

Workshop Manual Audi TT 2007 ➤

Running gear, front-wheel drive and four-wheel drive

Edition 08.2010



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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 Technical data

⇒ "1.1 Running gear", page 1

⇒ "1.2 Steering", page 1

⇒ "1.3 Wheels, tyres", page 1

1.1 Running gear

Front-wheel drive and four-wheel drive	
Front axle MacPherson struts with bottom wishbones Subframe Anti-roll bar	
Rear axle	Four-link suspension with separate spring/shock absorber layout Tubular anti-roll bar
Wheelbase mm	2467
Track width (front/rear) 1) mm	1572 / 1558

¹⁾ Front/rear track width only applicable to tyre size 225/55/R16 on 7.5Jx16 ET45 rims (ET= rim offset)

1.2 Steering

Front-wheel drive and four-wheel drive	
Steering Electro-mechanically assisted, maintenance-free rack-and-pinion stee box	
Maximum steering angle at inside wheel copyright. Copyring for private of	36° 48' r commercial purposes, in part or in whole, is not
Turning-circle diameters of informa	ion in this document. Copyright by AUDI AG. approx. 10.9 m

1.3 Wheels, tyres

For general information on wheel/tyre combinations, winter tyres, snow chains and recommended tyre makes, refer to \Rightarrow Wheel/ Tyre Guide .

2 Proper disposal of fluid-filled components

- ⇒ "2.1 Releasing gas in gas-filled shock absorbers (front)",
- ⇒ "2.2 Releasing gas in gas-filled shock absorbers (rear)", page 3
- "2.3 Releasing gas in Audi magnetic ride shock absorbers (front)", page 3
- ⇒ "2.4 Releasing gas in Audi magnetic ride shock absorbers (rear)", page 4

2.1 Releasing gas in gas-filled shock absorbers (front)

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



WARNING

Safety goggles must be worn when drilling.

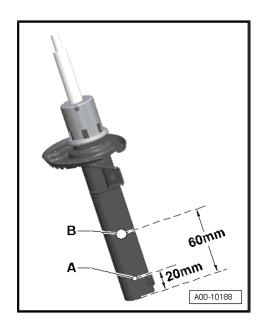
Drill a 3 mm Ø hole -arrow A- through outer tube of shock absorber.



Note

Gas will escape during drilling.

- Continue drilling until inner tube is fully penetrated (approx. 25 mm deep).
- Drill a second 6 mm \varnothing 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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Clamp gas-filled shock absorber vertically in vice, with piston rod pointing downwards.



WARNING

Safety goggles must be worn when drilling.

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



Note

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Gas will escape during drilling.

- Continue drilling until inner tube is fully penetrated (approx. 25 mm deep).
- Drill a second 6 mm Ø 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.

2.3 Releasing gas in Audi magnetic ride shock absorbers (front)

Clamp magnetic ride shock absorber vertically in a vice.



WARNING

Safety goggles must be worn when drilling.

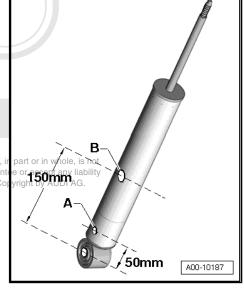
Drill a 3 mm Ø hole -arrow A- through outer tube of shock absorber.

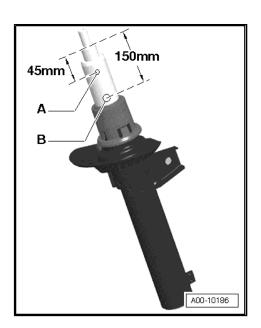


Note

Gas will escape during drilling.

- Drill a second 6 mm Ø 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.





2.4 Releasing gas in Audi magnetic ride shock absorbers (rear)

Clamp magnetic ride shock absorber vertically in vice with piston rod facing downwards.



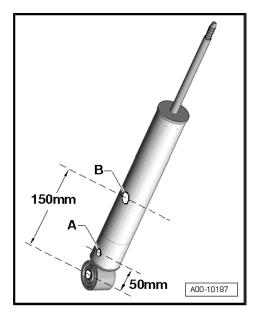
WARNING

Safety goggles must be worn when drilling.

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

ecNote opyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG. as will escape during drilling.

- Drill a second 6 mm Ø 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.



3 Checking shock absorbers

- ⇒ "3.1 Leaks at shock absorbers", page 5
- ⇒ "3.2 Checking shock absorbers when removed", page 5
- ⇒ "3.3 Checking shock absorbers on shock tester", page 6

3.1 Leaks at shock absorbers

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

Slight loss of fluid ("sweating") at the piston rod seal is not a reason for replacing a shock absorber. A shock absorber with slight fluid leakage can be accepted as "OK" under the following con-

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

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3.2 Checking shock absorbers when removed

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



Note

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

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

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

V40-1334



Note

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

3.3 Checking shock absorbers on shock tester

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

Special tools and workshop equipment required

- Boge shock tester or
- ♦ Sachs shock tester -V.A.G 1975- or
- ♦ Maha shock absorber tester -VAS 1990-



Note

- ♦ Temperature +10 ... +40 °C.
- Driver in vehicle.
- ♦ Vehicle stationary.
- ♦ Correct tyre inflation pressure.
- 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.
- ♦ Ignition on.
- Test mode active on vehicles with Audi magnetic ride (AMR)

 electronic damping control.

Activating test mode for Audi magnetic ride (AMR) - electronic damping control

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Press shock absorber damping adjustment button in this document. Copyright by AUDI AG.

⇒ page 45 in centre console and hold for over 5 seconds.

Diode in shock absorber damping adjustment button -E387flashes during test mode.

The test mode is deactivated when shock absorber damping adjustment button -E387- ⇒ page 45 is pressed again, when the ignition is switched off, or when the vehicle is driven at a speed of at least 10 km/h.

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 more detailed 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 stated values are exceeded, the shock absorber action has deteriorated to such an extent that replacement is recommended.

Example:

Maximum value = 70

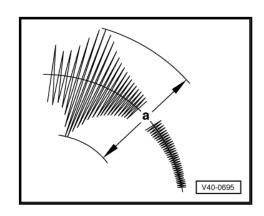
- a = higher than 70: unsatisfactory damping effect
- ♦ a = lower than 70: satisfactory damping effect

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.



Front axle	Damping effect	
	Inadequate	Adequate
Standard running gear (1BA)	a = Greater than 60	a = Less than 60
Sports running gear (1BV)	a = Greater than 60	a = Less than 60
Sports running gear (1BD)	a = Greater than 60	a = Less than 60

Rear axle	Damping effect	
	Inadequate	Adequate
Standard running gear (1BA)	a = Greater than 60	a = Less than 60
Sports running gear (1BV)	a = Greater than 60	a = Less than 60
Sports running gear (1BD)	a = Greater than 60	a = Greater than 60

Vehicles with Audi magnetic ride (AMR) - electronic damping control



Note

These values apply only when the test mode is activated ⇒ page 6 (in test mode, a diode flashes in the shock absorber damping adjustment button -E387- ⇒ page 45).

Front axle Damping effect		effect
	Inadequate	Adequate
Sports running gear (1BL)	a = Greater than 50	a = Less than 50
Sports running gear (1BQ)	a = Greater than 50	a = Less than 50

Rear axle	Damping effect	
	Inadequate	Adequate
Sports running gear (1BL)	a = Greater than 50	a = Less than 50
Sports running gear (1BQ)	a = Greater than 50	a = Less than 50



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Front suspension

General notes

- ⇒ "1.1 General information", page 9
- ⇒ "1.2 Contact corrosion", page 10
- ⇒ "1.3 Repairing threads in longitudinal member", page 10
- ⇒ "1.4 Lifting suspension to unladen position", page 11
- ⇒ "1.5 Exploded views of front axle", page 13

1.1 General information

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

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 or pneumatic pipes or electrical wires. This ensures re-installation at the original location.

Any cable ties, brackets or fasteners removed during repair work purposes, in part or in whole, is not must be re-attached at their original standard locations. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

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

When working on the vehicle, do not allow the drive shafts to hang down under their own weight and never let the joints bend to such an extent that they contact the end stop.

Do not attempt to move the vehicle without the drive shafts fitted; this would result in wheel bearing damage. If 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 120 Nm (twelve-point bolt) or 200 Nm (hexagon bolt).

Bonded rubber bushes can only be turned to a limited extent. The suspension must therefore always be in the unladen position or the reference position when the suspension link attachments are tightened.

 Lifting suspension to unladen position (vehicles with coil springs)

⇒ "1.4 Lifting suspension to unladen position", page 11

If the wheel alignment has to be checked and adjusted at a later stage, all bolts and nuts which need to be slackened to make adjustments should initially only be tightened to the specified torque figure. After wheel alignment has been checked and adjusted,



bolts and nuts must then be fully tightened by turning them through the specified angle.



WARNING

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

1.2 Contact corrosion

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

For this reason, all the fasteners on the vehicle have a special surface coating.

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

Always install new parts as listed in the Parts catalogue if you are not sure whether used parts can be refitted y copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability Note: with respect to the correctness of information in this document. Copyright by AUDI AG.

- We recommend using only genuine replacement parts; these have been tested and are compatible with aluminium.
- We recommend the use of Audi accessories.
- Damage resulting from contact corrosion is not covered under the warranty.

1.3 Repairing threads in longitudinal mem-

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

- Each thread can only be repaired once.
- If a second repair is needed, the captive nut must be renewed.



WARNING

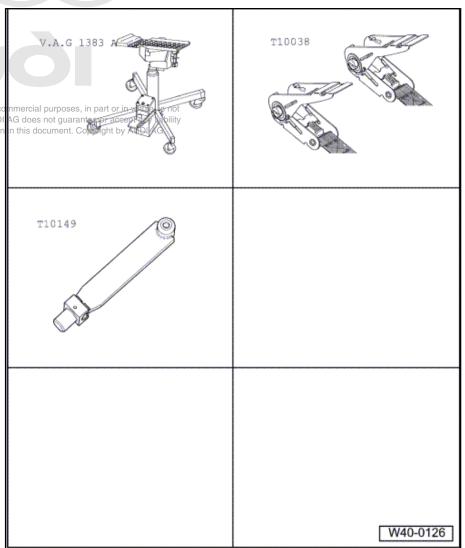
Always wear safety goggles when drilling.

- Have all thread repairs checked by foreman or supervisor.
- The thread insert must be of the same length as the thread in the body.
- Repair any damage to underseal ⇒ Body Repairs; Rep. gr. 00; Corrosion protection measures

1.4 Lifting suspension to unladen position

Special tools and workshop equipment required

- Engine and gearbox jack -V.A.G 1383 A-
- ◆ Tensioning strap -T10038-
- ◆oteSupporty型 10149g for private or commercial purposes, in part of permitted unless authorised by AUDI AG. AUDI AG does not guarant with respect to the correctness of information in this document. Cought





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 of the unladen vehicle 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 -V.A.G 1383 A- and support -T10149-.

 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).

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

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

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

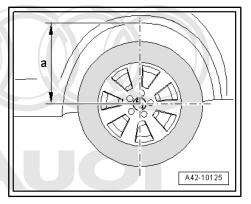
- Turn wheel hub until one of the wheel bolt holes is at the top. Copying for private or commercial purposes, in part or in whole, is not
- Attach support -T10149- to wheel hub using wheel boltet to the correctness of information in this document. Copyright by AUDI AG.
- Raise wheel bearing housing with engine and gearbox jack -V.A.G 1383 A- until distance -a- is obtained.

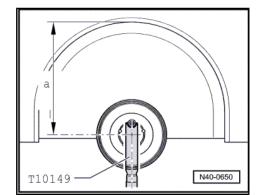
The bolts/nuts on the relevant suspension mountings must not be tightened until the distance -a- between the wheel centre and the lower edge of the wheel housing is the same as the distance measured before commencing work.



WARNING

- Do not lift or lower the vehicle while the engine/gearbox jack is under the vehicle.
- Do not leave engine and gearbox jack -V.A.G 1383 A- under vehicle for longer than necessary.
- Tighten relevant bolts/nuts.
- Lower wheel bearing housing.
- Pull out engine/gearbox jack from under vehicle.
- Remove support -T10149-.





Exploded views of front axle 1.5

⇒ "2 Subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 14

II -⇒ "3 Wheel bearing housing, * and bearing unit". wheel bearing unit", <u>page 39</u>

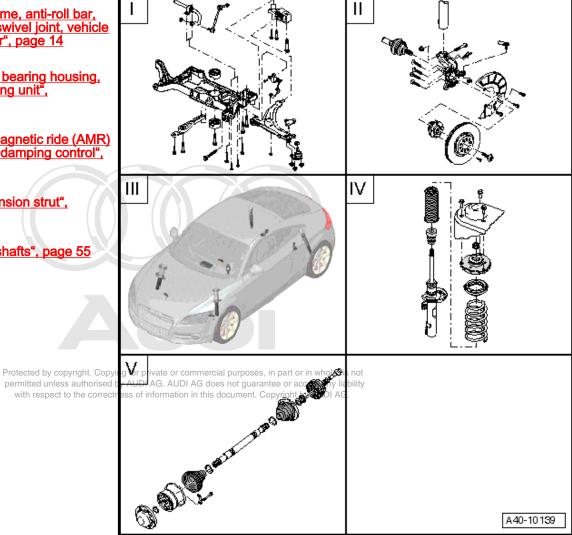
III -

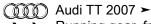
⇒ "4 Audi magnetic ride (AMR) - electronic damping control", <u>page 45</u>

⇒ "5 Suspension strut", <u>page 48</u>

٧-

⇒ "6 Drive shafts", page 55





2 Subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender

- ⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15
- ⇒ "2.2 Removing and installing subframe", page 17
- ⇒ "2.3 Servicing subframe", page 22
- ⇒ "2.4 Locating subframe in position", page 25
- ⇒ "2.5 Removing and installing anti-roll bar", page 26
- ⇒ "2.6 Removing and installing wishbone and mounting bracket", page 27
- ⇒ "2.7 Renewing bonded rubber bush in wishbone", page 31
- ⇒ "2.8 Renewing mounting bracket for wishbone", page 34
- ⇒ "2.9 Removing and installing swivel joint", page 35
- ⇒ "2.10 Checking swivel joint", page 37
- ⇒ "2.11 Removing and installing front left vehicle level sender G78 and front right vehicle level sender G289 ", page 37



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2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender

1 - Nut

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

2 - Anti-roll bar

- □ Removing and installing⇒ page 26
- □ Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"

3 - Coupling rod

☐ Link between anti-roll bar and suspension strut

4 - Nut

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

5 - Mounting bracket

- □ Locating in position
 ⇒ page 26
- ☐ With bonded rubber bush
- Renewing mounting bracket for wishbone ⇒ page 34

6 - Bolt

- □ 50 Nm + 90°
- Always renew if removed

7 - Bolt

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

8 - Bolt

□ 9 Nm

9 - Front left vehicle level sender -G78- and front right vehicle level sender -G289-

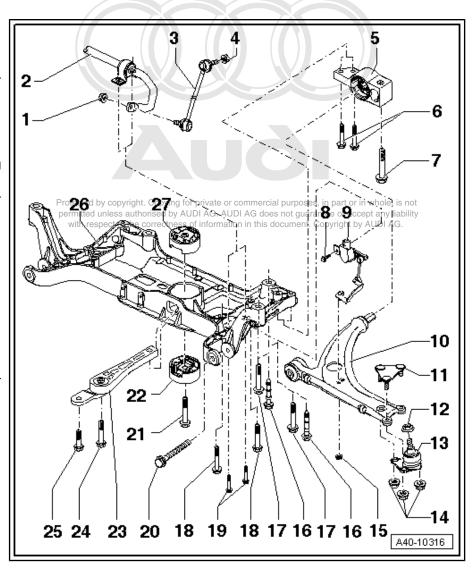
□ Removing and installing ⇒ page 37

10 - Wishbone

- ☐ Removing and installing wishbone and mounting bracket ⇒ page 27
- ☐ Renewing bonded rubber bush for wishbone ⇒ page 31
- □ Renewing mounting bracket for wishbone ⇒ page 34

11 - Retaining plate

Always renew if removed



12 -	Nut
	20 Nm + 90°
	Always renew if removed
13 -	Swivel joint
	Removing and installing <u>⇒ page 35</u>
	Checking ⇒ page 37
14 -	
	40 Nm + 45°
	Always renew if removed
15 - -	
	9 Nm
16 -	
	70 Nm + 90°
	Different country-specific versions are possible; for correct version, refer to ⇒ Electronic parts catalogue "ETKA"
	Note different thread lengths
	Positioned with indentation on bolt head at rear underbody attachment point Always renew if removed
	•
17 - □	70 Nm + 90°
_ _	
_	"ETKA"
	Always renew if removed
18 -	Bolt
	50 Nm + 90°
	Attachment for steering box
	Always renew if removed
19 -	
	20 Nm + 90°
	Attachment for anti-roll bar
	Always renew if removed
20 -	
_ - 21	
- 12 	
_	Do not tighten until pendulum support is bolted to gearbox
22 -	Bonded rubber bush (bottom) for pendulum support
23 -	Pendulum support
	Different versions are possible; for correct version, refer to ⇒ Electronic parts catalogue "ETKA"
24 -	Bolt Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not
	- normalited uplace outborized by ALDLAC ALDLAC does not grangentee or accept any liability
	Tightening torque for vehicles with automatic gearbox ⇒ Rep. gr. 37

25 - Bolt

- ☐ Tightening torque for vehicles with manual gearbox ⇒ Rep. gr. 34
- ☐ Tightening torque for vehicles with automatic gearbox ⇒ Rep. gr. 37

26 - Subframe

- ☐ Removing and installing ⇒ page 17
- ☐ Servicing subframe ⇒ page 22
- ☐ Locating subframe in position ⇒ page 25
- ☐ Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"

27 - Bonded rubber bush (top) for pendulum support

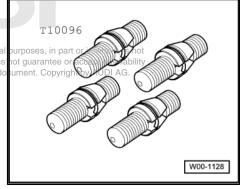
□ Removing and installing ⇒ page 22

2.2 Removing and installing subframe

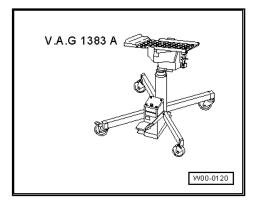
Special tools and workshop equipment required

♦ Locating pins -T10096-

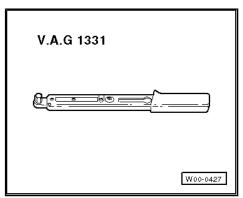
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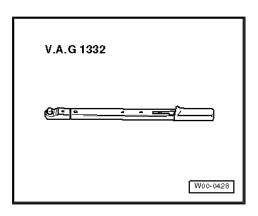


♦ Engine and gearbox jack -V.A.G 1383 A-



♦ Torque wrench -V.A.G 1331-





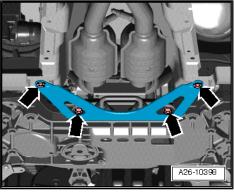
Removing



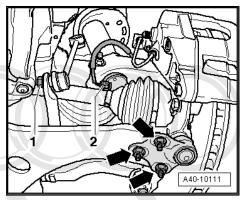
Note

The subframe is removed together with the anti-roll bar and wishbones.

- Remove wheels.
- Detach noise insulation (bottom) ⇒ Rep. gr. 66.
- Remove frame for noise insulation ⇒ Rep. gr. 50 .
- Remove bolts -arrows- for exhaust bracket.

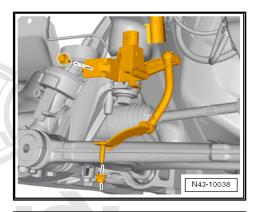


Remove nut -1-.



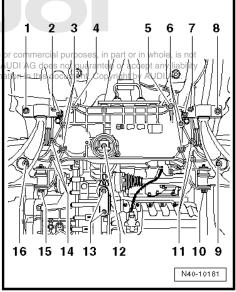
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On vehicles with vehicle level sender, unplug connector and unscrew nut from linkage at wishbone.

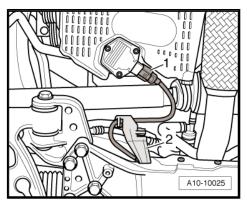


Unscrew bolts -13- and remove pendulum support from gearbox.

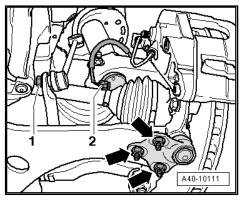
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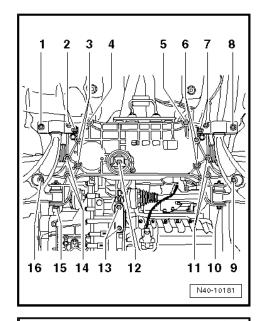
- Unplug connector -1- for oil level and oil temperature sender -G266- and unclip wiring from bracket -2-.



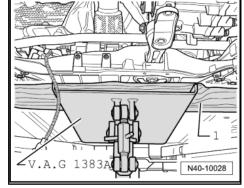
- Mark positions of nuts -arrows- with felt pen on both sides of vehicle.
- Remove nuts -arrows- on both sides of vehicle.
- Pull wishbone out of swivel joint.
- Locate subframe in position ⇒ page 25.



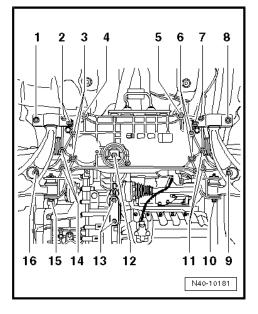
- Remove bolts -3- and -6- for steering box.



 Position engine and gearbox jack -V.A.G 1383 A- with suitable wooden block -1- under subframe and press subframe upwards lightly.



- Remove bolts -4- and -5-.
- Lower subframe with attached components approx. 30 mm and pry threaded sleeves for steering box out of holes in subframe.
- Secure steering box of Dody. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.



- Detach cable guide from subframe -arrow-.
- Lower subframe with attached components.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

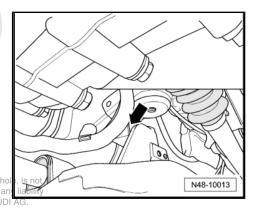
⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

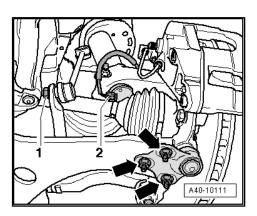
Tightening torques

⇒ "4 Electro-mechanical steering box", page 264

Threaded sleeves of steer in a floor with the surface of the surface of steer in a superfuse of accept an with respect to the surface as a union in this document. Language by Alice holes.

- Always renew retaining plate if removed <u>⇒ Item 11 (page 15)</u> .
- Align position of nuts -arrows- according to markings made on removal and tighten nuts.
- Install frame for noise insulation ⇒ Rep. gr. 50.
- Install noise insulation ⇒ Rep. gr. 66.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .

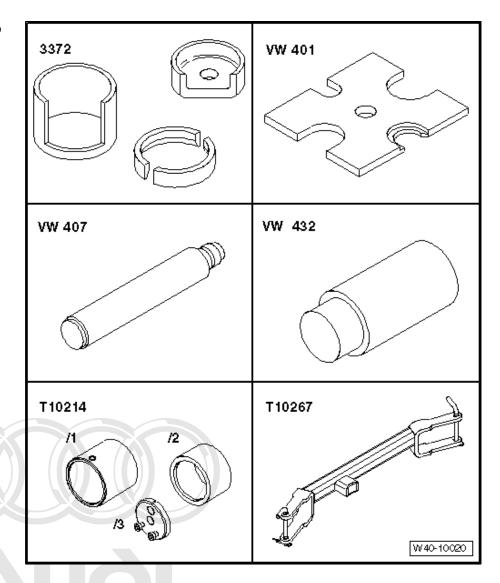




2.3 Servicing subframe

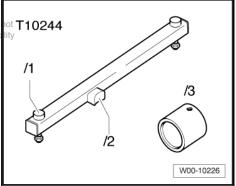
Special tools and workshop equipment required

- ♦ Removal tool -3372-
- ◆ Thrust plate -VW 401-
- ♦ Press tool -VW 407-
- ♦ Press tool -VW 432-
- ♦ Assembly tool -T10214-
- ♦ Assembly tool -T10267-



◆ Tube from assembly tool -T10244/3-

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- Remove subframe ⇒ page 17.
- Detach pendulum support from subframe.

Pressing out bonded rubber bush

- Attach assembly tool -T10267- -4- to subframe. Secure retaining pins of tool with locking pins.
- Press tool -VW 407-
- Thrust piece -3372/1-
- Thrust plate -VW 401-
- Assembly tool -T10267-4 -
- Tube -T10244/3-
- Press out both bonded rubber bushes together as shown.

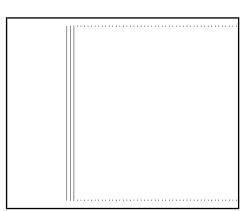


Note

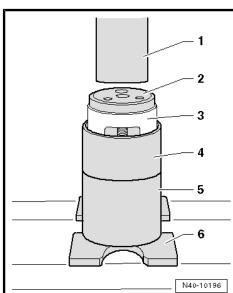
- The flattened side of press tool -3372/1- must face the attachment -A- on assembly tool -T10267-, otherwise the attachment can be damaged.
- The tube -T10244/3- has two different internal diameters. The subframe must be positioned on the larger diameter of the trube private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability -T10244/3-. with respect to the correctness of information in this document. Copyright by AUDI AG.

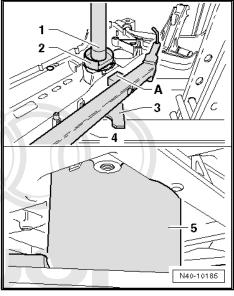


Bolt together both bonded rubber bushes with the genuine bolt (the two recesses -arrows- must be exactly above each other).



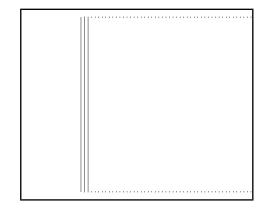
- Insert the assembled bonded rubber bushes into the larger diameter of tube -T10214/2- (with bolt head pointing downwards).
- Press tool -VW 432-
- 2 Press tool -T10214/3- without bolts.
- 3 -Bonded rubber bush
- Tube -T10214/2-4 -
- 5 -Tube -T10214/1-
- Thrust plate -VW 401-





Press in bonded rubber bushes -1- until dimension -a- is obtained.

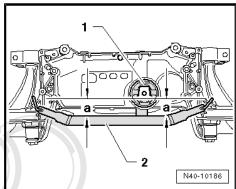
Dimension -a-=2-3 mm.



Align tube -T10214/2- containing pressed-in bonded rubber bushes on subframe. The corners of the inner core of the bush -1- should lie parallel with the edge of assembly tool -T10267-

The distance -a- must be identical on both sides to ensure parallel alignment.

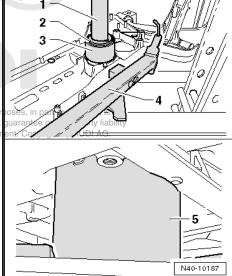
Place subframe onto smaller internal diameter of tube -T10244/3-.



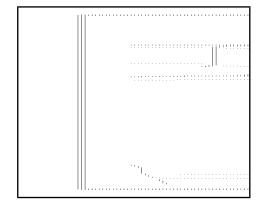
- Press in bushes as far as stop (until a force of 20 kN is attained).
- Press tool -VW 407-1 -
- 2 -Thrust piece -T10214/3-
- Tube -T10214/2-3 -
- Tube -T10244/3-

Assembly tool -T10267Protected by copyright. Copying for private or commercial put permitted unless authorised by AUDI AG. AUDI AG does no with respect to the correctness of information in this docu

Detach assembly tool -T10267- from subframe and check pressed-in bonded rubber bushes for proper seating.



- The outer diameter -1- of the two bonded rubber bushes may project up to 2 mm above the edge in the vicinity of the aperture for the pendulum support.
- The recesses of the bonded rubber bushes must be positioned in the centre of the aperture in the subframe.
- There may be a gap -arrow- between the bonded rubber bush-
- Install subframe ⇒ page 17.

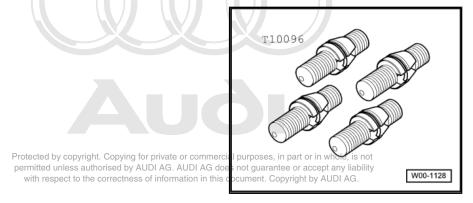




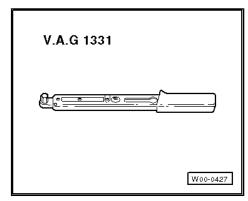
Locating subframe in position 2.4

Special tools and workshop equipment required

♦ Locating pins -T10096-



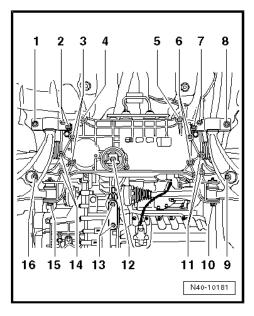
Torque wrench -V.A.G 1331-



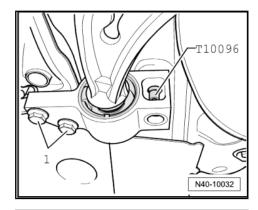
Installing locating pins -T10096-

The locating pins -T10096- must be screwed in one after the other at positions -1-, -8-, -9- and -16- to locate the subframe with wishbones in position.

Screw in locating pins -T10096- in place of securing bolts and tighten to 20 Nm.



Locating mounting bracket in position



Locating subframe in position

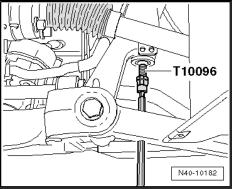
The front axle is now fixed in position.

Removing locating pins -T10096-

Installation is carried out in the reverse sequence. When installing, remove locating pins -T10096- one after the other and screw in new securing bolts in their place.

Tightening torques

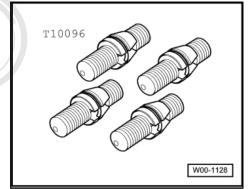
⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15



2.5 Removing and installing anti-roll bar

Special tools and workshop equipment required

♦ Locating pins -T10096-



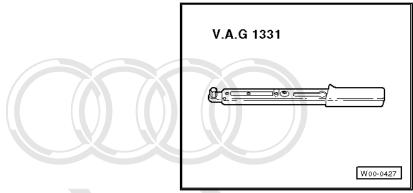
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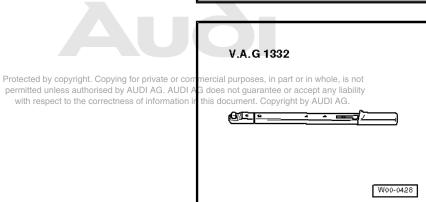
♦ Engine and gearbox jack to V.A.G.c.1383/Aformation in this document. Copyright by Al



Torque wrench -V.A.G 1331-



♦ Torque wrench -V.A.G 1332-



Removing

- Remove subframe ⇒ page 17
- Unbolt anti-roll bar from subframe -11 and 14-.
- Remove anti-roll bar.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

Tightening torques

⇒ "4 Electro-mechanical steering box", page 264

- Install subframe ⇒ page 17.
- Always renew retaining plate if removed ⇒ Item 11 (page 15) .

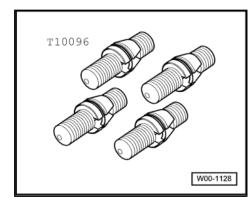
15 14 13 11 10 9 N40-10181

2.6 Removing and installing wishbone and mounting bracket

Special tools and workshop equipment required

Locating pins -T10096-

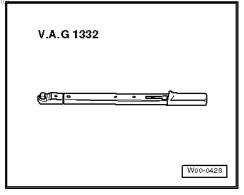




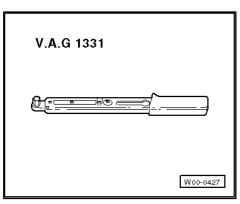
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Torque wrench: tht Ac.Get.332of information in this document. Copyright by AUDI AG.

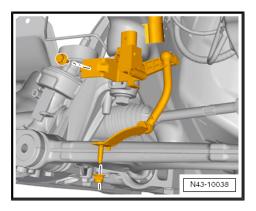


Torque wrench -V.A.G 1331-

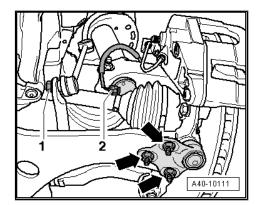


Removing

- Remove wheel.
- Detach noise insulation (bottom) ⇒ Rep. gr. 66.
- On vehicles with vehicle level sender, unscrew nut from linkage at wishbone.



- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of wishbone.

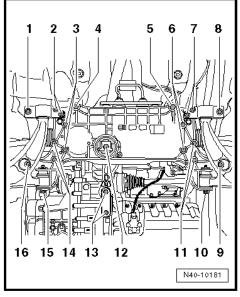


Screw in locating pins -T10096- in place of bolt -1- (left-side) and bolt -8- (right-side) and tighten locating pins to 20 Nm.



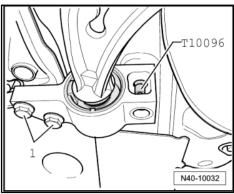
Caution

The locating pins -T10096- must not be tightened to more than 20 Nm, otherwise the threads of the locating pins will be damaged.



Remove bolts -1-.





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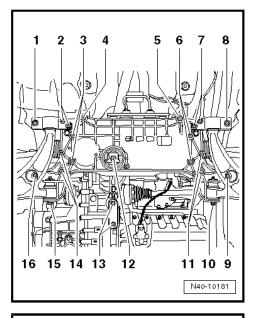
Unscrew bolt -15- on left side of vehicle or bolt -10- on right



Note

If bolt -15- or -10- cannot be unscrewed, the subframe must be removed on these vehicles ⇒ page 17.

Remove wishbone.



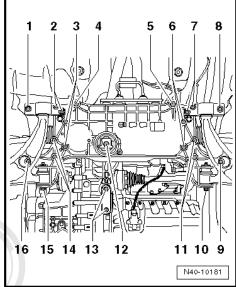
Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

- Fit bolt -15- on left side of vehicle or bolt -10- on right side, and tighten hand-tight.
- Always renew retaining plate if removed ⇒ Item 11 (page 15)

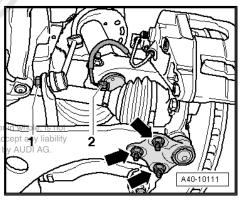


Align position of nuts -arrows- according to markings made on removal and tighten nuts.

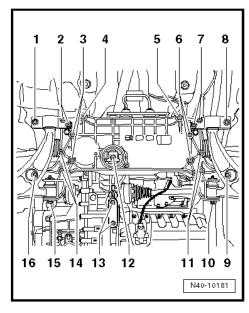


Note

- Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position or reference, in part permitted unless authorised by AUDI AG. AUDI AG does not guarantee or a position.
- Lifting suspension to unladen position (vehicles with coil springs) ⇒ page 11



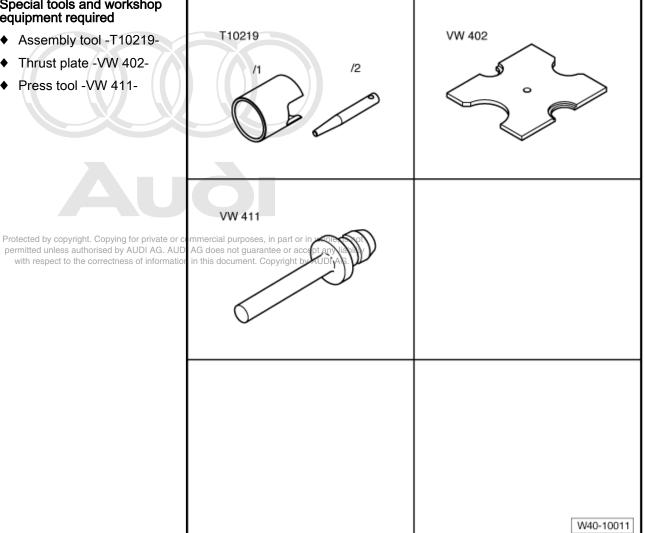
- With vehicle in unladen position ⇒ page 11, tighten bolt -15on left side of vehicle or bolt -10- on right side.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .



2.7 Renewing bonded rubber bush in wishbone

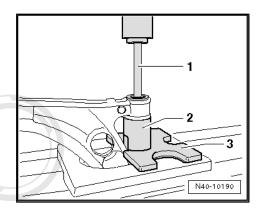
Special tools and workshop equipment required

- Assembly tool -T10219-
- Thrust plate -VW 402-



Pressing out bonded rubber bush

- Press out bonded rubber bush as shown.
- 1 Press tool -VW 411-
- 2 Tube -T10219/1-
- 3 Thrust plate -VW 402-

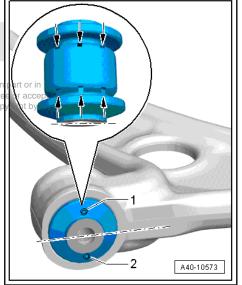


Pressing in bonded rubber bush

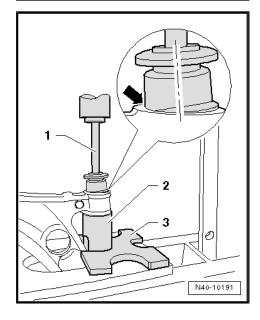
Note installation position of bonded rubber bush: retaining grooves -arrows- must be aligned symmetrically relative to axis of wishbone.

Beads -1 and 2- face towards front of vehicle as shown in illustration.

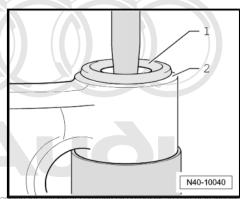
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- The bonded rubber bush must be applied at an angle to prevent damage when pressing in. The bush will then straighten up as it is pressed in.
- Apply assembly lubricant ⇒ Electronic parts catalogue (diluted 1:20 with water) to outside of bonded rubber bush.
- Apply bonded rubber bush at an angle (towards wishbone).
 Lip -arrow- must slide into hole as shown.
- 1 Mandrel -T10219/2-
- 2 Tube -T10219/1-
- 3 Thrust plate -VW 402-



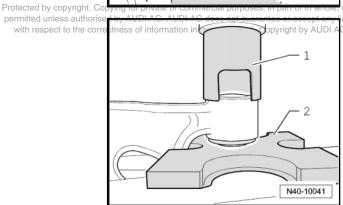
Press in bonded rubber bush until core of bush -1- is level with hole in wishbone -2-.

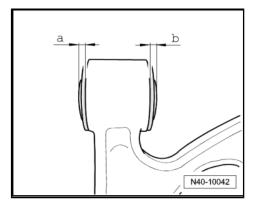


- Press back bush slightly in wishbone.

- Tube -T10219/1-
- Thrust plate -VW 402-

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

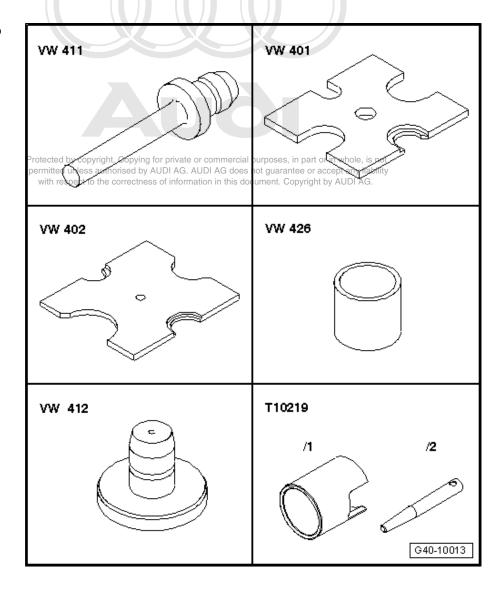




2.8 Renewing mounting bracket for wishbone

Special tools and workshop equipment required

- ♦ Press tool -VW 411-
- ♦ Thrust plate -VW 401-
- ♦ Thrust plate -VW 402-
- ♦ Tube -VW 426-
- ♦ Press tool -VW 412-
- ◆ Assembly tool -T10219-



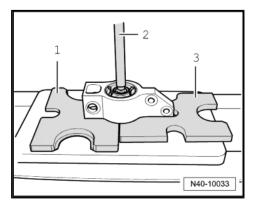
Pressing mounting bracket off wishbone



Note

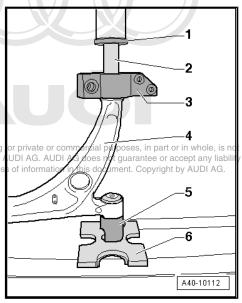
Hold wishbone while pressing it out

- 1 Thrust plate -VW 401-
- 2 Press tool -VW 411-
- 3 Thrust plate -VW 402-
- Press off mounting bracket with bonded rubber bush from wishbone.



Pressing mounting bracket onto wishbone

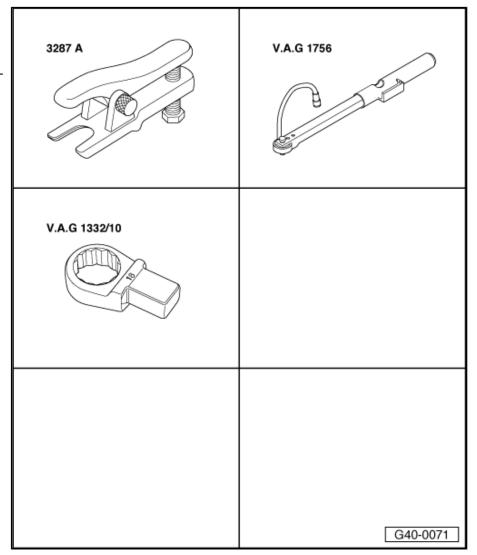
- Apply assembly lubricant ⇒ Electronic parts catalogue (diluted 1:20 with water) to hexagon flats of wishbone.
- Carefully press mounting bracket onto wishbone as far as it will go.
- Press tool -VW 412-1 -
- 2 -Tube -VW 426-
- Mounting bracket with bonded rubber bush Protected by copyright. Copying permitted unless authorised by 3 with respect to the correctness
- 4 -Wishbone
- 5 -Tube T10219/1 from assembly tool -T10219-
- Thrust plate -VW 401-



2.9 Removing and installing swivel joint

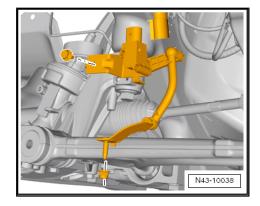
Special tools and workshop equipment required

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

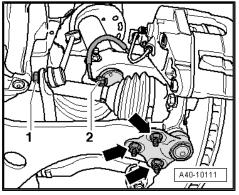


Removing

- Remove wheel.
- On vehicles with vehicle level sender, unscrew nut from linkage at wishbone.



- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Disengage wishbone from swivel joint.

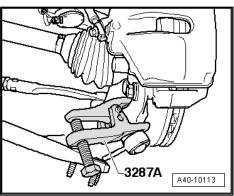


- Apply ball joint puller 3287 A to swivel joint as shown.
- Press swivel joint out of wheel bearing housing.



WARNING

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



Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

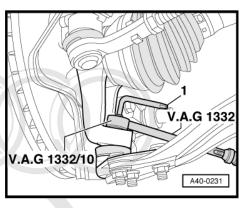
- ⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15
- Install new self-locking nut, and counterhold with Torx key -T40- -item 1-.



Note

Commercially available ring spanner type sockets (18 mm) can also be used instead of ring spanner insert -V.A.G 1332/10-.

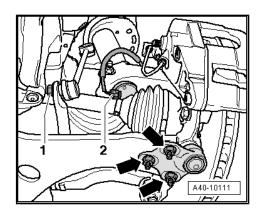
Always renew retaining plate if removed ⇒ Item 11 (page 15)



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- Align position of nuts -arrows- according to markings made on removal and tighten nuts.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position

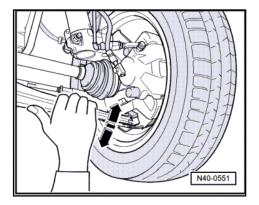
 Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243.



2.10 Checking swivel joint

Checking axial play

Pull wishbone firmly downwards and press back up again.



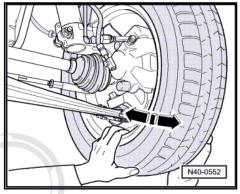
Checking radial play

Press bottom of wheel firmly inwards and outwards.



Note

- ♦ Observe the swivel joint while performing the tests.
- There should be no perceptible or visible "play" when carrying out both tests.
- Take into account any existing wheel bearing play or "play" in upper suspension strut mounting.
- Check rubber boot for damage, renew swivel joint if necessary.



2.11 Removing and installing front left vehicle level sender -G78- and front right vehicle level sender -G289-

General notes:

Vehicles with electronic damping control (April of any legic or decial purposes, in part or in whole, is not and/or gas discharge headlights have automatic headlight range ument. Copyright by AUDI AG. control fitted as standard equipment ⇒ Rep. gr. 94.

The electronic damping control (Audi magnetic ride) and the automatic headlight range control functions require information on the compression and rebound travel at the front and rear suspension.

For this purpose, the position of the left/right wishbone in relation to the body is transferred to the front left vehicle level sender - G78- and the front right vehicle level sender -G289- via a coupling rod. The senders then transmit electrical signals to the electroni-

cally controlled damping control unit -J250- and/or the gas discharge light control units (left/right) -J343/344- .

Servicing gas discharge light control unit (left/right) -J343/344- \Rightarrow Rep. gr. 94 .

On the rear axle these signals are supplied by the rear left vehicle level sender -G76- and rear right vehicle level sender -G77- to the electronically controlled damping control unit -J250- and/or the gas discharge light control units (left/right) -J343/344- .

These signals are required for calculating the current attitude of the vehicle.

The automatic headlight range control reacts to changes in the suspension height (attitude of the vehicle).

The following situations may produce a change in the suspension height:

- Towing a trailer/caravan
- ◆ Different loads (vehicle unladen, partly laden or fully laden)

The vehicle level sender is only available as a replacement part complete with coupling rod and upper and lower retaining plates.



Note

The basic headlight setting must always be checked and, on vehicles with electronic damping control (Audi magnetic ride), the reference position of the suspension must always be re-adapted in the following cases:

- Following assembly work on vehicle level sender
- If wishbone has been removed and installed
- ♦ If the bolted connections -2- or -5- have been unfastened

Removing

- Unplug connector.
- Remove nut -5-.
- Remove bolt -2-.
- Take out vehicle level sender -3-.

Installing

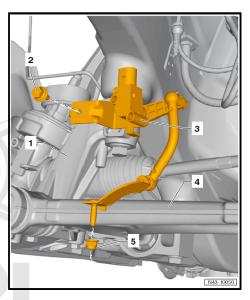
Installation is carried out in the reverse sequence. Note the following points:

Locating hook on coupling rod must engage on wishbone.

Lever of sender must face outwards.

Tightening torques <u>⇒ page 15</u>

- On vehicles with electronic damping control (Audi magnetic la purposes, in part or in whole, is not ride), re-adapt reference position at Vehicle diagnostic, testing and information system VAS 5051.
- Perform basic setting of headlights ⇒ Rep. gr. 94.



3 Wheel bearing housing, wheel bearing unit

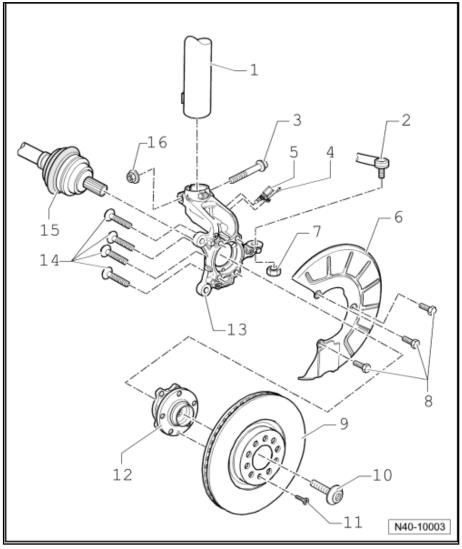
- ⇒ "3.1 Exploded view of wheel bearing housing and wheel bearing
- ⇒ "3.2 Removing and installing wheel bearing housing", page 40
- ⇒ "3.3 Removing and installing wheeldbearinghunit"yinpage√43 or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability

3.1 Exploded view of wheel bearing housing and wheel bearing unit

- 1 Suspension strut
- 2 Track rod ball joint
- 3 Bolt
 - □ 70 Nm + 90°
 - Always renew if removed
 - Threaded end of bolt points in direction of travel
- 4 Bolt
 - □ 8 Nm
- 5 Front left speed sensor -G47- / front right speed sensor -G45-
 - □ Before inserting sensor, clean inner surface of fitting hole and coat with grease G 000 650
- 6 Splash plate
- 7 Nut
 - □ 20 Nm + 90°
 - Always renew if removed
- 8 Bolt
 - □ 10 Nm
- 9 Brake disc
- 10 Bolt
 - ☐ Hexagon bolt = 200 Nm + 180° further ⇒ page 56
 - ☐ Twelve-point bolt = 70 Nm + 90° further ⇒ page 56
 - Always renew if removed
 - ☐ Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"
 - ☐ Before securing, clean the threads in the CV joint using a thread tap.
- 11 Bolt
 - □ 4 Nm

12 - Wheel hub with wheel bearing

- □ Removing and installing ⇒ page 43
- ☐ The ABS sensor ring is incorporated in the wheel hub



- - □ Different versions available
 - ☐ For correct version refer to ⇒ Electronic parts catalogue "ETKA"

13 - Wheel bearing housing

- ☐ Removing and installing ⇒ page 40
- ☐ For correct version refer to ⇒ Electronic parts catalogue "ETKA"

14 - Bolt

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

15 - Drive shaft

16 - Nut

□ Always renew if removed

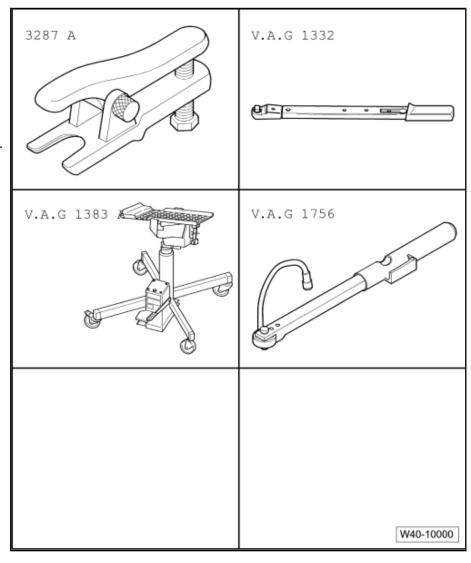


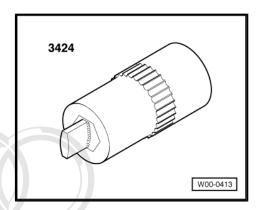
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3.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

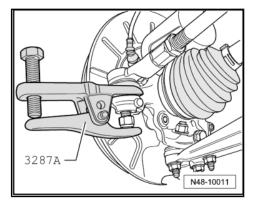
- Ball joint puller -3287A-
- Torque wrench -V.A.G 1332-
- Engine and gearbox jack -V.Ă.G 1383 Ă-
- Angle wrench -V.A.G 1756-



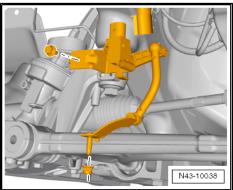


Removing

- Loosen bolt securing drive shaft at wheel hub.
- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG. Remove wheel.
- Detach brake caliper and tie to body with wire ⇒ Rep. gr. 46.
- Detach bracket for brake line and electrical wiring from wheel bearing housing.
- Remove ABS speed sensor ⇒ Rep. gr. 45.
- Remove brake disc.
- Detach splash plate from wheel bearing housing.
- Slacken off nut on track rod ball joint (but do not remove yet).
- Press track rod ball joint out of wheel bearing housing using ball joint puller -3287A- (and then unscrew nut).



On vehicles with vehicle level sender, unscrew nut from linkage at wishbone.



On vehicles with electronic damping control (Audi magnetic ride), unplug connector -2-.



Note

Use both hands to remove connector -2-: open the catch with one hand whilst pressing off the connector with the other, do not use any tools.

- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Guide wishbone out of wheel bearing housing together with swivel joint.
- Pull wheel bearing housing off drive shaft splines.

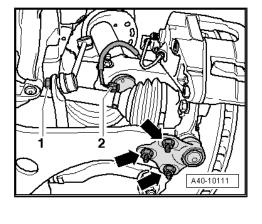


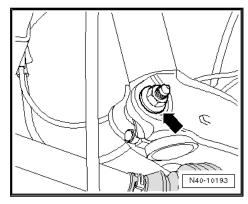
Note

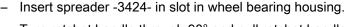
- Do not let the drive shaft hang down under its own weight, as otherwise excessive bending could damage the inner CV joint.
- Tie up drive shaft to body with wire.

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 Remove boilted connection between wheel bearing housing and suspension strut -arrow-.







- Turn ratchet handle through 90° and pull ratchet handle off spreader -3424-.
- Pull wheel bearing housing together with swivel joint downwards off shock absorber tube and remove.

Installing

Installation is performed in reverse sequence; note the following:

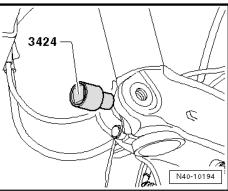
Tightening torques

 \Rightarrow "3.1 Exploded view of wheel bearing housing and wheel bearing unit", page 39

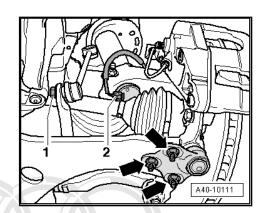
Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

Always renew retaining plate if removed ⇒ Item 11 (page 15)



- Align position of nuts -arrows- according to markings made on removal and tighten nuts.
- Tighten bolt securing drive shaft to wheel hub.
- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position \Rightarrow Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .



3.3 Removing and installing wheel bearing

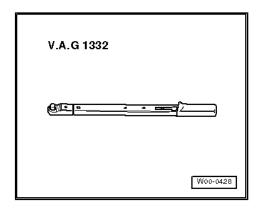
Special tools and workshop equipment required

♦ Angle wrench -V.A.G 1756-

with respect to the correctness of informati



♦ Torque wrench -V.A.G 1332-



Removing

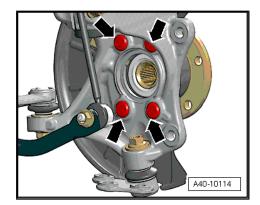
- Remove drive shaft \Rightarrow page 55.
- Detach brake caliper and tie to body with wire ⇒ Rep. gr. 46.
- Remove ABS speed sensor \Rightarrow Rep. gr. 45.
- Remove brake disc.

- Remove bolts -arrows-.
- Take 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.

Installing

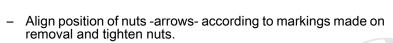
Installation is performed in reverse sequence; note the following:

Tightening torques

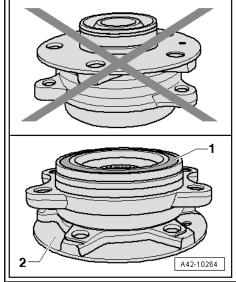
⇒ "3.1 Exploded view of wheel bearing housing and wheel bearing unit", page 39

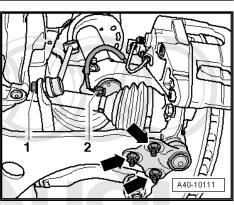
Tightening torques

- ⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15
- Always renew retaining plate if removed ⇒ Item 11 (page 15) .



- Tighten bolt securing drive shaft to wheel hub.
- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart
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4 Audi magnetic ride (AMR) - electronic damping control

⇒ "4.1 Overview of Audi magnetic ride (AMR) - electronic damping control", page 45

⇒ "4.2 Removing and installing electronically controlled damping control unit J250 ", page 46

4.1 Overview of Audi magnetic ride (AMR) - electronic damping control

1 - Shock absorber with front right shock absorber damper adjustment valve -N337-

- Removing and installing suspension strut ⇒ page 49
- □ Servicing suspension strut ⇒ page 52

2 - Front right vehicle level sender -G289-

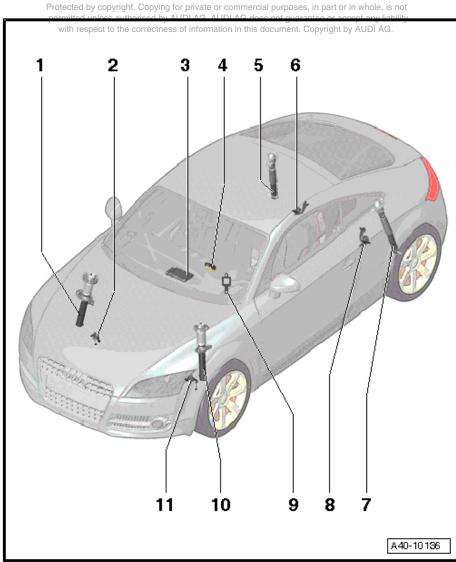
Removing and installing ⇒ page 37

3 - Electronically controlled damping control unit -J250-

- Removing and installing ⇒ page 46
- □ Reference position of suspension must be readapted if electronically controlled damping control unit -J250- is renewed.
- ☐ Fitting location: electronically controlled damping control unit -J250- is located under front passenger's seat

4 - Shock absorber damping adjustment button -E387-

Fitting location: shock absorber damping adjustment button -E387is located in row of switches on centre console



5 - Shock absorber with rear right shock absorber damper adjustment valve -N339-

- ☐ Removing and installing shock absorber (front-wheel drive vehicles) ⇒ page 155
- Servicing shock absorber (front-wheel drive vehicles) ⇒ page 156
- □ Removing and installing shock absorber (four-wheel drive vehicles) ⇒ page 203
- ☐ Servicing shock absorber (four-wheel drive vehicles) ⇒ page 204

6 - Rear right vehicle level sender -G77-

□ Removing and installing ⇒ page 179

7 - Shock absorber with rear left shock absorber damper adjustment valve -N338-

- ☐ Removing and installing shock absorber (front-wheel drive vehicles) > page 155
- ☐ Servicing shock absorber (front-wheel drive vehicles) <u>⇒ page 156</u>

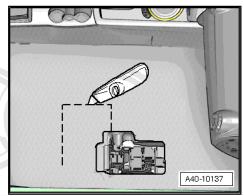
- □ Removing and installing shock absorber (four-wheel drive vehicles) ⇒ page 203
- ☐ Servicing shock absorber (four-wheel drive vehicles) ⇒ page 204
- 8 Rear left vehicle level sender -G76-
 - □ Removing and installing ⇒ page 179
- 9 Shock absorber damping adjustment warning lamp -K189-
 - ☐ The warning lamp in the instrument cluster lights up if there is a malfunction in the system
- 10 Shock absorber with front left shock absorber damper adjustment valve -N336-
 - ☐ Removing and installing suspension strut ⇒ page 49
 - □ Servicing suspension strut ⇒ page 52
- 11 Front left vehicle level sender -G78-
 - □ Removing and installing ⇒ page 37

4.2 Removing and installing electronically controlled damping control unit -J250-

Removing

The electronically controlled damping control unit -J250- is located under the front right seat.

- Remove front right seat ⇒ Rep. gr. 72.
- Using a carpet knife (commercially available type), cut out carpeting at the markings shown.



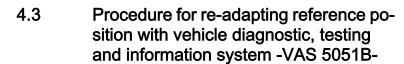
- Fold up carpeting and unclip control unit -2- -arrows-
- Unplug connector -1- and take out control unit -2-.

Installing

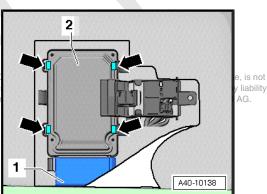
Installation is performed in reverse sequence; note the following: author

with respect to the

- Reference position of suspension must be re-adapted if electronically controlled damping control unit -J250- is renewed.
- Install carpet frame for access to control unit ⇒ Rep. gr. 70.
- Re-adapt reference position (default position) ⇒ Vehicle diagnostic, testing and information system VAS 5051.

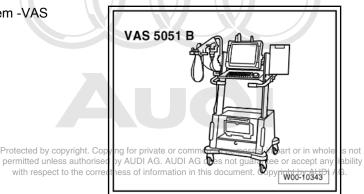


Special tools and workshop equipment required



Audi

 Vehicle diagnostic, testing and information system -VAS 5051B- with appropriate diagnosis cable





WARNING

- Test equipment must always be secured to the rear seat when road-testing the vehicle.
- While the vehicle is moving this equipment must be operated by a second person; NOT by the driver.
- Connect vehicle diagnostic, testing and information system -VAS 5051B- to vehicle with appropriate diagnosis cable
- Switch on vehicle diagnostic, testing and information system.

The vehicle diagnostic, testing and information system is ready for operation when the selector buttons for the operating modes appear on the screen.

Switch on ignition.



Note

When control units or other electrical/electronic components have been renewed, the relevant component(s) must be adapted via "Guided Functions".

Touch the Guided Functions button on the display screen.

Then:

- "Running gear (Rep. Gr. 01; 40 49)"
- "14 Wheel damping electronics"
- Select the relevant program in "Guided Functions".
- 14 Code control unit (Rep. Gr. 40)

or

14 - Replace control unit (Rep. Gr. 40)

or

- 14 Re-adapt reference position (default position) (Rep. Gr. 40)
- Follow the instructions on the screen.

5 Suspension strut

- ⇒ "5.1 Exploded view of suspension strut", page 48
- ⇒ "5.2 Removing and installing suspension strut", page 49
- ⇒ "5.3 Servicing suspension strut", page 52

5.1 Exploded view of suspension strut

1 - Shock absorber

- Removing and installing suspension strut ⇒ page 49
- ☐ Can be renewed separately
- □ For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- On vehicles with electronic damping control (Audi magnetic ride), readapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051

2 - Bump stop

■ Not fitted on vehicles with electronic damping control (Audi magnetic ride)

3 - Protective sleeve

4 - Coil spring

- Removing and installing ⇒ page 52
- Note colour code
- □ For correct version refer to ⇒ Electronic parts catalogue "ETKA"

Select correct spring according to PR No.

These numbers are indicated on the vehicle data sticker.

- ☐ Surface of spring coil must not be damaged
- 5 Deep groove ball thrust bearing

6 - Suspension strut mounting

■ Note correct installation position

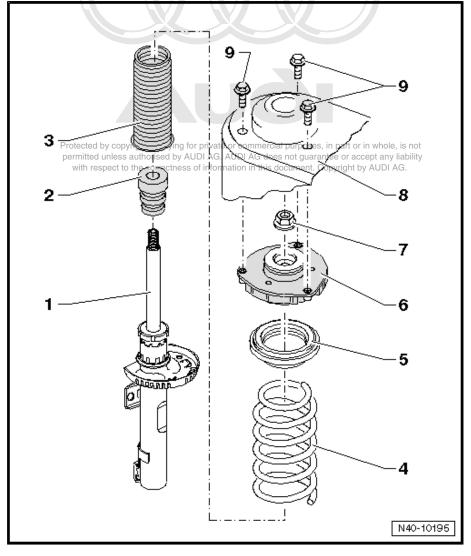
7 - Nut

- □ 60 Nm
- □ Always renew if removed

8 - Suspension turret

9 - Bolt

☐ 15 Nm + 90°

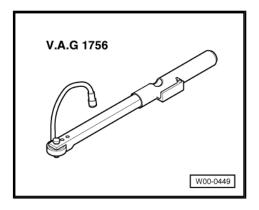


□ Always renew if removed

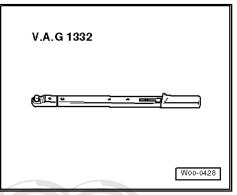
5.2 Removing and installing suspension strut

Special tools and workshop equipment required

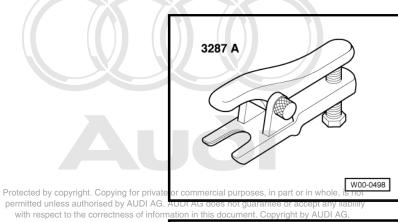
♦ Angle wrench -V.A.G 1756-



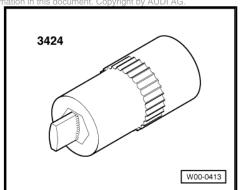
♦ Torque wrench -V.A.G 1332-



♦ Ball joint puller -3287 A-

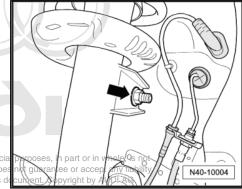


♦ Spreader -3424-



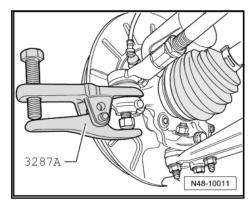
Removing

- Loosen bolt securing drive shaft at wheel hub.
- "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- Remove wheel.
- Detach brake caliper and tie to body with wire ⇒ Rep. gr. 46.
- Detach bracket for brake line and electrical wiring from wheel bearing housing.
- Remove ABS speed sensor ⇒ Rep. gr. 45.
- Unscrew top hexagon nut for coupling rod -arrow- from suspension strut.

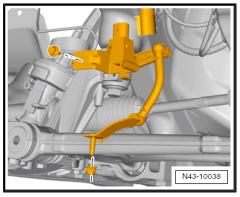


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- Slacken off nut on track rod ball joint (but do not remove yet).
- Press track rod ball joint out of wheel bearing housing using ball joint puller -3287A- (and then unscrew nut).



On vehicles with vehicle level sender, unscrew nut from linkage at wishbone.



On vehicles with electronic damping control (Audi magnetic ride), unplug connector -2-.



Note

Use both hands to remove connector -2-: open the catch with one hand whilst pressing off the connector with the other, do not use any tools.

- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Detach wishbone from swivel joint and pull wheel bearing housing off drive shaft splines.



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 plenum chamber cover ⇒ Rep. gr. 50.
- Unscrew hexagon bolts -arrows- for upper shock absorber mounting.
- Take out suspension strut.
- Detach bolt connection between suspension strut and wheel bearing housing.
- N40-10053
- Insert spreader -3424- in slot in wheel bearing housing.
- Turn ratchet handle through 90° and pull ratchet handle off spreader -3424-
- Pull suspension strut -1- out of wheel bearing housing -2-.

Installation is performed in reverse sequence; note the following:

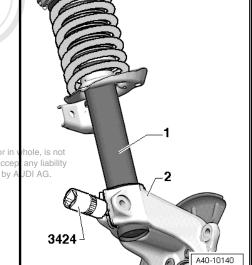
Tightening torques

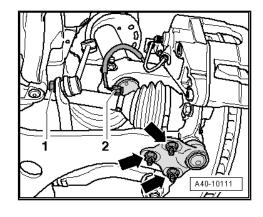
⇒ "3.1 Exploded view of wheel bearing housing and wheel bearing

unit", page 39

Protected by copyright. Copying for private or commercial purposes, in part or in Tightening torques with respect to the correctness of information in this document. Copyright by A ⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swive

joint, vehicle level sender", page 15

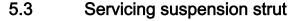




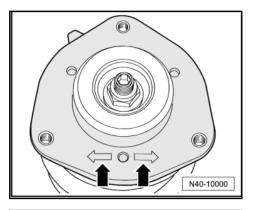
- Insert suspension strut; one of the two markings -arrows- must face in direction of travel.
- Always renew retaining plate if removed ⇒ Item 11 (page 15)

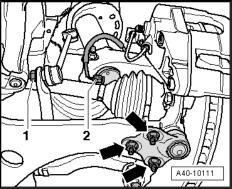


- Align position of nuts -arrows- according to markings made on removal and tighten nuts.
- Tighten bolt securing drive shaft to wheel hub.
- "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive not shaft to wheel bubth page 56 DI AG. AUDI AG does not guarantee or accept any liability
- with respect to the correctness of information in this document. Copyright by AUDI AG. Install plenum chamber cover ⇒ Rep. gr. 50.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart <u>⇒ page 243</u> .



Removing coil spring

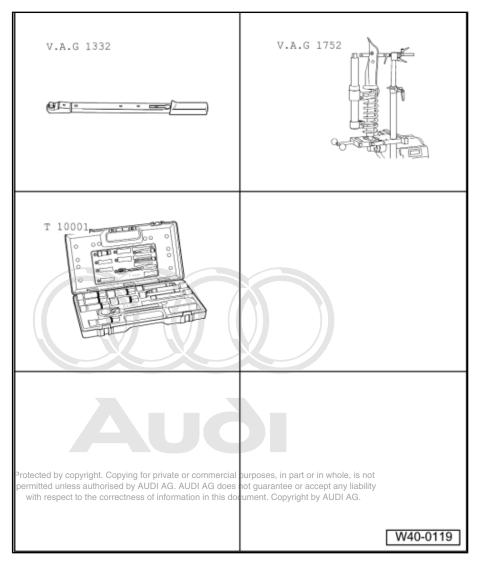






Special tools and workshop equipment required

- Torque wrench -V.A.G 1332-
- Spring compressor -V.A.G 1752/1-
- Spring retainer -V.A.G 1752/4-
- Shock absorber set -T10001-
- Commercially available ratchet



- Remove suspension strut, but do not separate from wheel bearing housing ⇒ page 49.
- Compress coil spring with spring compressor -V.A.G 1752/1until thrust bearing is free at top.
- Unscrew hexagon nut from piston rod.

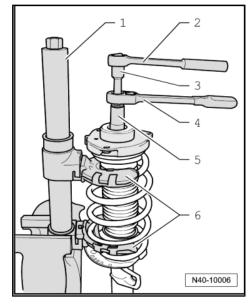
- Take off suspension strut components and coil spring together with spring compressor -V.A.G 1752/1-.
- Spring compressor -V.A.G 1752/1-1 -
- 2 -Torque wrench -V.A.G 1332-
- 3 -Socket -T10001/8-
- Ratchet -T10001/11-
- 5 -Socket -T10001/5-
- 6 -Spring retainer -V.A.G 1752/4-

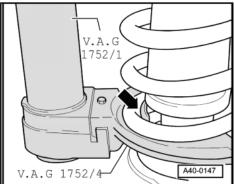


WARNING

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

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



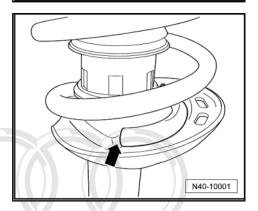


Installing coil spring

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 hexagon nut on piston rod ⇒ page 48.
- Slacken off spring compressor -V.A.G 1752/1- and detach from coil spring.
- Install suspension strut ⇒ page 49.





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6 Drive shafts

- ⇒ "6.1 General notes:", page 55
- "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.4 Removing and installing drive shaft (version with bolted flange on inner joint)", page 58
- ⇒ "6.5 Removing and installing drive shaft with sliding CV joint (version with splines on inner joint)", page 60
- 6.6 Removing and installing drive shaft with triple roller joint Protect AAR 3300i (with splines for stub shaft on gearbox), page 66
- permitted unless authorised by AUDI AG. AUDI AG does not quarantee or accept any liability with metabolic Removing and installing drive shart, with triple roller joint AAR 3300i (with splines for insertion in gearbox)", page 70
 - ⇒ "6.8 Servicing drive shaft (sliding inner CV joint with 100 mm dia.)", page 74
 - ⇒ "6.9 Servicing drive shaft (sliding inner CV joint with 108 mm dia.)", page 82
 - "6.10 Servicing drive shaft (sliding inner CV joint with splines, 100 mm dia.)", page 88
 - ⇒ "6.11 Checking outer constant velocity joint", page 93
 - ⇒ "6.12 Checking inner sliding CV joint", page 94
 - ⇒ "6.13 Servicing drive shaft with triple roller joint AAR 2600i", page 96
 - ⇒ "6.14 Dismantling and assembling drive shaft with triple roller joint AAR 2600i", page 100
 - ⇒ "6.15 Servicing drive shaft with triple roller joint AAR 3300i (with splines for insertion in gearbox)", page 104
 - ⇒ "6.16 Servicing drive shaft with triple roller joint AAR 3300i (with splines for stub shaft on gearbox)", page 109

6.1 General notes:

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.

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 120 Nm (twelve-point bolt) or 200 Nm (hexagon bolt).

Procedure for loosening bolt securing drive shaft at wheel hub:

- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56

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.

Before fitting the outer joint in the wheel hub, apply a thin coat of assembly paste to the splines on the outer joint \Rightarrow Electronic parts catalogue.

When working on the vehicle, do not allow the drive shafts to hang down under their own weight and never let the joints bend to such an extent that they contact the end stop.

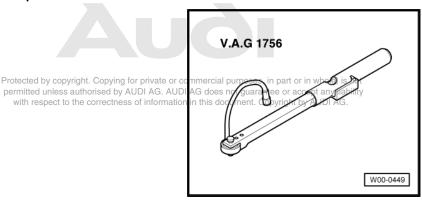
Always renew self-locking bolts/nuts.

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

6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub

Special tools and workshop equipment required

♦ Angle wrench -V.A.G 1756-



Loosening bolt securing drive shaft to wheel hub

- To avoid damage to wheel bearing, slacken off bolt no further than 90° with vehicle standing on its wheels.
- Raise vehicle so that wheels are off the ground.
- Have a second mechanic press the brake pedal.
- Remove bolt -2-.

Tightening bolt securing drive shaft to wheel hub

Renew bolt -2-.

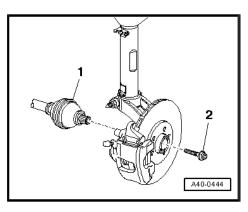


Note

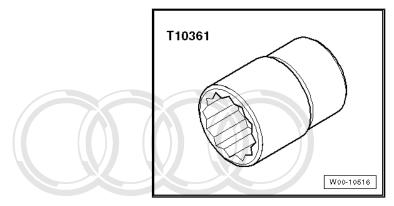
- Before securing, clean the threads in the CV joint using a thread tap.
- ♦ The wheels must not be in contact with the ground when initially tightening the drive shaft bolt; otherwise the wheel bearing will be damaged.
- Have a second mechanic press the brake pedal.
- Tighten bolt to 200 Nm.
- Lower vehicle onto its wheels.
- Turn bolt 180° further.

6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub

Special tools and workshop equipment required



♦ Socket (24 mm) -T10361-



♦ Angle wrench -V.A.G 1756-



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:

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 120 Nm.

Loosening twelve-point bolt

- To avoid damage to wheel bearing, slacken off twelve-point bolt no further than 90° with vehicle still standing on its wheels, using socket (24 mm) -T10361- .
- Raise vehicle so that wheels are off the ground.
- Have a second mechanic press the brake pedal.
- Remove twelve-point bolt -arrow-.



Note

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

Installing twelve-point bolt

Renew twelve-point bolt.





Note

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

- Have a second mechanic press the brake pedal.
- Tighten twelve-point bolt to 70 Nm.
- Lower vehicle onto its wheels.
- Turn twelve-point bolt 90° further.

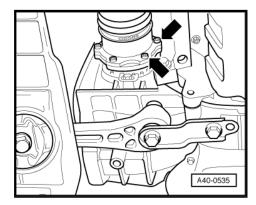
6.4 Removing and installing drive shaft (version with bolted flange on inner joint)

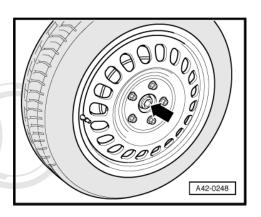
Removing

- Remove noise insulation panel. ⇒ Rep. gr. 66
- Loosen bolt securing drive shaft at wheel hub.

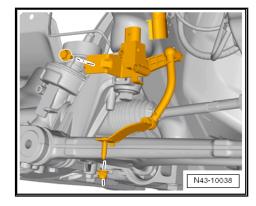
Procedure for loosening bolt securing drive shaft at wheel hub:

- ♦ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ♦ ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- Remove wheel.
- Unbolt drive shaft from flange on gearbox -arrows-.





On vehicles with vehicle level sender, unscrew nut from linkage at wishbone.



- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Guide wishbone out of wheel bearing housing together with swivel joint.
- Pivot suspension strut outwards, and at the same time push drive shaft out of wheel bearing unit with a brass drift (knock out gently if necessary).
- Take out drive shaft.

Installing

ted by copyright. Copying for private or commercial purposes, in part or in whole, is not Installation is performed in reverse sequence; note the following ability

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.

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing and wheel bearing unit", page 39

Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

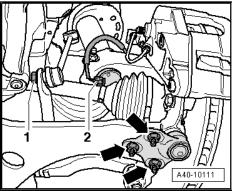
Tightening torques

⇒ "6.8 Servicing drive shaft (sliding inner CV joint with 100 mm dia.)", page 74

Tightening torques

⇒ "6.9 Servicing drive shaft (sliding inner CV joint with 108 mm dia.)", page 82

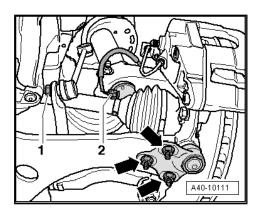
Always renew retaining plate if removed ⇒ Item 11 (page 15)



- Align position of nuts -arrows- according to markings made on removal and tighten nuts.
- Tighten bolt securing drive shaft to wheel hub.

Procedure for tightening bolt securing drive shaft to wheel hub:

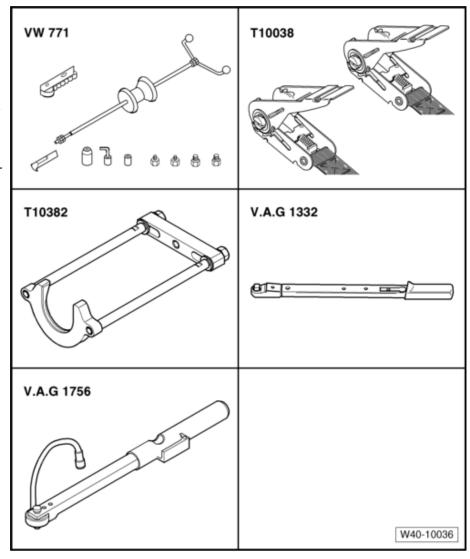
- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Wheel alignment must be checked and adjusted see chartle, is not ⇒ paget243 less authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.



Removing and installing drive shaft with sliding CV joint (version with splines 6.5 on inner joint)

Special tools and workshop equipment required

- Multi-purpose tool -VW 771-
- Tensioning strap -T10038-
- Drive shaft puller -T10382-
- Torque wrench -V.A.G 1332-
- Angle wrench -V.A.G 1756-



Removing

Loosen bolt securing drive shaft at wheel hub.

Procedure for loosening bolt securing drive shaft at wheel hub:

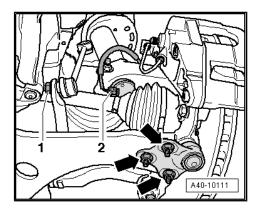
- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- Remove wheel.
- Remove noise insulation ⇒ Rep. gr. 66.
- To remove drive shaft on left side, first remove bottom section Protected b Protected by copyright. Copying for private or commercial purposes in part or in whole, is not permitted unless at the control of the private of accept any liability permitted unless at the control of the control of
 - If fitted, remove vehicle level senders <u>> page 37</u>.
 - Mark positions of nuts -arrows- with felt pen.
 - Unscrew nuts -arrows-.
 - Guide wishbone out of wheel bearing housing together with swivel joint.
 - Detach coupling rod from anti-roll bar on both sides.
 - Slide outer joint by hand out of wheel hub.
 - Secure drive shaft to prevent it from dropping.

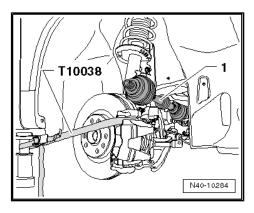


Note

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 drive shaft puller -T10382- . When doing this, take care not to damage any other parts (such as the brake hose or ABS wiring).

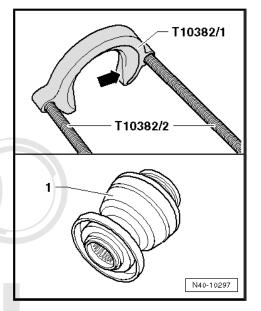
Pull suspension strut with attached components towards the rear using tensioning strap -T10038- (e.g. secured to arm of lifting platform) until drive shaft puller - T10382- can be inserted parallel with drive shaft.





Set up drive shaft puller -T10382- .

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

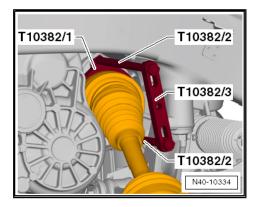


Apply puller plate -T10382/1- behind sliding constant velocity joint -1-.

Protected by copyright. Copying for private or commercial purposes. The recess -arrow- on puller plate-stal 0382/1/r/must-face towards guara sliding constant velocity joint -4spect to the correctness of information in this document. Commercial purposes.



- 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.



Note

When removing drive shaft on right side, ensure sufficient clearance from heat shield; re-position drive shaft puller -T10382- as necessary.

- Take drive shaft out of vehicle.

Installing

Installation is performed in reverse sequence; note the following: art or in whole, is not

Tightening torques with respect to the correctness of information in this document. Copyright by AUDI AG. ⇒ "3.1 Exploded view of wheel bearing housing and wheel bearing unit", page 39

Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

Four-wheel drive vehicles

Strike end of stub shaft (right-side) using a plastic hammer.



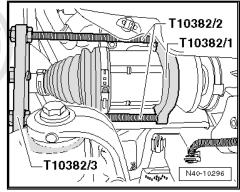
Caution

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

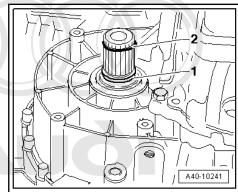
Applies to all vehicles:

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.

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



- Fit new seal -1- and circlip -2- in groove of stub shaft on gear-
- Apply approx. 2 g of grease all round splines on end of gearbox shaft ⇒ Electronic parts catalogue.
- 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 firmly onto stub shaft on gearbox.



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Note

- If the drive shaft cannot be pushed on 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.
- Check the firm fit of the sliding constant velocity joint by pulling the joint against the resistance of the circlip.



Caution

For this check, pull only on the sliding constant velocity joint and NOT on the drive shaft.

- Detach tensioning strap -T10038-.
- Guide outer joint into wheel hub splines as far as possible.
- Always renew retaining plate if removed ⇒ Item 11 (page 15)

Align position of nuts -arrows- according to markings made on removal and tighten nuts.



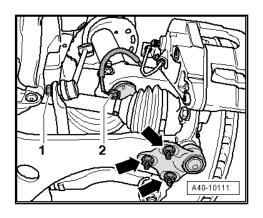
Note

Ensure sealing boot is not damaged or twisted.

- Attach noise insulation (bottom) ⇒ Rep. gr. 66.
- After installing drive shaft on left side, re-install bottom section of wheel housing liner ⇒ Rep. gr. 66.
- If fitted, install vehicle level senders ⇒ page 37.
- Tighten bolt securing drive shaft to wheel hub.

Procedure for tightening bolt securing drive shaft to wheel hub:

- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- \Rightarrow "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position \Rightarrow Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Wheel alignment must be checked and adjusted, see chart <u>⇒ page 243</u>



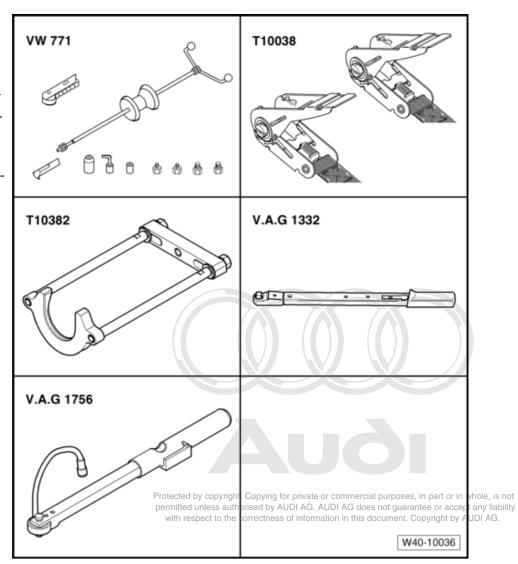


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6.6 Removing and installing drive shaft with triple roller joint AAR 3300i (with splines for stub shaft on gearbox)

Special tools and workshop equipment required

- Multi-purpose tool -VW
- Tensioning strap -T10038-
- Drive shaft puller -T10382-
- Torque wrench -V.A.G 1332-
- Angle wrench -V.A.G 1756-



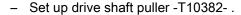
Removing

Loosen bolt securing drive shaft at wheel hub.

Procedure for loosening bolt securing drive shaft at wheel hub:

- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- ⇒ "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- Remove wheel.
- Remove noise insulation (bottom) ⇒ Rep. gr. 50.
- To remove drive shaft on left side, first remove bottom section of wheel housing liner ⇒ Rep. gr. 66.
- If fitted, remove vehicle level senders <u>⇒ page 37</u>.
- Mark positions of nuts -arrows- with felt pen.

- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Guide wishbone out of wheel bearing housing together with swivel joint.
- Detach coupling rod from anti-roll bar on both sides.
- Slide outer joint by hand out of wheel hub.
- Secure drive shaft to prevent it from dropping.



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

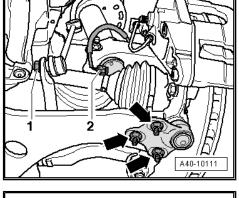
Assemble the drive shaft puller -T10382- together with the multi-purpose tool -VW 771-.

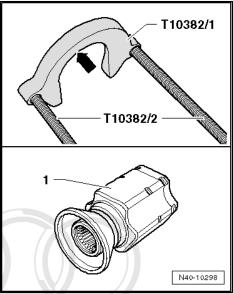


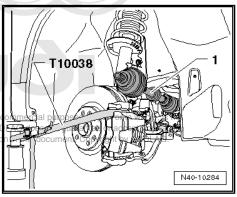
Note

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 drive shaft puller -T10382- . When doing this, take care not to damage any other parts (such as the brake hose or ABS wiring).

Pull the suspension strut and attachments to the rear with the tensioning strap -T10038- e.g. at the lifting platform arm until the drive shaft puller -T10382- can be inserted parallel with the drive shaft.







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



Note

When removing drive shaft on right side, ensure sufficient clearance from heat shield; re-position drive shaft puller -T10382- as necessary.

Take drive shaft out of vehicle.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing and wheel bearing unit", page 39

Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

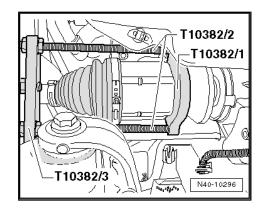
Strike end of stub shaft using a plastic hammer.



Caution

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

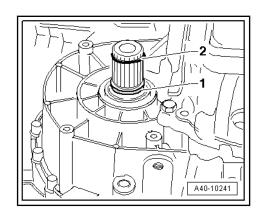
Remove any paint residue and/or corrosion on thread and splines of outer joint.





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- Fit new seal -1- and circlip -2- in groove of stub shaft on gear-
- Apply approx. 2 g of grease all round splines on end of gearbox shaft ⇒ Electronic parts catalogue.
- 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 firmly onto stub shaft on gearbox. You can use the sliding travel of the joint body in order to push it into place with one abrupt movement. However, do not pull the drive shaft too far out of the joint body.





Note

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

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

- Detach tensioning strap -T10038- Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability Guide outer joint into wheel hub splines as far as possible.
- Always renew retaining plate if removed ⇒ Item 11 (page 15)

Align position of nuts -arrows- according to markings made on removal and tighten nuts.



Note

Ensure sealing boot is not damaged or twisted.

- Attach noise insulation (bottom) ⇒ Rep. gr. 66.
- After installing drive shaft on left side, re-install bottom section of wheel housing liner ⇒ Rep. gr. 66.
- If fitted, install vehicle level senders ⇒ page 37.
- Tighten bolt securing drive shaft to wheel hub.

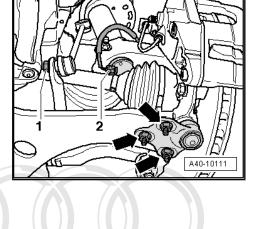
Procedure for tightening bolt securing drive shaft to wheel hub:

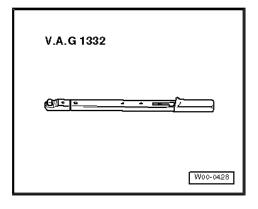
- "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position \Rightarrow Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 92 rotected by copyright. Copying for private or commercial purposes, in part of in which, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability
- Wheel alignment must be checked and adjusted, see chart ⇒ page 243 .

6.7 Removing and installing drive shaft with triple roller joint AAR 3300i (with splines for insertion in gearbox)

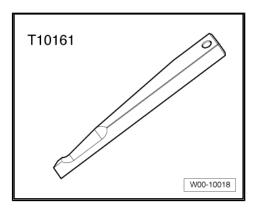
Special tools and workshop equipment required

◆ Torque wrench -V.A.G 1332-

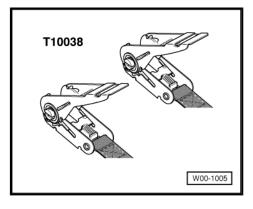




♦ Wedge -T10161-



◆ Tensioning strap -T10038-



Removing

- Loosen bolt securing drive shaft at wheel hub.

Procedure for loosening bolt securing drive shaft at wheel hub:

- ⇒ "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- \Rightarrow "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- Remove wheel.
- Remove noise insulation ⇒ Rep. gr. 66.
- To remove drive shaft on left side, first remove bottom section of wheel housing liner ⇒ Rep. gr. 66.
- If fitted, remove vehicle level senders ⇒ page 37.



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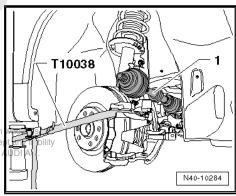
- Mark positions of nuts -arrows- with felt pen.
- Unscrew nuts -arrows-.
- Guide wishbone out of wheel bearing housing together with swivel joint.
- Detach coupling rod from anti-roll bar on both sides.
- Slide outer joint by hand out of wheel hub.
- Secure drive shaft to prevent it from dropping.



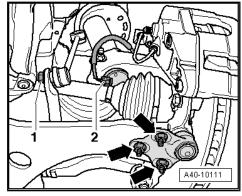
Note

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 drive shaft puller -T10382- . When doing this, take care not to damage any other parts (such as the brake hose or ABS wiring).

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



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- Place wedge -T10161- between gearbox housing and triple roller joint.
- Force inner joint out of gearbox by striking wedge -T10161with hammer.
- Take out drive shaft.

Installing

- Fit new circlip in groove on joint pin.
- 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.

You can use the sliding travel of the joint body in order to push it into place with one abrupt movement. However, do not pull the drive shaft too far out of the joint body.



Note

DO NOT use a hammer or the like.

Check secure fit of drive shaft in gearbox by pulling on joint body against resistance of circlip.



Caution

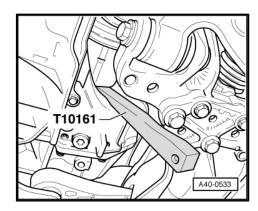
For this check, pull only on the joint body and NOT on the drive shaft. with respect to the correctness

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- Detach tensioning strap -T10038-.
- 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.

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

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



Align position of nuts -arrows- according to markings made on removal and tighten nuts.



Note

Ensure sealing boot is not damaged or twisted.

- Attach noise insulation (bottom) ⇒ Rep. gr. 66.
- After installing drive shaft on left side, re-install bottom section of wheel housing liner ⇒ Rep. gr. 66.
- If fitted, install vehicle level senders <u>⇒ page 37</u>.
- Tighten bolt securing drive shaft to wheel hub.

Procedure for tightening bolt securing drive shaft to wheel hub:

- "6.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 56
- "6.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 56
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Wheel alignment must be checked and adjusted, see chart ⇒ page 243

6.8 Servicing drive shaft (sliding inner CV joint with 100 mm dia.)

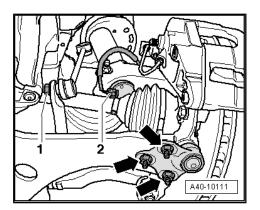
Grease filling of joints

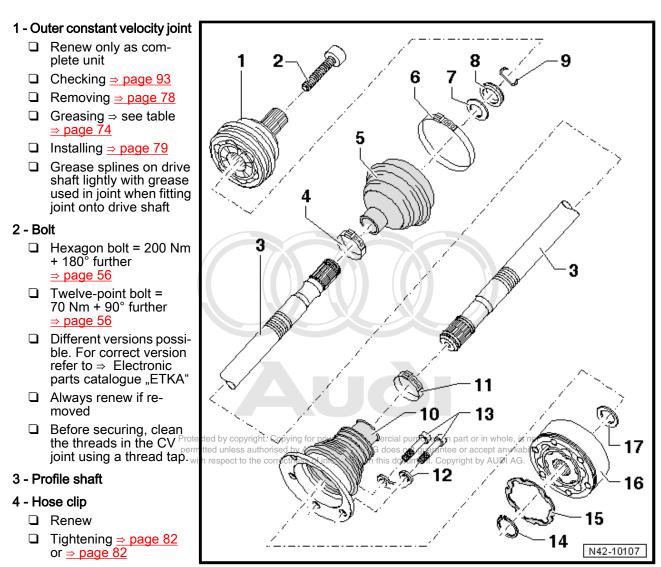
Grease	Outer joint Ø	Inner joint Ø	
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Total quantity respect to the o	orrectness of information in t	his document 6 opyright by A	UDI AG.
In joint	80 g	50 g	
In boot	40 g	60 g	



Note

Regrease joint when renewing boot.





5 - Boot for outer constant velocity joint

- Without vent hole
- Check for splits and chafing

6 - Hose clip

- □ Renew
- ☐ Tightening ⇒ page 82 or ⇒ page 82

7 - Dished spring

☐ Installation position ⇒ page 79

8 - Spacer ring (plastic)

☐ Installation position ⇒ page 79

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 attaching to constant velocity joint, apply sealant to sealing surface ⇒ Electronic parts catalogue "ETKA"

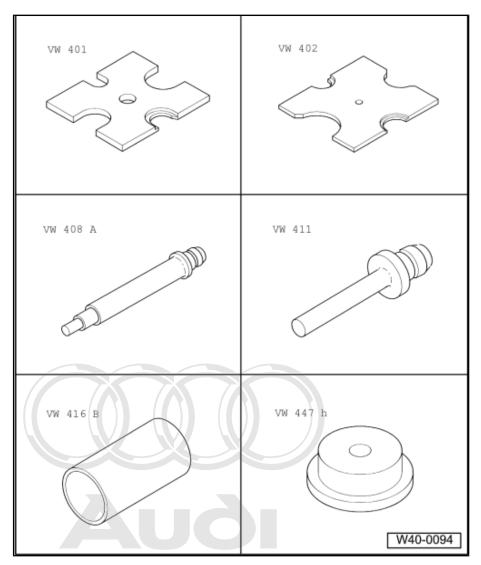
11 - Hose clip
☐ Renew
☐ Tightening ⇒ page 82 or ⇒ page 82
12 - Lock plate
13 - Bolt
 □ Initial tightening torque: 10 Nm in diagonal sequence □ Tightening torque, M8: 40 Nm in diagonal sequence □ Tightening torque, M10: 70 Nm in diagonal sequence □ Always renew if removed
14 - Circlip
☐ Renew
□ Removing and installing with -VW 161 A- ⇒ page 79
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 94
☐ Pressing off <u>⇒ page 80</u>
☐ Greasing ⇒ see table <u>⇒ page 74</u>
☐ Pressing on ⇒ page 80
☐ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft
17 - Dished spring
☐ Installation position ⇒ page 80

Dismantling and assembling drive shaft

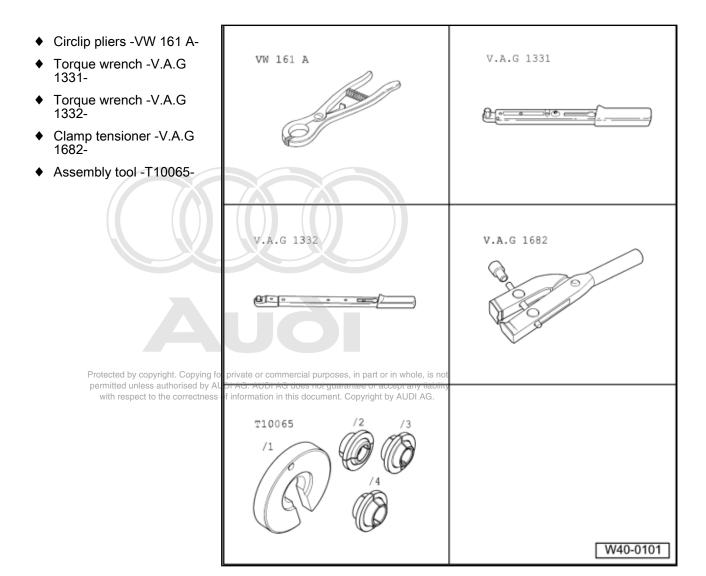
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Special tools and workshop equipment required

- ♦ 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-

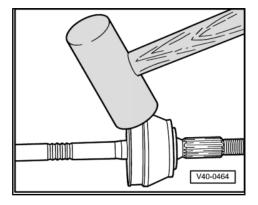


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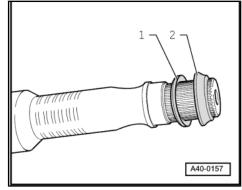
Removing outer constant velocity joint

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



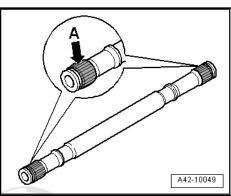
Installation position of dished spring and thrust washer at outer joint

- Dished spring
- Thrust washer



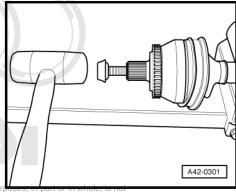
Installing outer constant velocity joint

Grease splines -A- on drive shaft lightly with grease used in joint before fitting constant velocity joint or triple roller spider onto drive shaft.



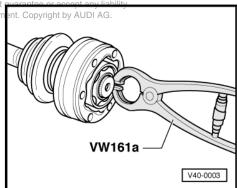
- Screw old bolt into CV joint as shown.
- Use plastic-headed hammer to drive joint onto shaft until circlip engages.

Dismantling and assembling inner constant velocity joint



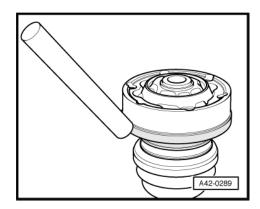
Removing circlip

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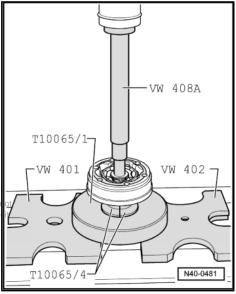
Knocking off cap (attached to boot) using a brass or copper drift



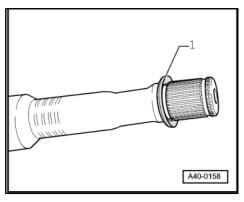
Pressing off inner constant velocity joint Assembling constant velocity joint



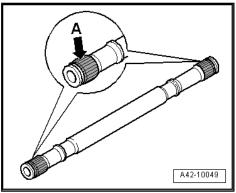
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Installation position of dished spring at inner joint



Pressing on inner constant velocity joint

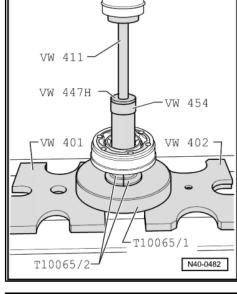


Grease splines -A- on drive shaft lightly with grease used in joint before fitting constant velocity joint or triple roller spider onto drive shaft.

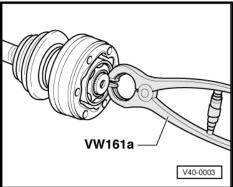


Note

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



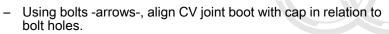
- Fit circlip.



- Apply sealing compound ⇒ Electronic parts catalogue "ETKA" to -hatched area- on clean inner surface of cap on CV joint boot. Sealant bead: continuous, 2...3 mm Ø. Route around inside of holes -arrow-.
- Use sealing compound ⇒ Electronic parts catalogue "ETKA".
- Push joint boot onto drive shaft.

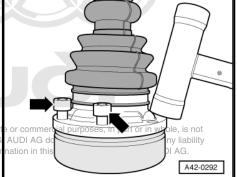
Drive shaft, boot and contact surface of cap must be free from grease!

Take care not to damage sealant bead.



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.



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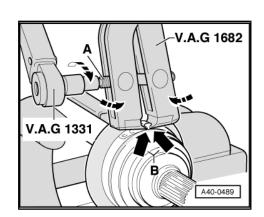
Tightening stainless-steel hose clips for Hytrel boots

- Apply clamp tensioner V.A.G 1682 as shown. Ensure jaws of clamp tensioner 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

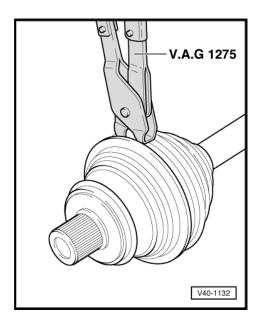
- ♦ Make sure thread of spindle on clamp tensioner moves freely. Lubricate with MoS₂ grease if necessary.
- If the thread is stiff (e.g. due to dirt), the required clamping force will not be attained at the hose clip when the specified tightening torque is applied.



Tightening hose clip for rubber boot



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6.9 Servicing drive shaft (sliding inner CV joint with 108 mm dia.)

Grease filling of joints

Grease	Outer joint Ø	Inner joint Ø
	98 mm	108 mm
Total quantity	120 g	130 g
In joint	80 g	60 g
In boot	40 g	70 g



Note

Regrease joint when renewing boot.

1 - Bolt

- ☐ Hexagon bolt = 200 Nm + 180° further ⇒ page 56
- Twelve-point bolt = 70 Nm + 90° further ⇒ page 56
- ☐ Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Always renew if removed
- Before securing, clean the threads in the CV joint using a thread tap.

2 - Outer constant velocity joint

- ☐ Renew only as complete unit
- ☐ Checking ⇒ page 93
- □ Removing ⇒ page 84
- ☐ Greasing ⇒ see table ⇒ page 82
- ☐ Installing ⇒ page 85
- Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

3 - Circlip

- Protected by copyright. Copying for private o
- Punittensertsin/groove on shaft

4 - Spacer ring (plastic)

Installation position ⇒ page 84

5 - Dished spring

☐ Installation position ⇒ page 84

6 - Hose clip

- □ Renew
- □ Tightening \Rightarrow page 87 or \Rightarrow page 88

7 - Boot for outer constant velocity joint

- Without vent hole
- Check for splits and chafing

8 - Hose clip

- □ Renew
- □ Tightening \Rightarrow page 87 or \Rightarrow page 88

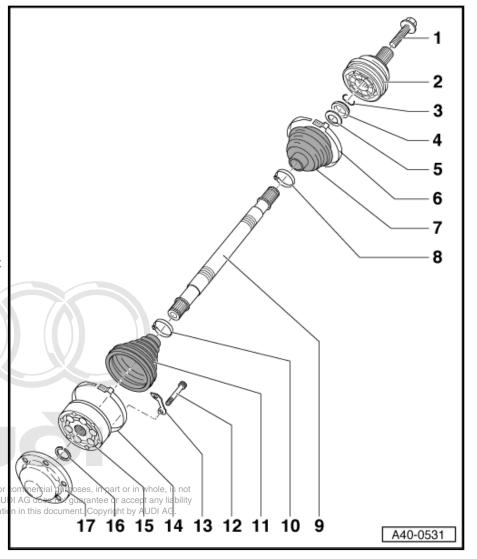
9 - Profile shaft

10 - Hose clip

- ☐ Renew
- ☐ Tightening ⇒ page 87 or ⇒ page 88

11 - Boot for inner constant velocity joint

Check for splits and chafing



12 - Bolt

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

13 - Lock plate

14 - Hose clip

- ☐ Renew
- ☐ Tightening ⇒ page 87 or ⇒ page 88

15 - Inner constant velocity joint

- ☐ Renew only as complete unit
- ☐ Checking ⇒ page 94
- □ Pressing off ⇒ page 86
- ☐ Greasing ⇒ see table <u>⇒ page 82</u>
- □ Pressing on ⇒ page 86
- ☐ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

16 - Circlip

- ☐ Renew
- □ Removing and installing with -VW 161 A- ⇒ page 85

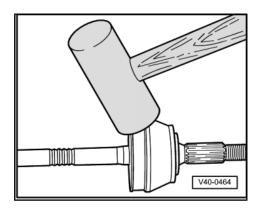
17 - Cover

- □ Renew
- Drive off constant velocity joint with a drift Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not
- □ Apply sealing compound ⇒ Electronic parts catalogue (ETKA) between joint and cover page 86 liability with respect to the correctness of information in this document. Copyright by AUDI AG.

Dismantling and assembling drive shaft

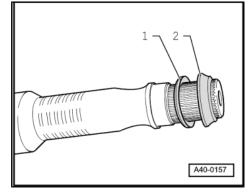
Removing outer constant velocity joint

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



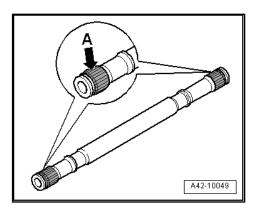
Installation position of spacer ring and dished spring on outer joint

- 1 Dished spring
- 2 Spacer ring (plastic)



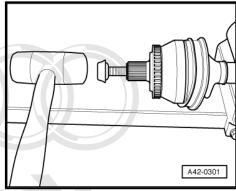
Installing outer constant velocity joint

Grease splines -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.

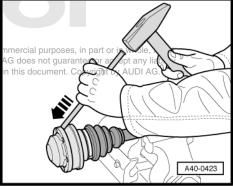
Dismantling and assembling inner constant velocity joint



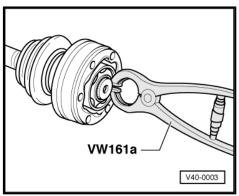
Removing cover

Drive off cover with a copper or brass drift.

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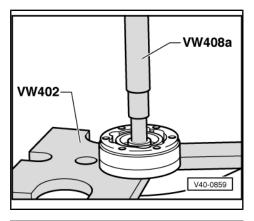


Removing and installing circlip

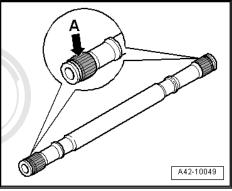


Pressing off inner constant velocity joint

- Use drift to drive off boot.
- Support ball hub while pressing off.



Pressing on inner constant velocity joint



- Grease splines -A- on drive shaft lightly with grease used in joint before fitting constant velocity joint or triple roller spider onto drive shaft.
- Press on joint as Protected by copyright. Copyring for private or commercial purposes, in par part of the state of th
- Fit circlip.

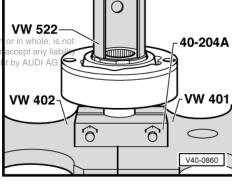


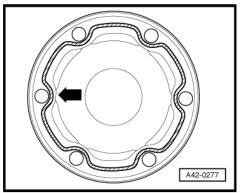
Note

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

Applying sealing compound to cover and installing cover

- Apply sealant -hatched area- to clean surface of cover.
- Sealant bead: continuous, 2...3 mm Ø. Route around inside of holes -arrow-.

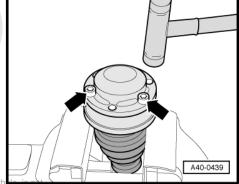




Using bolts -arrows-, align new cover in relation to bolt holes.

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

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



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Venting rubber boot espect to the correctness of information in this document. Copyright by AU

The CV 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.

Therefore please note the following:

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

V40-1133

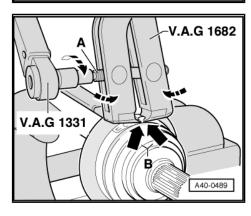
Tightening stainless-steel hose clips for Hytrel boots

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

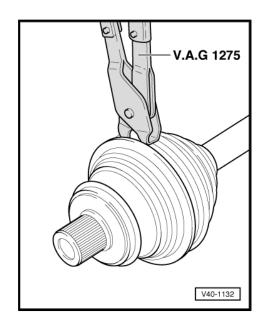


Note

- Make sure thread of spindle on clamp tensioner moves freely. Lubricate with MoS2 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



6.10 Servicing drive shaft (sliding inner CV joint with splines, 100 mm dia.)

Grease filling of joints

Grease	Outer joint	Inner joint
Total quantity	140 g	140 g



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1 - Bolt

- Twelve-point bolt = 70 Nm + 90° further ⇒ page 56
- ☐ Hexagon bolt = 200 Nm + 180° further ⇒ page 56
- ☐ Different versions possible. For correct version refer to \Rightarrow Electronic parts catalogue "ETKA"
- ☐ Always renew if removed
- □ Before securing, clean the threads in the CV joint using a thread tap.

2 - Outer constant velocity joint

- ☐ Renew only as complete unit
- □ Removing ⇒ page 90
- □ Distribute grease filling through ball races ⇒ page 88
- ☐ Installing: drive onto shaft as far as stop using a plastic head hammer
- □ Checking ⇒ page 93

3 - Circlip

- □ Always renew if removed
- ☐ Insert in groove on shaft

4 - Hose clip

- □ Always renew if removed
- ☐ Tightening <u>⇒ page 92</u>

5 - Boot

- Check for splits and chafing
- Material: Hytrel (polyelastomer)

6 - Hose clip

- □ Always renew if removed
- ☐ Tightening ⇒ page 92

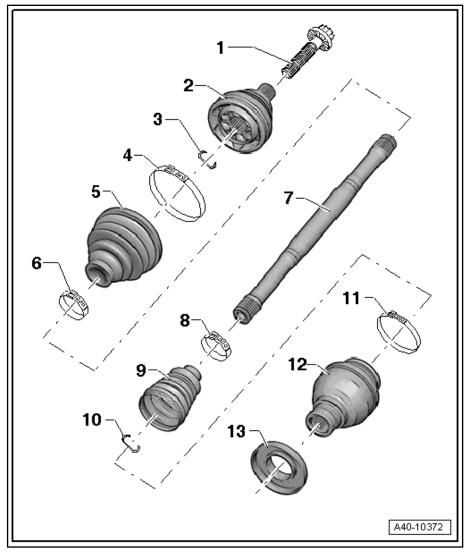
7 - Drive shaft

8 - Hose clip

- □ Always renew if removed
- ☐ Tightening ⇒ page 92

9 - Boot for sliding constant velocity joint

- ☐ Material: Hytrel (polyelastomer)
- Check for splits and chafing
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 - ☐ Always renew if removed
 - Insert in groove on shaft



11 - Hose clip

- □ Always renew if removed
- ☐ Tightening ⇒ page 92

12 - Sliding constant velocity joint

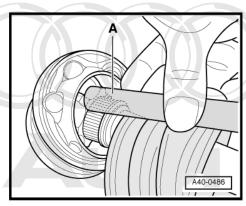
- ☐ Renew only as complete unit
- □ Removing ⇒ page 91
- ☐ Distribute grease filling through ball races <u>⇒ page 88</u>
- ☐ Installing: drive onto shaft as far as stop using a plastic head hammer

13 - Protective cap

- □ Detaching ⇒ page 92
- □ Driving on ⇒ page 93

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.

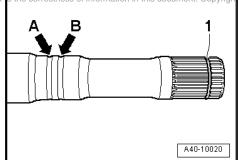


Installing outer joint

Boot and drive shaft must be free from grease.

- Always renew circlip -1-.
- Push on small hose clip with joint boot and bring boot into position on drive shaft.

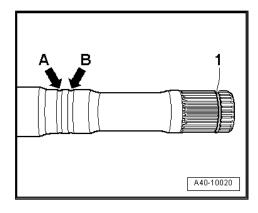
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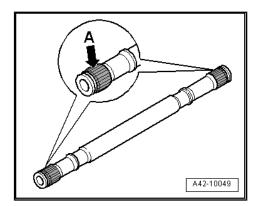


Position boot in outer groove -arrow B-.

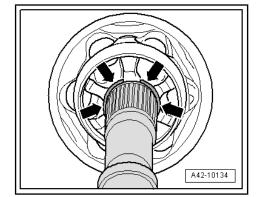
The inner groove -arrow A- must remain visible ("identification groove" for correct boot assembly).

Refer to table <u>⇒ page 88</u> and pack approx. 70% of indicated quantity of grease inside joint body.





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

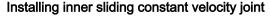


- Screw old drive shaft bolt into joint body as shown.
- Use plastic hammer to drive joint onto drive shaft until circlip engages.
- Pack remaining quantity of grease into boot side of joint body.
- Push boot onto joint body.
- Vent air from boot.
- ernMake sure boot is properly positioned on joint body any liability
- Boot must rest in groove and on contour of joint body
- Tighten hose clips on outer joint ⇒ page 92.

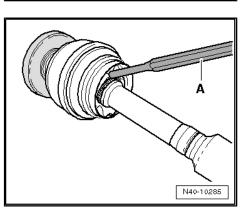
Removing inner sliding constant velocity joint

- 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 spider of the sliding constant velocity joint.



Knock joint onto shaft with plastic hammer until circlip engages.



A40-0479

Use clamp tensioner -V.A.G 1682- to fit and tighten stainless steel hose clip, as shown in illustration.

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

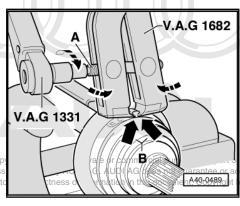


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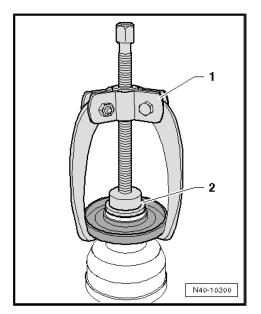
- Due to the hard material of the CV joint boot (as opposed to respect rubber), a stainless steel hose clip is required; this can only be tightened using clamp tensioner -V.A.G 1682- .
- Tightening torque: 25 Nm.
- Use torque wrench -C- with 5...50 Nm adjustment range (e.g. torque wrench -V.A.G 1331-).
- Ensure that the thread of spindle -A- is not tight. If necessary lubricate with MOS 2 grease.
- If the thread is stiff (e.g. due to dirt), the required clamping force will not be attained at the hose clip when the specified tightening torque is applied.

Removing protective cap from sliding constant velocity joint

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



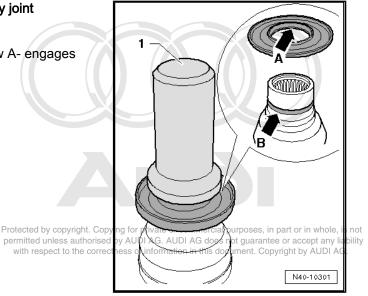




Driving protective cap onto sliding constant velocity joint

1 - Thrust piece -T10243-

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

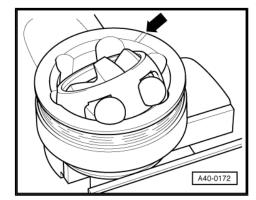


6.11 Checking outer constant velocity joint

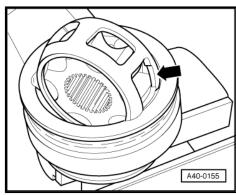
The joint should be dismantled to renew dirty grease or for checking the balls and ball races for wear and damage.

Removing

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

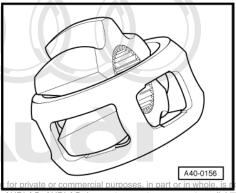


- Swivel one segment of the hub into one of the cage openings.
- Pivot hub out of cage.



Note

- ♦ The 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.



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Installing

Installation is performed in reverse sequence; note the following:

- Pack required amount of grease into joint body (check table).
- ◆ Grease quantity for outer joint (90 mm dia.) ⇒ page 74
- ◆ Grease quantity for outer joint (98 mm dia.) ⇒ page 82
- 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.

6.12 Checking inner sliding CV joint

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

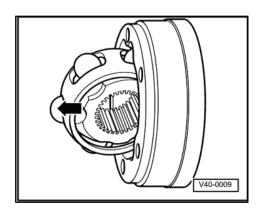


Note

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.



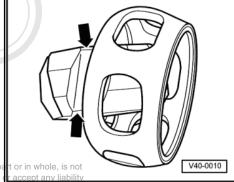
- Align ball hub with cage as shown -arrows- and pivot hub out
- Check joint, ball hub, ball cage and balls for pitting and signs of seizure.



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. Protected by copyright. Copying for private or commercial purposes, in p

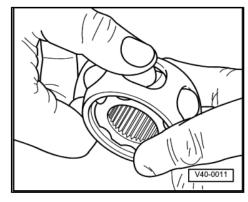
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Installing

Installation is performed in reverse sequence; note the following:

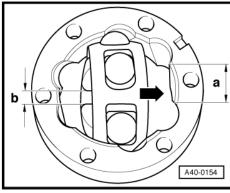
- Insert hub into cage via the two chamfers. No specific installation position is required. Push balls into cage.
- Insert hub with cage and balls at a right angle to the joint body.



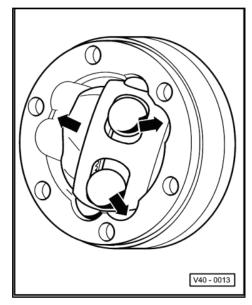


Note

- 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.
- On installation, also use felt-tip pen mark made on removal as a guide.



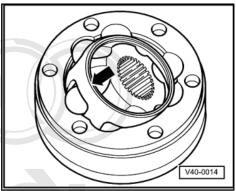
Swivel the hub into the joint body; at the same time the hub must be swivelled out of the cage -arrows- far enough to allow the balls to fit into the ball races.



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.



Servicing drive shaft with triple roller 6.13 joint AAR 2600i

Grease filling of joints

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	Outer joint
Total quantity	120 g
In joint	80 g
In boot	40 g
	Triple roller joint
Total quantity	140 g
In joint	70 g
In boot	70 g



Note

Regrease joint when renewing boot.

1 - Bolt

- ☐ Hexagon bolt = 200 Nm + 180° further ⇒ page 56
- Twelve-point bolt = 70 Nm + 90° further ⇒ page 56
- ☐ Different versions possible. For correct version $refer\ to \Rightarrow \ Electronic$ parts catalogue "ETKA"
- Always renew if removed
- □ Before securing, clean the threads in the CV joint using a thread tap.

2 - Hose clip

- □ Renew
- Tightening ⇒ page 99 or ⇒ page 99

3 - Boot for constant velocity joint

Check for splits and chafing

4 - Hose clip

- □ Renew
- Tightening ⇒ page 99 or <u>⇒ page 99</u>

5 - Profile shaft

6 - Hose clip

- □ Renew
- Tightening ⇒ page 99 or ⇒ page 99

7 - Boot for triple roller joint

Check for splits and chafing

8 - 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.

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wit Renew the correctness of information in this document. Copyright by AUDI AG.

10 - Bolt

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

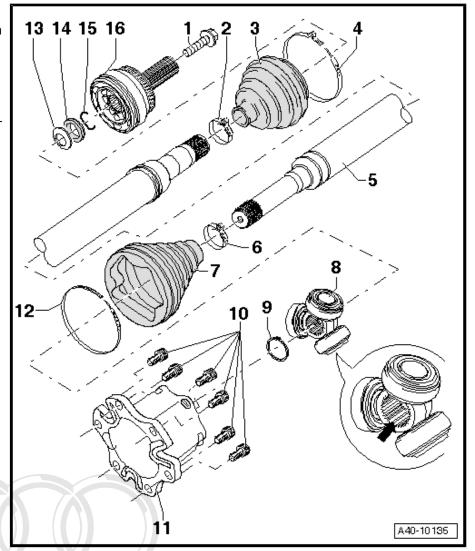
11 - Joint body (version with bolted flange)

12 - Hose clip

- □ Renew
- ☐ Tightening ⇒ page 99 or ⇒ page 99

13 - Dished spring

☐ Installation position ⇒ page 98



14 - Spacer ring (plastic)

□ Installation position ⇒ page 98

15 - Circlip

- □ Renew
- ☐ Insert in groove on shaft

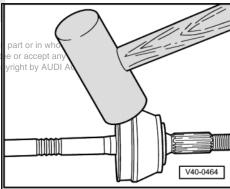
16 - Outer constant velocity joint

- □ Renew only as complete unit
- □ Removing ⇒ page 98
- ☐ Installing <u>⇒ page 98</u>
- □ Checking ⇒ page 93
- ☐ Greasing ⇒ see table ⇒ page 96
- Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

Removing outer constant velocity joint

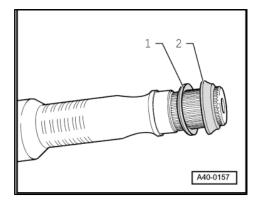
Drive joint off drive shaft with a firm blow from an aluminium Protected by copyright. Copying for private or commercial purposes, i permitted unless authorised by AUDI AG. AUDI AG does not guarant hammer.

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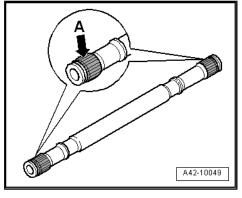
Installation position of spacer ring and dished spring

- 1 Dished spring
- 2 Spacer ring (plastic)

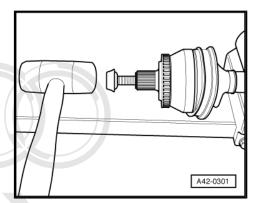


Installing outer constant velocity joint

Grease splines -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.

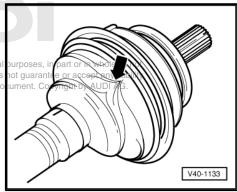


Venting rubber boot

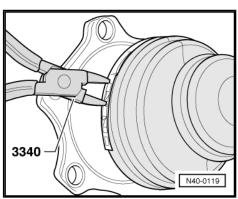
The CV joint boot is often squashed when it is installed on the joint body. This creates a partial vacuum inside the boot, which

draws in a fold -arrow- whilst driving led by copyright. Copying for private or commercial nermitted unless authorised by AUDI AG. AUDI AG does the following respect to the correctness of information in this do

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



Tightening large hose clip for rubber boot



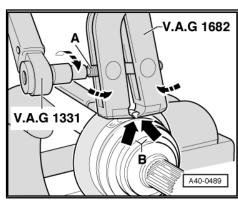
Tightening stainless-steel hose clips for Hytrel boots

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

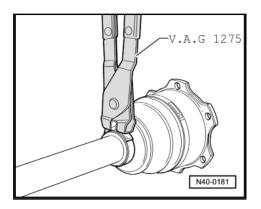


Note

- Make sure thread of spindle on clamp tensioner moves freely. Lubricate with MoS2 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.



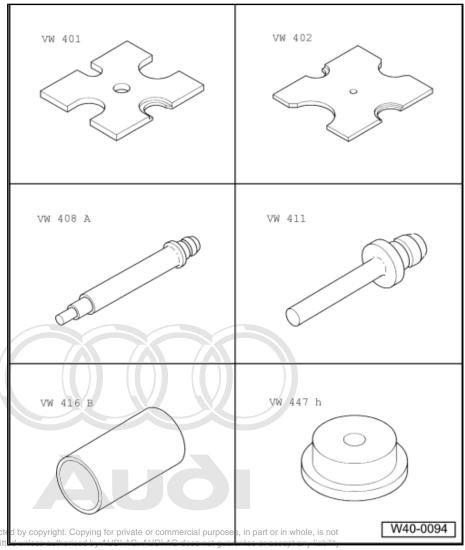
Tightening small hose clip for rubber boot



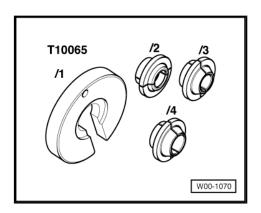
6.14 Dismantling and assembling drive shaft with triple roller joint AAR 2600i

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-

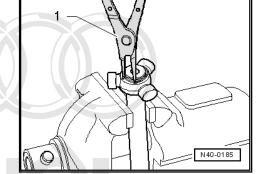


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Dismantling

- 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.



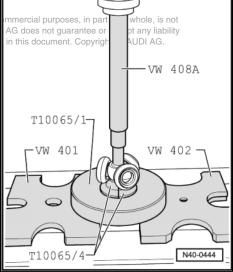
- Press triple roller spider off drive shaft.
- Pull boot off drive shaft.
- Protected by copyright. Copying for private or
- Clean shaft, joint body and groove for steal unless authorised by AUDI AG. AUD with respect to the correctness of information

Assembling

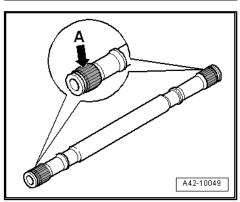
- Push small hose clip for boot onto shaft.
- Slide boot onto shaft.
- Push joint body onto shaft.

Fitting triple roller spider (tapered drive shaft version):

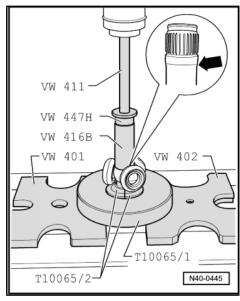
Chamfer on spider faces towards shaft and is used as an assembly aid.



Grease splines -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.

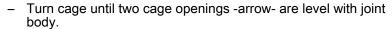


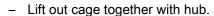
Checking outer constant velocity joint

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

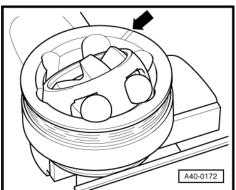
Removing

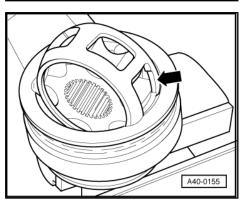
- Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scriber or oil stone -arrow-.
- Swivel ball hub and ball cage and take out balls one after the other.











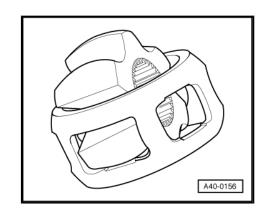
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- Swivel one segment of the hub into one of the cage openings.
- Pivot hub out of cage.



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

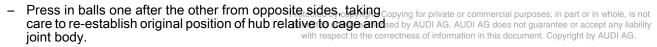
Installation is performed in reverse sequence; note the following:

- Pack required amount of grease into joint body (check table).
- Grease quantity for outer joint (90 mm dia.) ⇒ page 74
- Grease quantity for outer joint (98 mm dia.) ⇒ page 82
- Fit cage with hub into joint body.



Note

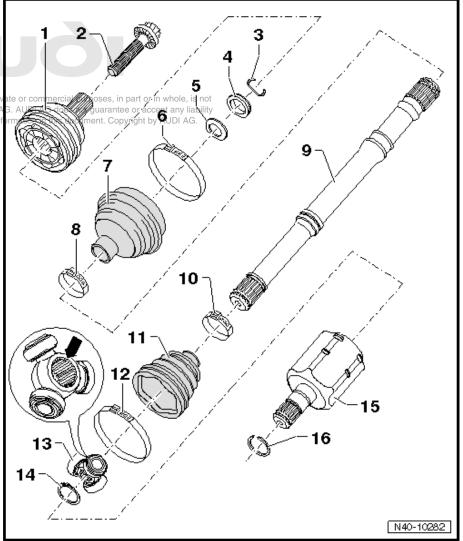
Make sure cage is inserted in correct position (i.e. sides facing in same direction as original position).



- Fit new circlip in shaft.
- Distribute remaining grease in boot.

6.15 Servicing drive shaft with triple roller joint AAR 3300i (with splines for insertion in gearbox)

1 - Outer constant velocity joint ☐ Renew only as complete unit □ Removing ⇒ page 107 ☐ Installing: drive onto shaft with plastic hammer until compressed p permitted unless authorised by CITCLIP SEATS CITCLIP SEATS □ Checking ⇒ page 93 2 - Bolt □ 70 Nm + turn 90° further □ Always renew if removed Vehicle must not be standing on its wheels when bolt is loosened or tightened 3 - Circlip □ Always renew if removed ☐ Insert in groove on shaft 4 - Thrust washer □ Installation position ⇒ page 107 5 - Dished spring Installation position ⇒ page 107 6 - Hose clip □ Always renew if removed ☐ Tightening ⇒ page 92 7 - Boot for constant velocity Check for splits and chafing ☐ Material: Hytrel (polyelastomer) 8 - Hose clip □ Always renew if removed ☐ Tightening ⇒ page 92 9 - Drive shaft 10 - Hose clip □ Always renew if removed ☐ Tightening ⇒ page 92



12 - Hose clip

11 - Boot for triple roller joint

□ Check for splits and chafing

□ Always renew if removed□ Tightening ⇒ page 92

13 - Triple roller spider with rollers

Chamfer -arrow- faces towards drive shaft splines

14 - Circlip

- □ Always renew if removed
- ☐ Insert in groove on shaft

15 - Joint body

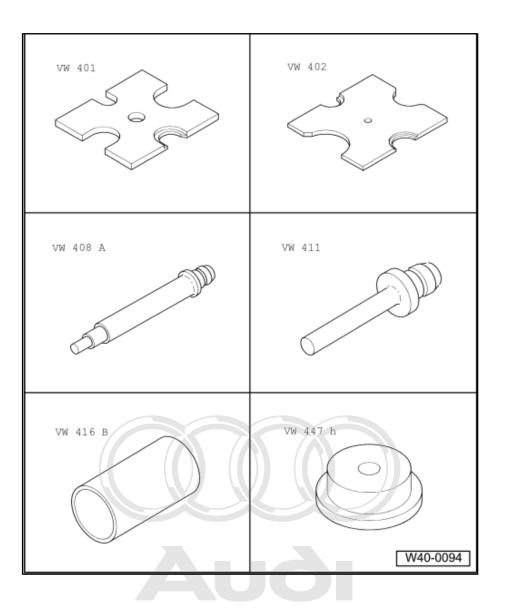
16 - Circlip

Always renew if removed

Dismantling

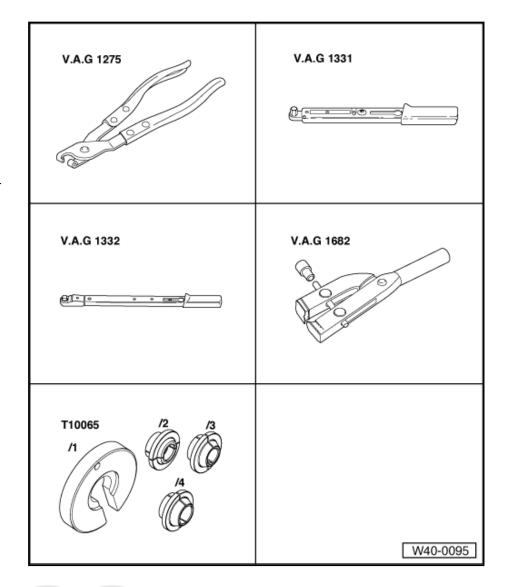
Special tools and workshop equipment required

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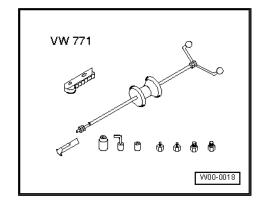
- Hose clip pliers -V.A.G 1275-
- Torque wrench -V.A.G 1331-
- Torque wrench -V.A.G 1332-
- Clamp tensioner V.A.G 1682-
- Assembly tool -T10065-



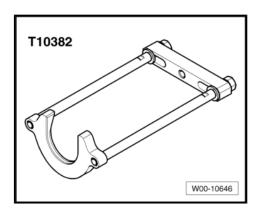
Multi-purpose tool -VW 771-



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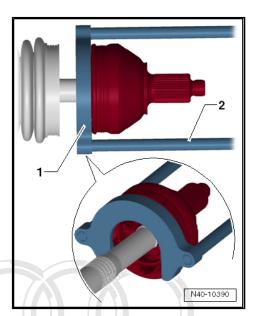
♦ Puller -T10382-



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 multipurpose tool -VW 771-.
- Puller plate -T10382/1-
- 2 -Spindles -T10382/2-

Driving on outer constant velocity joint



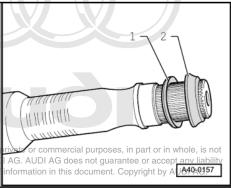
Installation position of dished spring and spacer ring on outer joint

- Dished spring
- Thrust washer
- Install new circlip.
- If necessary, push new boot onto drive shaft.
- Knock onto shaft with plastic hammer until circlip engages.

Dismantling

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- Open both hose clips on inner joint and push booth ecorrectness
- Pull joint body off drive shaft.



- Remove circlip.
- 1 Pliers (commercial type)
- Insert drive shaft in press.



- 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.

Installing triple roller spider

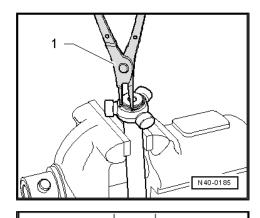
Drive shaft - tapered version

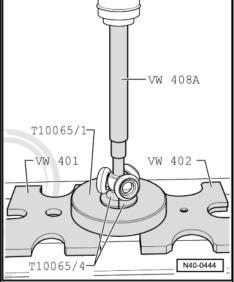
Chamfer on spider faces towards shaft and is used as an assembly aid.

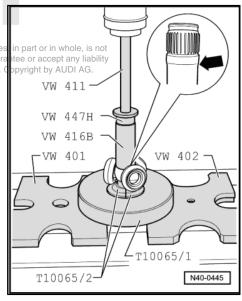
- Fit triple roller spider on shaft and press on as far as stop.
- Make sure pressure does not exceed 3.0 t.
- If necessary, grease splines of drive shaft and triple roller spinot guara der with lubricating paste 1142 052 142 A2 ness of information in this document.
- Install circlip (ensure proper seating).
- 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.

Installing triple roller spider

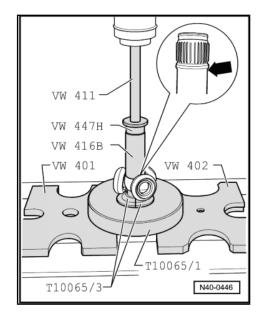
Drive shaft - cylindrical version







- 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 ⇒ page 92.



6.16 Servicing drive shaft with triple roller joint AAR 3300i (with splines for stub shaft on gearbox)

1 - Outer constant velocity joint ☐ Renew only as complete unit □ Removing ⇒ page 113 ☐ Installing: drive onto shaft with plastic hammer until compressed circlip seats □ Checking ⇒ page 93 2 - Bolt ☐ 70 Nm + turn 90° further □ Always renew if removed Vehicle must not be standing on its wheels when bolt is loosened or tightened 3 - Circlip □ Always renew if removed ☐ Insert in groove on shaft 4 - Hosepelipted unless authorised by AU Always renew if removed ☐ Tightening ⇒ page 92 5 - Boot for constant velocity joint Check for splits and 12 chafing Material: Hytrel (polyelastomer) N40-10283

6 - Hose c	li	ai
------------	----	----

- □ Always renew if removed
- ☐ Tightening <u>⇒ page 92</u>
- 7 Drive shaft
- 8 Hose clip
 - □ Always renew if removed
 - ☐ Tightening ⇒ page 92
- 9 Boot for triple roller joint
 - □ Check for splits and chafing
- 10 Hose clip
 - □ Always renew if removed
 - ☐ Tightening ⇒ page 92
- 11 Triple roller spider with rollers

Chamfer -arrow- faces towards drive shaft splines

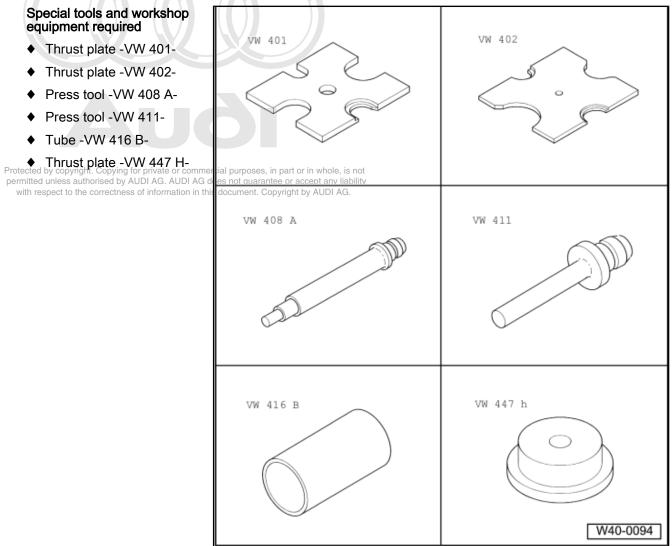
- 12 Circlip
 - □ Always renew if removed
 - ☐ Insert in groove on shaft
- 13 Adapter
- 14 Joint body
- 15 Protective cap
 - □ Detaching ⇒ page 115
 - □ Driving on ⇒ page 115

Dismantling

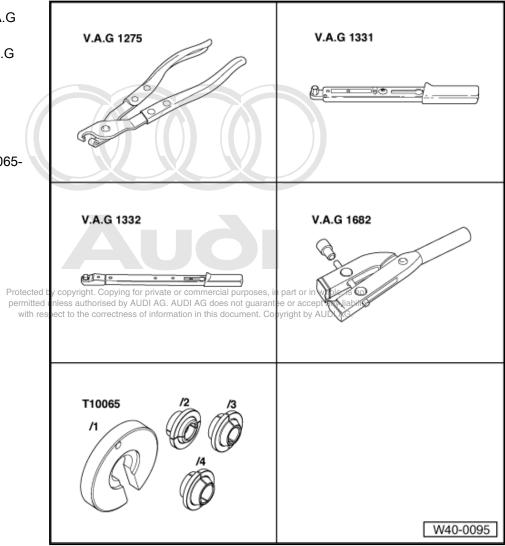
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Special tools and workshop equipment required

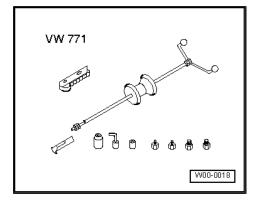
- ♦ Thrust plate -VW 401-
- ♦ Thrust plate -VW 402-
- ♦ Press tool -VW 408 A-
- ♦ Press tool -VW 411-
- ♦ Tube -VW 416 B-

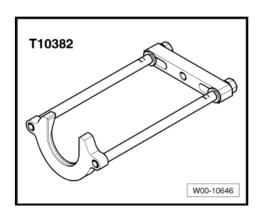


- Hose clip pliers -V.A.G 1275-
- Torque wrench -V.A.G 1331-
- Torque wrench -V.A.G 1332-
- Clamp tensioner V.A.G 1682-
- Assembly tool -T10065-



♦ Multi-purpose tool -VW 771-





Removing outer constant velocity joint

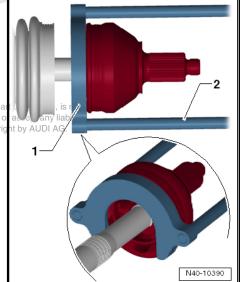
- Clamp drive shaft in vice using protective jaw covers.
- Fold back rubber boot.
- Set up puller -T10382- so that smooth side of puller plate T10382/1- faces towards spindles -T10382/2- .
- Assemble puller -T10382- together with multi-purpose tool -VW 771- .
- Pull CV joint off drive shaft using puller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

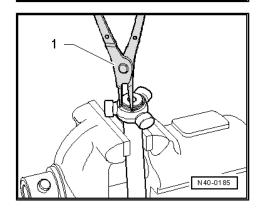
Driving on outer constant velocity joint

- Install new circlip. Protected by copyright. Copying for private or commercial purposes, in particle dunless authorised by AUDI AG. AUDI AG does not guarantee of
- If necessary, push new boot onto drive shaft mation in this document. Copyr
- Knock onto shaft with plastic hammer until circlip engages.

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.

Installing triple roller spider

Drive shaft - tapered version

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

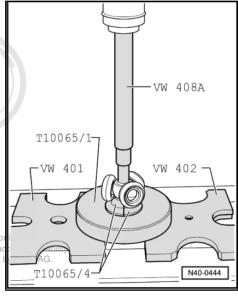
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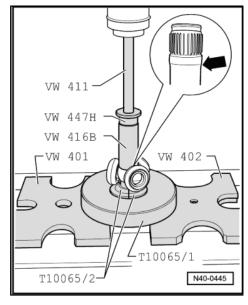
- Fit triple roller spider on shaft and press on as far as stop.
- Make sure pressure does not exceed 3.0 t.
- If necessary, grease splines of drive shaft and triple roller spider with lubricating paste -G 052 142 A2- .
- Install circlip (ensure proper seating).
- Press half the quantity of drive shaft 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.

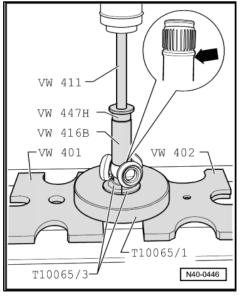
Installing triple roller spider

Drive shaft - cylindrical version

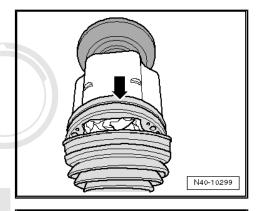
- Fit triple roller spider on shaft and press on as far as stop.
- Make sure pressure does not exceed 3.0 t.
- If necessary, grease splines of drive shaft and triple roller spider with lubricating paste -G 052 142 A2- .
- Install circlip (ensure proper seating).
- Press half the quantity of drive shaft 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.





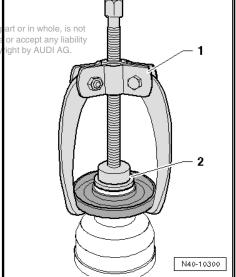


- Push joint boot onto adapter, making sure that boot engages properly in groove on adapter -arrow-.
- Fit hose clip and tighten sufficiently to ensure reliable sealing.



Pulling protective cap off triple roller joint

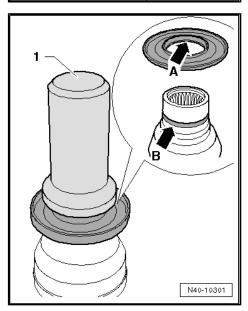
- Three-arm puller, e.g. Kukko 45-2
- Protected by copyright. Copying for private or commercial purposes, in a Thrust plate -VW 447tH-inless authorised by AUDI AG. AUDI AG does not guarantee with respect to the correctness of information in this document. Copy



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-.





Rear suspension

General notes on rear axle

- ⇒ "1.1 General notes:", page 116
- ⇒ "1.2 Contact corrosion", page 117
- "1.3 Repairing damaged threads in longitudinal member (subframe to body)", page 117
- ⇒ "1.4 Lifting suspension to unladen position", page 118
- ⇒ "1.5 Overview of rear axle (front-wheel drive)", page 120
- ⇒ "1.6 Overview of rear axle (four-wheel drive)", page 121

General notes:

by copyright. Copying for private or commercial purposes, in part or in whole, is not All contact surfaces must be cleaned when installing wax-coated guarantee or accept any liability components. The contact stirfaces must be free of wax and socument. Copyright by AUDI AG.

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 or pneumatic pipes or electrical wires. This ensures re-installation at the original location.

Any cable ties, brackets or fasteners removed during repair work must be re-attached at their original standard locations.

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

When working on the vehicle, do not allow the drive shafts to hang down under their own weight and never let the joints bend to such an extent that they contact the end stop.

Do not attempt to move the vehicle without the drive shafts fitted; this would result in wheel bearing damage. If 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 120 Nm (twelve-point bolt) or 200 Nm (hexagon bolt).

Bonded rubber bushes can only be turned to a limited extent. For this reason, do not tighten bolted connections on components with bonded rubber bushes until the wheel bearing housing has been lifted (suspension in unladen position) ⇒ page 118.

Always renew bonded rubber bushes on both sides of vehicle.

If the wheel alignment has to be checked and adjusted at a later stage, all bolts and nuts which need to be slackened to make adjustments should initially only be tightened to the specified torque



figure. After wheel alignment has been checked and adjusted, bolts and nuts must then be fully tightened by turning them through the specified angle.



WARNING

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

1.2 Contact corrosion

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

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

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

Note:

- We recommend using only genuine replacement parts; these have been tested and are compatible with aluminium.
- We recommend the use of Audi accessories.
- Damage resulting from contact corrosion is not covered under the warranty.

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

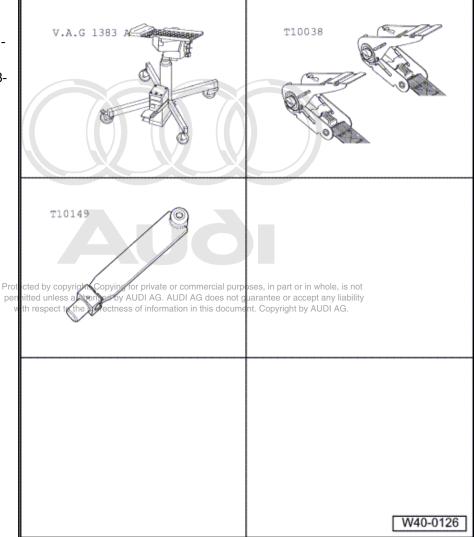
Under certain circumstances it is possible to repair the threads in the captive nuts in the longitudinal member.

- Each thread can only be repaired once.
- If a second repair is needed, the captive nut must be renewed.
- Have all thread repairs checked by foreman or supervisor.
- The thread insert must be of the same length as the thread in the body.
- Make good any damage to underseal ⇒ General Information; Body Repairs, General Body Repairs.

1.4 Lifting suspension to unladen position

Special tools and workshop equipment required

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



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

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 of the unladen vehicle 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 axle on one side with engine and gearbox jack -V.A.G 1383 A- and support -T10149-.

Use a measuring tape or similar to measure dimension -afrom wheel centre to lower edge of wheel housing.

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 on the suspension.

Before raising the axle on one side, the vehicle must be secured in position on the arms of the lifting platform with tensioning straps -T10038- .

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

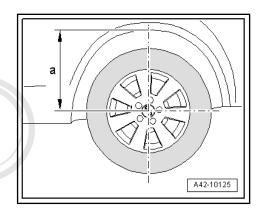
- Turn wheel hub until one of the wheel bolt holes is at the top.
- Use wheel bolt to attach support -T10149-.
- Raise wheel bearing housing with engine and gearbox jack -V.A.G 1383 A- untilidistance Habis obtained or co

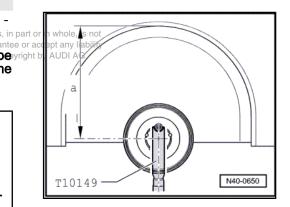
The bolts/nuts on the relevant suspension mountings must not be wright to tightened until the distance -a- between the wheel centre and the lower edge of the wheel housing is the same as the distance measured before commencing work.



WARNING

- Do not lift or lower the vehicle while the engine/gearbox jack is under the vehicle.
- Do not leave the engine/gearbox jack under the vehicle for longer than necessary.
- Tighten relevant bolts/nuts.
- Lower wheel bearing housing.
- Pull out engine/gearbox jack from under vehicle.
- Remove support -T10149-.





Overview of rear axle (front-wheel drive) 1.5

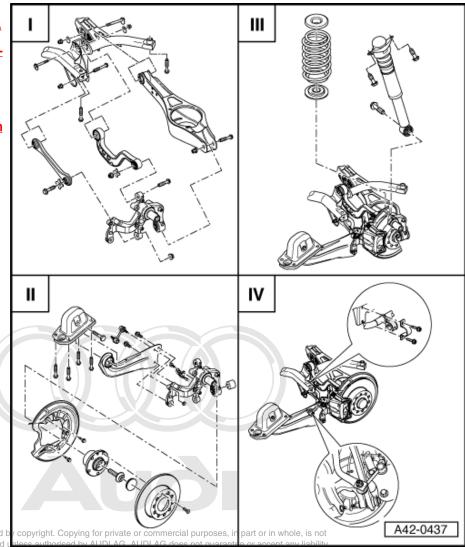
⇒ "2 Subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

|| -

⇒ "3 Wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

⇒ "4 Shock absorbers, coil springs", page 154

⇒ "5 Anti-roll bar", page 161



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Overview of rear axle (four-wheel drive) 1.6

⇒ "6 Subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) -Coupé", page 163

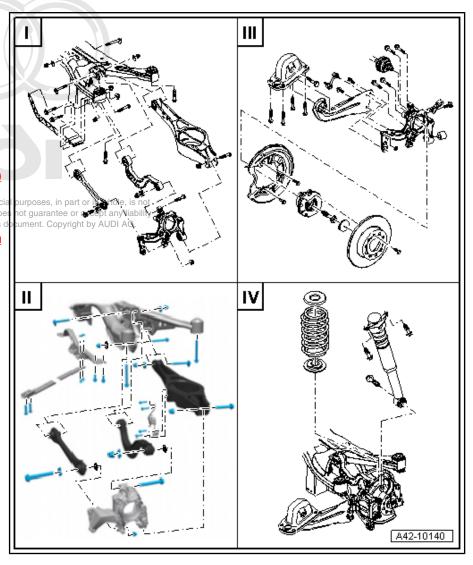
II -

⇒ "7 Subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

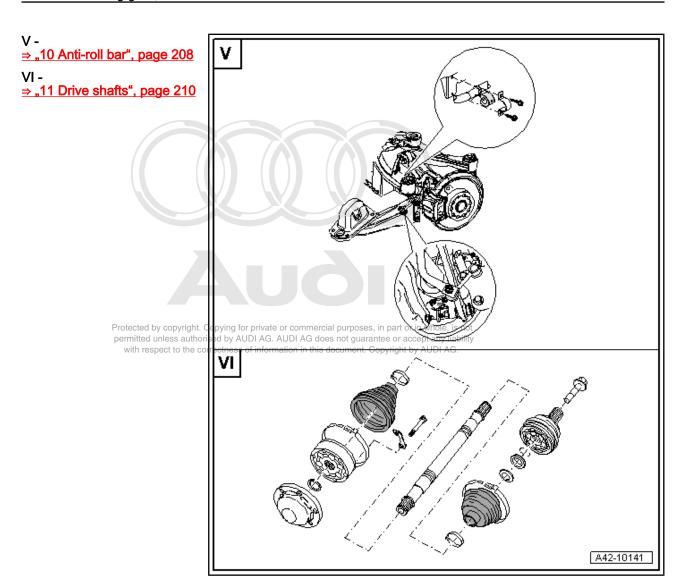
Protected by copyright. Copying for private or commercial permitted unless authorised by AUDI AG. AUDI AG does with r⇒p: 8 Wheel bearing housing this wheel bearing unit, trailing arm with mounting bracket", page 185

IV -

⇒ "9 Shock absorbers, coil springs", page 202







Subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (frontwheel drive)

- ⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123
- ⇒ "2.2 Removing and installing subframe with attachments", page 125
- ⇒ "2.3 Removing and installing diagonal struts", page 128
- ⇒ "2.4 Removing and installing lower transverse link", page 129
- ⇒ "2.5 Removing and installing upper transverse link", page 131
- ⇒ "2.6 Removing and installing track rod", page 132
- ⇒ "2.7 Removing and installing rear left vehicle level sender G76 and rear right vehicle level sender G77", page 134
- 2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)

1 - Eccentric bolt After slacke

- After slackening off, perform wheel alignment
 ⇒ page 242
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

2 - Nut

- □ 95 Nm
- Always renew if removed
- Always tighten bolted joints with suspension in unladen position
 ⇒ page 118

3 - Eccentric washer

☐ With lug on inner bore by a

4 - Eccentric bolt

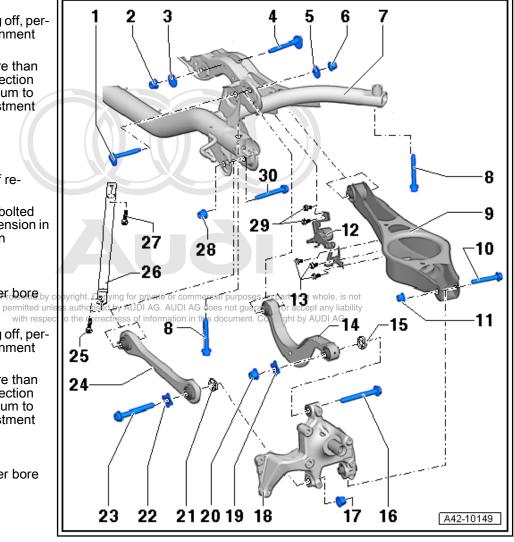
- After slackening off, perform wheel alignment
 ⇒ page 242
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

5 - Eccentric washer

□ With lug on inner bore

6 - Nut

□ 95 Nm



 Always renew if re- moved
☐ Always tighten bolted joints with suspension in unladen position ⇒ page 118
- 7 mayo tigritori bottoa jointo with odoponolori in amadori poottori - pago 110
Note
◆ Set torque wrench V.A.G 1332 to 80 Nm to tighten nut.
◆ This tightening torque only ap- plies when using socket tool T10179.
7 - Subframe
☐ Removing and installing ⇒ page 125
8 - Bolt
□ 90 Nm + 90°
☐ Always renew if removed
9 - Lower transverse link
☐ Removing and installing ⇒ page 129
10 - Bolt
☐ Always renew if removed
11 - Nut
90 Nm + 90° Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not Always repewtifuremoved AG. AUDI AG does not quarantee or accept any liability
 Always renew if removed AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG. Always tighten bolted joints with suspension in unladen position ⇒ page 118
12 - Rear left vehicle level sender -G76- and rear right vehicle level sender -G77-
☐ Removing and installing <u>⇒ page 134</u>
13 - Bolt
□ 5 Nm
14 - Upper transverse link
□ Removing and installing ⇒ page 131
15 - Washer
16 - Bolt
□ 130 Nm + 90°
□ Always renew if removed
□ Always tighten bolted joints with suspension in unladen position ⇒ page 118
17 - Nut
☐ Always renew if removed
18 - Wheel bearing housing
☐ Removing and installing ⇒ page 137
19 - Washer
20 - Nut
☐ Always renew if removed
•
21 - Washer
22 - Washer
23 - Bolt
□ 130 Nm + 90°
☐ Always renew if removed
☐ Always tighten bolted joints with suspension in unladen position ⇒ page 118

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24 - Track rod

- □ Removing and installing ⇒ page 132
- Closed side faces direction of travel

25 - Bolt

- □ 40 Nm + 45°
- For Roadster only

26 - Diagonal strut

- ☐ For Roadster only
- ☐ Removing and installing ⇒ page 128

27 - Bolt

- □ 90 Nm + 45°
- For Roadster only

28 - Nut

- □ 90 Nm + 90°
- □ Always renew if removed
- ☐ Always tighten bolted joints with suspension in unladen position <u>⇒ page 118</u>

29 - Bolt

□ 5 Nm

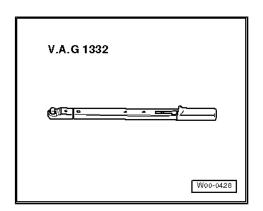
30 - Bolt

□ Always renew if removed

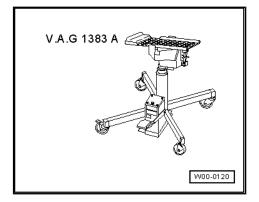
2.2 Removing and installing subframe with attachments

Special tools and workshop equipment required

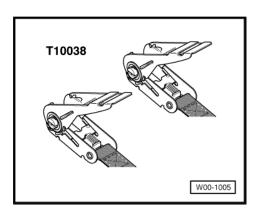
♦ Torque wrench -V.A.G 1332-



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



Tensioning strap -T10038-



Removing subframe with attachments

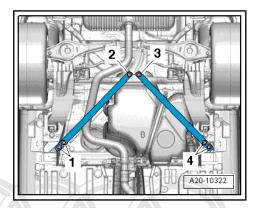
Remove wheels.

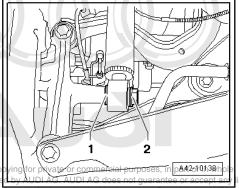
Applies to Roadster vehicles

Remove bolts -1- to -4- and take out diagonal struts.

All vehicles

- Detach stone deflector from trailing arm ⇒ page 153.
- Remove coil springs <u>⇒ page 159</u>.
- Remove rear silencer(s) \Rightarrow Rep. gr. 26.
- Disconnect electrical wiring from ABS speed sensors; on vehicles with vehicle level sender, detach and unclip electrical connectors.
- Remove bolt -2- and take off washer -1-.

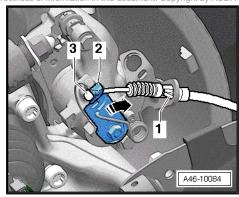




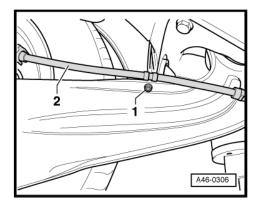
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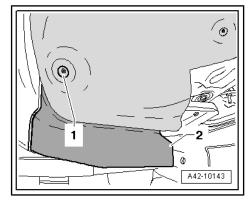
- Press brake lever -2- in direction of arrow and disengage handbrake cable -3-.
- Compress retaining tabs -1- and simultaneously pull out handbrake cable.



- Unscrew hexagon bolt -1- and detach handbrake cable -2from cable bracket.
- Remove brake caliper ⇒ Rep. gr. 46.
- Secure brake caliper to body so that weight of caliper does not stretch or damage brake hose or brake pipe.



Unscrew bolt -1- and remove cowl panel -2- ⇒ Rep. gr. 66.

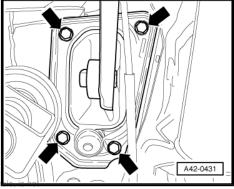


- Mark position of mounting bracket on body.
- Remove bolts -arrows-.



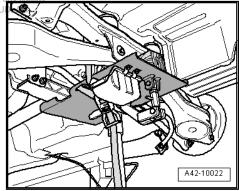
WARNING

BEFORE slackening subframe bolts, secure vehicle against tipping over (e.g. by placing a weight of approx. 50 kg in the luggage compartment).



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- Bring engine and gearbox jack A.G. 1383 Asiswith nuniversal to be AU gearbox support -V.A.G 1359/2- and a suitable block of wood into position under subframe.
- Secure subframe with tensioning straps.



Remove hexagon bolts -1- and -2-.



Note

For clarity, illustration only shows left side of vehicle.

Carefully lower subframe with attachments.



Note

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

Installing subframe with attachments

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

Bores in subframe must be aligned centrally with mounting points on body.

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

Tightening torques

⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

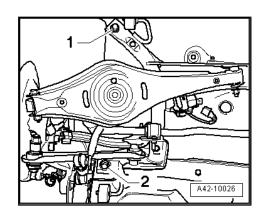
⇒ "5.1 Exploded view of anti-roll bar", page 161

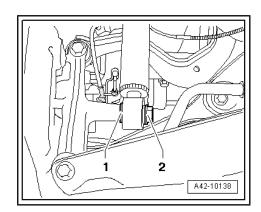
- Install bolt -2- with washer -1- (washer MUST be fitted).
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position \Rightarrow Vehicle diagnostic, testing and information system VAS 5051.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .

Front and rear wheel alignment must always be checked and adjusted if necessary using VW/Audi approved equipment.

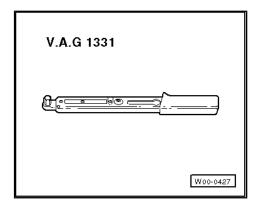


Special tools and workshop equipment required

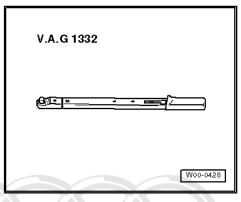




◆ Torque wrench -V.A.G 1331-



♦ Torque wrench -V.A.G 1332-



Removing

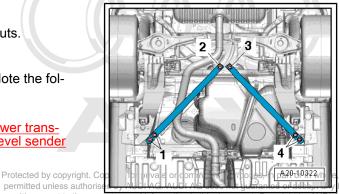
Remove bolts -1- to -4- and take out diagonal struts.

Installing

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

Tightening torques

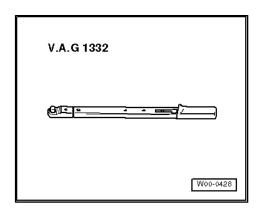
⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123



2.4 Removing and installing lower transverse link

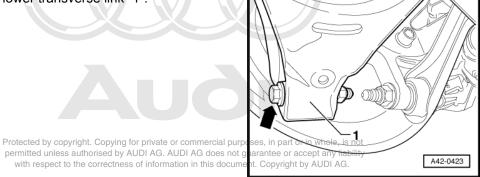
Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-



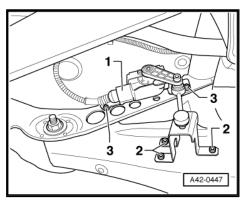
Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove coil spring ⇒ page 159.
- Unscrew bolt -arrow- for lower transverse link -1-



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On vehicles with vehicle level sender, unscrew bolts -2-.



- Use felt-tip pen or similar to mark position of eccentric bolt -arrow B- in relation to subframe.
- Disengage and lower rear part of exhaust system.
- Unscrew bolt -arrow B-.
- Take out lower transverse link.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

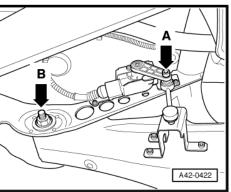
Tightening torques

⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

⇒ "5.1 Exploded view of anti-roll bar", page 161

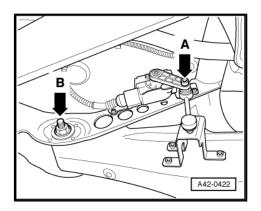
Before tightening bolts securing transverse link, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 118.



δυA

- Observe mark made for position of eccentric bolt -arrow B- in relation to subframe.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position

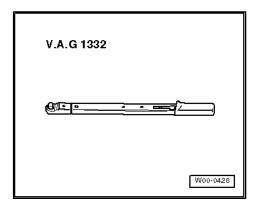
 Vehicle diagnostic, testing and information system VAS 5051.
- Check and adjust wheel alignment as required, see chart
 ⇒ page 243



2.5 Removing and installing upper transverse link

Special tools and workshop equipment required

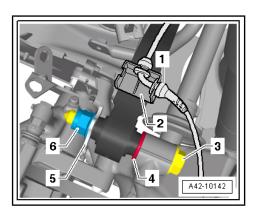
♦ Torque wrench -V.A.G 1332-



Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove coil spring ⇒ page 159.
- Detach wiring -1- completely from bracket -2-.
- Unscrew nut -6- and take off washer -5-.
- Remove bolt -3- and washer -4-.

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- (Audi TT 2007 ➤
- Use felt-tip pen or similar to mark position of eccentric bolt -arrow- in relation to subframe.
- Remove bolt -arrow-.
- Take out upper transverse link.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

Tightening torques

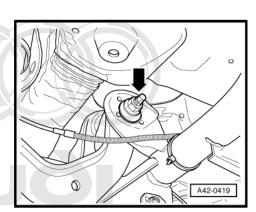
⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

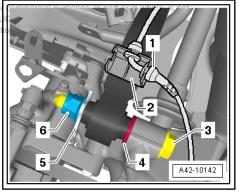
⇒ "5.1 Exploded view of anti-roll bar", page 161

Before tightening bolts securing transverse link, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 118.

Note mark for position of eccentric bolt -arrow- in relation to subframe.

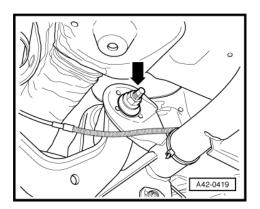


- Install bolt -3- with washer -4- (washer MUST oberfitted) using for private by AUDI AG. A
- Check and adjust wheel alignment as required, see chartes of inform ⇒ page 243 .

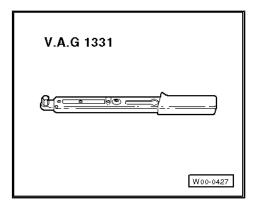


2.6 Removing and installing track rod

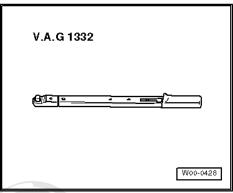
Special tools and workshop equipment required



◆ Torque wrench -V.A.G 1331-



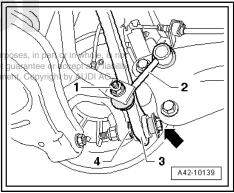
♦ Torque wrench -V.A.G 1332-



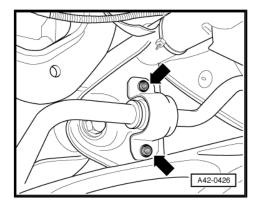
Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Detach stone deflector from trailing arm ⇒ page 153.
- Remove coil spring ⇒ page 159.
- Unscrew nut -1- and pull coupling rod -2- out of anti-roll bar.
- Remove bolt -arrow- for track rod -3- and take off washer -4-.

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- Unscrew bolts -arrows- for anti-roll bar clamp.



- Unscrew nut -arrow- and take out bolt towards the rear.
- Take out track rod.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

"3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

Tightening torques

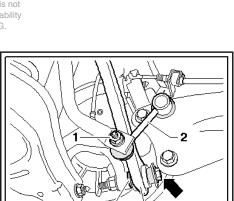
⇒ "4.1 Exploded view of shock absorbers, coil springs page 154

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- Install bolt -arrow- for track rod -3- with washer -4- (washer MUST be fitted).
- Insert track rod into vehicle and hand-tighten bolts.

Before tightening bolts securing track rod, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 118.

Check and adjust wheel alignment as required, see chart ⇒ page 243 .



A42-0424

A42-10139

2.7 Removing and installing rear left vehicle level sender -G76- and rear right vehicle level sender -G77-

General notes:

Vehicles with electronic damping control (Audi magnetic ride) and/or gas discharge headlights have automatic headlight range control fitted as standard equipment ⇒ Rep. gr. 94.

The electronic damping control (Audi magnetic ride) and the automatic headlight range control functions require information on the compression and rebound travel at the front and rear suspension.

For this purpose, the position of the left/right transverse link in relation to the body is transferred to the rear left vehicle level sender -G76- and the rear right vehicle level sender -G77- via a coupling rod. The senders then transmit electrical signals to the electronically controlled damping control unit -J250- and/or the gas discharge light control units (left/right) -J343/344- .

Servicing gas discharge light control unit (left/right) -J343/344- ⇒ Rep. gr. 94.

On the front axle these signals are supplied by the front left vehicle level sender -G78- and front right vehicle level sender -G289- to the electronically controlled damping control unit -J250- and/or the gas discharge light control units (left/right) -J343/344-.

These signals are required for calculating the current attitude of the vehicle.

The automatic headlight range control reacts to changes in the suspension height (attitude of the vehicle).

The following situations may produce a change in the suspension height:

- ◆ Towing a trailer/caravan
- ♦ Different loads (vehicle unladen, partly laden or fully laden)



Note

The basic headlight setting must always be checked and, on vehicles with electronic damping control (Audi magnetic ride), the reference position of the suspension must always be re-adapted in the following cases:

- Following assembly work on vehicle level sender
- ♦ If lower transverse link has been removed and installed
- ♦ If bolted connections -2- or -3- have been slackened

The vehicle level sender is only available as a replacement part does no complete with coupling rod and upper and lower retaining plates.

 On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position

Vehicle diagnostic, testing and information system VAS 5051.

Basic setting of headlights ⇒ Rep. gr. 94



- Unplug connector -1-.
- Remove bolts -2- and -3-.
- Take out sender.

Installing

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

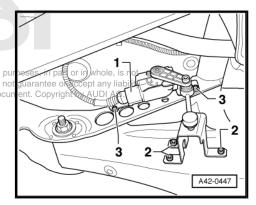
Tightening torques

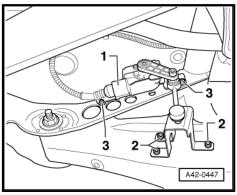
⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Lever on sender must face outwards.

- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position

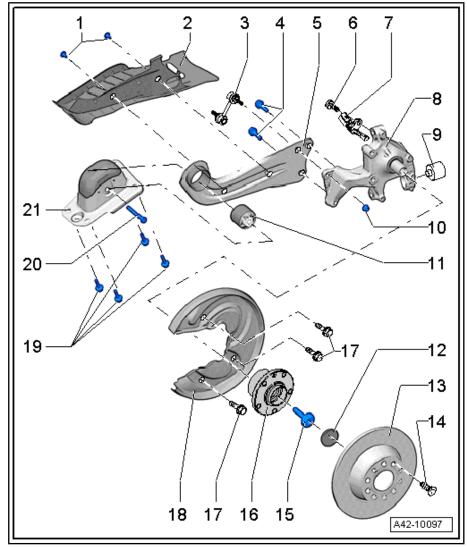
 Vehicle diagnostic, testing and information system VAS 5051.
- Perform basic setting of headlights ⇒ Rep. gr. 94.





3 Wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector

- ⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector",
- ⇒ "3.2 Removing and installing wheel bearing housing", page 137
- ⇒ "3.3 Renewing bonded rubber bush for wheel bearing housing", page 142
- ⇒ "3.4 Removing and installing wheel bearing unit", page 145
- 3.5 Removing and installing trailing arm with mounting bracket", vpage 147 the correctness of information in this document. Copyright by AUDI AG
- ⇒ "3.6 Servicing trailing arm", page 151
- ⇒ "3.7 Removing and installing stone deflector", page 153
- 3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector
- 1 Spreader rivet
- 2 Stone deflector
 - Removing and installing ⇒ page 153
- 3 Coupling rod
- 4 Bolt
 - □ 90 Nm + 45°
 - □ Always renew if removed
- 5 Trailing arm
 - Removing and installing ⇒ page 147
 - □ Servicing trailing arm ⇒ page 151
- 6 Bolt
 - □ 8 Nm
- 7 Speed sensor
- 8 Wheel bearing housing
 - Removing and installing ⇒ page 137
- 9 Bonded rubber bush
 - □ Renewing ⇒ page 142
- 10 Nut
 - □ 25 Nm
- 11 Bonded rubber bush
 - □ Renewing ⇒ page 151
- 12 Grease cap
 - □ Always renew if removed



	Pressing off and driving in ⇒ page 145
Prope	er sealing can only be achieved by installing a new grease cap.
13 - E	Brake disc
14 - E	Bolt
	4 Nm
15 - E	Bolt
	200 Nm + 180°
	Always renew if removed
	Before securing, clean threads in wheel bearing housing using a thread tap.
	Use M18 multi-point bit -T10162- for loosening and tightening
	Loosening and tightening bolt securing wheel hub at stub axle (same procedure as for four-wheel drive vehicles) ⇒ page 210
16 - V	Wheel bearing unit
	The ABS sensor ring is incorporated in the wheel bearing unit
	Removing and installing <u>⇒ page 145</u>
	This wheel bearing unit is maintenance-free and does not require adjustment. There is no provision for adjustment or repair.
17 - E	Bolt
	10 Nm
18 - 8	Splash plate
19 - E	Bolt
	50 Nm + 45°
	Always renew if removed
20 - E	Bolt
	90 Nm + 90°
	Always renew if removed

3.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-

21 - Mounting bracket

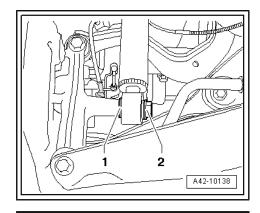


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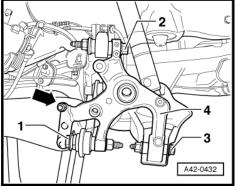
Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.

- Detach stone deflector from trailing arm ⇒ page 153.
- Remove coil spring <u>⇒ page 159</u>.
- Detach brake caliper / brake carrier and tie to body with wire ⇒ Rep. gr. 46.
- Remove ABS speed sensor from wheel bearing housing.
- Remove wheel bearing unit <u>⇒ page 145</u>.
- Remove splash plate.
- Remove bolt -2- and take off washer -1-.



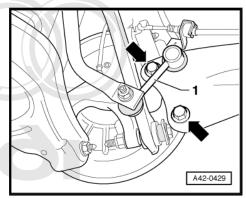
- Unscrew bolts for track rod -1-, upper transverse link -2- and lower transverse link -3- from wheel bearing housing -4-.
- Detach coupling rod from trailing arm -1-.



- Hold wheel bearing housing and unscrew bolts -arrows-.
- Pull coupling rod -1- out of trailing arm.
- Take out wheel bearing housing.

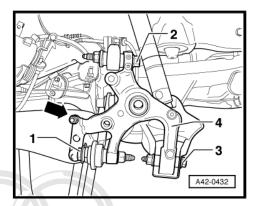
Installing

Installation is performed in reverse sequence; note the following:



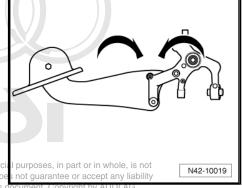
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- Fit bolts for track rod -1-, upper transverse link -2- and lower transverse link -3-, and tighten hand-tight.
- Bolt coupling rod -arrow- to trailing arm hand-tight.



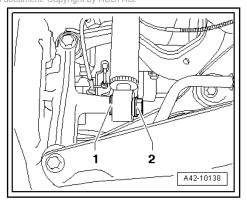
Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. The wheel suspension must be in extended position before securing. The trailing arm and the wheel bearing housing will only then move into the required position -arrows-.

It is important to keep to the specified sequence for the following operations.

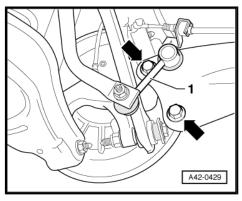


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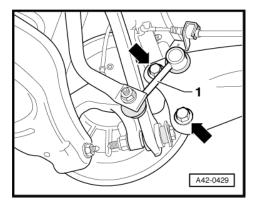
Install bolt -2- with washer -1- and tighten bolt (washer MUST be fitted).



- Fit trailing arm to wheel bearing housing with bolts -arrows-(do not tighten at this stage).
- Install coil spring ⇒ page 207.

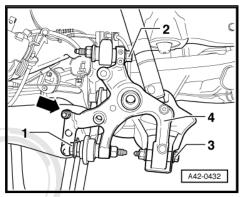


Tighten bolts -arrow-.

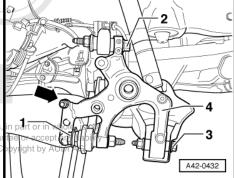


- Bolt coupling rod -arrow- to trailing arm.
- Install splash plate.

Bolt connections on wheel bearing housing may only be tightened when dimension "a" has been obtained \Rightarrow page 118 .



- Tighten bolt for track rod -1-.
- Tighten bolt for lower transverse link -3-.



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- Install bolt -3- with washer -4- and tighten bolt (washer MUST be fitted).
- Install ABS speed sensor in wheel bearing housing.
- Install brake disc.
- Install brake carrier with brake caliper. ⇒ Rep. gr. 46

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", <u>page 136</u>

Tightening torques

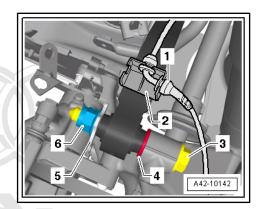
⇒ "4.1 Exploded view of shock absorbers, coil springs".

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Tightening torques

⇒ "5.1 Exploded view of anti-roll bar", page 161

- Fit and secure wheel.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .

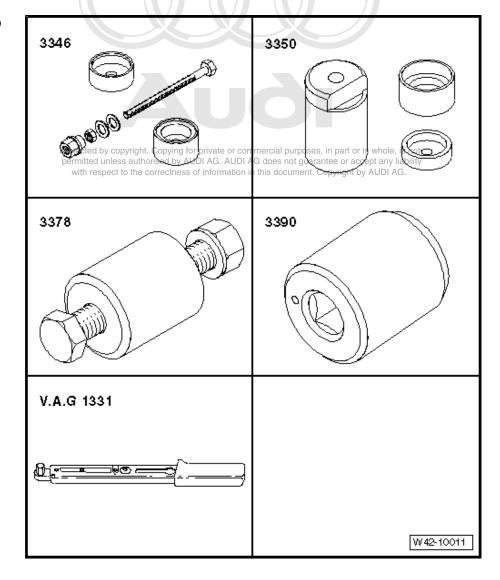




Renewing bonded rubber bush for wheel bearing housing 3.3

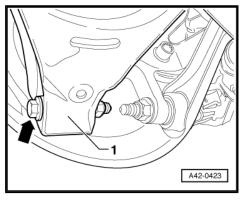
Special tools and workshop equipment required

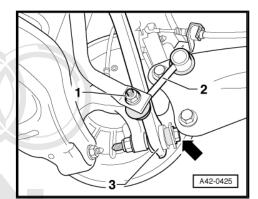
- Assembly tool -3346-
- Assembly tool -3350-
- Fitting sleeve -3378-
- Carrier -3390-
- Torque wrench -V.A.G 1332-



Removing

- Measure distance from centre of wheel to lower edge of wheel housing \Rightarrow page 118.
- Remove wheel.
- Remove coil spring <u>⇒ page 159</u>.
- Unscrew bolt -arrow- for lower transverse link -1-.





Pressing out bonded rubber bush

- Attach tools as shown in illustration.
- Nut -3346/3-
- 2 -Carrier -3390-
- 3 -Assembly tool -3350-
- 4 -Nut (commercially available type)
- 5 -Spindle -3346/2-
- Pull out bonded rubber bush by turning spindle.

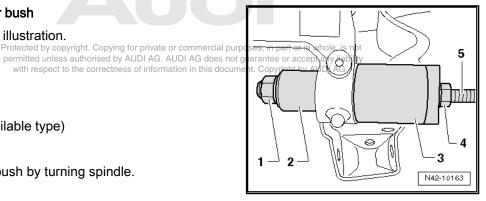
Installing bonded rubber bush

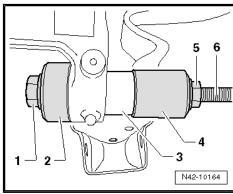
- Attach tools as shown in illustration.
- Nut -3346/3-
- 2 -Assembly tool -3346-
- 3 -Bonded rubber bush
- 4 -Fitting sleeve -3378-
- 5 -Nut (commercially available type)
- Spindle -3346/2-
- Draw in the bonded rubber bush by turning the spindle.



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 (measured at points without projecting seam or burrs on casting).
- Press bush in further if dimensions -A- and -B- are not equal.

If the bonded rubber bush has to be pressed in further, use a 27 mm socket (commercially available type) in place of fitting sleeve -3378- .

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

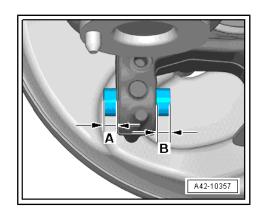
Tightening torques

⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

⇒ "5.1 Exploded view of anti-roll bar", page 161

Bolt connections on wheel bearing housing may only be tightened when original distance between wheel hub centre and lower edge of wheel housing (as measured before assembly) has been obtained ⇒ page 118.



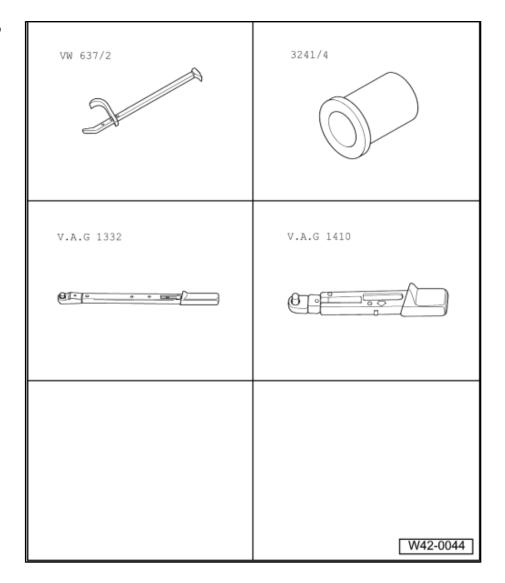


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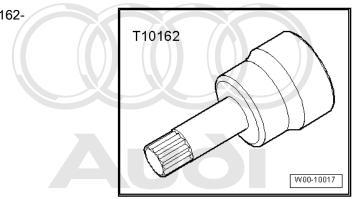
3.4 Removing and installing wheel bearing unit

Special tools and workshop equipment required

- Hub grease cap puller -VW 637/2-
- ♦ Fitting sleeve -3241/4-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Torque wrench V.A.G 1410-



♦ Bit for multi-point socket head bolt (M18) -T10162-

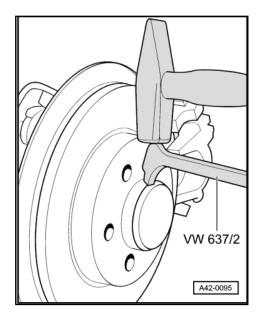


Removing

- Lift vehicle and remove wheel.

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



- Pry off grease cap.
- Detach brake caliper / brake carrier and tie to body with wire. ⇒ Brake system; Rep. Gr. 46



Note

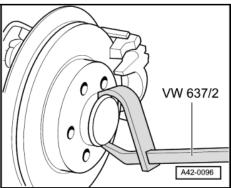
Do not suspend the brake caliper from the brake hose.

- Remove cross-head screw for brake disc and take off brake disc.
- Unscrew multi-point socket head bolt using bit for multi-point socket head bolt (M18) -T10162- .
- Pull wheel bearing unit off stub axle.



Caution

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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

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector",

Tightening torques

⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

⇒ "5.1 Exploded view of anti-roll bar", page 161

Carefully slide wheel hub/wheel bearing unit onto stub axle.

Take care to keep wheel hub/wheel bearing unit straight.

Fit new multi-point socket head bolt and tighten bolt ⇒ I<u>tem 15 (page 137)</u>



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- First tighten bolt with torque wrench to specified tightening torque.
- Use fixed wrench to turn bolt further through specified angle.
- Drive in grease cap.



Note

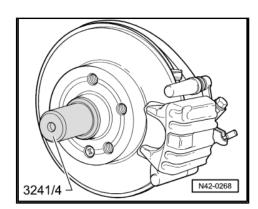
- Always renew grease caps.
- Damaged grease caps allow moisture to enter the bearing. For this reason it is important to use the tool shown in the illustration.

Remaining installation steps are carried out in reverse sequence:

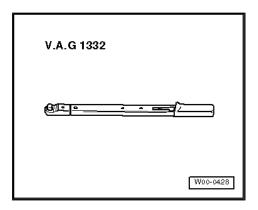
3.5 Removing and installing trailing arm with mounting bracket

Special tools and workshop equipment required

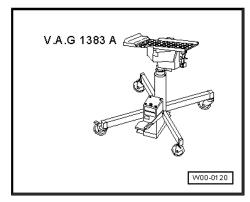




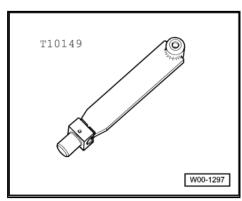
Torque wrench -V.A.G 1332-



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



Support -T10149-

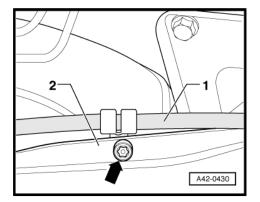


Removing

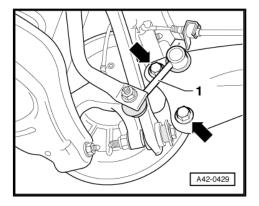
- Remove wheel.
- Detach stone deflector from trailing arm <u>⇒ page 153</u>.
- Remove coil spring ⇒ page 159.
- Unscrew bolt -arrow- for handbrake cable -1- from trailing arm -2-.



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- Unbolt coupling rod -1- from trailing arm.
- Remove bolts -arrows-.
- Mark position of mounting bracket on body.

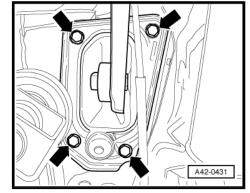


- Remove bolts -arrows-.
- Take out trailing arm with mounting bracket.

The mounting bracket must be detached from the trailing arm if the trailing arm is to be renewed.

The position of the mounting bracket must then be adjusted in relation to the trailing arm.

Setting installation position of mounting bracket in relation to trailing arm



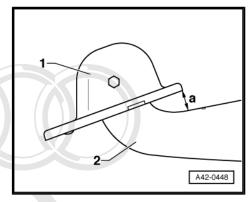
Dimension -a- is 34 mm.

- 1 Mounting bracket
- 2 Trailing arm
- After setting dimension -a-, tighten bolt ⇒ Item 20 (page 137) .

Installing

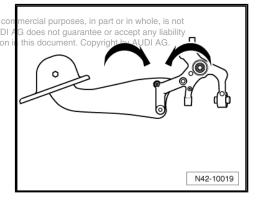
Installation is performed in reverse sequence; note the following:

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 wheel 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-.

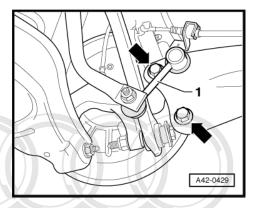


Installation position: Bolt connection between trailing arm and wheel bearing housing permitted unless authorised by AUDI AG. AUDI

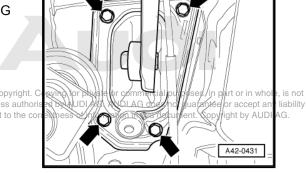
It is important to keep to the specified sequence for the following operations.



- Fit trailing arm and mounting bracket to wheel bearing housing with bolts -arrows- (do not tighten at this stage).
- Insert coupling rod -1- in trailing arm (do not tighten nut at this stage).
- Lift wheel suspension with engine and gearbox jack -V.A.G 1383 A- and support -T10149- until mounting bracket makes contact with body.

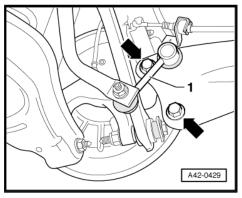


- Tighten bolts -arrows- onto old impression marks.
- Lower wheel suspension with engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Install coil spring ⇒ page 207.



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- Tighten trailing arm bolts -arrows- to torque (ensure that components are positioned as required) ⇒ page 149.
- Tighten nut -1- securing coupling rod to trailing arm.



- Secure handbrake cable -1- to trailing arm -2- -arrow-
- Fit and secure wheel.

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

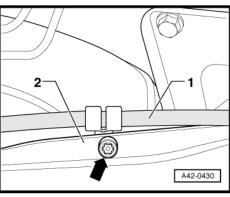
⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

Tightening torques

⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

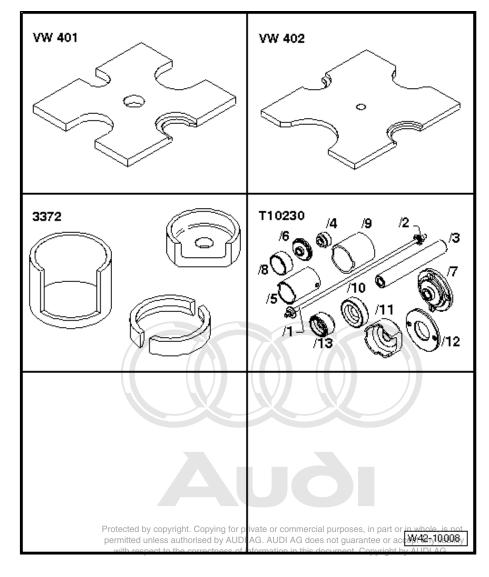
- "5.1 Exploded view of anti-roll bar", page 161
- Check and adjust wheel alignment as required, see chart <u>⇒ page 243</u> .



Servicing trailing arm 3.6

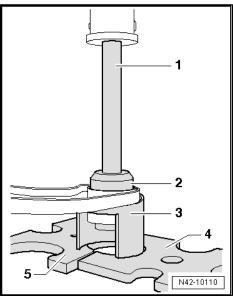
Special tools and workshop equipment required

- ♦ Thrust plate -VW 401-
- Thrust plate -VW 402-
- Removal tool -3372-
- Assembly tool -T10230-



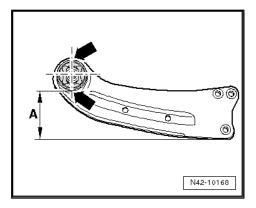
Pressing out bonded rubber bush

- Remove trailing arm with mounting bracket ⇒ page 147.
- Apply special tools as shown in illustration.
- Tube -T10230/3-
- Thrust piece -T10230/10-
- 3 -Removal tool -3372-
- 4 -Thrust plate -VW 401-
- Thrust plate -VW 402-
- Press out bonded rubber bush.



Pressing in bonded rubber bush

- Position trailing arm on a flat surface so that dimension -A- = 114 mm is obtained.
- Mark a vertical line on bush of trailing arm -arrows-.

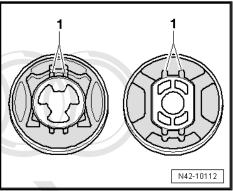


There are two different types of bonded rubber bushes. On both types the marked line must be between the projections -1- after pressing in.

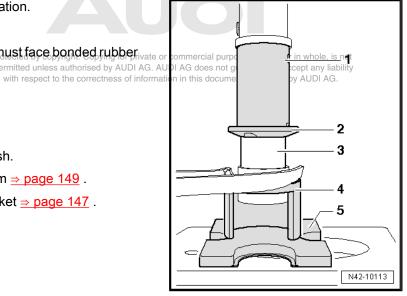


Note

It is very important that the bonded rubber bush is installed in the correct position relative to the bush of the trailing arm.



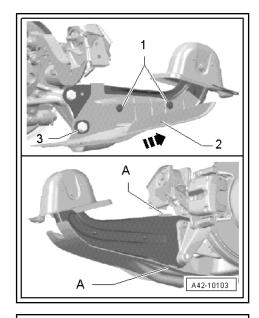
- Apply special tools as shown in illustration.
- Tube -T10230/5-
- Thrust plate -T10230/12- (chamfer must face bonded rubber ivate or bush). permitted unless authorised by AUDI AG. AU
- 3 -Bonded rubber bush
- 4 -Removal tool -3372-
- Thrust plate -VW 402-
- Press in bonded rubber bush until flush.
- Attach mounting bracket to trailing arm ⇒ page 149.
- Install trailing arm with mounting bracket ⇒ page 147.



3.7 Removing and installing stone deflector

Removing

- Remove spreader rivet -1-.
- Slide stone deflector -2- in direction of -arrow- until it makes contact with bolt -3-.
- Unclip retaining tabs -A- and detach stone deflector -2-.



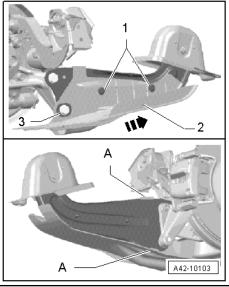
Installing

Installation is performed in reverse sequence; note the following:



Caution

- Take care not to damage retaining tabs -A- during removal and installation.
- is not Protected by copyright. Copying for private or commercial purposes, in part The component must be renewed if it is damaged or



4 Shock absorbers, coil springs

- ⇒ "4.1 Exploded view of shock absorbers, coil springs",
- ⇒ "4.2 Removing and installing shock absorber", page 155
- ⇒ "4.3 Servicing shock absorbers", page 156
- ⇒ "4.4 Removing and installing coil spring", page 159

4.1 Exploded view of shock absorbers, coil springs

1 - Top spring seat

2 - Coil spring

- Note different running gear versions
- When performing repairs please note the following ⇒ page 159
- Removing and installing ⇒ page 159

3 - Bottom spring seat

- □ Turn end of spring against stop
- ☐ Different versions: allrubber and rubber with zinc contact surface
- □ For correct version refer to ⇒ Electronic parts catalogue



Note

When renewing or performing re-pairs on the rear coil springs, the rubber spring seat with zinc contact surface must be replaced with a new spring seat of the all-rubber type. If the all-rubber spring seat is already installed it does not have to be renewed.

☐ 180 Nm

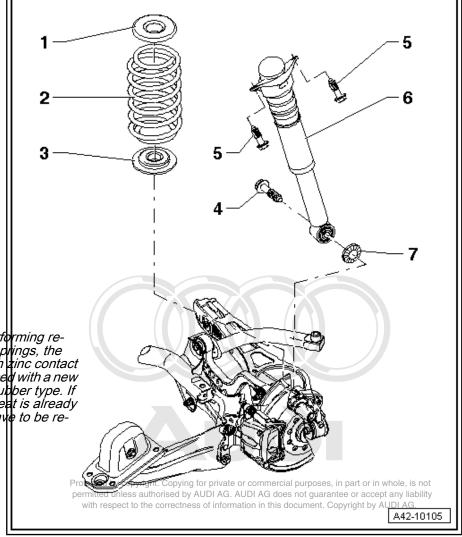
5 - Bolt

4 - Bolt

- □ 50 Nm + 45°
- □ Always renew if removed

6 - Shock absorber

- ☐ Shock absorbers with identical Part Nos. must be fitted on both sides
- □ Removing and installing ⇒ page 203
- □ Note different running gear versions; see ⇒ page 244, vehicle data sticker
- □ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 3
- □ Checking shock absorber following removal ⇒ page 5
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051



7 - Washer

- □ For corrosion protection
- Must always be installed

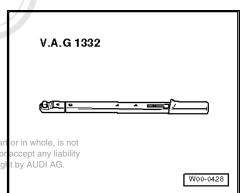
4.2 Removing and installing shock absorber

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-

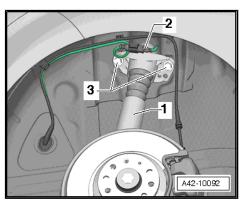


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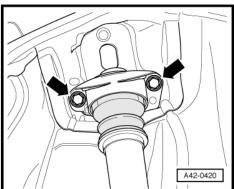


Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove wheel housing liner. ⇒ Rep. gr. 66
- Remove coil spring ⇒ page 159.
- On vehicles with electronic damping control (Audi magnetic ride), unplug connector -2-.



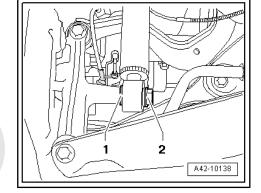
Remove bolts -arrows-.



- Remove bolt -2- and take off washer -1-.
- Take out shock absorber.

Installing

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



Install bolt -2- with washer -1- (washer MUST be fitted).

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "3.1 Exploded view of wheel bearing/housing, wheel bearing or in whole unit, trailing arm with hese aritings bracket stone deflector accept an unit, trailing arm with hese aritings bracket stone deflector accept an unit, trailing arm with hese aritings bracket stone deflectors. Copyright by AUDI page 136

Tightening torques

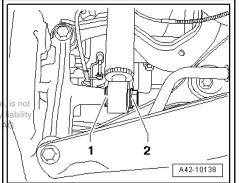
⇒ "4.1 Exploded view of shock absorbers, coil springs",

Tightening torques

⇒ "5.1 Exploded view of anti-roll bar", page 161

Bolt securing shock absorber to wheel bearing housing may only to be tightened when distance between centre of wheel hub and lower edge of wheel housing corresponds to that measured prior to removal ⇒ page 118.

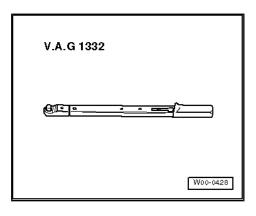
On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051



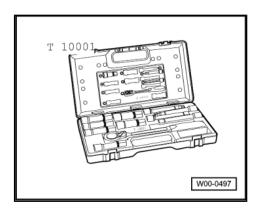
4.3 Servicing shock absorbers

Special tools and workshop equipment required

◆ Torque wrench -V.A.G 1332-



Shock absorber set -T10001-



Prisms for magnetic ride shock absorbers -T40129- (not illustrated)

1 - Shock absorber

- □ Shock absorbers with identical Part Nos. must be fitted on both sides
- Removing and installing ⇒ page 155
- Note different running gear versions; see ⇒ page 244, vehicle data sticker
- Defective shock absorbers must always be degassed and drained before disposal ⇒ page 3
- Checking shock absorber following removal ⇒ page 5
- On vehicles with electronic damping control (Audi magnetic ride), readapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051

2 - Protective tube

3 - Bump stop

4 - Washer

☐ Fitted on vehicles with electronic damping control (Audi magnetic ride)

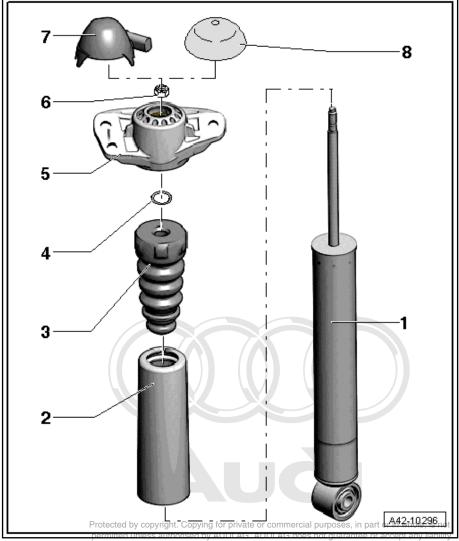
5 - Shock absorber mounting

6 - Nut

- □ 25 Nm
- □ Always renew if removed

7 - Cover (magnetic ride shock absorber)

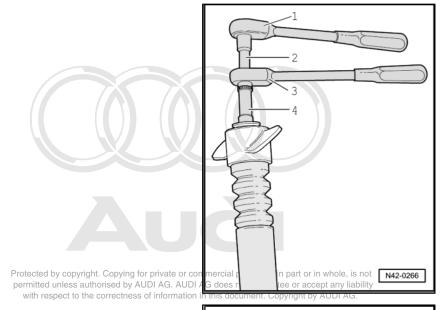
- □ Always renew if removed
- Cannot be removed without damage
- 8 Cover (standard shock absorber)



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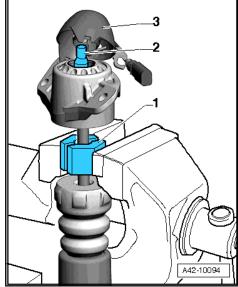
Standard shock absorber

- 1 Commercially available ratchet
- 2 Socket -T10001/9-
- 3 Ratchet -T10001/11-
- 4 Socket -T10001/1-

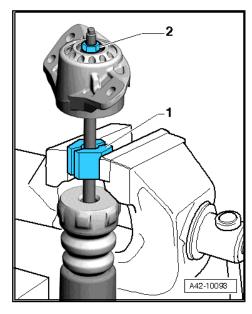


Magnetic ride shock absorber

- Clamp piston rod in vice using prisms for magnetic ride shock absorbers -T40129- -1- as illustrated.
- Pull cover -3- off upwards and unplug connector -2- from piston rod. (Parts are destroyed on removal.)



Remove nut -2-.



4.4 Removing and installing coil spring

When renewing or performing repairs on the rear coil springs, the rubber spring seat with zinc contact surface must be replaced with a new spring seat of the all-rubber type ⇒ Item the all-rubber spring seat is already installed it does not have to be renewed. For correct version refer to ⇒ Electronic parts catalogue . When installing the coil spring, ensure that the repainted section is at the top. This part is dull and usually slightly thicker than the rest of the spring. In many cases paint runs are visible, or possibly a drop of paint on the second coil.

Special tools and workshop equipment required

- Spring compressor of ViA: Gof 1752/1 rivate or commercial purposes, in part or in whole, is not AUDI AG. AUDI AG does not guarantee or accept any liability
- ♦ Spring retainer VeAt Cn4752/3A- of information in this document. Copyright by AUDI AG.

Removing

- Remove wheel.
- Insert spring compressor -1-.



WARNING

Make sure coil spring is properly seated in spring retainer -V.A.G 1752/3A- (risk of accident).

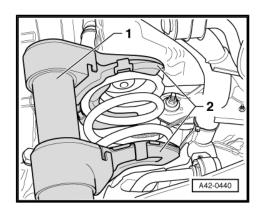
- Compress coil spring until it can be removed.
- Remove spring.
- 1 Spring compressor -V.A.G 1752/1-
- 2 Spring retainer -V.A.G 1752/3A-

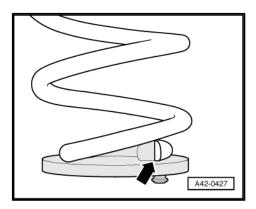
Installing

Installation is performed in reverse sequence; note the following ⇒ page 159 ...

End of spring -arrow- must lie against stop on bottom spring seat.

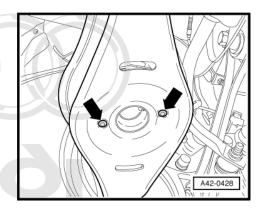
- Install spring together with spring seat.
- The bottom spring seat has two pins.







- Insert pins into holes in bottom transverse link -arrows-
- Then insert upper spring seat into upper end of spring.
- Slacken off spring. When doing so, locate upper spring seat onto lug on body.
- Fit and secure wheel ⇒ Rep. gr. 44.



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5 Anti-roll bar

- ⇒ "5.1 Exploded view of anti-roll bar", page 161
- ⇒ "5.2 Removing and installing anti-roll bar", page 161

5.1 Exploded view of anti-roll bar

1 - Anti-roll bar

- Note different running gear versions; see y copyright ⇒ page 244 pevenicless aut data sticker with respect to the data sticker
- Removing and installing ⇒ page 161

2 - Clamp

3 - Bolt

- □ 25 Nm + 90°
- ☐ Always renew if removéd

4 - Bush

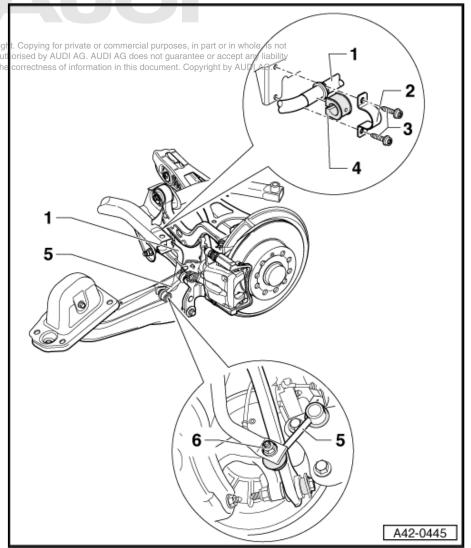
□ Always renew bushes on both sides of vehicle

5 - Coupling rod

☐ Connects anti-roll bar to trailing arm/wheel bearing housing

6 - Nut

□ 40 Nm

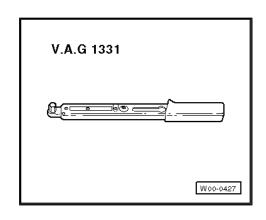


5.2 Removing and installing anti-roll bar

Special tools and workshop equipment required

Torque wrench -V.A.G 1331-





Removing

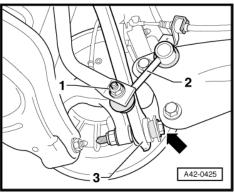
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Note

The following steps are described for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

Unscrew nut -1- and pull coupling rod -2- out of anti-roll bar.



- Unscrew bolts -arrows- for anti-roll bar clamp.
- Remove anti-roll bar.

Installing

Installation is performed in reverse sequence; note the following:

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

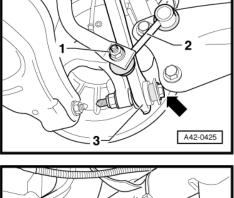
⇒ "3.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket, stone deflector", page 136

Tightening torques

⇒ "4.1 Exploded view of shock absorbers, coil springs", page 154

Tightening torques

⇒ "5.1 Exploded view of anti-roll bar", page 161



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6 Subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) -Coupé

- ⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163
- ⇒ "6.2 Removing and installing subframe with attachments", page
- ⇒ "6.3 Removing and installing subframe bushes", page 171
- ⇒ "6.4 Removing and installing lower transverse link", page 174
- ⇒ "6.5 Removing and installing upper transverse link", page 175
- ⇒ "6.6 Removing and installing track rod", page 177
- ⇒ "6.7 Removing and installing rear left vehicle level sender G76 and rear right vehicle level sender G77 ", page 179
- 6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Coupé

1 - Eccentric bolt

- After slackening off, perform wheel alignment
- □ Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

2 - Nut

- □ 95 Nm
- Always renew if removed
- □ Always tighten bolted joints with suspension in unladen position ⇒ page 118

3 - Eccentric washer

□ With lug on inner bore

4 - Eccentric bolt

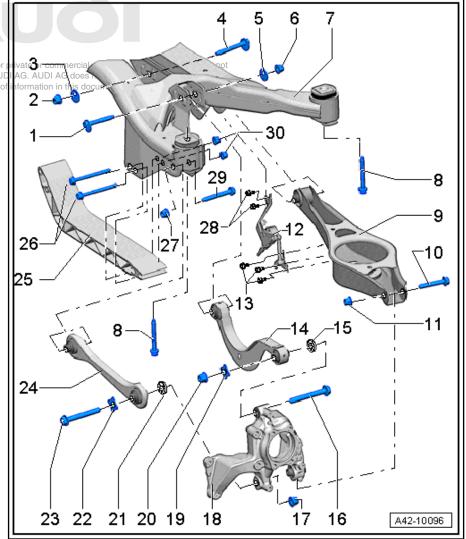
- ☐ After slackening off, perform wheel alignment ⇒ page 242
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

5 - Eccentric washer

With lug on inner bore

6 - Nut

□ 95 Nm



☐ Always renew if removed
 □ Always tighten bolted joints with suspension in unladen position ⇒ page 118
Note
♦ When tightening nut, set torque wrench -V.A.G 1332- to 80 Nm
◆ This tightening torque only applies when using insert tool - T10179-
7 - Subframe
□ Removing and installing subframe mountings ⇒ page 171
3 - Bolt
□ 90 Nm + 90°
☐ Always renew if removed
9 - Lower transverse link ☐ Removing and installing <u>⇒ page 174</u>
10 - Bolt
☐ Always renew if removed
11 - Nut
□ 90 Nm + 90°
☐ Always renew if removed
Always tighten bolted joints with suspension in unladen position ⇒ page 118
12 - Rear left vehicle level sender -G76- and rear right vehicle level sender -G77-
☐ Removing and installing <u>⇒ page 134</u>
13 - Bolt
□ 5 Nm
14 - Upper transverse link ☐ Removing and installing <u>⇒ page 175</u>
15 - Washer
16 - Bolt
□ 130 Nm + 90°
Always renew if removed Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability Always tighten bolted joints with suspension in unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability Always tighten bolted joints with suspension in unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability Always tighten bolted joints with suspension in unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability Always tighten bolted joints with suspension in unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability
17 - Nut
☐ Always renew if removed
18 - Wheel bearing housing ☐ Removing and installing ⇒ page 186
19 - Washer
20 - Nut
☐ Always renew if removed
21 - Washer
22 - Washer
23 - Bolt
□ 130 Nm + 90°
☐ Always renew if removed
□ Always tighten bolted joints with suspension in unladen position ⇒ page 118

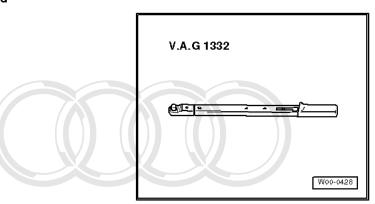
24 - Track rod

- □ Removing and installing ⇒ page 177
- Closed side faces direction of travel
- 25 Cross member
- 26 Bolt
- 27 Nut
 - □ 90 Nm + 90°
 - □ Always renew if removed
 - ☐ Always tighten bolted joints with suspension in unladen position ⇒ page 118
- 28 Bolt
 - □ 5 Nm
- 29 Bolt
 - □ Always renew if removed
- 30 Nut
 - □ 50 Nm + 180°
 - Always renew if removed

6.2 Removing and installing subframe with attachments

Special tools and workshop equipment required

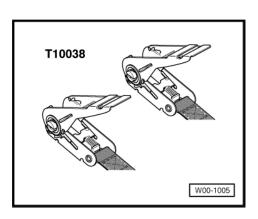
♦ Torque wrench -V.A.G 1332-



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

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Removing subframe with attachments



Note

If the bolt securing the drive shaft to the wheel hub has to be slackened for subsequent operations, remember that this must be done with the vehicle standing on its wheels. Slackening bolt securing drive shaft to wheel hub ⇒ page 210

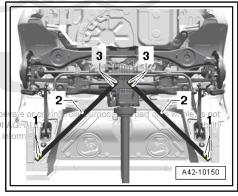
- Remove wheels.
- Remove coil springs ⇒ page 207.

Applies to Roadster vehicles

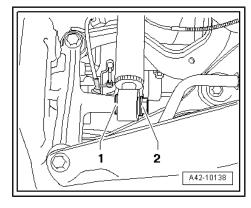
Remove bolts -1- and -3- and take out diagonal struts -2-.

All vehicles

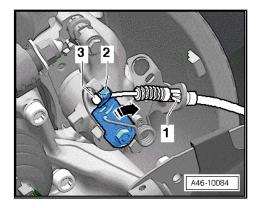
- Remove rear silencer(s) \Rightarrow Rep. gr. 26.
- Disconnect electrical wiring from Haldex coupling and ABS speed sensors; on vehicles with vehicle level-senders, ridetaching for p and unclip electrical connectors. with respect to the correctness of i



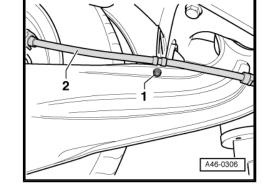
Remove bolt -2- and take off washer -1-.



- Press brake lever -2- in direction of arrow and disengage handbrake cable -3-.
- Compress retaining tabs -1- and simultaneously pull out handbrake cable.



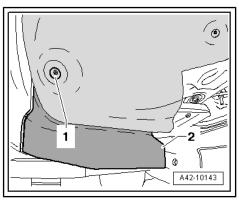
- Unscrew hexagon bolt -1- and detach handbrake cable -2from cable bracket.
- Remove brake caliper ⇒ Rep. gr. 46.
- Secure brake caliper to body so that weight of caliper does not stretch or damage brake hose or brake pipe.



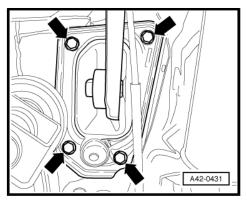
Unscrew bolt -1- and remove cowl panel -2- ⇒ Rep. gr. 66.



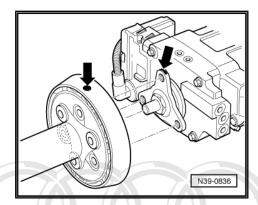
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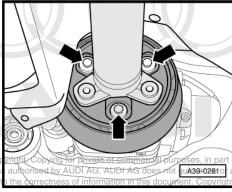
- Mark position of mounting bracket on body.
- Remove bolts -arrows-.



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-.



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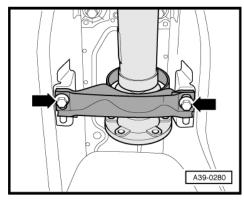
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Unscrew centre bearing bolts -arrows- two turns.



Note

The illustration shows the centre propshaft bearing with the heat shield removed.

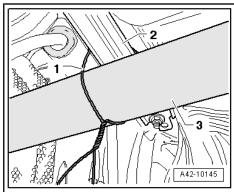


- Tie up propshaft -3- with wire -1- to exhaust bracket -2-.
- Push rear propshaft tube towards gearbox as far as possible.



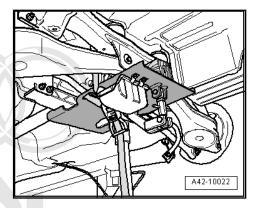
WARNING

BEFORE slackening subframe bolts, secure vehicle against tipping over (e.g. by placing a weight of approx. 50 kg in the luggage compartment).



Applies to Coupé vehicles

Position engine and gearbox jack -V.A.G 1383 A- with universal gearbox support -V.A.G 1359/2- beneath subframe and secure with tensioning straps -T10038-.



Applies to Roadster vehicles

- Position engine and gearbox jack -V.A.G 1383 A- with universal gearbox support -V.A. Guli 359/2-pbeneath subframe and hercial pur secure with tensioning straps to \$10038\$ thorised by AUDI AG. AUDI AG does not with respect to the correctness of information in this document.
- Support rear of subframe with a suitable block of wood -2-.
- Support front of subframe with a suitable block of wood -4below cross member -3-.
- Route tensioning straps -T10038- over subframe and below rear final drive -1-.



Caution

- Do not route tensioning straps -T10038- below drive shaft flanges.
- Route tensioning straps -T10038- below universal gearbox support -V.A.G 1359/2- and tighten straps.

All vehicles

Remove hexagon bolts -1- and -2-.



Note

For clarity, illustration only shows left side of vehicle.

Carefully lower subframe with attachments.



Note

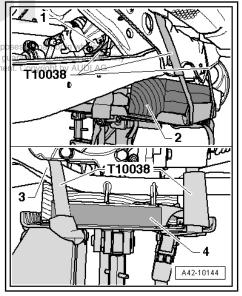
When lowering, make sure there is enough clearance for brake lines, electrical wiring and propshaft centring pin.

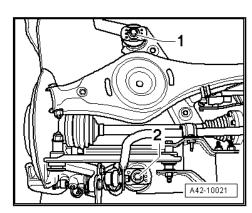
Installing subframe with attachments

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

Attach propshaft to rear final drive ⇒ Rep. gr. 39.

Bores in subframe mountings must be aligned centrally with mounting points on body.





Running gear, front-wheel drive and four-wheel drive - Edition 08.2010

Install bolt -2- with washer -1- (washer MUST be fitted).

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

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⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing in this do unit, trailing arm with mounting bracket", page 185

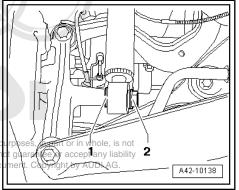
Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

- ⇒ "10.1 Exploded view of anti-roll bar", page 208
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .

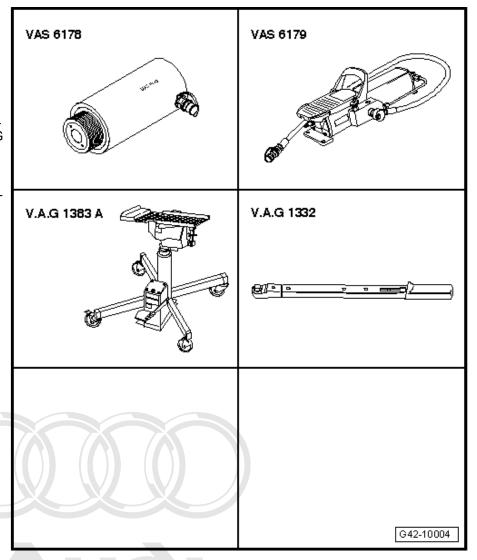
Front and rear wheel alignment must always be checked and adjusted if necessary using VW/Audi approved equipment.



6.3 Removing and installing subframe bushes

Special tools and workshop equipment required

- ♦ Foot pump -VAS 6179-
- Hydraulic press -VAS 6178-
- Engine and gearbox jack -V.Ă.G 1383 Ă- with universal gearbox support -V.A.G 1359/2-
- Assembly tool -T10263-
- Assembly tool -T10205/13-



Removing front/rear bonded rubber bushes

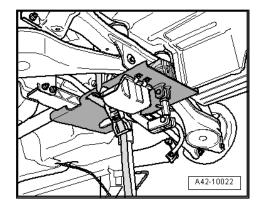
- Remove rear wheels.
- Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not Remove coil springs page 20.7d by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.
- Remove rear silencer(s) of exhaust system ⇒ Rep. gr. 26.
- Disconnect electrical wiring from Haldex coupling and electrical connectors (on vehicles with vehicle level senders).
- Remove anti-roll bar <u>⇒ page 208</u>.
- Remove track rods \Rightarrow page 177.
- Unclip electrical wiring at upper transverse links



WARNING

BEFORE slackening subframe bolts, secure vehicle against tipping over (e.g. by placing a weight of approx. 50 kg in the luggage compartment).

Position engine and gearbox jack -V.A.G 1383 A- with universal gearbox support -V.A.G 1359/2- beneath subframe and secure with strap.



Remove hexagon bolts -1- and -2-.



Note

For clarity, illustration only shows left side of vehicle.

- Lower subframe 10 cm with engine and gearbox jack -V.A.G 1383 A- .
- Use felt-tip pen or similar to mark installation position of bonded rubber bush relative to subframe.
- Screw press attachment -T10205/13- into hydraulic press -VAS 6178-.
- Apply special tools as shown in illustration.
- 1 Nut -T10263/5-
- 2 Washer
- 3 Subframe
- 4 Tube -T10263/1-
- 5 Hydraulic press -VAS 6178-
- 6 Washer

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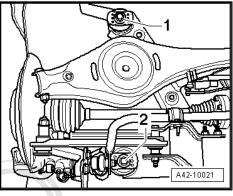
- 7 Nut -T10263/5-
- 8 Spindle -T10263/4-Take up play in special tools.
- Extract bonded rubber bush by actuating pump.

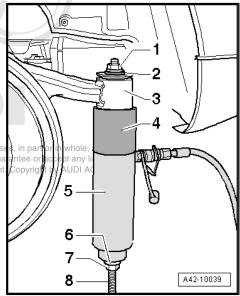
Fitting front/rear bonded rubber bushes

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

The front and rear bonded rubber bushes are of different heights. Ensure correct parts are used when installing. ⇒ Electronic parts catalogue "ETKA"

The bonded rubber bush must be installed facing in the correct direction; note the marks on the subframe for this purpose.





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



WARNING

The thrust piece -T10263/3- must be positioned so that the retainer tabs on the bonded rubber bush coincide with the aperture on the thrust piece -T10263/3-.

- 1 Nut -T10263/5-
- 2 Washer
- 3 Thrust piece -T10263/3-
- 4 Subframe
- 5 Bonded rubber bush
- 6 Thrust piece -T10263/2-
- 7 Hydraulic press -VAS 6178-
- 8 Washer
- 9 Nut -T10263/5-
- 10 Spindle -T10263/4-
- Take up play in special tools with bonded rubber bush.
- Install bonded rubber bush as far as stop by actuating pump.



Note

When installing, ensure that the bonded rubber bush is only pressed lightly against its seat in the subframe.

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

8.1 Exploded view of wheel bearing housing, wheel bearing to unit, trailing arm with mounting bracket to page 185 ight by AUDI AG.

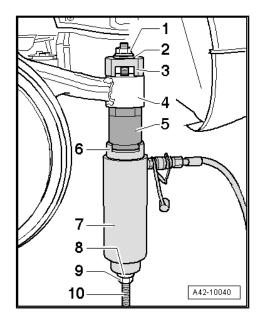
Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208

- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .

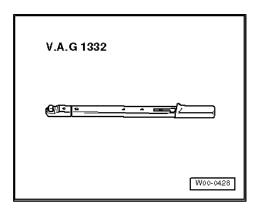


Front and rear wheel alignment must always be checked and adjusted if necessary using VW/Audi approved equipment.

Removing and installing lower trans-6.4 verse link

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-

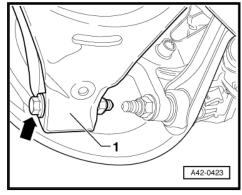


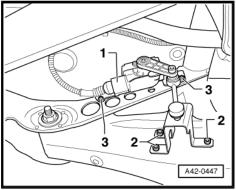
Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove coil spring <u>⇒ page 207</u>.
- Unscrew bolt -arrow- for lower transverse link -1-.









- Use felt-tip pen or similar to mark position of eccentric bolt -arrow B- in relation to subframe.
- Disengage and lower rear part of exhaust system.
- Unscrew bolt -arrow B-.
- Take out lower transverse link.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

"6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

Tightening torques

3,7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

Tightening torques

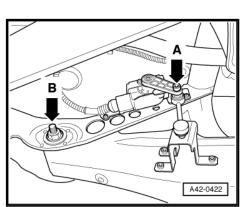
⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208

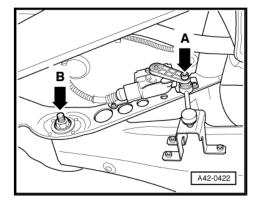
Before tightening bolts securing transverse link, obtain the same liability distance between wheel hub centre and lower edge of wheel up Ag. housing as measured before dismantling ⇒ page 118.

- Observe mark made for position of eccentric bolt -arrow B- in relation to subframe.
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .

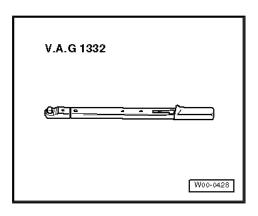


6.5 Removing and installing upper transverse link

Special tools and workshop equipment required

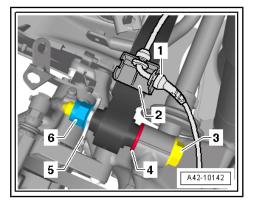


Torque wrench -V.A.G 1332-



Removing

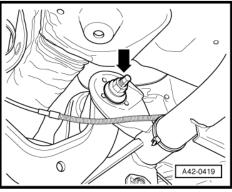
- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove coil spring ⇒ page 207.
- Detach wiring -1- completely from bracket -2-.
- Unscrew nut -6- and take off washer -5-.
- Remove bolt -3- and take off washer -4-.



- Use felt-tip pen or similar to mark position of eccentric bolt -arrow- in relation to subframe.
- Remove bolt -arrow-.
- Take out upper transverse link.

Installing

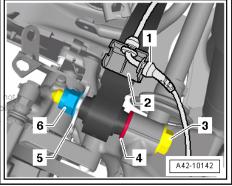
Installation is carried out in the reverse sequence. Note the following points:



Install bolt -3- with washer -4- (washer MUST be fitted).

Before tightening bolts securing transverse link, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 118.

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Note mark for position of eccentric bolt -arrow- in relation to subframe.

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive)
- Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181 right. Copying for private of

Tightening torques

permitted unless authorised by AUDI AG. A ⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing of information in the second of the se unit, trailing arm with mounting bracket", page 185

Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208



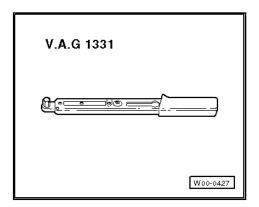
Note

Check and adjust wheel alignment as required, see chart ⇒ page 243 .

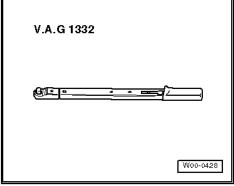
6.6 Removing and installing track rod

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



Torque wrench -V.A.G 1332-

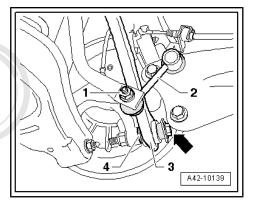


Removing

Measure distance from centre of wheel to lower edge of wheel housing <u>⇒ page 118</u> .

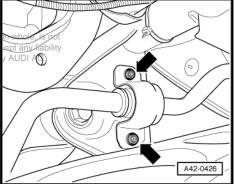


- Remove wheel.
- Remove coil spring <u>⇒ page 207</u>.
- Unscrew nut -1- and pull coupling rod -2- out of anti-roll bar.
- Remove bolt -arrow- for track rod -3- and take off washer -4-.



Unscrew bolts -arrows- for anti-roll bar clamp.

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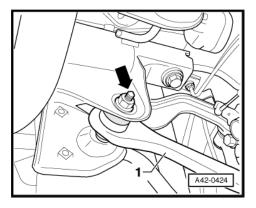


- Unscrew nut -arrow- and take out bolt towards the rear.
- Take out track rod.

Installing

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

Insert track rod into vehicle and hand-tighten bolts.



Install bolt -arrow- for track rod -3- with washer -4- (washer MUST be fitted).

Before tightening bolts securing track rod, obtain the same distance between wheel hub centre and lower edge of wheel housing as measured before dismantling ⇒ page 118.

Check and adjust wheel alignment as required, see chart ⇒ page 243 .

Tightening torques

⇒ "6.1 Exploded-view of subframe vilower transverse link pupper part or in transverse link, trackerodevehicleelevel/sender (four-wheel drive) racce - Coupé", page 163th respect to the correctness of information in this document.

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208

6.7 Removing and installing rear left vehicle level sender -G76- and rear right vehicle level sender -G77-

General notes:

Vehicles with electronic damping control (Audi magnetic ride) and/or gas discharge headlights have automatic headlight range control fitted as standard equipment ⇒ Rep. gr. 94.

The electronic damping control (Audi magnetic ride) and the automatic headlight range control functions require information on the compression and rebound travel at the front and rear suspension.

For this purpose, the position of the left/right transverse link in relation to the body is transferred to the rear left vehicle level sender -G76- and the rear right vehicle level sender -G77- via a coupling rod. The senders then transmit electrical signals to the electronically controlled damping control unit -J250- and/or the gas discharge light control units (left/right) -J343/344-.

Servicing gas discharge light control unit (left/right) -J343/344- ⇒ Rep. gr. 94.

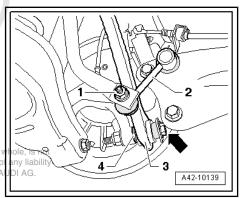
On the front axle these signals are supplied by the front left vehicle level sender -G78- and front right vehicle level sender -G289- to the electronically controlled damping control unit -J250- and/or the gas discharge light control units (left/right) -J343/344-.

These signals are required for calculating the current attitude of the vehicle.

The automatic headlight range control reacts to changes in the suspension height (attitude of the vehicle).

The following situations may produce a change in the suspension height:

- Towing a trailer/caravan
- Different loads (vehicle unladen, partly laden or fully laden)





Note

The basic headlight setting must always be checked and, on vehicles with electronic damping control (Audi magnetic ride), the reference position of the suspension must always be re-adapted in the following cases:

- Following assembly work on vehicle level sender
- If lower transverse link has been removed and installed
- If bolted connections -2- or -3- have been slackened.

The vehicle level sender is only available as a replacement part complete with coupling rod and upper and lower retaining plates.

On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position = Vehicle diagnostic, testing and information system VAS 5051.

Basic setting of headlights ⇒ Rep. gr. 94

Removing

- Unplug connector -1-.
- Remove bolts -2- and -3-.
- Take out sender.

Installing

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

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

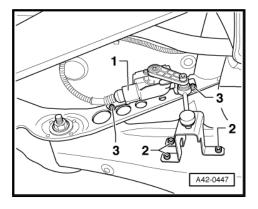
Tightening torques

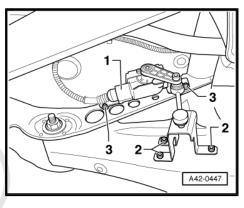
⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Lever on sender must face outwards.

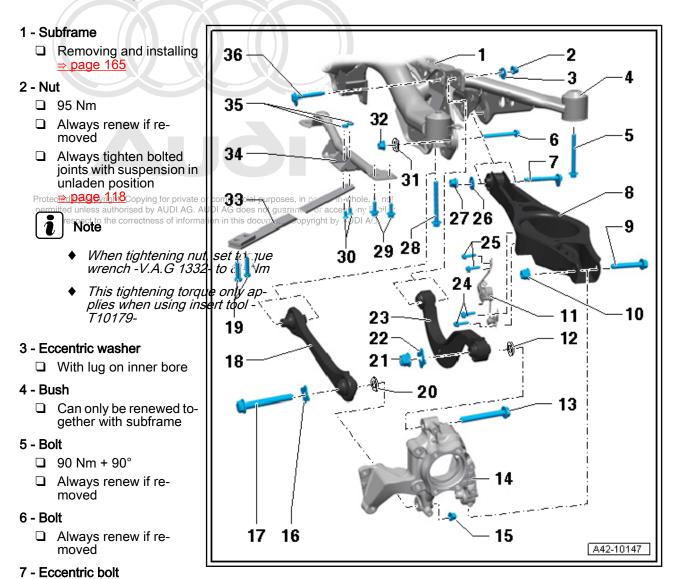
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- Perform basic protected by convicint. Croying for private or commercial purposes, in part or in whole, is not perform basic perfecting lost needing by sure Republic acts and guarantee or accept any liability

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- 7 Subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster
- ⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Roadster", page 181
- ⇒ "7.2 Removing and installing diagonal struts Roadster", page 183
- ⇒ "7.3 Removing and installing cross member Roadster", page 184
- 7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Roadster



7. Subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive)

☐ Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

After slackening off, perform wheel alignment ⇒ page 242

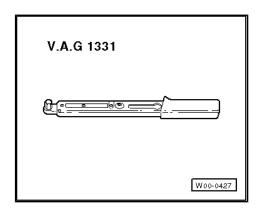
8 - Lower transverse link ☐ Removing and installing ⇒ page 174		
9 - Bolt		
☐ Always renew if removed		
10 - Nut		
90 Nm + 90°		
 □ Always renew if removed □ Always tighten bolted joints with suspension in unladen position ⇒ page 118 		
 11 - Rear left vehicle level sender -G76- and rear right vehicle level sender -G77- □ Removing and installing ⇒ page 179 		
12 - Washer		
☐ For corrosion protection		
☐ Must always be installed		
13 - Bolt		
□ 130 Nm + 90°		
☐ Always renew if removed		
☐ Always tighten bolted joints with suspension in unladen position ⇒ page 118		
14 - Wheel hearing housing		
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with respect to the correctness of information in this document. Copyright by AUDI AG. 15 - Nut		
☐ Always renew if removed		
·		
16 - Washer		
17 - Bolt		
□ 130 Nm + 90°		
☐ Always renew if removed ☐ Always tighten helted ininte with augmention in unlader position → page 118		
☐ Always tighten bolted joints with suspension in unladen position ⇒ page 118		
18 - Track rod		
 □ Removing and installing ⇒ page 177 □ Closed side faces direction of travel 		
19 - Bolt □ 40 Nm + 45°		
☐ Always renew if removed		
20 - Washer		
□ For corrosion protection		
☐ Must always be installed		
21 - Nut		
☐ Always renew if removed		
22 - Washer		
23 - Upper transverse link		
☐ Removing and installing ⇒ page 175		
24 - Bolt □ 5 Nm		
25 - Bolt		
□ 5 Nm		
26 - Eccentric washer		
☐ With lug on inner bore		

27 - Nut		
	95 Nm	
	Always renew if removed	
	Always tighten bolted joints with suspension in unladen position <u>⇒ page 118</u>	
28 - Bolt		
	90 Nm + 90°	
	Always renew if removed	
29 - Bolt		
	40 Nm	
30 - Bolt		
	40 Nm + 45°	
	Always renew if removed	
31 - Washer		
32 - N	Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not	
	90 Nm + 90 permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.	
	Always renew if removed	
	Always tighten bolted joints with suspension in unladen position <u>⇒ page 118</u>	
33 - D	Piagonal strut	
	Removing and installing <u>⇒ page 183</u>	
34 - Cross member		
	Removing and installing <u>⇒ page 184</u>	
35 - Nut		
	Always renew if removed	
36 - Eccentric bolt		
	After slackening off, perform wheel alignment ⇒ page 242	
	Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)	

7.2 Removing and installing diagonal struts - Roadster

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



^{7.} Subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive)

Removing

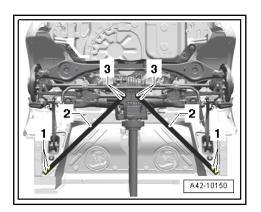
- Remove bolts -1- and -3- and take out diagonal struts -2-.

Installing

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

Tightening torques

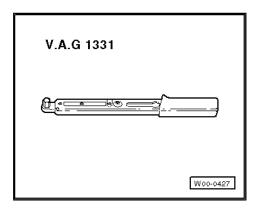
⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181



7.3 Removing and installing cross member - Roadster

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



Removing

- Remove diagonal struts ⇒ page 183 .
- Remove bottom bolts -1- on anti-roll bar clamps so you can then remove bolts -2-.
- Take off cross member -3-.

Installing

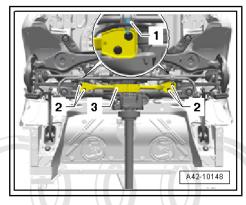
Installation is carried out in the reverse sequence. Note the following points:

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208





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8 Wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket

- ⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185
- ⇒ "8.2 Removing and installing wheel bearing housing", page 186
- ⇒ "8.3 Renewing bonded rubber bush for wheel bearing housing",
- ⇒ "8.4 Removing and installing wheel bearing unit", page 193
- ⇒ "8.5 Removing and installing trailing arm with mounting bracket", page 195
- ⇒ "8.6 Servicing trailing arm", page 199
- Exploded view of wheel bearing housing, wheel bearing unit, trailing arm 8.1 with mounting bracket

1 - Bolts

- □ 50 Nm + 45°
- ☐ Always renew if removed

2 - Mounting bracket

- 3 Bolt
 - □ 90 Nm + 90°
 - □ Always renew if removed

4 - Coupling rod

- 5 Bolt
 - □ 90 Nm + 45°
 - ☐ Always renew if removed

6 - Trailing arm

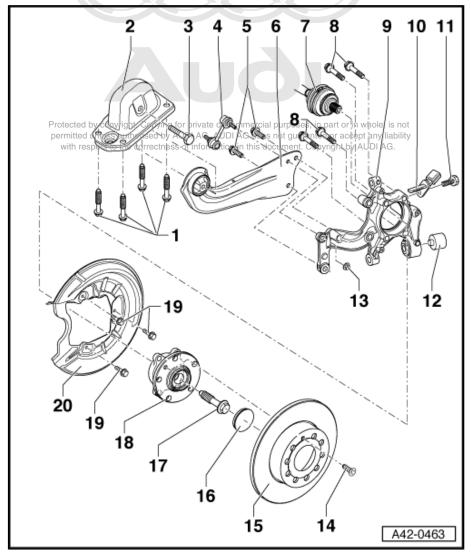
- □ Removing and installing ⇒ page 195
- Servicing trailing arm ⇒ page 199

7 - Drive shaft

- ☐ Tightening torque at final drive end ⇒ Item 13 (page 216)
- 8 Countersunk bolt
 - □ 70 Nm + 90°
 - ☐ Always renew if removed

9 - Wheel bearing housing

□ Removing and installing ⇒ page 186



10 - Speed sensor
11 - Bolt
□ 8 Nm

12 - Bonded rubber bush

□ Renewing ⇒ page 191

13 - Nut

□ 25 Nm

14 - Bolt, 4 Nm

15 - Brake disc

16 - Grease cap

☐ Not fitted on four-wheel drive vehicles

17 - Bolt

- □ Always renew if removed
- ☐ Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- ☐ Hexagon bolt = 200 Nm + 180° further ⇒ page 210
- ☐ Twelve-point bolt = 70 Nm + 90° further ⇒ page 211
- ☐ Before securing, clean the threads in the CV joint using a thread tap.

18 - Wheel bearing unit

- ☐ The ABS sensor ring is incorporated in the wheel bearing unit
- □ Removing and installing ⇒ page 193
- ☐ This wheel bearing unit is maintenance-free and does not require adjustment. There is no provision for adjustment or repair.

19 - Bolt

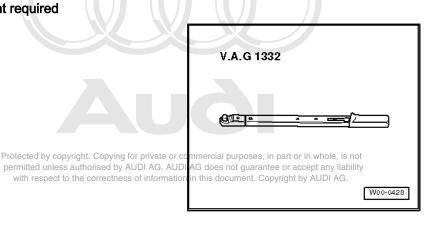
□ 10 Nm

20 - Splash plate

8.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-



Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Loosen outer bolt on drive shaft.

Procedure for loosening bolt securing drive shaft at wheel hub:

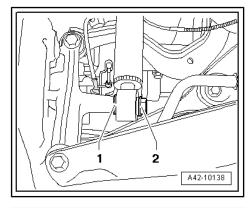
- ⇒ "11.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 210
- ⇒ "11.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 211
- Remove wheel.
- Remove coil spring \Rightarrow page 207.
- Detach brake caliper / brake carrier and tie to body with wire ⇒ Rep. gr. 46.



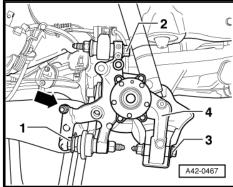
Note

Do not suspend the brake caliper from the brake hose.

- Remove splash plate.
- Remove ABS speed sensor from wheel bearing housing.
- Remove bolt -2- and take off washer -1-.



- Unscrew bolts for track rod -1-, upper transverse link -2- and lower transverse link -3- from wheel bearing housing -4-.
- Detach coupling rod from trailing arm -arrow-.



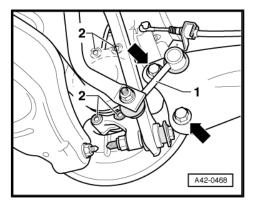
- Hold wheel bearing housing and unscrew bolts -arrows-.
- Pull coupling rod -1- out of trailing arm.
- Take out wheel bearing housing.

Installing

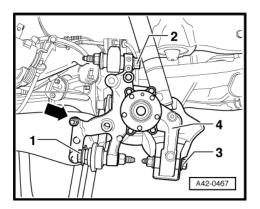
Installation is performed in reverse sequence; note the following:



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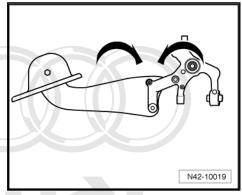


- Fit bolts for track rod -1-, upper transverse link -2- and lower transverse link -3-.
- Bolt coupling rod -arrow- to trailing arm hand-tight.



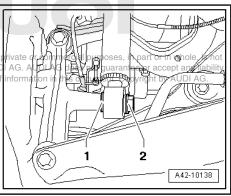
Do not tighten bolts securing trailing arm to wheel bearing housing until all other suspension components (especially spring and shock absorber) on that side are fitted. The wheel suspension must be in extended position before securing. The trailing arm and the wheel bearing housing will only then move into the required position -arrows-.

It is important to keep to the specified sequence for the following operations.

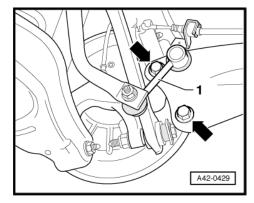


Install bolt -2- with washer -1- and tighten bolt (washer MUST be fitted).

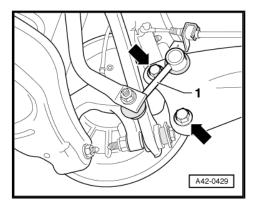
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- Fit trailing arm to wheel bearing housing with bolts -arrows-(do not tighten at this stage).
- Install coil spring ⇒ page 207.

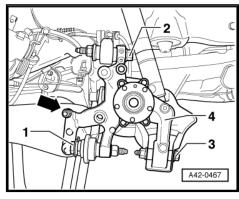


Tighten bolts -arrow-.



- Bolt coupling rod -arrow- to trailing arm.
- Install splash plate.

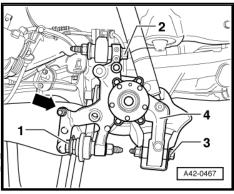
Bolt connections on wheel bearing housing may only be tightened when dimension "a" has been obtained \Rightarrow page 118 .



- Tighten bolt for track rod -1-.
- Tighten bolt for lower transverse link -3-.



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- Install bolt -3- with washer -4- and tighten bolt (washer MUST be fitted).
- Install ABS speed sensor in wheel bearing housing.
- Install brake disc.
- Install brake carrier with brake caliper. ⇒ Rep. gr. 46

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive)
- Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle <u>level sender (four-wheel drive) - Roadster", page 181</u>

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

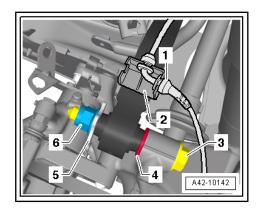
Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208

- Fit and secure wheel ⇒ Rep. gr. 44.
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .



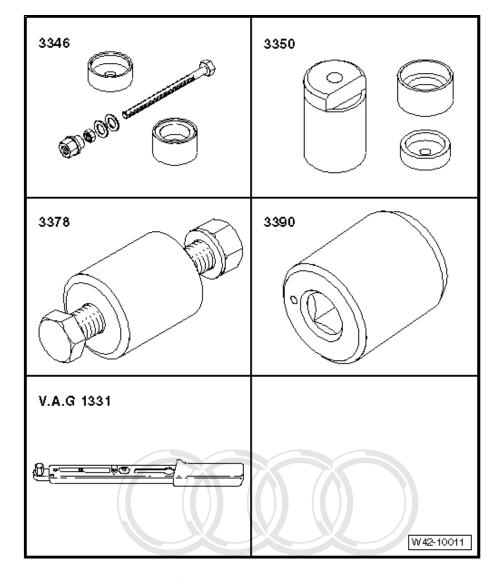


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8.3 Renewing bonded rubber bush for wheel bearing housing

Special tools and workshop equipment required

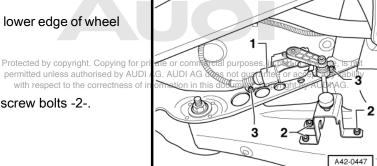
- ♦ Assembly tool -3346-
- Assembly tool -3350-
- Fitting sleeve -3378-
- Carrier -3390-
- Torque wrench -V.A.G 1332-



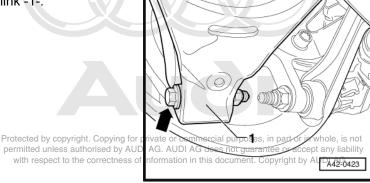
Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove coil spring <u>⇒ page 159</u>.

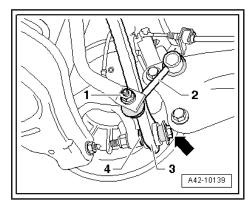
On vehicles with vehicle level sender, unscrew bolts -2-.



- Unscrew bolt -arrow- for lower transverse link -1-.



Remove bolt -arrow- for track rod -3- and take off washer -4-.



0

5

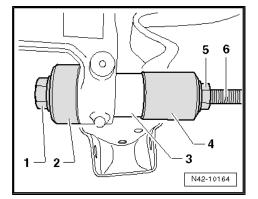
N42-10163

Pressing out bonded rubber bush

- Attach tools as shown in illustration.
- 1 Nut -3346/3-
- 2 Carrier -3390-
- 3 Assembly tool -3350-
- 4 Nut (commercially available type)
- 5 Spindle -3346/2-
- Pull out bonded rubber bush by turning spindle.

Installing bonded rubber bush

- Attach tools as shown in illustration.
- 1 Nut -3346/3-
- 2 Assembly tool -3346-
- 3 Bonded rubber bush
- 4 Fitting sleeve -3378-
- 5 Nut (commercially available type)
- 6 Spindle -3346/2-
- Draw in the bonded rubber bush by turning the spindle.





Note

- ♦ Do not use lubricant.
- Insert bush carefully to keep it straight.

A42-10139

- After installing, check that bonded rubber bush is in correct position.
- Dimensions -A- and -B- must be equal (measured at points without projecting seam or burrs on casting).
- Press bush in further if dimensions -A- and -B- are not equal.

If the bonded rubber bush has to be pressed in further, use a 27 mm socket (commercially available type) in place of fitting sleeve -3378- .

A42-10357

Installing

Installation is performed in reverse sequence; note the following:

Install bolt -arrow- for track rod -3- with washer -4- (washer MUST be fitted).

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

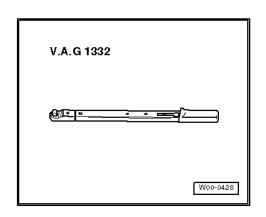
⇒ "10.1 Exploded view of anti-roll bar", page 208

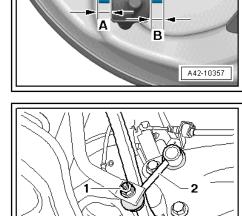
Bolt connections on wheel bearing housing may only be tightened when original distance between wheel hub centre and lower edge of wheel housing (as measured before assembly) has been obtained ⇒ page 11

8.4 Removing and installing wheel bearing unit

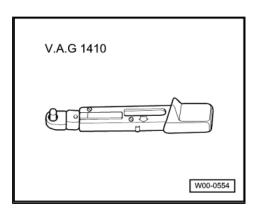
Special tools and workshop equipment required

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Torque wrench -V.A.G 1410-



Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove coil spring <u>⇒ page 207</u>.
- Remove drive shaft ⇒ page 213.
- Detach brake caliper / brake carrier and tie to body with wire ⇒ Rep. gr. 46.



Note

Do not suspend the brake caliper from the brake hose.

Remove cross-head screw for brake disc and take off brake disc.



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- Remove bolts -2-.
- Pull wheel bearing unit out of wheel bearing housing.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket regge not arantee or accept any liability Tightening with respect to the correctness of information in this document. Copyright by AUDI AG.

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

- ⇒ "10.1 Exploded view of anti-roll bar", page 208
- Fit new bolt and tighten bolt ⇒ Item 17 (page 186).



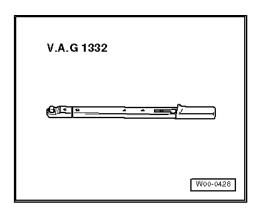
Note

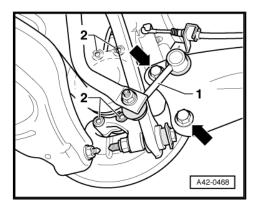
- First tighten bolt with torque wrench to specified tightening
- Use fixed wrench to turn bolt further through specified angle.

8.5 Removing and installing trailing arm with mounting bracket

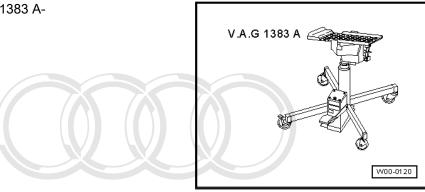
Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-

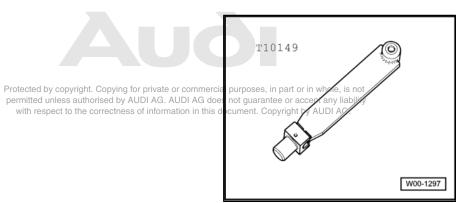




Engine and gearbox jack -V.A.G 1383 A-

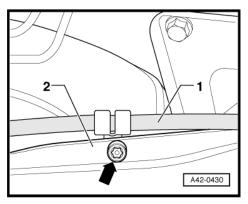


Support -T10149-

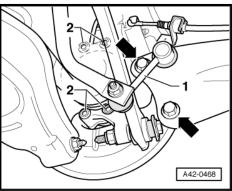


Removing

- Remove wheel.
- Remove coil spring <u>⇒ page 207</u>.
- Unscrew bolt -arrow- for handbrake cable -1- from trailing arm



- Unbolt coupling rod -1- from trailing arm.
- Remove bolts -arrows-.
- Mark position of mounting bracket on body.



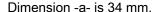
A42-0448

- Remove bolts -arrows-.
- Take out trailing arm with mounting bracket.

The mounting bracket must be detached from the trailing arm if the trailing arm is to be renewed.

The position of the mounting bracket must then be adjusted in relation to the trailing arm.

Setting installation position of mounting bracket in relation to trailing arm



- 1 Mounting bracket
- 2 Trailing arm
- After setting dimension -a-, tighten bolt ⇒ Item 3 (page 185).

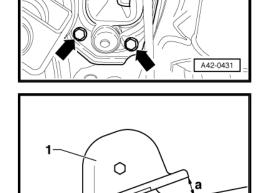
Installing

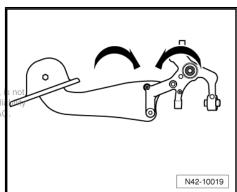
Installation is performed in reverse sequence; note the following:

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 wheel 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-.



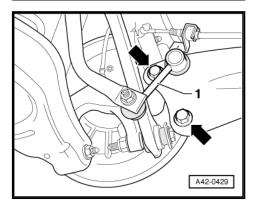
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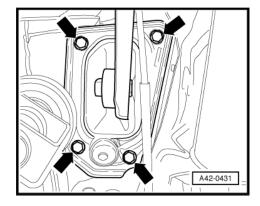


It is important to keep to the specified sequence for the following operations.

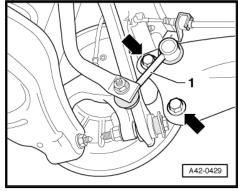
- Fit trailing arm and mounting bracket to wheel bearing housing with bolts -arrows- (do not tighten at this stage).
- Insert coupling rod -1- in trailing arm (do not tighten nut at this stage).
- Lift wheel suspension with engine and gearbox jack -V.A.G 1383 A- and support -T10149- until mounting bracket makes contact with body.



- Tighten bolts -arrows- onto old impression marks.
- Lower wheel suspension with engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Install coil spring <u>⇒ page 207</u>.



- Tighten trailing arm bolts -arrows- to torque (ensure that components are positioned as required) ⇒ page 197.
- Tighten nut -1- securing coupling rod to trailing arm.



- Secure handbrake cable -1- to trailing arm -2- -arrow-
- Fit and secure wheel.

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

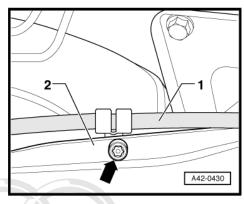
⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

- ⇒ "10.1 Exploded view of anti-roll bar", page 208
- Check and adjust wheel alignment as required, see chart ⇒ page 243 .



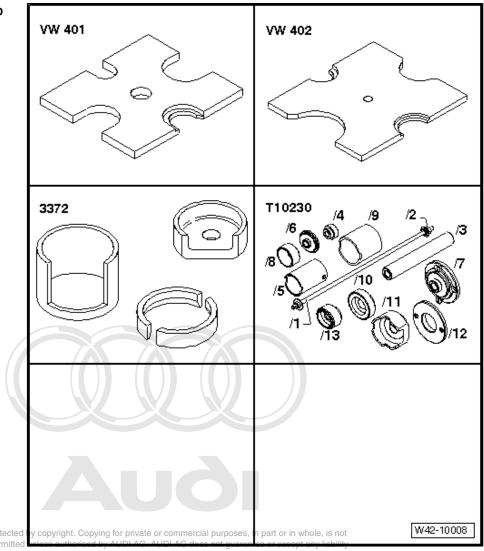
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8.6 Servicing trailing arm

Special tools and workshop equipment required

- ♦ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ♦ Removal tool -3372-
- Assembly tool -T10230-

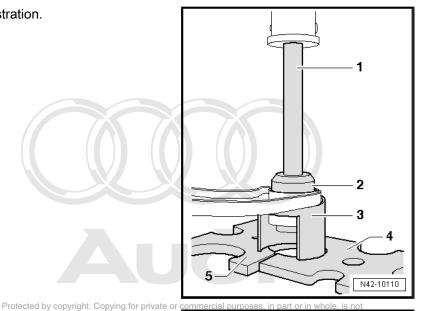


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Pressing out bonded rubber bush

Remove trailing arm with mounting bracket ⇒ page 195.

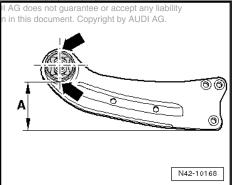
- Apply special tools as shown in illustration.
- Tube -T10230/3-
- 2 -Thrust piece -T10230/10-
- 3 -Removal tool -3372-
- Thrust plate -VW 401-4 -
- Thrust plate -VW 402-
- Press out bonded rubber bush.



Pressing in bonded rubber bush

permitted unless authorised by AUDI AG. AL with respect to the correctness of informat Position trailing arm on a flat surface so that dimension -A- = 114 mm is obtained.

Mark a vertical line on bush of trailing arm -arrows-.

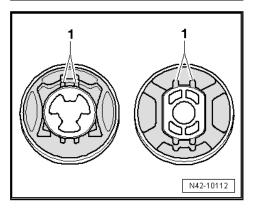


There are two different types of bonded rubber bushes. On both types the marked line must be between the projections -1- after pressing in.



Note

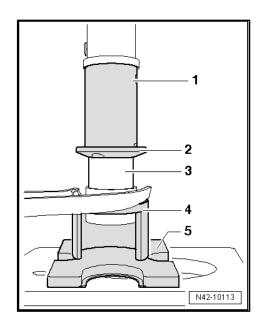
It is very important that the bonded rubber bush is installed in the correct position relative to the bush of the trailing arm.



- Apply special tools as shown in illustration.
- Tube -T10230/5-1 -
- Thrust plate -T10230/12- (chamfer must face bonded rubber 2 bush).
- Bonded rubber bush 3 -
- Removal tool -3372-
- 5 -Thrust plate -VW 402-
- Press in bonded rubber bush until flush.
- Attach mounting bracket to trailing arm ⇒ page 197.
- Install trailing arm with mounting bracket ⇒ page 195.







9 Shock absorbers, coil springs

- ⇒ "9.1 Exploded view of shock absorbers, coil springs",
- ⇒ "9.2 Removing and installing shock absorber", page 203
- ⇒ "9.3 Servicing shock absorbers", page 204
- ⇒ "9.4 Removing and installing coil spring", page 207

9.1 Exploded view of shock absorbers, coil springs

1 - Top spring seat

2 - Coil spring

- Note different running gear versions
- When performing repairs please note the following ⇒ page 207
- Removing and installing ⇒ page 207

3 - Bottom spring seat

- ☐ Turn end of spring by copyr against stop permitted un
- ☐ Different versions: allrubber and rubber with zinc contact surface
- □ For correct version refer to ⇒ Electronic parts catalogue



Note

When renewing or performing repairs on the rear coil springs, the rubber spring seat with zinc contact surface must be replaced with a new spring seat of the all-rubber type. If the all-rubber spring seat is already installed it does not have to be renewed.

4 - Bolt

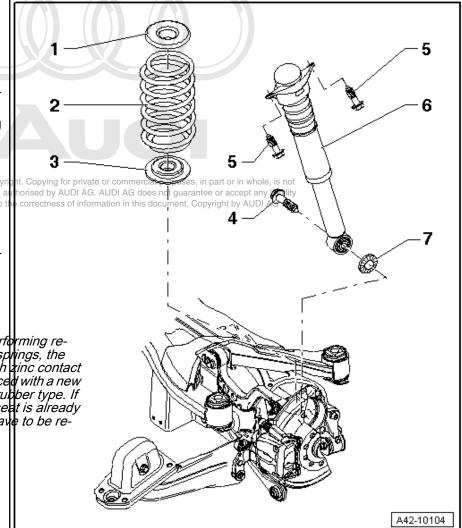
☐ 180 Nm

5 - Bolt

- □ 50 Nm + 45°
- □ Always renew if removed

6 - Shock absorber

- ☐ Shock absorbers with identical Part Nos. must be fitted on both sides
- □ Removing and installing ⇒ page 203
- Note different running gear versions; see ⇒ page 244 , vehicle data sticker
- ☐ Defective shock absorbers must always be degassed and drained before disposal ⇒ page 2
- □ Checking shock absorber following removal ⇒ page 5
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051



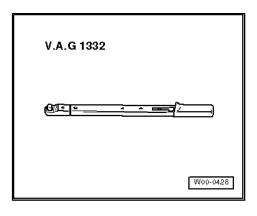
7 - Washer

- ☐ For corrosion protection
- Must always be installed

9.2 Removing and installing shock absorber

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1332-



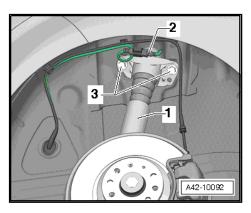
Removing

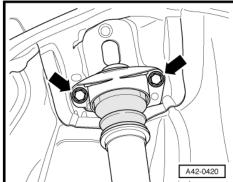
- Measure distance from centre of wheel to lower edge of wheel housing ⇒ page 118.
- Remove wheel.
- Remove wheel housing liner. ⇒ Rep. gr. 66
- Remove coil spring ⇒ page 207.
- On vehicles with electronic damping control (Audi magnetic ride), unplug connector -2-.



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Remove bolts -arrows-.





- Remove bolt -2- and take off washer -1-.
- Take out shock absorber.

Installing

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

Bolt securing shock absorber to wheel bearing housing may only to be tightened when distance between centre of wheel hub and lower edge of wheel housing corresponds to that measured prior to removal \Rightarrow page 118.

 Install bolt -2- with washer -1- and tighten bolt (washer MUST be fitted).

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

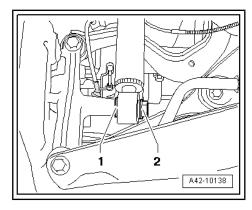
⇒ "10.1 Exploded view of anti-roll bar", page 208

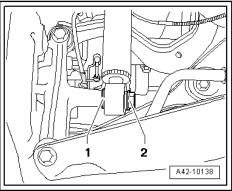
On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051

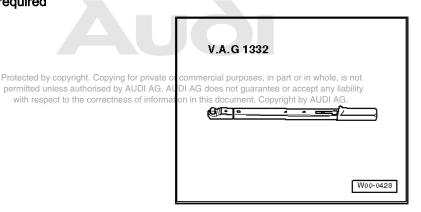
9.3 Servicing shock absorbers

Special tools and workshop equipment required

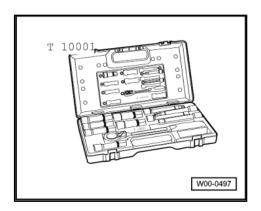
♦ Torque wrench -V.A.G 1332-







Shock absorber set -T10001-



Prisms for magnetic ride shock absorbers -T40129- (not illustrated)

1 - Shock absorber

- □ Shock absorbers with identical Part Nos. must be fitted on both sides
- Removing and installing ⇒ page 155
- Note different running gear versions; see ⇒ page 244, vehicle data sticker
- Defective shock absorbers must always be degassed and drained before disposal ⇒ page 3
- Checking shock absorber following removal ⇒ page 5
- On vehicles with electronic damping control (Audi magnetic ride), readapt reference position after renewing shock absorber ⇒ Vehicle diagnostic, testing and information system VAS 5051

2 - Protective cap

3 - Bump stop

4 - Washer

☐ Fitted on vehicles with electronic damping control (Audi magnetic ride)

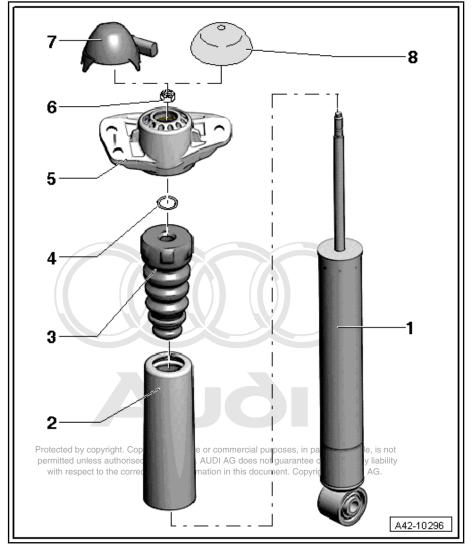
5 - Shock absorber mounting

6 - Nut

- □ 25 Nm
- □ Always renew if removed

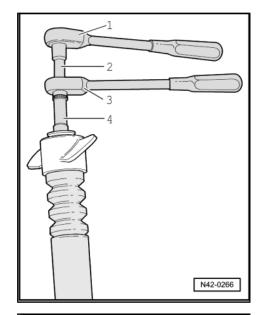
7 - Cover (magnetic ride shock absorber)

- □ Always renew if removed
- Cannot be removed without damage
- 8 Cover (standard shock absorber)



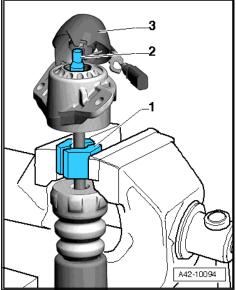
Standard shock absorber

- 1 Commercially available ratchet
- 2 Socket -T10001/9-
- 3 Ratchet -T10001/11-
- 4 Socket -T10001/1-

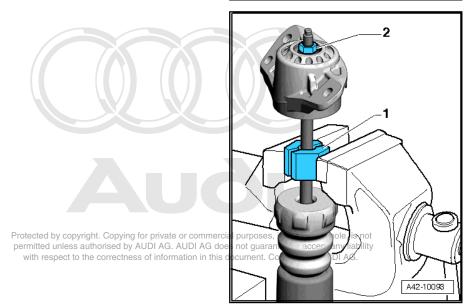


Magnetic ride shock absorber

- Clamp piston rod in vice using prisms for magnetic ride shock absorbers -T40129- -1- as illustrated.
- Pull cover -3- off upwards and unplug connector -2- from piston rod. (Parts are destroyed on removal.)



Remove nut -2-.



9.4 Removing and installing coil spring

When renewing or performing repairs on the rear coil springs, the rubber spring seat with zinc contact surface must be replaced with a new spring seat of the all-rubber type ⇒ Item 3 the all-rubber spring seat is already installed it does not have to be renewed. For correct version refer to ⇒ Electronic parts catalogue . When installing the coil spring, ensure that the repainted section is at the top. This part is dull and usually slightly thicker than the rest of the spring. In many cases paint runs are visible, or possibly a drop of paint on the second coil.

Special tools and workshop equipment required

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

Removing

- Remove wheel.
- Insert spring compressor -1-.



WARNING

Make sure coil spring is properly seated in spring retainer -V.A.G 1752/3A- (risk of accident).

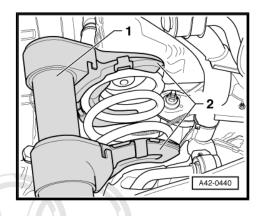
- Compress coil spring until it can be removed.
- Remove spring.
- 1 Spring compressor -V.A.G 1752/1-
- 2 Spring retainer -V.A.G 1752/3A-

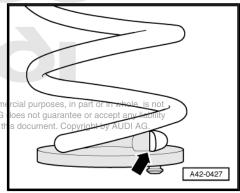
Installing

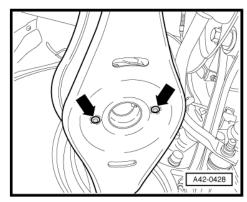
Installation is performed in reverse sequence; note the following ⇒ page 207

End of spring -arrow- must lie against stop on bottom spring seat.

- Install spring together with spring seat.
- ted by copyright. Copying for private or comm The bottom spring seat has two pinsted unless authorised by AUDI AG. AUDI AG with respect to the correctness of information in t
- Insert pins into holes in bottom transverse link -arrows-
- Then insert upper spring seat into upper end of spring.
- Slacken off spring. When doing so, locate upper spring seat onto lug on body.







10 Anti-roll bar

- ⇒ "10.1 Exploded view of anti-roll bar", page 208
- ⇒ "10.2 Removing and installing anti-roll bar", page 208

10.1 Exploded view of anti-roll bar



1 - Anti-roll bar

- Note different running gear versions; see page 244 , vehicle data sticker
- Removing and installing ⇒ page 208

2 - Clamp

3 - Bolt

- □ 25 Nm + 90°
- ☐ Always renew if removed

4 - Bush

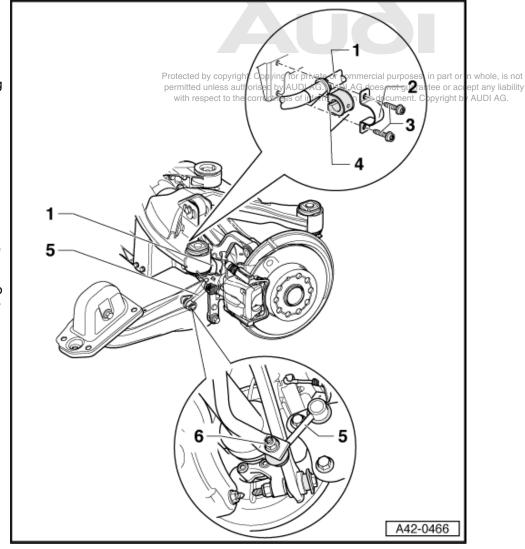
□ Always renew bushes on both sides of vehicle

5 - Coupling rod

☐ Connects anti-roll bar to trailing arm/wheel bearing housing

6 - Nut

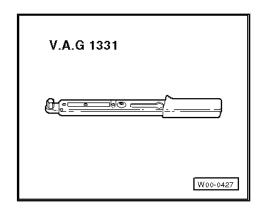
□ 40 Nm



10.2 Removing and installing anti-roll bar

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331-



Removing

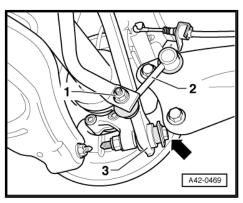
Remove rear wheels.



Note

The following steps are described for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

Unscrew nut -1- and pull coupling rod -2- out of anti-roll bar.



- Unscrew bolts -arrows- for anti-roll bar clamp.
- Remove anti-roll bar.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

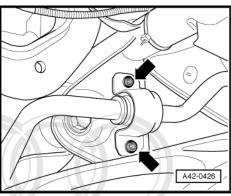
⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

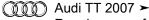
Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

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11 Drive shafts

- ⇒ "11.1 General notes:", page 210
- ⇒ "11.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 210
- ⇒ "11.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 211
- ⇒ "11.4 Removing and installing drive shaft", page 213
- ⇒ "11.5 Servicing drive shaft with outer constant velocity joint, 90 mm diameter", page 214
- ⇒ "11.6 Servicing drive shaft with outer constant velocity joint, 82 mm diameter", page 222
- ⇒ "11.7 Checking outer constant velocity joint", page 228
- ⇒ "11.8 Checking inner constant velocity joint", page 229

11.1 General notes:

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.

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 120 Nm (twelve-point bolt) or 200 Nm (hexagon bolt).

Procedure for loosening bolt securing drive shaft at wheel hub:

- → "11.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 210
- ♦ "11.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 211

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.

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

When working on the vehicle, do not allow the drive shafts to hang down under their own weight and never let the joints bend to such an extent that they contact the end stop.

Always renew self-locking bolts/nuts.

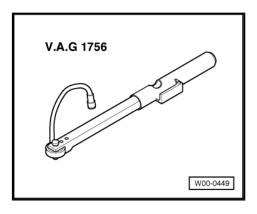
Always renew bolts and nuts which are tightened by turning rposes, in part or in whole, is not through a specified angle d unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

11.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub

Special tools and workshop equipment required

Angle wrench -V.A.G 1756-





Loosening bolt securing drive shaft to wheel hub

- -perTo:avoid damage to wheel bearing, do not slacken off bolt securing drive shaft to wheel hub furthen than 90% with vehicle still standing on its wheels.
- Raise vehicle so that wheels are off the ground.
- Have a second mechanic press the brake pedal.
- Remove bolt -arrow-.

Tightening bolt securing drive shaft to wheel hub

Renew bolt -arrow-.



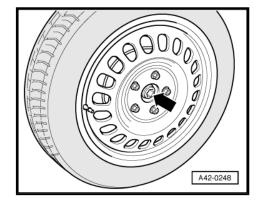
Note

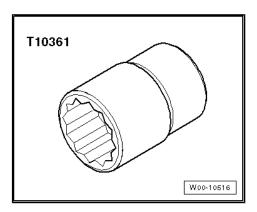
- Before securing, clean threads in CV joint using a thread tap
- The wheels must not be in contact with the ground when initially tightening the drive shaft bolt; otherwise the wheel bearing will be damaged.
- Have a second mechanic press the brake pedal.
- Tighten bolt to 200 Nm.
- Lower vehicle onto its wheels.
- Turn bolt 180° further.

11.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub

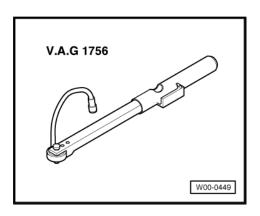
Special tools and workshop equipment required

♦ Socket (24 mm) -T10361-





Angle wrench -V.A.G 1756-



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 twelve-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 120 Nm.

Loosening twelve-point bolt

- To avoid damage to wheel bearing, slacken off twelve-point bolt no further than 90° with vehicle still standing on its wheels, using socket (24 mm) -T10361- .

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- Raise vehicle so that wheels are offrittied groundhorised by AUDI AG. AUDI AG does not guarantee or accept any liability correctness of information in this document. Copyright by AUDI AG.
- Have a second mechanic press the brake pedal.
- Remove twelve-point bolt -arrow-.



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

Installing twelve-point bolt

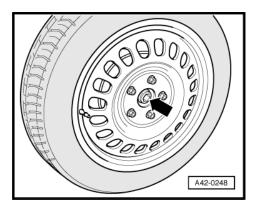
Renew twelve-point bolt.



Note

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

- Have a second mechanic press the brake pedal.
- Tighten twelve-point bolt to 70 Nm.
- Lower vehicle onto its wheels.
- Turn twelve-point bolt 90° further.



11.4 Removing and installing drive shaft

Removing

- Loosen bolt securing drive shaft at wheel hub.

Procedure for loosening bolt securing drive shaft at wheel hub:

- ⇒ "11.2 Loosening and tightening hexagon bolt securing drive shaft to wheel hub", page 210
- ⇒ "11.3 Loosening and tightening twelve-point bolt securing drive shaft to wheel hub", page 211
- Remove wheel.
- Remove coil spring <u>⇒ page 207</u>.
- On vehicles with vehicle level sender, remove bolts -2-.



Unscrew bolts securing track rod -1- and lower transverse link -3- from wheel bearing housing -4-.



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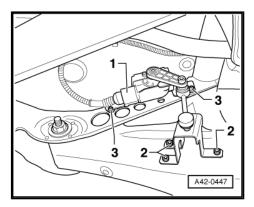
- Detach drive shaft from final drive.
- Pivot wheel bearing housing outwards and pull drive shaft out of wheel bearing splines.
- Take out drive shaft.

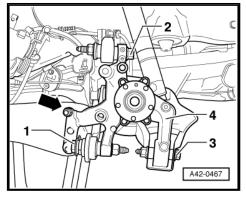
Installing

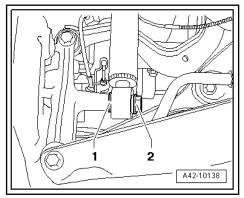
Installation is carried out in the reverse sequence. Note the following points:

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.

Bolt connections on wheel bearing housing may only be tightened when original distance between wheel hub centre and lower edge of wheel housing (as measured before assembly) has been obtained <u>⇒ page 118</u>.







 Install bolt -2- with washer -1- and tighten bolt (washer MUST be fitted).

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

Tightening torques

⇒ "8.1 Exploded view of wheel bearing housing, wheel bearing unit, trailing arm with mounting bracket", page 185

Tightening torques

⇒ "9.1 Exploded view of shock absorbers, coil springs", page 202

Tightening torques

⇒ "10.1 Exploded view of anti-roll bar", page 208

Tightening torque: (drive shaft flange/ rear final drive)

⇒ "11.6 Servicing drive shaft with outer constant velocity joint,
82 mm diameter", page 222

Tightening torque: (drive shaft flange/ rear final drive)

⇒ "11.5 Servicing drive shaft with outer constant velocity joint,
90 mm diameter", page 214

- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position ⇒ Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.

11.5 Servicing drive shaft with outer constant velocity joint, 90 mm diameter

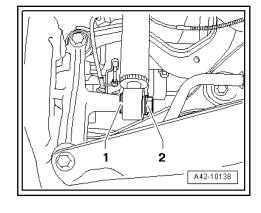
Grease filling of joints

Grease	Outer joint Ø	Inner joint Ø		
	90 mm	100 mm		
Total quantity	120 g	110 g		
In joint	80 g	50 g		
In boot	40 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 228
- □ Removing ⇒ page 218
- □ Greasing ⇒ see table <u>⇒ page 214</u>
- □ Installing ⇒ page 219
- ☐ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft

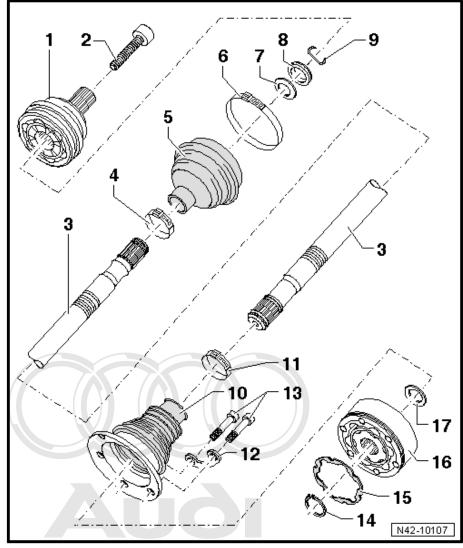
2 - Bolt

- ☐ Hexagon bolt = 200 Nm + 180° further
 - ⇒ page 210
- Twelve-point bolt = 70 Nm + 90° further ⇒ page 211
- Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- ☐ Always renew if removed
- □ Before securing, clean the threads in the CV joint using a thread tap.

3 - Profile shaft

4 - Hose clip

- Renew
- ☐ Tightening ⇒ page 222 or <u>⇒ page 2</u>



- 5 Boot for outer constant velocity joint
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 - Check for splits and chafing

6 - Hose clip

- □ Renew
- ☐ Tightening ⇒ page 222 or ⇒ page 222

7 - Dished spring

☐ Installation position ⇒ page 219

8 - Spacer ring (plastic)

☐ Installation position ⇒ page 219

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 222 or ⇒ page 222
12 - Lock plate
13 - Multi-point socket head bolt
☐ First pre-tighten in diagonal sequence to 10 Nm, then tighten in diagonal sequence to final specified torque
☐ Tightening torque, M8: 40 Nm in diagonal sequence
☐ Tightening torque, M10: 70 Nm in diagonal sequence
☐ Always renew if removed
14 - Circlip
□ Renew
□ Removing and installing with -VW 161 A- ⇒ page 219
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 229
☐ Pressing off ⇒ page 220
☐ Greasing ⇒ see table <u>⇒ page 214</u>
☐ Pressing on ⇒ page 220
☐ Grease splines on drive shaft lightly with grease used in joint when fitting joint onto drive shaft
17 - Dished spring

Dismantling and assembling drive shaft

☐ Installation position ⇒ page 220

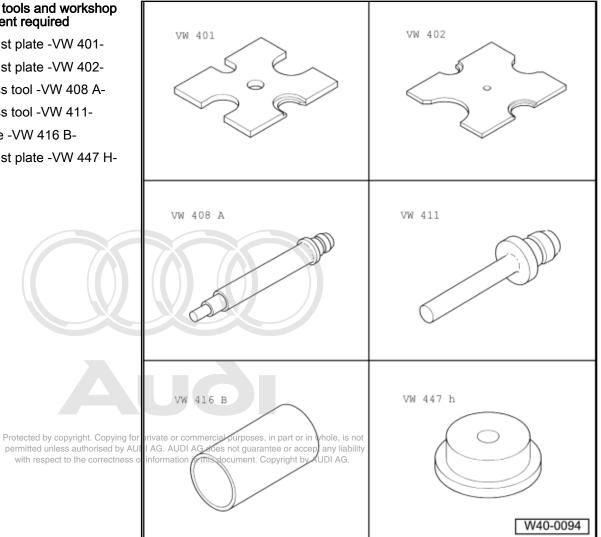


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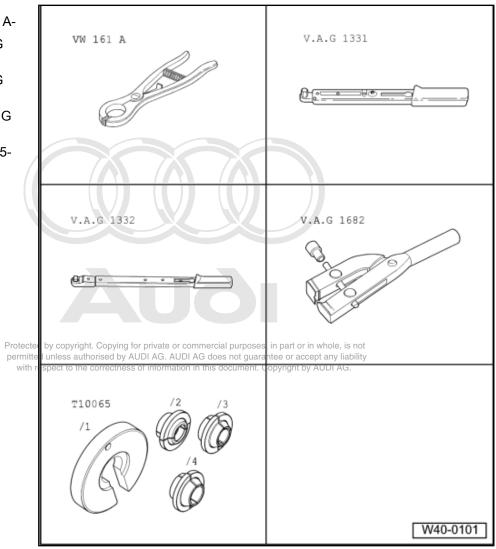


Special tools and workshop equipment required

- ♦ 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-

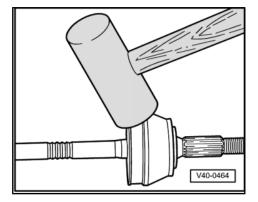


- Circlip pliers -VW 161 A-
- Torque wrench -V.A.G 1331-
- Torque wrench -V.A.G 1332-
- Clamp tensioner -V.A.G 1682-
- Assembly tool -T10065-



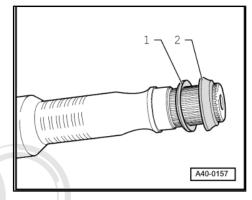
Dismantling and assembling outer constant velocity joint Removing outer constant velocity joint

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



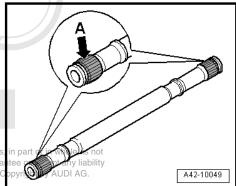
Installation position of dished spring and thrust washer at outer joint

- Dished spring
- Thrust washer



Installing outer constant velocity joint

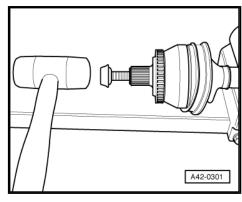
Grease splines -A- on drive shaft lightly with grease used in joint before fitting constant velocity joint or triple roller spider onto drive shaft.



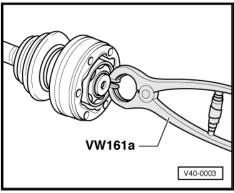
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- Screw old bolt into CV joint as shown.
- Use plastic-headed hammer to drive joint onto shaft until circlip engages.

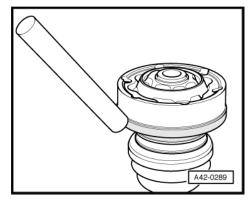
Dismantling and assembling inner constant velocity joint



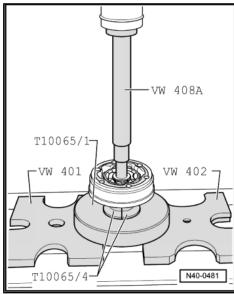
Removing circlip



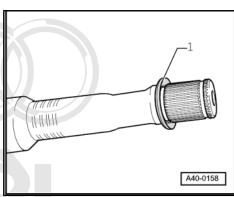
Knocking off cap (attached to boot) using a brass or copper drift



Pressing off inner constant velocity joint Assembling constant velocity joint



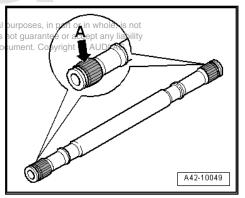
Installation position of dished spring at inner joint



Pressing on inner constant velocity joint

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Grease splines -A- on drive shaftdightly with grease used in AG does joint before fitting constant velocity joint or triple roller spider in this do onto drive shaft.

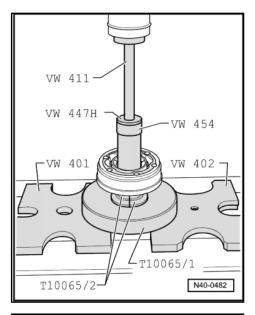


Pressing on inner constant velocity joint

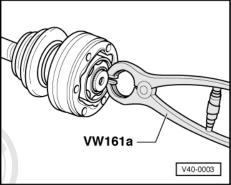


Note

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



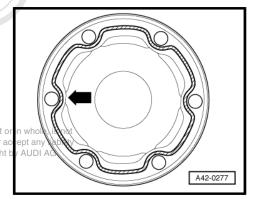
- Fit circlip.



- Apply sealing compound ⇒ Electronic parts catalogue "ETKA" to -hatched area- on clean inner surface of cap on CV joint boot. Sealant bead: continuous, 2...3 mm \varnothing . Route around inside of holes -arrow-.
- Use sealing compound ⇒ Electronic parts catalogue "ETKA".
- Push joint boot onto drive shaft.

Drive shaft, boot and contact surface of cap must be free from grease! permitted unless authorised by AUDI AG. AUDI AG does not guarantee or ac

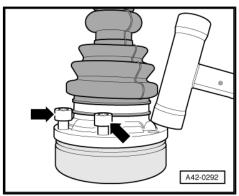
Take care not to damage sealant bead.



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.



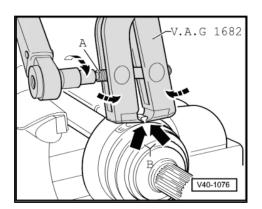
Tightening stainless-steel hose clips for Hytrel boots

- Apply clamp tensioner V.A.G 1682 as shown. Ensure jaws of clamp tensioner 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

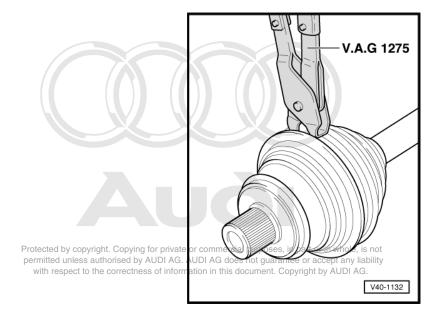


Note

- Make sure thread of spindle on clamp tensioner moves freely. Lubricate with MoS₂ 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



11.6 Servicing drive shaft with outer constant velocity joint, 82 mm diameter

Grease	Outer joint Ø Inner joint	
	82 mm	101 mm
Total quantity	45 g	110 g

1 - Outer constant velocity joint

- □ Renew only as complete unit
- Removing ⇒ page 226
- ☐ Installing: drive onto shaft as far as stop using a plastic head ham-
- Distribute grease filling evenly in joint
- □ Checking ⇒ page 228

2 - Bolt

- ☐ Hexagon bolt = 200 Nm + 180° further ⇒ page 210
- ☐ Twelve-point bolt = 70 Nm + 90° further ⇒ page 211
- □ Different versions possible. For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- □ Always renew if removed
- Before securing, clean the threads in the CV joint using a thread tap.

3 - Drive shaft

For correct version refer to ⇒ Electronic parts catalogue "ETKA"

4 - Hose clip

- □ Always renew if removed
- ☐ Tightening ⇒ page 228

5 - Boot

- Check for splits and chafing
- Material: Hytrel (polyelastomer)

6 - Hose clip

- □ Always renew if removed
- ☐ Tightening ⇒ page 228

7 - Dished spring

- With internal splines
- □ Installation position ⇒ page 227

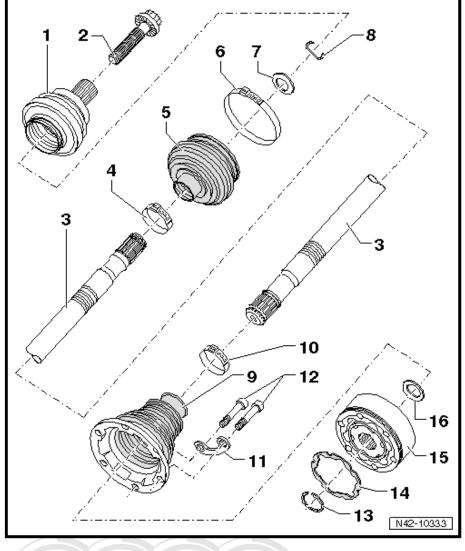
8 - Circlip

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- □ 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 228

11 - Lock plate

12 - Multi-point socket head bolt

- ☐ First pre-tighten in diagonal sequence to 10 Nm, then tighten in diagonal sequence to final specified torque
- ☐ Tightening torque, M8: 40 Nm in diagonal sequence
- ☐ Tightening torque, M10: 70 Nm in diagonal sequence
- □ Always renew bolts if removed

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 227
- □ Pressing on ⇒ page 227
- ☐ Checking ⇒ page 229

16 - Dished spring

- With internal splines
- □ Installation position ⇒ page 227

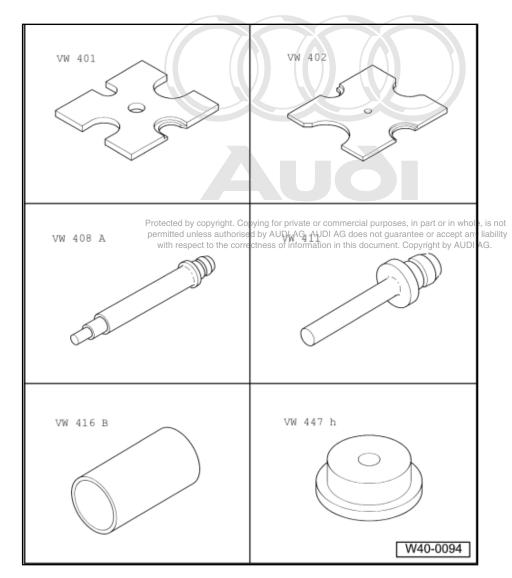
Dismantling and assembling drive shaft



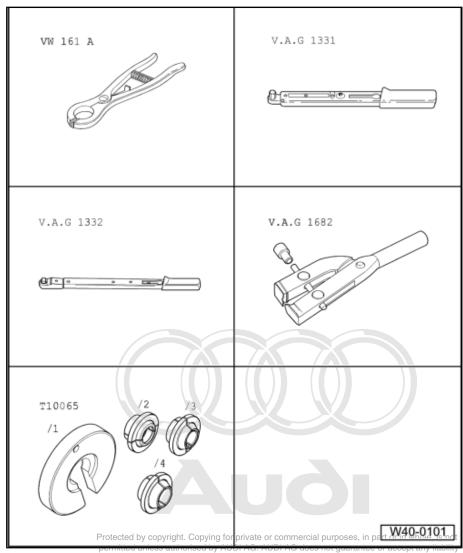
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Special tools and workshop equipment required

- ♦ 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-
- Assembly tool -T10065-



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Dismantling

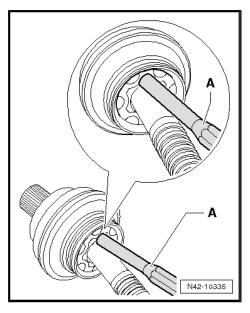
Driving off outer constant velocity joint

- 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 spider of the constant velocity joint.

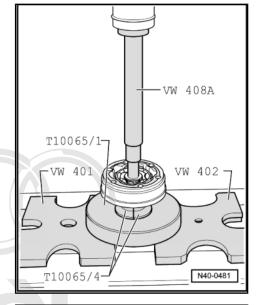
Installing joint

Knock joint onto shaft with plastic hammer until circlip engag-



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

- Protected by copyright. Copying for private or commercial permitted unless authorised by AUDI AG. AUDI AG does Dished spring
- Press on joint as far as stop.
- Engage circlip.

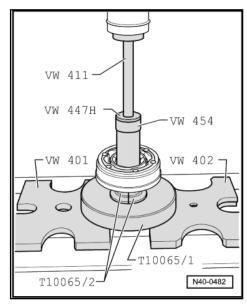


Pressing on inner constant velocity joint



Note

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



Tightening hose clip on outer joint

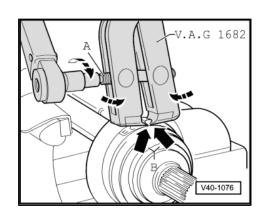
- Apply clamp tensioner -V.A.G 1682- as illustrated. Ensure jaws of clamp tensioner make contact with lugs -arrows B- on hose clip.
- Tighten hose clip by turning spindle with torque wrench (take care to keep tool straight).

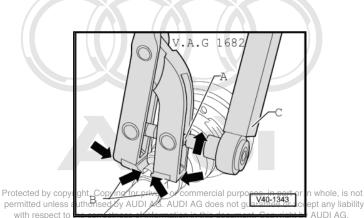


Note

- 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-.
- Tightening torque: 25 Nm.
- Use torque wrench -C- with 5...50 Nm adjustment range (e.g. torque wrench -V.A.G 1331-).
- Ensure that the thread of spindle -A- is not tight. If necessary lubricate with MOS 2 grease.
- If the thread is tight (e.g. due to dirt), the required clamping force will not be attained at the hose clip although the correct torque is applied.





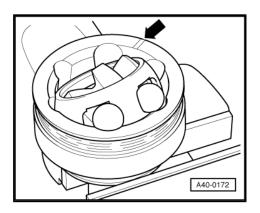


11.7 Checking outer constant velocity joint

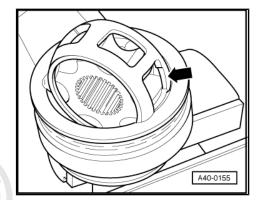
The joint should be dismantled to renew dirty grease or for checking the balls and ball races for wear and damage.

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.

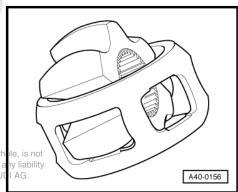


- Swivel one segment of the hub into one of the cage openings.
- Pivot hub out of cage.



Note

- The 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 by AU renewal of the joint.



Installing

Installation is performed in reverse sequence; note the following:

- Pack required amount of grease into joint body (check table)
- 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.

Checking inner constant velocity joint 11.8

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

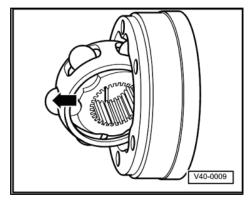


Note

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.

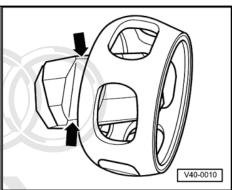


- Align ball hub with cage as shown -arrows- and pivot hub out
- Check joint, ball hub, ball cage and balls for pitting and signs of seizure.



Note

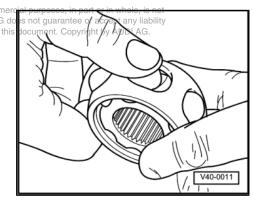
Excessive backlash in the joint will cause knocking or jolts under load change. In such cases the joint must be renewed. Polished areas and visible tracks in the ball races are not a reason for renewing the joint.



Installing

Installation is performed in reverse sequence; note the following:

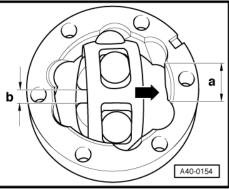
- Insert hub into cage via the two chamfers. No specific instal of Additional Insert hub into cage via the two chamfers. lation position is required. Push balls into cage rectness of information in this
- Insert hub with cage and balls at a right angle to the joint body.





Note

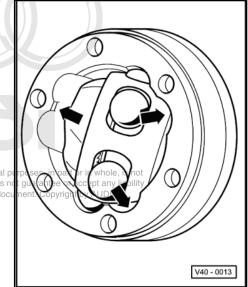
- When inserting, ensure that the wide spacing -a- on the joint body is aligned with the narrow spacing -b- on the hub after swivelling in.
- Chamfer on internal diameter of ball hub (splines) must face large diameter of joint body.
- On installation, also use felt-tip pen mark made on removal as a guide.



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.



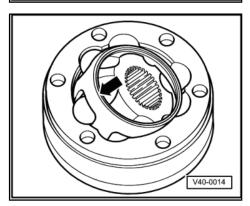
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Swivel in the hub with balls by applying firm pressure on the cage -arrow-.

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.





Wheels, tyres, vehicle geometry

Wheels, tyres

This information is contained in the Workshop Manual on Wheels and tyres \Rightarrow Wheels and tyres; Rep. gr. 44



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2 Tyre monitor display (TMD+)

⇒ "2.1 General notes:", page 233

⇒ "2.2 Removing and installing tyre pressure monitoring control unit 2 J793 ", page 233

2.1 General notes:

The tyre monitor display is a system designed to detect gradual or very slow losses of tyre pressure at one wheel justing the signate or commercial purposes, in part or in whole, is not permitted the converge to the signature of commercial purposes, in part or in whole, is not overy slow losses of tyre pressure at one wheel justing the signature or accept any liability nals from the ABS sensors, the TMD+ compares the wheels of information in this document. Copyright by AUDI AG. speeds and thus the rolling circumference of the individual wheels. The tyre monitor display in the instrument cluster lights up and an acoustic warning is given if the rolling circumference of one of the wheels changes. On vehicles with central display in the instrument cluster, the display also indicates which tyre is affected.

The control unit must be re-coded if a vehicle equipped with runflat tyres (SST) is subsequently fitted with conventional tyres, or vice versa.

The rolling circumference of the wheels can change due to the following circumstances:

- If the tyre pressure is too low.
- If the tyre is damaged.
- If the vehicle is loaded unevenly.
- If the wheels of one axle are subjected to a greater load (e.g. when pulling a trailer or when driving uphill and downhill).
- When driving with the temporary spare wheel.
- If one wheel per axle was changed. (Also if the wheels were changed from front to rear or vice versa.)

System fault in the TMD+ system

A system fault is stored in the fault memory of the tyre pressure monitoring control unit 2 -J793-; the yellow TMD+ warning lamp in the instrument cluster will then light up continuously. The TMD + warning lamp cannot be switched off by pressing the TMD+ button. If a system fault has been detected, connect -VAS 5051and select "Guided Fault Finding" ⇒ Vehicle diagnostic, testing and information system VAS 5051.

Performing calibration: (re-adaption of tyre pressure)

After any change affecting the wheels, the tyre pressure monitor button in the centre console must be pressed and held (with the vehicle stationary and the ignition on) until the TMD+ lamp in the instrument cluster flashes several times. The successful calibration (i.e. the re-adaption of the tyre pressures) is confirmed when the warning lamp flashes several times.

2.2 Removing and installing tyre pressure monitoring control unit 2 -J793-

Removing

The tyre pressure monitoring control unit 2 -J793- is located behind the instrument cluster.

Before removing the control unit, read out the coding via Guided Fault Finding using the function "Replace control unit".

Remove instrument cluster (dash panel insert.) ⇒ Rep. gr. 90.

Audi TT 2007 ➤

- Remove bolts -arrows-.
- Detach tyre pressure monitoring control unit 2 -J793- -2- and unplug connector -1-.

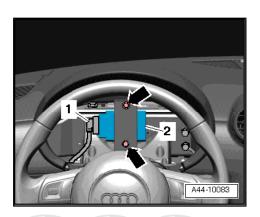
Installing

Installation is performed in reverse sequence; note the following:

- The system must be re-coded if the tyre pressure monitoring control unit 2 -J793- is renewed.
- Connect -VAS 5051- and select "Guided Functions" ⇒ Vehicle diagnostic, testing and information system VAS 5051

Then:

- 4C Tyre pressure monitor II J793
- 4C Replace control unit (Rep. Gr. 44)





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3 Tyre pressure monitoring system (TPM)

- ⇒ "3.1 General notes", page 235
- ⇒ "3.2 Tyre pressure monitoring system exploded view of components", page 236
- ⇒ "3.3 Operation of tyre pressure monitoring system", page 236
- "3.4 Removing and installing tyre pressure monitor control unit J502 ", page 238
- ⇒ "3.5 Exploded view of tyre pressure sensor ", page 239
- ⇒ "3.6 Removing and installing tyre pressure sensor",
- ⇒ "3.7 Changing a tyre", page 240

3.1 General notes

Please observe the instructions in the ⇒ Owner's Manual .

The tyre pressure monitoring system monitors the inflation pressure of the tyres on the four road wheels while the vehicle is moving.

For safety reasons, the tyre pressure sensors must be renewed if they are defective.

Do not use steam cleaners or a powerful jet of compressed air to clean the tyre pressure sensors.

For safety reasons, the tyre pressure sensor must be renewed and the wheel rim must be cleaned if tyre sealing compound has been used.

The tyre pressure monitoring system consists of a control unit, a central aerial integrated in the control unit and a tyre pressure sensor in each wheel.

If the wheels are changed or rotated to a different position on the vehicle, if the tyre pressure sensors are renewed, or if the tyre pressures are altered, the new status must always be confirmed by storing the pressures in the control unit.



Note

After changing wheels with tyre pressure sensors , for instance from summer to winter tyres, the tyre pressures must be checked and the sensors re-adapted to the control unit.

A fault may be detected and registered in the fault memory:

If there is a system malfunction.

If fewer than four wheels are fitted with tyre pressure sensors.

If the wrong type of tyre pressure sensor is fitted on winter tyres, or if winter tyres without tyre pressure sensors are fitted. (In this case the yellow warning lamp with "system malfunction" pictogram will light up in the instrument cluster; this cannot be deacti-Copying for private or commercial purposes, in part or in whole, is not vated via the system.) permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

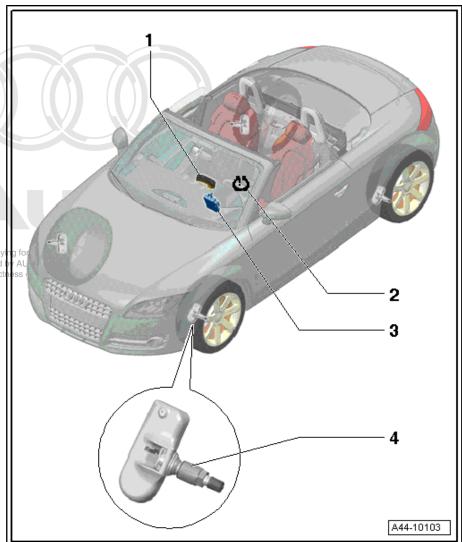
If the system has detected new sensors, but the tyre pressure monitor button -E226- has not been pressed in order to confirm the current inflation pressures. (In this case the system fault is cancelled when the button is pressed.)



3.2 Tyre pressure monitoring system - exploded view of components

1 - Tyre pressure monitor button -E226-

- ☐ Fitting location: tyre pressure monitor button -E226- is located in row of switches on centre console
- 2 Display in instrument clus-
 - See vehicle diagnostic, testing and information system -VAS 5051 A-
- 3 Tyre pressure monitor control unit -J502-
 - The system must be recoded if the tyre pressure monitor control unit -J502- isvirenewed the correct ⇒ page 236 .
- 4 Tyre pressure sensor, front left -G222-, front right -G223-, rear left -G224- and rear right -
 - Removing and installing ⇒ page 239
 - If the wheels are changed or rotated to a different position on the vehicle, if the tyre pressure sensors are renewed, or if the tyre pressures are altered, the control unit must be re-coded or the new status must be confirmed by storing the pressures in the control unit ⇒ page 236 .



3.3 Operation of tyre pressure monitoring system

Function:

The tyre pressure monitoring system is operated via tyre pressure monitor button -E226-, which is located in the row of switches on the centre console.

The system monitors the tyre pressures on the four road wheels that have been set by the operator and stored as reference values.

- The inflation pressures must first be checked and corrected, and then stored by means of the tyre pressure monitor button -E226- .
- Start by checking and correcting the inflation pressure of the tyres on the vehicle (including spare wheel) according to the figures listed on the sticker on the fuel filler flap or on the Bpillar.

Tyre pressure warning active

If the tyre pressure monitoring system detects a loss of pressure in one or more tyres, the tyre pressure warning lamp in the instrument cluster lights up continuously to warn the driver. A tyre warning symbol also lights up in the driver information system in the instrument cluster, together with the text "Please check tyre pressures". In this case the tyre pressures must be checked according to the figures listed on the sticker on the tank flap/B-pillar. If a severe loss of pressure has occurred at one or more tyres, check the tyres for damage and foreign bodies. Renew the tyre if necessary <u>⇒ page 240</u>.

System fault in tyre pressure monitoring system

A system fault will be stored in the tyre pressure monitor control unit -J502-. If a system fault is present or occurs while the vehicle is being driven, the yellow fault warning lamp in the instrument cluster will flash for 1 minute and then remain lit continuously every time the ignition is switched on. The yellow fault warning lamp cannot be cancelled by pressing the tyre pressure monitor button -E226- in the row of switches on the centre console. The letters "TPMS" also light up in the driver information system in the instrument cluster, together with the text "Tyre pressure! System malfunction". If a system fault has been detected, connect -VAS 5051- and select "Guided Fault Finding" ⇒ Vehicle diagnostic, testing and information system VAS 5051.

Re-coding tyre pressure monitor control unit -J502-

The new control unit must be coded if the tyre pressure monitor control unit -J502- is renewed. Proceed as follows:

Connect -VAS 5051 A-, start Guided Fault Finding sequence for the vehicle in question and use Go to button to select "Function /Component Selection".

Then

- "Running gear (Rep. Gr. 01; 40 49)"
- "Tyre pressure monitor system (Rep. Gr. 01; 44)"
- "01 Self-diagnosis compatible systems"
- "65 Tyre pressure monitor J502"
- "J502 Tyre pressure monitor control unit, Functions"
- "65 Replace control unit (Rep. Gr. 44)"

The new tyre pressures must be stored as reference values whenever the inflation pressures are changed intentionally.

Storing tyre pressures

To ensure reliable operation of the tyre pressure monitoring system, it is important to store the reference pressures correctly.

After any change affecting the wheels, the tyre pressure monitor button -E226- in the centre console must be pressed and held for approx. 5 seconds (with the vehicle stationary and the ignition on) until an acoustic tone sounds and the yellow fault warning lamp with "system fault" pictogram in the instrument cluster flashes several times. The successful calibration (i.e. the re-adaption of the tyre pressures) is confirmed when the warning lamp flashes several times.

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whenever the inflation pressures are changed intentionally. The system is adapted while the vehicle is driven.

Changing a wheel or renewing a tyre pressure sensor

To ensure reliable operation of the tyre pressure monitoring system, it is important to store the reference pressures from the tyre pressure sensors correctly.

After changing the wheels or renewing a tyre pressure sensor, the tyre pressure monitor button -E226- in the centre console must be pressed and held for approx. 5 seconds (with the vehicle stationary and the ignition on) until an acoustic tone sounds and the yellow fault warning lamp with "system fault" pictogram in the instrument cluster flashes several times.

If the tyre pressure monitor button -E226- is not pressed, the system will adapt itself to the new sensors, but will still activate the fault warning lamp to remind the driver to store the pressures.

The vehicle must now remain stationary for 20 minutes and then be driven for 3 minutes at a speed above 25 km/h to allow the control unit to "learn" the new pressures.

If the vehicle is not left stationary for the required period, the control unit will not be ready to learn the pressures and the system will register a fault in the radio data transmission. It will then only adapt automatically to the wheel electronics after the vehicle has been stationary for 20 minutes.

3.4 Removing and installing tyre pressure monitor control unit -J502-

Removing

The tyre pressure monitor control unit -J502- is located behind the instrument cluster.

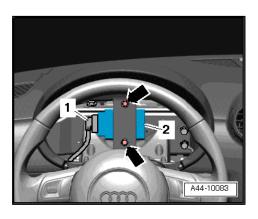
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not Before removing the control unit, read out the codings with Garding Wild Guide dUDI AG. AUDI AG does not guarantee or accept any liability Fault Finding using the function "Replace control unit."

- Remove instrument cluster (dash panel insert.) ⇒ Rep. gr.
- Remove bolts -arrows-.
- Detach tyre pressure monitoring control unit -J 502- -2- and unplug connector -1-.

Installing

Installation is carried out in the reverse sequence.

The system must be re-coded if the tyre pressure monitor control unit -J502- is renewed ⇒ page 236.



3.5 Exploded view of tyre pressure sensor

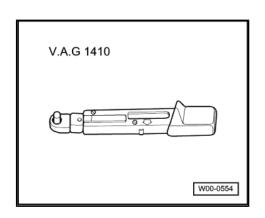
1 - Tyre pressure sensor, front left -G222-, front right -G223-, rear left -G224- or rear right -G225-

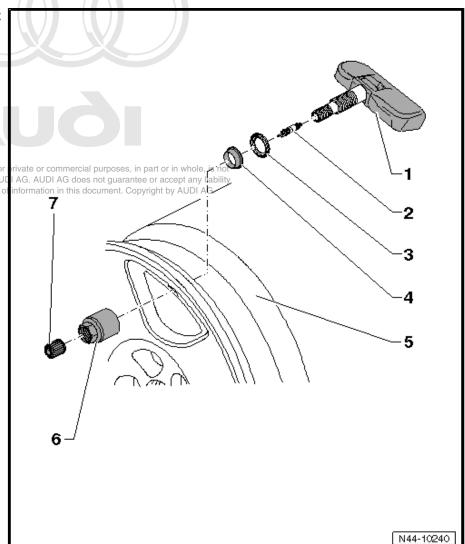
- Temperature and inflation pressure can be read out via diagnosis function with vehicle diagnostic, testing and information system -VAS 5051 B-
- Always renew valve by Al core when new tyres are fitted ⇒ Electronic parts catalogue,,ETKA"
- When re-installing used tyre pressure sensors, renew union nut, valve core, seal, sealing washer and valve cap ⇒ Electronic parts catalogue "ETKA"
- □ Removing and installing ⇒ page 239
- 2 Valve core
- 3 Sealing washer
- 4 Seal
- 5 Rim
 - Removing and fitting tyre <u>⇒ page 241</u> and ⇒ page 241
- 6 Union nut
 - □ 8 Nm
- 7 Valve cap
 - ☐ Use only genuine valve caps from repair kit ⇒ Electronic parts catalogue "ETKA"
 - ☐ Do not use metal valve caps or "convenience" valve caps

3.6 Removing and installing tyre pressure sensor

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1410-





Removing

- Remove union nut -1-.
- Remove tyre pressure sensor -2- from base of rim.

Installing

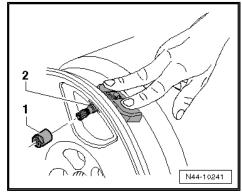


Note

- Always renew damaged sensors.
- When re-installing used tyre pressure sensors, inspect the parts to check whether the connection between the sensor and the valve is damaged.
- If tyre sealant has been used, wipe the tyre pressure sensor clean without removing it and make sure that the aperture for the pressure sensor is not obstructed. If the aperture is obstructed, the tyre pressure sensor must be renewed to prevent incorrect readings.
- Do not use steam cleaners or a powerful jet of compressed air for cleaning the tyre pressure sensor.
- Hold the valve body when sliding on the new seal and sealing washer to prevent it from being pushed out (this could damage the aerial connection).

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- Insert tyre pressure sensor with new seal and sealing washer through rim from inside and press seal into valve drilling ⇒ Electronic parts catalogue "ETKA".
- Screw union nut -1- onto tyre pressure sensor -2-.

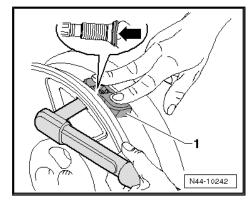


Press tyre pressure sensor -1- against base of rim and tighten union nut ⇒ page 239.



Note

- After installation, the tyre pressure sensor must be seated firmly against the base of the rim.
- The sealing washer -arrow- will be deformed slightly when the nut is tightened.

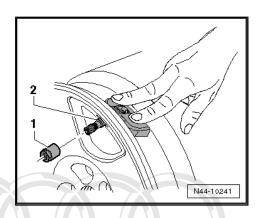


3.7 Changing a tyre

The nickel-plated valve core must always be renewed if a tyre is changed.

The tyre pressure sensor can be re-installed.

- Release air from tyre by unscrewing nickel-plated valve core.
- Remove tyre ⇒ page 241



When re-installing a used tyre pressure sensor, inspect the sensor to check whether the connection between the sensor and the metal valve is damaged.

Always renew damaged sensors.

- Fit tyre ⇒ page 241.
- Screw in new nickel-plated valve core.
- Inflate tyre.
- Balance tyre.

Removing tyre

Roll off or unseat tyre.

When using an unseating tool, first press off the tyre on the side opposite the valve.

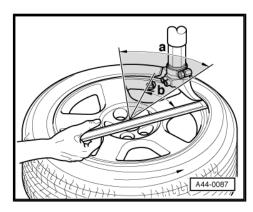
Unseating tools must not be used in hatched area -a-.

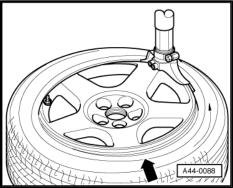
- Position head of installing tool close to valve so that tyre iron can be applied approx. 30° -b- away from valve.
- Then pull off the tyre in the valve area first.



Unseating tools must not be used in valve area.

- Position tyre pressure sensor approx. 180° opposite head of installing tool.
- Press tyre into well base approx. 90° in front of installing tool -arrow-.
- Fit tyre.







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4 Wheel alignment

- ⇒ "4.1 General information", page 242
- ⇒ "4.2 Wheel alignment must be checked:", page 243
- ⇒ "4.3 Explanatory notes on weight codes used in production (PR numbers)", page 244
- ⇒ "4.4 Test requirements:", page 245
- ⇒ "4.5 Wheel alignment specifications, front-wheel drive and fourwheel drive (Coupé/Roadster)", page 246
- ⇒ "4.6 Measurement procedure", page 247
- ⇒ "4.7 Adjusting camber at front wheels", page 248
- ⇒ "4.8 Adjusting camber at rear wheels", page 249
- ⇒ "4.9 Adjusting toe setting at rear wheels", page 250
- ⇒ "4.10 Adjusting toe setting at front wheels", page 250

4.1 General information

Wheel alignment must always be performed using wheel alignment equipment approved by VW/Audi.

The alignment check must always include both the front and the rear axles.

This is important to achieve proper handling and road behaviour.



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.



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If adjustments are made to the suspension geometry, the steering angle sender -G85- must be calibrated and the steering re-adapted on vehicles with ESP or ABS after wheel alignment has been completed ⇒ vehicle diagnosis, testing and information system VAS 5051 , Guided Functions.

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Then:

- 03 Brake electronics J104
- 03 Calibration of steering angle sender -G85

If the position of the rear axle and thus the overall running direction of the vehicle is not taken into account, this can result in an off-centre alignment of the steering wheel.

Steering wheel and steering column are marked.

This position must not be changed.

- A Line marking on steering wheel
- B Punch mark on steering column

Otherwise, the steering rack may not be located in the central position.

Steering columns supplied as replacement parts do not have a punch mark.

If the steering column or steering wheel is renewed, the marking must be re-applied on completion of wheel alignment and test drive.

Tightening torque

Component		Nm
Steering wheel to steering col- umn	Multi-point socket head bolt	50 ²⁾

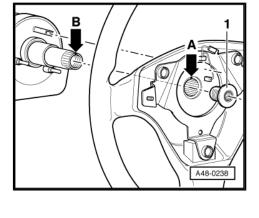


4.2 Wheel alignment must be checked:

- Following accident damage
- ♦ In the event of handling problems
- ♦ If tyres are worn unevenly.
- ♦ If suspension components have been removed.

If front or rear suspension components have been renewed:

Front suspension component renewed:	Wheel align- ment check required		Rear suspension component renewed:	Wheel align- ment check required	
	Yes	No		Yes	No
Suspension strut		X ²⁾	Shock absorb- er		X
Wishbone/bon- ded rubber bush	Х		Coil spring		Х
Swivel joint	Х		Wheel bearing housing	X	
Wheel bearing housing	Х		Subframe/bon- ded rubber bush ^{Protected} by cop	X yright. Copy	ing for priva
Track rod ball joint	Х		Lower tränspect to verse link		
Steering box	Х		Upper trans- verse link	X	
Subframe	Χ		Track rod	X	
Anti-roll bar		X ¹⁾	Trailing arm	Х	
			Anti-roll bar		Х

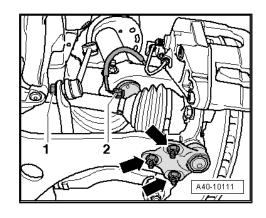


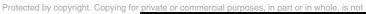
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- Audi TT 2007 ➤
- 1) Wheel alignment check is not required if position of subframe has been fixed using locating pins -T10096-.
- 2) Wheel alignment check is not required if positions of nuts -arrows- are marked before removal.

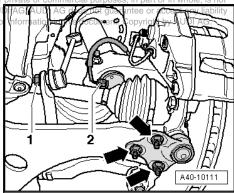
If front or rear suspension components have been removed and re-installed:

Front suspension component removed and re-installed:	Wheel align- ment check required		Rear suspension component removed and re-installed:	Wheel align- ment check required	
	Yes	No		Yes	No
Suspension strut		X ²⁾	Shock absorb- er		Х
Wishbone/bon- ded rubber bush	Х		Coil spring		Х
Swivel joint		X ²⁾	Wheel bearing housing	Х	
Wheel bearing housing		X ²⁾	Subframe/bon- ded rubber bush	X	
Track rod ball joint	Х		Lower trans- verse link	X	
Steering box	Х		Upper trans- verse link	Х	
Subframe		X ¹⁾	Track rod	Х	
Anti-roll bar		X ¹⁾	Trailing arm	Х	
			Anti-roll bar		-X





- 1) Wheel alignment check is not required if position of suborised by AL frame has been fixed using locating pins -T10096-.
- 2) Wheel alignment check is not required if positions of nuts -arrows- are marked before removal.



4.3 Explanatory notes on weight codes used in production (PR numbers)

The PR number on the vehicle data sticker indicates the type of running gear (for front axle and rear axle) fitted in the vehicle.

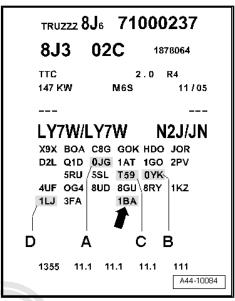
The vehicle data sticker can be found in the spare wheel well and in the Service Schedule.

Front axle/rear axle

The PR Nos. for the front axle and rear axle are shown in the illustration: -A- and -B-.

- -A- is the PR No. for the front axle
- -B- is the PR No. for the rear axle

The PR numbers can be used to identify the correct shock absorber combination in the Parts catalogue.



Running gear versions

The PR No. for the different running gear versions is indicated by the -arrow- in the illustration.

In this example the vehicle is fitted with standard running gear, version 1BA.

1BA = Standard running gear

1BL = Sports running gear, Audi magnetic ride (AMR) - electronic damping control

1BV = Sports running gear (S-line)

1BQ = Sports running gear Audi magnetic ride (AMR) or electronic roses t guara damping control with respect to the correctness of information in this document. C

1BD = Sports running gear (quattro GmbH, TT RS)



4.4 **Test requirements:**

- Check suspension, steering and steering linkage for damage and excessive play.
- Tread depth difference of no more than 2 mm on one axle.
- Tyres inflated to correct pressures
- Vehicle accurately aligned, suspension bounced and rocked several times
- Sensors must be properly attached and adjusted; refer to operating instructions of equipment manufacturer.
- Vehicle unladen 3)
- 3) "Unladen" means: the weight of the vehicle ready for the road (full tank, spare wheel, vehicle tools and vehicle jack).
- Wheel alignment platforms and computer measuring equipment can lose their original levelling setting and calibration over a period of time.
- Wheel alignment platforms and computer equipment should therefore be serviced and calibrated at least once a year.

- Precision equipment of this type should be treated with appropriate care.
- If necessary, contact the manufacturer for familiarisation with the proper use of the wheel alignment equipment.
- Ensure that the sliding plates and turntables are not touching the end stop when checking the alignment.
- 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.

4.5 Wheel alignment specifications, frontwheel drive and four-wheel drive (Coupé/Roadster)

These specifications are applicable for all engines in the specific at the spe

Front axle	Standard running gear 1BA	Sports running gear, Audi mag- netic ride (AMR) 1BL	Sports running gear 1BV/1BD	Sports running gear Audi mag- netic ride (AMR) 1BQ
Toe setting at each wheel	5′ ± 5′	5′ ± 5′	5′ ± 5′	5′ ± 5′
Total toe	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Camber	-41′ ± 30′	-41' ± 30'	-41′ ± 30′	-41' ± 30'
Maximum permissible difference between left and right	max. 30′	max. 30′	max. 30′	max. 30′
Toe-out on turns with 20° steering angle 4)	1° 18′ ± 20′	1° 18′ ± 20′	1° 20′ ± 20′	1° 20′ ± 20′
Maximum steering angle at inner wheel	36° 48'	36° 48'	36° 48'	36° 48'

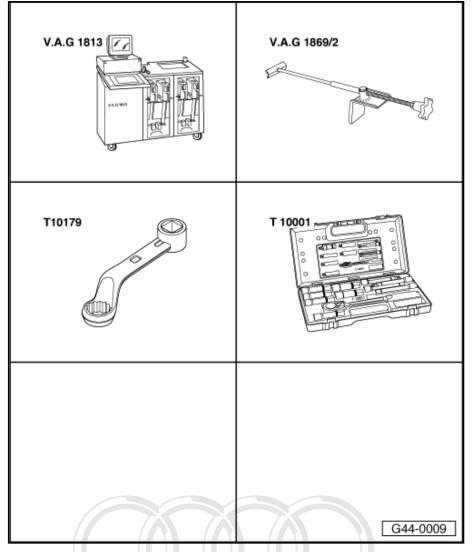
4) The wheel on the outside of a curve is turned in less than the inside wheel. This value shows the difference in the steering angles. It can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Rear axle	Standard running gear 1BA	Sports running gear, Audi mag- netic ride (AMR) 1BL	Sports running gear 1BV/1BD	Sports running gear Audi magnetic ride (AMR) 1BQ
Total toe	25' ± 10'	25' ± 10'	25' ± 10'	25' ± 10'
Toe setting at each wheel	12.5′ ± 5′	12.5 '± 5'	12.5 '± 5'	12.5′ ± 5′
Maximum permissible deviation from direction of travel	max. 10′	max. 10'	max. 10′	max. 10'
Camber	-1° 20′ ± 30′	-1° 20′ ± 30′	-1° 20′ ± 30′	-1° 20′ ± 30′
Maximum permissible difference between left and right	max. 30′	max. 30′	max. 30′	max. 30′

4.6 Measurement procedure

Special tools and workshop equipment required

- Wheel alignment computer -V.A.G 1813- or VW/Audi authorised wheel alignment equipment
- Brake pedal actuator -V.A.G 1869/2-
- Ring spanner -T10179-
- Shock absorber set -T10001-



Sequence of operations for checking and adjusting wheel alignment



Note

The vehicle must always be in unladen condition when measuring wheel alignment ⇒ page 245.

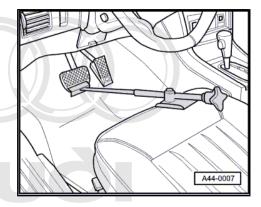
Always keep to the following sequence of operations authorised by AUDI AG. AUDI AG does not guarantee or accept any liability ess of information in this document. Copyright by AUDI AG.

- 1 Check camber at front wheels and adjust if necessary.
- a Front-wheel drive and four-wheel drive ⇒ page 248
- 2 Check camber at rear wheels and adjust if necessary.
- a Front-wheel drive and four-wheel drive ⇒ page 249
- 3 Check toe setting at rear wheels and adjust if necessary.
- a Front-wheel drive and four-wheel drive ⇒ page 250
- 4 Check toe setting at front wheels and adjust if necessary.

- a Front-wheel drive and four-wheel drive ⇒ page 250
- 5 If adjustments have been made to the running gear during wheel alignment on vehicles with ESP or ABS, the steering angle sender -G85- must be calibrated and the steering re-adapted ⇒ page 242 .
- 6 On vehicles with vehicle level senders, basic setting of headlight range control system must be performed after wheel alignment has been completed <u>⇒ page 134</u>.

Use vehicle diagnostic, testing and information system -VAS 5051B- for this purpose. ⇒ Vehicle diagnostic, testing and information system VAS 5051 under the function "Guided Fault Finding".

Apply brake pedal actuator -V.A.G 1869/2- .



Adjusting camber at front wheels, Copying for private or commercial purposes, in part or in whole, is not 4.7

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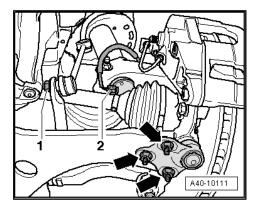
Note

Re-adjust the camber setting only if the actual value is outside the tolerance range of ± 30' related to the specification.

- Slacken off nuts -arrows-.
- Adjust the camber setting with the aid of the elongated holes in the swivel joint.
- Tighten nuts -arrows-.

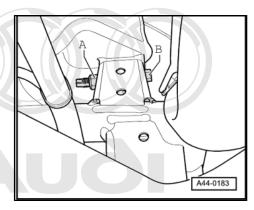
Tightening torques

"2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15



4.8 Adjusting camber at rear wheels

Unscrew nut -A- on bolted joint between upper transverse link and subframe, and loosely screw on new nut.



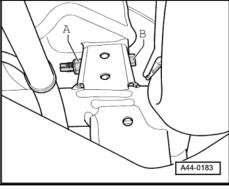
Adjust camber by turning eccentric bolt with 18 mind specific private or compensation and a specific private private or compensation and a specific private private private private or compensation and a specific private private



Note

The maximum adjustment range is 90° to the left or right of the centre position.

- A44-0186
- Tighten nut -A- using ring spanner -T10179- (special tool).
- Tightening torques <u>⇒ page 123</u>



- Use special tool as follows.
- Check camber value again after tightening nut -A-<u>⇒ page 246</u> .

Tightening torques

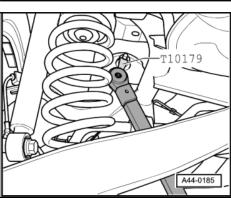
⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Coupé", page 163

Tightening torques

⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181



4.9 Adjusting toe setting at rear wheels

- Unscrew nut -A- on bolted joint between lower transverse 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-.
- Tightening torques ⇒ page 123
- Check toe setting again after tightening nut -A- ⇒ page 246.

Tightening torques

⇒ "2.1 Exploded view of subframe, diagonal strut, lower transverse link, upper transverse link, track rod, vehicle level sender (front-wheel drive)", page 123

Tightening torques

⇒ "6.1 Exploded view of subframe, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive)

- Coupé", page 163
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⇒ "7.1 Exploded view of subframe, diagonal struts, cross member, lower transverse link, upper transverse link, track rod, vehicle level sender (four-wheel drive) - Roadster", page 181

4.10 Adjusting toe setting at front wheels

- Counterhold track rod ball joint -A- with a spanner when loosening and tightening lock nut -B-.
- Loosen lock nut -B-.
- Adjust toe setting at both wheels by turning hexagon flats -C-



Note

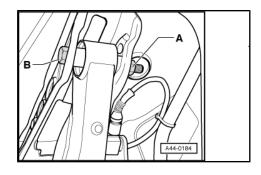
- Make sure boot on steering box is not damaged or twisted. Twisted rubber boots wear out quickly.
- The vehicle must be standing on the ground when tightening the lock nuts on the track rod; the track rod ball joint must be parallel with the steering arm on the suspension strut.
- Tighten lock nut -B- and check toe setting again.

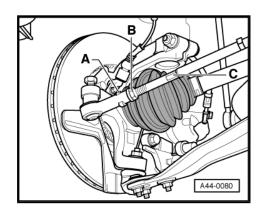
The setting may change slightly after tightening lock nut -B-.

However, the adjustment is correct if the measured toe value is still inside the tolerance.

Tightening torques

⇒ "4.4 Exploded view - servicing electro-mechanical steering box", page 272





Steering

General repair instructions

To achieve the desired results when performing repairs on the steering box 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 Man-

- ⇒ "1.1 Steering box", page 251
- ⇒ "1.2 Gaskets and seals", page 251
- ⇒ "1.3 Bolts and nuts", page 252
- ⇒ "1.4 Electrical components", page 252
- ⇒ "1.5 Guided Fault Finding, Vehicle Self-Diagnosis and Test Instruments", page 252

Steering box

- Thoroughly clean all unions and the adjacent areas before disconnecting.
- Ensure proper seating of dowel sleeves for centralising suspension bracket and steering box 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. Do not use fluffy cloths.
- Make sure to install clean parts: only remove replacement parts from packaging immediately prior to installation.
- Use only the grease and sealants with the Part No. stated.
- Carefully cover or seal open components if repairs are not to be carried out immediately.
- Two different types of steering boxes were fitted in model year 2008. For distinguishing features refer to ⇒ page 264.

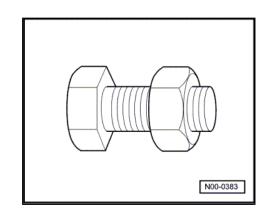
1.2 Gaskets and seals

- 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 box housing.

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1.3 **Bolts and nuts**

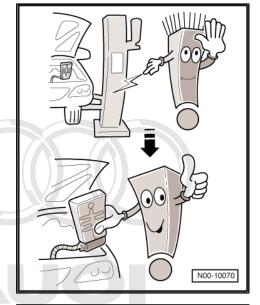
- Loosen and tighten bolts and nuts securing covers and housings in diagonal sequence.
- Take care not to tilt particularly sensitive components such as the servo motor with control unit; slacken off and tighten progressively in diagonal sequence.
- Tightening torques refer to unoiled bolts and nuts.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



1.4 Electrical components

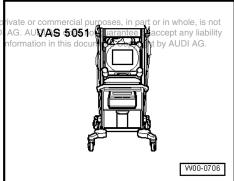
You have certainly experienced light electric shocks when touching metal objects. This is due to the electrostatic charge accumulated by the human body. This charge can cause malfunctions if you touch the electric steering box components.

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.



1.5 Guided Fault Finding, Vehicle Self-Diopyright. Copying for ss authorised by AUE agnosis and Test Instruments

Before carrying out repair work on the electro-mechanically assisted steering box, determine cause of the fault with Vehicle diagnostic, testing and information system -VAS 5051B- in the operating modes "Guided Fault Finding", "Vehicle Self-Diagnosis" and "Test Instruments " as accurately as possible.



2 Steering wheel with airbag

⇒ "2.1 Steering wheel with airbag - exploded view", page 253

Removing and installing steering wheel with airbag", page

2.1 Steering wheel with airbag - exploded view

1 - Airbag coil connector and return ring with slip ring -F138-

□ Removing and installing ⇒ Rep. gr. 94

2 - Steering wheel with airbag

- □ Removing and installing ⇒ page 253
- □ Different versions available
- □ For correct version refer to ⇒ Electronic parts catalogue "ETKA"

3 - Bolt

- □ 50 Nm
- ☐ Always renew if removed

4 - Connector

- □ For airbag coil connector and return ring with slip ring -F138-
- \square Renewing \Rightarrow Rep. gr.

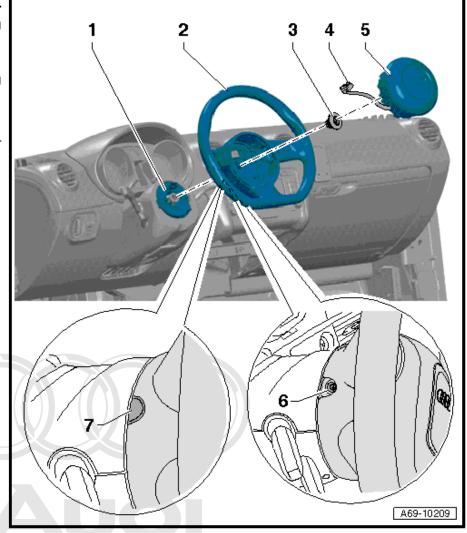
5 - Airbag unit

□ With driver side airbag igniter -N95- and driver side airbag igniter 2 -N250-



WARNING

Observe safety precautions for working on air-bags ⇒ Rep. gr. 69.



- □ Removing and installing ⇒ Rep. gr. 69
- Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability
 - ☐ Tightening torque ⇒ cRep grec69s of information in this document. Copyright by AUDI AG.

7 - Cap

- □ 2x
- For bolt securing airbag unit

2.2 Removing and installing steering wheel with airbag

Removing

Turn wheels to straight ahead position.

- Move steering wheel upwards and rearwards as far as possible, using the full range of the steering column adjuster.
- Remove airbag unit ⇒ Rep. gr. 69.



Note

The steering must be in the centre position (wheels straightahead) when the steering wheel is removed and installed.

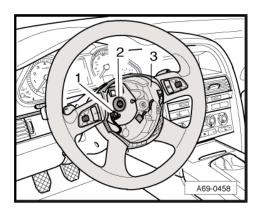
- Remove bolt -2-.
- Mark relative position of steering wheel to steering column with a felt-tip pen.
- Pull steering wheel -3- off steering column.

Installing

Installation is performed in reverse sequence; note 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 steering wheel.
- Install airbag unit ⇒ Rep. gr. 69.
- Test-drive vehicle.
- If steering wheel is not straight, remove it again and adjust it on steering column splines.





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Steering column, mounting bracket 3 with strut

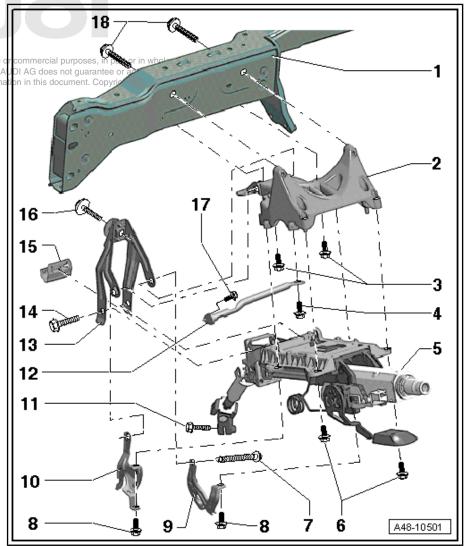
- ⇒ "3.1 Steering column and mounting bracket with strut (LHD vehicles) - exploded view", page 255
- ⇒ "3.2 Removing and installing steering column", page 256
- ⇒ "3.4 Checking steering column for damage", page 261
- ⇒ "3.5 Removing and installing mounting bracket with strut", page 261

Steering column and mounting bracket with strut (LHD vehicles) - exploded 3.1 view

1 - Central tube

2 - Mounting bracket

- Removing and installing permitted unless authorised by AUDI AG. A 3 - Bolt AG. A
- - Tightening torque ⇒ Rep. gr. 70
- 4 Bolt
 - Tightening torque ⇒ Rep. gr. 70
- 5 Steering column
 - □ Removing and installing ⇒ page 256
- 6 Bolt
 - □ 20 Nm
 - □ Always renew if removed
- 7 Bolt
 - □ 20 Nm
- 8 Bolt
 - □ 20 Nm
 - Always renew if removed
- 9 Support
 - ☐ Fitted on vehicles with knee airbag
- 10 Support
 - ☐ Fitted on vehicles with knee airbag
- 11 Bolt
 - □ 20 Nm + 90°
 - Always renew if removed
- 12 Brace
 - □ Fitted on Roadster
- 13 Strut
 - □ Removing and installing ⇒ page 261



1	4	_	Bo	١lt

□ 9 Nm

☐ Before securing, clip support -15- onto steering column

15 - Support

☐ Clip onto steering column

16 - Bolt

☐ Tightening torque ⇒ Rep. gr. 70

☐ Tightening torque ⇒ Rep. gr. 70

18 - Bolt

☐ Tightening torque ⇒ Rep. gr. 70

3.2 Removing and installing steering col umn

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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 ⇒ Rep. gr. 94.



WARNING

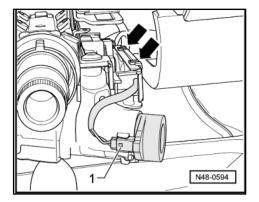
Observe the following points before working on the electrical system and removing the steering wheel:

- ♦ Unscrew earth strap from battery ⇒ Rep. gr. 27.
- Make sure wheels are in straight-ahead position.

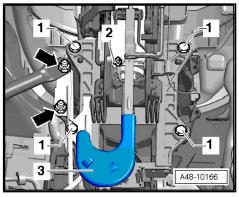
Failure to comply with these precautions may lead to subsequent failure of the airbag system.

- Turn wheels to straight ahead position.
- Pull down lever beneath steering column.
- Push steering column down as far as possible and pull out.
- Remove airbag unit ⇒ Rep. gr. 69 .
- Remove steering wheel ⇒ page 253.
- Remove trim for steering column switch ⇒ Rep. gr. 68.
- Remove storage compartment on driver's side. ⇒ Rep. gr. 68
- If fitted, remove knee airbag (driver's side) ⇒ Rep. gr. 69.
- Remove steering column switch ⇒ Rep. gr. 94.

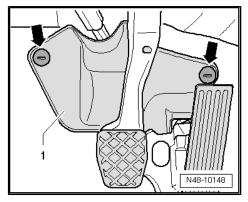
- Unplug connector -1-.
- Move wiring guide -2- clear.
- Remove footwell vent under steering column ⇒ Rep. gr. 80.



- Detach earth cable -2- from steering column.
- Unclip cable guide -3-.
- Unplug and move clear all electrical connectors on steering column.



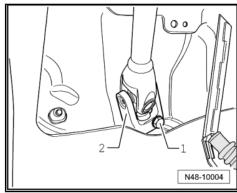
Unscrew securing nuts -arrows- and detach cover -1- for steering column universal joint.



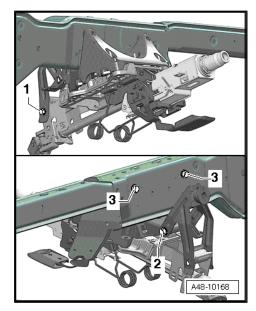
- Unscrew bolt -1- and detach universal joint -2- from steering
- If fitted, detach support for knee airbag on both sides ⇒ Rep. gr. 69.



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Remove bolt -1-.



- First remove securing bolts -arrow- for fuse holder, and then bolts -1-.
- Lower steering column slightly and then lift out carefully.



Caution

ALWAYS observe the instructions for the correct handling and transport of the steering column ⇒ page 259.

Carefully lift out steering column.

Installing

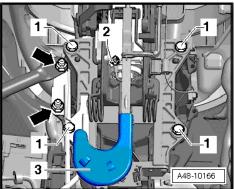
Installation is performed in reverse sequence; note the following:

⇒ "3.3 Handling and transporting steering column", page 259

Tightening torques

"3.1 Steering column and mounting bracket with strut (LHD vehicles) - exploded view", page 255

Engage steering column in assembly aid on mounting bracket.





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Align steering column with mounting bracket and fit in position.

The lugs -arrows A- on the mounting bracket and the holes -arrows B- in the steering column must be brought into alignment so that the lugs will fit into the holes.

If this is not done, it will not be possible to locate the steering column correctly in relation to the mounting bracket.

- If fitted, install support for knee airbag on both sides ⇒ Rep. gr. 69.
- Install steering column switch ⇒ Rep. gr. 94.
- Install trim for steering column switch ⇒ Rep. gr. 68.
- Install footwell vent under steering column ⇒ Rep. gr. 80.
- If fitted, install knee airbag (driver's side) ⇒ Rep. gr. 69.
- Install driver's storage compartment ⇒ Rep. gr. 68.
- Install steering wheel ⇒ page 253.
- Install airbag in steering wheel ⇒ Rep. gr. 69.
- Calibrate steering angle sender -G85- using vehicle diagnostic, testing and information system -VAS 5051B-

Steering angle sender -G85- must be calibrated after the following operations:

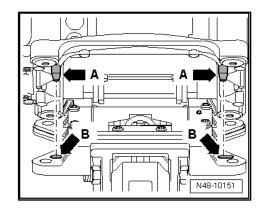
- ◆ After removing or renewing steering angle sender -G85-;
- After removing or renewing steering column;
- After removing or renewing steering column switch;
- After removing or renewing steering lock housing;
- After the steering wheel has been repositioned;
- After removing or renewing return ring with slip ring (coil connector);
- After removing or renewing the steering column electronics control unit.

3.3 Handling and transporting steering column

WARNING

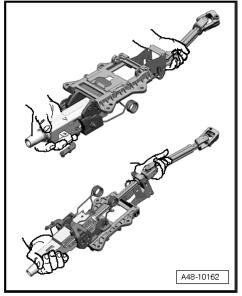
- These instructions for handling the steering column MUST be observed at all times.
- Incorrect handling can damage the steering column and thus cause a safety risk, with respect to the correctness of information in this

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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.



Incorrect handling of steering column

Carrying the steering column by the following parts will cause damage:

- 1 -Clamping lever
- Balance springs
- Deformation element

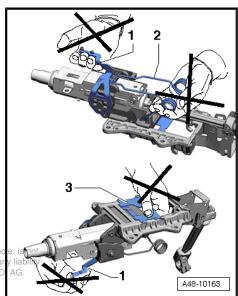


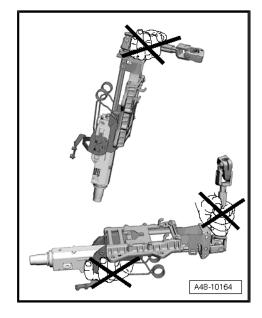
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The bushes of the universal joint at the lower steering column bearing will be damaged by:

- Picking up and carrying the steering column by the jointed shaft with one hand.
- Bending the universal joints further than 90°.





Checking steering column for damage 3.4

Visual inspection

- Check all steering column parts for damage.

Checking function

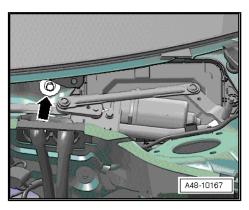
- Check that steering column turns easily and smoothly.
- Check that steering column can be adjusted for height and reach.

3.5 Removing and installing mounting

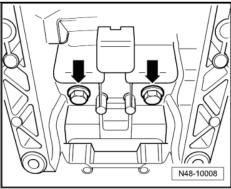
bracket Prejector by convigint. Copying for private or commercial purposes, in part or in whole, is not private or commercial purposes, in part or in whole, is not succept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

Removing

- Remove steering column ⇒ page 256.
- Remove plenum chamber cover ⇒ Rep. gr. 50.
- Remove bolt -arrow- in plenum chamber.



- Remove bolts -arrows-.



- Remove bolts -3-.
- Mounting bracket with strut can now be detached from body.

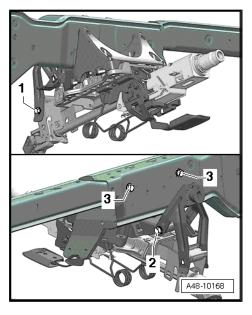
Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

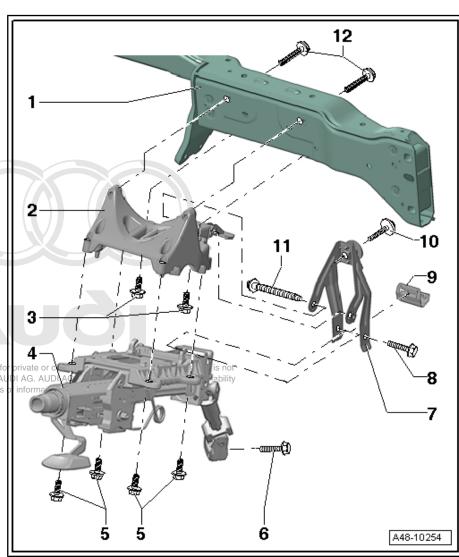
"3.1 Steering column and mounting bracket with strut (LHD vehicles) - exploded view", page 255

- Install steering column ⇒ page 256.
- Install plenum chamber cover ⇒ Rep. gr. 50.



3.6 Steering column and mounting bracket with strut (RHD vehicles) - exploded view

- 1 Central tube
- 2 Mounting bracket
- 3 Bolt
 - ☐ Tightening torque ⇒ Rep. gr. 70
- 4 Steering column
- 5 Bolt
 - □ 20 Nm
 - □ Always renew if removed
- 6 Bolt
 - □ 20 Nm + 90°
 - Always renew if removed
- 7 Strut
- 8 Bolt
 - □ 9 Nm
 - Before installing,clip supported 9y onto steering f ingpeolumnless authorised by A spect to the correctness
- 9 Support
 - ☐ Clip onto steering column
- 10 Bolt
 - ☐ Tightening torque ⇒ Rep. gr. 70
- 11 Bolt
 - □ 20 Nm



12 - Bolt

☐ Tightening torque ⇒ Rep. gr. 70



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4 Electro-mechanical steering box

- \Rightarrow "4.1 Differences between steering boxes (generations 2 and 3)", page 264
- \Rightarrow "4.2 Electro-mechanical steering box (LHD vehicles) exploded view", page 266
- ⇒ "4.3 Removing and installing electro-mechanical steering box", page 267
- ⇒ "4.4 Exploded view servicing electro-mechanical steering box", page 272
- ⇒ "4.5 Removing and installing rubber boot", page 275
- ⇒ "4.6 Removing and installing track rod", page 278
- ⇒ "4.7 Removing and installing bonded rubber bush for generation 2 steering box", page 281
- ⇒ "4.8 Renewing sensor wiring", page 281
- ⇒ "4.9 Renewing and adjusting hydraulic thrust piece", page 285
- ⇒ "4.10 Renewing and adjusting thrust piece at steering pinion end", page 291
- ⇒ "4.11 Removing and installing steering pinion with steering moment sender G269 ", page 298
- ⇒ "4.12 Electro-mechanical steering box (RHD vehicles) exploded view", page 302

4.1 Differences between steering boxes (generations 2 and 3)

A generation 2 steering box was fitted in the Audi TT 2007 ► at the start of production. This was superseded in Model Year 2008 by a generation 3 steering box; for correct version refer to ⇒ Electronic parts catalogue "ETKA".

Vehicles fitted with a generation 2 steering box can be converted to generation 3.

When replacing a generation 2 steering box with a generation 3 steering box, the electrical wiring ⇒ page 266 must also be replaced.

When fitted, the type of steering box can be identified from the number of securing bolts.

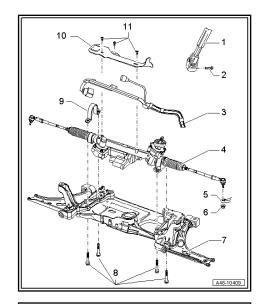
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Raise the vehicle.

The illustration shows a generation 2 steering box.

The generation 2 steering box is secured to the subframe with four bolts -8-.

The generation 3 steering box is attached to the subframe with three bolts -8- only; clamp -9- with bracket and rubber bush is



The generation 3 steering box is attached to the subframe on the right side with one bolt -5- only; clamp -1-, rubber bush -2- and bracket -3- are omitted. Instead of the fasteners -1-, -2- and -3-, the housing of the generation 3 steering box has a tapped hole for the securing bolt on the right side.

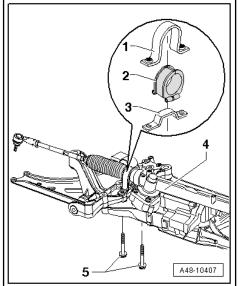


Note

The illustration shows the fastening elements of the generation 2 steering box.

Repair and servicing procedures for the generation 3 steering box are the same as for generation 2.

Generation 2 and 3 steering boxes continued ⇒ page 266



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4.2 Electro-mechanical steering box (LHD vehicles) - exploded view

1 - Universal joint

2 - Bolt

- □ 20 Nm + 90°
- ☐ Always renew if removed

3 - Electrical wiring

4 - Power steering box

- Removing and installing
- ☐ Different versions available; for correct version, refer to ⇒ Electronic parts catalogue "ETKA"
- When replacing a generation 2 steering box with a generation 3 steering box, the electrical wiring -3- must also be replaced.
- With power steering control unit -J500-
- Can be checked in "Guided Fault Finding" with vehicle diagnostic, testing and information system -VAS 5051B-

5 - Wheel bearing housing

6 - Nut

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

7 - Subframe with suspension brackets

8 - Bolt

- □ 50 Nm + 90°
- □ Always renew if removed
- ☐ Generation 3 steering box fitted with three bolts

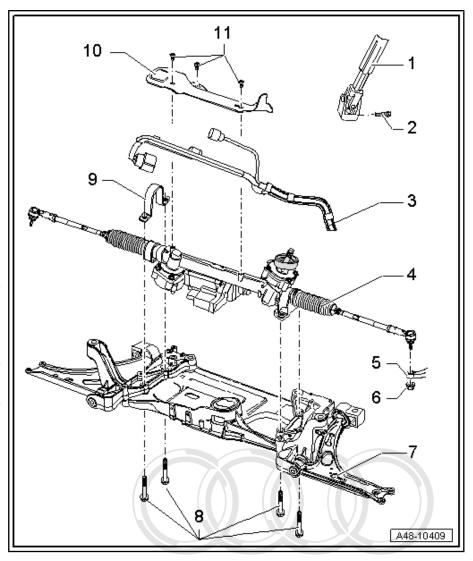
9 - Clamp with nuts

- □ Removing and installing ⇒ page 281
- □ Always renew if removed
- ☐ Only fitted with generation 2 steering box

10 - Guard plate

11 - Bolt

□ 6 Nm

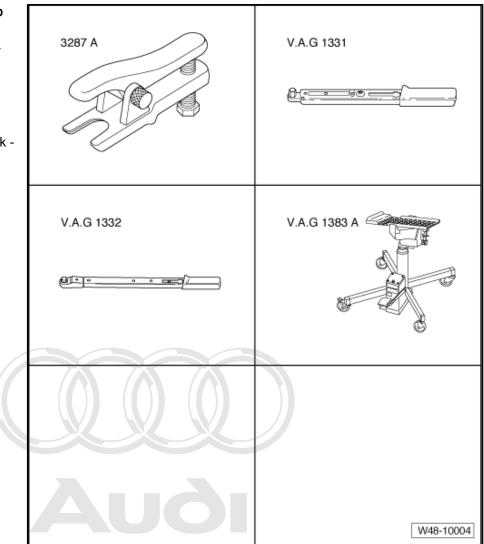


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4.3 Removing and installing electro-mechanical steering box

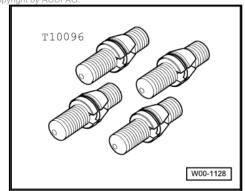
Special tools and workshop equipment required

- ♦ Ball joint puller -3287 A-
- Torque wrench -V.A.G 1331-
- Torque wrench -V.A.G 1332-
- Engine and gearbox jack V.A.G 1383 A-



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♦ Locating pins -T10096-



Removing



Note

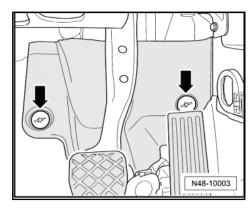
The steering box is removed together with the subframe, anti-roll bar and wishbones.



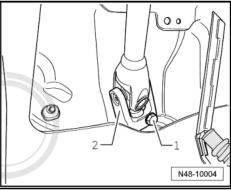
WARNING

Observe the following points before working on the electrical system and removing the steering wheel:

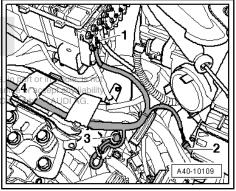
- ♦ Unscrew earth strap from battery ⇒ Rep. gr. 27.
- Make sure wheels are in straight-ahead position.
- Turn wheels to straight ahead position.
- Disconnect battery ⇒ Rep. gr. 27.
- Unscrew securing nuts -arrows- and detach cover for steering column universal joint.



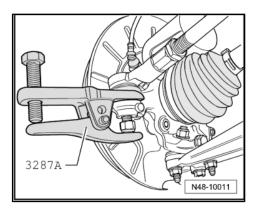
Unscrew bolt -1- and detach universal joint -2- from steering box.



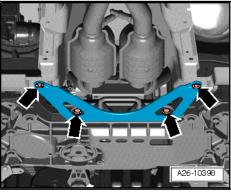
- Unplug connector -2- and disconnect wiring -1- and -3-.
- Unclip wiring harness -4- from cable duct.
- Remove front wheels.
- Detach noise insulation (bottom) PrigRep, gr for 66 vate or commercial purpose
- Remove frame for noise insulation the cheep of information in this document.
- Slacken off nut on track rod ball joint (but do not remove yet).



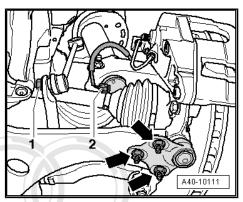
Press track rod ball joint off wheel bearing housing with -3287A-.



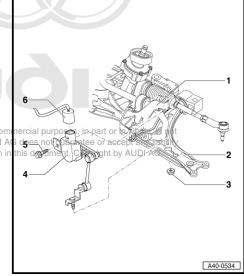
- Remove bolts -arrows- for exhaust bracket.



- Remove nut -1-.

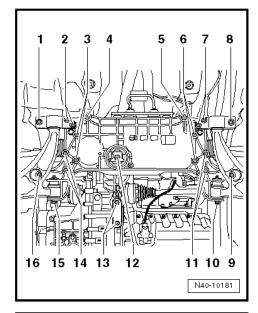


On vehicles with vehicle level sender, unscrew nut -3- and unplug connector -6-.

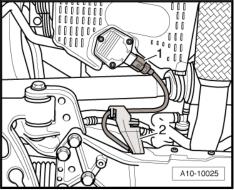


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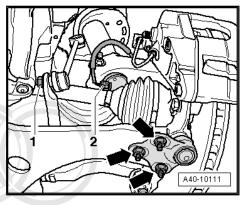
Unscrew bolts -13- and remove pendulum support from gear-



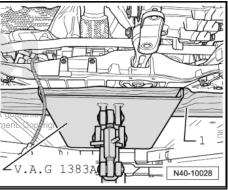
Unplug connector -1- for oil level and oil temperature sender -G266- and unclip wiring from bracket -2-.



- Mark positions of nuts -arrows- with felt pen on both sides of vehicle.
- Remove nuts -arrows- on both sides of vehicle.
- Pull wishbone out of swivel joint.
- Locate subframe in position ⇒ page 25.



Position engine and gearbox jack -V.A.G 1383 A- with suitable wooden block -1- under subframe and press subframe upwards lightly.



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- Remove bolts -4- and -5-.
- Lower subframe with attached components.

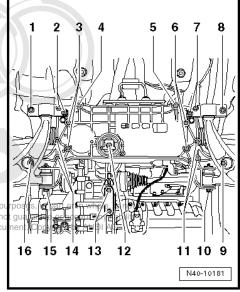


Note

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

- Unbolt cable duct from subframe.
- Detach heat shields from steering box.

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- Remove bolts -3- and -6- for steering box.
- Detach steering box from subframe.

Installing

Installation is performed in reverse sequence; note the following:

Tightening torques

⇒ "2.1 Exploded view of subframe, anti-roll bar, wishbone, swivel joint, vehicle level sender", page 15

Tightening torques

⇒ "4 Electro-mechanical steering box", page 264

Threaded sleeves of steering box must be located in subframe

Clamp with nuts must always be renewed when it has been removed <u>⇒ Item 16 (page 274)</u>.



Note

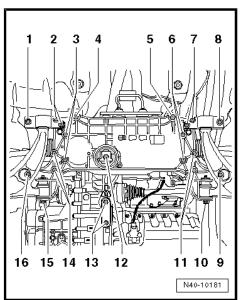
- Coat seal on steering box with suitable lubricant, e.g. soft soap, before installing steering box.
- ♦ After positioning steering box in relation to steering column shaft, ensure seal on steering box makes snug contact with base plate, without kinks, and properly seals off opening to footwell. Otherwise, this can result in water leaks and/or noise.
- ♦ Make sure sealing surfaces are clean.



Note

Ensure sealing boot is not damaged or twisted.

Always renew retaining plate if removed ⇒ Item 11 (page 15)



- Align position of nuts -arrows- according to markings made on removal and tighten nuts.
- Install frame for noise insulation ⇒ Rep. gr. 50.
- Install noise insulation ⇒ Rep. gr. 66.
- Connect battery ⇒ Rep. gr. 27.

Applies to vehicles with generation 2 steering box

If a new steering box has been installed, the basic setting for the power steering control unit -J500- must be re-adapted and a characteristic curve download must be performed using vehicle diagnostic, testing and information system -VAS 5051B- ⇒ Vehicle diagnostic, testing and information system VAS 5051 "Guided Fault Finding".

Applies to vehicles with generation 3 steering box

If a new steering box has been installed, the power steering connot trol unit 4500 must be re-adapted using vehicle diagnostic, visitity testing and information system VAS 5051B Vehicle diagnostic, testing and information system VAS 5051 "Guided Fault-Finding".

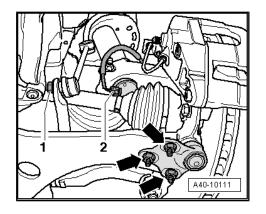
All vehicles

- Check and adjust wheel alignment as required, see chart ⇒ page 243 .
- On vehicles with electronic damping control (Audi magnetic ride), re-adapt reference position > Vehicle diagnostic, testing and information system VAS 5051.
- On vehicles with automatic headlight range control, carry out basic adjustment of headlights ⇒ Rep. gr. 94.
- If wheel alignment has been adjusted, calibrate steering angle sender -G85- using vehicle diagnostic, testing and information system -VAS 5051B- ⇒ page 242.

4.4 Exploded view - servicing electro-mechanical steering box

- ⇒ "4.5 Removing and installing rubber boot", page 275
- ⇒ "4.6 Removing and installing track rod", page 278
- "4.7 Removing and installing bonded rubber bush for generation 2 steering box", page 281
- ⇒ "4.8 Renewing sensor wiring", page 281
- ⇒ "4.9 Renewing and adjusting hydraulic thrust piece", page 285
- ⇒ "4.10 Renewing and adjusting thrust piece at steering pinion end", page 291
- ⇒ "4.11 Removing and installing steering pinion with steering moment sender G269 ", page 298

-Arrow- points in direction of travel.



1 - Steering box housing

2 - Track rod

- ☐ 100 Nm
- ☐ If defective, also renew track rod ball joint
- Removing and installing <u>⇒ page 278</u>

3 - Track rod ball joint (leftside)

Check that grease caps are seated correctly and not damaged

4 - Nut

- □ 50 Nm
- Counterhold track rod ball joint with spanner when loosening and tightening nut

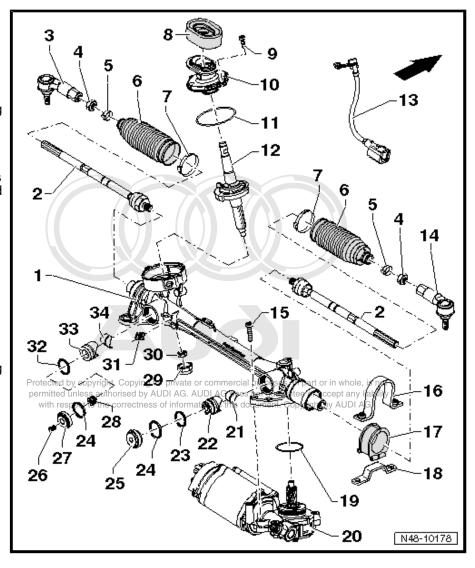
5 - Spring-type clip

6 - Boot

- Removing and installing ⇒ page 275
- □ Check for damage
- Must not be twisted when toe setting has been adjusted

7 - Hose clip

- ☐ Always renew if removed
- ☐ Secure new hose clip using locking pliers for steering box -VAS 6199-



8 - Seal

Between steering box and vehicle interior

9 - Bolt

- Secures cover ⇒ Item 10 (page 273) to steering box housing ⇒ Item 1 (page 273)
- □ 2x

10 - Cover

11 - Seal

Always renew

12 - Steering pinion with steering moment sender

- □ Removing and installing ⇒ page 298
- ☐ With steering moment sender -G269-

13 - Sensor wiring

- □ Removing and installing ⇒ page 281
- ☐ Electrical connection between steering moment sender -G269- and power steering control unit -J500-

14 - Track rod ball joint (right-side)

☐ Check that grease caps are seated correctly and not damaged

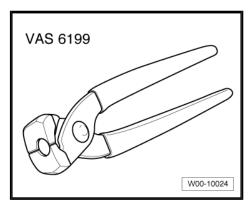
15 - E	Bolt
	Secures servo motor with control unit <u>⇒ Item 20 (page 274)</u> to steering box housing <u>⇒ Item 1 (page 273)</u>
16 - 0	Clamp with nuts
	Always renew if removed
	Removing and installing <u>⇒ page 281</u>
	Not fitted on vehicles with generation 3 steering box
	Generation 3 steering box is secured to the housing at this location with a bolt
17 - F	Rubber bush
	Removing and installing <u>⇒ page 281</u>
	Not fitted on vehicles with generation 3 steering box
18 - E	Bracket
	Removing and installing <u>⇒ page 281</u>
	Not fitted on vehicles with generation 3 steering box
19 - 9	Seal
	Always renew
20 - 9	Servo motor with control unit
	With power steering control unit -J500-
	With electromechanical power steering motor -V187-
	With steering motor speed sender -G 577-
	Can be checked in "Guided Fault Finding" with vehicle diagnostic, testing and information system -VAS
	5051B-
	Contact sheeting
	Fitted on hydraulic thrust piece <u>⇒ Item 22 (page 274)</u> , not supplied as individual component
	Lubricate sheeting on side facing rack with supplied grease -G 052 192 A1-
22 - ŀ	Hydraulic thrust piece
	Removing and installing <u>⇒ page 285</u>
23 - 8	Seal Seal
	Fitted on hydraulic thrust piece <u>⇒ Item 22 (page 274)</u>
24 - 9	Seal
	Insert into steering box housing (fitted between thrust piece and adjuster screw)
25 - <i>F</i>	Adjuster screw
	For hydraulic thrust piece <u>⇒ Item 22 (page 274)</u>
	Always renew
26 - F	Rubber plug
	Adjuster screw
	For mechanical thrust piece ⇒ Item 33 (page 275)
	Always renew
	Spring
_	Screw plug
	3 111 1 1 3
	Coat thread with LOCTITE -5910
1 - 08	
	Always renew if removed Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not
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	Secures sensor wiring \rightarrow Item 13 (page 273) to steering box housing \rightarrow Item 1 (page 273)

- 32 Seal
 - ☐ Fitted on mechanical thrust piece ⇒ Item 33 (page 275)
- 33 Mechanical thrust piece
 - ☐ Removing and installing ⇒ page 291
- 34 Contact sheeting
 - \Box Fitted on mechanical thrust piece \Rightarrow Item 33 (page 275), not supplied as individual component
 - ☐ Lubricate sheeting on side facing rack with supplied grease -G 052 192 A1-

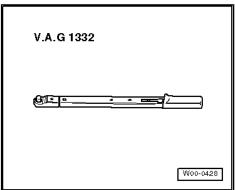
4.5 Removing and installing rubber boot

Special tools and workshop equipment required

◆ Locking pliers for Phaeton steering box -VAS 6199-



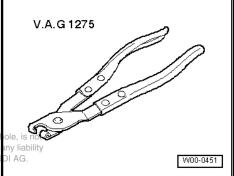
Torque wrench -V.A.G 1332-



♦ Hose clip pliers -V.A.G 1275-



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Removing



Note

Moisture and dirt will enter the steering box if the rubber boot is defective. It should be possible to feel a film of lubricant on and around the teeth of the steering rack. Renew steering box if no film of lubricant can be felt. Also renew steering box if there are signs of corrosion, damage or wear on the steering rack.

- Turn steering wheel to straight-ahead position.
- Remove wheel.
- Clean outside of steering box in area of rubber boot.

No dirt must be allowed to enter the steering box through a defective rubber boot during this operation.

- Mark position of nut -3- on track rod.
- Loosen nut -3- (counterhold track rod ball joint -2- for this pur-
- Loosen spring-type hose clip -1- on rubber boot using hose clip pliers -V.A.G 1275- and push onto track rod.
- Remove hose clip and detach rubber boot from steering box housing.
- Now unscrew track rod from track rod ball joint.
- Detach rubber boot with spring-type clip from track rod.



Note

- Renew complete steering box if there are signs of corrosion, damage, wear or dirt on the steering rack.
- The complete steering box must also be renewed if there is no visible lubricating film on the steering rack.

Installing

The steering rack must be lubricated with grease -G 052 192 A1supplied in the repair kit before installing.



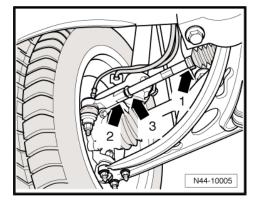
Caution

Do NOT use any other type of grease.

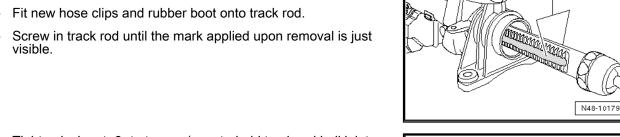
For this procedure turn steering to full lock in both directions.

A removed steering poxisis shown for ease of commercial outposes in part or in whole, is not proved in the control of the cont

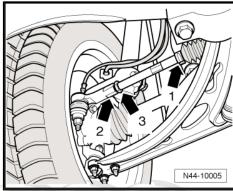
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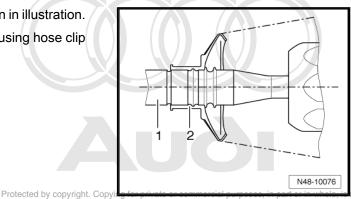
- Grease the steering rack on the side with teeth -A- and on the side that contacts the thrust pieces using grease -G 052 192 A1- .
- Turn steering wheel to straight-ahead position.



Tighten lock nut -3- to torque (counterhold track rod ball joint -2- for this purpose).



- 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- .
- Push rubber boot onto steering box housing.



Tighten new hose clip using locking pliers for Phaetonesteering correct box -VAS 6199- as far as shown in illustration.

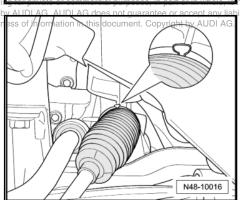
Remaining installation steps are carried out in reverse sequence.

Tightening torques

⇒ "4.4 Exploded view - servicing electro-mechanical steering box", page 272

Wheel alignment must be checked after installing.

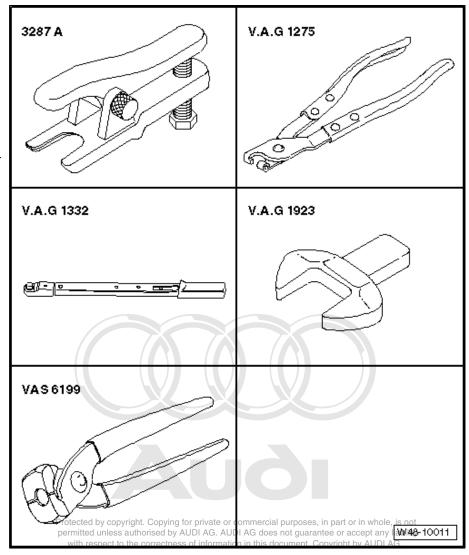
- Check wheel alignment ⇒ page 242
- Perform basic setting of steering angle sender -G85- ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding" .
- On vehicles with generation 2 steering box, basic setting of steering must then be re-adapted > vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".



Removing and installing track rod 4.6

Special tools and workshop equipment required

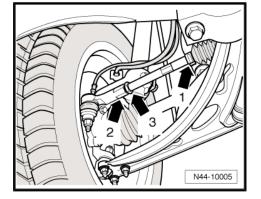
- ♦ Ball joint puller -3287 A-
- Hose clip pliers -V.A.G
- Torque wrench -V.A.G 1332-
- Open-end spanner attachment (38 mm) -V.A.G 1923-
- Locking pliers for Phaeton steering box -VAS 6199-



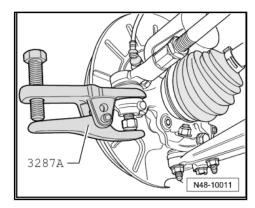
Removing track rod

- Turn steering wheel to straight-ahead position.
- Clean outside of steering box in area of rubber boot.
- Loosen nut -3- (counterhold track rod ball joint -2-).
- Remove front wheel.
- 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 out of wheel bearing housing using ball joint puller -3287 A- (and then unscrew nut).



- Loosen spring-type hose clip -1- on rubber boot using hose clip pliers -V.A.G 1275- and push onto track rod.
- Remove hose clip and detach rubber boot from steering box housing.



Unscrew track rod from steering rack using open end spanner Protected attachment (38 mm) e V Am C 1923 poses, in part or in whole, is not comitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.



Note

- Renew complete steering box if there are signs of corrosion, damage, wear or dirt on the steering rack.
- The complete steering box must also be renewed if there is no visible lubricating film on the steering rack.

Installing track rod

The steering rack must be lubricated with grease -G 052 192 A1supplied in the repair kit before installing.

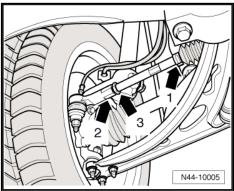


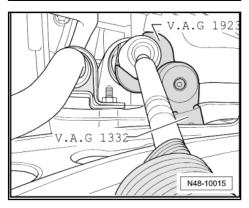
Caution

Do NOT use any other type of grease.

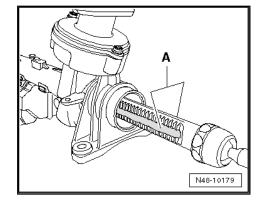
For this procedure turn steering to full lock in both directions.

A removed steering box is shown for ease of illustration.





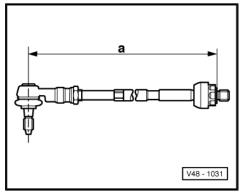
- Grease the steering rack on the side with teeth -A- and on the side that contacts the thrust pieces using grease -G 052 192
- Turn steering wheel to straight-ahead position.



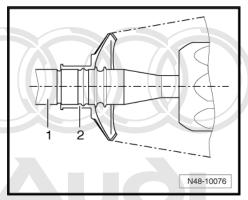
Screw track rod into track rod ball joint until dimension -a- is obtained.

Dimension -a- = $390 \pm 1 \text{ mm}$

- Fit new hose clips and rubber boot onto track rod.
- Screw track rod into steering rack and tighten to specified torque.



- Push rubber boot -2- onto track rod -1- (make sure boot is positioned correctly).
- Push rubber boot onto steering box housing as far as stop.



Tighten new hose clip using locking pliers for Phaeton steering box -VAS 6199- as far as shown in illustration. Protected by copy

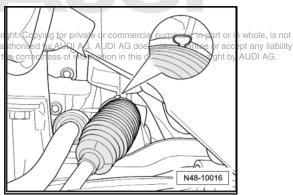
Remaining installation steps are carried out in reverse sequence.

Tightening torques

⇒ "4.4 Exploded view - servicing electro-mechanical steering

Wheel alignment must be checked after installing.

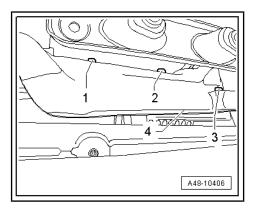
- Check wheel alignment ⇒ page 242
- Perform basic setting of steering angle sender -G85- ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".
- On vehicles with generation 2 steering box, basic setting of steering must then be re-adapted ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".



4.7 Removing and installing bonded rubber bush for generation 2 steering box

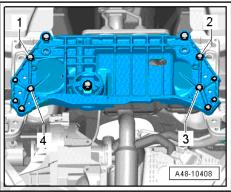
Removing

- Detach noise insulation (bottom) ⇒ Rep. gr. 66.
- Remove bolts -2- and -3- and press heat shield -4- upwards slightly.



- Loosen bolts -1- and -4- for steering box on left side of vehicle.
- Loosen and remove bolts -2- and -3- for steering box on right side of vehicle.

For clarity, the illustration shows the subframe and steering box removed from the vehicle.

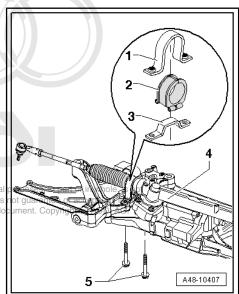


- Lift steering box -4- slightly on right side of vehicle.
- Detach clamp -1- and rubber bush -2- with bracket -3- from steering box.

Installing

Installation is performed in reverse sequence; note the following: Tightening torques ⇒ page 266.





4.8 Renewing sensor wiring

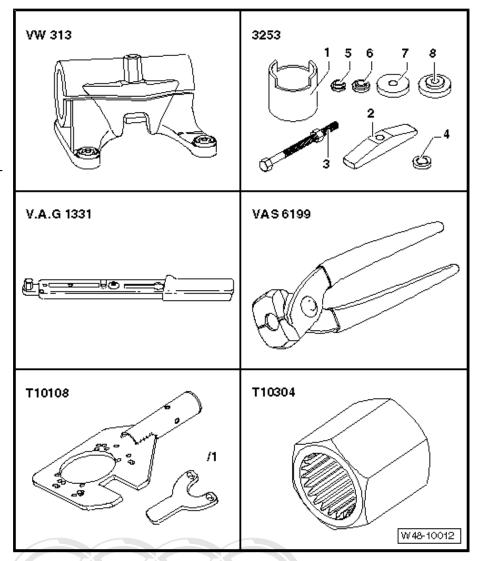


Note

This repair is not possible at present.

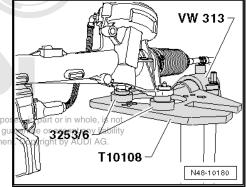
Special tools and workshop equipment required

- Support clamp -VW 313-
- Press tool -3253/6- Qty. 2
- Torque wrench -V.A.G 1331-
- Locking pliers for Phaeton steering box -VAS 6199-
- Gearbox support -T10108-
- Adapter -T10304-
- 2 bolts, M10 x 60



Removing

- Remove steering box \Rightarrow page 267.
- Clamp steering box as illustrated with 2 bolts (M10 x 60).
- Clean steering box in area of cover.



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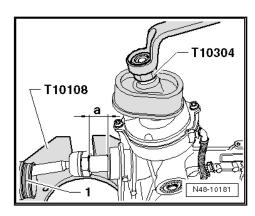
- Detach hose clip for rubber boot (left-side) -1- and pull boot off steering box housing.
- Turn steering to straight-ahead position using -T10304-.

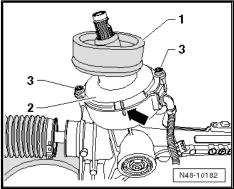
Dimension -a- must be 25.5 mm in this position.



- Remove seal -1- from cover -2-.
- Mark installation position of cover -2- on steering box housing -arrow-.
- Remove bolts -3- and detach cover -2-.

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Avoid touching electrical contacts -arrow-.

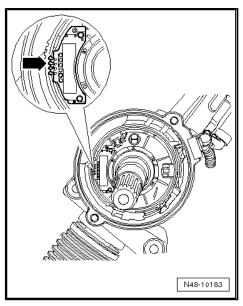
Note general repair instructions ⇒ page 251.



Caution

Use plastic sheeting or similar to cover open steering box housing and protect it from moisture if work is interrupted for more than a short period.

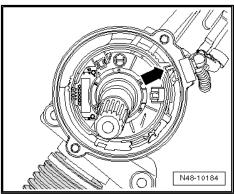
- Mark routing of sensor wiring on steering box housing.
- Unclip sensor wiring from steering box housing.





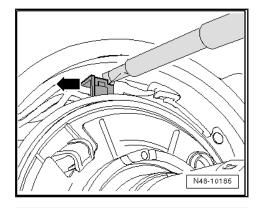
Note

The sensor wiring in the steering box housing is fitted with a securing element -arrow- for the steering pinion coil spring. When removing the sensor wiring, make sure that the coil spring is only turned as far as necessary to remove the electrical connector (not further than 30°).

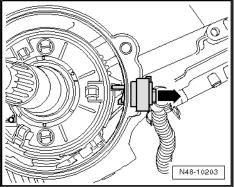


Now unplug sensor wiring connector at steering pinion.

To do so, press connector contact out of coil spring housing in direction of -arrow- using a screwdriver (width of blade 3 mm) as shown in illustration.



- Pull securing element out of steering box housing in direction of -arrow-.
- Carefully pull sensor wiring out of steering box housing.



- Unplug connector on sensor wiring at power steering control unit -J500- .
- To unplug connector, press tab -A- in direction of -arrow- and then detach connector.

Installing

- Carefully fit sensor wiring into steering box housing.
- When doing so, fit connector in coil spring housing, but do not lock it in place.

The connector is coded and can only be fitted in one position.



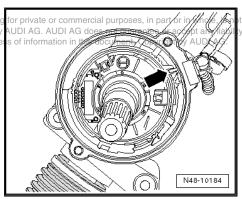
Note

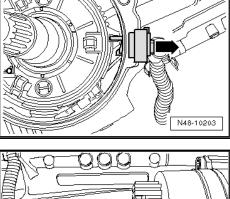
Turn the coil spring only as far as necessary to install the electrical connector (not further than 30°).

Press securing element into steering box housing.

Make sure that the securing element engages correctly in the ght. Copying plastic ring on the sensor unit -arrow-. permitted unless authorised by with respect to the correctn

Now lock connector in coil spring housing.





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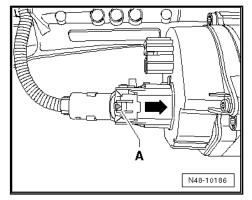
Attach connector on sensor wiring to power steering control unit -J500-

The connector should engage audibly.

Clip sensor wiring onto steering box housing.

Note routing of wires.

Renew seal on cover for steering pinion.



Pack space above oil seal in cover -arrow- completely with grease supplied -G 052 192 A1- .



Caution

Do NOT use any other type of grease.

- Fit cover according to mark made on removal ⇒ page 283.
- Fit new bolts and tighten to specified torque.

Tightening torques

⇒ "4.4 Exploded view - servicing electro-mechanical steering box", page 272

Remove excess grease on steering pinion and steering pinion cover.

Remaining installation steps are carried out in reverse sequence.

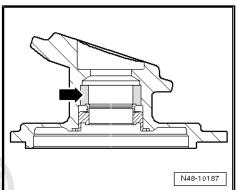
- Install steering box ⇒ page 267.
- Check wheel alignment → page 242
- Perform basic setting of steering angle sender -G85- ⇒ vehicle diagnostic, testing and information system eVAS 5051Bess, in part or in whole, is not "Guided Fault Finding" less authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.
- Then perform basic setting of steering ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".

4.9 Renewing and adjusting hydraulic thrust piece



Note

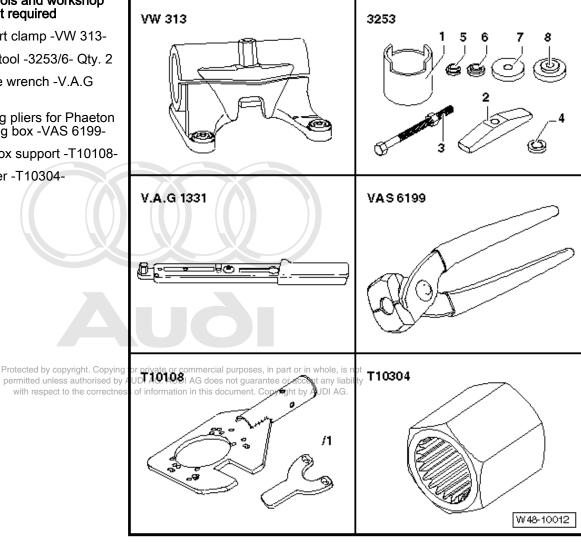
This repair is not possible at present.



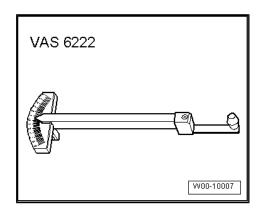


Special tools and workshop equipment required

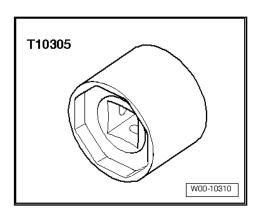
- Support clamp -VW 313-
- Press tool -3253/6- Qty. 2
- Torque wrench -V.A.G 1331-
- Locking pliers for Phaeton steering box -VAS 6199-
- Gearbox support -T10108-
- Adapter -T10304-



Friction gauge -VAS 6222-



♦ Adapter -T10305-

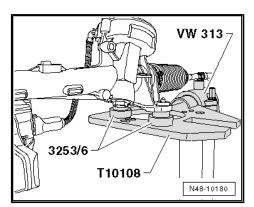


Special tools required in addition and auxiliary items (not illustrated)

- ♦ Wet and dry cleaner (e.g. -V.A.G 1373-)
- ♦ Battery-powered electric drill , e.g. -VAS 5036-
- ♦ Drill bit Ø 4 mm
- ♦ 2 bolts, M10 x 60

Removing

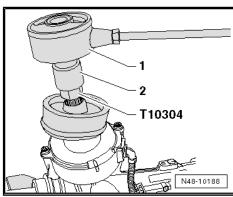
- Remove steering box ⇒ page 267.
- Clean steering box in area of adjuster screw.
- ocided by copyright. Copying for privite or commercial purposes in privation whole) is not Clamp, steering box as illustrated with 2 bolts (M10 x 60), billity with respect to the correctness of information in this document. Copyright by AUDI AG.



- Measure torque required to turn steering.
- First turn steering to full right lock (as seen in direction of trav-
- Then turn steering evenly back to full left lock using friction gauge, e.g. -VAS 6222- . Read off torque required to turn steering.

Specification: 3 ± 2 Nm

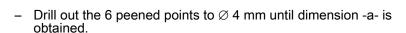
- 1 Friction gauge, e.g. -VAS 6222-
- 2 Socket, 24 mm



- Detach hose clip for rubber boot (left-side) -1- and pull boot off steering box housing.
- Turn steering to straight-ahead position using -T10304- .

Dimension -a- must be 25.5 mm in this position.

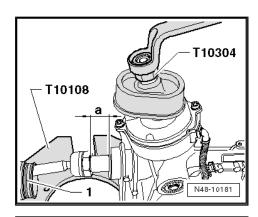
- Rotate steering box on assembly stand so that thrust piece with adjuster screw faces upwards.
- Now push rubber boot back onto steering box housing.

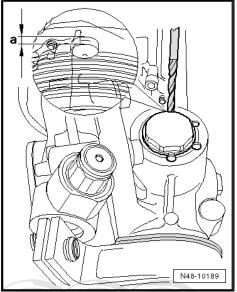


Dimension -a- = 3 mm

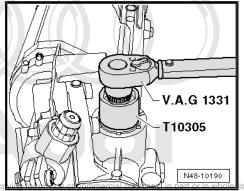
Do not drill below 3 mm.

Vacuum out all swarf from steering box housing using wet and dry cleaner -V.A.G 1373- or similar.





Unscrew adjuster screw.

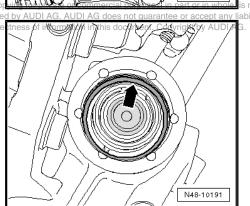


Remove seal -arrow-.

Pull steering rack towards thrust piece to help detach thrust piece.

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At the same time, pull hydraulic thrust piece out of steering box housing using suitable pliers.



Note

- Renew complete steering box if there are signs of corrosion, damage, wear or dirt on the steering rack.
- The complete steering box must also be renewed if there is no visible lubricating film on the steering rack.

N48-10192

Installing and adjusting

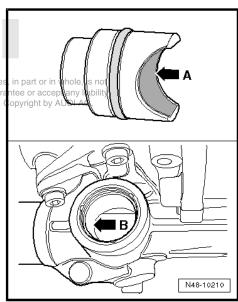
 Lubricate new thrust piece -arrow A- (on rack contact surface), seal and aperture in steering box housing -arrow B- with the grease supplied -G 052 192 A1- .



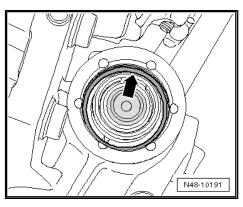
Caution

permitted unless authorised by AUDI AG. AUDI AG does in ot quar with respect to the correctness of information in this do

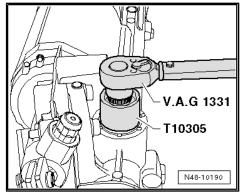
Do NOT use any other type of grease.



- Install hydraulic thrust piece and seal -arrow- by hand.

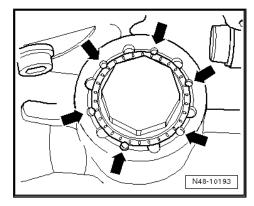


Tighten new adjuster screw to 40 Nm.



Peen adjuster screw 6 x -arrows- using a centre punch.

The punch marks must be offset by two graduations in relation to the drilled out punch marks.



- Mark the position of one of the graduations on the adjuster screw relative to the steering box housing -1-.
- Unscrew adjuster screw 5.5 graduations anti-clockwise -2-.

This should require a release torque of at least 15 Nm.

If this release torque is not attained:

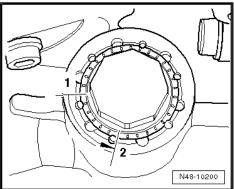
- Tighten adjuster screw once again to 40 Nm.
- Enlarge the 6 peening points using a centre punch.
- Check that marking of graduation on adjuster screw relative to steering box housing is still visible. Make new marking if necessary.
- Unscrew adjuster screw 5.5 graduations anti-clockwise.

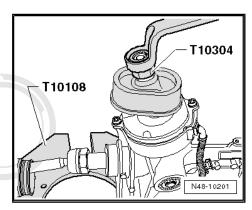
This should require a release torque of at least 15 Nm.

Using -T10304-, turn steering from full left lock to full right lock.

The steering should turn smoothly without sticking. If this is not the case, the surface of the steering rack is damaged and the steering box must be renewed.

Fit rubber boot (left-side) with new hose clip on steering box housing.





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- Measure torque required to turn steering.
- First turn steering to full right lock (as seen in direction of travel).
- Then turn steering evenly back to full left lock using friction gauge, e.g. -VAS 6222- . Read off torque required to turn steering.

Specification: 3 ± 2 Nm

- 1 Friction gauge, e.g. -VAS 6222-
- 2 Socket, 24 mm

If steering torque is higher than specified:

- Unscrew adjuster screw for hydraulic thrust piece one graduation anti-clockwise.
- Then check steering torque again ⇒ page 291.

If steering torque is lower than specified:

- Screw in adjuster screw for hydraulic thrust piece one graduation in clockwise direction.
- Then check steering torque again ⇒ page 291.
- Install steering box \Rightarrow page 267.
- Check wheel alignment ⇒ page 242
- Perform basic setting of steering angle sender -G85- ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".
- Then perform basic setting of steering ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".

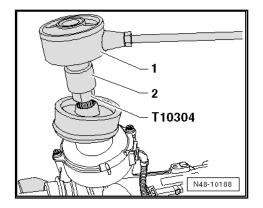
4.10 Renewing and adjusting thrust piece at steering pinion end



This repair is not possible at present.

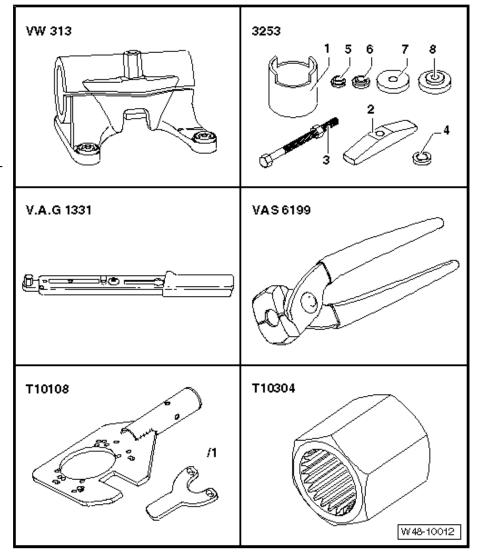


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Special tools and workshop equipment required

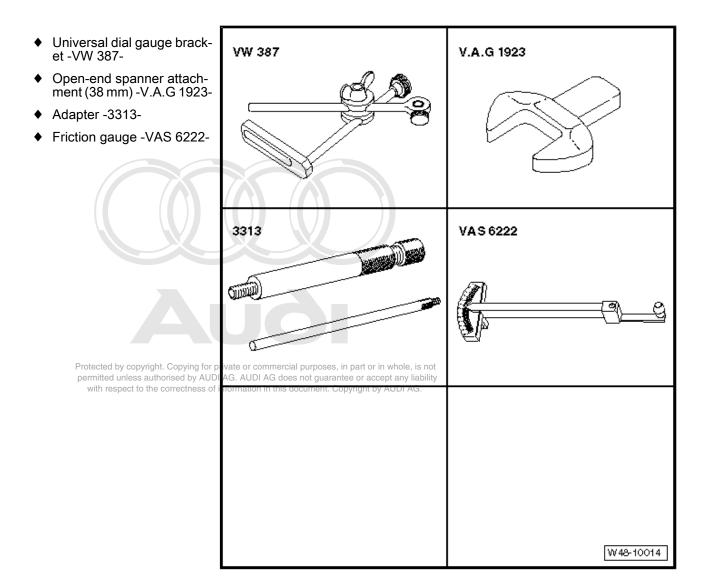
- Support clamp -VW 313-
- Press tool -3253/6- Qty. 2
- Torque wrench -V.A.G 1331-
- Locking pliers for Phaeton steering box -VAS 6199-
- Gearbox support -T10108-
- Adapter -T10304-





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Special tools required in addition (not shown on illustration)

Wet and dry cleaner (e.g. -V.A.G 1373-)

Battery-powered electric drill, e.g. -VAS 5036-

Drill bit Ø 4 mm

External circlip pliers, e.g. HAZET -1847-2-

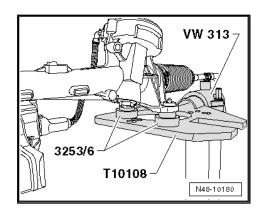
Dial gauge

2 bolts, M10 x 80

Removing

- Remove steering box ⇒ page 267.
- Clean steering box in vicinity of adjuster screw for mechanical thrust piece.

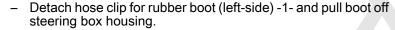
Clamp steering box as illustrated with 2 bolts (M10 x 80).



- Measure torque required to turn steering.
- First turn steering to full right lock (as seen in direction of trav-
- Then turn steering evenly back to full left lock using friction gauge, e.g. -VAS 6222- . Read off torque required to turn steering.

Specification: 3 ± 2 Nm

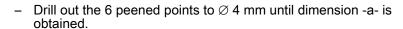
- 1 Friction gauge, e.g. -VAS 6222-
- 2 Socket, 24 mm



Turn steering to straight-ahead position using -T10304-.

Dimension -a- must be 25.5 mm in this position.

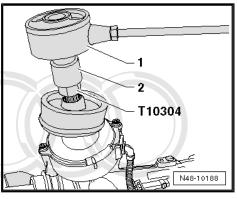
- Push rubber boot -1- back onto steering box housing, without by A hose clip.
- Rotate steering box on assembly stand so that thrust piece with adjuster screw faces upwards.

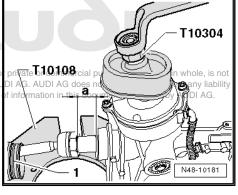


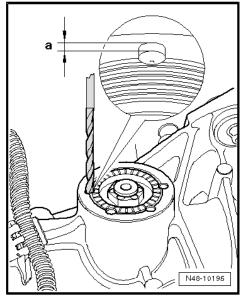
Dimension -a- = 3 mm

Do not drill below 3 mm.

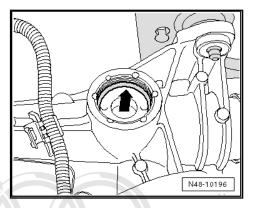
- Vacuum out all swarf from steering box housing using wet and dry cleaner -V.A.G 1373- or similar.
- Unscrew adjuster screw.







Remove spring and seal -arrow-.

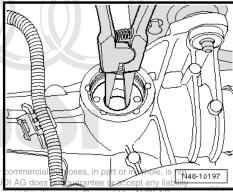


Pull thrust piece out of steering box housing using suitable pliers, e.g. HAZET -1847-2- .



Note

- Renew complete steering box if there are signs of corrosion, damage, wear or dirt on the steering rack.
- The complete steering box must also be renewed if there is no visible lubricating film on the steering rack.



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Installing and adjusting

Lubricate new thrust piece (on rack contact surface), seal and aperture in steering box housing with the grease supplied -G 052 192 A1- -arrows-.



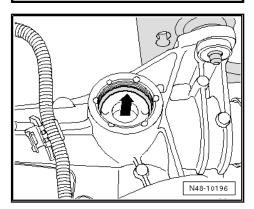
Caution

Do NOT use any other type of grease.

Fit thrust piece in steering box housing by hand.

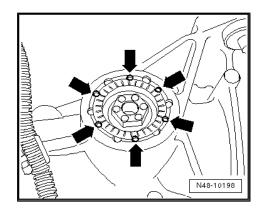
N48-10208

- Install new seal -arrow- and new spring.
- Tighten new adjuster screw to 40 Nm.



Peen adjuster screw 6 x -arrows- using a centre punch.

The punch marks must be offset by two graduations in relation to the drilled out punch marks.



- Mark the position of one of the graduations on the adjuster screw relative to the steering box housing -1-.
- Unscrew adjuster screw 6 graduations anti-clockwise -2-.

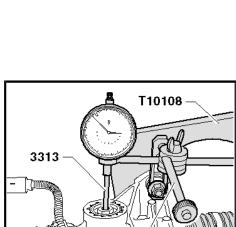
This should require a release torque of at least 15 Nm.

If this release torque is not attained:

- Tighten adjuster screw once again to 40 Nm.
- Enlarge the 6 peening points using a centre punch.
- Check that marking of graduation on adjuster screw relative to steering box housing is still visible. Make new marking if necessary.
- Unscrew adjuster screw 6 graduations anti-clockwise.

This should require a release torque of at least 15 Nm.

- Remove rubber plug from adjuster screw.
- Set up a dial gauge with 0.001 scale as shown in illustration.
- Set dial gauge to 1 mm preload.
- Apply torque wrench -V.A.G 1331- and open end spanner attachment (38 mm) -V.A.G 1923- to track rod and rotate steering rack with a torque of 40 Nm in the direction required to tighten the thread. Set dial gauge to "0" after torque wrench -V.A.G 1331- has attained the set torque.
- Detach torque wrench -V.A.G 1331- from track rod.
- Read off value indicated on dialigauge ercial purposes, in part or in whole, is not G does not guarantee or accept any liabili Specification: 0.005:005 mmormation in this document. Copyright by AUDI AG.



VW 387

N48-10202

N48-10199



Using -T10304-, turn steering from full left lock to full right lock. At the same time, watch values indicated on dial gauge.

Specification: 0.05...0.12 mm



Note

Renew the complete steering box if the clearance of the rack is not as specified.

- Detach dial gauge and adapter and press rubber plug into ad-
- Pull rubber boot (left-side) off steering box housing.
- Turn steering from full left lock to full right lock and grease visible parts of steering rack with the grease supplied -G 052 192 A1- .



Caution

Do NOT use any other type of grease.

permitti (ubber boot (left-side) with new hose clip on steering box winousing the correctness of information in this document. Copyright by AUDI AG.

- Measure torque required to turn steering.
- First turn steering to full right lock (as seen in direction of travel).
- Then turn steering evenly back to full left lock using friction gauge, e.g. -VAS 6222- . Read off torque required to turn steering.

Specification: 3 ± 2 Nm

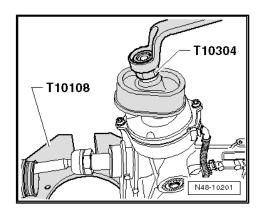
- 1 Friction gauge, e.g. -VAS 6222-
- 2 Socket, 24 mm

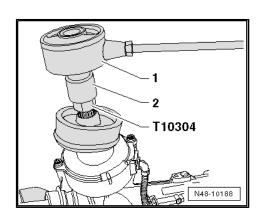
If steering torque is higher than specified:

- Unscrew adjuster screw for thrust piece at steering pinion end one graduation anti-clockwise.
- Then check steering torque again ⇒ page 297.

If steering torque is lower than specified:

- Screw in adjuster screw for thrust piece at steering pinion end one graduation in clockwise direction.
- Then check steering torque again ⇒ page 297.
- Install steering box ⇒ page 267.
- Check wheel alignment ⇒ page 242
- Perform basic setting of steering angle sender -G85- ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".
- Then perform basic setting of steering ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , "Guided Fault Finding".





Removing and installing steering pinion 4.11 with steering moment sender -G269-

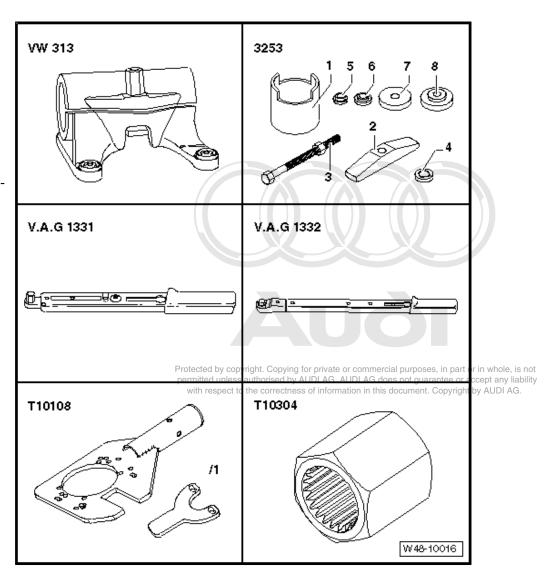


Note

This repair is not possible at present.

Special tools and workshop equipment required

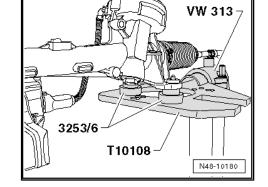
- Support clamp -VW 313-
- Press tool -3253/6- Qty. 2
- Torque wrench -V.A.G 1331-
- Torque wrench -V.A.G 1332-
- Gearbox support -T10108-
- Adapter -T10304-
- 2 bolts, M10 x 60



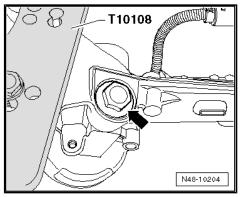
Removing

- Remove steering box \Rightarrow page 267.
- Clean steering box in vicinity of steering pinion, screw plug and adjuster screw.

- Clamp steering box as illustrated with 2 bolts (M10 x 80).
- Remove thrust piece at steering pinion end ⇒ page 291.
- Rotate steering box so that screw plug faces upwards.
- The track rods must be attached.



Remove screw plug -arrow- and clean thread.



- Unscrew hexagon nut -arrow- from steering pinion.

The rack will move to the end stop.

- Rotate steering box so that steering pinion faces upwards.
- Remove sensor wiring ⇒ page 281.



Note

The sensor wiring must be renewed. It is supplied with the repair

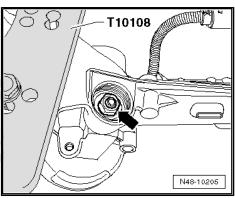
- Mark position of steering pinion in relation to steering box housing.
- Now pull steering pinion with steering moment sender out of steering box housing. Secure coil spring to stop it turning by

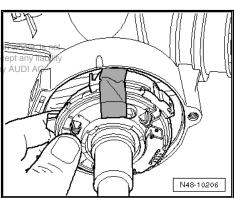
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Note

- Renew complete steering box if there are signs of corrosion, damage, wear or dirt on the steering rack.
- The complete steering box must also be renewed if there is no visible lubricating film on the steering rack.





Installing

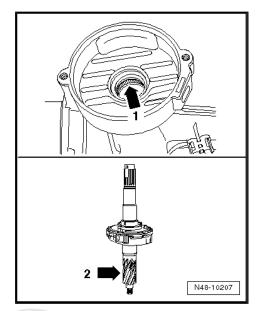
Lubricate bearing -arrow 1- and splines of steering pinion -arrow 2- using -G 052 192 A1- .

Do not apply grease on or near sensor.



Caution

Do NOT use any other type of grease.

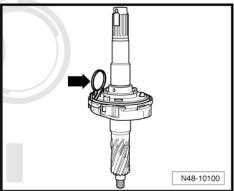


The new steering pinion with steering moment sender -G269- is fitted with a locating element -arrow-. This locating element must not be pulled out before the sensor wiring has been secured.

Do not remove the new steering pinion from the packaging until it is ready to be installed.

Avoid touching electrical contacts.

- Note general repair instructions <u>⇒ page 251</u>.
- Insert steering pinion into steering box housing.



Turn the steering pinion until the coil spring with the sensor urn the steering pinion until the coil spring with the sensor wiring -arrow- can be locked in position. The mark made when come removing must align with the mark on the steering box housing.



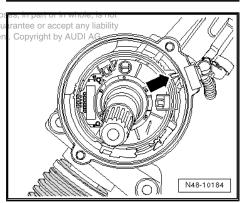
Note

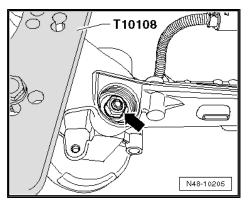
The sensor wiring must be renewed. It is supplied with the repair

- Pull locating element out of coil spring.
- Secure steering pinion with new hexagon nut -arrow-.

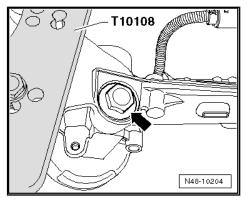
The rack will move to the end stop.

Pack space behind screw plug with grease -G 052 192 A1-.





- Apply LOCTITE -5910- sealant all round thread of screw plug -arrow- and install screw plug.
- Install sensor wiring ⇒ page 281.



- Turn steering to straight-ahead position using -T10304-.

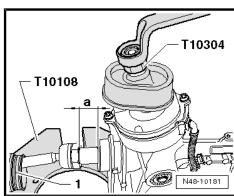
Dimension -a- must be 25.5 mm in this position.

Install and adjust thrust piece at steering pinion end ⇒ page 291

Tightening torques

⇒ "4.4 Exploded view - servicing electro-mechanical steering box", page 272

- Install steering box ⇒ page 267.
- Check wheel alignment ⇒ page 242
- Perform basic setting of steering angle sender -G85- ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , "Guided Fault Finding" .
- Then perform basic setting of steering ⇒ vehicle diagnostic, testing and information system -VAS 5051B-, "Guided Fault Finding".





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4.12 Electro-mechanical steering box (RHD vehicles) - exploded view

1 - Bolt

□ 6 Nm

2 - Guard plate

3 - Electrical wiring

4 - Hose clip

- □ Always renew if removed
- Secure new hose clip using locking pliers for steering box -VAS 6199-

5 - Boot

- Removing and installing ⇒ page 275
- Check for damage
- ☐ Must not be twisted when toe setting has been adjusted

6 - Spring-type clip

7 - Nut

- □ 50 Nm
- Counterhold track rod ball joint with spanner when loosening and tightening nut

8 - Track rod ball joint (leftside)

Check that grease caps are seated correctly and not damaged

9 - Track rod

- □ 100 Nm
- ☐ If defective, also renew track rod ball joint
- □ Removing and installing ⇒ page 278

10 - Subframe with suspension brackets

11 - Bolt

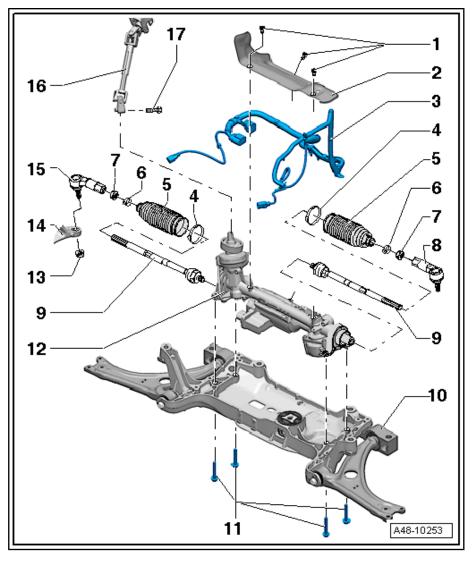
- □ 50 Nm + 90°
- □ Always renew if removed
- ☐ Generation 3 steering box fitted with 3 bolts

12 - Power steering box

- ☐ With power steering control unit -J500-
- Can be checked in "Guided Fault Finding" with vehicle diagnostic, testing and information system -VAS 5051B-

13 - Nut

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- 14 Wheel bearing housing
- 15 Track rod ball joint (right-side)
 - ☐ Check that grease caps are seated correctly and not damaged
- 16 Universal joint
- 17 Bolt
 - □ 20 Nm + 90°
 - □ Always renew if removed



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