339-

- ❑ Removing and installing shock absorber ⇒ page 233
- ❑ Servicing shock absorber ⇒ page 236

3 - Shock absorber with rear left shock absorber damper adjustment valve - N338-

- ❑ Removing and installing shock absorber ⇒ page 233
- ❑ Servicing shock absorber ⇒ page 236

4 - Rear left/right vehicle level senders - G76/G77-

- ❑ Removing and installing ⇒ page 306

5 - Shock absorber with front left shock absorber damper adjustment valve - N336-

- ❑ Removing and installing suspension strut ⇒ page 68
- ❑ Servicing suspension strut ⇒ page 72

6 - Front left vehicle level sender - G78-

- ❑ Removing and installing ⇒ page 305

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7 - Shock absorber with front right shock absorber damper adjustment valve - N337-

- ❑ Removing and installing suspension strut ⇒ page 68
- ❑ Servicing suspension strut ⇒ page 72

1.2 Removing and installing electronically controlled damping control unit - J250-

Special tools and workshop equipment required

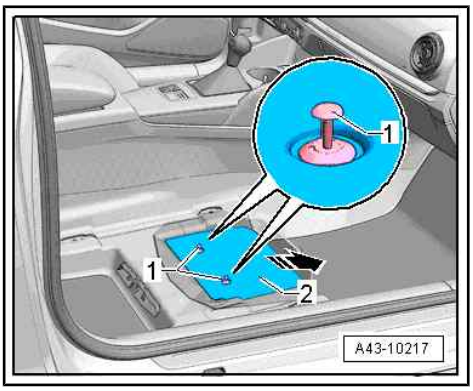
- ♦ Vehicle diagnostic tester

Removing

The electronically controlled damping control unit - J250- is located under the front right seat.

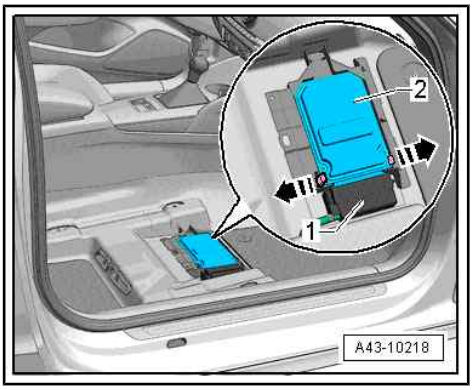
– Move front seat (right-side) as far back and as high as it will go.

– Pull out spreader rivets -1- and remove cover -2- from bracket in direction of -arrow-.



– Unclip electronically controlled damping control unit - J250- -2- from bracket -arrows- and remove control unit.

– Unplug electrical connector -1-.



Installing

Install in reverse sequence, paying attention to the following:

– Function “Replace control unit” must be performed with ⇒ Vehicle diagnostic tester if electronically controlled damping control unit - J250- has been renewed.

– If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .

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2 Vehicle level senders

⇒ “2.1 Exploded view - front vehicle level senders”, page 302

⇒ “2.2 Exploded view - rear vehicle level senders”, page 304

⇒ “2.3 Removing and installing front vehicle level senders G78 / G289 ”, page 305

⇒ “2.4 Removing and installing rear vehicle level senders G76 / G77 ”, page 306

2.1 Exploded view - front vehicle level senders

Note

The front left/right vehicle level sender - G78/G289- is only available as a replacement part complete with coupling rod and upper and lower retaining plates.

1 - Subframe

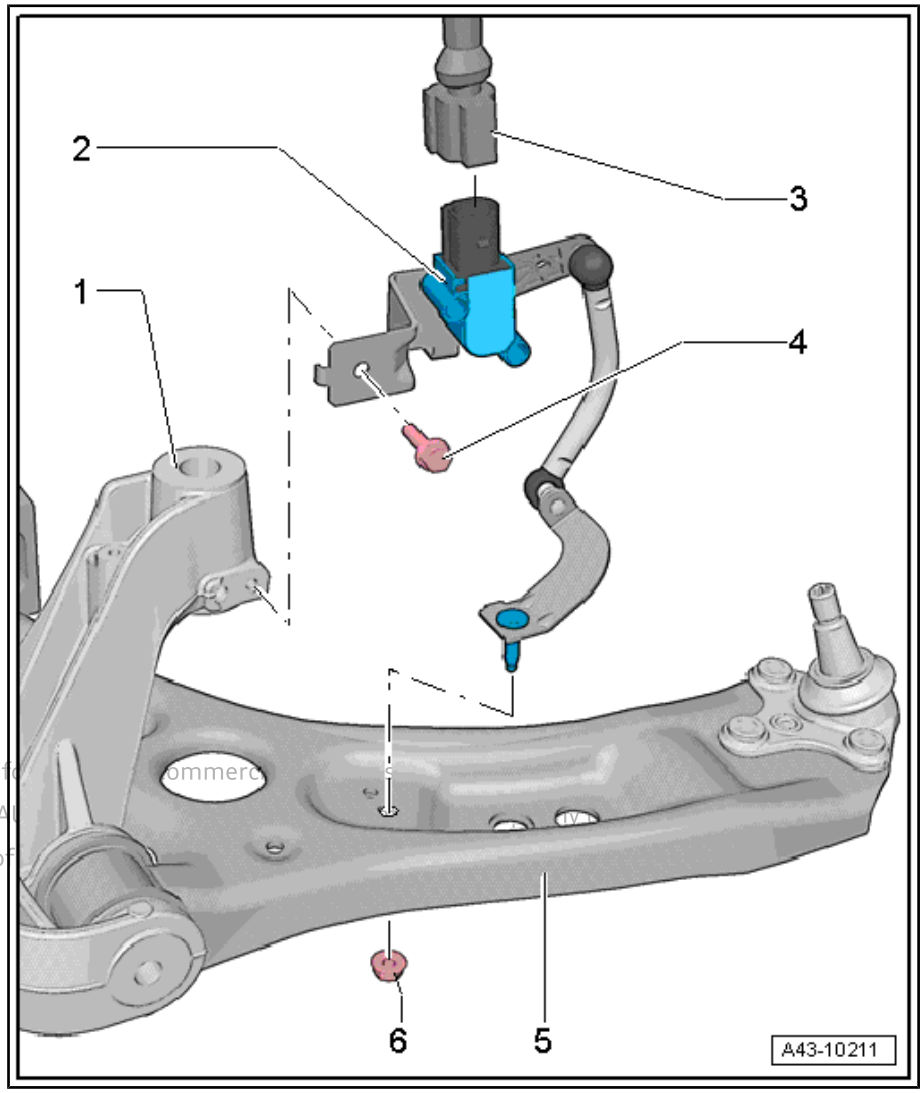
2 - Front left vehicle level sender - G78- and front right vehicle level sender - G289-

- ❑ Complete with mounting parts
- ❑ Lever must face outwards
- ❑ Removing and installing ⇒ page 305
- ❑ On vehicles with electronic damping control (Audi magnetic ride), perform function “Readapt reference position” using ⇒ Vehicle diagnostic tester if you have removed and installed front left vehicle level sender - G78- or front right vehicle level sender - G289- .
- ❑ If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- ❑ Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights

3 - Electrical connector

4 - Bolt

- ❑ 8 Nm



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5 - Wishbone

6 - Nut

- ❑ Always renew if removed
- ❑ 8 Nm

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2.2 Exploded view - rear vehicle level senders

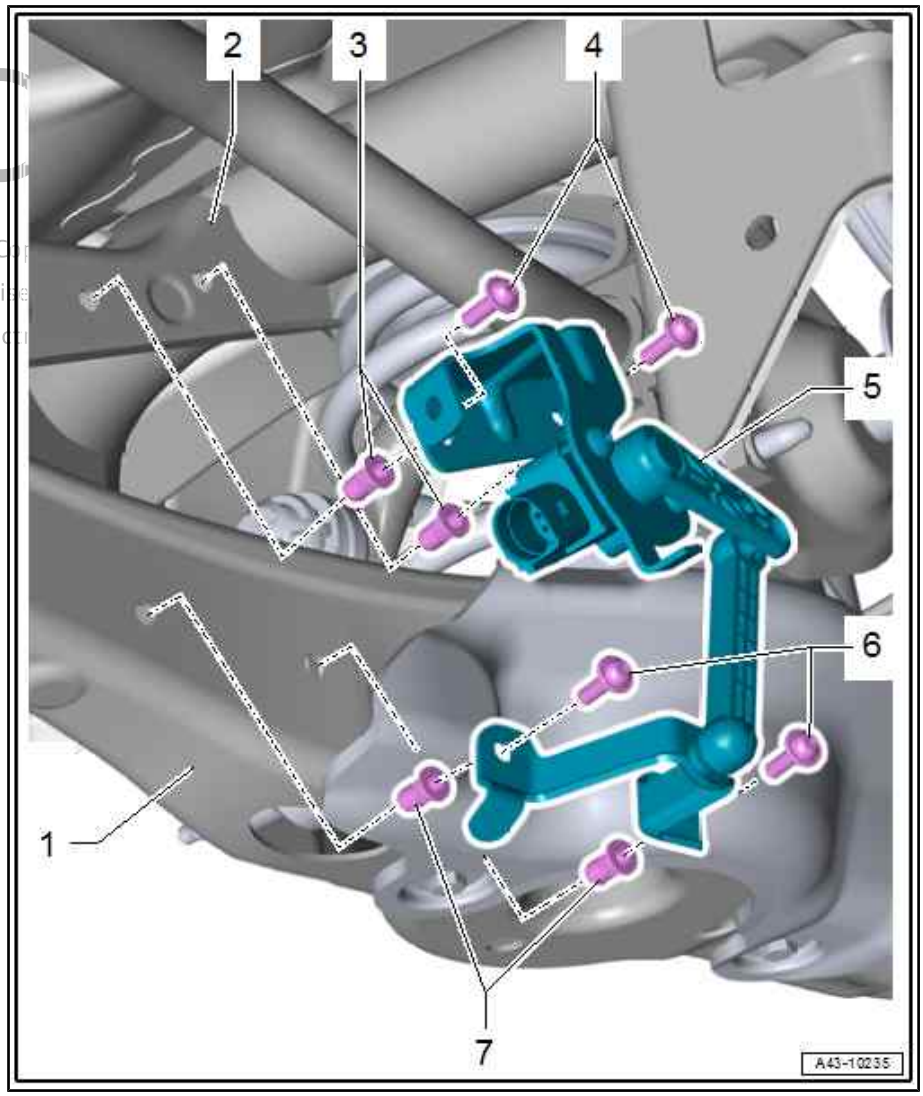
⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304

⇒ “2.2.2 Exploded view - rear left vehicle level sender G76 , vehicles with torsion beam axle”, page 305

2.2.1 Exploded view - rear left vehicle level sender - G76- / rear right vehicle level sender -G77- , vehicles with multi-link suspension

Note

The vehicle level sender is only available as a replacement part complete with coupling rod and upper and lower retaining plates.



1 - Lower suspension link

2 - Subframe

3 - Pop rivet nuts

4 - Bolts

- ❑ 5 Nm

5 - Rear vehicle level sender

- ❑ Complete with mounting parts
- ❑ Lever must face outwards
- ❑ Removing and installing ⇒ page 306
- ❑ On vehicles with electronic damping control (Audi magnetic ride), perform function “Readapt reference position” using ⇒ Vehicle diagnostic tester if you have removed and installed rear left vehicle level sender - G76- or rear right vehicle level sender - G77- .
- ❑ If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- ❑ Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights

6 - Bolts

- ❑ 5 Nm

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7 - Pop rivet nuts

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2.2.2 Exploded view - rear left vehicle level sender - G76- , vehicles with torsion beam axle

1 - Electrical connector

2 - Bolt

- ❑ 5 Nm

3 - Rear left vehicle level sender - G76-

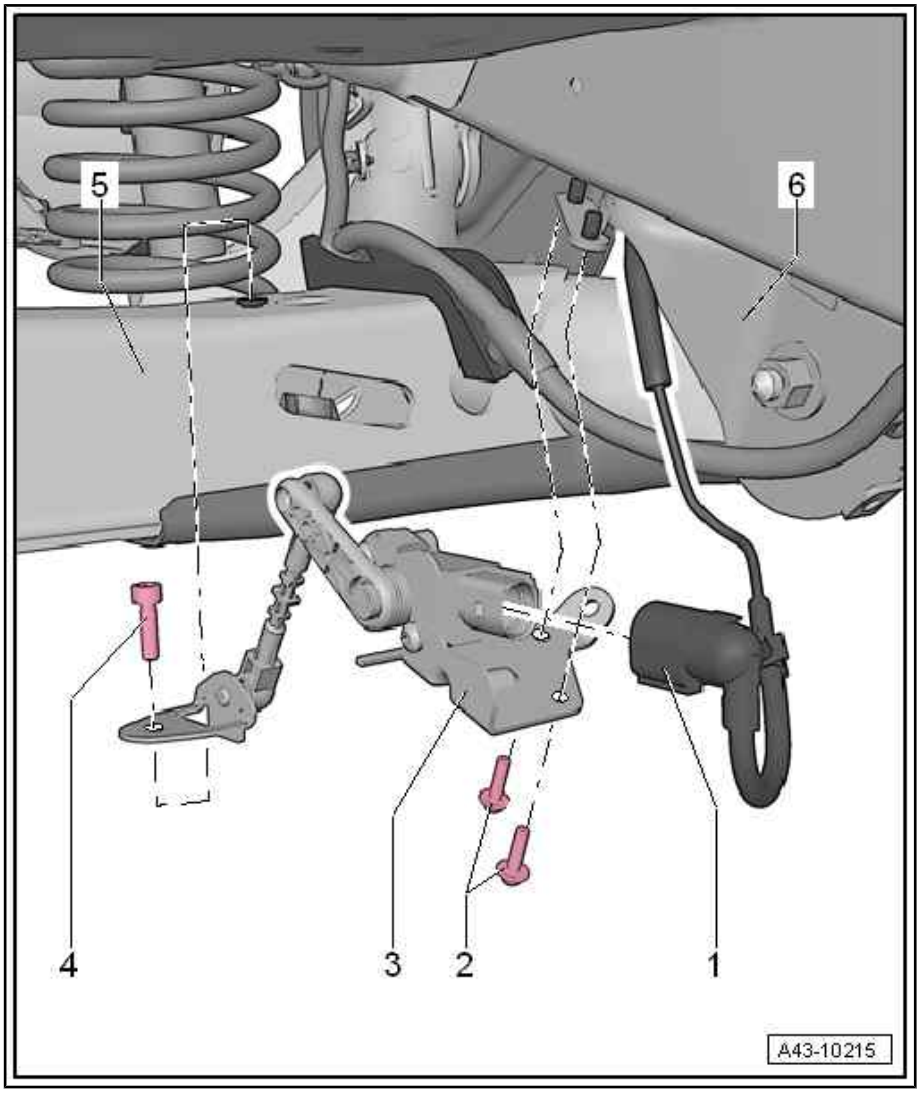
- ❑ Removing and installing ⇒ page 306
- ❑ Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights

4 - Bolt

- ❑ 8 Nm

5 - Axle beam

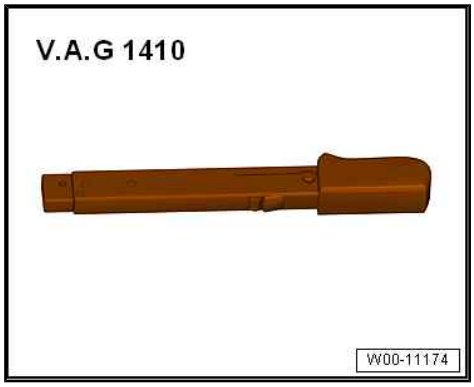
6 - Mounting bracket



2.3 Removing and installing front vehicle level senders - G78- / -G289-

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1410-



Removing

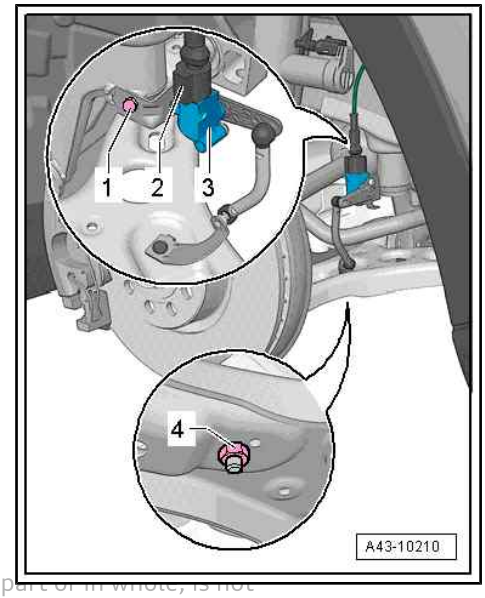
– Unplug connector -2-.

– Unscrew nut -4- and bolt -1-.

– Take out vehicle level sender -3-.

Installing

Installation is carried out in reverse sequence. Note the following:



Note

♦ *The lever on the vehicle level sender must face outwards.*

♦ *The thread of the vehicle level sender must be screwed into the front hole in the wishbone. The retaining lug for the vehicle level sender must engage in the rear hole to obtain the correct installation position.*

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

♦ ⇒ “2.1 Exploded view - front vehicle level senders”, page 302

2.4 Removing and installing rear vehicle level senders - G76- / -G77-

⇒ “2.4.1 Removing and installing rear vehicle level sender G76 - vehicles with torsion beam axle”, page 306

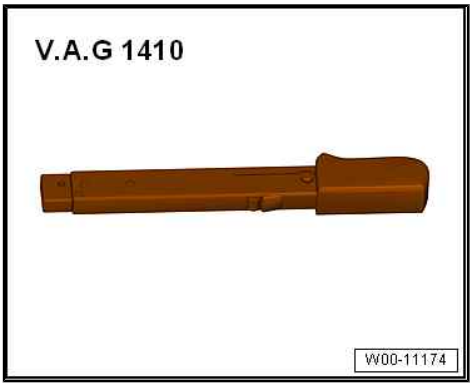
⇒ “2.4.2 Removing and installing rear vehicle level senders G76 / G77 - vehicles with multi-link suspension”, page 307

2.4.1 Removing and installing rear vehicle level sender - G76- - vehicles with torsion beam axle

Special tools and workshop equipment required

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♦ Torque wrench - V.A.G 1410-



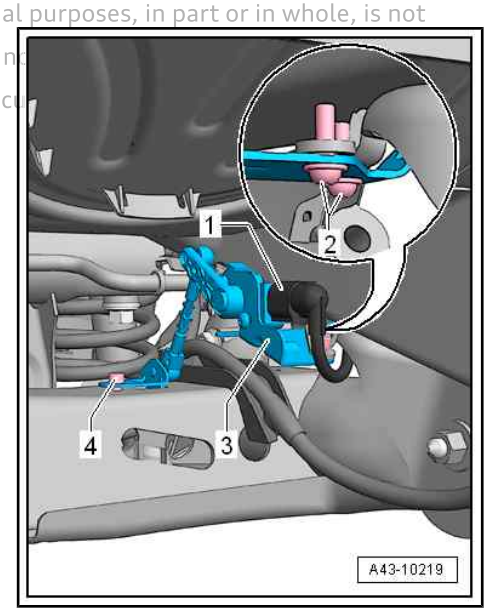
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Removing

– Unplug connector -1-.

– Remove bolts -4 and 2-.

– Take out rear vehicle level sender -3-.



Installing

Installation is carried out in reverse sequence. Note the following:

The lever on the vehicle level sender must face towards rear of vehicle.

- Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

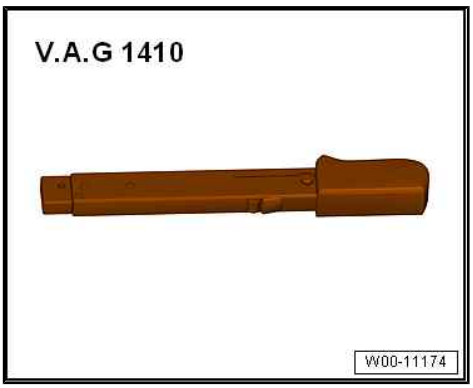
Tightening torques

♦ ⇒ “2.2.2 Exploded view - rear left vehicle level sender G76 , vehicles with torsion beam axle”, page 305

2.4.2 Removing and installing rear vehicle level senders - G76- / -G77- - vehicles with multi-link suspension

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1410-

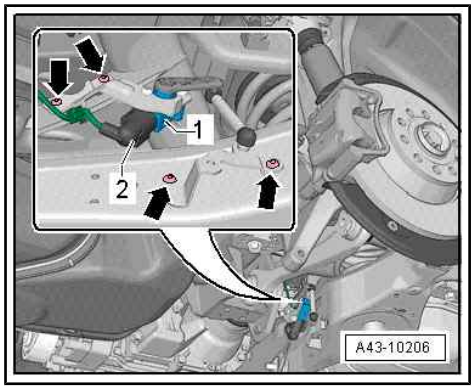


Removing

– Unplug connector -2-.

– Remove bolts -arrows-.

– Take out rear vehicle level sender -1-.



Installing

Installation is carried out in reverse sequence. Note the following:

The lever on the vehicle level sender must face outwards.

- On vehicles with electronic damping control (Audi magnetic ride), perform function “Re-adapt reference (default) position” using ⇒ Vehicle diagnostic tester.
- If the reference position has been re-adapted, the front camera for driver assist systems must be recalibrated on vehicles with lane departure warning function ⇒ page 343 .
- Perform basic setting of headlights ⇒ Electrical system; Rep. gr. 94 ; Headlights; Adjusting headlights .

Tightening torques

◆ ⇒ “2.2.1 Exploded view - rear left vehicle level sender G76 / rear right vehicle level sender G77 , vehicles with multi-link suspension”, page 304

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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 Wheel alignment

⇒ “2.1 Notes on wheel alignment”, page 310

⇒ “2.2 When does wheel alignment have to be checked?”, page 311

⇒ “2.3 Test requirements”, page 312

⇒ “2.4 Preparations required before calibration of driver assist systems”, page 313

⇒ “2.5 Explanatory notes on production control numbers (PR numbers)”, page 313

⇒ “2.6 Preparations for measurement”, page 314

⇒ “2.7 Wheel runout compensation”, page 315

⇒ “2.8 Checking full steering lock”, page 315

⇒ “2.9 Wheel alignment procedure”, page 316

⇒ “2.10 Wheel alignment specifications”, page 317

⇒ “2.11 Adjusting camber at front wheels”, page 321

⇒ “2.12 Adjusting camber at rear wheels”, page 322

⇒ “2.13 Adjusting toe setting at rear wheels”, page 324

⇒ “2.14 Adjusting toe setting at front wheels”, page 325

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2.1 Notes on wheel alignment

Wheel alignment must always be performed using wheel alignment equipment approved by VW/Audi.

All information required for wheel alignment is provided by the wheel alignment computer.

Current data »updates« are available in Audi ServiceNet.

⇒ Audi ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Beissbarth

⇒ Audi ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Hunter

⇒ Audi ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Corghi

⇒ Audi ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; John Bean

The alignment check must always include both the front and the rear axles.

This is important to achieve proper handling and road behaviour.

Otherwise, the rack may not be located in the central position.

Note

- *Wheel alignment should not be checked until the vehicle has completed 1000 to 2000 km, when the coil springs have had time to settle.*
- *When making adjustments, try to obtain the specified settings as accurately as possible.*
- *Vibrations can also be caused by excessive residual imbalance and/or radial runout of the wheels.*

WARNING

If adjustments are made to the suspension geometry, the steering angle sender - G85- must be calibrated on vehicles with ESP or ABS diagnostic tester .

WARNING

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

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WARNING

Risk of injury due to automatic engine start on vehicles with start/stop system.

- *On vehicles with activated start/stop system (indicated by a message in the instrument cluster), the engine may start automatically if it needs to.*
- *Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).*

2.2 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 removed.
- If tyres are worn unevenly.

- [1] Wheel alignment check is required if position of subframe has not been fixed using locating pins - T10486/1- or - T10486A- .

After REMOVING AND REINSTALLING components

Front axle	Wheel alignment check required		Rear axle	Wheel alignment check required	
	Yes	**No**		**Yes**	**No**
Suspension strut		X	Shock absorber		X
Suspension link/bonded rubber bush		X	Coil spring		X
Swivel joint		X	Wheel bearing housing		X
Wheel bearing housing	X		Subframe		X[1)]
Track rod ball joint/ track rod	X		Lower transverse link	X	
Steering rack	X		Upper transverse link	X	
Subframe		X[1)]	Track rod		X
Anti-roll bar		X[1)]	Trailing arm	X	
			Anti-roll bar		X

Front axle	Wheel alignment check required		Rear axle	Wheel alignment check required	
	Yes	No		Yes	No
			Axle beam (torsion beam axle)	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. Wheel alignment must be checked and adjusted if the steering wheel is not straight.

After RENEWING components

Front axle	Wheel alignment check required		Rear axle	Wheel alignment check required	
	Yes	No		Yes	No
Suspension strut		X	Shock absorber		X
Suspension link/bonded rubber bush		X	Coil spring		X
Swivel joint		X	Wheel bearing housing	X	
Wheel bearing housing	X		Subframe	X	
Track rod ball joint/ track rod	X		Lower transverse link	X	
Steering rack	X		Upper transverse link	X	
Subframe	X		Track rod	X	
Anti-roll bar		X[1)]	Trailing arm	X	
			Anti-roll bar		X
			Axle beam (torsion beam axle)	X	

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- 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. Wheel alignment must be checked and adjusted if the steering wheel is not straight.

2.3 Test requirements

- 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.
- Drive vehicle onto wheel alignment unit and ensure that suspension is not under stress, if necessary by moving vehicle backwards and forwards several times.
- Vehicle accurately aligned, suspension bounced and rocked several times.
- Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.
- 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- .
- Vehicle in unladen position [2)]

.

2) "Unladen condition" means: the height of the vehicle ready for the road (with full tank, spare wheel, vehicle tools and vehicle jack).

- 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.
- Sensors must be properly attached and adjusted; refer to operating instructions of equipment manufacturer.
- If necessary, contact the manufacturer for familiarisation with the proper use of the wheel alignment equipment.
- Wheel alignment platforms 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.

2.4 Preparations required before calibration of driver assist systems

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The following steps are required if one or more driver assist systems on the vehicle are to be calibrated via the "Quick-start" procedure (i.e. without first checking and adjusting the wheel alignment):

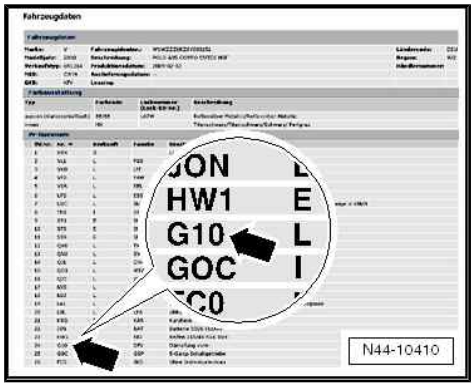
- Before driving the vehicle onto the alignment platform, make sure there is sufficient space between the vehicle and the calibration unit. The distance between the calibration unit and the vehicle must be 120 cm ± 2.5 cm.
- If the available space is not adequate, drive the vehicle backwards onto the alignment platform as required.
- Before commencing calibration, interrogate event memory and rectify any faults.
- Vehicle accurately aligned, suspension bounced and rocked several times.
- Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.
- Connect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
- Bring front wheels into straight-ahead position.
- Connect up ⇒ Vehicle diagnostic tester to vehicle and run diagnostic cable out through open window.
- Exterior lighting switched off.
- All vehicle doors closed.
- Press button to select required calibration on wheel alignment computer.

2.5 Explanatory notes on production control numbers (PR numbers)

The PR no. on the vehicle data sticker indicates the type of running gear (for front axle and rear axle) and which version of the Tyre Pressure Monitoring System / Tyre Pressure Loss Indicator is fitted in the vehicle.

The vehicle data sticker can be found in the spare wheel well and in the Service Schedule.

The required information on the type of running gear installed in the vehicle can be found in ELSA in the ⇒ Vehicle-specific notes in the document “Vehicle data”.



In this example the vehicle is equipped with the sports running gear G10 (see magnified section of illustration).

Standard running gear = 2UA and G01/G02/G03/G04/G05/G14/G15/G16/G21/G22/G23/G24/G41/G42/G43/G44/G51

Sports running gear = 2UC and G01/G02/G03/G04/G21/G22/G23/G24/G41/G42/G43/G44/G45/G62/G63/G64

Heavy-duty running gear = 2UF and G01/G02/G03/G04/G21/G22/G23/G24/G25

Sports running gear with Audi magnetic ride = 2UC and G05/G07/G25/G45

S3 sports running gear and S3 sports running gear with Audi magnetic ride = 2UC and G06/G07/G26/G27/G46/G47

S line sports running gear = 2UG and G34/G35/G36/G47/G48/G49/G50

RS 3 sports running gear = 2UC and G08/G09

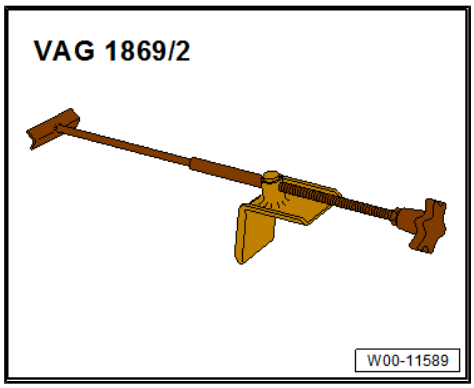
RS 3 sports running gear with Audi magnetic ride = 2UC and G08

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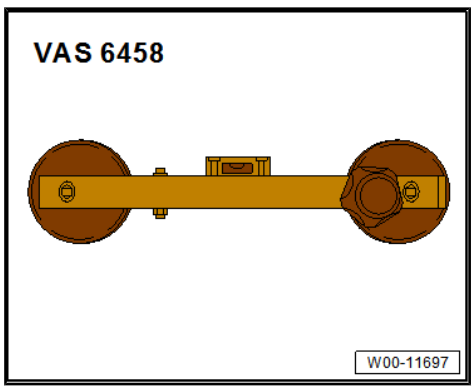
2.6 Preparations for measurement

Special tools and workshop equipment required

- Brake pedal actuator - V.A.G 1869/2-



- Steering wheel balance - VAS 6458-



- Wheel alignment computer approved by VW/Audi
- Sensors must be properly attached and adjusted; refer to operating instructions of equipment manufacturer.
- Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.

- Drive vehicle onto wheel alignment unit and ensure that suspension is not under stress, if necessary by moving vehicle backwards and forwards 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- .

The following steps are required if one or more driver assist systems on the vehicle are to be calibrated via the "Quick-start" procedure (i.e. without first checking and adjusting the wheel alignment):

- Before driving the vehicle onto the alignment platform, make sure there is sufficient space between the vehicle and the calibration unit. The distance between the calibration unit and the vehicle must be 120 cm ± 2.5 cm.
- If the available space is not adequate, drive the vehicle backwards onto the alignment platform as required.
- Before commencing calibration, interrogate event memory and rectify any faults.
- Vehicle accurately aligned, suspension bounced and rocked several times.
- Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.
- Connect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Bring front wheels into straight-ahead position.
- Connect up ⇒ Vehicle diagnostic tester to vehicle and run diagnostic cable out through open window.
- Exterior lighting switched off.
- All vehicle doors closed.
- Press button to select required calibration on wheel alignment computer.

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2.7 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 false results will be obtained.

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.

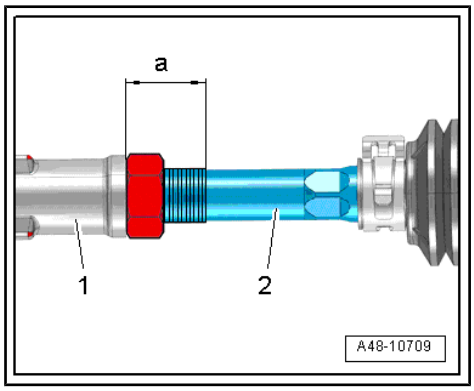
2.8 Checking full steering lock

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-.



Dimension -a- on track rod ball joint (right-side) = dimension -a- on track rod ball joint (left-side); maximum permissible difference between right and left < 2 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.

2.9 Wheel alignment procedure

Sequence of operations for checking and adjusting wheel alignment

Note

The vehicle must always be in unladen condition when measuring wheel alignment ⇒ page 312 .

Always keep to the following sequence of operations.

1 - Drive vehicle onto wheel alignment unit and ensure that suspension is not under stress, if necessary by moving vehicle backwards and forwards several times.

2 - 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-.

3 - Carry out wheel rim runout compensation ⇒ page 315 .

4 - Check full steering lock ⇒ page 315 .

5 - Check camber at front wheels and centralise if necessary ⇒ page 321 .

6 - Check camber at rear wheels and adjust if necessary ⇒ page 322 .

7 - Check toe setting at rear wheels and adjust if necessary ⇒ page 324 .

8 - Check toe setting at front wheels and adjust if necessary ⇒ page 325 .

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Note

- *If adjustments have been made to the suspension after a wheel alignment check on vehicles with ESP or ABS, the steering angle sender - G85- must be calibrated using the ⇒ Vehicle diagnostic tester.*
- *If any changes are made to the rear wheel alignment settings, the following driver assist systems must be recalibrated:*
- *Lane departure warning (Audi lane assist)*
  ⇒ "4.1 Calibrating front camera for driver assist systems", page 343 ,
- *Reversing camera system ⇒ Electrical system; Rep. gr. 91 ; Reversing camera system; Calibrating reversing camera system ,*
- *Adaptive cruise control*
  ⇒ "3.1 Adjusting adaptive cruise control", page 327 .

2.10 Wheel alignment specifications

These specifications are applicable to all engines.

⇒ "2.5 Explanatory notes on production control numbers (PR numbers)", page 313

Standard running gear 2UA and G01/G02/G03/G04/G05/G14/G15/G16/G21/G22/G23/G24/G41/G42/G43/G44/G51		
-Front axle-		
Total toe		10′ ± 10′
Toe setting at each wheel		5′ ± 5′
Camber (in straight-ahead position) [3] Maximum permissible difference between left and right		-35′ ± 30′ max. 30′
Toe-out on turns with 20° steering angle [4]		1° 19′ ± 20′
Caster Maximum permissible difference between left and right		7° 25′ ± 30′ max. 30′
Maximum steering angle at inner wheel		40°38′
-Rear axle-		
Total toe	Multi-link suspension	25′ ± 10′
	Torsion beam axle [5]	20′ ± 12′
Toe setting at each wheel	Multi-link suspension	12.5′ ± 5′
	Torsion beam axle [5]	10′ ± 6′
Camber	Multi-link suspension	-1° 20′ ± 30′
	Torsion beam axle [6]	-1° ± 10′
Maximum permissible difference between left and right	Multi-link suspension	max. 30′
	Torsion beam axle	max. 30′
Maximum permissible deviation from direction of travel	Multi-link suspension	max. 12′
	Torsion beam axle	max. 20′

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Sports running gear 2UC and G01/G02/G03/G04/G21/G22/G23/G24/G41/G42/G43/G44/G45/G62/G63/G64		
-Front axle-		
Total toe		10′ ± 10′
Toe setting at each wheel		5′ ± 5′
Camber (in straight-ahead position) [3] Maximum permissible difference between left and right		-46′ ± 30′ max. 30′
Toe-out on turns with 20° steering angle [4]		1° 30′ ± 20′
Caster Maximum permissible difference between left and right		7° 40′ ± 30′ max. 30′
Maximum steering angle at inner wheel		40°13′
-Rear axle-		
Total toe	Multi-link suspension	25′ ± 10′
	Torsion beam axle [5]	24′ ± 12′
Toe setting at each wheel	Multi-link suspension	12.5′ ± 5′
	Torsion beam axle [5]	12′ ± 6′
Camber	Multi-link suspension	-1° 20′ ± 30′
	Torsion beam axle [6]	-1° ± 10′
Maximum permissible difference between left and right	Multi-link suspension	max. 30′
	Torsion beam axle	max. 30′
Maximum permissible deviation from direction of travel	Multi-link suspension	max. 12′
	Torsion beam axle	max. 20′

Heavy-duty running gear 2UF and G01/G02/G03/G04/G21/G22/G23/G24/G25		
-Front axle-		
Total toe		10′ ± 10′
Toe setting at each wheel		5′ ± 5′
Camber (in straight-ahead position) [3] Maximum permissible difference between left and right		-21′ ± 30′ max. 30′
Toe-out on turns with 20° steering angle [4]		1° 09′ ± 20′
Caster Maximum permissible difference between left and right		7° 11′ ± 30′ max. 30′
Maximum steering angle at inner wheel		41°05′
-Rear axle-		
Total toe	Multi-link suspension	25′ ± 10′
	Torsion beam axle [5]	16′ ± 12′

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Heavy-duty running gear 2UF and G01/G02/G03/G04/G21/G22/G23/G24/G25		
Toe setting at each wheel	Multi-link suspension	12.5′ ± 5′
	Torsion beam axle [5)]	8′ ± 6′
Camber	Multi-link suspension	-1° 20′ ± 30′
	Torsion beam axle [6)]	-1° ± 10′
Maximum permissible difference between left and right	Multi-link suspension	max. 30′
	Torsion beam axle	max. 30′
Maximum permissible deviation from direction of travel	Multi-link suspension	max. 12′
	Torsion beam axle	max. 20′

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Sports running gear with Audi magnetic ride 2UC and G05/G07/G25/G45		
-Front axle-		
Total toe		10′ ± 10′
Toe setting at each wheel		5′ ± 5′
Camber (in straight-ahead position) [3)]		-46′ ± 30′
Maximum permissible difference between left and right		max. 30′
Toe-out on turns with 20° steering angle [4)]		1° 30′ ± 20′
Caster		7° 40′ ± 30′
Maximum permissible difference between left and right		max. 30′
Maximum steering angle at inner wheel		41°13′
-Rear axle-		
Total toe	Multi-link suspension	25′ ± 10′
Toe setting at each wheel	Multi-link suspension	12.5′ ± 5′
Camber	Multi-link suspension	-1° 20′ ± 30′
Maximum permissible difference between left and right		max. 30′
Maximum permissible deviation from direction of travel	Multi-link suspension	max. 12′

S line sports running gear 2UG and G34/G35/G36/G47/G48/G49/G50	
-Front axle-	
Total toe	10′ ± 10′
Toe setting at each wheel	5′ ± 5′
Camber (in straight-ahead position) [3)]	-52′ ± 30′
Maximum permissible difference between left and right	max. 30′
Toe-out on turns with 20° steering angle [4)]	1° 40′ ± 20′
Caster	7° 51′ ± 30′
Maximum permissible difference between left and right	max. 30′
Maximum steering angle at inner wheel	39°57′

S line sports running gear 2UG and G34/G35/G36/G47/G48/G49/G50		
-Rear axle-		
Total toe	Multi-link suspension	25′ ± 10′
	Torsion beam axle [5]	27′ ± 12′
Toe setting at each wheel	Multi-link suspension	12.5′ ± 5′
	Torsion beam axle [5]	13.5′ ± 6′
Camber	Multi-link suspension	-1° 20′ ± 30′
	Torsion beam axle [6]	-1° ± 10′
Maximum permissible difference between left and right	Multi-link suspension	max. 30′
	Torsion beam axle	max. 30′
Maximum permissible deviation from direction of travel	Multi-link suspension	max. 12′
	Torsion beam axle	max. 20′

S3 sports running gear and S3 sports running gear with Audi magnetic ride 2UC and G05/G07/G26/G27/G46/G47/G97	
-Front axle-	
Total toe	10′ ± 10′
Toe setting at each wheel	5′ ± 5′
Camber (in straight-ahead position) [3]	-52′ ± 30′
Maximum permissible difference between left and right	max. 30′
Toe-out on turns with 20° steering angle [4]	1° 40′ ± 20′
Caster	7° 51′ ± 30′
Maximum permissible difference between left and right	max. 30′
Maximum steering angle at inner wheel	39°57′
-Rear axle-	
Total toe	25′ ± 10′
Toe setting at each wheel	12.5′ ± 5′
Camber	-1° 20′ ± 30′
Maximum permissible difference between left and right	max. 30′
Maximum permissible deviation from direction of travel	max. 12′

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RS 3 sports running gear 2UC and G08/G09	
-Front axle-	
Total toe	10′ ± 10′
Toe setting at each wheel	5′ ± 5′
Camber (in straight-ahead position) [3]	-52′ ± 30′
Maximum permissible difference between left and right	max. 30′
Toe-out on turns with 20° steering angle [4]	1° 40′ ± 20′

RS 3 sports running gear 2UC and G08/G09	
Caster	7° 51′ ± 30′
Maximum permissible difference between left and right	max. 30′
Maximum steering angle at inner wheel	39°57′
-Rear axle-	
Total toe	10′ ± 10′
Toe setting at each wheel	5′ ± 5′
Camber	-1° 20′ ± 30′
Maximum permissible difference between left and right	max. 30′
Maximum permissible deviation from direction of travel	max. 12′

3) Camber cannot be adjusted. By moving the subframe, it is possible to centralise the camber setting symmetrically within the specified tolerance range.

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.

5) Toe setting cannot be adjusted. If the measurements are outside the permitted tolerances, check the axle beam for damage and renew if necessary.

6) Camber cannot be adjusted. If the measurements are outside the permitted tolerances, check the axle beam for damage and renew if necessary.

2.11 Adjusting camber at front wheels

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-



The camber cannot be adjusted.

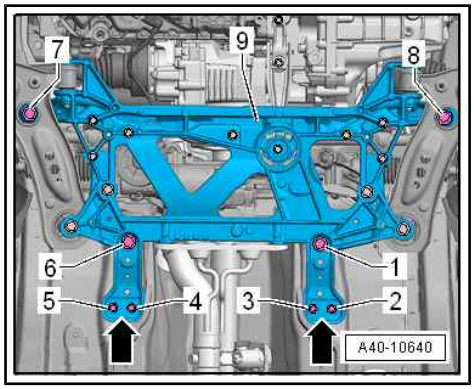
By moving the subframe, it is possible to centralise the camber setting symmetrically within the specified tolerance range.

- The subframe may be moved to the left or right, but NOT forwards or backwards in a longitudinal direction.

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

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– Unscrew bolts -1, 6, 7 and 8- one after the other and loosely screw in new ones.
– Move subframe -9- sideways until camber is the same on both sides ⇒ page 317 .
– Tighten subframe bolts -1, 6, 7 and 8-.



After moving subframe and consequently steering rack, ensure sufficient clearance between universal joint of steering column and aperture in bulkhead.

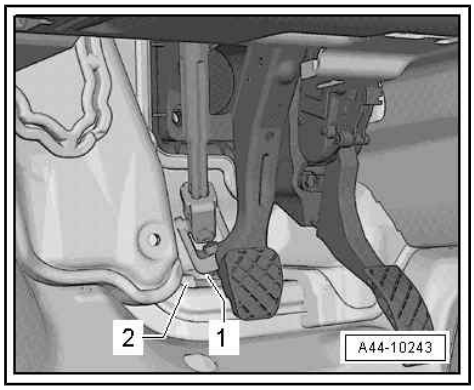
– Unscrew securing nuts -arrows- and remove footwell trim.



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

Tightening torques

- ⇒ “2.1 Exploded view - subframe”, page 18
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



2.12 Adjusting camber at rear wheels

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⇒ “2.12.1 Adjusting camber at rear wheels - vehicles with torsion beam axle”, page 322

⇒ “2.12.2 Adjusting camber at rear wheels - vehicles with multi-link suspension”, page 322

2.12.1 Adjusting camber at rear wheels - vehicles with torsion beam axle

Camber cannot be adjusted.

If the measurements are outside the permitted tolerances, check the axle beam for damage and renew if necessary.

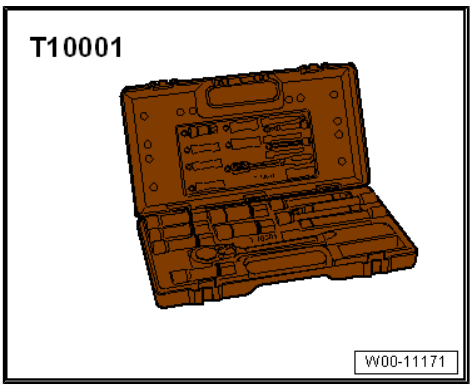
2.12.2 Adjusting camber at rear wheels - vehicles with multi-link suspension

Special tools and workshop equipment required

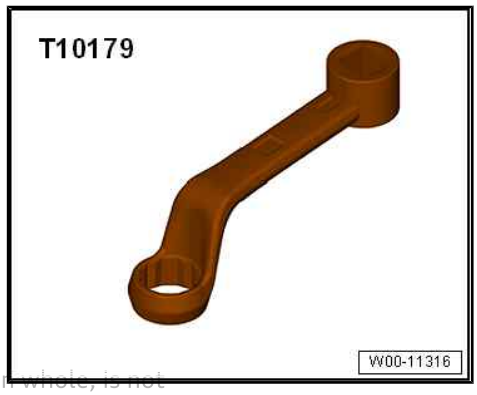
- Torque wrench - V.A.G 1332-



- 18 mm socket from shock absorber set - T10001-

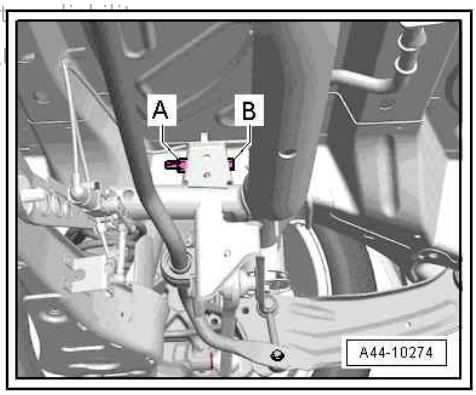


- Insert tool, 18 mm - T10179-



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– Unscrew nut -A- on bolted connection between upper suspension link and subframe, and loosely screw on new nut.



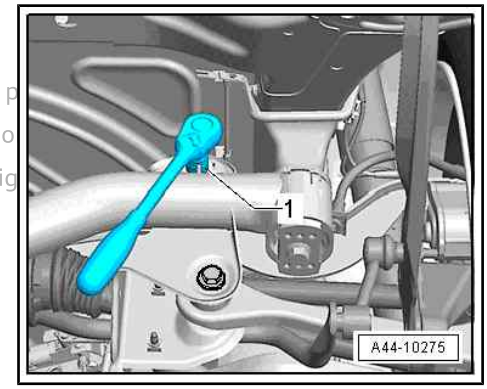
– Adjust camber by turning eccentric bolt -B- with 18 mm socket from shock absorber set - T10001- .

- The eccentric bolt -B- can also be turned via the hexagon flats at the tip of the bolt.

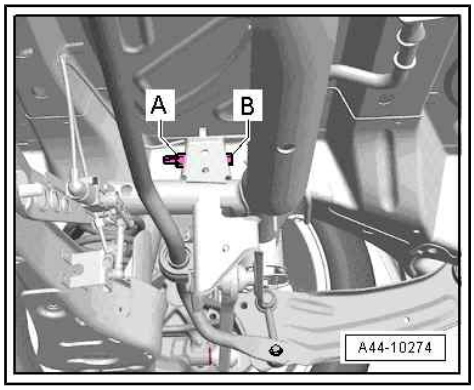
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Note

The maximum adjustment range is 90° to the left or right of the centre position.



– Tighten nut -A- using insert tool 18 mm - T10179- .

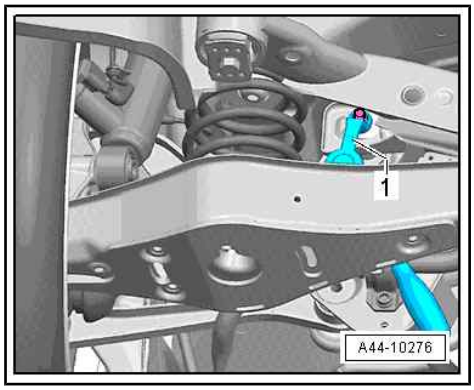


– Use insert tool 18 mm - T10179- -1- as shown in illustration.

– Check camber setting once again after tightening nut -A- ⇒ “2.10 Wheel alignment specifications”, page 317 .

Tightening torques

◆ ⇒ “5.1 Exploded view - transverse links”, page 224



2.13 Adjusting toe setting at rear wheels

⇒ “2.13.1 Adjusting toe setting at rear wheels - vehicles with torsion beam axle”, page 324

⇒ “2.13.2 Adjusting toe setting at rear wheels - vehicles with multi-link suspension”, page 324

2.13.1 Adjusting toe setting at rear wheels - vehicles with torsion beam axle

Toe cannot be adjusted.

If the measurements are outside the permitted tolerances, check the axle beam for damage and renew if necessary.

2.13.2 Adjusting toe setting at rear wheels - vehicles with multi-link suspension

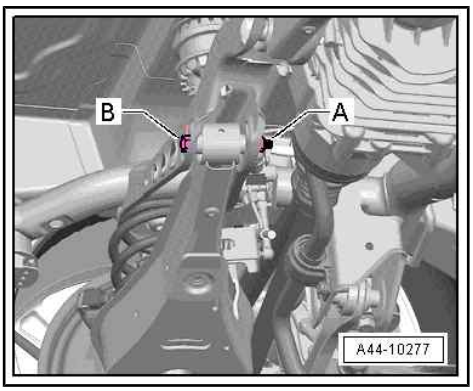
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



– Unscrew nut -A- on bolted connection between lower suspension link and subframe and loosely screw on new nut.

– Adjust toe setting by turning eccentric bolt -B-.



Note

The maximum adjustment range is 90° to the left or right of the centre position.

– Tighten nut -A-.

– Check toe setting once again after tightening nut -A- ⇒ “2.10 Wheel alignment specifications”, page 317 .

Tightening torques

♦ ⇒ “5.1 Exploded view - transverse links”, page 224

2.14 Adjusting toe setting at front wheels

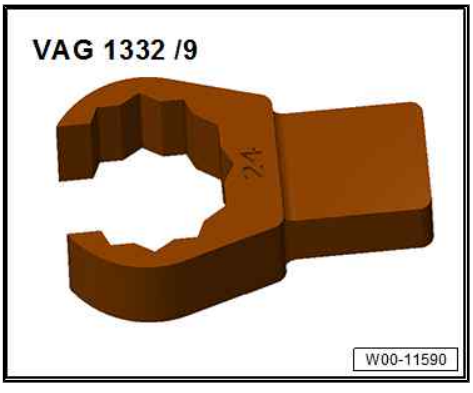
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-

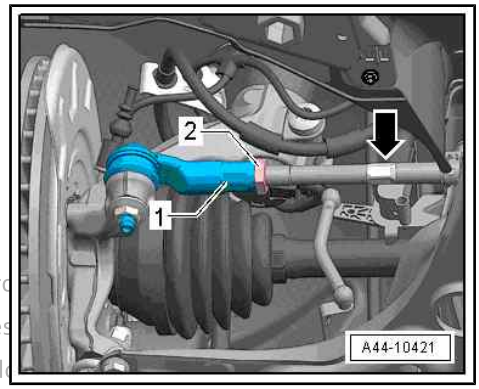
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♦ Tool insert - V.A.G 1332/9-



Procedure



– Counterhold track rod ball joint -1- with a suitable tool when loosening and tightening lock nut -2-.
– Loosen lock nut -2-.
– Adjust toe setting at left and right wheels via hexagon flats -arrow-.

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Note

- *Make sure boot on steering rack is not damaged or twisted. Twisted rubber boots wear out quickly.*
- *The vehicle must be standing on the ground and the track rod ball joint must be parallel with the contact surface on the steering arm of the wheel bearing housing when tightening the lock nuts on the track rod.*

– Tighten lock nut -2- and check toe setting again.

The setting may change slightly after tightening lock nut -2-.

However, the adjustment is correct if the measured toe value is still inside the tolerance
⇒ “2.10 Wheel alignment specifications”, page 317 .

Tightening torques

- ⇒ “3.2 Servicing steering rack”, page 363

3 Adaptive cruise control

⇒ “3.1 Adjusting adaptive cruise control”, page 327

3.1 Adjusting adaptive cruise control

⇒ “3.1.1 Different ACC radar sensors”, page 327

⇒ “3.1.2 Adjustment procedure using ACC setting device VAS 6190 - up to model year 2016”, page 327

⇒ “3.1.3 Adjustment procedure using ACC setting device VAS 6430 - up to model year 2016”, page 333

⇒ “3.1.4 Adjustment procedure using ACC setting device VAS 6430 - from model year 2017 onwards”, page 339

3.1.1 Different ACC radar sensors

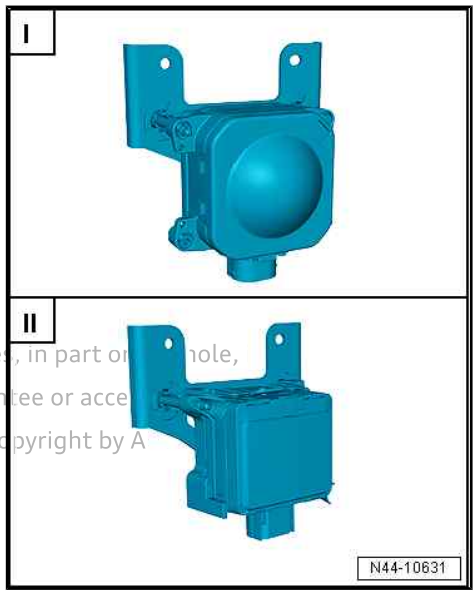
There are two ACC radar sensors (right adaptive cruise control sender - G259- and adaptive cruise control unit - J428-).

Version I:

- Spherical surface
- Adjustment procedure up to model year 2016 ⇒ page 327 / ⇒ page 333
- Adjustment procedure from model year 2017 onwards ⇒ page 339

Version II:

- Flat surface
- Adjustment procedure up to model year 2016 ⇒ page 327 / ⇒ page 333
- Adjustment procedure from model year 2017 onwards ⇒ page 339

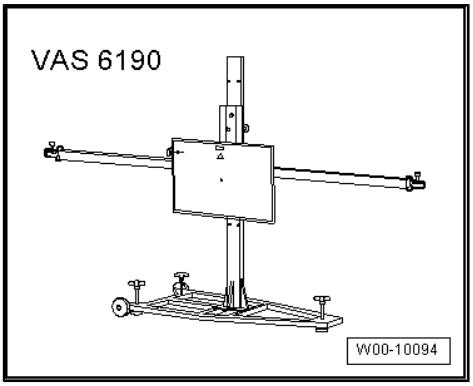


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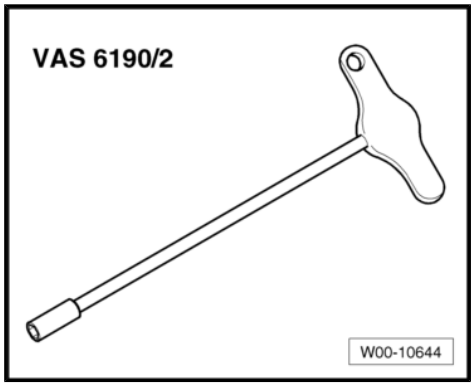
3.1.2 Adjustment procedure using ACC setting device - VAS 6190- - up to model year 2016

Special tools and workshop equipment required

- Vehicle diagnostic tester
- Wheel alignment computer
- ACC setting device - VAS 6190-



- Adjusting tool - VAS 6190/2-



Note

- *Before driving the vehicle onto the alignment platform, make sure there is sufficient space between the vehicle and the ACC setting device - VAS 6190- . The distance between the ACC setting device - VAS 6190- and the vehicle must be 120 cm ± 2.5 cm.*
- *If the available space is not adequate, drive the vehicle backwards onto the alignment platform as required.*

- Before commencing calibration, interrogate event memory and rectify any faults.

This section describes the calibration procedure using the ACC setting device - VAS 6190- . However, you can also use ADC adjustment device - VAS 6041- and ACC reflective mirror - VAS 6041/1- .

Note

The steps listed under "Calibration procedure (when wheel alignment has not been previously checked)" are only required if no wheel alignment check has already been performed.

Re-calibration is required when:

The rear axle toe setting has been changed.

The adaptive cruise control unit - J428- has been removed and installed or renewed.

The front lock carrier has been detached or moved.

The front impact bar has been detached or moved.

The front impact bar or lock carrier has been damaged.

The misalignment angle is greater than –0.8° to +0.8°.

Calibration procedure (when wheel alignment has not been previously checked)

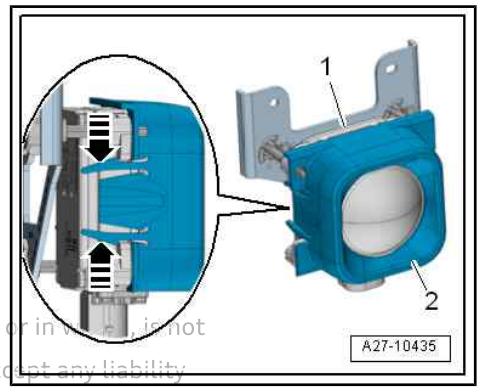
– Connect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
– Press button to select Adaptive cruise control in wheel alignment computer.
– Attach quick-release clamps to rear wheels.
– Attach rear wheel alignment sensors.
– Carry out wheel rim runout compensation for rear wheels.

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Note

Do not pull on the cross bar when moving -VAS 6190- .

Calibration procedure (irrespective of previous wheel alignment check)

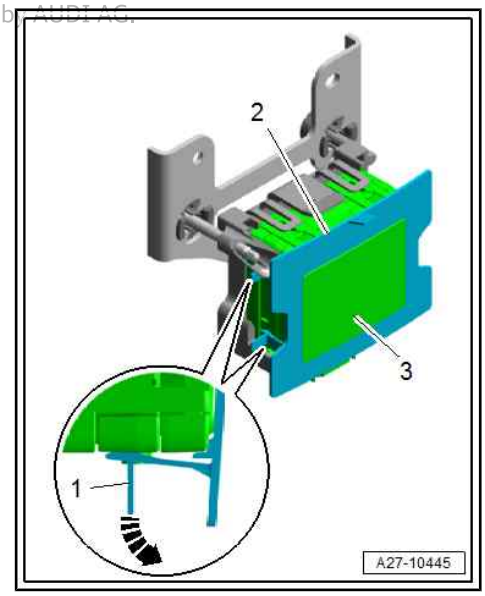


♦ Version I

– Release retaining tabs -arrows-.

– Detach cover -2- from adaptive cruise control unit - J428- -item 1-.

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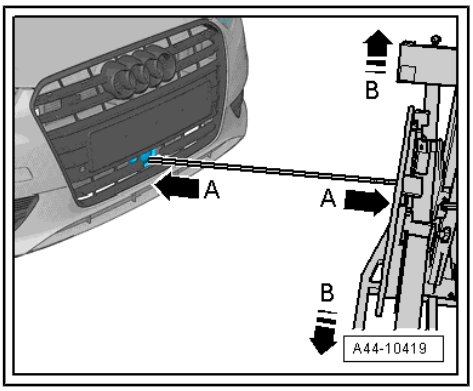


♦ Version II

– Release retaining tabs -1- -arrow-.

– Detach trim -2- from adaptive cruise control unit - J428- -item 3-.

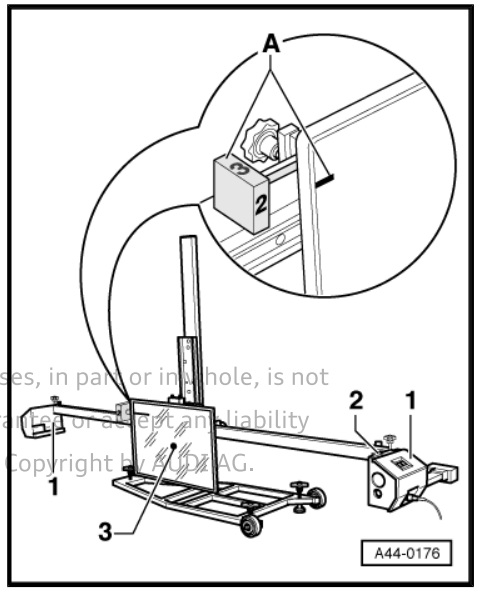
– Connect up vehicle diagnostic tester with appropriate diagnosis lead.



– Remove any dirt from sensor lens.

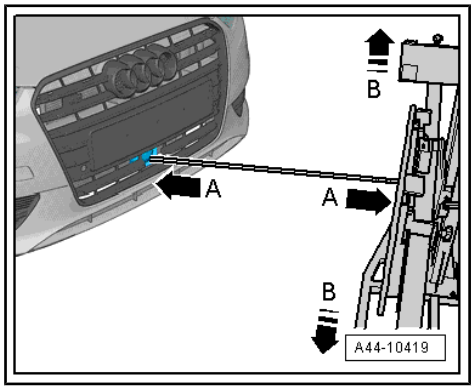
– Position ACC setting device - VAS 6190- so that distance -A- between sensor lens and surface of reflector is 120 cm ± 2,5 cm.

– Attach front wheel alignment sensors -1- to -VAS 6190- .
– In area -A-, align number -2- on rotary knob with mark on mirror (number 2 on rotary knob must face vehicle).

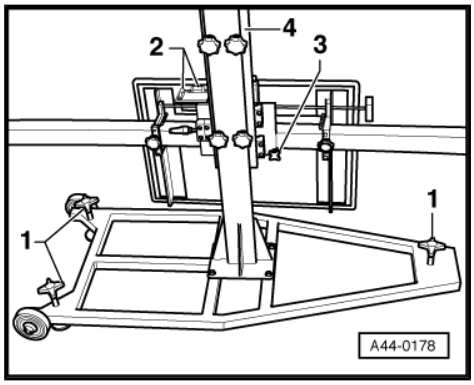


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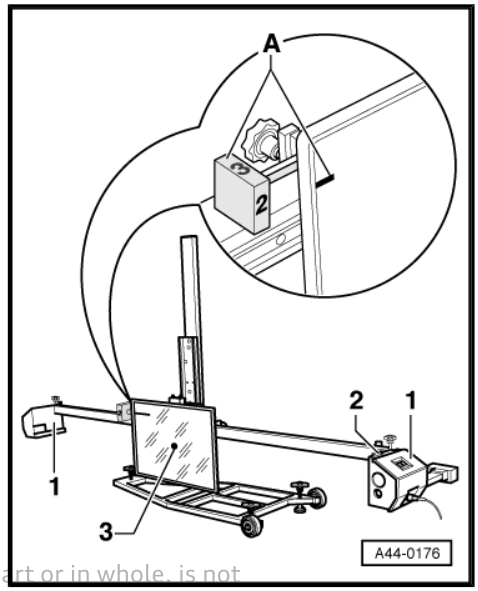
– By moving it sideways -arrows B-, set -VAS 6190- so that laser beam coincides with centre of sensor lens in the horizontal plane.



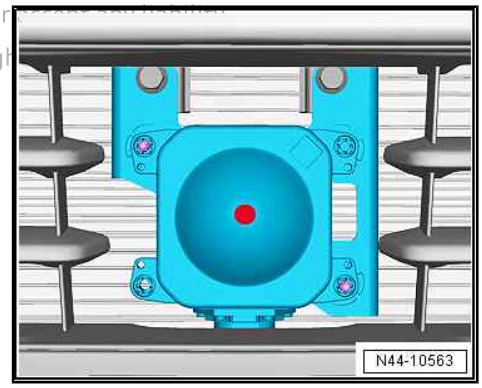
– Use adjusting screws -1- to bring spirit levels -2- on -VAS 6190- into horizontal position.
– Set vertical slide -4- of -VAS 6190- so that laser beam coincides with centre of sensor lens in vertical plane.
– Set identical individual front axle toe values with fine adjustment screw -3-.
– Difference between individual toe values must be less than 6' or equal.



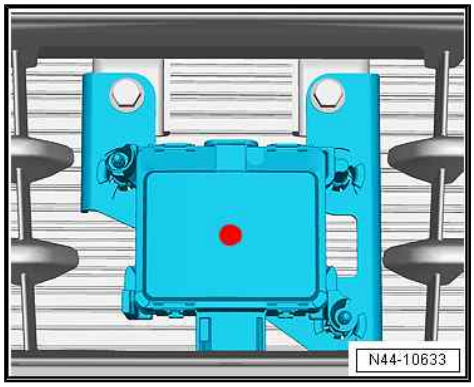
– Balance out spirit levels -2- on wheel alignment sensors -1-.
– Then check again that laser beam -3- coincides with sensor lens.



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- Version I
- Version II



Note

- *-VAS 6190- is correctly aligned if the laser beam still coincides with the centre of the sensor lens after the identical toe values have been set.*
- *The alignment of -VAS 6190- must be repeated if the laser beam does not coincide with the centre of the sensor lens.*

The remaining steps are now performed via the vehicle diagnostic tester :

⇒ Vehicle diagnostic tester is connected.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

- Body
- Electrical system
- 01 - Self-diagnosis compatible systems
- 13 - Adaptive cruise control -J428
- 13 - ACC control unit, functions
- 13 - Adjustment

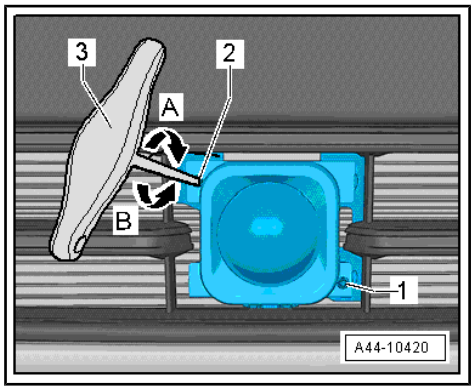
From this point you are guided through the calibration procedure by the ⇒ Vehicle diagnostic tester.

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- Version I

– For adjustment in “Guided Fault Finding” routine, use screws -1- and -2-.

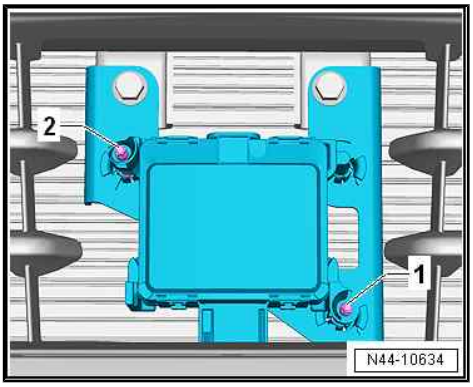
• Use adjusting tool - VAS 6190/2- -item 3- to adjust sensor for adaptive cruise control.



♦ Version II

– For adjustment in “Guided Fault Finding” routine, use screws -1- and -2-.

• Use adjusting tool - VAS 6190/2- to adjust sensor for adaptive cruise control.



WARNING

Calibration of the adaptive cruise control is not completed until ⇒ Vehicle diagnostic tester displays “Control element test ended”.

– Switch off ignition.

– Detach connector of diagnosis cable at diagnostic connection.

– Disconnect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .

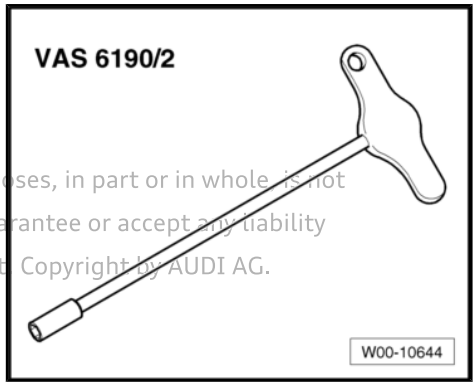
3.1.3 Adjustment procedure using ACC setting device - VAS 6430- - up to model year 2016

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

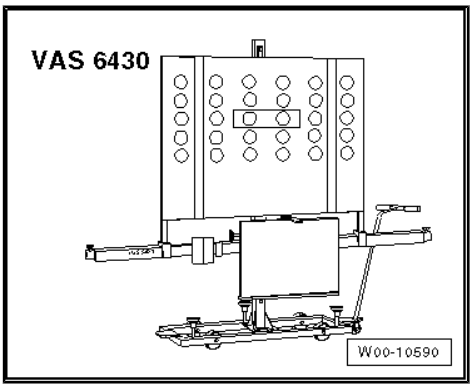
♦ Wheel alignment computer

♦ Adjusting tool - VAS 6190/2-



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♦ ACC setting device - VAS 6430-



♦ ACC reflective mirror, Audi - VAS 6430/3-

Note

- *Before driving the vehicle onto the alignment platform, make sure there is sufficient space between the vehicle and the ACC setting device -VAS 6430- . The distance between the ACC setting device -VAS 6430- and the vehicle must be 120 cm ± 2.5 cm.*
- *If the available space is not adequate, drive the vehicle backwards onto the alignment platform as required.*
- *Do not pull on the cross bar when moving -VAS 6430- .*

- Before commencing calibration, interrogate event memory and rectify any faults.

Re-calibration is required when:

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The rear axle toe setting has been changed.

The adaptive cruise control unit - J428- has been removed and installed or renewed.

The front lock carrier has been detached or moved.

The front impact bar has been detached or moved.

The front impact bar or lock carrier has been damaged.

The misalignment angle is greater than –0.8° to +0.8°.

Note

The steps listed under "Calibration procedure (when wheel alignment has not been previously checked)" are only required if no wheel alignment check has already been performed.

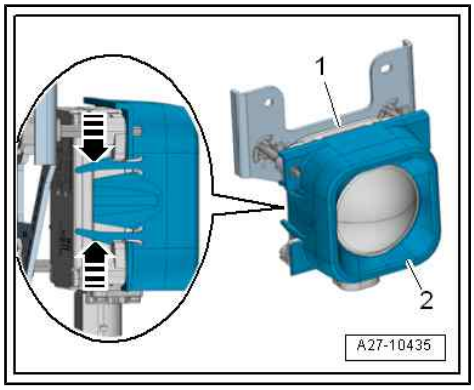
Calibration procedure (when wheel alignment has not been previously checked)

– Connect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
– Select Adaptive cruise control in wheel alignment computer.
– Attach quick-release clamps to rear wheels.
– Attach rear wheel alignment sensors.
– Carry out wheel rim runout compensation for rear wheels.

Calibration procedure (irrespective of previous wheel alignment check)

- Version I

– Release retaining tabs -arrows-.
– Detach cover -2- from adaptive cruise control unit - J428- -item 1-.

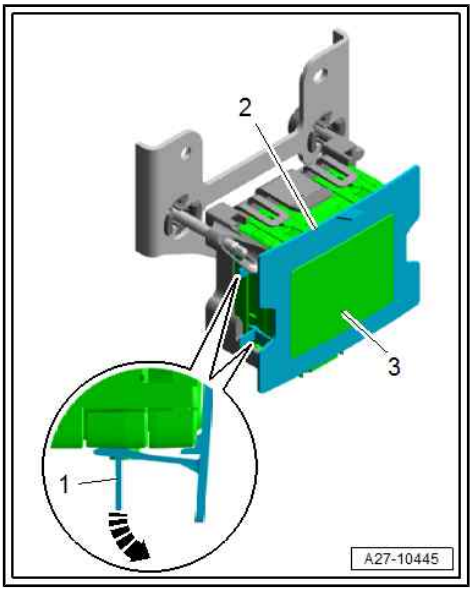


♦ Version II

– Release retaining tabs -1- -arrow-.

– Detach trim -2- from adaptive cruise control unit - J428- -item 3-.

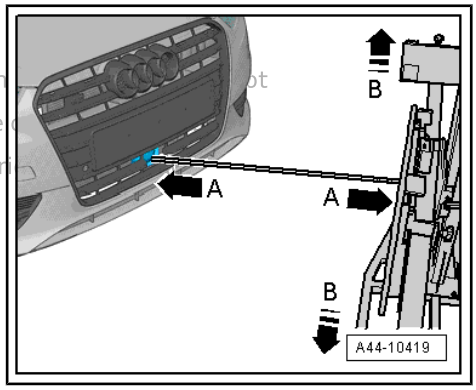
– Connect up vehicle diagnostic tester with appropriate diagnosis lead.



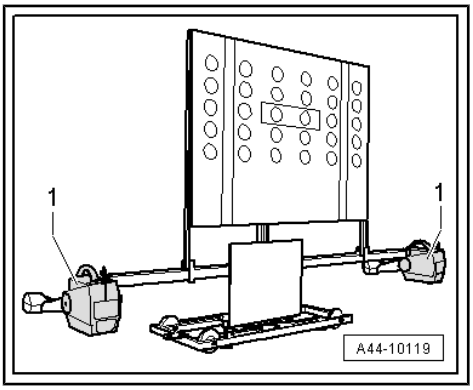
– Remove any dirt from sensor lens and inside of radar cover.

– Position ACC setting device - VAS 6430- so that distance -A- between sensor lens and surface of reflector is 120 cm ± 2,5 cm.

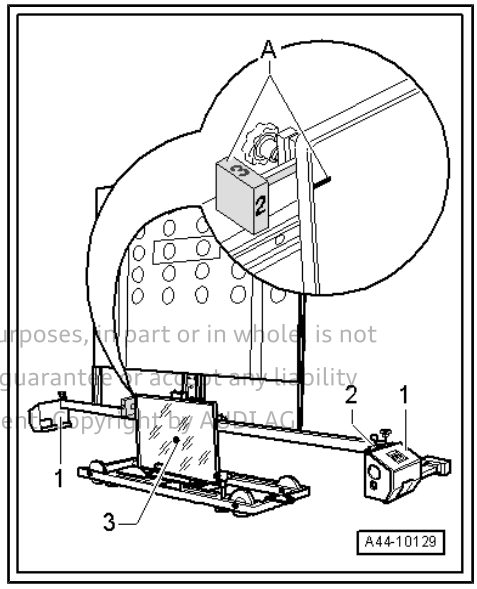
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– Attach front wheel alignment sensors -1- to -VAS 6430- .

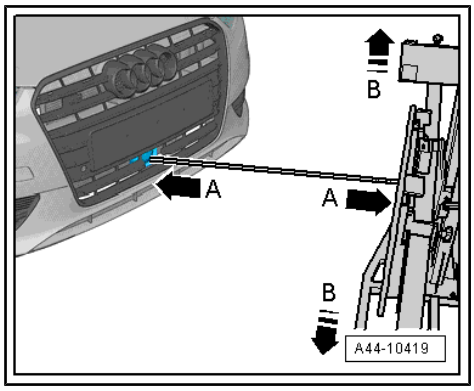


– In area -A-, align number -2- on rotary knob with mark on mirror (number 2 on rotary knob must face vehicle).

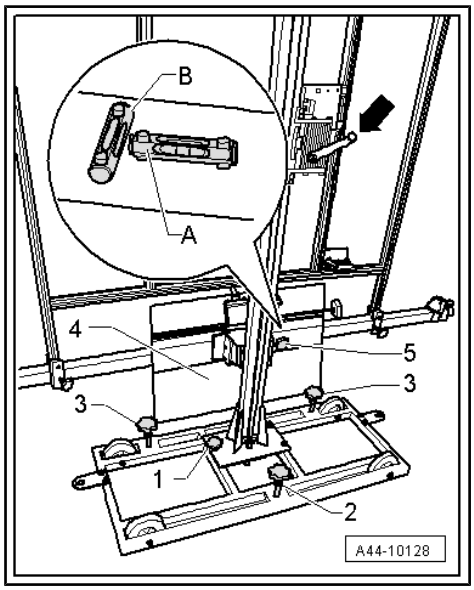


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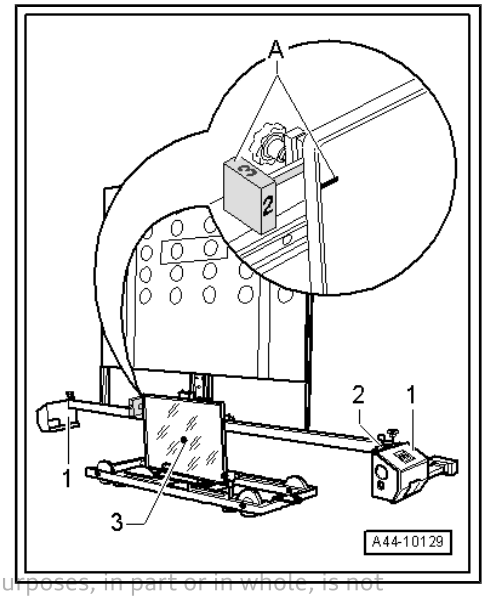
– By moving it sideways -arrows B-, set -VAS 6430- so that laser beam coincides with centre of sensor lens in the horizontal plane.



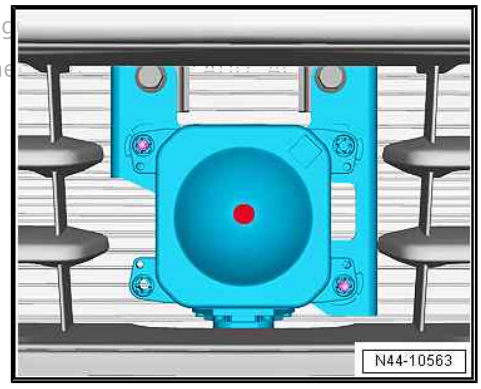
– Use adjusting screws -1-, -2- and -3- to bring spirit levels -A- and -B- on -VAS 6430- into horizontal position.
– Using crank handle -arrow- on -VAS 6430- , set mirror -4- so that laser beam coincides with centre of sensor lens in vertical plane.
– Set identical individual front axle toe values with fine adjustment screw -5-.
– Difference between individual toe values must be less than 6' or equal.



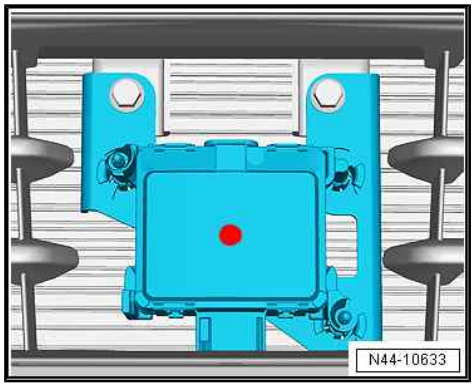
– Balance out spirit levels -2- on wheel alignment sensors -1-.
– Then check again that laser beam -3- coincides with sensor lens.



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- Version I
- Version II



Note

- *-VAS 6430- is correctly aligned if the laser beam still coincides with the centre of the sensor lens after the identical toe values have been set.*
- *The alignment of -VAS 6430- must be repeated if the laser beam does not coincide with the centre of the sensor lens.*

The remaining steps are now performed via the vehicle diagnostic tester :

⇒ Vehicle diagnostic tester is connected.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

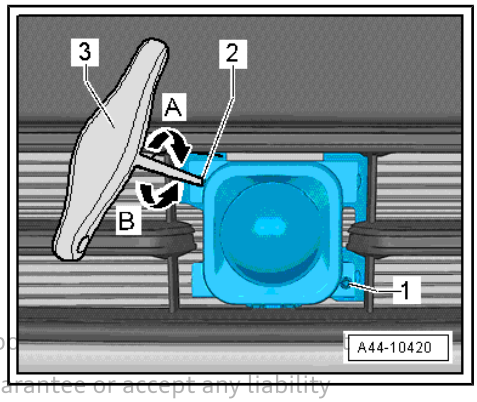
- Body
- Electrical system
- 01 - Self-diagnosis compatible systems
- 13 - Adaptive cruise control -J428
- 13 - ACC control unit, functions
- 13 - Adjustment

Then follow the instructions on the screen to perform the calibration.

- Version I

– For adjustment in “Guided Fault Finding” routine, use screws -1- and -2-.

• Use adjusting tool - VAS 6190/2- -item 3- to adjust sensor for adaptive cruise control.

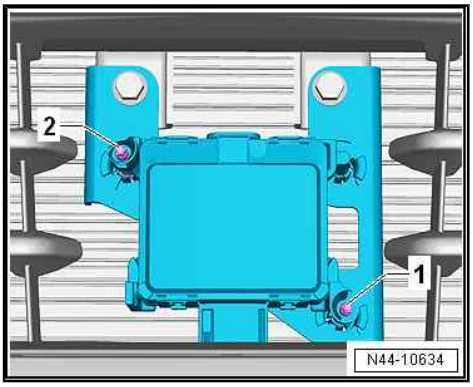


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♦ Version II

– For adjustment in “Guided Fault Finding” routine, use screws -1- and -2-.

• Use adjusting tool - VAS 6190/2- to adjust sensor for adaptive cruise control.



WARNING

Calibration of the adaptive cruise control is not completed until ⇒ Vehicle diagnostic tester displays “Control element test ended”.

– Switch off ignition.

– Detach connector of diagnosis cable at diagnostic connection.

– Disconnect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .

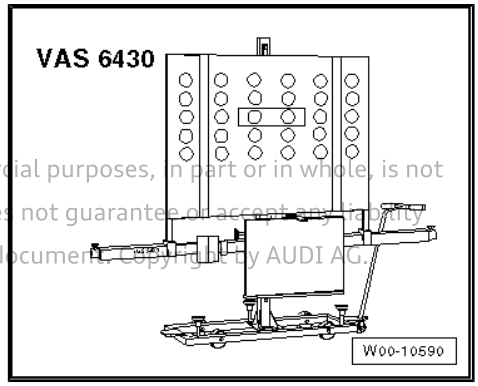
3.1.4 Adjustment procedure using ACC setting device - VAS 6430- - from model year 2017 onwards

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

♦ Wheel alignment computer

♦ Setting device - VAS 6430- or setting device, basic set - VAS 6430/1-



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♦ ACC reflective mirror - VAS 6430/10-

Procedure

The procedure is described for a John Bean wheel alignment computer -VAS 6331- as an example.

• Check that the ACC radar sensor is correctly seated in the bracket.

• Before commencing adjustment procedure, interrogate event memory and rectify any faults.

• The screws on the ACC radar sensor are only for the initial basic setting of the sensor.

There are two options for adjusting the sensor for adaptive cruise control:

Quick-start

This procedure (adjustment only) should be selected in the following cases:

- The adaptive cruise control unit - J428- has been removed and installed or renewed.
- The front lock carrier has been detached or moved.
- The front impact bar has been detached or moved.
- The front impact bar or lock carrier has been damaged.
- The misalignment angle is greater than –0.8° to +0.8°.

Full wheel alignment

This procedure (adjustment and wheel alignment) should be selected in the following cases:

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- 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.

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.

The steps listed under “Adjustment procedure (when wheel alignment has not been previously checked)” are only required if no wheel alignment check has already been performed.

- Please note preparations required before calibration/adjustment of driver assist systems ⇒ page 313 .
- ACC setting device must not be moved on cross bar.

Adjustment procedure (when wheel alignment has not been previously checked)

– Switch off ignition.

– Connect battery charger for backup power supply ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .

– Bring front wheels into straight-ahead position.

– Connect up vehicle diagnostic tester to vehicle and run diagnostic cable out through open window.

– Switch off exterior lights on vehicle.

– Close all vehicle doors.

– Attach quick-release clamps to rear wheels.

– Attach rear wheel alignment sensors.

– Carry out wheel rim runout compensation for rear wheels.

Adjustment procedure (irrespective of previous wheel alignment check)

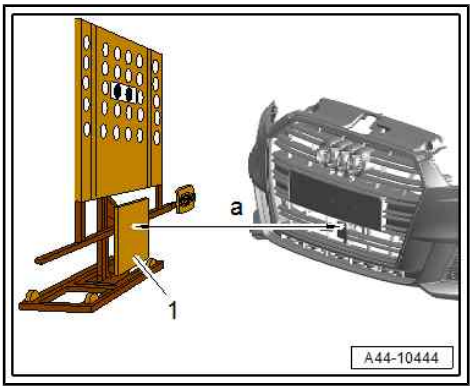
Note

Before performing ACC adjustment, inspect sensor and fasteners for signs of impacts and/or extraneous damage and check that they are properly secured. Service any damaged components as necessary.

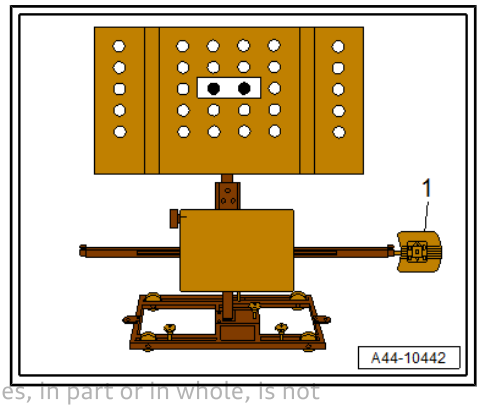
– Press button to select ACC adjustment procedure in wheel alignment computer.

– Attach ACC reflective mirror - VAS 6430/10- to centre of cross bar.
– Remove any dirt from sensor lens.
– Position ACC setting device - VAS 6430- with ACC reflective mirror - VAS 6430/10- -item 1- parallel in centre at distance -a- from sensor lens in radiator grille.

• Dimension -a- = 120 ± 2.5 cm

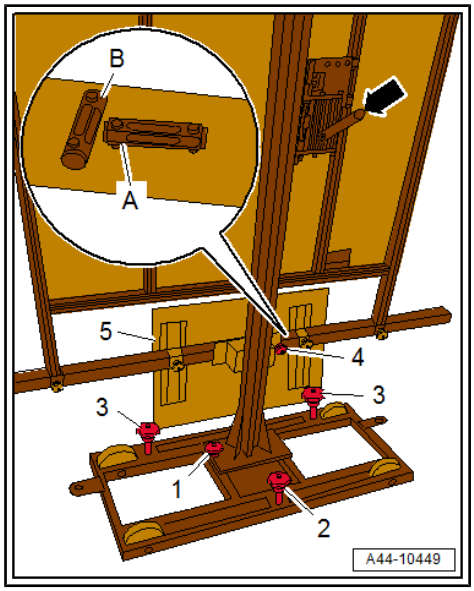


– Fit camera for ACC adjustment -VAS 6331/1- -item 1- on setting device - VAS 6430- (right-side) and secure camera.



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– Set spirit level -A- on ACC reflective mirror, Audi - VAS 6430/10- -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.



The remaining steps are now performed via the vehicle diagnostic tester :

⇒ Vehicle diagnostic tester is connected.

– Select `Diagnosis` mode and begin diagnosis.
– Select `Test plan` tab.
– Choose `Select own test` and select following options one after the other:

♦ Body
♦ Electrical system
♦ 01 - Self-diagnosis compatible systems
♦ 13 - Adaptive cruise control -J428
♦ 13 - ACC control unit, functions
♦ 13 - Adjustment

Follow the instructions on the screen to perform the adjustment.

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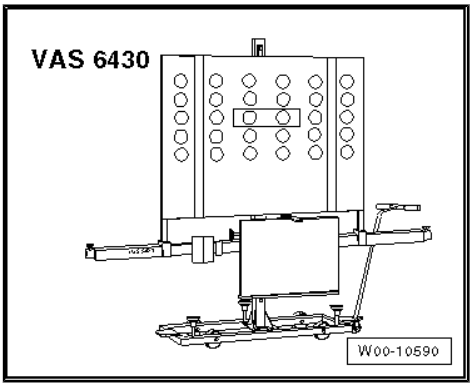
4 Front camera for driver assist systems

⇒ “4.1 Calibrating front camera for driver assist systems”, page 343

4.1 Calibrating front camera for driver assist systems

Special tools and workshop equipment required

- Diagnostic tester with appropriate diagnosis lead
- ACC setting device - VAS 6430-



- Wheel alignment computer

Note

- *Check that the front camera for driver assist systems - R242- is seated correctly in the bracket.*
- *Check that the camera vision is unobstructed (visual inspection).*
- *Before commencing calibration, interrogate event memory and rectify any faults.*

There are two options for performing the calibration:

Quick-start

This procedure (calibration only) should be selected if:

- The fault “No or incorrect basic setting / adaption” is registered in the event memory.
- The front camera for driver assist systems - R242- is removed and installed or renewed.
- The windscreen has been removed or renewed.
- The reference position was re-adapted on vehicles with electronic damping control (Audi magnetic ride).

Full wheel alignment

This procedure (calibration and wheel alignment) should be selected if:

- The rear axle toe setting has been changed.
- If the running gear of the vehicle is modified in any way – e.g. conversion from standard running gear to sports running gear.

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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.

Note preparations required before calibration of driver assist systems ⇒ page 313 .

Calibration procedure (when wheel alignment has not been previously checked)

- Select calibration procedure for front camera in wheel alignment computer.
- Attach quick-release clamps to all four wheels.
- Attach rear wheel alignment sensors.
- Carry out wheel rim runout compensation for rear wheels.

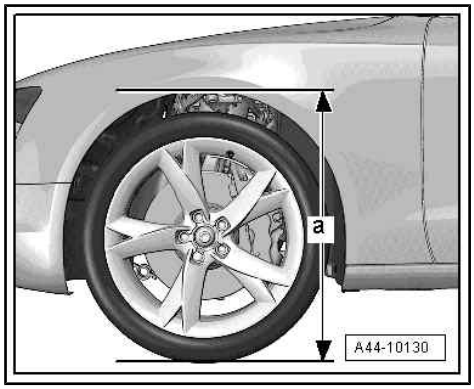
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Calibration when wheel alignment has been previously checked

- Connect battery charger ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
- Bring front wheels into straight-ahead position.
- Connect up vehicle diagnostic tester to vehicle and run diagnostic cable out through open window.
- Switch off exterior lights on vehicle.
- Close all vehicle doors.

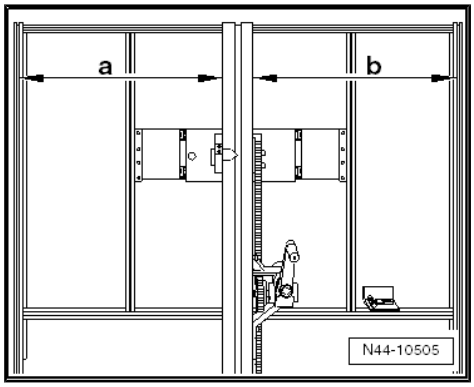
Calibration/adjustment procedure (irrespective of previous wheel alignment check)

- 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. Note down measurement.
- Select calibration procedure for front camera in wheel alignment computer.



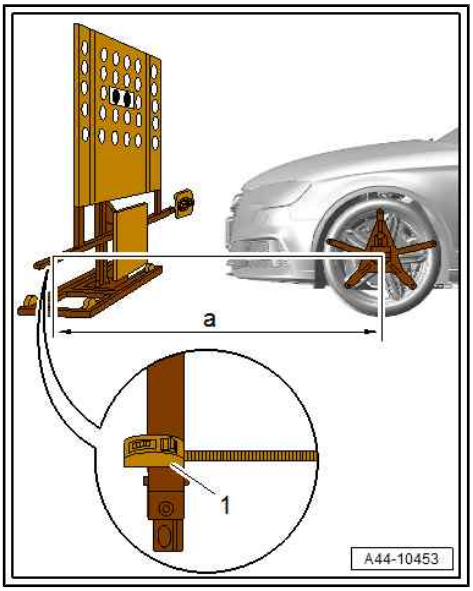
- Check that calibration screen is positioned centrally and engaged properly.

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 ± 2.5 cm.

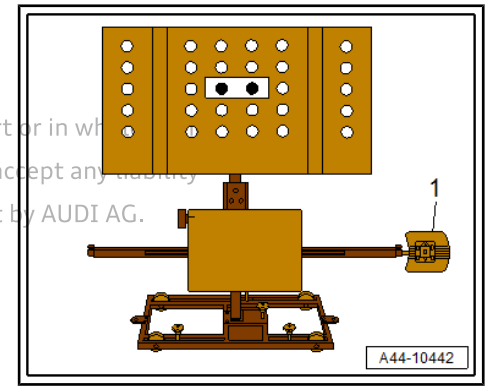
1 - Tape measure



Note

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.

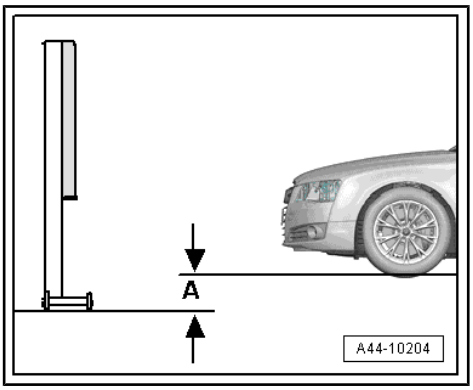


Note

For the next step the wheel alignment platform must be set at the lowest available position.

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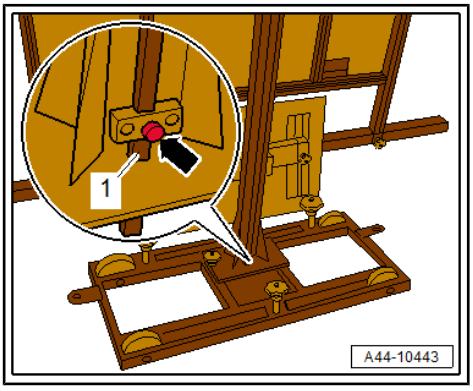
– Determine height difference -A- between floor level where -VAS 6430- is set up and wheel contact patch as shown in illustration and enter this value in the wheel alignment computer.



Note

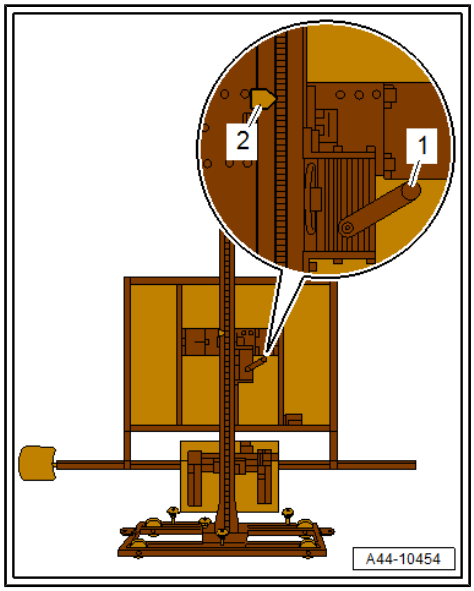
- *Height of calibration screen for all Audi SUV models: 1400 mm + height -A-*
- *Height of calibration screen for all Audi models except SUVs: 1200 mm + height -A-*

– 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 clamping bolt.

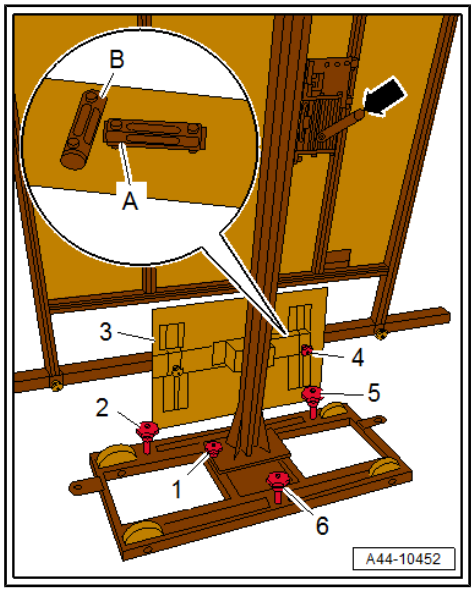


Note

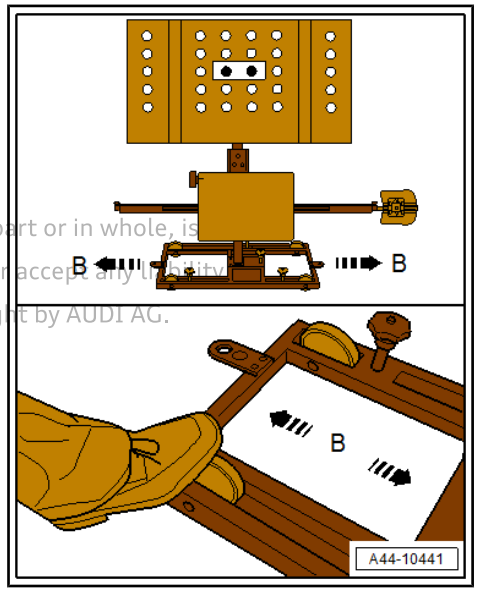
If the height of the calibration screen has to be corrected at a later stage of the procedure, the measuring bar must be set on the floor when making the adjustment.

– 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.

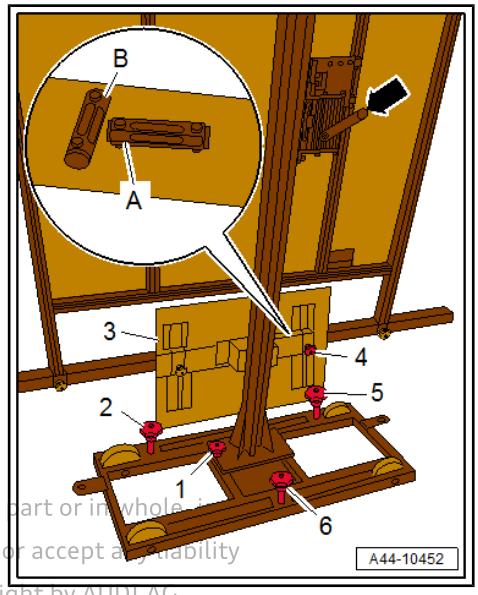


– Move -VAS 6430- sideways -arrow B- until display on wheel alignment computer is within tolerance.



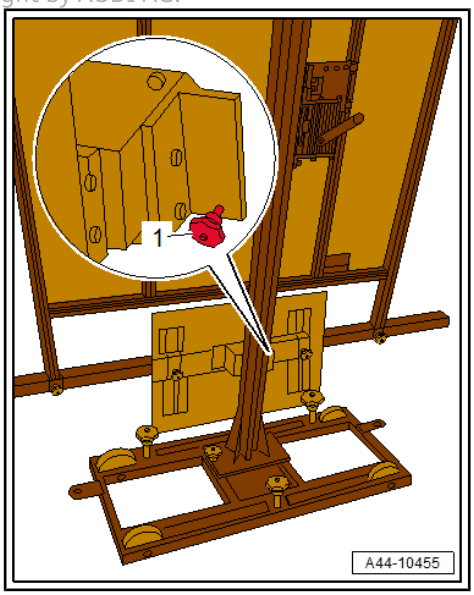
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– Secure by tightening bolts -2- and -3- -VAS 6430- lightly. (This will prevent the -VAS 6430- from rolling away).

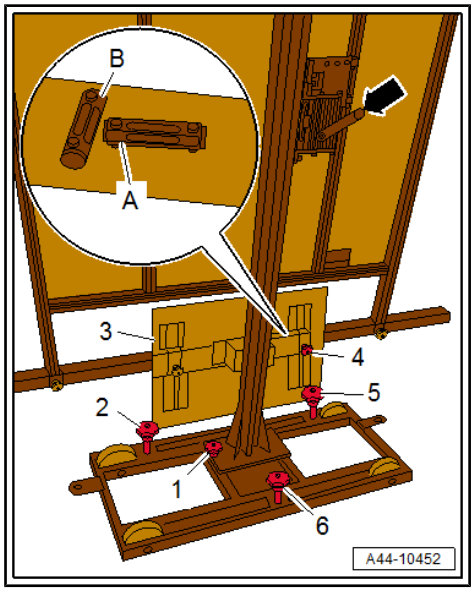


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– Turn fine adjustment screw -1- until display on wheel alignment computer is within tolerance.



– 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 346* *.*

The remaining steps are now performed via the vehicle diagnostic tester :

⇒ Vehicle diagnostic tester is connected.

– Select `Diagnosis` mode and begin diagnosis.
– Select `Test plan` tab.
– Choose `Select own test` and select following options one after the other:

- Body
- Electrical system
- 01 - Self-diagnosis compatible systems
- A5 - Front camera for driver assist systems - R242
- A5 - Front camera for driver assist systems, functions
- A5 - Calibrate control unit

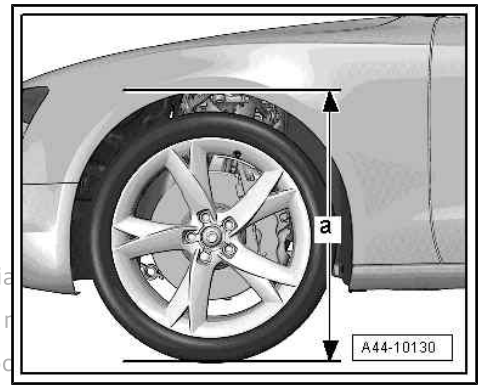
From this point you are guided through the calibration procedure by the ⇒ Vehicle diagnostic tester.

Then follow the instructions on the screen to perform the calibration.

Note

The next step required is to measure the height of the body.

– Enter dimension -a- for the height of the body, as noted previously.



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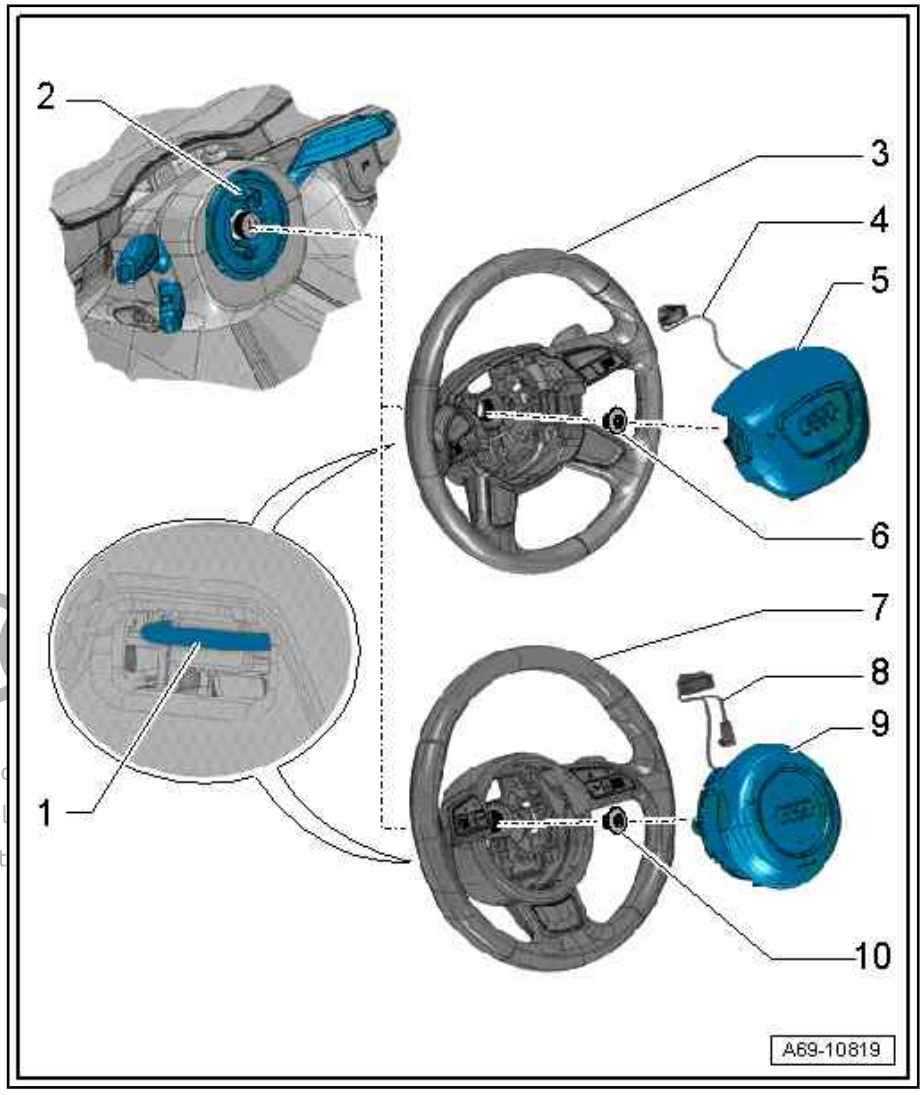
48 – Steering

1 Steering wheel

⇒ “1.1 Exploded view - steering wheel”, page 349

⇒ “1.2 Removing and installing steering wheel”, page 350

1.1 Exploded view - steering wheel



1 - Locking bar

2 - Steering column electronics control unit - J527-

- With airbag coil connector and return ring with slip ring - F138-
- Removing and installing ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Exploded view - steering column switch module

3 - Airbag steering wheel (4-spoke steering wheel)

- Different versions available ⇒ Electronic parts catalogue “ETKA”
- Removing and installing ⇒ page 350

4 - Wiring harness

- For airbag igniter on driver side - N95-

5 - Airbag unit

- With driver side airbag igniter - N95- and driver side airbag igniter 2 - N250-

WARNING

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); Exploded view - airbag (driver side)

6 - Bolt

- Always renew if removed
- 30 Nm +90°

7 - Airbag steering wheel (3-spoke steering wheel)

- Different versions available ⇒ Electronic parts catalogue “ETKA”

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❑ Removing and installing ⇒ page 350

8 - Wiring harness

❑ For airbag igniter on driver side - N95-

9 - Airbag unit

❑ With driver side airbag igniter - N95- and driver side airbag igniter 2 - N250-

WARNING

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); Exploded view - airbag (driver side)

10 - Bolt

❑ Always renew if removed

❑ 30 Nm +90°

1.2 Removing and installing steering wheel

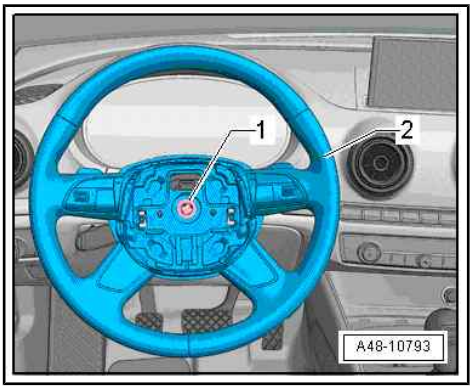
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-



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Removing



– Move steering wheel upwards and rearwards as far as possible, using the full range of the steering column adjuster.

– Remove airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag (driver side); Exploded view - airbag (driver side) .

Note

The steering must be in the centre position (wheels straight-ahead) when the steering wheel is removed and installed.

– Turn wheels to straight ahead position.

– Remove bolt -1-.

– Mark relative position of steering wheel to steering column with a felt-tip pen.

– Pull steering wheel -2- off steering column.

Installing

Install in reverse sequence, paying attention to the following:

Before fitting steering wheel, make sure wheels are in straight ahead position.

– If installing original steering wheel: Make sure marks on steering column and steering wheel coincide.

– If installing new steering wheel (no marks): Steering wheel must be mounted in centre position (spoke horizontal and wheels in straight-ahead position).

– Install airbag unit ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag (driver side); Exploded view - airbag (driver side) .

– Test-drive vehicle.

– If steering wheel is not straight, remove it again and adjust it on steering column splines.

Tightening torques

♦ ⇒ “1.1 Exploded view - steering wheel”, page 349

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2 Steering column

⇒ “2.1 Exploded view - steering column”, page 352

⇒ “2.2 Handling and transporting steering column”, page 353

⇒ “2.3 Checking steering column for damage”, page 354

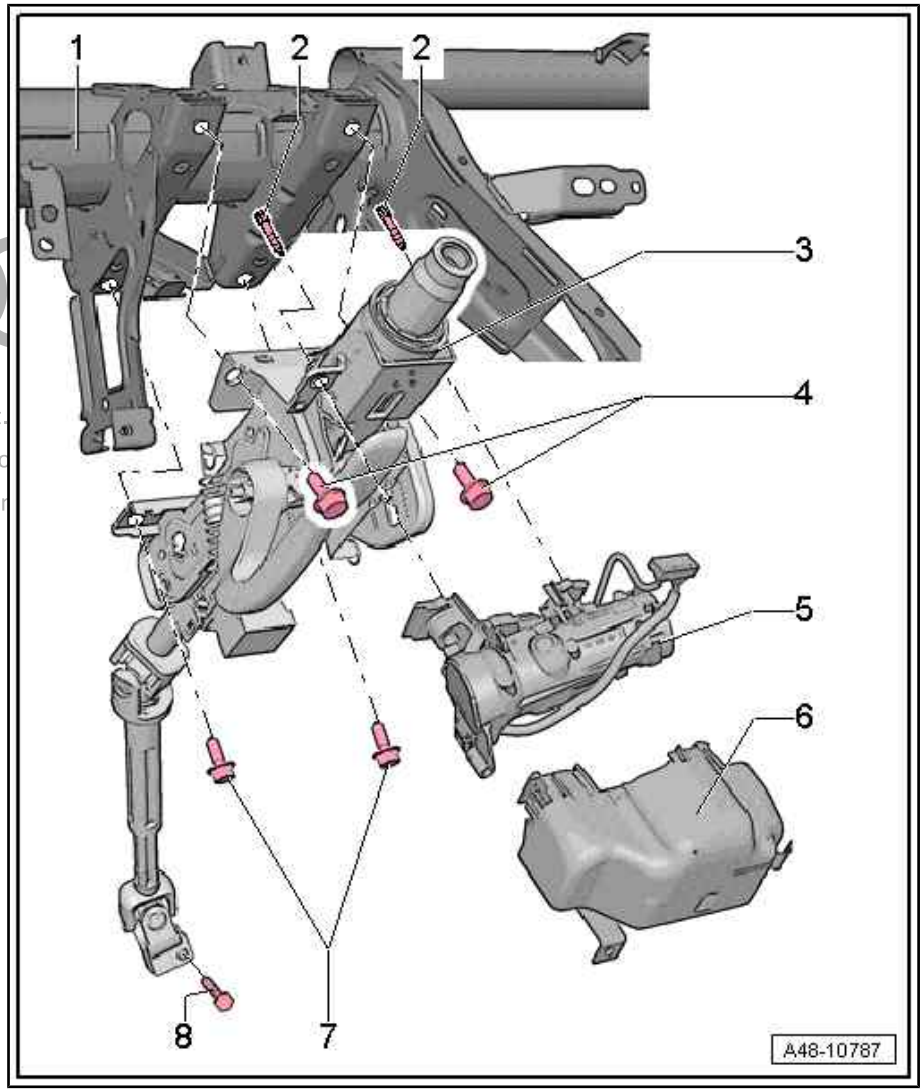
⇒ “2.4 Removing and installing steering column”, page 355

⇒ “2.5 Removing and installing control unit for electronic steering column lock J764 ”, page 359

2.1 Exploded view - steering column

Note

- *Always renew self-locking nuts.*
- *Always renew corroded nuts/bolts.*
- *Always renew bolts and nuts which are tightened by turning through a specified angle.*



1 - Central tube for dash panel

2 - Shear bolt

- ❑ Loosening and tightening ⇒ page 359

3 - Steering column

- ❑ Removing and installing ⇒ page 355
- ❑ When installing, steering column must be engaged at mounting bracket for central tube for dash panel (assists with installation).
- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”

4 - Bolt

- ❑ Always renew if removed
- ❑ 20 Nm

5 - Steering lock housing with lock cylinder and ignition/starter switch

- ❑ Removing and installing ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Exploded view - steering column switch module

6 - Control unit for electronic steering column lock - J764-

- ❑ Installed on vehicles with “keyless entry system”
- ❑ Removing and installing ⇒ page 359

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7 - Bolt

- ❑ Always renew if removed
- ❑ 20 Nm

8 - Bolt

- ❑ Always renew if removed
- ❑ Clean threaded hole (e.g. with a thread tap) before fitting new bolt
- ❑ 20 Nm +90°

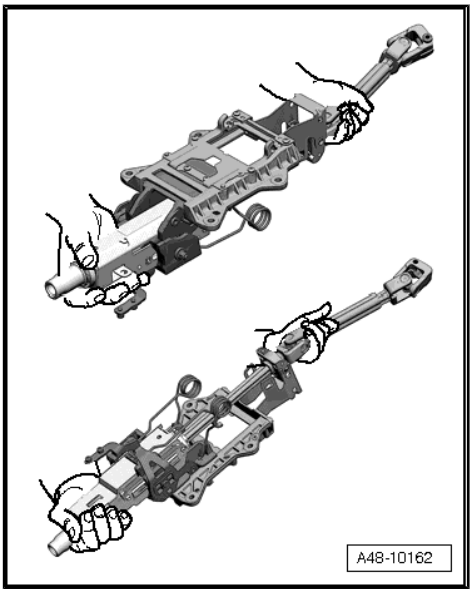
2.2 Handling and transporting steering column

WARNING

- *These instructions for handling the steering column MUST be observed at all times.*
- *Incorrect handling can damage the steering column and thus cause a safety risk.*

Correct handling and transportation of steering column

- Use both hands to carry the steering column.
- Take hold of the steering column at the top column tube and the upper universal joint.



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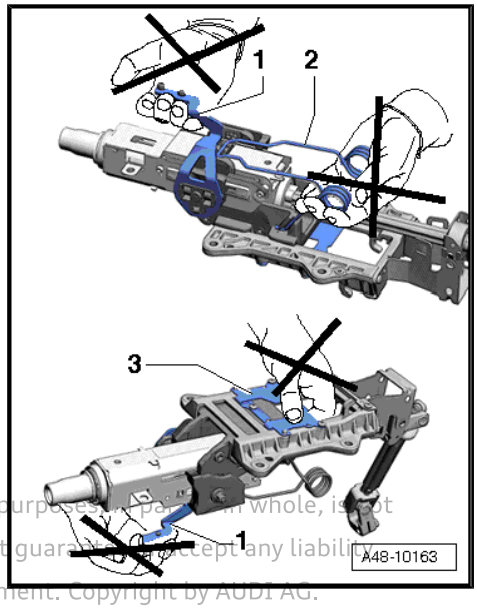
Incorrect handling of steering column

Carrying the steering column by the following parts will cause damage:

1 - Clamping lever

2 - Balance springs

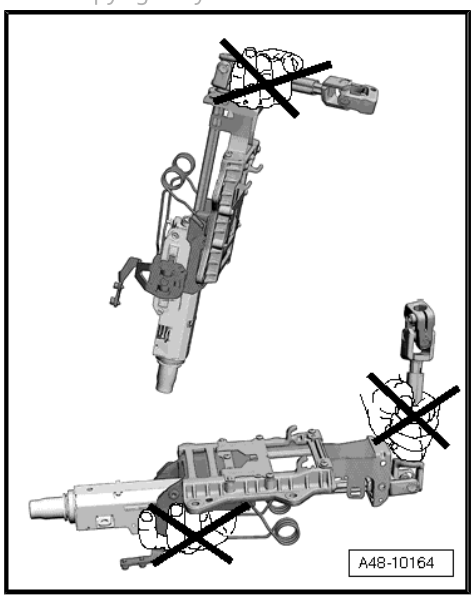
3 - Deformation element



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The bushes of the universal joint at the lower steering column bearing will be damaged by:

- Picking up and carrying the steering column by the jointed shaft with one hand.
- Bending the universal joints further than 90°.

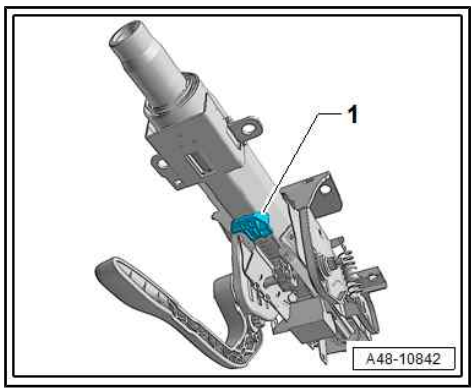


2.3 Checking steering column for damage

Visual inspection

– Check all steering column parts for damage.

– Check that steering column end stop -1- is firmly attached and undamaged.



Note

The steering column must be renewed if the steering column end stop is loose, damaged or missing.

Checking function

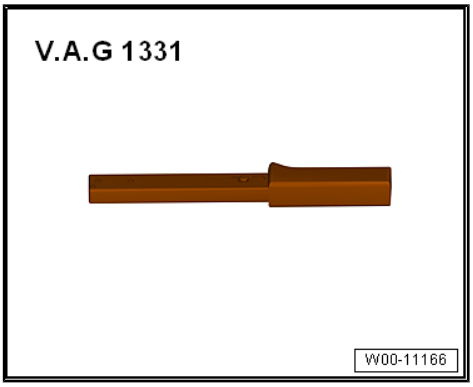
– Check that steering column turns easily and smoothly.

– Check that steering column can be adjusted for height and reach.

2.4 Removing and installing steering column

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



Removing

The replacement steering column is only supplied as a complete unit. Repair is not possible.

The steering lock housing can be transferred from the old unit ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Exploded view - steering column switch module .

The control unit for electronic steering column lock - J764- can be transferred from the old unit ⇒ page 359 .

– Turn wheels to straight ahead position.

– Pull down lever beneath steering column.

– Push steering column down as far as possible and pull out.

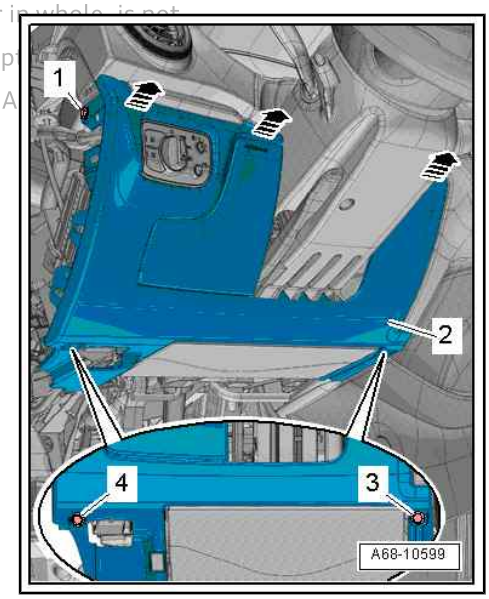
– Remove steering wheel ⇒ page 350 .

WARNING

Observe safety precautions for working on airbags ⇒ General body repairs, interior; Rep. gr. 00 ; Safety precautions; Safety precautions when working with pyrotechnic components .

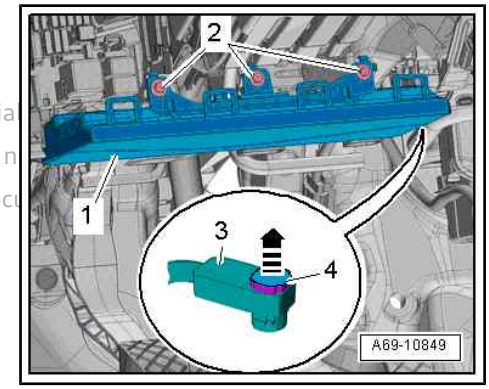
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– Remove dash panel cover (driver side) -2- ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers; Exploded view - dash panel cover (driver side) .



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– Remove knee airbag (driver's side) ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .



Caution

The surface of the knee airbag can be damaged by rough handling.

- ***After completing the repair, inspect the surface of the knee airbag visually to make sure it is undamaged, especially at the perforation.***

– Remove footwell vent below steering column ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Exploded view - routing of air flow and air distribution in passenger compartment .

– Unscrew securing nuts -arrows- and remove footwell trim.

– Remove steering column switch module ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Exploded view - steering column switch module .

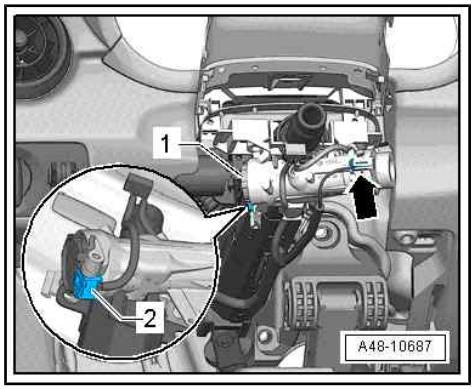


Vehicles with ignition/starter switch

– Unplug connector -arrow- from immobiliser reader coil - D2- .

– Unplug connector -2- from ignition/starter switch -1-.

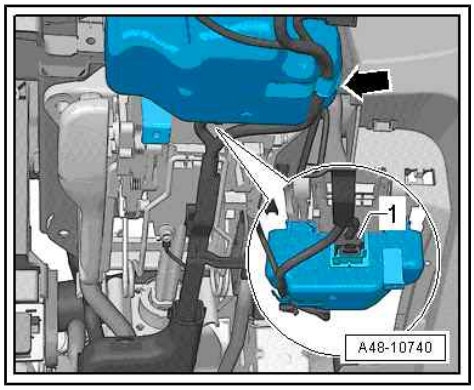
– Move electrical wiring clear.



Vehicles with keyless entry system

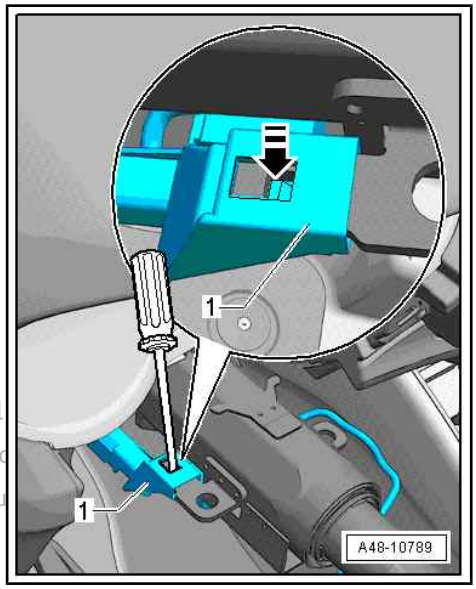
– Release connector -1- and detach from control unit for electronic steering column lock - J764- .

– Move electrical wiring clear at retaining bracket -arrow-.



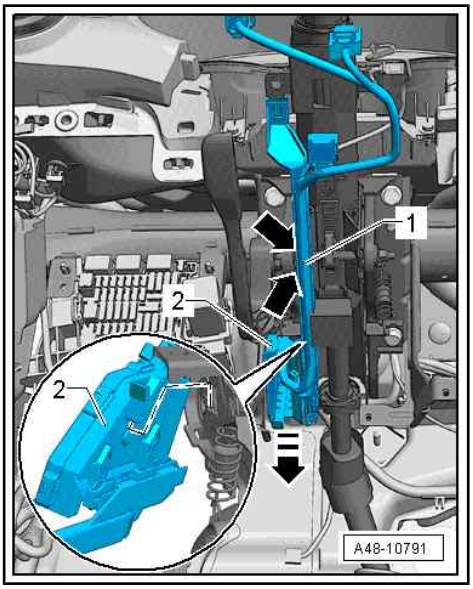
All vehicles (continued):

– Disengage lug -arrow- with a small screwdriver, pull cable guide -1- off metal tab towards front and detach from steering column.

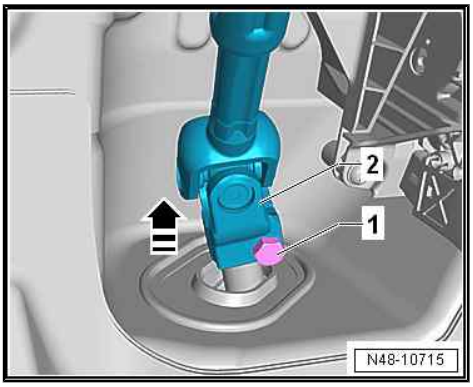


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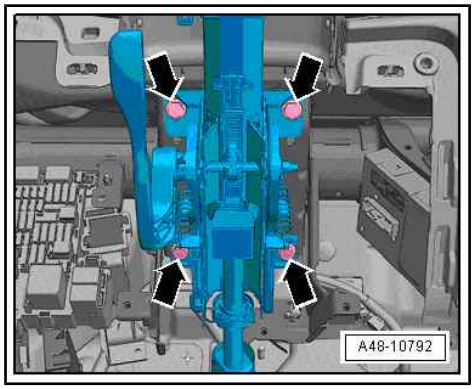
– Disengage lugs on cable guide -arrows- with a small screwdriver, pull cable guide -1- downwards and detach from steering column.
– Disengage wiring retainer (bottom) -2- and pull off downwards.
– Move electrical wire for steering column to side.



– Unscrew bolt -1- for universal joint -2- and pull universal joint off steering rack -arrow-.



– Remove bolts -arrows-, disengage steering column from mounting bracket upwards and remove.



Caution

Observe instructions for handling and transporting steering column ⇒ page 353 .

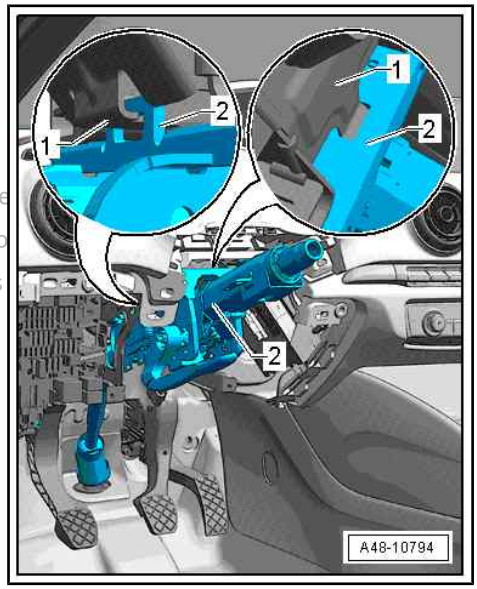
Installing

Install in reverse sequence, paying attention to the following:

– Hook steering column -2- into installation aids on mounting bracket -1- at top and bottom.

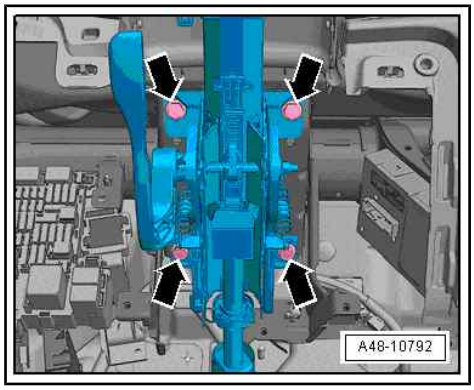
– Align steering column with mounting bracket and fit in position.

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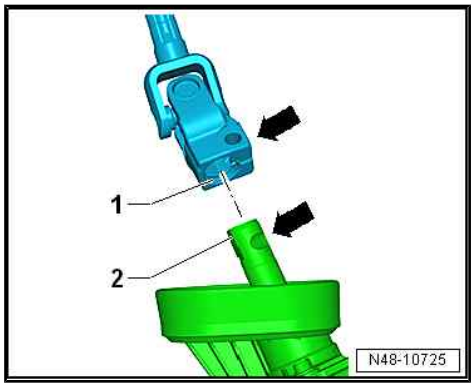
– Tighten top steering column bolts -arrows-.

– Tighten bottom steering column bolts -arrows- for steering column.



– Locate flat section of universal joint -1- on flat section of steering rack -2-.

• The slot on the steering rack must align exactly with the hole for the securing bolt -arrows-.



- Before fitting new bolt -1-, clean threaded hole with a thread tap or similar.

WARNING

With bolt -1- screwed into place, try to pull off universal joint to check that it is correctly seated. Then tighten bolt.

- After installing the steering column switch module, the steering angle sender - G85- must be calibrated; start the appropriate program on the ⇒ Vehicle diagnostic tester.

Tightening torques

- ⇒ “2.1 Exploded view - steering column”, page 352
- ⇒ Heating, air conditioning; Rep. gr. 87 ; Air routing; Exploded view - routing of air flow and air distribution in passenger compartment
- ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag
- ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Exploded view - steering column switch module

2.5 Removing and installing control unit for electronic steering column lock - J764-

Special tools and workshop equipment required

- Right angle drill
- Drill bit, 8.5 mm Ø

Removing

When renewing control unit, select “Replace” function for relevant control unit in “Guided Functions” on ⇒ vehicle diagnostic tester .

Follow the instructions on the screen.

– Turn wheels to straight ahead position.

– Pull down lever on side of steering column.

– Swing steering column down as far as possible and pull out.

– Press lever on side of steering column back up.

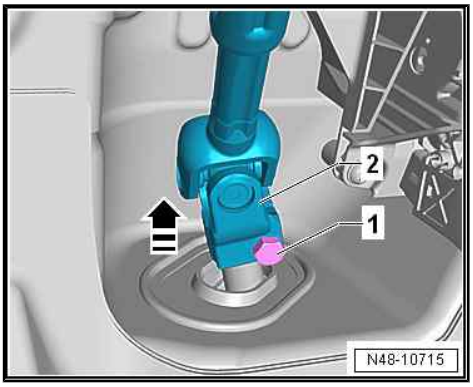
– Remove steering column switch module ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Exploded view - steering column switch module .

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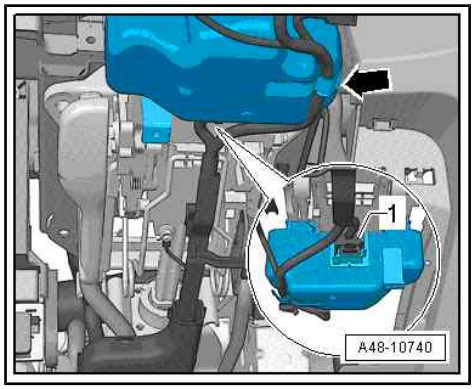
Caution

No swarf must enter the steering column.

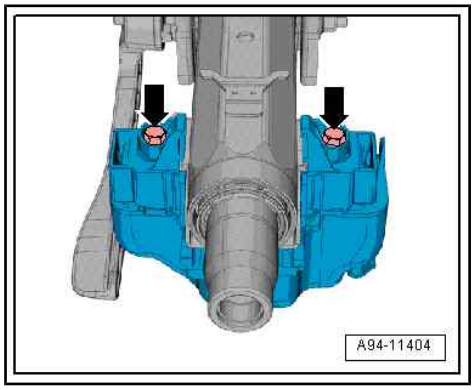
Use a cloth or similar to prevent swarf from dropping into the steering column.



– Release connector -1- and detach from control unit for electronic steering column lock - J764- .
– Move electrical wiring clear at retaining bracket -arrow-.



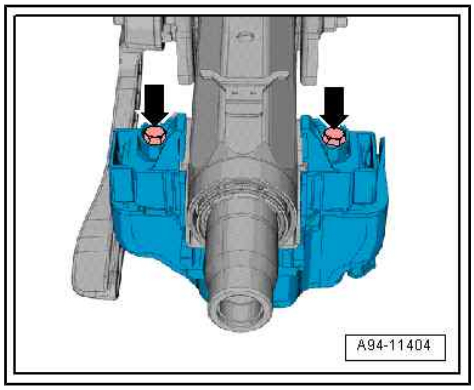
– Drill out shear bolts-arrows- using right angle drill with 8.5 mm Ø bit.
– Remove swarf with small brush.
– Carefully detach control unit for electronic steering column lock - J764- from steering column.



Installing

Installation is carried out in reverse sequence. Note the following:

– Secure control unit for electronic steering column lock - J764- with new shear bolts -arrows-.
– Tighten shear bolts -arrows- evenly until bolt heads shear off.
– If the control unit for electronic steering column lock - J764- has been renewed it must be adapted; select “Replace” function in “Guided Functions” on ⇒ vehicle diagnostic tester .



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3 Steering rack

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⇒ “3.1 Exploded view - steering rack”, page 361

⇒ “3.2 Servicing steering rack”, page 363

⇒ “3.3 Handling and transporting steering rack”, page 364

⇒ “3.4 Removing and installing steering rack”, page 364

⇒ “3.5 Removing and installing boot”, page 366

⇒ “3.6 Removing and installing track rod”, page 369

⇒ “3.7 Removing and installing track rod ball joint”, page 371

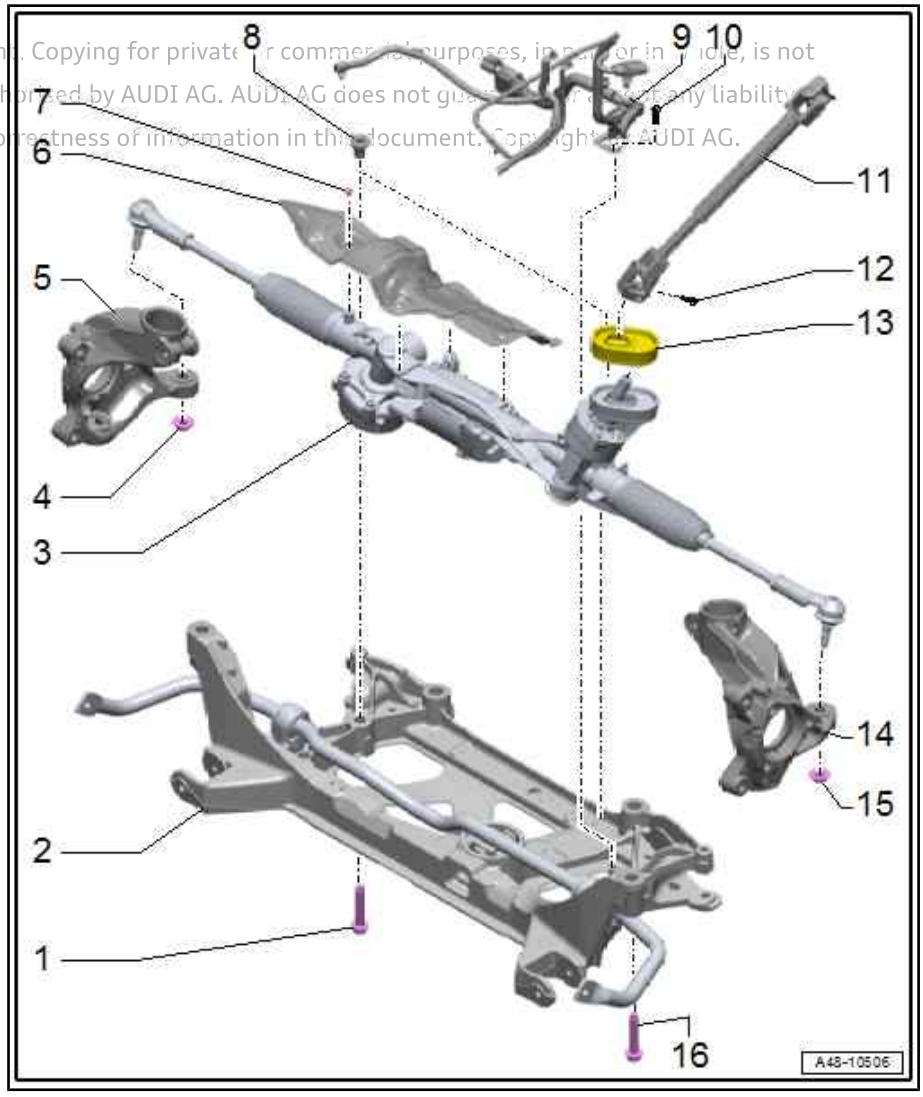
3.1 Exploded view - steering rack

If front axle components (axle parts and/or rim) are renewed due to deformations, the tightening torques at the following bolted connections must be checked if they were not renewed as part of the repair work:

- 80 Nm test torque for nut ⇒ Item 4 (page 362) and ⇒ Item 15 (page 363) to track rod ball joint ⇒ Item 1 (page 363) and ⇒ Item 8 (page 363) .
- 55 Nm test torque for locking nut for track rod ⇒ Item 2 (page 363) and ⇒ Item 9 (page 363) .

The connection must not turn until the test torque in the tightening direction is reached.

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1 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +90°

2 - Subframe

3 - Power steering rack

- ❑ Different versions available ⇒ Electronic parts catalogue “ETKA”
- ❑ Incorporates power steering control unit - J500- and steering angle sender - G85-
- ❑ Power steering control unit - J500- and steering angle sender - G85- can be checked via `Guided Fault Finding` ⇒ Vehicle diagnostic tester
- ❑ Power steering control unit - J500- and steering angle sender - G85- cannot be renewed separately. If defective, renew steering rack
- ❑ Removing and installing steering rack ⇒ page 364

4 - Nut

- ❑ Renew after removing
- ❑ When tightening, counterhold socket of track rod ball joint
- ❑ 20 Nm +90°

5 - Wheel bearing housing (right-side)

6 - Heat shield

- ❑ Different versions possible depending on engine version. Refer to ⇒ Electronic parts catalogue “ETKA”

7 - Bolt

- ❑ Either 3x or 4x are fitted depending on engine version. Refer to ⇒ Electronic parts catalogue “ETKA”
- ❑ To secure electrical wiring.
- ❑ 6 Nm

8 - Threaded bush

- ❑ 2x

9 - Electrical wire

10 - Expanding clip

11 - Steering shaft with universal joint

12 - Bolt

- ❑ Tightening torque ⇒ Item 8 (page 353)
- ❑ Always renew if removed
- ❑ Clean threaded hole (e.g. with a thread tap) before fitting new bolt

13 - Seal

- ❑ Renew if damaged

14 - Wheel bearing housing (left-side)

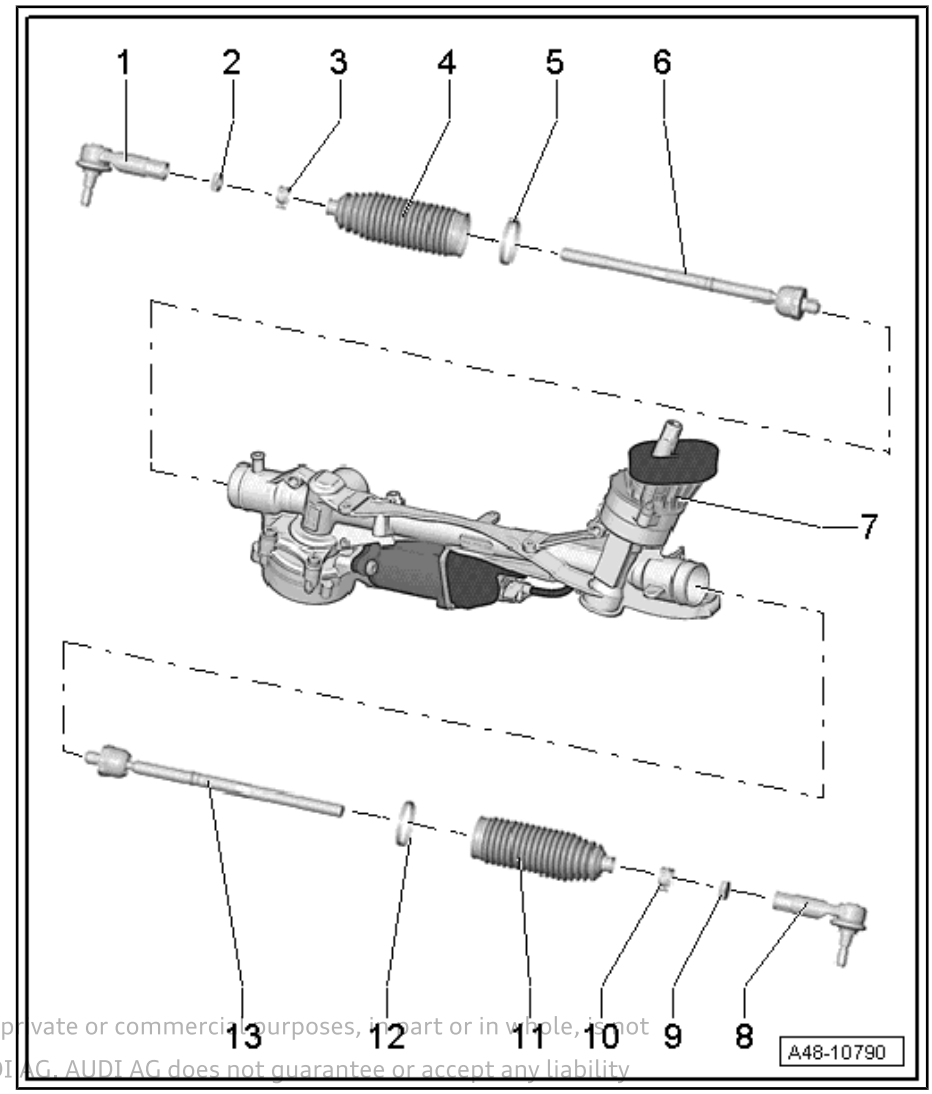
15 - Nut

- ❑ Renew after removing
- ❑ When tightening, counterhold socket of track rod ball joint
- ❑ 20 Nm +90°

16 - Bolt

- ❑ Always renew if removed
- ❑ 70 Nm +90°

3.2 Servicing steering rack



1 - Track rod ball joint (right-side)

- ❑ Check that dust caps are seated correctly and not damaged

2 - Nut

- ❑ Counterhold at track rod ball joint when loosening and tightening
- ❑ 70 Nm

3 - Spring-type clip

4 - Boot

- ❑ Removing and installing ⇒ page 366
- ❑ Check for damage
- ❑ Must not be twisted when toe setting has been adjusted

5 - Hose clip

- ❑ Always renew if removed
- ❑ Secure new hose clip using locking pliers for Phaeton steering rack - VAS 6199-

6 - Track rod

- ❑ If defective, also renew track rod ball joint
- ❑ Removing and installing ⇒ page 369
- ❑ 100 Nm

7 - Steering rack housing

8 - Track rod ball joint (left-side)

- ❑ Check that dust caps are seated correctly and not damaged

9 - Nut

- ❑ Counterhold at track rod ball joint when loosening and tightening
- ❑ 70 Nm

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10 - Spring-type clip

11 - Boot

- ❑ Removing and installing ⇒ page 366
- ❑ Check for damage
- ❑ Must not be twisted when toe setting has been adjusted

12 - Hose clip

- ❑ Always renew if removed
- ❑ Secure new hose clip using locking pliers for Phaeton steering rack - VAS 6199-

13 - Track rod

- ❑ If defective, also renew track rod ball joint
- ❑ Removing and installing ⇒ page 369
- ❑ 100 Nm

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3.3 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.*

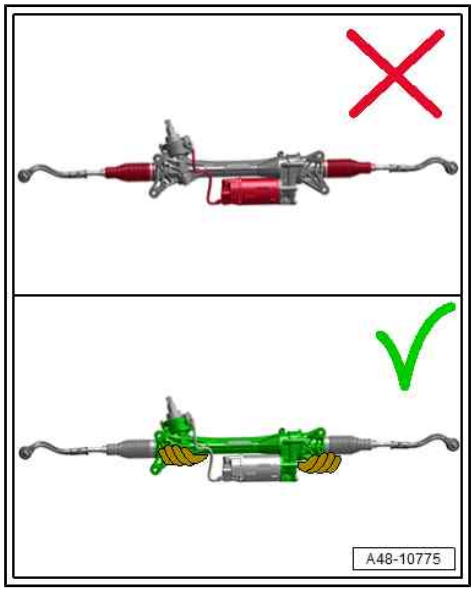
Incorrect handling and transport of the steering rack

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

WARNING

Risk of injury to hands.

- ♦ *Put on protective gloves.*

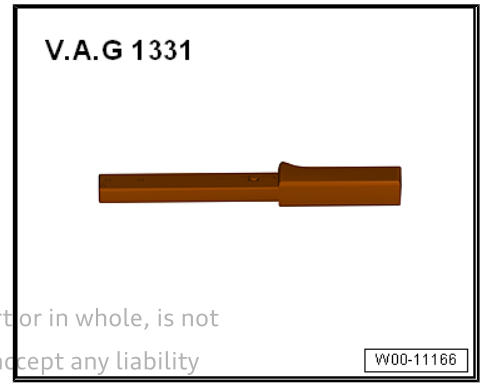
– Use both hands to carry the steering rack.

– Hold the steering rack only at the areas shown in green.

3.4 Removing and installing steering rack

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



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♦ Torque wrench - V.A.G 1332-



Removing

– Remove subframe with steering rack ⇒ page 43 .

– Remove bolts -1-.

– Detach steering rack from subframe.

Installing

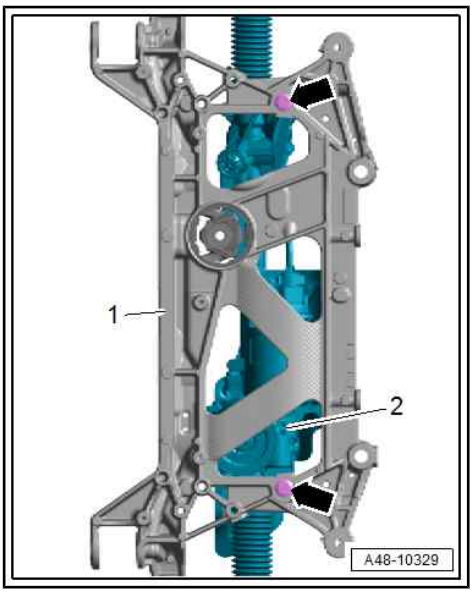
Installation is carried out in reverse sequence. Note the following:

Note

♦ *Coat seal on steering rack with suitable lubricant, e.g. soft soap, before installing steering rack.*

♦ *After positioning steering rack in relation to steering column shaft, ensure seal on steering rack makes snug contact with base plate, without kinks, and properly seals off opening to footwell. Otherwise, this can result in water leaks and/or noise.*

♦ *Make sure sealing surfaces are clean.*

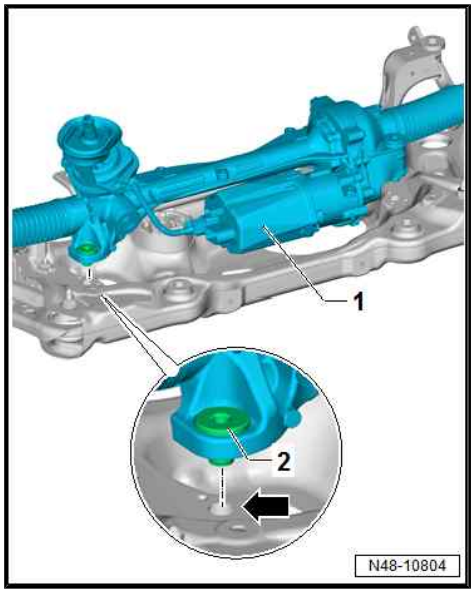


– Locate steering rack -1- in position on subframe.

• Threaded sleeves -2- on steering rack must be fitted in holes -arrow- in subframe.

– Fit bolts for steering rack.

– Install subframe with steering rack ⇒ page 43 .



Note

Ensure sealing boot is not damaged or twisted.

– If the steering rack has been removed and re-installed or if a new steering rack has been installed, calibrate steering angle sender - G85- using ⇒ Vehicle diagnostic tester Basic setting function.

• If a new steering rack has been installed, the power steering control unit - J500- must be adapted. ⇒ Vehicle diagnostic tester - “Replace control unit” function

• If steering rack has been removed and re-installed, check position of steering wheel by test-driving vehicle. Wheel alignment must be checked and adjusted if steering wheel is not in central position ⇒ page 310 .

• Perform wheel alignment after installing a new steering rack ⇒ page 310 .

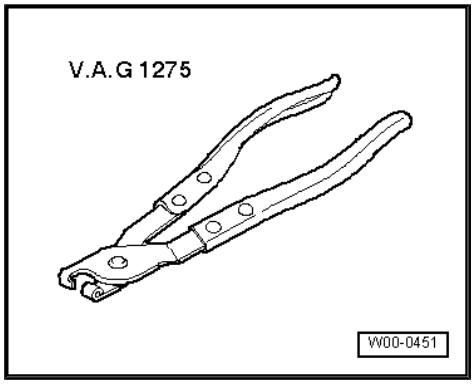
Tightening torques

♦ ⇒ “3.1 Exploded view - steering rack”, page 361

3.5 Removing and installing boot

Special tools and workshop equipment required

♦ Hose clip pliers - V.A.G 1275-

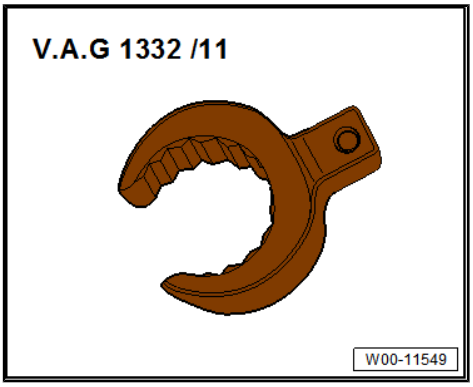


♦ Torque wrench - V.A.G 1332-

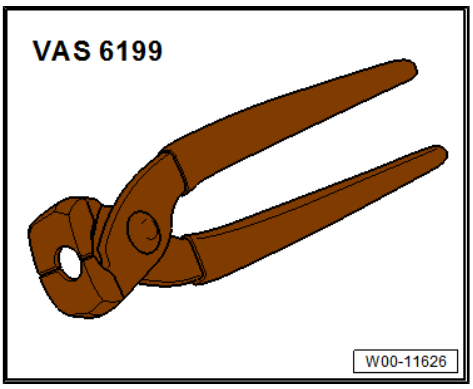
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♦ Ring spanner insert, AF 24 - V.A.G 1332/11-



♦ Locking pliers for Phaeton steering rack - VAS 6199-



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Removing

Caution

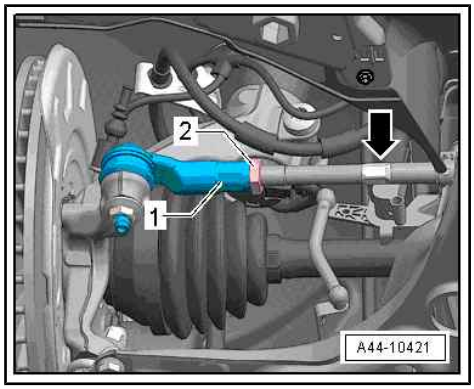
If boot is damaged, moisture and dirt can enter steering rack and cause irreparable damage.

- *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.*

– Observe rules for cleanliness ⇒ page 7 .
– Turn steering wheel to straight-ahead position.
– Remove wheel ⇒ page 309 .
– Clean outside of steering rack in area of rubber boot.

• No dirt must be allowed to enter the steering rack through a defective rubber boot during this operation.

– Mark position of nut -2- on track rod.
– Loosen nut -2- (counterhold track rod ball joint -1-).
– Loosen spring-type hose clip ⇒ Item 10 (page 364) on rubber boot using hose clip pliers - V.A.G 1275- and push onto track rod.
– Remove O-type hose clip ⇒ Item 5 (page 363) and detach rubber boot from steering rack housing.
– Now unscrew track rod from track rod ball joint.
– Unscrew nut from track rod.
– Detach rubber boot with spring-type clip from track rod.



Installing

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

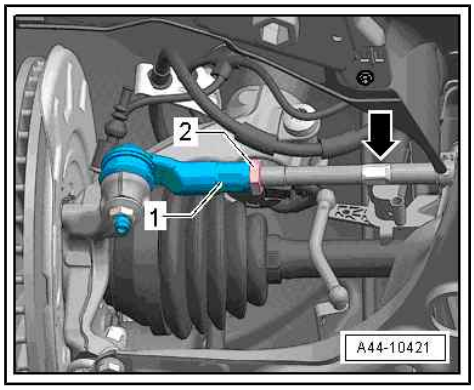
- Always renew boot if removed

Caution

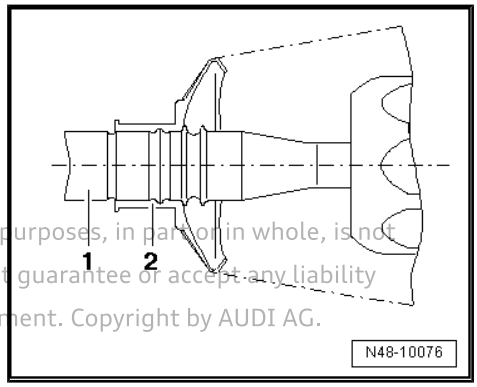
Risk of damage to boot if it is handled incorrectly.

- ***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.
– Turn steering wheel to straight-ahead position.
– Fit new hose clips and rubber boot onto track rod.
– Screw in track rod until the mark applied upon removal is just visible.
– Tighten lock nut -2- to specified torque (counterhold track rod ball joint -1- for this purpose).
– Lightly grease sealing point between rubber boot and track rod with grease from repair kit.

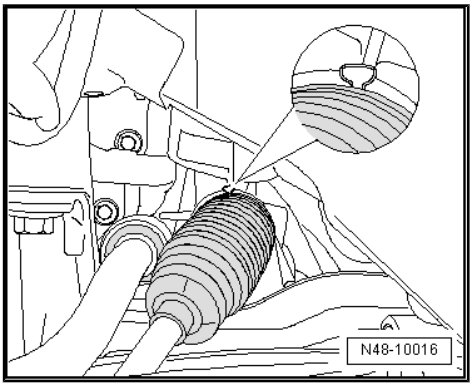


– Push rubber boot -2- onto track rod -1- as shown in illustration.
– Secure spring-type hose clip onto rubber boot using hose clip pliers - V.A.G 1275- .
– Lightly grease sealing point between rubber boot and steering rack housing with grease from repair kit.



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– Push rubber boot onto steering rack housing.
– Tighten new O-type hose clip using locking pliers for steering rack - VAS 6199- as far as shown in illustration.
– Check wheel alignment ⇒ page 310 .
– Perform basic setting of steering angle sender - G85- in “Guided Fault Finding” mode of ⇒ Vehicle diagnostic tester.
– Then perform basic setting of steering in “Guided Fault Finding” mode of ⇒ Vehicle diagnostic tester.



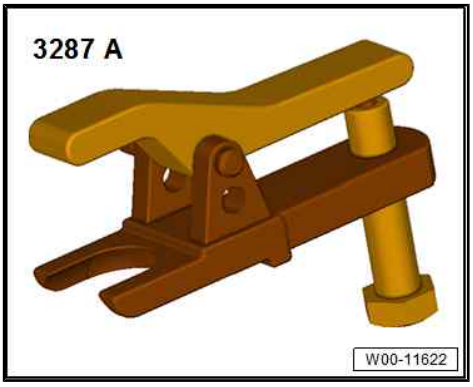
Tightening torques

♦ ⇒ “3.2 Servicing steering rack”, page 363
♦ ⇒ “1 Wheels, tyres”, page 309

3.6 Removing and installing track rod

Special tools and workshop equipment required

♦ Ball joint puller - 3287 A-



♦ Torque wrench - V.A.G 1332-



♦ Open-end spanner attachment - V.A.G 1923-



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Removing

– Remove rubber boot ⇒ page 366 .

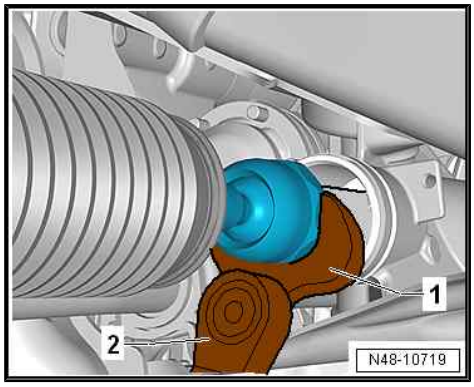
– Turn steering as follows:

- Turn steering to full right lock for left track rod.
- Turn steering to full left lock for right track rod.

– Unscrew track rod.

1 - Open-end spanner attachment - V.A.G 1923-

2 - Torque wrench - V.A.G 1332-



Caution

If boot is damaged, moisture and dirt can enter steering rack and cause irreparable damage.

- *Check that there is a visible film of lubricant on splines of steering rack.*
- *Renew steering rack if no film of lubricant is present.*

Installing track rod

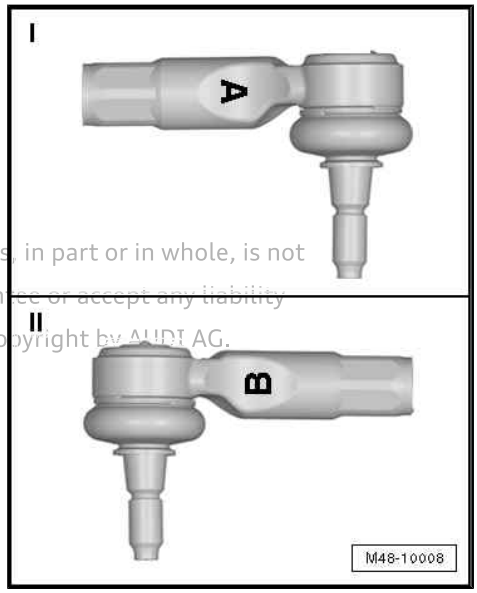
– Be sure to install the correct track rod ball joint on each side.

I - Track rod ball joint for right side of vehicle is marked “A”.

II - Track rod ball joint for left side of vehicle is marked “B”.

– Turn steering wheel to straight-ahead position.

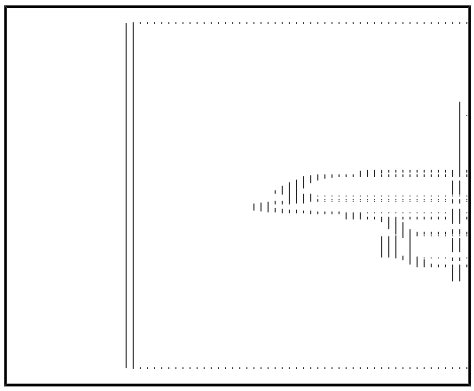
– Fit new hose clips and rubber boot onto track rod.



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– Screw track rod into track rod ball joint until dimension -a- is obtained.

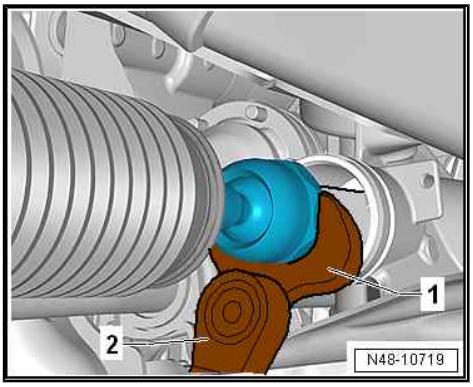
Dimension -a- = 373 ± 1 mm



– Screw track rod into rack and tighten to specified torque.

1 - Open-end spanner attachment - V.A.G 1923-

2 - Torque wrench - V.A.G 1332-



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

– Install rubber boot ⇒ page 366 .
– Check wheel alignment ⇒ page 310 .
– Perform basic setting of steering angle sender - G85- ⇒ Vehicle diagnostic tester.
– Perform basic setting of steering ⇒ Vehicle diagnostic tester.

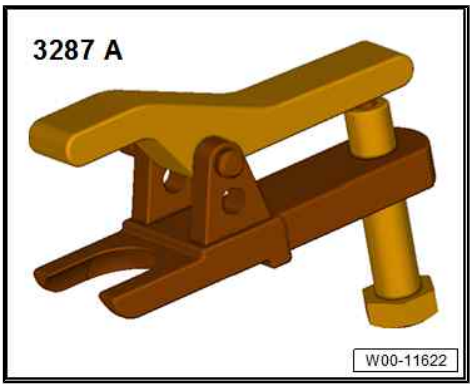
Tightening torques

- ⇒ “3.2 Servicing steering rack”, page 363
- ⇒ “3.1 Exploded view - steering rack”, page 361

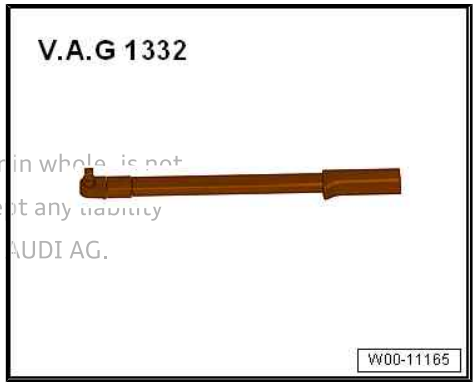
3.7 Removing and installing track rod ball joint

Special tools and workshop equipment required

- Ball joint puller - 3287 A-

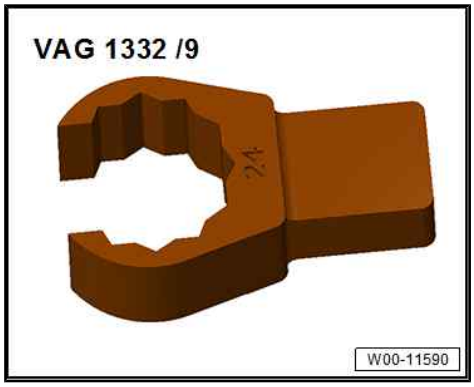


- Torque wrench - V.A.G 1332-



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♦ Tool insert - V.A.G 1332/9-

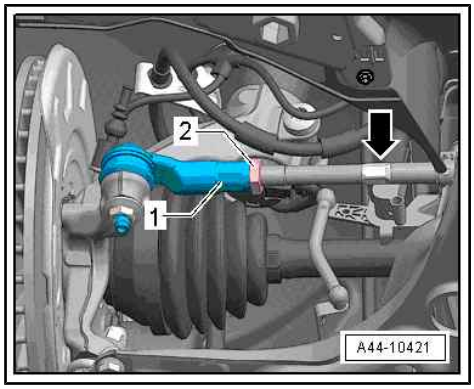


Removing track rod ball joint

– Turn steering wheel to straight-ahead position.

– Remove front wheel ⇒ page 309 .

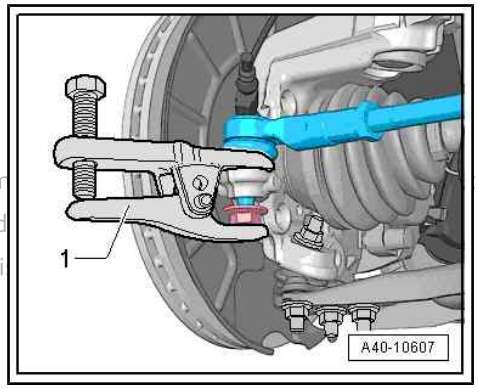
– Loosen nut -2- (counterhold track rod ball joint -1-).



– Slacken off nut on track rod ball joint (but do not remove yet).

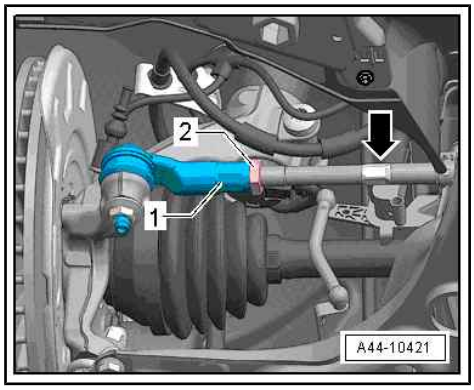
• Leave nut screwed on a few turns to protect threads on joint pin.

– Press track rod ball joint off wheel bearing housing using ball joint puller - 3287 A- -1- and then remove nut.

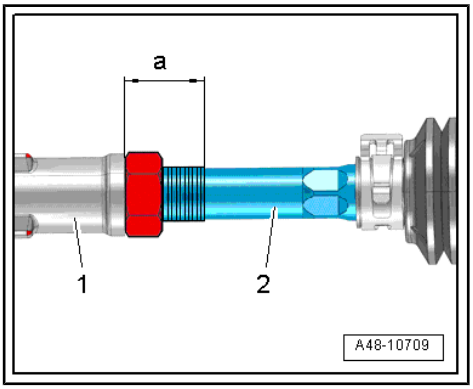


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– Unscrew track rod ball joint -1- from track rod (counterhold at hexagon flats on track rod -arrow-).



Installing track rod ball joint



Installation is carried out in reverse sequence. Note the following:

– Screw track rod ball joint -1- onto track rod -2-.

- Dimension -a- must be the same on left side and right side track rod ball joint.
- Maximum permissible difference between right and left < 2 mm.

Remaining installation steps are the reverse of removal; note the following:

– Check wheel alignment ⇒ page 310 .

Tightening torques

- ⇒ “3.2 Servicing steering rack”, page 363
- ⇒ “3.1 Exploded view - steering rack”, page 361
- ⇒ “1 Wheels, tyres”, page 309

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